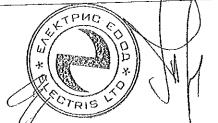
IEC 60 947-2

| Clause | Requirement – Test | Result – Remark | Verdict |
|-----------|--|--|---------|
| | | | |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release operate of the release | P |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A |
| 8.3.3.1.3 | Opening under overload conditions | | |
| a) | Instantaneous or definite time-delay releases | | |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated current: In (A) | | N1/6 |
| | Ambient temperature 10-40 °C : | | N/A |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 1 | N/A |
| | Range of adjustable setting current. (A) | | N/A |
| | Time delay stated by the manufacturer, in the cas of definite time delay releases. | 1-1. A.——————————————————————————————————— | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | , | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |

TRF No. IEC60947_2C



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Report No.600332-03/04

| 0 1 | IEC 60 947-2 | Result – Remark | Verdict |
|--|---|----------------------------|---------|
| Clause | Requirement Test | Result - Retitalk | verdict |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| ······································ | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1c | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | 25 A | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р |
| | Test ambient temperature (°C) | 40°C / | Р |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°6/ \ | Р |
| | Range of adjustable setting current: (A) | | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 21 A | Р |

TRF No. IEC60947_2C

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| | IEC 60 947-2 | | |
|----------|--|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 26 A | P |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | P |
| | Test current: 105% of the maximum adjustable setting current: (A) | 26,25 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | . Р |
| | Test current: 130% of the maximum adjustable setting current: (A) | 32,5 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| <u> </u> | Releases, independent of ambient air temperature | e: at 20°C or 40°C | |
| <u> </u> | Test ambient air temperature: | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | <u> </u> | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | , | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | An additional test, at a current specified by the r time/current characteristic of the releases conformanufacturer | THE COLOR OF THE C | |
| | Releases, dependent of ambient air temperatur Reference temperature (°C) | e: 40°C | P |
| L | | \sim \sim | |

TRF No. IEC60947_2C



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Report No.600332-03/01

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|-------------|--|---|---------|--|
| Clause | Requirement – Test | Result – Remark | Verdict | |
| | Releases, independent of ambient air temperature: at 30°C | - | N/A | |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | Short-circuit release ±20% Inverse time-delay Releases ±30% | P | |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | P | |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | | |
| | Test ambient air temperature: | | N/A | |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A | |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | N/A | |
| | · | | N/A | |
| | Manufacturer's name or trademark | OEZA.CO. | | |
| | Type designation or serial number | BC 160N | | |
| | Sample no: | 1d | | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | | |
| | Rated current: In (A) | 32 A | ļ | |
| | Ambient temperature 10-40 °C : | 40°C | Р | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 320 A | Р | |
| | Range of adjustable setting current. (A) | 160-320 A | P | |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | 9 | N/A | |
| · | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 128 A | Р | |

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| | - | IEC 60 947-2 | |
|--------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| | <u> </u> | | |

| Operating time: >0,2s in case of instantaneous releases: | | Р |
|--|--|-----|
| L1-L2: | No operate of the release No operate of the release | |
| Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | No operate of the release | N/A |
| L1-L2: L1-L3: L2-L3: | | |
| Test current: 80% of the maximum adjustable setting current: (A) | 256 A | Р |
| Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | 1 | P |
| Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: | | N/A |
| Test current: 120% of the rated, or minimum adjustable setting current: (A) | 192 A | P |
| Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3 | operate of the release | P |
| L2-L3 | | |
| Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| L1-L2:- | 3: | |

TRF No. IEC60947_2C

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Report No.600332-03/01

| Clause | Requirement – Test | Result - Remark | Verdict |
|-----------|--|---|----------|
| Clause | requirement – rest | Vezuit - Valliaiv | verdict |
| | Test current: 120% of the maximum adjustable setting current: (A) | 384 A | Р |
| | Operating time: <0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3: L2-L3: | operate of the release | |
| | | operate of the release | ļ |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: tripping current declared for single pole operation (A) | 320 A | P |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release | p |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | CM. | N/A |
| 8.3.3.1.3 | Opening under overload conditions | | |
| a) | Instantaneous or definite time-delay releases | | |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | <u> </u> |
| | Sample no: | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated current: In (A) | | <u> </u> |
| | Ambient temperature 10-40 °C: | | N/A |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | | N/A |

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| | IEC 60 947-2 | Result - Remark | Verdict |
|-------|---|----------------------------|---------|
| lause | Requirement – Test | Result - Remark | |
| | | | N/A |
| | Range of adjustable setting current. (A) | | |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | ٠ | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | (M | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| ļ | Type designation or serial number | BC 160N | |
| | Sample no: | 1d | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | 32 A | |

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| | IEC 60 947-2 | | |
|--------|--|---------------------------|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р |
| | Test ambient temperature (°C) | 40°C | Р |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р |
| | Range of adjustable setting current: (A) | - | .N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| - | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 26,25 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 26 A | P |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Test current: 105% of the maximum adjustable setting current: (A) | 32,5 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the maximum adjustable setting current: (A) | 41,6 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | |
| | Test ambient air temperature: | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A |

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| | IEC 60 947-2 | Danik Daniel | Verdict |
|----------|--|---|---|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | An additional test, at a current specified by the manu time/current characteristic of the releases conform to manufacturer | ufacturer to verify the o the curves provided by the | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | Р |
| <u> </u> | Releases, independent of ambient air temperature; at 30°C | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | Short-circuit release ±20% Inverse time-delay Releases ±30% | P |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes VV | Р |
| | Releases, independent of ambient air temperature | ; at 20°C or 40°C | |
| | Test ambient air temperature: | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | е | N/A |
| | | | 38 |
| - | Manufacturer's name or trademark | OEZ s.r.o. | 122 - 122 - 123 - |

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| | IEC 60 947-2 | | |
|--------|--|----------------------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1e | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | 111 |
| | Rated current: In (A) | 40 A | |
| | Ambient temperature 10-40 °C : | 40°C | Р |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 400 A | P |
| | Range of adjustable setting current. (A) | 200-400 A | Р |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 160 A | р |
| | Operating time: >0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3: L2-L3: | l . | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: | CM | N/A |
| | Test current: 80% of the maximum adjustable setting current: (A) | 320 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3 L2-L3 | No operate of the release | |
| | | No operate of the release | |

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| | · · · · · · · · · · · · · · · · · · · | IEC 60 947-2 | |
|--------|---------------------------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| Clause | rodanomon. | | |

| | Operating time: > twice time delay stated by the | | N/A |
|--|---|------------------------|-----|
| | manufacturer, in the case of definite time delay releases: | | |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 240 A | Р |
| | Operating time: <0,2s in case of instantaneous releases: | | P |
| | L1-L2: L1-L3: L2-L3: | | |
| | | operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: 120% of the maximum adjustable setting current: (A) | 480 A | P |
| <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u> | Operating time: <0,2s in case of instantaneous releases: | | P |
| | L1-L2: L1-L3 L2-L3 | | |
| | | operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3 L2-L3 | | |
| | Test current: tripping current declared for single pole operation (A) | 400 A | P |

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| Clause | Requirement – Test | | Result - Remark | Verdict |
|-----------|---|-------------------|--|---------------|
| | | | | |
| | | us 2: 3: | operate of the release operate of the release operate of the release | Р |
| | 1 | .1; .2; .3; | | N/A |
| 3.3.3.1.3 | Opening under overload conditions | | | |
| 1) | Instantaneous or definite time-delay releases | | | 1,5 |
| | Manufacturer's name or trademark | | | |
| | Type designation or serial number | | | 2 121 2 22 |
| | Sample no: | | | |
| | Rated operational voltage: Ue (V) | | | |
| | Rated current: In (A) | | | |
| | Ambient temperature 10-40 °C : | | | N/A |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value the shall operate. | еу | <u></u> | N/A |
| | Range of adjustable setting current. (A) | | | N/A |
| | Time delay stated by the manufacturer, in the ca of definite time delay releases. | ase | | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | • | | N/A |

🕢 ВЯРНО С ОРИГИНАЛА



Report No.600332-03/01

| | | Result – Remark | Verdict |
|----------|---|---------------------------|----------|
| lause | Requirement Test | Tour Trotton | |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| <u>,</u> | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | <u> </u> |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1e | <u> </u> |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690V AC | |
| | Rated current; In (A) | 40 A | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | P |
| | Test ambient temperature (°C) | 40°C | P |
| | If test made at a difference ambient temperature; Acc. manufacturer's correction temperature/curren data: | t 40°C | Р |
| | Range of adjustable setting current: (A) | - | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature at 30°C | : | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 33,6 A | Р |

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| IEC 60 947-2 | | | | |
|--------------|---|---|---------|--|
| Clause | Requirement – Test | Result - Remark | Verdict | |
| | | | 1 | |
| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | No operate of the release | Р | |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 41,6 A | Р | |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | Operate of the release | Р | |
| | Test current: 105% of the maximum adjustable setting current: (A) | 42 A | Р | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р | |
| | Test current: 130% of the maximum adjustable setting current: (A) | 52 A | Р | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р | |
| | Releases, independent of ambient air temperature | e: at 20°C or 40°C | | |
| | Test ambient air temperature: | | N/A | |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | · | N/A | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A | |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A | |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | · | N/A | |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A | |
| | An additional test, at a current specified by the ma time/current characteristic of the releases conforn manufacturer | anufacturer to verify the n to the curves provided by the | | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | Р | |

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|--------------|--|---|---------|--|
| Clause | Requirement – Test | Result – Remark | Verdict | |
| | Releases, independent of ambient air temperature: at 30°C | - | N/A | |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | short-circuit release ±20% Inverse time-delay releases ±30% | Р | |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | р | |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | | |
| | Test ambient air temperature: | | | |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A | |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | N/A | |
| | | | N/A | |
| | Manufacturer's name or trademark | OEZ s.r.o. | | |
| | Type designation or serial number | BC 160N | | |
| | Sample no: | 1f | | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | | |
| | Rated current: In (A) | 50 A | | |
| | Ambient temperature 10-40 °C : | 40°C | P P | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 50 A | P | |
| | Range of adjustable setting current. (A) | 250-500 A | P | |
| | | 1 | N/A | |

TRF No. IEC60947_2C

4/

Time delay stated by the manufacturer, in the case of definite time delay releases.

Test current: 80% of the rated, or minimum adjustable setting current: (A)

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200 A



N/A

| ause | Requirement – Test | Result – Remark | Verdict |
|------|---|---------------------------|---------|
| ause | Trequirement - 1650 | | |
| | Operating time: >0,2s in case of instantaneous releases: | | P |
| | L1-L2: | | |
| | L2-L3 | No operate of the release | |
| | · | No operate of the release | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: | q. | |
| | L2-L3 | | |
| | Test current: 80% of the maximum adjustable setting current: (A) | 400 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | Р |
| | L1-L2: | No operate of the release | |
| | L2-L | | |
| | | No operate of the release | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | Ces Ces | N/A |
| | L1-L2: L1-L L2-L | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 300 A | |
| | Operating time: <0,2s in case of instantaneous releases: | | P |
| | L1-L2: | operate of the release | |
| | L2-L | | |
| | | operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: | | |

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| | | Result - Remark | Verdict |
|---------------------------------------|---|------------------------|---------|
| ause | Requirement - Test | Treser Herris | |
| | Test current: 120% of the maximum adjustable setting current: (A) | 600 A | Р |
| · · · · · · · · · · · · · · · · · · · | Operating time: <0,2s in case of instantaneous releases: | | P |
| | L1-L2: L1-L3: L2-L3: | operate of the release | |
| | | operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: tripping current declared for single pole operation (A) | 500 A | P |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release | P |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1 L2 L3 | :: ' | N/A |
| 8,3.3.1.3 | Opening under overload conditions | | |
| a) | Instantaneous or definite time-delay releases | | |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated current: In (A) | | N/A |
| | Ambient temperature 10-40 °C : | | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value the shall operate. | ⊇y | N/A |

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| IEC 60 947-2 | | | |
|--------------|---|-----------------------------|---------------------------------------|
| lause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Range of adjustable setting current. (A) | | N/A |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| <u> </u> | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| | Type designation or serial number | BC 160N | 3 4 3 |
| | Sample no: | 1f | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V, 690 V AC | · · · · · · · · · · · · · · · · · · · |
| | Rated current: In (A) | 50 A | |

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| · | IEC 60 947-2 | n u D | Verdict |
|--------|--|---------------------------|----------|
| Clause | Requirement Test | Result – Remark | Verdict |
| | | | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р |
| | Test ambient temperature (°C) | 40°C | P |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р |
| | Range of adjustable setting current: (A) | - | <u> </u> |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | N/A | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 42 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 52 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Test current: 105% of the maximum adjustable setting current: (A) | 52,25 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the maximum adjustable setting current: (A) | 65 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Releases, independent of ambient air temperature | e: at 20°C or 40°C | |
| - | Test ambient air temperature; | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A |

V // / SPHO C OPUTUHANA



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| | IEC 60 947-2 | | |
|-------|--|---|---------|
| lause | Requirement - Test | Result - Remark | Verdict |
| | | | |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | | N/A |
| | An additional test, at a current specified by the man time/current characteristic of the releases conform manufacturer | ufacturer to verify the to the curves provided by the | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | Р |
| | Releases, independent of ambient air temperature at 30°C | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | short-circuit release ±20% Inverse time-delay releases ±30% | Р |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | P |
| | Releases, independent of ambient air temperature | e: at 20°C or 40°C | |
| | Test ambient air temperature: | | |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances). | e | N/A |
| | Manufacturer's name or trademark | OEZ s.r.o. | |

TRF No. IEC60947_2C

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Report No.600332-03/01

| | Dequirement Tast | Result - Remark | Verdict |
|----------|--|---------------------------|---------|
| Clause | Requirement – Test | | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1g | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500V,690 V AC | |
| | Rated current: In (A) | 63 A | |
| | Ambient temperature 10-40 °C : | 40°C | P |
| <u> </u> | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 630 A | Р |
| | Range of adjustable setting current. (A) | 315-630 A | Р |
| <u>,</u> | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 252 A | P |
| | Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: | No operate of the release | P |
| | L2-L3 | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | INA |
| | L1-L2: L1-L3 L2-L3 | | |
| | Test current: 80% of the maximum adjustable setting current: (A) | 504 A | P |
| | Operating time: >0,2s in case of instantaneous releases: | | |
| | L1-L2: L1-L L2-L | | |
| | | No operate of the release | |

TRF No. IEC60947_2C

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| | IEC 60 947-2 | Daniel Daniel | Vardiat |
|--------|---|------------------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 409,5 A | Р. |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | operate of the release | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | operate of the release | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: 120% of the maximum adjustable setting current: (A) | 756 A | Р |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3 | | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: | | N/A |
| | L1-L3 L2-L3 | 3: | |
| | Test current: tripping current declared for single pole operation (A) | 630 A | Р |

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| | Took | Result - Remark | Verdict |
|-----------|---|--|---------|
| Clause | Requirement - Test | Trootal | |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release operate of the release | P |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A |
| 8.3.3.1.3 | Opening under overload conditions | | |
| a) | Instantaneous or definite time-delay releases | | |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated operational voltage; Ue (V) | | |
| | Rated current: In (A) | | N/A |
| | Ambient temperature 10-40 °C : | | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value the shall operate. | ν | N/A |
| | Range of adjustable setting current. (A) | 1/1/ | N/A |
| | Time delay stated by the manufacturer, in the cas of definite time delay releases. | e | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |

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Report No.600332-03/01

| lause | Requirement – Test | Result Remark | Verdict |
|-------|---|-----------------------------|---------|
| | Nequientent 1000 | | |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| - | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1g | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V, 690 V AC | |
| | Rated current: In (A) | 63 A | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°¢ | Р |
| | Test ambient temperature (°C) | 40°C | Р |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р |
| | Range of adjustable setting current: (A) | - | N/A |
| • | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 52,5 A | Р |

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| | IEC | 60 947-2 | | | |
|--------|--------------------|-----------------|---------|--|--|
| Clause | Requirement - Test | Result – Remark | Verdict | | |

| lause | Requirement - rost | | |
|--|--|--|-------------|
| | Conventional non-tripping time: | No operate of the release | P |
| | 1h when In < 63A, 2h when In > 63 A | | |
| ······································ | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 65 A | Р |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | Operate of the release | P |
| | Test current: 105% of the maximum adjustable setting current: (A) | 66,15 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | P |
| | Test current: 130% of the maximum adjustable setting current: (A) | 81,9 A | P |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | Operate of the release | P |
| <u> </u> | Releases, independent of ambient air temperature | e: at 20°C or 40°C | |
| | Test ambient air temperature: | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | p, | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | An additional test, at a current specified by the r time/current characteristic of the releases conformanufacturer | nanufacturer to verify the rm to the curves provided by the | |
| | Releases, dependent of ambient air temperatur Reference temperature (°C) | re: 40°C | Р |

TRF No. IEC60947_2C

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BUBHO CODALARAM

Report No.600332-03/01

| | Tank | Result - Remark | Verdict |
|--------|--|---|---------|
| Clause | Requirement - Test | Tresuit - Hornark | |
| | Releases, independent of ambient air temperature: at 30°C | - | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | short-circuit release ±20% Inverse time-delay releases ±30% | P |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | Р |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | |
| | Test ambient air temperature: | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | N/A |
| | Manufacturer's name or trademark | OEZ s.r.o. | 2 |
| | Type designation or serial number | BC160N | |
| | Sample no: | 1h | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | 80 A | |
| | Ambient temperature 10-40 °C : | 40°C | Р |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 800 A | Р |
| | Range of adjustable setting current. (A) | 400-800 A | Р |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | , | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 320 A | Р |

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| | | Result – Remark | Verdict |
|---------|--|----------------------------|---------|
| lause | Requirement – Test | Result - Remark | |
| | Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | | P |
| | | No operate of the release | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3 L2-L3 | | |
| <u></u> | Test current: 80% of the maximum adjustable setting current: (A) | 640 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | P |
| · . | L1-L2: L2-L3 | | |
| | | No operate of the release | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L L2-L | | N/A |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 480 A | P |
| | Operating time: <0,2s in case of instantaneous releases: | · | Р |
| | L1-L2: L1-l L2-l | _3: operate of the release | |
| | | operate of the release | 1114 |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | | L3: L3: | |

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| | IEC 60 947-2 | | |
|-----------|---|--|---------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | Test current: 120% of the maximum adjustable setting current: (A) | 960 A | Р |
| | Operating time: <0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3: L2-L3: | operate of the release operate of the release operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: | | N/A |
| | L2-L3: | | |
| | Test current: tripping current declared for single pole operation (A) | 800 A | Р |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release | P |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | ^ | N/A |
| 8.3.3.1.3 | Opening under overload conditions | | |
| a) | Instantaneous or definite time-delay releases | | |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated current: In (A) | | |
| | Ambient temperature 10-40 °C : | | N/A |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | | N/A |

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BASHO COSALAHAVA

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| | IEC 60 947-2 | B B Barasti | Verdict |
|--|---|---------------------------|--|
| ause | Requirement – Test | Result – Remark | VERUICE |
| | | | N/A |
| | Range of adjustable setting current. (A) | | N/A |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A |
| <u> </u> | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| <u></u> | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| ······································ | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| <u> </u> | Manufacturer's name or trademark | OEZ s.r.o. | <u> </u> |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1h | 1.5 |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V 690V AC | 100 |
| | Rated current: In (A) | 80 A | 122 |

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| | IEC 60 947-2 | 1 | |
|--------|--|---------------------------|-------------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | | | T |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р. |
| | Test ambient temperature (°C) | 40°C | Р |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р |
| | Range of adjustable setting current: (A) | - | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 66,15 A | Р |
| - | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 81,9 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Test current: 105% of the maximum adjustable setting current: (A) | 84 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р |
| | Test current: 130% of the maximum adjustable setting current: (A) | 104 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Releases, independent of ambient air temperature | : at 20°C or 40°C | |
| | Test ambient air temperature: | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A |

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| | IEC 60 947-2 | | |
|------------|---|---|---------|
| 01-11-0 | Requirement – Test | Result – Remark | Verdict |
| Clause | Requirement | | |
| | Conventional tripping time: | | N/A |
| | <1h when in < 63A, <2h when in > 63 A | | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | | N/A |
| | An additional test, at a current specified by the mar time/current characteristic of the releases conform manufacturer | nufacturer to verify the to the curves provided by the | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | P |
| | Releases, independent of ambient air temperature at 30°C | - | N/A |
| , | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting | short-circuit release ±20% Inverse time-delay releases ±30% | P |
| | Current: (% or A) Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | Р |
| | Releases, independent of ambient air temperatur | e: at 20°C or 40°C | 21/4 |
| | Test ambient air temperature: | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting | | N/A |
| | current: (% or A) Tripping time acc, time/current characteristic of releases conform to the curves provided by the manufacturer. (within the stated tolerances) | the | N/A |
| | Thursday, and the same of the | | N/A |
| 1 | | C OEZ s.r.o. | |

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| | IEC 60 947-2 | | |
|--------|--|----------------------------|----------|
| Clause | Requirement Test | Result – Remark | Verdict |
| | | BC 160N | <u>,</u> |
| | Type designation or serial number | | <u></u> |
| | Sample no: | 11 | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | 100 A | |
| | Ambient temperature 10-40 °C : | 40°C | P |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 1000 A | Р |
| | Range of adjustable setting current. (A) | 500-1000 A | Р |
| • | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 400 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | P |
| | L1-L2: | No operate of the release | |
| | L1-L3: L2-L3: | | |
| | | No operate of the release | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3 L2-L3 | | |
| | Test current: 80% of the maximum adjustable setling current: (A) | A 008 | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | P |
| | L1-L2: | No operate of the release | |
| | L1-L3 L2-L3 | | |
| | | No operate of the release | |

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| | IEC 60 947-2 | | 1 |
|--------|---|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 600 A | P |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | operate of the release operate of the release operate of the release | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L2-L3 | | |
| | Test current: 120% of the maximum adjustable setting current: (A) | 1200 A | Р |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L L2-L | | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | Op-1- | N/A |
| | L1-L2: L1- L2- | | |
| · · | Test current: tripping current declared for single pole operation (A) | 1000 A | Р |

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| IEC 60 947-2 | | | | | |
|--------------|--|--|---------|--|--|
| Clause | Requirement – Test | Result – Remark | Verdict | | |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release operate of the release | Р | | |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A | | |
| 3.3.3.1.3 | Opening under overload conditions | | | | |
| a) | Instantaneous or definite time-delay releases | | | | |
| | Manufacturer's name or trademark | | | | |
| | Type designation or serial number | | | | |
| | Sample no: | | | | |
| | Rated operational voltage: Ue (V) | | | | |
| | Rated current: In (A) | | | | |
| | Ambient temperature 10-40 °C ; | | N/A | | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | | N/A | | |
| | Range of adjustable setting current. (A) | 1 | N/A | | |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | M | N/A | | |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A | | |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | | |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A | | |
| | Operating time: >0,2s in case of instantaneous releases | | N/A | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | | |

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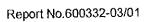
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| | IEC 60 947-2 | | |
|--------|---|----------------------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1i | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | <u></u> |
| | Rated current: In (A) | 100 A | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р |
| | Test ambient temperature (°C) | 40% | P |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/currendata: | 40°C | Р |
| | Range of adjustable selting current: (A) | - | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| - | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N// |
| | Releases, independent of ambient air temperature at 30°C | e: N/A | N// |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 84 A | P |

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| IEC 60 947-2 | | | | |
|--------------|---|---------------------------|---------|--|
| Clause | Requirement - Test | Result - Remark | Verdict | |
| - | | | | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р | |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 104 A | Р | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р | |
| | Test current: 105% of the maximum adjustable setting current: (A) | 105 A | Р | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р | |
| | Test current: 130% of the maximum adjustable setting current: (A) | 130 A | Р | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | P | |
| | Releases, independent of ambient air temperature: at 20°C or 40°C | | | |
| | Test ambient air temperature: | · | N/A | |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A | |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | | N/A | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A | |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A | |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A | |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | | N/A | |
| 1 | | | | |

An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the

Releases, dependent of ambient air temperature: Reference temperature (°C)

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| | | IEC 60 947-2 | |
|--------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |

| | Releases, independent of ambient air temperature at 30°C | э; - | | N/A |
|---------------|--|-------|---|-----|
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | - 1 | short-circuit release ±20% Inverse time-delay releases ±30% | р |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | ne | Yes | P |
| | Releases, independent of ambient air temperatur | re: a | t 20°C or 40°C | |
| | Test ambient air temperature: | | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | | N/A |
| | Tripping time acc, time/current characteristic of treleases conform to the curves provided by the manufacturer. (within the stated tolerances) | he | | N/A |
| | | - | | N/A |
| | Manufacturer's name or trademark | | OEZ s.r.o. | |
| | Type designation or serial number | 7 | BC 160N | |
| | Sample no: | 1 | 1j | |
| | Rated operational voltage: Ue (V) | / | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | | 125 A | |
| , | Ambient temperature 10-40 °C : | | 40°C | Р |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value the shall operate. | ney | 1250 A | Р |
| | Range of adjustable setting current. (A) | | 625-1250 A | Р |
| <u>. ·</u> | Time delay stated by the manufacturer, in the confiderinite time delay releases. | ase | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | | 500 A | Р |

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|--------------|---|--|--|--|
| Clause | Requirement – Test | Result - Remark | Verdict | |
| | Operating time: >0,2s in case of instantaneous releases: | | Р | |
| | L1-L2: L1-L3: L2-L3: | No operate of the release No operate of the release | | |
| | | No operate of the release | <u> </u> | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | |
| | L1-L2: L1-L3: L2-L3: | | A CONTRACTOR OF THE CONTRACTOR | |
| | Test current: 80% of the maximum adjustable setting current: (A) | 1000 A | Р | |
| | Operating time: >0,2s in case of instantaneous releases: | | Р | |
| | L1-L2: | No operate of the release | | |
| | L1-L3: L2-L3: | | . | |
| | | No operate of the release | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | |
| - | L1-L2: L1-L3: L2-L3: | \ \ \ | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 750 A | Р | |
| | Operating time: <0,2s in case of instantaneous releases: | | Р | |
| | L1-L2: | operate of the release | ' | |
| | L2-L3: | | | |
| | | operate of the release | | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | |
| | L1-L2: | | | |
| | L2- <u>//</u> 3: | | | |

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| | | IEC 60 947-2 | | |
|--------|------------------|--------------|-----------------|---------|
| Clause | Requirement Test | | Result – Remark | Verdict |

| | Test current: 120% of the maximum adjustable setting current: (A) | 1500 A | P |
|-----------|--|------------------------|-----|
| | Operating time: <0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3: L2-L3: | operate of the release | |
| | L2-L3. | operate of the release | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A |
| | L1-L2: L1-L3: L2-L3: | | |
| | Test current: tripping current declared for single pole operation (A) | 1250 A | Р |
| *** | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | | |
| · | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A |
| 8.3.3.1.3 | Opening under overload conditions | <u> </u> | |
| a) | Instantaneous or definite time-delay releases | | _ |
| | Manufacturer's name or trademark | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated current: In (A) | | |
| | Ambient temperature 10-40 °C : | | N/A |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | / | N/A |

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| IEC 60 947-2 | | | |
|--------------|---|--------------------------|----------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| | Range of adjustable setting current. (A) | | N/A |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases | | N/A |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | 1 | N/A |
| | Operating time: <0,2s in case of instantaneous releases | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | <u></u> |
| | Manufacturer's name or trademark | OEZ s.r.o. | <u></u> |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1j | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500V,690V AC | <u> </u> |
| | Rated current: In (A) | / 125 A | |

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| | IEC 60 947-2 | | 1 |
|-------------|--|---------------------------|-------------|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | | | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | Р |
| | Test ambient temperature (°C) | 40°C | Р |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р |
| | Range of adjustable setting current: (A) | ~ | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A |
| | Test ambient air temperature: | 40°C | N/A |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A |
| | Releases, independent of ambient air temperature: at 30°C | N/A | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 105 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | P |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 130 A | Р |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | Operate of the release | P |
| | Test current: 105% of the maximum adjustable setting current: (A) | 131,25A | |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | P |
| | Test current: 130% of the maximum adjustable setting current: (A) | 162,5 A | Р |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | Releases, independent of ambient air temperature | e: at 20°C or 40°C | |
| - | Test ambient air temperature: | | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | h | N/A |

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| IEC 60 947-2 | | | |
|--------------|--|---|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| <u> </u> | Conventional tripping time: | | N/A |
| | <1h when In < 63A, <2h when In > 63 A | | NI/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | | N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| | An additional test, at a current specified by the manutime/current characteristic of the releases conform to manufacturer | ufacturer to verify the o the curves provided by the | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | Р |
| | Releases, independent of ambient air temperature: at 30°C | - | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | short-circuit release ±20% Inverse time-delay releases ±30% | P |
| | Tripping time acc, time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | Р |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | |
| - | Test ambient air temperature: | | N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | N/A |
| | | | N/A |
| | Manufacturer's name or trademark | OEZ s.r.o. | |

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| | IEC 60 947-2 | | |
|--------|---|----------------------------|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| | | | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1k | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated current: In (A) | 160 A | |
| | Ambient temperature 10-40 °C : | 40°C | Р |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 1600 A | Р |
| | Range of adjustable setting current. (A) | 800-1600 A | Р |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 640 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | Р |
| | L1-L2: L1-L3: L2-L3: | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: | | N/A |
| | Test current: 80% of the maximum adjustable setting current: (A) | 1280 A | Р |
| | Operating time: >0,2s in case of instantaneous releases: | | P |
| | L1-L2: L1-L3 L2-L3 | | |
| | | No operate of the release | |

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| • | IEC 60 947-2 | | | | |
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| Clause | Requirement - Test | Result – Remark | Verdict | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | | |
| | L1-L2: L1-L3 L2-L3 | · | | | |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 960 A | Р | | |
| | Operating time: <0,2s in case of instantaneous releases: | | P | | |
| · | L1-L2: L1-L3 L2-L3 | I . | | | |
| | | operate of the release | | | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | | |
| | L1-L2: L1-L3 L2-L3 | | | | |
| | Test current: 120% of the maximum adjustable setting current: (A) | 1920 A | Р | | |
| | Operating time: <0,2s in case of instantaneous releases: | | Р | | |
| | L1-L2: | operate of the release | | | |
| | | operate of the release | | | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: | | N/A | | |
| | L1-L2: L1-L3 L2-L3 | | | | |
| | Test current: tripping current declared for single | 1600 A | Р | | |



Test current: tripping current declared for single pole operation (A)

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|-----------|---|---|---------|--|--|
| Clause | Requirement – Test | Result - Remark | Verdict | | |
| | Operating time: < 200 ms in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release | P | | |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A | | |
| 8.3.3.1.3 | Opening under overload conditions | | | | |
| a) | Instantaneous or definite time-delay releases | | | | |
| | Manufacturer's name or trademark | | | | |
| | Type designation or serial number | | | | |
| | Sample no: | | | | |
| | Rated operational voltage: Ue (V) | | | | |
| | Rated current: In (A) | | NI/A | | |
| | Ambient temperature 10-40 °C : | | N/A | | |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value the shall operate. | y | N/A | | |
| | Range of adjustable setting current. (A) | | N/A | | |
| | Time delay stated by the manufacturer, in the cas of definite time delay releases. | e | N/A | | |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | | N/A | | |
| | Operating time: >0,2s in case of instantaneous releases: | | N/A | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | | |
| | Test current: 90% of the maximum adjustable setting current: (A) | | N/A | | |
| | Operating time: >0,2s in case of instantaneous releases | | N/A | | |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | | |

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|--------------|---|----------------------------|---------|--|
| Clause | Requirement - Test | Result – Remark | Verdict | |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A | |
| | Operating time: <0,2s in case of instantaneous releases: | | N/A | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | | N/A | |
| | Operating time: <0,2s in case of instantaneous releases | | N/A | |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A | |
| b) | Inverse time delay releases | | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | | |
| | Type designation or serial number | BC 160N | | |
| | Sample no: | 1k | | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | | |
| | Rated current: In (A) | 160 A | | |
| | For releases dependent of ambient air temperature: Reference temperature | 40°C | P | |
| | Test ambient temperature (°C) | 40°C | р | |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | 40°C | Р | |
| | Range of adjustable setting current: (A) | • | N/A | |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | N/A | |
| | Test ambient air temperature: | 40°C | N/A | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | 40°C | N/A | |
| | Releases, independent of ambient air temperature: at 30°C | | N/A | |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 131,25 A | Р | |

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| Clause | Requirement - Test | | Result - Remark | Verdict |
| Clause | 10000000000000000000000000000000000000 | | <u> </u> | |

| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | elease P |
|----------|---|------------------|
| | Test current: 130% of the rated, or minimum 162,5 A adjustable setting current: (A) | Р |
| <u> </u> | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A Operate of the rele | ase P |
| | Test current: 105% of the maximum adjustable 168 A setting current: (A) | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A No operate of the r | elease P |
| | Test current: 130% of the maximum adjustable 208A setting current: (A) | |
| - | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | ease P |
| | Releases, independent of ambient air temperature: at 20°C or 40°C | |
| | Test ambient air temperature: | N/A |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | N/A |
| 4- | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | N/A |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | N/A |
| | Test current: 105% of the maximum adjustable setting current: (A) | N/A |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | , N/A |
| | Test current: 130% of the maximum adjustable setting current: (A) | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | N/A |
| | An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provide manufacturer | ne led by the |
| | Releases, dependent of ambient air temperature: 40°C Reference temperature (°C) | Р |

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| Clause | Requirement – Test | Result | – Remark | Verdict |

| | Releases, independent of ambient air temperature: at 30°C | - | N/A |
|----------------|--|---|-------|
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | short-circuit release ±20% Inverse time-delay releases ±30% | Þ |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | Yes | P |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | |
| | Test ambient air temperature: | | . N/A |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | | N/A |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | N/A |
| 8.3.3.1.4 | Additional test for definite time-delay releases / | | |
| a) | Time delay | 1 | |
| - i | Test is made at a current equal to 1,5 times the cur | rent setting | |
| | overload releases: (all phase poles loaded) | 1 | N/A |
| | short-circuit releases: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release. | | N/A |
| | Test current: 1,5 times of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time, overload releases: (s) | | N/A |
| | Time-delay: between the limits stated by the manufacturer: | | N/A |
| | Operating time, short-circuit releases: (s) L1-L2: L1-L3: L2-L3: | | N/A |

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| Clause | Requirement – Test | | Result – Remark | Verdict |

| | Time-delay: between the limits stated by the manufacturer: | N/A |
|---------------------------------------|---|-----|
| | Test current: 1,5 times of the maximum adjustable setting current: (A) | N/A |
| | Operating time, overload releases: (s) | N/A |
| | Time-delay: between the limits stated by the manufacturer: | N/A |
| · · · · · · · · · · · · · · · · · · · | Operating time, short-circuit releases: (s) L1-L2: L1-L3: L2-L3: | N/A |
| | Time-delay: between the limits stated by the manufacturer: | N/A |
| b) | Non-tripping duration | |
| | Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer. | |
| | overload releases: (all phase poles loaded) | N/A |
| - | short-circuit releases: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release. | N/A |
| | Test current: 1,5 times of the rated, or minimum adjustable setting current: (A) | N/A |
| | Time interval: non-tripping duration stated by the manufacturer: (s) | N/A |
| | Operating time, overload releases: the circuit-breaker does not trip: | N/A |
| | Operating time, short-circuit releases: the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | N/A |
| | Test current: 1,5 times of maximum adjustable setting current: (A) | N/A |
| | Time interval: non-tripping duration stated by the manufacturer: (s) | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | N/A |
| | Operating time, short-circuit releases: the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | N/A |

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| Clause | Requirement – Test | Result – Remark | Verdict |

| | Then, the current is reduced to the rated current an twice the time-delay stated by the manufacturer. The | | |
|------------------|--|--|-------|
| | Test current: of the rated, or minimum adjustable setting current: (A) | · | N/A |
| | Time interval: twice the delay-time stated by the manufacturer: (s) | | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | | N/A |
| | Operating time, <u>short-circuit releases</u> : the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | . N/A |
| | Test current: maximum adjustable setting current: (A) | | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | | N/A |
| | Operating time, <u>short-circuit releases</u> : the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | N/A |
| 3.3.3.2 | Test of dielectric properties, impulse withstand volta | age (Uimp indicated): | |
| 3.3.3.4 part1 | The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum | | |
| | - rated impulse withstand voltage (kV) : | 8 kV main circuits 4 kV auxiliary circuits | Р |
| | - sea level of the laboratory; | 340 m | Р |
| | - test Uimp main circuits (kV) : | 9,6 kV | Р |
| | - test Uimp auxiliary circuits (kV) : | 4,8 kV | Р |
| | - test Uimp control circuits (kV): | | N/A |
| - | - test Uimp on open main contacts (equipment suitable for isolating) (kV): | 14,5 kV | þ |
| a) | Application of test voltage | | Р |
| | i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in al normal positions of operation. | Meets | Р |

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| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | ii) Between all terminals of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation. | Meets | Р |
| | iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit | Meets | P |
| | - other circuits | Meets | P |
| | - exposed conductive parts | Meets | P |
| | - enclosure of mounting plate | Meets | Р |
| | iv) equipment suitable for isolation | Meets | P |
| | equipment not suitable for isolation | | N/A |
| | - no unintentional disruptive discharge during the test's | no | Р |
| | Test of dielectric properties, dielectric withstand vol | tage (Uimp not indicated): | |
| | - rated insulation voltage (V) : | | N/A |
| | - main circuits, test voltage for 1 min (V) | | N/A |
| | - auxiliary circuits, test voltage for 1 min (V) | | N/A |
| | - control circuits, test voltage for 1 min (V) | | N/A |
| 8.3.3.2.2 | Application of test voltage | | |
| 1) | with circuit-breaker in the closed position | • | |
| | - between all live parts of all poles connected together and the frame of the circuit-breaker. | Meets | Р |
| | - between each pole and all the other poles connected to the frame of the circuit-breaker | Meets | Р |
| 2) | with the circuit-breaker in the open position and, additionally, in the tripped position, if any. | | Р |
| | - between all live parts of all poles connected together and the frame of the circuit-breaker. | Meets | P |
| | - between the terminals of one side connected together and the terminals of the other side connected together. | Meets | Р |
| b) | Control and auxiliary circuits | | |
| 1) | between all the control and auxiliary circuits whice are not normally connected to the main circuit, connected together, and the frame of the circuit- breaker. | h Meets | Р |

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| Clause | Requirement - Test | Result – Remark | Verdict |
| 2) | - where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together. | Meets | Р |
| | No unintentional disruptive discharge during the test's | по | Р |
| 8.3.3.2 | For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA. | 0,015 mA | Р |
| 8.3.3.3 | Mechanical operation and operational performance | capability | |
| 8.3.3.3.2 | Construction and mechanical operation | | |
| a) | Construction | | |
| ; | A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1 | | N/A |
| | A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing | | N/A |
| b) | Mechanical operation | | |
| | A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3 | | N/A |
| . | A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer | | N/A |
| | A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage. | | . N/A |
| | It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device | | N/A |
| | For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker | Satisfy | P |
| | If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values | Satisfy | Р |

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| Clause Req | uirement – Test | Result – Remark | Verdict | | |
| | | | | | |
| c) Unde | ervoltage releases | | | | |
| requ the r havii | ervoltage releases shall comply with the irements of 7.2.1.3 of Part 1. For this purpose, release shall be fitted to a circuit-breakering the maximum current rating for which the ase is suitable | Satisfy | P | | |
| i) Drop | out voltage | | | | |
| the d | all be verified that the release operates to open circuit-breaker between the voltage limits cified | Satisfy | P | | |
| The a ra | voltage shall be reduced from rated voltage at te to reach 0 V in approximately 30 s | Satisfy | P | | |
| in th | test for the lower limit is made without current ne main circuit and without previous heating of release coil | Satisfy | P. | | |
| volt | ne case of a release with a range of rated ages, this test applies to the maximum voltage he range | Satisfy | Р | | |
| con app refe | e test for the upper limit is made starting from a stant temperature corresponding to the olication of rated control supply voltage to the ease and rated current in the main poles of the buit-breaker | Satisfy | Р | | |
| Thi rise | s test may be combined with the temperature- e test of 8.3.3.6 | Satisfy | P | | |

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In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages

Starting with the circuit-breaker open, at the temperature of the test room, and with the supply

voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator

When the supply voltage is raised to 85% of the

minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the

Test for limits of operation

operation of the actuator

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|--------------|---|-----------------|-----------|--|
| Clause | Requirement – Test | Result – Remark | Verdict | |
| ii) | Performance under overvoltage conditions | | | |
| , | With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions | Satisfy | . Р | |
| d) | Shunt releases | | | |
| | Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable | Satisfy | Р | |
| | It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker | Satisfy | P | |
| | In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage | Satisfy | Р | |
| 8.3.3.3.3 | Operational performance capability without current. | | | |
| | Type designation or serial number | BC 160N | | |
| | Sample no: | 1 | | |
| | Rated current In (A) | 160 A | | |
| | Rated operational voltage: Ue (V) | 690 V | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | N/A | | |
| | Rated control supply voltage of shunt releases: Uc (V) | 230 V AC | 3 3 j. 1. | |
| | Rated control supply voltage undervoltage releases: Uc (V) | 230 V AC | | |
| | Ambient temperature 10-40 °C : | 23°C | Р | |
| | Number of operating cycles per hour | 180/hour | Р | |
| | Number of cycles without current (total) (closing mechanism energized at the rated Uc) | 20000 | Р | |
| | Number of cycles without current (without releases) | 16000 | Р | |
| | Applied voltage: closing mechanism (V) | | N/A | |

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| | IEC 60 947-2 | e u B | Verdict |
|-----------|---|-------------------------|---------|
| Clause | Requirement – Test | Result – Remark | Veruici |
| | 10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated Uc | 2000 | Р |
| | Applied voltage: shunt releases (V) | 400 V AC | Р |
| | 10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated Uc | 2000 | Р |
| | 10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.) | Meets | Р |
| | Applied voltage: undervoltage releases (V) | 400 V AC | Р |
| | Electrical components do not exceed the value indicated in tab. 7. | | N/A |
| 8.3.3.3.4 | Operational performance capability with current. | | |
| | Rated current: In (A) | 160 A | |
| | Maximum rated operational voltage: Ue (V) | 690 V | |
| | Conductor cross-sectional area (mm²): | 70 mm ² | Р |
| | Number of operating cycles per hour | 180/hour | Р |
| | Number of cycles with current (total) (closing mechanism energized at the rated Uc) | 4000 | Р |
| | Applied voltage: closing mechanism (V) | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | Satisfy | Р |
| | Conditions, make/break operations: | | |
| | - test voltage U/Ue = 1,0 (V)L1: | 690 V 690 V 690 V | P |
| | - test current I/le = 1,0 (A) | 160 A 160 A 160 A | P |
| | - power factor/time constant: | 0,8 | Р |
| | - frequency: (Hz) | 50 Hz | Р |
| | - on-time (ms): | 60 ms | Р |

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| Clause | Requirement - Test | Result – Remark | Verdict |
| | - off-time (s): | 20 s | T P |
| | Electrical components do not exceed the value indicated in tab. 7. | Meets | P |
| 8.3.3.3.5 | Additional test of operational performance capabili withdrawable circuit-breaker. | Ity without current for | |
| | Number of operations cycles : 100 | | N/A |
| | After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service. | | N/A |
| 8.3.3.4 | Overload performance | | |
| | this test applies to circuit-breaker of rated current up to and including 630 A | | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 1 | |
| | Rated current in (A) | 160 A | |
| | Rated operational voltage: Ue (V) | 690 V AC | |
| | Rated control supply voltage of closing mechanism Uc (V) | N/A | |
| | Rated control supply voltage of shunt releases: Uc (V) | 230 V AC | |
| | Rated control supply voltage undervoltage releases: Uc (V) | 230 V AC | |
| | Ambient temperature 10-40 °C : | 22°C | Р |
| | Number of operating cycles per hour | 180/hour | Р |
| | Maximum rated operational voltage: Ue (V) | 690 V | Р |
| | Number of operating cycles per hour | 180/hour | Р |
| | Number of cycles with current (total) (closing mechanism energized at the rated Uc) | 12 | Р |
| | Applied voltage: closing mechanism (V) | , | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum. | Satisfy | Р |
| | Conditions, overload operations: | | |
| | - test voltage U/Ue = 1,05 (V) | 725 V 725 V 725 V | Р |



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| Clause | Requirement – Test | Result – Remark | Verdict | |
| | | | | |
| | - test current AC/DC: I/le = 6,0/2.5 (A) | 960 A AC 960 A AC 960 A AC | Р | |
| - | - power factor/time constant: | 0,5 | Р | |
| | - Number of cycles manually opened: 9 | - | | |
| | - Number of cycles automatically opened by an overload release: 3 | 12 | Р | |
| | - frequency: (Hz) | 50 Hz | Р | |
| | - on-time max 2s: | Satisfy | | |
| 8.3.3.5 | Verification of dielectric withstand | | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1380 V | p | |
| | - no breakdown or flashover | Meets | Р | |

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| Clause | Requirement – Test | Result – Remark | Verdict | | |

| 3.3.3.6 | Verification of temperature-rise | | |
|---------|---|-----------|---|
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | Meets | P |
| | Temperature rise of main circuit terminals ≤ 80 K (K): | Max. 68 K | Р |
| | conductor cross-sectional area (mm²) : | 70 mm² | P |
| | test current le (A) : | 160 A | p |
| 8.3.3.7 | Verification of overload releases | | |
| | Test current: 1.45 times the value of their current setting at the reference temperature: (A) | 232 A | P |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | 6'23" | Р |
| 8,3.3.8 | Verification of undervoltage and shunt releases | | |
| | Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage - | Satisy | Р |
| | and shall operate at 35% of the maximum control supply voltage. | Satisfy | Р |
| | Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature. | Satisfy | P |

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| Clause | Requirement - Test | | Result – Remark | Verdict | |

| 8.3.3.9 | Verification of the main contact position for circuit- | | |
|---------|--|-----------|-----|
| | actuating force for opening (N) | 55 N | |
| | test force with blocked main contacts for 10 s (N) | 165 N | _ |
| | Dependent power operation | | |
| | Supply voltage of 110% of rated voltage (V): | · | N/A |
| | Three attempts of 5 s to operate the equipment at intervals of 5 mln. | · | N/A |
| | Independent power operation | | |
| | Three attempts to operate the equipment by the stored energy. | Satisfy . | Р |
| | Lockability of driving mechanism in OFF-position at test force and blocked main contacts | | P |
| | Position indicator does not show OFF-position after capture of test force at blocked main contacts | Meets | Р |

| 8.3.4 | TEST SEQUENCE II (Ics): | | |
|---------|--|----------------------------|---|
| 8.3.4.1 | Test of rated service short-circuit breaking capacity | | |
| | Test sequence of operation: O - t - CO - t - CO Type designation or serial number BC 160 | | |
| | | | |
| | Sample no: | 2, 3, 4,5 | |
| | Rated current: In (A) | 160 A | |
| - | Rated operational voltage: Ue (V) | 230 A,415 V,500 V,690 V AC | |
| | Rated service short-circuit breaking capacity: (kA) | 20 kA/23 0V, 13 kA/415 V, | |
| | | 6 kA/500 V, 3 kA/690 V | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | Satisfy | Р |

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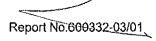
ВЯРНО С ОРИГИНАЛА

| | Requirement – Test | Result – Remark | Verdict |
|---------------------------------------|---|--------------------|---------|
| Clause | Requirement – rest | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | Salisfy | P · |
| · · · · · · · · · · · · · · · · · · · | Test made in free air: | Satisfy | P |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | P |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | Yes | Р |
| | - ratio hole area/total area: 0,45-0,65 | Satisfy | P |
| | - size of hole: <30mm² | Satisfy | P |
| | - finish: bare or conductive plating | Satisfy | P |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | Satisfy | P |
| | Circuit is earthed at: (load-star- or supply-star poin | t) Load-star | P |
| | Conductor cross-sectional area (mm²): | 70 mm ² | P |
| | If terminals unmarked: line connected at: (underside/upside) | 1 | N/A |
| | Tightening torques: (Nm) | 6 Nm | P |
| | Test sequence of operation: O-t-CO-t-CO | | |
| | - test voltage U/Ue = 1,05 (V) | 1200 1 | P |
| | - r.m.s. test current AC/DC: (A) L1 L2 L3 | 20 9 14 40 | Р |
| - | power factor/time constant : | 0,27 | p |
| | - Factor "n" | 2,0 | P |
| | - peak test current (A): | 41,0 kA | F |

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ВЯРНО С ОРИГИНАЛА

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| IEC 60 947-2 | | | | |
|--------------|--------------------|--|-----------------|---------|
| Clause | Requirement – Test | | Result – Remark | Verdict |

| Test sequence "O" | | |
|--|---|---|
| - max. let-through current: (kApeak)L1:L2:L3: | 8,75 kA 11,6 kA 6,54 kA | Р |
| - Joule integral I²dt (A²s) | 122000 A ² s 287000 A ² s 86300 A ² s | Р |
| Pause, t: (min) | 3 min | Р |
| Test sequence "CO" | | |
| - max. let-through current: (kApeak)L1: L2: L3: | 11,2 kA 9,84 kA 5,79 kA | P |
| - Joule integral I ² dt (A ² s)L1: L2: L3: | 231000 A ² s 268000 A ² s 91900 A ² s | Р |
| Pause, t: (min) | 3 min | Р |
| Test sequence "CO" | | |
| - max. let-through current; (kApeak)L1; L2; L3; | 8,56 kA 5,16 kA 12,0 kA | Р |
| - Joule integral I²dt (A²s)L1:L2:L3: | 144000 A ² s 434000 A ² s 298000 A ² s | р |
| Melting of the fusible element | | Р |
| Holes in the PE-sheet for test sequence "Q" | | Р |
| Cracks observed | | Р |
| Test sequence of operation: O-t-CO-t-CO | | |
| - test voltage U/Ue = 1,05 (V) | 436 V 436 V 436 V | Р |
| - r.m.s. test current AC/DC: (A) L1: L2: | 13,5 kA AC 13,0 kA AC 13,4 kA AC | Р |
| power factor/time constant : | 0,28 | Р |
| - Factor "n" | 2,0 | Р |
| - peak test current (A) : | 25,8 kA | Р |

4

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| Г | IEC 60 947-2 | | | | | | |
|---|--------------|--------------------|------------|--------|---------|--|--|
| | | | | armark | Verdict | | |
| | Clause | Requirement – Test | Result - R | enak | 70,0,0, | | |

| - | Test sequence "O" | |
|------------|---|---|
| | - max. let-through current: (kApeak) L1: 5,94 kA L2: 11,3 kA L3: 9,25 kA | P |
| | - Joule integral I ² dt (A ² s) | Р |
| <u>-</u> . | Pause, t: (min) 3 min | Р |
| | Test sequence "CO" | |
| · ., | - max. let-through current: (kApeak)L1: 11,4 kA 9,38 kA 6,72 kA | Р |
| | - Joule integral I ² dt (A ² s) | Р |
| | Pause, t: (min) 3 min | P |
| | Test sequence "CO" | |
| | - max. let-through current: (kApeak)L1: 7,5 kA 11,4 kA 6,59 kA | Р |
| <u> </u> | - Joule integral I²dt (A²s) | Р |
| | Melting of the fusible element | Р |
| | Holes in the PE-sheet for test sequence "O" | Р |
| | Cracks observed | P |
| | Test sequence of operation: O - t - CO | P |
| | L3: 550 V | |
| | - r.m.s. test current AC/DC: (A) L1: 6,19 kA AC 6,13 kA AC 6,38 kA AC | P |
| | power factor/time constant : 0,66 | Р |
| - | - Factor "n" | Р |
| | - peak test current (A) : 9,69 kA | P |

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| | IEC | 60 947-2 | |
|--------|------------------|-----------------|---------|
| Clause | Requirement Test | Result - Remark | Verdict |
| Clause | Nedmenter Lost | | |

| | Test sequence "O" | T | |
|----------|---|---|---|
| | - max. let-through current: (kApeak) | 5,0 kA 7,03 kA 6,41 kA | P |
| | - Joule integral I ² dt (A ² s) L1: | 120000 A ² s 184000 A ² s 203000 A ² s | P |
| - | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| <u> </u> | - max. let-through current: (kApeak)L1: L2: L3: | 5,0 kA 7,27 kA 6,09 kA | Р |
| | - Joule integral I²dt (A²s) | 140000 A ² s 213000 A ² s 186000 A ² s | P |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak)L1: L2: L3: | 72,7 kA 6,01 kA 5,63 kA | P |
| | - Joule integral I²dt (A²s)L1: L2: L3: | 249000 A ² s 105000 A ² s 140000 A ² s | Р |
| | Melting of the fusible element | | Р |
| | Holes in the PE-sheet for test sequence "O" | | р |
| | Cracks observed | | Р |
| | Test sequence of operation: O - t - CO - t - CO | | |
| | - test voltage U/Ue = 1,05 (V)L1:L2:L3: | 725 V | Р |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | 3,08 kA AC | P |
| · | power factor/time constant : | 0,8 | Р |
| | - Factor "n" | 1,5 | Р |
| | - peak test current (A): | 4,5 kA | Р |

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ВЯРНО С ОРИГИНАЛА

| | 1EC 60 947-2 | | |
|----------|--|--|---------|
| ause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Test sequence "O" | | |
| | - max. let-through current: (kApeak) | 3,6 kA 4,42 kA 4,43 kA | P |
| | - Joule integral I²dt (A²s) | 98700 A ² s 117000 A ² s 98800 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak)L1: L2: L3: | 4,361 kA 4,32 kA 3,78 kA | Р |
| | - Joule integral I²dt (A²s) | 109600 A ² s 96400 A ² s 91300 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak)L1: L2: L3 | 14,32 A | Р |
| | - Joule integral I ² dt (A ² s)L2 | 99300 A ² s 116000 A ² s 110000 A ² s | Р |
| | Melting of the fusible element | 1 4 | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | 1 | Р |
| 8.3.4.2 | Operational performance capability with current. | | |
| 0.0.4.2 | Rated current: In (A) | 160 A | |
| | Maximum rated operational voltage: Ue (V) | 230 V 415 V 500V 690 V | |
| <u> </u> | Conductor cross-sectional area (mm²): | 70 mm ² | |
| | Number of operating cycles per hour | 180/hour | Р |
| | Number (5% of the number given in column 4, to 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | ab. 50 | Р |
| | Applied voltage: closing mechanism (V) | | N// |

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| | Deguirement Test | Result – Remark | Verdict |
|---------|--|-------------------------------|---------|
| lause | Requirement – Test | 1/63011 1/6111011K | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | Satisfy | Р |
| | Conditions, make/break operations: | | |
| | Sample no | 2 3 4 5 | |
| | - test voltage U/Ue = 1,0 (V)L1: L2:L3: | 230 V 415 V 500 V 690 V | P |
| | - test current I/Ie = 1,0 (A) | 160 A 160 A | Р |
| | - power factor/time constant: | 0,8 | Р |
| | - frequency: (Hz) | 50 Hz | Р |
| | - on-time (ms): | 60 ms | Р |
| | - off-time (s): | 20 s | Р |
| | Electrical components do not exceed the value indicated in tab. 7. | Satisfy | Р |
| 8.3.4.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | Satisfy | Р |
| | - no breakdown or flashover | | Р |
| | Sample no | 2 3 4 5 | |
| | - the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue) | 0,1 mA 0,08 mA 0,1 mA 0,17 mA | Р |
| 8.3.4.4 | Verification of temperature-rise | | |
| | - the values of temperature-rise do not exceed those specified in tab. 7. | the Satisfy | Р |
| | Temperature rise of main circuit terminals. ≤ 80 (K) : | Мах. 73 К | P. |
| | conductor cross-sectional area (mm²); | 70 mm² | Р |
| | test current le (A): | 160 A | Р |
| 8.3.4.5 | Verification of overload releases | e | |
| | Test current: 1.45 times the value of their curre setting at the reference temperature: (A) | nt 232 A | Р |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | 8'01" 6'15" 9'35" 7'49" | Р |

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| | IEC 60 947-2 | m 11 P 1 | Verdict |
|---------|--|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | verdict |
| | | | 1 |
| 8.3.4 | TEST SEQUENCE II/III (Ics=Icu): | | |
| 8.3.4.1 | Test of rated service short-circuit breaking capacity | | |
| | Test sequence of operation: O - t - CO - t - CO | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated service short-circuit breaking capacity: (kA) | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| | For circult-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | N/A |
| | closing mechanism energized with 85% at the rated Uc: (V) | · | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | 1 | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | λ | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N// |
| | Circuit is earthed at: (load-star- or supply-star poir | nt) | N// |
| | Conductor cross-sectional area (mm²)/ | | N// |

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| | | IEC 60 947-2 | |
|--------|--------------------|---------------|---------|
| Clause | Requirement - Test | Result Remark | Verdict |

| | If terminals unmarked: line connected at: (underside/upside) | N/A |
|---------|---|-----|
| | Tightening torques: (Nm) | N/A |
| 8.3.5.1 | The operation of overload releases shall be verified at twice the value of their current setting on each pole separately. | |
| | The operating time shall not exceed the max, value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | |
| | Time specified by the manufacturer: | N/A |
| | - Operation time: (s) | N/A |
| | Test sequence of operation: O-t-CO-t-CO | |
| | - test voltage U/Ue = 1,05 (V) | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | N/A |
| | power factor/time constant : | |
| | - Factor "n" | N/A |
| | - peak test current (A): | N/A |
| | Test sequence "O" | |
| | - max. let-through current: (kApeak) | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | N/A |
| | Pause, t: (min) | |
| | Test sequence "CO" | |
| | - max. let-through current: (kApeak)L1: L2: L3: | N/A |
| | - Joule integral I²dt (A²s)L1: L2:L3: | N/A |
| | Pause, t: (min) | N/A |

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| lause | Requirement – Test | Result – Remark | Verdict |
|---------|---|-----------------|---------|
| | | | |
| | Test sequence "CO" | | 340 |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I ² dt (A ² s) L1: | | N/A |
| | L3: | | N/A |
| | Melting of the fusible element | | N/A |
| | Holes in the PE-sheet for test sequence "O" | | |
| | Cracks observed | | |
| 8.3.4.2 | Operational performance capability with current. | <u> </u> | |
| | Rated current: In (A) | | |
| | Maximum rated operational voltage: Ue (V) | | |
| | Conductor cross-sectional area (mm²): | | |
| | Number of operating cycles per hour | | N/A |
| | Number (5% of the number given in column 4, tal 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | b. | N/A |
| | Applied voltage: closing mechanism (V) | | N/A |
| | For circuit-breaker fitted with adjustable releases test shall be made with the overload setting at maximum and short-circuit setting at minimum. | | N/A |
| | Conditions, make/break operations: | <i>V</i> (| |
| | - test voltage U/Ue = 1,0 (V) | ** | N/A |
| | - test current I/Ie = 1,0 (A) | 1: 2: | N/A |
| | - power factor/time constant: | | N// |
| | - frequency: (Hz) | | N/. |
| - | | | N/ |
| | - on-time (ms): | | N/ |
| | - off-time (s): | <u> </u> | N/ |
| | Electrical components do not exceed the value indicated in tab. 7. | ^ | |

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N/A

| | IEC 60 947-2 | | |
|---------|---|---|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| 8.3.4.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | N/A |
| | - no breakdown or flashover | | N/A |
| | - the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue) | | N/A |
| 8.3.4.4 | Verification of temperature-rise | | |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | • | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | | N/A |
| | conductor cross-sectional area (mm²): | | N/A |
| | test current le (A): | | N/A |
| 8.3.4.5 | Verification of overload releases | | |
| | Test current: 1,45 times the value of their current setting at the reference temperature: (A) | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | | N/A |
| 8.3.5.4 | | | |
| | The operation of overload releases shall be verifi- their current setting on each pole separately. | ed at 2,5 times the value of | |
| | The operating time shall not exceed the max, value twice the current setting at the reference temperate | a stated by the manufacturer for ure, on a pole singly. | |

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Time specified by the manufacturer:

- Operation time: (s)L1:

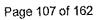
ВЯРНО С ОРИГИНАЛА

| | IEC | C 60 947-2 | |
|--------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| .3.5 | TEST SEQUENCE III (Icu) | | |
|---------|---|--|-------------|
| | Rated ultimate short-circuit breaking | | |
| | Except where the combined test sequence applies, the circuit-breaker of utilization category A and to circuit-the a rated ultimate short-circuit breaking capacity higher withstand current. | than the rated short-time | |
| | For circuit-breakers of utilization B having a rated sho equal to their rated ultimate short-circuit breaking can need not be made, since, in this case, the ultimate shis verified when carrying out test sequence IV. | Jacky, tilla teat acqueince | |
| | For integrally fused circuit-breakers, test sequence visequence. | / applies in place or this | |
| | Type designation or serial number | BC 160N | |
| | Sample no: | 6, 7, 8, 9 | |
| | Rated current: In (A) | 160 A | |
| | Rated operational voltage: Ue (V) | 230 V,415 V,500 V,690 V AC | |
| | Rated ultimate short-circuit breaking capacity: (kA) | 40 kA/230 V, 25 kA/415 V 12 kA/500 V, 6 kA/690 V | |
| | Rated control supply voltage of closing mechanism: Uc (V) | N/A | |
| | Rated control supply voltage of shunt release: Uc (V) | N/A | |
| | This test sequence need not be made when Icu | cs | |
| 8.3.5.1 | The operation of overload releases shall be verifie current setting on each pole separately. | | |
| | The operating time shall not exceed the max, value twice the current setting at the reference temperature. | stated by the manufacturer for tre, on a pole singly. | |
| | Time specified by the manufacturer: | 1117" | P |
| | Sample no: | 6 7 8 9 | |
| ·· | - Operation time: (s) | 1'26 1'45" 1'11" 1'25" 1'32" 1'24" 1'41" 1'31" 1'23" 1'40" 1'19" 1'20" | 9 |
| 8.3.5.2 | Test of rated ultimate short-circuit breaking capac | city | |
| | The test sequence of operations is O - t - CO | | <u></u> _ |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | Satisfy | Р |

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| IEC 60 947-2 | | | | | |
|--------------|----------------------|-----------------|---------|--|--|
| Claus | e Requirement - Test | Result – Remark | Verdict | | |

| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
|---|---|-------------------------------|-----|
| | The circuit-breaker is mounted complete on its own support or an equivalent support. Test made in free air: Distances of the metallic screen's: (all sides) Vide catalogue | | Р |
| | | | P |
| | | | Р |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal Yes | | Р |
| | - ratio hole area/total area: 0,45-0,65 | Satisfy | Р |
| | - size of hole: <30mm ² | Satisfy | þ |
| | - finish: bare or conductive plating | Satisfy | Р |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | Satisfy | P |
| | Circuit is earthed at: (load-star- or supply-star point) | Load-star | Р |
| | Conductor cross-sectional area (mm²): | 70 mm² | Р |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening, torques: (Nm) | 6 Nm | Р |
| | Test sequence of operation: O - t - CO | | |
| • | - test voltage U/Ue = 1,05 (V) L1: | 250 V 250 V 250 V | Р |
| | - r.m.s. test current AC/DC: (A) L1: | 41,7 kA 38,6 kA 40,7 kA | Р |
| | power factor/time constant : | 0,24 | Р |
| | - Factor "n" | 2,1 | р |
| | - peak test current (Amax) : | 84,4 kA | P |

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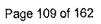
| | | IEC 60 947-2 | |
|--------|--------------------|-----------------|---------|
| 01 | Requirement – Test | Result - Remark | Verdict |
| Clause | Requirement - rest | | |

| | Test sequence "O" | | |
|---------------|---|--|---|
| C. | - max. let-through current; (kApeak)L1: L2: L3: | 10,9 kA 15,0 kA 7,8 kA | P |
| | - Joule integral I²dt (A²s) | 139000 A ² s 350000 A ² s 96300 A ² s | Р |
| , | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| <u>-</u> _ | - max. let-through current (kApeak)L1: L2: L3: | 6,25 kA 14,5 kA 10,9 kA | P |
| | - Joule integral I ² dt (A ² s) L1: L2: L3: | 43800 A ² s 315000 A ² s 143000 A ² s | Р |
| - | Melting of the fusible element | | P |
| | Holes in the PE-sheet for test sequence "O" | | р |
| | Cracks observed | | Р |
| | Test sequence of operation: O - t - CO | | |
| | - test voltage U/Ue = 1,05 (V)L1: | 440 V 440 V 440 V | þ |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | 25,7 kA 24,9 kA 25,7 kA | P |
| | power factor/time constant : | 0,20 | Р |
| | - Factor "n" | 2,1 | Р |
| · · · · · · | - peak test current (Amax): | 55,4 kA | Р |
| | Test sequence "O" | | |
| | - max. let-through current: (kApeak)L1: | 10,4 107 | Р |
| | - Joule integral I ² dt (A ² s)L1: L2: | 153000 A ² s 785000 A ² s | P |
| | Pause, t: (min) | 3 min | P |

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| IEC 60 947-2 | | | | | | |
|--------------|--------------------|--|---------------|---------|--|--|
| Clause | Requirement – Test | | Result Remark | Verdict | | |

| Test sequence "CO" | | |
|--|--|---|
| - max. let-through current: (kApeak) | 13,1 kA 6,25 kA 15,6 kA | P |
| - Joule integral I ² dt (A ² s)L1: L2: L3; | 434000 A ² s 65200 A ² s 664000 A ² s | Р |
| Melting of the fusible element | | Р |
| Holes in the PE-sheet for test sequence "O" | | Р |
| Cracks observed | | Р |
| Test sequence of operation: O – t – CO | | |
| - test voltage U/Ue = 1,05 (V) | 525 V [*] 525 V 525 V | Р |
| - r.m.s. test current AC/DC: (A) | 12,2 kA 12,0 kA 12,1 kA | Р |
| power factor/time constant : | 0,27 | Р |
| - Factor "n" | 2,0 | Р |
| - peak test current (Amax): | \$4,6 KA | Р |
| Test sequence "O" | | |
| - max. let-through current: (kApeak)L1: L2: L3: | 11,04 kA 10,1 kA 5,16 kA | P |
| - Joule integral I ² dt (A ² s)L1: L2: L3: | 337000 A-s | P |
| Pause, t: (min) | 3 min | P |
| Test sequence "CO" | | |
| - max. let-through current: (kApeak)L1: L2:L3: | [10,09 kA | P |
| - Joule integral I²dt (A²s)L1: L2: L3: | 313000 A ² s 638000 A ² s | Р |
| Melting of the fusible element | | Р |
| Holes in the PE-sheet for test sequence "O" | | P |
| Cracks observed | | ρ |

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| | | IEC 60 947-2 | |
|--------|--------------------|-----------------|---------|
| | Tont | Result - Remark | Verdict |
| Clause | Requirement - Test | | |

| use | Requirement - Test | L | | |
|----------|---|----------|--|--------------|
| <u> </u> | Test sequence of operation: O - t - CO | | | |
| | - test voltage U/Ue = 1,05 (V) | 72 | 5 V' 5 V 5 V | P |
| | - r.m.s. test current AC/DC: (A) | 6,0 | 12 kA 03 kA 0 kA | Р |
| | | 0, | | Р |
| | power factor/time constant : | 1, | | Р |
| | - Factor "n" | | 25 kA | P |
| | - peak test current (Amax): | 9, | 20 100 | |
| | Test sequence "O" | 1 | 0710 | Р |
| | - max. let-through current: (kApeak) L1: L2: L3: | 7 | ,67 kA ,24 kA ,72 kA | • |
| | - Joule integral I ² dt (A ² s)L1: | 9 | 8400 A ² s | Р |
| | - Joule integral Pot (APs) | 2 | 258000 A ² s 09900 A ² s | |
| | Pause, t: (min) | | 3 min | Р |
| | Test sequence "CO" | | | |
| | - max. let-through current: (kApeak)L1 | : | 7,12 kA 6,89 kA 6,13 kA | P |
| | L3: | + | 236000 A ² s | P |
| | - Joule integral I²dt (A²s) | 2: | 236000 A S 102000 A ² s 178000 A ² s | |
| | | | • | Р |
| | Melting of the fusible element | | | Р |
| | Holes in the PE-sheet for test sequence "O" | | | Р |
| | Cracks observed | | | |
| 8.3.5.3 | Verification of dielectric withstand | 6 | 7 8 9 | |
| | Sample no: | <u> </u> | 00 V 1000 V 1100 V 1380 V | P |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 100 | 90 V 1000 V 1100 V 1000 I | P |
| | - no breakdown or flashover | - | 7 0 0 | |
| | Sample no: | € | | - |
| | - the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue) | 0,0 | 9mA 0,42mA 0,59mA 0,1mA | P |

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| 3.3.5.6 | Verification of temperature-rise Sample no: - the values of temperature-rise do not exceed the those specified in tab. 7. Temperature rise of main circuit terminals. ≤ 80 K (K): conductor cross-sectional area (mm²): | 6 sStisfy Max 71 | 7 K 75 | 8 73 K | 9 | Verdict |
|---------|--|----------------------------|-----------------------|---------------------|-------------------|---------|
| | Sample no: - the values of temperature-rise do not exceed the those specified in tab. 7. Temperature rise of main circuit terminals. ≤ 80 K (K): conductor cross-sectional area (mm²): | sStisfy Max 71 | | | | Р |
| | Sample no: - the values of temperature-rise do not exceed the those specified in tab. 7. Temperature rise of main circuit terminals. ≤ 80 K (K): conductor cross-sectional area (mm²): | sStisfy Max 71 | | | | Р |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. Temperature rise of main circuit terminals. ≤ 80 K (K): conductor cross-sectional area (mm²): | Max 71 | K 75 | 73 K | 70. | Р |
| | Temperature rise of main circuit terminals. ≤ 80 K (K) : conductor cross-sectional area (mm²) : | | K 75 | 73 K | 70: | |
| | | 70 mm ² | | | 70 k | Р |
| | test current le (A): | | 2 | | | Р |
| | | 160 A | | | | |
| 8.3.5.4 | Verification of overload releases | | | | | |
| | The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately. | | | | | |
| | The operating time shall not exceed the max. twice the current setting at the reference temp | value state perature, o | ed by the n a pole | e manufa singly. | cturer for | |
| | Time specified by the manufacturer: | 65" | | <u></u> | | P |
| | Sample no: | 6 | 7 | 8 | 9 | |
| | - Operation time: (s)L1:L2:L3: | 62" 64" 62" | 68" 67" 69" | 64" 68" 67" | 62" 63" 67" | Р |
| 8.3.6 | TEST SEQUENCE IV | | | | | |
| | Rated short-time withstand current | | | | | |
| | Except where the combined test sequence a circuit-breakers of utilization category B and t covered by note 3 of table 4, and comprises the covered by note 3 of table 4. | the following | ng tests: | and of ca | | |
| | Where integrally fused circuit-breaker are of the requirements of this sequence. | utilization | category | B, they s | hall meet | |
| | Type designation or serial number | | | | | _ |
| | Sample no: | | | | | |
| | Rated current: In (A) | | | | | |
| | Rated operational voltage: Ue (V) | | | | | |
| | Rated short-time withstand current: (kA/s) | | | | | |
| | Rated frequency: (Hz) | | | | | |

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| | IEC 60 947-2 Result – Remark | Verdict |
|---------|---|---------|
| lause | Requirement – Test Result – Remark | |
| | The shall be verified at twice the value of their | |
| | The operation of overload releases shall be verified at twice the value of their current setting on each pole separately. | |
| | The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | |
| | Time specified by the manufacturer: | N/A |
| | - Operation time: (s) | N/A |
| 3,3.6.2 | Test of rated short-time withstand current. | |
| | For this test, any over-current release, including the instantaneous override, if any likely to operate during the test, shall be rendered inoperative. | '. |
| | - test frequency: (Hz) | N/A |
| | - duration of the test: (s) | N/A |
| | - test frequency: (Hz) | N/A |
| | - power factor / time constant (ms): | N/A |
| | - factor "n" | N/A |
| | - test voltage: (V) | N/A |
| | - r.m.s. test current: (kA) | N/A |
| | - highest peak current: (kA) | N/A |
| | Verification of temperature-rise | |
| 8.3.6.3 | - the values of temperature-rise do not exceed the those specified in tab. 7. | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K | N/A |
| | conductor cross-sectional area (mm²): | N/A |
| | test current le (A): | N/A |
| 0.264 | Test of short-circuit breaking capacity at the max, short-time withstand current. | |
| 8.3.6.4 | Rated short-time withstand current: (kA/s) | |
| | Test sequence: O - t - CO | |
| | max. available time setting of the short–time delay short-circuit release. (s) | N/A |

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| | IEC 60 947-2 | Donult Domark | Verdict |
|--------|--|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | - test voltage U/Ue = 1,05 (V)L1: | | N/A |
| | - r.m.s. test current AC/DC: (A) | | N/A |
| | L3: | | N/A |
| | - test frequency: (Hz) | | |
| | - power factor / time constant (ms): | | N/A |
| | - factor "n" | | N/A |
| | Test sequence "O" - max. let-through current: (kApeak) | | N/A |
| | - Joule integral I ² dt (A ² s) | | N/A |
| | Pause, t: (min) | | N/A |
| | the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release and - | | N/A |
| | - the instantaneous override, if any, shall not operate. | <u> M</u> | N/A |
| | -pause: t (s) | | N/A |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: | | N/A |
| | Pause, t: (min) | | N/A |
| | the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release and - | | N/A |
| | - the instantaneous override, if any, shall not operate. | | N/A |
| | - if the circuit-breaker has a making current release, this requirement does not apply to the CO operation, if the prospective current exceeds the pre-determined value, since it will then operate. | ; | N/A |

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| | IEC 60 947-2 | T | |
|---------|---|--|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| | | | |
| 8,3,6,5 | Verification of dielectric withstand | | N/A |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | * 1 |
| | - no breakdown or flashover | | N/A |
| 8.3.6.6 | Verification of overload releases | | N/A |
| | The operation of overload releases shall be verific current setting on each pole separately. | ed at twice the value of their | |
| | The operating time shall not exceed the max. valuativice the current setting at the reference temperate | e stated by the manufacturer for ure, on a pole singly. | , |
| | Time specified by the manufacturer: | | |
| | - Operation time: (s)L1:L2:L3: | | N/A |

| .3.7 | TEST SEQUENCE V | | |
|---------|--|---------|-------------|
| | Performance of integrally fused circuit-breakers | | |
| | STAGE 1 | -\A | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | |
| | Value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA) | | |
| : | Type of integrated fuses (all details) | | 5 F |
| | Rated control supply voltage of closing mechanism: Uc (V) | ਤ `` | 1 |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| 8.3.7.1 | Short-circuit at the selectivity limit current | | |
| | Test sequences "O" | | |
| | Fuses shall be fitted | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |

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| IEC 60 947-2 | | | | | | |
|--------------|--------------------|-----------------|---------|--|--|--|
| Clause | Requirement – Test | Result – Remark | Verdict | | | |

| | The circuit-breaker is mounted complete on its own support or an equivalent support. | N/A |
|---|--|-----|
| | Test made in free air: | N/A |
| | Distances of the metallic screen's: (all sides) | N/A |
| | The characteristics of the metallic screen: | |
| | - woven wire mesh | N/A |
| | - perforated metal | N/A |
| | - expanded metal | N/A |
| | - ratio hole area/total area: 0,45-0,65 | N/A |
| | - size of hole: <30mm² | N/A |
| | - finish: bare or conductive plating | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | N/A |
| | Conductor cross-sectional area (mm²): | N/A |
| · | If terminals unmarked: line-connected at: (underside/upside) | N/A |
| | Tightening torques: (Nm) | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | N/A |
| | - r.m.s, test current AC/DC: (A) | N/A |
| | power factor/time constant : | N/A |
| | - factor "n" | N/A |
| | - peak test current (Amax) : | N/A |
| | Test sequence "O" | |
| | - max. let-through current: (kApeak)L1: L2: L3: | N/A |

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| | IEC 60 947-2 | Y | · |
|-------------|---|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | | N/A |
| | - fuses shall still intact | · | N/A |
| | L2: | | |
| 8.3.7.2 | Verification of temperature-rise | | N/A |
| <u> </u> | - the values of temperature-rise do not exceed the those specified in tab. 7. | | N/A |
| | Temperature rise of main circuit terminals, ≤ 80 K (K): | | N/A |
| | conductor cross-sectional area (mm²): | | N/A |
| | test current le (A): | | N/A |
| 8.3.7.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | N/A |
| | - no breakdown or flashover | TI M | N/A |
| l | | V | |
| | STAGE 2 | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | _ |
| | 1.1 time the value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA) | | |
| | Type of integrated fuses (all details) | | |
| | Rated control supply voltage of closing mechanis Uc (V) | m: | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| | | 1 | l l |

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8.3.7.4

Verification of overload releases

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| IEC 60 947-2 | | | |
|--------------|--|--|--|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | The operation of overload releases shall be verified current setting on each pole separately. | at twice the value of their | |
| | The operating time shall not exceed the max. value studies the current setting at the reference temperature | tated by the manufacturer for , on a pole singly. | |
| | Time specified by the manufacturer: | | |
| | - Operation time: (s) | | N/A |
| 8.3.7.5 | Short-circuit at 1,1 times the take-over current | | |
| 8.3.7.1 | Short-circuit at the selectivity limit current | | |
| | Test sequences "O" | | |
| | Fuses shall be fitted | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| - | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | U | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | <u>. </u> |
| | - woven wire mesh | , | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0.8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point | | N/A |
| ļ | | | 1 |

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Conductor cross-sectional area (mm²):

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N/A

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| ause | Requirement Test Re | esult – Remark | Verdict |
|----------|--|------------------------------|---------|
| | requiement | | |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | 1.1 time the value of prospective current equal to the se declared by the manufacturer. (kA) | electivity limit current, as | |
| | - test voltage U/Ue = 1,05 (V)L1: | | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| | power factor/time constant : | | N/A |
| | - factor "n" | | N/A |
| | - peak test current (Amax) : | | N/A |
| | Test sequence "O" | ۸ | , , |
| <u> </u> | - max. let-through current: (kApeak)L1: L2: L3: | (M | N/A |
| | - Joule integral I ² dt (A ² s) L1: L2: L3: | | N/A |
| | - at least two of the fuses shall have blown L1: L2: L3: | | N/A |
| 8.3.7.6 | Short-circuit at ultimate short-circuit breaking capacity | У | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated ultimate short-circuit breaking capacity. (kA) | | |
| | Type of integrated fuses (all details) | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | |

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| | IEC 60 947-2 | | |
|----------------|--|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Test sequences: O - t - CO | | 13/4 |
| | Fuses shall be fitted | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc; (V) | | N/A |
| With | The circuit-breaker is mounted complete on its own support or an equivalent support. | | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm² | V | N/A |
| <u> </u> | - finish: bare or conductive plating | | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point | t) | N/A |
| | Conductor cross-sectional area (mm²); | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| ļ | power factor/time constant : | | N/A |



| | IEC 60 947-2 | 1 1/ " . |
|-------------|---|----------|
| lause | Requirement – Test Result – Remark | Verdict |
| | | N/A |
| | - factor "n" | N/A |
| | - peak test current (A) : | 19/3 |
| | Test sequence "O" | 31/4 |
| | - max. let-through current: (kApeak)L1: L2: L3: | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | N/A |
| | Pause: t (s) | N/A |
| | new fitted fuses | N/A |
| | | |
| | Test sequence "CO" - max. let-through current: (kApeak)L1: L2: | N/A |
| | - Joule integral I ² dt (A ² s) | N/A |
| 8.3.7.7 | - equal twice time rated operational voltage with a | N/A |
| | minimum of 1000 V (new fuses fitted) - no breakdown or flashover | N/A |
| 8,3.7.8 | Verification of overload releases | |
| 0.3.7.0 | The operation of overload releases shall be verified at 2.5 times the value of their current setting on each pole separately. | 25, |
| | The operating time shall not exceed the max. value stated by the manufacturer twice the current setting at the reference temperature, on a pole singly. | for |
| | Time specified by the manufacturer: | |
| | - Operation time: (s) | N/A |
| | | |
| 8.3.8 | Combined test sequence | |

At the discretion of, or in agreement with the manufacturer, this sequence may be applied to circuit-breaker of utilization cat. B:

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Sample no:

Type designation or serial number

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N/A

N/A

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| lause | Requirement – Test Result – Remark | Verdict |
|---------|---|---------------------------------------|
| | requirement | · · · · · · · · · · · · · · · · · · · |
| | Rated current: In (A) | N/A |
| | Rated operational voltage: Ue (V) | N/A |
| | Rated short-time withstand current: (kA/s) | N/A |
| | Rated frequency: (Hz) | N/A |
| 3.8.1 | Verification of overload releases | |
| | The operation of overload releases shall be verified twice times the value of their current setting on each pole separately. | |
| - | The operating time shall not exceed the max, value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | |
| | Time specified by the manufacturer: | |
| | - Operation time: (s) | N/A |
| 8.3.8.2 | Test of rated short-time withstand current. | |
| | For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative. | ļ |
| | - test frequency: (Hz) | N/A |
| | - duration of the test: (s) | N/A |
| | - test frequency: (Hz) | N/A |
| | - power factor / time constant (ms): | N/A |
| | - factor "n" | N/A |
| | - test voltage: (V)L1:L2:L3: | N/A |
| | - r.m.s. test current: (kA) | N/A |
| | L2: L3: | N/A |
| | - highest peak current: (kA) | |
| 8.3.8.3 | Test of rated service short-circuit breaking capacity | |
| | At the highest voltage applicable to the rated short-time current. | |
| - | Test sequence of operation: O - t - CO - t - CO | |
| | Type designation or serial number | |
| - | Sample no: | |
| | Rated current: In (A) | |

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| | | Desuit Demark | Verdict |
|--------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdiot |
| | | 1 | |
| | Rated operational voltage: Ue (V) | | |
| | Rated service short-circuit breaking capacity: (kA) | T' | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | n | N/A |
| | Test made in free air: | | N/A |
| · | Distances of the metallic screen's: (all sides) | . . | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | 11/4 | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | f | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star poi | int) | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | Test sequence of operation: O - t - CO - t - CO |) | N/A |
| | The highest voltage applicable to the rated sho time current. | | N/A |

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| 01 | Beguirement Toet | Result – Remark | Verdict |
|----------|--|--|---------|
| Clause | Requirement - Test | Troduction and the second and the se | |
| | - test voltage U/Ue = 1,05 (V)L1: | ~~~~ | N/A |
| | - r.m.s. test current AC/DC: (A) | | N/A |
| | L1: L2: L3: | | |
| | power factor/time constant : | | N/A |
| | - Factor "n" | | N/A |
| <u> </u> | - peak test current (A): | | N/A |
| | Test sequence "O" | <u> </u> | |
| | - max. let-through current: (kApeakL1:L2:L3: | | N/A |
| | - Joule integral I ² dt (A ² s) L1: | | N/A |
| ļ | Pause, t: (min) | | N/A |
| | Test sequence "CO" | 1 | |
| | - max. let-through current: (kApeak)L1: L2: | | N/A |
| | - Joule integral I²dt (A²s) L1: | | N/A |
| | | | N/A |
| | Pause, t: (min) | | |
| | Test sequence "CO" - max. let-through current: (kApeak) | | N/A |
| | - Joule integral I²dt (A²s)L1: L2: L3: | | N/A |
| | The circuit-breaker shall remain closed for the short-time corresponding to the max, available tim setting of the short-time delay short-circuit release | e . | N/A |
| | During this test the instantaneous override shall not operate | | N/A |
| | - and the making current release shall operate | | N/A |

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| | | IEC 60 947-2 | | |
|--------|--------------------|--------------|-----------------|---------|
| Clause | Requirement – Test | | Result – Remark | Verdict |
| Ciadoc | radament | | <u></u> | |

| 204 | Operational performance capability with current. | |
|---------|--|-----|
| 3.8.4 | | N/A |
| | Rated current: In (A) | N/A |
| | Maximum rated operational voltage: Ue (V) | N/A |
| | Conductor cross-sectional area (mm²): | N/A |
| | Number of operating cycles per hour | N/A |
| | Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | N/A |
| | Applied voltage: closing mechanism (V) | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | N/A |
| | Conditions, make/break operations: | N/A |
| | - test voltage U/Ue = 1,0 (V) | N/A |
| · | - test current I/le = 1,0 (A) | N/A |
| | - power factor/time constant: | N/A |
| | | N/A |
| | - frequency: (Hz) | N/A |
| | - on-time (ms): | N/A |
| | - off-time (s): | N/A |
| | Electrical components do not exceed the value indicated in tab. 7. | |
| 8.3.8,5 | Verification of dielectric withstand | N/A |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | |
| | - no breakdown or flashover | N/A |
| | - the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue) | N/A |
| 8.3.8.7 | Verification of temperature-rise | |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | N/A |

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| IEC 60 947-2 | | |
|---|---|---|
| Requirement – Test | tesult – Remark | Verdict |
| | | |
| conductor cross-sectional area (mm²): | | N/A |
| test current le (A): | | N/A |
| Verification of overload releases | | |
| Test current: 1,45 times the value of their current setting at the reference temperature: (A) | | N/A |
| Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | | N/A |
| their current setting on each pole separately. | | |
| The exerciting time shall not exceed the max, value stated by the manufacturer for | | |
| Time specified by the manufacturer: | | |
| - Operation time: (s) L1: | <u> </u> | N/A |
| | <u> </u> | Γ |
| Classification atc | | |
| Classification etc | | |
| Individual pole short-circuit test sequence | | |
| | | |
| | | |
| A short-circuit test is made with a value of prospective | ve current (Isu) equal to 25% | |
| | BC 160N | |
| | 10 | |
| Sample no: | 1 | |
| Rated current: In (A) | 160 A | |
| | 160 A 500 V | |
| Rated current: In (A) | 500 V | |
| Rated current: In (A) Rated operational voltage: Ue (V) | 500 V 12 kA | |
| | conductor cross-sectional area (mm²): test current le (A): Verification of overload releases Test current: 1,45 times the value of their current setting at the reference temperature: (A) Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A The operation of overload releases shall be verified their current setting on each pole separately. The operating time shall not exceed the max. value st wice the current setting at the reference temperature. Time specified by the manufacturer: - Operation time: (s) | conductor cross-sectional area (mm²): test current le (A): Verification of overload releases Test current: 1,45 times the value of their current setting at the reference temperature: (A) Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately. The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. Time specified by the manufacturer: - Operation time: (s) Circuit-breakers incorporating residual current protection Classification etc Individual pole short-circuit test sequence Circuit-breaker for use on phase-earthed systems Test of individual pole short-circuit breaking capacity A short-circuit test is made with a value of prospective current (Isu) equal to 25% of the ultimate rated short-circuit breaking capacity (Icu) |

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| | | IEC 60 947-2 | |
|--------|--------------------|---------------|---------|
| Clause | Requirement - Test | Result Remark | Verdict |
| | | | |

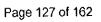
| | The test sequence of operations is O - t - CO | | |
|---------------|--|-------------------------|-----|
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | Satisfy | Р |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | Satisfy | Р |
| | Test made in free air: | Satisfy | P |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | Р |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | <u> </u> | N/A |
| - | - expanded metal | Yes / M | P |
| | - ratio hole area/total area: 0,45-0,65 | Satisty | P. |
| | - size of hole: <30mm ² | Satisfy | Р |
| | - finish: bare or conductive plating | Satisfy | р |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | Satisfy | Р |
| | Circuit is earthed at: (load-star- or supply-star point) |) Load-star | P |
| | Conductor cross-sectional area (mm²): | 70 mm ² | P |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | 6 Nm | P |
| | Test sequence of operation: O - t - CO | | |
| | Test circuit according figure: 9 | Satisfy | Р |
| | - test voltage U/Ue = 1,05 (V)L1: | 525 V 525 V 525 V | Р |
| | short-circuit test current (Isu): equal to 25% of the ultimate rated short-circuit breaking capacity (Icu) | | |
| | - r.m.s. test current AC/DC: (A): | 3 kA AC | P |
| | power factor/time constant : | 0,9 | P |

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| IEC 60 947-2 | | | | |
|--------------|--------------------|-----------------|---------|--|
| Clause | Requirement – Test | Result – Remark | Verdict | |

| , | - Factor "n" | 1,46 | Р |
|--|---|-------------------------|---|
| | - peak test current (Amax) : | 4,38 kA | Р |
| -+ | Test sequence "O" L1 | | |
| | - max. let-through current: (kApeak)L1; | 4,22 kA | Р |
| ····· | - Joule integral I²dt (A²s)L1: | 98000 A ² s | Р |
| | Pause, t: (min) | 3min | Р |
| | Test sequence "CO" L1 | | |
| | - max. let-through current: (kApeak)L1: | 4,37kA | Р |
| | - Joule integral I²dt (A²s)L1: | 111000 A ² s | Р |
| | Test sequence "O" L2 | | |
| | - max. let-through current: (kApeak)L2: | 4,18 kA | Р |
| | - Joule integral I ² dt (A ² s)L2: | 105000 A ² s | P |
| ···· | Pause, t: (min) | 3/min | P |
| ······································ | Test sequence "CO" L2 | | |
| | - max. let-through current; (kApeak)L2; | 4,41 A | Р |
| | - Joule integral I ² dt (A ² s)L2: | 109000 A ² s | Р |
| | Test sequence "O" L3 | | |
| | - max. let-through current: (kApeak) L3: | 4,14 kA | Р |
| | - Joule integral I ² dt (A ² s)L3: | 94000 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" L3 | | |
| | - max. let-through current: (kApeak)L3: | 3,63 kA | Р |
| | - Joule integral I ² dt (A ² s) L3: | | р |
| ······································ | Melting of the fusible element | | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | | Р |
| 2.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1000 V | Р |
| | - no breakdown or flashover | | Р |

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| | IEC 60 947-2 | Result – Remark | Verdict |
|----------|--|--|---------|
| lause | Requirement – Test | Result - Retitation | |
| | | | |
| 5.4 | Verification of overload releases | | |
| | The operation of overload releases shall be verified their current setting on each pole separately. | | |
| | The operating time shall not exceed the max, value twice the current setting at the reference temperature. | stated by the manufacturer for re, on a pole singly. | |
| | Time specified by the manufacturer: | 65" | |
| | - Operation time: (s)L1:L2:L3: | 69° 67″ 65° | Р |
| Annex F | Additional tests for circuit-breakers with electronic | | N/A |
| F.4. | over-current protection Immunity tests | | N/A |
| F.4.1. | Tests regarding non-sinusoidal currents resulting | g | N/A |
| F.4.1.1. | Test conditions | | N/A |
| 1.4.1.1. | Option b) | 1 1 | N/A |
| | Desired values: | M | N/A |
| | Third harmonic >60% | | N/A |
| | Fifth harmonic >14% | · | N/A |
| | Seventh harmonic >7% | | N/A |
| | Actual values: | | N/A |
| | Third harmonic | | N/A |
| | Fifth harmonic | | N/A |
| | Seventh harmonic | | N/A |
| - 1 d o | | | N/A |
| F.4.1.3. | Non-tripping current 0,9Ir | | N/A |
| | 11011 117 | | N/A |
| | Testing time | | N/A |
| | Tripping current 2 lr | | N/A |
| | Release time | · · · · · · · · · · · · · · · · · · · | |
| | Tripping current 2x lr | | |
| | Release time Performance criterion A of F.2.1.2. | | N/A |
| | Performance chieffort A of 1.2.1.2. | | N/A |
| | | | N/A |

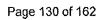
ВЯРНО С ОРИГИНТ

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| , | Requirement Test | Result - Remark | Verdict |
|------------------------|--|-----------------|---------|
| lause | Requirement - Test | | |
| .4.2. | Current dips | | N/A |
| | The test circuit shall be in accordance with figure F.2. IEC60947-2, | | N/A |
| | The current applied according to figure F.5 and to table F.1 | | |
| | Performance criterion B of F. 2.1.2. | | N/A |
| .4.3. | Electrostatic discharges | | N/A |
| EC61000-4- | At level | | N/A |
| nnex J.2.2. | Test voltage | | N/A |
| | Non-tripping current 0,9xlr | | N/A |
| | Test data | | N/A |
| | Tripping current 2xlr | | |
| | Release time | | N/A |
| | Performance criterion B of F. 2.1.2. | | N/A |
| F,4.4,IEC61 000-4-3 | Radiated radio-frequency electromagnetic fields | M | N/A |
| Annex | Non-tripping current 0,9xlr | | N/A |
| J.2.3. | Test data | | N/A |
| | Tripping current 2xlr | | N/A |
| | Release time | | N/A |
| | Performance criterion A of F. 2.1.2. | | N/A |
| F.4.5. | Electrical fast transients/bursts (EFT/B) | | N/A |
| F.5.2.2.1. | Non-tripping current 0,9xIr | | N/A |
| IEC61000-4- | | | N/A |
| 4 | Tripping current 2xIr | | N/A |
| Annex J.2.4. | Release time | | N/A |
| , v | Performance criterion A of F. 2.1.2. | | N/A |
| F.4.6. | Surges | | N/A |
| 1EC61000-4- | | | N/A |
| 5 | Total number of pulses | | N/A |
| Annex J.2.5. | Tripping current 2xlr | | N/A |
| | Release time | | N/A |
| | Performance criterion B of F. 2.1.2. | 1/1 | N/A |

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| Clause | Requirement – Test | Result – Remark | Verdict |
|---------------------------------------|--|-----------------|----------|
| Clause | Requirement – Test | Result – Remark | Vestuice |
| F.4.7. Annex | Conducted disturbances induced by radio- frequenci fields (common mode) | | N/A |
| J.2.6. | Non-tripping current 0,9xIr | | N/A |
| | Test data | | N/A |
| • | Tripping current 2 xlr | | N/A |
| | Release time | | N/A |
| | Performance criterion A of F. 2.1.2 | | N/A |
| F.5.4. AnnexJ.3.3 | Radiated RF disturbances (30MHz -1GHz) | | N/A |
| · Figure F.3. | Meet the condions for classes "B" | | N/A |
| F.6. | Suitability for multiple frequencies | | N/A |
| F.6. | Suitability for multiple frequencies | | N/A |
| F.7. | Dry heat test | | N/A |
| | Ambient temperature | V | , N/A |
| | Testing time | | N/A |
| | Test data | | N/A |
| F.7.3. | Verificatin of overload releases: | | N/A |
| 7.2.1.2.4.b) | Instanteanous release: | | N/A |
| | setting release | | N/A |
| | Tripping current | | N/A |
| | Inverse time-delay releases: | | N/A |
| · · · · · · · · · · · · · · · · · · · | Ambient temperature | | N/A |
| | Non-tripping current 1,05xIr | | N/A |
| | Testing time | | N/A |
| | Tripping current 1,3xIr | | N/A |
| | Release time | | N/A |
| | Ambient temperature | | N/A |
| | Non-tripping current 1,05xIr | | N/A |
| | Testing time | | N/A |
| | Tripping current 1,3xIr | | N/A |
| | Release time | 7 | N/A |

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| IEC 60 947-2 | | | | |
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| Clause | Requirement - Test | Result – Remark | Verdict | |
| | | | | |

| .8. | Damp heat test | N/A |
|---|---|-----|
| · · · · · · · · · · · · · · · · · · · | The upper temperature The number of cycles | N/A |
| .8.2. | Verification of overload releases | N/A |
| .2.1.2.4.b) | Instanteanous release: | N/A |
| | setting release 8xIr | N/A |
| | Tripping current | N/A |
| | setting release 4xIr | N/A |
| | Tripping current | N/A |
| | Inverse time-delay releases : | N/A |
| | Ambient temperature | N/A |
| | Non-tripping current 1,05xIr | N/A |
| | Testing time | N/A |
| | Tripping current 1,3xIr | N/A |
| | Release time | N/A |
| | Ambient temperature | N/A |
| | Non-tripping current 1,05xIr | N/A |
| <u>, , , , , , , , , , , , , , , , , , , </u> | Testing time | N/A |
| | Tripping current 1,3xIr | N/A |
| | Release time | N/A |
| F .9. | Temperature variation cycles at a specified | N/A |
| EC60068-2-14 | Number of operating | N/A |
| | Test data | N/A |
| F.8.2. | Verification of overload releases: | N/A |
| | Instanteanous release: | N/A |
| | setting release 8xIr | N/A |
| <u></u> | Tripping current | N/A |
| | setting release 4xlr | N/A |
| | Tripping current | N/A |
| | Inverse time-delay releases: | N/A |
| | Ambient temperature | N/A |

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| | IEC | C 60 947-2 | |
|--------|--------------------|---------------|---------|
| Clauca | Requirement - Test | Result Remark | Verdict |
| Clause | requiement | | |

| | Non-tripping current 1,05xIr | | N/A |
|-------------|--|-----------------------------|----------|
| | | | N/A |
| | Tripping current 1,3xlr | | N/A |
| | , , , , , , , , , , , , , , , , , , , | | N/A |
| • | Release time | | N/A |
| | Ambient temperature | | N/A |
| | Non-tripping current 1,05xlr | | N/A |
| | Testing time | | N/A |
| | Tripping current 1,3xIr | | N/A |
| | Release time | | |
| Annex G | Power loss | | |
| | Phase Li | 15 W | |
| | L2 | 15 W | |
| | L3 | 15/W/ | |
| Annex H | Individual pole short-circuit test sequence | | |
| | Circuit-breaker for use in IT systems | | |
| H.2 | Test of individual pole short-circuit breaking capacity | | <u> </u> |
| | A short-circuit test is made on the individual poles of a value of prospective current (I _{IT}) equal to 1,2 times time delay release tripping current or, in the absence the max. setting of the tripping current of the instanta relevant 1,2 times the max. setting of the definite time current, but not exceeding 50kA. | of such a release, 1,2 time | |
| | Type designation or serial number | BC 160N | <u> </u> |
| | Sample no: | 11 | 1000 |
| | Rated current: In (A) | 160 A | <u> </u> |
| | Rated operational voltage: Ue (V) | 690 V | |
| | Rated ultimate short-circuit breaking capacity: (kA) | 1600 kA | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | N/A | |
| | The test sequence of operations is O - t - CO | | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | Satisfy | P |

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| 1 | • | IEC 60 947-2 | |
|--------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result – Remark | Verdict |
| Clade | 1,040,011,011 | | |

| | closing mechanism energized with 85% at the | | N/A |
|------|--|-------------------------|-----|
| | rated Uc: (V) | | P |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | Satisty | |
| | Test made in free air: | Satisfy | P |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | P |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | N/A | N/A |
| | - perforated metal | N/A | N/A |
| | - expanded metal | Yes | P |
| | - ratio hole area/total area: 0,45-0,65 | Satisfy | P P |
| | - size of hole: <30mm² | Satisfy | P P |
| ···· | - finish: bare or conductive plating | Satisfy | P |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | <u> </u> | |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | Satisfy | Р |
| | Circuit is earthed at: (load-star- or supply-star point |) Load-star | P |
| | Conductor cross-sectional area (mm²): | 70 mm ² | P |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | 6 Nm | P |
| | Test sequence of operation: O - t - CO | | |
| · | Test circuit according figure: 9 | Satisfy | P |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | 725 V 725 V 725 V | P |
| | Short-circuit test current (I _{IT}): equal to 1,2 times the max. setting of the short-time delay release tripping current, | ne | N/A |
| | or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release, | | N/A |
| · | or, where relevant 1,2 times the max. setting of the definite time delay release tripping current, but no exceeding 50kA. | e Satisfy t | Р |

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| | IEC 60 947-2 | | |
|---------|---|----------------------------|---------|
| use | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | - r.m.s. test current AC/DC: (A) | 2110 A AC | P |
| | power factor/time constant : | 0,89 | Р |
| | - Factor "n" | 1,5 | P |
| | - peak test current (Amax) : | 3010 A | P |
| | Test sequence "O" L1 | | |
| | - max. let-through current: (kApeak)L1: | 2,97 kA | |
| | - Joule integral I ² dt (A ² s)L1: | 72000 A ² s | P |
| | Pause, t: (min) | 3 min | |
| | Test sequence "CO" L1 | | |
| | - max. let-through current: (kApeak)L1: | : 2,77 kA | P |
| | - Joule integral I ² dt (A ² s)L1 | | P |
| ······ | Test sequence "O" L2 | A | P |
| | - max. let-through current: (kApeak)L2 | 2:/ 3,01 kA | |
| | - Joule integral I ² dt (A ² s)L2 | 2: 87000 A ² s | P |
| | Pause, t: (min) | 3 min | |
| | Test sequence "CO" L2 | | P |
| | - max. let-through current: (kApeak)L | 2: 2,85 kA | |
| | - Joule integral I²dt (A²s)L | 2: 75000 A ² s | P |
| | Test sequence "O" L3 | | P |
| | - max. let-through current: (kApeak)L | .3: 3,01 kA | P |
| | - Joule integral I ² dt (A ² s) L | .3: 82000 A ² s | |
| | Pause, t: (min) | 3 min | |
| | Test sequence "CO" L3 | | F |
| | - max. let-through current: (kApeak) | L3: 2,62 kA | |
| | - Joule integral l²dt (A²s) | L3: 63000 A ² s | |
| | Melting of the fusible element | | |
| | Holes in the PE-sheet for test sequence "O" | | |
| | Cracks observed | | |
| H.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage of a minimum of 1000 V | with 1380 V | |
| | - no breakdown or flashover | | |

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| | IEC 60 947-2 | Daniel Daniel | Verdict |
|---|---|-------------------|---------------|
| Clause | Requirement - Test | Result Remark | Verdict |
| | | | |
| 1.4 | Verification of overload releases | | |
| | The operation of overload releases shall be verified their current setting on each pole separately. | | |
| | The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | | |
| | Time specified by the manufacturer: | 65" | |
| | - Operation time: (s) | 67" 66" 63" | Р |
| H,5 | Marking | | |
| | Circuit-breaker for which all values of rated voltage have not been tested according to this annex or are not covered by such testing, shall be identified by the symbol which shall be market on the | Satisfy | Р |
| | circuit-breaker immediately following these values of rated voltage | 1 () l | |
| | | V 1 | |
| Annex M Modular residual current devices (without integral current breaking device) | | | |
| | | | |
| M.8.3 | Operating characteristics | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | <u> </u> |
| | Rated operational voltage: Ue (V) | | <u> </u> |
| | Rated frequency (Hz) | | |
| | Terminal type or through conductor type | | |
| | MRCD with sensing means and processing device combined or separate | Combined/separate | |
| | MRCD with voltage source | | |
| | Operating automatically in case of failure of the voltage source. | Yes/no | |
| | Rated insulation voltage (Ui) | | |
| | Rated impulse withstand voltage (Ump) | | Trible of |
| | Characteristics of the voltage source of MRCDs | | Other Science |
| | Rated values of the voltage source of MRCDs | ሐ | 対抗の合語を |

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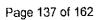
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| | IEC 60 947-2 |) f = u=l! = 6 |
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| lause | Requirement – Test Result – Remark | Verdict |
| | | LEEFESKALE (S |
| | Rated values of the frequencies of the voltage source of MRCDs | |
| | Rated insulation voltage (Ui) | |
| | Rated impulse withstand voltage (Uimp) | |
| 1,4,1.3 | Characteristics of auxiliary contacts | |
| Л.4.2 | Characteristics of MRCDs concerning their residual current function | |
| <u>л.4.2,2</u> | Operating characteristic in case of residual current with d.c. component | |
| | Type AC MRCD | |
| | Type A MRCD | |
| | Type B MRCD | |
| M.4.3 | Behaviour under short-circuit conditions | |
| | Rated conditional short-circuit current (Icc) | |
| | Rated conditional residual short-circuit current (/Δc) | |
| | Rated short-time withstand current (Icw) | |
| | Rated residual short-time withstand current (/Δw) | |
| | Peak withstand current | |
| M.4.4 | Preferred and limiting values | (7) (8) ₁₀ |
| | Preferred values of the rated residual operating current (IΔn) | <u> </u> |
| | Minimum value of the rated residual non- operating current (/Δno) | |
| | Limiting value of the non-operating overcurrent in the case of a single-phase load in a multiphase circuit | |
| | Preferred values of rated voltage of the voltage source of MRCDs | N/A |
| | Compliance with constructional requirements | - IVIA |
| MI | Test sequence MI | A1/2 |
| M.8.3.4.2 | Verification of operating in case of steady increase of the residual current (figur M.1) | |
| | Increase the residual current from 0,2 IΔn to IΔn in 30 sec. | N/A |
| | Required: value between 0,2 IΔn and IΔn | |

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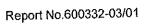
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| | IEC 60 947-2 | |
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| Clause | Requirement – Test Result – Rem | ark Verdict |
| | | |
| | Min. setting I∆n.(mA): Interm. setting I∆n.(mA): Max. setting I∆n.(mA): | N/A |
| M.8.3.4.3 | Verification of operating in case of closing on residual current (figure | ıre M.2) N/A |
| | The MRCD is closes on IΔn or each specified setting | N/A |
| | Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | |
| | Min. setting lΔn.(ms): Interm. setting lΔn.(ms): Max. setting lΔn.(ms): | N/A |
| M.8.3.4.4 | Verification of operating in case of a sudden appearance of the re (figure M.2 and M3) | esidual current N/A |
| | A residual current is sudden appear on the MRCD of IΔn | N/A |
| | Required: no value exceeds the specified limiting value of Table B1: 300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting.l∆n.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn | N/A |
| | Required : no value exceeds the specified limiting value of Table B1: 150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of [] 5 IΔn or [] 0,25 A | N/A |
| | Required : no value exceeds the specified limiting value of Table B1: 40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |

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|-----------|--------------|-----------------|---------|
| nt – Test | | Result – Remark | Verdict |

| Clause | Requirement – Test | Result – Remark | Verdict |
|--------|--|-----------------|---------|
| | | | |
| | A residual current is sudden appear on the MRCD of □10 lΔn or □ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting I∆n.(ms): Interm. setting I∆n.(ms): Max. setting I∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) | | |
| | Min. setting l∆n.(ms) Interm. setting l∆n.(ms) Max. setting l∆n.(ms) | : \ | N/A |
| | A residual current is sudden appear on the MRCE of IΔn: 10 A | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting I∆n.(ms Interm. setting I∆n.(ms Max. setting I∆n.(ms |): | N/A |
| | A residual current is sudden appear on the MRC of IΔn: 20 A | | N/A |
| | Required : no value exceeds the specified limitin value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | g | |
| | Min. setting l∆n.(ms Interm. setting l∆n.(ms Max. setting l∆n.(ms | s): | N/A |
| | A residual current is sudden appear on the MRC of IΔn: 50 A | | N/A |
| | Required: no value exceeds the specified limitir value of Table B1 (40 ms) or Table B2 (150 ms and a non actuating time of 60 ms | ng | |
| | Min. setting IΔn.(m Interm. setting IΔn.(m Max. setting IΔn.(m | s): | N/A |

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| | IEC 60 947-2 | Mandina |
|-----------|--|---------|
| Clause | Requirement – Test Result – Remark | Verdict |
| | A residual current is sudden appear on the MRCD of IAn: 100 A | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min, setting lΔn.(ms): Interm. setting lΔn.(ms): Max. setting lΔn.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 200 A | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min. setting lΔn.(ms): Interm. setting lΔn.(ms): Max. setting lΔn.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of I∆n: 500 A | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min, setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| M.8.3.4.5 | Verification of the limiting non-operating time of time delayed type MRCDs (figure M3) | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer | N/A |
| | Required : The MRCD shall not operated | NIZA |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | N/A |
| M.8.3.5 | Tests at the temperature limits | N/A |
| M.8.3.5.1 | General (clause B.8.2.5 applies) | |
| <u> </u> | Minimum temperature (°C) | |
| | Maximum temperature (°C) | |
| M.8.3.5.2 | Verification of operating in case of a sudden appearance of the residual currer at -5°C or minimum temperature limit (figure M.2 and M3) | ıt . |

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| | IEC 60 947-2 | Mardiat |
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| ause | Requirement – Test Result – Remark | Verdict |
| | | |
| | A residual current is sudden appear on the MRCD of IΔn | N/A |
| | Required : no value exceeds the specified limiting value of Table B1:.300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | N1/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn | N/A |
| | Required : no value exceeds the specified limiting value of Table B1: 150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | |
| | Min. setting I∆n.(ms): Interm. setting I∆n.(ms): Max. setting I∆n.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of | N/A |
| | Required : no value exceeds the specified limiting value of Table B1: 40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | A residual current is sudden appear on the MRCD of □10 IΔn or □ 0,5 A | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | Verification of the limiting non-operating time of time delayed type MRCDs at – 5°C or minimum temperature limit (figure M3) | N/A |
| | A residual current is sudden appear on the MRCD of 2 ΙΔn for a time declared by the manufacturer | N// |
| | Required : The MRCD shall not operated | N/ |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | |
| M.8.3.5.3 | Verification of operating in case of a sudden appearance of the residual current at +40°C (figure M.2 and M3) | IN/A |

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| | IEC 60 947-2 | Result Remark | Verdict |
|-------|---|-------------------|---------|
| lause | Requirement – Test | Result - Itellian | 1 |
| | | I A | |
| | Load : | ^ | |
| | | | |
| | Torque : | Nm | |
| | Connection: | mm² | |
| , | A residual current is sudden appear on the MRCD of iΔn | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1:.300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| , | Min. setting l∆n.(ms) Interm. setting l∆n.(ms) Max. setting l∆n.(ms) |): | N/A |
| | A residual current is sudden appear on the MRCI of 2 IΔn | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1: 150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | ill | |
| | Min. setting l∆n.(ms Interm. setting l∆n.(ms Max. setting l∆n.(ms | s): | N/A |
| | A residual current is sudden appear on the MRC of 5 IΔn or 0,25 A | D | N/A |
| | Required: no value exceeds the specified limitin value of Table B1: 40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | 9 | |
| | Min. setting l∆n.(ms Interm. setting l∆n.(ms Max. setting l∆n.(ms | s): | N/A |
| | A residual current is sudden appear on the MRC of ☐ 10 IΔn or ☐ 0,5 A | OD | N/A |
| | Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | ng) | |
| | Min. setting l∆n.(m Interm. setting l∆n.(m Max. setting l∆n.(m | is): | N/A |
| | A residual current is sudden appear on the MRC of 2 IΔn for a time declared by the manufacture | CD | N/A |
| | Required : The MRCD shall not operated | 11/1 | |

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| | D / Task | esult – Remark | Verdict |
|--------------|---|--------------------------------|--|
| ause | Requirement - Test R | esur Noman | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| | Verification of dielectric properties | · | N/A |
| 1,8.4. | Verification of rated impuls withstand voltage | | N/A |
| 1.8.4.1 | | | |
| | rated impulse withstand voltage | | |
| | test impulse voltage (see table 12 part 1) test impulse voltage for isolating (see table 14 part 1) | | |
| A.8.4.1.2 | Verification of rated impulse withstand voltage with r circuit | espect to the monitored | N/A |
| VI.8.4.1.2.1 | Test for terminal type MRCD | | N/A |
| M.8.4.1.2.2 | Tests for MRCDs of through-conductor type | | N/A |
| M.8.4.1.3 | Verification of rated impulse withstand of the voltage | source circuit (if applicable) | N/A |
| M.8.5 | Verification of the operation of the test device at the | Mimits of the rated voltage | N/A |
| Wi.O.O | For MRCDs having an adjustable time-delay the test is made at the maximum setting of time-delay: | s | |
| M.8.5.a | Setting IAn or minimum setting of IAn | A | |
| | Test voltage (1,1 x Ue max) | V | |
| | Number of operations | 25 | Property and the second |
| | Interval time | 5 s | |
| <u> </u> | Tripping | ☐ Yes / ☐ No | N/A |
| M.8.5.b | Setting I∆n or minimum setting of I∆n | A | 12 (12 (12 (12 (12 (12 (12 (12 (12 (12 (|
| WI.O.O.B | Test voltage 0,85 x Ue max) | V | (1) 107 CP (1) |
| | Number of operations | 3 | |
| ļ | Interval time | 5 s | |
| | Tripping | ☐ Yes / ☐ No | N/A |
| 11050 | Setting IΔn or minimum setting of IΔn | ΑΑ | M2 (18 6) 2.5 |
| M.8.5,c | Test voltage (1,1 x Ue max) | v | |
| | Number of operations | 1 | |
| | Operating means of the test device held in close position | 5 s | Handy Carlon and |
| | Tripping | Yes / No | N/A |

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| Clause | Requirement – Test | Result - Remark | Verdict | |

| Л.8.6 | Verification of the limiting value of non-operating current under overcurrent conditions, in case of a single phase load. | | N/A |
|---------|---|---------|--|
| M.8.6 | Circuit diagram | Fig. M4 | |
| | Setting IΔn or minimum setting of IΔn if adjustable | A | |
| | Test current equal to the lower value of: | | |
| | ☐ 6 x In or | | |
| | ☐ 80 % of the maximum short-circuit release current setting | A | |
| | Test voltage: | | |
| | ☐ rated voltage or | | |
| | ☐ any convenient voltage | V | |
| | Test frequency | Hz | |
| | Power factor (0,5) | | |
| | Current flow time | / 2 s | |
| | Interval time | 60 s | (2) (1) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4 |
| | Calibration plot number | | |
| | No tripping / change of state | | N/A |
| M.8.7 | Resistance against unwanted tripping due to surge currents resulting from impulse voltages | | N/A |
| M.8.7.2 | Verification of the resistance to unwanted tripping in case of loading of the network capacitance | | N/A |
| B.8.6.1 | Current surge test for RMCDs (0,5 µs / 100kHz ring wave test) | | |
| | One pole of the MRCD is submitted to 10 applications of a surge current according to th following requirements: | е | |
| | - peak value: 200 A + 10/0% | | |
| | - virtual front time: 0,5 μs ± 30% | | LIEB STATE |
| | - period of the following oscillatory wave: 10 μs ± 20% | | |
| | - each successive peak: about 60% of the preceding peak | | |
| | The polarity shall be inverted after every two applications | | |
| | The interval between two consecutive application shall be about 30 s | 75() | |

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| Clause | Requirement – Test | | |
| | | | |

| ause | Requirement – Test | |
|-------------|--|-----------------------------------|
| | · | N/A |
| | During the test the MRCD shall not trip: | N/A |
| .8.7.3 | Verification of the resistance to unwanted tripping in case of flashover without follow-on current. | |
| .8.6.2 | Verification of behaviour at surge current up to 250 A (8/20 µs surge current test) | N/A |
| | One pole of the MRCD is submitted to 10 applications of a surge current according to the following requirements: | |
| | - peak value: 250 A + 10/0% | |
| | - virtual front time: 8 µs ± 20% | 第二十二十二章章章 第二十二章章 |
| | - virtual time to half value: 20 μs ± 20% | |
| | - peak of reverse current:: less than 30% of peak value | |
| | The polarity shall be inverted after every two applications | |
| | The interval between two consecutive applications shall be about 30 s | E I A L |
| | During the test the MRCD shall not trip: | N/A |
| M.8.8 | Verification of the behaviour in case of an earth fault current comprising a d.c component. | |
| M.8.8.2 | Type A MRCD | N/A |
| | For MRCDs the operation of which depends on a voltage source the test are made at 1,1 and 0,85 times the rated voltage of the voltage source (Us). | |
| M.8.8.2.2 | Verification of operation in case of a continuous rise of a residual pulsating di | rect N/A |
| | Rated voltage | |
| B.8.7.2.1 | - steady increase from zero to: 1,4 IΔn for IΔn > 0,01 A with 1,4 IΔn/30 A/s (mA) | |
| | - steady increase from zero to: 2 IΔn for IΔn < 0,01 A with 2 IΔn/30 A/s (mA) | |
| | - angle = 0 (+/-): | \$7 <u>\$1</u> \$6567 83518724 |
| | - angle = 90 (+/-) : | 一 |
| | - angle = 135 (+/-) : | |
| | No value exceeds the relevant specified limiting | N/A |
| M.8.8.2.3 | Verification of operation in case of a suddenly appearing residual pulsating current | direct N/A |

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| Clause | Requirement – Test Result – Remark | Verdict | | |
| | | T | | |
| B.8.7.2.2 | Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle = 0°) | N/A | | |
| | Rated voltageV | , | | |
| | RCCB's with Ion > 0,015 A: | | | |
| | - maximum break time (ms) at: 1,4 lΔn (+/-) : | | | |
| | - maximum break time (ms) at: 2,8 lΔn (+/-) : | | | |
| | - maximum break time (ms) at: 7 lΔn (+/-) : | | | |
| | - maximum break time (ms) at: 14 IΔn (+/-) : | 以 (207章要) | | |
| | No value exceeds the relevant specified limiting value | N/A | | |
| | RCCB's with IΔn = 0,015 A: | N/A | | |
| | - maximum break time (ms) at: 2 IΔn (+/-) : | Africas Africa Matematika | | |
| | - maximum break time (ms) at: 4 lΔn (+/-) | | | |
| | - maximum break time (ms) at: 10lΔn (+/-) | | | |
| | - maximum break time (ms) at: 20 IΔn (+/-) | 1487年15月 安徽 1674年 第1975年 | | |
| | No value exceeds the relevant specified limiting value | N/A | | |
| M.8.8.2.4 | Verification of operation with load at reference temperature | | | |
| | Rated voltageV | | | |
| B.8.7.2.1 | - steady increase from zero to: 1,4 lΔn formA IΔn > 0,015 A with 1,4 lΔn/30 A/s (mA) | | | |
| | - steady increase from zero to: 2 IΔn formA IΔn < 0,015 A with 2 IΔn/30 A/s (mA) | | | |
| | - angle = 0 (+/-) : | A. Frein. | | |
| | - angle = 90 (+/-) : | | | |
| | - angle = 135 (+/-) : | | | |
| | No value exceeds the relevant specified limiting values | N/A | | |
| M.8.8.2.5 | Verification of operation of a residual pulsating direct current superimposed by a smooth direct current of 6 mA. | | | |
| | Rated voltageV | | | |
| B.8.7.2.1 | - steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA) + 6 mA | | | |

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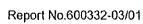
| | | IEC 60 947-2 | |
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| Clause | Requirement – Test | Result – Remark | Verdict |

| | -steady increase from zero to: 2 IΔn for IΔn < 0,015 A with 2 IΔn/30 A/s (mA) + 6 mA | mA | |
|-----------|---|--------------------------------|------------|
| | - angle = 0 (+/-) : | | |
| | No value exceeds the relevant specified limiting values | | N/A |
| A.8.8.3 | Type B MRCD | | N/A |
| M.8,8.3.2 | Verification of operation in case of a slowly rising re | esidual smooth direct current | |
| | Rated voltage (1,1*Un) | V | |
| 3.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | V | |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A vith 1,4 lΔn/30 A/s (mA) | | |
| | - angle = 90 (+/-) : | | <u> </u> |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| M.8.8.3.3 | Verification of operation in case of a suddenly appropriate current | pearing residual smooth direct | N/A |
| B.8.7.2.2 | Verification of the correct operation in case of suddenly appearing a smooth residual direct currents by closing S2 | | |
| | Rated voltage (1,1*Un) | V | ļ <u>.</u> |
| | RCCB's with IΔn > 0,015 A: | | |
| | - maximum break time (ms) at: 2 lΔn (+/-) | | |
| | - maximum break time (ms) at: 4 lΔn (+/-) | | <u> </u> |
| | - maximum break time (ms) at: 10 IΔn (+/-): | | |
| | - maximum break time (ms) at: 20 lΔn (+/-) : | | |
| | No value exceeds the relevant specified limiting value | | N/A |
| B.8.7.2.2 | Verification of the correct operation in case of suddenly appearing a smooth residual direct currents by closing S2 | | N/A |
| | Rated voltage (0,85*Un) | V | |
| | RCCB's with IΔn > 0,015 A: | | |
| 1 | - maximum break time (ms) at: 2 lΔn (+/-) | h | |

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|-------------------------|--|--------------------------------|---------------------------------------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | ÿ | · · · · · · · · · · · · · · · · · · · |
| | - maximum break time (ms) at: 4 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 10 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 20 lΔn (+/-) : | | |
| | No value exceeds the relevant specified limiting value | | N/A |
| M.8.8.3.4 | Verification of operation in case of a slowly rising rafault in a circuit fed by a three-pulse star or a six | | N/A |
| | Rated voltage (1,1*Un) | v | |
| B.8,7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| • | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | v | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| M.8.8.3.5. | Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line. | | N/A |
| | Rated voltage (Un) | v | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | |
| | Operation shall occur between 0,5 and 1,4ldn | | N/A |
| M.8.8.3,6 | Verification of operation with load at the reference | temperature | N/A |
| M.8.8.3.6- M.8.8.3.2 | Verification of operation in case of a slowly rising | residual smooth direct current | N/A |
| | Rated voltage (1,1*Un) | v | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | v | |

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|--------------------------|---|----------|
| | | |
| 3.8,7,2.1 | - steady increase from zero to: 2 IΔn A withmA | |
| | - angle = 90 (+/-) | |
| | Operation shall occur between 0,5 and 2ldn | N/A |
| M.8.8.3.6- M.8.8.3.4 | Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by a three-pulse star or a six-pulse connection | N/A |
| | Rated voltage (1,1*Un) | |
| 3.8.7.2.1 | - steady increase from zero to: 2 IΔn A with mA 1,4 IΔn/30 A/s (mA) | |
| | - angle = 90 (+/-) : | |
| | Operation shall occur between 0,5 and 2ldn | N/A |
| | Rated voltage (0,85*Un) | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with mA 1,4 IΔn/30 A/s (mA) | |
| | - angle = 90 (+/-) | |
| | Operation shall occur between 0,5 and 2ldn | N/A |
| M.8.8.3.6- M.8.8.3.5. | Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line. | |
| | Rated voltage (Un) | |
| B,8.7.2.1 | - steady increase from zero to: 2 iΔn A with mA mA mA | |
| | - angle = 0 (+/-) | |
| | Operation shall occur between 0,5 and 1,4ldn | N/A |
| | | N/A |
| M.8.9. | Verification of the behaviour of MRCDs with separate sensing means in case of a failure of the sensing means connection | N/A |
| M.8.9.2 | Test method 1 | N/A |
| | Rated voltage of the sensing means | |
| | Interval time Required <5 sec | N/A |
| M.8.9.3 | Test method 2 | N/A |
| | Test shall be carried out as follows: | |
| | - The test device is activated | |
| | - The sensing means are disconnected and the test device is activated. The MRCD shall not | |

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| Clause | Requirement - Test | Result Remark | Verdict | |
| | | | | |
| | Rated voltage of the sensing means | | | |
| | Test device activated MRCD shall operate | | N/A | |
| | Rated voltage of the sensing means | | | |
| | Sensing device disconnected and Test device activated MRCD shall not operate | | N/A | |
| VI.8.10 | Verification of temperature-rise of terminal type MF | RCDs | N/A | |
| vi.8.10.2 | Tambient;°C | | | |
| 3.3.2.5 | Main circuits | | | |
| | Conventional thermal current Ith | A | | |
| | Conventional thermal current for enclosure I _{the} | A | | |
| | Conventional thermal current for the neutral pole | A | | |
| | Cabling characteristics | M | | |
| | Cable | mm² | | |
| · · · · · · · · · · · · · · · · · · · | Bar / number / length | mm / / m | | |
| | Arrangement | ☐ 3 phase - ☐ poles on serie | | |
| | Tightening torque | Nm | | |
| | Neutral pole (if applicable) | | | |
| | Cable | mm² | | |
| | Bar / number / length | mm / / m | | |
| | Tightening torque | Nm | | |
| | Terminals(see table 2) | | | |
| | Manual operating means | | | |
| | Parts which need not be touched but not hand held | | | |
| , | Parts which need not be touched during normal operation | | | |
| VI.8.11 | Verification of mechanical and electrical endurance | | N/A | |
| | 500 off-load operations controlled by the test device | | | |
| | Rated voltage: | V 🗌 ac 🗌 dc | | |
| | Result: | afteroperations, | N/A | |

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|--------------|---|---------------------------------------|---------|
| ause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | 500 off load operations by passing the rated residual operating current IΔn through one current path | | |
| | Rated voltage: | V □ac □dc | |
| -, | Rated residual current | mA | <u></u> |
| | Result: | afteroperations, | N/A |
| | 500 on-load operations controlled by the test device | | |
| | Rated voltage: | V 🗌 ac 🗌 dc | |
| | Test current | A | |
| | Power factor | | |
| | Test circuit | <u> </u> | |
| | Result: | afteroperations, | N/A |
| | 500 on-load operations by passing the rated residual operating current l∆n through one current path. | | |
| | Rated voltage: | V ☐ ac ☐ dc | |
| | Test current | A | |
| | Power factor | | |
| | Test circuit | | |
| | Rated residual current | mA | ļ |
| | Result: | after operations, | N/A |
| | Show no damage | | N/A |
| | High voltage test: twice rated voltage | Test voltage:V | N/A |
| | A residual current is sudden appear on the MRCI of IΔn (mA) | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1:.300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| M.8.12. | Verification of the behaviour of MRCDs in case of for MRCDs classified under M.3.2.2.1 | of failure of the voltage source | N/A |
| M.8.12.2 | Determination of the limiting value of the voltage | | N/A |
| | Source voltage (Us) | Max Us:V □ac □ | |

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|----------|--|---|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | | Min Us:V □ac □ dc | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | \$ | |
| | Time period of voltage decreasing | 30 s or a period enough with respect to delayed opening | |
| | Min voltage to automatic opening (U > 0,85 x Us) | | |
| | A residual current is sudden appear on the MRCD of IΔn (mA) at a value just above highest measured value | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1:.300 ms | | |
| | It's not possible to switch "ON" by manual operating means at a lower value than the lower measured value. | M | N/A |
| M.8.12.3 | Verification of automatic opening in case of voltage | e source failure | N/A |
| | Source voltage (Us) | Max Us: V ☐ac ☐ dc | |
| · | | Min Us:V □ac □ dc | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | s | |
| | Time period | Max 1 s or max. 1 s+time delay setting | |
| | Time period to automatic anoning | | |

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No value exceeds the relevant specified limiting value

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N/A

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| Clause | Requirement - Test | Result – Remark | Verdict |
|------------|--|-----------------------|---------|
| | | | |
| M.8,13 | Verification of the behaviour of MRCDs with voltage source as classified under M.3.2.2.2 in case of failure of the voltage source. | | N/A |
| | Source voltage (Us) | Max Us:V 🗍 ac 🗍 dc | |
| | | Min Us:V □ac □ dc | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | \$ | |
| | Switch off and reclosed Sa or S1 and reduced the source voltage to 70 % | | N/A |
| | | 70% Us = V □ac □ | |
| | Time period to automatic opening | II // | N/A |
| MII | Test sequence MII | <u> </u> | N/A |
| M.8.14 | Verification of the behaviour of the MRCD under short-circuit conditions | | N/A |
| | Type designation or serial number | | _ |
| | Sample no: | | |
| M.8.14.3 | Verification of the rated conditional short-circuit current (1∞) | | N/A |
| | Verification of the coordination between the MRCD and the SCPD | | |
| | Test circuit according to figure : | | |
| | Point of test circuit which is directly earthed: | | |
| | Grid distance "a" (mm) : | | |
| | Silver wire diameter (mm) : | | |
| | Used SCPD during the tests | | |
| | Prospective current (A): | | |
| | Prospective current obtained (A) : | | |
| | Power factor / ratio n : | | |
| | Power factor / ratio n obtained : | | |
| | Plot no. | | |
| | Test sequence: O-t-O | | |

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|--------------|---|--|---------|--|
| Clause | Requirement - Test | Result – Remark | Verdict | |
| | 12+ /LA2n\: In /LA\ | ri-10. | | |
| | l²t (kA²s); lp (kA) : | First O: | | |
| | | lp:kA | | |
| | | l²t;kA²s | | |
| | | Plot no | | |
| | | Second O: | | |
| | | lp :kA | | |
| | | ²t;kA²s | | |
| · | | Plot no.: | | |
| | If tested at separate testing station see report | No.: oftesting station | | |
| | · | | | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | | N/A | |
| | After the tests no damage Impairing further use | M | N/A | |
| 8.3.3.5 | Dielectric strength test of the main circuit at test vo | Itage of 2 Un for 1 min: | | |
| | Test voltage | | N/A | |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting: | I test: mA trip time: ms | N/A | |
| M.8.12.3 | Verification of automatic opening in case of voltage source failure | | N/A | |
| | Source voltage (Us) | Max Us: V □ac □ | | |
| | | Min Us:V □ac □ dc | | |
| | Adjustable residual current setting | mA (lowest) | | |
| | Adjustable time-delay setting | s | | |
| | Time period | Max 1 s or max. 1 s+time delay setting | | |
| | Time period to automatic opening | | N/A | |
| | No value exceeds the relevant specified limiting value | | N/A | |
| | The polyethylene sheet shows no holes | | N/A | |
| | | | N/A | |
| M.8.14.4 | Verification of rated short-time withstand current (Ic | w) | N/A | |

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| lause | Requirement – Test | Result – Remark | Verdict |
| | | | |
| | Test circuit according to figure : | | <u></u> |
| | Point of test circuit which is directly earthed: | | |
| <u> </u> | Grid distance "a" (mm) : | | |
| | Prospective current (A): | | |
| | Prospective current obtained (A) | | |
| | Power factor / ratio n : | | |
| | Power factor / ratio n obtained : | | |
| | Plot no. | | |
| | Test sequence: O | | |
| | I²t (kA²s); lp (kA) | Ip:kA I²t; | |
| | If tested at separate testing station see report | No.:oftesting station | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | | N/A |
| | After the tests no damage impairing further use | | N/A |
| 8.3.3.5 | Dielectric strength test of the main circuit at test ve | oltage of 2 Un for 1 min: | N/A |
| <u> </u> | Test voltage | - | N/A |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 IΔr (ms) in minimum setting: | l test: mA trip time: ms | N/A |
| | | | N/A |
| M.8.12.3 | Verification of automatic opening in case of voltage | | N/A |
| | Source voltage (Us) | Max Us: V □ac □ dc | ļ |
| | | Min Us:V ☐ac ☐ dc | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | s | <u> </u> |
| | Time period | Max 1 s or max. 1 s+time delay setting | |

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| Clause | Requirement Test | Result – Remark | Verdict |
| | · | | |
| | Time period to automatic opening | | N/A |
| | No value exceeds the relevant specified limiting value | } | N/A |
| | The polyethylene sheet shows no holes | | N/A |
| | | | N/A |
| M.8.14.5 | Verification of the rated conditional residual short- | circuit current (IΔc) | N/A |
| | Test circuit according to figure : | | |
| | Point of test circuit which is directly earthed: | | |
| | Grid distance "a" (mm) : | | |
| | Silver wire diameter (mm) : | | |
| | Used SCPD during the tests | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | |
| | Prospective current (A): | | |
| | Prospective current obtained (A) : | | |
| | Power factor / ratio n : | | |
| | Power factor / ratio n obtained : | | |
| - | Plot no. | | |
| | Test sequence; O-t-O | | |
| | l²t (kA²s); lp (kA) : | First O: | |
| | | lp :kA | |
| | + | l²t;kA²s | |
| | | Plot no. | |
| | | Second O: | |
| | | lp :kA | |
| | | l²t;kA²s | |
| | | Plot no.: | |
| | If tested at separate testing station see report | No.: of testing station | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | | N/A |
| | After the tests no damage impairing further use. | | N/A |
| 8.3.3.5 | Dielectric strength test of the main circuit at test vo | olage of 2 Un for 1 min: | N/A |

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|------------|--|---------------------------------------|----------------|
| ause | Requirement - Test | Moon | |
| | 1 | | N/A |
| | Test voltage | " I tost: mA | N/A |
| 8.10.3.2 | The RCCB shall trip with a test current of 1,25 lb | trip time: ms | |
| | I (ms) in minimum secons. | (ii) (iii) (iii) | N/A |
| 1.8.12.3 | Verification of automatic opening in case of volta | Max Us:V []ac [| |
| | Source voltage (Us) | dc | |
| | | Min Us: ∨ ☐ac [|] |
| | | dc (lowest) | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | S S S S S S S S S S S S S S S S S S S | |
| | Time period | Max 1 s or max. 1 s+tim delay setting | |
| ı | | | N/A |
| | Time period to automatic opening | | N/A |
| | No value exceeds the relevant specified limiting value | <u> </u> | N/A |
| | The polyethylene sheet shows no holes | | N/A |
| | | | N/A |
| M.8.14.6 | Verification of rated residual short-time withs | tand current (IAW) | |
| 191.0.14.0 | Test circuit according to figure : | | |
| | Point of test circuit which is directly earthed | : | |
| | Grid distance "a" (mm) : | | |
| | Prospective current (A) : | | |
| | Prospective current obtained (A) : | | |
| | Power factor / ratio n : | | ` _ |
| | Power factor / ratio n obtained : | | |
| | Plot no. | | |
| | Test sequence: O | | |
| \ | I²t (kA²s); Ip (kA) | lp :kA | |
| | Let (wy all the a | | ms (|
| - | | Test duration: | |
| | | Plot no. | _ |
| | | | |

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| Clause | Requirement – Test | Result – Remark | Verdict |

| | If tested at separate testing station see report | No.: of testing station | |
|------------|---|--|-----|
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | | N/A |
| | After the tests no damage impairing further use | | N/A |
| 8.3,3.5 | Dielectric strength test of the main circuit at test vo | Itage of 2 Un for 1 min; | N/A |
| | Test voltage | - | N/A |
| B.8.10,3.2 | The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting: | I test:mA trip time:ms | N/A |
| | | | N/A |
| M.8,12.3 | Verification of automatic opening in case of voltage | source failure | N/A |
| | Source voltage (Us) | Mak Vs:V □ac □ | |
| | | Min Us:V □ac □ dc | |
| | Adjustable residual current setting | mA (lowest) | |
| | Adjustable time-delay setting | s | |
| | Time period | Max 1 s or max. 1 s+time delay setting | N/A |
| | Time period to automatic opening | | N/A |
| | No value exceeds the relevant specified limiting value | | N/A |
| | The polyethylene sheet shows no holes | | N/A |
| M.III | Test sequence MIII | | N/A |
| M.8.15 | Verification of effects of environmental conditions | | N/A |
| | Type designation or serial number | 1 | |
| | Sample no: | | |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting: | I test:mA trip time:ms | N/A |
| | · | | N/A |
| M.IV | Test sequence MIV | | N/A |
| M.8.16 | Verification of electromagnetic compatibility | | |

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| Clause | Requirement – Test | Result – Remark | Verdict |

| TABLE: Heating Test | | | |
|---|--------------------|-----------|--------------------------------|
| Test voltage (V) | ************ | 20 V | |
| Ambient (°C) | | 40°C | |
| Thermocouple Locations | max. temperature r | neasured, | max. temperature limit (°C) |
| Terminals for external connections | 97 | | 110 |
| Manual operating means non-metalic | 51 | | 65 |
| Parts intended to be touched non-metelic | 61 | | 80 |
| Parts which no need be touched for normal operation non-metelic | 78 | | 90 |

| normal operation non-meteric | | |
|---|----------------------------|-----------------------------------|
| TABLE: dielectric strength | <u> </u> | |
| test voltage applied between: | test potential applied (V) | breakdown / flashover (Yes/No) |
| Between all theterminals main circuit | 1890 V | no |
| Between each pole of the main circuit and the other poles and to the mounting plate | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the maincircuit | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the other circuit | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the mounting platre | 1890 V | no |
| For equipment suitable for isolation, acros s the poles of the main circuit | 1890 V | no |
| supplementary information: | | |

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| Clause | Requirement – Test | Result Remark | Verdict |

| TABLE: impact | E: impact resistance | | | | |
|---------------------------|----------------------|----------------------|--|--|--|
| impacts per surface | surface tested | impact energy (Nm) | comments | | |
| | - | - | - | | |
| upplementary information: | | | ······································ | | |

| | TABLE: el | lectrical data | (in normal co | onditions) | | |
|-------|-------------|----------------|---------------|------------|-------------|------------------|
| fuse# | I rated (A) | U (V) | P (W) | I (mA) | I fuse (mA) | condition/status |
| X, | 160 A | 690 V | 15 W | Х | X | -40 - +55°C |

| | TABLE: clearance | and creepag | ge distance me | asurements | M | | |
|--|------------------|-------------|----------------|-------------|---------|--------------|-------|
| clearance cl and creepage distance dcr at/of; | | Up | U r.m.s. (V) | required cl | cl (mm) | required dcr | der |
| | | (V) | | (mm) | (mm) | | (mm) |
| | - | 976 V | 690 V | 8mm | 13 | 9 mm | 11 mm |

| TABLE: distance through insulation measurements | | | | |
|---|-----------------|---------------------|---------------------|------------|
| distance through insulation di at/of: | U r.m.s. (V) | test voltage (V) | required di (mm) | di (mm) |
| 17 | - | - | • | ~ |
| supplementary information:N/A | | | | |

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| Clause | Requirement – Test | Result – Remark | Verdict |
| | TABLE: ball pressure test of thermoplastics | | N/A |
| | allowed impression diameter (mm) | , | |
| part | | test temperature (°C) | impression diamete (mm) |
| | - | - | - |
| suppleme | ntary information: | | |
| | | | |

| TABLE: threaded | part torque test- | | |
|------------------------------|----------------------------|---------------|-----------------------|
| threaded part identification | diameter of thread (mm) | column number | applied torque (Nm) |
| connector | 6 mm | I,II and III | 6 Nm |
| supplementary information: | | | |

| | TABLE: over-voltage | and under-voltage | test | | N/A |
|------|---------------------|----------------------|---------------------|---------------------|----------|
| test | operating condition | rated voltage (V) | test voltage (V) | temperature (°C) | comments |
| - | - | _ | - | - | • |

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| Clause | Requirement – Test | | Result – Remark | Verdict |

| TAE | BLE: Resistance to fire (Glov | wire test |) | | | | | |
|-----|-------------------------------|-----------|---------------|-------|---------------------------|------------------|--------------------|---------|
| no. | Specimen | | | | | | | Verdict |
| | Description | Colour | Thick (mm) | Temp. | burning after t (s) | drops | support burning | |
| 1 | Base circuit breaker | blue | 2mm | 960°C | 0 | EN60695 -2-11 | _ | Р |
| 2 | Enclosure terminals | Black | 1,5 mm | 960°C | 0 | EN60695 -2-11 | | Р |
| 3 | actuator | black | 6 mm | 960°C | 0 | EN60695 -2-11 | - | Р |
| 4 | Frame arc chute | white | 1,2 mm | 960°C | 0 | EN60695 -2-11 | | Р |
| 5 | Rotating shaft | black | 1,1 mm | 960°C | 0 | EN60695 -2-11 | - | Р |
| 6 | Base release | black | 1, 2mm | 960°C | 0 | EN60695 -2-11 | - | Р |

| TAE | BLE: Resistance | to tracking (| tracking te | st) | | | | | |
|-----|-----------------|---|-------------|----------------|-----------------|---------|----------------|--------|---------|
| no. | Specimen | , | | | | | | | Verdict |
| | Description | | Colour | Drops (no.) | Impress (mm) | Burning | Current (A) | Result | |
| 1 | _ | | - | - | - | - | - | - | N/A |
| 2 | | | | | | | | | N/A |
| 3 | | | | | | | | | N/A |
| 4 | | | | | | | | | N/A |
| 5 | | | | | | | | | N/A |
| 6 | | | | | | | | | N/A |
| 7 | | | | | | | | | N/A |
| 8 | | | | | | | | | N/A |
| 9 | | | | | | | | | N/A |
| 10 | | | | | | | | | N/A |

TRF No. IEC60947_2C

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| National Differences for (country name) | |
|---|-------|
| | N/A |
| : | N/A |
| : | N/A |
| | n N/A |
| | / N/A |
| | N/A |
| | |
| | N/A |
| | N/A |
| | 707 |
| | N/A |
| | N/A |
| | N/A |
| | |
| | |
| | N/A |

TRF No. IEC60947_2C

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ВЯРНО С ОРИГИНАЛА



Ref. Certif. No.

CZ-1752

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST_CERTIFICATE CERTIFICAT D'ESSAI OC

Product Produit

Name and address of the applicant Nom et adresse du demandeur

Name and address of the manufacturer Nom et adresse du fabricant

Name and address of the factory Nome et adresse de l'usine

Ratings and principal characteristics Valeurs nominales et caractéristiques principales

Trademark (if any) Marque de fabrique (si elle existe)

Model / Type Ref. Ref. De type

Additional Information (if necessary) Information complémentaire (si nécessaire)

A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la

As shown in the Test Report Ref. No, which forms part of this Certificate

Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat

Circuit-breaker

OEZ s. r. o. Šedivská 339, 561 51 Letohrad, Czech Republic

OEZ s. r. o. Šedlyská 339, 561 51 Letohrad, Czech Republic

OEZ s. r. o. Šedivská 339, 561 51 Letohrad, Czech Republic

ln = 100, 160, 250 A, Un = 690 V

BD250

PUBLICATION

EDITION

IEC 60947-2

2003

604548-01/01 of: 06.03.2007

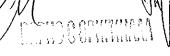
This CB Test Certificate is issued by the National Certification Body Ce Certificat d'essai OC est établi par l'Organisme National de Certification

Elektrotechnický zkušební ústav Pod lisem 129, 171 02 Praha 8 -Czech Republic

Date: 14.3.2007

ertification and Inspection Manager

ikkuka 2001-12





604548-01







TEST REPORT IEC 60 947-2

Low-voltage switchgear and controlgear

Part 2: Circuit - breakers Report Reference No.....: 604548-01/01 Tested by (name+signature).....: Rezková Alena Witnessed by (name+signature) ..: Hlavatý Jan Supervised by (name+signature) . : Hlavatý Jan Approved by (name+signature)....: Hlavatý Jan Date of issue: 06.03.2007 CB Testing Laboratory....:: Elektrotechnický zkušební ústav, s.p. Address.....: Pod Lisem 129, 171 02 Praha 8-Troja Czech Republic Testing location/ procedure: CBTL X RMT | SMT | WMT | TMP Testing location/ address:: Elektrotechnický zkušební ústav, s.p. Applicant's name: OEZ s.r.o Address....: OEZ s.r.o. Šedivská 339 56151 Letohrad, Czech Republic Test specification: Standard: IEC 60 947 - 2: 2003 (3rd Edition) Test procedure....: Non-standard test N/A method....: Test Report Form No...... IEC60947_2D Test Report Form(s) Originator....: KEMA Nederland B.V. Master TRF Dated 2006-04 Copyright © 2006 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not

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This report is not valid as a CB Test Report unless signed by an approyed CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

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placement and context.





| Test item description Circuit - breakers | |
|---|------------------------------------|
| Trade Mark: OEZ. | |
| Manufacturer OEZ s.r.o. | |
| Model/Type reference OEZ s.r.o. Šedivská | 339 56151 Letohrad, Czech Republic |
| Ratings: BD250 | · |
| Particulars: test item vs. test requirements | |
| 3 Classification | AND AND THE SAME |
| 3.1. Utilization category: (A or B): | A |
| 3.2. Interruption medium: (air, vacuum, gas Break): | Air |
| 3.3. Design: (open construction, moulded case) | moulded case |
| 3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power): | independent manual operation |
| 3.5. Suitability for insulation: (suitable, not -suitable): | suitable |
| 3.6. Provision for maintenance: (maintainable, non maintainable) | non maintainable |
| 3.7. Method of installation: (fixed, plug in, withdrawable: | withdrawable |
| 3.8. Degree of protection: (IP code): | IP20 |
| 4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD: | N/A |
| 4.9. Switching overvoltages: (when Uimp. is declared): | Yes |
| 7.3 Electromagnetic compatibility (EMC) Environment A or B: | Yes |
| Circuit-breaker for use on phase-earthed systems: | Yes |
| Circuit-breaker for use in IT systems: | Yes |
| Rated and limiting values, main circuit | |
| - rated operational voltage: Ue (V): | 415 V/500 V/690 V AC |
| - rated insulation voltage: Ui (V): | 690 V |
| - rated impulse withstand voltage: Uimp (kV): | 8 kV |
| - rated operational current: le (A) | 250 A |
| - kind of current: | AC |
| - conventional free air thermal current: Ith (A): | 250 A |
| - conventional enclosed thermal current; Ithe (A): | N/A |
| - current rating for four-pole circuit-breakers: (A): | N/A |
| - number of poles | S FOIGO U- |
| - rated frequency: (Hz) | 50/60 Hz |
| - Integral ruses (ruted values) manimum manimum | No Exp |
| / TDE No. (ECCOMAZ 2D) | M 17 1/ "1000 0000000 |

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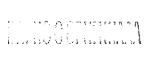
Report No.604548-01/01

| Rated duty: | Neport 10,004040-0 (701 |
|---|--|
| - eight-hour duty | Yes |
| - uninterrupted duty: lu (A) | 250 A |
| Short circuit characteristic | |
| rated short-time making capacity: lcm (kA) | 445 V 70 NA |
| rated ultimate short-circuit breaking capacity: Icu (kA): | 415 V 76 kA |
| rated service short-circuit breaking capacity: Ics (kA) | 415 V 36 kA, 500 V 16 kA, 690 V 10 kA |
| rated short-time withstand current: lcw (kA/s) | 415 V 18 kA, 500 V 8 kA, 690 V 5 kA |
| 0.00 | 2,5 kA/1 s |
| Control circuits : | NA |
| - kind of current: (AC, DC): | |
| - rated frequency: (Hz): | |
| - rated control circuit voltage: Uc (nature, frequency, V): | |
| - rated control supply voltage: Us (nature, frequency V): | |
| Air supply control circuits:(pneumatic or electro-pneumatic | ic) : |
| - rated pressure and its limit | |
| - volumes of air, at atmospheric pressure, required for each closing and each opening operation | |
| Auxiliary circuits | A STATE OF THE STA |
| Rated and limiting values, auxiliary circuits | |
| - rated operational voltage Ue (V) | 500 V AC 240 V DC |
| - rated insulation voltage: Ui (V) | 500 V AC 240 V DC |
| - rated operational current; le (A) | 2 A AC 0,2 A DC |
| - kind of current | AC/DC |
| - rated frequency: (Hz) | 50/60 HZ |
| - number of circuits | 1 |
| - number and kind of contact elements | 1a or 1b |
| - rated uninterrupted current: lu (A) | 10 A |
| - utilization category: (AC, DC, current and voltage): | 2 A/500 V/AC15 0,2 A /240 V/DC13 |
| Short-circuit characteristic : | (M |
| - Rated conditional short-circuit current (kA): | - |
| - Co-ordination of short-circuit protective devices: | |
| - kind of protective device | (18133) |
| | 7 |

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| Releases | TOPOIL TO COULT OF THE PARTY OF |
|---|--|
| 1) shunt release: | Yes |
| 2) Over-current release: | Yes |
| a) instantaneous: | Yes |
| b) definite time delay: | x |
| c) Inverse time delay: | x |
| - Independent of previous load: | x |
| - dependent on previous load; (for example thermal type release): | x |
| 3) Undervoltage release (for opening): | Yes |
| 4) Other releases: | X |
| Characteristics: | |
| 1) Shunt release and undervoltage release (for opening).: | |
| - rated control circuit voltage: Uc (nature, frequency, V): | AC 24 V, 48 V, 110 V, 230 V, 400 V,500 V |
| | DC 24 V,48 V, 110 V,220 V |
| - kind of current | AC/DC |
| - rated frequency: (if AC): | 50/60 Hz |
| 2) Over-current release: | |
| - rated current | 250 A |
| - kind of current: | AC |
| - rated frequency: (if AC) | 50/60 Hz |
| - current setting (or range of settings): | 0,4 –1 lr |
| - time settings (or range of settings): | x |

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Copy of marking plate

Report No.604548-01/01

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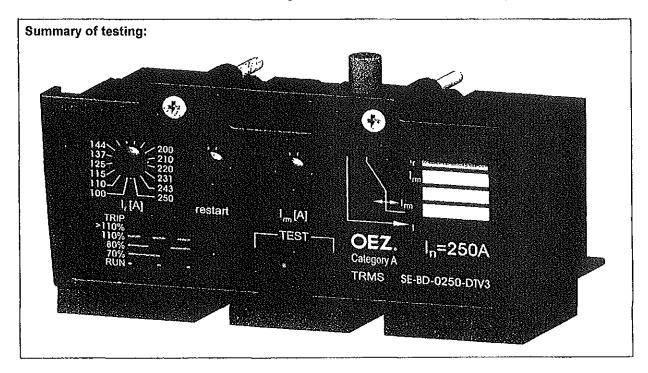
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TRF No. IEC 60947_2D



| ······································ | |
|--|---|
| Test item particulars: | |
| Classification of installation and use: | X |
| Supply Connection | |
| | |
| | |
| Possible test case verdicts: | |
| - test case does not apply to the test object: | N/A |
| - test object does meet the requirement: | P(Pass) |
| - test object does not meet the requirement: | F(Fail) |
| Testing | |
| Date of receipt of test item | 08.01.2007 |
| Date (s) of performance of tests | |
| General remarks: | |
| | |
| The test results presented in this report relate only t This report shall not be reproduced, except in full, w laboratory. | o the object tested. rithout the written approval of the Issuing testing |
| "(see Enclosure #)" refers to additional information "(see appended table)" refers to a table appended to | appended to the report. the report. |
| Throughout this report a comma (point) is used as | the decimal separator. |
| General product information: | |
| | i |
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TRF No. IEC 60947_2D

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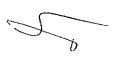
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| IEC 60947-2 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 5.2 | MARKING | | |
|-----|---|---|-----|
| a) | The following data shall be marked on the circuit-br plate or nameplates attached to the circuit-breaker, that they are visible and legible when the circuit-bre | and located in a place such | |
| | - rated current: | 250 A | |
| | - suitability for isolation, if applicable, with the symbol | | P |
| . , | - indication of the open and closed position: with ○ and I respectively, if symbols are used | | Р |
| b) | Marking on equipment not needed to be visible after | r mounting: | |
| | - manufacturer's name or trademark | OEZ | · P |
| | - type designation or serial number | BD250 | P |
| | - IEC 60947-2 if the manufacturer claims compliance with this standard. | | Р |
| | - utilization category | Α | P |
| | - rated operational voltage(s) Ue | 415 V, 500 V, 690V AC | Р |
| | - Circuit-breaker for use in IT systems: Circuit-breaker for which all values of rated voltage have not been tested according to annex H or are not covered by such testing, shall be identified by the symbol which shall be marked on the circuit-breaker immediately following these values of rated voltage | Circuit-breaker is sultable for use in IT systems 415 V, 500 V, 690 V | P |
| | - value (or range) of the rated frequency and/or the indication DC (or symbol) | 50/60Hz | Р |
| | - rated service short-circuit breaking capacity. Ics | 18 kA/415 V, 8 kA/500 V, 5 kA/690 V | P |
| | - rated ultimate short-circuit breaking capacity. Icu | 36 kA/415 V, 16 kA/500 V, 10 kA/690 V | Р |
| | - rated short-time withstand current, (lcw) and associated short-time delay, for utilization category B | V | N/A |
| | - line and load terminals, unless their connection is immaterial | | P |

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| | IEC 60947-2 | | |
|----------|---|---|--|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - neutral pole terminals, if applicable, by the letter | | N/A |
| | - protective earth terminal, where applicable, by the symbol acc. 7.1.9.3 of part 1 | | N/A |
| | - ref. temperature for non-compensated thermal releases, if different from 30°C | +40°C | Р |
| c) | Marked on the circuit-breaker as specified in item b), or shall be made available in the manufacturer's published information: | | Statement way |
| | - rated short-circuit making capacity (lcm) (if higher than specified in 4.3.5.1) | 75 kA/415 V | P |
| | - rated insulation voltage. (Ui) if higher than the maximum rated operational voltage) | 690 V | Р |
| | - rated impulse withstand voltage (Uimp), when declared. | 8 kV | Р |
| | - pollution degree if other than 3 | 3 | P |
| | - conventional enclosed thermal current (Ithe) if different from the rated current: | ith=in | Р |
| | - IP Code, where applicable: | IP20 | P |
| | - minimum enclosure size and ventilation data (if any) to which marked ratings apply: | | N/A |
| | - details of minimum distance between circuit- breaker and earthed metal parts for circuit-breaker intended for use without enclosure: | Vide catalogue | P |
| | - r.m.s sensing if applicable, according to F.4.1.1 | | Р |
| | - suitability for environment A or B | В | Р |
| d) | The following data concerning the opening and closbreaker shall be placed either on their own nameplathe circuit-breaker: | sing devices of the circuit- ites or on the nameplate of | In Property of the State of the |
| | - rated control circuit voltage of the closing device, and rated frequency for AC: | | N/A |
| | - rated control circuit voltage of the shunt release and/or of the under-voltage release, and rated frequency: | 24,48,110,230,400,500 V AC 24,48,110,220 V DC 50/60Hz | Р |
| <u>,</u> | - rated current of indirect over-current releases: | | N/A |
| | - number and type of auxiliary contacts and kind of current, rated frequency (if AC) and rated voltages of the auxiliary switches, if different from those of the main circuit. | Vide catalogue | P |

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| | IEC 60947-2 | | | | |
|---------------------------------------|--|---------|--|--|--|
| Clause | Requirement + Test Result - Remark | Verdict | | | |
| e) | Terminal shall be clearly and permanently identified in acc. with IEC 60445 and annex L: | | | | |
| - | - line terminal | P | | | |
| | - load terminal | P | | | |
| | - neutral pole terminal "N" | N/A | | | |
| | - protective earth terminal | N/A | | | |
| | - terminal of coils (A/B) | N/A | | | |
| | - terminal of shunt release (B) | Р | | | |
| | - terminals of under-voltage release (D) | Р | | | |
| | - terminals of interlocking electromagnets (E) | N/A | | | |
| · · · · · · · · · · · · · · · · · · · | - terminals of Indicated light devices (X) | N/A | | | |
| | - terminals of contact elements for switching devices (no) | N/A | | | |

| 7.1 | CONSTRUCTION | | J. F. J. S. |
|-------------------|--|-------------|-------------|
| 7.1.1 | Withdrawable circuit-breaker | | р |
| | In the disconnected position (main- and auxiliary cli | rcuits) | · 3. |
| | Isolating distances for circuit-breaker suitable for isolating warranted: | 16 mm | Р |
| ···- | Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts. | | Р |
| | Mechanism fitted with interlocks which only permit the isolating contacts to be separate or reclosed when main contacts are open | M | Р |
| | Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed. | | Р |
| | Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position. | | P |
| | The isolating distances between the isolating contacts cannot be inadvertently reduced. | | SINIO |
| 7.1.1.1 part 1 | Resistance to abnormal heat and fire | IEC 60947-1 | * |

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| | IEC 60947-2 | | |
|-------------------|---|-----------------|---------------------------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1.2 part 1 | Current-carrying parts and their connection | IEC 60947-1 | Р |
| 7.1.3 | Clearances and creepage distances: | | |
| | For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.) | | |
| | Clearances distances: | 20 mm | |
| | - Uimp is given as: | 8 kV | |
| · | - max. value of rated operational voltage to earth | 400 V | |
| | - nominal voltage of supply system: | | |
| | - overvoltage category: | IV | 2 4 7 E |
| <u> </u> | - pollution degree: | 3 | · · · · · · · · · · · · · · · · · · · |
| | - fleld-in or homogeneous: | inhomogeneous | Carrier Control |
| | - minimum clearances (mm): | 8 mm | 与"心" |
| | - measured clearances (mm): | 19,4 mm | Р |
| | Creepage distances: | | |
| | - rated insulation voltage Ui (V) | 690 V | |
| | - pollution degree | 3 | 1.50 |
| ···· | - comparative tracking index (V) | 400 V | |
| · | - material group | 2 | 1100 |
| | Minimum creepage distances (mm) | 9 mm | |
| | Measured creepage distances (mm) | 23,7 mm | P |
| 7.1.4 part I | Actuator | | 1 |
| 7.1.4.1 part 1 | Insulation | <u></u> | |
| | The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage | | Р |
| | If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation | A C C | |

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| | IEC 60947-2 | | |
|-------------------|---|-------------------|--------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage | | Р |
| 7.1.4.2 | Direction of movement | | 4 |
| | The direction of operation for actuators of devices shall normally conform to IEC 60447. | | P |
| | Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "I" and "O" positions and the direction of operation | | P |
| 7.1.5 part 1 | Indication of contact position | | |
| 7.1.5.1 part 1 | Indicating means | | |
| | When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated | | P |
| | This is done by means of a position indicating device (see 2.3.18) | | P |
| | If symbols are used, they shall indicate the closed respectively, in accordance with IEC 60417-2: | and open position | |
| | - 60417-2-IEC-5007 I On (power) | | Р |
| | - 60417-2-IEC-5007 O Off (power) | | Р |
| | For equipment operated by means of two push- buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O" | Ch | N/A |
| | Red colour shall not be used for any other push- button | | 400A NA |
| | The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073 | | NA STORY |
| 7.1.5.2 part 1 | Indication by the actuator | | The state of |

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| | IEC 60947-2 | | |
|---------|---|------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided | | P |
| 7.1.6 | Additional safety requirements for equipment suita | ble for isolation | F |
| 7.1.6.1 | Additional constructional requirements for equipm (Ue > 50 V): | | |
| | Equipment suitable for isolation shall provide in the distance in acc. with the requirements necessary to function. Indication of the main contacts shall be profollowing means: | satisfy the isolating | |
| - | - the position of the actuator | | P |
| | - a separate mechanical indicator | | N/A |
| · | - visibility of the moving contacts | | Р |
| | When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position | | Р |
| | Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking | | Р |
| | The indicated open position is the only position in which the specified isolation distances between the contacts is ensured. | \wedge | P |
| | - minimum clearances across open contacts (see Table XIII, Part 1) (mm) : | 8 mm | |
| | - measured clearances (mm) : | 20 mm | P |
| | - test Uímp across gap (kV) : | 8 kV | Р |
| '.1.6.2 | Supplementary requirements for equipment with printerlocking with contactors or circuit-breakers: | ovision for electrical | |
| | auxiliary switch shall be rated according to IEC 60 947-5-1 | D/N d | NA |

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| IEC 60947-2 | | | | |
|-------------|---|-------------------|-----------|--|
| Clause | Requirement + Test | Result - Remark | Verdict | |
| | If equipment suitable for isolation is provided with an auxiliary switch for the purpose of electrical interlocking with contactor (s) or circuit-breaker(s) and intended to be used in motor circuits, the following requirements shall apply unless the equipment is rated for AC-23 utilization category | | N/A | |
| | The time interval between the opening of the contacts of the auxiliary switch and the contacts of the main poles shall be sufficient to ensure that the associated contactor or circuit-breaker interrupts the current before the main poles of the equipment open | | N/A | |
| | Unless otherwise stated in the manufacturer's technical literature, the time interval shall be not less than 20 ms when the equipment is operated according to the manufacturer instructions | | N/A | |
| | Compliance shall be verified by measuring the time interval between the instant of opening of the auxiliary switch and the instant of opening of the main poles under no-load conditions when the equipment is operated according to the manufacturer's instructions | | N/A | |
| | During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles | | N/A | |
| | A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed | M | N/A | |
| 7.1.6.3 | Supplementary requirements for equipment provid padlocking the open position: | ed with means for | | |
| | the locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed | , | Р | |
| | Alternatively, the design may provide padlockable means to prevent access to the actuator | | N/A | |
| | test force F applied to the actuator in an attempt to operate to the closed position (N): | 60 N | Р | |
| | rated impulse withstand voltage (kV) : | 8 kV | P | |
| | test Uimp on open main contacts at the test force | | C STEER P | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1.7 | Terminals | | 1. 李章 |
| 7.1.7.1 | All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength | | P |
| | Terminal connections shall be such that necessary contact pressure is maintained | | Р |
| | Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal | | Р |
| | Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value | | P |
| 7.1.7.2 | Connection capacity | - | |
| | type of conductors : | cable | P |
| | minimum cross-sectional area of conductor (mm²); | | N/A |
| | maximum cross-sectional area of conductor (mm²) : | 120 mm ² | Р |
| | number of conductors simultaneously connectable to the terminal : | 1 | Р |
| 7.1.7.3 | Connection | | |
| | terminals for connection to external conductors shall be readily accessible during installation | (), | P |
| | clamping screws and nuts shall not serve to fix any other component | M | Р |
| 7.1.7.4 | Terminal identification and marking | · · · · · · · · · · · · · · · · · · · | |
| | terminal intended exclusively for the neutral conductor | | N/A |
| | protective earth terminal | | N/A |
| | other terminals | | N/A |
| '.1.8 part | Additional requirements for equipment provided with | th a neutral pole | OH THE |
| | When an equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.). | WAT TO THE TOTAL T | NIA * E E |

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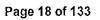
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A switched neutral pole shall break not before and shall make not after the other poles | | N/A |
| | For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles | | N/A |
| | For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher | | N/A |
| | if a pole with a appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, shall operate substantially together. | | N/A |
| 7.1.9 | Provisions for protective earthing | | |
| 7.1.9.1 | The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor | | N/A |
| part 1 | This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly | | N/A |
| | Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts | a | N/A |
| 7.1.9.2 part 1 | Protective earth terminal | | |
| - | The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed | | Р |
| | The protective earth terminal shall be suitably protected against corrosion | | DOLP* |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors | | P |
| | The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 2.1.1.5 – Note). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal | | P |
| 7.1.9.3 | Protective earth terminal marking and Identification | | |
| | The protective earth terminal shall be clearly and permanently identified by its marking | | P |
| | The identification shall be achieved by colour (green-yellow mark) or by the notation PE, or PEN, as applicable, in accordance with IEC 60445, subclause 5.3, or, in the case of PEN, by a graphical symbol for use on equipment | | P |
| | Graphical symbol to be used: 60417-2-IEC-5019 Protective earth (ground) in accordance with IEC 60417-2 | | P |
| '.1.10 | Enclosure for equipment | | |
| 1.10.1 | Design | | |
| | The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible | Ch . | N/A |
| | Sufficient space shall be provided inside the enclosure | | N/A |
| | The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor | | N/A |
| | Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place | , | N/A |

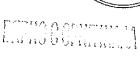
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations | | N/A |
| | When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices | | N/A |
| | If the enclosure is used for mounting push- buttons, it shall not be possible to remove the buttons from the outside of the enclosure | | N/A |
| 7.1.10.2 | Insulation | | F. E. |
| | If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure | | Р |
| 7.1.11 | Degree of protection of enclosed equipment | | |
| | Degree of protection. | IP20 | |
| | Test for first characteristic. | IP20 | |
| | Test for first numeral | 2 | P |
| | Test for second characteristic | IP20 | ,) |
| | Test for second numeral: | 0 | Р |
| 7.1.12 part 1 | Conduit pull-out, torque and bending with metallic | conduits | A. C. |
| | Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending | | N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.2 | Performance requirements | | |
| 7.2.1 | Operating condition | | |
| 7.2.1.1 | Closing | | |
| | For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity | | P |
| 7.2.1.1.1 | Dependent manual closing | <u> </u> | Print I |
| | For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation | | N/A |
| | Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA | | N/A |
| | However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned | | N/A |
| 7.2.1.1.2 | Independent manual closing | | 公本 (1) |
| | A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation | | P |
| 7.2.1.1.3 | Dependent power closing | | |
| | At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker. | | N/A |



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|-----------|--|--|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit. | | N/A |
| 7.2.1.1.4 | Independent power closing | | 78.5 |
| | A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing | | N/A |
| | Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification | · | N/A |
| 7.2.1.1.5 | Stored energy closing | | |
| | Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity | | N/A |
| | - when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged. | | N/A |
| | - means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control supply voltage. | M | N/A |
| | - not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation. | | N/A |
| | - by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.) | | N/A |
| | - For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker. | | N/A N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.2.1.2 | Opening | | 14 4 4 |
| 7.2.1.2.1 | Circuit-breakers which open automatically shall be to otherwise agreed between manufacturer and user, so the tripping operation stored prior to the completion | hall have their energy for | Andreas and the second |
| 7.2.1.2.2 | Opening by undervoltage releases | | 2 新 編 |
| 7.2.1.3. a part 1 | Operating voltage | | 13 4 |
| | An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage | | P |
| | An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value | | P |
| | Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value | | P |
| 7.2.1.3. b part 1 | Operating time | | |
| | For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment | | N/A |
| 7.2.1.2.3 | Opening by shunt releases | $-(\beta)$ | N/A |
| 7.2.1.4 part 1 | Limits of operation of shunt releases | — V — | 雪遊 5 以 |
| | A shunt release for opening shall cause tripping under all operating conditions of an equipment when the supply voltage of the shunt release measured during the tripping operation remains between 70% and 110% of the rated control supply voltage and, if a.c., at the rated frequency | | P |
| .2.1.5 part 1 | Limits of operation of current operated relays and rele | eased | * 2 |
| | Limits of operation of current operated relays and releases shall be stated in the relevant product standard | DWG B | PIRTO |

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| Clause | Requirement + Test | Result - Remark | Verdict |

| 7.2.1.2.4 | Opening by over-current releases | | B # 41 /2 |
|-----------|--|-----------|--|
| a) | Opening under short-circuit conditions | | |
| | The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release | | P |
| | Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing | | P |
| | - maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical) | | P |
| - | - I ² t characteristics for circuit-breakers of utilization category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 8.3.5) | | P |
| b) | Opening under overload conditions | | in contract of the contract of |
| 1) | Instantaneous or definite time-delay operation | | |
| | The release shall cause tripping of the circuit- breaker with an accuracy of \pm 10% of the tripping current value of the current setting for all values of current setting of the overload release | | P |
| 2) | Inverse time-delay operation | | · · · · · · · · · · · · · · · · · · · |
| | At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature | CM | P |
| | Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later | | Р |
| | If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K | <i>f.</i> | P 00A*0 |
| | The width of the temperature band shall be at least 10 K on either side of the reference temperature | No. | |

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| Clause | Requirement + Test | Result - Remark | Verdict | | |
| 7.2.4.2 | Operational performance capability | · | | | |
| 7.2.4.2 part 1 | The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations | | P | | |
| | The operational performance on-load during which the equipment shall make and break the specified current corresponding, where relevant, to its utilization category for the number of operations stated in the relevant product standard | | P | | |

| 8 | TESTS | | 17.00 (A) |
|-------|---|----------------------------|---|
| 8.2.4 | Mechanical properties of terminals | | |
| | Mechanical strength of terminals | | |
| | maximum cross-sectional area of conductor (mm²): | 120 mm² | artistaday meningan |
| | diameter of thread (mm) : | 8 mm | |
| | torque (Nm): | 15 Nm | |
| | 5 times on 2 separate clamping units | | P |
| | Testing for damage to and accidental loosening of | f conductor (flexion test) | |
| | conductor of the smallest cross-sectional area (mm²) : | 10 | |
| | number of conductors of the smallest cross section: | 1 | |
| | diameter of bushing hole (mm) : | 25 | 123.5 |
| | height between the equipment and the platen : | 280 mm | |
| | mass at the conductor(s) (kg) : | 2,0 . | |
| | 135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit | | P |
| | Pull-out test | <u> </u> | |
| | force (N): | 90 | |

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| | 1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit | meets | Р |
| | | 240 | |
| | number of conductors of the largest cross section : | 1 | |
| | diameter of bushing hole (mm) : | 25 | |
| | height between the equipment and the platen : | 464 mm | |
| | mass at the conductor(s) (kg): | 20 | |
| | 135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit | | P |
| · · · · · · · · · · · · · · · · · · · | Pull-out test | | 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | force (N): | 578 N | |
| | 1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit | meets | P |
| | conductor of the largest and smallest cross- sectional area (mm²): | | \$ 77 · · · |
| | number of conductors of the smallest cross section, number of conductors of the largest cross section : | | |
| | diameter of bushing hole (mm) : | | 3 4 % |
| | height between the equipment and the platen : | | ※養佐、 |
| | mass at the conductor(s) (kg) : | | 17 |
| | 135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit | | N/A |
| | Pull-out test | <u> </u> | |
| | force (N): | <u> </u> | 1 20 |
| | 1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit | | N/A |

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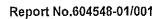
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| Clause | Requirement + Test | Result - Remark | Verdic |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE C | HARACTERISTICS | |
| 8.3.3.1 | Tripping limits and characteristic | | 116 |
| 3.3.3.1.2 | Opening under short-circuit conditions | | |
| | Manufacturer's name or trademark | OEZ s.r.o. | |
| <u> </u> | Type designation or serial number | BD250 | 1 1 2 2 |
| | Sample no: | 1 | |
| | Rated operational voltage: Ue (V) | 415 V,500 V,690 V AC | F a' |
| | Rated current: In (A) | 250 A | 五十 五 |
| | Ambient temperature 10-40 °C : | | P |
| | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 2500 A | Р |
| - | Range of adjustable setting current. (A) | 2500 A | P |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 80% of the rated, or minimum adjustable setting current: (A) | 2000 kA | Р |
| | Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | No operate of the release No operate of the release No operate of the release | Р |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: | \bigcap | N/A |
| i | L1-L3: | (/ | |
| | L2-L3: | V 1 | |
| | Test current: 80% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | 400 | NA A * Q Y Y |

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| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: | | N/A |
| | Test current: 120% of the rated, or minimum adjustable setting current: (A) | 3000 kA | P |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | operate of the release operate of the release operate of the release | Р |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3 | | N/A |
| | Test current: 120% of the maximum adjustable setting current: (A) | | N/A |
| | Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: | | N/A |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: | | N/A |
| | Test current: tripping current declared for single pole operation (A) | 2500 A | Р |
| | Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: | operate of the release operate of the release operate of the release | P |
| | Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: | | N/A |

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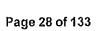
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| Clause | D | T | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.1.3 | Opening under overload conditions | | 19 14 14 |
| a) | Instantaneous or definite time-delay releases | <u> </u> | |
| | Manufacturer's name or trademark | OEZ s.r.o. | · z .; ,,, |
| | Type designation or serial number | BD250 | |
| | Sample no: | 1 | · · · · · · · · · · · · · · · · · · · |
| | Rated operational voltage: Ue (V) | 415 V,500 V,690 V AC | 2022 |
| | Rated current: In (A) | 250 A | Parks to serve |
| | Ambient temperature 10-40 °C : | | P |
| , | Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate. | 1000 A - 2000 A | Р |
| | Range of adjustable setting current. (A) | 1000 A - 2000 A | Р |
| | Time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the rated, or minimum adjustable setting current: (A) | 900 A | P |
| | Operating time: >0,2s in case of instantaneous releases: | No operate of the release | Р |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 90% of the maximum adjustable setting current: (A) | 1800 A | Р |
| | Operating time: >0,2s in case of instantaneous releases | No operate of the release | Р |
| | Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| | Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | 1100 A | P N/A |
| | 0 | operate of the release | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | (2) | O dN/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A) | 2200 A | P N/A |
| | Operating time: <0,2s in case of instantaneous releases | operate of the release | P |
| | Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases. | | N/A |
| b) | Inverse time delay releases | | Parties of the second |
| | Manufacturer's name or trademark | OEZ s.r.o. | chis sansati |
| ., | Type designation or serial number | BD250 | 建設 |
| | Sample no: | 1 | * 3.5 |
| | Rated operational voltage: Ue (V) | 415 V, 500 V, 690 V AC | 市金融 |
| ···· | Rated current: In (A) | 250 A | Section 2 |
| | For releases dependent of ambient air temperature: Reference temperature | | N/A |
| | Test ambient temperature (°C) | | N/A |
| | If test made at a difference ambient temperature: Acc. manufacturer's correction temperature/current data: | | N/A |
| ····· | Range of adjustable setting current: (A) | | N/A |
| | For releases independent of ambient temperature: Test made at 30°C and/or at 20/40°C | | P |
| | Test ambient air temperature: | 30°C | Р |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | | N/A |
| | Releases, independent of ambient air temperature: at 30°C | | P |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 105 A | Р |
| | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | р |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 130 A | S P D |

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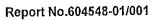
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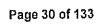
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| Clause | Requirement + Test | Result - Remark | Verdic | |
| | For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2. | | N/A | |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р | |
| | Test current: 105% of the maximum adjustable setting current: (A) | 263 A | Р | |
| - | Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A | No operate of the release | Р | |
| | Test current: 130% of the maximum adjustable setting current: (A) | 325 A | Р | |
| | For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2. | | N/A | |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | Operate of the release | Р | |
| | Releases, independent of ambient air temperature: | at 20°C or 40°C | \$ \$ / · | |
| | Test ambient air temperature: | 40°C | p | |
| | Test current: 105% of the rated, or minimum adjustable setting current: (A) | 105 A | Р | |
| | Conventional non-tripping time: 1h when in < 63A, 2h when in > 63 A | No operate of the release | Р | |
| | Test current: 130% of the rated, or minimum adjustable setting current: (A) | 130 A | Р | |
| | For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2. | CM | N/A | |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | Operate of the release | Р | |
| | Test current: 105% of the maximum adjustable setting current: (A) | 263 A | Р | |
| | Conventional non-tripping time: 1h when ln < 63A, 2h when ln > 63 A | No operate of the release | P | |
| | Test current: 130% of the maximum adjustable setting current: (A) | 325 A | Pol | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2. | | N/A |
| | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | Operate of the release | Р |
| | An additional test, at a current specified by the man time/current characteristic of the releases conform the manufacturer | nufacturer to verify the to the curves provided by | |
| | Releases, dependent of ambient air temperature: Reference temperature (°C) | | N/A |
| | Releases, independent of ambient air temperature: at 30°C | 30°C | Р |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | Instantaneous release±20% short-circuit release ±10% Inverse time-delay releases ±30% | P |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | Р |
| | Releases, independent of ambient air temperature | at 20°C or 40°C | |
| | Test ambient air temperature: | 40°C | P |
| | Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A) | Instantaneous release±20% short-circuit release ±10% Inverse time-delay releases ±30% | p |
| | Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances) | | 500/ |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.1.4 | Additional test for definite time-delay releases | | |
| a) | Time delay | | 143% |
| | Test is made at a current equal to 1,5 times the curr | ent setting | 1 |
| | overload releases: (all phase poles loaded) | | N/A |
| | for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting; | | N/A |
| | short-circuit releases: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release. | | N/A |
| • | Test current: 1,5 times of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Operating time, overload releases: (s) | | N/A |
| | Time-delay: between the limits stated by the manufacturer: | | N/A |
| | Operating time, <u>short-circuit releases</u> : (s) . L1-L2: L1-L3: L2-L3: | | N/A |
| | Time-delay: between the limits stated by the manufacturer: | | N/A |
| | Test current: 1,5 times of the maximum adjustable setting current: (A) | | N/A |
| | Operating time, <u>overload releases</u> : (s) | | N/A |
| | Time-delay: between the limits stated by the manufacturer: | \wedge | N/A |
| | Operating time, <u>short-circuit releases</u> : (s) . L1-L2: L1-L3: L2-L3: | M | N/A |
| | Time-delay: between the limits stated by the manufacturer: | | N/A |
|)) | Non-tripping duration | | £ . |
| | Firstly, the test current equal to 1,5 times the current time interval equal to the non-tripping duration state | t setting is maintained for a d by the manufacturer. | 7000 |
| | overload releases: (all phase poles loaded) | //. | NIA |

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| lause | Requirement + Test | Result - Remark | Verdict |
| | short-circuit releases: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release. | | N/A |
| | Test current: 1,5 times of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Time interval: non-tripping duration stated by the manufacturer: (s) | | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | | N/A |
| | Operating time, short-circuit releases: the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | N/A |
| | Test current: 1,5 times of maximum adjustable setting current: (A) | | N/A |
| | Time interval: non-tripping duration stated by the manufacturer: (s) | | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | | N/A |
| | Operating time, short-circuit releases: the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | N/A |
| | Then, the current is reduced to the rated current are for twice the time-delay stated by the manufacture not trip. | nd maintained at this value r. The circuit-breaker shall | |
| | Test current: of the rated, or minimum adjustable setting current: (A) | | N/A |
| | Time interval: twice the delay-time stated by the manufacturer: (s) | r L | N/A |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | V \ | N/A |
| | Operating time, <u>short-circuit releases</u> : the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | N/A |
| | Test current: maximum adjustable setting current: (A) | | ONTA |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Operating time, <u>overload releases</u> : the circuit-breaker does not trip: | | N/A |
| | Operating time, <u>short-circuit releases</u> : the circuit-breaker does not trip: L1-L2: L1-L3: L2-L3: | | N/A |
| 8.3.3.2 | Test of dielectric properties, impulse withstand vo | Itage (Uimp indicated): | |
| 8.3.3.4 part1 | The 1,2/50µs impulse voltage shall be applied five intervals of 1s minimum | | |
| | - rated impulse withstand voltage (kV) : | 8 kV main circuits 6 kV auxiliary circuits | P |
| | - sea level of the laboratory: | 340 m | Р |
| | - test Uimp main circuits (kV) : | 9,6 kV | Р |
| <u></u> | - test Uimp auxiliary circuits (kV) : | 7,2 kV | P |
| | - test Uimp control circuits (kV) : | | N/A |
| | - test Uimp on open main contacts (equipment suitable for isolating) (kV) : | 14,5 kV | P |
| a) | Application of test voltage | | |
| | i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation. | P M | Р |
| | ii) Between all terminals of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation. | | Р |
| | iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit | | Р |
| | - other circuits | | Р |
| | - exposed conductive parts | | Р |
| | - enclosure of mounting plate | | P |
| - | iv) equipment suitable for isolation | | Р |
| | equipment not suitable for isolation | | NA |
| | - no unintentional disruptive discharge during the test's | XX | |
| | | 1 1 | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test of dielectric properties, dielectric withstand vol | tage (Uimp not indicated): | |
| | - rated insulation voltage (V) : | | N/A |
| * | - main circuits, test voltage for 1 min (V) | | N/A |
| | - auxiliary circuits, test voltage for 1 min (V) | | N/A |
| #4 - 5 | - control circuits, test voltage for 1 min (V) | | N/A |
| 3.3.3.2.2 | Application of test voltage | | 章 |
| 1) | with circuit-breaker in the closed position | | |
| | - between all live parts of all poles connected together and the frame of the circuit-breaker . | | Р |
| | - between each pole and all the other poles connected to the frame of the circuit-breaker | | P |
| 2) | with the circuit-breaker in the open position and, additionally, in the tripped position, if any. | | Р |
| | - between all live parts of all poles connected together and the frame of the circuit-breaker. | | Р |
| | - between the terminals of one side connected together and the terminals of the other side connected together. | | P |
| b) | Control and auxiliary circuits | | |
| 1) | - between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker. | | P |
| 2) | - where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together. | | P |
| | No unintentional disruptive discharge during the tests | | P |
| 8.3.3.2 | For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA. | 0,02 mA | P |

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| Clause | Requirement + Test | Result - Remark | Verdic |
| 8.3.3.3 | Mechanical operation and operational performance | capability | 2 |
| 8.3.3.3.2 | Construction and mechanical operation | | 1 1 1 |
| a) | Construction | | 1 4 4 |
| | A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1 | | Р |
| | A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing | | N/A |
| o) | Mechanical operation | | |
| | A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3 | | N/A |
| | A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer | | N/A |
| · · · · · · · · · · · · · · · · · · · | A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage. | | N/A |
| | It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device | (M | N/A |
| | For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker | | Р |
| | if the closing and opening times of a circuit- breaker are stated by the manufacturer, such times shall comply with the stated values | | Р |
| | Undervoltage releases | *************************************** | |
| | Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| i) | Drop out voltage | | 111 |
| | It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified | | Р |
| | The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s | | Р |
| | The test for the lower limit is made without current in the main circuit and without previous heating of the release coil | | Р |
| | In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range | | P |
| | The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker | | P |
| | This test may be combined with the temperature- rise test of 8.3.3.6 | | Р |
| | In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages | | P |
| ii) | Test for limits of operation | | |
| | Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator | | P |
| • | When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator | | P |
| iii) | Performance under overvoltage conditions | | |
| | With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions | | P |

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| Clause | Requirement + Test | Result - Remark | Verdic |
| d) | Shunt releases | | 2 3 |
| | Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable | | Р |
| | It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker | | P |
| | In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage | | Р |
| 3.3.3.3 | Operational performance capability without current | • | \$ \$ 4 5 |
| | Type designation or serial number | BD250 | £ 4 . |
| | Sample no: | 1 | |
| | Rated current in (A) | 250 A | |
| | Rated operational voltage: Ue (V) | 690 V | 14 - 24 - 14 - 14 - 14 - 14 - 14 - 14 - |
| | Rated control supply voltage of closing mechanism: Uc (V) | - | 1 1 |
| ··· | Rated control supply voltage of shunt releases: Uc (V) | 230 V AC | - A. C |
| | Rated control supply voltage undervoltage releases: Uc (V) | 230 V AC | |
| · | Ambient temperature 10-40 °C : | 23°C | Р |
| | Number of operating cycles per hour | 180/hour | Р |
| | Number of cycles without current (total) (closing mechanism energized at the rated Uc) | 30000 | р |
| | Number of cycles without current (without releases) | 27000 | р |
| | Applied voltage: closing mechanism (V) | | N/A |
| | 10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated Uc | 3000 | Р |
| | Applied voltage: shunt releases (V) | 500 V AC | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | 10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated Uc | 3000 | P |
| | 10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.) | | P |
| | Applied voltage: undervoltage releases (V) | 24 V AC | · P |
| | Electrical components do not exceed the value indicated in tab. 7. | | N/A |
| B.3.3.3.4 | Operational performance capability with current. | | |
| | Rated current: In (A) | 250 A | |
| | Maximum rated operational voltage: Ue (V) | 690 V | diam's |
| | Conductor cross-sectional area (mm²): | 120 mm ² | р |
| | Number of operating cycles per hour | 120/hour | Р |
| | Number of cycles with current (total) (closing mechanism energized at the rated Uc) | 3000 | Р |
| | Applied voltage: closing mechanism (V) | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | | P |
| | Conditions, make/break operations: | | |
| | - test voltage U/Ue = 1,0 (V)L1: L2: L3: | 750 V 750 V 750 V | Р |
| | - test current I/Ie = 1,0 (A)L1:L2:L3: | 250 A 250 A 250 A | Р |
| · | - power factor/time constant: | 0,8 | Р |
| | - frequency: (Hz) | 50 Hz | Р |
| | - on-time (ms): | 60 ms | Р |
| , ,,,,,,, | - off-time (s): | 20 s | Р |
| | Electrical components do not exceed the value indicated in tab. 7. | | р |

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| Clause | Requirement + Test | Result - Remark | Verdic |
| 8.3.3.3.5 | Additional test of operational performance capak withdrawable circuit-breaker. | oility without current for | And the state of t |
| | Number of operations cycles : 100 | | P |
| | After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service. | | P |
| 3.3.3.4 | Overload performance | | |
| | this test applies to circuit-breaker of rated curren | t up to and including 630 A | |
| | Type designation or serial number | BD250 | |
| | Sample no: | 1 | 2 4 3 4 3 4 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 |
| | Rated current In (A) | 250 A | |
| *************************************** | Rated operational voltage: Ue (V) | 690 V | En species se s |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt releases: Uc (V) | 230 V AC | |
| | Rated control supply voltage undervoltage releases: Uc (V) | 230 V AC | A CONTRACTOR OF THE PARTY OF TH |
| | Ambient temperature 10-40 °C : | 22°C | P |
| | Number of operating cycles per hour | 120 | P |
| | Maximum rated operational voltage: Ue (V) | 690 V AC | P |
| *************************************** | Number of operating cycles per hour | 120 1 | Р |
| | Number of cycles with current (total) (closing mechanism energized at the rated Uc) | 1/2 | P |
| *** | Applied voltage: closing mechanism (V) | 725 V AC | Р |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum. | | Р |
| | Conditions, overload operations: | | - |
| | - test voltage U/Ue = 1,05 (V)L1: | 725 V AC 725V AC 725V AC | P |
| | - test current AC/DC: I/le = 6,0/2.5 (A) | 1500 A 1500 A 1500 A | РИСК |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - power factor/time constant: | 0,8 | Р |
| | - Number of cycles manually opened: 9 | | Р |
| | - Number of cycles automatically opened by an overload release: 3 | | Р |
| | - frequency: (Hz) | 50 Hz | Р |
| | - on-time max 2s: | | Р |
| 8.3.3.5 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1380 V | р |
| | - no breakdown or flashover | | Р |
| 8.3.3.6 | Verification of temperature-rise | | |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | | Р |
| | Temperature rise of main circuit terminals ≤ 80 K (K): | Max. 63 K | Р |
| | conductor cross-sectional area (mm²): | 120 mm ² | Р |
| | test current le (A) : | 250 A | Р |
| 8.3.3.7 | Verification of overload releases | | 10% |
| | Test current: 1.45 times the value of their current setting at the reference temperature: (A) | 362,5 A | Р |
| - | Conventional tripping time: <1h when In < 63A, <2h when In > 63 A | 31′18" | р |
| 8.3.3.8 | Verification of undervoltage and shunt releases | 1 | |
| | Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage - | | P |
| | and shall operate at 35% of the maximum control supply voltage. | | P |
| · | Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature. | | p |

| 8.3.3.9 | Verification of the main contact position for circuit-breakers for isolation | | |
|---------|--|------|---------|
| | actuating force for opening (N): | 20 N | 2 11 31 |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | test force with blocked main contacts for 10 s (N) | 60 N | 新夏·李 |
| | Dependent power operation | | |
| | Supply voltage of 110% of rated voltage (V): | | N/A |
| | Three attempts of 5 s to operate the equipment at intervals of 5 min. | | Р |
| | Independent power operation | | |
| | Three attempts to operate the equipment by the stored energy. | | Р |
| | Lock ability of driving mechanism in OFF-position at test force and blocked main contacts: | 60 N | Р |
| | Position indicator does not show OFF-position after capture of test force at blocked main contacts | | Р |

| 8.3.4 | TEST SEQUENCE II (Ics): | | 11音楽 |
|---------|--|---|------|
| 8.3.4.1 | Test of rated service short-circuit breaking capac | ity | |
| | Test sequence of operation: O-t-CO-t-CO | | |
| | Type designation or serial number | BD250 | 46 |
| | Sample no: | 2, 3, 4 | |
| | Rated current: In (A) | 250 A | 學者看得 |
| | Rated operational voltage: Ue (V) | 415 V,500 V,690 V AC | |
| | Rated service short-circuit breaking capacity: (kA) | 18 kA/415 V, 10 kA/500 V, 5 kA/690 V | 19 多 |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| - | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | Р |
| | closing mechanism energized with 85% at the rated Uc: (V) | /TPV | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | * W | * |

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| | Test made in free air: | | Р | |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | Р | |
| | The characteristics of the metallic screen: | | Tabelus : | • |
| | - woven wire mesh | | N// | A |
| | - perforated metal | | N/A | A |
| ···· | - expanded metal | | Р | , |
| | - ratio hole area/total area: 0,45-0,65 | | P | , |
| | - size of hole: <30mm ² | | р |) |
| | - finish: bare or conductive plating | | P |) |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/ | Α |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | F | > |
| | Circuit is earthed at: (load-star- or supply-star point) | Load-star | F |) |
| | Conductor cross-sectional area (mm²) : | 120 mm ² | F | P |
| | If terminals unmarked: line connected at: (underside/upside) | | N | /A |
| | Tightening torques: (Nm) | 15 Nm ₁ | i | P |
| | Test sequence of operation: O - t - CO - t - CO | |] | P |
| | - test voltage U/Ue = 1,05 (V)L1: | 440 V 440 V 440 V | I | P |
| | - r.m.s. test current AC/DC: (A) | 17,8 kA AC 17,8 kA AC 18,5 kA AC | | P |
| | power factor/time constant : | 0,26 | | P |
| | - Factor "n" | 2,03 | | P |
| | - peak test current (A) : | 36,1 kA | | P |
| | Test sequence "O" | | TAPHO | ţ ţ |
| | - max. let-through current: (kApeak) L1: L2: L3: | 10,4 kA 15,8 kA 18,8 kA | * ODD * | A |

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| | - Joule integral I²dt (A²s)L1: L2: L3: | 0,57 10 ⁶ A ² s 1,04 .10 ⁶ A ² s 1,1 .10 ⁶ A ² s | P |
| | Pause, t: (min) | 3 min | P |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | 18,1 kA 12,3 kA 17,2 kA | р |
| | - Joule integral I²dt (A²s) L1: | 1,01 . 10 ⁶ A ² s 0,51 .10 ⁶ A ² s 1,32 .10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | 12,8 kA 16,6 kA 18,8 kA | P |
| | - Joule integral I ² dt (A ² s)L1:L2;L3: | 0,6 . 10 ⁶ A ² s 1,18 .10 ⁶ A ² s 1,16.10 ⁶ A ² s | Р |
| | Melting of the fusible element | · | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | | P |
| | Test sequence of operation: O-t-CO-t-CO | \ | |
| | - test voltage U/Ue = 1,05 (V)L1:L2:L3: | 550 V 550 V 550 V | P |
| | - r.m.s. test current AC/DC: (A) | 8,2 kA AC 8,3 kA AC 8,4 kA AC | р |
| | power factor/time constant : | 0,49 | P |
| | - Factor "n" | 1,7 | Р |
| | - peak test current (A) : | 14,0 kA | P |
| | Test sequence "O" | 54 | OP |

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|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - max. let-through current: (kApeak) L1: L2: L3: | 8,5 kA 10,9 kA 10,6 kA | Р |
| 1 1 1 1 1 1 | - Joule integral I ² dt (A ² s)L1: L2: L3: | 0,27. 10 ⁶ A ² s 0,57 .10 ⁶ A ² s 0,48.10 ⁶ A ² s | Р |
| ***** | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | P |
| | - max. let-through current: (kApeak) L1: L2: L3: | 11,4 kA 8,1 kA 10,0 kA | P |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | 0,32 10 ⁶ A ² s 0,54 .10 ⁶ A ² s 0,41.10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | P |
| | - max. let-through current: (kApeak) L1: L2: L3: | 10,3 kA 11,0 kA 7,6 kA | P |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | 0,66. 10 ⁶ A ² s 0,58 .10 ⁶ A ² s 0,27.10 ⁶ A ² s | P |
| | Melting of the fusible element | | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | ∇ | Р |
| | Test sequence of operation: O-t-CO-t-CO | | P |
| | - test voltage U/Ue = 1,05 (V)L1: L2: | 770 V 770 V 770 V | P |
| | - r.m.s. test current AC/DC: (A) L1: L2: | 5,2 kA AC 5,1 kA AC 5,1 kA AC | Р |
| | power factor/time constant : | 0,68 | YTPUC : |
| | - Factor "n" | 1,5 | S R |
| | - peak test current (A) : | 7,9 kA | * |

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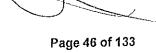
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test sequence "O" | | P |
| | - max. let-through current: (kApeak) L1: L2: L3: | 6,4 kA 7,6 kA 6,9 kA | Р |
| | - Joule integral I²dt (A²s) L1: L2: L3: | 0,191 . 10 ⁶ A ² s 0,34 .10 ⁶ A ² s 0,28.10 ⁶ A ² s | P |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | Р |
| | - max. let-through current: (kApeak) L1: L2: L3: | 7,9 kA 5,7 kA 7,2 kA | Р |
| | - Joule integral I²dt (A²s) L1: L2: L3: | 0,34 . 10 ⁶ A ² s 0,19.10 ⁶ A ² s 0,22.10 ⁶ A ² s | P |
| | Pause, t: (min) | 3 min | P |
| | Test sequence "CO" | | Р |
| | - max, let-through current: (kApeak) L1: L2: L3: | 7,0 kA 7,9 kA 6,0 kA | Р |
| | - Joule integral I ² dt (A ² s) L1: L2: L3: | 0,22 . 10 ⁶ A ² s 0,39 .10 ⁶ A ² s 0,22.10 ⁶ A ² s | Р |
| | Melting of the fusible element | | N/A |
| | Holes in the PE-sheet for test sequence "O" | | N/A |
| - | Cracks observed | | Р |
| 8.3.4.2 | Operational performance capability with current. | | |
| | Rated current: In (A) | 250 A | 1 3 4 |
| | Maximum rated operational voltage: Ue (V) | 690 V | |
| | Conductor cross-sectional area (mm²) : | 120 mm ² | 1 |
| | Number of operating cycles per hour | 120/hour | Р |
| | Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | 50 | Р |
| | Applied voltage: closing mechanism (V) | 1 | *WA |

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|--------------|--|---|-------------|
| lause | Requirement + Test | Result - Remark | Verdict |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | | P |
| | Conditions, make/break operations: | | |
| | Sample no 2 | 3 4 | |
| . | - test voltage U/Ue = 1,0 (V)L1: L2: | 415 V 500 V 690 V 415 V 500 V 690 V 415 V 500 V 690 V | P |
| | - test current I/le = 1,0 (A) L1: | 250 A 250 A 250 A | P |
| | - power factor/time constant: | 0,8 | P |
| ··· | - frequency: (Hz) | 50 Hz | Р |
| | - on-time (ms): | 60 ms | Р |
| | - off-time (s): | 20 s | Р |
| | Electrical components do not exceed the value indicated in tab. 7. | | Р |
| 8.3.4.3 | Verification of dielectric withstand | | 李 |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1380 V | Р |
| | - no breakdown or flashover | | P |
| | Sample no | 2 3 4 | |
| | - the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue) | 0,01 mA 0,1 mA 0,1 mA | |
| 8.3.4.4 | Verification of temperature-rise | | offered a |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | | P |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | Max. 64 K | P |
| | conductor cross-sectional area (mm²): | 120 mm ² | P |
| | test current le (A): | 250 A | P A TEST |
| 8.3.4.5 | Verification of overload releases | | 4.00 |
| | Test current: 1.45 times the value of their curren setting at the reference temperature: (A) | | р ——— |
| | Conventional tripping time: <1h when in < 63A, <2h when in > 63 A | 31′21" 30′45" 32′07" | |
| ı | , , , , , , , , , , , , , , , , , , , | 1 // // | ((3) |

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| Clause Requirement + Test | Result - Remark | Verdict |

| 8.3.4 | TEST SEQUENCE II/III (Ics=Icu): | | 1616年 |
|---------|--|--|--|
| 8.3.4.1 | Test of rated service short-circuit breaking capacity | | |
| | Test sequence of operation: O - t - CO - t - CO | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated service short-circuit breaking capacity: (kA) | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | · | |
| | Rated control supply voltage of shunt release: Uc (V) | | Service and Servic |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | <u></u> | N/A |
| | closing mechanism energized with 85% at the rated Uc: (V) | M | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | V | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | \$-800 <u>\$</u> 70. | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm² | | N/A |
| | - finish: bare or conductive plating | ************************************** | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |

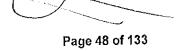
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| lause | Requirement + Test | Result - Remark | Verdict |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| 8.3.5.1 | The operation of overload releases shall be verific current setting on each pole separately. | | |
| | The operating time shall not exceed the max. value for twice the current setting at the reference temperature. | stated by the manufacturer rature, on a pole singly. | West States |
| | Time specified by the manufacturer: | | <u> </u> |
| | - Operation time: (s) | | N/A |
| | Test sequence of operation: O-t-CO-t-CO | | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| | power factor/time constant : | | N/A |
| | - Factor "n" | | N/A |
| | | | N/A |
| | - peak test current (A): | | Charles of the state of the sta |
| | Test sequence "O" | - | N/A |
| | - max. let-through current: (kApeak) L1: L2: L3: | | |
| | - Joule integral I²dt (A²s)L1: L2: L3: | | N/A |
| t | | | NA |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test sequence "CO" | | |
| - | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I²dt (A²s)L1: L2: L3: | | N/A |
| | Pause, t: (min) | | N/A |
| | Test sequence "CO" | | e augusta |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I²dt (A²s) L1: L2: L3: | | N/A |
| | Melting of the fusible element | | N/A |
| | Holes in the PE-sheet for test sequence "O" | | N/A |
| | Cracks observed | | N/A |
| 8.3.4.2 | Operational performance capability with current. | | 3 6 7 3 |
| | Rated current: In (A) | | |
| | Maximum rated operational voltage: Ue (V) | | |
| | Conductor cross-sectional area (mm²): | | 17 3 3 2 |
| | Number of operating cycles per hour | | N/A |
| | Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | | N/A |
| | Applied voltage: closing mechanism (V) | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | | N/A |
| | Conditions, make/break operations: | <u> </u> | , , , , |
| | - test voltage U/Ue = 1,0 (V)L1: | | N/A |
| | - test current I/Ie = 1,0 (A)L1: | | N/A PAG ED |



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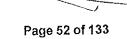
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| lause | Requirement + Test | Result - Remark | Verdict |
| | | | N/A |
| | - power factor/time constant: | | N/A |
| | - frequency: (Hz) | | N/A |
| | - on-time (ms): | | N/A |
| | - off-time (s): | | N/A |
| | Electrical components do not exceed the value indicated in tab. 7. | | |
| 3.3.4.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | N/A |
| | - no breakdown or flashover | | N/A |
| | - the leaking current for circuit-breaker sultable for isolation: (<2mA / 1,1 Ue) | | N/A |
| 8.3.4.4 | Verification of temperature-rise | | |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | | N/A |
| | conductor cross-sectional area (mm²) : | | N/A |
| | test current le (A): | | N/A |
| 8.3.4.5 | Verification of overload releases | ^ | |
| | Test current: 1,45 times the value of their current setting at the reference temperature: (A) | | N/A |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | | N/A |
| 8.3.5.4 | Verification of overload releases | | 100 mm |
| | The operation of overload releases shall be verif | led at 2,5 times the value of | |
| | The operating time shall not exceed the max. value for twice the current setting at the reference temp | ue stated by the manufacturer perature, on a pole singly. | - 6 8 |
| | Time specified by the manufacturer: | | N/A |
| | - Operation time: (s) | | N/A |
| | N: | | 4 X - 3 3 |

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|---------|---|---|--|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.5 | TEST SEQUENCE III (Icu) | | <u> </u> |
| | Rated ultimate short-circuit breaking | | * * * * * * * * * * * * * * * * * * * |
| | Except where the combined test sequence applie to circuit-breaker of utilization category A and to having a rated ultimate short-circuit breaking cap short-time withstand current. | circuit-breaker of utilization B | |
| | For circult-breakers of utilization B having a rated equal to their rated ultimate short-circuit breaking need not be made, since, in this case, the ultimat capacity, is verified when carrying out test seque | g capacity, this test sequence e short-circuit breaking | |
| | For integrally fused circuit-breakers, test sequence V applies in place of this sequence. | | 1. C. |
| | Type designation or serial number | BD250 | 1 1 1 1 |
| | Sample no: | 5, 6, 7 | |
| | Rated current: In (A) | 250 A | |
| | Rated operational voltage: Ue (V) | 415,500,690 V AC | |
| | Rated ultimate short-circuit breaking capacity: (kA) | 36 kA/415V, 16 kA/500 V, 10 kA/690 V | 4 A |
| | Rated control supply voltage of closing mechanism: Uc (V) | u. | |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| | This test sequence need not be made when Icu = | ics | |
| 8.3.5.1 | The operation of overload releases shall be verif current setting on each pole separately. | fied at twice the value of their | A CALL OF THE CALL |
| | The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | | A Company of the Comp |
| | Time specified by the manufacturer: | 3′52" | Р |
| | Sample no: | 5 6 7 | Р |
| | - Operation time: (s) | 3'42" 3'47" 3'41" 3'44" 3'45" 3'48" 3'42" 3'45" 3'41" | Р |

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|-------------|--|-------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.5.2 | Test of rated ultimate short-circuit breaking capac | ity | 1 |
| | The test sequence of operations is O – t - CO | | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | · | P |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | | P |
| | Test made in free air: | | P |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | р |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | P |
| | - ratio hole area/total area: 0,45-0,65 | | P |
| | - size of hole: <30mm ² | | Р |
| , | - finish: bare or conductive plating | | Р |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | P |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | M | Р |
| | Circuit is earthed at: (load-star- or supply-star point) | Load-star | P |
| | Conductor cross-sectional area (mm²): | 120 mm ² | P |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening, torques: (Nm) | 15 Nm | Р |
| | Test sequence of operation: O - t - CO | | |
| | - test voltage U/Ue = 1,05 (V)L1: L2: | 440 V 440 V 440 V | P |
| | - r.m.s. test current AC/DC: (A) | 37,0 kA | * |

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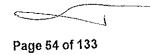
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| Clause | Requirement + Test | Result - Remark | Verdic |
| | power factor/time constant : | 0,20 | Р |
| | - Factor "n" | 2,16 | Р |
| | - peak test current (Amax) : | 79,2 kA | Р |
| | Test sequence "O" | | |
| ···· | - max. let-through current: (kApeak) L1: L2: L3: | 12,65 kA 22,2 kA 28,8 kA | Р |
| | - Joule integral I ² dt (A ² s) | 0,29 . 10 ⁶ A ² s 1,21 .10 ⁶ A ² s 1,97 . 10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak)L1: L2: L3: | 27,8 kA 12,8 kA 21,4 kA | Р |
| | - Joule integral I²dt (A²s) L1: | 1,97 . 10 ⁶ A ² s 0,51 . 10 ⁶ A ² s 1,46 . 10 ⁶ A ² s | Р |
| | Melting of the fusible element | | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | , | Р |
| | Test sequence of operation: O – t – CO | 1 | |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | 548 V 548 V 548 V | Р |
| | - r.m.s. test current AC/DC: (A)L1: L2: L3: | 16,3 kA 17,0 kA 15,8 kA | Р |
| | power factor/time constant : | 0,28 | Р |
| | - Factor "n" | 2,1 | Р |
| | - peak test current (Amax) : | 36,5 kA | Р |
| | Test sequence "O" | | **** |
| | - max. let-through current: (kApeak) L1: | 8,0 kA 13,7 kA 15,6 kA | Р |

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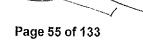




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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | 0,14. 10 ⁶ A ² s 0,58.10 ⁶ A ² s 0,82. 10 ² A ² s | P |
| ., | Pause, t: (min) | 3 min | Р |
| | | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | 14,7 kA 13,4 kA 13,7 kA | P |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | 0,76 . 10 ⁶ A ² s 0,58 . 10 ⁶ A ² s 1,26 .10 ⁶ A ² s | Р |
| | Melting of the fusible element | | P |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | | Р |
| | Test sequence of operation: O - t - CO | | |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | 740 V 740 V 740 V | P |
| | - r.m.s. test current AC/DC: (A)L1: L2: | 10,3 kA 10,4 kA 10,3 kA | . P |
| | power factor/time constant : | 0,45 | P |
| | - Factor"n" | 1,73 | Р |
| | - peak test current (Amax) : | 18,0 KA | P |
| | Test sequence "O" | | |
| | - max. let-through current: (kApeak)L1: L2: | 10,2 kA 13,4 kA 13,0 kA | P |
| | - Joule integral I²dt (A²s)L1: L2: L3: | 0,48 . 10 ⁶ A ² s 1,02. 10 ⁶ A ² s 0,74 . 10 ⁶ A ² s | P |
| | Pause, t: (min) | 3 min | P |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | 13,0 KA | P |

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| Clause | Requirement + Test | Result - Remark | Verdic |
| | - Joule integral I ² dt (A ² s) L1: L2: L3: | 0,91 . 10 ⁶ A ² s 0,77. 10 ⁶ A ² s 0,63 . 10 ⁶ A ² s | P |
| | Melting of the fusible element | | P |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | | P |
| 8.3.5.3 | Verification of dielectric withstand | T | |
| ······ | Sample no: | 5 6 7 | P |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1000 V 1000 V 1380 V | Р |
| | - no breakdown or flashover | | P |
| | Sample no: | 5 6 7 | Р |
| | - the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue) | 0,76 mA 0,09 mA 0,58mA | Р |
| 8.3.5.4 | Verification of overload releases | | \$ 1 9 M |
| | The operation of overload releases shall be verifie their current setting on each pole separately. | d at 2,5 times the value of | |
| | The operating time shall not exceed the max. value for twice the current setting at the reference temper | stated by the manufacturer ature, on a pole singly. | |
| | Time specified by the manufacturer: | 1′22" | Р |
| | Sample no: | 5 6 7 | P |
| | - Operation time: (s) | 1.26" 1.22" 1.21" 1.22" 1.24" 1.25" 1.17" 1.21" 1.19" | Р |
| B.3.6 | TEST SEQUENCE IV | | N/As. |
| | Rated short-time withstand current | | Section 1 |
| | Except where the combined test sequence applies, to circuit-breakers of utilization category B and to the category A covered by note 3 of table 4, and comprise | iose circuit-breaker of | Talifaria (Alifaria) Talifaria (Alifaria) |
| | Where integrally fused circuit-breaker are of utilizati meet the requirements of this sequence. | on category B, they shall | 京 養 安 |
| | Type designation or serial number | | 1 |
| " | Sample no: | | |
| | Rated current: In (A) | | 大型(A) · · · · · · · · · · · · · · · · · · · |

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| ause | Requirement + Test Result - | Remark Verdict |
| | D. t. d. an arrational voltages Ho (V) | |
| | Rated operational voltage: Ue (V) | |
| | Rated short-time withstand current: (kA/s) | |
| | Rated frequency: (Hz) | |
| 3.6.1 | Verification of overload releases | |
| | The operation of overload releases shall be verified at twice current setting on each pole separately. | · · · · · · · · · · · · · · · · · · · |
| | The operating time shall not exceed the max. value stated by for twice the current setting at the reference temperature, on | |
| | Time specified by the manufacturer: | N/A |
| | - Operation time: (s) | N/A |
| .3.6.2 | Test of rated short-time withstand current. | A CONTROL OF THE CONT |
| | For this test, any over-current release, including the instantany, likely to operate during the test, shall be rendered inop | aneous override, if erative. |
| | - test frequency: (Hz) | N/A |
| | - duration of the test: (s) | N/A |
| <u> </u> | - test frequency: (Hz) | N/A |
| | - power factor / time constant (ms): | N/A |
| | - factor "n" | N/A |
| | - test voltage: (V)L1: L2: L3: | N/A |
| | - r.m.s. test current: (kA) L1: | N/A |
| | - highest peak current: (kA) | N/A |
| 8,3,6,3 | Verification of temperature-rise | The same of the sa |
| 0.0.0.0 | - the values of temperature-rise do not exceed the those specified in tab. 7. | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | N/A |
| | conductor cross-sectional area (mm²) : | TPUG NIA |
| | test current le (A): | S PNA |

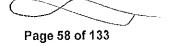
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| Clause | Requirement + Test | esult - Remark | Verdic |
| 8.3.6.4 | Test of short-circuit breaking capacity at the max. sho | rt-time withstand current. | 美宝宝 |
| | Rated short-time withstand current: (kA/s) | | |
| | Test sequence: O - t - CO | | |
| | max. available time setting of the short–time delay short-circuit release. (s) | | N/A |
| | - test voltage U/Ue = 1,05 (V) | | N/A |
| | - r.m.s. test current AC/DC: (A) | | N/A |
| | - test frequency: (Hz) | | N/A |
| | - power factor / time constant (ms): | | N/A |
| | - factor "n" | | N/A |
| ··· | Test sequence "O" | | 对张德 蒙 |
| | - max. let-through current: (kApeak) L1: L2: L3: | | 多道 N/A |
| | - Joule integral I ² dt (A ² s) | | N/A |
| | - the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release and - | ^ | N/A |
| | - the instantaneous override, if any, shall not operate. | | N/A |
| | -pause: t (s) | V | N/A |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | - | N/A |
| * | - Joule integral i²dt (A²s) | | N/A |
| | - the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release and - | A TANGE | N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - the instantaneous override, if any, shall not operate. | | N/A |
| | - if the circuit-breaker has a making current release, this requirement does not apply to the CO operation, if the prospective current exceeds the pre-determined value, since it will then operate. | | N/A |
| 8.3.6.5 | Verification of dielectric withstand | | N/A |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | Traine and the state of the sta |
| · · · · · | - no breakdown or flashover | | N/A |
| 8.3.6.6 | Verification of overload releases | | N/A |
| | The operation of overload releases shall be verific current setting on each pole separately. | ed at twice the value of their | 100 mm m m m m m m m m m m m m m m m m m |
| | The operating time shall not exceed the max. value for twice the current setting at the reference tempe | stated by the manufacturer rature, on a pole singly. | |
| | Time specified by the manufacturer: | | 7 |
| | - Operation time: (s) | ^ | N/A |
| | | | -1 |
| 8.3.7 | TEST SEQUENCE V | \ / \ | ₹ N/A |

| | | 1 <u>1 1</u> | |
|-------------|--|--------------|--------------|
| 8.3.7 | TEST SEQUENCE V | | ₹ N/A |
| <u> </u> | Performance of integrally fused circuit-breakers | | |
| | STAGE 1 | | |
| | Type designation or serial number | | |
| | Sample no: | | |
| | Rated current: In (A) | | 美和鲁 意 |
| | Rated operational voltage: Ue (V) | | |
| | Value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA) | | |
| | Type of integrated fuses (all details) | | 1 1 2 7 7 |
| | Rated control supply voltage of closing mechanism: Uc (V) | | TPUC |
| <u> </u> | | 13 | (B D |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Rated control supply voltage of shunt release: Uc (V) | | |
| 8.3.7.1 | Short-circuit at the selectivity limit current | | |
| | Test sequences "O" | | |
| | Fuses shall be fitted | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | | N/A |
| | Test made in free air: | | N/A |
| · | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | \sim | N/A |
| | - finish: bare or conductive plating | 1 / | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | V | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | , | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: | 1.0 | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| | power factor/time constant : | | N/A |
| | - factor "n" | | N/A |
| | - peak test current (Amax) : | | N/A |
| | Test sequence "O" | | |
| | - max. let-through current: (kApeak)L1: L2: L3: | | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | | N/A |
| | - fuses shall still intact L1: L2: L3: | | N/A |
| 3.3.7.2 | Verification of temperature-rise | | N/A |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | | N/A |
| | conductor cross-sectional area (mm²) : | 10 | N/A |
| | test current le (A): | | N/A |
| 8.3.7.3 | Verification of dielectric withstand | | |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1 | N/A |
| | - no breakdown or flashover | | N/A |

| STAGE 2 | |
|-----------------------------------|-----|
| Type designation or serial number | |
| Sample no: | |
| Rated current: In (A) | |
| Rated operational voltage: Ue (V) | 4 4 |

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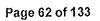


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| Clause | Requirement + Test Result - Remark | Verdict |
| | 1.1 time the value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA) | |
| | Type of integrated fuses (all details) | 3 4 4 |
| | Rated control supply voltage of closing mechanism: Uc (V) | |
| | Rated control supply voltage of shunt release: Uc (V) | |
| 8.3.7.4 | Verification of overload releases | N/A |
| | The operation of overload releases shall be verified at twice the value of thei current setting on each pole separately. | |
| | The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | A STATE OF THE STA |
| | Time specified by the manufacturer: | 秦东人员 |
| | - Operation time: (s) | N/A |
| 8.3.7.5 | Short-circuit at 1,1 times the take-over current | 44.3 |
| 8.3.7.1 | Short-circuit at the selectivity limit current | () |
| | Test sequences "O" | 1, 1 1 |
| | Fuses shall be fitted | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | : |
| | closing mechanism energized with 85% at the rated Uc: (V) | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | N/A |
| | Test made in free air: | N/A |
| | Distances of the metallic screen's: (all sides) | N/A |
| | The characteristics of the metallic screen: | |
| | - woven wire mesh | N/A |
| | - perforated metal | N/A |
| | - expanded metal | N/A |
| | - ratio hole area/total area: 0,45-0,65 | N/A |

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| | IEC 60947-2 | | |
|---------------------------------------|---|----------------------------------|----------|
| lause | Requirement + Test | Result - Remark | Verdict |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | | N/A |
| · · · · · · · · · · · · · · · · · · · | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0.8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| 7 | 1.1 time the value of prospective current equal to t declared by the manufacturer. (kA) | he selectivity limit current, as | |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | | N/A |
| | - r.m.s. test current AC/DC: (A) | | N/A |
| | power factor/time constant : | | N/A |
| | - factor "n" | 1 | N/A |
| ···· | - peak test current (Amax) : | | N/A |
| | Test sequence "O" | J | |
| | - max. let-through current: (kApeak)L1: L2: | | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | | N/A |
| | - at least two of the fuses shall have blown . L1: | | N/A |
| 8.3.7.6 | Short-circuit at ultimate short-circuit breaking cap | pacity | ji se se |
| | Type designation or serial number | - | とき変 |

Service Management



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Sample no: | | |
| | Rated current: In (A) | | |
| | Rated operational voltage: Ue (V) | | |
| | Rated ultimate short-circuit breaking capacity. (kA) | | |
| | Type of integrated fuses (all details) | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | | A STATE OF THE STA |
| | Rated control supply voltage of shunt release: Uc (V) | | The state of the s |
| | Test sequences: O-t-CO | | |
| | Fuses shall be fitted | | <u> </u> |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | \wedge | |
| | - woven wire mesh | | N/A |
| | - perforated metal | | N/A |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | /ex | TPUC |

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| lause | Requirement + Test | Result - Remark | Verdict |
| | Conductor cross-sectional area (mm²): | | N/A |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: | | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| | power factor/time constant : | | N/A |
| · · · · · · · · · · · · · · · · · · · | - factor "n" | | N/A |
| | - peak test current (A) : | | N/A |
| | Test sequence "O" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I ² dt (A ² s)L1: L2: L3: | | N/A |
| | Pause: t (s) | Λ, Λ | N/A |
| - | new fitted fuses | | N/A |
| | Test sequence "CO" | | 4 |
| | - max. let-through current: (kApeak)L1: L2: L3: | | N/A |
| | - Joule integral l²dt (A²s)L1: L2: L3: | | N/A |
| 8.3.7.7 | Verification of dielectric withstand | | |
| | - equal twice time rated operational voltage with a minimum of 1000 V (new fuses fitted) | | N/A |
| | - no breakdown or flashover | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7.8 | Verification of overload releases | | ili i |
| | The operation of overload releases sh their current setting on each pole sep | all be verified at 2.5 times the value of arately. | |
| | The operating time shall not exceed the max. value stated by the manufacture for twice the current setting at the reference temperature, on a pole singly. | | |
| | Time specified by the manufacturer: | | |
| | - Operation time: (s) | L2: L3: | N/A |

| 8.3.8 | Combined test sequence | I NA |
|---------|---|-------|
| | At the discretion of, or in agreement with the manufacturer, this sequence may be applied to circuit-breaker of utilization cat. B: | |
| | Type designation or serial number | N/A |
| | Sample no: | N/A |
| | Rated current; In (A) | N/A |
| | Rated operational voltage: Ue (V) | N/A |
| | Rated short-time withstand current: (kA/s) | N/A |
| | Rated frequency: (Hz) | N/A |
| 8.3.8.1 | Verification of overload releases | 2 2 |
| | The operation of overload releases shall be verified twice times the value of their current setting on each pole separately. | |
| | The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly. | |
| | Time specified by the manufacturer: | |
| | - Operation time: (s) | N/A |
| 8.3.8.2 | Test of rated short-time withstand current. | |
| | For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative. | |
| | - test frequency: (Hz) | N/A |
| | - duration of the test: (s) | PUNTA |

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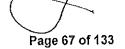
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| Clause | Requirement + Test | Result - Remark | Verdice |
| | - test frequency: (Hz) | | N/A |
| | - power factor / time constant (ms): | | N/A |
| | - factor "n" | | N/A |
| | - test voltage: (V)L1: L2: L3: | | N/A |
| | - r.m.s. test current: (kA) L1: L2: L3: | | N/A |
| ···· | - highest peak current: (kA) | | N/A |
| 8.3.8.3 | Test of rated service short-circuit breaking capac | ity | |
| | At the highest voltage applicable to the rated sho | rt-time current. | |
| | Test sequence of operation: O - t - CO - t - CO | | |
| | Type designation or serial number | | ATT TO SERVICE AND ADDRESS OF THE PARTY OF T |
| - | Sample no: | | |
| | Rated current: In (A) | | 4 |
| | Rated operational voltage: Ue (V) | | |
| | Rated service short-circuit breaking capacity: (kA) | | |
| | Rated control supply voltage of closing mechanism: Uc (V) | VM | |
| | Rated control supply voltage of shunt release: Uc (V) | | - 2 - |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | · | N/A |
| | Test made in free air: | | N/A |
| | Distances of the metallic screen's: (all sides) | | N/A |
| | The characteristics of the metallic screen: | | |
| | - woven wire mesh | | Y P NIA |

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| lause | Requirement + Test | Result - Remark | Verdict |
| | | | N/A |
| | - perforated metal | | |
| | - expanded metal | | N/A |
| | - ratio hole area/total area: 0,45-0,65 | | N/A |
| | - size of hole: <30mm ² | | N/A |
| | - finish: bare or conductive plating | · | N/A |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | N/A |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | N/A |
| | Circuit is earthed at: (load-star- or supply-star point) | | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | if terminals unmarked: line connected at: (underside/upside) | | N/A |
| | Tightening torques: (Nm) | | N/A |
| | Test sequence of operation: O-t-CO-t-CO | | N/A |
| | The highest voltage applicable to the rated short-time current. | | N/A |
| | - test voltage U/Ue = 1,05 (V)L1: L2: L3: | | N/A |
| | - r.m.s. test current AC/DC: (A) L1: L2: L3: | | N/A |
| · | power factor/time constant : | | N/A |
| | - Factor "n" | | N/A |
| | - peak test current (A) : | | N/A |
| | | | |
| | Test sequence "O" | | N/A |
| | - max. let-through current: (kApeakL1: | | 100 |
| | L3: | | |
| | - Joule integral I ² dt (A ² s)L1: | | ENE TANA |
| | L2: | | / + / |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Pause, t: (min) | | N/A |
| | Test sequence "CO" | <u> </u> | |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I²dt (A²s)L1:L2:L3: | | N/A |
| | Pause, t: (min) | <u> </u> | N/A |
| | Test sequence "CO" | | |
| | - max. let-through current: (kApeak) L1: L2: L3: | | N/A |
| | - Joule integral I²dt (A²s)L1: L2: L3: | | N/A |
| | The circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release. | | N/A |
| | During this test the instantaneous override shall not operate | | N/A |
| | - and the making current release shall operate | V | N/A |
| .3.8.4 | Operational performance capability with current. | | |
| | Rated current: In (A) | | N/A |
| | Maximum rated operational voltage: Ue (V) | | N/A |
| | Conductor cross-sectional area (mm²): | | N/A |
| | Number of operating cycles per hour | | N/A |
| | Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc) | | N/A |
| | Applied voltage: closing mechanism (V) | | N/A |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum. | | N/A |
| | Conditions, make/break operations: | / | EXTANA |

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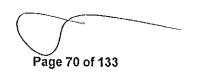
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - test voltage U/Ue = 1,0 (V)L1:L2:L3: | | N/A |
| • | - test current I/Ie = 1,0 (A)L1: L2: L3: | | N/A |
| | - power factor/time constant: | | N/A |
| | - frequency: (Hz) | | N/A |
| | - on-time (ms): | | N/A |
| | - off-time (s): | | N/A |
| | Electrical components do not exceed the value indicated in tab. 7. | | N/A |
| 8.3.8.5 | Verification of dielectric withstand | | N/A |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | | The second secon |
| | - no breakdown or flashover | | N/A |
| | - the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue) | | N/A |
| 8.3.8.7 | Verification of temperature-rise | 4 | |
| | - the values of temperature-rise do not exceed the those specified in tab. 7. | <u> </u> | N/A |
| | Temperature rise of main circuit terminals. ≤ 80 K (K): | | N/A |
| | conductor cross-sectional area (mm²) : | | N/A |
| | test current le (A) : | | N/A |
| 8.3.8.7 | Verification of overload releases | | |
| | Test current: 1,45 times the value of their current setting at the reference temperature: (A) | | N/A |
| | Conventional tripping time: <1h when ln < 63A, <2h when ln > 63 A | | N/A |

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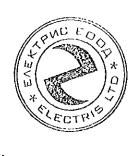
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The operation of overload releases shal their current setting on each pole separate | I be verified at 2,5 times the value of ately. | |
| | The operating time shall not exceed the max. value stated by the manufaction for twice the current setting at the reference temperature, on a pole singly. | | |
| | Time specified by the manufacturer: | 1 | |
| | - Operation time: (s) | L2: | N/A |

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| Clause | Requirement + Test | | Result - Remark | Verdict |

| nnex B | Circuit-breakers incorporating residual current prot | tection | NA |
|---------------------------------------|--|-------------------------|---|
| | | | 10.00 |
| 3.3 | Classification | | |
| 3.3.1 | | | |
| 3.3.1.1 | CBR functionally independent of line voltage | | |
| 3.3.1.2 | CBR functionally dependent on line voltage | | 1 4 5 |
| 3.3.1.2.1 | Opening automatically in the case of failure of the line voltage with or without delay. | | |
| 3.3.1.2.2 | Not opening automatically in the case of failure of line voltage. | | |
| 3.3.2 | THE RESIDUAL OPERATING CURRENT | ···· | |
| 3.3.2.1 | CBR WITH SINGLE RATED RESIDUAL OPERATING CURRENT | | |
| 3.3.2.2 | CBR WITH MULTIPLE SETTINGS OF RESIDUAL OPERATING CURRENT | Fixed steps/continuous | |
| 3.3.3 | CLASSIFICATION ACCORDING TO TIME-DELAY OF THE RESIL | DUAL CURRENT FUNCTION | |
| 3.3.3.1 | CBR WITHOUT TIME-DELAY: NON-TIME-DELAYED TYPE | | 1997 |
| 3.3.3.2 | CER WITH TIME-DELAY: TIME-DELAYED TYPE | | B A B |
| B.3.3.2.1 | CBR with non-adjustable time-delay | IM | |
| B.3.3.2.2 | CBR with adjustable time-delay | Fixed steps/continuous | |
| B,3.4 | Classification according to behaviour in presence of a d.c. component | CBR of type AC / type A | |
| | | | 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| В,4 | Characteristics of CBRs concerning their residual | current function | 1 2 2 |
| B.4.1.1 | <i>Ι</i> Δ | | |
| B.4.1.2 | /Δ | | 1888 |
| B.4.1.3 | ſΔ | | |
| B.4.2 | Preferred and limiting values | | |
| | Preferred values of the rated residual operating current (/Δn) | | Marie Constitution of the |
| · · · · · · · · · · · · · · · · · · · | Limiting value of the non-operating overcurrent in the case of a single-phase load in a multiphase circuit | | W. FO |
| B.4.2.4 | Operating characteristics | | |

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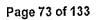
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The value of the rated voltage of the voltage source of CBRs | | |
| | For a time-delay type, the limiting non-actuating time is defined at 2 l∆n and shall be declared by the manufacturer. | | N/A |
| | For CBR's having a limiting non-actuating time higher than 0,06 s, the manufacturer shall declare the maximum break time at Δ n, 2 Δ n, 5 Δ n, and 10 Δ n. | | N/A |
| | In the case of a CBR having an inverse current/time characteristic, the manufacturer shall state the residual current/break time characteristic. | | N/A |
| B.4.3 | <i>Ι</i> Δ | | |
| | The minimum value of /Δm is 25 % of cu. | | N/A |
| *************************************** | | | N/A |
| B.5. | Marking | | N/A |
| | Data according B.5. section a) shall be marked on integral CBRs (see B.1.1), in addition to the marking specified in 5.2, and be clearly visible in the installed position | | N/A |
| | Data according B.5. section b) shall be marked on r.c. units and be clearly visible in the installed POSITION | V | N/A |
| | Data according B.5. section c) shall be marked on r.c. units and be visible after assembly with the CIRCUIT-BREAKER: | | N/A |
| | Data according B.5.section d) shall be marked on integral CBRs or r.c. units, as applicable, or made available in the manufacturer's literature: | | N/A |
| | Data according section B.5. section e) shall be made available in the manufacturer's literature: | | N/A |
| B. 8. | Tests | | - |
| | This clause specifies tests for CBRs having a rated residual operating current /Δn up to and INCLUDING 30 Å. | <i>(</i> , s | W. |
| | The applicability of the tests specified in this clause when /∆n > 30 A is subject to agreement BETWEEN MANUFACTURER AND USER. | | |



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| Requirement + Test | Result - Remark | Verdict |
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| · · · · · · · · · · · · · · · · · · · | l | |
| The instruments for the measurement of the residual current shall be at least class 0,5 (SEE SEC 60051) AND SHALL SHOW (OR PERMIT TO DETERMINE) THE TRUE R.M.S. VALUE. | | N/A |
| The instruments for the measurement of time shall have a relative error not greater than 10 % OF THE MEASURED VALUE. | | N/A |
| | | # W 24 15F |
| OPERATIONAL PERFORMANCE CAPABILITY | | \$ 1 A A |
| During the operating cycles with current a third of the breaking operations shall be performed by actuating the test device, and a further third by applying a residual current of value /Δn (or, if applicable, of the lowest setting of the residual operating current) to any one pole. | | N/A |
| In the case of a reset-CBR, it is not possible to reclose the CBR after tripping without the intentional resetting action. This verification shall take place at the beginning and at the end of the operational performance capability test with current | | N/A |
| NO FAILURE TO TRIP SHALL BE ADMITTED. | + () | |
| | J | |
| RATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TI | est sequence II) | 養養養 |
| Following the tests of 8.3.4, verification of the correct operation of the CBR in case of residual CURRENT SHALL BE PERFORMED IN ACCORDANCE WITH | | |
| Verification of operating in case of steady increase (figure B.1) | se of the residual current | |
| Increase the residual current from 0,2 l Δn to l Δn in 30 sec. | | N/A |
| Required: value between lΔno and lΔn | | |
| Interm. setting I∆n.(mA | s):] | N/A |
| | lov | C |
| The correct operation of the overload releases o 8.3.5.1 and 8.3.5.4 by two-pole tests, on all possible combinations of phase poles in turn | of V | NA |
| | EC 60051) AND SHALL SHOW (OR PERMIT TO DETERMINE) THE TRUE R.M.S. VALUE. The instruments for the measurement of time shall have a relative error not greater than 10 % OF THE MEASURED VALUE. OPERATIONAL PERFORMANCE CAPABILITY During the operating cycles with current a third of the breaking operations shall be performed by actuating the test device, and a further third by applying a residual current of value IΔn (or, if applicable, of the lowest setting of the residual operating current) to any one pole. In the case of a reset-CBR, it is not possible to reclose the CBR after tripping without the intentional resetting action. This verification shall take place at the beginning and at the end of the operational performance capability test with current MO FAILURE TO TRIP SHALL BE ADMITTED. PRATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TO FOILURE TO TRIP SHALL BE ADMITTED. PRATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TO FOILURE TO TRIP SHALL BE ADMITTED. PRATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TO FOILURE TO TRIP SHALL BE ADMITTED. PRATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TO FOILURE TO TRIP SHALL BE PERFORMED IN ACCORDANCE WITH B.B.2.4.1. Verification of operating in case of steady increat (figure B.1) Increase the residual current from 0,2 IΔn to IΔn in 30 sec. Required: value between IΔno and IΔn Min. setting IΔn. (mA Interm. setting IAn. (mA In | EC G051) AND SHALL SHOW (OR PERMIT TO DETERMINE) THE TRUE R.M.S. VALUE. The instruments for the measurement of time shall have a relative error not greater than 10 % DETHE MEASURED VALUE. DEPERATIONAL PERFORMANCE CAPABILITY During the operating cycles with current a third of the breaking operations shall be performed by actuating the test device, and a further third by applying a residual current of value /Δn (or, if applicable, of the lowest setting of the residual operating current) to any one pole. In the case of a reset-CBR, it is not possible to reclose the CBR after tripping without the intentional resetting action. This verification shall take place at the beginning and at the end of the operational performance capability test with current MO FAILURE TO THIP SHALL BE ADMITTED. PRATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY (TEST SEQUENCE II) Following the tests of 8.3.4, verification of the correct operation of the CBR in case of residual current operation of operating in case of steady increase of the residual current (figure B.1) Increase the residual current from 0,2 IΔn to IΔn in 30 sec. Required: value between IΔno and IΔn Min. setting IΔn.(mA): htterm. setting IΔn.(mA): htterm. setting IΔn.(mA): Max. setting IΔn.(mA): Max. setting IΔn.(mA): |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Following the tests of 8.3.5, verification of the correct operation of the CBR shall be performed IN ACCORDANCE WITH B.8.2.4.3. | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appe current (figure B.1) | arance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms); Max. setting l∆n.(ms); | | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | · | |
| | Min, setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 5 IΔn or 0,25 A | W | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of ☐10 I∆n or ☐ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | | | |
| | a) Behaviour during rated short-time withstand current test NO TRIPPING SHALL OCCUR DURING THE TEST OF 8.3.6.2 OR 8.3.8.2, AS APPLICABLE. | | NA NA |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) Verification of overload releases test sequence IV For the purpose of verifying the correct operation of the overload releases in accordance with 8.3.6.1 and 8.3.6.6, the single pole tests specified in 8.3.5.1 shall be replaced by two-pole tests, made on all possible combinations of | | N/A |
| | phase poles in turn. b) Verification of overload releases for combined test sequence. For the purpose of verifying the correct operation of the overload releases in accordance with 8.3.8.1, the single pole test specified in 8.3.5.1 shall be replaced by two-pole tests made on all possible combinations of phase poles in turn. | | N/A |
| | b) For the purpose of verifying the correct operation of overload releases in accordance with 8.3.8.6, the test specified in 8.3.3.7 shall be made using a three-phase supply. | | N/A |
| | c) Verification of the residual current tripping device Following the tests of 8.3.6 or 8.3.8, as applicable, verification of the residual current tripping device shall be performed in accordance with B.8.2.4.3. | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden apper | earance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting l∆n.(ms) Interm. setting l∆n.(ms) Max. setting l∆n.(ms) |): <u> </u> | N/A |
| | A residual current is sudden appear on the CBR of 2 ΙΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms Interm. setting l∆n.(ms Max. setting l∆n.(ms |): | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the CBR of | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms); Interm. setting l∆n.(ms); Max. setting l∆n.(ms); | | N/A |
| | A residual current is sudden appear on the CBR of []10 Δn or [] 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | | | 10000000000000000000000000000000000000 |
| | For the purpose of verifying the correct operation of the overload releases, the single-pole tests specified in 8.3.7.4 and 8.3.7.8 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn, the test conditions being as specified in 8.3.7.4 and 8.3.7.8 but applicable to two poles. | | N/A |
| | Following the tests of 8.3.7, verification of the correct operation of the CBR shall be performed in accordance with B.8.2.4.3. | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appea current (figure B.1) | arance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ṃs): Interm. setting l∆n.(ṃs): Max. setting l∆n.(ṃs): | | N/A |
| | A residual current is sudden appear on the CBR of 2 ΙΔη | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | / | AC EDO |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 5 Δn or 0,25 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| · · · · · · · · · · · · · · · · · · · | A residual current is sudden appear on the CBR of □10 IΔn or □ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| 4-5- | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | COMBINED TEST SEQUENCE | ^ | N/A |
| | Following the tests of 8.3.8, verification of the correct operation of the CBR shall be performed in accordance with B.8.2.4.3. | T U | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appe current (figure B.1) | earance of the residual | N/A |
| | A residual current is sudden appear on the CBR of $I\Delta n$ | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting I∆n.(ms) Interm. setting I∆n.(ms) Max. setting I∆n.(ms) |): [| N/A |
| | A residual current is sudden appear on the CBR of 2 ΙΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms Interm. setting l∆n.(ms Max. setting l∆n.(ms | s): | NIA |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the CBR of ☐ 5 I∆n or ☐ 0,25 A Required: no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 | | N/A |
| | (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | - | | N/A |
| ВІ | | | 10000000000000000000000000000000000000 |
| | | | N/A |
| | Tests shall be made at the following values of voltage applied to the relevant terminals: - 0,85 times the minimum rated voltage for the tests specified in B.8.2.4 and B.8.2.5.1; - 1,1 times the maximum rated voltage for the tests specified in B.8.2.5.2. | W | N/A |
| | CBRs with more than one rated frequency or a range of rated frequencies shall be tested in each case at the highest and lowest rated frequency. However, for CBRs rated at 50 Hz and 60 Hz, tests at 50 Hz or 60 Hz are considered to cover the requirements. | | N/A |
| B.8.2.4 | | | N/A |
| B.8.2.4.1 | Verification of operating in case of steady increase (figure B.1) | of the residual current | N/A |
| | Increase the residual current from 0,2 lΔn to lΔn in 30 sec. | | N/A |
| | Required: value between lΔno and lΔn | | |
| - | Min. setting I∆n.(mA): Interm. setting I∆n.(mA): Max. setting I∆n.(mA): | | N/A |
| B.8.2.4.2 | Verification of operating in case of closing on resi | dual current (figure B.1) // | NION |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The CBR is closes on IAn or each specified setting Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appearurent (figure B.1) | arance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn Required: no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | CM | N/A |
| | Min. setting I∆n.(ms) Interm. setting I∆n.(ms) Max. setting I∆n.(ms) | :\ | N/A |
| | A residual current is sudden appear on the CBR of ☐ 5 I∆n or ☐ 0,25 A Required: no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 | | N/A |
| | (150 ms) and a non actuating time of 60 ms Min. setting I∆n.(ms) Interm. setting I∆n.(ms) Max. setting I∆n.(ms) |): | N/A |
| | A residual current is sudden appear on the CBR of ☐10 i∆n or ☐ 0,5 A | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| , , , , , , , , , , , , , , , , , , , | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | Verification of the limiting non-operating time of ti | me delayed type CBRs | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer | | N/A |
| | Required : The CBR shall not operate | | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| B.8.2.5 | Tests at the temperature limits | | N/A |
| | General | | 夏季 |
| | Minimum temperature (°C) | | September 1 |
| | Maximum temperature (°C) | | N/A |
| B,8,2,5,1 | Verification of operating in case of a sudden appearurent at –5°C or minimum temperature limit | arance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | Oh | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | : | N/A |
| | A residual current is sudden appear on the CBR of [5 ΙΔη or [0,25 Α | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1: (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A TPUC |

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| | A residual current is sudden appear on the CBR of 10 IΔn or 0,5 A Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 | N/A |
| | (150 ms) and a non actuating time of 60 ms Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | Verification of the limiting non-operating time of time delayed type 5°C or minimum temperature limit | e CBRs at - N/A |
| | A residual current is sudden appear on the CBR of 2 lΔn for a time declared by the manufacturer | N/A |
| | Required : The CBR shall not operate | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | N/A |
| B.8.3.5.2 | Verification of operating in case of a sudden appearance of the recurrent at +40°C | esidual N/A |
| | A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn Required: no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 | N/A |
| | (200 ms) and a non actuating time of 60 ms | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | |
| | A residual current is sudden appear on the CBR of | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 2 lΔn for a time declared by the manufacturer | | N/A |
| | Required : The CBR shall not operate | | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| B.8.3 | Verification of dielectric properties | | N/A |
| B.8.3.3.2 | Verification of rated impuls withstand voltage | - | N/A |
| | rated impulse withstand voltage | | 464 |
| | test impulse voltage (see table 12 part 1) | 1 1 | |
| | test impulse voltage for isolating (see table 14 part 1) | | |
| B.8.4 | Verification of the operation of the test device at the limits of the rated voltage | | N/A |
| | For CBRs having an adjustable time-delay the test is made at the maximum setting of time-delay: | s | |
| 3.8.4.a | Setting IΔn or minimum setting of IΔn | Α | |
| | Test voltage (1,1 x Ue max) | v | |
| | Number of operations | 25 | |
| | Interval time | 5 s | 2. |
| | Tripping | ☐ Yes / ☐ No | N/A |
| B.8.4.b | Setting l∆n or maximum setting of l∆n | A | 1 |
| | Test voltage (0,85 x Ue min) | V | |
| | Number of operations | 3 | |
| | Interval time | 5 s | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Tripping | ☐ Yes / ☐ No | N/A |
| 3.8.4.c | Setting I∆n or minimum setting of I∆n | A | |
| | Test voltage (1,1 x Ue max) | v | |
| | Number of operations | 1 | |
| | Operating means of the test device held in close position | 5 s | |
| | Tripping | ☐ Yes / ☐ No | N/A |
| B.8.5 | Verification of the limiting value of non-operating current under overcurrent conditions, in case of a single phase load. | | N/A |
| | Setting l∆n or minimum setting of l∆n if adjustable | A | |
| | Test current equal to the lower value of: | | |
| | ☐ 6 x in or | | |
| | ☐ 80 % of the maximum short-circuit release current setting | A | |
| | Test voltage: | 1 | 海船臺山 |
| | rated voltage or | 1 / 1 / | 建 |
| | any convenient voltage | | |
| | Test frequency | Hz | |
| | Power factor (0,5) | | 1 5 5 |
| | Current flow time | 2 s | 20110 |
| | Interval time | 60 s | , |
| * | Calibration plot number | | |
| | No tripping / change of state | | N/A |
| B.8.6 | | | N/A |
| B.8.6.1 | Verification of the resistance to unwanted tripping in case of loading of the network capacitance | | N/A |
| | Current surge test for CBR (0,5 µs / 100kHz ring wave test) | | Total State of the |
| | One pole of the CBR is submitted to 10 applications of a surge current according to the following requirements: | | |
| | - peak value: 200 A + 10/0% | | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - virtual front time: 0,5 μs ± 30% | | 11. 1 |
| | - period of the following oscillatory wave: 10 μs ± 20% | | |
| | - each successive peak; about 60% of the preceding peak | | |
| | The polarity shall be inverted after every two applications | | |
| | The interval between two consecutive applications shall be about 30 s | | |
| | During the test the CBR shall not trip: | - | N/A |
| B.8.6.2 | Verification of the resistance to unwanted tripping without follow-on current. | g in case of flashover | N/A |
| | Verification of behaviour at surge current up to 25 test) | 50 A (8/20 µs surge current | N/A |
| | One pole of the CBR is submitted to 10 applications of a surge current according to the following requirements: | | |
| | - peak value: 250 A + 10/0% | | |
| | - virtual front time: 8 μs ± 20% | (1) | |
| | - virtual time to half value: 20 µs ± 20% | M | |
| | - peak of reverse current:: less than 30% of peak value | | |
| | The polarity shall be inverted after every two applications | | |
| | The interval between two consecutive applications shall be about 30 s | | |
| | During the test the CBR shall not trip: | | N/A |
| B.8.7 | Verification of the behaviour in case of an earth fault current comprising a d.c. component. | | N/A |
| | Type A CBR | THE COLUMN | N/A |
| | For CBRs the operation of which depends on a voltage source the test are made at 1,1 and 0,85 times the rated voltage of the voltage source (Us). | | |
| B.8.7.2.1 | Verification of operation in case of a continuous rise of a residual pulsating direct current | | NO NA |
| | Rated voltage | V | |

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| lause | Requirement + Test | Result - Remark | Verdict |
| | - steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | Section 1 |
| | - angle = 90 (+/-) : | | |
| - | - angle = 135 (+/-) : | | |
| | No value exceeds the relevant specified limiting | ng | N/A |
| 3.8.7.2.2 | Verification of operation in case of a suddenly direct current | / appearing residual pulsatin | g N/A |
| | Verification of the correct operation in case of pulsating direct currents by closing S2 (angle | f suddenly appearing residua = = 0°) | ıl N/A |
| | Rated voltage | V | |
| | RCCB's with IΔn > 0,015 A: | | |
| | - maximum break time (ms) at: 1,4 I∆n (+/-) | : | |
| ., | - maximum break time (ms) at: 2,8 l∆n (+/-) | 2 | 7 |
| | - maximum break time (ms) at: 7 IΔn (+/-) | : () () | 1 1 1 1 |
| | - maximum break time (ms) at: 14 lΔn (+/-) | : \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | No value exceeds the relevant specified limit | ing | N/A |
| | RCCB's with I∆n ≤ 0,015 A: | | N/A |
| | - maximum break time (ms) at: 2 lΔn (+/-) | : | |
| | - maximum break time (ms) at: 4 iΔn (+/-) | : | |
| | - maximum break time (ms) at: 10l∆n (+/-) | : | |
| | - maximum break time (ms) at: 20 I∆n (+/-) | : | |
| | No value exceeds the relevant specified limit value | | N/A |
| B.8,7.2.3 | Verification of operation with load at referen | ce temperature | N/A |
| | Rated voltage | V | A STATE OF THE STA |
| B.8.7.2.1 | - steady increase from zero to: 1,4 iΔn for iΔn > 0,015 A with 1,4 iΔn/30 A/s (mA) | mA | 101 |
| | - steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) | mA | EVE |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - angle = 0 (+/-) : | | # # # |
| | - angle = 90 (+/-) : | | |
| | - angle = 135 (+/-) : | | |
| | No value exceeds the relevant specified limiting values | | N/A |
| B.8.7.2.2 | Verification of operation in case of a suddenly application current | pearing residual pulsating | N/A |
| | Verification of the correct operation in case of suc pulsating direct currents by closing S2 (angle = 0 | | N/A |
| | Rated voltage | V | 100 |
| | RCCB's with IΔn > 0,015 A: | | 7 |
| | - maximum break time (ms) at: 1,4 l∆n (+/-) : | | 重重 |
| | - maximum break time (ms) at: 2,8 l∆n (+/-) : | | |
| | - maximum break time (ms) at: 7 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 14 lΔn (+/-) : | | |
| | No value exceeds the relevant specified limiting value | CI. | N/A |
| | RCCB's with I∆n ≤ 0,015 A: | M | N/A |
| | - maximum break time (ms) at: 2 lΔn (+/-) : | . 0 | 1 2 2 2 |
| | - maximum break time (ms) at: 4 l∆n (+/-) : | | 义 爱 |
| | - maximum break time (ms) at: 10lΔn (+/-) : | | D. State |
| | - maximum break time (ms) at: 20 lΔn (+/-) : | | 多1 多 |
| | No value exceeds the relevant specified limiting value | | N/A |
| B.8.7.2.4 | Verification of operation of a residual pulsating direct current superimposed by a smooth direct current of 6 mA. | | N/A |
| | Rated voltage | v | 1112 |
| | - steady increase from zero to: 1,4 iΔn for IΔn > 0,015 A with 1,4 iΔn/30 A/s (mA) + 6 mA | mA | |
| | -steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) + 6 mA | mA | AT-V |
| | - angle = 0 (+/-) : | (3) | |
| | No value exceeds the relevant specified limiting values | (i) | NA) |



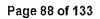
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| Requirement + Test | Result - Remark | Verdict | | |
| | | N/A | | |
| | | | | |

| 3.8.8 | | | N/A |
|-------|---|-------|------------|
| | For CBRs having an adjustable residual operating current, the test is made at the lowest SETTING. | | |
| | FOR CBR'S WITH AN ADJUSTABLE TIME-DELAY, THE TEST IS MADE AT ANY ONE OF THE TIME-DELAY SETTINGS. | | |
| | | | N/A |
| | A voltage equal to the rated voltage is applied to the line terminals of the CBR and is then progressively lowered to zero over a time period corresponding to the longer of the two values given hereinafter until automatic opening occurs: – about 30 s; – a period long enough with respect to the delayed opening of the CBR, if any (see B.7.2.11). | | |
| - | Three measurements are made. All the values shall be less than 0,85 times the minimum rated voltage of the CBR. | | N/A |
| | A residual current is sudden appear on the CBR of IΔn (mA) at a value just above highest measured value Required: no value exceeds the specified limiting value of Table B1: 300 ms | (U | N/A |
| | For any value of voltage less than the lowest value measured, it is not be possible to close the CBR by manual operating means. | - V-1 | N/A |
| | The CBR being closed, a voltage equal to its rated voltage, or, in the case of a range of rated voltages, any one of the rated voltages is applied to its line terminals. The voltage is then switched off. The CBR shall trip. The time interval between the switching off and the opening of the main contacts is measured. | | N/A |
| | for CBRs opening without delay no value shall exceed 0,2 s; | | N/A |
| | for CBRs opening with delay the maximum and minimum values shall be situated within the range indicated by the manufacturer. | | N/A |
| | Tange malouted by the management | | APNG E NIA |
| B.8.9 | | | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | For CBRs having an adjustable residual operating current, the test is made at the lowest setting. For CBRs having an adjustable time-delay the test is made at any one of the time-delay settings. | | N/A |
| B.8.9.1 | | | |
| | The CBR is connected according to figure B.3 and is supplied on the line side at 0,85 times the rated voltage, or, in the case of a range of rated voltages, at 0,85 times the lowest value of rated voltage. | | N/A |
| | Verification with one phase is switched off | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appe current | arance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn | | N/A |
| | Required: no value exceeds the specified limiting value of Table B1: (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 5 IΔn or 0,25 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min, setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the CBR of □10 IΔn or □ 0,5 A Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting I∆n.(ms): Interm. setting I∆n.(ms): Max. setting I∆n.(ms): | | N/A |
| | | | N/A |
| | Verification with other phase switched off | | N/A |
| B.8.2.4.3 | Verification of operating in case of a sudden appear current (figure B.1) | rance of the residual | N/A |
| | A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn Required: no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | M | N/A |
| | Min. setting I∆n.(ms): Interm. setting I∆n.(ms): Max. setting I∆n.(ms): | | N/A |
| | A residual current is sudden appear on the CBR of [5 1Δn or [] 0,25 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting I∆n.(ms): Interm. setting I∆n.(ms): Max. setting I∆n.(ms): | | N/A |

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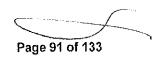
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the CBR of ☐10 I∆n or ☐ 0,5 A Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | N/A |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | Test is repeated with resistor connected to other two phases in turn. | | N/A |
| | The CBR is connected according to figure B.3 and is supplied on the line side with the rated voltage or, in the case of a range of rated voltages, with the lowest rated voltage. The supply is switched off. The CBR shall not trip. With supply connected the voltage is reduced as follows: a) for CBRs for use with a three-phase supply: to 70 % of the lowest rated voltage; b) for CBRs for use with a single phase supply: to 85 V applied as follows: - for single-pole and two-pole CBRs: between poles; - for three-pole and four-pole CBRs, declared as suitable for use with a single-phase supply (see B.5 e)): between each combination of two poles, connected according to the manufacturer's | M . | N/A |
| | specification. A current of value ∆n is then applied to a) and/or b), as applicable. The CBR shall trip. | | N/A |
| | | | |
| BII | Test sequence BII | | |
| | Where applicable, the CBR is adjusted at the lowest setting of residual operating current and at the maximum setting of time-delay. | | X OT 3 |

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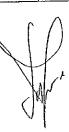
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| Clause | Requirement + Test | Result - Remark | Verdict | |
| | If the CBR has more than one value of cu, each one having a corresponding value of .m, the test is made at the maximum value of .m, at the corresponding phase-to-neutral voltage. | | | |
| | maximum value of .m | | | |
| | Type designation or serial number | | 7 E. Z. L | |
| | Sample no: | | Z Z Z | |
| | Point of test circuit which is directly earthed: | | | |
| | Grid distance "a" (mm): | | 4/4/4 | |
| | Fine wire diameter (mm): | | | |
| | Prospective current (A): | | | |
| | Prospective current obtained (A): | | | |
| | Power factor / ratio n: | | | |
| | Power factor / ratio n obtained: | | 4.44. | |
| | Plot no. | | | |
| | Test sequence: O-t-CO | | | |
| | l²t (kA²s); lp (kA): | O operation: p:kA *t;kA^2s Plot no | | |
| | | CO operation: | | |
| | | l²t;kA²s Plot no.: | | |
| | If tested at separate testing station see report | · | | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | of | N/A | |
| | | | N/A | |
| | After the tests no damage impairing further use | | N/A | |
| | Dielectric strength test of the main circuit at test | voltage of 2 Un for 5 s: | N/A | |
| | Test voltage | | MAT | |





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| Clause | Requirement + Test | Result - Remark | Verdict |
| ···· | Making and breaking its rated current at its | | |
| | maximum rated operational voltage. | | N/A |
| | The CBR shall be capable of performing satisfactorily the tests specified in B.8.2.4.3, but at a value of 1,25 l∆n and without measurement of break time. The test is made on any one pole, taken at random. | | N/A |
| | If the CBR has an adjustable residual operating current, the test is made at the lowest setting, at a current of a value of 1,25 times that setting. | | N/A |
| | Where applicable the CBR shall also be submitted to the test of B.8.2.4.4. | | N/A |
| | Verification of the limiting non-operating time of ti | me delayed type CBRs | N/A |
| | A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer | | N/A |
| | Required : The CBR shall not operate | | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| | CBRs functionally dependent on line voltage shall also satisfy the tests of B.8.8 or B.8.9, as applicable. | | N/A |
| | | | N/A |
| B | Test sequence B III | 00 | |
| | | | N/A |
| 8.8.11 | VERIFICATION OF THE EFFECTS OF ENVIRONMENTAL COND | DITIONS | |
| | The test is carried out according to IEC 60068-2-30. | | |
| | The upper temperature shall be 55 °C ± 2 °C (variant 1) and the number of cycles shall be – 6 for l∆n > 1 A – 28 FOR l∆n ≤ 1 A | | |
| | At the end of the cycles the CBR shall be capable of complying with the tests of B.8.2.4.3, but with a residual operating current of 1,25 l∆n and without measurement of break time. Only one VERIFICATION NEED BE MADE. | | N/A |
| | Where applicable the CBR shall also comply with the test of B.8.2.4.4. Only one verification NEED BE MADE. | | N/A |
| | Verification of the limiting non-operating time of ti | me delayed type CBRs | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate | | N/A |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| | | 21 | |
| B.8.12 | Verification of electromagnetic compatibility (EMC See report: | -) | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |

| Annex C | Individual pole short-circuit test sequence | | · 李春春春 |
|---------------------------------------|--|---|---------------|
| | Circuit-breaker for use on phase-earthed system | ms | 17388 |
| C.2 | Test of individual pole short-circuit breaking c | | 1111 |
| | A short-circuit test is made with a value of pros 25% of the ultimate rated short-circuit breaking | pective current (Isu) equal to capacity (Icu) | |
| | Type designation or serial number | BD250 | |
| | Sample no: | 8 | i la n |
| · · · · · · · · · · · · · · · · · · · | Rated current: In (A) | 250 A | |
| | Rated operational voltage: Ue (V) | 500 V | TOTAL STATE |
| | Rated ultimate short-circuit breaking capacity: (kA) | 25 kA | TOTAL |
| | Rated control supply voltage of closing mechanism: Uc (V) | | |
| | Rated control supply voltage of shunt release: Uc (V) | | * A 41 * A. A |
| | The test sequence of operations is O - t - CO | N 1 1 | |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | M | Р |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | | Р |
| | Test made in free air: | | P |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | P |
| | The characteristics of the metallic screen: | | 7 |
| | - woven wire mesh | | / 注章和 N/A |
| | - perforated metal | - | N/A |
| | - expanded metal | | P |
| | - ratio hole area/total area: 0,45-0,65 | | P |
| | - size of hole: <30mm² | | 17 R |
| | - finish: bare or conductive plating | 8/6 | R |

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Manual Assertion

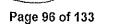


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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | P |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | P |
| | Circuit is earthed at: (load-star- or supply-star point) | Load-star | Р |
| | Conductor cross-sectional area (mm²): | 120 mm² | P |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A |
| -, | Tightening torques: (Nm) | 15 Nm | Р |
| | Test sequence of operation: O – t – CO | | |
| | Test circuit according figure: 9 | | Р |
| | - test voltage U/Ue = 1,05 (V)L1:L2:L3: | 558 V ⁻ 558 V 558 V | P |
| | short-circuit test current (Isu): equal to 25% of the ultimate rated short-circuit breaking capacity (Icu) | | P |
| | - r.m.s. test current AC/DC: (A): | 4,1 kA AC | Р |
| | power factor/time constant: | 0,77 | Р |
| | - Factor "n" | 1,51 | P |
| | - peak test current (Amax): | 6,2 kA | Р |
| | Test sequence "O" L1 | | |
| | - max. let-through current: (kApeak)L1: | 6,07 kA | Р |
| | - Joule integral l ² dt (A ² s)L1: | 0,36 . 10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" L1 | | |
| | - max. let-through current: (kApeak)L1: | 5,57 kA | P |
| | - Joule integral l ² dt (A ² s)L1: | 0,285 . 10 ⁶ A ² s | Р |
| | Test sequence "O" L2 | | 1000 |
| | - max. let-through current: (kApeak)L2: | 6,05 kA | Р |
| | - Joule integral I²dt (A²s)L2: | 0,342 . 10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | *OTJE |

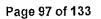
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test sequence "CO" L2 | | Control of the contro |
| | - max. let-through current: (kApeak)L2: | 5,92 kA | P |
| | - Joule integral I²dt (A²s)L2: | 0,32 . 10 ⁶ A ² s | Р |
| · · | Test sequence "O" L3 | | |
| | - max. let-through current: (kApeak)L3: | 5,98 kA | P |
| | - Joule integral I ² dt (A ² s)L3: | 0,344 . 10 ⁶ A ² s | Р |
| | Pause, t: (min) | 3 min | P |
| | Test sequence "CO" L3 | | 阿爾斯斯 |
| | - max. let-through current: (kApeak)L3: | 5,61 kA | Р |
| | - Joule integral I ² dt (A ² s)L3: | 0,299 . 10 ⁶ A ² s | Р |
| | Melting of the fusible element | | Р |
| | Holes in the PE-sheet for test sequence "O" | | Р |
| | Cracks observed | | Р |
| C.3 | Verification of dielectric withstand | | The state of the s |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1000 V | p |
| | - no breakdown or flashover | Λ. | Р |
| C.4 | Verification of overload releases | 11 | المع المعادية |
| | The operation of overload releases shall be verified at 2.5 times the value of their current setting on each pole separately. | | |
| | The operating time shall not exceed the max. va manufacturer for twice the current setting at the pole singly. | | |
| | Time specified by the manufacturer: | 1′22" | 7 |
| | - Operation time: (s)L1:L2:L3:L3: | 1′18" 1′20" 1′18" | Р |
| Annex F | Additional tests for circuit-breakers with electronic over-current protection | | Р |
| F.4. | Immunity tests | | Р |
| F.4.1. | Tests regarding non-sinusoidal currents resulting from harmonics | 1 | 017 5/ |
| F.4.1.1. | Test conditions | | P P |

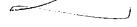
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| | IEC 60947-2 | | |
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| Clause R | lequirement + Test | Result - Remark | Verdict |
| | Option b) | | Р |
| | Desired values: | | Р |
| | Third harmonic >60% | | Р |
| | Fifth harmonic >14% | | Р |
| | Seventh harmonic >7% | | Р |
| | Actual values: | - | Р |
| | Third harmonic | 72,49% | Р |
| | Fifth harmonic | 34,3% | Р |
| | Seventh harmonic | 8,21% | Р |
| 4.1.3. | Test procedure | | P |
| | Non-tripping current 0,9Ir | 225 A | Р |
| | Testing time | Non-tripping 2380 sec. | Р |
| | Tripping current 2 lr | 500 A | Р |
| | Release time | 3′42 " | P |
| | Tripping current 2x lr | 500 A | Р |
| | Release time | 3′51" | Р |
| | Performance criterion A of F.2.1.2. | | Р |
| | | | |
| F.4.2. | Current dips | | Р |
| | The test circuit shall be in accordance with figure F.2. IEC60947-2, | | Р |
| | The current applied according to figure F.5 and to table F.1 | It did not trip | Р |
| | Performance criterion B of F. 2.1.2. | | Р |
| F.4.3. IEC61000-4- | Electrostatic discharges | | Р |
| 2 | At level | 4 | P |
| Annex J.2.2. | Test voltage | 8 kV | Р |
| | Non-tripping current 0,9xlr | 225 A | P |
| | Test data | it did not trip | 7 S/P |
| | Tripping current 2xlr | 500 A | |

| | IEC 60947-2 | | |
|------------------------|--|-----------------|--------|
| Clause | Requirement + Test | Result - Remark | Verdic |
| , | Release time | 3′54" | Р |
| | Performance criterion B of F. 2.1.2. | | P |
| F.4.4.IEC61 000-4-3 | Radiated radio-frequency electromagnetic fields | | P |
| Annex J.2.3. | Non-tripping current 0,9xlr | 225 A | Р |
| | Test data | it did not trip | P |
| | Tripping current 2xlr | 500 A | Р |
| | Release time | 3′59" | P |
| | Performance criterion A of F. 2.1.2. | | P |
| F.4.5. | Electrical fast transients/bursts (EFT/B) | | P |
| F.5.2.2.1. | Non-tripping current 0,9xlr | 225 A | P |
| IEC61000-4- 4 | Testing time | 1′ | P |
| Annex | Tripping current 2xir | 500 A | Р |
| J.2.4. | Release time | 3′95" | P |
| | Performance criterion A of F. 2.1.2. | | P |
| F.4.6. | Surges | | Р |
| EC61000-4- 5 | Non-tripping current 0,9xlr | 225 A | Р |
| Annex | Total number of pulses | 20_ | Р |
| J.2.5. | Tripping current 2xir | 500 A | P |
| | Release time | 4'00" | P |
| | Performance criterion B of F. 2.1.2. | \ | Р |
| F.4.7. Annex | Conducted disturbances induced by radio- frequenci fields (common mode) | | Р |
| J.2.6. | Non-tripping current 0,9xir | 225 A | Р |
| | Test data | it did not trip | Р |
| | Tripping current 2 xir | 500 A | Р |
| | Release time | 3′53" | Р |
| | Performance criterion A of F. 2.1.2 | | Р |
| F.5.4. AnnexJ.3.3. | Radiated RF disturbances (30MHz -1GHz) | | Р |
| Figure F.3. | Meet the conditions for classes "B" | \ /* | 01 5/8 |
| F.6. | Suitability for multiple frequencies | 8/ | MAZ |
| F. 6. | Suitability for multiple frequencies | | NAW |

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| Clause | Requirement + Test | Result - Remark | Verdict |
|--------------------|--|-----------------|---------|
| - .7. | | | |
| /. | Dry heat test | +40°C | P |
| | Ambient temperature | | P |
| | Testing time | 168 h | P |
| | Test data | it did not trip | P |
| 7.3. | Verification of overload releases: | | P |
| 7.2.1.2.4.b) | Instantaneous release: | | Р |
| | setting release | 2 kA | Р |
| | Tripping current | 2,1 kA | P |
| | Inverse time-delay releases : | | Р |
| ····· | Ambient temperature | +30°C | Р |
| | Non-tripping current 1,05xlr | 263 A | P |
| | Testing time | >2h | Р |
| | Tripping current 1,3xlr | 325 A | P |
| | Release time | 33′01" | P |
| | Ambient temperature | +50°C | Р |
| | Non-tripping current 1,05xlr | 263 A | Р |
| | Testing time | >2h | Р |
| | Tripping current 1,3xlr | 325 A | P |
| | Release time | 33/51 | Р |
| F .8. | Damp heat test | | P |
| IEC 60068- 2-30 | The upper temperature The number of cycles | +55°C 6 | Р |
| F.8.2. | Verification of overload releases | | Р |
| 7.2.1.2.4.b) | Instantaneous release: | | Р |
| - | setting release 8xIr | 2000 A | Р |
| | Tripping current | 1990 A | Р |
| | setting release 4xlr | 1000 A | Р |
| | Tripping current | 990 A | Р |
| | Inverse time-delay releases : | | ¥ a. |
| | Ambient temperature | +30°C | OS R |

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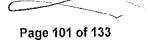
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| Clause | Requirement + Test | Result - Remark | Verdic |
| | Non-tripping current 1,05xlr | 263 A | P |
| · | Testing time | >2 h | P |
| | Tripping current 1,3xlr | 325 A | P |
| <u> </u> | Release time | 34'12" | P |
| | Ambient temperature | +50°C | P |
| - | Non-tripping current 1,05xir | 263 A | P |
| · · _ · _ · | Testing time | >2 h | Р |
| | Tripping current 1,3xir | 325 A | P |
| | Release time | 35'45" | P |
| 9. | Temperature variation cycles at a specified | | P |
| EC60068 <mark>-</mark> 2- 4 | Number of operating | 28 | |
| 1-3 | Test data | it did not trip | Р |
| .8.2. | Verification of overload releases: | • | P |
| '.2.1.2.4.b) | Instantaneous release: | | P |
| ···· | setting release 8xlr | 2000 A | P |
| | Tripping current | 2070.A | P |
| | setting release 4xIr | 1000 A\ | P |
| | Tripping current | 970 A | P |
| | Inverse time-delay releases : | | P |
| | Ambient temperature | +30°C | Р |
| | Non-tripping current 1,05xlr | 263 A | P |
| | Testing time | >2h | P |
| | Tripping current 1,3xlr | 325 A | P |
| · · · · · · · · · · · · · · · · · · · | Release time | 34′37" | P |
| | Ambient temperature | +50°C | P |
| | Non-tripping current 1,05xlr | 263 A | Р |
| | Testing time | >2h | P |
| | Tripping current 1,3xlr | 325 A | P |
| | Release time | 34′58" | Р |
| Annex G | Power loss | 1/25 | 18 7 48 2 |

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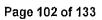
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | . Phase L1 | 17,5 W | 3 1 3 2 % |
| | L2 | 7,8 W | *- |
| | L3 | 17,9 W | k ', ! , ½ ⅓ ⅓ |

| Annex H | Individual pole short-circuit test sequence | | - 1 |
|----------|--|---|---------------------------------------|
| | Circuit-breaker for use in IT systems | | . १४ ह |
| H.2 | Test of individual pole short-circuit breaking ca | pacity | ٠. |
| | A short-circuit test is made on the individual pol breaker at a value of prospective current (I _{IT}) equ setting of the short-time delay release tripping c such a release, 1,2 time the max. setting of the tr instantaneous release, or, where relevant 1,2 time definite time delay release tripping current, but re- | ual to 1,2 times the max. urrent or, in the absence of ripping current of the nes the max. setting of the | |
| <u> </u> | Type designation or serial number | BD250 | 11 |
| | Sample no: | 9 | |
| | Rated current: In (A) | 250 A | |
| | Rated operational voltage: Ue (V) | 690 V | 1 |
| | Rated ultimate short-circuit breaking capacity: (kA) | 2,0 kA | * * * * * * * * * * * * * * * * * * * |
| | Rated control supply voltage of closing mechanism: Uc (V) | - \ \ | |
| | Rated control supply voltage of shunt release: Uc (V) | - 0 | |
| • | The test sequence of operations is O - t - CO | | 2 |
| | For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum. | | P |
| | closing mechanism energized with 85% at the rated Uc: (V) | | N/A |
| | The circuit-breaker is mounted complete on its own support or an equivalent support. | | P |
| | Test made in free air: | | Р |
| | Distances of the metallic screen's: (all sides) | Vide catalogue | Р |
| | The characteristics of the metallic screen: | CINI | 4 |
| | - woven wire mesh | | √ N/A |

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|--------|---|-----------------------------|---------|--|
| Clause | Requirement + Test | Result - Remark | Verdict | |
| | - perforated metal | | N/A | |
| | - expanded metal | | P | |
| | - ratio hole area/total area: 0,45-0,65 | | P | |
| | - size of hole: <30mm ² | | P | |
| | - finish: bare or conductive plating | | Р | |
| **** | Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure: | | Р | |
| | Fuse "F": copper wire: diameter 0,8 mm, 50 mm long | | Р | |
| | Circuit is earthed at: (load-star- or supply-star point) | Load-star | Р | |
| | Conductor cross-sectional area (mm²): | 120 mm² | Р | |
| | If terminals unmarked: line connected at: (underside/upside) | | N/A | |
| | Tightening torques: (Nm) | 15 Nm | Р | |
| | Test sequence of operation: O - t - CO | | Р | |
| | Test circuit according figure: 9 | | Р | |
| | - test voltage U/Ue = 1,05 (V)L1:L2:L3: | 760 V . 760 V . 760 V | Р | |
| | Short-circuit test current (I _{IT}): equal to 1,2 times the max. setting of the short- time delay release tripping current, | | N/A | |
| • | or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release, | | Р | |
| | or, where relevant 1,2 times the max. setting of the definite time delay release tripping current, but not exceeding 50kA. | · | N/A | |
| | - r.m.s. test current AC/DC: (A) | 2400 A AC | Р | |
| | power factor/time constant: | 0,85 | . P | |
| | - Factor "n" | 1,5 | Р | |
| | - peak test current (Amax) : | 3,5 kA | Р | |
| | Test sequence "O" L1 | | | |
| | - max. let-through current: (kApeak)L1: | 3,5 kA | B | |

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| | IEC 60947-2 | Result - Remark | Verdict |
|--------------|---|-------------------------|---------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| • | - Joule integral I ² df (A ² s)L1: | 183000 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" L1 | | To the second |
| | - max. let-through current: (kApeak)L1: | 3,48 kA | Р |
| | - Joule integral I ² dt (A ² s)L1: | 137000 A ² s | Р |
| | Test sequence "O" L2 | | 7.4 |
| | - max. let-through current: (kApeak)L2: | 3,48 kA | Р |
| -, | - Joule integral I ² dt (A ² s)L2: | 187000 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| | Test sequence "CO" L2 | | TAREZA. |
| . =. | - max, let-through current: (kApeak)L2: | 3,37 kA | Р |
| | - Joule integral I ² dt (A ² s)L2: | 117000 A ² s | Р |
| | Test sequence "O" L3 | | |
| | - max. let-through current: (kApeak)L3: | 3,45 kA | P |
| | - Joule integral I²dt (A²s)L3: | 177000 A ² s | Р |
| | Pause, t: (min) | 3 min | Р |
| , | Test sequence "CO" L3 | | 电影 |
| | - max. let-through current: (kApeak)L3: | 3,37 kA | Р |
| | - Joule integral I ² dt (A ² s)L3; | 141000 A ² s | Р |
| | For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by $\sqrt{3}$. This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles. | 3. | N/A |
| - | Test sequence "O" N | | VIII. |
| | - max, let-through current: (kApeak)N: | | N/A |
| | - Joule integral I ² dt (A ² s)N | | N/A |
| | Pause, t: (mln) | | N/A |
| | Test sequence "CO" N | | |
| | - max. let-through current: (kApeak)N | : | N/A |
| | - Joule integral I ² dt (A ² s)N | : | SIUNIA |

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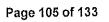
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| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|---|---------------------------------------|
| | | | |
| | Melting of the fusible element | | N/A |
| | Holes in the PE-sheet for test sequence "O" | | N/A |
| | Cracks observed | | N/A |
| H.3 | Verification of dielectric withstand | | 亲圣·章·美 |
| | - equal to twice the rated operational voltage with a minimum of 1000 V | 1380 V | Р |
| | - no breakdown or flashover | | P |
| H.4 | Verification of overload releases | | 5 4 1 |
| | The operation of overload releases shall be ver of their current setting on each pole separately. | | Constitution (Co.) |
| | The operating time shall not exceed the max. val manufacturer for twice the current setting at the pole singly. | | |
| | Time specified by the manufacturer: | 1′22" | P |
| | - Operation time: (s) | 1'22" 1'18" 1'20" 1'18" 1'19" 1'19" 1'24" 1'25" 1'23" | P |
| H.5 | Marking | | |
| | Circuit-breaker for which all values of rated voltage have not been tested according to this annex or are not covered by such testing, shall be identified by the symbol which shall be market on the circuit-breaker immediately following these values of rated voltage | | |
| Annex M | Modular residual current devices (without integ | ral current breaking device) |) NA |
| M.8.3 | Operating characteristics | | 2 |
| ¥1.0.3 | Type designation or serial number | | |
| | Sample no: | | · · · · · · · · · · · · · · · · · · · |
| | Rated current: In (A) | - | の意味で |
| | Rated operational voltage: Ue (V) | | # *** |
| | Rated frequency (Hz) | 13/10 | |
| | Terminal type or through conductor type | 0 | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| startle V | MRCD with sensing means and processing device combined or separate | Combined/separate | A Comment of the Comm |
| # * | MRCD with voltage source | · | |
| **** | Operating automatically in case of failure of the voltage source. | Yes/no | |
| | Rated insulation voltage (<i>U</i> i) | | |
| | Rated impulse withstand voltage (Uimp) | | A STATE OF THE STA |
| | Characteristics of the voltage source of MRCDs | 5 | |
| | Rated values of the voltage source of MRCDs (Us) | | |
| | Rated values of the frequencies of the voltage source of MRCDs | | |
| | Rated insulation voltage (Ui) | | |
| | Rated impulse withstand voltage (Uimp) | | |
| M.4.1.3 | Characteristics of auxiliary contacts | | A STATE OF THE STA |
| M.4.2 | Characteristics of MRCDs concerning their res | Characteristics of MRCDs concerning their residual current function | |
| M.4.2.2 | Operating characteristic in case of residual cu | rrent with d.c. component | |
| | Type AC MRCD | | |
| | Type A MRCD | | |
| | Type B MRCD | | |
| M.4.3 | Behaviour under short-circuit conditions | 1M | 1000円の100円の100円の100円の100円の100円の100円の100 |
| | Rated conditional short-circuit current (/cc) | | |
| •• | Rated conditional residual short-circuit current ($I\Delta c$) | | To Chicago and Chicago |
| | Rated short-time withstand current (/cw) | | 1 |
| | Rated residual short-time withstand current (/Δw) | · | |
| | Peak withstand current | | |
| M.4.4 | Preferred and limiting values | | The second second |
| | Preferred values of the rated residual operating current (/Δn) | 1037 | |
| | Minimum value of the rated residual non- operating current (/Δno) | | |

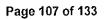
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Limiting value of the non-operating overcurrent in the case of a single-phase load in a multiphase circuit | | A COLUMN TO THE PROPERTY OF TH |
| | Preferred values of rated voltage of the voltage source of MRCDs | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | Compliance with constructional requirements | | N/A |
| MI- | Test sequence MI | | STATE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TO THE PERSON NAMED IN |
| M.8.3.4.2 | Verification of operating in case of steady increase (figure M.1) | ase of the residual current | N/A |
| | Increase the residual current from 0,2 IΔn to IΔn in 30 sec. | | N/A |
| | Required: value between 0,2 lΔn and lΔn | | |
| | Min. setting l∆n.(mA): Interm. setting l∆n.(mA): Max. setting l∆n.(mA): | | N/A |
| M.8.3.4.3 | Verification of operating in case of closing on re | esidual current (figure M.2) | N/A |
| | The MRCD is closes on IΔn or each specified setting | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | [\(\lambda \) | N/A |
| M.8.3.4.4 | Verification of operating in case of a sudden ap current (figure M.2 and M3) | pearance of the residual | N/A |
| | A residual current is sudden appear on the MRCD of IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn | \$187; | AVA E |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | 0 * 4 | EVE |



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| Clause | Requirement + Test | Result - Remark | Verdict | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A | |
| | A residual current is sudden appear on the MRCD of ☐ 5 I∆n or ☐ 0,25 A | | N/A | |
| | Required: no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A | |
| | A residual current is sudden appear on the MRCD of ☐10 IΔn or ☐ 0,5 A | | N/A | |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A | |
| | A residual current is sudden appear on the MRCD of IΔn: 5 A | | N/A | |
| | Required: no value exceeds the specified limiting value of Table B1 (40 ms) | | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A | |
| | A residual current is sudden appear on the MRCD of IΔn: 10 A | | N/A | |
| | Required: no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A | |
| | A residual current is sudden appear on the MRCD of IΔn: 20 A | | N/A | |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | P | # LE | |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 50 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 100 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| · | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 200 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | M | N/A |
| | A residual current is sudden appear on the MRCD of IΔn: 500 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| M.8.3.4.5 | Verification of the limiting non-operating time o (figure M3) | f time delayed type MRCDsi | NVA |
| | A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer | 70 * 40 * 60 * 60 * 60 * 60 * 60 * 60 * 6 | NA NA |
| | Required : The MRCD shall not operated | EO | ONO |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Min. setting I∆n. Min. setting time delay (ms): Min. setting I∆n. Max. setting time delay (ms): | | N/A |
| M.8,3.5 | Tests at the temperature limits | | N/A |
| M.8.3.5.1 | General (clause B.8.2.5 applies) | | |
| | Minimum temperature (°C) | | |
| | Maximum temperature (°C) | | TA TA |
| M.8.3.5.2 | Verification of operating in case of a sudden ap current at –5°C or minimum temperature limit (f | pearance of the residual igure M.2 and M3) | |
| | A residual current is sudden appear on the MRCD of IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of 2 ΙΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of ☐ 5 I∆n or ☐ 0,25 A | To. | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | : | 'N/A |
| | A residual current is sudden appear on the MRCD of 10 IΔn or 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | 237 | X 1973 E |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| - | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | Verification of the limiting non-operating time of at –5°C or minimum temperature limit (figure M3) | | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer | | N/A |
| | Required : The MRCD shall not operated | | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| M.8.3.5.3 | Verification of operating in case of a sudden app current at +40°C (figure M.2 and M3) | earance of the residual | N/A |
| | A residual current is sudden appear on the MRCD of I∆n | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of 2 IΔn | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms | CM | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of 5 lΔn or 0,25 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | (P) | AIN A K E I |

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| Clause I | Requirement + Test | Result - Remark | Verdict |
| | A residual current is sudden appear on the MRCD of ☐10 IΔn or ☐ 0,5 A | | N/A |
| | Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms | | |
| | Min. setting l∆n.(ms): Interm. setting l∆n.(ms): Max. setting l∆n.(ms): | | N/A |
| | A residual current is sudden appear on the MRCD of 2 l∆n for a time declared by the manufacturer | | N/A |
| | Required : The MRCD shall not operated | | |
| | Min. setting l∆n. Min. setting time delay (ms): Min. setting l∆n. Max. setting time delay (ms): | | N/A |
| M.8.4. | Verification of dielectric properties | | N/A |
| M.8.4.1 | Verification of rated impuls withstand voltage | | N/A |
| | rated impulse withstand voltage | | A CONTRACTOR |
| | test impulse voltage (see table 12 part 1) | | |
| | test impulse voltage for isolating (see table 14 part 1) | | The second secon |
| M.8.4.1.2 | Verification of rated impulse withstand voltage monitored circuit | with respect to the | N/A |
| M.8.4.1.2.1 | Test for terminal type MRCD | | N/A |
| M.8.4.1.2.2 | Tests for MRCDs of through-conductor type | <u> </u> | N/A |
| M.8.4.1.3 | Verification of rated impulse withstand of the v applicable) | oltage source circuit (if | N/A |
| M.8.5 | Verification of the operation of the test device a voltage | at the limits of the rated | N/A |
| | For MRCDs having an adjustable time-delay the test is made at the maximum setting of time-delay: | s | |
| M.8.5.a | Setting l∆n or minimum setting of l∆n | А | |
| | Test voltage (1,1 x Ue max) | V | |
| | Number of operations | 25 | |
| | Interval time | 5 s | |
| | Tripping | ☐ Yes / ☐ No | WAD 23 |



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| Clause | Requirement + Test | Result - Remark | Verdict | |
| M.8.5.b | Setting I∆n or minimum setting of I∆n | A | | |
| | Test voltage (0,85 x Ue max) | V | | |
| | Number of operations | 3 | 1 1 1 | |
| ····· | Interval time | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | |
| ···· | | 5 s | <u> </u> | |
| | Tripping | Yes / No | N/A | |
| M.8.5.c | Setting IΔn or minimum setting of IΔn | Α | | |
| | Test voltage (1,1 x Ue max) | VV | | |
| · | Number of operations | 1 | *** | |
| | Operating means of the test device held in close position | 5 s | | |
| | Tripping | ☐ Yes / ☐ No | N/A | |
| M.8.6 | Verification of the limiting value of non-operatiovercurrent conditions, in case of a single pha | | N/A | |
| M.8.6 | Circuít diagram | Fig. M4 | 4 | |
| | Setting IΔn or minimum setting of IΔn if adjustable | A | | |
| | Test current equal to the lower value of: | | , , , | |
| | ☐ 6 x In or | | | |
| | ☐ 80 % of the maximum short-circuit release current setting | A | Action of the second | |
| | Test voltage: | | | |
| | <u> </u> | I M | \$ \$ t | |
| | rated voltage or | v | | |
| | any convenient voltage | | 16123 | |
| | Test frequency | Hz | \$ 5. · · | |
| | Power factor (0,5) | | | |
| | Current flow time | 2 s | 38. | |
| | Interval time | 60 s | 1 4 4 5 | |
| | Calibration plot number | | | |
| | No tripping / change of state | | N/A | |
| M.8.7 | Resistance against unwanted tripping due to s impulse voltages | surge currents resulting from | N/A | |
| M.8.7.2 | Verification of the resistance to unwanted trip network capacitance | Verification of the resistance to unwanted tripping in case of loading of the | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| B.8.6.1 | Current surge test for RMCDs (0,5 µs / 100kHz | ring wave test) | |
| | One pole of the MRCD is submitted to 10 applications of a surge current according to the following requirements: | | |
| | - peak value: 200 A + 10/0% | | |
| | - virtual front time: 0,5 μs ± 30% | | 15.3 |
| | - period of the following oscillatory wave: 10 µs ± 20% | | |
| | - each successive peak: about 60% of the preceding peak | | |
| | The polarity shall be inverted after every two applications | | in to the state of |
| | The interval between two consecutive applications shall be about 30 s | | |
| | During the test the MRCD shall not trip: | - | N/A |
| M.8.7.3 | Verification of the resistance to unwanted trips without follow-on current. | oing in case of flashover | N/A |
| B.8.6.2 | Verification of behaviour at surge current up to 250 A (8/20 µs surge current test) | | N/A |
| | One pole of the MRCD is submitted to 10 applications of a surge current according to the following requirements: | | |
| | - peak value: 250 A + 10/0% | | |
| | - virtual front time: 8 μs ± 20% | 1000 | |
| | - virtual time to half value: 20 µs ± 20% | | 上海 |
| | - peak of reverse current:: less than 30% of peak value | | |
| | The polarity shall be inverted after every two applications | | |
| | The interval between two consecutive applications shall be about 30 s | | |
| | During the test the MRCD shall not trip: | | NA EAE |
| M.8.8 | Verification of the behaviour in case of an ear d.c. component. | th fault current comprising a | |
| M.8.8.2 | Type A MRCD | \\ \alpha | NIA HO |

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| | For MRCDs the operation of which depends o are made at 1,1 and 0,85 times the rated voltage | n a voltage source the test ge of the voltage source (Us | |
| M.8.8.2.2 | Verification of operation in case of a continuo pulsating direct current | us rise of a residual | N/A |
| | Rated voltage | V | |
| B.8.7.2.1 | - steady increase from zero to: 1,4 lΔn for lΔn > 0,015 A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | |
| | - angle = 90 (+/-) : | | |
| | - angle = 135 (+/-) ; | | 李 章 響 |
| | No value exceeds the relevant specified limiting values | | N/A |
| M.8.8.2.3 | Verification of operation in case of a suddenly pulsating direct current | appearing residual | N/A |
| B.8.7.2.2 | Verification of the correct operation in case of pulsating direct currents by closing S2 (angle | | al N/A |
| | Rated voltage | v | 第 分書書 |
| | RCCB's with IΔn > 0,015 A: | ^ | |
| | - maximum break time (ms) at: 1,4 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 2,8 l∆n (+/-) : | 100 | |
| | - maximum break time (ms) at: 7 l∆n (+/-) : | | \$ 7 F |
| | - maximum break time (ms) at: 14 lΔn (+/-) : | | 17 19 |
| | No value exceeds the relevant specified limiting value | | N/A |
| | RCCB's with I∆n ≤ 0,015 A: | | N/A |
| | - maximum break time (ms) at: 2 lΔn (+/-) : | | The state of the s |
| | - maximum break time (ms) at: 4 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 10l∆n (+/-) : | | |
| | - maximum break time (ms) at: 20 iΔn (+/-) : | //- | 3 |
| | No value exceeds the relevant specified limiting value | CTR | NA) |
| M.8.8.2.4 | Verification of operation with load at reference | 1 0 | 1 |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Rated voltage | v | |
| 3.8.7.2.1 | - steady increase from zero to: 1,4 lΔn for lΔn > 0,015 A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | |
| | - angle = 90 (+/-) : | | * 3 A |
| a . | - angle = 135 (+/-) : | | |
| | No value exceeds the relevant specified limiting values | | N/A |
| VI.8.8.2.5 | Verification of operation of a residual pulsating superimposed by a smooth direct current of 6 | g direct current mA. | N/A |
| | Rated voltage | V | 1 4 5 |
| B.8.7.2.1 | - steady increase from zero to: 1,4 lΔn for lΔn > 0,015 A with 1,4 lΔn/30 A/s (mA) + 6 mA | mA | N TO THE REAL PROPERTY OF THE PERSON OF THE |
| | -steady increase from zero to: 2 lΔn for lΔn ≤ 0,015 A with 2 lΔn/30 A/s (mA) + 6 mA | mA | |
| | - angle = 0 (+/-) : | | 11 |
| | No value exceeds the relevant specified limiting values | 10,1 | N/A |
| M.8.8.3 | Type B MRCD | \M | N/A |
| M.8.8.3.2 | Verification of operation in case of a slowly ris | sing residual smooth direct | |
| | Rated voltage (1,1*Un) | V | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | 1 1 1 1 |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | V | N. S. |
| B.8.7.2.1 | - steady Increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | | |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | 1 | * NIA |
| M.8.8.3.3 | Verification of operation in case of a suddenly direct current | y appearing residual smooth ເດີດໃຊ້ | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| B.8.7.2.2 | Verification of the correct operation in case of s smooth residual direct currents by closing S2 | suddenly appearing a | |
| | Rated voltage (1,1*Un) | V | |
| | RCCB's with I\(\Delta\n > 0,015 A:\) | | |
| | - maximum break time (ms) at: 2 l∆n (+/-) : | | |
| | - maximum break time (ms) at: 4 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 10 lΔn (+/-) : | | **** |
| | - maximum break time (ms) at: 20 lΔn (+/-) : | | |
| | No value exceeds the relevant specified limiting value | | N/A |
| B.8.7,2.2 | Verification of the correct operation in case of s smooth residual direct currents by closing S2 | uddenly appearing a | N/A |
| | Rated voltage (0,85*Un) | v | |
| | RCCB's with IΔn > 0,015 A: | , | |
| | - maximum break time (ms) at: 2 lΔn (+/-) : | | |
| | - maximum break time (ms) at: 4 iΔn (+/-) | | |
| | - maximum break time (ms) at: 10 lΔn (+/-) : | ^ | |
| | - maximum break time (ms) at: 20 IΔn (+/-) : | | |
| | No value exceeds the relevant specified limiting value | M | N/A |
| M.8.8.3.4 | Verification of operation in case of a slowly rising resulting from a fault in a circuit fed by a three-parametrion. | ng residual current bulse star or a six-pulse | N/A |
| | Rated voltage (1,1*Un) | V | 7. 下草 |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | V | |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | NA |

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| Л.8.8.3.5. | Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line. | | |
| | Rated voltage (Un) | V | |
| 3.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | TE |
| | Operation shall occur between 0,5 and 1,4ldn | | N/A |
| VI.8.8.3.6 | Verification of operation with load at the refere | nce temperature | N/A |
| VI.8.8.3.6- VI.8.8.3.2 | Verification of operation in case of a slowly ris | ing residual smooth direct | N/A |
| | Rated voltage (1,1*Un) | V | 1136 |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | V | \$ 10 mm |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - angle = 90 (+/-) | | |
| | Operation shall occur between 0,5 and 2ldn | L DA | N/A |
| M.8.8.3.6- M.8.8.3.4 | Verification of operation in case of a slowly ris resulting from a fault in a circuit fed by a three connection | ing residual current e-pulse star or a six-pulse | N/A |
| | Rated voltage (1,1*Un) | V | 1 |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | mA | *************************************** |
| | - angle = 90 (+/-) : | | |
| | Operation shall occur between 0,5 and 2ldn | | N/A |
| | Rated voltage (0,85*Un) | v | Section 1 |
| B.8.7.2.1 | - steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA) | mA | * 100 |
| | - angle = 90 (+/-) | | |
| | Operation shall occur between 0,5 and 2ldn | (F) | NA /- |

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| M.8.8.3.6- M.8.8.3.5. | Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line. | | N/A |
| | Rated voltage (Un) | V | 13-16-18 |
| B.8.7.2.1 | - steady increase from zero to: 2 lΔn A with 1,4 lΔn/30 A/s (mA) | mA | |
| | - angle = 0 (+/-) : | | |
| | Operation shall occur between 0,5 and 1,4ldn | | N/A |
| | | | N/A |
| M.8.9. | Verification of the behaviour of MRCDs with sep case of a failure of the sensing means connection | | N/A |
| M.8.9.2 | Test method 1 | | N/A |
| | Rated voltage of the sensing means | | 17FF T |
| | Interval time Required <5 sec | | N/A |
| M.8.9.3 | Test method 2 | | N/A |
| | Test shall be carried out as follows: | | A DOM |
| | - The test device is activated | | |
| | - The sensing means are disconnected and the test device is activated. The MRCD shall not operate | | |
| · | Rated voltage of the sensing means | | |
| | Test device activated MRCD shall operate | | N/A |
| | Rated voltage of the sensing means | l. | |
| | Sensing device disconnected and Test device activated MRCD shall not operate | / | N/A |
| M.8.10 | Verification of temperature-rise of terminal type | MRCDs | N/A |
| M.8.10.2 | Tambient:°C | | |
| 8.3.2.5 | Main circuits | | 1. 景學 |
| | Conventional thermal current I _{th} | A | |
| | Conventional thermal current for enclosure Ithe | A | |
| | Conventional thermal current for the neutral pole | A | |
| | Cabling characteristics | | The state of the s |
| | Cable | mm ² | The No. |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Bar / number / length | mm / / m | |
| | Arrangement | 3 phase - poles on serie | |
| | Tightening torque | Nm | ころ 大き |
| | Neutral pole (if applicable) | | 6. Z. B. A. |
| | Cable | mm² | |
| | Bar / number / length | mm//m | · · · · · · · · · · · · · · · · · · · |
| | Tightening torque | Nm | |
| - | Terminals(see table 2) | | 这篇篇影 |
| | Manual operating means | | 4404 |
| | Parts which need not be touched but not hand held | | |
| | Parts which need not be touched during normal operation | | |
| M.8.11 | Verification of mechanical and electrical endura | ance | N/A |
| | 500 off-load operations controlled by the test device | | 10000000000000000000000000000000000000 |
| | Rated voltage: | V 🗌 ac 🗌 dc | |
| | Result: | afteroperations, | N/A |
| | 500 off load operations by passing the rated residual operating current l∆n through one current path | | |
| | Rated voltage: | V 🗌 ac 🗌 dc | |
| 1 | Rated residual current | mA | · 查里曼 |
| | Result: | afteroperations, | N/A |
| | 500 on-load operations controlled by the test device | | |
| | Rated voltage: | V ac dc | |
| | Test current | A | 1 |
| ate the color of t | Power factor | | |
| | Test circuit | | 建建造 |
| | Result: | after operations, | N/A |

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| | 500 on-load operations by passing the rated residual operating current lΔn through one current path. | | | |
| | Rated voltage: | V 🗌 ac 🗌 dc | | |
| | Test current | A | | |
| | Power factor | | | |
| | Test circuit | | | |
| | Rated residual current | mA | The state of | |
| | Result: | after operations, | N/A | |
| | Show no damage | | N/A | |
| · · · · · · · · · · · · · · · · · · · | High voltage test: twice rated voltage | Test voltage:V | N/A | |
| | A residual current is sudden appear on the MRCD of IΔn (mA) | | N/A | |
| | Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms | | | |
| M.8.12. | Verification of the behaviour of MRCDs in case of failure of the voltage source for MRCDs classified under M.3.2.2.1 | | N/A | |
| M.8.12.2 | Determination of the limiting value of the voltage source | | | |
| | Source voltage (Us) | Max Us: V ☐ac ☐ dc | | |
| | | Min Us: V ☐ac ☐ dc | | |
| | Adjustable residual current setting | mA (lowest) | | |
| | Adjustable time-delay setting | S | 入外学 | |
| | Time period of voltage decreasing | 30 s or a period enough with respect to delayed opening | | |
| | Min voltage to automatic opening (U > 0,85 x Us) | | | |
| | A residual current is sudden appear on the MRCD of IΔn (mA) at a value just above highest measured value | | N/A | |
| | Required : no value exceeds the specified limiting value of Table B1: 300 ms | ONEKT. | PUC | |
| | | 1 + 1 A | Malal | |

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|------------|--|---|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | It's not possible to switch "ON" by manual operating means at a lower value than the lower measured value. | | N/A |
| A.8.12.3 | Verification of automatic opening in case of volt | age source failure | N/A |
| | | Max Us: V ☐ac ☐ dc | |
| | | Min Us:V ☐ac ☐ dc | |
| | Adjustable residual current setting | mA (lowest) | 建 图 |
| | Adjustable time-delay setting | s | 建筑 |
| | i i i i i i i i i i i i i i i i i i i | Max 1 s or max. 1 s+time delay setting | |
| | Time period to automatic opening | | |
| | No value exceeds the relevant specified limiting value | | N/A |
| • | | | |
| VI.8.13 | Verification of the behaviour of MRCDs with voltage source as classified under M.3.2.2.2 in case of failure of the voltage source. | | |
| | Source voltage (Us) | Max Us: V ☐ac ☐ dc | |
| | | Mín Us:V ☐ac ☐ dc | |
| | Adjustable residual current setting | mA (lowest) | N. G. A. |
| | Adjustable time-delay setting | s | |
| | Switch off and reclosed Sa or S1 and reduced the source voltage to 70 % | 9 | N/A |
| | | 70% Us = V | |
| | Time period to automatic opening | | N/A |
| MII | Test sequence MII | | N/A |
| M.8.14 | Verification of the behaviour of the MRCD under short-circuit conditions | | N/A |
| | Type designation or serial number | | |
| | Sample no: | | |
| M.8.14.3 | Verification of the rated conditional short-circuit | current (Icc) | N NAO |
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| / | \mathscr{U}_{1} | | MANA |



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| Verdict |
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| N/A |
| N/A |
| n: N/A |
| N/A |
| AVETER |
| N/A |
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|-----------|---|---|--|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Source voltage (Us) | Max Us: V ☐ac ☐ | 10000000000000000000000000000000000000 |
| | | Min Us: Vac dc | The state of the s |
| | Adjustable residual current setting | mA (lowest) | 建 |
| • | Adjustable time-delay setting | s | 1 |
| | Time period | Max 1 s or max. 1 s+time delay setting | · · · · · · · · · · · · · · · · · · · |
| | Time period to automatic opening | | N/A |
| | No value exceeds the relevant specified limiting value | | N/A |
| | The polyethylene sheet shows no holes | | N/A |
| | | | N/A |
| M.8.14.4 | Verification of rated short-time withstand current | (l _{cw}) | N/A |
| | Test circuit according to figure: | | |
| | Point of test circuit which is directly earthed: | | |
| | Grid distance "a" (mm): | | 10000000000000000000000000000000000000 |
| | Prospective current (A): | | |
| | Prospective current obtained (A): | | · 真确 (验) |
| | Power factor / ratio n: | V | |
| | Power factor / ratio n obtained: | | 1 1 1 1 1 |
| | Plot no. | | 新华市 |
| | Test sequence: O | | 1000 |
| | I²t (kA²s); lp (kA): | lp :kA | かる |
| | | l²t;kA²s | 7 7 |
| | | Test duration: | |
| | | Plot no. | |
| | If tested at separate testing station see report | No.: of testing station | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | of CTD | N/A |
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|---------------------------------------|--|--|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| , , , , , , , , , , , , , , , , , , , | After the tests no damage impairing further use | | N/A |
| 8.3.3.5 | Dielectric strength test of the main circuit at test | voltage of 2 Un for 1 min: | N/A |
| | Test voltage | - | N/A |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting: | I test: mA trip time: ms | N/A |
| | | | N/A |
| M.8.12.3 | Verification of automatic opening in case of volta | ge source failure | N/A |
| | Source voltage (Us) | Max Us:V □ac □ dc | |
| | | Min Us: V ☐ac ☐ dc | |
| | Adjustable residual current setting | mA (lowest) | 1 |
| | Adjustable time-delay setting | s | |
| | Time period | Max 1 s or max. 1 s+time delay setting | |
| | Time period to automatic opening | | N/A |
| | No value exceeds the relevant specified limiting value | \wedge | N/A |
| | The polyethylene sheet shows no holes | \ \ \ \ \ | N/A |
| - ,- | | | N/A |
| M.8.14.5 | Verification of the rated conditional residual short | t-circuit current (I∆c) | N/A |
| | Test circuit according to figure: | | |
| | Point of test circuit which is directly earthed: | | |
| | Grid distance "a" (mm): | | |
| | Silver wire diameter (mm): | | |
| | Used SCPD during the tests | | |
| | Prospective current (A): | | |
| | Prospective current obtained (A): | | |
| | Power factor / ratio n: | | |
| | Power factor / ratio n obtained: | | |
| | Plot no. | | |

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|------------|---|--|---------|--|--|
| Clause | Requirement + Test | Result - Remark | Verdict | | |
| | Test sequence: O-t-O | | | | |
| | I²t (kA²s); Ip (kA): | First O: | | | |
| | (((((((((((((((((((| lp :kA | | | |
| | | l²t;kA²s | | | |
| | | Plot no. | | | |
| | | Second O: | | | |
| | | lp :kA | | | |
| | | l²t;kA²s | | | |
| | | Plot no.: | | | |
| | If tested at separate testing station see report | No.: of testing station | | | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | | N/A | | |
| | After the tests no damage impairing further use | | N/A | | |
| 8.3.3.5 | Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min: | | | | |
| | Test voltage | . | N/A | | |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting: | I test: mA | N/A | | |
| M.8.12.3 | Verification of automatic opening in case of voltage | ge source failure | N/A | | |
| - | Source voltage (Us) | Max Us: V □ac □ dc | | | |
| | | Min Us; V ☐ac ☐ dc | | | |
| | Adjustable residual current setting | mA (lowest) | | | |
| | Adjustable time-delay setting | s | T. T. | | |
| | Time period | Max 1 s or max, 1 s+time delay setting | | | |
| | Time period to automatic opening | | N/A | | |
| | No value exceeds the relevant specified limiting value | 9812373 | N/A | | |
| | The polyethylene sheet shows no holes | | N/A | | |
| | | * 7 | N/A | | |
| | . [] | PANC EDO | // | | |

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|-------------|---|-------------------------|---|--|--|--|
| Clause | Requirement + Test | Result - Remark | Verdict | | | |
| M.8.14.6 | Verification of rated residual short-time withstand | current (IΔw) | N/A | | | |
| | Test circuit according to figure: | | | | | |
| | Point of test circuit which is directly earthed: | | | | | |
| | Grid distance "a" (mm): | | | | | |
| | Prospective current (A): | | | | | |
| | Prospective current obtained (A): | | 7 () () () () () () () () () (| | | |
| | Power factor / ratio n: | | | | | |
| | Power factor / ratio n obtained: | | | | | |
| | Plot no. | | L | | | |
| | Test sequence: O | | | | | |
| | l²t (kA²s); lp (kA): | lp :kA | | | | |
| | | l²t;kA²s | 100000 | | | |
| | | Test duration:ms | 1000年 | | | |
| | | Plot no. | | | | |
| | If tested at separate testing station see report | No.: of testing station | | | | |
| | During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F | M | N/A | | | |
| | After the tests no damage impairing further use | | N/A | | | |
| 8.3.3.5 | Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min: | | | | | |
| | Test voltage | - | N/A | | | |
| B.8.10.3.2 | The RCCB shall trip with a test current of | I test: mA | N/A | | | |
| | 1,25 l∆n (ms) in minimum setting: | trip time: ms | | | | |
| | | | N/A | | | |
| M.8.12.3 | Verification of automatic opening in case of voltage so | urce failure | N/A | | | |
| | Source voltage (Us) | Max Us: V □ac □ dc | | | | |
| | | Min Us: V ae l | XXXX | | | |
| | Adjustable residual current setting | mA (lowest) | | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict | | |
| | Adjustable time-delay setting | s | | | |
| | Time period | Max 1 s or max. 1 s+time delay setting | N/A | | |
| | Time period to automatic opening | | N/A | | |
| | No value exceeds the relevant specified limiting value | | N/A | | |
| | The polyethylene sheet shows no holes | | N/A | | |
| M.III | Test sequence MIII | | | | |
| M.8.15 | Verification of effects of environmental conditions | | | | |
| . | Type designation or serial number | | | | |
| ······································ | Sample no: | | | | |
| B.8.10.3.2 | The RCCB shall trip with a test current of 1,25 l∆n (ms) in minimum setting: | I test: mA trip time: ms | N/A | | |
| · · · · · · · · · · · · · · · · · · · | | | N/A | | |
| M.IV | Test sequence MIV | | | | |
| M.8.16 | Verification of electromagnetic compatibility | | | | |
| | See report | | N/A | | |
| | • | | N/A | | |

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| | | , | | | |
| | TABLE: | | | | N/A |
| | *************************************** | 1/4 | *************************************** | | _ |
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| uppleme | ntary information | | , | | |
| | | | | | |
| ······ | TABLE: | | | | N/A |
| | | | | | Comments |
| ······································ | | | | | |
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| uppleme | ntary information | : N/A | ······ | | |
| | | | | | |
| | TABLE: | | | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | N/A |
| | *************************************** | ***************************** | | \mathcal{M} | |
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| suppleme | ntary information | : N/A | | | 7 |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | | | |
| | TABLE: | | N/A |
| | | re | sult code |
| | | | |
| | | | |
| | | | |
| supplem | entary information: N/A | | |

| TABLE: | | | | | | N/A | |
|--------------|---|-----------------|--|---|---------|------|--|
| 4474444 | *************************************** | *************** | | | | | |
| ******* | | | | : | | | |
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| | | | | | | | |

| TABLE: Heating Test | | $-\left\{ \sqrt{\Lambda}\right\}$ | \ | Р |
|--|--------------------|-----------------------------------|-------------------------|--------------|
| | | 20V | | |
| Test voltage (V): | | | | |
| Ambient (°C): | | 40°C | | |
| Thermocouple Locations | max. temperature n | neasured, | max. temperatur (°C) | e limit, |
| Terminals for external connections | 105 | | 110 | |
| Manual operating means non-metalic | 51 | | 65 | |
| Parts intended to be touched non- metelic | 59 | | 80 | |
| Parts which need be touched for normal operation non-metelic | 72 | | 90 | |

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|--------|---------------|------|---------------------------------------|-----------------|---------|
| Clause | Requirement + | Test | | Result - Remark | Verdict |
| | TABLE: | | · · · · · · · · · · · · · · · · · · · | | N/A |
| | | | | | |
| | | | | | - Mar |
| | | | | | -d |

| TABLE: dielectric strength | | Р |
|---|-------------------------------|-----------------------------------|
| test voltage applied between: | test potential applied (V) | breakdown / flashover (Yes/No) |
| Between all theterminals main circuit | 1890 V | no |
| Between each pole of the main circuit and the other poles and to the mounting plate | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the maincircuit | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the other circuit | 1890 V | no |
| Between each control and auxiliary circuit not normally connected to the main circuit and the mounting platre | 1890 \$ | no |
| For equipment suitable for isolation, acros s the poles of the main circuit | 1890 V | no |
| supplementary information:P | I | |

| TAE | BLE: impac | t resistance | | N/A | Α |
|---------------|-------------|----------------|----------------------|----------|---|
| impacts per s | surface | surface tested | impact energy (Nm) | comments | |
| - | | = | - | No. | |
| supplementary | information | : N/A | | | |

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supplementary information: N/A

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|--------|--------------------|-------------|-----------------|---------|
| Clause | Requirement + Test | | Result - Remark | Verdict |

| fuse# | I rated (A) | U (V) | P (W) | I (mA) | I fuse (mA) | condition/status | |
|-------|-------------|-------|-------|--------|-------------|------------------|--|
| X | 250 A | 690 V | 18 W | х | Х | -40 - +50°C | |

| | TABLE: clearance | and creepa | ige distance | measuremen | ts | | Р |
|-------------|------------------------|------------|-----------------|---------------------|---------|----------------------|-------------|
| clearance d | and creepage cr at/of: | Up (V) | U r.m.s. (V) | required cl (mm) | ci (mm) | required dcr (mm) | dcr (mm) |
| | .,, | 976 V | 690 V | 8 mm | 19,4 mm | 9 mm | 23,7 mm |

| TABLE: distance through insul | ation measureme | ents | | N/A |
|---------------------------------------|-----------------|---------------------|---------------------|---------------------------------------|
| distance through insulation di at/of: | U r.m.s. (V) | test voltage (V) | required di (mm) | di (mm) |
| | _ | | | |
| | | | | |
| supplementary information: N/A | | 1 | | · · · · · · · · · · · · · · · · · · · |
| | | / M: | | |

| | TABLE: ball pressure test of thermoplastics | | | N/A |
|---------|---|--------------------------|------------------|-----|
| | allowed impression diameter (mm) | | | |
| part | | test temperature (°C) | impre diamete | |
| | - | - | | • |
| suppler | nentary information: N/A | | | |

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|--------|--------------------|-------------|-----------------|---------|
| Clause | Requirement + Test | | Result - Remark | Verdict |

| | TABLE: threa | aded part torque test | | P | |
|--|--------------|-----------------------------------|---------------------|-------|--|
| threaded part diameter of thread identification (mm) | | column number (l, ll, or lll) | applied torque (Nm | | |
| connector | | 8 mm | I,II and III | 15 Nm | |

| TA | BLE: over-voltage | and under-volta | ige test | | N/A |
|-------------|---------------------|----------------------|---------------------|---------------------|----------|
| test | operating condition | rated voltage (V) | test voltage (V) | temperature (°C) | comments |
| - | * | ₩ | • | - | |
| pplementary | information: lsn't | dependent upo | n outer power s | supply N/A | |

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| | IEC 6xxxx | | |
|-------------|---|-----------------|-------------|
| Clause | Requirement + Test | Result - Remark | Verdic |
| | National Differences for (country | name) | |
| | Tractional Emission | , | N/A |
| | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | N/A |
| | | | N/A |
| ··- | | | N/A |
| | | • | N/A |
| | | | N/A |
| | | | N/A |
| | · | | |
| | | | N/A |
| | , | : | N/A |
| | | | N/A |
| | · | | N/A |
| | | | N/A |
| | | | N/A |
| | | | NI/A |

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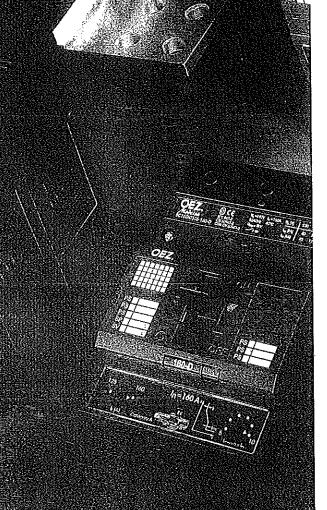
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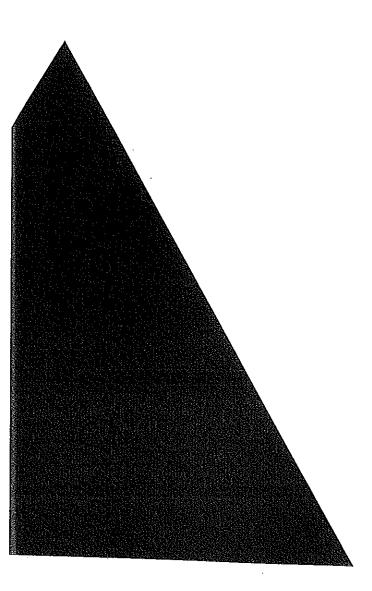
Modelon

Moulded case circuit breakers

KATANOF 3a 0771 u 0772







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| (A) | | BD250N, BD250S | Е |
| | | | |
| | | BH630N, BH630S | |
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| | | BL1600S | Н |
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 Z0-BD-0250-400
 E5

 Z0-BH-0630-300
 F4

 Z0-BH-0630-400
 F5

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| AN MARKET | |
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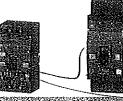


SPECIFICATIONS TO SELECT CIRCUIT BREAKERS

» for AC operation









| Type | 为10分钟数 40 | BC160N | : BD250N, BD250S | BH630N/BH630S | BETOODS S | BL160092 |
|--|---|--|--|--|--|--|
| Rated normal current | Ļ | 160 A | 250 A | 630 A | 1 000 A | 1 600 A |
| Rated operating voltage | U, | max. 690 V a.c., 250 V d.c. | max, 690 V a.c. | max. 690 V a.c. | max. 690 V a.c. | max, 690 V a.c. |
| Rated frequency | f | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Utilization category (selectivity) | 4 3 3 3 3 | The Art of the | A / W | | A,8 | A,B |
| Rated short-circuit ultimate breaking capacity 19 | I_/U_ NORMAL SUPERIOR | 25 kA / 415 V a.c. — | 36 kA / 415 V a.c. 65 kA / 415 V a.c. | 36 kA / 415 V a.c. 65 kA / 415 V a.c. | 65 kA / 415 V a.c. | – 65 kA / 415 V a.c. |
| Rated short-time with stand current at $U_{ij} = 690 \text{ V}$ a.c. | C/E | | 2.5 kJ/1s | 8 kA/S0 ms, 7 kA/300 ms, 6.5 kA/1 s | 15 kA/1 s | 20 kA/1s |
| Dimensions W x H x D | and the second second | 75 x 135 x 70 mm | 105 x 225 x 105 mm | 140 x 275 x 105 mm | 210 x 350 x 135 mm | 210 x 350 x 135 mm |
| Number of poles | vante Mersons | 3,4 | 第39人。 334 号音音 | (4) (3.4 からり) | | Contract of the second |
| Residual current device | oferende and the end of | O Cale of the AFRE somethick state | ↔ Beatowyktych a élek | ing and the second section of the sec | inger in der State der Sta | — Christorian (and the control of t |
| Additional cover for overcurrent release | | 的自然是自然的 | | (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) | 是是一种的特别的 | 经验的数据 对对结构 |
| Plug-in design | e Sineral de la composition della composition de | ernaktionare Application (1995) var | e No Cartal All Parketine | • dekto venet kommentito | ve staroven reverses Vestaroven | — Grandario de Cardario (Cardario) |
| Withdrawable design | भारतिहरूते, भारत | | | 据自身中央。 | 19 19 19 19 19 19 19 19 19 19 19 19 19 1 | NSO POSILA POR PER |
| Front/rear connection Connection - busbars/cable lugs/cables | Rajakan karasyonin | o/o 2004 0/o/o 552 850 | e/o ::: o o o | o/o | 0/0 0/0/0/0/0/0/0/ | •/• •/•/• |
| Potential terminals | BERKER V. Z.A. I | i dekirin a (201 2) | is a ses iana a | | 等中的人物等。(本學的哲學學) | SAN GRANITATION (|
| Switches - auxiliary/relative/signal/early | MOTOR NAME OF STREET | | | 0/0/0/0 | | |
| Short trip | Skatotelleru († 1757) | ম দাৰ কৈ উপিউচিউক। ম চাল্ডেল এপটা া | ାନ ବର୍ଷ ଅନୁକ୍ଷିକ୍ତିକ ଅନ୍ୟାନ ଅନ୍ୟର୍ଷ ଭ | নিয়াৰ প্ৰচিট নিয়াই কৰি কৰিছে। • | ABAN BINTERNA BATTA PALATU TA | |
| Undervoltage release/with early contact | SECTION OF | 6/ - | \$1.50 0/0 \$1.55 | 0/0 | 0/- | M. (2.6) |
| Hand drive/with adjustable lever | A SANG DO KURUMAN BARA SURWA | 0/0 | •/• | e/o | 0/0 | •/a |
| Motor drive/with counter of cycles | | 14 1 1 6/4 (12 14 14 14 14 14 14 14 14 14 14 14 14 14 | 0/0/2013 | 0/6 | | 6/6 |
| Lever with locking | ungenskenste krunktertuels in 1990 | B (A) TO SERVE THE RESPONSE. | • ************************************ | er ones yn y grinnfluor II Amri (1964) • | Carrier and the first of the service | California (Anna C |
| Mechanical Interlocking for hand drive/with Bowden cable | | . •/ − | ●/● | 0/0 | . () | ,0/0 |
| Terminal cover IP20 | | • | • | 6 | • | |

SPECIFICATIONS TO SELECT SWITCH-DISCONNECTORS

» for AC and DC operation











| Dec. To the second of the seco | NOTE: | 802.00 | *BIGNET | BL 100035 | 8 1005 |
|--|--|--|--|--|--|
| Rated operating current | 160 A | 250 A | 630 A | 1 000 A | 1600A \ |
| Rated operating voltage U | max. 690 V a.c., 440 V d.c. | ∵ max.690 V a.c.;440 V d.c | max. 690 V a.c., 440 V d.c. 🖓 | List 1 do List Series and Camparity experiences during the | / max.690 V.a.c., 440 V.d.c. |
| Rated frequency f | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Utilization category (switching mode) | AC-23B/690Va.c | AC - 23B / 690 Y a.c. DC - 23B / 440 Y d.c. | AC = 23B / 690 V a.c. DC = 23B / 440 V d.c. | AC - 23B / 690 V a.c. DC - 23B / 440 V d.c. | AC+23B7690Va.c DC-23B7440Vd.c |
| Rated short-time withstand current I _G /t | 2kA/1s | 3 kA/5 s | 8 kA/5 s | 15 kA/1 s | 20 kA/1 s |
| at $U = 690 \text{V}$ a.c. | | unana arakan kanar matakan 1979-etak | n to some stand the other manute of | a to tura a vicini, menona fivaria esta e | visance experiencialinasii. |
| Rated short-circuit making capacity I / U | 2.8 kA / 415 V a.c. | 4 kA / 415 V a.c. | 13 kA / 415 V a.c. | 30 kA / 415 V a.c. | 40 kA/415 V a.c |
| Dimensions W x H x D Number of poles | 75 x 130 x 70 mm | 105 x 225 x 105 mm • 330 4 4 4 2 3 4 4 4 4 5 5 6 6 6 6 | 140 x 275 x 105 mm 8000 800 84 8 7 20 8 8 8 8 8 8 | 210 x 350 x 135 mm | 210 x 350 x 135 mm |
| Residual current device | | a da sa | | ng versiele weer near a teatra | |
| Plug-in design | | ANNO ANTO NO PARE | ning de la company | Z404514144444444 | |
| Withdrawable design | en transformation and the desire desired to the second state of th | O September 1998 September 1995 September 1996 Septem | • इ. २१ अरस्य संस्था का वे स्टायन व्यवस्था | e endre i kreint en disk bedekk bedek • | • ************************************ |
| Front/rear connection | 7. sagra (1. sagra) ././. (1. sagra) | 0/0 | T388840/6191894 | **** */• ****** | •/• |
| Connection - busbars/cable lugs/cables | 0/0/0 | 0/0/0 | 0/0/0 | 0/0/0 | 0/6/0 |
| Potential terminals | | | TO THE STATE OF TH | \$ 15 X X X 10 X X X X X X X X X X X X X X X | |
| Switches - auxiliary/relative/signal/early | 0/-/e/- | e/e/e/e | | •/•/-/- | 0/0/-/- |
| Shunt trip | | | | | • |
| Undervoltage release/with early contact 14.4.4.14.2.5.14.5.4.5.4.5.4.5.4.5.4.5.4.5.4.5.4.5. | •/- Research Weber (Composers) | • /- Etwasoanst€patrastasati | o/o Dan Bultuy saagalaan kan 1000 | •/ → Presenter 1984 (1996) | •/ •>> |
| Hand drive/with adjustable lever Motor drive/with counter of cycles | | •/• •/• | 4987,248 2/2 407/2464 •/• | e/e | 9/0 •/0 |
| Lever with locking | •/+ | | FRANCINA (AND CAR) | | |
| Mechanical interlocking - | | 表现的现在分词是可能的是是 | S NOVE FEW WELL WELL | ua muruh dinganoni - 1- | |
| for hand drive/with Bowden cable | •1+ • • • • • • • • • • • • • • • • • • • | •/• Accessay was ease ease sea | A sa | e/e www.sa.comstrum.comstrum.com | e/e Bras neutario Jaio (Brasses) |
| Terminal cover IP20 | Barran Santan Santa | 11000 | | 年的地位。即在接触 | |

[•] available, — unavailable, + being prepared "
1- in case circuit breaker connection is reversed (input terminals 2, 4, 6, output terminals 1, 3, 5) laddoes not change

FUNCTIONS AND PROPERTIES OF THE OVERCURRENT RELEASES

Introduction

Overcurrent release which measures/monitors the current passing through the circuit breaker is part of every circuit breaker. Its main task is to get an impulse for circuit breaker switching off if the value of current which is given by tripping characteristic of each circuit breaker or overcurrent release is exceeded. The switching off itself based on the impulse from the overcurrent release is ensured by the switching system — another main part of each circuit breaker.

Division

Overcurrent releases can be divided into two basic types - electronic and thermomagnetic (bimetallic) ones. Electronic releases can be solved by discrete components and integrated circuits. Thermomagnetic releases use bimetal for the evaluation of overload and magnetic circuit for the evaluation of short-circuit. BC160 circuit breaker has a thermomagnetic release. BD250, BH630, BL1000, BL1600S circuit breakers have an electronic release.

Properties, specifications

The circuit breakers with both the thermomagnetic and overcurrent releases protect against overload and short-circuit respectively. Circuit breaker tripping is given by the tripping characteristic of the overcurrent release. Tripping characteristic defines the time when the circuit breaker switches off in passage of a current higher than the rated current in or reduced current l.

The tripping characteristic can be divided into two principal ranges:

- in this range a "dependent time release" (also called thermal release) ensures device protection against "Overload"
- the dependent time release means that the breaking time depends indirectly on the strength of current, i.e. the higher is the current (overload), the shorter is the releasing time - the releasing time is given by the tripping characteristic of the overcurrent release

- 🛮 overload limit is given by rated current in or reduced current $I_{\rm g}$ - the value of $I_{\rm g}$ can be set for most types of the overcurrent releases - $\mathbf{I}_{\mathbf{p}}$ or $\mathbf{I}_{\mathbf{q}}$ must be never higher than the rated current of the protected device
- **闽** EN 60 947-2 sets two fixed values of time and current that must be always met by the circuit breaker:

Conventional non-tripping current

-the circuit breaker must not break 1.05 l_ or l_ in 2 hours

Conventional tripping current

- The circuit breaker must break 1.3 In or ${
 m I}_{\rm g}$ in 2 hours (1.21, or In shall apply for protection of motors)
- circuit breakers with In or I_a lower than 63 A have conventional non-breaking an breaking time of 1 hour
- remaining part of the tripping characteristic is given by the manufacturer (the standard states max. tolerances of values for individual ranges)
- for some overcurrent releases it is possible to set the cut-off time of thermal release at 7.2 $I_{\rm g}$ – parameter $t_{\rm g}$ — so called thermal release delay, to enable, for instance, start of a motor (the start can last up to 30 s, and the current reaches on average 7.2 ()

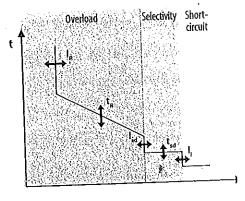
2nd range:

- in this range an "independent time release" (also called short-circuit release) ensures device protection against "Short-circuit" - parameter I,
- independent time release means that the cut-off time is independent of the value of current; as soon as current reaches certain value, the circuit breaker will immediately trip (the cut-off time is 10 to 30 ms; some overcurrent releases enable setting of delay 50 ms) - the value of the short-circuit release I, can be set for most types of overcurrent releases, and thus to adapt it to the impedance loop and enable start of a motor

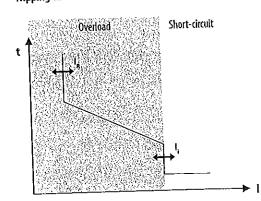
Special overcurrent releases

- the short-circuit protection range is further divided; it contains, beside the short-circuit release also a selective
- according to EN 60 947-2 this range is called independent time-delayed release — parameter Isd
- unlike the short-circuit release, the selective release can have delay of up to 1000 ms – parameter ${\rm t_{sl}}$ – thus it can reach a higher or full selectivity with assigned or backup circuit breakers or fuses

Tripping characteristic of the special overcurrent release



Tripping characteristic of the basic overcurrent release





FUNCTIONS AND PROPERTIES OF THE OVERCURRENT RELEASES

Basic overcurrent releases

D, DTV3 – for protection of distribution transformers and lines with a minimum motor load

- it is possible to set reduced current $I_{\rm a}$ and the value of short-circuit release $I_{\rm a}$

M - for protection of motors

- it is possible to set reduced current l
- -The value of short-circuit release is fixed at 10x I_a

MTV8 – TV mode -- for protection of distribution transformers and lines feeding motors

- it is possible to set reduced current l.
- it is possible to set thermal release $\hat{\text{delay}}$ to enable motor starting
- it is possible to set the short-circuit release value I, and its delay to enable motor starting

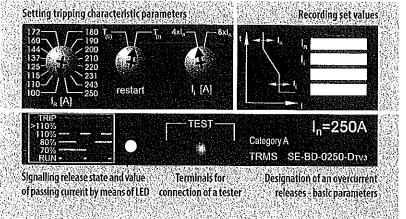
- M mode - for protection of motors (complete protection of motors)

- it is possible to set reduced current l
- it is possible to set thermal release delay $\mathbf{t}_{\mathbf{r}}$ to enable motor starting
- undercurrent release is active, and will switch off the circuit breaker in 4 s in phase failure
- it is possible to set the short-circuit release value I, and its delay to enable motor starting

L, LOO1 - for protection of lines with small current impulses

- the value of rated current in is fixed (the circuit breakers are manufactured in standardized series of currents)
- the value of short-circuit release I, is fixed at 41

Overcurrent release label



M

FUNCTIONS AND PROPERTIES OF THE OVERCURRENT RELEASES

Overcurrent release setting

Reduced current I_R



- reduced current I_R shall be set according to the rated current of the protected device or, for instance, permissible load current of the cable
- ↓ undesired circuit breaker trip will take place during normal operation
- ↑ overload of the protected device or cable can occur

Thermal memory T (restart)

Thermal memory provides protection of the protected device against repeated overload, in particular in attempt at restart after switching off by overload

- thermal memory switched on the circuit breaker remembers" previous thermal overload
 - after circuit breaker switching off by overload it is not possible to switch it on again for a time; it is necessary to wait until the both protected device and the circuit breaker will "cool down"
 - -the circuit breaker remembers previous thermal overload even after drop of current in the circuit below I_p or I_g, and at next thermal overload the releasing time of the thermal release is shortened (the time follows from the tripping characteristic in so called "hot" state)
 - the thermal memory must remain active in protection of distribution transformers, lines and motors
- thermal memory switched off the circuit breaker "does not remember" previous thermal overload
 - after circuit breaker switching off by overload the thermal memory will reset, and the circuit breaker can be immediately switched on again, and in the next overload the releasing time is not shortened (the time follows from the tripping characteristic in so called "cold" state)

- after drop of current in the circuit below the set value of I_R the thermal memory is reset, and in next overload the releasing time is not shortened (the time follows from the tripping characteristic in so called "cold" state)
- thermal memory can be switched off only in certain cases, when the protected device is rated for repeated overload (e.g. spot welding machines or rail cranes)

TV/M mode

- TV mode for protection of distribution transformers and lines feeding mainly motors
 - undercurrent release is not active
- M mode for direct protection of motors
 - undercurrent release is active (in phase failure the circuit breaker trips in 4 s)

Thermal release delay t



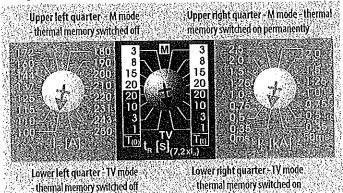
- √ in protection of motors or lines with prevailing motor load it is necessary to set the thermal release delay t_a correctly and thus enable motor starting
- ↓ undesired circuit breaker switching off will take place in motor starting
- ↑ overload of the motor or cable can occur

Short-circuit release value I,



- ✓ the short-circuit release value I₁ must be set higher than the maximum peak current in the circuit (making current of the protected device) and at the same time it must be set to fulfil the conditions of automatic disconnection from the power supply in failure
- ↓ undesired circuit breaker switching off will take place (e.g. in motor starting)
- circuit breaker will not disconnect the circuit from power supply in case of failure (short-circuit) in prescribed time
- in protection of motors or lines with motor or capacitive load it is suitable to set a delay of the short-circuit release to enable motor starting (e.g. a motor can take up to 15 l for $10 \div 15$ ms in starting)

Setting TV/M mode of the thermal memory





Legend:

✓ correct setting ₹

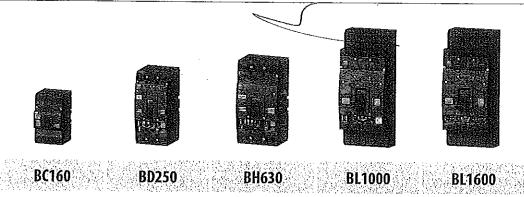
₩ wrong setting - low value

↑ wrong setting - high value





OVERVIEW OF BASIC OVERCURRENT RELEASES



| Lines | | 12 ÷ 160 A | 40 ÷ 250 A | 100 ÷ 630 A | 125 ÷ 1 000 A | 315 ÷ 1'600 A |
|------------------------------|----------|----------------------------|------------------------------|-------------------------------|-------------------------------|---------------------------------|
| | OPTIMUM | egystys (f | - 200 mg | | - 19 <u>18</u> - | |
| | EXPANDED | | MTV8 TV mode | Mrv8 avande. | MTV8 TV modes | MTV8=TV/modes |
| | SIMPLE | L | L001 | L001 | | |
| | | | | | | |
| Distribution transformers | | 25 kVA 50 kVA 63 kVA | 63 kVA 100 kVA 160 kVA | 160 kVA 250 kVA 400 kVA | 250 kVA 400 kVA 630 kVA | 400 kVA 630 kVA 1 000 kVA |
| | OPTIMUM | - | | | | |
| | EXPANDED | | MTV8 - Vamodis | MTV8=12/mone | MINS avimodes | MIVS Symoils |

| Motors | | 7.5 ÷ 55 kW | 22 ÷ 132 kW | 75 ÷ 315 kW | 75 ÷ 315 kW | 75 ÷ 315 kW |
|--------|---------|-------------|---------------|-------------|-------------|---------------|
| | ОРТІМИМ | M | MTV8: Mimalie | MTV8_Minude | Mivs Minode | MIV8 Wimbales |

| Generators | 30 ÷ 150 kVA | 80 ÷ 400 kV4 | 100 ÷ 630 bVA | 750 + 1 000 LVA | |
|------------|--------------|--------------|---------------|-----------------|--|
| | | | | | |

30 ÷ 150 kVA

| | OPTIMUM | MTV8 Tymode: MTV8 Tymode: MTV8 Tymode MTV8-Tymode. |
|--|---------|--|
|--|---------|--|

80 ÷ 400 kVA

 $100 \div 630 \text{ kVA}$



250 ÷ 1 000 kVA

OVERVIEW OF SPECIAL OVERCURRENT RELEASES

Short-circuit protection

BC160 - overcurrent release N



Circuit breaker BC160 with overcurrent release of N type protects against short-circuit only

- it does not protect in the overload range it does not react to low over-currents
- m it is possible to set the value of the short-circuit release from 5 to 10 l
- m suitable for protection of e.g. motors with own overload protection
- m overcurrent release indicates switching off by short-circuit

Protection in TN-S, TN-C-S networks - 4-pole design of circuit breakers

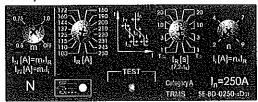
BC160 - overcurrent release D



BC160 circuit breaker of 4-pole design can have an overcurrent release, which reacts also to the value of current in the fourth/N pole

- the value of reduced current I, and of short-circuit release L for the fourth pole is the same as for the other three poles
- all the other properties and parameters are identical to those of the standard overcurrent release of type D

BD250, BH630 - overcurrent release 4D01

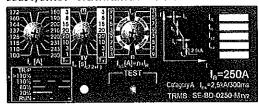


BD250 and BH630 circuit breakers of 4-pole design can have an overcurrent release of type 4D01, which reacts also to the value of current in the fourth/N pole

- m protects against both overcurrent and short-circuit
- **a** setting of reduced current $I_a = 0.4 \div 1I_a$
- **m** thermal memory can be switched on/off (ON = t_{ov} , OFF = t_{ov})
- setting of delay of the thermal release 1 s, 3 s, 10 s a 20 s
- setting of the value of the short-circuit release I, in 4 steps
- I, setting, t, and I, by means of rotary switches is stepwise
- # the overcurrent release indicates operating state and the value of the passing current by means of LED

Time selective protection

BD250, BH630 - overcurrent release MTV9



It is designed for demanding applications with a complicated load and required high selectivity with fuses or circuit breakers

- 🗯 the MTV9 release is based on MTV8 release, and in addition enables setting a value of the selective release including delay
- protects against both overcurrent and short-circuit
- **m** setting of reduced current $I_0 = 0.4 \div 1I_0$
- **u** thermal memory can be switched on/off (ON = T_{ny} , OFF = T_{ny})
- TV mode for protection of lines and distribution transformers (undercurrent release is not active)
- M mode for protection of motors (undercurrent release is active)
- setting of delay of thermal release t,
- setting of the value of selective release l_{st} in 4 steps (independent time-delayed release)
- setting of delay of the selective release t_s 0 ms, 100 ms, 200 ms or 300 ms
- m setting of let tell and tell by means of rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED

BL1000, BL1600 - overcurrent release U001



It is designed for demanding applications with a complicated load and required high selectivity with fuses or circuit breakers

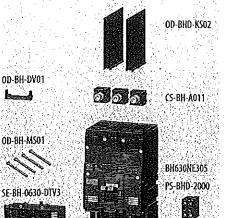
- protects against both overcurrent and short-circuit
- **m** setting of reduced current $l_0 = 0.4 \div 11_0$
- **m** thermal memory can be switched on/off (ON = $T_{(a)}$, OFF = $T_{(b)}$)
- setting of delay of the thermal release t_n in 8 steps, possibility of setting of gradient of characteristic of the thermal release Ist (adaptation of time-current characteristic of the fuse)
- setting of the value of selective release I_a in 8 steps (independent time-delayed release)
- setting of the value of setective release t_{st} 50 to 1 000 ms including possibility of setting of characteristic l²t (adaptation of the tripping characteristic of the fuse)
- setting of the value of the short-circuit release I, in 8 steps
- setting of I_s, t_s, t_s, and I_s by means of rotary switches is stepwise
- mu the overcurrent release indicates operating state and the value of the passing current by means of LED

SM/

PURCHASE ORDER EXAMPLE

Example: You need circuit breaker for a transformer of power output 400 kVA, nominal current 577 A and maximum short-circuit current up to 36 kA. The incoming

and outgoing lines of the circuit breaker will be formed by Cu busbars. Further requirements: signalization of main contacts and remote control of the circuit breaker.



SP-BHD-X230

Your purchase order:

(do not enter text from grey area into your purchase order)

NUMBER TYPE

PRODUCT CODE

1 pc BH630NE305

14412

-- switching unit with rated current 630 A and rated short-circuit ultimate capacity 36 kA

- components of the switching unit are

connecting sets for connecting Cu/Al busbars or cable lugs (CS-BH-A011)

insulating barriers (OD-BHD-KSO2)

mounting bolts set for installing switching unit (OD-BH-MSO1)

conductor holder (OD-BH-DVO1)

1 pc SE-BH-0630-DTV3 25100

overcurrent release for protection of transformers and lines with the rated current

up to 630 A and its regulation 0 \div 60 %

1 pc PS-BHD-2000

13689

auxiliary switch (2x make contact)

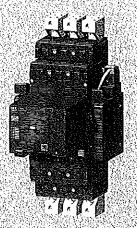
1 pc SP-BHD-X230

24420

undervoltage release (230 V a.c., 400, 500 V/220 V d.c.)

CUSTOM ASSEMBLY OF CIRCUIT BREAKERS

CS-BH-A011



- at customer's request
- warranty not only for components, but for the entire configuration
- after consulting with OEZ company, based on particular specification of your configuration
- the delivery terms in 1 4 weeks
- extra charge for completion and special packing

Your order should include the following specification:

- w type of circuit breaker switching unit
- # type, rated current and adjustment of the electronic release
- types of connecting terminal
 - for input terminals of circuit breaker
 - for output terminals of circuit breaker
- Installation requirements, type and function of auxiliary switches
- m installation requirement and type of auxiliary releases, including rated voltage
- requirements for fitting circuit breaker with drive
 - type of hand drive, including accessories (control lever, bearing, shaft)
 - motor drive type including control voltage and your demand for counter of cycles, extension cable and sealable cover of switch on button
- **EXECUTE** required withdrawable or plug-in design of circuit breakers
- requirement for fitting withdrawable device with signalling of individual positions
- requirement for sealing the overcurrent release

Auxiliary circuits of the withdrawable design will be installed according to the wiring diagram supplied by the customer.





NOTES

MOULDED CASE CIRCUIT BREAKERS BC160N



COMMERCIAL INFORMATION

| ū | Circuit breakers | | 04 |
|--------|---|---|--------|
| | Switch-disconnect | tors | D5, D8 |
| | Residual current d | levices | |
| Q | Connecting sets fo | or residual current device | D9 |
| | Residual current m | nonitor | 09 |
| | Current transform | ers for residual current monitor | D9 |
| П | Connecting sets | | D10 |
| | Mounting sets | | D11 |
| | Switches | | D12 |
| a | Shunt trips | | 012 |
| | Undervoltage rele | eases | D12 |
| | ·· · | | |
| | | | |
| | * | ocking and parallel switching | |
| | 2, -1. | - | |
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| gir. | | | |
| CHN | IICAL INFORM | MATION | |
| Å. | | | |
| □ | Circuit breakers, s | witch-disconnectors | |
| | 187, F | - specifications | |
| | | - diagram - connecting, mounting | |
| | 4. | - deionization space | |
| | | - dimensions | |
| | : | - WIRCHOOD AND AND AND AND AND AND AND AND AND AN | |
| ്ന | Residual current d | fevires | |
| ∵. | nestadui carrent d | - specifications | |
| | | - diagram | |
| 71. | • • | - connecting, mounting | |
| | A. | | |
| | Overcurrent releas | | |
| | : - | - description, specifications | D37 |
| П | Connecting sets | - specifications | D18 |
| | 1. | | |
| \Box | Switches | - sperifications | D45 |
| | Switches | - specifications | |
| | Switches Shunt trips | - specifications | |
| | | - specifications | D46 |
| | Shunt trips | - specifications | D46 |
| | Shunt trips | - specifications | D46 |
| | Shunt trips Undervoltage rele Hand drives | - specificationseases - specifications, diagram | D46 |
| | Shunt trips Undervoltage rele Hand drives | - specificationseases - specifications, diagram | D46 |
| | Shunt trips Undervoltage rele Hand drives | - specifications | D46 |

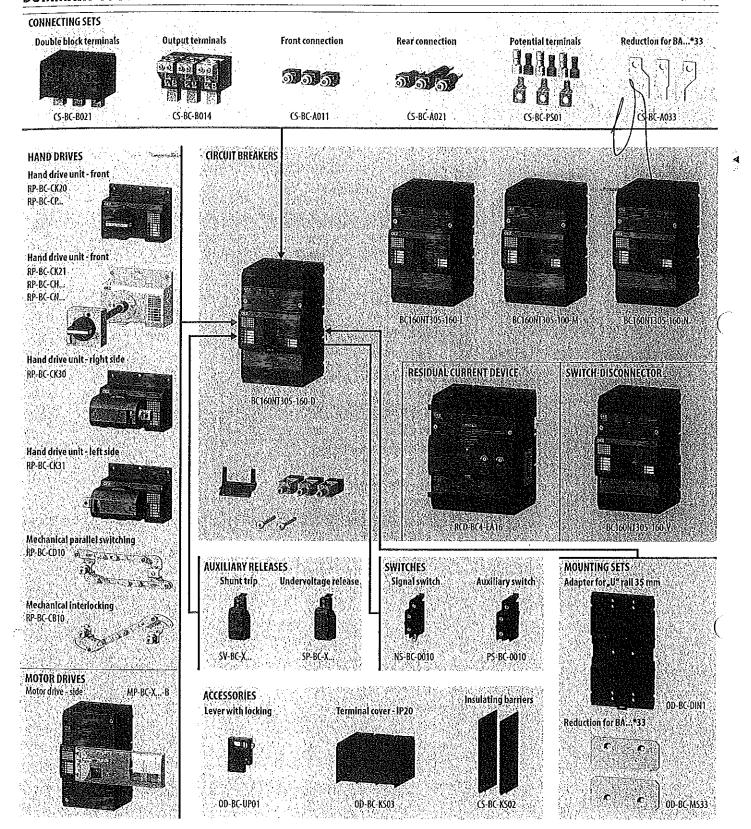
- description, specifications, dimensions.....



Modeion

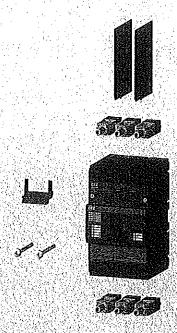
SUMMARY OF MODELS AND ACCESSORIES

3P 4P





CIRCUIT BREAKERS



- Circuit breaker includes:

- 2 connecting sets for connecting Cu/Al cables with cross-sections 2.5 \div 95 mn
- in case of the connection of the fine stranged conductor, we recommend using of the end sleeve (connecting sets are installed in the circuit breake
- insulating barriers OD-BC-KS02
- mounting bolts set OD-BC-MS01 (2x M3x30)
- conductor holder OD-BC-DV01
- the method of power circuit connection must observe recommendations, see page D18 as well as deionizatio space, see page D21 $\,$
- $^{\eta}$ for connecting in another way, one may use CS-BC-... connecting sets, see page D10, D11

Characteristic **D** - distribution

m protection lines and transformers

| MAIL. | Lype | Product code | . Figering (Alax | eza el filiados | eWeightikalis | Package (pc |
|-------|------------------|--------------|------------------|-----------------|---------------|-------------|
| 16 | BC160NT305-16-D | 20209 | 12.5 ÷ 16 | 160 ÷ 240 | 1.00 | 1 |
| 20 | BC160NT305-20-D | 20211 | - 16 ÷ 20 → | - 200 ÷ 300 | 1,00 | |
| 25 | BC160NT305-25-D | 20212 | 20 ÷ 25 | 250 ÷ 375 | 1.00 | 1 |
| 32 | BC160NT305-32-D | 20213 | 25 + 32 | 160 ÷ 320 | 1,00 | |
| 40 | BC160NT305-40-D | 20215 | 32 ÷ 40 | 200 ÷ 400 | 1.00 | 1 |
| 50 | BC160NT305-50-D | 20217 | 40÷50 | ≥ 250 ÷ 500 | 1.00 | W.12. |
| 63 | BC160HT305-63-D | 20219 | 50 ÷ 63 | 315 ÷ 630 | 1.00 | 1 |
| 80 | BC160NT305-80-D | 20222 | 63 + 80 | 400 ÷ 800 | 1.00 | |
| 100 | BC160NT305-100-D | 20204 | 80 ÷ 100 | 500 ÷ 1 000 | 1.00 | 1 |
| 125 | BC160NT305-125-D | 20206 | 100 ÷ 125 a | 625 ÷ 1 250. | 1.00 | |
| 160 | BC160HT305-160-D | 20208 | 125 ÷ 160 | 800 ÷ 1 600 | 1.00 | 1 |

⁻ TECHNICAL INFORMATION, see page D15, D37

Characteristic M - motor

■ motors protection

| l (d) | ips . | Product code | t setting (A) 3 | | ce Weight (rg) 4 s. | ≥ Package (pc) |
|-------|------------------|--------------|--------------------|-------|---------------------|----------------|
| 16 | BC160NT305-16-M | 20243 | 12.5 ÷ 16 | 160 | 1.00 | 1 |
| 20 | BC160NT305-20-M | 20244 | 16 ÷ 20 | 200 | 1.00 | |
| 25 | BC160NT305-25-M | 20245 | 20 ÷ 25 | 250 | 1.00 | 1 |
| 32 | BC160NT305-32-M | 20246 | 25 + 32 | 320 | 1.00 | |
| 40 | BC160NT305-40-M | 20247 | 32 ÷ 40 | 400 | 1.00 | 1 |
| 50 | BC160NT305-50-M | 20248 | 40÷50 | 500 | 1.00 | 1991 |
| 63 | BC160NT305-63-M | 20249 | 50 ÷ 63 | 630 | 1.00 | 1 |
| 80 | BC160NT305-80-M | 20250 | 63 - 80 | 800 | 1.00 | 4.3.1-3.5 |
| 100 | BC160NT305-100-M | 20242 | 80 ÷ 100 | 1 000 | 1.00 | 1 |

⁻TECHNICAL INFORMATION, see page D15, D37

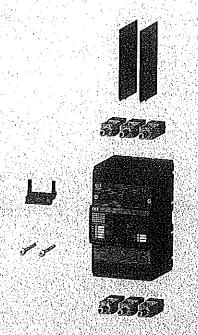
Characteristic L - lines

- protection lines with low starting currents
- without I, setting

| 40 | BC160NT305-40-L | 20214 | 160 | 1.00 | 1 |
|-----|------------------|-------|-----|--------|---|
| 50 | BC160NT305-50-L | 20216 | 200 | 1.00 | |
| 63 | BC160NT305-63-L | 20218 | 252 | 1.00 | 1 |
| 80 | BC160NT305-80-L | 20221 | 320 | 1,00 | 1 |
| 100 | BC160NT305-100-L | 20203 | 400 | 1.00 | 1 |
| 125 | BC160NT305-125:L | 20205 | 500 | 1.00// | |
| 160 | BC160NT305-160-L | 20207 | 640 | 1 00 / | 1 |

3P

CIRCUIT BREAKERS

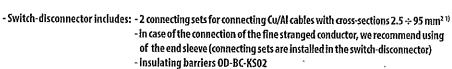


Characteristic N - only short-circuit release

| 32 | BC160NT305-32-N | 20641 | | 160 ÷ 320 | 2 neggirtky) 1.00 | rackage(pc)s: |
|-----|------------------|-------|--|---------------|----------------------|---------------|
| 40 | BC160HT305-40-N | 20642 | | 200 ÷ 400 | 1.00 | |
| 50 | BC160NT305-50-N | 20643 | · . | 250 ÷ 500 | 1.00 | 1 |
| 63 | BC160NT305-63-N | 20644 | | 315÷630 | 1.00 | 1. |
| 80 | BC160NT305-80-N | 20645 | • | 400 ÷ 800 | 1.00 | 1 |
| 100 | BC160NT305-100-N | 20646 | Turing tig 12 years and Tig New York tig 12 years | ÷ 500 ÷ 1 000 | 1,00 | (. m. 1 %) |
| 125 | BC160NT305-125-N | 20647 | - | 625 ÷ 1 250 | 1.00 | 1 |
| 160 | BC160NT305-160-N | 20621 | | 800 ÷ 1 600 | 1.00 | n nakati |

-TECHNICAL INFORMATION, see page D15, D37

SWITCH-DISCONNECTOR



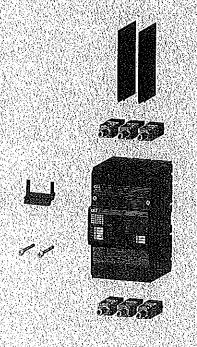
- mounting bolts set OD-BC-MS01 (2x M3x30)
- conductor holder OD-BC-DV01

 $^{1)}$ – for connecting in another way, one may use CS-BC-... connecting sets, see page D10, D11

| JAA | and the large | Productroder | , Weight (k | il se de Package (pel |
|-----|------------------|--------------|-------------|-----------------------|
| 160 | BC160NT305-160-Y | 20585 | 1.00 | 1 |

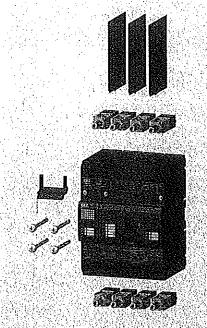
-TECHNICAL INFORMATION, see page D15







CIRCUIT BREAKERS



- Circuit breaker includes: connecting terminals for connecting cu/Al cables with cross-sections 2.5 \pm 95 mm^{2 1)}
 - in case of the connection of the fine stranged conductor, we recommend using of the end sleeve (connecting terminals are installed in the circuit breaker)
 - insulating barriers OD-BC-KS02 and OD-BC-KS42
 - 2 sets of mounting bolts OD-BC-MS01 (4x M3x30)
 - conductor holder OD-BC-DV01 (it is installed in the circuit breaker)
- the method of power circuit connection must observe recommendations, see page D18 as well as defonization space, see page D21
- 1) for connecting in another way, it is necessary to use CS-BC-... connecting sets, see page D10, D11

Characteristic **D** - distribution

3P + N - for unprotected N conductor

| - | ction lines and transformers Type | Driving and a | A Sile Setting (A) | es permississis | -Weight (kg) | Package (fici |
|-----|--------------------------------------|---------------|------------------------|-----------------|--------------|---------------|
| 16 | BC160NT405-16-D | 33617 | 12.5÷16 | 160 ÷ 240 | 1.3 | 1 |
| 20 | BC160NT405-20-D | 33616 | . 16÷20 | 200 ÷ 300 | 13 | |
| 25 | BC160NT405-25-D | 33615 | 20 ÷ 25 | 250 ÷ 375 | 1.3 | 1 |
| 32 | BC160NT405-32-D | 33614, | 25 4 32 ··· | 160÷320 | 1.3 | |
| 40 | BC160NT405-40-D | 33613 | 32 ÷ 40 | 200 ÷ 400 | 1.3 | 1 |
| 50 | BC160NT405-50-D | 33611 | 40 ÷ 50 | 250 ÷ 500 | 13 | 的的论 |
| 63 | BC160NT405-63-D | 33609 | 50 ÷ 63 | 315 ÷ 630 | 1,3 | 1 |
| 80 | BC160NT405-80-D | 33607 | 63÷80 | 400 ÷ 800 | 13 | |
| 100 | BC160NT405-100-D | 33605 | 80 ÷ 100 | 500 ÷ 1 000 | 1.3 | 1 |
| 125 | BC160NT405-125-D | 33603 | 100÷125 | 625÷1250 | 13 | 美国基本 |
| 160 | BC160NT405-160-D | 33601 | 125 ÷ 160 | 800 ÷ 1 600 | 13 👍 | 1 |

⁻ TECHNICAL INFORMATION, see page D15, D37

Characteristic L - lines

3P + N - for unprotected N conductor

- m protection lines with low starting currents
- without I, setting

| 開新 | Туре | Product code 2 2 | eq setting (A) | | Weight (kg) | ¿Package(pcl=c |
|-----|------------------|------------------|----------------|-----|-------------|----------------|
| 40 | BC160NT405-40-L | 33612 | - | 160 | 1.3 | 1 |
| 50 | BC160NT405-50-L | 33610 | 多对方的成 | 200 | 13 | |
| 63 | BC160NT405-63-L | 33608 | - | 252 | 1.3 | 1 |
| 80 | BC160HT405-80-L | 33606 | | 320 | () | 1 |
| 100 | BC160NT405-100-L | 33604 | - | 400 | 1.3 | 1 |
| 125 | BC160NT405-125-L | 33602 | | 500 | 13 | |
| 160 | BC160NT405-160-L | 33600 | • | 640 | 1.3 | 1 |

- TECHNICAL INFORMATION, see page D15, D37
- custom production

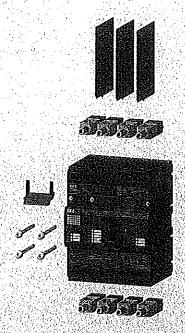
Characteristic N - only short-circuit release

3P + N - for unprotected N conductor

| MATTER STATE | nut i setting | | | | | |
|--------------|------------------|---------------|--|-------------|------|---------------------|
| 進例數 | | Shoonca coost | A PRINCIPLE OF THE PRIN | 是經過數學 | 統領部的 | SHEET WAS INTEREST. |
| 32 | BC160NT405-32-N | 33625 | - | 160 ÷ 320 | 1.3 | 1 |
| 40 | BC160NT405-40-N | 33624 | | 200 ÷ 400 | 13 | |
| 50 | BC160NT405-50-N | 33623 | - | 250 ÷ 500 | 1.3 | 1 |
| 63 | BC160NT405-63-N | ii 33622 / □ | | 315 ÷ 630 | | |
| 80 | BC160NT405-80-N | 33621 | - | 400 ÷ 800 | 1.3 | 1 |
| 100 | BG160NT405-100 N | 33620 | | 500 ± 1 000 | 13 | |
| 125 | BC160NT405-125-N | 33619 | - | 625 ÷ 1 250 | 1.3 | 1 |
| 160 | BC160NT405-160-N | 33618 | | 800 ÷ 1 600 | | |

- -TECHNICAL INFORMATION, see page D15, D37
- custom production

CIRCUIT BREAKERS



Circuit breaker includes: -connecting terminals for connecting cu/Al cables with cross-sections 2.5 \div 95 mm²⁻⁹

- in case of the connection of the fine stranged conductor, we recommend using
 of the end sleeve (connecting terminals are installed in the circuit breaker)
- insulating barriers OD-BC-KSO2 and OD-BC-KS42
- 2 sets of mounting bolts OD-BC-MS01 (4x M3x30)
- conductor holder OD-BC-DV01 (it is installed in the circuit breaker)

- the method of power circuit connection must observe recommendations, see page D18 as well as deionization space, see page D21

1) – for connecting in another way, it is necessary to use CS-BC-... connecting sets, see page D10, D11

Characteristic D - distribution protection lines and transformers

4P - for protected N conductor

| T ATE | lype as a se | Product code: | s (Selting (A) | I JAN S | Weight Tight | ackage fixt |
|-------|------------------|---------------|-------------------|-------------|---------------|-------------|
| 16 | BC160NT406-16-D | 33644 | 12.5 ÷ 16 | 160 ÷ 240 | 1.3 | 1 |
| 20 🖂 | BC160NT406-20-D | 33643 | 16 ÷ 20 | 200 ÷ 300 | . 1 .3 | |
| 25 | BC160NT406-25-D | 33642 | 20 ÷ 25 | 250 ÷ 375 | 1.3 | 1 |
| 32 | BC160NT406-32-D | 33641 | 25÷32 | 160 ÷ 320 | 13 | |
| 40 | BC160HT406-40-D | 33640 | 32 ÷ 40 | 200 ÷ 400 | 1.3 | 1 |
| 50 | BC160NT406-50-D | 33638 | 40 ÷ 50 | 250 ÷ 500 | 13 | |
| 63 | BC160NT406-63-D | 33636 | 50 ÷ 63 | 315 ÷ 630 | 1.3 | 1 |
| 80 | BC160NT406-80-D | 33634 | 63 ÷ 80 | 400 ÷ 800 | 1,3 | |
| 100 | BC160NT406-100-D | 33632 | 80 ÷ 100 | 500 ÷ 1 000 | 1.3 | 1 |
| 125 | BC160NT406-125-D | 33630 | 100 ÷ 125 | 625 ÷ 1 250 | 1.3 | |
| 160 | BC160NT406-160-D | 33628 | 125 ÷ 160 | 800 ÷ 1 600 | 1.3 | 7 1 |

⁻ TECHNICAL INFORMATION, see page D15, D37

Characteristic L - lines

4P - for protected N conductor

- m protection lines with low starting currents
- without I_e setting

| MAIS | and appears | e Product code | es (I settind (A) = 20 | | : Weight (kg) 10 | Package (pc) |
|------|------------------|----------------|------------------------|-----|------------------|--------------|
| 40 | BC160NT406-40-L | 33639 | - | 160 | 1.3 | 1 |
| 50 | BC160NT406-50-L | 33637 | | 200 | 13 | |
| 63 | BC160NT406-63-L | 33635 | - | 252 | 1.3 | 1 |
| 80 | BC160NT406-80-L | 33633 | | 320 | 13 | |
| 100 | BC160NT406-100-L | 33631 | - | 400 | 1.3 | 1 (|
| 125 | BC160NT406-125-L | 33629 | | 500 | | |
| 160 | BC160NT406-160-L | 33627 | • | 640 | 1.3 | 1 |

- -TECHNICAL INFORMATION, see page D15, D37
- custom production

Characteristic N - only short-circuit release

4P - for protected N conductor

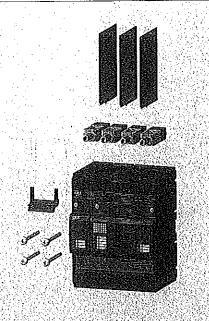
| E W | ithout I. | setting |
|------|-----------|---------|
| _ ,, | tuiont i | |

| | yes yes | Product rodes | algoritmy A) s | a similar | (Yeight (kg)) | Package (pc) |
|-----|-------------------|---------------|----------------|----------------|---------------|------------------|
| 32 | BC160NT406-32-N | 33652 | - | 160 ÷ 320 | 1.3 | 1 |
| 40 | BC160NT406-40-N | 33651 😘 😘 | | 200 ÷ 400 | 13 | \$ 55 B. B. |
| 50 | BC160NT406-50-N | 33650 | - | 250 ÷ 500 | 1.3 | 1 |
| 63 | BC160NT406-63-N | 33649 | | 315 ÷ 630 | 13 | $G(q\mathbf{t})$ |
| 80 | BC160NT406-80-N | 33648 | - | $400 \div 800$ | 1.3 | 1 |
| 100 | -BC160NT406-100-N | 33647 | | 500 ± 1 000 | 13 | |
| 125 | BC160NT406-125-N | 33646 | - | 625 ÷ 1 250\ | 1.3 | 1 |
| 160 | BC160NT406-160-N | 33645 | | 800 ÷ 1600 | 13 | 1004 |

- TECHNICAL INFORMATION, see page D15, D37
- custom production



SWITCH-DISCONNECTOR



BC160N

- Switch-disconnector includes: -2 connecting sets for connecting Cu/Al cables with cross-sections 2.5 \div 95 mm²⁻¹⁾
 - in case of the connection of the fine stranged conductor, we recommend using of the end sleeve (connecting sets are installed in the switch-disconnector)
 - insulating barriers OD-BC-KS02 and OD-BC-KS42
 - 2 sets of mounting bolts OD-BC-MS01 (4x M3x30)
 - conductor holder OD-BC-DVO1 (it is installed in the switch-disconnector)

 $^{\rm H}$ - for connecting in another way, one may use CS-BC-... connecting sets, see page D10, D11

| I (A) | a in earlype | Product codes | Weight | (kg) 💖 Padrage (pc) |
|-------|------------------|---------------|--------|---------------------|
| 160 | BC160NT405-160-V | 33626 | 1.3 | 1 |

- TECHNICAL INFORMATION, see page D15

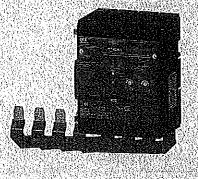
RESIDUAL CURRENT DEVICES



3-pole design, with interconnecting busbars

| lype | ≥ Prodúrt code re | eDescription and a second | Yeight (kg) | Palkage [pc] |
|--------------|-------------------|---|-------------|--------------------|
| RCD-BC3-EF06 | 37745 | I 63 A, I 0.3 A, without t setting | 1.44 | 1 |
| RCD-BC3-EF16 | 37746 | 1, 160 A, 1, 0.3 A, without t _{ac} setting | 1.65 | 3.0 1 4.5 E |
| RCD-BC3-FA06 | 37747 | 1, 63 A, I, 0.03 ÷ 3 A, without t setting | 1.44 | 1 |
| RCO-BC3-EA16 | 37748 | I 160 A, I 0.03 ÷ 3 A without t setting | 1.65 | 1.00 |

- CS-BC-LO06 or CS-BC-LO16 is part of residual current module
- -TECHNICAL INFORMATION, see page D22



-TECHNICAL INFORMATION, see page D22

4-pole design, with interconnecting busbars

| Type and the second | Productions | Deappor 4 Co. 3 | z e yeight (g) z | Package (pc) |
|---------------------|-------------|---|---|------------------------|
| RCD-BC4-EF06 | 37753 | 1, 63 A, I, 0.3 A, without t _{est} setting | 1.75 | 1 suatwistikanitika |
| RCO-BC4-EF16 | 37754 | ા 160 A, I હ 0.3 A, without t setting ા | 2.03 | 1.5 |
| RCD-BC4-EA06 | 37755 | 63 A, 0.03 ÷ 3 A, without t, setting | 1.75 Anno 100 anno 1 31 0 anno 1410 an | 1 wataokatan |
| RCD-BC4-EA16 | 37756 | 1, 160 A, L, 0.03 ÷ 3 A, without t, setting | 2,03 | 自然从 类45 |

- CS-BC-L406 or CS-BC-L416 is part of residual current module

4-pole design, without interconnecting busbars

| RCO-BCO-EA16 37762 1 160 A) 1, 0.03 ± 3 A without t, setting 1.27 1 RCO-BCO-EF06 38375 J 63 A, J, 0.3 A without t, setting 1.27 1 RCO-BCO-EA06 38376 1,63 A, I, 0.03 ± 3 A, without t, setting 1.27 1 | RCO-BCO-EF16 | 37761 | I ₂ 160 A, I _A , O,3 A, without t _{as} setting | 1.27 | 1 |
|---|--------------|-------|---|----------|----------------|
| RCO-BCO-EFO6 38375 1, 63 A, I ₂₀ 0,3 A, without t ₂₀ setting 1.27 1 | | 37762 | [160 A, I 0,03 ÷ 3 A, without t setting | 127 | NEW YEAR |
| RCD-BCO-FA06 38376 [63 A, I 0,03 ÷ 3 A, without t setting / 1.27 | | 38375 | I, 63 A, I, 0,3 A, without t _{es} setting | 1.27 | 1 |
| | RCD-BCO-FA06 | 38376 | 1_6 63 A, 1_6 0,03 \pm 3 A, without t_6 setting | ∕_\1.27. | 党等有49 于 |

- TECHNICAL INFORMATION, see page DZZ



Modelon

CONNECTING SETS FOR RESIDUAL CURRENT DEVICE

3P 4



| Types P | oduct code | Description (1986) | | | g) Package (s |
|------------|------------|----------------------------|------------------------|------|---------------|
| CS-8C-5006 | 38379 | Interconnecting busbars, I | = 63 A, for 3P design | 0.17 | 1 |
| CS-BC-S016 | 38380 | Interconnecting busbars, I | = 160 A, for 3P design | 0.44 | 1.0 |

- TECHNICAL INFORMATION, see page D24



| | | | | / | \parallel | |
|-------------------|----------------|----------------------------|------------------------|----|-----------------|-------------------|
| Туре | Product rode | (Description | | 劉潔 | 褲 | [kg] 🍮 Package (s |
| CS-BC-S406 | 38383 | Interconnecting busbars, I | | 1 | 0.21 | 1 |
| CS-BC-S416 | 38384 | Interconnecting busbars, I | = 160 A, for 4P design | | 0.64 | 表示的10% |
| -TECHNICAL INFORM | ATION, see pag | e D24 | | 1/ | \mathcal{T}^- | |

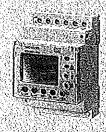
RESIDUAL CURRENT MONITOR

3P 4



| Jype (S. 1) | Product code | Description | Weight (kg) Packam ry |
|-------------|--------------|--|-----------------------|
| 55V8000-6KK | 42658 | Analogue design, l _{ss} and t _{ss} setting | 0.18 |

- TECHNICAL INFORMATION, see page P4



| meser 2 | Product code | , Description 8, 18, 18, 18, 18 | Weight (| g] e Package (s |
|-------------|--------------|---|-----------------|-----------------|
| 5SV8001-6KK | 42659 | Digital design, l_{in} and t_{in} setting | 0.26 | 1 |
| 55V8200-6KK | 42660 | Digital design, I and t setting, | f channels 0.26 | AND BIE |

-TECHNICAL INFORMATION, see page P4

CURRENT TRANSFORMERS FOR RESIDUAL CURRENT MONITOR









| Type costs | Producticode | A Deciptions Exp. (6.2) The State of the Sta | Weight (kg) | a Package Is |
|-------------|--------------|--|-------------|--------------|
| 5SV8700-0KK | 42661 | Internal diameter 20 mm, including holder on "U" rail according to EN 60715 wide 35 mm | 0.09 | 1 |
| 55V8701-0XK | 42662 | Internal diameter 30 mm, Including holder on ,U", rall according to EN 607,15 wide 35 mm | 0.11 | |

-TECHNICAL INFORMATION, see page P4

| Type see a see a see | Product code | A Decipionia de la companya de la c | | . Parkage (y |
|----------------------|--------------|--|------|--------------|
| 5SV8702-0KK | 42663 | Internal diameter 35 mm, including holder on the panel | 0,2 | 1 |
| 55V8703-0KK | 42664 | Internal diameter 70 mm, including holder on the panel | 0.31 | 45.51 |
| 55V8704-0KK | 42665 | Internal diameter 105 mm, including holder on the panel | 0.6 | 1 |
| 55V8705-0KK | 42666 : | Internal diameter 140 mm, including holder on the panel | 1.35 | |
| 55V8706-0KK | 42667 | Internal diameter 210 mm, including holder on the panel | 2.25 | 1 |
| | | | | |

| Type | | l code | Westiphon as the state of the s | Weight (kg) | Package(s |
|--------------|---|--------|--|-------------|-----------|
| 55V8 900-1KK | 4 | 2668 | Holder on "U" rail according to EN 60715 wide 35 mm for current | 0.01 | 2 |
| | 1 | | transformers with internal diameter up to and including 105 mm | | |

-TECHNICAL INFORMATION, see page P4

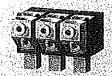
CONNECTING SETS



3 terminals

| Type \$ 1.2. Product code & Description have a \$\forall \text{Immq} \text{Velood of Connection \$ 2. \text{Weight(kg)} Package | (vet |
|--|------|
| CS-BC-A011 20223 Front connection Cu/Al busbars, cable lugs 0.05 1 | |

-TECHNICAL INFORMATION, see page D18



| CS-BC | B021 20237 | Double block 2x (2! | 5 ÷ 120) Cu/Al c ables | 0.18 | |
|--------|--|---------------------------|-------------------------------|--|--|
| 30,000 | \$20,000 mention (\$20,000 min ref) and (\$20,000 min ref) | reinfulor of the State of | | The first of the state of the first of the state of the s | |

- TECHNICAL INFORMATION, see page D18

- terminals cover included - degree of protection IP20



|--|

-TECHNICAL INFORMATION, see page D18



| CS-BC-PS01 20239 Potential terminals 15÷25;4÷6 Cu flexible conductor 0.01 1 |
|---|
|---|

5x (2.5 ÷ 25) ... Cu/Al cables

- TECHNICAL INFORMATION, see page D18





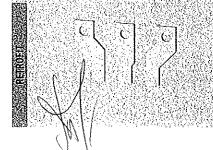
CS-BC-B014

- terminals cover included - degree of protection IP20





TECHNICAL INFORMATION, see page D18 _____, -for total replacement of 8A...*33 circuit breaker also is necessary the 0D-BC-MS33 mounting set



▶ D10

"- one set provides for connecting one side of the circuit breaker (set includes three terminals with necessary coppling elements)

Modeion

CONNECTING SETS

3P 4P



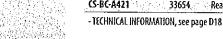
1 terminal

| Type | Product code | Description 🖖 💰 S | Imm'l : Method of connection : | Weight (kg) | Padkage (set) |
|------------|--------------|-------------------|--------------------------------|-------------|---------------|
| CS-BC-A411 | 33653 | Front connection | Cu/Al busbars, cable lugs | 0.02 | 1 |

- TECHNICAL INFORMATION, see page D18



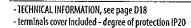
CS-BC-A421 33654 Rear connection Cu/Al busbars, cable lugs





0.25

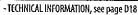




CS-BC-B421 33658 Double block 2x (25 ÷ 120) Cu/Al cables terminal



| CS-BC-B414 34958 Block terminal 5x (2,5 ÷25) Cu/Al cables 0,24 1 : for 5 cables |
|---|
|---|



- terminals cover included - degree of protection IP20

-TECHNICAL INFORMATION, see page D18

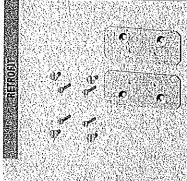
CS-BC-PS41 36030. Potential terminals $1.5 \div 2.5/4 \div 6$. Cu flexible conductor

0.005



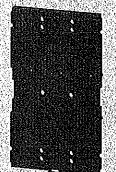
MOUNTING SETS

3P: 4P



| irpy in the Product and explosing tion is some services and the service of the Velopic Rackage (set). | 2 |
|--|---|
| OD-BC-MS33 20625 Reduction for BA | Ċ |

-for total replacement of BA...*33 circuit breaker 2 connecting sets CS-BC-A033 are necessary

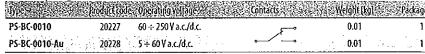


- DIMENSIONS, see page D29

2- one set provides for replacing one circuit breaker (set instudes coupling elements necessary to assemble circuit breaker and mounting set) RETROPTOS - sets, which enable replacement of the disput breakers by a new circuit breakers without switch board reconstruction

SWITCHES

Auxiliary - signal state of the main contacts



-TECHNICAL INFORMATION, see page D4S



| DIPE SEE SEE | Product cod | e neculinous | Louisits (See | Yeight (Kg) | s Kackad |
|---------------|-------------|----------------------|---------------|-------------|----------|
| NS-BC-0010 | 20225 | 60 ÷ 250 V a.c./d.c. | ţ | 0.01 | 1 |
| NS-BC-0010-Au | 20226 | 5 ÷ 60 V a.c/d.c. | ·-/ | 0.01 | <u> </u> |

- TECHNICAL INFORMATION, see page D45

SHUNT TRIPS

 type 3
 Product core
 Operating voltage
 Weight (kg)
 Package

 5V-BC-X024
 20233
 24,48Va.c/d.c.
 0.05
 1

 5V-BC-X110
 20234
 110,230Va.c/t10,220Vd.c.
 0.05
 1

230,400 V a.c./ 220 V d.c.

-TECHNICAL INFORMATION, see page D46

SV-BC-X230

UNDERVOLTAGE RELEASES

3P

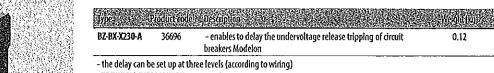
3P

3P



| SP-BC-X024 | 20229 | 24, 48 V a.c./d.c. | 0.05 | 1 |
|------------|-------|-----------------------------|------|-----|
| SP-BC-X110 | 20231 | , 110,230 Va.c/110,220 Vd.ç | 0.05 | |
| SP-BC-X230 | 20232 | 230, 400 V a.c./ 220 V d.c. | 0.05 | . 1 |

DELAY UNIT



-TECHNICAL INFORMATION, see page P2



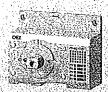
Cy

Modelon

HAND DRIVES

3P 4P

















| RP-BC-CK20 | 20593 | Hand drive unit | - with locking | 0.08 |
|---|--------------------|---------------------------------|--|------------|
| TECHNICAL INFORMAT | | | muriodalig | 0.00 |
| - TECHNICAL INTORMA Hand drive unit must b | | or control on the circuit break | er - hand drive lever RP-BC-CP I door - extension shaft RP-BC-CH - hand drive bearing RP-BC- - hand drive lever RP-BC-CP | CN |
| RP-BC-CK21 | 20594 | Hand drive unit - yellow | - with locking | 0.08 4] 1 |
| - TECHNICAL INFORMA Hand drive unit must b | e fitted with: 🗖 f | or control on the switching ur | nit - hand drive lever RP-BC-CP door - extension shaft RP-BC-CH - hand drive bearing RP-BC- - hand drive lever RP-BC-CP | IN., |

- TECHNICAL INFORMATION, see page D48

Hand drive unit must be fitted with: with the extension shaft RP-BC-CH..., with the hand drive bearing RP-BC-CN..., with the hand drive lever RP-BC-CV.

| RP-BC-CP10 | 20561 | Hand drive lever - black | - without locking | 0.02 | |
|------------|-------|--------------------------|-------------------|------|---|
| RP-BC-CP20 | 20562 | Hand drive lever - black | - with locking | 0.02 | 1 |

-TECHNICAL INFORMATION, see page D48

| RP-BC-CP21 205 | 97 Hand drive lever - re | d - with locking | 0.02 | 医隐含性结合 |
|----------------|--------------------------|------------------|------|--------|
| | | | | |
| | | | | |

- TECHNICAL INFORMATION, see page D48

| RP-BC-CN10 | 20564 | Hand drive bearing | degree of protection IP40 | 0.05 | |
|------------|-------|--------------------|---|------|---|
| RP-BC-CN20 | 20565 | Hand drive bearing | degree of protection IP66 | 0.05 | 1 |

- TECHNICAL INFORMATION, see page D48
- is used in combination with the black lever of RP-BC-CP 10 or RP-BC-CP20 hand drive

| RP-BC-CN11 | 20598 | Hand drive bearing yellow | degree of protection IP40 | 0.05 | 1 |
|------------|-------|--------------------------------|-----------------------------|------|---|
| RP-BC-CN21 | 20599 | Hand drive bearing - yellow | - degree of protection IP66 | 0.05 | 1 |

- TECHNICAL INFORMATION, see page D48
- is used in combination with the red lever of RP-BC-CP21 hand drive

~TECHNICAL INFORMATION, see page D48

| RP-B(| -CH2 | 20600 Extension shaft - telescopic, length 199 ÷ 352 mm : 0.92 |
|-------|------|--|
| | | |

- TECHNICAL INFORMATION, see page D48





| Type 22 | Product code | Namet | | ackage [p;] |
|------------|--------------|-------------------------|------|-------------|
| RP-BC-CB10 | 20601 | Mechanical interlocking | 0.09 | |

-TECHNICAL INFORMATION, see page D49

- Mechanical interlocking must be fitted with: 2 hand drive units RP-BC-CK.. (cannot be combined with hand drive unit for side control) 2 hand drive levers RP-BC-CP..



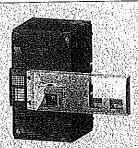
| THE SERVER HERE IN COURT IN THE TRANSPORT OF A PARTY OF | | 0.11 |
|---|----------------------------------|--|
| DD.DC.CD40 20602 | dechanical narallel switching | Markata da Para Maria da Maria da Hara |
| Ul-fic, CD10 | il constituent parameters in the | |

-TECHNICAL INFORMATION, see page D49

- Mechanical parallel switching must be fitted with: 2 hand drive units RP-BC-CK.. (cannot be combined with hand drive unit for side control) 1 hand drive lever RP-BC-CP..

MOTOR DRIVES

3P 4P



| MP-BC-X024-B | 34450 | Motor drive side, 24 V a.c./d.c. | 0.9 | 1 |
|--------------|-------|---|-----|---|
| MP-BC-X048-B | 34451 | Motor drive side, 48 V a.c./d.c. | 6.9 | 1 |
| MP-BC-X110-B | 34452 | Motor drive side, 110 V a.c./d.c. Motor drive side, 230 V a.c./d.c | 0.9 | 1 |

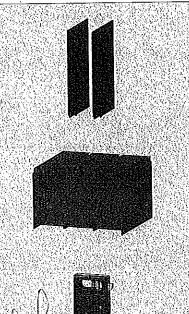
- TECHNICAL INFORMATION, see page D50



| OD-BC-KA02-A | 34454 | // Extension cable, length 0.6 m, for motor drive | 0.1 | (#j.) |
|--------------|-------|---|-----|-------|
| OD-BC-KA02-B | 37510 | Extension cable, length 3 m, for motor drive | 0.2 | 1 |

ACCESSORIES

3P 4P



| Night and a second | ss Product rode | SHAzev-popus | Weight (kg) | . Padkage (pc) |
|--------------------|-----------------|--|---------------|----------------|
| OD-BC-KSO2 | 20224 | Insulating barriers - set (two pieces), for 3P and 4P design | 0.03 | 1 |
| OD-BC-KS42 | 33660 | Insulating barrier - one piece, for 4P design | 3/C0.02/5 3/5 | 9 1 |

- included with each circuit breaker or switch-disconnector order

- In case connection is reversed (supply to terminals 2, 4, 6) it is necessary to install these barriers also on the lower side, for more detailed information see page D21

| OD-BC-KSO3 | 20240 | Terminal cover - degree of protection IP20, for 3P | 0.05 | 1: |
|------------|-------|--|------|----|
| OD-BC-KS43 | 33661 | Terminal cover - degree of protection IP20, for 4P | 0.07 | 1 |

- increases degree of protection of connection point to IP20, e.g. when used with cable lugs

| OD-BC-UP01 20241 | Lever wi | th locking | 藩 | MIN | 至使 | Missi | :7; :;; | f. |
|------------------|----------|------------|---|-----|---------|-------|------------|----|
| <u> </u> | , , | | _ | | 1.4 | 71 1 | nl | |

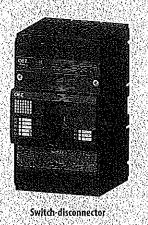
- enables to lock the circuit breaker/switch-disconnector in "switched off manually" position (loaded)

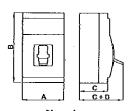
– locking is possible using padlock with shank diameter $3 \div 4$ mm

3P 4P

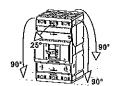


Circuit breaker

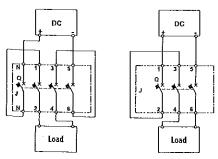




Dimensions



Installation positions



Connection of 3P circuit breaker Connection of 4P circuit breaker in DC circuit up to 250 V d.c. in DC circuit up to 440 V d.c.

| INNECTORS | | or ar |
|--|--|--|
| Specifications Type | CIRCUIT BREAKER BC160HT. | SWITCH-DISCONNECTOR |
| Series | NORMAL | |
| Dimensions A x B x C + D (3P/4P design) | 75/100x130x70 + 23 mm | 75/100 x 130 x 70 + 23 mm |
| Weight (3P/4P design) | 1/1.3 kg | 1/1.3 kg |
| Standards | EN 60947-2, IEC 60947-2 | EN 60947-3, IEC 60947-3 |
| Approval marks | C€® : | \/ c€® |
| Number of poles | 3,4 | 3,4 |
| Rated current I | 16÷160 Å [⊅] | |
| Rated normal current | .16 ÷ 160 A 7 | 160 A |
| Rated operating current | | 160 A |
| Rated operating voltage U | max. 690 V a.c. | max. 690 V a.c. |
| | max. 250 V d.c. (3P) max. 440 V d.c. (4P) | max. 250 V d.c. (3P) max. 440 V d.c. (4P) |
| Rated frequency f | 50/60 Hz | 50/60 Hz |
| Rated Impulse withstand voltage | 4.47 - 1.78 W | 8 kV |
| Rated insulation voltage U | 690 V | 690 V |
| Utilization category (selectivity) 690 V a.c. | Mark Andrews | (7) 智慧的 对 解的包括 |
| Utilization category (switching mode) | AC-3 (16 ÷ 100 A) | AC-23 A |
| | AC-2 (125 ÷ 160 A) DC-22A | DC-22A |
| Rated short-time withstand current | | 2 kA/1s |
| Rated short-circuit ultimate breaking capacity (rms) $\frac{1}{2}$ $\frac{1}{2}$ | 6 kA/690 V a.c. | |
| | 12 kA/500 V a.c. 25 kA/415 V a.c. | |
| | 40 kA/230 V a.c. | - |
| | 25 kA/250 V d.c τ = max. 15 ms (3P) 20 kA/440 V d.c τ = max. 15 ms (4P) | |
| Off time at I | 7 ms | |
| Rated short-circuit service breaking capacity (rms) $\frac{1}{2} / \frac{1}{2}$ | 3 kA/690 V a.c. | 10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | 6 kA/500 V a.c. 13 kA/415 V a.c. | |
| | 20 kA/230 V a.c. | . |
| | 13 kA/250V d.c τ = max. 10 ms (3P) 13 kA/440V d.c τ = max. 10 ms (4P) | |
| Rated short-circuit making capacity (peak value) | 52 kW415 V a.c. | 2.8 kA/415 V a.c. |
| | | |
| Losses per 1 pole at I _n = 160 A Mechanical endurance | 15 W | 15 W |
| Electrical endurance (U, = 415 Y a.c.) | 20 000 cycles | 20 000 cycles |
| Switching frequency | 6 000 cycles | 6 000 cycles |
| Control force (3P/4P design) | 120 cycles/hr 55/65 N | 120 cycles/hr 55/65 N |
| Degree of protection from front side of the device | 1P 40 | 33/63 K |
| Degree of protection of terminals | IP20 | V20 1820 |
| Operating conditions | 11 20 | 11 20 |
| Reference ambient temperature | 40℃ | 40℃ |
| Amblent temperature range | 40°C++55°C | -40°C ÷ +55°°C |
| Working environment | dry and tropical dimate | dry and tropical dimate |
| Climaticresistance | EN 60068 | EN 60068 |
| Pollution degree | province and the comprehensive and the comprehensive and the comprehensive and the comprehensive and the compre 3 | - 19,7 % (1999) (1995) 3 |
| Max sea Jevel | 2000 m | 2 000 m |
| Selsmic resistance | 3g (8 ÷ 50) Hz | 3g (8 ÷ 50) Hz |
| Design modifications | | |
| Front/rear connection | 0/0 | 0/0 |
| Plug-in design \ | Espan diamentaren 194 Nobel eta | |
| Withdrawable design \bigcap_{l} | ← | - |
| Accessories - 10 10 10 10 10 10 10 10 10 10 10 10 10 | | |
| Switches - auxiliary/relative/signal/early | e/-/e/ | 0/-/•/- |
| Shunt trip/with signal switch | •/• | •/• |
| Undervoltage release/with early switch/with signal switch | o/-/o | e//o |
| Front hand drive/side drive right/left | 0/0/0 | •/•/e |
| Mechanical interlocking - with Bowden cable/for hand drive | -/• | -/o |
| Motor drive/with counter of cycles | ***** •/ -****** | |
| Lever with locking | • | • |

¹⁻in case drout breaker connection is reversed (input terminals 2.4, 6, output terminals 1, 3, 5) l_o does not change 2-ranges of rated currents vary according to characteristics set page 1337 – protection of Modeion switch-disconnectors, see page 18

Specifications

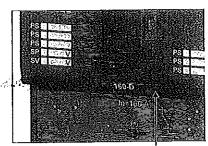
Description of push button function and signalling

TEST push button – by pressing you will switch off the circuit breaker/switch-disconnector, including to actuate the auxiliary switches

Inspection push button – by pressing you will simulate tripping of the circuit breaker by the overcurrent release, including to actuate the auxiliary switches and signal switch. Pressing

requires a suitable instrument, such as a wire with cross-section of about 1 mm.

Signalling of tripping by the overcurrent release - after tripping of the circuit breaker by the overcurrent release, it will display the indicator "

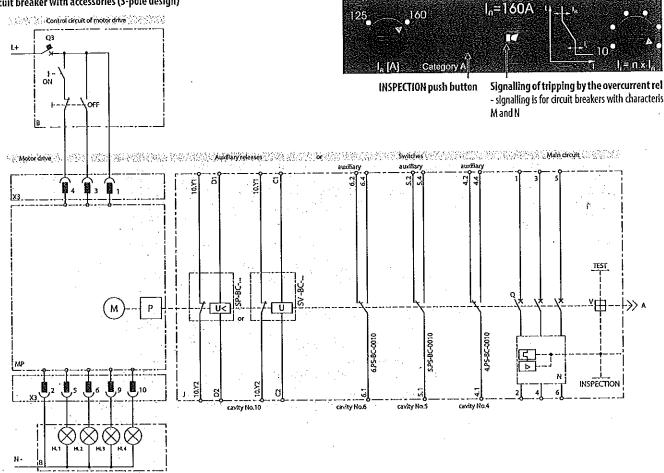


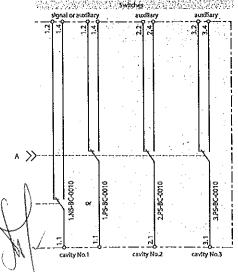
TEST push button

Diagram

Þ

Circuit breaker with accessories (3-pole design)





Control circuit of motor drive, signating

Power losses (per 1 pole)

| a i kana piwi na seba |
|-----------------------|
| 4 |
| 发的分别的 有 数多数的 |
| 4 |
| |
| 4 / 1 / |
| 5 / / /- |
| 6 // |
| |
| 10 |
| 15 |
| 15 |
| |



Diagram

Circuit breaker with accessories (4-pole design)

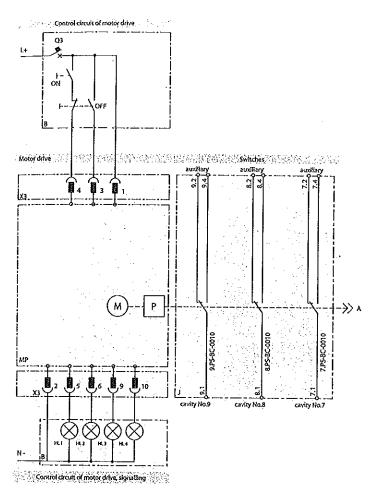
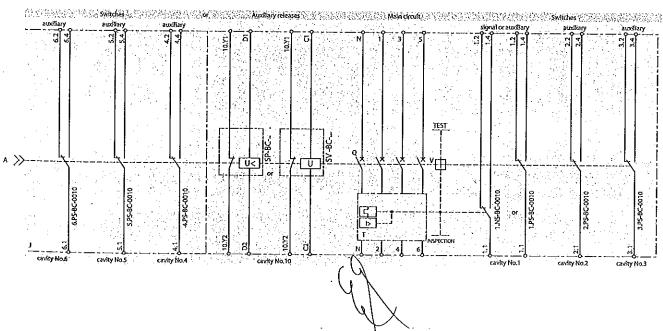


Diagram description

| MP | motor drive - MP-BC |
|---------------------|---|
| M | motor |
| P | gearunit |
| ХЗ | connector for connection of control and signalling circuits |
| B | recommended wiring of the control drouits. |
| JAN SALES WAR | it is not a part of motor drive |
| ON | switch on button |
| OFF | switch off button |
| 03 | motor drive circuit breaked - see page D50 |
| J ÉKÉTÉT | drcuit breaker BC 60 \ |
| 0 1 0 1 | main contacts |
| \mathbf{I}^{ASMA} | thermomagnetic overcurrent release |
| | 3P+N (3 poles are projected. A pole is unprotected) |
| | 4P (all 4 poles are protected) |
| V . 4 | trip-free mechanism |
| iei . | push button to test release |
| REVIZE | Inspection push button of release |
| SP-8C-X | undervoltage release |
| SV-BC-X | shunt trip |
| | ure stgnalling (unreliable switching on or switching off); ssible load 10 W 7 |
| | of circuit breaker lever position , loaded , max, permissible load 10 W $^{\circ}$ |
| HL3 signalling of | opening of the front safety cover of the drive, max, permissible load 10 W $^{\circ}$ |
| HL4 Signalling o | f exsertion of the drive locking bar, max, permissible load 10 W $^{\circ}$ |
| | |
| -/ voitage on term | tnals 5, 6, 9, 10 is the same as U _p of the motor drive |





Specifications

Connecting and installation

Power circuit

- connected with Cu/AI busbars or cables and possibly cables with cable lugs
- connection sets are produced to provide greater connecting options, see page D10
- generally, conductors from the supply are connected to input terminals 1, 3, 5 and conductors from the load to terminals 2, 4, 6; however, it is possible to reverse the connection (exchanging input and output terminals without limiting rated short-circuit ultimate breaking capacity I
- m in case of reversed connection, circuit breaker/switchdisconnector must be fitted with ODBL-KSO2 insulating barriers also on the side of terminals 2, 4, 6, for more detailed information see page D21

- m we recommend painting the connecting busbars
- input and output conductors/busbars must be mechanically einforced in order to avoid transferring electrodynamic forces to the circuit breaker during short-circuiting
- $\ensuremath{\mathbf{m}}$ the method of connecting the power diruit must observe the deionization space of the circuit breaker/switch-disconnector, see page D21

Auxiliary circuits

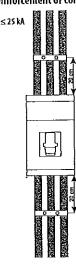
switches, shunt trips or undervoltage releases are connected using flexible Cu conductors with cross-section $0.5 \div 1 \text{ mm}^2$ directly to terminals on these devices

Recommended minimum cross-sections of cables, busbars and flexibars

| J. (L) TAIS | Gibles | Inn De | Busbars Gr | Volationalistic (Sec.) |
|------------------------|--|--------------------|----------------|------------------------|
| 16 | 2,5 | | - | |
| 20 | 2,5 | | | |
| 25 5 60000000000000 | 4 90 50.00.000.000.000.000.000.000 | ansiyasakasidhilik | | - Siga waxania |
| 32 40 | 10 | | | 9 <i>m/20</i> 44000 |
| 50 | 10 | 16 | | |
| 63 80 | 16 25 | 25 35 | | - (2:38:50) |
| 100 | 35 | 50 | 16 x 2; 12 x 3 | 16 x4; 12 x 5 |
| 125 | 50 | 70 | 16x4; 12x5 | 16x5; 12x6 |
| 160 | 70 | 95 | 16 x 5; 12 x 6 | 16 x 6; 12 x 8 |

- it is necessary to follow the relevant valid standards when cables are designed

Mechanical reinforcement of conductors for BC



Connecting set specifications

| Connecting set s | ecincatio | NS | | | | |
|--|---|--|--|---|---|--|
| Typ == 5 | AL (A) | er en | nifesianges if confection co | ASSOCIOUS INTRA A COMP | | |
| | | vient Able as a stector standed. | a Consolidado | ez el congrationida | rollidsold | |
| | 6.6 | ype ii caul | | | | |
| | | | | | / Y | |
| | | | | | | Briston and cables and edinical and trops with the second community |
| | | | | 902 1995 | | SAN SANGE MANAGEMENT OF THE PROPERTY. |
| CS-BC-B021 | 160 | 2x (25 ¹⁾ ÷ 120) | 2x (25 ÷ 120) | 2x (25 ¹⁾ ÷ 120) | 2x (25 ÷ 120) | page D25 |
| CS-BC-B421 | 160 | 2x (25 ^q ÷ 120) | 2x (25 ± 120) | 2x (25 ¹⁾ ÷ 120) | 2x (25 ÷ 120) | page 031 |
| 1.4.8.8.8.3.46.346. | 100000000000000000000000000000000000000 | (1915年1955年中1950年1955年195日 1950年1950年1950年1950年1950年1950年1950年1950年 | (\$) \$.70 p. 90 455 25 25 25 25 25 25 25 25 25 25 25 25 2 | | ing the externing and activities and activities | 16 x page D25 |
| CS-BC-A011 | 160 | Control of the contro | uma a carababboararararar | | สังเปราะเทยเลยอย่าย | • - |
| CS-BC-A411 | 160 | | ing parties and the state of | | | page D31 |
| CS-BC-A021 | 160 | process, 2003, 100, 100, 100, 100, 100, 100, 100, | 2.0 (4.0) (\$1.00) (\$1.00) (\$2.00) (\$1.00) (\$2.00) | | | 16 x page D26 |
| 10.0159000000000000000000000000000000000 | entwikiag: | ecterans datamentalistis | ardamerakan kanggar | STANCE AND | Next action views | page D32 |
| CS-BC-A421 | 160 | | e markitikatan | | | hade nay |
| CS-BC-PS01 | 10/16 | | 1,5 ÷ | 2,5/4÷6 | | |
| CS-BC-PS41 | 10He | COVALOS DE PROPERTO DE CARACADA | | 2,5/4+6 | | MARKATA TATO |
| C. C | 10/16 | 是其中的性質的學術學的學術學的學術學 | 公共2004年20日县5000000 | EARWENERS DAMANTALITY SPECIES MASS | 88424666144 WESSESSESS | |
| CS-BC-A033 | 160 | RETROFIT—reduction for circuit breal | er BA*33 with front connectio | XI | | 30 x page D27 |
| CS-BC-B014 | 160 | 5x (2,5 ± 25) | 5x (2,5 ÷25) | 5x (2,5 ÷ 25) | 5x (2,5 ÷ 25) | page D26 |
| | | anni Arene ete ete jir iyota daran kana kana ete e vi | | PROCESS (BELL SPEEDS CARDING ACCURAGE OF SPEEDS | Sx (2,5 ÷ 25) | page D32 |
| CS-BC-B414 | 160 | 5x (2,5 ÷ 25) | 5x (2,5 ÷ 25) | 5x (2,5 ÷ 25) | 2¥ (5'2 ± 52) | -1/4, page 0.72 |

RETROFIT - sets, which enable replacement of older circuit breakers by a new circuit breakers without switchboard reconstruction

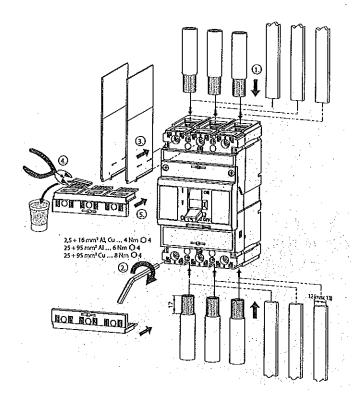
1) stranded conductor with cross-sections 25 mm² ÷ 50 mm² only with end sleeve



3P 4P

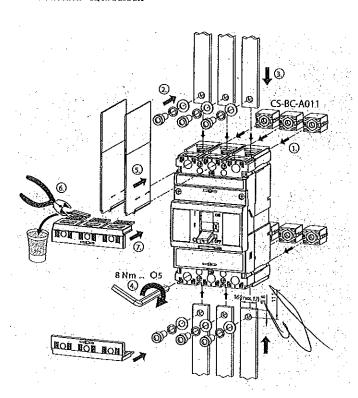
Connecting and installation

Front connection - Cu/Al cables, busbars (connecting set is a part of circuit breaker/switch-disconnector)

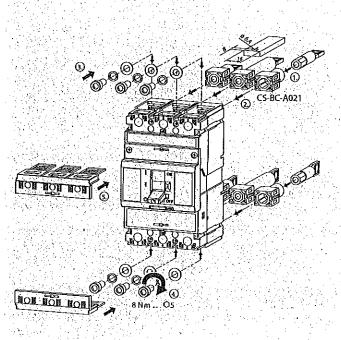




Front connection - Cu/Al busbars



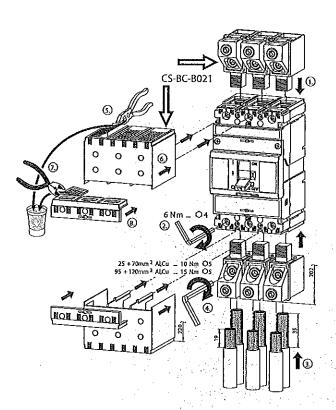
Rear connection - Cu/Al busbars



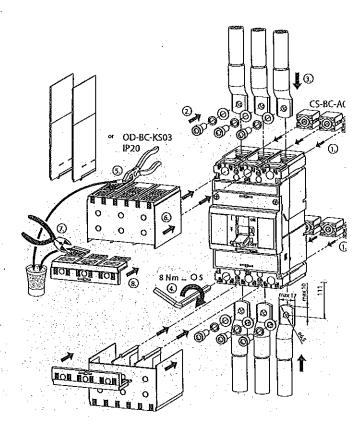


Connecting and installation

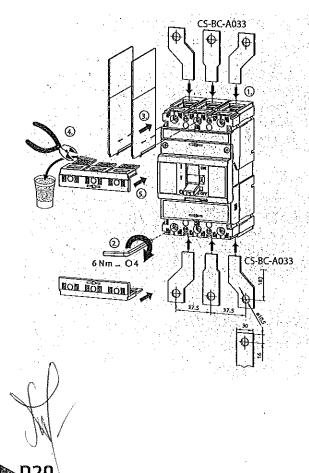
Front connection - 2x Cu/Al cables



Front connection - cable lugs



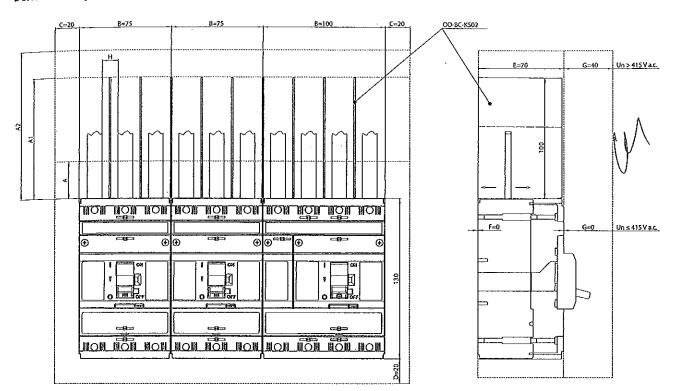
Front connection - reduction to BA...*33

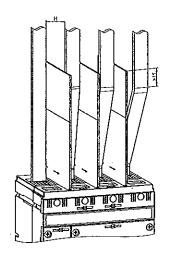




3P 4P

Deionization spaces





A...minimum distance between the circuit breaker//switch-disconnector and uninsulated earthed wall (applicable for connection using insulated conductors, cables, flexibars or with rear connection)

A1...minimum insulation length of bare conductors (using OD-BC-KSO2 and OD-BC-KS42 insulating barriers from 50 mm to max. 100 mm, or by adding additional insulation for the conductors with barriers to obtain at least A1 value)

| elleleinie sa | da a Dimiension de la c |
|---------------|-------------------------|
| A | 50 mm |
| Ai | 100 mm |
| A2 | 150 mm |
| THE HOUSE | 30 mm |

A2...minimum distance:

- between the circuit breaker/switch-disconnector and uninsulated earthed wall (applicable for uninsulated conductors and busbars)
- between the circuit breaker/switch-disconnector and busbar
- between two circuit breakers/switch-disconnectors situated vertically above one another
- between uninsulated connections of two circuit breakers/switch-disconnectors above one another

C, D, E, F, G. . . minimum distance between the circuit breaker/switch-disconnector and uninsulated earthed wall

H...minimum distance between uninsulated conductors

USE OF INSULATING BARRIERS AND TERMINAL COVERS WITH CIRCUIT BREAKERS AND SWITCH-DISCONNECTORS

FIXED DESIGN

- front connection

- terminals N, 1, 3, 5 - it is always necessary to use OD-BC-KSO2 and OD-BC-KSO2 insulating barriers or OD-BC-KSO3 and OD-BC-KSO3 terminal cover (when using CS-BC-B421 connections sets for connecting circuit breaker/switch-disconnector, the terminal cover is included in the connecting set)

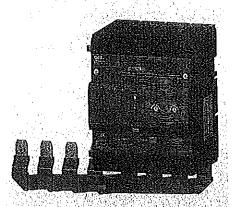
- terminals N, 2, 4, 6 - it is always necessary to use OD-BC-KS02 and OD-BC-KS42 insulating barriers or a OD-BC-KS43 terminal cover if circuit breaker/switch-disconnector is connected to the supply using terminals N, 2, 4, 6 (when using CS-BC-B421 connections sets for connecting circuit breaker/switch-disconnector, the terminal cover is included in the connecting set)

- rear connection

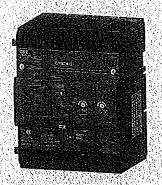
- insulating barriers and covers need not be used --



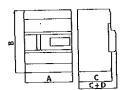
RESIDUAL CURRENT DEVICES



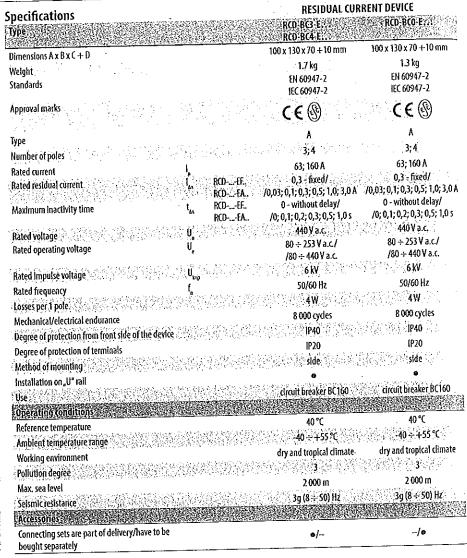
RCD-BC3-E... RCD-BC4-E...



RCD-BCO-E.,



Dimensions



Description

- Designed to protect against leakage/residual current
- Accessories for BC160NT circuit breakers... simple mounting on left side of the device
- s Can be mounted on DIN rail by means of adapter
- Can be connected with the circuit breaker by interconnecting busbars (can be part of the device itself) or by standard cable
- Design according to the way of connection:
 - Version without interconnecting busbars (they are not a part of module)
 - interconnecting busbars can be bought separately, see RCD connection
 - can be connected to the circuit breaker by a cable,
 see RCD connection (cable is not part of the module)
 - Version with interconnecting busbars
 - the interconnecting busbars for connection to the circuit breaker are part of the (module circuit breaker terminals N, 2, 4, 6 and module terminals N, 1, 3, 5 are connected)
- The circuit breaker is switched off by special shunt trip, that is part of the residual current module
- 🗷 Design according to nominal current:
 - Version up to 63 A for BC160NT ...circuit breakers up to 63 A
- Version up to 160 A for BC160NT . . . dircuit breakers from 80 up to 160 A

- Design according to the parameters setting:
 - Version with fixed residual current l_{2a} = 300 mA, without dela
 - \blacksquare Design with gradual setting of residual current l_{kn} and with setting of ultimate no action time of t_{kn} (see table)
 - \blacksquare When there is set $I_{t_{a}} = 0.03$ A the delay is always 0 s !
- M Setting can be sealed
- Module can be connected directly by means of CU/Al cable max. 95 mm²
- For other connection standard BC160 terminals with the exceptix of rear connection can be used
- LED to indicate device operation
- za LED signals 50 % i,
- Remote signalling of 50 % 1 by means of make contact (or at RCD-BC.-EA..)
- \blacksquare Remote signalling of circuit breaker switch off based on \mathbf{I}_{ts} level by means of break contact in shunt trip
- Mechanism for disconnection of electronic parts of module fit voltage - disconnection has to be done before the insulation resistant test is effected
- TEST push button complete test of the device by means of simulation of real residual current
- Circuit breaker can not be assembled by another shunt trip undervoltage release
- Two circuit breakers with residual turnent module can be assemble neither by mechanical interlocking noy by parallel switching



3P 4P

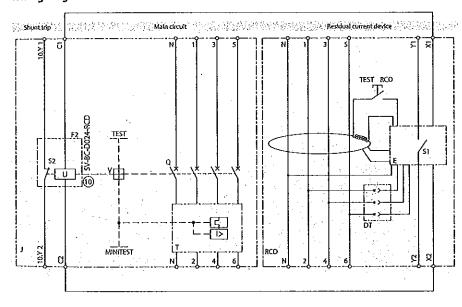
RESIDUAL CURRENT DEVICES

Disconnection of residual current module from voltage Transparent sealable cover LED signals 50 % of residual current Interconnecting busbars Setting of nominal residual current inactivity time t_{to}

Signal contact specifications

| | Ssionalling swite | of meeting the value of 50.% | |
|--|----------------------------------|------------------------------|----|
| Arrangement of Contacts | | - 1 - 01 | |
| Thermal current Arrangement of contacts | Basa l_a spirit | 6A 01 | |
| Rated operating current | I /U | 2 A/ 230 V a.c. | |
| Rated impulse withstand voltage Rated frequency | U _{kep} | 4 kV 50/60 Hz | ٠. |
| Rated insulation voltage | ป | 250V | |
| Rated operating voltage | Ų | 230 V a.c. | |

Wiring diagram



| 1 | circuit breaker BC160 |
|------------|---|
| RCD | residual current device |
| Q | main contacts |
| V | trip-free mechanism |
| 1000 | thermomagnetic overcurrent release |
| E 发表多数 | electronic of residual current device |
| ILSI 🐪 | push button to test release |
| MUNITEST | inspection push button of release |
| TEST RCD | button of residual current module |
| S1 | signalling of 50 % residual current value |
| 52 | signalling switch of switch off by a failure |
| F2 | shunttrip |
| DĬ | disconnection of residual current module from voltage |
| 工艺 医医结合性溃疡 | 医神经结形 有的复数对非常知识的 斯特拉斯 的复数化化增强化 |

Total max. switching off time

| | | | az Makimint Tuacto | nytime adjisteli | alue se se se se | |
|-------------|---------------|----------------|--------------------|------------------|------------------|------------|
| | COms . | 2100 ms | 2/00 ms 2 | 2 300 mg | 300 jik | 1000 (15) |
| 1x | < 70 ms | < 230 ms | < 350 ms | < 440 ms | < 630 ms | < 1 200 ms |
| $[X]_{L_1}$ | < 40 ms ⋅ ⋅ ⋅ | √ × < 200 ms → | < 320 ms | ं < 430 ms ∕ \ | < 620 ms, ± | < 1 200 ms |
| 5x I, | < 40 ms | < 210 ms | <310 ms | < 420 ms | < 630 ms | < 1 200 ms |

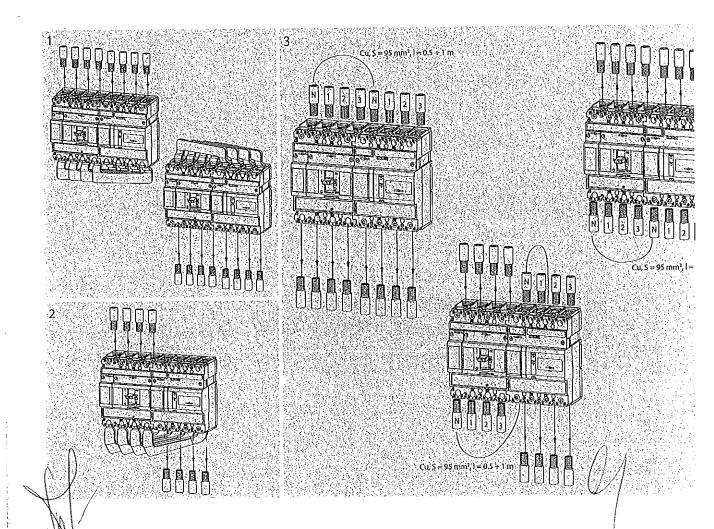


RESIDUAL CURRENT DEVICES

Connecting and installation

| Reduction of rated co | urrent of Cil | rcuit breaker accord | ng to connection type | | er nasker og skalet at skalet for | | | |
|-----------------------|-------------------------------|------------------------------|--|---------------------------|-----------------------------------|---------------------|--------------------------|------------------------------------|
| Circult breaker# | Rafed coment Brook breaker | A Residual current device | Connection betiveen *** circuit breaker and RCD* | Inlet/outlet cables | eduction coefficients k / h | Adjusted current Is | 3 14 2 3 3 4 2 4 4 2 4 1 | i] ((#40/€).9 ≌[j xk : (|
| | | RCD-BCO-EF16 | CS-BC-S016 ^a | 5 20 15 | 0.0 | 160 A | 144 A | (160 x 0.90) |
| | | RCD-BCO-EA16 | CS-BC-S416 ²⁹ | Cu, 70 mm ^{2 5)} | 0.9 | 125 A | 112.5 A | (125 x 0.90) |
| BC160NT305-160-D | | RCD-BC3-EF16 RCD-BC3-EA16 | CS-BC-L016 | Cu, 70 mm ^{2 s)} | 0.95 | 160 A | 152 A | (160 x 0.95) |
| BC160NT405-160-D | | RCD-BC4-EF16 RCD-BC4-EA16 | CS-BC-L416 | CU,70 min | | 125 A | 119 A | (125 x 0.95) |
| BC160NT406-160-D | | RCD-BCO-EF16 | CS-BC-S016 ⁷⁾ | Cu, 95 mm² ^s) | 1 | 160 A | 160 A | |
| BC160NT305-160-L | 160 A | RCD-BCO-EA16 | (S-BC-S416 ²⁾ | (0, 95 mm · | | 125 A | 125 A | |
| BC160NT405-160-L | | RCD-BC3-EF16 RCD-BC3-EA16 | CS-BC-L016 | Cu, 95 mm ^{1 9} | | 160 A | 160 A | |
| BC160NT406-160-L | | RCD-BC4-EF16 RCD-BC4-EA16 | CS-BC-L416 | Cu, 23 IIIIn | | 125 A | 125 A | |
| | | | | 10 | | 160 A | 160 A | |
| | | | cable S == 95 mm² [©] | Cv, 70 mm² s | | 125 A | 125 A | |

⁻ in case of the connection of the fine stranged conductor, we recommend using of the end sleeve



 $^{^{13}}$ - for others circuit breaker is reduction coefficient k=1 23 - connecting sets can be mounted on both upper/lower terminals

^{3) -} coefficients, k" are not dependent on ambient temperature
9 - dependency of nominal current I_a on ambient temperature can be found in the catalogue, see page D37

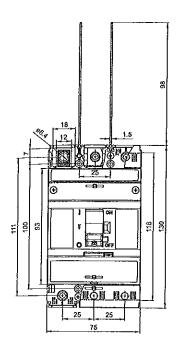
^{5 -} length of cables 2 m is given by standard EN 60 947-1

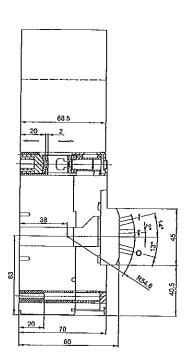
^{6 -} cables length 0.5 up to 1 m

3 P

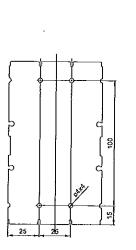
Dimensions

Fixed design, front connection

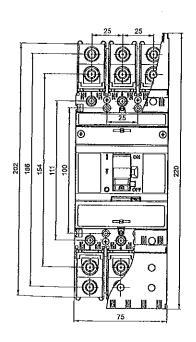


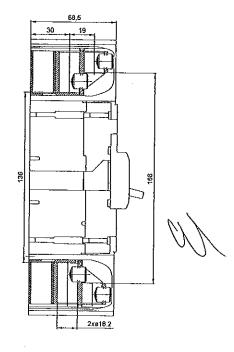






Fixed design, front connection (CS-BC-B021 connecting set)

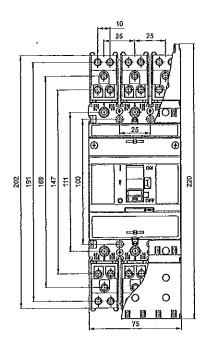


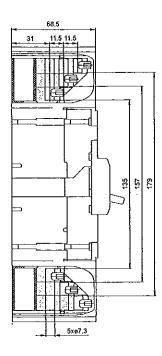




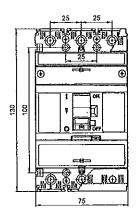
Dimensions

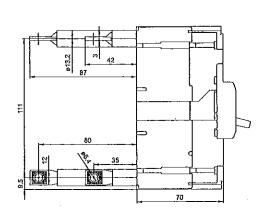
Fixed design, front connection (CS-BC-B014 connecting set)



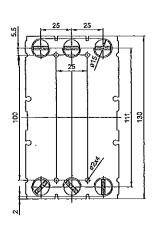


Fixed design, rear connection (CS-BC-A021 connecting set)





Drilling diagram



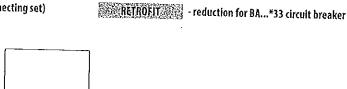




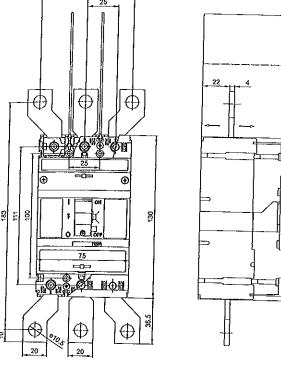
3P

Dimensions

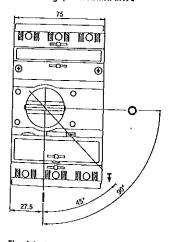
Fixed design, front connection (CS-BC-A033 connecting set)

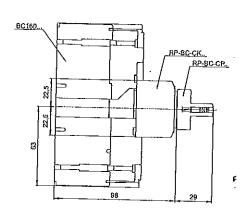




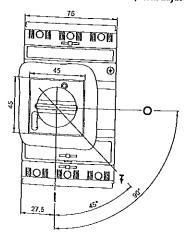


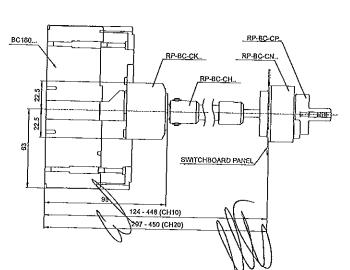
Fixed design, front hand drive



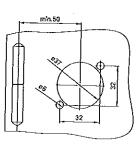


Fixed design, hand drive - front, with adjustable lever



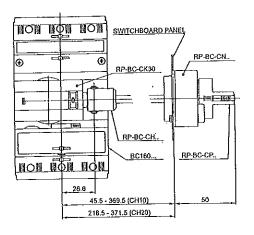


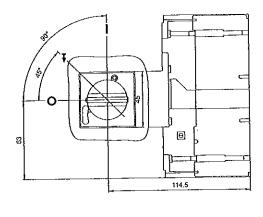
Switchboard door modification



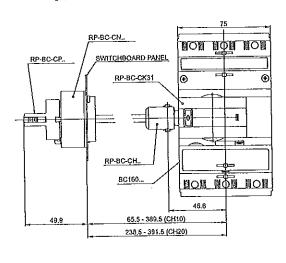
Dimensions

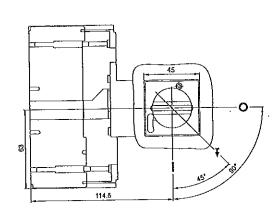
Fixed design, hand drive - control on right side, with adjustable lever





Fixed design, hand drive - control on left side, with adjustable lever

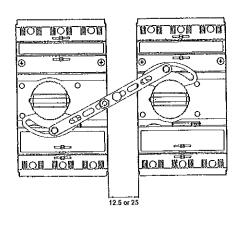


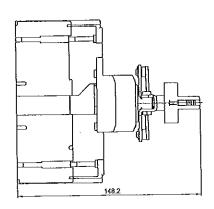


Switchboard modification



Fixed design, circuit breaker with RP-BC-CB10 mechanical interlocking







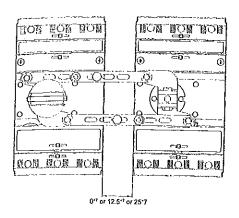


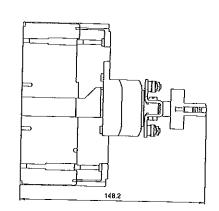
3 P

CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

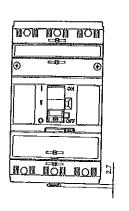
Dimensions

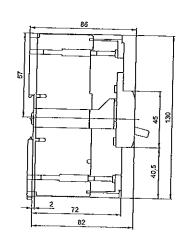
Fixed design, circuit breaker with RP-BC-CD10 mechanical parallel switching



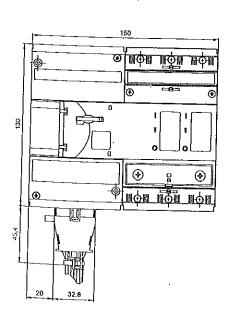


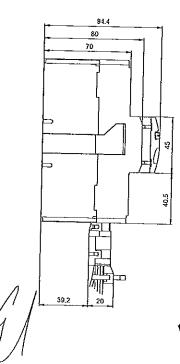
Fixed design, installation on 35 mm DIN rail



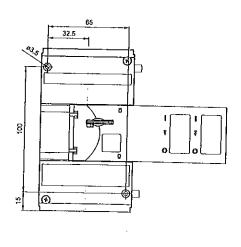


Fixed design, motor drive





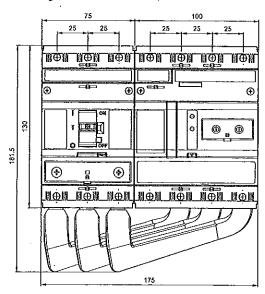
Drilling diagram

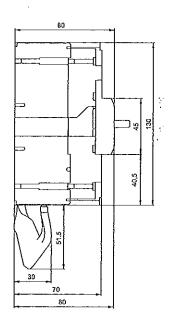




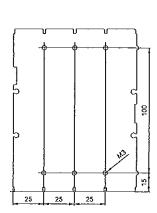
Dimensions

Fixed design, residual current device, rear connection

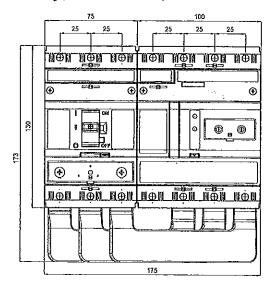


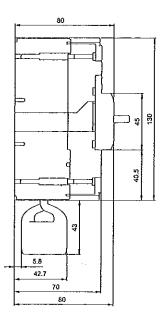






Fixed design, residual current device, bottom connection





07

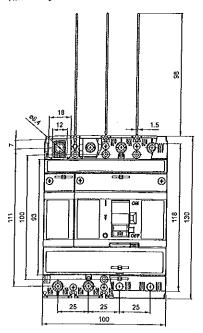


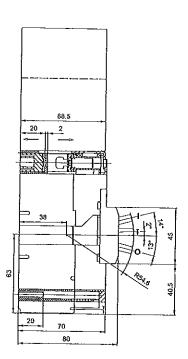


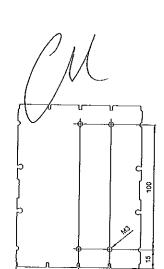
4P

Dimensions

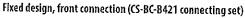
Fixed design, front connection

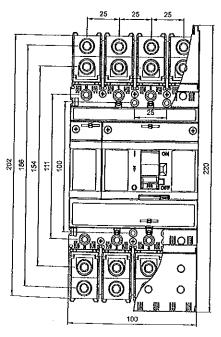


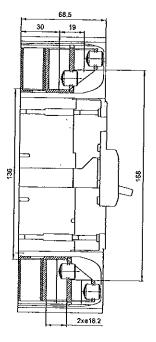




Drilling diagram





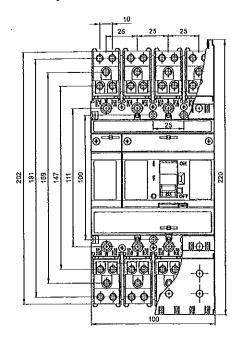


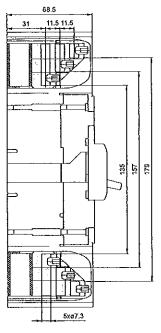




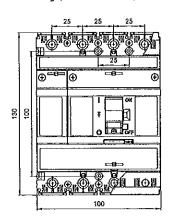
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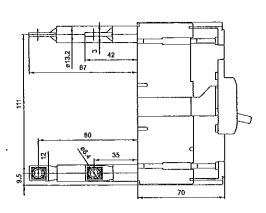
Fixed design, front connection (CS-BC-B414 connecting set)



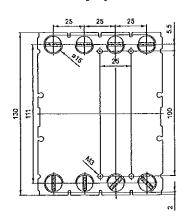


Fixed design, rear connection (CS-BC-A421 connecting set)

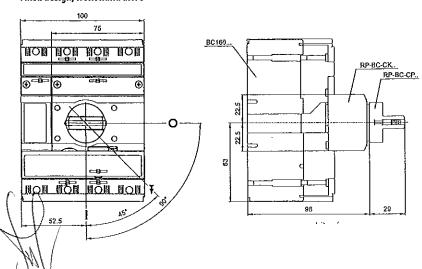




Drilling diagram



Fixed design, front hand drive

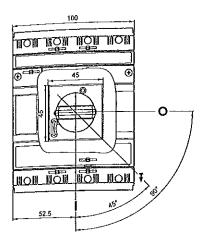


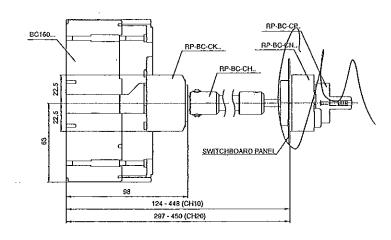




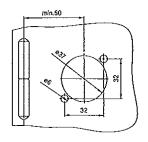
Dimensions

Fixed design, hand drive - front, with adjustable lever





Switchboard door modification

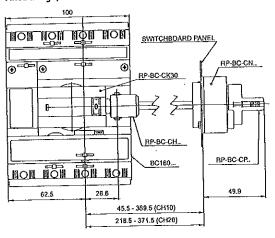


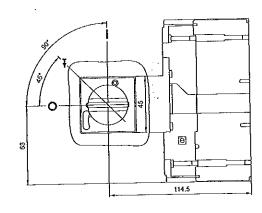




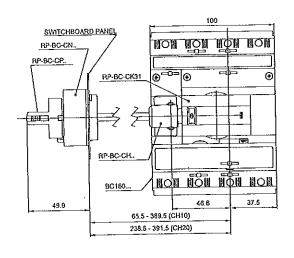
Dimensions

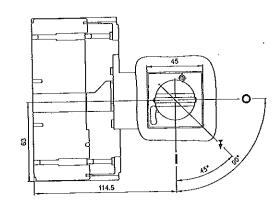
Fixed design, hand drive - control on right side, with adjustable lever





Fixed design, hand drive - control on left side, with adjustable lever





Switchboard modification





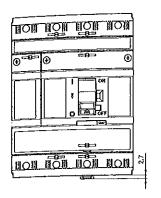


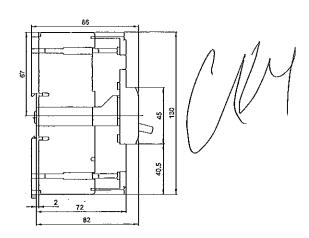


4P

Dimensions

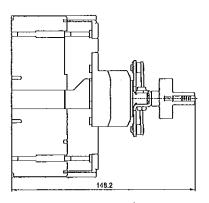
Fixed design, installation on 35 mm DIN rail



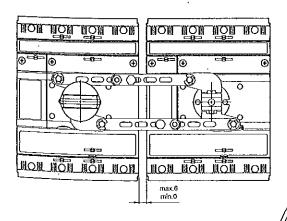


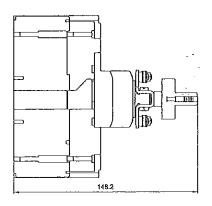
Fixed design, circuit breaker with RP-BC-CB10 mechanical interlocking

| KON NÖN HÖN NO | |
|------------------------|-----------------|
| ⊕ ⁼⁸⁼ ⊕ =8= | |
| | |
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| NON HON NON NON | NOR HOR HOR NOR |



Fixed design, circuit breaker with RP-BC-CD10 mechanical parallel switching

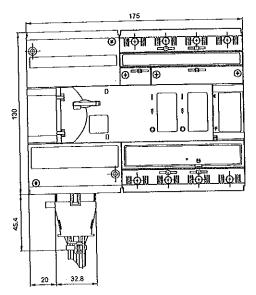




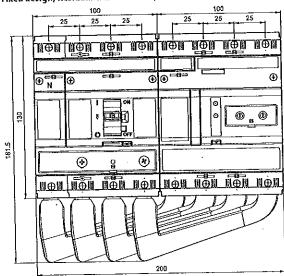


Dimensions

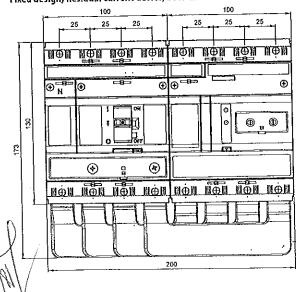
Fixed design, motor drive



Fixed design, Residual current device, rear connection

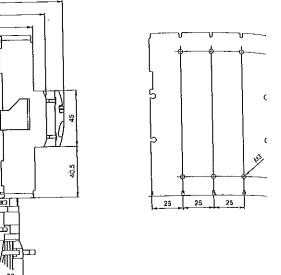


Fixed design, Residual current device, bottom connection

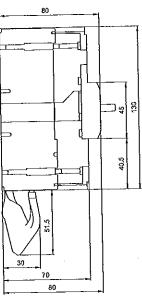


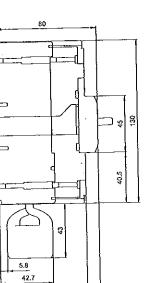
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Drilling diagram

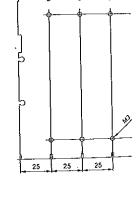


Drilling diagram









OVERCURRENT RELEASES

3P 4P

Overcurrent release is built into circuit breaker. Release cannot be demounted and exchanged. 4-pole circuit breakers are produced in variants:

3P+N (3 poles are protected, N pole is unprotected)
4P (all 4 poles are protected)

Permissible strength of N pole is 100 % |

Tripping characteristics

Circuit breakers are supplied with four types of tripping characteristics.

They are designated with the letters:

"L"- lines (3P, 3P+N, 4P)

- protection lines with low starting currents

"D" - distribution (3P, 3P+N, 4P)

- protection lines and transformers

_M" - motor (3P, 3P+N, 4P)

- motors protection

"N" - only short-circuit release (3P, 4P)

f B BC160N circuit breakers with "L" characteristic have a given and fixed rated current value. The circuit breakers are produced with In values in a standardized series of currents $40 \div 160$ A see table. Short-circuit release is fixed at the setting $4x \ln a$.

B BC160 circuit breakers with "D" characteristic have the option of setting to a reduced current in a range of approximately $0.75 \div 1 \, I_a$. The circuit breakers are produced with I_a values in a standardized series of currents $16 \div 160$ A see table. Short-circuit release is adjustable. Adjustment values are given in the table.

■ BC160N circuit breakers with "M" characteristic have the option of setting to a reduced current in a range of approximately $0.75\div1$ I_n . The circuit breakers are produced with I_n values in a standardized series of currents $16\div100$ A see table. Short-circuit release is fixed at the setting $10xI_n$. Circuit breakers are not produced in 4-pole design.

B BC160N circuit breakers with "N" characteristic have only short-circuit release. They are produced with I_a values in a standardized series of currents from 32 A to 160 A. Short-circuit release is adjustable. Values are given in the table.

Circuit breaker designation is set according to the requested rated current and protection characteristics. For example: Motors protection with I = 32 A.

Type designation will be BC160NT305-32M,

Tripping characteristic setting:

m dependent release (thermal) L (for circuit breakers with characteristics, D" and, M"). Dependent release (reduced current value 1) is being set in a continuous range using the I_i adjustment dial on the overcurrent release. The I_i adjustment range is $0.75 \div 11$.

Independent instantaneous release (short-circuit trip) I (for circuit breakers with "D" and "N" characteristics). With an independent instantaneous release (short-circuit current value I), adjustment is possible in a continuous range. All values are given in the table.

The value of short-circuit release in DC circuit In case that the circuit breaker is used in a DC circuit, it is necessary to set the value of the short-circuit release correctly. DC circuit the short-circuit release I_i (DC) = $I_i \times \sqrt{2}$

Rated currents in accordance with ambient temperature

| 160 | 145 | 160 | 168 | 175 |
|------------|-----|---------|-------|----------|
| 125 | 112 | 125 | 133 | 145 |
| 100 | 92 | 100 | 108 | 122 |
| 80 | 73 | 80 | 88 | 100 |
| 63 | 57 | 63 | 69 | 83 |
| _50 | 48 | - 50 | 36 | 66 |
| 40 | 38 | 40 | 45 | 53 |
| 32 | 29 | 32 | 36 | ./÷ 41 ∵ |
| 25 | 23 | 25 | 28 | 31 |
| 20 | 19. | 20 | 22 | 25 |
| 16 | 15 | 16 | 17 | 19 |
| | 新的 | e torca | #2010 | (1515 Č |
| AT ALL | | | | |

Ranges of overcurrent release and their possible setting at 40 °C

| | BC160N | 1305;†;; L | BC160N | 1305 is D. | # BC160NT | OS WHAT | # BC16 | ONT305(\$\.\.) |
|-------------------|-----------------------|-------------------------------------|-------------|---------------|--------------------|-----------|--------|----------------|
| | i janja | | a alf(Alia) | (SEE) (A) | i plate | LODIAL CO | ji (A) | PARTIAL X |
| 16 | | en en far betre fan en en | 12.5 ÷ 16 | 160 ÷ 240 | 12.5 ÷ 16 | 160 | - | |
| 20 | Spilling S | | 16 + 20 : . | 200 ÷ 300 | 16÷20 | 200 | ŊĠĸŧĊ | |
| 25 360 6000000 | = Gastanto teri | e Autoria de la Augusta de la Co | 20 ÷ 25 | 250 ÷ 375 | 20 ÷ 25 | 250 | - | - |
| 32 | 本版版 | | 25 ÷ 32 | 160 ÷ 320 | 25 ; 32 | 320 | | 160 ÷ 320 |
| 40 | 40 | 160 | 32 ÷ 40 | 200 ÷ 400 | 32 ÷ 40 | 400 | | 200 ÷ 400 |
| 50 👈 | v2 50 | 200 | 40 + 50 | 250 ÷ 500 | √ 40 ÷ 50 | 500 | | 250 ÷ 500 |
| 63 | 63 6.27% (355-955) | 252 | 50 ÷ 63 | 315 ÷ 630 | 50 ÷ 63 | 630 | - | 315 ÷ 630 |
| \$ 80 X | . 80 . | 320 | 63÷80 | > 400 ÷ 800 ∞ | 63 ÷ 80 | 800 | | 400 ÷ 800 |
| 100 | 100 | 400 | 80 ÷ 100 | 500 ÷ 1 000 | 80÷100 | 1 000 | | 500 ÷ 1 000 |
| 125 | 125 | 500 | 100 ÷ 125 | 625 ÷ 1 250 | 法经验的 | | | 625 ÷ 1 250 |
| 160 | 160 | 640 | 125 ÷ 160 | 800 ÷ 1 600 | | | | 800 ÷ 1 600 |

Tripping characteristic class

Tripping times of the overcurrent release of circuit breakers BC160 with characteristic M at $7.2 \, l_{\rm n}$ corresponds to the release class 10 A, 10 and 20 according to EN 60947-4-1.

| 100 | and processing | e dine |
|------------------------|------------------|--------|
| 16 | BC160NT305-16-M | 10A |
| 20 | BC160NT305-20-M | 10A |
| 25 | BC160NT305-25-M | 10A |
| 32 | BC160NT305-32-M | 10 |
| 40 | BC160NT305-40-M | 10 |
| - 50 | BC160NT305-50-M | 20. |
| 63 10 m (5, amb y m | BC160NT305-63-M | 20 |
| 80 | BC160NT305-80-M | 20 |
| 100 | BC160NT305-100-M | 20 |





OVERCURRENT RELEASES - D



Short-circuit release Reduced current $1 = 16 \, \text{A}$ BC160NT305-16-D $I_{-} = 20 \text{ A}$ BC160NT30S-20-D I = 25 ABC160NT305-25-D $I_{2} = 32 \text{ A}$ BC160NT305-32-D $1 = 40 \, \text{A}$ BC160NT305-40-D 1 = 50 ABC160NT305-50-D $1 = 63 \, \text{A}$ BC160NT305-63-D $I_{.} = 80 A$ BC160NT305-80-D $I_{-} = 100 \, A$ BC160NT305-100-D $I_1 = 125 \text{ A}$ BC160NT305-125-D I = 160 A BC160NT305-160-D

Properties

- suitable for protection of lines and distribution transformers
- m protects against both overcurrent and short circuit
- **Example 2** reduced current setting $I_a = 0.75 \div 1I_a$
- setting of short-circuit release:
- circuit breakers with $l_a = 16$ A, 20 A, 25 A, 32 A in the range of $10 \div 15 l_a$
- -circuit breakers with $l_{\rm p}$ = 40 A to 160 A in the range of 5 ÷ 101
- setting of l_g and l_l by means of knobs is smooth and linear in the marked range
- overcurrent release indicates circuit breaker switching off by overcurrent or short circuit by an optical symbol [Est]
- the values of parameters of the overcurrent release are set by the manufacturer to maximum

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release setting
Reduced current
Short-circuit release current

BC160NT305-... D

l,A LA(....xl_a)



IMPORTANT

the set value of current of the short-circuit release must correspond to the impedance loop -conditions must be fulfilled for automatic disconnection from power supply in case of failure

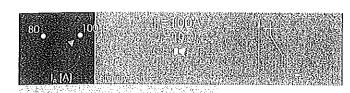


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OVERCURRENT RELEASES - M

3P 4P







 $I_n = 16 \text{ A}$ BC160NT305-16-M



 $I_n = 20 \text{ A}$ BC160NT305-20-M

 $I_n = 25 \text{ A}$ BC160NT305-25-M

L = 32 A

BC160NT305-32-M

 $I_n = 40 \text{ A}$ BC160NT305-40-M

I_ = 50 A

BC160NT305-50-M

 $l_{\perp} = 63 \text{ A}$

BC160NT305-63-M

I = 80 A

BC160NT305-80-M

 $I_n = 100 \text{ A}$ BC160NT305-100-M



Properties

- appropriate for protection of motors
- protects against both overcurrent and short circuit
- **B** reduced current setting $I_a = 0.75 \div 1I_a$
- f e the value of the short-circuit release is fixed at 10 $f l_a$
- setting of l_k by means of knob is smooth and linear in the marked range
- overcurrent release indicates circuit breaker switching off
 by overcurrent or short circuit by an optical symbol (Far)
- m the values of parameters of the overcurrent release are set by the manufacturer to maximum

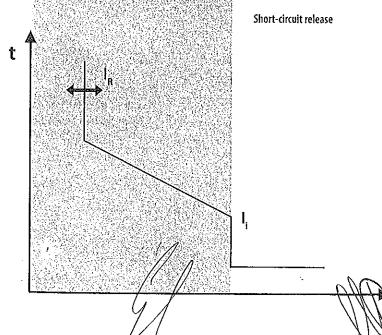
Data for the project

Circuit breaker
Overcurrent release
Overcurrent release setting
Reduced current

Short-circuit release current

M ... A (10x I₂)

BC160NT305-...





IMPORTANT

reduced current I_s must not be higher than rated current of the motor

OVERCURRENT RELEASES - L

 $I_n = 40 \text{ A}$ BC160NT305-40-L



 $I_n = 50 \text{ A}$ BC160NT305-50-L

 $I_n = 63 \text{ A}$ BC160N1305-63-L

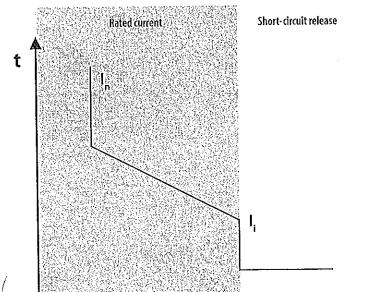
 $I_n = 80 \text{ A}$ BC160NT305-80-1.

 $I_n = 100 \text{ A}$ BC160NT305-100-L

 $l_n = 125 \text{ A}$ BC160NT305-125-L

I_n = **160 A** BC160NT305-160-L





Properties

- the release is suitable for protection of lines with low impulse currents
- 🗷 protects against both overcurrent and short circuit
- \boldsymbol{m} it is not possible to set a reduced current $\boldsymbol{I}_{\boldsymbol{R}}$
- m the value of the short-circuit release l, is fixed at 4 l

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release values
Rated current

Short-circuit release current

BC160NT305-.



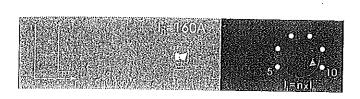
IMPORTANT

high impulse current must not be in the circuit - undesirable breaking would take place, because the current of the short-circuit release is fixed at 4!

M

OVERCURRENT RELEASES - N

3P 4P



Short-circuit release

1 = 50 A

BC160NT305-40-N

I = 32 A

 $l_{.} = 40 \text{ A}$

BC160NT305-32-N

BC160NT305-50-N

 $I_n = 63 \text{ A}$ BC160NT305-63-N

 $I_n = 80 \text{ A}$ BC160NT305-80-N

I = 100 A BC160NT305-100-N

 $I_n = 125 \text{ A}$ BC160NT305-125-N

I_n = **160 A** BC160NT305-160-N



Properties

- m for protection of e.g. motors with own overload protection
- it does not protect in the overload range it does not react to low over-currents
- f e the set values of the short-circuit release within 5 \div 10 $I_{f e}$
- ${\bf m}$ setting of ${\bf I}_{\rm I}$ by means of knobs is smooth and linear in the marked range
- the overcurrent release indicates circuit breaker switching off by short circuit by an optical symbol 🗺
- the values of parameters of the overcurrent release are set by the manufacturer to maximum

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release setting
Rated current
Short-circuit release current

BC160NT305-... N

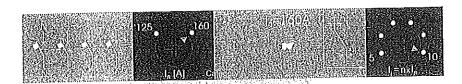
A(C.XI)



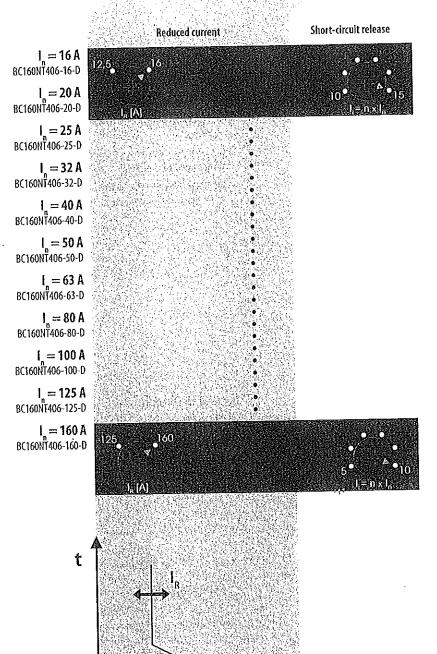


the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure

OVERCURRENT RELEASES - D







Properties

- it is appropriate for protection of lines and distributio transformers with protected "N" conductor in TN-C-S TN-S networks
- protects against both overcurrent and short circuit
- **n** reduced current setting $l_8 = 0.75 \div 11_n$
- setting of short-circuit release:
 - circuit breakers with $I_a = 16$ A, 20 A, 25 A, 32 A in the range of $10 \div 15 I_a$
 - circuit breakers with $l_a = 40$ A to 160 A in the range of 5
- $\mbox{\ensuremath{\mathbf{g}}}$ the value of reduced current $\mbox{\ensuremath{\mathbf{I}}}_{\mbox{\ensuremath{\mathbf{g}}}}$ and of short-circuit rel for the fourth pole is the same as for the other three
- setting of i_k and i_k by means of knobs is smooth and i in the marked range
- the overcurrent release Indicates circuit breaker swite off by short circuit by an optical symbol [84]
- the values of parameters of the overcurrent release a by the manufacturer to maximum

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release setting
Reduced current
Short-circuit release current

BC160NT405-.

D .

_kΑΑ(....xI_r



IMPORTANT

the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure



 $l_{1} = 160 A$

BC160NT406-160-L

OVERCURRENT RELEASES - L

4P



Properties

- it is appropriate for protection of lines with low starting currents including the protected "N" conductor in TN-C-S and TN-S networks
- it protects against overcurrent and short circuit
- \mathbf{m} it is not possible to set a reduced current $\mathbf{I}_{\mathbf{g}}$
- the value of the reduced release I, is fixed at 4 l
- the value of reduced current I_R and of short-circuit release I_R for the fourth pole is the same as for the other three poles
- the values of parameters of the overcurrent release are set
 by the manufacturer to maximum

 $I_n=160A \qquad \qquad I_{k}=I_n \\ I_k=I_n \\ I_j=4\cdot x\cdot I_n$ Calegory A

Rated current

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release values
Rated current
Short-circuit release current

BC160NT406-... LAA (4x1_a)



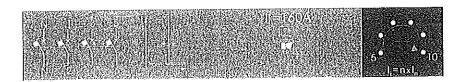
Short-circuit release

IMPORTANT

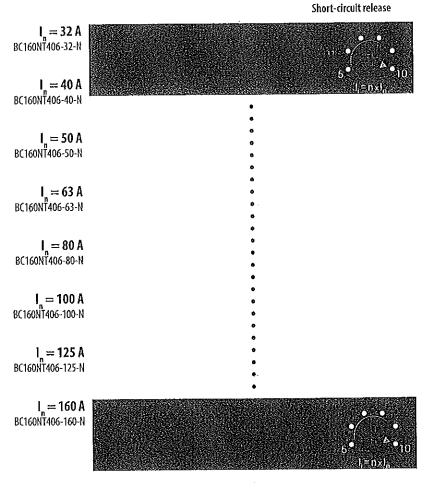
high impulse current must not be in the circuit

 undesirable breaking would take place,
 because the current of the short-circuit
 release is fixed at 4 l.

OVERCURRENT RELEASES - N







Properties

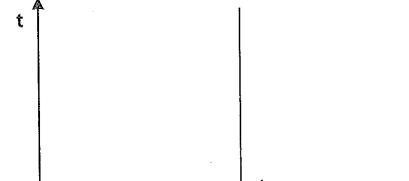
- the release is suitable for protection of e.g. motors own overload protection in TN-C-S a TN-S network:
- it does not protect in the overload range it does r to low over-currents
- m the set values of the short-circuit release within 5 -
- the value of the short-circuit release I, for the fourth the same as for the other three poles
- setting of I, by means of knobs is smooth and linear marked range
- the overcurrent release indicates circuit breaker sw off by short circuit by an optical symbol
- the values of parameters of the overcurrent release by the manufacturer to maximum

Data for the project

Circuit breaker
Overcurrent release
Overcurrent release setting
Rated current
Rated current

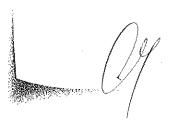
BC160NT406 N

I, 提為A(A)





the set value of current of the short-circuit release must correspond to the impedance loc -conditions must be fulfilled for automatic disconnection from power supply in case of failu





3P 4P

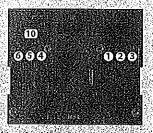
SWITCHES



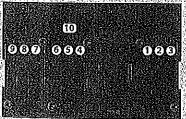
Auxiliary switch PS-BC-0010 / PS-BC-0010-Au
- make-and-break contact



Signal switch NS-BC-0010 / NS-BC-0010 Au - make-and-break contact -- switch can be used only in cavity No. 1



Position of cavities in BC160N.... circuit breaker/ /switch-disconnector. When one of cavities 4, 5 or 6 is in use, cannot be used with a shunt trip or undervoltage release.



Position of cavities in BC160NT4, : circuit breaker/ /switch-disconnector. When one of cavities 4,5 or 6 Is in use, cannot be used a shunt trip or undervoltage release

Specifications

| CONTRACTOR DESCRIPTION OF THE PROPERTY OF THE | Date of the second seco | | |
|---|--|--------------------------------------|--|
| Type | Parish salities | PS-BC-0010, NS-BC-0010 | PS:B\$ 0010-Au; NS-BC-0010-Au- |
| Rated operating voltage | U, | 60 ÷ 250 V a.c. | S ÷ 60 V a.c. |
| | • • | 60 ÷ 250 V d.c. | 5 ÷ 60 V d.c. |
| | | 250 V. | 250V |
| Rated impulse withstand voltage | je U _{kra} | 4 kV | 4 kV |
| Rated frequency | | 50/60 Hz | 50/60 Hz |
| Rated operating current | I,/U, AC-12 | 6 A/250 V | 0.004 ÷ 0.1 A/5 ÷ 60 V |
| | AC-15 | 5 A/60 V, 3 A/110 V, 1.5 A/230 V | $0.004 \div 0.1 \text{ A/5} \div 60 \text{ V}$ |
| | DC-12 | 0.25 A/2SOV | 0.1 A/60 V |
| tion comments and | DC-13 | 0.5 A/60 V, 0.2 A/110 V, 0.1 A/250 V | $0.004 \div 0.1 \text{ A/S} \div 60 \text{ V}$ |
| Thermal current | | 64 | 0.5 A |
| Arrangement of contacts | | 001 | 001 |
| Connection cross-section | ()\$ | 0.5 ± 1 mm ² | . 0,5 ÷ 1 mm² |
| Degree of protection of termina | le (connected suitch) | IP20 | IP20 |

Function, name and location of switches according to type designation

| Types and the state of the | Synthiname | Position of switch as | Switch function (1995) State of the Switch Control of the Switch C |
|----------------------------|--------------|--|--|
| PS-BC-0010 | Ath | C. 2. 47 2. 2. 4. 5. 45 | Signals state of circuit breaker/switch-disconnector's main |
| PS-BC-0010-Au | Auxiliary | Cavity 1 ²³ , 2, 3, 4, 5, 6 ¹³ | contacts |
| NS-BC-0010 | \$100.105 PM | | |
| NS-BC-0010-Au | Signal | Cavity 14 | Signals tripping of circuit breaker by overcurrent release |

^{11 -} when one of cavities 4, 5 or 6 is in use for auxiliary switches, cannot be used a shunt trip or undervoltage release

States of switches in circuit breaker/switch-disconnector

| Cayly | | | 7.743.455677891 | | 700 0 |
|---|------------------------------|----------------------------|-----------------|------------|--------------------|
| State of circuit breaker | Grait breaker lever position | State of the main contacts | PS-8C-0010 | NS-BC-0010 | SV-BC-X SP-BC-X |
| Switchedon | 1 | 1. | .1.0 | 0 1 | |
| Switched off manually (loaded state) | | 0 | 0 1 | 0 1 | 1 |
| Switched off by the overcurrent release or INSPECTION push button | ∛ | 0 | 0 1 | 1.0 | 1: |
| Switched off by auxiliary release | ₹ | 0 | 0 1 . | 0 1 | 0 |
| Switched off by TEST push button | ₹. | 0 | 0 1 | 0 1 | 1313 |

note: 0 - contact open, 1 - contact closed

*only 4P design



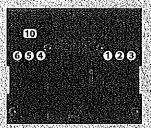
²¹ - in cavity 1, PS-BC-0010 auxiliary switch and NS-BC-0010 signal switch cannot be used simultaneously

SHUNT TRIPS

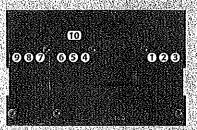


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| ٦п | $\mu_{\Gamma 111}$ | CALL | nn |
| | | | |

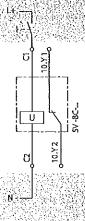
| Type | | SV BCX |
|---|-----------------------|--|
| Rated operating voltage | U. | 24, 48, 110, 230, 400 V a.c. 24, 48, 110, 220 V d.c. |
| Rated frequency | $f_{\vec{a}}$ | 50/60 Hz |
| • • | 40 | 2 YA |
| Tanan sa kacamatan sa |)C | 2W |
| Characteristic | | $0 \ge 0.7 \text{U}_{\downarrow}$ the circuit breaker must trip |
| Time to switching off | | 15 ms |
| Loading time | | |
| Connection cross-section | S | 0.5 ÷ 1 mm² |
| Degree of protection of termin | als (connected rel | ease) IP20 |
| Position in cavity No. | | 10 |
| | | SIGNAL SWITCH as lighted tripping by short to |
| Rated operating voltage | U, | 230 V a.c. |
| Rated insulation voltage | | 250 V |
| Rated impulse withstand voltage | e U _{tro} | 4 kV |
| Rated frequency | (1901) (1901) | 50/60 Hz |
| Rated operating current | ١٠/٥° | 2 N/230 V a.c. |
| Thermal current | | 64 |
| Arrangement of contacts | | 01 |



Position of cavities in BC160NT.,.. circuit breaker/ /switch-disconnector. When shunt trip is used, cavities 4, 5, 6 cannot be used for auxiliary switches



Position of cavities in BC160NTA, circult breaker/ /switch-disconnector. When one of cavities 4, 5 or 6 is in use, cannot be used a shunt trip or undervoltage release.

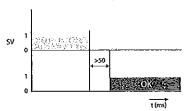


Type designation according to rated operating voltage

| | Elije St. |
|-------------------------------|------------|
| 24, 48 V a.c./d.c. | SV-BC-X024 |
| 110, 230 V a.c/110, 220 V d.c | SV-BC-X110 |
| 230, 400 V a.c./220 V d.c. | SV-BC-X230 |

The specific rated operating voltage of the release is set up by jumpers directly on the release. The setting from the manufacturer is always to the value corresponding to the type designation. (see fig. 1)

Reaction time of the shunt trip



Cooperation of motor drive and shunt trip

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and shunt trip at once. The following time delays have to be kept between the disconnection of voltage from the shunt trip and the control impulse for switch on of the motor drive:

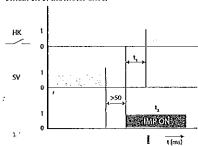
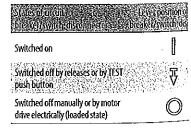




Fig. 1 - The rated operating voltage setting

States and positions of circuit breaker/switch-disconnector lever



Description of graphs

| HK Sympos | Main contacts |
|--------------|--------------------------------------|
| OK | Circuit breaker is ready for further |
| IMP ON | Make impulse for the motor drive |
| SV. | Control yoltage on the shunt trip |

 $t_1 = 70 \text{ ms (mode 1, 2), /140 ms (mode 3)}$ $t_2 = 60 \div 500 \text{ ms (mode 1, 3), } 60 \div \infty \text{ (mode 2)}$



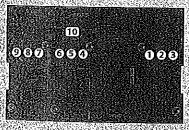
3P 4P

UNDERVOLTAGE RELEASES

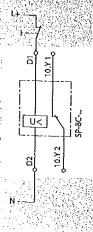


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Position of cavities in BC160NT... circuit breaker/ /switch-disconnector. When undervoltage release is used, cavities 4, 5; 6 cannot be used for auxiliary switches.



Position of Cavities in BC160NT4. : circult breaker/ /switch-disconnector. When one of cavities 4, 5 or 6 is in use, cannot be used a shunt trip or undervoltage release.



Specifications

| Specifications | | X |
|---------------------------------|---------------------|--|
| Type | | SP:BCY/ |
| Rated operating voltage | U _e | 24, 48, 110, 230, 400 V a.c. |
| `n. 11 | | 24, 48, 110, 220 V d.c. |
| Rated frequency | | 50/60 Hz |
| | NC NC | 2 V A 2W |
| Characteristic ¹⁾ | | $U \le 0.35 U_c$ the circuit breaker must trip. $U \ge 0.85 U_c$ it is possible to switch on the circuit breaker |
| Time to switching off | | 15 ms |
| Loading time | | |
| Connection cross-section | S | $0.5 \div 1 \text{ mm}^2$ |
| Degree of protection of termina | ls (connected relea | se) IP20 |
| Position in cavity No. | | 10 |
| | | SIGNALSWITCH signals tripping by Unidevoltage release |
| Rated operating voltage | U, | 230 V a.c. |
| Rated insulation voltage | . u , 3/3; | 250V |
| Rated impulse withstand voltage | U _{lesp} | The control of the section of the se |
| Rated frequency | | \$50/60 Hz |
| Rated operating current | 1,/0 | 2A/230 V a.c. |
| Thermal current | | 64 |
| Arrangement of contacts | | 나는 사람들이 가장 그는 사람들이 되었다. 그 사람들이 되었다면 하는 사람들이 되었다면 하는 것이 되었다면 하는 것이 되었다. |

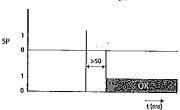
^{13 -} tripping of the undervoltage release can be delayed using the delay unit BZ-BX-X230-A, for more detailed information see page P2

Type designation according to rated operating voltage

| | lypeles |
|--------------------------------|------------|
| 24, 48 V a.c./d.c. | SP-BC-X024 |
| 110, 230 V a.c./110, 220 V d.c | SP-BC-X110 |
| 230, 400 V a.c./220 V d.c. | SP-BC-X230 |

The specific rated operating voltage of the release is set up by jumpers directly on the release. The setting from the manufacturer is always to the value corresponding to the type designation (see fig. 1).

Reaction time of the undervoltage release



Cooperation of motor drive and undervoltage release

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and undervoltage release at once. The following time delays have to be kept between bringing the voltage to the undervoltage release and the control impulse for switch on of the motor drive:

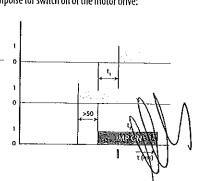




Fig. 1 - The rated operating voltage setting

States and positions of circuit breaker/switch-disconnector lever

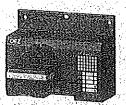
| | everposition of arcuits a kevisyndisdisconnector |
|---|---|
| Switched on | |
| Switched off by releases or by TEST push button | ₹ |
| Switched off manually or by motor drive electrically (loaded state) | 0 |

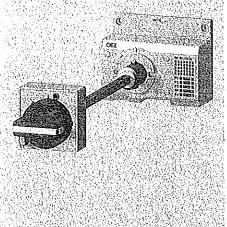
Description of graphs

| Symbol 1 | «Description |
|----------|---|
| нк | Main contacts |
| OK | Circuit breaker is ready for further handling |
| IMP ON | Make impulse for the motor drive |
| SP | Control voltage on the undervoltage release |

 t_1 = 70 ms (mode 1, 2), 140 ms (mode 3) t_2 = 60 ÷ 500 ms (mode 1, 3), 60 ÷ ∞ (mode 2)

HAND DRIVES





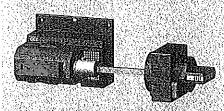


Fig. 3 - DIMENSIONS, see page D28, D34

Description

The hand drive permits controlling the circuit breaker//switch-disconnector by turning the lever, e.g. to switch machines on and off. Modular conception of the drives enables simple mounting on the circuit breaker (also additionally) after the cover of cavities is removed. The fixed drive can be sealed. The drive and its accessories are ordered separately according to your choice, see page 013.

■ The hand drive makes possible to control the circuit breaker:

a) from the front panel (fig. 1)

Hand drive unit RP-BC-CK..

+ Hand drive lever RP-BC-CP..

b) through the switchboard door (fig. 2)

Hand drive unit RP-BC-CK..

- + Extension shaft RP-BC-CH...
- + Hand drive bearing PR-BC-CN..
- + Hand drive lever + RP-BC-CP..
- c) through the side wall of the switchboard (fig. 3)
 - in left- or right-side designs Hand drive unit for side control

right RP-BC-CK30

- or left RP-BC-CK31
- + Extension shaft RP-BC-CH...
- + Hand drive bearing PR-BC-CN..
- + Hand drive lever + RP-BC-CP..
- The hand drive unit is fixed directly to circuit breaker or switch-disconnector.
- ₱3 He hand drive bearing is fixed to the switchboard door and it provides degree of protection IP40 or IP66.
- Hand drive lever is fixed on the hand drive unit or on the hand drive bearing.
- The extension shaft is supplied in two options, standard (length 350 mm can be shortened) and telescopic (adjustable length 199 ÷ 352 mm).

Enhanced safety for operator:

■ The hand drive unit and hand drive lever are also supplied with the possibility to lock the circuit breaker in position "switched off manually". The unit and lever of the hand drive can be locked using three padlocks with shank diameter max. 4 mm.

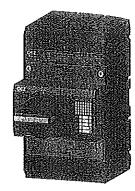


Fig. 1 - DIMENSIONS, see page D27, D31

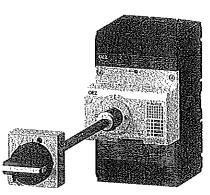


Fig. 2 - DIMENSIONS, see page D27, D33

- Each hand drive bearing prevents the switchboard door from opening when the circuit breaker is switched on or ina state of being switched off by releases. By means of the device, it is possible to turn off this locking and to open the door. Locking of the switchboard door opening also is possible in the circuit breaker's switched off manually state. It is necessary to activate the locking by means of the lever on the bearing and to lock the hand drive.
- Two circuit breakers with hand drives can be fitted abs with reciprocal mechanical interlocking or mechanical parallel switching, see page D49.

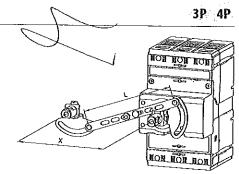
Specifications

| specific | 1610112 | | | | | | | | | me=233 |
|---------------------------------------|---|--------------------------|--|---|--|-------------------------------------|--|---------------------------|-----------------------------------|----------------|
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| ivie | Description | and the factor of the | individue the o | | THE PERSON NAMED AND ADDRESS OF THE PERSON NAMED AND ADDRESS O | | | | oor opening Willy - Length | |
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| RP-BC-CK1 | O Hand drive unit blue | blue | no | _ | - | | | ··· | - | - |
| RP-BC-CK2 | 经收收 化二氯甲基苯甲基苯甲基苯酚 | blue | 3494 84555 943 | | | | | HERRICH TOP | | |
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| RP-BC-CK3 | O Hand drive unit – right s | ide blue | no . | | | | 是心性衰弱 | 建筑线影响 | | - 1 |
| RP-BC-CK3 | Hand drive unit - left sid | le blue | no | - | - | | - | | - | |
| RP-BC-CP1 | 0 Hand drive lever | black | no. | ingererakket. 1000 april 1884 e | | 多的。它是这种的 表示。2013年 | 第45人的 第45人的 | | | |
| RP-BC-CP2 | 10 Hand drive lever | black | yes | _ | - | | - | | - | |
| RP-BC-CP2 | 1 Hand drive lever | red | yes | STAGORAN | | vice in the | | | | |
| RP-BC-CN1 | 10 Hand drive bearing | black | - | IP40 | yes | ý | es |) | res . | - - 5.3.8 |
| RP-BC-CH | 11 Hand drive bearing | yellow | | IP40 | yes X Production | SECTION IN | 6 , 1 | | (es/) | |
| RP-BC-CN7 | 20 Hand drive bearing | black | - | IP66 | yes | у | es | /) | red [| # * / \$ |
| RP-BG-CN | 21 Hand drive bearing | yellow 🖖 | ALAENSA. | IP66 | yes | | 8 | 為海峡及河南 | 6 | - 3 |
| RP-BC-CH | 化工工工具 医多种性神经病性病病 化硫酸二烷烷 | an i an an an an an E | ra komatematan (garusar). — | ran essannighan a | A STATE CASE LANGUE STATE | 60.50.68.41.50. 55.155 | en e | 17 | _ / 350(| can be |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | Excusor share | | • | | | | | | | teneo) |
| RP-BC-CH | 20 Extension shaft | 4.科格拉拉拉的 | 的影響對於 | SHEWSA | 第349 14333 | | | | √ 199 | ÷352 |
| VY [3] | | | | | | 想法理學家 | | 學學學的學是 | /, telescop | ic design |

RP-BC-CB10 Mechanical interlocking

Provides mechanical interlocking of two circuit breakers//switch-disconnectors so that they cannot both be tripped simultaneously, but only one of them at a time. Both circuit breakers may be switched off simultaneously. Interlocking can be used between two BC160N circuit breakers. Both circuit breakers must be equipped with a hand drive (at least one with a hand drive unit and hand drive lever) see page D48. In order to use the interlocking, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table. For correct function and signalling the state of the BC160 circuit breaker with RP-BC-CB10 mechanical interlocking, circuit breaker must be switched off, or switch-disconnector must be in loaded position.

| Dimension | and the first that the same of |
|-----------|--|
| Х | 87.5 or 100 |
| | 94.5 or 106 |



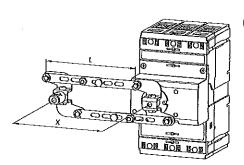


RP-BC-CD10 Mechanical parallel switching

Enables for simultaneous switching of two circuit breakers/switch-disconnectors. Parallel switching can be used between two BC160N circuit breakers. Both circuit breakers must be equipped witha hand drive unit and at least one with a hand drive lever, see page D48.

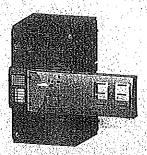
In order to use parallel switching, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table.

| Dimension | a sedmil ce |
|-----------|-------------------------|
| χ | 75+7 or 87.5+7 or 100+7 |





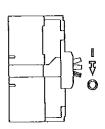




Motor drive side MP-BC-X...-B



Connecting cable OD-BC-KA02



Switched on manually or by motor drive electrically

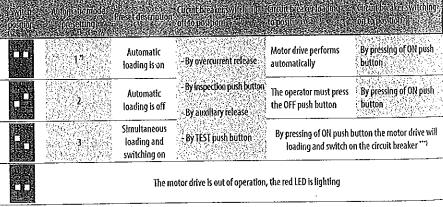
- Switched off by overcurrent releases, shunt trip of undervoltage release, TEST or INSPECTION push button
- Switched off manually or by motor drive electrically, loaded state

Description

- Motor drive is an accessory of the circuit breaker/switch-disconnector, by means of which it is possible to switch the circuit breaker or switch-disconnector on and off remotely. Modular conception of the drives enables simple mounting on the circuit breaker also additionally. The drive is used for both remote and local control of 3-pole and 4-pole circuit breakers BC160. It is manufactured in the design for side mounting next to the circuit breaker on the switchboard panel or on DIM rail. The mounting of motor drive to the circuit breaker is done by bayonet mechanism placed on the side of the circuit breaker. The mounted motor drive can be locked by means of terminal cover seal.
- Modeion BC160 circuit breakers with the motor drive are intended for industrial, power engineering and infrastructure applications. The motor drives have a system of direct control of the circuit breaker, without a spring storage unit.
- The motor drive can work in the local or remote control mode. The local control mode is used, for instance in loss of control voltage. Local control of the circuit breaker is accessible only after lifting the transparent safety cover of the drive off. This action locks the remote electrical control circuits automatically. The lifted off position of the cover can be indicated remotely.

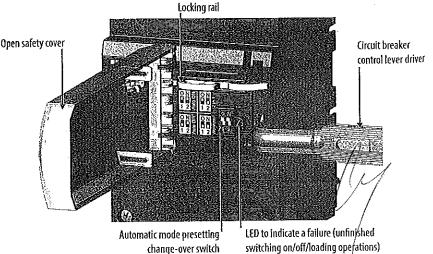
- The circuit breaker is switched on and off by means of the control lever driver. After returning the safety cover to the original position, the drive is switched into the remote control mode automatically.
- After lifting the safety cover off it is possible to handle an automatic mode presetting change-over switch. Under the transparent cover there is also a red LED which lighting indicates a failure (unfinished switching on/off/loading operations).
- Electronics circuits of the motor drive block erroneous control processes, e.g. drive cycling after overcurrent or auxillary release tripping.
- Side drive can be locked in off position of the circuit breaker by up-to three padlocks with shaft diameter with shank diameter max. 4 mm. It is possible to signal the locking remotely. The protective cover of the drives can also be sealed.
- The position of the main contacts of the circuit breaker indicated by the position of the circuit breaker driver lever under the transparent protective cover of the drive. The wound up position of the circuit breaker can also be signalled remotely.
- In the remote control mode the circuit breaker is switched on and off by ON and OFF push buttons respectively. The motor drive accessories include an extension cable OD-BC-KAO2.

Motor drive automatic mode presettings



- Standard factory setting of the switch.
- When the circuit breaker is switched off by the motor drive electrically with the use of the OFF push button, the circuit breaker control level qets into the wound up position automatically, independently of the automatic mode presetting.
- By pressing the OFF push button, the motor drive only winds the circuit breaker up to the position.

Side drive description



3P 4P

Diagram

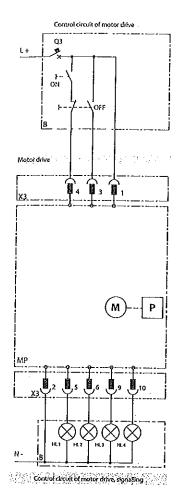


Diagram description

| MP | motor drive - MP-BC |
|------------------|---|
| M | motor |
| P | gearunit |
| ХЗ | connector for connection of control and signalling circuits |
| В | recommended wiring of the control circuits - it is not a part of MP-BC |
| ON | |
| OFF | switch off button |
| Q3 | motor drive circuit breaker |
| HL1 remote failu | re signalling (unreliable switching on or switching off), |
| | ssible load 10 W ¹¹ |
| HL2 signalling o | f circuit breaker lever position_loaded", max. permissible load 10 W ! |
| HL3 signalling o | f opening of the front safety cover of the drive, max. permissible load |
| HL4 signalling o | f exsertion of the drive locking bar, max, permissible load 10 W $^{\circ}$ |
| | |

 $^{^{\}rm D}$ voltage on terminals 5, 6, 7, 8, 9,10 is the same as $\rm U_{\rm n}$ of the motor drive

For complete wiring diagram of the circuit breaker BC160 with motor drive see page D16

Specifications

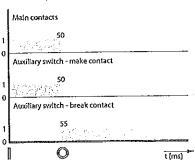
| | APBGX B |
|--|---|
| U <u>.</u> | 24, 48, 110, 230 V a.c. |
| - 11 or | 24, 48, 110, 220 V d.c. |
| | 50/60 Hz |
| for switching on | 60 ms ÷ ∞ ") |
| for switching off | 60 ms ÷ ∞ *) |
| AND THE SEASON AND THE SEASON | <70 ms 32 |
| रार्थ के विवेशिक्य केसी कि स्टिक्ट्री प्रश्नीमान्द्र, राज्ये | < 50 ms ¹ |
| | 5 cycles/min |
| era rackourourourourouro F F | erversele et i kalendarin kan kan kan bankan sa sa 10 cycles |
| | 20 000 cycles |
| .(19.3 | 。" [1996] (1994) [1997] [1994] [1995 |
| *** | 100 VA |
| L | 100W 12 A / 24 V, a.c./d.c. 6 A / 48 V; a.c./d.c. 4 A / 110 V a.c./d.c. 2 A / 230 V a.c. / 220 V.d.c. |
| um nemakangan kan sa salah terhada di hada di Kalabi, Sebasika | 1PN-4C-1;1PN-2C-1 |
| | LPN-DC-4C-1; LPN-DC-2C-1 |
| | OD BCKAOZA |
| | 8 |
| | () () () () () () () () () |
| 17 中国中华和阿拉斯的美国国际中国 |)0.6 m |
| | U, for switching on for switching off FF AC DC |

*) The values depends on the motor drive automatic mode presetting, see pages D50, D52, D53, D54

Specifications

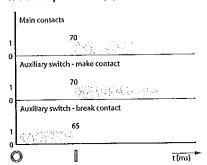
Circuit breaker switching off by motor drive electrically with OFF push button

Automatic operation No. 1, 2, 3



Circuit breaker switching on electrically by motor drive with ON push button

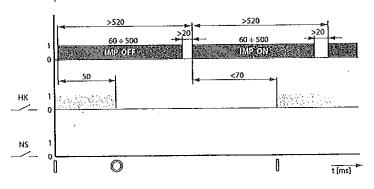
Automatic operation No. 1, 2, 3



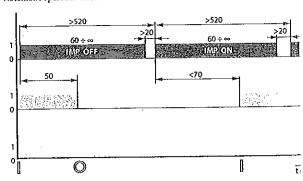
Recommended control impulses

Circuit breaker switching on and off by motor drive electrically using the ON and OFF push buttons

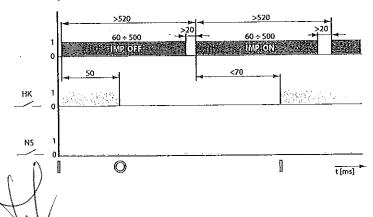
Automatic operation No. 1



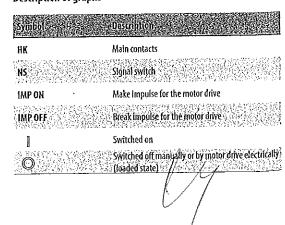
Automatic operation No. 2



Automatic operation No. 3



Description of graphs



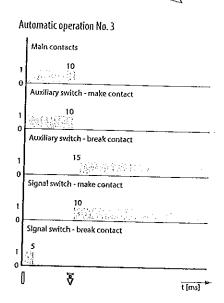
3P 4P

Specifications

Circuit breaker switching off by overcurrent release or inspection push button

Automatic operation No. 1 Main contacts Auxiliary switch - make contact Auxiliary switch - break contact Signal switch - make contact 1080 Signal switch - break contact 1085 ₹ t [ms]

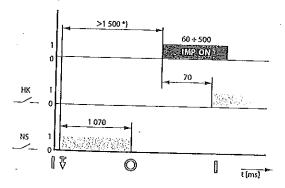
| A | utomatic operation No. 2 |
|---|----------------------------------|
| | Main contacts |
| 1 | 10 2544534 |
| | Auxiliary switch - make contact |
| 1 | 10 |
| · | Auxiliary switch - break contact |
| 1 | 15 |
| Ĭ | Signal switch - make contact |
| 1 | 10 |
| J | Signal switch - break contact |
| 1 | 5 20 65 |
| ſ | 3 |

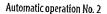


Recommended control impulses

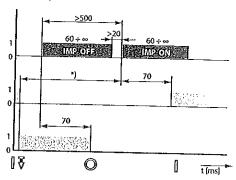
Circuit breaker switching on with motor drive after its tripping by overcurrent release or inspection push button

Automatic operation No. 1

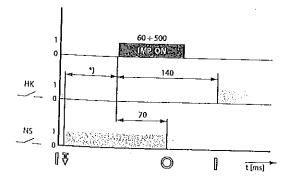




t [ms]



Automatic operation No. 3



Description of graphs

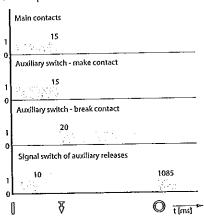
| Symbol' | en se Description de la company |
|---------|--|
| HK | Main contacts |
| HS | Signal switch |
| IMP ON | Make impulse for the motor drive |
| IMP OFF | Break impulse for the motor drive |
| 0 | Switched on |
| 7 | Switched off by releases, Test or INSPECTION push button |
| 0 | Switched off manually or by motor drive electrically (loaded state) |
| | |

If the circuit breaker was switched off by an overcurrent release, it is necessary to remove the cause of the error before its

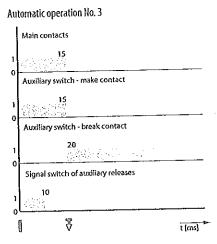
Specifications

Circuit breaker switching off by shunt trip, undervoltage release or TEST push button

Automatic operation No. 1



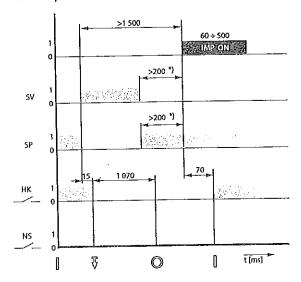
| Aut | omatic operation No. 2 | |
|-----|-------------------------------------|--------|
| - | Main contacts | |
| 1 | 15 13 4 5 1 | |
| 0 | Auxiliary switch - make contact | |
| 1 | 15 2003 | |
| Ü | Auxiliary switch - break contact | |
| 1 | 20 | |
| ٠ | Signal switch of auxiliary releases | |
| 1 | 10 | |
| • | 0 ₹ | t (ms) |



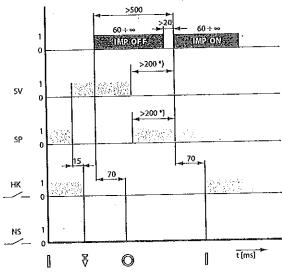
Recommended control impulses

Circuit breaker switching on by motor drive after tripping by shunt trip or undervoltage release

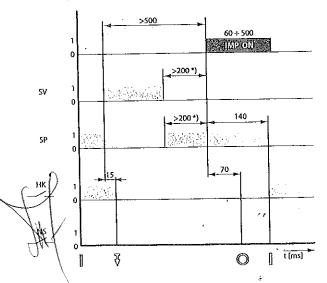
Automatic operation No. 1



Automatic operation No. 2



Automatic operation No. 3



Description of graphs

| Symbol | Description) |
|---------|---|
| нк | Main contacts |
| NS. | Signal switch |
| SV | Impulse for shunt trip |
| SP | Impulse for undervoltage release |
| IMP ON | Make impulse for the motor drive |
| IMP OFE | Break impulse for the motor drive |
| 9 | Switched on |
| T. | Switched off by releases, TEST or HISPECTION push but |
| | Switched off manually or by motor drive electrically (Joaded state) |

Restart is only possible after deactivation of shunt trip or undervoltage release.

MOULDED CASE CIRCUIT BREAKERS BD250N, BD250S









□ Switching units, plug-in device, withdrawable device.....

COMMERCIAL INFORMATION

| | Overcurrent releas | ses, switch-disconnector unit | |
|---------------|--|---|-----|
| | Residual current m | nonitor | £7 |
| | Current transform | ers for residual current monitor | F7 |
| | Connecting sets | | E7 |
| П | Mounting sets | | E10 |
| 'n | | | |
| | | | |
| | - | | |
| M., | , | ases | |
| | , | | |
| | | | |
| | Mechanical interlo | ocking and parallel switching | E13 |
| П | Motor drives | | E13 |
| □ | Control relay | | E13 |
| a | Accessories | | E14 |
| E CH A | IICAL INFORN | ANTION | |
| | | | |
| Q | Circuit breakers, sv | witch-disconnectors - specifications | E15 |
| | ¥ | - diagram | |
| | | - connecting, mounting | |
| | ¥. | - defonization spaces | |
| a | Plug-in device | - description, specifications, diagram | |
| | Withdrawable devi | • | - |
| | at taling a second of the seco | - description, specifications, diagram | E52 |
| | Overcurrent releas | · | |
| | Maria. | DTV3 - distribution | FC1 |
| | | - description, specifications | |
| | | - description, specifications | E55 |
| | | LOO1 - lines | |
| | | - description, specifications | 57 |
| 25,45 | 1.1 | - description, specifications | FS8 |
| | -41 * | 4D01 - distribution with N-pole protection - description, specifications | |
| ū | Connecting sets | - specifications | |
| | Switches | - specifications, diagram | |
| | Shunt trips | - specifications, diagram. | |
| | Undervoltage rele | ases | |
| | | - specifications, diagram | E64 |
| () | Hand drives | - description, specifications | |
| 10 | Mechanical interio | cking and parallel switching | |
| 1/1 | | - description, specifications, dimensions | E67 |
| d/W | Motor drives | - description, specifications, diagram | E69 |



Modelon





3P 4P



Block terminals

Block terminals

Double block terminals

Block terminals

Rear connection

Front connection



CS BD-T011

OOO CS-BD-B011

CS-BD-B012

BD250SE30S

BD250NE30S

CS-BD-B021, CS-BD-B022

CS-BD-B014

CS-BD-A021

CS-BD-A011

CS-BD-PS01



Mechanical parallel switching



Mechanical interlocking

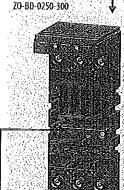




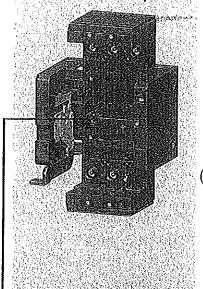
MOTOR DRIVES



SWITCHING UNIT PLUG-IN DEVICE ZO-BD-0250-300



WITHDRAWABLE DEVICE ZV-BD-0250-300



Alechanical blocking with Bowden cable







Make-and-break



















Signalling of position SO-BHD-0010



ACCESSORIES Lever with locking



Sealing Insert



OD-BD-YP01

Additional cover



OD-BD-VP02



Insulating barriers

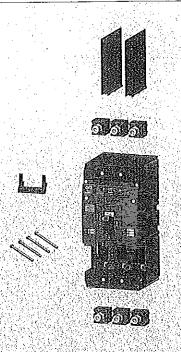




3P

3P

SWITCHING UNITS



| Type | 8 | roduct code | i (A) | V II IMI | Weight Ik | g) 🍀 🤃 Package (p |
|------------|-------|-------------|-------|----------|-----------|-------------------|
| BD250NE305 | | 14414 | 250 | 36 | 2.84 | 1 |
| BD250SE305 | • 2 • | 14415 | 250 | 65 | 2.84 | 1 |

- TECHNICAL INFORMATION, see page E15

- the method of power circuit connection must observe recommendations, see page E18 as well as deionization space, see pag

Switching unit: includes

- 2 CS-BD-A011 connecting sets - for connecting busbars or cable luc

- insulating barriers OD-BHD-KS02

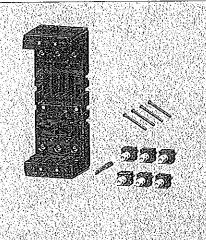
- mounting bolts set OD-BD-MS01 (4x M4x35)

- conductor holder OD-BD-DV01

must be fitted with - by overcurrent release SE-BD-... (circuit breaker)
or switch-disconnector unit SE-BD-0250-V001 (switch-disconnector

" - for connecting in another way, it is necessary to use CS-BD-... connecting sets, see page E8

PLUG-IN DEVICE



| Type is the | Produkt code | Hame State | Yeightakgla A | Package (j |
|----------------|--------------|----------------|---------------|------------|
| ZO-BD-0250-300 | 14558 | Plug-in device | 1.593 | 1 |

-TECHNICAL INFORMATION, see page page E50

Plug-in device: includes

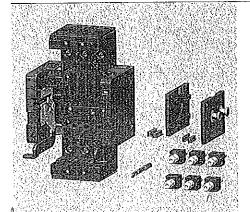
- complete accessories for assembly circuit breakers/switch-disconne in plug-in design

- mounting bolts set (4x M4x40) - for affixing switching unit to plug-in ¢

must be fitted with - switching unit BD250..305

for connecting plug-in device with busbars or cable lugs, connecting sets CS-BD-A011 can be used, that are included in the pof the BD250..305 switching unit – for connecting in another way, it is necessary to use CS-BD-... connecting sets, see p

WITHDRAWABLE DEVICE



| Tyrie | Product rodes | en o Mames e e e e e e e e e e e e e e e e e e | . Weight (kg): | Package |
|----------------|---------------|--|----------------|---------|
| ZV-BD-0250-300 | 14557 | .Withdrawable device | 2.692 | 1 |

- TECHNICAL INFORMATION, see page ES2

- Withdrawable device: includes

complete accessories for assembly circuit breakers/switch-disconning withdrawable design

must be fitted with - switching unit BD250..305

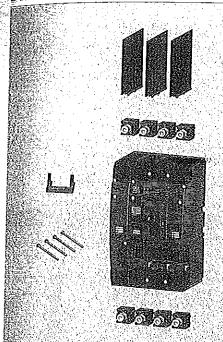
- for connecting withdrawable device with busbars or cable lugs, connecting sets CS-BD-A011 can be used, that are in with the BD250..305 switching unit - for connecting in another way, it is necessary to use CS-BD ... connecting sets, see |



4P

40

SWITCHING UNITS



| Type: | Product code | a i jaka | EUS (KAI) | | Welght Ika | Padrane Incl. |
|------------|--------------|----------|-----------|-----------------------------|------------|---------------|
| BD250NE405 | 19571 | 250 | 36 | 3P + N -conductor switching | 3.7 | 1 |
| BD2505E405 | 19573 | 250 | 65 | 3P+N-conductor switching | 3.7 | 1 1 |
| BD250NE406 | 19572 | 250 | 36 | 4P -conductor protection | 3.9 | 1 |
| BD250SE406 | 19574 | 250 | 65 | 4P -conductor protection | 3.9 | 1.0 |

- TECHNICAL INFORMATION, see page E15

-the method of power circuit connection must observe recommendations, see page E18 as well as deionization space, see page E23

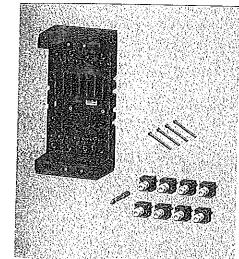
Switching unit: includes

- 2 connecting sets for connecting busbars or cable lugs ¹⁾
- insulating barriers
- mounting bolts set OD-BD-MS01 (4x M4x35)
- conductor holder OD-BD-DV01

must be fitted with - by overcurrent release SE-BD-... (circuit breaker) or switch-disconnector unit SE-BD-0250-V001 (switch-disconnector)

 $^{ ext{N}}$ - for connecting in another way, it is necessary to use CS-BD-... connecting sets, see page E8

PLUG-IN DEVICE



| Type | Product code | Name | - Weight (kg) | Para Santa |
|----------------|--------------|----------------|---------------|------------|
| ZO-BD-0250-400 | 20651 | Plug-in device | 2.1 | 1 |

- TECHNICAL INFORMATION, see page ESO

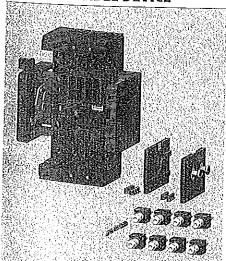
Plug-in device: includes

- complete accessories for assembly circuit breakers/switch-disconnectors in plug-in design
- mounting bolts set (4x M4x40) for affixing switching unit to plug-in device

must be fitted with - switching unit BD250..405 or BD250..406

- for connecting plug-in device with busbars or cable lugs, connecting sets can be used, that are included in the package of the BD250..40.. switching unit - for connecting in another way, it is necessary to use CS-BD-... connecting sets, see page E8

WITHDRAWABLE DEVICE



| lyp: | Product code | a Ligne | Weightikatis | Padaratici |
|----------------|--------------|---------------------|--------------|------------|
| ZV-BD-0250-400 | 20652 | Withdrawable device | 3.2 | 1 |

- TECHNICAL INFORMATION, see page E52

Withdrawable device: includes

 complete accessories for assembling breaker/switch-disconnector in withdrawable design

must be fitted with - switching unit BD250..405 or BD250..406

for connecting withdrawable device with busbars or cable lugs, connecting sets can be used, that are included with the BD250x.49x. switching unit - for connecting in another way, lit is necessary to use CS-BD-... connecting sets, see page E8

OVERCURRENT RELEASES



DTV3 - characteristic D - distribution

■ protection lines and transformers

| | Type | Product cod | es : Description August 2003 | Weight (kg) | Padoge [pr |
|-----|-----------------|-------------|---|-------------|------------|
| 100 | SE-BD-0100-DTV3 | 24300 | $I_{\rm g}$ setting \Rightarrow 40 \div 100 A | 0.317 | 1 |
| 160 | SE-BD-0160-DTV3 | 24200 | l, setting = 63 ÷ 160 Å | 0.317 | 1 |
| 250 | SE-BD-0250-DTV3 | 24100 | 1, setting = 100 ÷ 250 A | 0.317 | 1 |

⁻ TECHNICAL INFORMATION, see page ES4

MTV8 - characteristic M - motor

- m direct protection for motors and generators
- suitable also for protection lines and transformers

| TAR | lipe is a second | * Product rode (| Description: | a Weight (kg) 's | Package (p |
|-----|------------------|------------------|--------------------------------------|------------------|------------|
| 100 | SE-BD-0100-MTV8 | 24310 | l _e setting == 40 ÷ 100 A | 0.317 | 1 |
| 160 | SE-BD-0160-MTV8 | 24210 | I _A setting = 63 + 160 Å | 0.317 | 可能有。 |
| 250 | SE-BD-0250-MTV8 | 24110 | l_g setting = 100 ÷ 250 A | 0.317 | 1 |

⁻TECHNICAL INFORMATION, see page ESS

L001 - characteristic L - lines

- protection lines with low starting currents
- without I_e setting

| UALD | Iype a Salas a salas | Product code () | (Description, 41) All Sci. | As Weight (kg). Sek | Package (pc |
|------|----------------------|-----------------|--------------------------------|---------------------|-------------|
| 160 | SE-BD-0160-L001 | 20612 | Without I _e setting | 0.317 | 1 |
| 200 | SE-BD-0200-L001 | 20666 | Without I, setting | 0.317 | \$ (1) |
| 250 | SE-BD-0250-L001 | 20613 | Without I _s setting | 0.317 | 1 |

⁻ TECHNICAL INFORMATION, see page ES7

MTV9 - characteristic M - motor with adjustable timing selectivity

- direct protection for motors and generators
- m suitable also for protection lines and transformers
- m enables setting delay of independent release to 0, 100, 200 or 300 ms

| | Appelled the second | Product code | a Description | Weight (kg) | es a Package Ipc |
|-----|---------------------|--------------|--------------------------------------|-------------|------------------|
| 100 | SE-BD-0100-MTV9 | 17304 | l _e setting == 40 ÷ 100 Å | 0.317 | 1 |
| 160 | SE-BD-0160-MTV9 | 19569 | l, setting = 63 ± 160 Å | 0.317 | 经验证 |
| 250 | SE-BD-0250-MTV9 | 19570 | I _s setting = 100 ÷ 250 A | 0,317 | 1 |

⁻ TECHNICAL INFORMATION, see page ES8

OVERCURRENT RELEASES



4D01 - characteristic D - distribution with N-pole protection

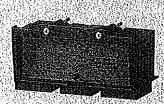
protection lines and transformers in TN-C-S and TN-S networks

| | - Type | Product code | rectrond | Weightakgisw | va Parkige (pe |
|-----|------------------|--------------|-------------------------------------|--------------|----------------|
| 100 | SE-BD-0100-4D01 | 33423 | l _a setting = 40 ÷ 100 A | 0.327 | 1 |
| 160 | \SE-BD-0160-4D01 | 33424 | l, setting = 63 ± 160 Å | 0.327 | |
| 250 | SE-BD-0250-4D01 | 33425 | l, setting == 100 ÷ 250 Å | 0.327 | 1 |

-TECHNICAL INFORMATION, see page E60

- intended for BD250..406 switching unit

SWITCH-DISCONNECTOR UNIT



| | i promoti di salah s | a Klodickode S | Want w | Veight kg | Package (p. |
|-----|--|----------------|--------------------------|-----------|-------------|
| 250 | SE-BD-0250-V001 | 24120 | Switch-disconnector unit | 0.267 | 1 |

- TECHNICAL INFORMATION, see page E1S



3 P



































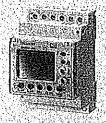
3P 4P

RESIDUAL CURRENT MONITOR



| | | | 1 | | |
|-------------|--------------|----------------------------------|---|------------------|---------------|
| Type 1 | Product code | Description : | | e . ₩eight (kg): | Package (set) |
| 55V8000-6KK | 42658 | Analogue design, I and t setting | | 0.18 | 11 |

- TECHNICAL INFORMATION, see page P4



| уре | Pioducticod | va Description see Ass | | | (Weight (kg) | Padage [set] [| | |
|--|-------------|------------------------|-------------------------|--|--------------|----------------|--|--|
| 55V8001-6KK | 42659 | Digital design, I, and | t _{so} setting | | 0.26 | 1 | | |
| 55V8200-6KK 42660 Digital design, I and t setting, 4 channels 0.26 1 | | | | | | | | |

- TECHNICAL INFORMATION, see page P4

CURRENT TRANSFORMERS FOR RESIDUAL CURRENT MONITOR





| aype as a septoduction of the proposition of the second second second second second second second second second | 國 |
|---|---|
| 55V8700-OKK 42661 Internal diameter 20 mm, including holder on "U" rail according 0.09 1 to EN 60715 wide 35 mm | |
| SSV8701-OKK 42662 Internal diameter 30 mm, Including holder on ¿U* roll according 0.11 1 to EN 60715 wide 35 mm | |

-TECHNICAL INFORMATION, see page P4



| 5SV8706-0KK | 42667 | Internal diameter 210 mm, including holder on the panel | 1.25 | 1 |
|-------------|--------------|--|-------------|---|
| 5SV8705-0KK | 42666 | Internal diameter 140 mm, including holder on the panel | 1.35 | 72 No. |
| 5SV8704-0KK | 42665 | Internal diameter 105 mm, including holder on the panel | 0.6 | 1 |
| 55V8703-0KK | 42664 | Internal diameter 70 mm, including holder on the panel | 0.31 | 表於因為原 |
| 55V8702-0KK | 42663 | Internal diameter 35 mm, including holder on the panel | 0.2 | 1 Name of the Control |
| in a second | Product code | Description of the second seco | Weight (kg) | Patkade (sel) in |

- TECHNICAL INFORMATION, see page P4



| | 1 | Λ, | | | |
|---------------------|-------------------------------|-----------|---------------------|--------------|-------------------|
| books and the study | ode: Usapping states as | | | . Veight (to | Se (Package(sel)) |
| 55V8 900-1KK //426 | | 1 | S Vivie 35 Am for a | | 2 |
| // | transformers with internal da | ineter vp | to bod including 10 | 5 mm | |

- TECHNICAL INFORMATION, see page P4

CONNECTING SETS

| 3P | 46 |
|----|----|
|----|----|



























| Type Product code Description System Herboral connection Weight (vi) Package (set |
|---|
| CS-BD-T011 24810 Clamp terminals 16 ÷ 150 Cu cables, flexibars 0.24 1 |
| TECHNICAL INFORMATION See name F19 |

| CS-BD-B011 24751 Block ferminals 25 ÷ 150 Cu/Al cables 0.21 1 |
|---|
| |

- TECHNICAL INFORMATION, see page E19

| CS-BD-B012 17534 | Block terminals 150 + 240 Cu/Al cable | 8 . 1 |
|------------------|---------------------------------------|-------|
| | | · |

- TECHNICAL INFORMATION, see page E19

⁻ using the OD-BD-KSO3 cover the degree of protection IP20 is fulfilled

| CS-BD-B021 | 24752 | Double block terminals | 2x (25 ÷ 150) | Cu/Al cables | 0.51 | 1 |
|------------|-------|------------------------|----------------|--------------|------|---|
| CS-BD-B022 | 13808 | Double block terminals | 2x (150 ÷ 240) | Cu/Al cables | 0.62 | 1 |

- TECHNICAL INFORMATION, see page E19

⁻ using the OD-BD-KSO3 cover the degree of protection IP20 is fulfilled

| CS-80-8014 20119 Block tem - for 6 cab | ninals : 6x(6+35) \ Cu/ | Al Gibles | 0.3 |
|--|-------------------------|--|--------------------------|
| - AND SERVICE OF A VIOLENCE AND A SERVICE OF TOT O COD | NES 经基础基本的经验 格尔斯 经产 | \$P\$\$P\$ \$P\$\$P\$\$P\$ \$P\$ \$P\$ \$P\$ \$P\$ \$P\$ \$P | 没有任务以外的人的关系 。多、多、 |

- TECHNICAL INFORMATION, see page E19

⁻ using the OD-BD-KSO3 cover the degree of protection IP20 is fulfilled

| | CS-BD-A021 24770 Rear connection Cu/Al busbars, cable lugs 0.237 | 學是有一些 |
|--|--|-------|
|--|--|-------|

- TECHNICAL INFORMATION, see page E19

| Potential terminals $1.5 \div 2.5; 4 \div 6$. Cu flexible conductor 0.017 1 |
|--|
| |

- TECHNICAL INFORMATION, see page E19

| CS-BD-A011 24750 | Front connection | Cu/Al busbars cable luc | o. 12 |
|------------------|------------------|-------------------------|-------|
| | | flevihars | |

- TECHNICAL INFORMATION, see page E19
- Included in every supply of switching units

1 terminal

| CS-BD-T411) 19578 Clamp tempinal 16.÷ 150 Cu cables, flexibars 0.08 1 | pe versus apodutades Disarbonas, est simmilios Methodologication est evelopello | ila e kakage isti. |
|---|---|--------------------|
| | CS-BD-T411 19578 Clamp terminal 16.÷150 Cu cables, flexibars. 0.08 | 影響等 |

- TECHNICAL INFORMATION, see page E19

| CS-BD-B411 19582 Block terminal 25 ± 150 Cu/Al cables 0.07 1 |
|--|
|--|

-TECHNICAL INFORMATION, see page E19

| CS:BD-B412 19577 Block terminal 150 ÷ 240 C | iu/Al cables | |
|---|--------------|--|
| -TECHNICAL INFORMATION, see page E19 | | |

11 - set includes three terminals

CONNECTING SETS



3P 4P









| - 1 | terminal | |
|-----|----------|--|
| | terminai | |
| | | |

| Types 12.32 - Product code: Descriptions 228 23 (mml) 2.32 Method of connection 2.32 Weight IX | g), '4/Packagê (pc) i |
|--|-----------------------|
| CS-BD-B421 19579 Double block terminal 2x (25 ÷ 150) Cu/Al cables 0.17 | 1 |
| YCCHUICAL INCODERATION | |

TECHNICAL INFORMATION, see page E19

CS-BD-B422 19580 Double block terminal 2x (150 ÷ 240) Cu/Al cables 0.21

- TECHNICAL INFORMATION, see page E19

 CS-BD-B414
 21170
 Block terminal 6x (6 ÷ 35)
 Cu/Al cables
 0.1
 1

 -for 6 cables
 -</

- TECHNICAL INFORMATION, see page E19

CS-BD-A421 19581 Rear connection Cu/Al busbars, cable lugs 0.08 1

- TECHNICAL INFORMATION, see page E19

CS-BD-PS41 36031 Potential terminal 1.5 ÷ 2.5/4 ÷ 6 0.005 1

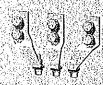
- TECHNICAL INFORMATION, see page E19

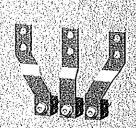
CONNECTING SETS

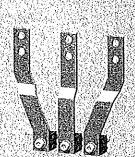
3P











3 terminals

| 2 (Cilillian) | | |
|--|---|---|
| | | |
| Francisco de la companya de la comp | Conntinue See See 12 See 2 Method of | from perion # 224 Weight kn i vs. Padcage loci. |
| | | |
| Contract to the contract of th | ····································· | 医眼膜切除 医乳腺管理 化环烷基 电电流电阻 化二氯化物 医动脉神经 医二氯甲基甲基磺基甲基甲基 |
| CC.RD. 4027 | Reduction for BA*37-50 Cu/Al bus | bars, cable lugs, 0.3 |
| | | |
| 一名的复数形式机器全角的运动物品的影響 | front connection - flevinars | |
| (Astronomy Marine) (22) (Environment States) | Halfredillection: A. P. M. M. W. W. Willewinger | er de Paris III en de de Paris de mante de la compresión de la respectación de la compresión de la compresión |

- TECHNICAL INFORMATION, see page E19

CS-BD-A039 24771 Reduction for BA...*39-50 a JZUX50 Cu/Al busbars, cable lugs, 0.447 1
- front connection flexibars

- TECHNICAL INFORMATION, see page E19

- for total replacement of BA ... *39-50 or J2UX50 circuit breaker with front connection OD-BHD-MS39 connecting set is necessary

CS-BD-Z039 18201 Reduction for BA...*39 a J2UX Cu/Al busbars, cable lugs, 0.739 1 -- rear connection flexibars

-TECHNICAL INFORMATION, see page E19

-for total replacement of BA...*39 or J2UX circuit breaker with rear connection OD-BD-MZ39 and CS-BD-AO21 connecting sets are necessary

CS-BD-JX75 18023 Reduction for BA_**39-75 and J2UX75 - Cu/Al busbars, 0.558 1

front connection, withdrayrable designicable lugs, flexibars

- TECHNICAL INFORMATION, see page E19

- for total replacement of BA...*39-75 or J2UX75T circuit breakers with front connection in withdrawable design OD-BHD-MS75 connecting set and ZO-BD-O250-300 plug-in device or ZV-BD-O250-300 withdrawable device are necessary

CS:BD-JT75 18024 Reduction for J2UX75T - front Cu/Al busbars, 0.711 1

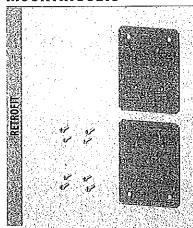
connection, withdrawable design Cable lugs, flexibars

- TECHNICAL HIFORMATION, see page E19

- for total epiacement of J2UX75T circuit breaker with front connection in withdrawable design OD-BHO-MS75 connecting set and ZO-BO-0250-390 plug-in device or ZV-BD-0250-300 withdrawable device are necessary

- sets, which enable replacement of older circuit breakers by a new circuit breakers without switchboard reconstruction

MOUNTING SETS



| Type | |
|---|----------|
| OD-BHD-MS39 24741 Reduction for BA*39-50 and J2UX50 - front connect | tion 0.7 |

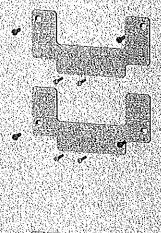
- DIMENSIONS see page E28
- for total replacement of BA ... *39-50 or J2UXSO circuit breaker with front connection 2 connecting sets CS-BD-A039 are necessary



OD-BD-MZ39 18203 Reduction for BA...*39 and J2UX - rear connection 1.255

-DIMENSIONS see page E28

- for total replacement of BA...*39 or J2UX circuit breaker with rear connection 2 connecting sets CS-BD-Z039 and CS-BD-A021 are necess



OD-BD-MT75 33330 Reduction for J2UX75T - front connection, withdray/able design

- DIMENSIONS see page E34, E38

 for total replacement of J2UX75T circuit breaker with front connection in withdrawable design 2 connecting sets CS-BD-JT75 at ZO-BD-0250-300 plug-in device or ZY-BD-0250-300 withdrawable device are necessary



OD-BHD-MS75 14563 Reduction for BA...*39-75 and J2UX75 - Front connection, 0.446 1
withdrawable design

- DIMENSIONS see page E34, E37

- for total replacement of BA...*39-75 or J2UX75 circuit breaker with front connection in withdrawable design 2 connecting sets CS-80-9X2
and ZO-BD-0250-300 plug-in device or ZV-BD-0250-300 withdrawable device are necessary



¹³ - one set provides for replacing one circuit breaker (set includes coupling elements necessary to assemble circuit breaker and mounting sell a compart of selections of comments of comments of selections of selecti

≥ E10

3P 4P

SWITCHES



Single make contacts

| Type some some P | roduct code | Operating voltage is a second | a gas Contacts A se | Weight [kg] | = Package (pcl = |
|------------------|-------------|-------------------------------|---------------------|-------------|------------------|
| PS-BHD-1000 | 24700 | 60 ÷ 500 V a.c./d.c. | •——• | 0.012 | 1 |
| PS-BHD-1000-Au | 24702 | 5 ÷ 60 V a.c./d.c. | | 0.012 | 1. |

Single break contacts

| lype | | Operating voltage | (Ontacts | Yeight (kgt :), | - Package (pc) |
|----------------|-------|----------------------|----------|------------------|----------------|
| PS-BHD-0100 | | 60 ÷ 500 V a.c./d.c. | ~~~ | 0.013 | 1 |
| PS-BHD-0100-Au | 24703 | 5 ÷ 60 V a.c./d.c. | | 0.013 | |

Double

| D. C. L. S. C. L. DOLLAR S. C. L. L. C. L. C. L. | Product cod | Operating voltage e | . Lontacts - 140 | Welgii (kg) 0.026 | Package (ps). |
|--|-------------|--|------------------|----------------------|---------------|
| PS-BHD-0200 PS-BHD-0200-Au | | 60 ÷ 500 V a.c./d.c. 5 ÷ 60 V a.c./d.c. | •—- | 0.026 | (30%) (35,7%) |
| PS-BHD-1100 | 13691 | 60 ÷ 500 ¥ a.c./d.c. | | 0.025 | 1 |
| PS-BHD-1100-Au A | 13694 | 5 ÷ 60 ¥ a.c./d.c | | 0.025 | 10%(1%)// |
| PS-BHD-2000 | 13689 | 60 ÷ 500 ¥ a.c./d.c. | | 0.024 | 1 |
| PS-BHD-2000-Au | 13692 | 5 ÷ 60 ¥ a.c./d.c. | | 0.024 | 1441 |

Make-and-break

| PS-BHD-0010 | 18021 | 60 ÷ 250 V a.c./d.c. | ţ• | 0.013 | 1 |
|----------------|--------|----------------------|-------------|-------|-------|
| PS-BHD-0010-Au | 18022 | 5 ÷ 60 V a c/d.c. | <i>-</i> ∕- | 0.013 | 的多价值等 |
| PS-BHD-0020 | 35 893 | 60 ÷ 250 V a.c./d.c. | | 0.026 | 1 |

Early

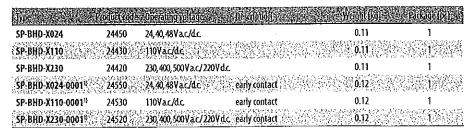
| Types to a second | s Product cod | es Description | ge Contacts of | Weight (kg) | Package (pc) // |
|-------------------|---------------|----------------|----------------|-------------|-----------------|
| SP-BHD-0002 | 16169 | Early contact | 77 (54) | 0.045 | 1 |

~TECHNICAL INFORMATION for all switch, see page E61

SHUNT TRIPS

| Type Market State (1997) | Production | ez Operatino voltage | The State of the S | (Package lpc)c |
|--------------------------|------------|------------------------|--|-------------------|
| SV-BHD-X024 | 24650 | 24,40,48Va.c/d.c | 0.14 | 1 |
| SV:BHO-X110 | 24630 | 110Vac/dc | 0.14; | 次。在 1 000年 |
| SV-BHD-X230 | 24620 | 230,400,500Va.c/220Vdc | 0.14 | . 1 |

UNDERVOLTAGE RELEASES



- TECHNICAL INFORMATION, see page E62

DELAY UNIT

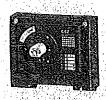


| Type 7 to 25 Product code | Disampion | | a Wegitiki Pa | Patrizor (IKP) |
|---------------------------|--------------------------------|--|---------------|----------------|
| BZ-BX-X2394 / 36696 | - enables to delay the undervo | ltage release tripping of circuit | 0.12 | 1 |
| | breakers Modeion | , \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | | |

⁻TECHNICAL MYORMATION, see page P2

⁻ TECHNICAL INFORMATION, see page E64 ¹¹ - cannot be used in combination with motor drive MP-BD-X...

HAND DRIVES



















| | | v Name-descripti | on its of | | | ≥ Package [|
|------------|---------|------------------|------------------|-------------------|-------|-------------|
| RP-BD-CK10 | 13651 | Hand drive unit | eres established | - without locking | 0.223 | 1 |
| RP-BD-CK20 | V 13652 | Hand drive unit | 196 s 1 | - with locking | 0.223 | 1 |

- TECHNICAL INFORMATION, see page E66

Hand drive unit must be fitted with:

For controlling on switch unit - with the black hand drive lever RP-BHD-CP10 or RP-BHD-CP20

■ for controlling through the switchboard door - with the extension shaft RP-BHD-CH..

- with the hand drive bearing RP-BHD-CH..

- with locking

- with the hand drive lever RP-BHD-CP.

RP-BD-CK21 13684 - TECHNICAL INFORMATION, see page E66

Hand drive unit must be fitted with: ■ for controlling on switch unit - with the red hand drive lever RP-BHD-CP21

Hand drive unit - yellow label

:

I for controlling through the switchboard door - with the extension shaft RP-BHD-CH..

with the hand drive bearing RP-BHD-CN..

with the hand drive lever RP-BHD-CN..

| on by ciza | or right side control 0.484 | 1 |
|-------------------------------------|-----------------------------|---|
| | oft cide control 0.484 | 1 |
| RP-BD-CK31 37251 Hand drive unit te | R side condo | |

-TECHNICAL INFORMATION, see page E66

| DD.RUD.CO10 | 13655 | Hand drive lever - black | - Without locking | 0.075 | (1) (1) |
|-------------|-------|--------------------------|-------------------|-------|---------|
| RP-BHD-CP20 | 13656 | Hand drive lever – black | - with locking | 0.075 | 1 |

- TECHNICAL INFORMATION, see page E66

- TECHNICAL INFORMATION, see page E66

| | The second process of the second problems. | enterior de la company de la c | AND THE SEA OF SECTION AS A SECTION OF SECTION AS A SECTI |
|--|---|--|--|
| RP-BHD-CN40 37246 | Hand drive bearing | -degree | 网络安拉罗拉拉拉 克斯克 |
| PORTANTAL STATE OF THE STATE OF | ada (1886年) 1886年 - 18864 - 1 | of protection IP40 | |

- TECHNICAL INFORMATION, see page E66

- is used in combination with the black lever of RP-BHD-CP10, RP-BHD-CP20 hand drives

| RP-BHD-CK41 37247 Hand drive bearing -degree: 0.14 1 -yellow label of projection IP40 |
|---|
|---|

- TECHNICAL INFORMATION, see page E66

- is used in combination with the red lever of RP-BHO-CP21 hand drive

| RP-BHO-CN60 37248 Hand drive bearing - degree 0.14 1 of protection IP66 |
|---|
|---|

- TECHNICAL INFORMATION, see page E66

- is used in combination with the black lever of RP-BHD-CP10, RP-BHD-CP20 hand drives

| RP-BHD-CNG1 37249 Hand drive bearing : yellow label degree of protection IP66. | degree 0.14 of protection IP66//// |
|--|---------------------------------------|
| -TECHNICAL INFORMATION, see page E66 | 14 |

- is used in combination with the red lever of RP-BHD-CP21 hand drive

HAND DRIVES



| THE STATE OF THE S | |
|--|---------------------------|
| Type: Product codes: Name = description | Weight (kg) Package incl. |
| RP-BHD-CH10 13658 Extension shaft - length 365 mm, can be shortened | 0.705 |
| -TECHNICAL INFORMATION CORPORATES | |

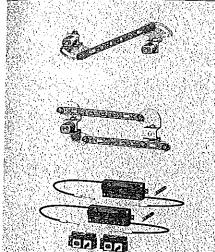
13659 Extension shaft - telescopic, length 245 ÷ 410 mm

- TECHNICAL INFORMATION, see page E66

MECHANICAL INTERLOCKING AND PARALLEL SWITCHING

3P 4P

3P 4P



| Kh-RHD-C810 | Product to Je Hame description: Weight Ikolog & Package (px) 18290 Mechanical Interlocking - for fixed design 0.16 |
|----------------------|---|
| - TECHNICAL INFOR | MATION, see page E67 |
| - mechanical interio | ocking must be fitted with: 2 hand drive units RP-BD-CK |
| | 2 hand drive levers RP-BHD-CP |
| RP.RUD.CO16 | 18289 Mechanical parallel switching – for fixed désign 0.23 |
| ייין טוטיינטן ווו | <u>、 1985年25年25年3日 - Indianation Familia Suitchiuid Lind Tried (GSIdU (新聞) とうかんによる数を(194年7月2日 (新聞) 2年7日 (日本) 2年7日 (1945年7月2日 (1945年7月1日 (1945年7月1日 (1945年7月1日 (1945年7月1日 (1945年7月1日 (1945年7月1日 (1945年7月 (1945年7月1日 (1945年7月1日 (1945年7月1日 (1945年7月 (</u> |
| - IECUMICAL IMPORT | AATION, see page E67 |
| - IECUMICAL IMPORT | AATION, see page E67 I switching must be fitted with: 2 hand drive units RP-BD-CK the hand drive lever RP-BHD-CP. |

MB-BD-PV05 19612 Mechanical Interlocking - for two circuit breakers BD250 0.448 ... MB-BHD-PV03 Mechanical interlocking - for one BD250 and one BH630 0.448 circuit breaker

- TECHNICAL INFORMATION, see page E67

- mechanical blocking with Bowden cable is intended for fixed, plug-in and withdrawable design

MOTOR DRIVES

3P 4P







| 21216 | Motor drive | 3Operatirig voltage 3 | | 1 |
|-------|---|--|--|---------------------|
| 19790 | Motor drive | | | 1980 - Visto |
| 13537 | Motor drive | | | 847936A7959 1 |
| 13535 | Motor drive | 230Vac/220Vdc | 1520 | Wateriere. |
| 20592 | Motor drive – with counter | of cycles 24V a.c./d.c. | | |
| 19791 | | | | WAR AND THE |
| 13686 | Motor drive - with counter | nforder 110V a.e./de | 44400 1977 (1446). 1.546 | |
| | 19790 13537 13535 20592 19791 | 19790' Motor drive 13537 Motor drive 13535 Motor drive 20592 Motor drive - with counter 19791 Motor drive - with counter | 19790 Motor drive 48Va.c./d.c. 13537 Motor drive 110Va.c./d.c. 13535 Motor drive 230Va.c./220Va.c. 20592 Motor drive - with counter of cycles 24Va.c./d.c. 19791 Motor drive - with counter of cycles 48Va.c./d.c. | 19790 Motor drive |

-TECHNICAL INFORMATION, see page E69

- motor drive cannot be used in combination with SP-BHD-X...-0001

1) - custom production

OD-BHD-PP01 13688 Counter of cycles - cable length 1.1 m 0.08 - DIMENSIONS see page E30

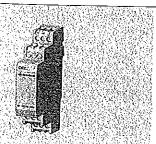
- upon agreement with the manufacturer, different conductor lengths can be supplied

OD-BHD-KA02 13809 Extension cable - to motor drive 12 wires, [ength 0.6 m 0.1

- TECHNICAL INFORMATION, see page E69

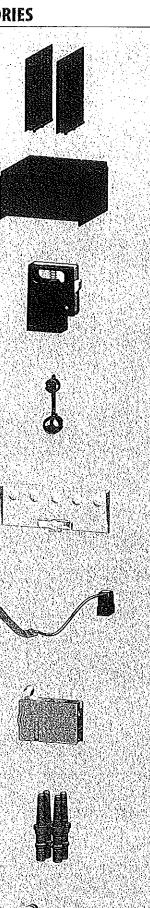
- upon agreement with the manufacturer, different conductor lengths can be supplied

CONTROL RELAY



| John State | odyction | spealistions | | | W. | iohtikaisi | |
|-------------------|------------|------------------|--|----------------------------|--|------------------|----------------|
| OD-BHD-RX01 | 37425 | 24 V a.c/d.c. | | The same of the same | | 0.06 | 1 |
| OD-BHD-RX02 | 37426 | ′48Va.c/d.c∵⊹ | | | MODERNA CONTRACTOR POR SECTION | The Development | |
| OD-BHO-BAGS | 37427 | 110 ÷ 230 V a.c. | er i i a si e su e su en | 51 19 SETT LESS TA, (18 SE | | 0.06 | ANTIKATAN 1 |
| OD BHD RO04 | 37428 | 110Vd.c | $M_{\mathbf{A}}$ | \mathbb{N} | | 0.06 | 2594-237 |
| - TECHNICAL INFOR | AATION, se | e page P3 | 1111 | 1/7 | erent to a series of the desired territories of the series | <u>жив,чкосу</u> | <u> </u> |

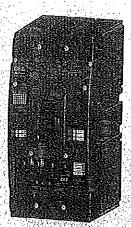
•



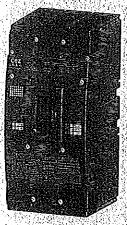
| Type and the same | Product cod | es:Kame : description : s |
|--|---------------------------------|--|
| OD-BHD-KS02 | 24740 | Insulating barriers - set (two pleces), for 3P and 4P design 0.077 |
| OD-BHD-KS42 | 19575 | Insulating barrier - one plece, for 4P design 0.039 |
| - included with each sw - in case circuit breaker/ these barriers also on - for more detailed infor OD-BD-KS03 OD-BD-KS43 | switch-discor the lower sid | nnector connection is reversed (supply to terminals 2, 4, 6) it is necessary in most cases to e |
| - Increases degree of pro - intended for fixed, plu | | nnection point to IP20 when using CS-BD-B012, B021, B022 and B014 block type terminal |
| o presidente a com segora e co | -1.56.1005 | en en gestigen de la gewen van gemeen te valget, de voorboeke op de valgen beven stigen voor van de van de ver |
| OD-BD-UPO1 | | Lever with locking 0.009 |
| | | "switched off manually" position (loaded) th shank diameter 4 ÷ 6 mm |
| OD-BD-VPO1 | 15328 | Bolt sealing Jasert 0.001 |
| - enables sealing for: - | | |
| | terminal cove overcurrent re | |
| | hand drive un | |
| -1 | motor drive | |
| | | • |
| OD-BD-VP02 | 18215 | Additional cover for overcurrent release 0.08 |
| – enables sealing for ove | ercurrent relea | ases such as circuit breakers in the main meter switchboard |
| | | |
| | | |
| | | |
| OD BHD KAO1 | 14555 | Connecting cable s to connect the circuit breaker/ 0.12 /switch-disconnector accessories in the plug-in/. /withdrawable design ~15 Wires (It is possible for plug-in design and fixed design) |
| | | |
| SO-BHD-0010 | 14560 | Signalling of position - signals circuit breaker position |
| | | In the plug-in or withdrawable device |
| - TECHNICAL INFORMATI | ON, see page | ESO, ES2 |
| | | |
| | Modeline or in | Nigo Nang Perioden San Karanggan pengganggan pengganggan penggan penggan |
| OD-BD-KK01 | 14559 | Keying set - prevents inserting in the plug-in or : 0.002 withdrawable devices beyond the syntching unit |
| -TECHNICAL INFORMATI | ON, see page | |
| | | // |
| | | 1/1 |
| • | | 1 / / |
| OD-BHD-KT01 | 14642 | Cover of switch on button - for motor drive, cover can 0.002 |
| 7227 Y W W W W W W W W W W W W W W W W W W | | be sealed |
| - TECHNICAL INFORMATI | LIM COS DOGS | thu . |



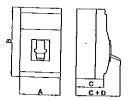
3P 4P



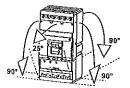
Circuit breaker



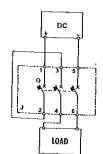
Switch-disconnector



Dimensions



nstallation positions - fixed, plug-in and withdrawable design

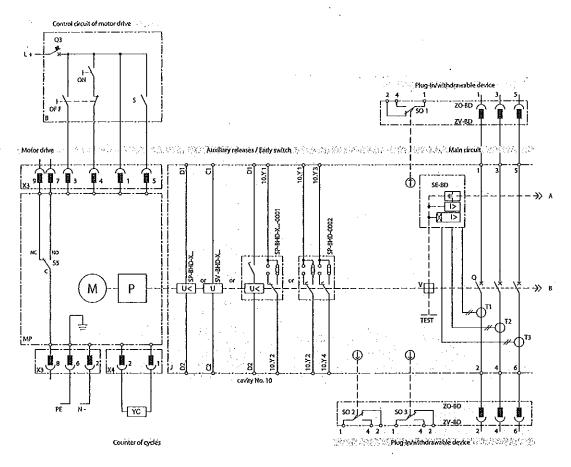


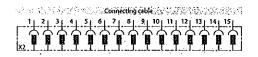
Connection of switch-disconnector for DC circuits

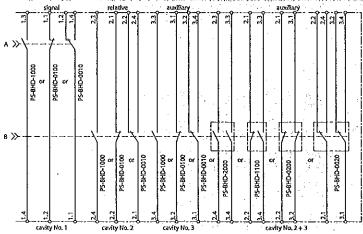
| Specifications | CIRCUIT BREAKER | SWITCH-DISCONNECTOR |
|--|--|--|
| Type: Dimensions A x B x C + D (3P/4P design) | BD250N, BD250S | |
| Weight (3P/4P design) | 105/140 x 225 x 105 + 43 mm | 105/140x225x105+43mm |
| Standards | 3 kg/4 kg EN 60947-2, IEC 60947-2 | 3 kg/4 kg EN 60947-3, IEC 60947-3 |
| Approval marks | The second se | The state of the s |
| Must be a final and a second of the second o | C E (6) | € ₩ |
| Number of poles Rated current | 3,4 | 3,4 |
| Rated normal current | 100, 160, 200, 250 A | |
| Rated operating current | 250 A Hiji Asar Kalang (Mg) Ng Malang Kalang | 250 A |
| Rated operating voltage U | max, 690 V a,c, | 250 A max, 690 V a.c. |
| Rated frequency | esta (Salaharan Berlanda) (Berlanda) (Berlan | max. 440 V d.c. |
| The first of the control of the cont | 50/60 Hz | 50/60 Hz |
| Rated insulation voltage U | 8 kV | 8 kV 690 V |
| Utilization category (selectivity) 690 V a | | 050.8 |
| Utilization category (switching mode) 690 V a.c | | AC-23B |
| Rated short-time with stand current at $U_c = 690 \text{ V a.c.}$ I_c/t | 2.5 kV1 s | DC-23B |
| | 2.3 KA/ 1 S | 3 kA/S s |
| Series : | NORMAL SUPERIOR | |
| Rated short-circuit ultimate breaking capacity (rms) " | BD250N BD250S 60 kA 100 kA 230 V a.c. | |
| · · · | 36kA 65kA 415Va.c | |
| | 16kA 25kA 500Va.c. | Ā |
| Rated short-circuit service breaking capacity (rms) | 10 kA 13 kA 690 V a.c. 30 kA 50 kA 230 V a.c. | nananak deremakan |
| | 18kA 36kA 415Va.c | |
| | - 8kA∵ 13kA∴ 500Va¢ | |
| Rated short-circuit making capacity (peak value) | 5kA 8kA 690Va.c 75kA 140kA 415Va.c | 4 kA/415 V a.c. |
| CA E | 1000 41510.0 | 4 kA/440 V d.c. |
| Switching off time at i Losses per 1 pole fixed/withdrawable design | 10 ms | |
| vechanical endurance | 18W/25W Sasyawayana na mayana | 18 W/25 W |
| Tectrical endurance | 30 000 cycles | 30 000 cycles |
| Witching frequency | 3 000 cycles | 3 000 cydes |
| ontrol force | 120 cydes/hr. 80 N | 120 cycles/hr |
| Degree of protection from front side of the device | 1P40 | 80 N |
| legree of protection of terminals | 1920 1920 | IP40 IP20 |
| perating conditions & & & & & & & & & & & & & & & & & & & | | 1170 |
| eference ambient temperature | 40℃ | 40℃ |
| mblent température range | -40℃÷+55℃ | -40℃÷∔55℃ |
| Vorking environment | dry and tropical climate | dry and tropical dimate |
| limalic resistance | EN 60068 | EN 60068 |
| ollution degree CNNO 64 Teach Colon | 3 Signal to decrease to the control of | 3 |
| ax, sea leve) eismic resistance | 2 000 m | 2000 m |
| esign modifications | 3g (8 ÷ 50) Hz | 3g (8 ÷ 50) Hz |
| onVrear connection | | |
| yg-in design 3P/4P | o/e 1988-90-65-70-90-00-6-6-6 | o/o cossa de sous sanciación e e |
| tal drawable design 3P/4P | s/o | •/• |
| ressories | u/• | o/e |
| vitches - auxiliary/relative/signal/early | 0/0/0 | •/•/•/• |
| iunt trip | | |
| ndervoltage release/with early switch | ০/০ ১,१ ছ ছৰ ব্যৱস্থা এই প্ৰতিশ্ৰম সংগ্ৰম প্ৰৱন্ধীয়েল। স | (१) क्रिकेट के क्रिकेट |
| ont hand drive/with adjustable lever | •/• | \$1.00 6/6 \$6.00 |
| echanical interlocking-with Bowden cable/for hand drive | e/e •/e | \$\delta \text{\te}\text{ |
| otor drive/with counter of cycles | | 7 |
| ver with locking | ************************************** | over the stransfer, our Strains (|
| At sealing insert additional cover for overcurrent release | •/• | Z-3 c•/• \$2.20 |
| available, — yilavailable, + being prepared | | |
| in case circuit breaker connection is reversed (Input terminals 2, 4,6, o otertion of Modelon switch-disconnectors, see page R | rputiterminals 1, 3, 5) la does not ch | ange |
| disconnectors, see page it | N W // | |

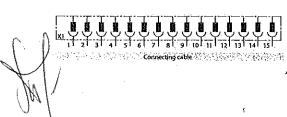
Diagram -

Circuit breaker with accessories (3-pole design)









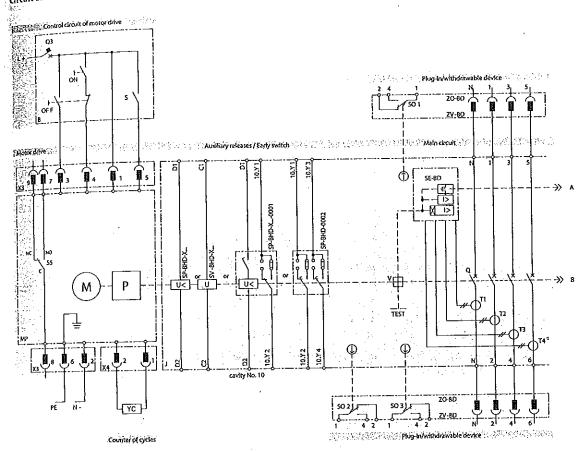
| | motor drive - MP-BD-X |
|-----------------------------|--|
| MP | ra del provincia de provincia de como como como de la como de la como del como de la como de la como de la com |
| M | motor |
| X | storage device connector for conhection of control circuits |
| λ) Χ4 | connector for external counter of cycles |
| S5 | switch to Indicate AUTO (NO-C) / MANUAL (NC-C) modes |
| Ϋ́C | external counter of cycles - OD-BHD-PPO) |
| B | recommended wiring of the control circuits - it is not a part of motor di |
| ON | switch on button |
| OFF | switch off button |
| 5 | switch for energy storage (switched on = automatic storage, |
| 斯勒斯基度 的 | switch may be continuously switched on) |
| 03 | motor drive circuit breaker - see page E69 |
| ii ea a | switching unit - B0250.305 |
| 6.4 | main contacts |
| Ĩ1, 12, 13, 14 ¹ | current transformers |
| | trip-free mechanism |
| SE-BD | ctrouit breaker - overcurrent release - SE-BD syntch-disconnect |
| | - svritch-disconnector unit - SE-BD-0250-V001 |
| ाठा 🔻 | push button to test release |
| 20-BD | plug-In device |
| ZV-BD | withdrawable device = ZV-BD-0250-300 |
| X1,X2 | connecting cable - OD-BHD-KAO1 |
| \$01,502,503 | contacts signalling circuit breaker/switch-disconnector position in |
| 3500000000 | plug-in or withdrawable device SO-BHD, 0010 - for more detailed |
| | information see page ESO, ES2 |
| SP-BHD-X | Underyoltage release //// |
| SV-BHD-X. | shunt trip |
| SP-8HD-X::-0001 | undervoltage release with early contact |
| SP-BHD-0002 | early contact |
| 3475年4476624161 | AMPHARAM PARKATAN KANTAN K |

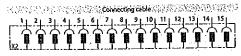
1) - only for 4-pole design of BD250..406 switching unit

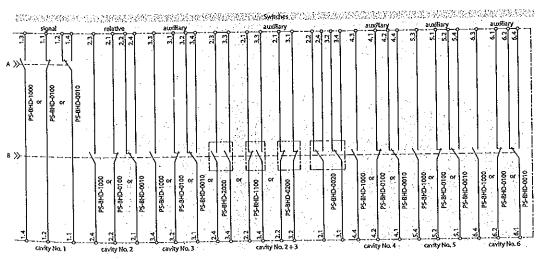


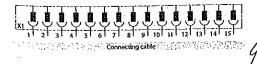
Diagram

Circuit breaker with accessories (4-pole design)











Connecting and installation

Power circuit

- connected with Cu/Al busbars or cables and possibly cables with cable lugs
- connection sets are produced to provide greater connecting options, see page E8
- generally, conductors from the supply are connected to input terminals 1, 3, 5 and conductors from the load to terminals 2, 4, 6; however, it is possible to reverse the connection (exchanging input and output terminals without limiting rated short-circuit ultimate breaking capacity l,,)
- in case of reversed connection, in the majority of cases, circuit breaker/switch-disconnector must be fitted with OD-BHD-KSO2 insulating barriers also on the side of terminals 2, 4, 6, for more detailed information see page E22
- we recommend painting the connecting busbars
- input and output conductors/busbars must be mechanically reinforced in order to avoid transferring electrodynamic forces to the circuit breaker/ /switch-disconnector during short-circuiting
- the method of connecting the power circuit must observe the delonization space of the circuit breaker/ /switch-disconnector, see page E23

Auxiliary circuits

- switches, shunt trips or undervoltage releases are connected using flexible Cu conductors with cross-section 0.5 ÷ 1 mm² directly to terminals on these devices
- motor drive and auxiliary circuits of the plug-in or withdrawable design are connected using a connector

Recommended min. cross-sections of cables, busbars and flexibars for fixed, plug-in and withdrawable designs

| ecommenaea min | | names as a second second | | VXH1mmis . |
|------------------------------|--|--------------------------------------|--|-----------------|
| ni we sita | A Section 25 Cables | Simmiles (A) | a ville single single | |
| | and a company of the company | GEORGE AND INC. | A STATE OF THE STA | SERVICE SERVICE |
| 10 | 10 | 16 | | - |
| io | 10 | 16 | | |
| 3 | 16 | 25 | - | er era da ili |
| 30 0 1 1 1 1 1 1 1 | 35 (Yes) | 35 | | |
| 18(6) 28 J. 1841 P. G. S. W. | | 50 | 20 x 2 | 25 x 2 |
| 100 | 35 sa experimentario de la Applicación de | our Curvino, arrespesa estrate, S | | 3 3 7 3 F w 2 - |
| 125 | 50 | 70 | 25 x 2 | 23 X 3 |
| | 70 | 95 | 25 x 3 | 25 x 4 |
| iov nelectricity (1972) | secretario de la composição de la compos | | 是30.3%多 35v 4用33 | 25 x 5 |
| 200 | 2. S. | 120 | 25X4 | Karana sa |
| 250 | 120 | 150 | 25 x 5 | 25 x 6 |

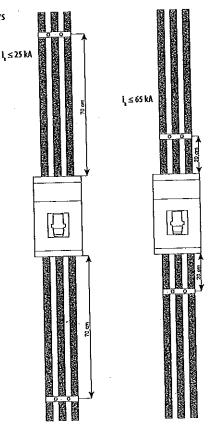
⁻ it is necessary to follow the relevant valid standards when cables are designed

Maximum circuit breaker/switch-disconnector loads in accordance with ambient temperature

Circuit breaker/switch-disconnector BD250 - connection by Cu cable 1x 120 mm² per pole

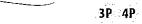
| 50:0 | 4.000 | 7 60 C | 65(0) | 2007C 15 |
|-------|-------|--------|-------|----------|
| 250 A | 250 A | 250 A | 250 Å | 250 A |

Mechanical reinforcement of conductors for BD250









Connecting and installation

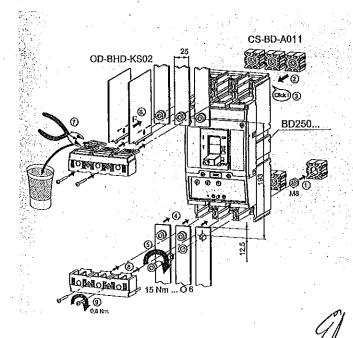
| c-nnocting | cate | necifi | cations |
|------------|------|--------|---------|
| CANBOCTION | 200 | perm | |

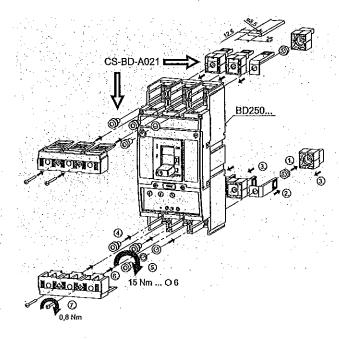
| Connecting set | specifications | | | an markalan andar an an an | | | |
|--------------------------|------------------------------|--|----------------------------------|--|-----------------------------|---|----|
| | | | le aranges of connection cros | ************************************** | | | |
| | ja i j | e of cable) at a sector stranded at a | sector solide (2.18) | cound stranded | round solid | | |
| | 0.00 | | | | | | |
| | | | | | | arsandrables admensional s Wx II (mm) adrawing 3P/40 | |
| es 00 5011 | 250 | | | | | 25 x | |
| CS-BD-A011 | 物质的设备 | | | | | 25 x pagé E27, E41 | |
| CS BD-B421 | 250 | | 1970年的 1970年 | CONTRACTOR | | Shirt Shirt Shirt Shirt | |
| CS-8D-T011 | 250 | 16 ÷ 150 Cu | 10 ÷ 150 Cu | 16 ÷ 150 Cu | 10 ÷ 150 Cu | | -< |
| CS-BD-T411 | | | 美国的基础的 | | | | Ą |
| 60.80.8011 CS.80.8411 | 250 | 25 + 150 CU/Al | . 16 ÷ 150 Cu/Al | 25 ÷ 150 Cu/Al | 16 ÷ 150 Cu/Al | 第 13年 | |
| (S-BD-B012 | 250 | 150 ÷ 240 Cu/Al | 120 ÷ 240 Cu/Al | 150 ÷ 240 Cu/AJ | 120 ÷ 240 Cu/Al | page E24, E39 | |
| (S-BD-B412 | i Kasantawa e. | | TERMINETENSION NEWS | 29 W 1881 SE (ISBN 1881) | | | |
| CS-BD-B021 CS-BD-B421 | 250 | 2x (2S ÷ 150) Cu/Al | 2x (16 ÷ 150) Cu/Al | 2x (25 ÷ 150) Cu/Al | 2x (16 ± 150) Cu/Al | , page E24, E39 | (|
| CS-BD-B022 | 250 | 2x (150 ÷ 240) Cu/Al | 2x (120 ÷ 240) Cu/Al | 2x (150 ÷ 240) Cu/Al | 2x (120 ÷ 240) Cu/Al | page E25, E40 | / |
| (S-BD-B422 | 230 Websel \$45775 | | ANNE HONE ENGINEERS | STERRING SECTION SHEAR | kenin kananyanan | OF SECTION ASSESSED. | |
| CS BD-B014 | 250 | 6x (6 ÷ 35) Cu/Al | 6x (6 ÷ 35) CWAI | 6x (6 ÷ 35) Cu/Al | 6x (6 ÷ 35) Cu/Al | page E26, E40 | |
| CS-BD-B414 CS-BD-A037 | 250 | RETR | OFIT - reduction for circuit bre | aker BA*37 with front connec | ion | page E26, E41 | |
| CS-BD-A039 | 250 | RETROFIT | - reduction for circuit breaker | BA: *39 and J2UX with front co | nnection | page E27 | |
| CS-BD-Z039 | 250 | RETROFII | - reduction for circuit breaker | BA*39 and J2UX with rear cor | nection | page E28 | |
| CS-BD-JX75 | 250 | RETROFIT - reduction for dro | uit breaker BA., 39-75 and J2U | X75 with front connection in plu | j-in or withdrawable device | page F28 | |
| CS-BD-JT75 | 250 | RETROFIT - reduction | for circuit breaker J2UX75T wi | th front connection in plug-in or v | vithdrawable device | page E34, E38 | |
| CS-BD-PS01 | 10/16 | | | 1,5÷2.5/4÷6 Ou flexible conductor | | 特别的现在分词 | |
| CS-BD-PS41 | 10/16 | | | 1.5÷2.5/4÷6 Cu flexible conductor | | | |
| DETDARIT | . 1.4 1 | - same at of alder circuit breakers by a new cir | arit broakere without aritebbe | and reconstruction : | | | |

RETROFIT - sets, which enable replacement of older circuit breakers by a new circuit breakers without switchboard reconstruction

Front connection - Cu/Al busbars

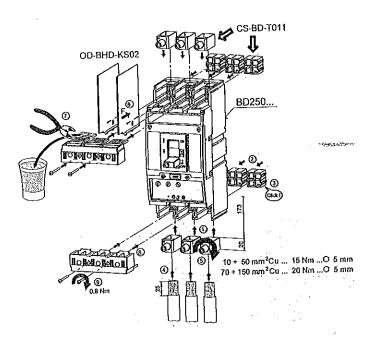
Rear connection - Cu/Al busbars



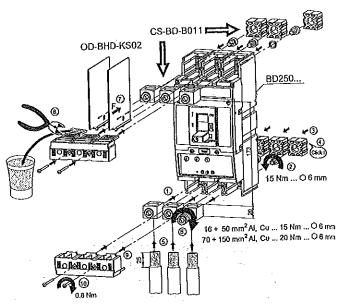


Connecting and installation--

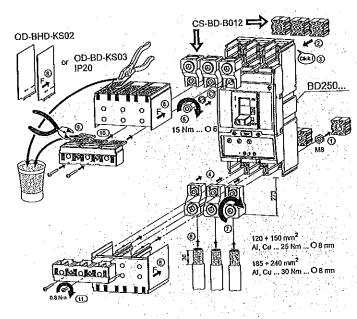
Front connection - Cu cables



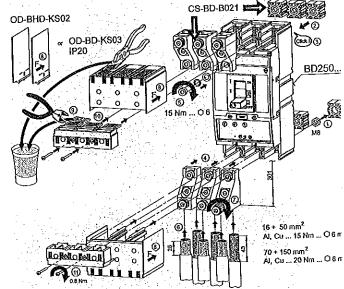
Front connection - Cu/Al cables cables - up to 150 mm²



Front connection - Cu/Al cables up to 240 mm²



Front connection - 2 Cu/Al cables





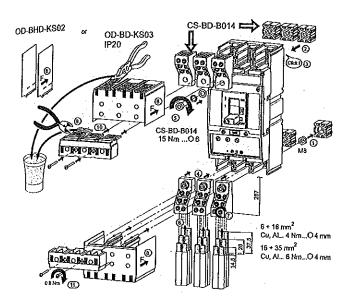


3P 4P

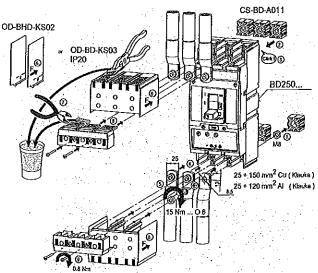
CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

Connecting and installation

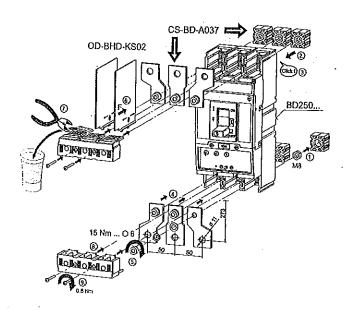
Front connection - 6 Cu/Al cables



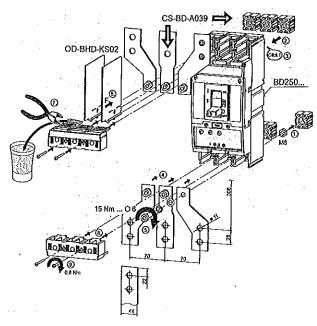
Front connection - cable lugs



Front connection - reduction BD to BA...*37



Front connection - reduction BD to BA...*39 and J2UX

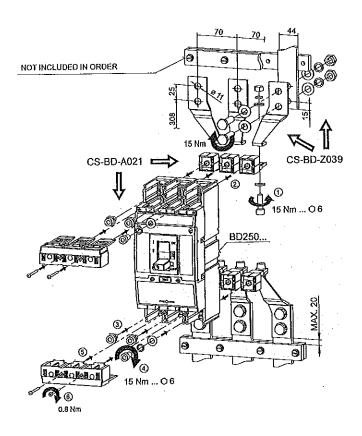






Connecting and installation

Rear connection – reduction BD to BA ...*39 and J2UX with rear connection



Deionization spaces

USE OF INSULATING BARRIERS AND TERMINAL COVERS WITH CIRCUIT BREAKERS AND SWITCH-DISCONNECTORS

■ FIXED DESIGN

- front connection

a) if $\rm U_{\rm e} \gtrsim 415$ V a.c., it is necessary to use OD-BHD-KS02 insulating barriers or a OD-BHD-KS03 term - terminals 1, 3, 5 (upper side)

b) if insulated conductors are not used for connecting power circuit to terminals 1, 3, 5, flexibars (connection, it is necessary to use OD-BHD-KSO2 insulating barriers or a OD-BHD-KSO3 terminal cov

only in case that circuit breaker/switch-disconnector is connected to the source using terminals - terminals 2, 4, 6 2, 4, 6 and furthermore: (lower side)

a) if U $_{e} \! \geq \! 415$ V a.c., it is necessary to use OD-BHD-KS02 insulating barriers or a OD-BHD-KS03 terminal

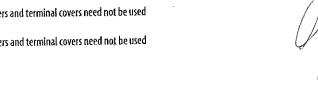
b) if insulated conductors are not used for connecting power circuit to terminals 2, 4, 6, flexibars connection, it is necessary to use OD-BHD-KS02 insulating barriers or a OD-BHD-KS03 terminal col

- rear connection

- insulating barriers and terminal covers need not be used

LUG-IN AND WITHDRAWABLE DEVICE

- insulating barriers and terminal covers need not be used

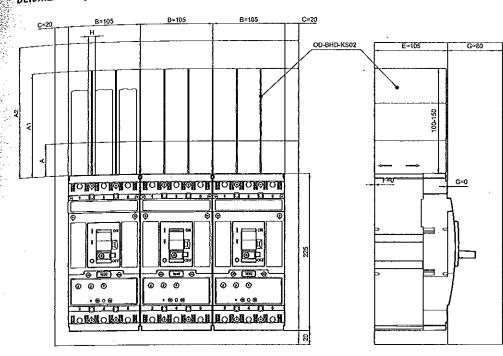






3P 4P

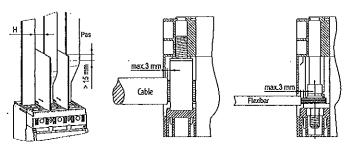
Deionization spaces



- A...minimum distance between the circuit breaker/ /switch-disconnector and uninsulated earthed wall (applicable for connection using insulated conductors, cables, flexibars or with rear connection)
- A1...minimum insulation length of bare conductors (using OD-BHD-KSO2 insulating barriers from 100 mm to max. 150 mm, or by adding additional insulation for the conductors with barriers to obtain at least A1 value)

A2...minimum distance:

- between the circuit breaker/switch-disconnector and uninsulated earthed wall (applicable for uninsulated conductors and busbars)
- between the circuit breaker/switch-disconnector and busbar
- between two circuit breakers/switch-disconnectors situated vertically above one another
- between uninsulated connections of two direct breakers/switch-disconnectors above one another
- C, D, F, F, G...minimum distance between the circuit breaker/switch-disconnector and uninsulated earthed wall
- H...minimum distance between uninsulated conductors
- minimum distance of circuit breakers without using of uninsulated barriers is 50 mm



When insulating conductors, cables, flexibars or rear connection are used up to $U \le 415 \, V$ a.c., it is not necessary to use OD-BHD-KSO2 insulating barriers.

| | | | L WEST | | | | 00 | 0.000 |
|-------------|--------------------|-----------------|------------|------|------|---------|-----|-------|
| 1020 yandi | jih i 2. 3. | | e juli e n | 10.5 | 6-60 | 10 10 2 | | |
| SUZSOLWIENT | | | i lai | | | | | 0.00 |
| | S THUMPS | A | [mm] | 50 | 50 | 50 | 50 | 50 |
| | ≥ 10 | Al | [mm] | 100 | 150 | 100 | 150 | 150 |
| < 80 | | A2 | [mm] | 200 | 250 | 200 | 250 | 250 |
| | | A A STATE | [mm] | 50 | 50 | 50 | 50 | 50 |
| | ≥30 | A1 | [mm] | 100 | 150 | 100 | 150 | 150 |
| | | (((A2)) | o∵ (mmj b | 150. | 200 | 150 | 200 | 200 |
| | | A Company Compa | [mm] | 50 | 50 | 50 | 50 | 50 |
| ≥80 | ≥ 10 | 3 A1 | [mm] | 100 | 150 | 100 | 150 | 150 |
| | | A2 | [mm] | 150 | 200 | 150 | 200 | 200 |

pozn.: [" - max. short-circuit current in the protected circuit (rms)

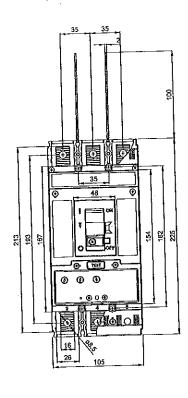


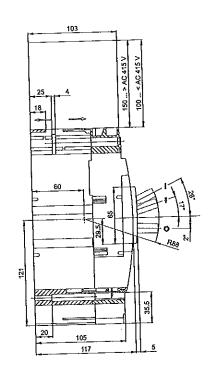


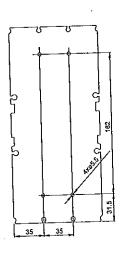
Dimensions

Fixed design, front connection

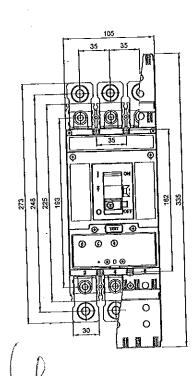


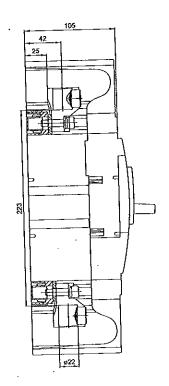






Fixed design, front connection (CS-BD-B012 connecting set)



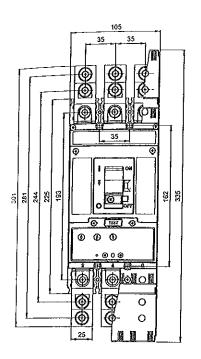


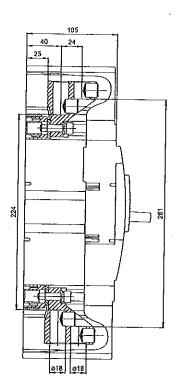


3P

)imensions

Tixed design, front connection (CS-BD-B021 connecting set)



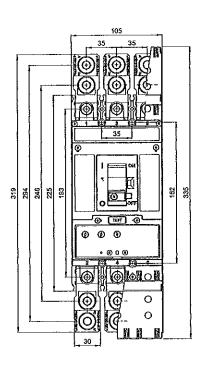


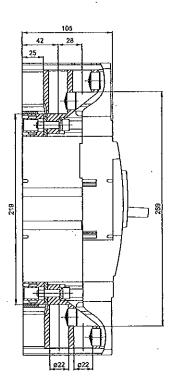




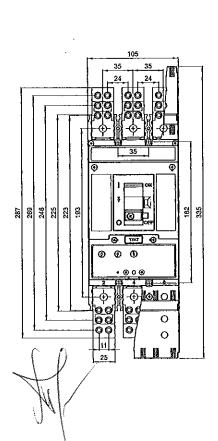
Dimensions

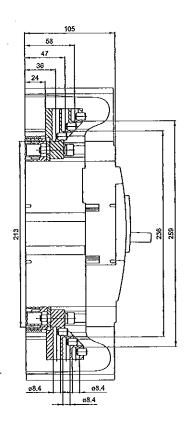
Fixed design, front connection (CS-BD-B022 connecting set)





Fixed design, front connection (CS-BD-B014 connecting set)







3P

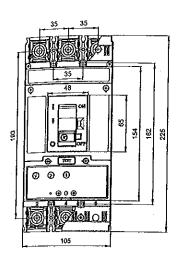
CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

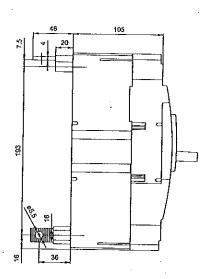
Dimensions

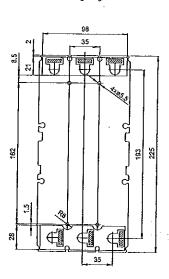
Fixed design, rear connection (CS-BD-A021 connecting set)



Drilling diagram

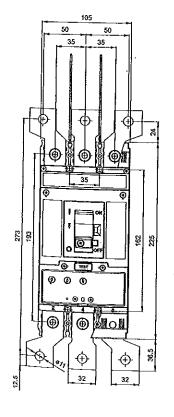


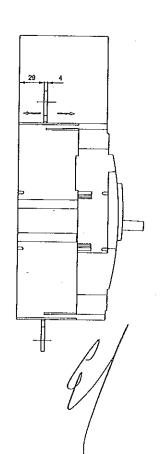




Fixed design, front connection (CS-BD-A037 connecting set)





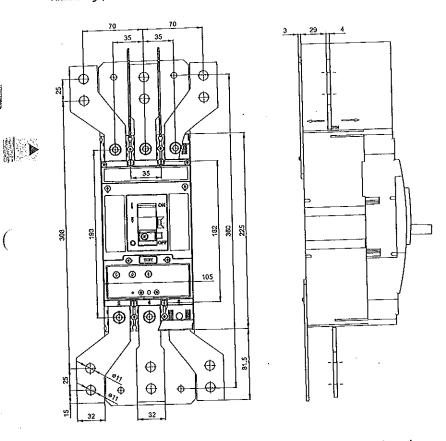




Dimensions

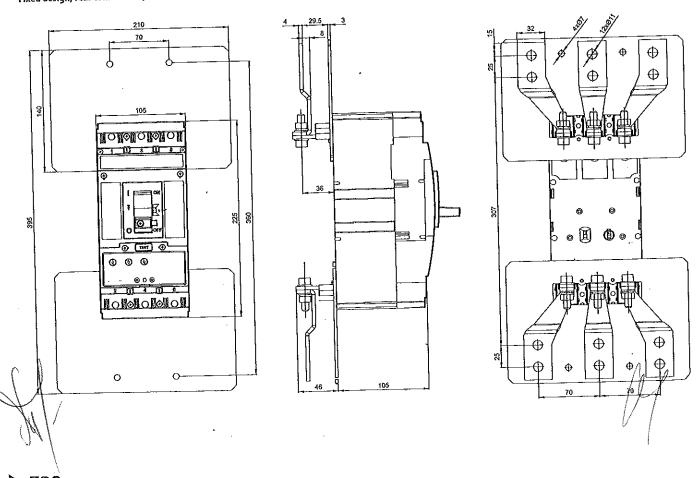
Fixed design, front connection (CS-BD-A039 connecting set, OD-BHD-M539 mounting set)





Fixed design, rear connection (CS-BD-Z039 connecting set, OD-BD-MZ39 mounting set)

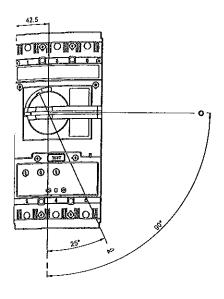
RETROFIT

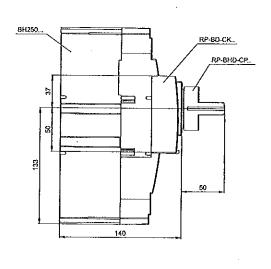


3P

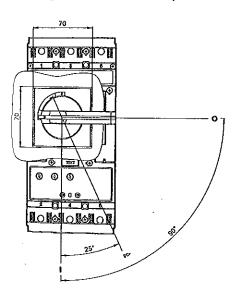
)imensions

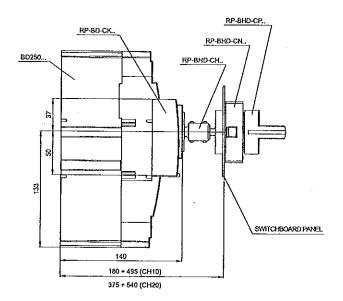
ixed design, hand drive



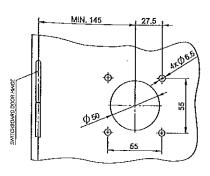


Fixed design, hand drive - front, with adjustable lever





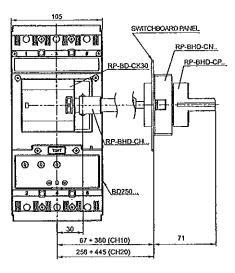
Switchboard door modification

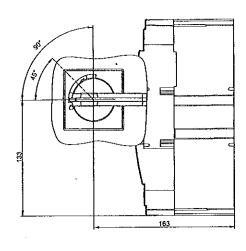




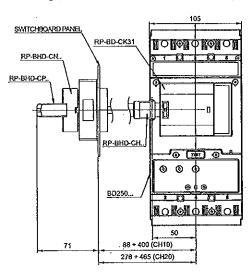
Dimensions

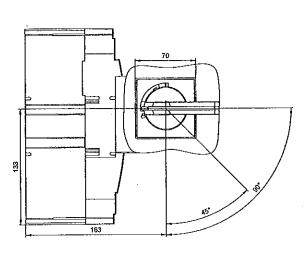
Fixed design, hand drive - control on right side, with adjustable lever



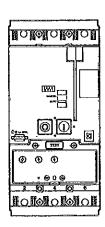


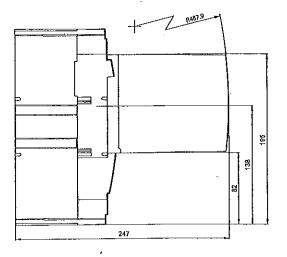
Fixed design, hand drive - control on left side, with adjustable lever



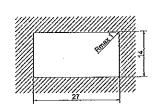


Fixed design, MP-BD-X... motor drive





Opening dimensions in switchboard door for external counter of cycles







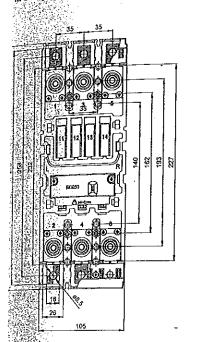


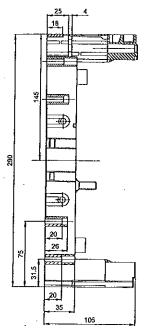
3P

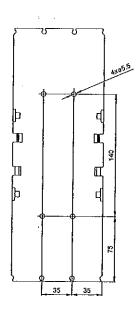
ensions

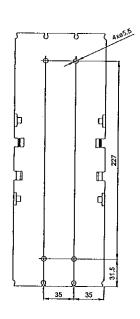
in device



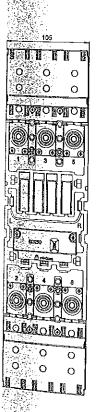


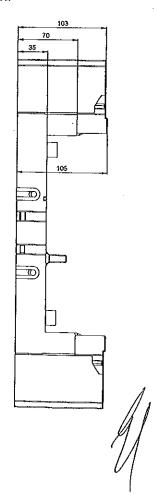






In device, OD-BD-KS03 terminal cover

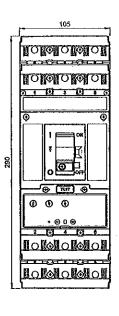


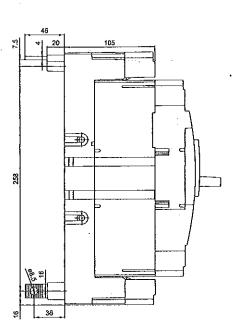


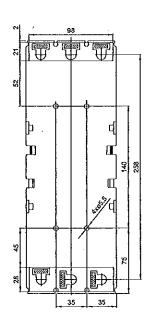


Dimensions

⁻Plug-in design



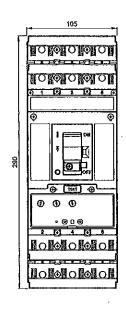


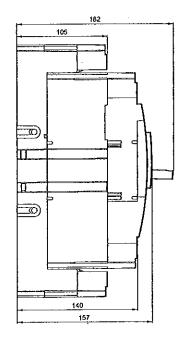




Drilling diagram

Plug-in design





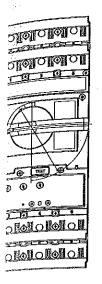
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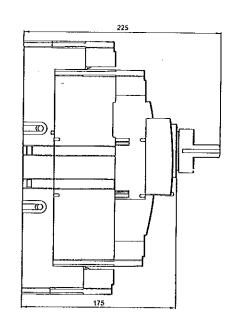


3 P

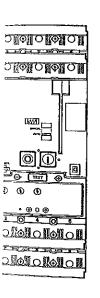
nensions

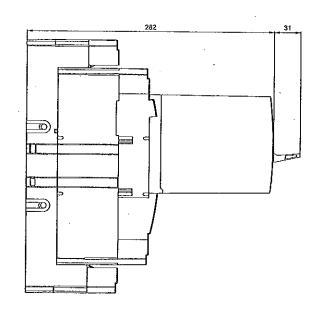
g-in design, hand drive





g-in-design, motor drive



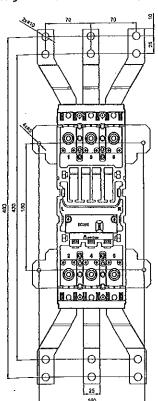


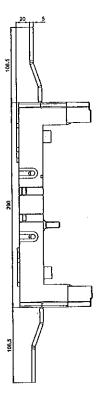




Dimensions

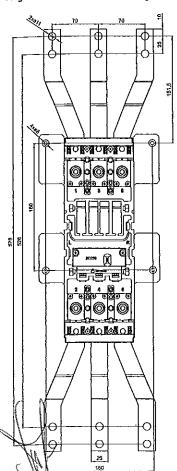
Plug-in device (CS-BD-JX75 connecting set, OD-BHD-MS75 mounting set)

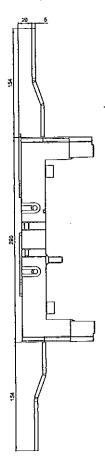




RETROFIT

Plug-in device (CS-BD-JT75 connecting set, OD-BD-MT75 mounting set)





RETROFIT

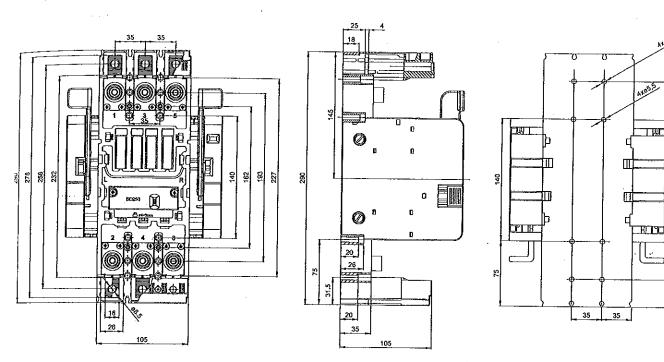


)imensions

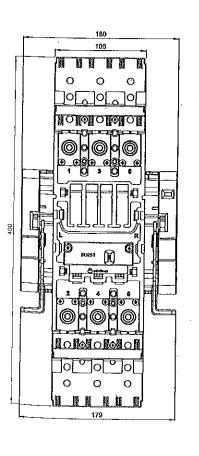
yithdrawable device

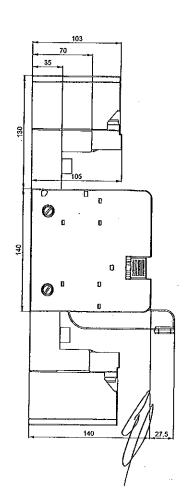


Drilling diagram



Nithdrawable device, OD-BD-KSO3 terminal cover

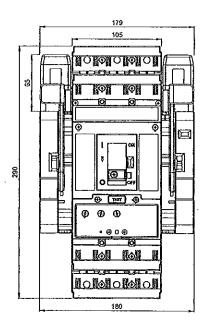




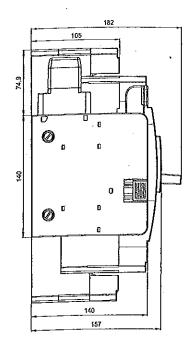


Dimensions

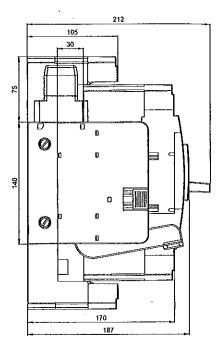
Withdrawable design



Working position



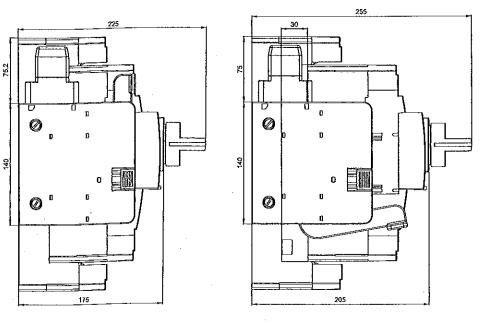
Inspection position



Withdrawable design, hand drive



Inspection position







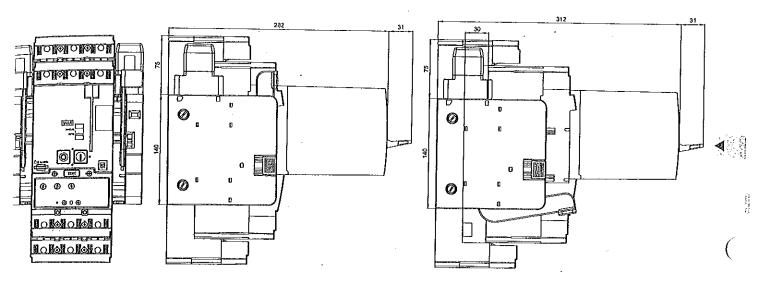
3P

imensions

ithdrawable design, motor drive

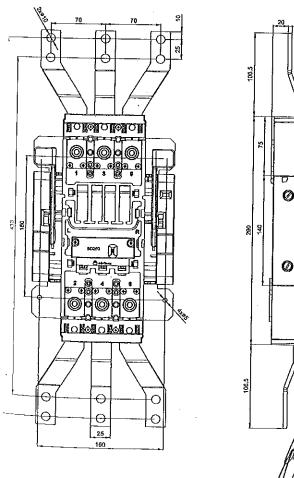
Working position

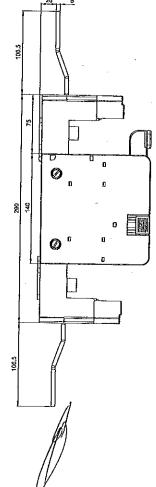
Inspection position



ithdrawable device (CS-BD-JX75 connecting set, OD-BHD-MS75 mounting set)

PRETROFIT TO



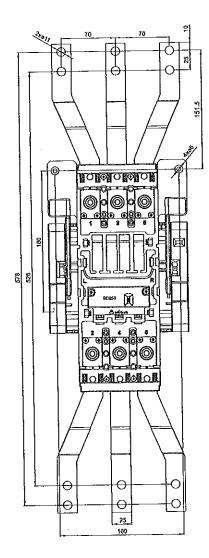


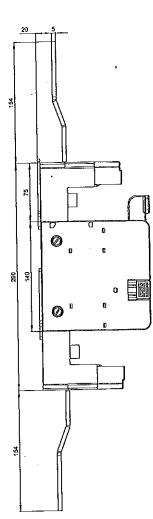


Dimensions

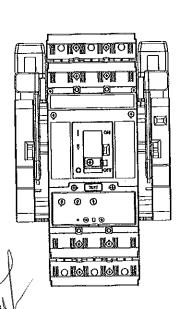
Withdrawable device (CS-BD-JT75 connecting set, OD-BD-MT75 mounting set)

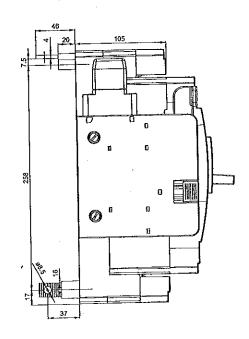


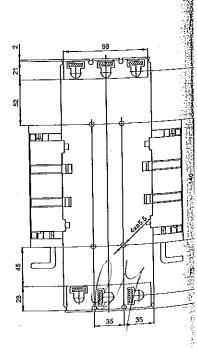




Withdrawable device, rear connection (CS-BD-A021 connecting set)



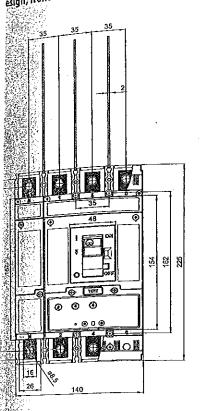


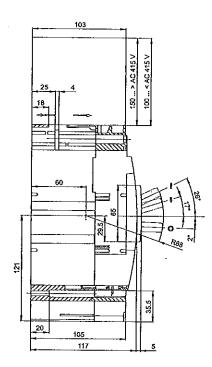




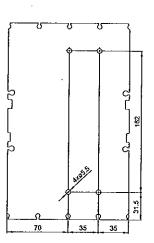
glons

esign, front connection

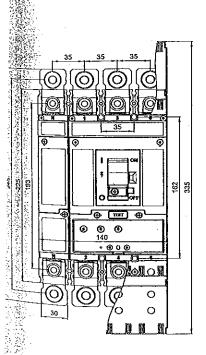


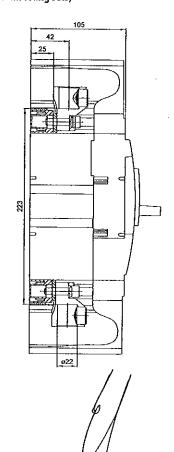






[design, front connection (CS-BD-B012 + CS-BD-B412 connecting sets)

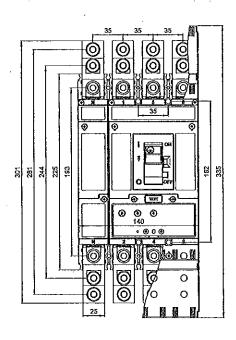


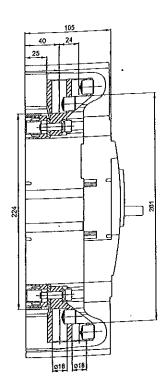




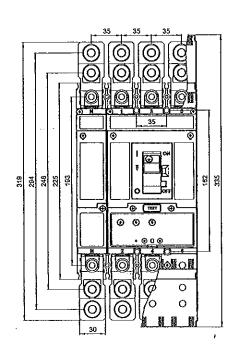
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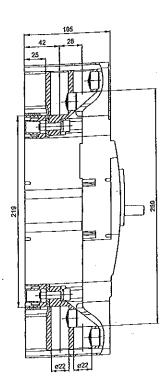
Fixed design, front connection (CS-BD-B021 + CS-BD-B421 connecting sets)





Fixed design, front connection (CS-BD-B022 + CS-BD-B422 connecting sets)



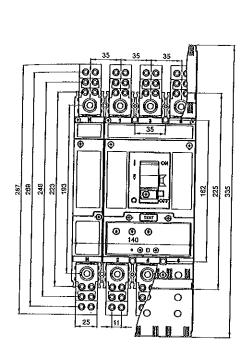


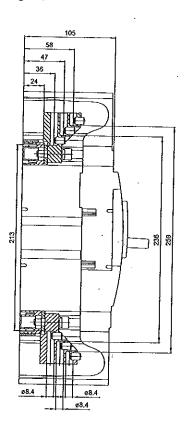




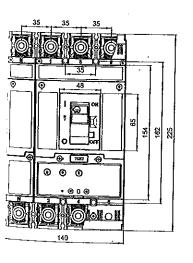
Dimensions

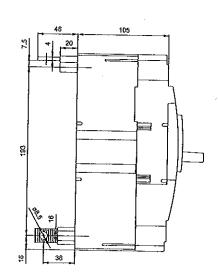
Fixed design, front connection (CS-BD-B014 + CS-BD-B414 connecting sets)

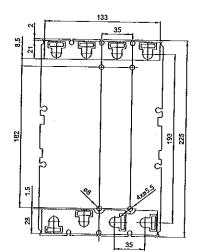




Fixed design, rear connection (CS-BD-A021 + CS-BD-A421 connecting sets)







Drilling diagram

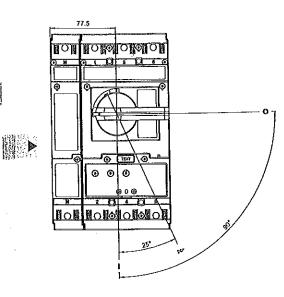


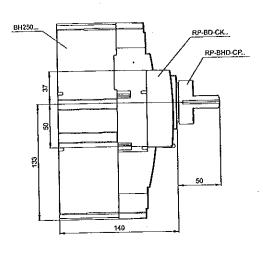


4P

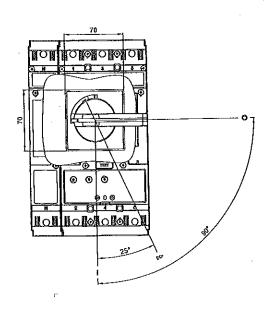
Dimensions

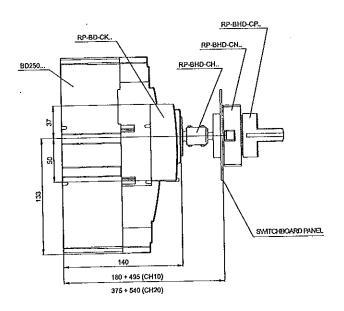
Fixed design, hand drive



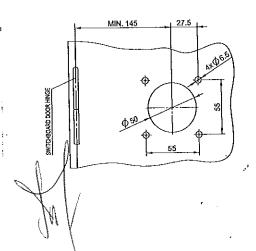


Fixed design, hand drive - front, with adjustable lever





Switchboard door modification





4P

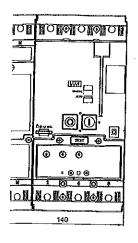
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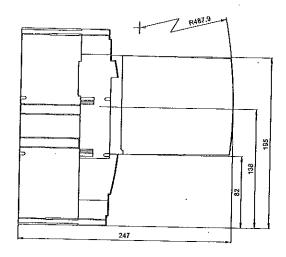
IRCUIT BREAKERS, SWITCH-DISCONNECTORS



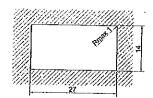
imensions

xed design, motor drive



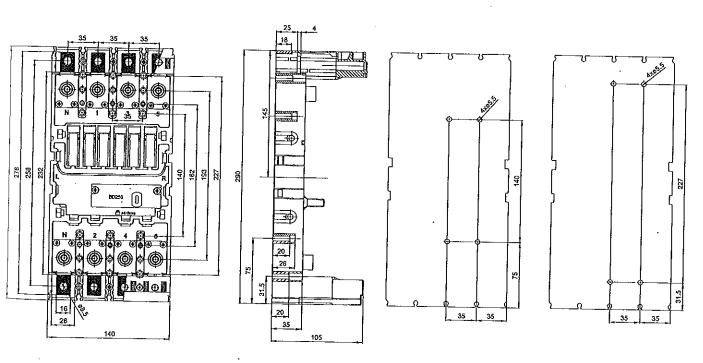


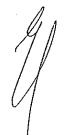
Opening dimensions in switchboard door for external counter of cycles



ug-in device

Drilling diagram

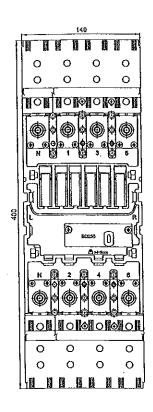


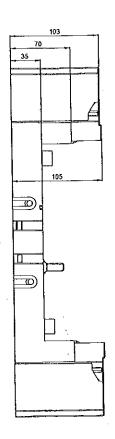




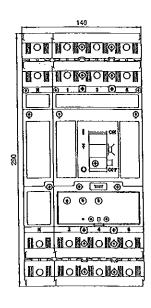
Dimensions

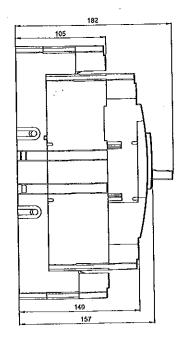
Plug-in device, OD-BD-KS43 terminal cover





Plug-in design





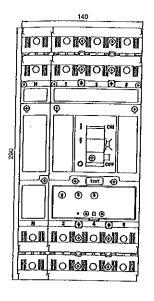


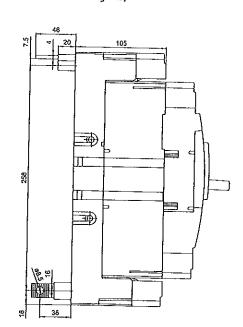


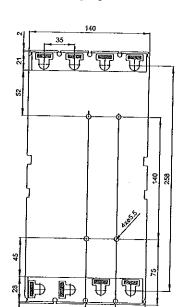
4P

Jimensions

 $\label{eq:lug-indesign} \textit{Plug-in design, rear connection (CS-BD-A021 + CS-BD-A421 connecting sets)}$





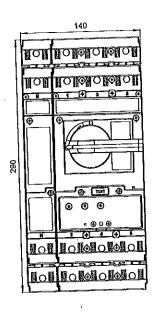


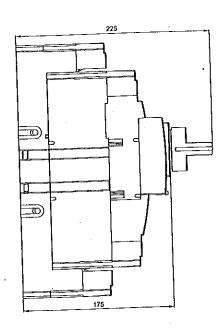
Drilling diagram

) |. |

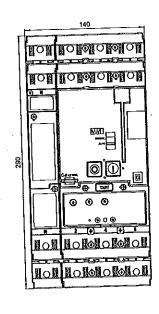
Dimensions

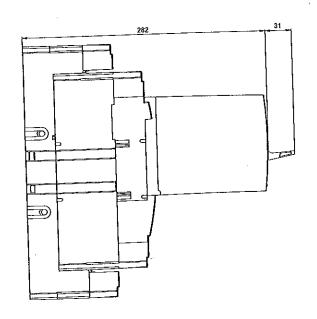
Plug-in design, hand drive





Plug-in design, motor drive







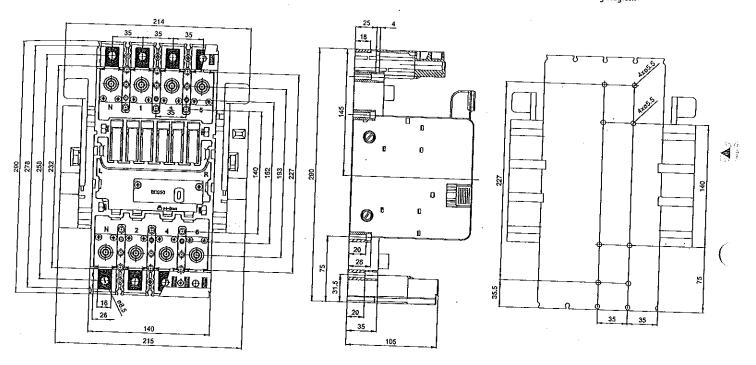


4P

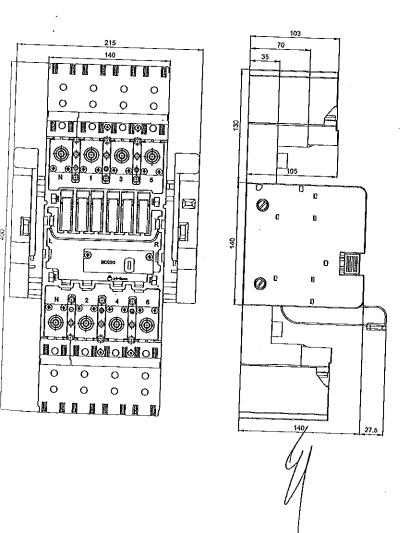
Dimensions

Withdrawable device





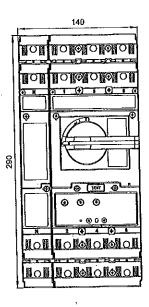
Withdrawable device, OD-BD-KS43 terminal cover

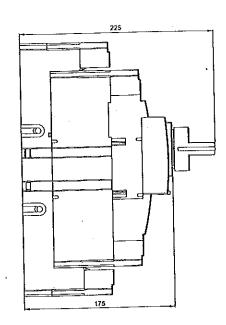




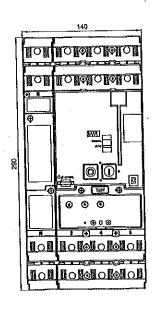
Dimensions

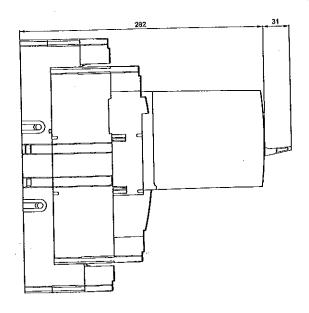
Plug-in design, hand drive





Plug-in design, motor drive







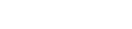


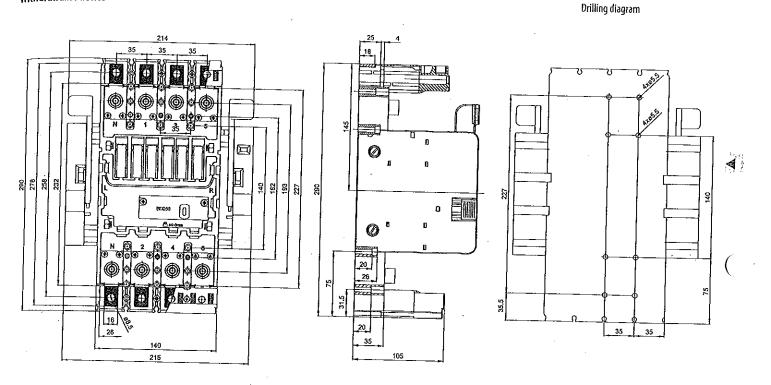
4P

CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

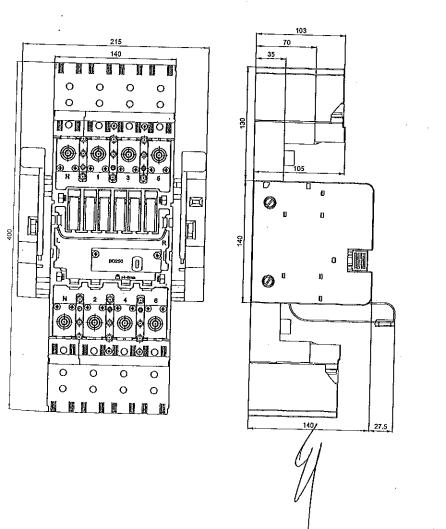
Dimensions

Withdrawable device





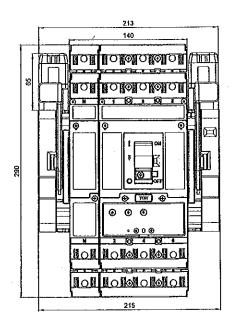
Withdrawable device, OD-BD-KS43 terminal cover



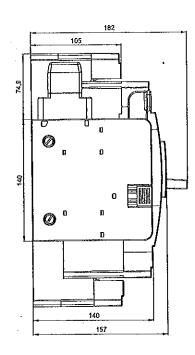


Dimensions

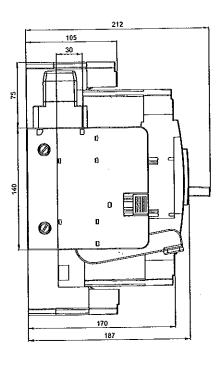
Withdrawable design



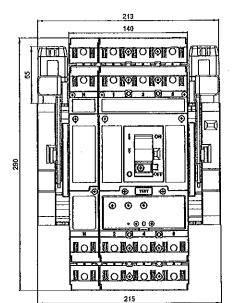
Working position



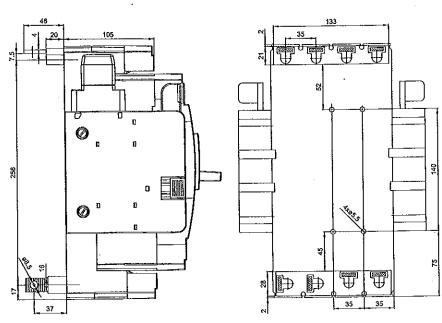
Inspection position



Withdrawable design, rear connection (CS-BD-A021 + CS-BD-A421 connecting sets)



Drilling diagram





M

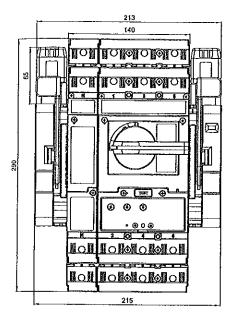
Modelon

CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

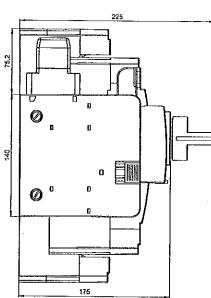


)imensions

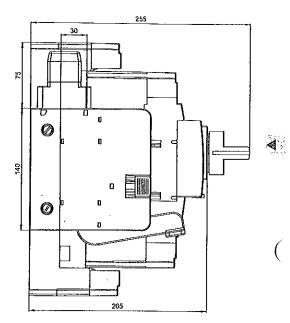
Nithdrawable design, hand drive



Working position

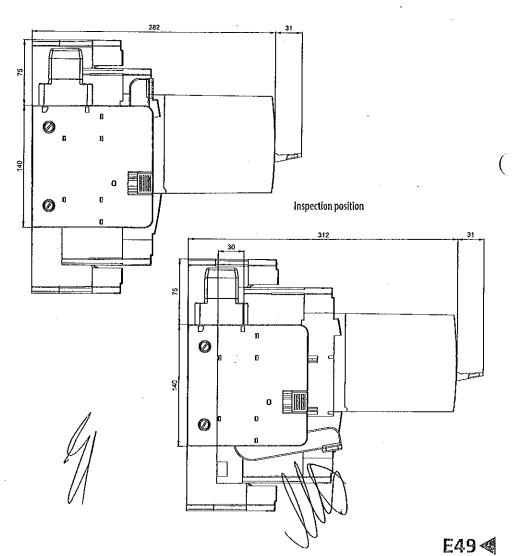


Inspection position

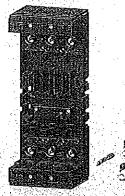


Hithdrawable design, motor drive

Working position



PLUG-IN DEVICE



Plug-in device



Circuit breaker in plug-in design



locking plug-in device against Inserting drouit breaker



Position of cavities for switch SO-BHD-0010 in plug-in device



11, 12, 13, 14



Keylng set OD-BD-KK01

Description

Plug-in design of the circuit breaker/switch-disconnector is intended for demanding industrial applications where rapid exchange of the circuit breaker along with both visual and conductive disconnection of the circuit are needed.

- plug-in device includes complete accessories for assembling circuit breaker/switch-disconnector in plugin design from the originally fixed design
- components of the plug-in device are:
 - base of the plug-in device
 - 2 connecting sets (total of 6 terminals) for fitting onto the switching unit
 - interlocking connecting rod (ensures automatic switching off of the circuit breaker for handling inserting and removal)
 - set of mounting bolts for affixing circuit breaker to plug-in device (set of mounting bolts is used to fasten the plug-in device into the switchboard, that is included in delivery of switching unit)

Circuit breaker positions

Circuit breaker in plug-in design has two positions:

- 1. inserted (working position)
- 2. removed

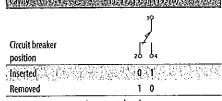
Power circuit

- connecting set CS-BD-A011 is used for connecting with busbars or cable lugs, that is included in delivery of BD250... switching unit
- for connecting in another way, it is necessary to use connecting sets, see page E8
- connection must comply with our recommendations, see page E18

Auxiliary circuits

These are connected using 15-wire cable OD-BHD-KAO1.

States of switches SO-BHD-0010 in plug-in device according to circuit breaker position



note: 0 - contact open, 1 - contact closed ¹¹ - cavities 19 and 20 are only for 4-pole design

Signalling of position SO-BHD-0010

Plug-in device may be fitted with a maximum of for switches (for 4-pole design, max. 6 switches) for signallin the inserted/removed position.

Keying set OD-BD-KK01

Plug-in device and circuit breaker can be fitted with keying se which prevents inserting any other circuit breaker into the plug in device.

Circuit breaker accessories in plug-in design

Circuit breaker in plug-in design has the same accessories a the fixed circuit breaker.

Advantages and enhanced safety for operator:

- unambiguous remote signalling of the circuit breake position
- option to lock plug-in device with padlocks to prevent inseriing of circuit breaker
- visible and conductive disconnection of the power circu
- a easy exchange of circuit breakers in case of failure
- 🛮 IP20 degree of protection of all termination points
- 🛮 plug-in device does not need earthing



Keying set OD-BD-KK01



Connecting cable OD-BHD-KA01



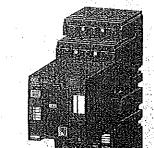
Signalling of position SO-BHD-0010

Specifications SO-BHD-0010

| Rated operating voltage | U, | 400 V a.c. |
|-------------------------------------|--------------------------|---|
| | • | 220 Y d.c. |
| Rated Insulation voltage | | 500 V a.c. |
| Rated frequency | f | 50/60 Hz |
| Rated operating current | . /U AC-13 √L/U DC-15 | 3 A /400 Y a.c. 3.5 Å /24 V d.c., 1 A/48 V d.c., 0.3 A/110 V d.c., 0.15 Å/220 V d.c. |
| Thermal current | l _a ' | 6A |
| Arrangement of contacts: | | 001 |
| Connection cross-section | \$ | 0.5 ÷ 1 / nq/² // |
| Degree of protection of terminals (| onnected switch) | IPZO / |

For wiring diagram of circuit breaker in plug-in device with accessories see page E16/





Circuit breaker in plug-in design with motor drive

Recommended circuit breaker manipulation

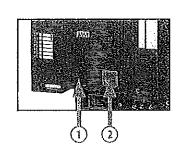
During the manipulation with circuit breaker in plug-in design with motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

- 1) To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" below
- 2) To connect OD-BHD-R... control relay into the motor drive circuit according to wiring diagram, see page E73

Recommended process of manipulation

After every manipulation with circuit breaker in plug-in design is necessary to accomplish the operations in following sequence, after repeated insertion into the plug-in device:

1) press the switch off button (red) on the motor drive, see fig. 2) press the switch on button (green) on the motor drive, see fig.



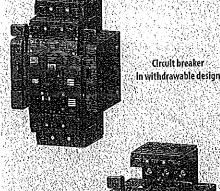
| Changes in states of | f switches in cavities | of switching unit who | removing circuit breaker |
|----------------------|--------------------------|-----------------------|---------------------------------|
| cuandes in states a | i swittiies III talities | or switching and wife | i i Ciliovilla Ciccuit Di Cakei |

| Changes in states of switches in cavities of s | switching uni | t when ren | noving circuit | breake | r | | | | | | | | | |
|--|-------------------------------|----------------------------|----------------|-------------|------------------------------|-----------------------|--------------|-------------|---------------|-------------|----------------------|-------------|-------------|---------------------------------|
| State of circult breaker befor removing (1977) | | | Staletys | ritches b | elojesemov | 100 100 | rted positio | 1 | | favildie | Sperion | oying y | igh dayon p | anin' |
| | | | Cavity | | New Profession Profession | 2 | 3(4, | 5,6)0 | | | (9. 60%) (4. 60%) | 2 | 3 (4, | 5,6)" |
| | ever position | n contacts | PS-BHD-1000 | PS-8HD-0100 | PS-BHD-1000 | PS-8HD-0100 | PS-8HD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 |
| | Grcuit breaker lever position | State of the main contacts | , , | 10 | 30 | 10 | ١ | 10 | 40 J 30 | 10 | 30 | 20 | 30 | 10 |
| Switched on | | 11/2/2 | 1 | 0 | 0 | s) し) お[2 3, 9) | 1 | 0 | 1 | Ō | 100 1 100 1 | 0. | 0 | 1 1 1 1 1 1 1 |
| Switched off manually or by motor drive electrically (loaded state) | \bigcirc | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| Switched off by overcurrent release | ₹ | 0. | 0/ | | | 0 | 0 | | 0 | 1. | , l | 0 | 0.0 | |
| Switched off from switched on state: by auxiliary release, or by TEST push button or by the switch off button on the motor drive | ₹ | 0 | by A | 0 | 1 | 0 | . 0 | . 1 | 1 | 0 / 0 | 1 | 0 | 0 | 1 |
| note: 0 - contact open, 1 - contact closed | | ** | - 1/ | | | | • | | | N | | | | |

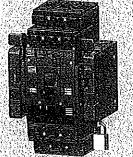
" - cavities 4, 5, 6 are only for 4-pole design

WITHDRAWABLE DEVICE

Withdrawable device

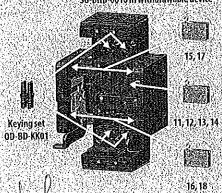






Locking withdrawable drouit breaker against tampering

Position of cavities for switch SO-BHD 0010 in withdrawable device



Description

BD250N, BD250S

Withdrawable design of the circuit breaker/switch-disconnector is intended for demanding industrial applications where rapid exchange of the circuit breaker, frequent checking and both visual and conductive disconnection of the circuit are needed.

- withdrawable device includes complete accessories for assembling circuit breaker/switch-disconnector in withdrawable design from the originally fixed design
- components of the withdrawable device are:
 - base of the withdrawable device
 - 2 movable side plates
 - 2 connecting sets (total of 6 terminals) for fitting onto the switching unit
 - interlocking connecting rod (ensures automatic switching off of the circuit breaker for handling inserting and withdrawing)
 - set of mounting bolts is used to fasten the withdrawable device into the switchboard, that is included in delivery of switching unit

Circuit breaker positions

Circuit breaker in withdrawable design has three positions:

- 1. inserted (working position)
- 2. withdrawn (inspection position)
- 3. removed

Keying set OD-BD-KK01

Withdrawable device and circuit breaker can be fitted with keying set, which prevents inserting any other circuit breaker into the withdrawable device.

States of switches SO-BHD-0010 in withdrawable device according to circuit breaker and arrestment positions

| Lavely and the second | (49) | 0 | 引99 | 0)\$ | | |
|---|-------------|---------------|---------|------|--------|----|
| Circuit breaker and arrestment position | 20 |) | ړ کا | | ر ر |] |
| Inserted and not arrested | 0 | \$ 1 % | 1 ; | 0 | . 0 | Ţ, |
| Inserted and arrested | 0 | 1 | 1 | 0 | 1 | 0 |
| Withdrawn and not arrested | 1 | 0 | 0, | 1 | 0. | |
| Withdrawn and arrested | 1 | 0 | 0 | 1 | 1 | 0 |
| Removed and not arrested | 991 | 0 | 10 | 0 | 0 | 1, |
| Removed and arrested | 1 | 0 | 1_ | 0 | 1 | 0 |
| 10 | **** da | ad. | | | | |

note: 0 - contact open, 1 - contact closed

- operating state is always in arrested position
- in arrested position it is possible to lock the withdrawable device (for more information see "Advantages and enhanced safety for operator")
- 11 cavities 19 and 20 are only for 4-pole design

Specifications SO-BHD-0010

Signalling of position SO-BHD-0010

Withdrawable device can be fitted with the switches for signalling the position of the circuit breaker inserted/withdrawn/removed.

Power circuit

- connecting set CS-BD-A011 is used for connecting with husbars or cable lugs, that is included in delivery of BD250.. switching unit
- for connecting in another way, it is necessary to use connecting sets, see page E8
- connection must comply with our recommendations, see page E18

Auxiliary circuits

These are connected using 15-wire cable OD-BHD-KA01.

Circuit breaker accessories in withdrawable design Circuit breaker in withdrawable design has the same accessories as fixed circuit breaker.

Advantages and enhanced safety for operator:

- は unambiguous remote and local signalling of the circuit breaker and arrestment positions
- checking of circuit breaker and accessories function in the inspection position
- locking withdrawable device against inserting circul breaker, locking of circuit breaker in inserted (operating position, locking of circuit breaker in withdrawn (check ing) position - locking by means of padlocks
- visible and conductive disconnection of the power circuit
- measy exchange of circuit breakers in case of failure
- IP20 degree of protection of all termination points
- 🛮 withdrawable device does not need earthing



Keying set OD-BD-KK01

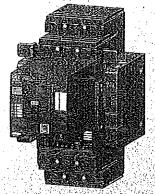


Connecting cable OD-BHD-KA01



Signalling of position SO-BHD-0010

| Rated operating voltage | U | 400 V a.c. |
|--|---------------------------|--|
| • | t . | 220 V d.c. |
| Rated Insulation voltage | , v | \$00.V a.c |
| Rated frequency | ť | 50/60 Hz |
| grend skilediğirili ilkili ilkili ilki | , (/U AG-13) /U DC-15 | 3 A /400V ö.cs 3 S A /24V d.c, 1 A/48V d.c, 0.3 A/110V d.c, 0.15 A/220V d.c |
| Thermal current | l <u>,</u> | 6A |
| Arrangement of contacts | | tion of the second of the seco |
| Connection cross-section | S onnected switch) | 0.5 ÷ 1 m/b ² /) 1P20/ |



Circuit breaker in withdrawable design with motor drive

Recommended circuit breaker manipulation

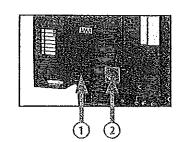
During the manipulation with circuit breaker in withdrawable design with motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

- To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" helow
- 2) To connect OD-BHO-R... control relay into the motor drive circuit according to wiring diagram, see page E73

Recommended process of manipulation

After every manipulation with discuit breaker in withdrawable design is necessary to accomplish the operations in following sequence, after repeated insertion into the pluq-in device:

1) press the switch off button (red) on the motor drive, see fig. 2) press the switch on button (green) on the motor drive, see fig.



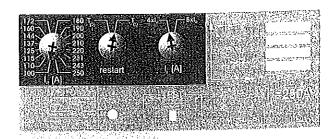
hanges in states of switches in cavities of switching unit when inserting and withdrawing circuit breaker

| | Statek | ior insertion/y | ditiraval | | | | | | | Stati | alterinsel | hontyil | idaya 🐔 | |
|--|--------------------------------|----------------------------|--------------|------------------------------|----------------|----------------------|-----------------|-----------------|---------------|-------------|---------------------------|-------------|-------------|--------------------|
| State of circuit breaker before insertion | | 3099 | State of swi | chès be | fore Insertior | ı-with | drawn position | 9.225 3.235 | → State | of switch | hes after in: | sertion - | inserted po | ition |
| State of circuit breaker before withdrawal | | | State of swi | tches be | fore withdra | wal - in: | serted position | | ➤ State of | switches | after with | drawal - | withdrawn | position |
| | | | Cavity 1 | 2011 2011 2011 2011 | | | 3 (4, 5, | 6) ^b | 1988 1 | | A的资格 AAAG | 2 | 3 (4, | 5, 6) ⁿ |
| | ever position | in contacts | PS-BHD-1000 | PS-8HD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-8HD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 |
| | Circuit breaker lever position | State of the main contacts | 30 | 20 | ا ي | 10 | 30 | 20 | 40 | 10 | 30 | 10 | 30 | 10 |
| Switched on : | | 125 | 1 | 0 | 0 | 10 (1) (1) (2) | 1 | 0 N | 1241X | 0 | 7:22\/ 2:4- 1 : | 0 | 0. | |
| Switched off manually or by motor drive electrically (loaded state) | \bigcirc | 0 | . 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| Switched off by overcurrent release | ₹ |) 01 | 0 | ì | | 0 | 0 | | 0 | | 1 | 0 | 0 | |
| Switched off from switched on state: by auxiliary release, or by TEST push button or by the switch off button on the motor drive | ₹ | 0 | 1 | [p] | 1 | , 0 | 0 | 1 | 1 | 0 | 1 | , 0 | 0 | 1 |
| note: 0 - contact open, 1 - contact closed | | | | 17 | | | | | | | $V \parallel$ | 1 4 | | |

rrore: 0 – contact open, 1 – contact closed ¹⁷ – cavities 4, 5, 6 are only for 4-pole design

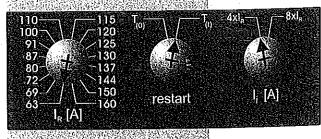


OVERCURRENT RELEASES - DTV3

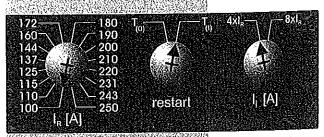


I_n = 100 A SE-BD-0100-DTV3

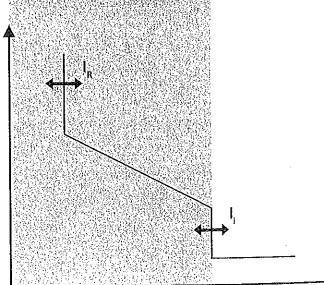
 $I_n = 160 \text{ A}$ SE-BD-0160-DTV3



I_n == **250 A** SE-BD-0250-DTV3



t



Properties

- suitable for protection of lines and distribution transfore
- protects against both overcurrent and short circuit
- \mathbf{m} reduced current setting $\mathbf{I}_{\mathbf{g}} = 0.4 \div 1 \, \mathbf{I}_{\mathbf{g}}$
- \blacksquare thermal memory can be switched on/off (ON = $T_{N'}$ OFF =
- setting of the value of the short-circuit release l_i in two steps, 41_g or 81_g
- setting of I_g and I_c by means of the rotary switches is step
- the overcurrent release indicates operating state and t value of the passing current by means of LED
- the values of parameters of the overcurrent release aπ by the manufacturer to minimum

Data for the project



IMPORTANT

 thermal memory must be switched on in protection of transformers and lines
 thus the transformer or the line will be protected against repeated overload

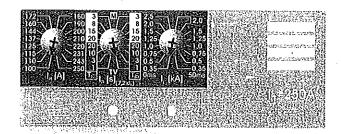




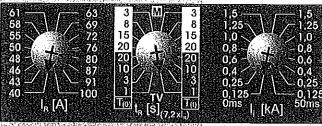
Short-circuit release

JYERCURRENT RELEASES - MTV8, TV mode

Reduced current

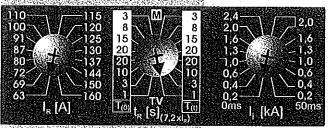


I_n = **100 Å** SE-BD-0100-MTV8

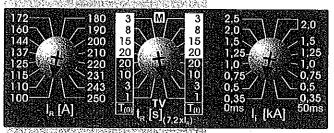


Thermal release delay

 $I_n = 160 \text{ A}$ SE-BD-0160-MTV8



I = **250 Å** SE-BD-0250-MTV8



Properties

- TV mode suitable for protection of lines, distribution transformers and generators
- protects against both overcurrent and short circuit
- reduced current setting $I_s = 0.4 \div 1I_s$
- **u** thermal memory can be switched on/off (ON = $T_{(x)}$, OFF = $T_{(y)}$)
- in TV mode the undercurrent release is inactive
- setting of delay of the thermal release t, 1 s, 3 s, 10 s and 20 s
- setting of the value of short-circuit release I_i in 8 steps and possibility of switching the short-circuit release off with a delay of 50 ms
- setting of I_s, t_s and I_s by means of the rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

| Switching unit | BD250 |
|----------------------------------|-----------------------|
| Overcurrent release | SE-BD- |
| Overcurrent release setting | |
| Reduced current | I, WARREN |
| Mode | TV Section 1 |
| Thermal memory | T Name of the second |
| Thermal release delay | t, 3s |
| Short-circuit release current | |
| Setting of short-circuit release | 2. vi. ms / 5/4/1947. |

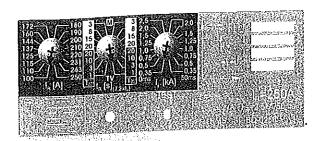


IMPORTANT

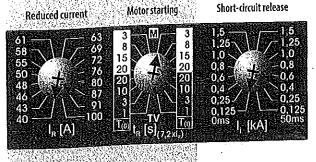
 the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure



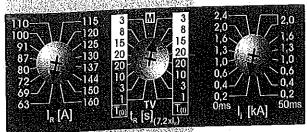
OVERCURRENT RELEASES - MTV8, M mode



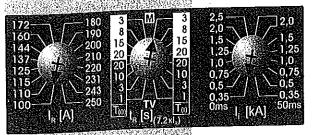
I_n = **100 A** SE-BD-0100-MTV8



 $I_n = 160 \text{ A}$ SE-BD-0160-MTV8



 $I_n = 250 \text{ A}$ SE-BD-0250-MTV8



Properties

- M mode suitable for protection of motors
- protects against both overcurrent and short circuit
- \mathbf{m} reduced current setting $\mathbf{l}_{\mathbf{g}} = 0.4 \div 1 \mathbf{l}_{\mathbf{g}}$
- \mathbf{m} thermal memory can be switched on/off (ON = T_{co} , OFF =)
- in M mode the undercurrent release is active
- setting of delay of the thermal release t_g 3 s, 8 s, 15 s an 20 s according to the motor starting class
- setting of the value of short-circuit release I_i in 8 steps a possibility of switching the short-circuit release off with a delay of 50 ms
- setting of l_g, t_g and L by means of the rotary switches is stepv
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are: by the manufacturer to minimum

Data for the project

| Coule hi - munit | RD250 |
|----------------------------------|------------------|
| Switching unit | 100230 |
| Overcurrent release | SE-BD |
| Overcurrent release setting | |
| Reduced current | l _a A |
| Mode | М. |
| Thermal memory | T SERVE |
| Thermal release delay | ել Հ Տ |
| Short-circuit release current | Į ŝ. A |
| Setting of short-circuit release | ms |



IMPORTANT

- M mode must be selected in protection of motors
 the motor will be protected in phase failure
- thermal release delay t_R must correspond to the motor starting class
- in protection of motors it is suitable to set the delay of the short-circuit release at 50 ms

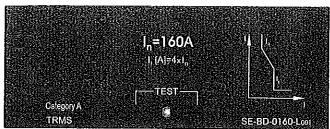




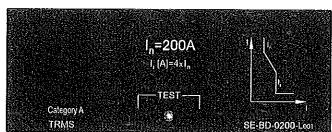
OVERCURRENT RELEASES - LOO1

3P 4P

 $I_{\rm p} = 160 \, \text{A}$ SE-BD-0160-L001



$I_n = 200 \text{ A}$ SE-BD-0200-L001

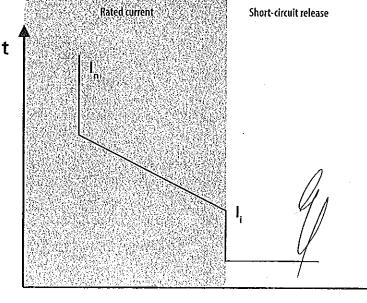


Properties

- suitable for protection of lines with low impulse currents
- protects against both overcurrent and short circuit
- reduced current cannot be set
- m thermal release cannot be switched off
- short-circuit release is fixed at 41

$l_n = 250 \text{ A}$ SE-BD-0250-L001





Data for the project

Switching unit
Overcurrent release
Overcurrent release values
Rated current
Short-circuit release current

BD250... SE-BD-...

,A (4 x l_a)

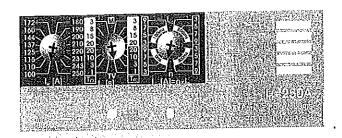


IMPORTANT

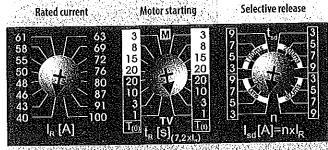
high impulse current must not be in the circuit - undesirable breaking would take place, because the current of the short-circuit release is fixed at 4 I



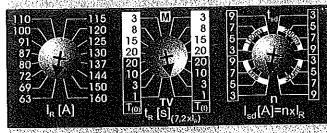
OVERCURRENT RELEASES - MTV9, TV mode



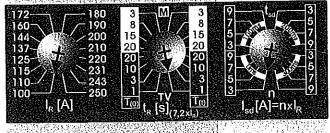
 $I_n = 100 \text{ A}$ SE-BD-0100-MTV9



 $I_n = 160 \text{ A}$ SE-BD-0160-MTV9



 $I_n = 250 \text{ A}$ SE-BD-0250-MTV9



Properties

- TV mode suitable for protection of lines, distribution transformers and generators — enables setting of time selectivity
- protects against both overcurrent and short circuit
- \mathbf{m} reduced current setting $l_g = 0.4 \div 1 l_g$
- \mathbf{m} thermal memory can be switched on/off (ON = $\mathbf{T}_{\mathbf{n}'}$, OFF =
- in TV mode the undercurrent release is inactive
- ${f m}$ setting of delay of the thermal release ${f t_g}$ 1 s, 3 s, 10 s and
- setting of the value of selective release l_{st} in 4 steps (independent time-delayed release)
- setting of delay of the selective release t_{sd} 0 ms, 100 ms 200 ms or 300 ms
- \mathbf{z} setting of $\mathbf{I}_{\mathbf{k}'}\mathbf{t}_{\mathbf{k}'}\mathbf{I}_{\mathbf{s}d}$ and $\mathbf{t}_{\mathbf{s}d}$ by means of rotary switches is step
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are by the manufacturer to minimum

Data for the project

| Data for the project | state of the mode, so and help as |
|-----------------------------|-------------------------------------|
| Switching unit | BD250 |
| Overcurrent release | SE-BD |
| Overcurrent release setting | |
| Reduced current | I _R Co. A |
| Mode | ŢŸ |
| Thermal memory | T ASSESSED |
| Thermal release delay | t _a s |
| Selective release value | ا _م ۸ (x۱ _۵) |
| Selective release delay | t _a ms |



IMPORTANT

Short-circuit release

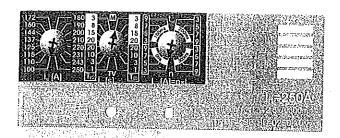
the set value of current of the short-circuit release must correspond to the impedance loop -conditions must be fulfilled for automatic disconnection from power supply in case of failure





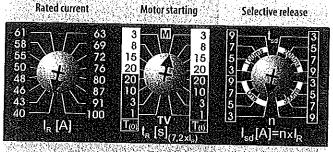
OVERCURRENT RELEASES - MTV9, M mode

3P 4P

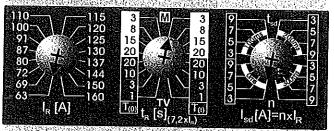




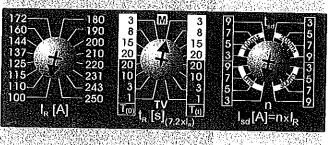
I_n = **100 A** SE-BD-0100-MTV9



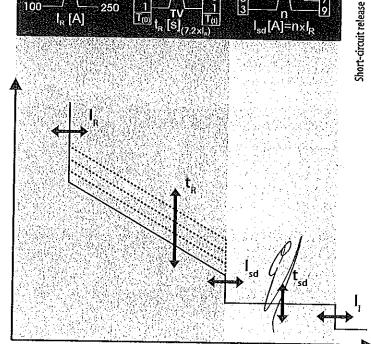
 $I_n = 160 \text{ A}$ SE-BD-0160-MTV9



 $I_n = 250 \text{ A}$ SE-BD-0250-MTV9



t



Properties

- M mode suitable for protection of motors enables setting of time selectivity
- protects against both overcurrent and short circuit
- reduced current setting $l_{g} = 0.4 \div 1 l_{g}$
- thermal memory can be switched on/off (ON = $T_{(y)}$ OFF = $T_{(y)}$)
- **m** in M mode the undercurrent release is active
- setting of delay of the thermal release t_g 3 s, 8 s, 15 s and 20 s according to the motor starting class
- setting of the value of selective release I_{st} in 4 steps (independent time-delayed release)
- setting of delay of the selective release t_{st} 0 ms, 100 ms, 200 ms or 300 ms
- \blacksquare setting of $I_{g'}$ $I_{g'}$ I_{gd} and I_{gg} by means of rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum .

Data for the project

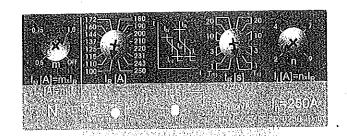
| (· · · / - · · | |
|-----------------------------|---|
| Switching unit | BD250. |
| Overcurrent release | SE-BD |
| Overcurrent release setting | |
| Reduced current | I. V. A. A. S. A. |
| Mode | M |
| Thermal memory | T TANKS OF THE |
| Thermal release delay | t, %s |
| Selecțive release value | LA (xL) |
| Selective release delay | t, w.ms |
| | 24 ** A ** |



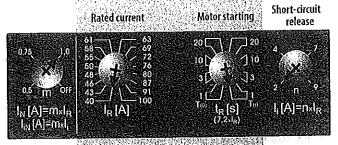
IMPORTANT

- **x** M mode must be selected in protection of motors
- the motor will be protected in phase
- \mathbf{m} failure thermal release delay $\mathbf{t}_{\mathbf{g}}$ must correspond to the motor starting class

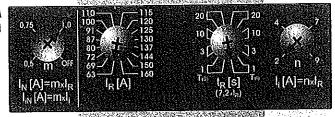
OVERCURRENT RELEASES - 4D01



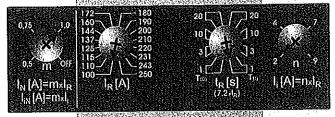
 $I_n = 100 \text{ A}$ SE-BD-0100-4D01

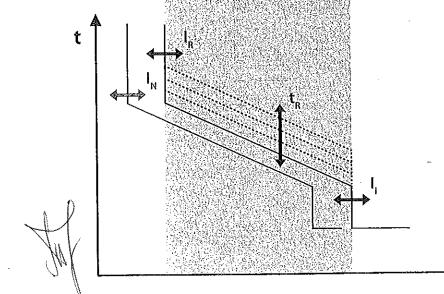


I_n = **160**,**A** SE-BD-0160-4D01



 $I_n = 250 \text{ A}$ SE-BD-0250-4D01





Properties

- it is appropriate for protection of lines and distribution transformers with protected "N" conductor in TN-C-S a TN-S networks
- m protects against both overcurrent and short circuit
- \mathbf{z} reduced current setting $\mathbf{I}_{a} = 0.4 \div 1 \mathbf{I}_{a}$
- \blacksquare thermal memory can be switched on/off (ON = T_{o}) OFF =
- setting of delay of the thermal release t_a 1 s, 3 s, 10 s and
- setting of the value of the short-circuit release I, in 4 st
- $\{2 \div 9\}$ I_g setting of the value of reduced current I_g and short-circ current I_g in the 4th pole
- setting of l, t, l, and l, by means of rotary switches is ster
- the overcurrent release indicates operating state and to value of the passing current by means of LED
- the values of parameters of the overcurrent release are by the manufacturer to minimum

Data for the project

| Switching unit | | BD250. |
|--|----------------|--------------|
| Overcurrent release- | | SE-BD |
| Overcurrent release setting | | |
| Reduced current | l _R | And A |
| Thermal memory | T | 3. W. 17. W. |
| Thermal release delay | tg | |
| Level of reduced current in the 4th pole | l, | A (|
| Level of reduced current in the 4th pole | Ŋ | (A) |
| | | |



IMPORTANT

the set value of current of the short-circuit release must correspond to the impedance loop -conditions must be fulfilled for automatic disconnection from power supply in case of failure





E61 €

0

Simple



lambla



Make and break



Double make-and-break



Early



Cavitles in BD250... switching unit

Specification

| Rated operating voltage | U. | 60÷500 V a.c. | 5 ÷ 60 V a.c. |
|--------------------------|-----------------|---------------------------------------|--------------------------------|
| | • | 60 ÷ 500 V d.c. | 5 ÷ 60 ¥ d.c. |
| Rated insulation voltage | U _i | 500 V | 500 V |
| Rated frequency | f | 50/60 Hz | 50/60 Hz |
| Rated operating current | I / U AC-15 | 6 A/240 V, 4 A/400 V, 2 A/500 V | AC-12, DC-12 0.004 ÷ 0.5 A/SV, |
| | 1,/U, DC-13 | 0.4 A/240 V, 0.3 A/400 V, 0.2 A/500 V | 0.004 ÷ 0.01/60 V |
| Fhermal current | l _{va} | 10 A | 0,5 A |
| Arrangement of contacts | | 01, 10, 02, 11, 20 | 01, 10, 02, 11, 20 |
| Connection cross-section | S | 0.5 ÷ 1 mm ² | 0.5 ÷ 1 mm² |

| Type | | SP. BHD:0002 | PS:BHD:0010/0020 | PS:BHO 0010 AV/0020 Auk |
|-------------------------------|------------------|----------------|-------------------------|--|
| Rated operating voltage | Ű, | 250 V a.c. | 60 ÷ 250 V a.c. | 5 ÷ 60 V a.c. |
| and the second second second | | | 60 ÷ 250 V d.c. | S ÷ 60 V d.c. |
| Rated insulation voltage | V _I | 250 Y | 250 V | 2501 |
| Rated frequency | f | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Rated operating current | . i./U. i./U. | 1A/250 V a.c. | | AC-12, DC-12 0.004 ÷ 0.5 A/5 V, 0.004 ÷ 0.01/60 V |
| Thermal current | ا | = | 6 A | 0,5 A |
| Arrangement of contacts | | 02,11,20 | 001/002 | 001/002 |
| Connection cross-section | S | 0.5 ÷ 1 mm² | 0.5 ÷ 1 mm ³ | 0.5 ÷ 1 mm² |
| Degree of protection of termi | nals (connecte | d switch) IP20 | IP20 | IP20 |

^{1) -} PS-BHD-,...- Au is not suitable to control electromagnetic loads

Type designation, number and type of contacts according to contact arrangement

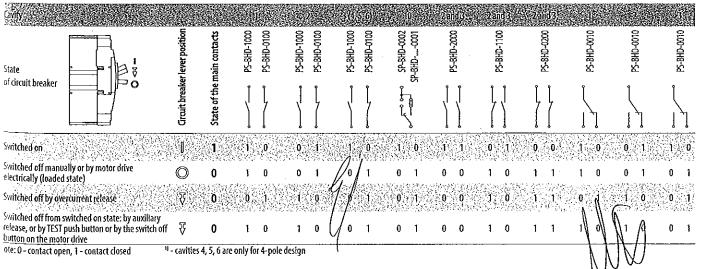
| Arrangemento | contacts hypera where the Vi | mberof contac | ss contact types |
|--------------|------------------------------|----------------------|------------------|
| 01 | PS-BHD-1000 (-Au) | 1 | make |
| 20 | PS-BHD-2000 (-Au) | 34.3 2 (1995) | make |
| 01 | PS-BHD-0100 (-Au) | 1 | break |
| 02 00 000 | PS-BHD-0200 (-Au) | 2/5/ | break |
| 11 | PS-BHD-1100 (-Au) | 1+1 | break+make |
| 001 | PS-BHD-0010 (-Au) | 经分类的 | make-and-break |
| 002 | PS-BHD-0020(-Au) | 2 | make-and-break |

Function and names of switches according to their location in cavities

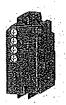
| Position of switt | y Withnine | Synch function (1997) |
|---------------------------------|-------------|---|
| Cavity 1 | Signat | signals tripping of circuit breaker by overcurrent release |
| Cavity 2 | Relative | signals tripping of circuit breaker/switch-disconnector by releases, TEST push button |
| | | or by the switch off button on the motor drive |
| Cavity 3 (4, 5, 6) ² | 1 Auxiliary | switch signals position of circuit breaker/switch-disconnector's main contacts |
| Cavity 10 | Early | makes/biraks in advance before making the maln confact of circuit breaker/switch-disconnector |

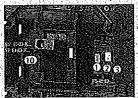
^{24 -} cavities 4, 5, 6 are only for 4-pole design

tates of switches in the circuit breaker cavities

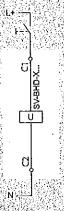


SHUNT TRIPS





Cavities in BD250... switching unit



Specifications

| Rated operating voltage | U _e | 24, 40, 48, 110, 230, 400, 500 V a.c. 24, 40, 48, 110, 220 V d.c. |
|---------------------------------------|----------------|--|
| Rated frequency | f, | 50/60 Hz |
| Input power at 1.1 U | /C /C | <3VA <3W |
| Characteristlc | | $U \ge 0.7 U_{\rm s}$ the circuit breaker must trip |
| Time to switching off Loading time | | 20 ms 11. 1994 11. 15. 15. 15. 15. 15. 15. 15. 15. 15. |
| Connection cross-section | S | 0.5 ÷ 1 mm² 1P20 |
| Position in cavity No. | | . 10 |

Type designation according to rated operating voltage

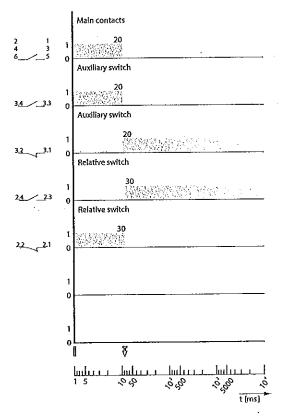
| 230, 400, 500 V a.c. /220 V d.c. | SV-BHD-X230 |
|--|----------------------------|
| 24, 40, 48 V a.c./d.c. 110 V a.c./d.c | SV-BHD-X024 SV-BHD-X110 |
| | |
| U. Santa and American | Type Free 1 |

The specific rated operating voltage of the release is set up by jumpers directly on the release. It is always set to the maximum value by default (see fig. 1).



Fig. 1 - The rated operating voltage setting

Circuit breaker/switch-disconnector switching off by shunt trip



States and positions of circuit breaker/switch-disconnector lever

| -States of organic breakers witch: Hisconifes | torace Leverposition of group bleaker/sylldhalp o | nilector |
|--|---|------------|
| Switched on | | 714 |
| Switched off by releases, TEST or by switch button on the motor drive | or 🔻 | W / |
| Switched off manually or by motor drive electrically (loaded state) | O . | *** |



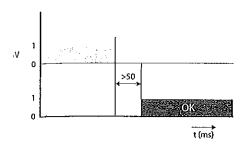
HUNT TRIPS

3P 4P

pecifications

leaction time of the auxiliary releases

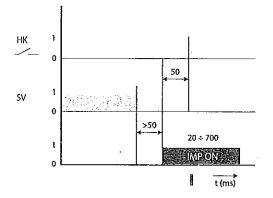
hunt trip



Goperation of motor drive and shunt trip

t is necessary to keep time delay when the control of the circuit breaker is lone by motor drive and shunt trip or undervoltage release. The following ime delays have to be kept between the disconnection of voltage from the hunt trip or bringing the voltage to the undervoltage release and the control inpulse for switch on of the motor drive:

Shunt trip



States and positions of circuit breaker/switch-disconnector lever

| States of qualithic stars with disconnections a leaver position of | icu türekeri wilde üldömedi) |
|--|------------------------------|
| Switched on | |
| Switched off by releases, TEST or by switch off button on the motor drive | ∄ |
| Switched off manually or by motor drive electrically (loaded state) | 0 |

Description of graphs

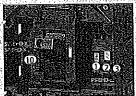
| Yabota : | 42 - Description is a second of the second o |
|----------|--|
| HK | Main contacts |
| OK (1) | Circuit breaker is ready for further handling |
| IMP ON | Make impulse for the motor drive |
| SV 35 | Control voltage on the shunt trip |
| SP | Control voltage on the undervoltage release |





UNDERVOLTAGE RELEASES





Cavities in BD250... switching unit



Specifications

| Tima Services | and september | SP-BHD.X. | SP-BHD-X., 0001 ⁸ |
|--|--|--|--|
| Rated operating voltage | Ų | 24, 40, 48, 110, 230, 400, 500 V a.c. 24, 40, 48, 110, 220 V d.c. | 24, 40, 48, 110, 230, 400, 500 V a.c. 24, 40, 48, 110, 220 V d.c. |
| Rated frequency | f | 50/60 Hz | 50/60 Hz |
| Input power at 1.1 U | AC DC | <3 VA <3 W | < 3 VA < 3 W |
| Characteristic ¹⁾ | | $U \ge 0.85 \text{U}_{\odot}$ - it is possible to $U \le 0.35 \text{U}_{\odot}$ - the circ | o switch on the circuit breaker cult breaker must trip |
| Time to switching off | • | 20 ms | 20 ms |
| and the second of the con- | | | ∞ |
| Connection cross-section | \$ | 0.5 ÷ 1 mm² | 0.5 ÷ 1 mm² |
| Degree of protection of term | inals (connected | release) IP20 | IP20 |
| Position in cavity No. | grang paratri para s | 10 | 10 |
| Early switch | | | |
| Rated operating voltage | | • | 250 V a.c. |
| Rated frequency | ones Prose | | 50/60 Hz |
| Rated operating current | l¹\n' istadani | garagasaga da internativa da anti-anti-anti-anti-anti-anti-anti-anti- | 1 A/250 V a.c. |
| Arrangement of contacts | 化化化物物 斯克拉克 化二氯化二甲基 | | 10,01 |
| * * * * * * * * * * * * * * * * * * * | C. 1845 C. 184 | # \$ v nijek wiletskije severine napist (popuje i nestranje pr | 0.5 ÷ 1 mm ¹ |
| Connection cross-section Degree of protection of terr | ninals (connecte | l release) | IP20 |

^{13 –} tripping of the undervoltage release can be delayed using the delay unit BZ-BX-X230-A, for more detailed information see page P2

Number and type of contacts according to contact arrangement

| break |
|-------|
| DICOK |
| make |
| |

Type designation according to rated operating voltage

| | ATIPO S |
|-------------------------------|------------|
| 24, 40, 48 V a.c. | SP-BHD-X02 |
| 110V a.C./d.c | SP-BHD-X11 |
| 230, 400, 500 a.c./220 V d.c. | SP-BHD-X23 |

The specific rated operating voltage of the lease is set up by jumpers directly on the relea It is always set to the maximum value by defa (see fig. 1).

Circuit breaker/switch-disconnector switching off by undervoltage release

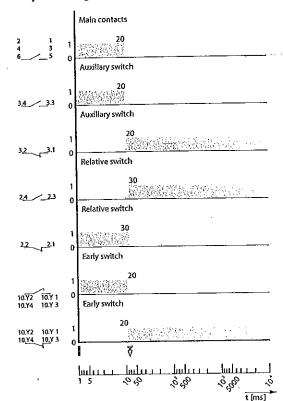
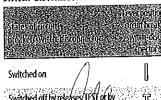




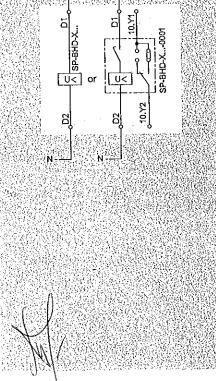
Fig. 1 - The rated operating voltage setting

States and positions of circuit breaker/ switch-disconnector lever



Switched off by releases/TESF or switch off button on the motor drive

Switched off manually or by motor drive electrically (loaded state)



E64

^{» -} cannot be used in combination with motor drive MP-BD-X....

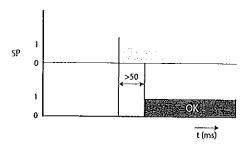
UNDERVOLTAGE RELEASES

3P 4P

Specifications

Reaction time of the auxiliary releases

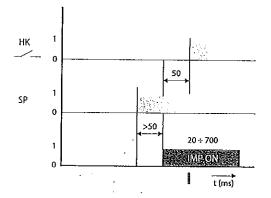
Undervoltage release



Cooperation of motor drive and undervoltage release

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and shunt trip or undervoltage release. The following time delays have to be kept between the disconnection of voltage from the shunt trip or bringing the voltage to the undervoltage release and the control impulse for switch on of the motor drive:

Undervoltage release



States and positions of circuit breaker/switch-disconnector lever

| States of an any time tensivitely distanties and a Laves point Switched on | iivitotajantiivsikelavitahaissoniettor |
|---|--|
| Switched off by releases, TEST or by switch off button on the motor drive | A. |
| Switched off manually or by motor drive electrically (loaded state) | |

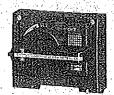
Description of graphs

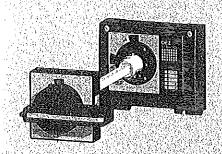
| Symbol | A. Descriptions |
|--------|---|
| НК | Main contacts |
| OΚ | Circuit breaker is ready for further handling |
| IMP ON | Make Impulse for the motor drive |
| sÿ | Control yoltage on the shunt trip |
| SP | Control voltage on the undervoltage release |





HAND DRIVES





Description

BD250N, BD250S

The hand drive permits controlling the circuit breaker//switch-disconnector by turning the lever, e.g. to switch machines on and off. Modular conception of the drives enables simple mounting on the switching unit (also additionally) after the cover of cavities is removed. The fixed drive can be sealed. The drive and its accessories are ordered separately according to your choice, see page E12.

■ The hand drive makes possible to control the circuit breaker:

a) from the front panel (fig. 1)

Hand drive unit RP-BD-CK..

+ Hand drive lever RP-BHD-CP.

b) through the switchboard door (fig. 2)

Hand drive unit RP-BD-CK..

- + Extension shaft RP-BHD-CH..
- + Hand drive bearing PR-BHD-CN..
- + Hand drive lever + RP-BHD-CP..
- The hand drive unit is fixed directly to switching unit of the circuit breaker
- The hand drive bearing is fixed to the switchboard door and it provides degree of protection IP40 or IP66.
- Hand drive lever is fixed on the hand drive unit or on the hand drive bearing.
- ™ The extension shaft is supplied in two options, standard (length 365 mm can be shortened) and telescopic (adjustable length 245 ÷ 410 mm).

Enhanced safety for operator:

- The hand drive unit and hand drive lever are also supplied with the possibility to lock the circuit breaker in position "switched off manually". The unit and lever of the hand drive can be locked using three padlocks with shank diameter max. 6 mm.
- ME Each hand drive bearing prevents the door from opening when the circuit breaker is switched on or in a state of being switched off by releases and in the circuit breaker state "switched off manually" and hand drive lever is locked up.
- Two circuit breakers with hand drives can be fitted also with reciprocal mechanical interlocking or mechanical parallel switching, see page E67.

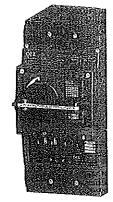


Fig. 1 - DIMENSIONS, see pa

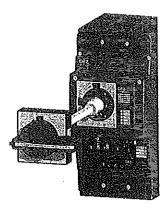
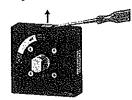


Fig. 2 - DIMENSIONS, see pa

By a screwdriver it is possible to unlock the mechanism ing the switchboard door opening with the circuit be switched on (for bearing RP-BHD-CN40 and RP-BHD-C



Specification

| | Specification | n | | | MINING PARTY OF THE | ******************** | | | | | | ee 51 |
|-------------------|---------------|--------------------------------|------------------------|------------|---------------------|--------------------------------------|--|--|--|----------------------------|-----------------------|----------|
| 1 | | | | | Lond | g of the syntabo | nd dopropening in | the arcuit breaker | states constraints | | | Š |
| į | Type | Description | Glair Locking | Hethevior | Defless & W | dedoners er | synthedallman | ially and focked | | 4400 CO 100 CO 100 CO | With Length | Į |
| | | | | | polection e (%) | | | 美国的 | e Sthermotto | eakersyitulei | Ion at the | Ü |
| 1 | RP-BD-CK10 | Hand drive unit | blue | по | - | - | | | | - eacher as could be t | War of the head to be | - |
| | RP-BD-CK20 | Hand drive unit | / blue | yes 🔻 🐪 | | | 10000000000000000000000000000000000000 | | | | | , (|
| | RP-BD-CK21 | Hand drive unit | yellow | yes | - | | | o soundered to the control of | a constitution is the first of | ia Se sense en en en en | New state was the | |
| | RP-BD-CK30 | . Hand drive unit - right side | blue | | | | | | | | | . Ł |
| | RP-BD-CK31 | Hand drive unit - left side | blue | - | _ | and a second of the shoots | TOTAL CONTROL OF STREET | and the state of t | via is ivida de esiste tradition (| * Sentar militarasio | e denombratacio | |
| | RP-BHD-CP10 | Hand drive lever | black | no | | | | | | 是否是 | | |
| | RP-BHD-CP20 | Hand drive lever | black | yes | * | - | m The same seasons and the same | Na dava kanasa Kab | umatikaskastatánzálássz | # WHOSE ESPEC | Editatis Kildo Ale | ÷ |
| | RP-BHD-CP21 | Hand drive Jever | red . | yes | | | | | | 强烈也多 | | ₹ |
| | RP-BHD-CN40 | Hand drive bearing | black | - | 1240 | yes | ye | STORES AND SERVICE | one come and the design of the | yes A. A. | is extense in | |
| | RP-BHD-CN41 | Hand drive bearing | yellow | | IP40 | yes: | ye ye | 5 | | 19/1/ | | <u>.</u> |
| Λ | RP-BHD-CN60 | Hand drive bearing | black | - | 1P66 | yes | ye | iS Kanadanan Kanadanan da Ta | , in its extraordist size, had | no/ | uraya ayar keye. | - |
| | RP-BHD-CN61 | Hand drive bearing | o yellow | (frillian) | IP66 · · · | yes 2 2 2 | dagada Sayı | 5 | 30000000000000000000000000000000000000 | 96 | | -" |
| 1 | RP-BHD-CH10 | Extension shaft | 1 : 157 (M.22M-1247-2) | = | - | - | - | | | - | 365 (c short | |
| The second second | RP-BHD-CH20 | Extension shaft – telescopic | | | | eron, segregiste Ji Tregonia (fr. | | | | | 245 | |

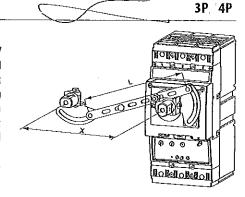
MECHANICAL INTERLOCKING AND PARALLEL SWITCHING



RP-BHD-CB10 Mechanical interlocking

Provides mechanical interlocking of two circuit breakers//switch-disconnectors so that they cannot both be tripped simultaneously, but only one of them at a time. Both circuit breakers may be switched off simultaneously. Interlocking can be used between two BDZSO circuit breakers or between BDZSO and BH63O circuit breakers. Both circuit breakers must be equipped with a hand drive (at least one with a hand drive unit and hand drive lever), see page E66.

In order to use the interlocking, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table.



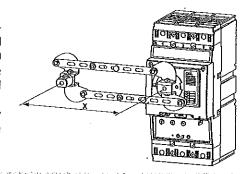
Right switching unit

| | a Diménsion (min) | BDZ50 | | , BD25 | 0.45 | BH630 Y |) 9 , 7 , 7 | 8163 | 0.4 |
|-------------|----------------------|----------------|------------|------------|----------------|----------------|-------------|------|-------|
| aing unit | BD2503., BD2504. | 105 105 | 112 112 | 140 140 | 145.5 145.5 | 122.5 122.5 | 128.5 | 181 | 185.5 |
| Left switci | BH6303 | 122.5 122.5 | 128.5 | 157.5 | 162.5 | 140 | 145.5 | 185 | 189 |



Enables for simultaneous switching of two circuit breakers/switch-disconnectors. Parallel switching can be used between two BD250 circuit breakers or between BD250 and BH630 circuit breakers. Both circuit breakers must be equipped with a hand drive unit and at least one with a hand drive lever, see page E66.

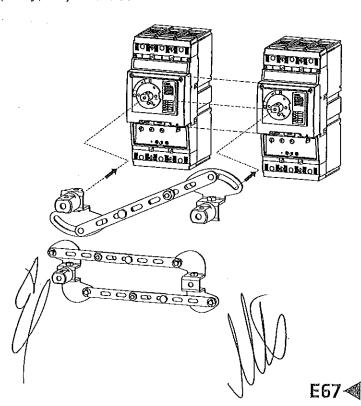
In order to use parallel switching, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table.

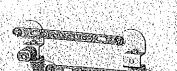


Right switching unit

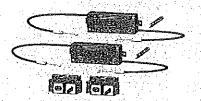
| | Dimension (min) | , 18D25 V | 0.5., 7.18.1 | 20025 Xm 110 | | alici (** | | 8161 | A Part |
|-----------|-----------------------|--|--|---------------------|--|--|---------------------|--------|--------|
| hing unit | BD250.3., BD250.4. | 105 ⁺⁷ 105 ⁺⁷ | 164.5 ⁻⁷ 164.5 ⁻⁷ | 122.5 ⁺⁷ | 164.5 ⁻⁷ 164.5 ⁻⁷ | 122.5 ⁺⁷ | 164.5 ⁻⁷ | χ | X |
| Leftswitd | BH6303 BH6304. | 122.5 ⁺⁷ 122.5 ⁺⁷ | 164.5 ⁻⁷ | 140+7 140+7 | 164.5 ⁷ 164.5 ⁷ | 140+ ⁷ 140+ ⁷ | 164.5 ⁻⁷ | X X | x |

1) - Switching unit BH630..4.. (4-pole design) can only be on the left side





MECHANICAL INTERLOCKING



Mechanical interlocking MB-BD-PV05

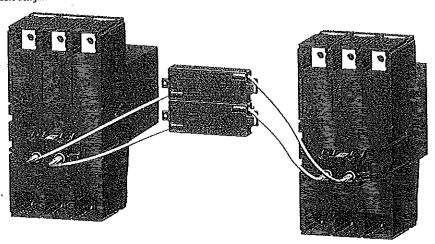
MB-BHD-PV03

Provides mechanical interlocking of two circuit breakers/ /switch-disconnectors so that they cannot both be tripped simultaneously, but only one of them at a time. Both circuit breakers may be switched off simultaneously.

■ Mechanical interlocking MB-BD-PV05 is intended for two BD250 circuit breakers. Interlocking MB-BHD-PV03 is intended for one BD250 circuit breaker and one BH630.

■ Circuit breakers may be in fixed, plug-in and withdrawable designs.





Circuit breaker placement in switchboard

Detailed information can be found in the instructions for use, which you may download from our website www.oez.com.

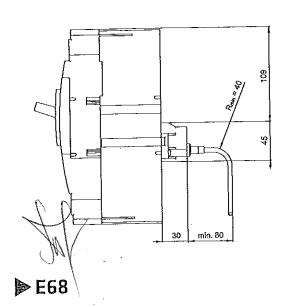
Recommended circuit breaker manipulation

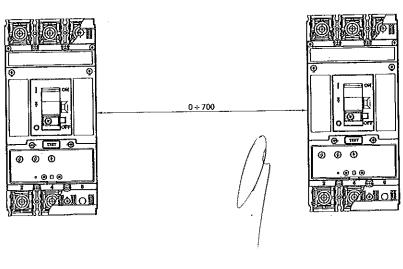
During the manipulation with circuit breaker with mechanical interlocking and motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

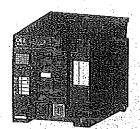
- To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" below
- To connect OD-BHD-R... control relay into the motor drive circuit according to wiring diagram, see page E74

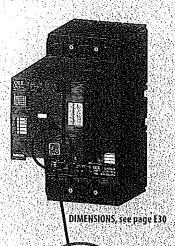
Recommended process of manipulation

- Shunt trip/undervoltage release must be used to off the circuit breaker. Circuit breaker switching o not be made by motor drive
- 2) Circuit breaker can be stored and switched on the second circuit breaker is in switch-off mode. breaker status indicator on motor drive is in "O" pc Between storing and switching on the circuit b it is necessary to keep the time interval min. 10 Switch "S" must be disconnected.
- In case of infringement of these principles, th switching on of circuit breaker is unsuccessful.









Cover of switch on button OD-BHD-KTO1



Connecting cable OD-BHD-KA02



Description

- It is used for remote control of the circuit breaker (switch OFF/ON).
- Simple mounting on the circuit breaker after the circuit breaker cover of cavities is removed.
- Usage in industrial applications e.g. switching of stand by units etc. or wherever the automatic operation of electric devices is needed.
- In order to speed up the circuit breaker's switch off (e.g. safety STOP button) the undervoltage release or shunt trip can be used.
- On the motor drive front panel there is a change-over switch to select the drive modes AUTO/MANUAL:
 - AUTO mode remote control. The circuit breaker is controlled by buttons for remote switch off/on, furthermore in this position mechanical control can be used on the front panel of the motor drive
 - MANUAL mode -- manual control, Control voltage is not needed. The circuit breaker can be switched on using the green switch on button and switched off using the red switch off button on the front part of the drive cover. Electric switch on is blocked. Electric switch off is functional. The accumulation of energy can be done by means of hinged lever.
- Possibility to indicate remotely the state of the AUTO/MANUAL switch.
- Switch 5 (external switch has to be bought separately) enables the choice of automatic accumulation of energy (circuit breaker loading).
 - automatic accumulation of energy is on (S switch switched on): after tripping of the circuit breaker by the overcurrent release, by auxiliary release, or by TEST push button or by the switch off button on the motor drive motor drive immediately accumulates energy (circuit breaker loading), motor drive is then ready to switch on the circuit breaker

- automatic accumulation of energy is switched off (S switch open): after tripping of the circuit breaker by the overcurrent release, by auxiliary release, or by TEST push button or by the switch off button on the motor drive both motor drive and circuit breaker stay in position "switched off by releases". In this position motor drive waits for the impulse from switch S. When the impulse is brought in the motor drive accumulates energy (turn on the circuit breaker) and after this loading the motor drive is ready to switch on the circuit breaker. It is not possible to switch on the circuit breaker when motor drive is not loaded.
- Front panel state indicating device of the stored energy signals the state of motor drive storage devices. The state can be signalled from a distance.
- The drive may be furnished with an electromechanical counter of cycles.
 - internal design on the motor drive cover
 - external design OD-BHD-PP01 for mounting on the switchboard's door or inside the switchboard by means of metal holder, that is part of the delivery
- Motor drive can be sealed by means of bolt sealing insert (OD-BD-VPO1).
- Drive can be locked in off position by up to three padlocks (shank diameter max. 4.3 mm).
- Switch on button can be covered and sealed (OD-BHD-KTO1).
- Drive is connected by multi-pole connector with cavities (in order to connect cables special tongs have to be used).
- Drive can be furnished with cable (OD-BHD-KAO2), that has on one side connector to the motor drive and on the other side free terminals for connection to etc. switchboard's terminal block.

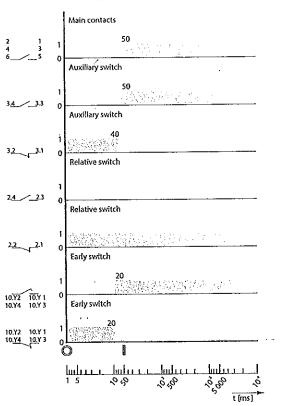
Specifications

| | | MP BD XX MP BD XX P |
|--|--|---|
| Operating voltage | U _e | 24, 48, 110, 230 V a.c. |
| Rated frequency | Pitti kalendari kan dari katawa da da | 24, 48, 110, 220 V d.c. |
| explores to a recent on a service of the service and a median of a first ST of recent and options with Op- | | , 50/60 Hz |
| Control impulse length for storage | | 400 ms ÷ ∞ 1) |
| Control Impulse length for switching on for switching off | | 20 ms ÷700 ms ⁿ 400 ms ÷ ∞ ⁿ > |
| Time to switching on | | < 50 ms |
| Time to switching off | | 800 ms |
| Frequency of cycles ON/OFF . | | 3 cycles/min |
| Frequency of cycles - Instant successive ON/OFF | | 10 cycles |
| Mechanical endurance | THE THE RESIDENCE OF THE CONTRACT OF THE CONTR | 30 000 cycles |
| Input power | AC DC | 100 VA 100 W |
| Protection | 24, 48, 110 V a.c.; 230 V a.c. | LPN-4C-1; LPN-2C-1 |
| | 24, 48, 110 V d.c.; 220 V d.c. | LPN-DC-4C-1; LPN-DC-2C-1 |
| Rated operating current of the change-over switch AUTO/MANUAL | Ų√ų, | 5 A/250 V a.c. 0.5 A/250 V d.c. |
| | | OU BHO KAOZ |
| Number of conductors | | 12 |
| Conductor cross-section | 2.00 | № № № № |
| Conductor lengths | en daktorische einer Friederen ich sie de betreit ein des ist ein de | 0.67 |
| ¹¹ - for sequence of control impulses, see page E72 | | |
| (| | E69 |

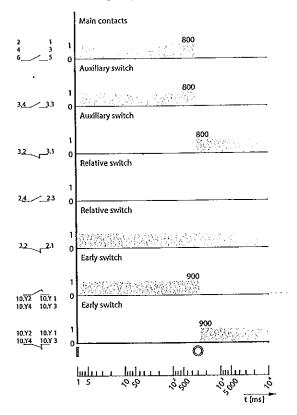
MOTOR DRIVES

Specifications

Circuit breaker switching on by motor drive - electrically by ON push button



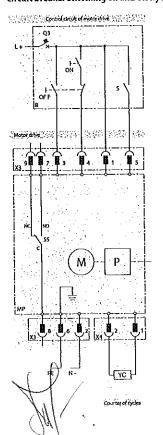
Circuit breaker switching off by motor drive - electrically by OFF push button



Diagram

► E70

Circuit breaker switching on and off by motor drive - electrically by ON and OFF push button



States and positions of circuit breaker/switch-disconnector lever

| 5 Care and passing 1 and 1 | |
|--|---|
| | see a everyounder of circuits as |
| States of circuit breaker/syntdi/disconnector | |
| | as an area and a supplied and seems as |
| | П |
| Switched on | li . |
| | u en la caracteria de la compania d |
| Switched off by releases, TEST or by switch off | and a company of the |
| "Smillicularly recess, in it was suitable." | |
| button on the motor drive | |
| | |
| Switched off manually or by motor drive | (C) |
| electrically (loaded state) | \smile |

Wiring diagram description

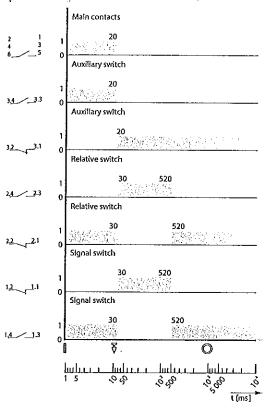
| MP | motor drive MP-BD-X |
|----------|---|
| M | motor |
| P | storage device |
| X3 | connector for connection of control drouts |
| X4 | connector for external counter of cycles |
| S5*) | switch to indicate AUTO (NO-C)/MANUAL (NC-C) modes |
| YC | external counter of cycles OD-BHD-PPO1 |
| B | recommended wining of the control circuits (not included in motor drive order) |
| ON | switch off button |
| OFF | switch off button |
| S | switch for energy storage |
| | (switched on = automatic storage, may be continuously switched on) |
| 03 | motor drive circuit breaker - sée page 168 |

MOTOR DRIVES

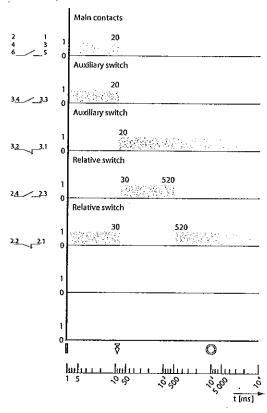
3P 4P

Specifications

Switching off of the circuit breaker with motor drive by overcurrent release (5 switch in switched on state-automatic storage)

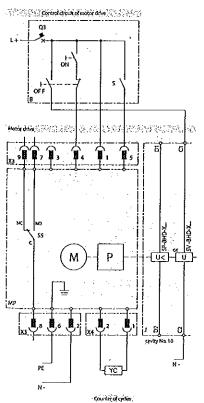


Switching off of the circuit breaker with motor drive by shunt trip or undervoltage release (switch s in switched on state-automatic storage)

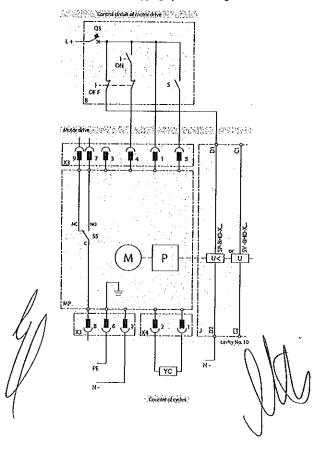


Diagram

Circuit breaker switching on by motor drive (electrically by ON push button) and tripping by shunt trip



Circuit breaker switching on by motor drive (electrically by ON push button) and tripping by undervoltage release



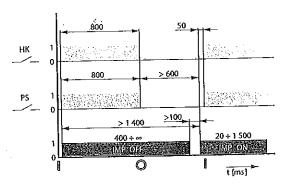
MOTOR DRIVES

Specifications

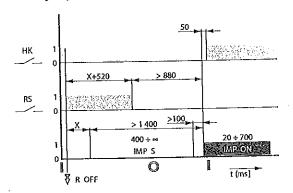
Recommended control impulses

Circuit breaker switching on and off by motor drive

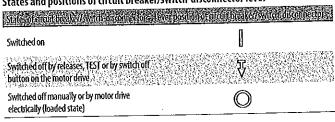
- S switch permanently switched on (automatic storage) or open



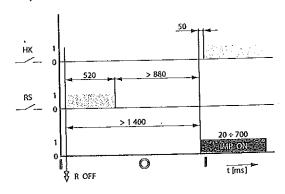
Circuit breaker switching off by overcurrent or auxiliary release and switching on by motor drive - S switch switched on only for storing up



States and positions of circuit breaker/switch-disconnector lever



Circuit breaker switching off by overcurrent or auxiliary release and switching on by motor drive – S switch permanently switched on (automatic storage)



Description of graphs

| BK | main contacts |
|------------|--|
| PS · | auxiliaryswitch |
| RS ROFF | relative switch circuit breaker closing instant by release of circuit breaker |
| IMP S | Impulse to store up motor drive energy (generated by S switch) make impulse for the motor drive |
| IMP OFF | break impulse for the motor drive random segment of time |

► F72



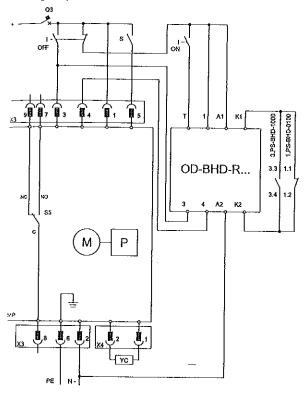
NOTOR DRIVES

3P 4P

4

)jagram

:ecommended wiring diagram of connecting the circuit breaker ontrol circuits in withdrawable/plug-in design with motor drive connecting with control relays operating voltage U_{ϵ} 24 V a.c./d.c., 48 V a.c./d.c., 110 \div 230 V a.c., 110 V d.c. witching off by motor drive



| Diagram descrip | tion |
|--------------------|---|
| | (Decraphian 1) |
| Salaria Marail And | |
| MP | motor drive – U _s of drive must be the same as Ue of control relay |
| Market | motor |
| P | storage device |
| X3 | connector for connection of control circuits |
| X4 | connector for external counter of cycles |
| SS S | syntch to indicate AUTO (NO-C) / MANUAL (NC-C) modes |
| YC | external counter of cycles OD-BHD-PPO1 |
| | (not included in motor drive order) |
| OFF (W/ Vic | switch off button |
| S | switch for energy storage |
| 03 | motor drive circuit breaker for 24 V a.c. LPN-4C-1 |
| | for 48 V a.c. LPN-4C-1 |
| | for 110 V a.c. LPN-4C-1 |
| A Contract of | for 230 V a.c. LPN-2C-1 |
| | for 24V d.c. LPN-DC-4C-1 |
| | 医心管囊膜炎 医克勒氏线 医克勒氏试验 医克克斯氏征 医多种性 电影 化二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基 |
| | for 48 V d.c.LPN-DC-4C-1 |
| 一名作品和技术的特色程序的 | for tiny direction and a second |

control relay for 24 V a.c./d.c. QD-BHD-RXQ1 for 48 V a.c./d.c. QD-BHD-RXQ2 for 110 ÷ 230 V a.c. QD-BHD-RAQ3 for 110 V d.c. QD-BHD-RQQ4

áuxiliary switch

for 220 V d.c. LPN-DC-2C-1

- impulse on T terminal reacts to trailing edge

signal switch

OD-BHD-R...

3.PS-BHD-1000

1.PS-BHD-0100













Diagram

Recommended wiring diagram of connecting the circuit breakers control circuits with mechanical interlocking and motor drive (applicable for any circuit breaker)

- connecting with control relays
- operating voltage U_ 24 V a.c./d.c., 48 V a.c./d.c., 110 ÷ 230 V a.c., 110 V d.c.

Switching off is possible only by undervoltage release or shunt trip

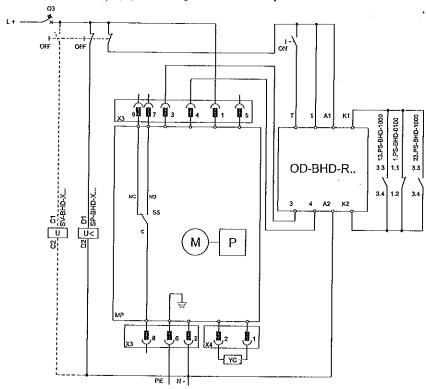


Diagram description

| viagram descri | ption |
|-------------------------|--|
| Symbol | ar Descriptions research |
| MP | motor drive - U _e of drive must be the same as Ue of control relay |
| · 解說接受器 | molor |
| P | storage device |
| ХЗ : | connector for connection of control circuits |
| X4 | connector for external counter of cycles |
| S5 | switch to indicate AUTO (NO-C) / MANUAL (NC-C) modes |
| YC | external counter of cycles OD-BHD-PP01 |
| ÓFF | switch off button |
| Q3 | motor drive circuit breaker for 24 V a.c. LPN-4C-1 |
| | for 48 V a.c. LPN-4C-1 |
| | for 110 V a.c. LPN-4C-11 |
| | for 230 V a.c. LPN-2C-1 |
| | for 24 V d.c. LPN-DC-4C-1 |
| | for 48 V d.c. LPN-DC-4C-1 |
| | for 110 V d.c. LPN-DC-4C-1 |
| ೨೯೬೮ ರಾಜಕ ಮಾಡಿಕೆ ನಿಗ್ರಿ | for 220 V d.c. LPN-DC-2C-1 |
| OD-BHD-R | control relay for 24 y a.c./d.c. OD-BHD-RX01 |
| | for 48 V a.c./d.c. OD-BHD-RX02 |
| | for 110 ± 230 V a.c. QD-BHD-RA03 |
| | for 110 V d.c. OD_BHD_RD04 |
| 1.PS-8HD-0100 | signal switch |
| 13,PS-8HD-1000 | switch inserted in cavity 3 (first circuit breaker) - auxiliary switch |
| 23.PS-BHD-1000 | and the form that the second of the second o |
| SP-BHD-X | undervoltage release : U of release must be the same as U of control relay |
| SV-BHD-X | shunt trip – U _e of release must be the same as U _e of control relay |
| - impulse on T te | rminal reacts to trailing edge |

-impulse on T terminal reacts to trailing edg

COMMERCIAL INFORMATION

| Ш | Switching units, j | plug-in device, withdrawable device | |
|--|--|---|-----|
| | Overcurrent relea | ses, switch-disconnector unit | |
| . 0 | Residual current | monitor | F7 |
| Q | Current transform | ners for residual current monitor | F7 |
| 0 | Connecting sets | | F8 |
| u | Mounting sets | | F10 |
| ,D | Switches | | F11 |
| ۵ | Shunt trips | | F11 |
| | Undervoltage rel | eases | F11 |
| a | Delay unit | | F11 |
| П | Hand drives | | F12 |
| ū | Mechanical interl | ocking and parallel switching | F12 |
| 0 | Motor drives | | F12 |
| □ | Control relay | | F12 |
| o. | Accessories | | F14 |
| enn. | IIZAL ISIPADA | | |
| CHN | IICAL INFORM | MAITUN | |
| · ., | Circuit hroakore s | witch-disconnectors | |
| ď | Citate preakers, 3 | - specifications | F15 |
| | Ne. | - diagram | F16 |
| | NA STATE OF THE ST | - connecting, mounting | F18 |
| | en en distribution de la companya de La companya de la co | - deionization spaces | |
| | | - dimensions | |
| 일었다. | Plug-in device | - description, specifications, diagram | |
| | | Ce - description, specifications, diagram | F50 |
| | Overcurrent releas | | |
| | e de fra | DTV3 - distribution - description, specifications | F52 |
| grande de la companya | . A A | - description, specifications | |
| 3.0 | | - description, specifications | F53 |
| | | LOO1 - lines | |
| | • | - description, specifications | F55 |
| . 47 7. 6 | | MTV9 - motor with adjustable timing selectivity | FCC |
| | *** | - description, specifications 4D01 - distribution with N-pole protection | dc1 |
| | 79 | - description, specifications | F58 |
| | | | |
| 53 □ 5 | Connecting sets | - specifications | |

- specifications, diagram.....

- description, specifications, diagram.....

- description, specifications, dimensions.....

- specifications..

Mechanical interlocking and parallel switching

- description, specifications......

04



□ Switches □ Shunt trips

Hand drives

☐ Motor drives

□ Undervoltage releases

Modelon

JUMMARY OF MODELS AND ACCESSORIES



3P 4P



Clamp terminals





CS-BH-T011



CS-BH-B011, CS-BH-B012





CS-BH-B021, CS-BH-B022 CS-BH-B031, CS-BH-B032



CS-8H-B014



CS-BH-A021









CS-8H-A011 CS-BH-PS01



RP-BH-CK. RP-BHD-CP.



Mechanical parallel switching

RP-BHD-CD10 The Control of the Contr

Mechanical interlocking



Mechanical blocking with Bowden cable



MOTOR DRIVES

OD-BHD-KA02

OD-BHD-PPO1

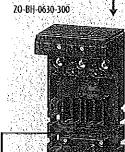


SWITCHING UNIT BH6305E305

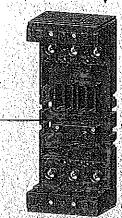




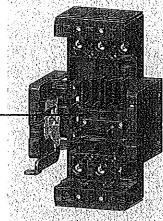












66 G

MP-BII-X,



෧෧෧











SHUNT TRIP

SV-BHD-X



UNDERVOLTAGE RELEASE SP-BHD-X









SWITCH:DISCONNECTOR UNIT





Signalling of position SO-BHD-0010

ACCESSORIES TO

ZO... AND ZV.. Connecting cable OD-BHD-KAO1







OD-BH-UP01



OD-BH-VPO1



OD-BH-VP02



OD-BH-KSO3





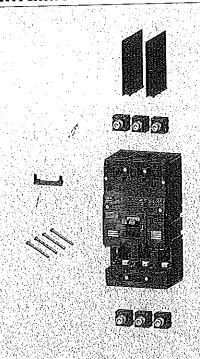


Keying set

OD-BH-KKO1

3P

SWITCHING UNITS



| Type | Pioductcode | E VIA | e (l'Ika) | Weight I | g]>>> Padage [pc] |
|------------|-------------|-------|-----------|----------|-------------------|
| BH630NE305 | 14412 | 630 | 36 | 5.3 | 1 |
| BH630SE305 | 14413 | 630 | 65 | 53 | september 1 |

- TECHNICAL INFORMATION, see page F15

-the method of power circuit connection must observe recommendations, see page F18 as well as deionization space, see page F2

- Switching unit: includes - 2 CS-BH-A011 connecting sets - for connecting busbars or cable lugs $^{\rm 10}$

-insulating barriers OD-BHD-KS02

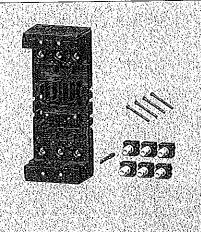
- mounting bolts set OD-BH-MSO1 (4x M5x35)

- conductor holder OD-BH-DV01

must be fitted with - by overcurrent release SE-BK-...-(circuit breaker) or switch-disconnector unit SE-BH-0630-V001 (switch-disconnector)

1) – for connecting in another way, it is necessary to use CS-BH-... connecting sets, see page F8

PLUG-IN DEVICE



| Type 10 | Production | Mame . | i - Pasa Wejoji (Koligisa) | aPackage[pc] |
|----------------|------------|----------------|----------------------------|--------------|
| ZO-BH-0630-300 | 14556 | Plug-in device | 2.61 | 1 |

- TECHNICAL INFORMATION, see page F48

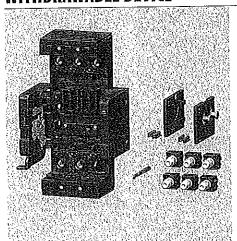
- Plug-in device: includes - complete accessories for assembly circuit breakers/switch-disconnectors

- mounting bolts set (4x M5x45) for affixing switching unit to plug-in device

must be fitted with - switching unit BH630..305

- for connecting plug-in device with busbars or cable lugs, connecting sets CS-BH-A011 can be used, that are included the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH-... connecting sets, see page F8

WITHDRAWABLE DEVICE



| | | Water the second | | Dadamain 12 |
|--------------------|-------------|---------------------|-------|-------------|
| Type has been been | Productione | | 建筑的流流 | 克里洛尔 |
| ZV-BH-0630-300 | 14553 | Withdrawable device | 3,664 | 1 |

- TECHNICAL INFORMATION, see page FSO

- Withdrawable device: includes - complete accessories for assembly circuit breakers/switch-disconnectors in withdrawable design

must be fitted with - switching unit BH630..305

- for connecting withdrawable device with busbars or cable lugs, connecting sets CS-BH-A011 can be used, that are include in the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting in the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting in the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting in the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting in the package of the BH630..305 switching unit - for connecting in another way, it is necessary to use CS-BH ... connecting in the package of the BH630... sets, see page F8

Modelon

WITCHING UNITS

| | | • | | |
|-------|--------|--|----------------|---------------|
| I (A) | SILIVA | NAMES OF THE PARTY | .Weight [kg] s | Package (pcf) |
| 630 | | 3P + N - conductor switching | 6.65 | 1 |
| 630 | 65 | 3P + N - conductor switching | 6.65 | 1 |
| 630 | 36 | 4P - conductor protection | 7 | 1 |

-TECHNICAL INFORMATION, see page F15

19585

19584

19586

BH630NE405 BH630SE405

BH630NE406

BH6305E406

-the method of power circuit connection must observe recommendations, see page F18 as well as deionization space, see page F22

- Switching unit: includes - 2 connecting sets - for connecting busbars or cable lugs 11

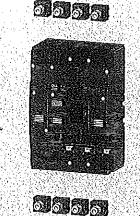
- insulating barriers

- mounting bolts set OD-BH-MS01 (4x M4x35)

4P - conductor protection

- conductor holder OD-BH-DV01

must be fitted with - by overcurrent release SE-BH-...-... (circuit breaker)
or switch-disconnector unit SE-BH-0630-V001 (switch-disconnector)



¹⁾ - for connecting in another way, it is necessary to use CS-BH-... connecting sets, see page F8

PLUG-IN DEVICE

4P

4P

| | 在特別 | (2) (1) (1) | | |
|---------------------------------------|----------------------------|--------------|--------|----------------|
| | (3.998) | - 500 | | 1970 |
| | \$4500000 | 10 A | 3.58PP | w. joya |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | (North Co | | 12.76 |
| | SEC. | Application | | |
| | | | | |
| | 表記(30) 和 10 × 10 × 10 | | | |
| | 100-100-100 | | | |
| , <u>ea</u> | | | 133.00 | Vinglasii V |
| | (1) | 01 | | |
| | 2000 | | M. N. | 50.00 |
| | MAXXX | | 5 G. W | 以外学出 |
| | 表示实验 | 13.3 | 安装单 | 5000 |
| | 影教验 | 1413.5 | M:0.60 | 38847 |
| | • | Total attent | 2.21 | |
| | .X. 3 | | | |
| | | 1.12 | 10.00 | J. 35 4 7 4 |
| | | | 746 | |
| | - - 24 | THE ! | | |

| Type Sales Sales | Productode | e a Names | Weight (ki) | Ridole(KI*) |
|------------------|------------|----------------|-------------|-------------|
| ZO-BH-0630-400 | 20649 | Plug-in device | 3.4 | 1 |

- TECHNICAL INFORMATION, see page F48

Plug-in device: includes - complete accessories for assembly circuit breakers/switch-disconnectors
in plug-in design

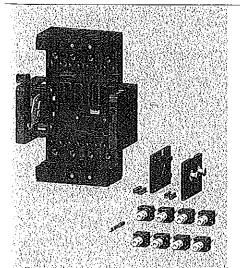
- mounting bolts set (4x M4x45) - for affixing switching unit to plug-in device

must be fitted with - switching unit BH630..405 or BH630..406

- for connecting plug-in device with busbars or cable lugs, connecting sets can be used, that are included in the package of the BH630..40... switching unit - for connecting in another way, it is necessary to use CS-BH-... connecting sets, see page F8

NITHDRAWABLE DEVICE





| Type many | s Product code | rica A Nàmes a sa a | . Weigheikgi | -Package (pc) |
|----------------|----------------|---|--------------|---------------|
| ZV-BH-0630-400 | 20650 | Withdrawable device | 4.5 | 1 |

-TECHNICAL INFORMATION, see page F50

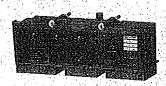
Withdrawable device: includes - complete accessories for assembly circuit breakers/switch-disconnectors
in withdrawable design

must be fitted with - switching unit BH630..405 or BH630..406

- for connecting withdrawable device with busbars or cable lugs, connecting sets can be used that are included with the BH630..40... switching unit - for connecting in another way, it is necessary to use CS-BH-... connecting sets, see page F8

D

OVERCURRENT RELEASES



DTV3 - characteristic D - distribution

m protection lines and transformers

| HAR | -Type | Product code | Description = +C > 2 | 带 Weight LKgt 家食 | · kackade ibo | 18 |
|-----|-----------------|--------------|--------------------------------------|------------------|---------------|----|
| 250 | SE-BH-0250-DTV3 | 25300 | I _R setting = 100 ÷ 250 Å | 0.345 | 1 | |
| 400 | SE-BH-0400-DTV3 | 25200 | $I_{\rm g}$ setting = 160 ÷ 400 Å | .0.345 | 1 | |
| 630 | SE-BH-0630-DTV3 | 25100 | l _s setting = 250 ÷ 630 Å | 0.345 | 1 | |

⁻ TECHNICAL INFORMATION, see page F52

MTV8 - characteristic M - motor

■ direct protection for motors and generators

m possibility of protection lines and transformers

| MALE | Type Texts a series | Product code 7: | Description () | (Welghit [kg]) | , Ji Package (pc) |
|------|---------------------|-----------------|----------------------------------|-----------------|---------------------------------------|
| 250 | SE-BH-0250-MTV8 | 25310 | I_g setting = 100 ÷ 250 Å | 0.345 | <mark>1</mark> am restuat elektras |
| 400 | SE-BH-0400-MTV8 | 25210 | I setting = 160 ÷ 400 Å | 0.345 | 10010 |
| 630 | SE-BH-0630-MTV8 | 25110 | I_g setting = 250 \div 630 Å | 0.345 | 1 |

⁻ TECHNICAL INFORMATION, see page F53



L001 - characteristic L - lines

■ protection lines with low starting currents

a without I, setting

| 315 SE-BH-0315-1001 20 | 616 Without | L setting | 0.345 | 1 |
|------------------------|---------------------|------------------------|--------------------------|----------------------|
| 315 SE-BH-0315-L001 20 | 616 Without | L setting | 0.345 | 1 |
| 315 SE-BH-0315-1001 20 | 615 Without | l _a setting | 0.493 | # Water out of |
| 230 92 011 423 1 | | | とはは こうしょう しゃくり いいかい アステム | . 1 |
| 250 SE-BH-0250-L001 20 | 514 Without | l _a setting | 0.345 | _1 ¥955 à 175 513 |
| or (A) Produ | t codey 🚞 Descripti | ón a parasas pasasas W | eight (kg) | 師的理 |

⁻ TECHNICAL INFORMATION, see page F55

MTV9 - characteristic M - motor with adjustable timing selectivity

a direct protection for motors and generators

m possibility of protection lines and transformers

■ enables setting delay of independent release to 0, 100, 200 or 300 ms

| MATE | STYPE PRODUCT | se Product code (s) | ** Description | : Weight lkg) | Package (pc) |
|------|-----------------|---------------------|---------------------------------------|---------------|---|
| 250 | SE-BH-0250-MTV9 | 19566 | I _R setting = 100 ÷ 250 Å | 0.345 | 1 a.a.a.a.a.a.a.a.a.a.a.a.a.a.a.a.a.a.a. |
| 400 | SE-BH-0400-MTV9 | 19567 | I _a setting = 160 ÷400 Å | 0.345 | 31.5 |
| 630 | SE-BH-0630-MTV9 | 19568 | I _s setting == 250 ÷ 630 Å | 0.345 | 11 |
| | | | | - | |

⁻TECHNICAL INFORMATION, see page F56

OVERCURRENT RELEASES



4D01 - characteristic D - distribution with N-pole protection

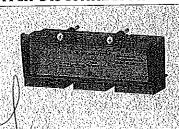
protection lines and transformers in TN-C-S and TN-S networks

| | | | | | • |
|------------------|---------------------------------|----------------|--|------------------|----------------------|
| 630 | SE-BH-0630-4D01 | 33428 | 1, setting == 250 ÷ 630 Å | 0.355 | 1 |
| 400 | SE-BH-0400-4D01 | 33427 | I, setting = 160 ÷ 400 Å | 0.333 | MENSEN STATE |
| 250 | SE-BH-0250-4D01 | | and the same the commence of the contract of t | erandari (M | |
| SCH METABOLIA | of DI 0270 4003 | 33426 | I_setting == 100 ÷ 250 A | 0.355 | 1 |
| TALE | e Type to the second | 2 Product code | s. Decipion | SA GRADITION SEE | 经过程787 278745 |
| succession and a | in craumorenen muse Cattil Holl | | | | Sagna Azaraha India |

-TECHNICAL INFORMATION, see page F58

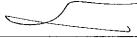
- intended for BH630..406 switching unit

SWITCH-DISCONNECTOR UNIT



| | Tipe as a same | a Product rode as | Name | |
|---------|----------------------------|-------------------|--------------------------|-------|
| 630 | SE-BH-0630-V001 | 25120 | Switch-disconnector unit | 0.295 |
| -TECHNS | AL INFORMATION, see page F | 15 | | / K/ |

RESIDUAL CURRENT MONITOR

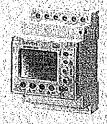


3P 4P



| lype | Product code | : Description C | Weight (kg) | Padkage (set) |
|-------------|--------------|--|-------------|---------------|
| 55V8000-6KK | 42658 | Analogue design, I _{ss} and t _{ss} setting | 0.18 | 1 |

- TECHNICAL INFORMATION, see page P4



| lype sees | Product code | Description: | . Weight (k | g) = c Package (set) |
|-------------|--------------|---|-------------|----------------------|
| 5SV8001-6KK | 42659 | Digital design, I _{sa} and t _{sa} setting | 0.26 | 1 |
| 55V8200-6KK | 42660 | Digital design, $I_{\rm La}$ and $t_{ m La}$ setting, 4 cha | nnels 0.26 | 的复数的 |

-TECHNICAL INFORMATION, see page P4



CURRENT TRANSFORMERS FOR RESIDUAL CURRENT MONITOR

3P 4P



| 23304-33744-8-234-23-2 | CARLES AND STREET | | F-5310-03-05 | 经验证证证 |
|------------------------|-------------------|---|--------------|--------------|
| 5SV8700-0KK | 42661 | Internal diameter 20 mm, Including holder on "U" rail according | 0.09 | 1 |
| | | to EN 60715 wide 35 mm | | |
| 55V8701.0KW | 42662 | Internal diameter 30 mm, including holder on "U" rall according | 66771468 | SERVICE. |

-TECHNICAL INFORMATION, see page P4



| yp ^o | Product code | S Description | . Weight ikgh is | a Parkage (set) |
|-----------------|--------------|---|------------------|-----------------|
| 55V8702-0KK | 42663 | Internal diameter 35 mm, including holder on the panel | 0.2 | 1 |
| 55V8703-0KK | 42664 | Internal diameter 70 mm, including holder on the panel | 0.31 | 强烈的数 |
| 5SV8704-0KK | 42665 | Internal diameter 105 mm, including holder on the panel | 0.6 | 1 |
| 55V8705-0XK | 42666 | Internal diameter 140 mm, including holder on the panel | À 1.35 | 编数 i 类类 |
| 55V8706-0KK | 42667 | Internal diameter 210 mm, including holder on the panel | 1.25 | 1 |

- TECHNICAL INFORMATION, see page P4



| | | 4 | | |
|------------------|-------------|--|-----------|-----------------------|
| Aype to a second | rjodinskide | Description of the Control of the Co | alahit Ak | glode Parkage (set) s |
| 55V8 900-1KK | 42668 | Holder on "U" rail according to EN 60715 wide 35 mm, for current A | 0.01 | 2 |
| | 7 | transformers with internal diameter up to and including 105 mm \ | II II | ١. |

- TECHNICAL INFORMATION, see page P4

0.302

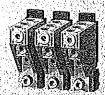
0.721

CONNECTING SETS

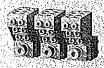
| | 31. | 110 | 14.0 | 100 |
|-----|-----|-------|----------|-----|
| . 2 | === | | . | |
| 15 | 16 | 16 | 44 | |
| C) | |) [| () | 3 |
| | | 71. | | |





















| 3 | termina | Is |
|---|---------|----|
| | | |

CS-BH-B011

(S-BH-B021

CS-BH-B022

| | |
|--------------------------------|---|
| 3 terminals | |
| Type Product code | Description See Signification Method of connection (See Weight [kg]) Package [set]] |
| CS-BH-T011 24820 | Clamp terminals 35 ÷ 240 Cu cables, flexibars 0.433 1 |
| - TECHNICAL INFORMATION, see p | age F19 |

Cu/Al cables

24761

| CS-BH-B012 | 24762 | Block terminals | 25 ÷ 150 | Cu/Al cables | 0.302 | 11 |
|-------------------|-------------------|-----------------|----------|--------------|-------|----|
| - TECHNICAL INFO | RMATION, see p | age F19 ' | | | | |
| - Technique in or | 010111011171171 F | -3 | • | | | |
| | | | | | | |

Double block terminals $2x(25 \div 150)$ Cu/Al cables

24781 Double block terminals 2x (150 ÷ 240) Cu/Al cables

 $150 \div 240$

.Block terminals

| CS-BH-B031 | 36604 | Block terminals | 3x (150 ÷ 240) | Cu/Al cables | 0.9 | 1 | |
|------------|-------|-----------------|----------------|--------------|-----|-----|--|
| CS-BH-B032 | 42691 | Block terminals | 3x (25 ÷ 150) | | 0.9 | _1_ | |

⁻ TECHNICAL INFORMATION, see page F19

[–] conductor cross-section for potential terminal is $1.5 \div 6 \, \text{mm}^2$

⁻ TECHNICAL INFORMATION, see page F19

| (S-BH-B014 20121 Block terminals 6x (6 ÷ 35) Co/Al cables 0.3 1 - for 6 cables |
|---|
|---|

⁻ TECHNICAL INFORMATION, see page F19

⁻using the OD-BH-KSO3 cover the degree of protection 1P20 is fulfilled

| CS.BH-A011 24760 Front connection Cu/l | NULARI BUTTO DE VARIOZ VANCE A CO |
|--|-----------------------------------|
| CS.BH-A011 .24760 Front connection CW/ | Al Dusbars, cable lugs, V. 100 C |
| flexi | ibais |

⁻TECHNICAL INFORMATION, see page F19

⁻ included in every supply of switching units

| CS-8H-P501 13683 Potential terminals 15÷25,4÷6 Cu flexible conductor 0,0021 1 |
|---|
|---|

⁻TECHNICAL INFORMATION, see page F19

1 terminal

| Types See Product code a Description (See Section 1) is a Melliot of Connection as a Weight (Ed. Section 1) set |
|---|
| |
| CS-BH-T411 19589 Clamp terminal 35 ÷ 240. (U.G.DIES, TEXTIDATS |
| TECHNICAL INTERMATION COS PRICE F19 |

| CS-BH-B411 | 19593 | Block terminal | 150 ÷ 240 | Cu/Al cables | 0.093 | . j |
|------------|-------|----------------|-----------|--------------|-------|------------|
| CS-BH-B412 | 19588 | Block terminal | 25 ÷ 150 | Cu/Al cables | 0.101 | 1 |

⁻ TECHNICAL INFORMATION, see page F19

| CS-BH-B421 | 19590 | Double block terminal 2x (150+240) Cu/Al cables |) 24 × 1 |
|------------------|----------------|---|------------|
| CS-BH-B422 | 19591 | Double block terminal 2x (25÷150) Cu/Al cables | //0.25 / 1 |
| - TECHNICAL INFO | RMATION, see p | age F19 | |

[&]quot;- set includes three terminals

⁻ TECHNICAL INFORMATION, see page F19

⁻ using the OD-BH-KSO3 cover the degree of protection IP20 is fulfilled

⁻ using the OD-BH-KSO3 cover the degree of protection IP20 is fulfilled



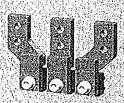


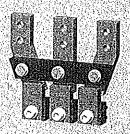












RETROFIT

1 terminal

| CS-BH-B431 36605 Block terminals 3x(150÷240) Cu/Al cables 0.3 1 | CS-RH-R432 | 42692 | Black terminals | $3 \times (25 \div 150)$ | CulALcablac | 6.2 | 1 |
|---|------------|-------|-----------------|--------------------------|--------------|-----|---|
| | CS-BH-B431 | 36605 | Block terminals | 3x (150 ÷ 240) | Cu/Al cables | 0.3 | 1 |

- TECHNICAL INFORMATION, see page F19

- conductor cross-section for potential terminal is 1.5 ÷ 6 mm²

| CS-BH-B414 21169 Block terminal $6x (6 \div 35)$ Cu/Al cables 0.1 - for 6 cables | 1.00 |
|--|------|
| and the state of t | |
| - <u>할 게 되는 단계를 받는 것은 사람들은 사람들은 하면 O CableS 가득하면 하는 사람들은 사람들은 사람들은 하는 사람들은 다음을 다 했다.</u> | |

- TECHNICAL INFORMATION, see page F19

| CS-BH-A421 1959 | 2 Rear connection | Cu/Al busbars, cable l | lugs 0.189 | |
|-----------------|-------------------|------------------------|------------|--|
| | | | | |

- TECHNICAL INFORMATION, see page F19

| | CS-BH-PS41 36032 Potential terminal 15+25/4+6 0,005 1 |
|---|---|
| • | - TECHNICAL INFORMATION, see page F19 |

3 terminals

| lype to the stroot | ode: Description : 5 / 5 / 5 / 5 / 5 / Method Disconection (5 / Weight Lkg), 1 | Package (pc) |
|--------------------|---|--------------|
| CS-BH-A037 24 | Reduction for BAL.*37-50 Cu/Al busbars, cable lugs; 0.47 - front connection flexibars | 53.1 |

- TECHNICAL INFORMATION, see page F19

| A CAMPA CONTRACTOR AND A CAMPACA CAMPA | |
|--|--|
| CS-BH-A039 24782 Reduction for BA*39-50 and Cu/Al busbars, cable lugs, 0.62 | 2017年 联系 自然结合,华达斯的人。 |
| CS-BH-AU39 Z4/8Z Z4/8Z Z5/ Registion for RA 254-50 and Z5/25/ Cit/Al hisbars (cable lines 22/25/25/ | JR .6653/4869/623 1 PH/ No |
| | |
| The state of the s | 法,不是不会的。因为是是不是的 |
| 12UXSO - front connection flexibars | 有年級 医毛色色医毛虫 |

- TECHNICAL INFORMATION, see page F19

- for total replacement of BA ... *39-50 or J2UX50 circuit breaker with front connection OD-BHD-MS39 connecting set is necessary

| N_G | 3A_*39 a J2UX Cu/Al busbars, cable (ugs 0,9 | STEPPING AND PROPERTY OF STREET |
|------------------------------------|--|---------------------------------|
| ES-8H-Z039 18702 Reduction for Re- | 34 *39 a DIN Tullat hitchard cable lime | Marsalas 1 e.s.s. |
| | 101 35 directings | 是特定全别,就是由1988年2 |
| Lipar connection | nn de la la companya de la companya | |

-TECHNICAL INFORMATION, see page F19

- for total replacement of BA...*39 or J2UX circuit breaker with rear connection OD-BH-MZ39 and CS-BH-AO21 connecting sets are necessary

| CS-BH-DX75 14567 Reduction for RA #39-75 and DJIK75 / CIJ/Al bushare 1.937 | NEW MINES |
|--|-----------|
| CS-BH-DX75 14562: Reduction for BA*39-75 and J2UX75: Ctu/Al busbars, 1.924 front connection, withdrawable design. flexibars, cable lugs | |

- TECHNICAL INFORMATION, see page F19

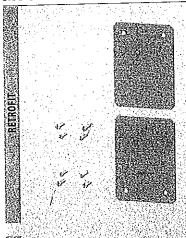
- for total replacement of BA...*39-75 or J2UX75T circuit breakers with front connection in withdrawable design OD-BKD-MS75 connecting set and ZO-8H-0630-300 plug-in device or ZV-BH-0630-300 withdrawable device are necessary

-TECHNICAL INFORMATION, see page F19

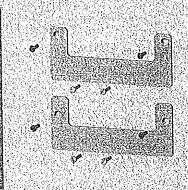
- for total replacement of J2UX75T cifuit breaker with front connection in withdrawable design OD-BHD-MS75 connecting set and ZO-BH-0630-300 plug-in devige of ZV-BH-0630-300 withdrawable device are necessary

RETROPITE - sets, which enable replacement of older circuit breakers by a new circuit breakers without write board recognistruction

MOUNTING SETS









| Type Product oder Decorption Veight (kg) Package (kg) |
|--|
| OD-BHD-MS39 24741 Reduction for BA*39-50 and J2UXSO - front connection 0.7 1 |

- DIMENSIONS see page F27
- for total replacement of BA ...*39-50 or J2UXSO circuit breaker with front connection 2 connecting sets CS-BH-A039 are necessary

| OD-BH-M239 18204 Reduction for BA*39 and J2UX - rear connection 1.195 1 |
|---|
|---|

- DIMENSIONS see page F27
- for total replacement of BA...*39 or J2UX circuit breaker with rear connection also 2 connecting sets CS-BH-Z039 and CS-BH A021

| OD-BH-MT75 33331 | Réduction for J2UX75T - fron | t connection, withdrawable | design | |
|------------------|--|----------------------------|--------|--|
| OD DII 111172 | gen de <u>forder de de la companya de </u> | | | |

- DIMENSIONS see page F33, F37
- for total replacement of J2UX75T circuit breaker with front connection in withdrawable design 2 connecting sets CS-BH-JT7 and ZO-BH-0630-300 plug-in device or ZV-BH-0630-300 withdrawable device are necessary

| OD-BHD-M575 14563 Reduc | tion for BA*39-75 a J2UX75 - front connection rayable design | , 0.446 1 |
|--|---|--|
| PACKET STATES AND A STATE OF A CHARLES | tawanis nepidi 🔗 🖘 🕬 a takan a takan 1997 a ta | Control of the Contro |

- DIMENSIONS see page F33, F37
 for total replacement of BA...*39-75 or J2UX75 circuit breaker with front connection in withdrawable design 2 connecting sets CS-BH-JT7 and ZO-BH-0630-300 plug-in device or ZV-BH-0630-300 withdrawable device are necessary

13 - one set provides for replacing one circuit breaker (set includes coupling elements necessary to assemble circuit breaker and mounting se RETROLUTE: - sets, which enable replacement of older circuit breakers by a new circuit breakers without switchboard reconstruct



(ILIARY SWITCHES



3P 4P











Single make contacts

| Туре | Product code | Operating voltage | Park Contacts: | n. Weight [kg] | : Package (pc) |
|----------------|--------------|----------------------|----------------|----------------|----------------|
| PS-BHD-1000 | 24700 | 60 ÷ 500 V a.c./d.c. | 0 | 0.012 | 1 |
| PS-BHD-1000-Au | 24702 | 5 ÷ 60 V a.c/d.c. | | 0.012 | . ya 🛊 |

Single break contacts

| Туре | Product code | Operating voltage: | Contacts \ | Veight (kg) | a Package (pc) |
|----------------|--------------|----------------------|------------|-------------|----------------|
| PS-BHD-0100 | | 60 ÷ 500 V a.c./d.c. | •— | 0.013 | 1 |
| PS-BHD-0100-Au | 24703 | 5 ÷ 60 V a.c./d.c | | 0.013 | 1 |

Double

| Type of the Co | Product cod | e s Operating voltage | a Contacts | Yelght (kg) → | Package [pc] |
|----------------|-------------|-----------------------|--|---------------|--------------|
| PS-BHD-0200 | 13690 | 60 ÷ 500 V a.c/d.c | ~ | 0.026 | 1 |
| PS-BHD-0200-Au | 13693 | . 5 ÷ 60 V a.c./d.c. | •—— | 0.026 | 9.21.44X |
| PS-BHD-1100 | 13691 | 60 ÷ 500 V a.c/d.c. | —————————————————————————————————————— | 0.025 | 1 |
| PS-BHD-1100-Au | 13694 | 5 ÷ 60 V a.c/d.c. | | 0.025 | S. 31 (3) 5 |
| PS-BHD-2000 | 13689 | 60 ÷ 500 V a.c./d.c. | · · · · · · · · · · · · · · · · · · · | 0.024 | 1 |
| PS-BHD-2000-Au | 13692 | 5 ÷ 60 V a c/d.c | | 0.024 | 383433 |

Make-and-break

| PS-BHD-0010 | 18021 | 60 ÷ 250 V a.c./d,c. | veromaes seems | ezes ≤ Weight (kg)(≥3) 0.013 | Package (pc) |
|----------------|--------|----------------------|----------------|---------------------------------|--------------|
| PS-BHD-0010-Au | 18022 | 5 ÷ 60 V a.c/d.c. | | 0.013 | 1004 300 |
| PS-BHD-0020 | 35 893 | 60 ÷ 250 V a.c./d.c. | | 0.026 | 1 |
| PS-BHD-0020-Au | 37467 | 5 ÷ 60 V a.c/d.c. | | 0.026 | |

Early

| Type | ioduct cod | Description | Contacts 44 | Weight [kg] | Package [pc] |
|-------------|------------|--------------|-------------|-------------|--------------|
| SP-BHD-0002 | 16169 | Early switch | | 0.045 | 1 |

- TECHNICAL INFORMATION for all switch, see page F59

SHUNT TRIPS





| SV-BHD-X110 | 24630 | 110Va <i>c/</i> dc | 0.14 | i i |
|-------------|-------|--------------------|------|-----|
| SV-BHD-X024 | 24650 | 24,40,48V a.c/d.c | 0.14 | 1 |

-TECHNICAL INFORMATION, see page F60

UNDERVOLTAGE RELEASES

3P 4P



| Type of the second | Production | ⊋θperating voltage: | Cescription 2 | yelghtakdi; | Package (pc)(3) |
|--------------------------------|------------|-------------------------|----------------------------|-------------|-----------------|
| SP-BHD-X024 | 24450 | 24,40,48V a.c/d.c. | | 0.11 | 1 |
| SP-BHD-X110 | 24430 | /110Vac/dc | | 0.11 | 以可称的 |
| SP-BHD-X230 | 24420 | 230, 400, 500V a.c./220 | DV d.c. | 0.11 | 1 |
| SP-BHD-X024-00010 | 24550 ÷ | 24,40,48Va.c/d.c | with early contact | 0.12 | ÇESTÎ ŞUNG. |
| SP-BKD-X110-00011) | 24530 | 110Vac/dc | - with early contact | 0.12 | 1 |
| SP-BHD-X230-0001 ¹⁾ | 24520 | 230,400,500Vac/220 | OV dc - with early contact | 0.12 | |

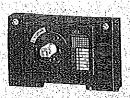
DELAY UNIT



| lype | odvarade | alpesemptio | | | | . We | mi | ol J | Package [jk] |
|----------------|-------------|--------------|-------|----|----------------------------------|------|--|------|--------------|
| BZ-BX-X230-A | 36696 | -enables | logel | aj | he undervoltage release tripping | | 0.12 | ٠ | 1 |
| | | of circuit b | ryake | W | odeion | | $oldsymbol{oldsymbol{oldsymbol{oldsymbol{eta}}}$ | Yı | |
| -TECHNICAL INF | ORMATION, s | ee page P2 | // | 1 | | - 1 | \prod | 1 | 1 |

⁻ TECHNICAL INFORMATION, see page F62
11 - cannot be used in combination with motor drive MP-BH-X...

HAND DRIVES



















| | Product cod | - Name - descripti | Mester and the second | Weight [kg] | ≱ Package (pc) \ |
|------------|-------------|--------------------|-----------------------|-------------|------------------|
| RP-BH-CK10 | 13653 | Hand drive unit | ~ without locking | 0.223 | 1 |
| RP-BH-CK20 | 13654 | Hand drive unit | - with locking | 0.223 | 1 |

- TECHNICAL INFORMATION, see page F64

- recomment, incommention, see page ros
Hand drive unit must be fitted with: **B** for controlling on switch unit - with the black hand drive lever RP-BHO-CP10 or RP-BHO-CP20
Hand drive unit must be fitted with: **B** for controlling through the switchboard door - with the extension shaft RP-BHO-CH..

- with the hand drive bearing RP-BHO-CH..

- with the hand drive lever RP-BHO-CP.

RP-BH-CK21 13685 Hand drive unit - yellow label

- TECHNICAL INFORMATION, see page F64
- TECHNICAL INFORMATION, see page F64
- Hand drive unit must be fitted with:

for controlling through the switchboard door – with the extension shaft RP-BHD-CH..

- with the hand drive bearing RP-BHD-CN..

- with the hand drive lever RP-BHD-CR.

- with locking

| RP-RH-CK30 | 37252 | Hand drive unit for right side control | 0.512 | |
|------------|-------|--|---------|--|
| | | Hand drive unit for left side control | 0,512 1 | |
| RP-BH-CK31 | 37253 | Halld drive plut for left side courtor | | |

-TECHNICAL INFORMATION, see page F64

| RP-RHD-CP10 | 13655 | Hand drive lever - black | - without locking | 0.075 | |
|-------------|-------|--------------------------|-------------------|-------|---|
| RP-BHD-CP20 | 13656 | Hand drive lever - black | - with locking | 0,075 | 1 |

-TECHNICAL INFORMATION, see page F64

| RP-BHD-CP21 13657 Hand drive lever - red - with locking 0.075 1 |
|---|
|---|

- TECHNICAL INFORMATION, see page F64

| RP-BHD-CN40 37246; Hand drive bearing degree of protection IP40 0.14 | 1 |
|--|---|
| RP-BHD-CN49 | |

- TECHNICAL INFORMATION, see page F64

- Is used in combination with the black lever of RP-BHD-CP10, RP-BHD-CP20 hand drives

| RP-BHD CN41 37247 Hand drive bearing ; yellow label - degree of protection IP40 0.14 1 |
|--|
|--|

- TECHNICAL INFORMATION, see page F64

- is used in combination with the red lever of RP-BHO-CP21 hand drive

| RP-BHD-CH60 37248 Hand drive bearing - degree of protection IP66 0.14 1 |
|---|
|---|

-TECHNICAL INFORMATION, see page F64

- Is used in combination with the black lever of RP-BHD-CP10, RP-BHD-CP20 hand drives

| RP-BHD-CN61 37749 Hand drive bearing 2 yellow label - degree of protection IP66 |
|---|
|---|

- TECHNICAL INFORMATION, see page F64

- is used in combination with the red lever of RP-BHD-CP21 hand drive



Modeion

0.255

0.448

0.448

IAND DRIVES



3P 4P



| RP-BHD-CH10 | 13658 | Extension shaft - length 365 mm, can be shortened 0.205 | 3 T 1 T |
|----------------------|---------------|---|---------|
| - TECHNICAL INFORMAT | ATION see par | ne FKA | |

Extension shaft - telescopic, length 245 ÷ 410 mm

-TECHNICAL INFORMATION, see page F64

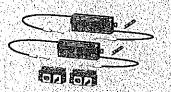
RP-BHD-CH20 13659

MECHANICAL INTERLOCKING AND PARALLEL SWITCHING

3P 4P







| | 18290 Mechanical Interlocking for fixed design 0.16 1 MATION, see page F65 |
|--------------------|--|
| | ocking must be fitted with: 2 hand drive units RP-BH-CK |
| | 2 hand drive levers RP-BHD-CP. |
| | |
| RP-BHD-CD10 | . 18289 Mechanical parallel switching - for fixed design 0.23 1 |
| | |
| - TECHNICAL INFORM | |

Mechanical blocking with Bowden cable - for two circuit

Mechanical blocking with Bowden cable – for one BD250 and one BH630 circuit breaker - TECHNICAL INFORMATION, see page F66

19611

19613

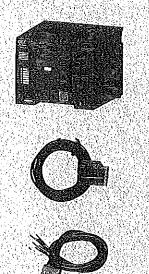
MB-BH-PV04

MB-BHD-PV03

- mechanical blocking with Bowden cable is intended for fixed, plug-in and withdrawable design

breakers BH630

MOTOR DRIVES



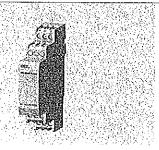
| MP-BH-X024 ¹⁾ | 20590 | Motor drive | 24Va.c/d.c | 1.691 | 1 |
|----------------------------|-------|--------------------------|----------------------------------|---------------------------|------------|
| MP-BH-X048 ¹⁾ | 19792 | Motor drive | 48Va.c/d.c | 1.691 | |
| MP-BH-X110 | 13539 | Motor drive | 110Va.c/dc | 1.691 | 1 |
| MP-BH-X230 | 13536 | Motor drive | 230V a.c/220V d.c | 1,691 | N. Birkh |
| MP-BH-X024-P ¹⁾ | 20591 | Motor drive | 24V a.c./d.c. | 1.708 | 1 |
| MP-BH-X048-P ⁰ | 19793 | Motor drive - with count | er of cycles , 48V a.c/d.c | 1.708 | |
| MP-BH-X110-P | 13687 | Motor drive - with count | er of cycles 110V a.c./d.c | 1.708 | 1 |
| MP-BH-X230-P | 13540 | Motor drive - with count | er of cycles 230V a.c./220V d.c. | 1,708 | North Asso |
| - TECHNICAL INFORMA | | | | Trusting 146 2 1 1 14 444 | |

OD-BHD-PP01 13688 Counter of cycles - cable length 1.1 m - DIMENSIONS see page F67 - upon agreement with the manufacturer, different conductor lengths can be supplied

OD-BHD-KAO2 13809 Extension cable - to motor drive; 12 wires, length 0.6 m 0.1

~TECHNICAL INFORMATION, see page F67 - upon agreement with the manufacturer, different conductor lengths can be supplied

CONTROL RELAY



| Types () es Productiode? Spécificatio | | Weight (kg) = Package (pc) |
|--|----|----------------------------|
| OD-BHD-RX01 37425 24V a.c/d.c. | | 0.06 1 |
| OD-BHD-RXO2 37426 48 V a.c/d.c | | 0.06 |
| OD-BHD-RA03 37427 110÷230V | | 0.06 |
| OD-BHD-RDO4 37428 110Vd.c | | 0.00 M) (1) |
| -TECHNICAL INFORMATION, see page P3 | VI | |

F13 🗐

ACCESSORIES



















| 14.720.500 | Productrode | Hame description Weight (kg) | Package Ip | ç). |
|-------------|-------------|--|------------|-----|
| OD-BHD-KS02 | 24740 | Insulating barriers – set (two pieces), for 3P and 4P design 0.077 | 1 | |
| OD-BHD-KS42 | 19575 | Insulating barrier - one piece, for 4P design 0.039 | 1. | |

- included with each switching unit order
- -in case circuit breaker/switch-disconnector connection is reversed (supply to terminals 2, 4, 6) it is necessary in most cases to install these barriers also on the lower side
- for more detailed information see page F22

| OD-BH-KS03 | 13531 | Terminal cover - degree of protection IP20, for 3P design | 0.144 | 1 |
|------------|-------|---|-----------------------------|---|
| | 10507 | Terminal cover - degree of protection IP20, for 4P design | 0.209 | 1 |
| OD-BH-KS43 | 19587 | | » Dota black type terminals | |

- increases degree of protection of connection point to IP20 when using B021, B022, B031, B032 a B014 block type terminals
- intended for fixed, plug-in and withdrawable design

| OD-BH-UP01 13532 Leverwith locking 0.013 1 |
|--|
|--|

- enables to lock the circuit breaker in switched off manually position (loaded)
- locking is possible using padlock with shank diameter 4 \div 6 mm

| enables sealing for: - cover of cav terminal co | |
|--|---------|
| - fellilling co | ver |
| - overcurrent | release |
| - hand drive | unit |
| - motor drive | ! |

- enables sealing for overcurrent releases such as circuit breakers in the main meter switchboard

| OD-BHD-KA01: 14555 Connecting cable - to connect the drouit breaker/ 0.12 1 | |
|--|-------------|
| 0.12 | ijŸ ijŽĎ |
| | (2) |
| | 12.0 |
| THE BOOK WAS AND SEED OF SEPTEMBER AND APPLICATION FANCE - TO LIKERALL MIC LIKERA PROPERTY AND ASSESSMENT AND ASSESSMENT OF A SEPTEMBER AND ASSESSMENT AND ASSESSMENT OF A SEPTEMBER AND ASSESSMENT ASSESSMENT AND ASSESSMENT ASS | |
| THE REPORT OF THE PROPERTY OF | |
| IN UPPUITURITY PARTICULAR CONTRACTOR OF TARIES AND AND THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF T | 27 4 27 |
| OD-BHD-KAO1. 14323 Commecting data: Commercial State of the Plug-In/ | |
| /switch-disconnector accessories in the program /withdrawable design = 15 wires / it is possible for plua-in design and fixed design) | |
| ,大量是一个大型,我们就是我们的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的, | |
| | |
| - ぶんこうでは といったが とんさい こうしょ しゃく かんこうらようかん 最高に高くしる めんりゅうこう しんがいかん くうしょうん しょうこう こうじょうか ていたく うっとがく リフラー アリー | - F |
| TO STATE OF THE PORT OF THE PROPERTY OF TAXISHII INVALIDE DESIGNED BY THE PORT OF THE PORT | |
| 一次是一种的,我们就是我们的我们还是我们的,我们就是这个人的,我们就是这个人的,我们就是这个人的,我们就是这个人的,我们就是这个人的,我们就是一个人的,我们就是 | |
| 는 가장하다. 생각 사람들이 있다면 하다 가는 사람이 가장 하는 사람들이 없는 사람들이 없는 사람들이 되는 것으로 되었다. 기능하는 밤 전혀 들어 다양하는 것이다. 나는 사람들이 다양하는 것이다. | |
| TARKET AND THE SECOND OF THE PROPERTY OF THE ARRAINS BY DISTANCE OF THE SECOND OF THE | |
| /withdrawable design = 15 v/ires : (it is possible for plug-in design and fixed design) | |
| | |
| | |

| SO-BHD-0010 14560 Signalling of the plug | and a server active in a service in the Contractive Public | OMOGRAFIA AND WEST STORM IN THE |
|--|--|--|
| Co pue coso 14560 Signalling (| of position - signals circuit breaker position | my a gruulo a vara a tara |
| 20-RHD-0010 | ta a set describle doutce | 化电影通过电影影响 医克雷克氏征 |
| 不改造的基本的基本的基本的基本的 the plug | -ILI OL MINIMINADAS RELICE | the grant and a first transfer to the second |

- TECHNICAL INFORMATION, see page F48, F50

| OD-BH-KKO1 14554 Keying set : prevents fisefting in the plug-ln: 0.005 1 or withdrawable devices beyond the switching unit |
|--|
|--|

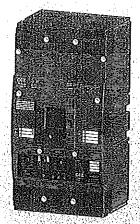
- TECHNICAL INFORMATION, see page F48, F50

| / Y | |
|--|-------------------|
| OD-BHD-KT01 14642 Cover of switch on button - for motor drive, cover can | 1.60 |
| OD-BHD-XT01 14642 Cover of switch on button – for motor drive, cover can | $T_{i,i,\lambda}$ |
| | f_{xx} |
| be sealed | 7 |

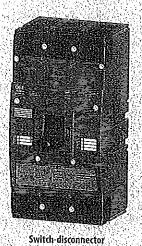
-TECHNICAL INFORMATION, see page F67



3P 4P

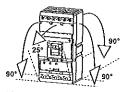


Circuit breaker

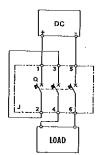


m C C C C + D

Dimensions



nstallation positions - fixed, plug-in and withdrawable design



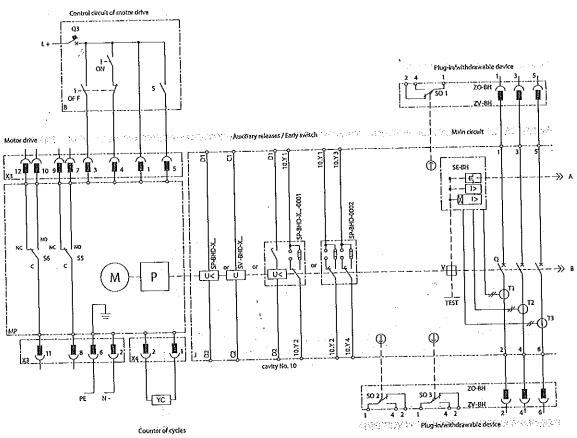
Connection of switch-disconnector for DC circuits

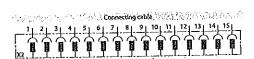
- protection of Modelon switch-disconnectors, see page R

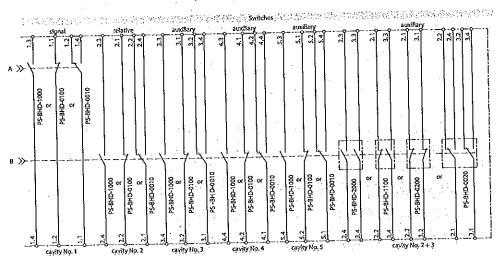
| Specifications | | CIRCUIT BREAKER | SWITCH-DISCONNECTO |
|--|---|--|--|
| Туре | Telesteriketen Medakorora | BHG3ON/BHG3OS | |
| Dimensions A x B x C + D (3P/4P design) | | 140/185 x 275 x 105 + 49 mm | 140/185 x 275 x 105 + 49 лэд |
| Weight (3P/4P design) | | 5.4/7.4 kg | 5.4 ka |
| Standards | | EN 60947-2 | EN 60947-3 |
| Assumption of the second | | IEC 60947-2 | IEC 60947-3 |
| Approval marks | | (€® | 6 M |
| Allerta de la companione de la companion | | | (C) (4) |
| Number of poles | | 3,4 | 3,4 |
| Rated current | i. | 250, 315, 400, 500, 630 A | |
| Rated normal current | l, | 630 A | 630 A |
| Rated operating current | | | 630 A |
| Rated operating voltage | U, | max. 690 V a.c. | max. 690 V a.c. |
| - LANGE MARKETAN INCOME OF A SECULOR SEC | e e e e e e e e e e e e e e e e e e e | | max. 440 V d.c. |
| Rated frequency | $f_{f a}$, where $f_{f a}$, where $f_{f a}$ | 50/60 Hz | 50/60 Hz |
| Rated impulse withstand voltage | U _{ksp} | 8 kV | 8 kV |
| Rated Insulation voltage | Zaka ú | 690V | 690 V |
| Utilization category (selectivity) | 690 V a.c. | A | - |
| Utilization category (switching mode) | 690 V a.c. | | ÁC-23B |
| | 440 V d.c. | | DC-23B |
| Rated short-time with stand current at $U_e = 690 \text{V}$ a. | c. i _∞ /t | 8 kA/50 ms, 7 kA/300 ms, | 7.5 kA/5 s |
| Series . | . 18 The William Control | 6.5 kA/1 s | |
| Sens | | NORMAL SUPERIOR U | |
| Rated short-circuit ultimate breaking capacity (rms) |) [| BH630N BH630S 60 kA 100 kA 230 V a.c. | |
| (mb) | 'o . | 36 kA 65 kA 415 V a.C | |
| | | 20 kA 35 kA 500 V a.c. | - |
| - Maria da Bizilia (higi higina) de la | ter tem kalanda a | 15kA 20kA 690Vac | |
| Rated short-circuit service breaking capacity (rms) | | 40kA 75kA 230Va.c | |
| | | 18kA 36kA 415Vac 10kA 20kA 500Vac | |
| | | 8kA 15kA 690Vac | |
| Rated short-circuit making capacity (peak value) | 1_/U | 75 kA 140 kA 415 V a.c. | 14 kA/415 V a.c. |
| MARI TOMPROTORO CONSTRUCTORO SE | Mentional and a con- | and Maria and Principles of State of St | 14 kA/440 V d.c. |
| Switching off time at 1 | | | いいちょう こうさいしゅん あまげい たいべつ |
| lance of the track to the | SUPPLIED PROPERTY | 20 ms | 持一步用度抵抗的阻碍性 智 |
| Losses per 1 pole fixed/withdrawable design | | 75 W/85 W | 75 W/85 W |
| Mechanical endurance | | 75 W/85 W 20 000 cycles | 75 W/85 W 20 000 cycles |
| Mechanical endurance Electrical endurance | | 75 W/85 W 20 000 cycles 5 000 cycles | 20 000 cycles 5 000 cycles |
| Mechanical endurance Electrical endurance Switching frequency | | 75 W/85 W 20 000 cycles | 20 000 cycles |
| Mechanical endurance Electrical endurance Switching frequency Control force | | 75 W/85 W 20 000 cycles 5 000 cycles | 20 000 cycles 5 000 cycles |
| Mechanical endurance Electrical endurance Switching frequency | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir | 20 000 cycles 5 000 cycles 120 cycles/hr |
| Mechanical endurance Electrical endurance Switching frequency Control force | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N | 20 000 cycles 5 000 cycles 120 cycles/fir 110 N |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degreating conditions | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N IP40 | 20 000 cycles 5 000 cycles 120 cycles/fir 110 N 1P40 |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N IP40 | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 IP20 |
| Mechanical endurance Electrical endurance Switshing frequency Control force Degree of protection from front side of the device Degree of protection of terminals Operating conditions: | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degrating conditions Reference ambient temperature Ambient temperature range | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degree of protection of terminals Reference ambient temperature Ambient temperature range Working environment | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C dry and tropical dimate |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degree of protection of terminals Reference ambient temperature Ambient temperature range Working environment Limatic resistance | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate EN 60068 | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 - +55 °C dry and tropical dimate ER 60068 |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Operating Conditions Reference ambient temperature Ambient temperature range Working environment Limatic resistance Pollution degree | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate EM 60068 3 | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C dry and tropical dimate ER 60068 3 |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degree of protection of terminals Degrating Conditions Reference ambient temperature Ambient temperature range Working environment Llimatic resistance Vollution degree Max. sea level | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical dimate EN 60068 3 2 000 m | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C dry and tropical dimate EN 60068 3 2,000 m |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degrating Conditions Reference ambient temperature Ambient temperature range Working environment Llimatic resistance Pollution degree Max. sea level Liesmic resistance | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate EM 60068 3 | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C dry and tropical dimate ER 60068 3 |
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| Mechanical endurance Electrical endurance Switshing frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degree of protection of terminals Degree of protection of terminals Personal from the device Degree of protection of terminals Degree of protection | | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hir 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical dimate EN 60068 3 2 000 m | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C -40 ÷ +55 °C dry and tropical dimate EN 60068 3 2,000 m |
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| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degrating conditions Reference ambient temperature Ambient temperature range Working environment Limatic resistance Pollution degree Max. sea level Seismic resistance Design modifications Front/rear connection Tug-in design 3P/4P Withdrawable design 3P/4P Withdrawable design 3P/4P Micessories Working environment Use in design 3P/4P Micessories Writches - auxiliary/relative/signal/early hout trip Indervoltage release/with early switch roott hand drive/with adjustable lever lechanical interlocking-with Bowden cable/for hand | drive /// | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate EN 60068 3 2 000 m 3g (8 ÷ 50) Hz •/e •/e •/e •/e •/e •/e •/e •/e •/e | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical dimate EN 60068 3 2 000 m 3g (8 ÷ 50) Hz •/• •/• •/• •/• •/• |
| Mechanical endurance Electrical endurance Switching frequency Control force Degree of protection from front side of the device Degree of protection of terminals Degrating conditions Reference ambient temperature Ambient temperature range Working environment Limatic resistance Pollution degree Max. sea level Leismic resistance Leismic | drive | 75 W/85 W 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical climate EN 60068 3 2 000 m 3g (8 ÷ 50) Hz ●/● ●/● ●/● ●/● ●/● ●/● ●/● | 20 000 cycles 5 000 cycles 120 cycles/hr 110 N 1P40 1P20 40 °C 40 ÷ +55 °C dry and tropical dimate EN 60068 3 2 000 m 3g (8 ÷ 50) Hz •/• •/• •/• •/• •/• •/• •/• •/• |
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Diagram

Circuit breaker with accessories (3-pole design)







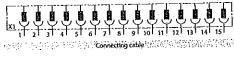
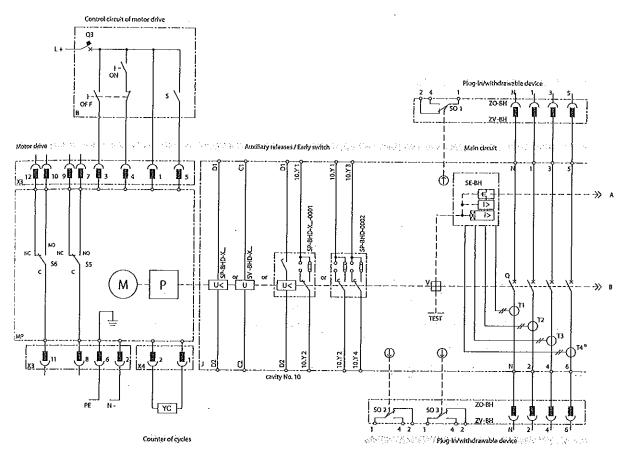


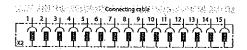
Diagram description (3D and AP decign)

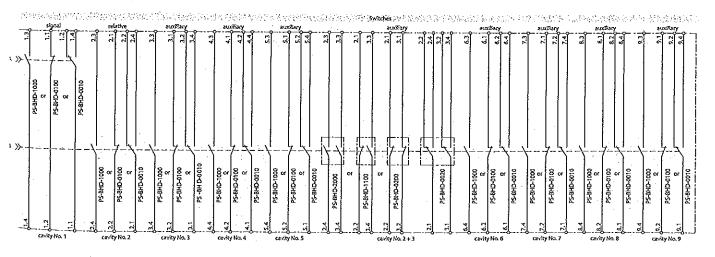
| Diagram descri | ption (3P and 4P design) |
|-----------------------------|--|
| | uo pu V |
| MP | motor drive - MP-BH-X motor |
| M S X S S | storage device |
| Р ХЗ | connector for connection of control drea |
| X4 | connector for external counter of cycle |
| S5 | switch to indicate AUTO AUTO (NO-C)/ |
| | /MANUAL (NC-C) |
| S6 | switch to indicate full storage |
| | (ready to switch on: NO-C) |
| Ϋ́C | external counter of cycles = OD-BHD-PI |
| B | recommended wiring of the control circl |
| | - It is not a part of motor drive |
| ON | switch on button |
| OFF | switch off button |
| 5 | switch for energy storage (switched on |
| 3507.028.00 | = automatic storage, switch may be |
| 76 S. 19 W. 1 | continuously switched on) |
| 03: | motor drive circuit breaker - see page l |
| 上来的人 | switching unit + BH630 |
| $Q \subset \mathbb{R}^{n}$ | main contacts |
| T1, I2, I3, I4 ⁰ | current transformers |
| CC OU SO SO SO | trip-free mechanism circuit breaker - overcurient release |
| SE-BH | SE-BH |
| 大多数数 | switch-disconnector - switch-disconnect |
| | unit - SE-BH-0630-V001 |
| TEST | push button to test release |
| ZO BH | nlum in device - ZO-BH-0630 |
| ZV-BH | withdrawahle device -7V-BH-0630 |
| X1, X2 | connecting cable - CO-BHD-KAUL |
| 501, 502, 503 | confacts signalling circuit breaker |
| 大阪市が開催 | /switch-disconnector position in pluy |
| | The withdrawable device 50- Driv TVV 13 |
| | for more detailed information see pat |
| 9 46 4 4 3 | /F48,F50 |
| SP-BHD-X | undervoltage release |
| SV-BHQ-X | shunt trip |
| SP-BHD-X::-00 | OT undervoltage release with early conto |
| SP-BHD-0002 | early contact |
| 1) - only for 4-pol | e design of BH630406 switching unit |
| ····, ··· · · · · | - ' |

)iagram

:ircuit breaker with accessories (4-pole design)













Connecting and installation

Power circuit

- connected with Cu/Al busbars or cables, and possibly cables with cable lugs
- connection sets are produced to provide greater connecting options, see page F7
- generally, conductors from the supply are connected to input terminals 1, 3, 5, (N) and conductors from the load to terminals 2, 4, 6, (N); however, it is possible to reverse the connection (exchanging input and output terminals without limiting rated short-circuit ultimate breaking capacity I_n)
- m in case of reversed connection, in the majority of cases, circuit breaker/switch-disconnector must be fitted with OD-BHD-KSO2 insulating barriers also on the side of terminals 2, 4, 6, for more detailed information see page F22
- ma we recommend painting the connecting busbars
- m input and output conductors/busbars must be mechanically reinforced in order to avoid transferring electrodynamic forces to the drcuit breaker/switchdisconnector during short-circuiting
- the method of connecting the power circuit must observe the deionization space of the circuit breaker see page F23

Auxiliary circuits

- \blacksquare switches, shunt trips or undervoltage releases are connected using flexible Cu conductors with cross-section $0.5 \div 1 \text{ mm}^2$ directly to terminals on these devices
- m motor drive and auxiliary circuits of the plug-in or withdrawable design are connected using a connector

Recommended min. cross-sections of cables, busbars and flexibars for fixed, plug-in and withdrawable designs

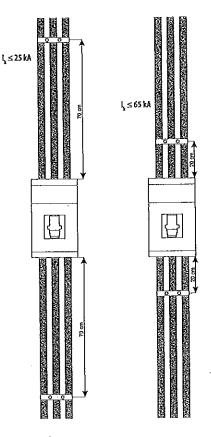
| 500 |
|-----|
| |
| 400 |
| 315 |
| 250 |
| 200 |
| 160 |
| 125 |
| 100 |
| 100 |

- it is necessary to follow the relevant valid standards when cables are designed
- " connection of withdrawable and plug-in design by 2x 240 mm² Cu
- ²⁰ withdrawable and plug-in design can not be connected by Al
- " connection of withdrawable and plug-in design by min. 32 x 16 Cu

Maximum circuit breaker/switch-disconnector loads in accordance with ambient temperature Circuit breaker/switch-disconnector BH630 - connection by cu cable 2x 185 mm² per pole

630 A 620 A 580 A 540 A 500 A

Mechanical reinforcement of conductors for BH630





> F18



3P 4P

IRCUIT BREAKERS, SWITCH-DISCONNECTORS

mnecting and installation

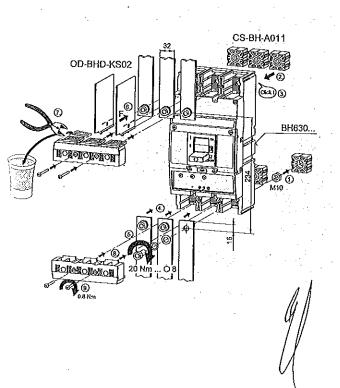
nnecting set specifications

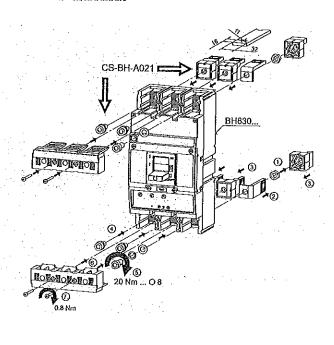
| LEFE TASKS! | | | STATES TO THE THE STATE OF THE S | AARVETENZETIAN MODELLA AARVETEN AARVETEN AARVETEN AARVETEN AARVETEN AARVETEN AARVETEN AARVETEN AARVETEN AARVET | | |
|--------------------------|-------------------|--|--|--|--|--|
| Type: | [[A] [A] | | Cable , ranges of connection cro | os sections 5 (mm²) = -5. | | |
| | Type | of cable sector stranded | sector solid | of round strandeds | a service of the serv | |
| | - C-40 20 Fe 64 A | *** \$ \$\$\$\$\$\$ | | | | |
| | | | | | () | Busbas and cable (Dimensional- |
| (S-BH-A011 | | | | | | log WXII (mm) = Conving 3P/4P |
| (S-BH-A411 | 670 | | | | | 32 x |
| (S-BH-A021 | | | H. 1868 Had Grown Inc. | Na o Salanarana wa | Kilografia Para da Nordaleo | Paris no di Herinaria. |
| (S-BH-A421 | | | | | | 32 x pagè F26/F40 |
| (S-BH-T011 (S-BH-T411 | 400 | 35 ÷ 240 Cu | 35 ÷ 240 Cu | 35 ÷ 240 €u | 35 ÷ 240 Cu | n talan arang dan kalandaran salah sal |
| 'S-BH-B011 | 480 | 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | EA BAAAAAAA | adekul Tist ununttalisis. |
| 3-8H-B411 | | 150 ÷ 240 Cu/Al | 120 ÷ 240 Cu/Al | 150 ± 240 Cu/Al | 120 ÷ 240 Cu/Al | |
| :S-BH-B012 :S-BH-B412 | 715 | 25 ÷ 150 Cu/Al | 16 ÷ 150 Cu/Al | 25 ÷ 150 Cu/Al | 16 ÷ 150 Cu/Al | The first is the second of |
| 3-BH-B021 | 670 | | | | | tePagrest Alexandres (200 |
| S-BH-B421 | | 2x (150 ÷ 240) Cu/Al | 2x (120 + 240) Cu/AJ | 2x (150 ÷ 240) Cu/AI | 2x (120 ÷ 240) Cu/Al | page F24/F38 |
| :S-BH-B022 :S-BH-B422 | 500 | 2x (25 ÷ 150) Cu/Al | 2x (16 ÷ 150) Cu/AI | 2x (25 ÷ 150) Cu/Al | 2x (16 ÷ 150) Cu/Al | page F24/F38 |
| .S-BH-8014 | 373 are 533 | SANAYAZININ MARANA ACS | STANGER SANGER STANGER | NAPASY ANY ARTHURA | SMILNESS CANADAS | payer 24/156 SANG Self Trishett (1990-19, engless) |
| .S-BH-B414 | 250 | 6x (6 ÷ 35) Cu/AI | 6x (6 ÷ 35) Cu/Al | 6x (6 ÷ 35) Cu/Al | 6x (6 ÷ 35) Cu/Al | page F25/F39 |
| :S-BH-B031 :S-BH-B431 | 630 | 3x (150 ÷ 240) Cu/Al | 3x (120 ÷ 240) Cu/Al | 3x (150 ÷ 240) Cu/Al | 3x (120 ÷ 240) Cu/Al | na tras e la estada de la traca. |
| S-BH-B032 | | NE CONTRACTOR DE SECULIA. | Kulis ik sandisungan ng s | 77.77.77.77.77.77.77.77.77.77.77.77.77. | 3 4 (120 + 240) (U/A) 39633658638638978638585 | page F25/F39 |
| :S-BH-B432 | 630 | 3x (25 ÷ 150) Cu/Al | 3x (16 ÷ 150) Cu/A1 | 3x (25 ÷ 150) Cu/Al | 3x (16 ÷ 150) Cu/Al | page F26/F40 |
| :S-BH-A037 | 400 | RETROFIT | - reduction for circuit breaker (| BA*37 with front connection | page F27 | page F27 |
| :S-BH-A039 | 630 | | | BA*39 with front connection | | page F27 |
| CS-BH-Z039 | 630 | | | BA*39 with rear connection p | | page F27 |
| CS-BH-JX75 | 630 | | | with front connection in withdr | | page F33, F37 |
| CS-BH-JT75 | 630 | | | front connection in withdrawabl | | Control of the confidence state of the |
| S-BH-PS01 | 10/16 | | 1,5 ÷ 2,5/4 ÷ 6 Cu | 架柱 医自治病炎 第四人 医乳性毛膜炎病毒 经出现 | c ocaign page 133, 137 | page F33, F37 @ Williams |
| CS-BH-PS41 | 10/16 | | | Zuga karamenti na Arta Perenti | CONTRACTOR AND | 40年第二年第二十五年 |
| ~ | | | いっ テムコッチ ひくひ | HEXIDE COHORCOL | | |

TROFIT – sets, which enable replacement of older circuit breakers by a new circuit breakers without switchboard reconstruction

ont connection - Cu/Al busbars

Rear connection - Cu/Al busbars

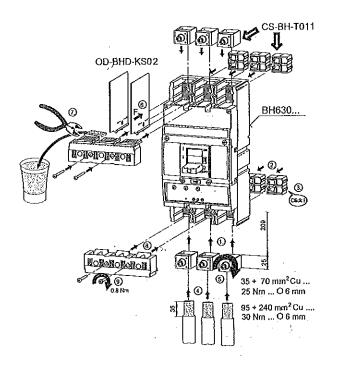




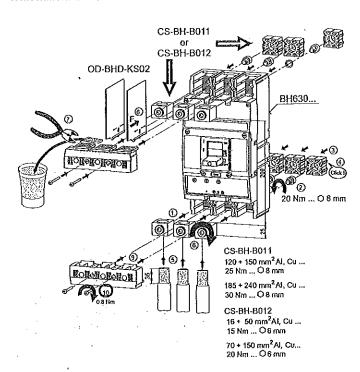


Connecting and installation

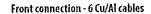
Front connection - Cu cables

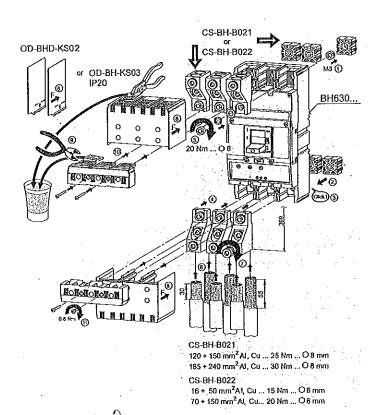


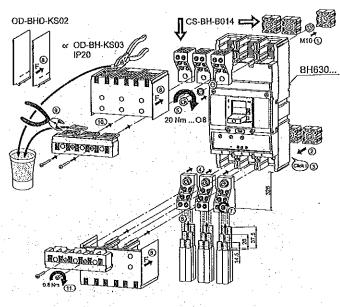
Front connection - Cu/Al cables



Front connection - 2 Cu/Al cables







Of



F20

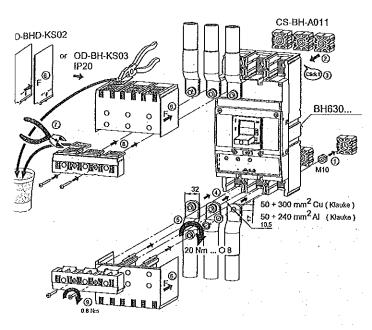


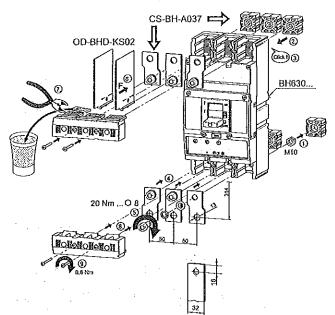
3P 4P

onnecting and installation

ront connection - cable lugs

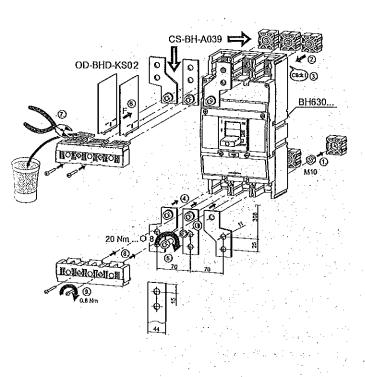


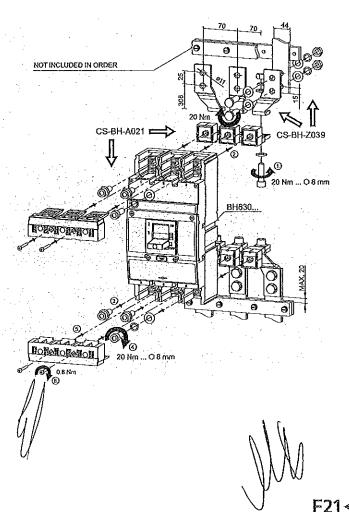




ront connection - reduction BH to J2UX and BA...39

Rear connection - reduction BH to J2UX and BA...39 with rear connection





Deionization spaces

USE OF INSULATING BARRIERS AND TERMINAL COVERS WITH CIRCUIT BREAKERS AND SWITCH-DISCONNECTORS

m FIXED DESIGN

- front connection

- terminals 1, 3, 5 (upper side) a) if Ue \geq 415 V a.c., it is necessary to use OD-BHD-KSO2 insulating barriers or a OD-BHD-KSO3 terminal cover

b) if insulated conductors are not used for connecting power circuit to terminals 1, 3, 5, flexibars or rear connection, it is necessary to use OD-BHD-KSO2 insulating barriers or a OD-BHD-KSO3 terminal cover

- terminals 2, 4, 6 (lower side) only in case that circuit breaker/switch-disconnector is connected to the source using terminals 2, 4, 6 and furthermore:

a) if $U_e \ge 415$ V a.c., it is necessary to use OD-BHD-KSO2 insulating barriers or a OD-BHD-KSO3 terminal cove

 b) if insulated conductors are not used for connecting power circuit to terminals 2, 4, 6, flexibars or rear connection, it is necessary to use OD-BHD-KSO2 insulating barriers or a OD-BHD-KSO3 terminal cover

- rear connection

- insulating barriers and terminal covers need not be used

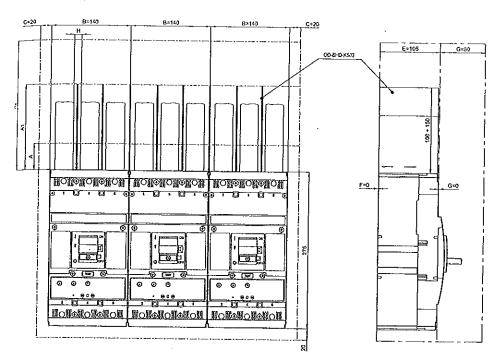
■ PLUG-IN AND WITHDRAWABLE DEVICE

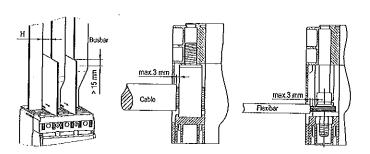
- insulating barriers and terminal covers need not be used

M

3P 4P

Jeionization spaces





- A...minimum distance between the circuit breaker/ /switch-disconnector and uninsulated earthed wall (applicable for connection using insulated conductors, cables, flexibars or with rear connection)
- A1...minimum insulation length of bare conductors (using OD-BHD-KSO2 insulating barriers from 100 mm to max. 150 mm, or by adding additional insulation for the conductors with barriers to obtain at least A1 value)

A2...minimum distance:

- between the circuit breaker/switch-disconnector and uninsulated earthed wall (applicable for uninsulated conductors and busbars)
- between the circuit breaker/switch-disconnector and busbar
- between two circuit breakers/switch-disconnectors situated vertically above one another
- between uninsulated connections of two circuit breakers/switch-disconnectors above one another
- C, D, E, F, G...minimum distance between the circuit breaker/switch-disconnector and uninsulated earthed wall
- H...minimum distance between uninsulated conductors
- minimum distance of circuit breakers without using of uninsulated barriers is 50 mm

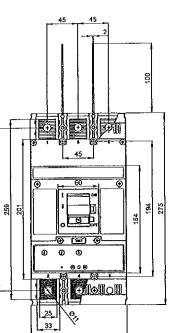
| BH6305 Vine | d With E | | i ALLUS SUKAT | 200 | er konstrueren era Grande era | | | | 1 | 0 1 |
|------------------|---|-----------------|------------------|-----|----------------------------------|-------|---------------|-----|-----|-----|
| BI(630)) Wife | a Vinda (*) | | e jkaj: | 7 W | | | | 20 | | |
| Equipment | | | | | | | | | | |
| | | A Hagarianay | [mm] | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | ≥ 13 | :\A1 | (mm) | 150 | , 200 | 100 | 200 | 150 | 250 | 150 |
| < 80 | | A2 | [mm] | 250 | 300 | 200 | 300 | 250 | 350 | 250 |
| | | , A , | (mm) | 50 | 50 2 77 | 50 | 50 | 50 | 50 | /50 |
| | ≥ 30 | A1 | [mm] | 100 | 150 | 100 | 150 | 150 | 150 | 150 |
| | | A2 | [mm] | 150 | 200 | 150 | 200 | 200 | 200 | 200 |
| | | A | [mm] | 50 | 50 | 50 | <i>1</i> / 50 | 50 | 50 | 50 |
| ≥ 80 | ≥ 13 | A1 | [ww] | 100 | 150 | 100 / | 150 | 150 | 150 | 150 |
| | | A2 | [mm] | 150 | 200 | 150 | 200 | 200 | 200 | 200 |
| ote: i," - max. | le: ["-max. short-circuit current in the protected circuit (rms) | | | | | _ | | | | |

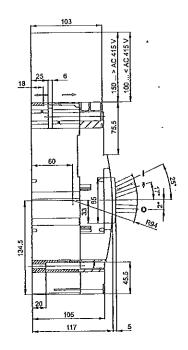
Dimensions

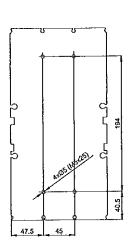
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Fixed design, front connection

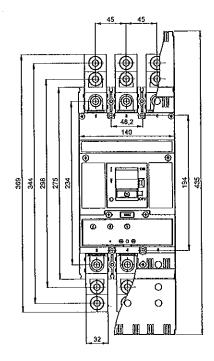


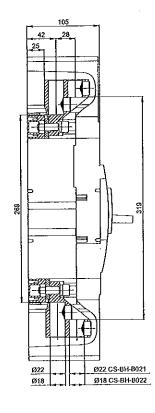




Drilling diagram

Fixed design, front connection (CS-BH-B021, CS-BH-B022 connecting sets)





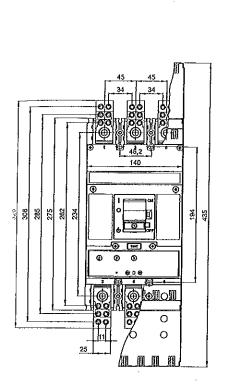


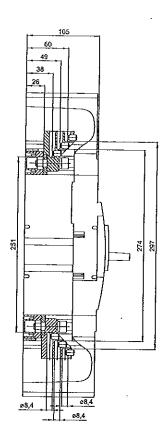




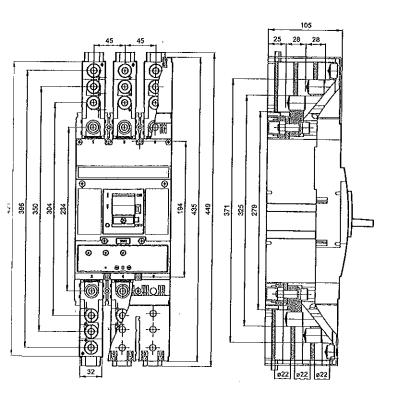
)imensions

ixed design, front connection (CS-BH-B014 connecting set)





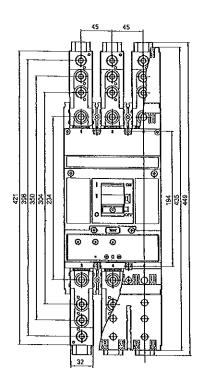
ixed design, front connection (CS-BH-B031 connecting set)

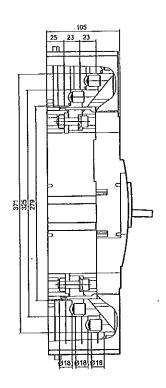




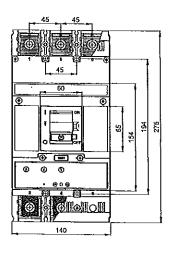
Dimensions

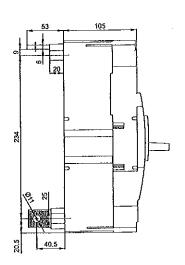
Fixed design, front connection (CS-BH-B032 connecting set)



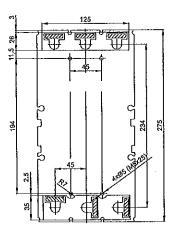


Fixed design, rear connection (CS-BH-A021 connecting set)





Drilling diagram



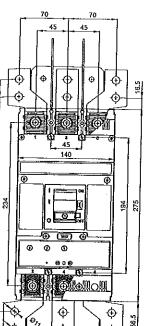


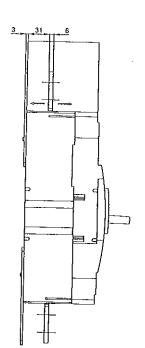


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)imensions

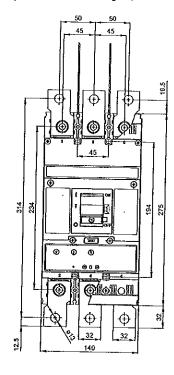
ixed design, front connection (S-BH-A039 connecting set, OD-BHD-MS39 mounting set)



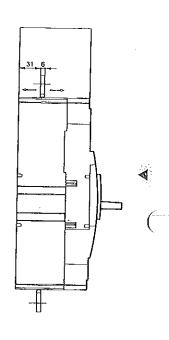


RETROFIT

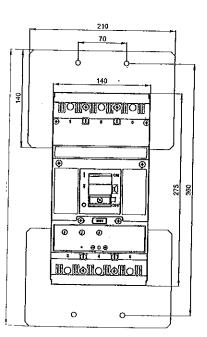
Fixed design, front connection (CS-BH-A037 connecting set)

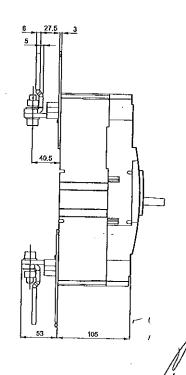


RETROFIT

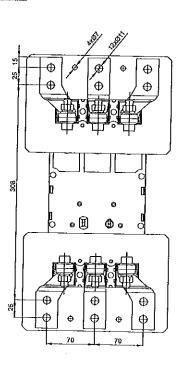


xed design, rear connection (CS-BH-Z039 connecting set, OD-BH-MZ39 mounting set)





RETROFIT

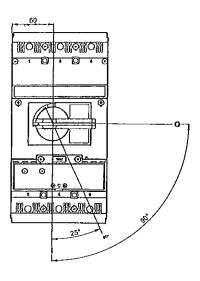


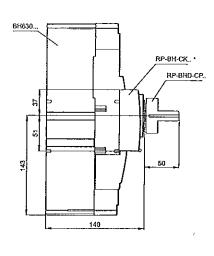


Dimensions

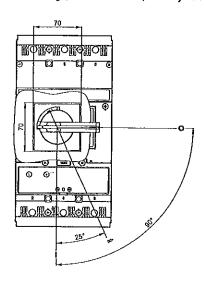
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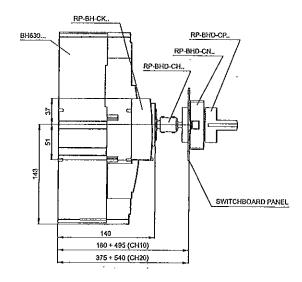
Fixed design, hand drive



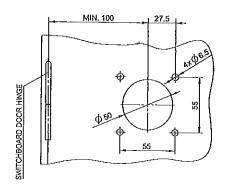


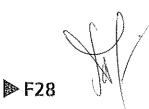
Fixed design, hand drive - front, with adjustable lever





Switchboard door modification





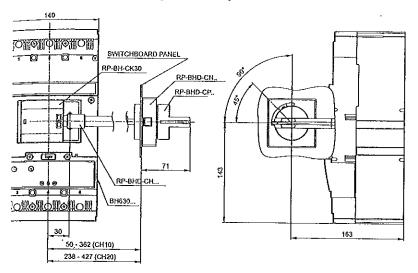


3P

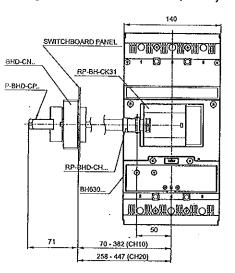
RCUIT BREAKERS, SWITCH-DISCONNECTORS

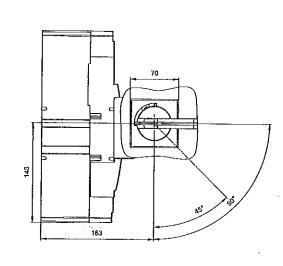
mensions

ed design, hand drive - control on right side, with adjustable lever



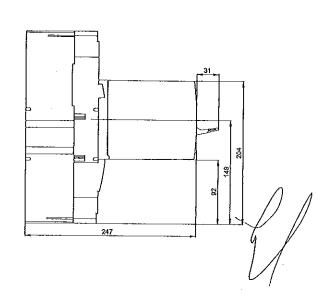
ed design, hand drive - control on left side, with adjustable lever



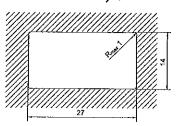


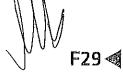
red design, MP-BH-X... motor drive





Opening dimensions in switchboard door for external counter of cycles

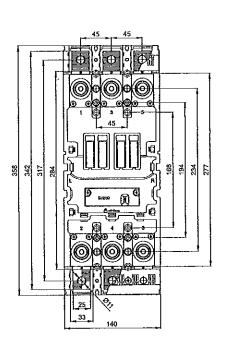


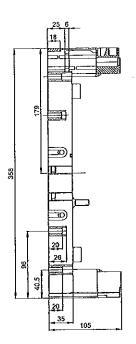


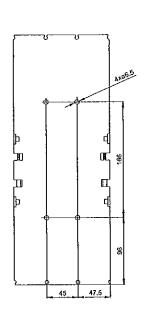
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Dimensions

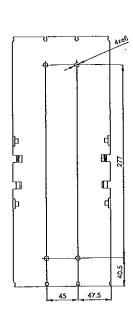
Plug-in device



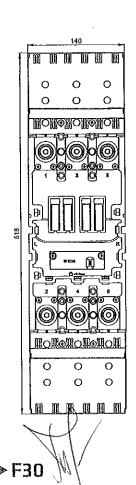


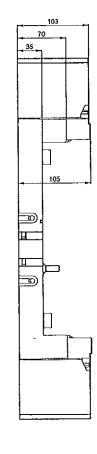


Drilling diagram



Plug-in device, OD-BH-KSO3 terminal cover

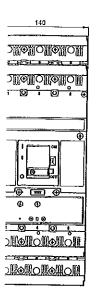


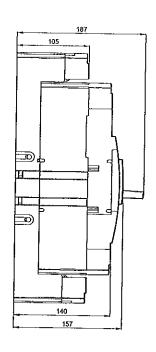




sions

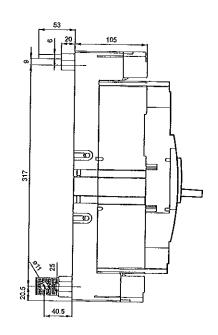
design



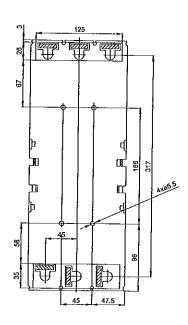


lesign, rear connection (CS-BH-A021 connecting set)







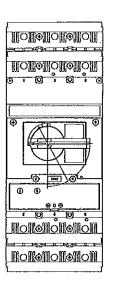


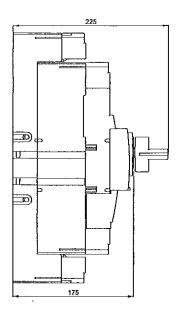




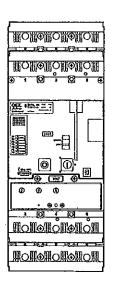
Dimensions

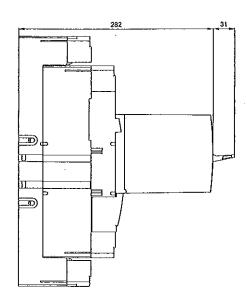
Plug-in design, hand drive





Plug-in design, motor drive







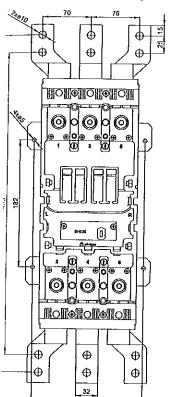


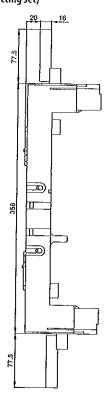
REALERS, SWITCH-DISCONNECTORS

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tensions

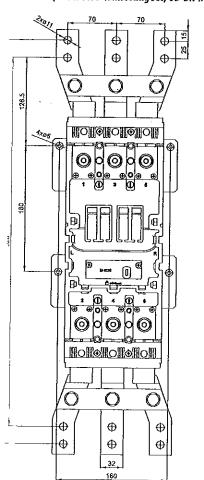
j-in device (CS-BH-JX75 connecting set, OD-BHD-MS75 connecting set)

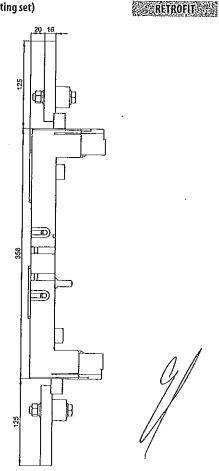




RETROFIT

-in device (CS-BH-JT75 connecting set, OD-BH-MT75 mounting set)





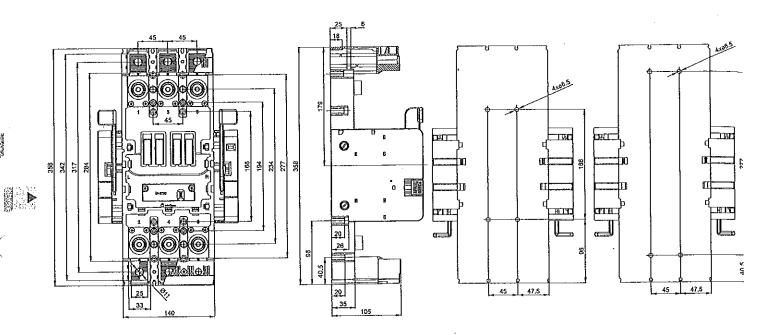


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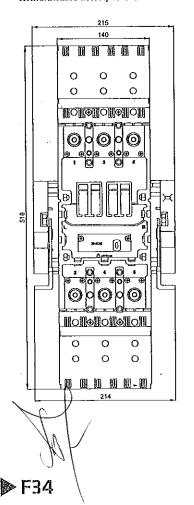
Dimensions

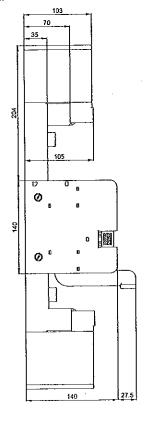
Withdrawable device

Drilling diagram



Withdrawable device, OD-BH-KS03 terminal cover



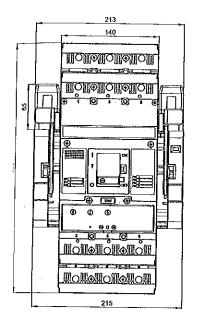




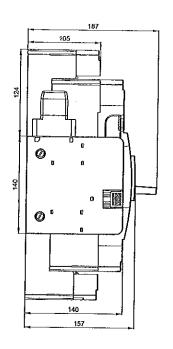


imensions

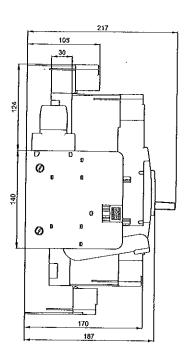
lithdrawable design



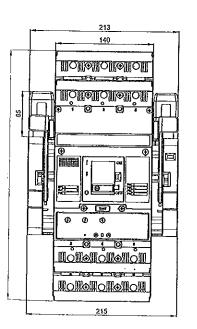
Working position



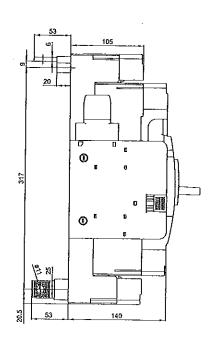
Inspection position



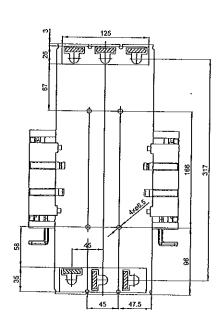
ithdrawable design, rear connection (CS-BH-A021 connecting set)



Working position



Inspection position

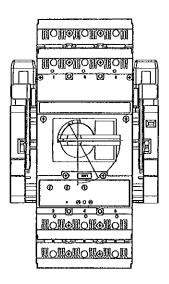




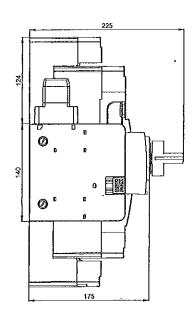


Dimensions

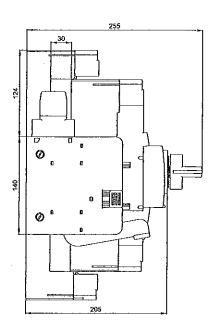
Withdrawable design, hand drive



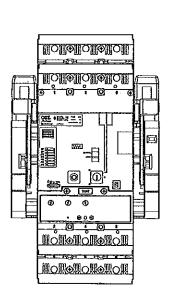
Working position



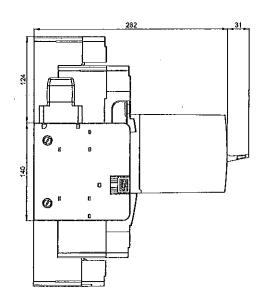
Inspection position



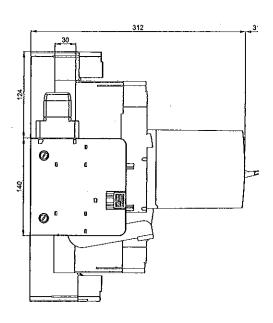
Withdrawable design, motor drive



Working position



Inspection position



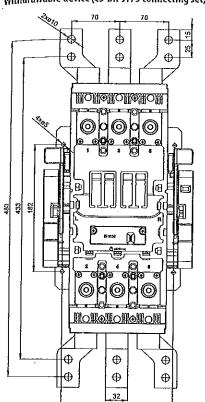


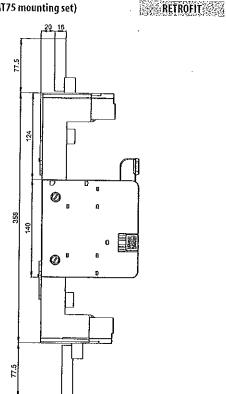


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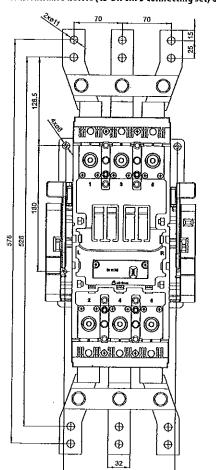
Dimensions

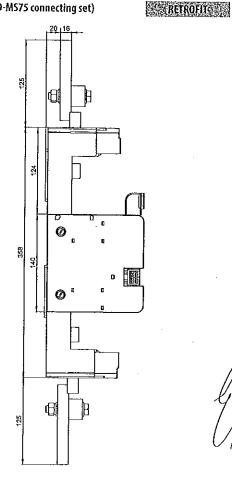
Withdrawable device (CS-BH-JT75 connecting set, OD-BH-MT75 mounting set)





Withdrawable device (CS-BH-JX75 connecting set, OD-BHD-MS75 connecting set)



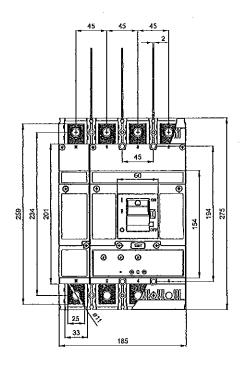


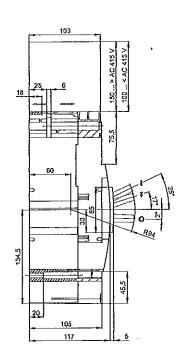


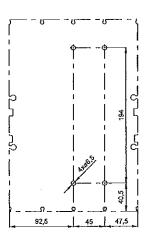
Dimensions

Fixed design, front connection

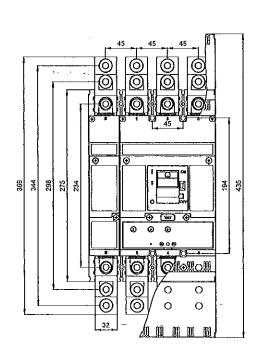


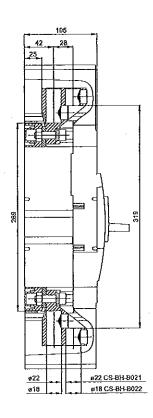


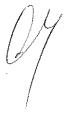




 $Fixed \ design, front \ connection \ (CS-BH-B021+CS-BH-B421, CS-BH-B022+CS-BH-B422 \ connecting \ sets)$





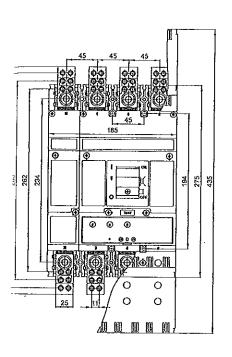


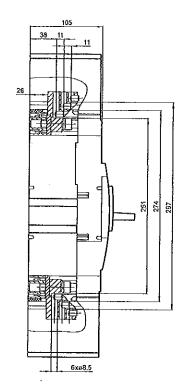
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4P

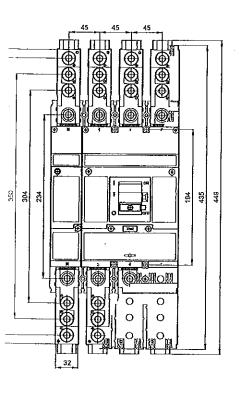
ısions

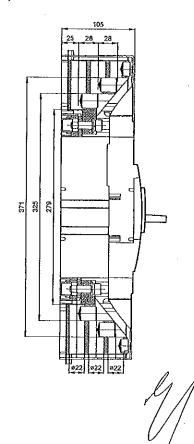
esign, front connection (CS-BH-B014 + CS-BH-B414 connecting sets)

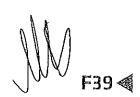




esign, front connection (CS-BH-B031 + CS-BH-B431 connecting sets)

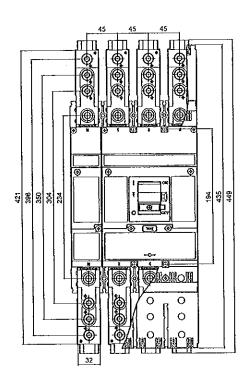


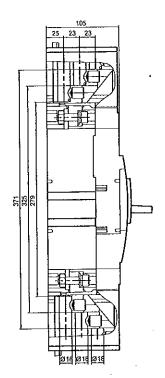




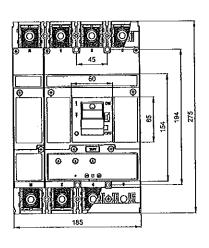
Dimensions

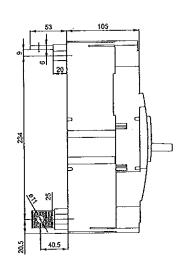
Fixed design, front connection (CS-BH-B032 + CS-BH-B432 connecting sets)



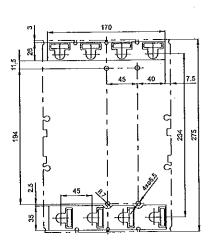


Fixed design, rear connection (CS-BH-A021 + CS-BH-A421 connecting sets)



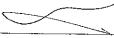


Drilling diagram



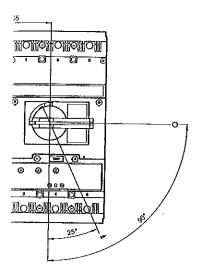


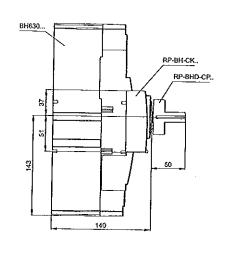




sions

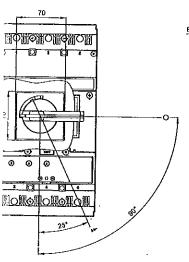
sign, hand drive

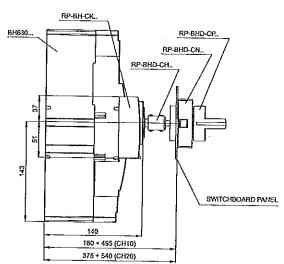




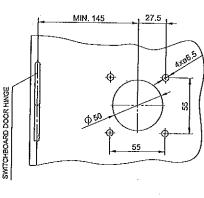
·

sign, hand drive - front, with adjustable lever

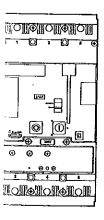


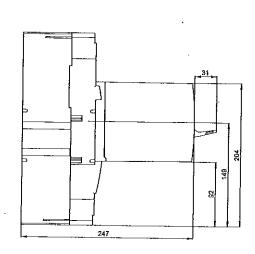


Switchboard door modification

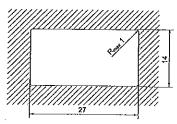


iign, motor drive





Opening dimensions in switchboard door for external counter of cycles



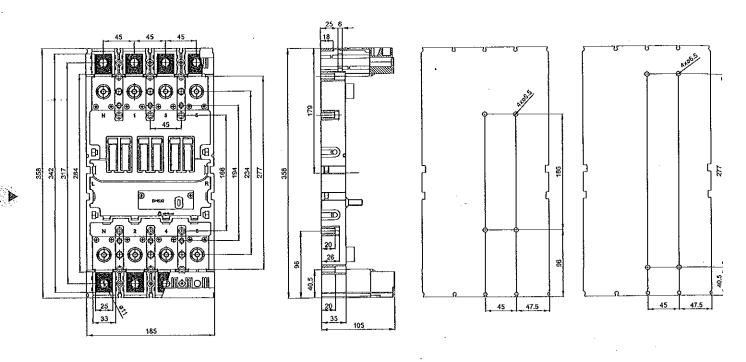
4//



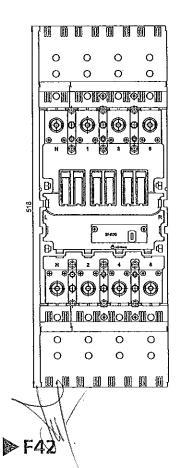
Dimensions

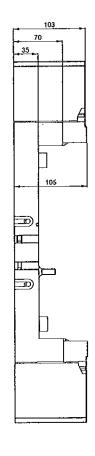
Plug-in device

Drilling diagram



Plug-in device, OD-BH-KS43 terminal cover

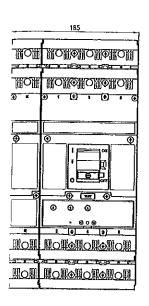


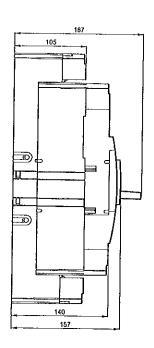




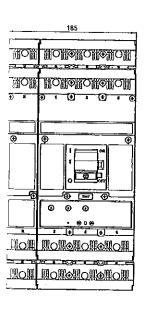
nensions

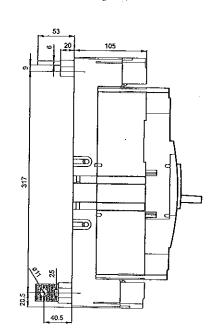
_J-in design



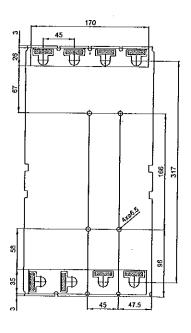


 \vdash in design, rear connection (CS-BH-A021 + CS-BH-A421 connecting sets)

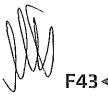




Drilling diagram



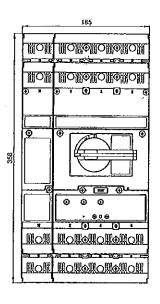


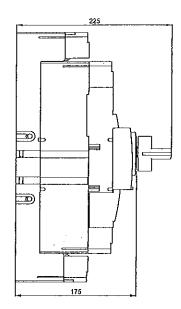


Dimensions

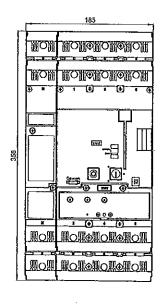
Þ

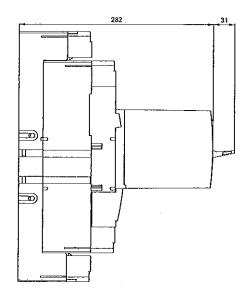
Plug-in design, hand drive





Plug-in design, motor drive









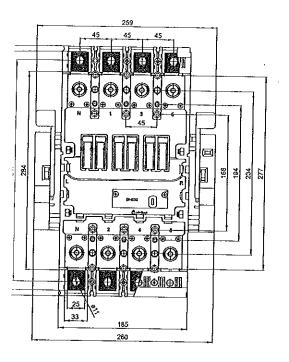
Drilling diagram

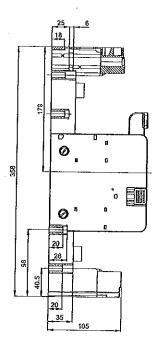
UIT BREAKERS, SWITCH-DISCONNECTORS

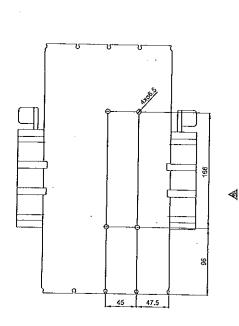
4P

isions

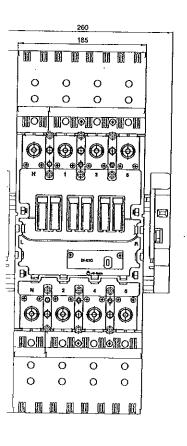
awable device

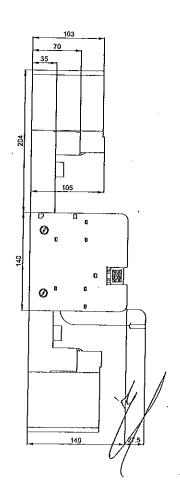






wable device, OD-BH-KS43 terminal cover



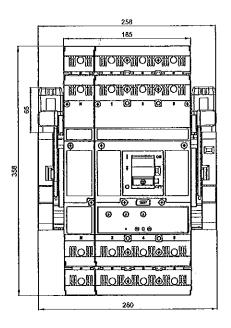




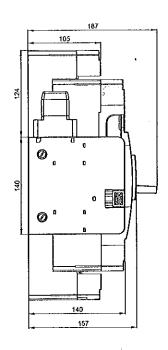
Dimensions

Þ

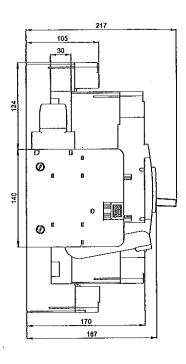
Withdrawable design



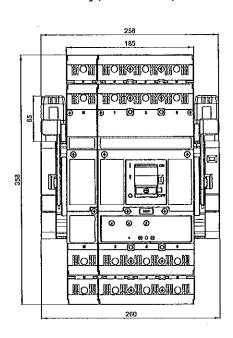
Working position

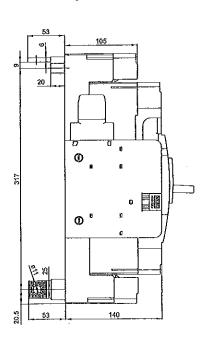


Inspection position

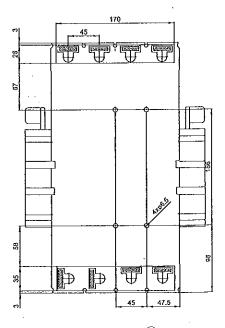


Withdrawable design, rear connection (CS-BH-A021 + CS-BH-A421 connecting sets)





Drilling diagram



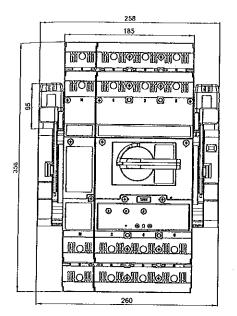


4P

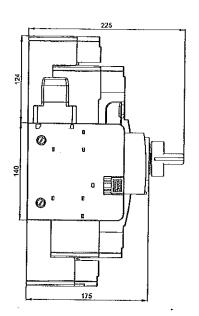
CIRCUIT BREAKERS, SWITCH-DISCONNECTORS

Dimensions

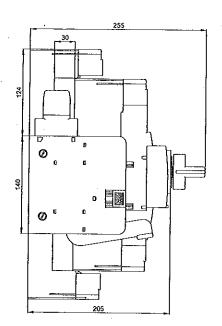
Nithdrawable design, hand drive



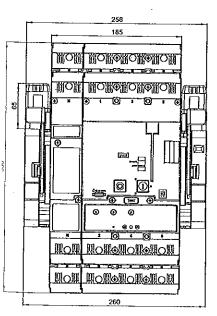
Working position



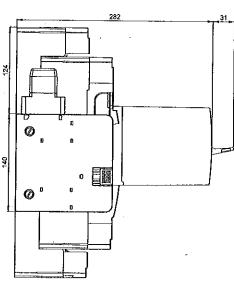
Inspection position



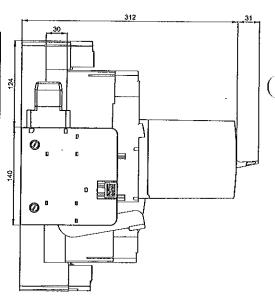
lithdrawable design, motor drive



Working position



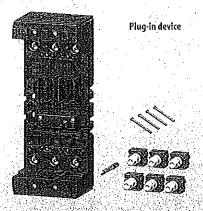
Inspection position

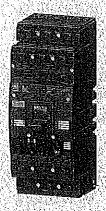






PLUG-IN DEVICE

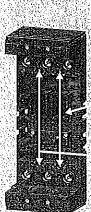




Circuit breaker in plug in design



Locking plug-in device against inserting drout breaker



Position of cavities for switch SO-BHD-0010 In plug-in device



11, 12, 13, 14



Keying set OD-BH-KK01

Description

BH630N, BH630S

Plug-in design of the circuit breaker/switch-disconnector is intended for demanding industrial applications where rapid exchange of the circuit breaker along with both visual and conductive disconnection of the circuit are needed.

- plug-in device includes complete accessories for assembling circuit breaker/switch-disconnector in plug-in design from the originally fixed design
- **域** components of the plug-in device are: .
 - base of the plug-in device
 - 2 connecting sets for fitting onto the switching unit
 - interlocking connecting rod (ensures automatic switching off of the circuit breaker for handling inserting and removal)
 - set of mounting bolts for affixing circuit breaker to plug-in device (set of mounting bolts is used to fasten the plug-in device into the switchboard, that is included in delivery of switching unit)

Circuit breaker positions

Circuit breaker in plug-in design has two positions:

- 1. inserted (working position)
- 2. removed

Power circuit

- connecting set CS-BH-A011 is used for connecting with busbars or cable lugs, that is included in delivery of switching unit
- for connecting in another way, it is necessary to use connecting sets, see page F8
- connection must comply with our recommendations, see page F18

Auxiliary circuits

These are connected using 15-wire connecting cable **OD-BHD-KAO1**.

States of switches SO-BHD-0010 in plug-in device according to circuit breaker position

| Gvily | 341/12 19/14(19/20) |
|-----------------------------|---------------------|
| Circuit breaker position | 19 20 04 |
| Inserted | 0.1 |
| Removed | 1 0 |
| note: 0 contact open 1- | contact closed |

note: 0 - contact open, 1 - contact closed
" - cavities 19 and 20 are only for 4-pole design

Signalling of position SO-BHD-0010

Plug-in device may be fitted with a maximum of fou switches (for 4-pole design, max. 6 switches) for signalling the inserted/removed position.

Keying set OD-BH-KK01

Plug-in device and circuit breaker can be fitted with keying set, which prevents inserting any other circuit breaker into the plug-in device.

Circuit breaker accessories in plug-in design Circuit breaker in plug-in design has the same accessories a the fixed circuit breaker.

Advantages and enhanced safety for operator:

- unambiguous remote signalling of the circuit breake position
- option to lock plug-in device with padlocks to preven inserting of circuit breaker
- visible and conductive disconnection of the power circuit
- $\boldsymbol{\mathsf{m}}$ easy exchange of circuit breakers in case of fallure
- IP20 degree of protection of all termination points
- plug-in device does not need earthing



Keying set OD-BH-KK01



Connecting cable OD-BHD-KA01

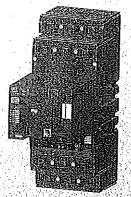


Signalling of position SO-BHD-0010

Specifications SO-BHD-0010

| Rated operating voltage | V. | 400 V a.c. |
|--------------------------|-------------------------|--|
| | • | 220 V d.c. |
| Rated insulation voltage | | 500 V a.c. |
| Rated frequency | f, | 50/60 Hz |
| Rated operating current | 1/0 AC-13 1/10 DC-15 | 3 A /400 V a.c. 3.5 A /24 V d.c.; 1 A /48 V d.c.; 0.3 A /110 V d.c.; 0.15 A /220 V d.c. |
| Thermal current | الم | 6A //// |
| Arrangement of contacts | | 901 // |
| Connection cross-section | S | 0.5 ÷ 1 mm ² // / |

For wiring diagram of circuit breaker in plug-in device with accessories see page F16.



Circuit breaker in plug-in design with motor drive

Recommended circuit breaker manipulation

During the manipulation with circuit breaker in plug-in design with motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

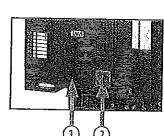
1) To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" below

2) To connect OD-BHD-R... control relay into the motor drive circuit according to wiring diagram, see page F71

Recommended process of manipulation

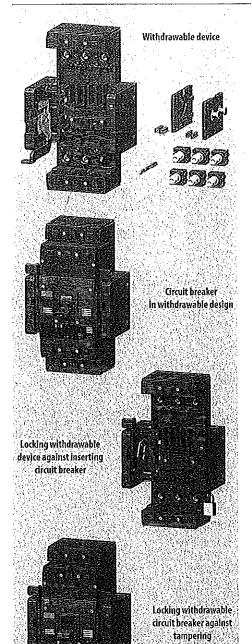
After every manipulation with circuit breaker in plug-in design is necessary to accomplish the operations in following sequence, after repeated insertion into the plug-in device:

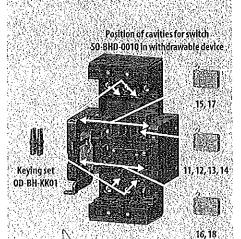
1) press the switch off button (red) on the motor drive, see fig. 2) press the switch on button (green) on the motor drive, see fig.



| inges in states of switches in cavities of | switchin | g unit when rei | movina circuit | breake | r | | | | | | | | | |
|--|--------------------------------|----------------------------|--|-------------|---|--------------|--------------|-------------|----------------|--------------|-------------|-------------|--------------------|------------------------|
| ite of cricuit breaker before removing | | | N. 18 18 18 18 18 18 18 18 18 18 18 18 18 | 200 | 70 X 30 X | | | | le say | | | | | |
| | 40.62 5 5 5 X | | 1 1 1 2 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | ray day | ild his | ited boothog | | | igo sym | uesalterie | noving | removed po | ng 3 |
| • | | | Cavity | la grett | 等的 | 7 (-) | 3,4,5,(6, | 7,8,9) | 经验额 | 1998 | | 2 | 3,4,5, | 6,7,8,9) ¹⁾ |
| | 5 | | PS-BHD-1000 | 916 | 8 | 100 | 8 | 5 | 8 | 5 | 8 | | 8 | 8 |
| | pisoc | ta ca | 皇 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 | <u>=</u> | 슬 | -14 -14 | 5 | 7 | 5 |
| | Circuit breaker lever position | State of the main contacts | <u>%</u> | 5. | 25. B-25. | P.S. | 쫎 | PS-8 | PS-8HD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 |
| | akeri | . E | 49 | 20 | 49 | 20 | 49 | 29 | 49 | 20 | 49 | 19 | 49 | 20 |
| | it bre | of th | /: | 7 | 1 | |) | | | (| | | | (|
| • | G | State | 30 | 16 | 30 | Ţ | `J | 10 | 1 3 | ¹Ç, | 30 | ľ, | ΄, | ή, |
| | | MANALON SAN | 773-3949-395. | Sel 1988 | ich Santa | dalah da | MANAGAN | KEMER! | 3040438 | energen va | | en area | n skazesáka a kir. | on were |
| itched on | | | | 0 | 0 | | 11. | 0 | | 0 | (2) | Ó | 10.35/35 10.00 | |
| itched off manually or by motor drive electrically | 2097/384 | ar to resymples. | 数数12数40000000000000000000000000000000000 | V (17) | (1975) [2] | HYE. | | | | | | | A WILLIAM | WATE. |
| aded state) | \bigcirc | 0 | 1 | 0 | . 0 | 1 | . 0 | 1 | 1 | 0 | 1 | 0 | . 0 | 1 |
| | 18 A 18 | 975.4628.539v | HTT STATES | 85586P | ************************************** | .C769473 | Madaman ar | Market | Talente (de co | NI SAMBER DU | Octobrance | Annageer | eta i entantiss | יא פורי. כי |
| itched off by overcurrent release | ₹. | 0 / 1 | · (/) / () | | | 0 | 0 | í. | 0 | 447 | | 0 | 0.4 | |
| ached off from switched on state: by auxiliary release, | | 40,690 Stell | MPS VIEL | 建的物质 | | J'MAS | | (1973) | | | | 為經 | 學的學 | |
| 1y TEST push button or by the switch off button on | \mathbb{F} | 0 . | 1 | 0 | 1 | 0 | . 0 | , | | ۸ | | | | |
| motor drive | ν | | • | • | , | U | | ′' // | Ī | 0 | I | 0 | 0 | 1 |
| : 0 - contact open, 1 - contact closed 3 vities 6, 7, 8, 9 are only for 4-pole design | | | | | | | | | | | | | <u> </u> | |
| | | | | | | | 4 | 1 | | | | _ | 11 IP . | |

WITHDRAWABLE DEVICE





Description

BH630N, BH630S

Withdrawable design of the circuit breaker/switch-disconnector is intended for demanding industrial applications where rapid exchange of the circuit breaker, frequent checking and both visual and conductive disconnection of the circuit are needed.

- m withdrawable device includes complete accessories for assembling circuit breaker/switch-disconnector in withdrawable design from the originally fixed design
- components of the withdrawable device are:
 - base of the withdrawable device
 - 2 movable side plates
 - 2 connecting sets for fitting onto the switching unit
 - -interlocking connecting rod (ensures automatic switching off of the circuit breaker for handling - inserting and withdrawing)
 - set of mounting bolts is used to fasten the withdrawable device into the switchboard, that is included in delivery of switching unit

Circuit breaker positions

Circuit breaker in withdrawable design has three positions:

- 1. inserted (working position)
- 2. withdrawn (inspection position)
- 3. removed

Keying set OD-BH-KK01

Withdrawable device and circuit breaker can be fitted with keying set, which prevents inserting any other circuit breaker into the withdrawable device.

States of switches SO-BHD-0010 in withdrawable device according to circuit breaker and arrestment positions ravity 4-45 12-45 15-16-18-

| |) | | j |
|--|-------|-------|--------|
| Circuit breaker and arrestment position | 20 04 | 20 04 | 20 04 |
| Inserted and not arrested 🦂 | 0.1 | 1 0 | 0 1 |
| Inserted and arrested | 0 1 | 1 0 | 1 0 |
| Withdrawn and not arrested | 1.0 | 0 1 | .,0,∵1 |
| Withdrawn and arrested | 1 0 | 0 1 | 1 0 |
| Removed and not arrested | 170 | 1 0 | 0 1 |
| Removed and arrested | 1 0 | 1 0 | 1 0 |

- operating state is always in arrested position
- in arrested position it is possible to lock the withdrawable device (for more information see, Advantages and enhanced safety for operator")
- 11 cavities 19 and 20 are only for 4-pole design

Signalling of position SO-BHD-0010

Withdrawable device can be fitted with the switches for signalling the position of the circuit breaker inserted/withdrawn/removed.

Power circuit

- connecting set CS-BH-A011 is used for connecting with busbars or cable lugs, that is included in delivery of switching unit
- for connecting in another way, it is necessary to use connecting sets, see page F8
- connection must comply with our recommendations, see page F18

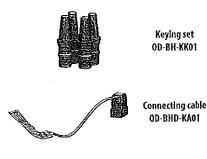
Auxiliary circuits

These are connected using 15-wire cable OD-BHD-KA01.

Circuit breaker accessories in withdrawable design Circuit breaker in withdrawable design has the same accessories as fixed circuit breaker.

Advantages and enhanced safety for operator:

- unambiguous remote and local signalling of the circuit breaker and arrestment positions
- checking of circuit breaker and accessories function in the inspection position
- locking withdrawable device against inserting circuit breaker, locking of circuit breaker in inserted (operating) position, locking of circuit breaker in withdrawn (checking) position locking by means of padlocks
- visible and conductive disconnection of the power circuit
- measy exchange of circuit breakers in case of failure
- IP20 degree of protection of all termination points
- 🗷 withdrawable device does not need earthing





Signalling of position SO-BHD-0010

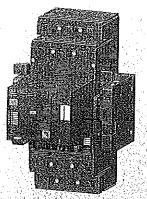
Specifications SO-BHD-0010

| Rated operating voltage | U <u>.</u> | 400 V a,c |
|--------------------------|---------------------------------------|---|
| , , | • | 220 V d.c. |
| Rated insulation voltage | | 500 V a.c. |
| Rated frequency | f | 50/60 Hz |
| Rated operating current | , , , , , , , , , , , , , , , , , , , | 3 A/400 V a.c |
| | | 3.5 A /24V d.c. 1 A/48V d.c. 0.3 A/110V d.c. 0.15 A/220V d.c. |
| Thermal current | l _{fs} | 6A //n / |
| Arrangement of contacts | | 001. / / / |
| Connection cross-section | r | 0.5 ÷ 1 mm/ /// |

For wiring diagram of circuit breaker in withdrawable device with accessories see page F16.

ITHDRAWABLE DEVICE

3P 4P



ircuit breaker in withdrawable design with motor drive

Recommended circuit breaker manipulation

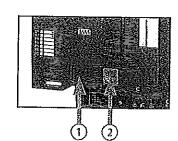
During the manipulation with circuit breaker in withdrawable design with motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

- 1) To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" below
- 2) To connect OD-BHD-R... control relay into the motor drive circuit according to wiring diagram, see page F71

Recommended process of manipulation

After every manipulation with circuit breaker in withdrawable design is necessary to accomplish the operations in following sequence, after repeated insertion into the plug-in device:

1) press the switch off button (red) on the motor drive, see fig. 2) press the switch on button (green) on the motor drive, see fig. $\,$

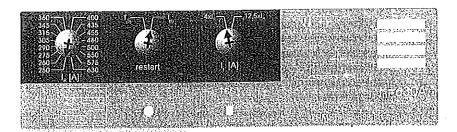


ages in states of switches in cavities of switching unit when inserting and withdrawing circuit breaker

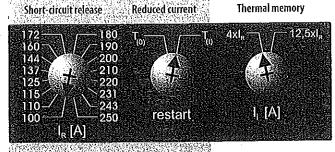
| ages in states of switches in Cavilles of S | | nit when in: lore insertionly | State of the Annual of | tndrawi | ng circul | t breake | er Salata | | | | | | | |
|---|--------------------------------|----------------------------------|------------------------|--------------|-------------------|-------------|---------------|-----------------------|--------------|-------------|---------------------------|-------------|-------------|-------------|
| e of circuit breaker before insertion | STOLEN SE | | tend Manhantonson | ritches befo | oie insertio | n - withdr | awn position | edistri Name | → Sta | | atteringe hes after in | | nserted pos | itlon |
| e of circuit breaker before withdrawal | | | State of sw | itches bef | ore withdra | wal-Inse | rted position | 1. 2.7502.3 <u>2.</u> | | | | | vithdrawn p | |
| | | | Cavity 🕮 🛴 | 13.438 | 學學學 | 2 | 3,4,5,(6, | 7,8,9)0 🤄 | 1000 | 1288年 | | 21 | OF PEOPLE | 6,7,8,9)1 |
| | lever position | in contacts | PS-8HD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 |
| | Circuit breaker lever position | State of the main contacts | 30 | 10 | 30 | 10 | 19 | 20 | 30 | 10 | 30 | 20 | 30 | 29 |
| ched on | | | 1 | 0 | 0 | 7 jay | | Ó | 1.1 | 0 | . (1.) | -0 -0 | 0 | (4) (4) |
| ched off manually or by motor drive electrically ded state) | \bigcirc | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 000 c 2 |
| ched off by overcurrent telease | ₹. | 0 | 0 | 3.1 3.1 | (1 %) 6 7 1 % | 0. | 0 | (1) 1 | 2 -0 2 -0 | 1 | 1 | ġ | 0 | |
| ched off from switched on state; by auxiliary release, /TEST push button or by the switch off button on notor drive | Ą | 0 | 1 | 0 | # ###### 1 | 0 | 0 | 1 | | 0 | 1 | 0 | 0 | 1 |
| 0 - contact open, 1 - contact closed | | | | | | | | 1 | 1 | | | | | |

rities 6, 7, 8, 9 are only for 4-pole design

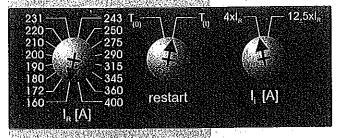
OVERCURRENT RELEASES - DTV3



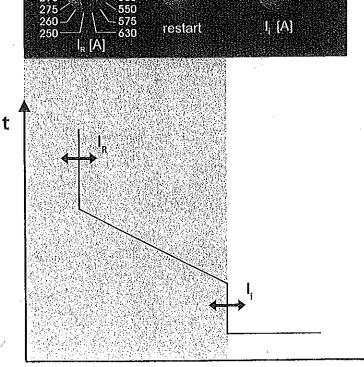
 $l_{n} = 250 A$ SE-BH-0250-DTV3



l = 400 A SE-BH-0400-DTV3



 $I_n = 630 A$ SE-BH-0630-DTV3



Properties

- suitable for protection of lines and distribution transformers
- protects against both overcurrent and short circuit
- \blacksquare reduced current setting $I_a = 0.4 \div 1I_a$
- **w** thermal memory can be switched on/off (ON = I_{tot} OFF = I_{tot})
- setting of short-circuit release I, in two steps, 4 I, or 12.5 I,
- setting of I_g and I_g by means of the rotary switches is stepwise
- m the overcurrent release indicates operating state and the value of the passing current by means of LED
- m the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

12,5xl_R

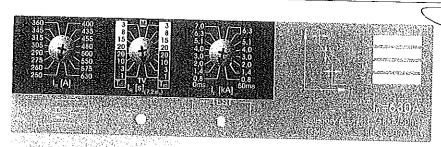
Switching unit BH630; . SE-BH-... Overcurrent release Overcurrent release setting ...A. Reduced current Thermal memory Į λ (.... x l₂) Short-circuit release current



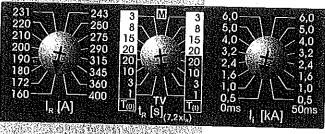
IMPORTANT

- n thermal memory must be switched on in protection of transformers and lines - thus the transformer or the line will be
 - protected against repeated overload

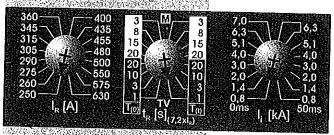




I_n = **400 A** BH-0400-MTV8



 $I_n = 630 \text{ A}$ 3H-0630-MTV8



Properties

- TV mode suitable for protection of lines, distribution transformers and generators
- protects against both overcurrent and short circuit
- reduced current setting $l_g = 0.4 \div 1 l_g$
- \blacksquare thermal memory can be switched on/off (ON = $T_{(q)}$ OFF = $T_{(g)}$)
- in TV mode the undercurrent release is inactive
- f g setting of delay of the thermal release $f t_g$ 1 s, 3 s, 10 s and 20 s
- setting of the value of short-circuit release I_i in 8 steps and possibility of switching the short-circuit release off with a delay of 50 ms
- f a setting of $f l_{k'}$ $f t_k$ and $f l_k$ by means of the rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

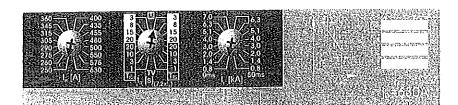
| and for the broject | |
|----------------------------------|------------------|
| Switching unit | BH630 |
| Overcurrent release | SE-BH |
| Overcurrent release setting | |
| Reduced current | I, OLANGERS |
| Mode | W |
| Thermal memory | T No. 10 Comment |
| Thermal release delay | t,s |
| Short-circuit release current | i, standarda |
| Setting of short-circuit release | ms |
| | |



IMPORTANT

the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure

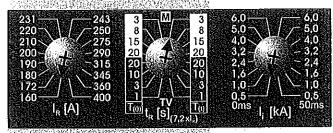
> ₩ F5:



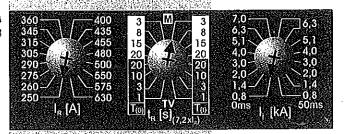
Short-circuit release Motor starting Reduced current $I_a \approx 250 \text{ A}$ SE-BH-0250-MTV8

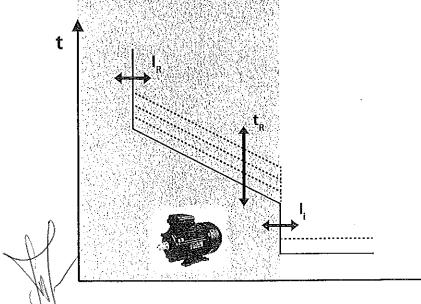
BH630N, BH630S

 $I_n = 400 \text{ A}$ SE-BH-0400-MTV8



 $I_n = 630 \text{ A}$ SE-BH-0630-MTV8





Properties

- M mode suitable for protection of motors
- protects against both overcurrent and short circuit
- **a** reduced current setting $l_a = 0.4 \div 1 l_a$
- **a** thermal memory can be switched on/off $(ON = T_{nr})$ OFF $= T_{nr})$
- in M mode the undercurrent release is active
- setting of delay of the thermal release t, 3 s, 8 s, 15 s and 20 s according to the motor starting class
- setting of the value of short-circuit release I, in 8 steps and possibility of switching the short-circuit release off with a delay of 50 ms
- setting of I_c, t_c and I_c by means of the rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

| Switching unit | BH630 |
|----------------------------------|----------------------------|
| Overcurrent release | SE-BH- |
| Overcurrent release setting | |
| Reduced current | l, Wassers |
| Mode | |
| Thermal memory | I THE STATE OF |
| Thermal release delay | t, (5.13.2) |
| Short-circuit release current | I ANAMAS SAN |
| Setting of short-circuit release | 1. 1. ms |



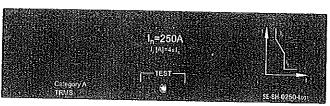
IMPORTANT

- m M mode must be selected in protection of motors - the motor will be protected in phase failure
- m thermal release delay to must correspond to the motor starting class.
- in protection of motors it is suitable to set the delay of the short-circuit release at 50 ms

VERCURRENT RELEASES - LOOT

3P 4P

 $L = 250 \, \text{A}$ E-BH-0250-L001

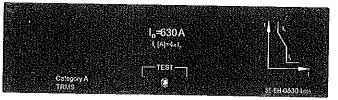


 $I_2 = 315 A$ E-BH-0315-L001

 $I_{.} = 400 \, A$ E-BH-0400-L001

 $I_{x} = 500 \, A$:-8H-0500-L001

l = 630 A-BH-0630-L001



Short-circuit release

Properties

- $\ensuremath{\mathbf{u}}$ suitable for protection of lines with low impulse currents
- protects against both overcurrent and short circuit
- reduced current cannot be set
- thermal release cannot be switched off
- short-circuit release is fixed at 41

Data for the project

Switching unit Overcurrent release Overcurrent release values

Rated current

Short-circuit release current

BH630 ...

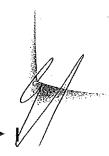
SE-BH-...

.... A (4x1)

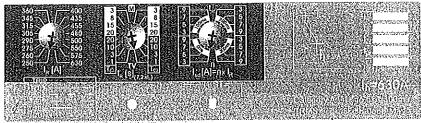
Rated current

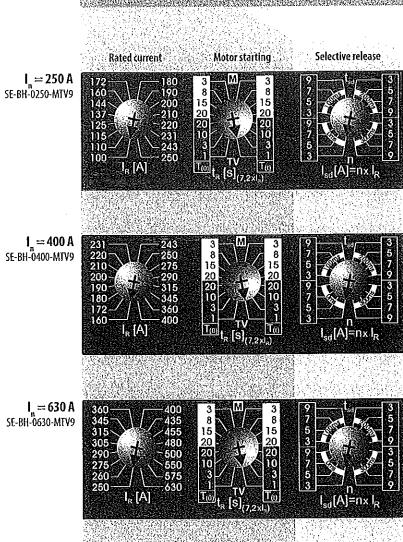
IMPORTANT

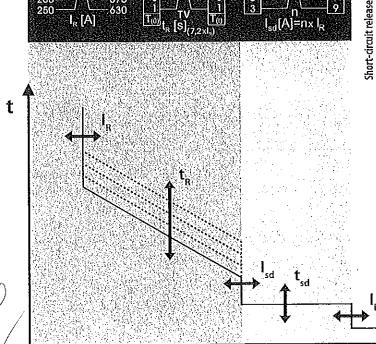
■ high impulse current must not be in the circuit - undesirable breaking would take place, because the current of the short-circuit release is fixed at 41



OVERCURRENT RELEASES - MTV9, TV mode







Properties

- TV mode suitable for protection of lines, distribution transformers and generators — enables setting of time selectivity
- protects against both overcurrent and short circuit
- \blacksquare reduced current setting $I_g = 0.4 \div 1I_g$
- **u** thermal memory can be switched on/off (ON = T_{co} , OFF = T_{co}
- in TV mode the undercurrent release is inactive
- $\,\blacksquare\,$ setting of delay of the thermal release t_g 1 s, 3 s, 10 s and 20
- setting of the value of selective release l_{st} in 4 steps (independent time-delayed release)
- setting of delay of the selective release t_{st} 0 ms, 100 ms, 200 ms or 300 ms
- f m setting of $f l_{sc}$ $f t_{sc}$ $f l_{sc}$ and $f t_{sc}$ by means of rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- st the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

| Switching unit | ВН630 |
|-----------------------------|-------------------------|
| Overcurrent release | SE-BH |
| Overcurrent release setting | • |
| Reduced current | I _R (A)A)是是有 |
| Mode | TV. |
| Thermal memory | T WARREN |
| Thermal release delay | t _e s |
| Selective release value | $I_{st} \dots A(xI_s)$ |
| Selective release delay | t, ms |
| | |



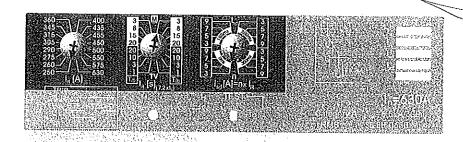
IMPORTANT

■ the set value of current of the short-circuit release must correspond to the impedance loop – conditions must be fulfilled for automatic disconnection from power supply in case of failure





Rated current

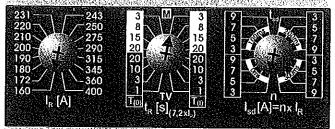


 $I_n = 250 \text{ A}$ SE-BH-0250-MTV9

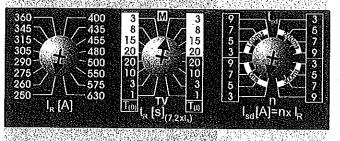
Selective release

Motor starting

 $l_n = 400 \text{ A}$ SE-BH-0400-MTV9



 $I_n = 630 \text{ A}$ SE-BH-0630-MTV9



Short-circuit release

Properties

- M mode suitable for protection of motors enables setting of time selectivity
- protects against both overcurrent and short circuit
- \blacksquare reduced current setting $l_0 = 0.4 \div 1 l_1$
- **III** thermal memory can be switched on/off (ON = T_{nx} , OFF = T_{nx})
- in M mode the undercurrent release is active
- $\, f s \,$ setting of delay of the thermal release $\, t_g \, 3 \, s$, $\, 8 \, s$, $\, 15 \, s \,$ and 20 s according to the motor starting class
- setting of the value of selective release 1, in 4 steps (independent time-delayed release)
- f a setting of delay of the selective release t_{st} 0 ms, 100 ms, 200 ms or 300 ms
- setting of L, t, l, and t, by means of rotary switches is stepwise
- # the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

| BH630 |
|--|
| SE-BH |
| |
| l, 74A 3 |
| M. M |
| T GARAGE |
| t Wasser |
| L N. A(. XI) |
| t _{st} (v., ims |
| |



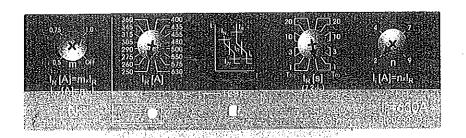
IMPORTANT

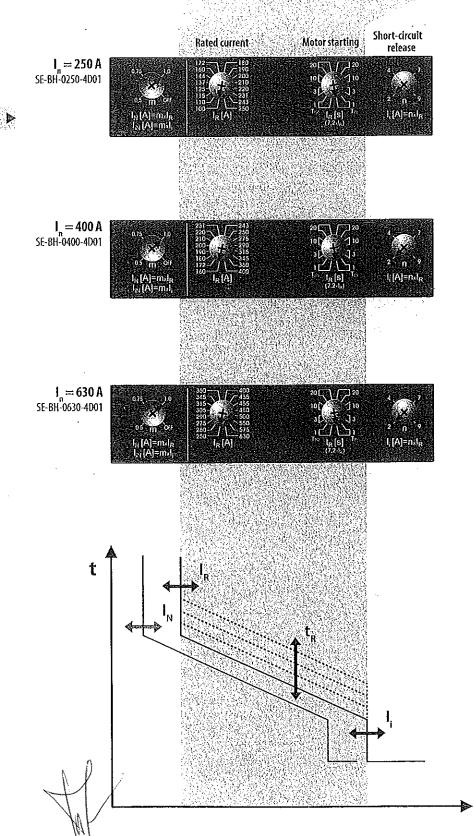
- M mode must be selected in protection of motors - the motor will be protected in phase failure
- $\boldsymbol{\bowtie}$ thermal release delay $\boldsymbol{t_g}$ must correspond to the motor starting class





OVERCURRENT RELEASES - 4D01





Properties

- it is appropriate for protection of lines and distribution transformers with protected "N" conductor in TN-C-S and TN-S networks
- protects against both overcurrent and short circuit
- reduced current setting $l_g = 0.4 \div 1 l_n$
- thermal memory can be switched on/off (ON = T_{tot} , OFF = T_{tot}
- setting of delay of the thermal release t₈ 1 s, 3 s, 10 s and 20
- setting of the value of the short-circuit release I_1 in 4 steps $(2 \div 9) I_g$
- setting of the value of reduced current l_w and short-circuit current l_w in the 4th pole
- \mathbf{z} setting of \mathbf{I}_{x} , \mathbf{I}_{x} , \mathbf{I}_{y} and \mathbf{I}_{y} by means of rotary switches is stepwise
- the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set b the manufacturer to minimum

Data for the project

| Switching unit | ВН630 |
|--|---------------------------|
| Overcurrent release | ŚĘ-BH |
| Overcurrent release setting | |
| Reduced current | I MAN |
| Thermal memory | T A. S. S. |
| Thermal release delay | t _R |
| Level of reduced current in the 4th pole | I _N |
| Level of reduced current in the 4th pole | ا _{اه} ۸ (۱ x۱٫) |
| | |



IMPORTANT

■ the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure





Simple



Double



Make-and-break



Double make and break



Early



Cavitles in BH630... switching unit

Specifications

| Rated operating voltage | U <u>.</u> | 60 ÷ 500 V a.c. | 9 (5 PS BHD (00 Au) 5 ÷ 60 V a.c. |
|--------------------------|---------------------------|--|--|
| | ل _و َ | 60 ÷ 500 V d.c. | S ÷ 60 V d.c. |
| Rated insulation voltage | $\mathbf{U}_{\mathbf{i}}$ | 500 V | 500 V |
| Rated frequency | f _a | 50/60 Hz | 50/60 Hz |
| Rated operating current | I /U AC-1S I /U DC-13 | 6 A/240 V, 4 A/400 V, 2 A/500 V 0.4 A/240 V, 0.3 A/400 V, 0.2 A/500 V | AC-12, DC-12 0.004 ÷ 0.5 A/5 V, 0.004 ÷ 0.01/60 V |
| Thermal current | l _{ts} | 10 A | 0.5 A |
| Arrangement of contacts | | 01, 10, 02, 11, 20 | 01, 10, 02, 11, 20 |
| Connection cross-section | 5 | 0.5 ÷ 1 mm² | 0.5 ÷ 1 mm² |

| Туре | | SP-BHD-0002 | PS:BHD:0010/0020 | PS BHD 0010 Au/0020 Au |
|---------------------------------|----------------|--|--|--|
| Rated operating voltage | Ū, | 250 V a.c. | 60 ÷ 250 V a.c. | 5 ÷ 60 V a.c. |
| Harting Martineses of the | U | a diff su distribuir e distribuir anno a company | 60 ÷ 250 V d.c. | 5 ÷ 60 V d.c. |
| Rated insulation voltage | U ₁ | 250 V | 250 V | 250 V |
| Rated frequency | f | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Rated operating current | i, /V, | 1A/250V a.c. | AC-15 1.5 A/250V a.c. DC-13 0.2 A/250V d.c. | AC-12,DC-12 0.001÷0.5A/5V, 0.004÷0.01/60V |
| Thermal current | l, | _ | 6 A | 0.5 A |
| Arrangement of contacts | | 02, 11, 20 | 001/002 | 001/002 |
| connection cross-section | 2 | 0.5 ÷ 1 mm² | 0.5 ÷ 1 mm² | 0,5 ÷ 1 mm² |
| Degree of protection of termina | k (connecte | dswitch) IP20 | IP20 | IP20 |

^{13 -} PS-BHO-...- Au is not suitable to control electromagnetic loads

Type designation, number and type of contacts according to contact arrangement

| 002 | PS-BHD-0020(-Au) | 2 | make-and-break |
|-----|-------------------|-----------------|----------------|
| 001 | PS-BHD-0010 (-Au) | | make-and-break |
| 11 | PS-BHD-1100 (-Au) | 1+1 | break+make |
| 02 | PS-BHD-0200 (-Au) | | break |
| 01 | PS-BHD-0100 (-Au) | 1 | hreak |
| 20 | PS-BHD-2000 (-Au) | 7 N. 3: 2: N. 1 | make |
| 01 | PS-BHD-1000 (-Au) | 1 | make |

Function and names of switches according to their location in cavities

| Position of switch | Switch nar | ne X a a Switchtunding y |
|---|------------------|--|
| Cavity I | Signal | signals tripping of circuit breaker by overcurrent release |
| Cavity 2 | Relative | signals tripping of circuit breaker/switch-disconnector by releases. TEST pirch button or |
| Cavity 3, 4, 5 (6, 7, 8, 9) ²⁾ | Auxiliary | by switch off button on the motor drive signals position of circuit breaker/switch-disconnector's main contacts |
| Cavity 10 | Early 💎 | makes/breaks in advance before making the main contact of druit breaker/switch-disconnector |
| 2) conflict 7 0 0 acres | white a document | The second secon |

a - cavities 6, 7, 8, 9 are only for 4-pole design

es of switches in the circuit breaker cavities

| | | | | | | | (67 14 (67) | 165 80] | 10 | 22and | Jan Jan | 3 2 2 and | 6 (S. 281). | 1 | 3457 |
|---|----------------------|-------------------------|-------------|-------------|-------------|-------------|----------------|-------------------|-----------------------------|-------------|--|------------------|-------------|-----------------|-------------|
| cuit breaker | er lever position | main contacts | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-BHD-0100 | PS-BHD-1000 | PS-8HD-0100 | SP-BHD-0002 SP-BHD-X0001 | PS-8H0-2000 | PS-BHD-1100 | PS-BHD-0200 | PS-BHD-0010 | PS-8HD-0010 | PS-BHD-0010 |
| | Grcuit breaker lever | State of the main conta | | | | ļ | Ì | ļ | |] [| | | | | |
| ched on | | 1 | | 0 | 0 | | | 0 | 1 0 | 1 1 | 0 1 | 0 0 | 1: 0 | ù 1 | 1 0 |
| ched off manually or by motor drive rically (loaded state) | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 1 | ೧೯೯೪೧ № 2561 0 1 | n n | depopulation. • • • | 1 - 1 - 1 - 1 | | | |
| thed off by overcurrent release | V. | 0 | 0 | (1) (1) | formus | 0 | 0.01030841 | 1. | 0 (1 | 6.8787457.5 | ر ا 1 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 | | 0 1 | 0 1 1 0 | 0 1 |
| thed off from switched on state; by auxilian | y | FFINTI L | turner til | 10 F 2 E | \$444 C | 1444 | \$103x114x | 3143+1 <u>0</u> 4 | WASTA A GRANDS | entile (| | | | | enners : |
| se, or by TEST push button or by the switch no on the motor drive | off 🏠 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 1 | 0 0 | 1 0 | 1 /A / | 1 0 | 1 00 | \ |
| J - contact open, T - contact closed | 1) – cavities | 6, 7, 8, 9 | re only | for 4-p | ole destg | 7 | | | · · · · · · | | | -///- | | {} { | 1 |

SHUNT TRIPS





Cavities in BH630,.. switching unit



| Rated operating voltage | U, | 24, 40, 48, 110, 230, 400, 500 V a.c. 24, 40, 48, 110, 220 V d.c. |
|------------------------------|--|--|
| Rated frequency | er er f | 50/60 Hz |
| Input power at 1.1 U | AC DC | <3 VA <3 W |
| Characteristic | | $U \ge 0.7 \text{U}_{\text{e}}$ the circuit breaker must trip |
| Time to switching off | <u>.</u> | 20 ms |
| Connection cross-section | S Element element element (1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 | 0.5 ÷ 1 mm² - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 |
| Degree of protection of term | ninals (connected release) | 1P20 |
| Position in cavity No. | | 10 |

Type designation according to rated operating voltage

| 230, 400, 500 V a.c. /220 V d.c. | SV-BHO-X230 |
|----------------------------------|-------------|
| 110Va.c/d.c. | SV-BHO-X110 |
| 24, 40, 48 V a.c./d.c. | SV-BHD-X024 |
| U | (Jype) |

The specific rated operating voltage of the release is set up by jumpers directly on the release. It is always set to the maximum value by default (see fig. 1).



Fig. 1 - The rated operating voltage setting

States and positions of circuit breaker/

/switch-disconnector lever

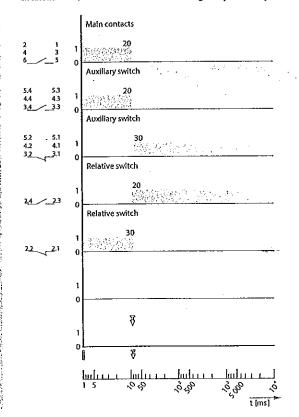
- Switched off by releases, TEST or by switch off button on the motor drive

Switched off manually or by

motor drive electrically (loaded

Switched on

Circuit breaker/switch-disconnector switching off by shunt trip



► F60

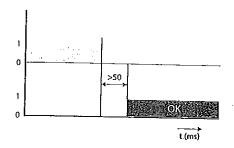
JUNT TRIPS

3P 4P

ecifications

action time of the auxiliary releases

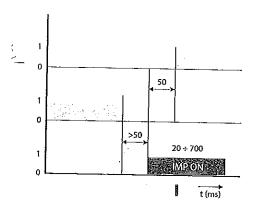
ınt trip



peration of motor drive and shunt trip

necessary to keep time delay when the control of the circuit breaker is by motor drive and shunt trip or undervoltage release. The following delays have to be kept between the disconnection of voltage from the t trip or bringing the voltage to the undervoltage release and the control ilse for switch on of the motor drive:

nt trip



es and positions of circuit breaker/switch-disconnector level

| and bostdons of circuit pleave | aramitti-aistoillettot lekel |
|--|---|
| outure size en estados | an a Aldyer position of maint a Main |
| (er/switch-disconnectors as | be akenswith disconnector |
| | |
| fied on | |
| A series and a series and a | IJ |
| hed off by releases, TEST or by switch off | 的数据是1982年1988年1982年1982年1 |
| n on the motor drive | |
| | 4.4.15.2.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4. |
| hed off manually or by motor drive | |
| ically (loaded state) | \bigcirc |
| | |

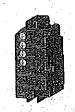
Description of graphs

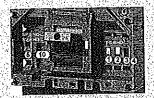
| INTERNATION CONTRACTOR | A Legipton |
|------------------------|---|
| HK | Main contacts |
| OK | Circuit breaker is ready for further handling |
| IMP ON | Make impulse for the motor drive |
| SV | Control voltage on the shunt trip |
| SP | Control voltage on the undervoltage release |



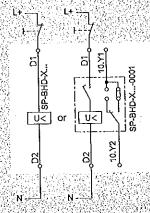


UNDERVOLTAGE RELEASES





Cavities in BH630... switching unit



Specifications

| | SP-BHD-X. | SP-BHD-X0001* |
|-------------------------|--|--|
| U _e | 24, 40, 48, 110, 230, 400, 500 V a.c. 24, 40, 48, 110, 220 V d.c. | 24, 40, 48, 110, 230, 400, 500 24, 40, 48, 110, 220 V d.c |
| f | 50/60 Hz | 50/60 Hz |
| VC VC | < 3 VA < 3 W | < 3 VA < 3 W |
| ix. | $U \ge 0.85 U$ — it is possible to $U \le 0.35 U$ — the cir | o switch on the circuit breaker cuit breaker must trip |
| - | 20 ms | 20 ms |
| 40.000 | | ∞ |
| S | 0.5 ÷ 1 mm² | 0.5 ± 1 mm ² |
| nicale leannacted roles | Contraction of the services of the State State State of the State of t | IP20 |
| umais fromterica seica. | Paragraphic region of the control of the second of the control of | 10 |
| | | |
| (1) | | 250 V a.c. |
| u. San Barangan | RELEASED TO THE MENT OF THE STATE OF | 50/60 Hz |
| | | 1 A/250 V a.c. |
| I, /U, | entra alaman kersera erik deliminasi oleh Kirol Merik disebilik Tangan berasaran | 10,01 |
| | | 10.01 C |
| | | 医异丙基基氏管性纤维性 化二氯甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基 |
| S | | 0,5 ÷ 1 mm² (P20 |
| | f AC AC DC S ninals (connected releated releat | $\begin{array}{cccc} & & 24,40,48,110,230,400,500 V a.c. \\ & & & 24,40,48,110,220 V d.c. \\ & & & & 50/60 \ Hz \\ & & & & & & \\ AC & & & & & & \\ BC & & & & & & \\ & & & & & & & \\ & & & & $ |

^{11 -} tripping of the undervoltage release can be delayed using the delay unit BZ-BX-X230-A, for more detailed information see pag

Number and type of contacts according to contact arrangement

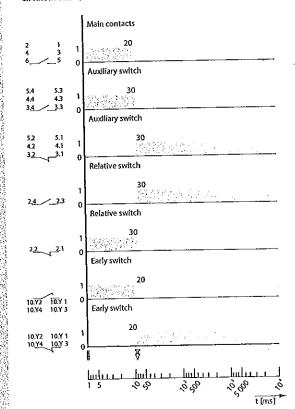
| Arrangement o | frontacts Nimberofo | optacts'; s Contact types; |
|---------------|---------------------|----------------------------|
| 01 | 1 | break |
| 10 | 运送 为 经验 | make |

Type designation according to rate operating voltage

| United the state of the | lype |
|------------------------------|-------|
| 24, 40, 48 V a.c. | SP-BH |
| 110Va.c/d.c | SP-BH |
| 230, 400, 500 a.c/220 V d.c. | SP-BH |

The specific rated operating voltage c lease is set up by Jumpers directly on th It is always set to the maximum value I (see fig. 1).

Circuit breaker/switch-disconnector switching off by shunt trip



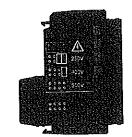


Fig. 1 - The rated operating voltage st

States and positions of circuit bro switch-disconnector lever



Switched off by releases, TEST or by switch off button on the motor drive.

Switched off manually or by

Switched off manually or by motor drive electrically (loaded state)



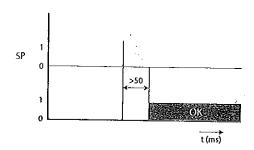
^{*-} cannot be used in combination with motor drive MP-BH-X....

UNDERVOLTAGE RELEASES

3P 4P

Specifications

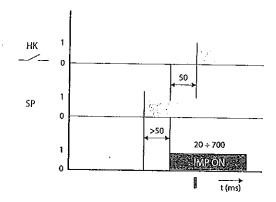
Reaction time of the auxiliary releases Undervoltage release



Cooperation of motor drive and undervoltage release

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and shunt trip or undervoltage release. The following time delays have to be kept between the disconnection of voltage from the shunt trip or bringing the voltage to the undervoltage release and the control impulse for switch on of the motor drive:

Undervoltage release



States and positions of circuit breaker/switch-disconnector lever

| Personal Provider of Circuit Dictarcity 31 | arcal arrealistic fol level |
|--|--|
| States of manners of the second second | |
| | TELEFICIAL DISTRIBUTION OF THE PROPERTY OF THE |
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| | _ |
| Switched on | |
| ······································ | IJ |
| BENERAL SERVENCES AND | NAMES OF THE PROPERTY OF THE PARTY OF THE PA |
| Switched off by releases, TEST or by switch off | |
| button on the motor drive | 3.544 30 45 45 45 45 45 45 45 45 45 45 45 45 45 |
| button on the motor drive | 等和的基础。这种的特别的 |
| | |
| Switched off manually or by motor drive | |
| electrically (loaded state) | |

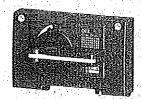
Description of graphs

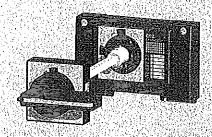
| Symbol | Complines and the second second |
|--------|---|
| HK | Main contacts |
| OK 🔻 👈 | Circuit breaker is ready for further handling |
| IMP ON | Make impulse for the motor drive |
| SV . | Control voltage on the shunt trip |
| SP | Control voltage on the undervoltage release |





HAND DRIVES





Description

The hand drive permits controlling the circuit breaker/ /switch-disconnector by turning the lever, e.g. to switch machines on and off. Modular conception of the drives enables simple mounting on the switching unit (also additionally) after the cover of cavities is removed. The fixed drive can be sealed. The drive and its accessories are ordered separately according to your choice, see page F12.

■ The hand drive makes possible to control the circuit breaker:

a) from the front panel (fig. 1)

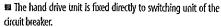
Hand drive unit RP-BH-CK.

+ Hand drive lever RP-BHD-CP..

b) through the switchboard door (fig. 2)

Hand drive unit RP-BH-CK...

- + Extension shaft RP-BHD-CH.,
- + Hand drive bearing PR-BHD-CN...
- + Hand drive lever + RP-BHD-CP..



- The hand drive bearing is fixed to the switchboard door and it provides degree of protection IP40 or IP66.
- Hand drive lever is fixed on the hand drive unit or on the hand
- The extension shaft is supplied in two options, standard (length 365 mm - can be shortened) and telescopic (adjustable length $245 \div 410$ mm).

Enhanced safety for operator:

- The hand drive unit and hand drive lever are also supplied with the possibility to lock the circuit breaker in position "switched off manually". The unit and lever of the hand drive can be locked using three padlocks with shank diameter
- Each hand drive bearing prevents the door from opening when the circuit breaker is switched on or in a state of being switched off by releases and in the circuit breaker state "switched off manually" and hand drive lever is locked up.
- Two circuit breakers with hand drives can be fitted also with reciprocal mechanical interlocking or mechanical parallel switching, see page F65.

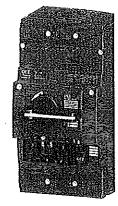


Fig. 1 - DIMENSIONS see page (

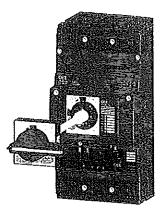
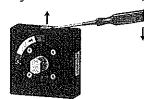


Fig. 2 - DIMENSIONS see page F

By a screwdriver it is possible to unlock the mechanism bloing the switchboard door opening with the circuit breal switched on (for bearing RP-BHD-CN40 and RP-BHD-CN41)



Specifications

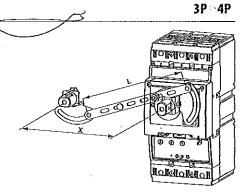
| | | | | lokin | of the switches | rodovravelungin the or | Littive keratate E. c. | | |
|--------------------------------------|--|------------------------------------|----------------------------------|--|---|---------------------------------------|--|--------------------------------------|-----------------------------|
| Type | Description: | and the second second | | in Degree of | CONTRACTOR OF THE PARTY OF THE | syliched of glanda | ly and locked a Switch | | |
| RP-BH-CK10 | Hand drive unit | blue | igalerisin Oli Adal no | es protections as | | | s see lieq | corbiceakerswitchedo | |
| RP-BH-CK20 | Secretary and services and accompanies of the second | blue | No Yes | vana inica | NARRES AND A | | | - Amanaire (1994) | |
| RP-BH-CK21 | South English States and Frances | yellow | pes | - PATACLATANNA, | | 574 6 3 783 C 777 5 1 | | ran wateran da Poto. - | A WOMARINE TO |
| RP-BH-CK30 | Hand drive unit - right sid | يحالوا مريضات فالمراكز أكالراب الإ | | | | | | | |
| RP-BH-CK31 | and the second of the second o | divinity of the state of the state | 9994.0.5% • 14 0 A45 4 19 6 * | i populate in in established in esta | - - | - esta estandos do esta está tidad | Calendar Sept. 1888 (1986) (17) | # ERC# 80100891 544 585551 1949 | 1964 4 WM M - VI - |
| RP-BHD-CP1 | lO Hand drive lever | black | по | | MARKATAN MARKATAN | | | | |
| RP-BHD-CP2 | Contract to the second second | black | yes | - | - | • | | -11 | - |
| RP-BHD-CP2 | 1 Hand drive lever | red | , yes, | | | | | | |
| RP-BHD-CN4 | totale and the same of the same of the same | black | = Eddetituetaken e | IP40 | yes | yes | . Suit a contract in contract management | / y es/ | |
| and the second section of the second | 11 Hand drive bearing | yellow | | 1P40 | y e s . | ්)ජ | | / yes | 漢語字色 |
| All the second sections in the | 60 Hand drive bearing | black ₹-275215553% | Sulangan | IP66 Es sambolia escapacións | yes Society (Society | yes. Samtos cours mada | Seltit vergiödessän si Maas | no Fototististos | enderski produce i se se se |
| 1 100/2 | To Hand drive bearing | yellow | | IP66 | yes | yes | | nd | |
| RP-BHD-CH1 | 10 Extension shaft 10 Extension shaft - telescop | | - 1013-02-036 | Kares kepāres | | SPATAVANOSARIO | PLECKER AND AND A | Sing pengangangan sing s | 365 (can be shortened |
| A Jour XII | of Alexiconomandit - referrol | NE SERVICE | 和新维度的企 | 45000000000000000000000000000000000000 | 着"结别"。现在 | | PROPERTY OF | grants separation of | 245÷410 |

AECHANICAL INTERLOCKING AND PARALLEL SWITCHING

RP-BHD-CB10 Mechanical interlocking

Provides mechanical interlocking of two circuit breakers/ /switch-disconnectors so that they cannot both be tripped simultaneously, but only one of them at a time. Both circuit breakers may be switched off simultaneously. Interlocking can be used between two BH630 circuit breakers or between BH630 and BD250 circuit breakers. Both circuit breakers must be equipped with a hand drive (at least one with a hand drive unit and hand drive lever), see page F63.

In order to use the interlocking, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table.

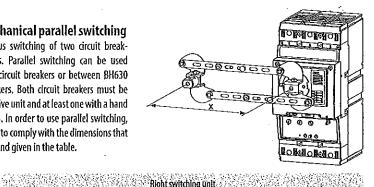


Right switching unit

| 불 8D250.3 105 112 140 145.5 122.5 128.5 181 등 8D250.4 105 112 146 145.5 122.5 128.5 181 | Section Control |
|--|-----------------|
| 量 - 高校等等級の日本の内では、大学は大学目標を指摘ないのはあるのは、1990代表では、20代の子学目を記載される。 | 185,5 |
| E BH630.3 122.5 128.5 157.5 162.5 140 145.5 185 E BH630.4 122.5 128.5 157.5 162.5 140 145.5 185. | 189 |



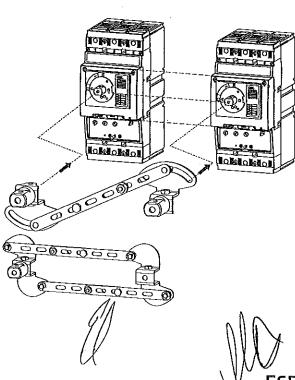
Enables for simultaneous switching of two circuit breakers/switch-disconnectors. Parallel switching can be used between two BH6301) circuit breakers or between BH630 and BD250 circuit breakers. Both circuit breakers must be equipped with a hand drive unit and at least one with a hand drive lever, see page F63. In order to use parallel switching, it is absolutely necessary to comply with the dimensions that are shown in the figure and given in the table.



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| 쳗 | BD250,.3., | 105+7 | 164.5-7 | 122.5+7 | 164.5 ⁻⁷ | 122.5+7 | 164.5 ⁻⁷ | v | v |
| = | DDZ.70, | 100 | 107.5 | | | 122.3 | LATE OF THE PARTY | | |
| Ę | DUDGO A | 10C+7 | 164 67 | 1111 547 // | 164.57 | ~122.5 ⁺⁷ | . 164.5 ⁻⁷ № | | |
| 逗 | 3DDZ3045 | . 103 | 164.5 | 3144.3 | 23.3047 See | 1,7,7,7 | . 104.5 | PARKA (1985) | A |
| Æ | BH6303 | 122.5+7 | 164.5 ⁻⁷ | 140+7 | 164.5 ⁻⁷ | 140+7 | 164.5 ⁻⁷ | l . | v I |
| ₹ | D11030"" | 122.5 | 104.3 | 140 | 104'3. | 140 | 10473 | | |
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| 괵 | BH030,4,132,51 | 122.5* | 104.5 | 2 140°2 | 104.5 | 140+7 | 104.5 | 基式 X 医内部 | , X |

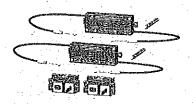
1) - Switching unit BH630..4.. (4-pole design) can only be on the left side







MECHANICAL INTERLOCKING



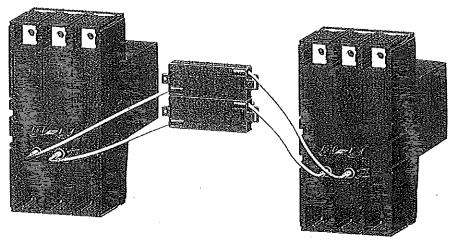
Mechanical interlocking MB-BH-PV04 MB-BHD-PV03

■ Provides mechanical interlocking of two circuit breakers/ /switch-disconnectors so that they cannot both be tripped simultaneously, but only one of them at a time. Both circuit breakers may be switched off simultaneously.

Mechanical interlocking MB-BH-PV04 is intended for two BH630 circuit breakers. Interlocking MB-BHD-PV03 is intended for one BH630 circuit breaker and one BD250.

■ Circuit breakers may be in fixed, plug-in and withdrawable designs.

| Type of circuit breakers | BH630 BH630 | 80250 8H630 |
|---------------------------------|----------------|----------------|
| Type of mechanical interlocking | | MB-BHD-PV03 |



Circuit breaker placement in switchboard

Detailed information can be found in the instructions for use, which you may download from our website www.oez.com.

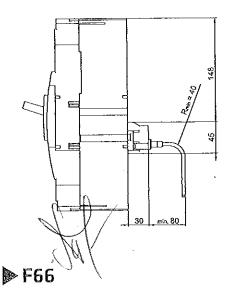
Recommended circuit breaker manipulation

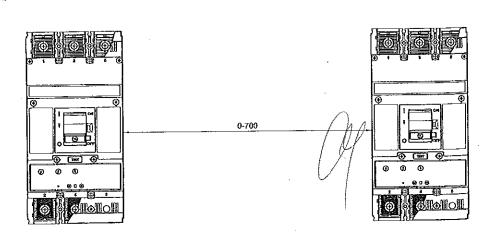
During the manipulation with circuit breaker with mechanical interlocking and motor drive, the circuit breaker may reach the state, in which the first attempt at switching on by motor drive is unsuccessful. Switching on is executed after repeated make impulse. To avoid this effect, some of the following steps may be done:

- 1) To keep the process of manipulation with the circuit breaker, see "Recommended circuit breaker manipulation" below
- 2) To connect OD-BHD-R... control relay into the motor drive circuit according to wiring diagram, see page F72

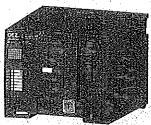
Recommended process of manipulation

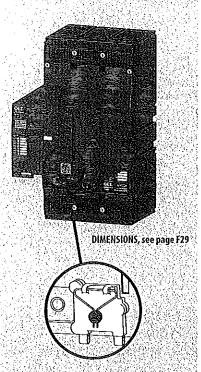
- Shunt trip/undervoltage release must be used to switch off the circuit breaker. Circuit breaker switching off cannot be made by motor drive
- 2) Circuit breaker can be stored and switched on only if the second circuit breaker is in switch-off mode. Circuit breaker status indicator on motor drive is in "O" position. Between storing and switching on the circuit breaker, it is necessary to keep the time interval min. 100 ms. Switch "S" must be disconnected.
- In case of infringement of these principles, the first switching on of circuit breaker is unsuccessful.















Connecting cable OD-BHD-KA02



Description

- If it is used for remote control of the circuit breaker (switch OFF/ON).
- Simple mounting on the circuit breaker after the circuit breaker cover of cavities is removed.
- Usage in industrial applications e.g. switching of stand by units etc. or wherever the automatic operation of electric devices is needed
- In order to speed up the circuit breaker's switch off (e.g. safety STOP button) the undervoltage release or shunt trip can be used.
- On the motor drive front panel there is a change-over switch to select the drive modes AUTO/MANUAL:
 - AUTO mode remote control. The circuit breaker is controlled by buttons for remote switch off/on, furthermore in this position mechanical control can be used on the front panel of the motor drive
 - MANUAL mode manual control. Control voltage is not needed. The circuit breaker can be switched on using the green switch on button and switched off using the red switch off button on the front part of the drive cover. Electric switch on is blocked. Electric switch off is functional. The accumulation of energy can be done by means of hinged lever.
- Possibility to indicate remotely the state of the AUTO/MANUAL switch.
- Switch 5 (external switch has to be bought separately) enables the choice of automatic accumulation of energy (circuit breaker loading).
 - automatic accumulation of energy is on (S switch switched on): after tripping of the circuit breaker by the overcurrent release, by auxiliary release, or by TEST push button or by the switch off button on the motor drive motor drive immediately accumulates energy (circuit breaker loading), motor drive is then ready to switch on the circuit breaker

- automatic accumulation of energy is switched off (5 switch open): after tripping of the circuit breaker by the overcurrent release, by auxiliary release, or by TEST push button or by the switch off button on the motor drive both motor drive and circuit breaker stay in position,, switched off by releases". In this position motor drive waits for the impulse from switch S. When the impulse is brought in the motor drive accumulates energy (turn on the circuit breaker) and after this loading the motor drive is ready to switch on the circuit breaker. It is not possible to switch on the circuit breaker when motor drive is not loaded
- Front panel state indicating device of the stored energy signals the state of motor drive storage devices. The state can be signalled from a distance.
- The drive may be furnished with an electromechanical counter of cycles:
 - internal design on the motor drive cover
 - external design OD-BHD-PPO1 for mounting on the switchboard's door or inside the switchboard by means of metal holder, that is part of the delivery
- Motor drive can be sealed by means of bolt sealing insert (OD-BH-YPO1).
- Drive can be locked in off position by up to three padlocks (shank diameter max. 4.3 mm).
- Switch on button can be covered and sealed (OD-BHD-KTO1).
- Drive is connected by multi-pole connector with cavities (in order to connect cables special tongs have to be used).
- Drive can be furnished with cable (OD-BHD-KAO2) that has on one side connector to the motor drive and on the other side free terminals for connection to etc. 'switchboard's terminal block.

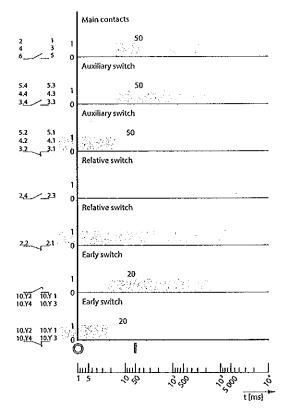
Specifications

| Specifications Type 18 18 18 18 18 18 18 18 18 18 18 18 18 | | ANRIBH XII ZMP BH XII P A |
|---|---|---|
| Operating voltage | U, | 24, 48, 110, 230 ¥ a.c. |
| Rated frequency | | 24, 48, 110, 220 V d.c. 50/60 Hz |
| Control impulse length for storage | SALVERN STREET STREET STREET | 6.08 ms $\div \infty$ 13 |
| Control Impulse length for switching on for switching off | | 20 → 700 ms ⁴ 400 ms → ∞ ¹ |
| Time to switching on | Stratura (1996) i de biologia (1996) este describación de la companya (1996). Este de la companya (1996) este d Companya (1996) este de la companya (1996) este de la companya (1996) este de la companya (1996) este de la co | < 60 ms |
| Time to switching off | | 900 ms |
| Frequency of cycles ON/OFF | | 3 cycles/mln |
| Frequency of cycles - Instant successive (| ON/OFF | 10 cycles |
| Mechanical endurance | | 20 000 cycles |
| Input power | AC DC | 100 VA 100 W |
| Protection | 24, 48, 110 V a.c; 230 V a. | • |
| s Zooth Majorin Ayas a thairin a C. Marine old majorin its na channe to | 24, 48, 110 V d.c; 220 V d. | and a subject to the first that the contract of |
| Rated operating current of the change-over switch AUTO/MANUAL | I _Z U _Z | 5 Å/250 V a.c. 0.5 Å/250 V d.c. |
| Type | | OD BHO KAO2 |
| Number of conductors | 1 | 12 |
| Conductor cross-section | 5 // /- | 0.35 mm² |
| Conductor lengths | | 0.6 m |
| ¹¹ - for sequence of control impulses, see | . page F70 | |

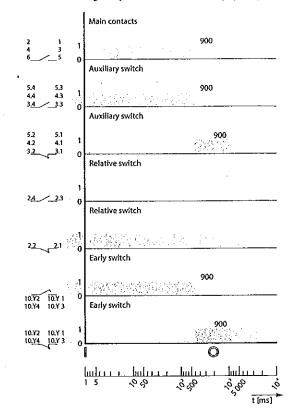
MOTOR DRIVES

Specifications

Circuit breaker switching on by motor drive - electrically by ON push button

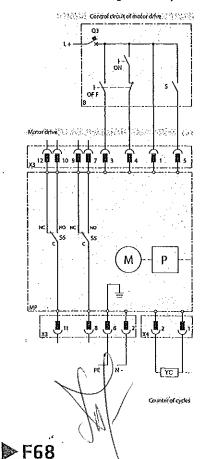


Circuit breaker switching off by motor drive - electrically by OFF push buttor



Diagram

Circuit breaker switching on and off by motor drive - electrically by ON and OFF push button



States and positions of circuit breaker/switch-disconnector lever

| States and positions of circuit preaker/switch | -uisconnector rever |
|---|--------------------------------------|
| Statisof digit breakers with discourse of | tini breaker/switch disconnection as |
| Switched on | |
| Switched off by releases, TEST or by switch off button on the motor drive | ₹ |
| Switched off manually or by motor drive electrically (loaded state) | |

Wiring diagram description

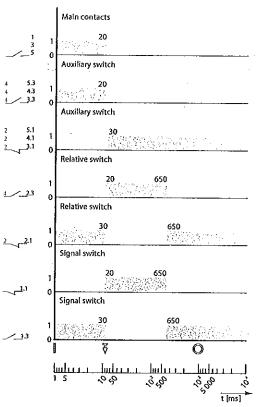
| Wiring diag | gram description |
|---------------|--|
| Symbol 2 | as Descripting a season of the |
| MP | motor drive MP-BH-X |
| M | mótor |
| P | storage device |
| X3 (1) | connector for connection of control circuits |
| X4 | connector for external counter of cycles |
| S5 | switch to Indicate AUTO (NO-C)/MANUAL modes (NC-C) |
| 56 | switch to indicate full storage (ready to switch on; NO-C) |
| YC | external counter of cycles OD-BHD-PP01 / //:/ |
| В | recommended wiring of the control circuits (not included in motor drive order) |
| ON | switch off button |
| OFF | switch off button |
| \$ | switch for energy storage (switched on = automatic storage, may be continuously switched on). |
| Q3 | motor drive circuit breaker - see page F66 |

3P 4P

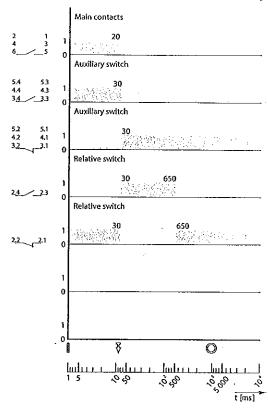
10TOR DRIVES

pecifications

vitching off of the circuit breaker with motor drive by overcurrent release switch in switched on state-automatic storage)

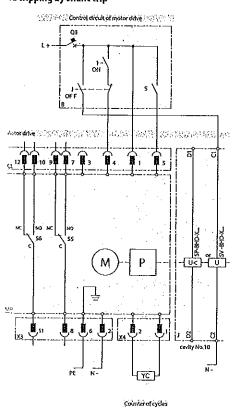


Switching off of the circuit breaker with motor drive by shunt trip or undervoltage release (switch S in switched on state-automatic storage)

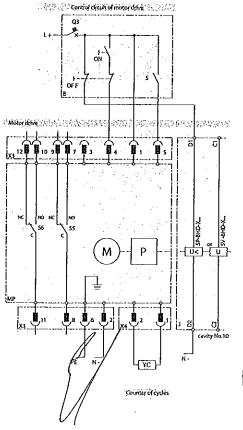


iagram

rcuit breaker switching on by motor drive (electrically by ON push button) ad tripping by shunt trip



Circuit breaker switching on by motor drive (electrically by ON push button) a tripping by undervoltage release





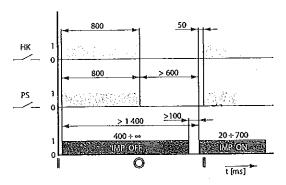
MOTOR DRIVE

Specifications

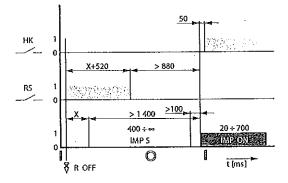
Recommended control impulses

Circuit breaker switching on and off by motor drive

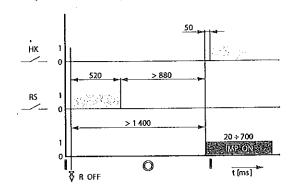
- S switch permanently switched on (automatic storage) or open



Circuit breaker switching off by overcurrent or auxiliary release and switching on by motor drive - S switch switched on only for storing up



Circuit breaker switching off by overcurrent or auxiliary release and switching on by motor drive - S switch permanently switched on (automatic storage)



Description of graphs

| HK | main contacts |
|---------|--|
| PS | auxillary switch |
| RS | relative switch |
| ROFF | circuit breaker closing instant by release of circuit breaker |
| IMP S | impulse to store up motor drive energy (generated by S switch) make impulse for the motor drive |
| IMP OFF | break impulse for the motor drive |
| XXX | random segment of time |

States and positions of circuit breaker/switch-disconnector lever

| Vates of areal breaker/switch disconnection | Large Cave position & State of Society (Constitution of Society) |
|---|--|
| Switched on | |
| Switched off by releases, TEST or by switch off button on the motor drive | ₩. |
| Switched off manually or by motor drive electrically (loaded state) | 0 |



OTOR DRIVES

3P 4P

ıgram

ommended wiring diagram of connecting the circuit breaker trol circuits in withdrawable/plug-in design with motor drive

anecting with control relays

erating voltage U, 24 V a.c./d.c., 48 V a.c./d.c., 110 ÷ 230 V a.c., 110 V d.c.

tching off by motor drive

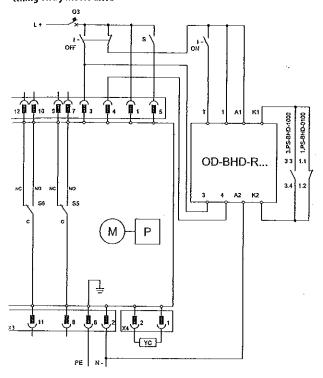
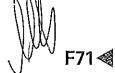


Diagram description

| MP | motor drive - U, of drive must be the same as U, of control relay |
|---------------|--|
| M. | motor - |
| P | storage device |
| ХЗ. | connector for connection of control circuits |
| X4 | connector for external counter of cycles |
| \$5 | switch to indicate AUTO (NO-C) / MANUAL modes |
| YC | external counter of cycles OD-BHD-PP01 |
| | (not included in motor drive order) |
| OFF | switch off button |
| 5 | switch for energy storage |
| Q3 | motor drive circuit breaker for 24 V a.c. LPN-4C-1 |
| 表表為。這 | for 48 V a.c. LPN-4C-1 |
| | for 110 V a.c. LPN-4C-1 |
| Electrical | for 230 V a.c. LPN-2C-1 |
| 的基础的 | for 24 V d.c. LPN-DC-4C-1 |
| | for 48 V d.c. LPN-DC-4C-1 |
| 经运动设计 | for 110.V d.c. LPN-DC-4C-1 |
| OD-BHD-R | control relay for 24 V a.c./d.c. OD-BHD-RX01 |
| | for 48 V a.c./d.c. OD-BHD-RXO2 |
| | for 110 ÷ 230 V a.c. OD-BHD-RA03 |
| | for 110 V d.c. OD-BHD-RD04 |
| 3.PS-BHD-1000 | auxiliary switch |
| 1.PS-BHD-0100 | · 医环境性 (1964年) 1966年 1966年 1966年 1966年 1964年 |

-impulse on T terminal reacts to trailing edge





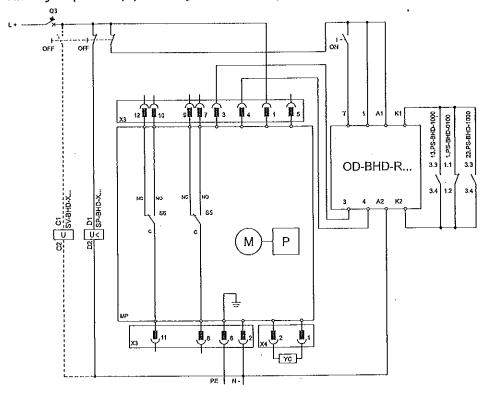
MOTOR DRIVES

Diagram

Recommended wiring diagram of connecting the circuit breakers control circuits with mechanical interlocking and motor drive (applicable for any circuit breaker)

- connecting with control relays
- operating voltage U $_{\rm e}$ 24V a.c./d.c., 48 V a.c./d.c., 110 \div 230 V a.c., 110 V d.c.

Switching off is possible only by undervoltage release or shunt trip



| Dlagram d | lescription | |
|-----------|-------------|--|

| Diagram descript | [0]] |
|--------------------|--|
| Symbol 💝 😓 | Description (1988) The Reservoir Control of the Con |
| MP | motor drive – U of drive must be the same as U of control relay |
| Markey | motor |
| P | storage device |
| X3 | connector for connection of control circuits |
| X4 | connector for external counter of cycles |
| SS: 10 (V) | switch to indicate AUTO (NO-C) / MANUAL modes |
| YC | external counter of cycles OD-BHD-PPO1 |
| · 56 | switch to indicate full storage (ready to switch on: NO-C) |
| 0FF | switch off button |
| Q3 | motor drive circuit breaker for 24 V a.c. LPN-4C-1 |
| | for 48 V a.c. LPN-4C-1 |
| | for 110 V a.c. LPN-4C-1 |
| | for 230 V a.C LPN-2C 1 |
| | for 24 V d.c.(PN-DC-4C-1 |
| | for 48 V d.c. LPN-DC-4C-1 |
| 等的的数据 | for 110 V d.c. LPN-DC-4C-1 |
| OD-BHD-R | control relay for 24 V a.c./d.c. OD-BHD-RX01 |
| | for 48 V a.c./d.c. OD-BHD-RXOZ |
| | for 110 ÷ 230 V a.c. OD-BHD-RAO3 |
| - 30,537,058,166.a | for 110 V d.c, OD-BHD-RD04 |
| 1,PS-BHD-0100 | signal switch |
| 13.PS-BHD-1000 | switch inserted in cavity 3 (first circuit breaker) |
| | - auxiliary switch |
| 23.PS-BHD-1000 | switch Inserted in cavity 3 (second circuit breaker) |
| | - auxiliary switch |
| SP-BHD-X | undervoltage release - U _e of release must be the same as U _e of control relay |
| SV-BHD-X | shoot trip - U, of release must be the same as U, of control relay |
| -impolse on ter | minal reacts to trailing edge |



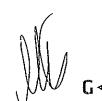




MOULDED CASE CIRCUIT BREAKERS BL1000S



4/



COMMERCIAL INFORMATION

| | Switching units, withdrawable device64 |
|----------|---|
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| □ | Connecting sets H7 |
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| П | Shunt trips |
| □ | Undervoltage releasesH8 |
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| П | Accessories |

TECHNICAL INFORMATION

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| 1 | - description, specifications | |
| | MTV8 - motor | |
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| | - specifications | 1147 |
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| ч | Auxiliary switches | |
| î j | -specifications | |
| | Shunt trips | |
| | - specifications | Н38 |
| u | Undervoltage releases | |
| | -specifications | หรอ |
| n | Hand drives | |
| | NATE OF THE PARTY | |
| | - description, specifications | |
| | Mechanical interlocking | |
| | - description, specifications, dimensions | H41 |
| Π. | Motor drives | |
| 74 | 1 \ 1 I | 14.5 |
| . \ | - description, specifications, diagram | |



Modelon

MMARY OF MODELS AND ACCESSORIES



3P



(S-BL-W010

Clamp terminals CS-BL-W011



SWITCHING UNIT BL1000SE305









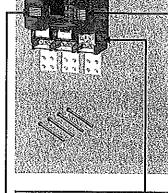




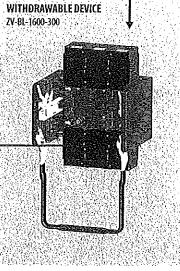




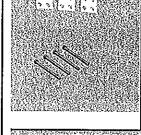










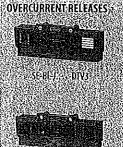






UNT TRIP SV-BL-X...



















OD-BL-VP01



OD-BL-KAO1



OD-BL-KS09

Mounting bolts



OD-BL-KSO4

Insulating barriers







OD-BL-KS03

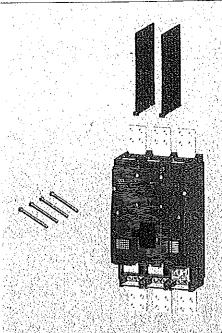




OD-BL-KS01



SWITCHING UNITS





| lype says a says | n Product code | ZĄJAJĄ. | al (KA) | ¥ Yeight (kg) | Package [pc] s |
|------------------|----------------|---------|---------|---------------|----------------|
| BL1000SE305 | 19381 | 1 000 | 65 | 20 | 1 |

- -TECHNICAL INFORMATION, see page G6
- the method of power circuit connection must observe recommendations, see page H13 as well as deionization space, see page H16
- Switching unit: includes
- insulating barriers OD-BL-KSO2
- mounting bolts set OD-BL-MS01 (4x M8x80)
- connecting sets for front connection busbars connection

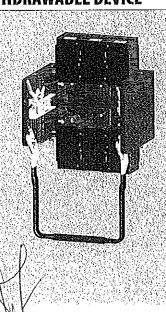
must be fitted with - by overcurrent release SE-BL-J....-.... (circuit breaker)
or switch-disconnector unit SE-BL-J1000-V001 (switch-disconnector)



| Type * | Productode | | i i įkaj | Veightikalie | Padage (pc) |
|-------------|------------|-------|----------|--------------|-------------|
| BL1000SE320 | 19382 | 1 000 | 65 | 23 | 11 |

- TECHNICAL INFORMATION, see page G6
- Switching unit must be fitted with: by overcurrent release SE-BL-J...-.... (circuit breaker)
 or switch-disconnector unit SE-BL-J1000-V001 (switch-disconnector)
 - withdrawable device ZV-BL-1600-300

MITUDDAWARI E DEVICE

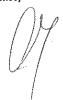


G4

| lyer s | (Productions | | , Veglekje | Parkage (px) |
|----------------|--------------|---------------------|------------|--------------|
| ZV-BL-1600-300 | 21010 | Withdrawable device | 14 | 11 |

- TECHNICAL INFORMATION, see page H30
- $\hbox{- the method of power circuit connection must observe recommendations, see page H30 as well as deionization space, see page H160 and the connection of t$
- Withdrawable device: must be fitted with 2 connection sets CS-BL-A010 (front connection)
 or CS-BL-A020 (rear connection)

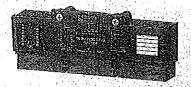
we recommend fitting with - mounting bolts set OD-BI-MSO2 (4x M8x60)



OVERCURRENT RELEASES



3P



DTV3 - characteristic D - distribution

■ protection lines and transformers

| 315 | SE-BL-J315-DTV3 | 22111 | l, setting = 125 ÷ 315 Å | 0.5 | 1 |
|-----|-----------------|-------|--------------------------|-------|----|
| 630 | SE-BL-J630-DTV3 | 22211 | l, setting = 250 ÷ 630 A | - 0.5 | 1. |
| 800 | SE-BL-J800-DTV3 | 22311 | 1, setting = 315 ÷ 800 A | 0.5 | 1 |

⁻ TECHNICAL INFORMATION, see page 67

MTV8 - characteristic M - motor

■ direct protection for motors and generators

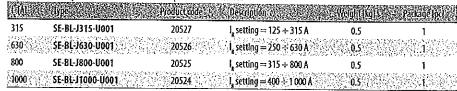
■ possibility of protection lines and transformers

| HIA | V Type Co. 1 | Product code | Descriptioners (#1925) | Weight (kg) : e | re Package (pc) est |
|------|------------------|--------------|---------------------------|-----------------|---------------------|
| 315 | SE-BL-J315-MTV8 | 22101 | l, setting = 125 ÷ 315 A | 0.5 | 1 |
| 630 | SE-BL-J630-MTV8 | 22201 | l₂ setting = 250 ÷ 630 Å | 0.5 | |
| 800 | SE-BL-J800-MTV8 | 22301 | I, setting = 315 ÷ 800 A | 0.5 | 1 |
| 1000 | SE-BL-J1000-MTV8 | 19384 | l_setting = 400 + 1 000 A | 0.5 | |

⁻ TECHNICAL INFORMATION, see page G8

U001 - characteristic U - universal

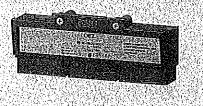
m protection complicated loads or those not specified in advance



⁻ TECHNICAL INFORMATION, see page G10

SWITCH-DISCONNECTOR UNIT

3P

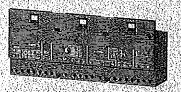


| 加量 | lyper seems of | e Product code s | Name, | :Weight (kg) | a Patkage (pcl a) |
|------|------------------|------------------|--------------------------|--------------|--------------------|
| 1000 | SE-BL-J1000-V001 | 19385 | Switch-disconnector unit | 0.4 | 1 |

⁻TECHNICAL INFORMATION, see page G6

5IGNALLING UNIT

3P



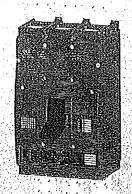
| | Prodlict rodes | a Description | a aveintakjist | Package(pcl) |
|------------|----------------|--------------------------|----------------|--------------|
| SB-BL-0002 | 13765 | for overcurrent releases | 0,67 | 1 |
| | | DTV3, MTV8 and U001 | | |

-TECHNICAL INFORMATION, see page H36

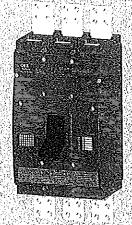
- for connecting of circuit breaker with signalling unit CS-BL-B*** block terminals cannot be used



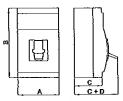




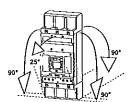
Circuit breaker



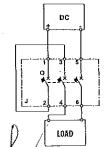
Switch-disconnector



Dimensions



Mounting



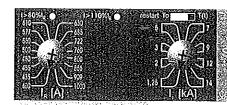
Connection of switch-disconnector for DC circuits

| Specification | | CIRCUIT Breakers Bi1000s | SWITCH- DISCONNECTORS |
|--|--|--|--|
| 44.5 4 - (4.12) | Dette de service de la contra | SUPERIOR | |
| Series | | 210x350x135+63 mm | 210x350x135+63mm |
| Dimensions A x B x C + D | | * * * * | 20 kg |
| Weight | 4. | 20 kg EN 60947-2 | ZU KG EN 60947-3 |
| Standards | | EC 60947-2 | IEC 60947-3 |
| Approval marks | | | |
| жируштагнансь • | | (€® | € ₩ |
| Number of poles | and the second | | ີ 3 - ∑ຸ່ງ |
| | 1 | 315, 630, 800, 1 000 A | - 1 |
| Rated current | | 1 000 A | 1000 A |
| Rated normal current | | S. M. S. D. 1889 I am W. Labele. | · 14.1 (1996年) 1996年 (1996年) |
| Rated operating current | andro en aleman | e und des lucture for Wasse 2 signification | 1 000 A max. 690 V a.c. |
| Rated operating voltage | . ' | max. 690 V.a.c. | max. 440 V d.c. |
| 一型 经保险条件 医克拉克氏 的复数电影 化二氢苯酚甲基苯酚 | 2001, 6475-1678 | 50/60 Hz | 50/60 Hz |
| Rated frequency | T. State who six | The second secon | and the second second second |
| Rated impulse withstand voltage | U _E | 8 kV | 8 kV |
| Rated insulation voltage | U _i | 690 V | 690 V |
| Utilization category (selectivity) | 690 V a.c. | A,B | AC-23B |
| Utilization category (switching mode) at I, = 1 000 A | 690 V a.c. | • | AC-23B |
| • | 440 V d.c. | in a company of the c | DC-23B |
| Rated short-time withstand current at | l _a /t | 15 kW1 s | 15 kA/1 s |
| U _e = 690 V a.C. | | | (基本本語)等(基本本本) |
| Rated short-circuit ultimate breaking capacity (rms) 11 | l _a /U, | 85 kA/230 V a.c. | |
| | | 65 kA/415 V a.c. 45 kA/500 V a.c. | - |
| | | 20 kA/690 V a.c. | |
| 。 10.00000000000000000000000000000000000 | WELL CLOSE | 20 AV 090 V 1.C. | STEENSTAND |
| Switching off time at I | ', /υ <u>,</u> | 45 kA/230 V a.c. | |
| Rated short-circuit service breaking capacity (rms) | 1 ₀ / 0 _t | 36 kA/415 V a.c. | |
| · | | 30 kA/500 V a.c. | • |
| | | 20 kA/690 V a.c. | |
| Rated short-circuit making capacity | (_/0 | 140 kA/415 V a.c. | 30 kA/415 V a.c. |
| | | 等原本 的复数形式 | 30 kA/440 V d.c. |
| Losses per 1 pole fixed/withdrawable design | | 100 W/139 W | 100 W/139 W |
| Mechanical endurance | | 10 000 cycles | 10 000 cydes |
| Electrical endurance | , , | 4 000 cycles | 4 000 cycles |
| Switching frequency | 罗斯克斯斯 克 | 120 cycles/hr | 120 cycles/hr |
| Control force | Bess to be Charles in Nation | 230 N | 230 N |
| and the second s | PORTE AND BUT | P40 - Section | 1P40 (|
| Degree of protection from front side of the device | 美国新兴建县 李小老人 | 希腊機能は表表をあるいいにはないにはない。 | IP20 |
| Degree of protection of terminals | | IP20 | irzu |
| Operating conditions | 1000 | | |
| Reference ambient temperature | ur destrutivas das statos | 40°C Laternation to the Section (Association (Section | 40°C e 4.e 5 est estret e 1 7777 € √30 |
| Ambient temperature range | | -40÷+55℃ | -40 ÷ +55 ℃ |
| Working environment | | dry and tropical dimate | dry and tropical dimat |
| Climatic resistance | 动物的复数形 | EN 60068 | EN 60068 |
| Pollution degree | alles in a symmetric service | 3 | 3 |
| Max. sea level | REGISTERAL | 2 000 m | 2 000 m |
| The San Sald San Land Committee of the C | \$1000 FEBRUARY | 3g (8 ÷ 50) Hz | 3g (8 ÷ 50) Hz |
| Seismic resistance | | 71 (or + o) pc | 39(0.30/12 |
| Design modifications | | | |
| Front/rear connection | | | |
| Plug-in design | | | |
| Withdrawable design | alting and | 48.50 July 18 18 18 18 18 18 18 18 18 18 18 18 18 | |
| Arressories | hi di kacamatan | | |
| Switches - auxiliary/relative/signal/early | | •/•/-/ | •/e/-/ |
| | | | |
| Shunt trip | Marketon di Printiga | interpolation in the properties of the propertie | |
| Undervoltage release/with early switch | ajtij 4, gyjet závětky. | | 100 (81 & 10 - 81) |
| Front hand drive/with adjustable lever | · [4] [4] [4] [4] [4] | EKSONE DO DO DO PROPOS PRINCIPALINA | Vilancias as as as a |
| Mechanical interlocking-with Bowden cable/for hand dri | VE Rophies (1980 - Commenter | ************************************** | An union respens |
| Motor drive/with counter of cycles | | ************************************** | // |
| Lever with locking | er er er er er er er er | | edulari mases must |
| Bolt sealing insert/additional cover for overcurrent releas | e 200 | (\$\delta\) •1-2008 | 月 為美國 •/ -東京 |
| available. – unavailable | | | 1 |

• available, – unavailable

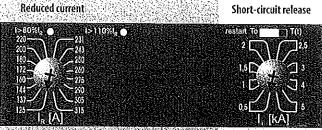
" - in case circuit breaker connection is reversed (input terminals 2, 4, 6, output terminals 1, 3, 5) i_{or} does not change - protection of Modeion switch-disconnectors, see page R

You can find softle more technical information in chapter "BL 1000S, BL 1600S — Technical information" (Circuit breakers, switch-disconnectors - diagram, connecting, mounting, delonization spaces, dimensions.









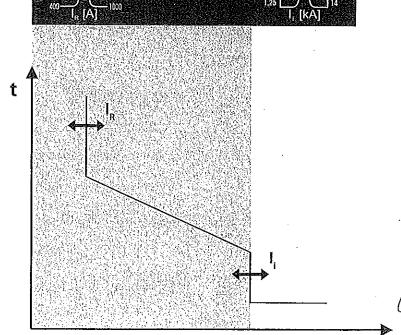
 $I_{2} = 630 \, A$ E-BL-J630-DTV3



 $I_{n} = 800 A$ E-BL-1800-DTV3



 $I_{s} = 1000 \, A$ -BĹ-J1000-DTV3



Properties

- suitable for protection of lines and distribution transformers
- protects against both overcurrent and short circuit
- so reduced current setting $I_{\rm g} = 0.4 \div 1 I_{\rm g}$
- **14** thermal memory can be switched on/off (0N = $T_{(y)}$, OFF = $T_{(y)}$)
- setting of the value of the short-circuit release l, in 8 steps
- 🗷 setting of I, and I, by means of the rotary switches is stepwise
- # the overcurrent release indicates the value of the passing current by means of LED
- **a** the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

Switching unit BL1000... Overcurrent release SE-BL-J... Overcurrent release setting Reduced current Thermal memory Short-circuit release current

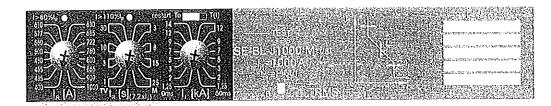


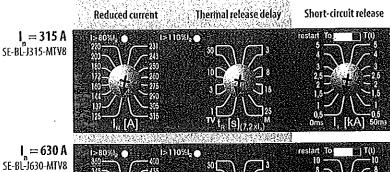
IMPORTANT

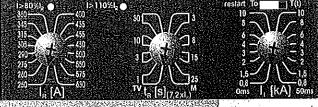
- thermal memory must be switched on in protection of transformers and lines
- thus the transformer or the line will be protected against repeated overload



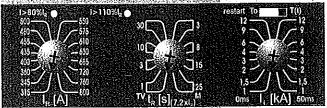
OVERCURRENT RELEASES-MTV8, TV mode



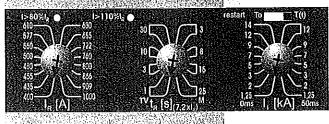




 $I_{1} = 800 \, A$ SE-BL-J800-MTV8



 $I_{-} = 1000 \,\text{A}$ SE-BI-J1000-MTV8



Properties

- TV mode suitable for protection of lines, distribution transformers and generators
- protects against both overcurrent and short circuit
- \blacksquare reduced current setting $I_a = 0.4 \div 11_a$
- **u** thermal memory can be switched on/off ($0N = T_{tot}$, $0FF = T_{tot}$
- in TV mode the undercurrent release is inactive
- setting of delay of the thermal release t, 1 s, 3 s, 10 s and 30
- setting of the value of short-circuit release I, in 8 steps and possibility of switching the short-circuit release off with a delay of 50 ms
- f u setting of $f l_k$, $f t_k$ and $f l_i$ by means of the rotary switches is stepwis
- m the overcurrent release indicates the value of the passing current by means of LED
- m the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

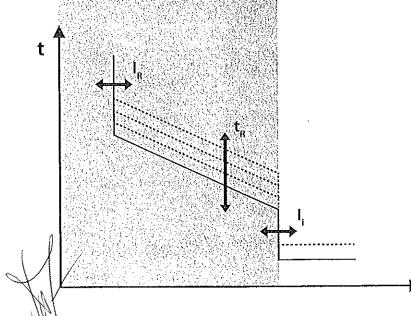
| bata for the project | AN ALL A NOTICE OF THE CO. T. C. |
|----------------------------------|----------------------------------|
| Switching unit | BL 1000 |
| Overcurrent release | SE-BL-J |
| Overcurrent release setting | |
| Reduced current | la Tina |
| Mode | · Y |
| Thermal memory | 1 74.00 |
| Thermal release delay | t _e zzas zasta za |
| Short-circuit release current | I WAXA MASSA |
| Setting of short-circuit release | ., . ms |



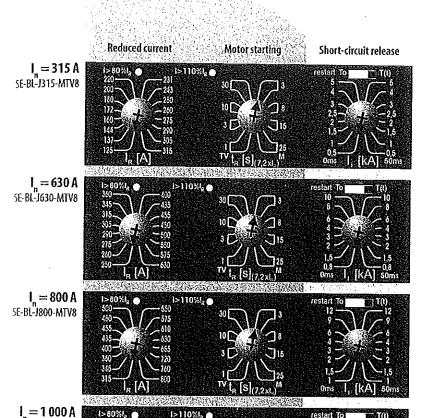
IMPORTANT

■ the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure









E-BL-J1000-MTV8

Properties

- M mode suitable for protection of motors
- protects against both overcurrent and short circuit
- m reduced current setting $l_{\rm g} = 0.4 \div 1 l_{\rm g}$
- **u** thermal memory can be switched on/off (ON = T_{av} , OFF = T_{av})
- In M mode the undercurrent release is active
- setting of delay of the thermal release t_R 3 s, 8 s, 15 s and 25 s according to the motor starting class
- setting of the value of short-circuit release I, in 8 steps and possibility of switching the short-circuit release off with a delay of 50 ms
- setting of I_s, t_s and I_s by means of the rotary switches is stepwise
- the overcurrent release indicates the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

Switching unit

Overcurrent release

Overcurrent release setting

Reduced current

Mode

Thermal memory

Thermal release delay

Short-circuit release

L

BL1000.

SE-BL-J.

A

M

Thermal memory

T

Thermal memory

T

Setting of short-circuit release

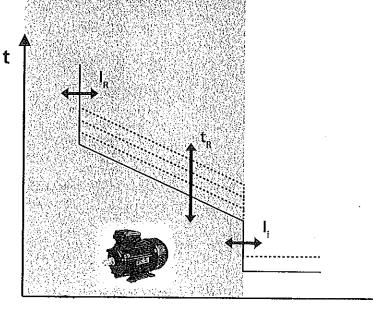
Ins.





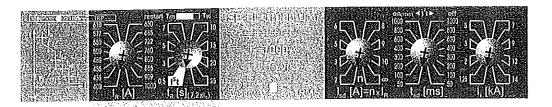
IMPORTANT

- M mode must be selected in protection of motors
 the motor will be protected in phase failure
- thermal release delay t_n must correspond to the motor starting class
- in protection of motors it is suitable to set the delay of the short-circuit release at 50 ms

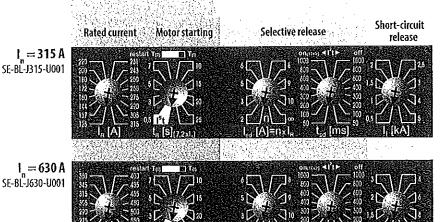




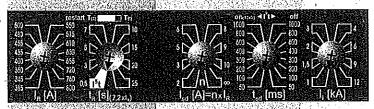
OVERCURRENT RELEASES - U001



BL1000S

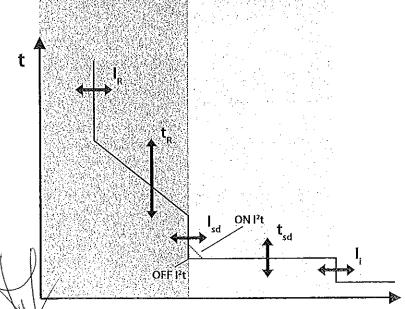


 $I_{2} = 800 \, A$ SE-BL-J800-U001



 $I_{..} = 1000 \, A$ SE-BL-J1000-U001





Properties

- ø it is designed for demanding applications with a complicated load and required high selectivity with fuses or circuit breaker
- rotects against both overcurrent and short circuit

- reduced current setting I_R = 0.4 ÷ 1 I_R
 thermal memory can be switched on/off (ON = T_{RY} OFF = T_{RY}
 setting of the value of selective release t_R in 8 steps, possibility of setting of gradient of characteristic of the thermal release I't (adaptation of time-current characteristic of the fuse)
- setting of the value of selective release I, in 8 steps (independent time-delayed release)
- setting of delay of the selective release t , 50 to 1000 ms including possibility of setting of a gradient of characteristic of the short-circuit release (adaptation of the time-current characteristic of the fuse)
- setting of the value of the short-circuit release I, in 8 steps
- \mathbf{z} setting of \mathbf{I}_{st} , \mathbf{t}_{st} , \mathbf{I}_{st} , \mathbf{t}_{sd} and \mathbf{I}_{t} by means of rotary switches is stepwise
- m the overcurrent release indicates operating state and the value of the passing current by means of LED
- # the values of parameters of the overcurrent release are sel by the manufacturer to minimum

Data for the project

Switching unit BL1000... SE-BL-J. Overcurrent release Overcurrent release setting Reduced current Thermal memory Setting of the gradient of characteristic of the thermal release Thermal release delay Selective release valueA (...;xl_e) Selective release delay ..., ms Setting of the gradient of characteristic of the short-circuit release Short-circuit release value l,A



IMPORTANT

m to achieve as high selectivity as possible, use the possibility of setting of the current and delay including gradient of the time-current characteristic of the independent (short-circuit) time-delayed release.

For selectivity solution, use the calculation program Sichr.

> G10

Modeion



MOULDED CASE CIRCUIT BREAKERS BL1600S



9/



COMMERCIAL INFORMATION

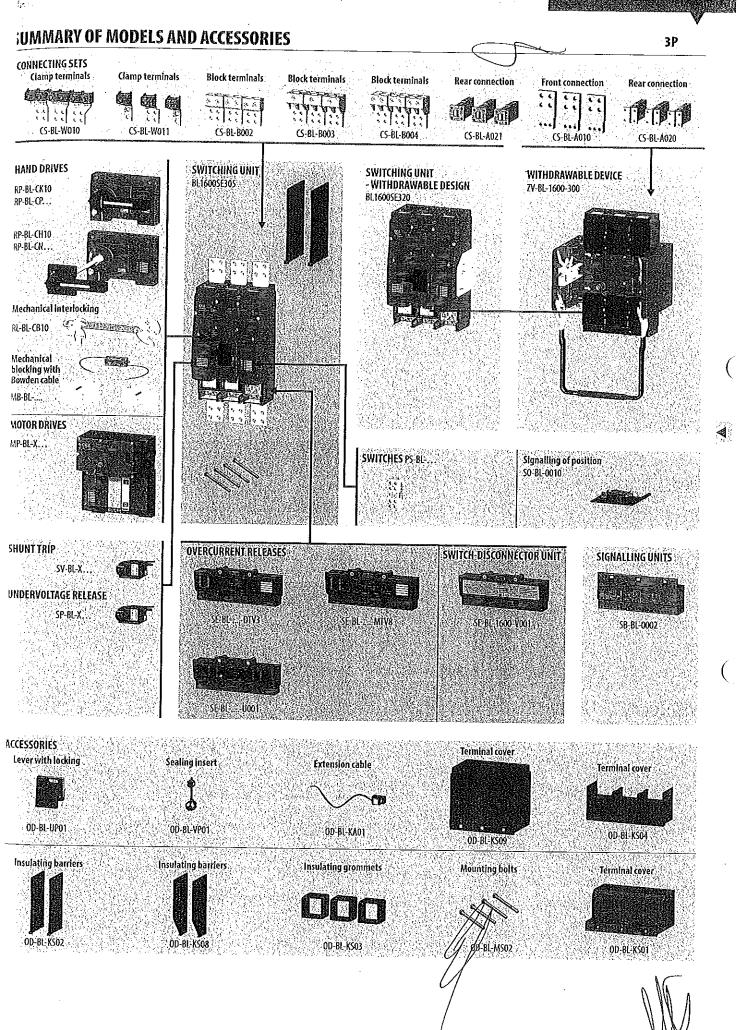
| | Switching units, withdrawable device |
|---|--------------------------------------|
| | Overcurrent releases |
| | Signalling unitsHS |
| | Residual current monitor |
| | |
| | Connecting sets |
| | Auxiliary switches |
| ш | Shunt tripsH8 |
| | Undervoltage releasesH8 |
| | Delay unitH9 |
| а | Hand drives |
| | Mechanical interlockingH9 |
| | Motor drivesHs |
| п | Accessories H10 |

TECHNICAL INFORMATION

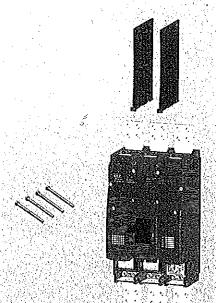
| | Circuit breakers, swi | tch-disconnectors | |
|---|-----------------------|--|-----|
| Õ. | • | - specifications | H11 |
| 3 | • | - 030000 | H1Z |
| | | - connecting, mounting | HI3 |
| | | - delonization spaces | H16 |
| | 14. | - dimensions | H17 |
| . [] | Withdrawable devic | φ. | |
| 7 | III CHARLE WELL | - description, specifications, diagram | H30 |
| | | | |
| | Overcurrent release | | |
| | | DTV3 - distribution - description, specifications | H30 |
| | | MTV8 - motor | |
| : :::::::::::::::::::::::::::::::::::: | • | - description, specifications | H31 |
| As a second | | IIOO1 - universal | |
| | 7 | - description, specifications | H35 |
| | Signalling units | | |
| · u | Signaliniy umis | - description, specifications, diagram | H36 |
| | ' ÷ | - description, specifications, diagrammination | |
| Ç 🗀 | Connecting sets | | |
| | | - specifications | K13 |
| ் 🚣 | Auxiliaeu cuitchac | | |
| ्राधाः अ | Auxiliary switches | - specifications | H37 |
| | file in the second | - specifications | |
| П | Shunt trips | | |
| | | - specifications | H38 |
| | Undervoltage relea | roc | |
| · u | ontiet voltage reiea | - specifications | H39 |
| 7.45 | | - 2becincanous | |
| °О. | Hand drives | | |
| | | - description, specifications. | H40 |
| | Mechanical interlo | -bina | |
| . | mechanical interior | - description, specifications, dimensions | H41 |
| N.A. | ń | actorphism specialisms of minimaters and an arrangement of the special | |
| ū | Motor drives | | |
| ř* | V . | - description, specifications, diagram | H43 |
| 5 1 mg | 1 / | | |



Modelon



SWITCHING UNITS



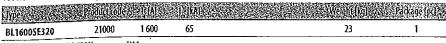
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| Liven acada | | | | | |
|--|----------------|--------------|------------|--|----------------------|
| and the same of th | | e in the | 1111 | and the second of the second o | Later of the Control |
| Type | Stanonica fons | 3.5% (1)4.2% | S. P. IVII | 公共发展中国的时间 。 | rackade Ibdiss |
| 2.1.5 | 4 / 110 | 1.400 | | | |
| BL16005E305 | 14410 | 1 600 | 65 | 11 | 1 |
| | | | | | |

- TECHNICAL INFORMATION, see page H10
- the method of power circuit connection must observe recommendations, see page H13 as well as deionization space see page H16
- Switching unit: includes
- insulating barriers OD-BL-KS02
- mounting bolts set OD-BL-MS01 (4x M8x80)
- connecting sets for front connection busbars connection

must be fitted with - by overcurrent release SE-BL-....- (circuit breaker) or switch-disconnector unit SE-BL-1600-V001 (switch-disconnector)

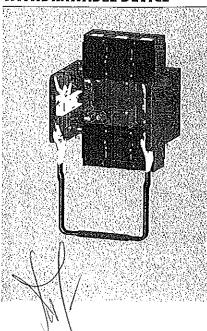




-TECHNICAL INFORMATION, see page H11

- Switching unit must be fitted with: - by overcurrent release SE-BL-....- (circuit breaker) or switch-disconnector unit SE-BL-1600-V001 (switch-disconnector)

- withdrawable device ZV-BL-1600-300



| liype . | Product code A | Name of the state | Yeight lkg) | Package [pt] |
|----------------|----------------|---|-------------|--------------|
| ZV-BL-1600-300 | 21010 | Withdrawable device | 14.3 | 1 |

- -TECHNICAL INFORMATION, see page H28
- the method of power circuit connection must observe recommendations, see page H30 as well as deionization space, see page H16
- Withdrawable device must be fitted with 2 connection sets CS-BL-A010 (front connection) or CS-BL-A020 (rear connection)

we recommend fitting with - mounting bolts set OD-BL-MSO2 (4x M8x60)



3P

Modelon

IVERCURRENT RELEASES





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| FA | Typerata | Product code | v a Description | - Welaht (ka) (| Package [pc] |
|-------|-----------------|--------------|--|-----------------|--------------|
| 630 | SE-BL-0630-DTV3 | 20070 | l _s setting = 250 ÷ 630 Å | 0.5 | 1 |
| 1 000 | SE-BL-1000-DTV3 | 20080 | l _a setting = 400 ÷ 1 000 A | 0.5 | 1 |
| 1 250 | SE-BL-1250-DTV3 | 19388 | I, setting = 500 ÷ 1 250 A | 0.5 | 1 |
| 1 600 | SE-BL-1600-DTV3 | 20090 | l, setting = 630 ÷ 1 600 Å | 0.5 | 1 |

⁻ TECHNICAL INFORMATION, see page H32

MTV8 - characteristic M - motor

■ direct protection for motors and generators

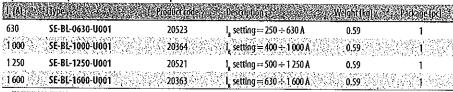
m possibility of protection lines and transformers

| LIAI | lypés | Product code | st. Description as a series | Weight (kg) | t Package (pc) |
|---------|-----------------|--------------|--------------------------------------|-------------|----------------|
| 630 | SE-BL-0630-MTV8 | 20071 | I _a setting ⇒ 250 ÷ 630 A | 0.5 | 1 |
| 1 000 | SE-BL-1000-MTV8 | 20081 | l, setting ≠ 400 + 1 000 Å | 0.5 | 2000年 |
| 1 250 | SE-BL-1250-MTV8 | 19389 | I, setting = 500 ÷ 1 250 Å | 0.5 | 1 |
| 1 600 | SE-BL-1600-MTV8 | 20091 | I, setting = 630 ÷ 1 600 A | 0,5 | STATE OF STATE |
| TECHNIC | AL INCODMATION | 3 | | | |

TECHNICAL INFORMATION, see page H33

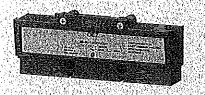
U001 - characteristic U - universal

■ protection complicated loads or those not specified in advance



⁻ TECHNICAL INFORMATION, see page H3S

SWITCH-DISCONNECTOR UNIT

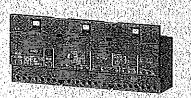


| MAI | . Director | se Product code e | - Name - C | Weight (kg) 2 | Package (pc) |
|-----------|----------------------------|-------------------|--------------------------|---------------|--------------|
| 1 600 | SE-BL-1600-V001 | 20400 | Switch-disconnector unit | 0.4 | 1 |
| - TECHNIC | AL INFORMATION see nage H1 | 1 | | | |

SIGNALLING UNITS

3P

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| LVP* 2 | aus Product rodes | a Description | a tweight (kg) - 2 | Package(pc) |
|------------|-------------------|---|--------------------|-------------|
| SB-BL-0002 | 13765 | - for overcurrent releases DTV3, MTV8 and U001 | 0.67 | 1 |

- TECHNICAL INFORMATION, see page H36

- for connecting of circuit breaker with signalling unit CS-BL-B*** block terminals cannot be used



RESIDUAL CURRENT MONITOR



| Types, 1 s. s | Product code | Description | | ackage (set) |
|---------------|--------------|--|------|--------------|
| 55V8000-6KK | 42658 | Analogue design, l _{ss} and t _{ss} setting | 0.18 | 1. |
| | | | | |

- TECHNICAL INFORMATION, see page P4



| Type | Product code | Description | . Veight (Vol | go!Package (set) |
|-------------|--------------|--|---------------|------------------|
| 55V8001-6KK | 42659 | Digital design, l_{sa} and t_{sa} setting | 0.26 | 1 |
| 55V8200-6KK | 42660 | Digital design, $\mathbf{I}_{\mathbf{s}_{\mathbf{s}}}$ and $\mathbf{t}_{\mathbf{s}_{\mathbf{s}}}$ setting, 4 | channels 0.26 | (1) |

-TECHNICAL INFORMATION, see page P4

CURRENT TRANSFORMERS FOR RESIDUAL CURRENT MONITOR





| Type Samuel | Prodom code | (Designation 2.3) | Yeight (kg) \$ | Package (sel) |
|-------------|-------------|--|----------------|-----------------|
| 5SV8700-0KK | 42661 | Internal diameter 20 mm, Including holder on "U" rail according to EN 60715 wide 35 mm | 0.09 | 1 |
| 55V8701-0KK | 42662 | Internal diameter 30 mm, including holder on "U" rail according to EN 60715 wide 35 mm | 0.11 | を (1) (2) |
| | | | | |

-TECHNICAL INFORMATION, see page P4



▶ H6

| Type: 474.2 | Product code | Posapion as a second second second | | Padkage [sel] |
|-------------|--------------|---|-----------------|---------------|
| 55V8702-0KK | 42663 | Internal diameter 35 mm, Including holder on the panel | 0.2 | 1 |
| 55V8703-0KK | 42664 | Internal diameter 70 mm, including holder on the panel | . Ster 031 o S. | \$ 1.00 |
| 55V8704-0KK | 42665 | Internal diameter 105 mm, including holder on the panel | 0.6 | 1 |
| 55V8705-0KK | 42666 | internal diameter 140 mm, including holder on the panel | 135 | |
| 55V8706-0KK | 42667 | Internal diameter 210 mm, including holder on the panel | 1,25 | 1 |

- TECHNICAL INFORMATION, see page P4

| | T. | - TECHNICAL IN | IFORMATION, see pa | transforme age P4 |
|----------|----|----------------|--------------------|----------------------|
| | | 5SV8 900-1K# | K 42668 | Holder on "l |
| D | | TYRES SE | ? Production | ea Descripțion |

Weighte kg) is Pactage liset

July rail according to EN 60715 wide 35 mm for current one of the control of the

3P

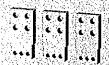
CONNECTING SETS

























| spipe 1833 Poduct ode Desalption 1838 Staint Methol of connections Weight (kg) | gi-Padkage (seU) |
|--|------------------|
| CS-BL-W010 20710 Clamp terminals - 2x (70 ÷ 240) Cy/Al cables 1.47 double | |

- -TECHNICAL INFORMATION, see page H13
- for connection four 70 ÷ 240 mm² cables per pole, it is possible to use two CS-BL-W010 connecting sets, see page H19 (not for BL1000SE305 switching unit)
 -conductor cross-section for potential terminal is 2.5 mm²

70 ÷ 240 Cu/Al cables

CS-BL-W011 20930 Clamp terminals -TECHNICAL INFORMATION, see page H13

- for connection three $70 \div 240 \, \text{mm}^3$ cables per pole, it is possible to combine CS-BL-W011 connecting set with CS-BL-W010 connecting set, see page H16, H19 (not for BL1000SE305 switching unit)

| 1929 L. 1922 Della Miller (1829) (1948) 196 | A CONTRACTOR CONTRACTOR PROGRAMMENTS | CANDING NOONANDE | CENTER CONTRACTOR SERVICE |
|---|--------------------------------------|------------------|---------------------------|
| CS-BL-A022 20611 Rear co | nnection – up to 1 000 A | CO/Al Duspars | al /4 /2006 |
| for fix | ed design | 其為結構等的 表別或分別 | 어려워 없는 사람들의 사람들이 |

- TECHNICAL INFORMATION, see page H13

| CS-BL-A021 20610 Rear connection – Up to 1 600 A Cu/Al busbars 2.76 1 - for fixed design |
|--|
|--|

-TECHNICAL INFORMATION, see page H13

| CS-BL-A010 21050 | Front connection - for withdrawable | desion Cu/Al busbai | | 2.73 |
|------------------|-------------------------------------|---------------------|----------------|---|
| | | BOYEST WARREST VIA | 83864457 11710 | er et til til store i til et til |

- TECHNICAL INFORMATION, see page H13

| CS-BL-A020 21070 | Rear connection - for withdrawa | ble design Cu/Al busbars | 3.42 |
|------------------------------|---------------------------------|--------------------------|-------------------------|
| - かいかいち しだ ひょぞうじ ありくん うしゅくしゃ | 医异戊基 化硫铁矿 化电流管线 抗學 | の あんこだい だいがんしいいふかか | 化有类型的 医水杨二维 医多种类的 医马克克氏 |

-TECHNICAL INFORMATION, see page H13

| CS-BL-A015 41469 Front connection | Cu/Al busbars 4.5 |
|--|---|
| ,我们就在这个人的意思,我们就是一个人的,我们就是这个人的,我们就是一个人的,我们就是一个人的,我们就会看到一个人的,我们就是这个人的,我们就是这个人的。""这 | |
| for fixed design, for BL1600 | [1] [1] [1] [1] [1] [1] [1] [1] [1] [1] |

-TECHNICAL INFORMATION, see page H13

| CC DI AO16 | A STATE OF THE STA | 1 |
|----------------------|--|---|
| CS-DL-AV10 | C. C | |
| for fixed design, fo | Cu/Al busbars : 3.00 1 L1000 | |

-TECHNICAL INFORMATION, see page H13

| . CS.BL.B002 20116 Block terminal 150 ÷ 300 Cu/Al cables - for 2 cables | DESCRIPTION OF THE PROPERTY AND THE |
|---|--|
| Control Districtions (Control Control | |
| Tor 2 Cables | (1) 15 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) |

- TECHNICAL INFORMATION, see page H13
- conductor cross-section for potential terminal is 1.5 ÷ 6 mm²
- it is necessary to use insulating barriers
- using the OD-BD-KSO9 cover the degree of protection IP20 is fulfilled without the need to apply insulating barriers

| 。 | 3.400000 \$P\$ | 79 |
|--|--|-------|
| CS-BL-B003 20117 B | lock terminal | |
| (3-pr-pu03 Z011/ B | | S. 75 |
| 。在1980年的基本的企業的企業的企業。 1980年的基本的企業的企業的企業的企業的企業的企業的企業的企業的企業的企業的企業的企業的企業的 | far braklant fra stolet er feltet til bes statet fra att beste ble et beste ble et beste ble ble ble ble ble b | 300 |
| 。这些情况的特别的大学的特殊的人,然后是这种的自然的是一个 | [MT] TEMES (1975) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) | |
| | | |

- TECHNICAL INFORMATION, see page H13
- conductor cross-section for potential terminal is $1.5 \div 6 \, \text{mm}^2$
- it is necessary to use insulating barriers
- using the OD-BO-KSO9 cover the degree of protection IP20 is fulfilled without the need to apply insulating barriers

| CS:BL-B004 20118 Block terminal 150 ± 300 for 4 cables | 0 | Cu/Al cables 1.80 |
|--|---|-------------------|
| | | fi . |

- TECHNICAL INFORMATION, see page H13
- conductor cross-section for potential terminal is 1.5 ÷ 6 mm²
- it is necessary to use insulating barriers
- using the OD-BD-KS09 cover the degree of protection IP20 is fulfilled without the need to apply insulating barriers

^{10 -} one set provides for connecting one side of the circuit breaker (set includes three terminals with necessary coupling elem



AUXILIARY SWITCHES

| Type 1 | Product cod | e > Operating voltage > 5 | Contacts | 75 (Véight (kg) 5 3° € 1 | ackage [pc] |
|---------------|-------------|---------------------------|----------|--------------------------|-------------|
| PS-BL-2200 | 20510 | 60÷500Vac/60÷240Vdc | | 0.041 | 1 |
| PS-BL-2200-Au | 12808 | 5 ÷ 60 ¥ a.c/d.c. | | 0.041 | 1 } |

3P

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3P

SHUNT TRIPS



| SV-BL-X024 | 16162 | 24 V a.c/d.c. | 0.22 | 1 |
|------------|--------------|---------------------|------|--------|
| SV-BL-X048 | 16161 | 48 V a.c/d.c. | 0.22 | 1 |
| SV-BL-X110 | 16160 | 110 V a.c/d.c. | 0.22 | 1 |
| SV-BL-X230 | 16159 | 230 V à.c/220 V d.c | 0.22 | 3 n. 1 |
| SV-BL-X400 | 16158 | 400 V a.c. | 0.22 | 1 |

⁻TECHNICAL INFORMATION, see page H38

UNDERVOLTAGE RELEASES



| Type and the | A Product code | Operating voltag | r i v | ght (kg) sea se | Package [pc] |
|--------------|----------------|------------------|-------|-----------------|--------------|
| SP-BL-X024 | 16168 | 24 V a.c/d.c. | | 0.22 | 1 |
| SP-BL-X048 | 16167 | 48 V a.c/d.c | | 0.22 | 761. C. |
| SP-BL-X110 | 16166 | 110 V a.c/d.c. | | 0.22 | 1 |
| SP-BL-X230 | 16165 | 230 V a.c./220 V | | 0,22 | 1 |
| SP-BL-X400 | 16164 | 400 ¥ a.c. | | 0.22 | 1 |
| SP-BL-X500 | , 16163 | .500 V a.c. | | 0.22 | 据设1 日光學 |

⁻TECHNICAL INFORMATION, see page H39

DELAY UNIT



| Jype San | Prodlict rode | (Description | e lekipiriki) !! | Pagage (pc) s |
|--|---------------|---|------------------|---------------|
| BZ-BX-X230-A | 36696 | - Enables to delay the undervoltage release tripping of circuit breakers Modeion | 0:12 | 1 |

- the delay can be set up at three levels (according to wiring) TECHNICAL INFORMATION, see page P2

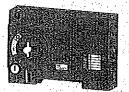


⁻TECHNICAL INFORMATION, see page H37

Modelon

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HAND DRIVES





| Type Contractor | Product code | Name_description | | Patrage[pc] |
|-----------------|--------------|--|------|-------------|
| RP-BL-CK10 | 20850 | Hand drive unit - with locking | 0.23 | 1 |
| RP-BL-CK52 | 20678 | Hand drive unit, 2 pcs, with the same lock and key | 0.46 | 1 |
| RP-BL-CK53 | 20679 | Hand drive unit, 3 pcs, with the same lock and key | 0.69 | 1 |
| RP-BL-CK54 | 20680 | Hand drive unit, 4 pcs, with the same lock and key | 0.92 | 1 |
| RP-BL-CK55 | 20681 | Hand drive unit, 5 pcs, with the same lock and key | 1,15 | 1 |

- TECHNICAL INFORMATION, see page H40

Hand drive unit must be fitted with: ■ for controlling on switch unit - with the black hand drive lever RP-BL-CP

for controlling through the switchboard door - with the extension shaft RP-BL-CH10 - with the hand drive bearing RP-BL-CN.. - with the hand drive lever RP-BL-CP..



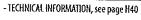


RP-BL-CP10 20865 20867

Hand drive lever - black - with locking Hand drive lever - red - with locking

0.261











| RP-BL-CN10 20870 Hand dri | bearing - degree of protection IP44 1.1 1 |
|--------------------------------------|---|
| -TECHNICAL INFORMATION COS DOGS NAME | |

RP-BL-CP11

RP-BL-CN20 19103 Hand drive bearing - degree of protection IP66 - TECHNICAL INFORMATION, see page H40

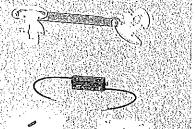


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- TECHNICAL INFORMATION, see page H40

MECHANICAL INTERLOCKING





| iyee a see | Noducarode | Allescriptions | a k 45 Yeight (kg) 🗽 | Package (pc) |
|------------|------------|---|----------------------|--------------|
| RP-BL-CB10 | 20880 | For circuit breakers/switch-disconnectors in fixed design | 0.12 | 1 |

- TECHNICAL INFORMATION, see page H41

- Both circuit breakers must be equipped with a hand drive (at least one with a hand drive unit and hand drive lever)

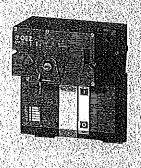
With Bowden cable

| MB-BL-VV06 | 20528 | For circuit breakers/switch-disconnectors in withdrawable design | 0.4 | 1 |
|------------|-------------|--|---------------|------------------|
| MB-BL-PV08 | 20529 | For one fixed and one Withdrayvable circuit breaker/swritch-disconnector | 0.4 | 4.56 1 65 |
| MB-BL-PP07 | 19807 | For circuit breakers/switch-disconnectors in fixed design | 0.4 | 1 |
| | LOGOET COOL | s declinor de la company d | Yelghe (kg) & | Package (pc) |

- TECHNICAL INFORMATION, see page H43

MOTOR DRIVES



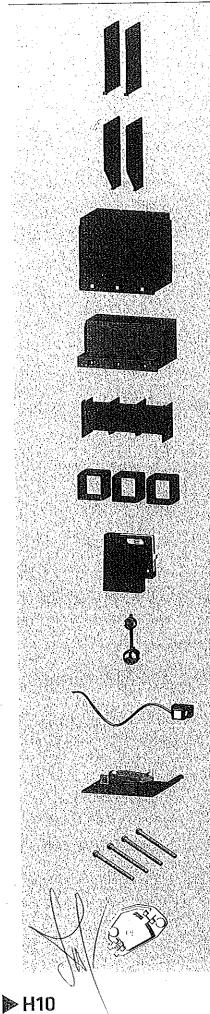


| | 1601 | Motor drive | 110 V a.c./d.c. | 4.35 | 1 |
|--------------|------|----------------------------|--|------|---|
| MP-BL-X230 | 1600 | Motor drive | 230 V a.c/220 V d.c | 4.35 | |
| MP-BL-X110-P | 1604 | Motor drive - with counter | er of cycles 110 V a.c./d.c. Sr of cycles : 230 V a.c./220 V d.c. | 4.4 | 1 |

- TECHNICAL INFORMATION, see page H43



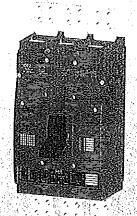
ACCESSORIES



| | duct code ² Hame, description, 2001 (Weight [Eq]) Package (pc |
|---|--|
| | tion (supply to terminals 2, 4, 6), must be installed also on lower side |
| | 20569 Insulating barriers - for withdrawable device 0.142 1 on withdrawable device when clamp or block type terminals are used for its connection |
| OD-BL-KSO9 - increases degree of proter - it is intended for fixed des | 39893 Terminal cover — degree of protection IP20 0.7 1 ction of connection point to IP20 when using CS-BL-B002, CS-BL-B003, CS-BL-B004 block type terminals sign |
| | 20810 Terminal cover – for circuit breaker/switch-disconnector 0.287 1 in fixed design with rear connection ection of connection point to IP20 |
| OD-BL-KSO4 | 20940 Terminal cover - for withdrawable device with front 0.168 1 Connection ble device with front connection |
| - we recommend its instal | llation on both sides of withdrawable device for increasing safety in servicing electrical device |
| → insulate connecting sets | 20920 Insulating grommets - for rear connection 0.1 esign of switching unit and withdrawable device with rear connection s of rear connection from switchboard structure ng on all connecting sets with rear connection |
| OD-BL-UPO1 | 13621 Lever with locking 0.041 1 r of circuit breaker in "switched off manually" position (loaded) g up to three padlocks with max. shank diameter 4 ÷ 6 mm |
| OD-BI-VP01 enables sealing for: | 13924 Bolt sealing insert 0,003 2 - overcurrent release - cover of cavities |
| OD-BI-KAO1 | 21030 Connecting cable – for connecting circuit breaker, 0.12 1 accessories in Withdrawable design – 15 wires |
| SO-BL-0010 -TECHNICAL INFORMATI | 21020 Signalling of position - signals direvit breaker/switch 0.02 1 - disconnector position in withdrawable design 10N, see page H28 |
| OD-BL-MS02 - bolts M8x60 | 14855 Mounting bolts set 3 for withdrawable device 0.1447 1 |
| | 14643 Coyer of switch on button - for motor drive, cover can be sealed 0.019 1 |

3P

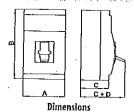
CIRCUIT BREAKERS, SWITCH-DISCONNECTORS



Circuit breaker



Switch-disconnector



Mounting

DÇ LOAD

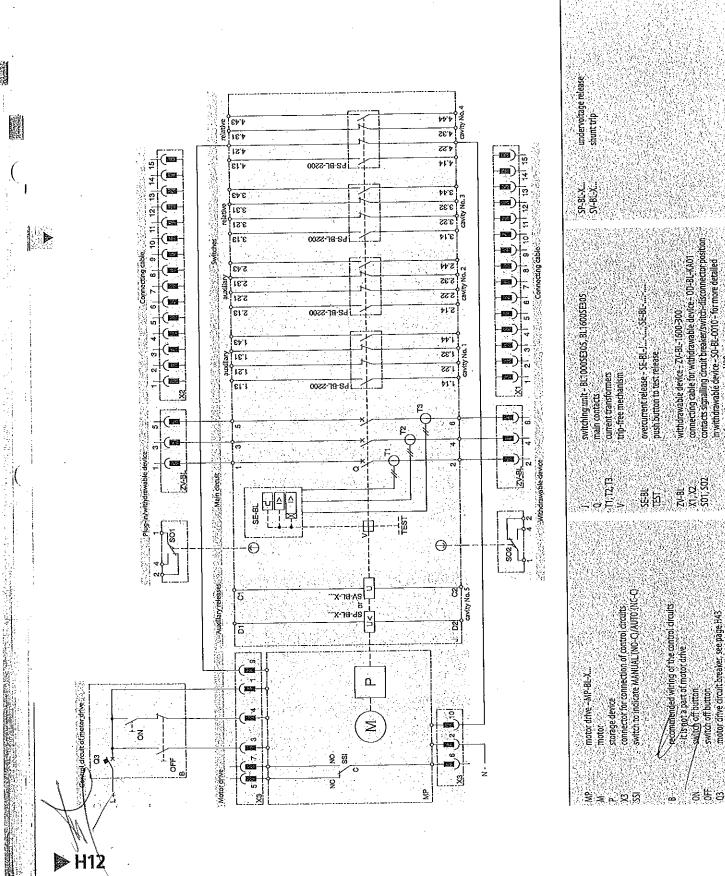
Connection of switch-disconnector for DC circuits

- protection of Modelon switch-disconnectors, see page $\ensuremath{\mathtt{R}}$

| Specifications Type | | CIRCUIT BREAKERS | SWITCH- Disconnectors |
|---|-------------------------------|--|--|
| Series | E-HE-HE-E-H-W | A BL16005 4\A | |
| Dimensions A x B x C + D | | SUPERIOR | |
| | | 210 x 350 x 135 + 63 mm | 210 x 350 x 135 + 63 mm |
| Weight Standards | - | 22 kg | 22 kg |
| Standards | | EN 60947-2 | EN 60947-3 |
| Approval marks | | IEC 60947-2 | 1EC 60947-3 |
| Leading the state of the state | | € € | G 🖣 |
| Number of poles | Service Land | 3 | S. 1. 1913 |
| Rated current | I _a | 630, 1 000, 1 250, 1 600 A | - |
| Rated normal current | 1 | 1 600 A | 1600 A |
| Rated operating current | Į, | · · · · · · · · · · · · · · · · · · · | 1 600 A |
| Rated operating voltage | ្រប់ ្រ | max, 690 V a.c. ²⁾ | max, 690 V a.c. ²⁾ |
| rovination to the control of the con | | | max. 440 V d,c, |
| | , . . | 50/60 Hz | 50/60 Hz |
| Rated Impulse withstand voltage | U _{rs} | 8 ky | 8 kV |
| Rated insulation voltage August 1994 to be of the transport to the state of the control of the c | U _j | 690 V | 690 V |
| Utilization category (selectivity) | 690 V a.c. | A, B | 민준이 경우를 샀는다. |
| Utilization category (switching mode) | 690 V a.c. | - | AC-23B |
| Rated short-time with stand current at | 440 V d.c. | 20 kW1 s | DC-23B 20 kA/1 s |
| U = 690 V a.c | | | 20,0013 |
| Rated short-circuit ultimate breaking capacity (rms) ¹⁾ | l" \n" | 85 kA/230 V a.c. | na na katan atau a |
| | | 65 kA/415 V a.c. | - |
| | | 45 kA/500 V a.c. | |
| witching off time at [| BYSD BUSSE | 20 kA/690 V a.c. 30 ms | |
| Rated short-circuit service breaking capacity (rms) | [/U[| 45 kA/230 V a.c. | ATTERNOOPS (1) |
| , , , , , , , , , , , , , , , , , , , | 8 | 36 kA/415 V a.c. | |
| | | 30 kA/500 V a.c. | - |
| Rated short-circuit making capacity | a kalangga Salatan K | 20 kA/690 V a.c. | raina recharga serioción i loca |
| arton maning capacity | . l _o , / U, | 140 kA/415 V a, c | 40 kA/415 V a.c. 40 kA/440 V d.c. |
| .osses per 1 pole fixed/withdrawable design | 1. 1.4.7.4.1. 1.34.1 | 120 W/300 W | 120 W/300 W |
| dechanical endurance | | 10 000 cycles | 10 000 cycles |
| Bectrical endurance | a sere e a ser a granter | 4 000 cycles | 4 000 cycles |
| witching frequency | | 120 cycles/hr | 120 cydes/hr |
| ontrol force | terristication of the service | 230 N | 230 N |
| legree of protection from front side of the device | <u> </u> | 1P40 | 20 N |
| legree of protection of terminals | रेक्टर स्थाद राजकार | P20 | 1P20 |
| perating conditions as a factor | and the factor of the | | 11 20 |
| eference ambient temperature | CANADA TRANSPORTER | 40°C | 40°C |
| mblent temperature range | UAS 2011 (1911) | -40 ÷ 4557C | -40 ÷ +55 ℃ |
| orking environment | 1996 - 24 6491 | dry and tropical climate | dry and tropical climate |
| imatic resistance | arakhara | EN 60068 | EN 60068 |
| of lution degree | , 你就就要给你你 | 3 | in a property of the property of the property of |
| ax, sea leyel | THE STATE OF THE | a profession dates weappoint to a new person | 3 Tanta val isa san |
| - ४ वर्ग में मानविष्य अनेता प्रकार नराय नाव शिक्ष कर से अपने अनेता है। ilsmlc resistance | SACTOR CONTRACTOR | 2 000 m | 2,000 m |
| esign middifications | | 3g (8 ÷ 50) Hz | 3g (8 ÷ 50) Hz |
| ont/rear connection | | . / | |
| ug-In design | Secretaria de la constanta | •/• \$1,4955099550555555555 | e/o chilosannishari |
| ithdrawable design | aa-destard) | | 學是是是自己的 |
| (Cesone) | | | |
| | | | a state to the |
| vitches - auxiliary/relative/signal/early unt trip | Nadobele stead do | e/o/-/- Guardo sistema a logo des | •/e/-/- |
| 수 있는 도시에서 원칙에 시작하는 사람들은 사람들이 얼마나 없었다. 그렇지만 얼마를 하는 것이 없는 것이 얼마나 없다. 그는 사람들이 없는 것이 없는 것이다. | 的对象的 | | |
| idervoltage release/with early switch | ng pagamagan sa na na | o/ | •/- |
| ont hand drive/with adjustable lever | | •/• | 0/0 |
| echanical interlocking – with Bowden cable/for hand drive | | 0/0 | 0/0 |
| otor drive/with counter of cycles | 达为公司 | | 0/0 |
| ver with locking | | / • | e i da an i kwa ka anta an i tau i • |
| olt sealing insert/additional cover for overcurrent release | | $Z/\bullet L$ | •/- |
| ıvailable, — unavailable | / | | 1000 |
| in case circuit breaker connection is reversed (input terminals | 2, 4, 6, output term | inals 1, 3, 5) I does not change | ~ 100 |
| in IT networks up to 500 V a.c. | <i>)</i> | 1, " | 1/ 1/ 1/ // |

Diagram

Circuit breaker with accessories



3 P

Connecting and installation

ower circuit

- connected with Cu/Al busbars or cables, and possibly ables with cable lugs
- connection sets are produced to provide greater conlecting options see page H7
- e generally, conductors from the supply are connected o input terminals 1, 3, 5 and conductors from the load to erminals 2, 4, 6; however, it is possible to reverse the conjection (exchanging input and output terminals without miting rated short-circuit ultimate breaking capacity [_)
- in case of reversed connection, circuit breaker/ switch-disconnector must be fitted with ODBE-USO2 insulating barriers also on the side of erminals 2, 4, 6, for more detailed information see lage H16
- I we recommend painting the connecting busbars
- input and output conductors/busbars must
 mechanically reinforced to avoid transfering electrodynamic force to the circuit breaker/switch-disconnector during short-circuiting
- the method of connecting the power circuit nust observe the deionization space of the circuit reaker/ switch-disconnector, see page H16

auxiliary circuits

- r switches, shunt trips or undervoltage releases areonnected using flexible Cu conductors with cross-secion 0.5 ÷ 1 mm² directly to terminals on these devices
- motor drive and auxiliary circuits of the plug-in or vithdrawable design are connected using a connector

Recommended min. cross-section of cables and busbars (flexibars) for fixed and withdrawable design

| | • | The same of the sa |
|-------------|---|--|
| abl Cabl | 5\$[mm ²] | Bushari W.x H (mml) |
| er-verion = | All | |
| 17/1 | 150 | CONTRACTOR OF STATE O |
| 185 | | |
| 2x 150 | 2 x 185 | |
| 2x 185 | 2 x 240 | |
| 2x 240 | 3 x 240 | 50 x 10; 2x 50 x 5 2x 50 x 8 |
| 2x 240 | 3 x 240 | 2x50x6 2x50x10 |
| 3x 240 | 4 x 240 | 2x 50 x 10 |
| 4x 240 | | |
| | | 2x 50 x 10 ¹⁾ |
| | 2x 150 2x 185 2x 240 2x 240 3x 240 | 185 240 2x 150 2x 185 2x 185 2x 240 2x 240 3x 240 2x 240 3x 240 3x 240 4x 240 |

- ¹⁹ withdrawable device connected by 2x 50 x 10 mm Cu busbar can be loaded with max. 1 450 A. For 1 600 A loading, the withdrawable device must be connected with 2x 50 x 12 mm busbar.
- it is necessary to follow the relevant valid standards when cables are designed

Maximum circuit breaker/switch-disconnector loads in accordance with ambient temperature

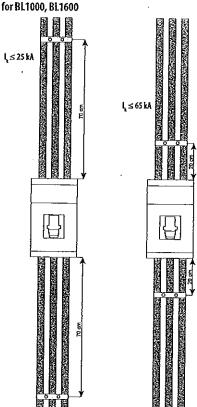
Circuit breaker/switch-disconnector BL1000S

- connection by Cu busbars 2x 50 x 6 mm per pole

| 4.000.4 | ***** | ez erasantsensusen | 的名字的 | SPIES/S |
|---------|---------|--------------------|-------------|---------|
| 1 000 A | 1 000 A | 940 A | 870 A | 800 A |

1400 Å 1300 Å 1200 Å 1100 Å . 1000 Å

Mechanical reinforcement of conductors



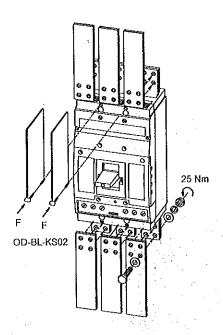
onnecting set specification

| lypeare | i dal | THE REPORT OF THE PARTY OF THE | ble=Jängesüf∉ghnerionym | | | |
|--------------------------|----------------|---|---|--|--|---|
| | | e oficialle | at to solid | a compostranției. | a someold | |
| | | | | | | Disarki ade - Denensojali NVX (((nuo) - Diavillo |
| CS-BL-W010 CS-BL-W011 | 800 | 2x (70 ÷ 240) Cu/Al | 2x (95 ÷ 300) Cu/Al | 2x (50 ÷ 185) Cu/Al | 2x (70 ÷ 240) (u/Al | page H18, H25 |
| (S-BL-B002 | 500 1 000 | . 70 ÷ 240 Cu/Al 2x (150 ÷ 300) Cu/Al | 95 ÷ 300 Cu/Al 2x (150 ÷ 300) Cu/Al | .50 ÷ ,185 Cu/A 2x (150 ÷ 300) Cu/Al | 70 ÷ 240 Cu/Al 2x (150 ÷ 300) Cu/Al | page H18, H26 |
| CS-BL-B003 | 1 500 | 3x (150 ± 300) Cu/Al | 3x (150 = 300) Cu/AI | 3k (150 ÷ 300) Cu/Al | 3x (150 + 300) Cu/Al | раде Н19 раде Н19, Н26 |
| CS-BL-B004 CS-BL-A022 | 1 600 1 000 | 4x (150 ÷ 300) Cu/Al | 4x (150 ÷ 300) Cu/AJ | 4x (150 ÷ 300) Cu/Al | 4x (150 ÷ 300) Cu/Al | page H20, H27 |
| CS-BL-A021 | 1600 | a ar i ki an kemen utan arawata an kisi masa di saperanci yan bili. Ukulimba 1903 mata masa masa kisa terah masa kisi utan kisi utan kisi utan kisi utan kisi utan kisi utan kisi u | SAN TERMENATUR YNDOG ARDATOL TOUR TOUR DE ANTEREN OER ANDER OAR EN | avie so arragos pareira pos asa. | | 50 x page H17/H27 50 x page H17 |
| CS-BL-A010 CS-BL-A020 | 1 600 1 600 | | | | | 50 x page FI24 |
| CS-BL-A015 | 1600 | 表情感的表情感觉的 | 高文学等基本的 | 832 V 394 | , 数数数据序式会选法 | 50 x \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |
| _CS-BL-A016 | 1 000 | | | // | | 50 x \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |
| | | | | V (| | , \\\\ |

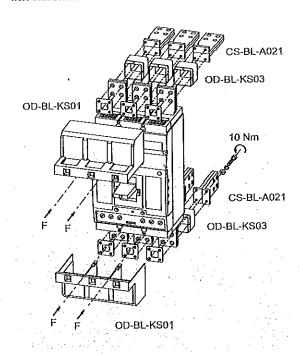
_ H13 €

Connecting and installation

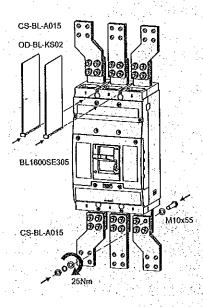
Front connection - busbars



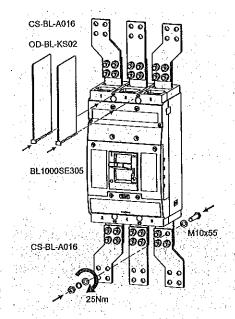
Rear connection



Front connection - busbars



Front connection - busbars

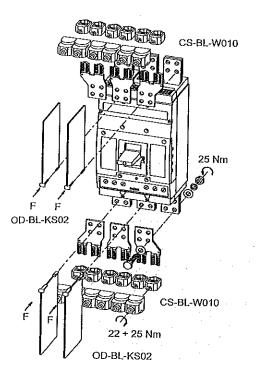






Connecting and installation

Front connection - 2 Cu, Al cables

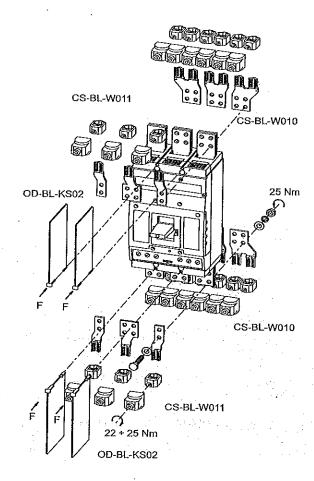


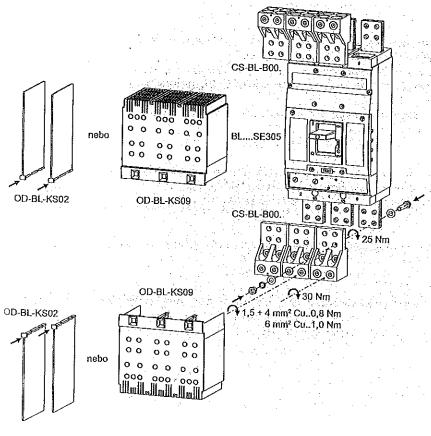
Front connection - cables

- 2 Cu/Al cables connecting sets CS-BL-B002
- 3 Cu/Al cables connecting sets CS-BL-B003
- 4 Cu/Al cables connecting sets CS-BL-B004



Front connection - 3 Cu, Al cables (not for BL1000SE305 switching unit)



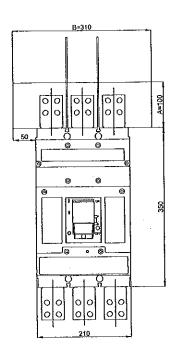


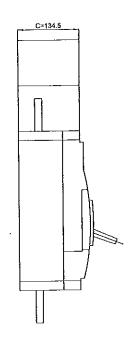




Deionization spaces

A, B, C - minimum deionization space free of earthed metal parts





Applicable for operational voltage $U_{\bullet} \le 690 \, \text{V}$ a.c./d.c. (DC only for switch-disconnector)

USE OF INSULATING BARRIERS AND TERMINAL COVERS WITH CIRCUIT BREAKERS AND SWITCH-DISCONNECTORS

₱ FIXED DESIGN

- front connection - terminals 1, 3, 5 (upper side) OD-BL-KS02 insulating barriers must always be installed on circuit breaker/switch-disconnector

- terminals 2, 4, 6 (lower side) a) if circuit breaker/switch-disconnector is connected to the supply using terminals 2, 4, 6, OD-BL-KSO2 insulating barriers must always be installed on it

b) if circuit breaker/switch-disconnector is connected on lower side using clamp or block type terminals, OD-BL-KSO2 insulating barriers must always be installed on it

-rear connection

- terminals 1, 3, 5 (upper side) - OD-BL-KSO1 insulating cover or OD-BL-KSO2 insulating barriers must always be installed on circuit breaker/switch-disconnector

- we recommend installing OD-BL-KSO3 insulating grommets with all sets for rear connection

- terminals 2, 4, 6 (lower side) - if circuit breaker/switch-disconnector is connected to the supply using terminals 2, 4, 6, 0D-BL-KS01 insulation cover must always be installed on it

- we recommend installing OD-BL-KSO3 insulating grommets with all sets for rear connection

M WITHDRAWABLE DESIGN

- front connection

- terminals 1, 3, 5 (upper side) - withdrawable device is connected on upper side using clamp or block type terminals, OD-BL-KS08 insulating barriers must always be installed — in all other cases, we recommend installing OD-BL-KS04 insulating cover on upper side of the device

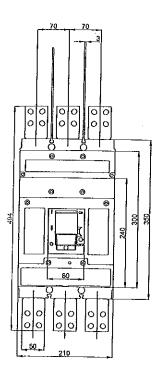
terminals 2, 4, 6 (lower side) - if withdrawable device is connected on lower side using clamp or block type terminals, OD-BL-KSO8 insulating barriers must always be installed — in all other cases, we recommend installing OD-BL-KSO4 insulating cover on lower side of withdrawable device

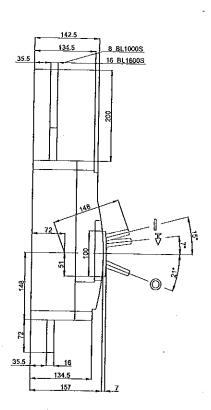
► H16

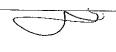
3P

imensions

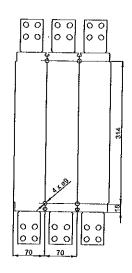
xed design, front connection

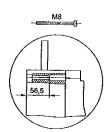






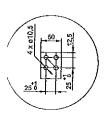
Drilling diagram



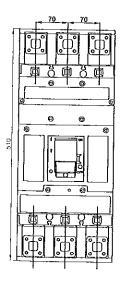


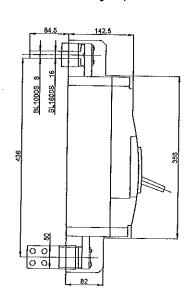


nnecting busbar modification

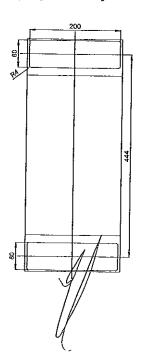


ted design, rear connection (CS-BL-A021, CS-BL-A022 connecting sets)





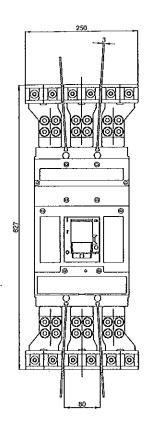
Openings for insulation grommets



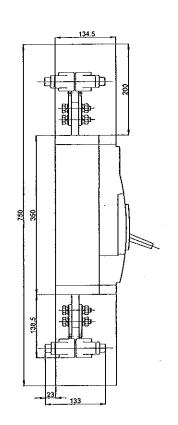


Dimensions

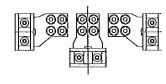
Fixed design, clamp terminals (CS-BL-W010 connecting sets) - combination of two sets arranged vertically can not be applied for BL1000SE305 switching unit



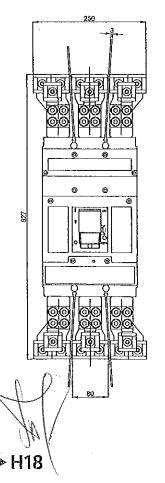
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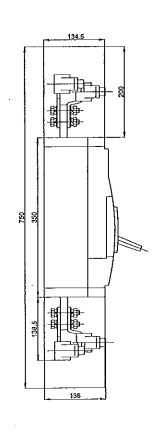


Another possibility of connection



Fixed design, clamp terminals (CS-BL-W010 and CS-BL-W011 connecting sets) - combination of two sets arranged vertically can not be applied for BL1000SE305 switching unit



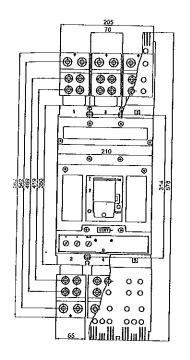


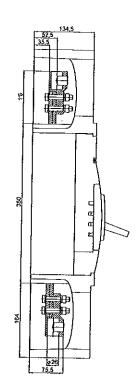


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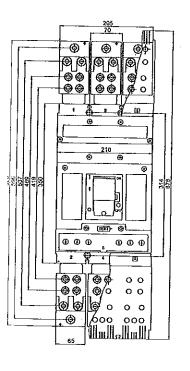
Dimensions

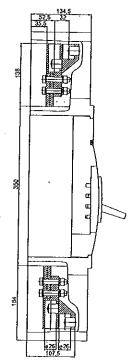
Fixed design, block terminals (CS-BL-B002)





fixed design, block terminals (CS-BL-B003)



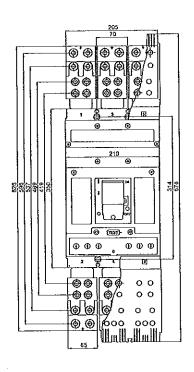


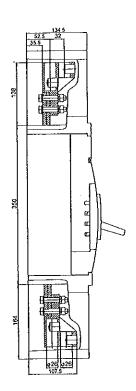




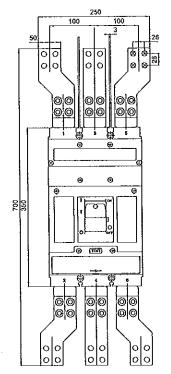
Dimensions

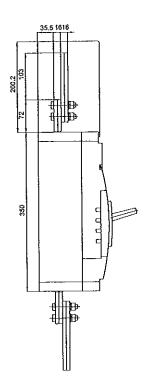
Fixed design, block terminals (CS-BL-B004)





Fixed design, CS-BL-A015 front connection





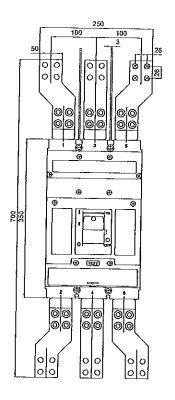


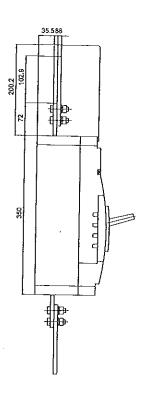


3P

Dimensions

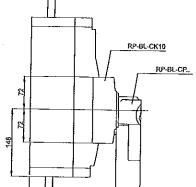
Fixed design, CS-BL-A016 front connection

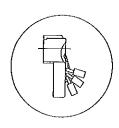




Fixed design, front hand drive

RP-BL-CK10



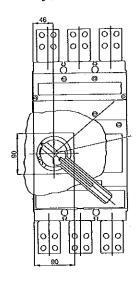


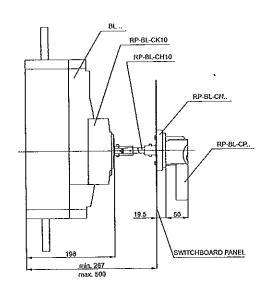
Hand drive lever - with locking (RP-BL-CP10, RP-BL-CP11)



Dimensions

Fixed design, front hand drive, adjustable lever



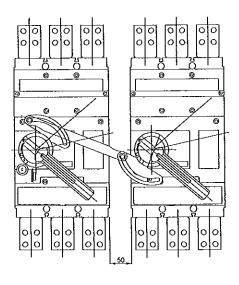


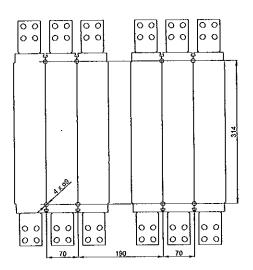


Switchboard door modification

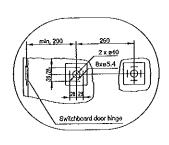


RP-B1-CB10 mechanical interlocking





Switchboard door modification



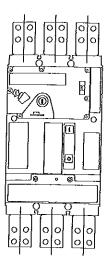


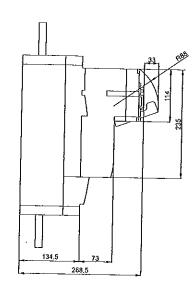


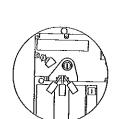
3P

Dimensions

Fixed design, MP-BL-X... motor drive

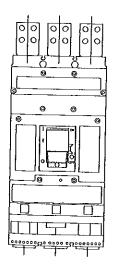


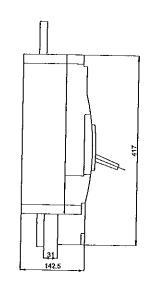




Locking using three padlocks

Fixed design, SB-BL-0002 signalling unit

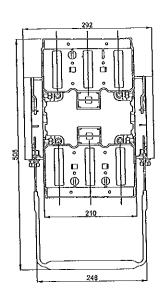


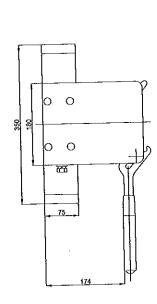


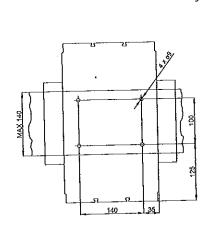


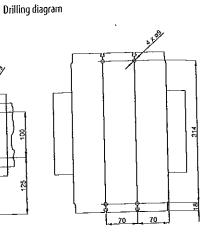
Dimensions

ZV-BL-1600-300 withdrawable device

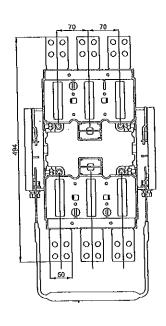


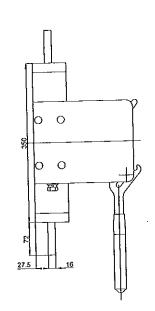


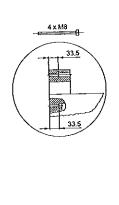




Withdrawable device, front connection (CS-BL-A010 connecting sets)







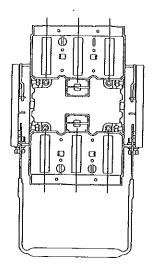


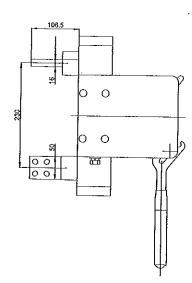


3P

Dimensions

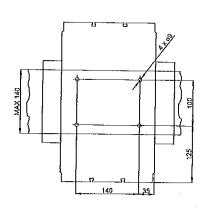
Withdrawable device, rear connection (CS-BL-A021 connecting set)



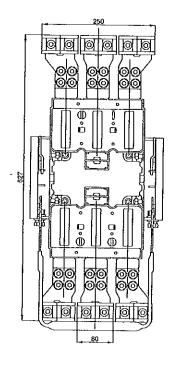


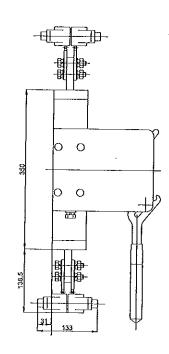


Drilling diagram



Withdrawable device, clamp terminals (CS-BI-W010 connecting set)



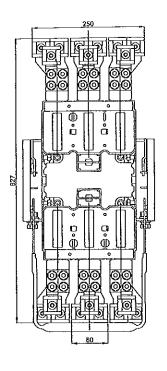


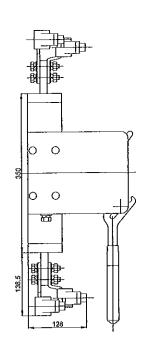
M



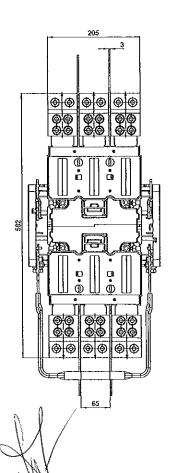
Dimensions

Withdrawable device, clamp terminals (CS-BL-W010 and CS-BL-W011 connecting sets)



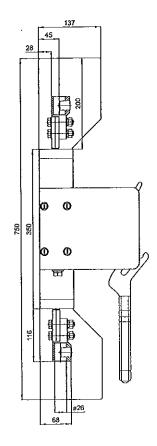


Withdrawable device, block terminals



► H26

Working position

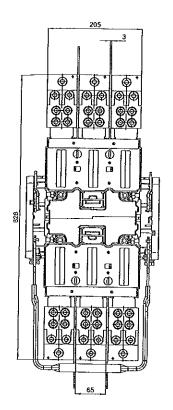


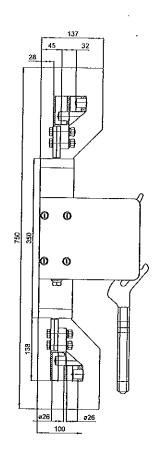


3P

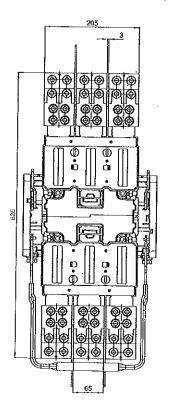
)imensions

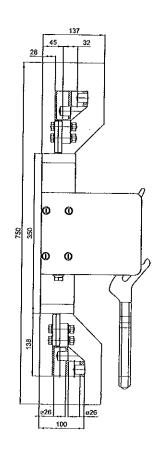
Withdrawable device, block terminals (CS-BL-B003)





Vithdrawable device, block terminals (CS-BL-B004)









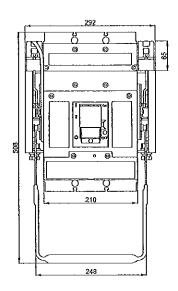
(

4

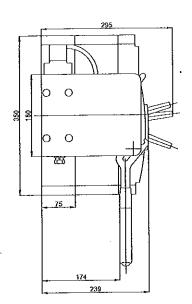
.

Dimensions

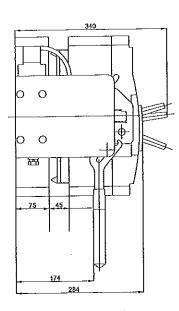
Withdrawable design



Working position



Inspection position

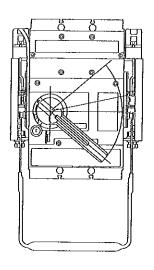




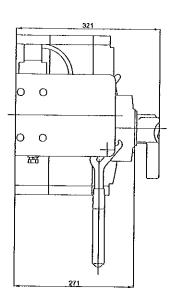


Dimensions

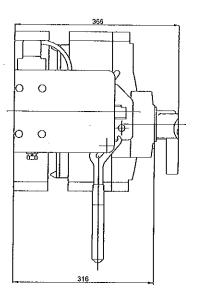
Withdrawable design, hand drive



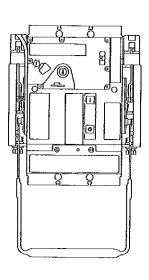
Working position



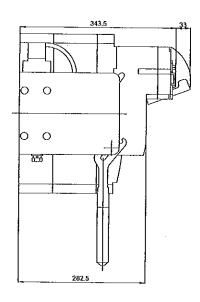
Inspection position



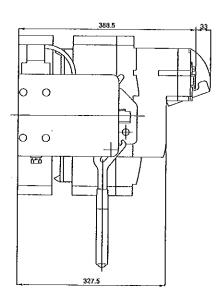
Withdrawable design, MP-BL-X230 motor drive



Working position



Inspection position





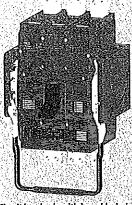




WITHDRAWABLE DEVICE



Withdrawable device ZV-BL-1600-300



Circuit breaker in withdrawable design



Withdrawable design of the circuit breaker/switch-disconnector is intended for demanding industrial applications where rapid exchange of the circuit breaker, frequent checking and both visual and conductive disconnection of the circuit are needed.

withdrawable device must be fitted with connecting the sets: 2 sets CS-BL-A010 – pro front connection or 2 sets CS-BL-A020 - for rear connection

■ OD-BL-MSO2 set of mounting bolts is used to fasten the withdrawable device into the switchboard, see page H10

Circuit breaker positions

Circuit breaker in withdrawable design has three positions:

- 1. inserted (working position)
- 2. withdrawn (inspection position)
- 3. removed

Power circuit

- connecting set CS-BL-A010 is used for connecting with busbars or cable lugs (front connection) or CS-BL-A020 connecting set (rear connection)
- for connection using cables, it is necessary in addition to a connection set CS-BL-A010 or CS-BL-A020 to use connection sets, see page H7
- the method of power circuit connection must observe recommendations, see page H12, as well as deionization space, see page H16

Auxiliary circuits

These are connected using 15-wire cable OD-BL-KAO1.

Circuit breaker accessories in withdrawable design Circuit breaker in withdrawable design has the same accessories as fixed circuit breaker.

Signalling of position 50-BL-0010

Withdrawable device can be fitted with up to four switches for signalling the position of the circuit breaker inserted, see table.

Advantages and enhanced safety for operator:

- remote signalling of circuit breaker's inserted position (position of locking is not signalled)
- checking of circuit breaker and accessories function in the inspection position
- locking withdrawable device against inserting circuit breaker, locking of circuit breaker in withdrawn (checking) position locking by means of padlocks
- visible and conductive disconnection of the power circuit
- easy exchange of circuit breakers in case of failure



Auxiliary circuits OD-BL-KA01



Signalling of position SO-BL-0010

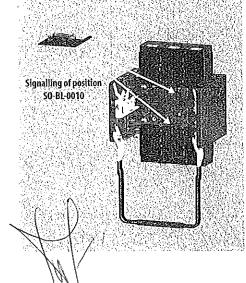
States of switches SO-BL-0010 in withdrawable device according to circuit breaker and arrestment positions (montheater position)

| Citratenicasci hosinoriis algebia | |
|--|-----------------------|
| | 10 |
| on the reconstruction that end in the left | 20 04 |
| Inserted (arrested and not arrested | 1 五字的設計(41号)集集 |
| Other positions | 1 0 |
| note: 0 - contact open. 1 - contact do | sed |

Specifications SO-BL-0010

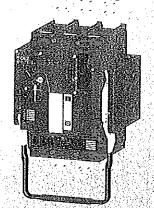
| Rated operating voltage | | 230 V a.c. |
|--|------------------|---|
| , acces of account of a constant of a consta | υ _ε | 220 V d.c. |
| Rated frequency | | 50/60 Hź |
| Rated operating current | 1 /U AC-13 | 6 A/230 V a.c. |
| | ຼົ້/ປົ DC-15 3.5 | A/24V d.c., 1 A/48V d.c., 0.3 A/110 Y d.c., 0.15 A/220 V d.c. |
| Arrangement of contacts | | 001 / / / |
| Connection cross-section | \$ | 0,5 ÷ 1 rg/m ² // |
| Degree of protection of terminals (o | apported switch) | IP20 // |

For wiring diagram of circuit breaker in withdrawable device with accessories, see page H12



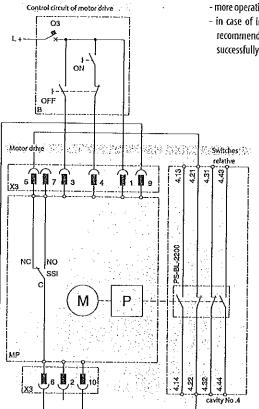


VITHDRAWABLE DEVICE



Circuit breaker in withdrawable design with motor drive

Recommended connection of circuit breaker in withdrawable design with motor drive



Inserting and withdrawing the circuit breaker with motor drive

- each time before inserting or withdrawing the circuit breaker we recommend at first to run the AUTO/MANUAL switch on the motor drive to the MANUAL position
- more operating information can be found in the operating instructions
- in case of infringement of this procedure or failing to follow the recommended wiring could mean that the circuit breaker will not successfully switch on at the first attempt



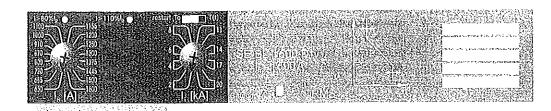
Diagram description

| Diag. | ant accompany |
|-------|---|
| Sym | of Description 3.5 |
| MP | motor drive MP-BL-X |
| M | motor |
| P | storage device |
| Х3 | connector for connection of control circuits |
| 551 | switch to indicate MANUAL (NO-C)/AUTO (NC-C) |
| В | recommended wiring of the control dircrits (not included in motor drive order) |
| ON | switch on button |
| OFF. | switch off britton |
| Q3 | motor drive circuit breaker for 110 V a.c. LPN-4C-1 |
| | for 230 V a.c. LPN-2C-1 |
| | for 110 V d.c. LPN-DC-4C-1 |
| | for 220 V d.c. LPN-DC-2C-1 |

Changes in states of switches in cavities of switching unit when inserting and withdrawing circuit breaker

| State of quality | iker U | tort us | nionwilhilia | | | | | | akerane dravale | nserijon/ |
|--|--------------------------------|---|---------------------------------|------------|---|-----------------------------|---|---------------|--------------------|------------|
| State of circuit breaker before insertion | | greed Chien | State of switc = withdrawn p | | e insertio | n | | | es after in | sertion |
| State of circuit breaker before withdrawal | | State of switches before withdrawal - Inserted position | | | State of switches after withdrawal - withdrawn position | | | | | |
| | | | Cavity 1 | ,2 | 3 | .4 . (5) | | ,2 | | 4 |
| | lever position | iin contacts | i | PS-8L-2200 | i | r>-BL-2200 | | PS-8L-2200 | i | PS-BL-2200 |
| | Circuit breaker lever position | State of the main contacts | 49 30 | 10 | 30 | 20 | 1 | 10 | 19 1 | 20 |
| Switched on | | 10 | 1 | 0 | (i) | 0 | 0 | Sulfi Sire | 0 | 1 |
| Switched off manually or by motor drive electrically (loaded state) | 0 | 0 | 0 | 1 | 1 . | 0 | 0 | 1 | 1 | 0 |
| Switched off from switched on state: by the releases or TES1 pilsh button | Ĭ | Ō | 0 | 1/ | 1 | 25 (1) V. 1) (1) | 0 | 1 | \^ | \ 0 0 |
| note: 0 - contact open, 1 - contact closed | | | | 4 | | | | | | |

OVERCURRENT RELEASES - DTV3







 $I_1 = 1000 \, A$ SE-BL-1000-DTV3



L = 1250 ASE-BL-1250-DTV3



I = 1600 A SE-BL-1600-DTV3



Properties

- suitable for protection of lines and distribution transformers
- m protects against both overcurrent and short circuit
- m reduced current setting $I_n = 0.4 \div 1 I_a$
- **m** thermal memory can be switched on/off (ON = T_{tc} , OFF = T_{tc})
- m setting of the value of the short-circuit release L in 8 steps
- setting of l_a and l by means of the rotary switches is stepwise
- m the overcurrent release indicates the value of the passing current by means of LED
- # the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

Switching unit Overcurrent release Overcurrent release setting Reduced current Thermal memory Short-circuit release current





IMPORTANT

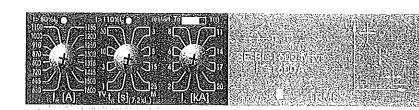
■ thermal memory must be switched on in protection of transformers and lines - thus the transformer or the line will be protected against repeated overload

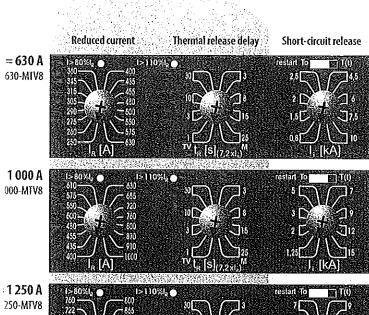


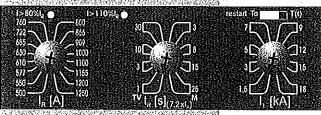
t

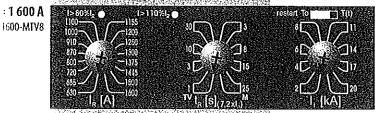












Properties

- 🗷 TV mode suitable for protection of lines, distribution transformers and generators
- protects against both overcurrent and short circuit
- reduced current setting $I_g = 0.4 \div 11_g$
- **a** thermal memory can be switched on/off (ON = T_{nv} OFF = T_{nv})
- in TV mode the undercurrent release is inactive
- $\,\blacksquare\,$ setting of delay of the thermal release $\rm t_{\rm g}$ 1 s, 3 s, 10 s and 30 s
- 🛮 setting of the value of the short-circuit release I, in 8 steps
- setting of l_e, t_e and l_e by means of the rotary switches is stepwise
- m the overcurrent release indicates the value of the passing current by means of LED
- mage the values of parameters of the overcurrent release are set by the manufacturer to minimum

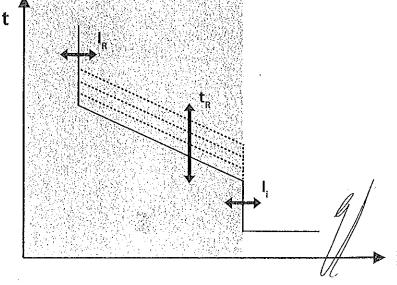
Data for the project

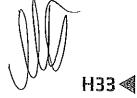
| Data tot the project | |
|-------------------------------|---------------|
| Switching unit | /BL1600. |
| Overcurrent release | SE BL |
| Overcurrent release setting | |
| Reduced current | I, WARREN |
| Mode | iv. |
| Thermal memory | T 2000 T 3000 |
| Thermal release delay | t, 15.33 |
| Short-circuit release current | L MANAGEMENT |
| | |



IMPORTANT

m the set value of current of the short-circuit release must correspond to the impedance loop - conditions must be fulfilled for automatic disconnection from power supply in case of failure

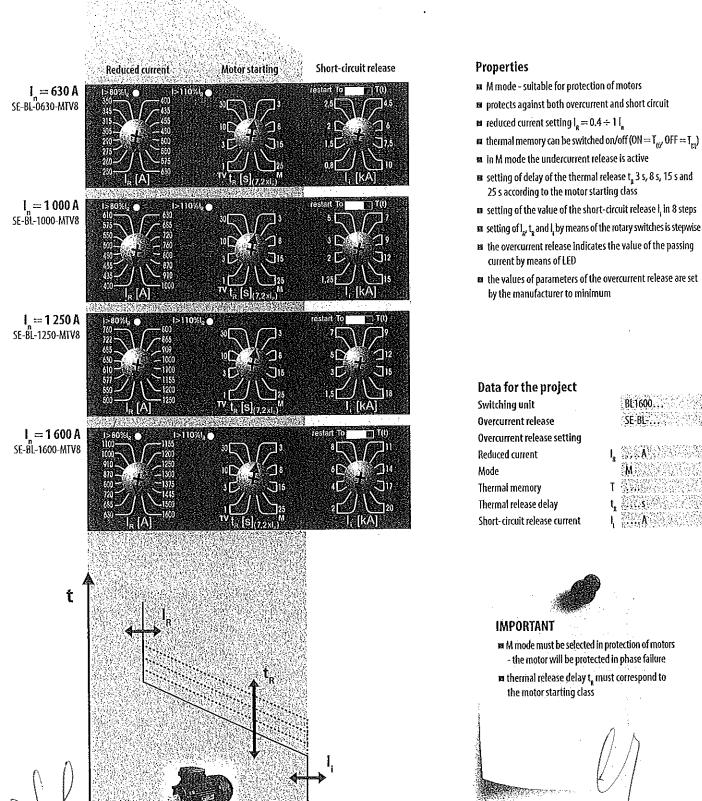




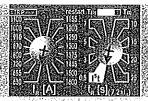
OVERCURRENT RELEASES - MTV8, M mode

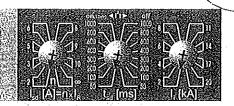
BL1600S





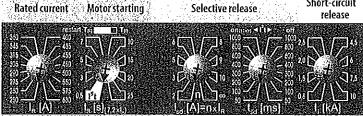
VERCURRENT RELEASES - U001



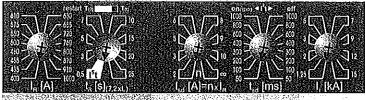


Short-circuit

 $I = 600 \, A$ SE-BL-600-U001



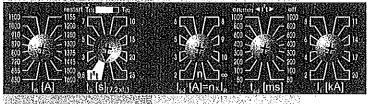
 $l_{\rm p} = 1\,000\,{\rm A}$ SE-BL-1000-U001

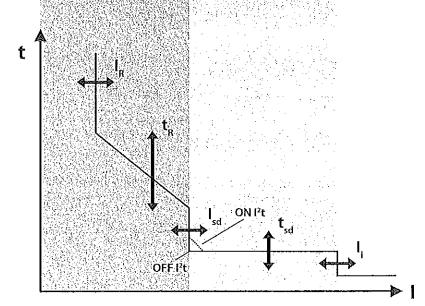


 $I_{x} = 1250 \,\text{A}$ SE-BL-1250-U001



I = 1600 ASE-BL-1600-U001





Properties

- **III** it is designed for demanding applications with a complicated load and required high selectivity with fuses or circuit breakers
- protects against both overcurrent and short circuit

- reduced current setting $I_g = 0.4 \div 1 I_g$ thermal memory can be switched on/off $(0N = T_{ey}, 0FF = T_{ey})$ setting of the value of selective release t_g in 8 steps, possibility of setting of gradient of characteristic of the thermal release I^s t (adaptation of time-current characteristic of the fuse)
- setting of the value of selective release I in 8 steps (independent time-delayed release)
- setting of delay of the selective release t_s, 50 to 1000 ms including possibility of setting of a gradient of characteristic of the short-circuit release (adaptation of the time-current characteristic of the fuse)
- setting of the value of the short-circuit release 1, in 8 steps
- setting of l_{st}, t_{st}, t_{st} and l_s by means of rotary switches is stepwise
- m the overcurrent release indicates operating state and the value of the passing current by means of LED
- the values of parameters of the overcurrent release are set by the manufacturer to minimum

Data for the project

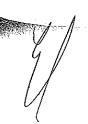
| Switching unit | BL1600 |
|---|---------------|
| Overcurrent release | SE-BL |
| Overcurrent release setting | |
| Reduced current | I. AMAGOMENTO |
| Thermal memory | i nakomasaka |
| Setting of the gradient of charac- teristic of the thermal release | Pt |
| Thermal release delay | t, 12.5 |
| Selective release value | I A (3. xl.) |
| Selective release delay | t ms |
| Setting of the gradient of charac- teristic of the short-circuit release | Pt val. |
| Short-circuit release value | Ι Α |



IMPORTANT

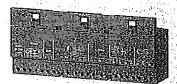
u to achieve as high selectivity as possible, use the possibility of setting of the current and delay including gradient of the time-current characteristic of the independent (short-circuit) time-delayed release.

For selectivity solution, use the calculation program Sichr.

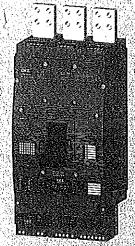




SIGNALLING UNITS



SB-BL-0002



DIMENSIONS see page H23

Description

- the SB-BL-0002 signalling unit is a modular accessory for the BL1000S and BL1600S circuit breakers and collaborates with the electronic releases SE-BL-...-DTV3, SE-BL-...-MTV8 and SE-BL-....-U001
- xx it is intended for applications in automated-control systems
- **s** the unit signals reaching a certain current value in a circuit and the tripping of the circuit breaker by releases (dependent, independent, undercurrent)
 - user has an option to set up (by steps, using a rotary switch) an amount of currenthe wishes to indicate if it has been reached
- can be set 70; 80; 90; 100; 120; 140; 160 or 180 % l_R (for more details see table)
- local indication regarding the state of the circuit breaker and the protected circuitry is carried out by LED indicators on the front panel of the unit
- the information on the state of the circuit breaker is transferred from the release to the signalling unit by means of optical coupling

- remote indication on the state of the circuit breaker and the protected circuitry is ensured by a relay, the make and break contacts of which are pulled into the terminal strip on the unit
- relays to indicate tripping of dependent or undercurrent and independent releases have storage – they do not change their state after disconnection from supply voltage
- after the storage relay is activated by tripping of a release, it is necessary to reset the relay using the front panel RE-SET switch or by an external push button remotely - reset is functional in case the supply voltage is connected to the signalling block
- supply voltage values are given in the table
- mathe main power supply and the reset circuit are not concurrently conformable with conditions for safe separation of the circuits
- the external RESET push button must be connected using a screened cable or a twisted wire with maximum resistence of the loop 100 0hm

The signalling unit will not work without power supply!

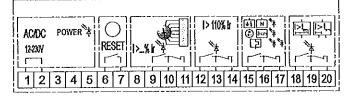
Specifications

| Туре | | SB:BI 0002 |
|--|--|---|
| Rated operating voltage | U, | 12 ÷ 230 V a.c./d.c. |
| Short-circuit protection | tube fuse | 11,64 |
| Rated frequency | f <u>.</u> | 50/60 Hz |
| Current consumption (mrs) max. at U | 12 V a C/d C 24 V a C/d C 48 V a C/d C 110 V a C/d C 230 V a C/220 V d | 370 mA 170 mA 100 mA 60 mA c. 50 mA |
| Rated operating current (of relay contact) | I, /U, AC-1 | 8 A/230 V a.c. |
| • | lj./Uj. DC-1 | σ.25 A/220 V d.c., 8 A/30 V d.c. |
| Connection cross-section | 多原物等级 | 0.5÷ 1 mm² |

Power circuit status indication

| | < 70 % I _g | _ | + |
|---------------------|-------------------------------------|----|-----|
| Reaching | 110%[| + | + |
| | 70; 80; 90; 100; 120; 140; 160; 180 | | + |
| | Settings | + | + |
| | By dependent/undercurrent | 4, | +/+ |
| Iripping by release | Independent | + | + · |

Connection



1,2 - supply

6,7 - external RESET push button

9,10,11 - relay contacts indicating preset lg

12,13,14 - relay contacts indicating reaching 110 % l

15,16,17 - relay contacts indicating tripping by dependent or undercurrent releases

18,19,20 - relay contacts indicating tripping by independent release (instantaneous or delayed ones



Modelon

3P

ILIARY SWITCHES



| ÷ . | | | | | |
|-----|----|---------|----------|-------|------------|
| | | | | | (1) (1) |
| No. | | | | | |
| Ø | 60 | \$40 HR | 建 | -7202 | 15.14 |

Cavities in switching unit BL1000SE305 BL1600SE305

Specifications

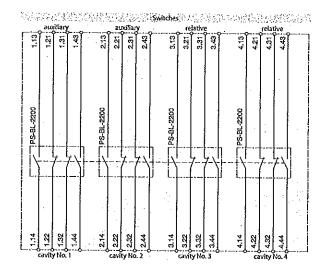
| Rated operating voltage | U, | 60 ÷ 500 V a.c. 60 ÷ 240 V d.c. | 5 ÷ 60 V a.c. 5 ÷ 60 V d.c. |
|--|----------------|---|---|
| Rated insulation voltage | U _I | 500 V | 500 V |
| Rated frequency | f | 50/60 Hz | 50/60 Hz |
| Rated operating current | | AC-15 6 A/60V ÷ 240V, 3 A/400V, 1.5 A/500V DC-13 1 A/60V, 0.7 A/110V, 0.3 A/240V | AC-12, DC-12 0.004 ÷ 0.5 A/5 V, 0.004 ÷ 0.01/60 V |
| | ,,,, | 11400 1101 1011 1011 1011 | 0.004 ÷ 0.01/00 ¥ |
| | ا | 6A | 0.5 Å |
| | إ | 6 A | 0.5 A |
| Thermal current Arrangement of contacts Connection cross-section Degree of protection of ter | ્રો - ડે | 6 A | term to the first term of the |

^{11 –} PS-BL-...- Au is not suitable to control electromagnetic loads

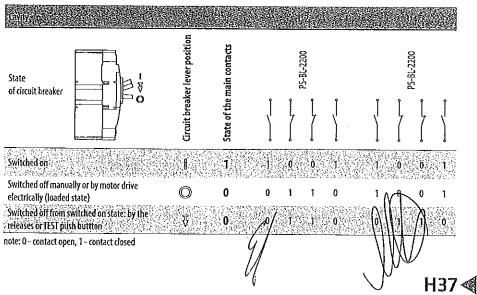
| Arrangement of | contacts Number of cont | arts in Confact Types |
|----------------|-------------------------|-----------------------|
| 22 | 2+2 | break + make |

Names and functions of switches according to their location in cavities

| Position of switch | switth name | S SWIGHT TURNING SELECTION OF THE SELECT |
|--------------------|------------------|--|
| Cavity 3, 4 | Relative switch | to Indicate tripping of the circuit breaker by releases, TEST push button or by motor |
| Cavity 1, 2 | Auxiliary switch | signals position of circuit breaker/switch-disconnector's main contacts |

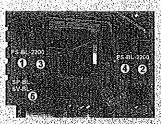


States of switches in the circuit breaker cavities



SHUNT TRIPS





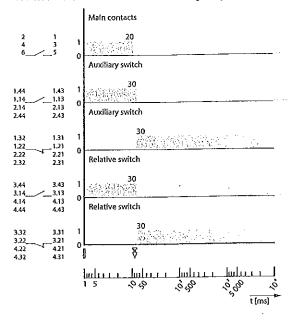
Cavitles in switching unit BL1000SE305 BL1600SE305



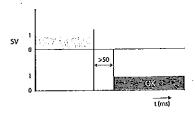
Specifications

| Rated operating voltage | U, | 24, 48, 110, 230, 400, 500 V a.c. 24, 48, 110, 220 V d.c. | |
|---|----|--|-----|
| Rated frequency Input power at 1.1 U | f | 50/60 Hz < 2,5 VA < 2 W | ./8 |
| Characteristic | | $U \ge 0.7 U_{\rm e}$ the circuit breaker must trip | |
| Time to switching off | • | 20 ms | |
| Loading time | | | |
| Connection cross-section | 5 | 0,5 ÷ 1 mm³ JP20 | |
| Position In cavity No. | • | 5 | |

Circuit breaker/switch-disconnector switching off by shunt trip

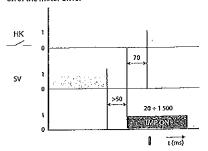


Reaction time of the shunt trip

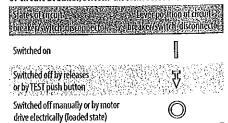


Cooperation of motor drive and shunt trip

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and shunt trip at once. The following time delays have to be kept between the disconnection of voltage from the shunt trip and the control impulse for switch on of the motor drive:



States and positions of circuit breaker/switch-disconnector lever



Description of graphs

| KK | CDESCRIPTION CONTROL OF THE CONTROL OF T | |
|--------|--|------|
| OK + | Circuit breaker is ready for further handli | nd . |
| IMP ON | Make impulse for the motor drive | |
| SV | Control voltage on the shunt trip | |

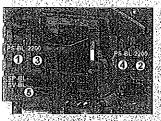




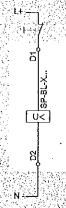
3P

RVOLTAGE RELEASES





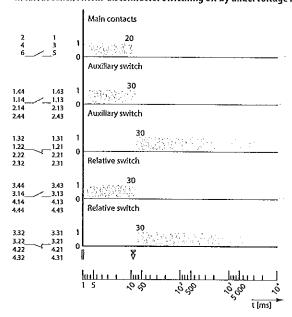
Cavities in switching unit BL10005E305 BL1600SE305



Specifications

| Rated operating voltage | U, | 24, 48, 110, 230, 400, 500 V a.c. |
|--|------------------|--|
| Rated frequency | , f _e | 24, 48, 110, 220 V d.c. 50/60 Hz |
| Input power at 1.1 U _e | | <2.5VA <2W |
| Characteristic ¹⁾ | | $U \ge 0.85 U_{\rm s}$ it is possible to switch on the circuit breaker $U \le 0.35 U_{\rm s}$ the circuit breaker must trip. |
| Time to switching off | | 20 ms |
| Loading time | | |
| Connection cross-section | S | 0.5 ÷ 1 mm² |
| Degree of protection of terminals (conne | cted release) | IP20 |
| Position în cavity No. | | 5 |

Circuit breaker/switch-disconnector switching off by undervoltage release

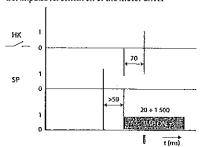


Reaction time of the undervoltage release



Cooperation of motor drive and undervoltage release

It is necessary to keep time delay when the control of the circuit breaker is done by motor drive and undervoltage release at once. The following time delays have to be kept between bringing the voltage to the undervoltage release and the control impulse for switch on of the motor drive:



States and positions

of circuit breaker/switch-disconnector lever

| at cucour bisavet\2Mit(ii-m2coll | Herror tevel |
|---|--------------------------|
| States at circuites electric assets (1911) | ever position of arcults |
| breaker/synchroliskomerom seksbre | key/swirch disconnectors |
| Switched on | |
| Switched off by releases or by TEST push bufton | ₩. |
| Switched off manually or by motor drive electrically (loaded state) | |

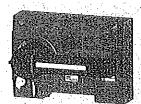
Description of graphs

| Symbol | December 2 |
|--------|---|
| НК | Main contacts |
| OK 🗀 🗀 | Circuit breaker is ready for further handling |
| IMP ON | Make impulse for the motor drive |
| SP | Control voltage on the undervoltage release |





HAND DRIVES



Description

The hand drive is the accessory of the circuit breaker//switch-disconnector which enable circuit breakers BL800S and BL1600S to be controlled locally by applying rotary movement on the lever, e.g. for switching electrical equipment on and off. Modular conception of the drives enables simple mounting on the circuit breaker after the circuit breaker cover of cavities is removed. The drive and its accessories are ordered separately according to your choice, see page H9.

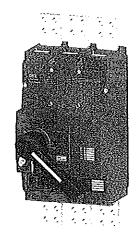
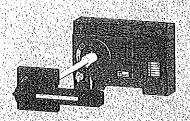


Fig. 1 - DIMENSIONS see page H21



- The hand drive enables to control the circuit breaker through the front panel or through the switchboard door, the outlet for the operating shaft has the IP44 or IP66 degree of protection for bearings.
- Hand drive control lever can be fitted with an extension shaft which makes possible to control the circuit breaker also in deeper switchboards.
- In order to enhance safety for the operator of the electrical equipment, the mechanism of the drive is furnished with locking system preventing the switchboard door from opening when the circuit breaker is in closed position.
- When the circuit breaker is in position for manual open, the drive handle can be locked up using the built-in cylinder type lock (FAB) and as many as three padlocks with shank diameter up to 6+8 mm.
- ₩ When the drive lever is in position manual open, it is possible to remove the handle.
- The circuit breaker with hand drives can be fitted with mechanical interlocking system, see page H41.

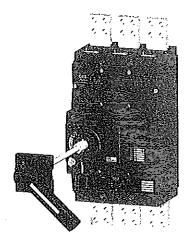


Fig. 2 - DIMENSIONS see page H22

Specification

| Specification | | | ooking While Ane chou't breakers an OTE | | ngorthesvalijipontdooropeninginthe svandledooropolithraeless | |
|--------------------------|--|------------|--|--|---|---|
| RP-BL-CK10 | Hand drive unit | - | yes | - | - | Contract the same and appearance and part of the Late 2 |
| RP-BL-CP10 | Hand drive lever | black | yes | | | |
| RP-BL-CP11 RP-BL-CN10 | Hand drive lever Hand drive bearing | red | yes | - 1 P44 | yes | |
| RP-BL-CN20 | Hand drive bearing | | er vara sava ustava er er ektor atrata er ett 1800 var | | yes | |
| RP-BL-CH10 | Extension shaft | 100 5 9 12 | And any delivery of the latest and the | \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | | 365 |





Modelon

ECHANICAL INTERLOCKING

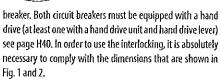
3P



RP-BL-CB10 Mechanical interlocking

Provides mechanical interlocking of two circuit breakers so that they cannot both be tripped simultaneously, but only one of them at a time.

🗷 Interlocking can be used between two BL1000S or BL1600S circuit breakers or between a BL1000S and BL1600S circuit



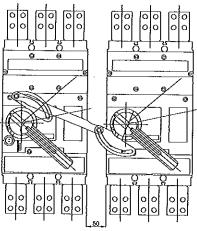


Fig. 1

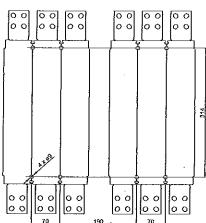
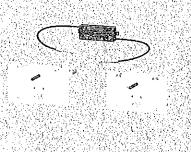


Fig. 2



MB-BL-PP07 Mechanical blocking with Bowden cable

Provides mechanical interlocking of two circuit breakers so that they cannot both be tripped simultaneously, but only one of them at a time.

■ Interlocking can be used between two BL1000S or BL1600S circuit breakers or between a BL1000S and BL1600S circuit breaker. For interlocking, circuit breakers can be equipped

MB-BL-PP07 fixed - fixed MB-BL-PV08 fixed - withdrawable MB-BL-VV06 withdrawable - withdrawable with a hand or motor drive. In order to use the interlocking, it is absolutely necessary to comply with the dimensions that are shown on page H42. Mechanical interlocking allows to be switched on of the first circuit breaker and loaded position of the second circuit breaker,

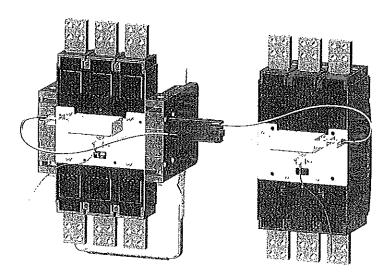
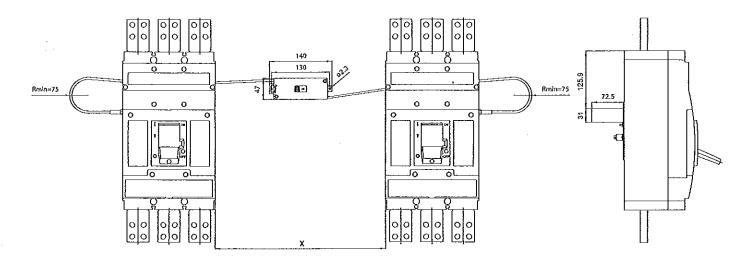


Fig. 3 - Mechanical blocking with Bowden cable between fixed and withdrawable BL circuit breakers



MECHANICAL INTERLOCKING

Mechanical interlocking - option for locating the circuit breaker/switch-disconnector

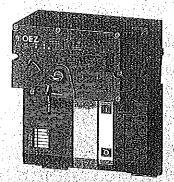


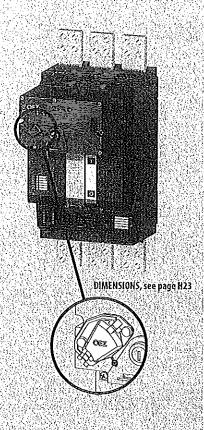
| Combination of arout breakers & co | Distance b | etween the o | iont breakers |
|------------------------------------|------------|--------------|---------------|
| fixed - fixed | 0 | or | 100 ÷ 1 450 |
| fixed - withdrawable | 0 | or | 50 ÷ 1 400 |
| withdrawable - withdrawable | 0 | or | 50 ÷ 1 350 |

[&]quot;-TECHNICAL INFORMATION, see Instruction for use



1





Cover of switch on button OD-BL-KT01



Description

- It is used for remote control of the circuit breaker (switch off/on).
- Simple mounting on the circuit breaker after the circuit breaker cover of cavities is removed.
- Usage in industrial applications e.g. switching of stand by units, synchronization of two sources or wherever the automated and unmanned operation of electric devices is needed.
- In order to speed up the circuit breaker's switch off (e.g. safety STOP button) the undervoltage release or shunt trip can be used.
- On the motor drive front panel there is a change-over switch to select the drive modes AUTO/MANUAL:
 - mode AUTO remote control. The circuit breaker is controlled by buttons for electric switch off/on. The circuit breaker can be switched off by TEST button on the overcurrent release.
 - mode MANUAL manual control. Control voltage is not needed. The circuit breaker can be switched on using the green button on the motor drive front panel and switched off using the red button on the overcurrent release. Electric switch on is blocked. Electric switch off is functional. The accumulation of energy can be done by means of hinged lever.
 - possibility of remote signalling of the state of the switch AUTO/MANUAL.

- The presence of control voltage U_is signalled by green LED
- If the circuit breaker is not stored by motor drive until 30 s., e.g. due to undervoltage, extremely low temperature, mechanical or electrical failure, the LED diode on the front panel is shining in red. During the lighting of the red LED, the drive is disconnected electronically, and cannot be remotely controlled. In order to restore remote control it is necessary to disconnect the drive for 30 s. At tripping of the circuit breaker by the overcurrent release, by auxiliary releases, or by TEST push button (in drive mode AUTO), the motor drive automatically accumulates energy (circuit breaker loading), motor drive is then ready to switch on the circuit breaker
- \blacksquare Drive can be locked in off position by lamellar lock (it is part of the drive with two keys) or by up to three padlocks (shank diameter max. $4 \div 7$ mm).
- Drive can by furnished with the counter of cycles.
- Switch on button can be covered and sealed (OD-BL-KTO1).
- The transparent part of front panel enables to determine the state of circuit breaker according to the lever position.
- Drive can be connected by terminal block with screws or by means of multi-pole connector with cavities (in order to connect cables special tongs have to be used).



Specifications

| Type | | MPBEX (MPBEX) P |
|---|--|--|
| Operating voltage | IJ _e | 110, 230 V a.c. |
| | • | 110, 220 V d.c. |
| Rated frequency | | 50/60 Hz |
| Control impulse length for switching on | | >20 ÷ 1 500 ms ¹⁾ |
| Control impulse length for switching off | | >20 ms + ∞ ¹⁾ |
| Time to switching on | | <70 ms |
| Time to storage (loading) of motor drive at | t Ü _e 230 V a.c. 220 V d.c | 14 s 18 s |
| Time to switch-off of circuit breaker U_2. | | 105 |
| | 20 V d.c. | 12 s |
| Frequency of cycles ON/OFF | | , 2 cycles/mln |
| Frequency of cycles – instant successive 0 | N/OFF | 8 cycles |
| Mechanical endurance | 的,我们就是一个 | 10 000 cydes |
| Input power | AC | 200 VA |
| | DC | 200 W |
| Protection | 110 Y a.c., 230 Y a.c. 110 Y d.c., 220 Y d.c. | 你没有的事情,你可以看到,只要是我们的自己的人,我没有一个的事情,我们就是这样的。""我们的是一个人的人。" |
| Rated operating current of the change-over AUTO/MANUAL | rswitch [ˌ/Uˌ | 6 A/250 V a.c. |

^{11 -} for sequence of control impulses, see page H46

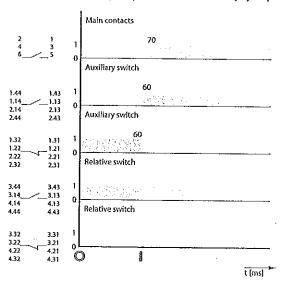




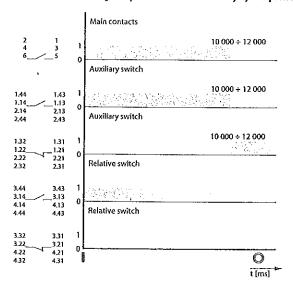
MOTOR DRIVES

Specifications

Circuit breaker switching on by motor drive - electrically by ON push button

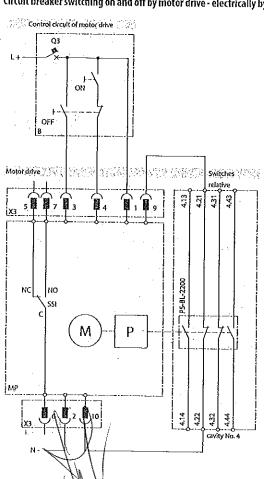


Circuit breaker switching off by motor drive - electrically by OFF push button



Diagram

Circuit breaker switching on and off by motor drive - electrically by ON and OFF push button



States and positions of circuit breaker/switch-disconnector lever

| gstatesofringili Shr <u>eaker/syutdr</u> ullsronnertøre | A gyer position of arount 1973 S breaker/syntal-disconnecting |
|---|--|
| Switched on | |
| Switched off by releases or by TEST push button | $\overline{f v}$ |
| Switched off manually or by motor drive electrically (loaded state) | 0 |

Diagram description

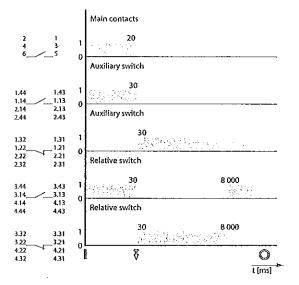
| Symbol v | and the completion of the comp |
|----------|--|
| MP | motor drive MP-BL-X |
| | moter |
| P | STOFAGE GEVICE |
| X3 | connector for connection of control circuits : |
| SSI | switch to indicate MANUAL (NO-C)/AUTO (NC-C) |
| B | recommended wiring of the control circuits - It is not a part of major drive |
| ON | switch on button |
| OFF | syritch off button |
| Q3 | motor drive circuit breaker - see page H43 |





Specifications

Switching off of the circuit breaker with motor drive by shunt trip or undervoltage release





States and positions of circuit breaker/switch-disconnector lever

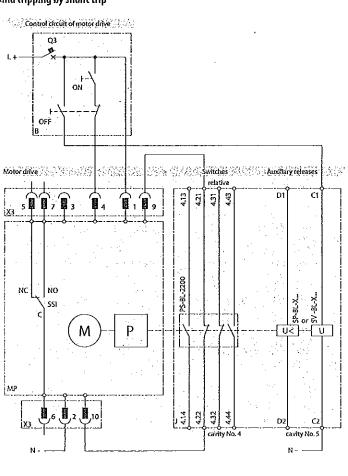
| States of circuit breaker/switch disconnector (Level po | sition of grout breaker/switch-disconnector |
|---|---|
| Switched on | |
| Switched off by releases or by TEST push button | V |
| Switched off manually or by motor drive electrically (loaded state) | |

Diagram description

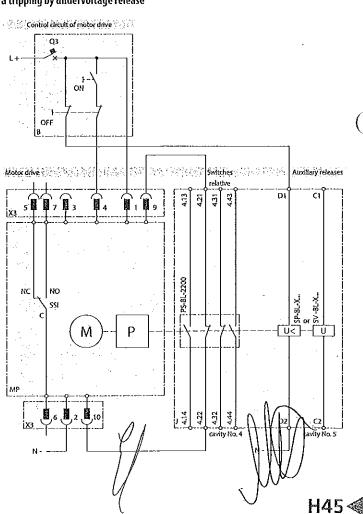
| MP | motor drive MP-BL-X |
|-----------|--|
| M | motor |
| P | storage device |
| X3 | connector for connection of control circults |
| SSI | switch to Indicate MANUAL (NO-C)/AUTO (NC-C) |
| В | recommended withing of the control circuits - not included in motor drive order |
| ON | switch on button |
| OFF / | switch off button |
| Q3 | motor drive circuit breaker - see page H43 |

Diagram

Circuit breaker switching on by motor drive (electrically by ON push button) and tripping by shunt trip



Circuit breaker switching on by motor drive (electrically by ON push button) a tripping by undervoltage release

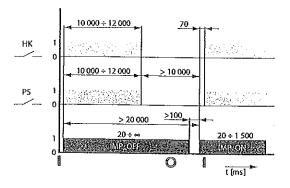


MOTOR DRIVES

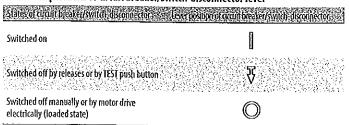
Specifications

Recommended control impulses

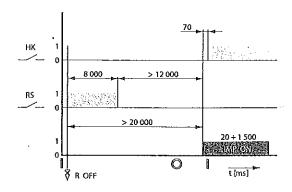
Circuit breaker switching on and off by motor drive



States and positions of circuit breaker/switch-disconnector lever



Circuit breaker switching off by overcurrent release, shunt trip or undervoltage release and switching on by motor drive



Description of graphs

| Symbol (# 152 | Description |
|--------------------------|--|
| HK -8 Contraction (1) | main contacts protects approximate the contacts of the contact of |
| PS RS | auxillary switch |
| | circuit breaker closing instant by release |
| IMP ON | make impulse for the motor drive |
| IMP OFF | break impulse for the motor drive |





Modeion



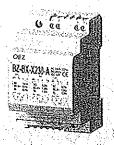
OTHER ACCESSORIES OF MOULDED CASE CIRCUIT BREAKERS

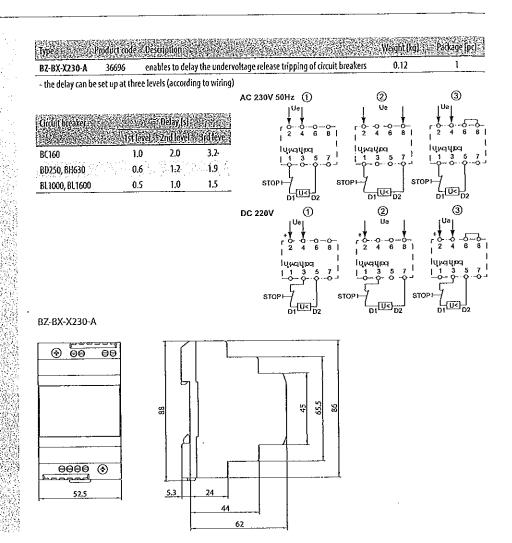




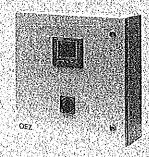


DELAY UNIT





AUTOMATIC STANDBY UNIT MODI



| MODIZA - enables safe control of switching of two power supplies to one or two loads with exclusion of parallel operation of the power supplies - enables various adaptations according to the customer's requirements - for backup operation with a transformer or generator - from 16 to 6 300 Å | l'ipe | Descriptions: | Weightikal | Padkage (pc) |
|--|--------|--|------------|--------------|
| | MODIZA | two loads with exclusion of parallel operation of the power supplies - enables various adaptations according to the customer's requirements - for backup operation with a transformer or generator | 10 | 1 |

- for circuit breakers and switch-disconnectors Modeion and Arion WL
- for detail information see catalogue Automatic standby unit MODI ZA

| · Barrier | 。 第一条数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据 | 100 | 经(海)经验 |
|-----------|---|-----|--------|
| MODI ZB | enables safe control of two power supplies to one load with exclusion of parallel operation of the power supplies for backup operation, in particular with a generator | 10 | 1 |
| | – from 40 to 630 A | | |

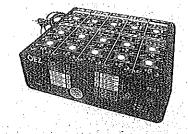
- for Modeion circuit breakers
- -for detail information see catalogue Automatic standby unit MODI ZB





Modelon

TESTER OF OVERCURRENT RELEASES OF CIRCUIT BREAKERS



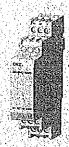
| Typexi≕s | Product code | Vescription: | Weight [kg] | Package (pc) s |
|----------|--------------|--|-------------|----------------|
| ZES4 | 17273 | Tester of overcurrent releases of circuit breakers BD250, BH630, BL1000S and BL1600S | 3.75 | 1 |

- service device for checking the functionality of electronic overcurrent releases and switching units for Modeion circuit breakers
- tests: overcurrent releases
 - functionality of switching unit tripping mechanism
 - current transformers
- tests overcurrent releases: L001, DTV3, MTV8, MTV9, U001
- tests switching units for circuit breakers: BD2SON, BD2SOS, BH63ON, BH63OS, BL10OOS, BL16OOS

Tester must be connected to an external power supply. Power supply voltage of tester is 230 V a.c.

 $For more \ detailed \ information \ and \ documentation \ contact \ our \ technical \ support\ No.: +420\ 465\ 672\ 191\ or\ visit\ our\ websites\ www.oez.com$

CONTROL RELAYS FOR BD250 AND BH630



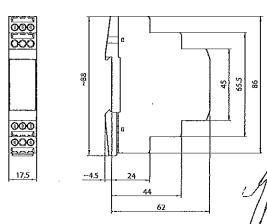
| OD-BHD-RX01 | 37425 | 24 V a.c./d.c. | Weight (Vg) 0.06 | 1 |
|-------------|-------|------------------|---------------------|--------------------|
| OD-BHD-RX02 | 37426 | 48Va.c/d.c | 0.06 | (\mathbb{V}_1) |
| OD-BHD-RA03 | 37427 | 110 ÷ 230 V a.c. | 0.06 | 1 |

- control relay is suitable for control of the circuit breaker with motor drive in withdrawable/plug-in device or in combination with mechanical interlocking by Bowden, see page E72, E73, F70, F71

Specifications

| Type gent | | OD BHO R |
|--|--|---|
| Standards . | | EN 61812-1 |
| Approval marks | | C €® |
| Control arcuit | | |
| Rated operating voltage | Ų | 24 V a.c/d.c., 48 V a.c/d.c., |
| Rated frequency Consumption at U _a | at 24 ÷ 230 V a.c. | 110 ÷ 230 V a.c/d.c., 110 V d.c. 250 Hz 1.2 VA ÷ 2.6 VA |
| Mechanical endurance | at 24 ÷ 220 V d.c. | 1.4W ÷ 1.7W 30 000 cycles |
| Electrical endurance | | 30 000 cycles |
| Connection | | 0.2 ÷ 2.5 mm² |
| Torque | And the second s | 0.5 Nm |
| Control impulser s.s. | | |
| Min. excitation time | <u> </u> | 15 ms |
| Max. excitation time | | unlimited |
| Other data 124 | | |
| Mounting on "U" rail according to EN 60715 - | - type | TH 35 |
| Degree of protection | | IP20 |
| Ambient temperature | an en rees transfer til er er i det betægt statet. It | -20 ÷ +50 ℃ |
| Working position | | , arbitrary |
| Seismic resistance | AND THE PERSON OF THE PERSON O | 3g/8÷50Hz |

OD-BHD-R...





RESIDUAL CURRENT MONITOR



55V8000-6KK



55V8001-6KK, 55V8200-6KK

| ecific | |
|--------|--|
| | |
| | |
| | |
| | |

| Type designation 3 to 1 | SSV8 000-6KK | SSV8 001-6KK | ~5SV8·200-6KK |
|---|--|--|---|
| Dimensions - number of modules | 2 | 3 | 3 |
| Weight | 0.17 kg | 0.24 kg | 0.24 kg |
| Standards | EN 62020 IEC 62020 | EN 62020 IEC 62020 | EN 62020 IEC 62020 |
| Approval marks | C€ | ζ€ | C€ |
| Number of independent circuits | 1 | 1 | 4 |
| Rated residual current | 0.03 ÷ 5 A | 0.03 ÷ 30 Å | 0.03 ÷ 30 A |
| Maximum inactivity time | 0,02 ÷ 5 s | 0.02 ÷ 10 s | 0.02 ÷ 10 s |
| | (up to I _{2a} = 3 A) (I _{2a} from 3 to 5 A) | A (up to I _{sa} = 3 A) AC (I _{sa} from 3 to 30 A) / / | A (up to $I_{4a} = 3 \text{ A}$) C (I_{4a} from 3 to 30 A) |
| Rated voltage | 230 V a.c. | 230 V a.c. | 230 V a.c. |
| Rated operating voltage | 64÷284V a.c. | 164 ÷ 284 V a.c. | 164 ÷; 284 V a.c: |
| Rated frequency | SO Hz | 50 Hz | 50 Hz |
| Electrical endurance | 10 x 10° cycles | 10 x 10° cycles | 10 x 10 ^s cycles |
| Degree of protection from front side of the device | IP41 | JP41 | IP41 |
| Degree of protection of terminals | IP20 | IP20 | 1P20 |
| Method of mounting | "U" rail 35 mm | ,U" rail 35 mm | "U" rail 35 mm |
| Ambient temperature range | -10 ÷ 50 °C | -10 ÷50°C | -10 ± 50 ℃ |
| Max. sea Tevel | 2 000 m | 2 000 m | 2 000 m |
| Relative humildity | 5÷95% | 5≑95% | 5=95% |
| Connection cross-section | 0.2 ÷ 2 mm² | 0.2 ÷ 2 mm² Pro tractescon 2-7/20/2009 | 0.2 ÷ 2 mm² |
| Extérnal remote trip/reset | 利利的法 | e/e | •/• |
| Internal diameter of the transformer | 30 ÷ 210 mm | 30 ÷ 210 mm | 30 ÷ 210 mm |
| Local signalling of reach of relative low value of (), (ALARM) Remote signalling of reach | • | g | • |
| of relative low value of l _{in} (ALARM) | | 0 | • |
| Local stgnalling of power supply/ALARM/failure/value of I _{sa} | 9/0/9/9 | 0/0/0/8 | e/e/e/e |
| Display STREET | — Bandanan dalam | ◆ PROTEINA DE COMPANIE DES SERVICIES DE C | ● C SEASON SAVENCONS C |
| Sealing of setting/control panel | | • | |
| Control urain surpuis | | | 2518-50 -2 018-501 |
| Rated operating voltage | 230 V a.c. | 230 V a.c. | 230 ¥ a.c. |
| Rated current | 6A | 64 | 6A |
| Max. switched power - AC1 | 2 500 VA | 2 500 VA | 2 500 VA |
| Rated frequency | SO Hz | 50 Hz | 50 Hz |
| Number of control contacts | 1(0 | 2(0 | 4 NO |
| Control arcult amplies | | | |
| Rated voltage | | 110 ÷ 230 V a.c./d.c. | 230 V a.c. |
| Rated operating voltage | | 110 ÷ 284V a.c/d.c | 230÷284Va.c. |
| Input power | _ | 0.7 W | 0.7W |
| • available — unavailable + being prepared | | | · · · · · · · · · · · · · · · · · · · |

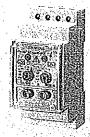
• available, — unavailable, + being prepared

Total max, switching off time

| | | | a se sama | dominacijijty | tiole adjuited | volje Sa Sa | | |
|--------------------|---------|------------|-----------|---------------|----------------|-------------|-------------|------------|
| | 2010 | (00)052 | 200 mil | 300 ms | 400 m | 300mg | c 750 jis - | rowns |
| 1x l _{ss} | < 80 ms | | | < 340 ms | | < 540 ms | | < 1 050 ms |
| אָגע | < 60 ms | , < 130 ms | < 230 ms | √ < 330 ms | < 435 ms | < 540 ms | < 780 ms | < 1 040 ms |

Modelon

RESIDUAL CURRENT MONITOR - ANALOG



5SV8000-6KK

Description

- designed for monitoring of leakage current (residual/ /fault current) and protection against fire e.g. due to worsened insulation or sneak currents
- \blacksquare possibility of setting of residual current I_{L_1} and setting of limit time of inactivity of I_{L_1} (see parameters) by means of rotary switches

Local signalling

- first LED signals functionality of the relay and current transformer:
 - LED is lighting the relay is in order
 - LED does not light the relay is not supplied
 - LED is flashing interrupted connection between the relay and the transformer, or broken secondary winding
- the second LED signals value of the passing current:

 LED is lighting signalling reach of 100 % residual current

 LED is flashing flashing period increases with increasing
 residual current

- mounting on "U" rail
- measurement by means of external summation current transformer
- circuit breaker switching off by means of shunt trip or undervoltage release

Remote signalling:

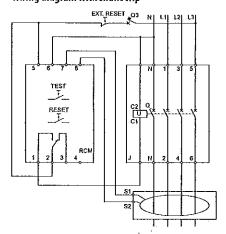
- by means of make-and-break contact (CO)
- serves for signalling of reach of the set value of I_{2a} and/or for circuit breaker switching off via undervoltage release or shunt trip

Control

- the TEST push-button serves for testing of the function of both the relay and circuit breaker - disconnects the circuit
- if the relay trips (switches the circuit breaker off) it is necessary to reset it by the "RESET" push-button, or interrupt its supply and thus perform the remote reset
- setting can be sealed

Wiring diagram

Wiring diagram with shunt trip



Wiring diagram with undervoltage release

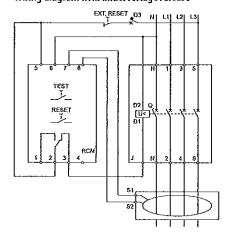
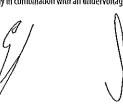


Diagram description

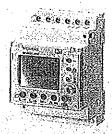
| Symbols | en la appliar e de la encesa de la composición del composición de la composición de la composición de la composición del composición de la composición del composición de la composición del composición del composición del composición del composición del composición del composición d |
|---------|--|
| J | circuit breaker |
| RCM | residual current monitor |
| TEST | test push-button of the relay |
| RESET | local reset push-button |
| _ | RESET remote reset push-button or STOP push-button ¹⁾ |
| S1,S2 | current transformer terminals |
| Q3 | protection of relay LPN-2C-1 |
| | |

1) only in combination with an undervoltage release





RESIDUAL CURRENT MONITOR - DIGITAL



55V8001-6KK

Description

- designed for monitoring of leakage current (residual// fault current) and protection against fire e.g. due to worsened insulation or sneak currents
- \blacksquare possibility of setting of residual current l_{ba} and setting of maximum inactivity time l_{ba} by means of push-buttons and the display (see table)
- presentation of cause of trip and of current value of residual current on the display

Local signalling

- the first LED signals functionality of the relay and trip in reach of the set residual current:
 - LED gives a green light the relay is supplied LED gives a red light - signalling of reach of 100 % residual current
- the second LED signals reach of relative low set value: LED gives a yellow light - signalling of reach of the set value

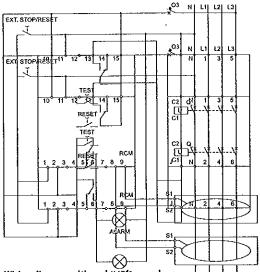
- **⊠** mounting on "V" rail
- measurement by means of external transformer
- circuit breaker switching off by means of shunt trip or undervoltage release
- possibility of setting of characteristic S selective

Remote signalling

- by means of make-and-break contact (CO)
- serves for signalling of reach of the set value of I_{ta} and/or for circuit breaker switching off via undervoltage release or shunt trin
- possibility of remote switching off by applying voltage 110 ÷ 230 V a.c./d.c. on potential free terminals number 1 and 2
- the TEST push-button serves for testing of the function of both the relay and circuit breaker - disconnects the circuit
- if the relay trips (switches the circuit breaker off) it is necessary to reset it by the "RESET" push-button, or interrupt its supply and thus perform the remote reset
- **setting** can be sealed

Wiring diagram

Wiring diagram with shunt trip



Wiring diagram with undervoltage release

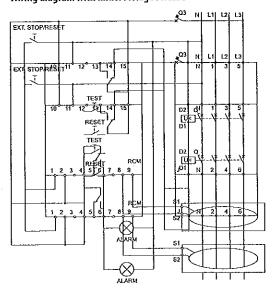


Diagram description

| Symbolic | Description : |
|-----------------|---|
| J | dravit breaker |
| RCM | residual current monitor. |
| TEST | test push-button of the relay |
| RESET | local reset push-button |
| EXT. STOP/RESET | remote reset push-button or STOP push-button |
| 51,52 | current transformer terminals |
| ALARM | signalling of reach of the set |
| Q3 | protection of pelay LPN-2C-1 |
| | |
| | 1 |

RESIDUAL CURRENT MONITOR - DIGITAL, 4-CHANNEL



Description

- designed for monitoring of leakage current (residual/fault current) and protection against fire e.g. due to worsened insulation or sneak currents
- $m m{m}$ possibility of setting of residual current l_{ta} and setting of maximum inactivity time l_{ta} by means of push-buttons and the display (see table)
- presentation of cause of trip and of current value of residual current on the display

™ mounting on "U" rail

- measurement by means of an external transformer; it is possible to connect up to 4 transformers
- circuit breaker switching off by shunt trip
- possibility of setting of characteristic S selective

Local signalling

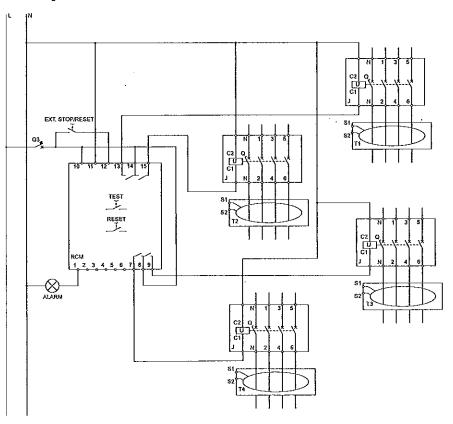
- the first LED signals functionality of the relay and trip in reach of the set residual current: LED gives a green light - the relay is supplied LED gives a red light - signalling of reach of 100 % residual current
- the second LED signals reach of relative low set value: LED gives a yellow light – signalling of reach of the set value

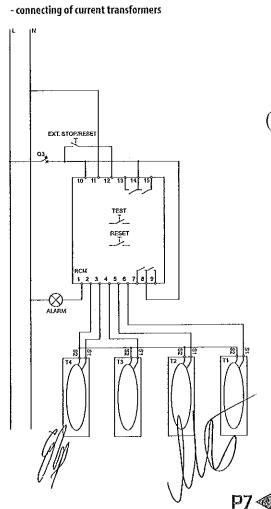
Remote signalling

- by means of make-and-break contact (CO)
- serves for signalling of reach of the set value of l_{so} and/or for circuit breaker switching off via undervoltage release or shunt trip
- possibility of remote switching off by applying voltage 110 ÷ 230 V a.c./d.c. on potential free terminal number 12
- the TEST push-button serves for testing of the function of both the relay and circuit breaker - disconnects the circuit
- if the relay trips (switches the circuit breaker off) it is necessary to reset it by the "RESET" push-button, or interrupt its supply and thus perform the remote reset
- setting can be sealed

Wiring diagram

Wiring diagram with shunt trip - connecting of circuit breakers



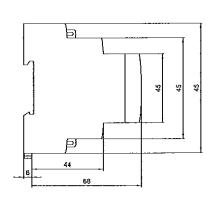


RESIDUAL CURRENT MONITOR

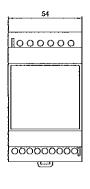
Dimensions

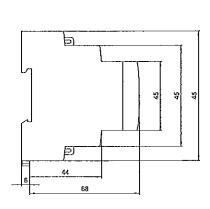
Residual current monitor 5SV8000-6KK



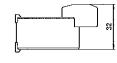


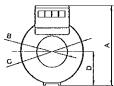
Residual current monitor 5SV8001-6KK, 5SV8200-6KK





Measuring current transformers 5SV8700-0KK, 5SV8701-0KK

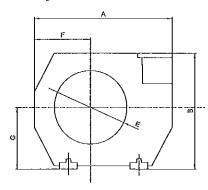


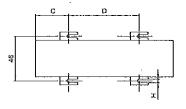


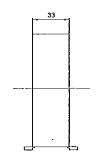
| Туре | A. | Bi | Ç. | |
|-------------|----|----|-----|----|
| 55V8700-0KK | | 20 | | |
| SSV8701-0KK | 70 | 30 | -59 | 30 |



Measuring current transformers 5SV87...-OKK







| j | ype : | | | | | is Ti | , E | ¥ŧ | 4.6 | |
|---|----------------|-------|------|------|---------------|-------|--------------|------|------|-----|
| | | | | | | 6 4 | | | | |
| | | | | | | 2/ 6 | | | | |
| 5 | S V 870 | 34-0K | K 1. | 70 1 | 46 / | 8 / 9 | \$ 10 | 5 72 | . 73 | 6 |
| 5 | SV870 |)5-0K | K 2 | 10 1 | 96/./ | 9 12 | 3/14 | 0 97 | 98 | .6 |
| 5 | SV870 | 36-0K | K 2 | 99 2 | 8 4 -4 | 9/16 | j 21 | 0 14 | 1 14 | 2 6 |
| | | | | | | | | | | |

Modelon

SPARE PARTS OF CIRCUIT BREAKERS AND SWITCH-DISCONNECTORS MODEION





| OD-BC-SP01 | 34456 | · Control lever | 0.002 1 |
|------------|-------|---|---------|
| OD-BC-DV01 | 20606 | Conductor holder | 0.001 |
| OD-BC-MS01 | 20607 | Set of screws M3x30, 2 pcs | 0.005 1 |
| CS-BC-T411 | 33656 | Connecting terminal | 0.094 1 |
| CS-BC-T412 | 33657 | Connecting terminal | 0.095 1 |
| OD-BC-KS01 | 20624 | Terminal cover, upper or lower terminals, 3P design, 1 pc | 0.01 .1 |
| OD·BC·KS41 | 33659 | Terminal cover, upper or lower terminals, 4P design, 1 pc | 0.015 1 |
| OD-BC-KOH2 | 37798 | Connector and sockets for MP-BC-XB | 0.02 |



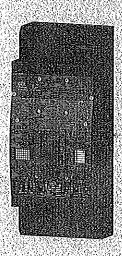
Spare parts for BD250N, BD250S

| OD-BD-SP01 | 34457 | Control lever | 0.007 | 1 |
|-------------|-------|---|-------|-------|
| OD-BD-DV01 | 15329 | Conductor holder | 0.002 | 1. |
| OD-BD-MS01 | 14419 | Set of screws M4x35, 4 pcs | 0.018 | 1 |
| OD-8D-KS01 | 24720 | Terminal cover, upper or lower terminals, 3P design, 4 pc | 0.1 | 1 7 |
| OD-BD-KS44 | 35896 | Terminal cover, lower terminals, 4P design, 1 pc | 0.1 | 1 |
| OD-BD-KS45 | 35897 | Terminal cover, upper terminals, 4P design, 1 pc | 0.1 | |
| OD-BHD-JUMP | 34460 | Jumper for auxiliary releases | 0.001 | 1 |
| OD-BHO-KON2 | 34461 | Connector and sockets for MP-BD, BH | 0.004 | 31 de |
| OD-BX-KON1 | 34462 | Connector and sockets for OD-xx-KA01 | 0,017 | 1 |



Spare parts for BH630N, BH630S

| OD-BH-SP01 | 34458 | Control lever | 0.012 | 1 |
|-------------|-------|---|-------|--------|
| OD-BH-DV01 | 15331 | Conductor holder | 0,002 | 的研究 |
| OD-BH-MS01 | 14420 | Set of screws MSx25, 4 pcs | 0.03 | 1 |
| OD-BH-KS01 | 24730 | Terminal cover, upper or lower terminals, 3P design, 1 pc | 0.15 | . 141. |
| OD-BH-KS44 | 35894 | Terminal cover, lower terminals, 4P design, 1 pc | 0.2 | 1 |
| OD-BH-K\$45 | 35895 | Terminal cover, upper terminals, 4P design, 1 pc | 0.2 | |
| OD-BHD-JUMP | 34460 | Jumper for auxiliary releases | 0.001 | 1 |
| OD-BHD-KON2 | 34461 | Connector and sockets for MP-BD,BH | 0.004 | 1/1/4 |
| OD-BX-KON1 | 34462 | Connector and sockets for OD-xx-KA01 | 0.017 | 1 |



Spare parts for BL1000S, BL1600S

| lype 2 | ductione | Wanner description | eight (ró) (a) Pá | (kagere |
|--------------|----------|--------------------------------------|-------------------|---------|
| 40 DE 21 G L | 34459 | Control lever | 0.03 | 1 |
| OD-BL-MS01 | 14854 | Set of screws M8x80, 4 pcs | 0.144 | 1.60 |
| OD DE HOUSE | 34463 | Connector and sockets for MP-BL-X | 0.004 | 1 |
| OD-BX-KON1 | 34462 | Connector and sockets for OD-xx-KAO1 | 0.017 | 150 |



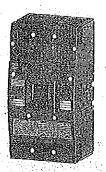


NOTES

▶ P10

Modelor

HE USAGE OF SWITCH-DISCONNECTORS AT GIVEN OVERCURRENT PROTECTION



Particular designs of Modelon switch-disconnectors can be used together with the assigned device (circuit breaker, fuse-link) at the spot of electrical circuit where the value of initial peak short-circuit current $I_{\bf k}^{\,\prime\prime}$ is lower or max equal to the related value from the table:

| | | Type of Mod | elon switch c | lisconnector | |
|---|--------|------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Backup protective device | 7, (F) | | (kA]/400 V.a | | |
| | BC | BD | BH | BL1000 | BL1600 |
| BC160 (all overcurrent releases types) | 25 | 25 | 25 | 25 | 25 |
| BD250 (all overcurrent releases types) | 18 | 18 | 36 ¹¹ , 65 ²³ | 36 ¹⁾ , 65 ²⁾ | 36 ¹⁾ , 65 ²⁾ |
| 8H630 (all overcurrent releases types) | - | - | 36 ¹⁾ , 65 ²⁾ | 36 ¹⁾ , 65 ²⁾ | 36 ¹³ , 65 ²³ |
| BL 1000 (all overcurrent releases types) | 12 | $-1 \le 2 \le 2$ | | 50. | 50 |
| BL1600 (all overcurrent releases types) | - | - | | _ | 50 |
| PN, PLN, PHN gG max. I _n = 125 A ^{sj} | 100 | 63) | o ³⁾ | e ^{3j} | Θ 3) |
| PN, PEN, PHN gG max. I = 224 A ⁿ | - | 65 | © 3] | • ³⁾ | $\mathbf{e}^{3)}$ |
| PN, PHN gG max. I = 500 A³ | - | | 65 | o ³⁾ | \mathbf{e}_{ij} |
| PN, PHN gG max. 1, = 630 A ³⁵ | | _ | - | 65 | 65 |

Notes

8/



⁹ Additional values in table 1) are related to the back-up circuit breaker of design N.

 $^{^{\}rm 3}$ Additional values in table 2) are related to the back-up circuit breaker of design S.

³³ Max value of initial peak short-circuit current that enables the usage of switch-disconnector with backup fuse-links of lower rated currents (see ³¹) is determined on the basis of equality of their limited current i.

⁻ I rated current of backup fuse-link has to be min by one degree lower than I rated current of the switch-disconnector.

⁻ Given values are valid for voltage 400 V a.c.

| Modelon | 9 W | | ¥П | 1002 | 国企 类 | 20 | ģ |
|-------------------------------|-------|-----|----|------|-------------|--------|---|
| 8 A A E S I V I wal E G I H I | 9 .Y | ra) | a | r-1 | rei | m | ğ |
| | 3 A-A | Fe? | | 1000 | Ka) | 1 11 1 | ă |

Moulded case circuit breake

NOTES



≥R2



OSSARY OF TERMS

 $\texttt{x:} \ Precise \ wording \ of \ definitions \ and \ texts \ relating \ to \ a \ given \ term \ are \ detailed \ in \ the \ respective \ standards, see \ Name.$

| me gg | Symbol | Explanation |
|--|-----------------------|--|
| ted operating voltage 60947-1; 4.3.1.1 | IJ _e | Voltage fixed by the manufacturer. Several pertinent tests relate to its determination, as may also the utilization category. Along with the rated (operating) current, it determines the device's utilization. The highest value of rated operating voltage may in no case be greater than the value of the rate insulation voltage U ₁ . |
| ted insulation voltage 60947-1; 4.3.1.2 | U, | Voltage measure to which are related tests of dielectric strength and creepage distance. |
| ted current 60947-2; 4.3.2.3 | I _n | Current value of particular circuit breaker that can be handled uninterruptedly. The highest current valued tripping the circuit breaker in conformity with a specifically stated tripping characteristic. |
| duced rated current | l _R . | Specifically established, reduced value of \mathbf{I}_n current for a regulated time-dependent (thermal) release and that the circuit breaker can handle continuously. Maximum setting is at value equal to \mathbf{I}_n . Changing \mathbf{I}_n moves the release's tripping characteristic along the current axis. $\mathbf{I}_r = \mathbf{k} \times \mathbf{I}_n$ holds where $\mathbf{k} \leq 1$ |
| pping time at a given I, multiple | t _R | Time after which circuit breaker will trip, if a current flows through it that is equal to the given multiple of $\mathbf{I_g}$. Changing $\mathbf{t_g}$ moves the tripping characteristic along the time axis. |
| lease current of independent instantaneous lective) release | l _{sd} | Minimum current value that causes tripping of the time-independent delayed release. |
| lay of time-independent delayed release | t _{sd} | If a current flows through the circuit breaker equal to at least \mathbf{I}_{sd} but not reaching \mathbf{I}_{sd} the circuit breaker will trip with time delay \mathbf{t}_{sd} . Total switching off time is influenced by the tripping of the circuit breaker itself and is about $10 \div 20$ ms longer. |
| lease current of independent instantaneous ort-circuit) release | i, | Minimum current value that causes tripping of the time-independent instantaneous release. |
| ted operating current 60947-1; 4.3.2.3 | l _e | Rated operating current of device (switch-disconnector) is fixed by the manufacturer with consideration for the rated operating voltage, rated frequency, rated operation, utilization category and type of protective cover, if that comes into consideration. |
| ted normal current 60947-1; 4.3.2.4 | l _u | Current value set by the manufacturer and which the device can handle in continuous operation, i.e. during a period longer than 8 hours (weeks, months, or longer). |
| ted short-circuit ultimate breaking capacity 60947-2; 2.15.1; 4.3.5.2.1 | l _{cu} | Value of ultimate short-circuit breaking capacity expressed as the rms value of the alternating component of the assumed short-circuit current that the circuit breaker must be able to manage in the mode: 1x switching off of the short-circuit and a following 1x make-break sequence. After testing, the circuit breaker need not be able to conduct the rated current uninterruptedly. \mathbf{l}_{ca} is set for the rated operating voltage at the rated frequency and at the established power factor for alternating current or at the time constant for direct current. Must fulfil the condition: $\mathbf{l}_{ca} \geq \mathbf{l}_{k}$ |
| ted short-circuit service breaking capacity 60947-2; 2.15.2; 4.3.5.2.2 | l _s | Value of the operating short-circuit breaking capacity expressed as the rms value of the alternating component of the assumed short-circuit current that the circuit breaker must be able to manage in the mode: 1x switching off of the short-circuit and a following 2x make-break sequence. May also be expressed as a percentage of I_{co} . After testing, the circuit breaker must be able uninterruptedly to conduct the rated current and to switch off the overcurrent. Temperature increase of the main terminals may be greater. I_{co} is set for the rated operating voltage at the rated frequency and at the established power factor for alternating current or at the time constant for direct current. Permitted: $I_{co} \ge I_{k}$ |
| ted short-time withstand current 60947-1; 4.3.6.1 60947-2; 4.3.5.4 60947-3; 4.3.6.1 | l _{cw} | Value of short-time withstand current specified by the manufacturer that the device is able to handle without damage during a designated time period (short-time delay). In case of alternating current, it is the rms value of the alternating component of the assumed short-circuit current I |

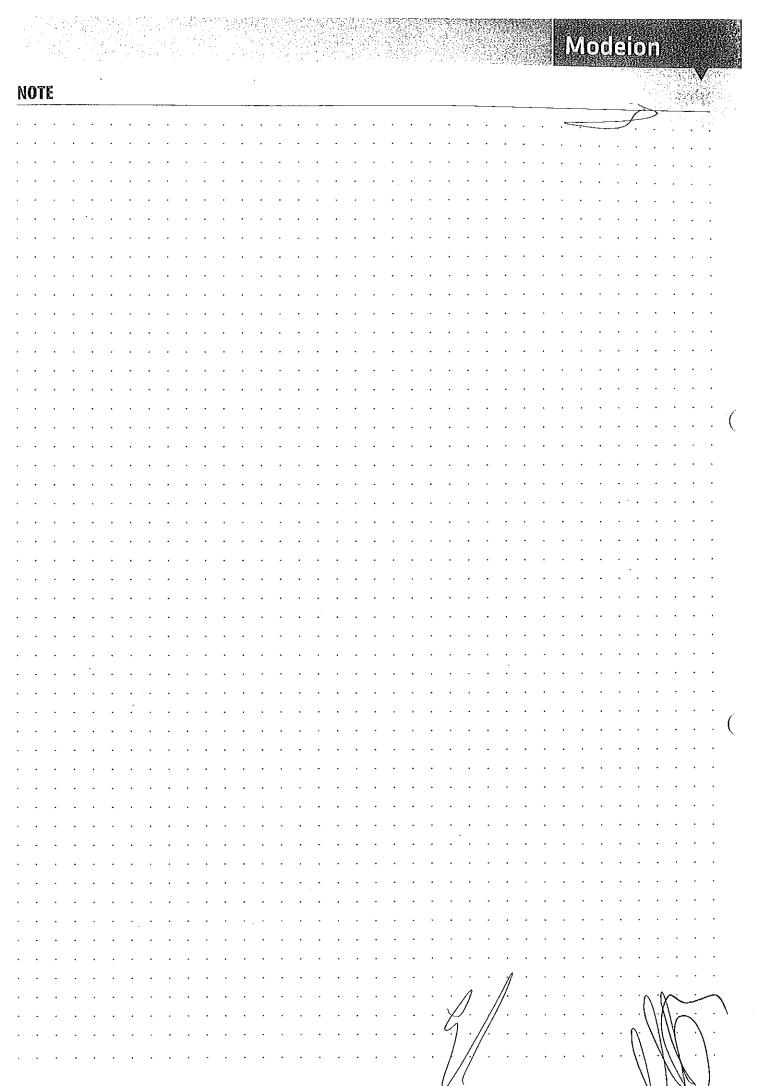


GLOSSARY OF TERMS

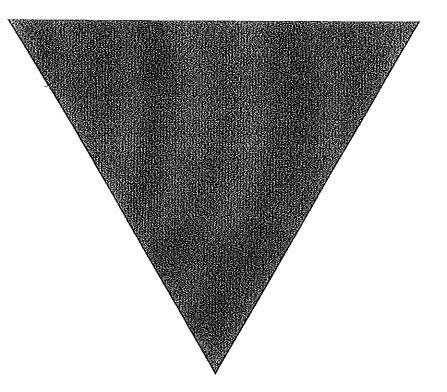
Note: Precise wording of definitions and texts relating to a given term are detailed in the respective standards, see Name.

| ·Name | Symbol: | Explanation |
|--|------------------|---|
| Rated short-circuit making capacity EN 60947-1; 4.3.6.2 EN 60947-2; 4.3.5.1 EN 60947-3; 4.3.6.2 | l _m | Value of short-circuit making capacity specified by the manufacturer for the rated operating voltage at the rated frequency and at the established power factor for alternating current or at the time constant for direct current. It is expressed as the maximum assumed peak current. Must fulfil the condition: $\mathbf{I}_{cm} \geq \mathbf{i}_{p}$ |
| Initial peak short-circuit current EN 60909-0; 1.3.5 | l,* | Short-circuit current value at the moment of its arising at a given point in the electrical distribution expressed as the rms value of the alternating symmetrical component of the assumed short-circuit current. |
| Surge short-circuit current EN 60909-0; 1.3.8 | i _p | Maximum possible momentary value of the assumed short-circuit current. (Corresponds to the moment the short arises, as a result of which there occurs the peak value of the short-circuit current.) |
| Prospective short-circuit current EN 60947-1; 2.5.5 EN 60909-0; 1.3.3 | l _p | Short-circuit current value, which would flow through the circuit if the protection device were replaced and a short-circuit were experienced by conductors with negligible impedance. (In a three-phase distribution, it is assumed that the short-circuit is simultaneous in all phases.) |
| Rated impulse withstand voltage EN 60947-1; 4.3.1.3 | U _{lmp} | Peak value of the voltage impulse of the prescribed form and polarity which the device is able to withstand without failure at the established conditions and pertinent to which is the value of the separating air distance. $\mathbf{U}_{\rm Imp}$ of the device must be equal to or higher than the value established for momentary overvoltage at the point in the circuit (overvoltage category) where the device is used. |
| Overvoltage category EN 60947-1; 2.5.60 | | Numerically defined level of momentary overvoltage, i.e. overvoltage having its origin in atmospheric or switching. Standard EN 60664-1 establishes for electrical equipment the overvoltage categories: Overvoltage category IV - service entrance, outside lead Overvoltage category II - fixed wiring Overvoltage category II - appliances Overvoltage category I - light-current appliances |
| Rated frequency EN 60947-1; 4.3.3 | f _n | Frequency of the supply network for which the device is proposed and that corresponds to its other characteristics values. |
| Utilization category (circuit breakers — time selectivity) EN 60947-2; 4.4 | | Utilization category of circuit breaker establishes whether or not the circuit breaker specifically is intended for providing selectivity by means of intentional time delay (timing selectivity) with other protective devices connected in series on the load side in short-circuiting conditions. Utilization category: A - circuit breakers are not specifically intended for providing timing selectivity B - circuit breakers are specifically intended for providing timing selectivity |
| Utilization category (switch-disconnectors — switching mode) EN 60947-3; 4.4 | | Utilization category defines the assumed use of switch devices (switch-disconnectors). Characterized by values of current and voltage, expressed as multiples of rated operating current and rated operating voltage, and further by power factors or time constants of the circuit. Utilization category: AC-21B (DC-21B) - infrequent switching of resistive loads, including moderate overloading AC-22B (DC-21B) - infrequent switching of roised resistive and inductive loads, including moderate overloading AC-23B (DC-23B) - infrequent switching of motor loads or other highly inductive loads |
| Pollution degree EN 60947-1; 2.5.58; 6.1.3.2 | | Pollution degree relates to the conditions of the surrounding environment for which the device is intended. Pollution degree: 1 - No contamination will occur, or only dry, non-conducting contamination. 2 - Normally occurs only non-conducting contamination, but sometimes there may occur temporary conductibility due to condensation. |
| | | 3 - There occurs conductive contamination or dry non-conducting contamination that with the effect of condensation will become conductive. 4 - Contamination generates continuous conductibility, by means of, for example, conductive dust, rain or snow. |





Modelon NOTE





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