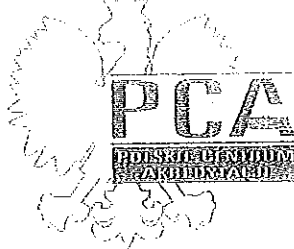


POLSKIE CENTRUM AKREDYTACJI
POLISH CENTRE FOR ACCREDITATION



Sygnatariusz EA MLA
EA MLA Signatory

CERTYFIKAT AKREDYTACJI
LABORATORIUM BADAWCZEGO
ACCREDITATION CERTIFICATE OF TESTING LABORATORY
Nr AB 044

Potwierdza się, że: / This is to confirm that:

STOWARZYSZENIE ELEKTRYKÓW POLSKICH

ul. Świętokrzyska 14, 00-050 Warszawa

STOWARZYSZENIE ELEKTRYKÓW POLSKICH

BIURO BADAWCZE ds. JAKOŚCI

LABORATORIUM BADAWCZE

ul. M. Pożaryskiego 28, 04-703 Warszawa

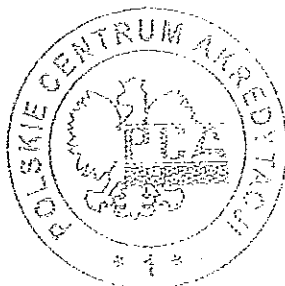
spełnia wymagania normy PN-EN ISO/IEC 17025:2005
meets requirements of the PN-EN ISO/IEC 17025:2005 standard

Akredytowana działalność jest określona w Zakresie Akredytacji Nr AB 044
Accredited activity is defined in the Scope of Accreditation No AB 044

Akredytacja pozostaje w mocy pod warunkiem przestrzegania
wymagań jednostki akredytującej określonych w kontrakcie Nr AB 044
This accreditation remains in force provided the Laboratory observes
the requirements of Accreditation Body defined in the Contract No AB 044

Certyfikat akredytacji ważny do dnia 20.06.2018 r.
The certificate of accreditation is valid until 20.06.2018

Akredytacji udzielono dnia 30.11.1995 r.
Accreditation was granted on 30.11.1995



DYREKTOR
POLSKIEGO CENTRUM AKREDYTACJI


EUGENIUSZ W. ROGUSKI

Warszawa, 18 czerwca 2014 roku

ZAKRES AKREDYTACJI LABORATORIUM BADAWCZEGO Nr AB 044

wydany przez
POLSKIE CENTRUM AKREDYTACJI
01-382 Warszawa, ul. Szczętkarska 42

Wydanie nr 12, Data wydania: 18 czerwca 2014 r.

| | |
|---|--|
|  <p>AB 044</p> | <p>Nazwa i adres</p> <p>STOWARZYSZENIE ELEKTRYKÓW POLSKICH ul. Świętokrzyska 14, 00-050 Warszawa</p> <p>STOWARZYSZENIE ELEKTRYKÓW POLSKICH BIURO BADAWCZE ds. JAKOŚCI LABORATORIUM BADAWCZE ul. M. Pożaryskiego 28, 04-703 Warszawa</p> |
| <p>Kod identyfikacji dziedziny/obiekt badań</p> | <p>Dziedzina/obiekt badań:</p> |
| <p>E/6 H/6 J/6 M/6; M/7; M/8 N/6</p> | <p>Badania elektryczne i elektroniczne wyrobów i wyposażenia elektrycznego, telekomunikacyjnego i elektronicznego</p> <p>Badania ogniowe wyrobów i wyposażenia elektrycznego, telekomunikacyjnego i elektronicznego</p> <p>Badania mechaniczne wyrobów i wyposażenia elektrycznego, telekomunikacyjnego i elektronicznego</p> <p>Badania inne wyrobów i wyposażenia elektrycznego, telekomunikacyjnego i elektronicznego, wyrobów konstrukcyjnych</p> <p>Badania właściwości fizycznych wyrobów i wyposażenia elektrycznego, telekomunikacyjnego i elektronicznego</p> |

Wersja strony: A



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**KIEROWNIK
DZIAŁU AKREDYTACJI
LABORATORIÓW**

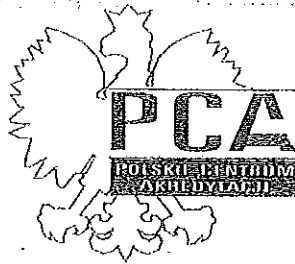
TADEUSZ MATRAS

Niniejszy dokument jest załącznikiem do Certyfikatu Akredytacji Nr AB 044 z dnia 18.06.2014 r.
Status akredytacji oraz aktualność zakresu akredytacji można potwierdzić na stronie internetowej PCA www.pca.gov.pl

| Zakład Sprzętu Elektroinstalacyjnego, Elektronicznego i Oświetleniowego ul. M. Pożaryskiego 28, 04-703 Warszawa | | |
|--|---|---|
| Badane obiekty / Grupa obiektów | Badane cechy i metody badawcze | Normy i/lub udokumentowane procedury badawcze |
| Gniazda wtyczkowe i wtyczki do instalacji przemysłowych | Trwałość znakowania Wymiary liniowe Ochrona przed porażeniem prądem elektrycznym Przystosowanie do uziemienia ochronnego Ciągłość połączeń ochronnych Rezystancja połączeń ochronnych Prawidłowość wymiarów i konstrukcji | PN-EN 60309-1: 2002 + A1:2009 + A2:2013 EN 60309-1:1999+ A1:2007 + A2:2012 IEC 60309-1:1999 + Am1:2005 + Am2:2012 z wyłączeniem rozdz. 20 i 21 dla gniazd 63A, 125A i 250A |
| Gniazda wtyczkowe i wtyczki do instalacji przemysłowych ze stykami tulejkowo-kołkowymi | Urządzenia blokujące, łączniki i ich elementy Odporność gumy i materiału termoplastycznego na starzenie Stopnie ochrony IP do 67 Rezystancja i wytrzymałość elektryczna izolacji Zdolność wyłączenia Trwałość w warunkach normalnych Przyrost temperatury Wytrzymałość mechaniczna - odporność na uderzenia, ściskanie, skręcanie i wyciąganie Trwałość połączeń elektrycznych i mechanicznych | PN-EN 60309-2: 2002 + A1:2009 + A2:2012 EN 60309-2: 1999 + A1:2007 + A2:2012 IEC 60309-2: 1999 + Am1:2005 + Am2:2012 z wyłączeniem rozdz.20 i 21 dla gniazd 63A i 125A |
| Gniazda wtyczkowe i wtyczki do instalacji przemysłowych ze stykami prostokątnymi | Odstępy izolacyjne powierzchniowe, powietrzne i przez masę zalewową Odporność na podwyższoną temperaturę, żar i prądy pelzające Odporność na rdzewienie Wytrzymałość na prąd zwarciový | PN-E-93251:98 z wyłączeniem próby zdolności łączeniowej i trwałości p.3.4 i 3.5 dla gniazd 63A |
| Nasadki i wtyki do użytku domowego i podobnych ogólnych zastosowań | Trwałość znakowania Wymiary liniowe Ochrona przed porażeniem prądem elektrycznym | PN-EN 60320-1:2005 + A1:2009 EN 60320-1:2001 + A1:2007 IEC 60320-1:2001 + A1:2007 |
| Nasadki i wtyki do maszyn do szycia | Przystosowanie do uziemienia ochronnego Rezystancja połączeń ochronnych | PN-EN 60320-2-1:2001 EN 60320-2-1:2000 IEC 60320-2-1:2000 |
| Połączenia wtykowo-nasadkowe | Prawidłowość wymiarów i konstrukcji zacisków Odporność na wilgoć | PN-EN 60320-2-2:2001 EN 60320-2-2:1998 IEC 60320-2-2 :1998 |
| Nasadki i wtyki typu B 10A 250V | Rezystancja i wytrzymałość elektryczna izolacji Siły niezbędne do włożenia i wyciągnięcia nasadki Odporność na nagrzewanie nasadek i wtyków do pracy gorącej i bardzo gorącej Zdolność wyłączenia Trwałość w warunkach normalnych Przyrost temperatury Przylączalność przewodów giętkich Wytrzymałość mechaniczna – odporność na uderzenia, skręcanie, wyciąganie, ściskanie i upadki Odporność na podwyższoną temperaturę i starzenie Trwałość połączeń elektrycznych i mechanicznych Odstępy izolacyjne powierzchniowe, powietrzne i skrośne przez izolację Odporność materiału izolacyjnego na podwyższoną temperaturę, ogień i prądy pelzające. Odporność na rdzewienie | PN-E-93209:1998 |

Wersja strony: A

POLSKIE CENTRUM AKREDYTACJI
POLISH CENTRE FOR ACCREDITATION



Sygnatariusz EA MLA
EA MLA Signatory

CERTYFIKAT AKREDYTACJI
JEDNOSTKI CERTYFIKUJĄCEJ WYROBY
ACCREDITATION CERTIFICATE FOR PRODUCT CERTIFICATION BODY

Nr AC 012

Potwierdza się, że: / This is to confirm that:

STOWARZYSZENIE ELEKTRYKÓW POLSKICH

ul. Świętokrzyska 14, 00-050 Warszawa

STOWARZYSZENIE ELEKTRYKÓW POLSKICH

BIURO BADAWCZE DO SPRAW JAKOŚCI

JEDNOSTKA CERTYFIKUJĄCA

ul. M. Pożaryskiego 28, 04-703 Warszawa

spełnia wymagania normy PN-EN 45011:2000
meets requirements of the PN-EN 45011:2000 standard

Akredytowana działalność jest określona w Zakresie Akredytacji Nr AC 012
Accredited activity is defined in the Scope of Accreditation No AC 012

Akredytacja pozostaje w mocy pod warunkiem przestrzegania
wymagań jednostki akredytującej określonych w kontrakcie Nr AC 012

This accreditation remains in force provided the Body observes
the requirements of Accreditation Body defined in the Contract No AC 012

Certyfikat akredytacji ważny do dnia 21.12.2018 r.

The certificate of accreditation is valid until 21.12.2018

Akredytacji udzielono dnia 22.12.1993 r.

Accreditation was granted on 22.12.1993

DYREKTOR
POLSKIEGO CENTRUM AKREDYTACJI


EUSENIUSZ W. ROGUSKI

Warszawa, 19 grudnia 2014 roku

ZAKRES AKREDYTACJI JEDNOSTKI CERTYFIKUJĄCEJ WYROBY Nr AC 012

wydany przez
POLSKIE CENTRUM AKREDYTACJI
01-382 Warszawa, ul. Szczęśliwarska 42

Wydanie nr 11 Data wydania: 19 grudnia 2014 r.

| | |
|--|---|
|  <p>AC 012</p> | <p>Nazwa i adres jednostki certyfikującej</p> <p>STOWARZYSZENIE ELEKTRYKÓW POLSKICH ul. Świętokrzyska 14, 00-050 Warszawa</p> <p>STOWARZYSZENIE ELEKTRYKÓW POLSKICH BIURO BADAWCZE DO SPRAW JAKOŚCI JEDNOSTKA CERTYFIKUJĄCA ul. M. Pożaryskiego 28, 04-703 Warszawa</p> |
| <p>Certyfikacja :</p> <p>- zgodności wyrobów, kod ICS: 13.260; 17.220; 19.080; 29.020; 29.060; 29.120; 29.130; 29.140; 29.180; 29.200; 29.240; 33.120; 33.160; 35.020; 35.260; 91.060; 91.120; 97.030; 97.100; 97.120; 97.170; 97.200.</p> <p>- na znaki zgodności, kod ICS: 13.260; 17.220; 19.080; 29.020; 29.060; 29.120; 29.130; 29.140; 29.180; 29.200; 29.240; 33.120; 33.160; 35.020; 35.260; 91.060; 91.120; 97.030; 97.100; 97.120; 97.170; 97.200.</p> | |

Wersja strony: A

**KIEROWNIK
DZIAŁU AKREDYTACJI
JEDNOSTEK CERTYFIKUJĄCYCH
I INSPEKCYJNYCH**

KRZYSZTOF WOŹNIAK

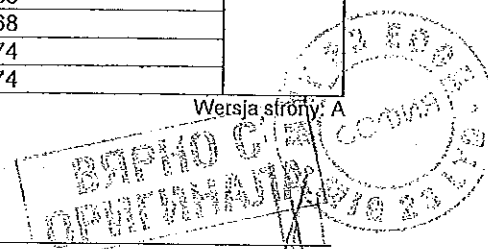
Niniejszy dokument jest załącznikiem do Certyfikatu Akredytacji Nr AC 012 z dnia 19.12.2014 r.
Staż akredytacji oraz aktualność zakresu akredytacji można potwierdzić na stronie internetowej PCA www.pca.gov.pl

Rodzaj działalności:

CERTYFIKACJA ZGODNOŚCI WYROBÓW / CERTYFIKACJA NA ZNAKI ZGODNOŚCI

| Nazwa wyrobu/ grupy wyrobów | System certyfikacji wg PKN-Guide 67 | Akronim programu certyfikacji | Numer normy lub dokumentu kryterialnego | ICS |
|---|-------------------------------------|-------------------------------|---|--------|
| Urządzenia ochrony przed porażeniem prądem elektrycznym | 1a 5 | CZ B-BBJ | PN-E-08509:1988 | 13.260 |
| | | | PN-EN 61230:2011 EN 61230:2008 IEC 61230:2008 | |
| | | | PN-EN 61243-3:2010 EN 61243-3:2010 IEC 61243-3:2009 | |
| Przyrządy pomiarowe wielkości elektrycznych i magnetycznych | 1a 5 | CZ B-BBJ | PN-EN 60044-1:2000 | 17.220 |
| | | | PN-EN 60044-1:2000/A1:2003 | |
| | | | PN-EN 60044-1:2000/A2:2004 | |
| | | | EN 60044-1:1999 | |
| | | | EN 60044-1:1999/A1:2000 | |
| | | | EN 60044-1:1999/A2:2003 | |
| Elektryczne i elektroniczne przyrządy pomiarowe | 1a 5 | CZ B-BBJ | PN-EN 61010-1:2011 | 19.080 |
| | | | EN 61010-1:2010 | |
| | | | IEC 61010-1:2010 | |
| Elektryczne i elektroniczne wyposażenie maszyn | 1a 5 | CZ B-BBJ | PN-EN 50102:2001 | 29.020 |
| | | | PN-EN 50102:2001/AC:2011 | |
| | | | EN 50102:1995 | |
| | | | EN 50102:1995/A1:1998 | |
| | | | EN 50102:1995/AC:2002 | |
| | | | PN-EN 60529:2003 | |
| Kable i przewody elektryczne | 1a 5 | CZ B-BBJ | PN- E-90050:1987 | 29.060 |
| | | | PN- E-90052:1987 | |
| | | | PN- E-90054:1987 | |
| | | | PN- E-90056:1987 | |
| | | | PN- E-90060:1987 | |
| | | | PN- E-90067:1987 | |
| | | | PN- E-90070:1987 | |
| | | | PN- E-90071:1987 | |
| | | | PN- E-90073:1987 | |
| | | | PN- E-90074:1987 | |
| | | | PN- E-90115:1988 | |
| | | | PN- E-90116:1988 | |
| | | | PN- E-90117:1988 | |
| | | | PN- E-90120:1968 | |
| | | | PN- E-90121:1968 | |
| | | | PN- E-90122:1968 | |
| | | | PN- E-90123:1968 | |
| | | | PN- E-90124:1968 | |
| | | | PN- E-90125:1968 | |
| | | | PN- E-90126:1968 | |
| PN- E-90180:1974 | | | | |
| PN- E-90181:1974 | | | | |

Wersja strony: A



SR

APATOR[®] SA



DEKLARACJA CE ZGODNOŚCI

EC Declaration of conformity



| | |
|--|---|
| Nr No | 0023/04 |
| Producent Manufacturer | APATOR SA |
| Adres Address | ul. Żółkiewskiego 13/29; 87-100 Toruń PL |
| Oznaczenie produktu (nazwa, typ) Product designation (name, type) | Rozłączniki izolacyjne bezpiecznikowe listwowe typu ARS 2- |

Deklarujemy, że oznaczony wyrób jest zgodny z następującymi wymaganiami:
It is declared that the designed product is in conformity with the provisions of the following requirements:

| | |
|---|---|
| Dyrektyw europejskich: European Directives: | 73/23/EEC + 93/68/EEC Dyrektywa niskonapięciowa dotycząca harmonizacji przepisów prawnych państw członkowskich odnoszących się do sprzętu elektrycznego przeznaczonego do użytkowania w określonych zakresach napięć. |
| Norm zharmonizowanych i/lub norm IEC: Harmonised standards and/or IEC standards: | PN-EN 60947-1 Aparatura rozdzielcza i sterownicza niskonapięciowa Część 1: Postanowienia ogólne PN-EN 60947-3 Aparatura rozdzielcza i sterownicza niskonapięciowa Część 3: Rozłączniki, odłączniki, rozłączniki izolacyjne i zestawy łączników z bezpiecznikami topikowymi |
| Norm krajowych i/lub dokumentacji technicznych: National standards and/or technical specification: | Dokumentacja techniczna rysunki zestawcze: 63-811216-*, 63-811217-*, 63-811463-* |
| Dokumenty identyfikujące wyrób: Product identification documents: | Karta katalogowa „Łączniki listwowe serii ARS, PBS” Nr 1/2003/1 |
| Miejscowość, data Place, date | Toruń, 2004.04.30 |
| Imię nazwisko stanowisko podpis Name, surname, function, signature | Janusz Niedźwiecki, Dyrektor Generalny |

*W przypadku wprowadzenia niezgodniomych z producentem zmian w wyrobie lub zastosowaniu go niezgodnie z przeznaczeniem niniejsza deklaracja traci ważność.
If any changes of the product are not agreed with the manufacturer or the product is inappropriately used, this declaration becomes null and void.*

ЕТ "АДИС - 9 -
Анелия Митева"

АГЕНЦИЯ ЗА
ПРЕВОДИ

Адрес на управление: 4023 Пловдив, ж.р.Тракия, бл.20, ет.9, ап.53, тел: 032/ 826632; 266292

Превод от полски език

APATOR SA

Декларация СЕ за съответствие

| | |
|---|--|
| № | 0023/04 |
| Производител: | APATOR SA |
| Адрес: | ул. Золкиевскиего 13/29; 87-100 Торун Полша |
| Обозначение на продукта (име, тип): | Вертикални разединители с ножови предпазители тип ARS 2- |
| Декларираме, че посочения продукт съответства на следните изисквания: | |
| Европейски директиви: | 73/23/ЕЕС + 93/68/ЕЕС Директива за ниско напрежение, касаеща хармонизирането на правните предписанията на държавите членки, които се отнасят за електрическата техника, предназначена за използване в определени граници на напрежение. |
| Съгласувани стандарти и/или стандарти на IEC: | PN-EN 60947-1 Комутационна и контролна апаратура ниско напрежение Част 1: Общи решения PN-EN 60947-3 Комутационна и контролна апаратура ниско напрежение Част 3: Превключватели, разединители, превключващи разединители и комбинирани устройства със стопяеми предпазители |
| Държавни норми и/или техническа документация: | Техническа документация и комплект от чертежи 63-811216-*; 63-811217-*; 63-811463.* |
| Документи идентифициращи стоката: | Каталожна карта "Ножови включватели серия ARS, PBS" №1/2003/1. |
| Град, дата: | Торун, 30.04.2004г. |
| Име, фамилия, длъжност, подпис: | Генерален Директор Януш Пнеджвидзки Подпис: не се чете |

В случай на въвеждане на изменения на продукта, несъгласувани с производителя или ако използването не е съгласно предназначението, тази декларация става невалидна.

Подписаната Анелия Иванова Митева удостоверявам верността на извършения от мен превод от полски език на български език на приложения документ "Декларация СЕ за съответствие". Преводът се състои от 1 (една) страница.

Преводач:

Анелия Иванова Митева
ЕГН 5909284635



APATORSA[®]



DEKLARACJA CE ZGODNOŚCI EC Declaration of conformity



| | |
|--|---|
| Nr No | 0021/04 |
| Producent Manufacturer | APATOR SA |
| Adres Address | ul. Żółkiewskiego 13/29; 87-100 Toruń PL |
| Oznaczenie produktu (nazwa, typ) Product designation (name, type) | Rozłączniki izolacyjne bezpiecznikowe listwowe typu ARS 00- |

Deklarujemy, że oznaczony wyrób jest zgodny z następującymi wymaganiami:
It is declared that the designed product is in conformity with the provisions of the following requirements:

Dyrektyw europejskich:
European Directives:

73/23/EEC + 93/68/EEC

Dyrektywa niskonapięciowa dotycząca harmonizacji przepisów prawnych państw członkowskich odnoszących się do sprzętu elektrycznego przeznaczonego do użytkowania w określonych zakresach napięć.

Norm zharmonizowanych
i/lub norm IEC:
Harmonised standards
and/or IEC standards:

PN-EN 60947-1

Aparatura rozdzielcza i sterownicza niskonapięciowa
Część 1: Postanowienia ogólne

PN-EN 60947-3

Aparatura rozdzielcza i sterownicza niskonapięciowa
Część 3: Rozłączniki, odłączniki, rozłączniki izolacyjne
i zestawy łączników z bezpiecznikami topikowymi

Norm krajowych
i/lub dokumentacji technicznych:
National standards
and/or technical specification:

Dokumentacja techniczna rysunki zestawcze:
63-811410-011

Dokumenty identyfikujące wyrób:
Product identification documents:

Karta katalogowa „Łączniki listwowe serii ARS, PBS”
Nr 1/2003/1

Miejscowość, data
Place, date

Toruń, 2004.04.30

Imię nazwisko stanowisko podpis
Name, surname, function, signature

Janusz Niedźwiecki, Dyrektor Generalny

*W przypadku wprowadzenia niezgodnych z producentem zmian w wyrobie lub zastosowania go niezgodnie z przeznaczeniem niniejsza deklaracja traci ważność.
If any changes of the product are not agreed with the manufacturer or the product is inappropriately used, this declaration becomes null and void.*

ЕТ "АДИС - 9 -
Анелия Митева"

АГЕНЦИЯ ЗА
ПРЕВОДИ

Адрес на управление: 4023 Пловдив, ж.р.Траклия, бл.20, ет.9, ап.53, тел: 032/ 826632; 266292

Превод от полски език

APATOR SA

Декларация СЕ за съответствие

| | |
|---|--|
| № | 0021/04 |
| Производител: | APATOR SA |
| Адрес: | ул. Золкиевскиего 13/29; 87-100 Торун Полша |
| Обозначение на продукта (име, тип): | Вертикални разединители с ножови предпазители тип ARS 00- |
| Декларираме, че посочения продукт съответства на следните изисквания: | |
| Европейски директиви: | 73/23/ЕЕС + 93/68/ЕЕС Директива за ниско напрежение, касаеща хармонизирането на правните предписанията на държавите членки, които се отнасят за електрическата техника, предназначена за използване в определени граници на напрежение. |
| Съгласувани стандарти и/или стандарти на IEC: | PN-EN 60947-1 Комутационна и контролна апаратура ниско напрежение Част I: Общи решения PN-EN 60947-3 Комутационна и контролна апаратура ниско напрежение Част 3: Превключватели, разединители, превключващи разединители и комбинирани устройства със стопяеми предпазители |
| Държавни норми и/или техническа документация: | Техническа документация и комплект от чертежи 63-811410-011 |
| Документи идентифициращи стоката: | Каталожна карта "Ножови включватели серия ARS, PBS" №1/2003/1. |
| Град, дата: | Торун, 30.04.2004г. |
| Име, фамилия, длъжност, подпис: | Генерален Директор Януш Ниедзвидзки Подпис: не се чете |

В случай на въвеждане на изменения на продукта, несъгласувани с производителя или ако използването не е съгласно предназначението, тази декларация става невалидна.

Подписаната Анелия Иванова Митева удостоверявам верността на извършения от мен превод от полски език на български език на приложения документ - "Декларация СЕ за съответствие". Преводът се състои от 1 (една) страница.

Преводач:

Анелия Иванова Митева
ЕГН 5909284635



526

ЕТ "АДИС - 9"
Анелия Митева"

АГЕНЦИЯ ЗА
ПРЕВОДИ

Адрес на управление: 4023 Пловдив, ж.р.Тракия, бл.20, ет.9, ап.53, тел: 032/ 266292; 826632

Превод от английски език

ИЗПИТАТЕЛНА ЛАБОРАТОРИЯ
Електротехнически институт – филиал в Гданск

КЕМА

ПРОТОКОЛ ОТ ИЗПИТАНИЕ
EN 60 947-3

Комутационна и контролна апаратура ниско напрежение
Част 3: Превключватели, разединители, превключващи разединители и
комбинираны устройства със стопяеми предпазители

| | |
|---|--|
| Номер на протокола | 088/LDM-660/97 |
| Съставен от (+подпис) | Анджей Цеве (подпис нечетлив) |
| Одобен от (+подпис) | Кшищоф Цимерман (подпис нечетлив) |
| Дата на издаване | 27.10.1997 (Оригинал на полски) |
| Изпитваща лаборатория | Изпитателна лаборатория на електротехническият институт – филиал в Гданск |
| Адрес | Нарвицка 1, 80-557 Гданск, Полша Тел.: +48 58 343 06 45 Факс: +48 58 343 12 95 |
| Място на провеждане на изпитванията | Виж по-горе |
| Дата на получаване на мострите за изпитване | 03.08.1997 |
| Период на провеждане на изпитването | 13.08 – 15.10.1997 |
| Заявител | APATOR S.A. |
| Адрес | Золкиевского 13/29, 87-100 Торун, Полша |
| Стандарт | EN 60 947-3:1992 |
| Номер на формуляра на протокола от изпитание | 60947-3A |
| Дата на формуляра на протокола от изпитание | 93-07 |
| Формулярът на протокола от изпитанието е издаден от | N.V.КЕМА |



817

| | |
|---|--|
| Авторско право върху бланката за протокола от изпитание | Издателят на формуляра на протокола от изпитание и N.V.KEMA. Този доклад се базира на бланка за протокол от изпитание, подготвена от N.V.KEMA, като е използвана информацията получена от Издателя на формуляра на протокола от изпитание. |
| Процедура на изпитване | IEC 60 947-3:1992 (Отговаря на полския стандарт PN-93/E-06150/30) |
| Отклонение от процедурата | Не |
| Нестандартен метод на изпитване | Не |
| Тип изпитвани изделия | Стопяем предпазител – прекъсвач |
| Търговска марка | APATOR S.A. |
| Означение на модела/типа | ARS 00-SM |
| Производител | APATOR S.A., Золкиевскиего 13/29, 87-100 Торун, Полша |
| Номинални стойности | 160A, 690V |

Забележка:

Тези резултати от изпитание се отнасят за изпитвания обект. Протоколът от изпитанието може да се възпроизвежда само изцяло, освен ако има писмено разрешение от изпитващата лаборатория.

Клиентът може да използва следното изявление:

“Това изпитание беше проведено в изпитателната лаборатория на гданския филиал на електротехническият институт, Полша, призната от КЕМА, Регистриран сертификат за качество за признаване № 2.04.97 и акредитиран от полския център за изпитание и акредитация, сертификат № L 7/3/98.

Подписаната Анелия Иванова Митева удостоверявам верността на извършения от мен превод от английски език на български език на приложеня документ Протокол от изпитание EN 60 947-3. Преводът се състои от 2 (две) страници.

Преводач:

*Анелия Иванова Митева
EГН 5909284635*



810



TEST LABORATORY

GDANSK BRANCH OF THE ELECTROTECHNICAL
INSTITUTE 75 (+48 56) 343 06 45 Fax: (+48 56) 343 12 95 e-mail:
institut@iel.gda.pl



Certificate of accreditation:
No. L7/3/98L7/3/98

TEST REPORT

EN 60 947-3

Low-voltage switchgear and controlgear

Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

| | |
|-----------------------------------|--|
| Report reference No | : 088/LDM-660/97 |
| Compiled by (+ signature) | : Andrzej Cewe: <i>Andrzej Cewe</i> |
| Approved by (+ signature) | : Boleslaw Wybraniak, PhD <i>Boleslaw Wybraniak</i> |
| Date of issue | : 27.10.1997 (original Polish). |
| Testing laboratory | : Laboratorium Badawcze Oddzialu IET w Gdansk |
| Address | : Narwicka 1, 80-557 Gdansk, Poland, tel. +48 58 343 06 45 |
| Testing location | : see above, fax: +48 58 343 12 95; |
| Test sample(s) received | : 03.08.1997. |
| Tested in period | : 13.08 – 15.10.1997 |
| Applicant | : APATOR S.A. |
| Address | : Zolkiewskiego 13/29, 87-100 Torun, Poland |
| Standard | : EN 60 947-3: 1992 |
| Test Report Form No. | : 60947-3A |
| TRF date | : 93-07 |
| TRF originator | : N.V. KEMA |
| Copyright blank test report | : TRF originator and N.V. Kema. This report is based on a blank test report that was prepared by N.V. KEMA using information obtained from the TRF originator. |
| Test procedure | : IEC 60 947-3:1992 [idt. Polish Std. PN-93/E-06150/30] |
| Procedure deviation | : No |
| Non-standard test method | : No |
| Type of test item | : fuse-disconnector |
| Trademark | : APATOR S.A |
| Model/type reference | : ARS 00-SM |
| Manufacturer | : APATOR S.A. Zolkiewskiego 13/29, 87-100 Torun, Poland |
| Rating | : 160A, 690V |

Note:

These test results refer to the object tested. The test report shall not be reproduced except in full without the written approval of the test laboratory.

Client is allowed to use the following statement:

"This test has been carried out in Test Lab of Gdańsk Branch of the Electrotechnical Institute, Poland, recognised by KEMA Registered Quality, certificate of recognition No. 2.04.97 and accredited by Polish Centre of Testing and Accreditation, certificate No L 7/3/98"

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[Handwritten signature]
50

ЕТ "АДИС - 9 -
Анелия Митева"

АГЕНЦИЯ ЗА
ПРЕВОДИ

Адрес на управление: 4023 Пловдив, ж.р.Траклия, б.л.20, ет.9, ап.53, тел: 032/ 266292; 826632

Превод от английски език

ИЗПИТАТЕЛНА ЛАБОРАТОРИЯ
Електротехнически институт – филиал в Гданск

КЕМА

ПРОТОКОЛ ОТ ИЗПИТАНИЕ
EN 60 947-3

Комутационна и контролна апаратура ниско напрежение
Част 3: Превключватели, разединители, превключващи разединители и
комбинирани устройства със стопяеми предпазители

| | |
|---|--|
| Номер на протокола | 164/LLP-197/A/95 |
| Съставен от (+подпис) | Анджей Цеве (подпис нечетлив) |
| Одобрен от (+подпис) | Кшищоф Цимерман (подпис нечетлив) |
| Дата на издаване | 24.11.1995 (Оригинал на полски) |
| Изпитваща лаборатория | Изпитателна лаборатория на електротехническият институт – филиал в Гданск |
| Адрес | Нарвицка 1, 80-557 Гданск, Полша Тел.: +48 58 343 06 45 Факс: +48 58 343 12 95 |
| Място на провеждане на изпитванията | Виж по-горе |
| Дата на получаване на мострите за изпитване | 08.09.1995 |
| Период на провеждане на изпитването | 01.10 – 31.10.1995 |
| Заявител | APATOR S.A. |
| Адрес | Золкиевскиего 13/29, 87-100 Торун, Полша |
| Стандарт | EN 60 947-3:1992 |
| Номер на формуляра на протокола от изпитание | 60947-3A |
| Дата на формуляра на протокола от изпитание | 93-07 |
| Формулярът на протокола от изпитанието е издаден от | N.V.КЕМА |



5/20

| | |
|---|---|
| Авторско право върху бланката за протокола от изпитание | Издателят на формуляра на протокола от изпитание и N.V.KEMA. Този доклад се базира на бланка за протокол от изпитание, подготвена от N.V.KEMA, като е използвана информация получена от Издателя на формуляра на протокола от изпитание |
| Процедура на изпитване | IEC 60 947-3:1992 (Отговаря на полския стандарт PN-93/E-06150/30) |
| Отклонение от процедурата | Не |
| Нестандартен метод на изпитване | Не |
| Тип изпитвани изделия | Стопяем предпазител – прекъсвач |
| Търговска марка | APATOR S.A. |
| Означение на модела/типа | ARS 2-3 |
| Производител | APATOR S.A., Золкиевскиего 13/29, 87-100 Торун, Полша |
| Номинални стойности | 400A, 690V |

Забележка:

Тези резултати от изпитание се отнасят за изпитвания обект. Протоколът от изпитанието може да се възпроизвежда само изцяло, освен ако има писмено разрешение от изпитващата лаборатория.

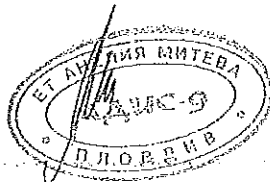
Клиентът може да използва следното изявление:

“Това изпитание беше проведено в изпитателната лаборатория на гданския филиал на електротехническият институт, Полша, призната от КЕМА, Регистриран сертификат за качество за признаване № 2.04.97 и акредитиран от полския център за изпитание и акредитация, сертификат № L 7/3/98.

Подписаната Апелия Иванова Митева удостоверявам верността на извършения от мен превод от английски език на български език на приложения документ - Протокол от изпитание EN 60 947-3. Преводът се състои от 2 (две) страници.

Преводач:

Апелия Иванова Митева
ЕГН 5909284635



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TEST LABORATORY

GDANSK BRANCH OF THE ELECTROTECHNICAL
INSTITUTE ☎ (+48 58) 343 06 45 Fax: (+48 58) 343 12 95 e-mail:
instytut@iel.gda.pl

KEMA
Certificate of recognition No. 2.04 97



TEST REPORT EN 60 947-3

Low-voltage switchgear and controlgear
Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

| | |
|-----------------------------------|--|
| Report reference No | : 164/LLP-197/95 |
| Compiled by (+ signature) | : Andrzej Cewe: <i>Andrzej Cewe</i> |
| Approved by (+ signature) | : Boleslaw Wybraniak, PhD <i>Boleslaw Wybraniak</i> |
| Date of issue | : 24.11.1995 (original Polish). |
| Testing laboratory | : Laboratorium Badawcze Oddzialu IEI w Gdansk |
| Address | : Narwicka 1, 80-557 Gdansk, Poland, tel. +48 58 343 06 45 |
| Testing location | : see above, fax: +48 58 343 12 95. |
| Test sample(s) received | : 08.09.1995. |
| Tested in period | : 01.10 - 31.10.1995 |
| Applicant | : APATOR S.A. |
| Address | : Zolkiewskiego 13/29, 87-100 Torun, Poland |
| Standard | : EN 60 947-3: 1992 |
| Test Report Form No. | : 60947-3A |
| TRF date | : 93-07 |
| TRF originator | : N.V. KEMA |
| Copyright blank test report | : TRF originator and N.V. Kema. This report is based on a blank test report that was prepared by N.V. KEMA using information obtained from the TRF originator. |
| Test procedure | : IEC 60 947-3:1992 [idt. Polish Std. PN-93/E-06150/30] |
| Procedure deviation | : No |
| Non-standard test method | : No |
| Type of test item | : fuse-disconnector |
| Trademark | : APATOR S.A |
| Model/type reference | : ARS 2-3 |
| Manufacturer | : APATOR S.A. Zolkiewskiego 13/29, 87-100 Torun, Poland |
| Rating | : 400A, 690V |

Note:

These test results refer to the object tested. The test report shall not be reproduced except in full without the written approval of the test laboratory.

Client is allowed to use the following statement:
"This test has been carried out in Test Lab of Gdansk Branch of the Electrotechnical Institute, Poland, recognised by KEMA Registered Quality, certificate of recognition No. 2.04 97 and accredited by Polish Centre of Testing and Accreditation, certificate No L-73/98".

22

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСВИЕ

Долуподписаният Антон Иванов Илиев, с ЛК№ 641903354 издадена на 01.02.2011г. от МВР София, с ЕГН 7103186662, в качеството ми на представляващ „МИГ 23“ ЕООД , кандидат за участие в търг с предмет:

„Доставка и монтаж на комплектни метални трансформаторни постове ”
(наименование на обществената поръчка)

Реф. № РРД 15-065

ДЕКЛАРИРАМ:

1. Предлаганите от фирма „МИГ 23“ ЕООД Вертикален разединител НН, с триполюсно управление, производство на APATOR SA, съответстват на предлаганото изпълнение с изискванията на техническата спецификация на този стандарт за материал, вкл. на параграфи „Характеристика на материала” и „Съответствие на предложеното изпълнение с нормативно-техническите документи”.

2. Продуктите отговарят на препоръки за стандартизация:
Национални стандарти и / или технически спецификации:

IEC/EN 60947-1

IEC/EN 60947-3

Продуктите изпълняват изискванията за СЕ маркировка според Ниско волтовата директива 2006/95 / ЕО

Известно ми е, че при деклариране на неверни данни, нося наказателна отговорност по чл. 313 от НК.

23.10.2015 г.

Декларатор:.....



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1998-1999

1998-1999

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(

Инструкции за транспортиране и складиране въвеждане в експлоатация и поддържане

1. Транспорт

Електрооборудването се транспортира в оригиналната транспортна опаковка на производителя, в която стандартно се доставя.

Препоръчва се избягването на натоварване и слагане на тежки предмети/товари върху опаковките на оборудването. Така се гарантира предпазване от счупване или деформация при съхранение и транспорт.

2. Съхранение

Доставяното електротехническо оборудване се съхранява в сухи и затворени складови помещения предоставящи нормални условия за съхраняване на стандартно електрооборудване.

Оборудването да се предпазва от влага и течаща вода.

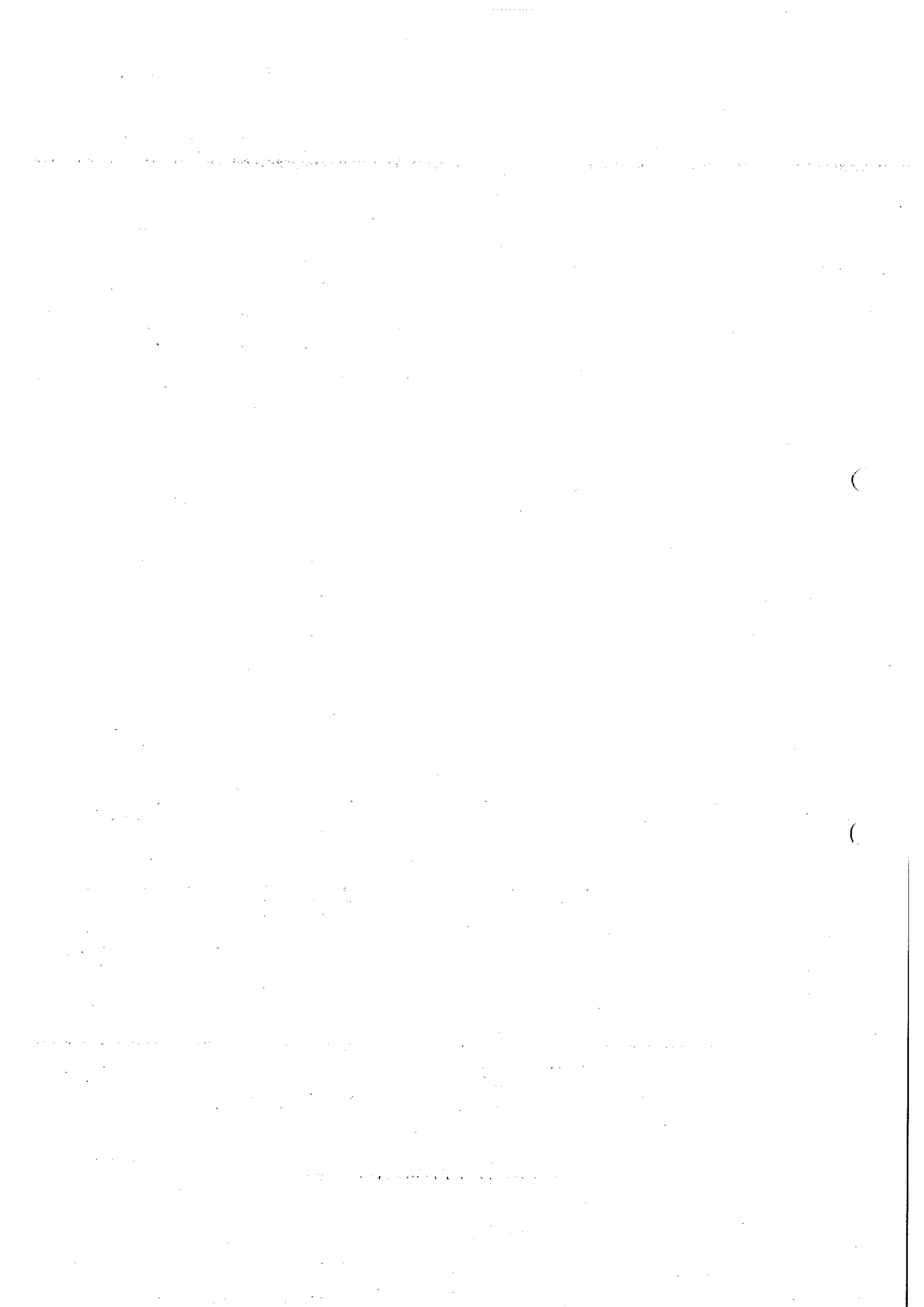
3. Монтаж

Монтажа се извършва само от компетентен и упълномощен за работа с електрооборудване персонал.

Монтажа се извършва съгласно пълните инструкции за монтаж приложени към всяко изделие.

4. Обслужване и поддържане

Производителя на електрооборудването не предвижда специализирани дейности по обслужването и поддръжката на апаратурата.



Описание на потенциалната заплаха за увеличаване опасността и рисковете от замърсяване на околната среда и класификация

Предлаганите от фирма „МИГ 23“ ЕООД прекъсвачи НН, производство на Апатор Полша, изпълняват и отговарят напълно на изискванията за рециклиране и обезвреждане на продукти.

Те са произведени от съвместими с околната среда материали, за да се не се допуска опасност от вреда на околната среда или здравето причинено от опасни материали. Подходящи за съхранение на суровините и енергията и избягване на замърсяване.

Продуктите са произведени от безопасни материали, които подлежат на рециклиране след експлоатация. Процедурата се регулира строго от властите и нормативната база на страната.

Материалите са използвани в съответствие с производствените стандарти и не представляват опасност за увеличаване нивото на отпадъците или застрашаване на околната среда.

Електротехническите продукти са произведени в съответствие с внедрената система за управление и опазване на околната среда ISO 14001.

Класификация на отпадъците, съгласно Наредба №3/2004 г. за класификация на отпадъците, издадена от министъра на околната среда и водите и министъра на здравеопазването, обн. ДВ, бр. 44 от 25.05.2004 г.):

| | |
|----------|--------------------|
| 17 04 01 | мед, бронз, месинг |
| 17 04 02 | алуминий |
| 17 02 03 | пластмаса |
| 17 04 07 | смеси от метали |

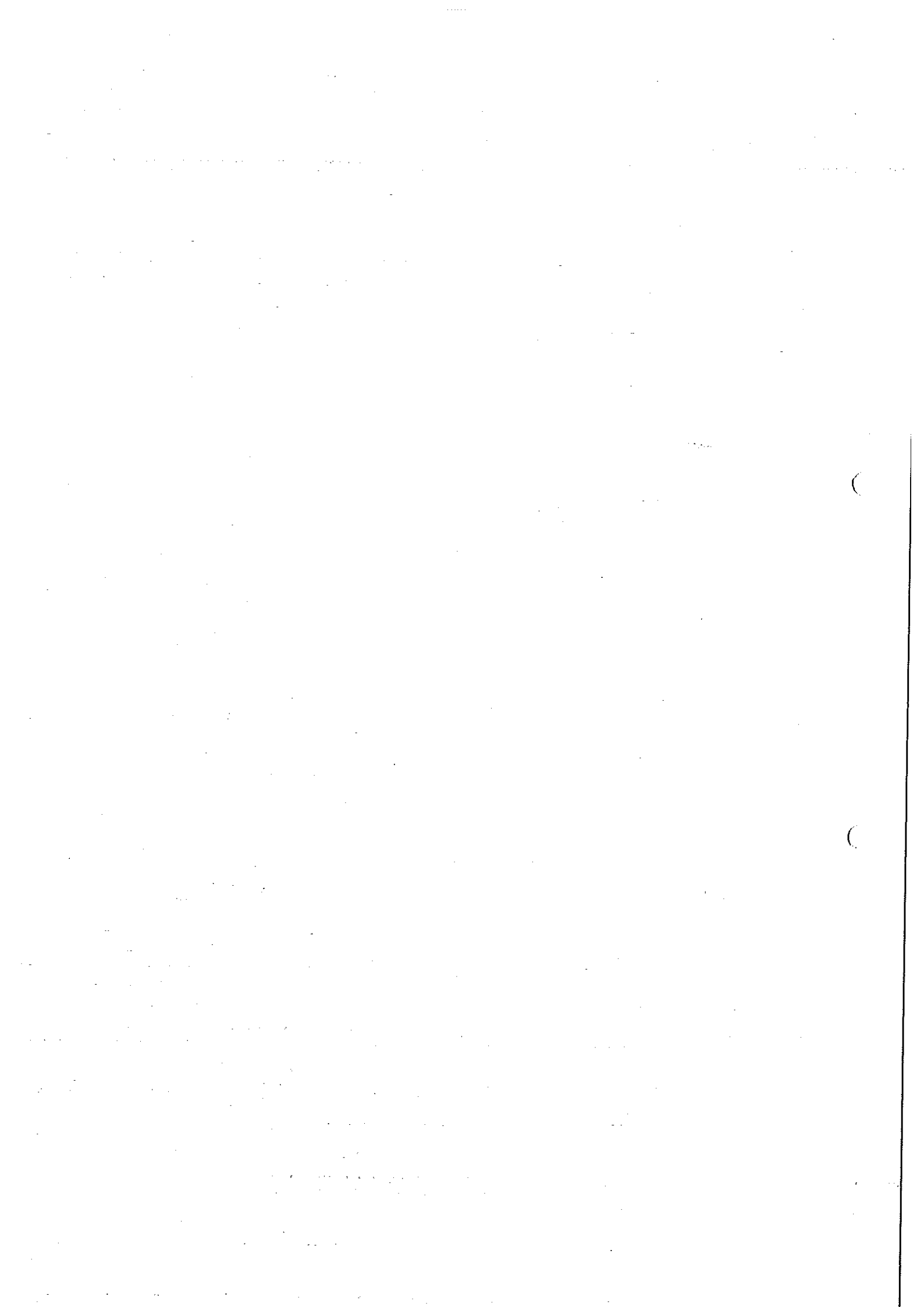
23.10.2015 г.

Декларатор:.....

(Антон Илиев)



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ДЕКЛАРАЦИЯ

за обстоятелства свързани с възможностите за рециклиране и обезвреждане на продукти

Долуподписаният Антон Иванов Илиев, с ЛК№ 641903354 издадена на 01.02.2011г. от МВР София, с ЕГН 7103186662, в качеството ми на представляващ „МИГ 23“ ЕООД , кандидат за участие в търг с предмет:

„Доставка и монтаж на комплектни метални трансформаторни постове ”
(наименование на обществената поръчка)

Реф. № РРД 15-065

ДЕКЛАРИРАМ:

1. Предлаганите от фирма „МИГ 23“ ЕООД автоматични прекъсвачи НН, лят корпус производство на АББ Консорциум с подразделение SACE – Италия, изпълняват и отговарят напълно на изискванията за рециклиране и обезвреждане на продукти.
2. Съставните части на системите на продуктите, такива като структурни части и материали, могат да бъдат рециклирани, където съществуват съоръжения за рециклиране. Предприятията е възможно да демонтират, оползотворяват, рециклират или обезвреждат електротехническите продукти.
3. Устройство на еколого-съобразни продукти, и тяхното интегриране в процеса планиране и развитие. Целта е да се постигне оптимална съвместимост с околната среда на продуктите, като се вземе под внимание всички фази на експлоатация, също така и икономическите и технически аспекти.

Стандартизирането на рециклирането покрива всички аспекти на указанията на IEC 109 “Екологични страни – включително в електротехническите стандарти”.

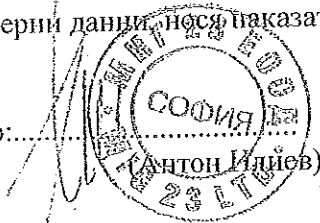
4. Продуктите отговарят на препоръки за стандартизация:

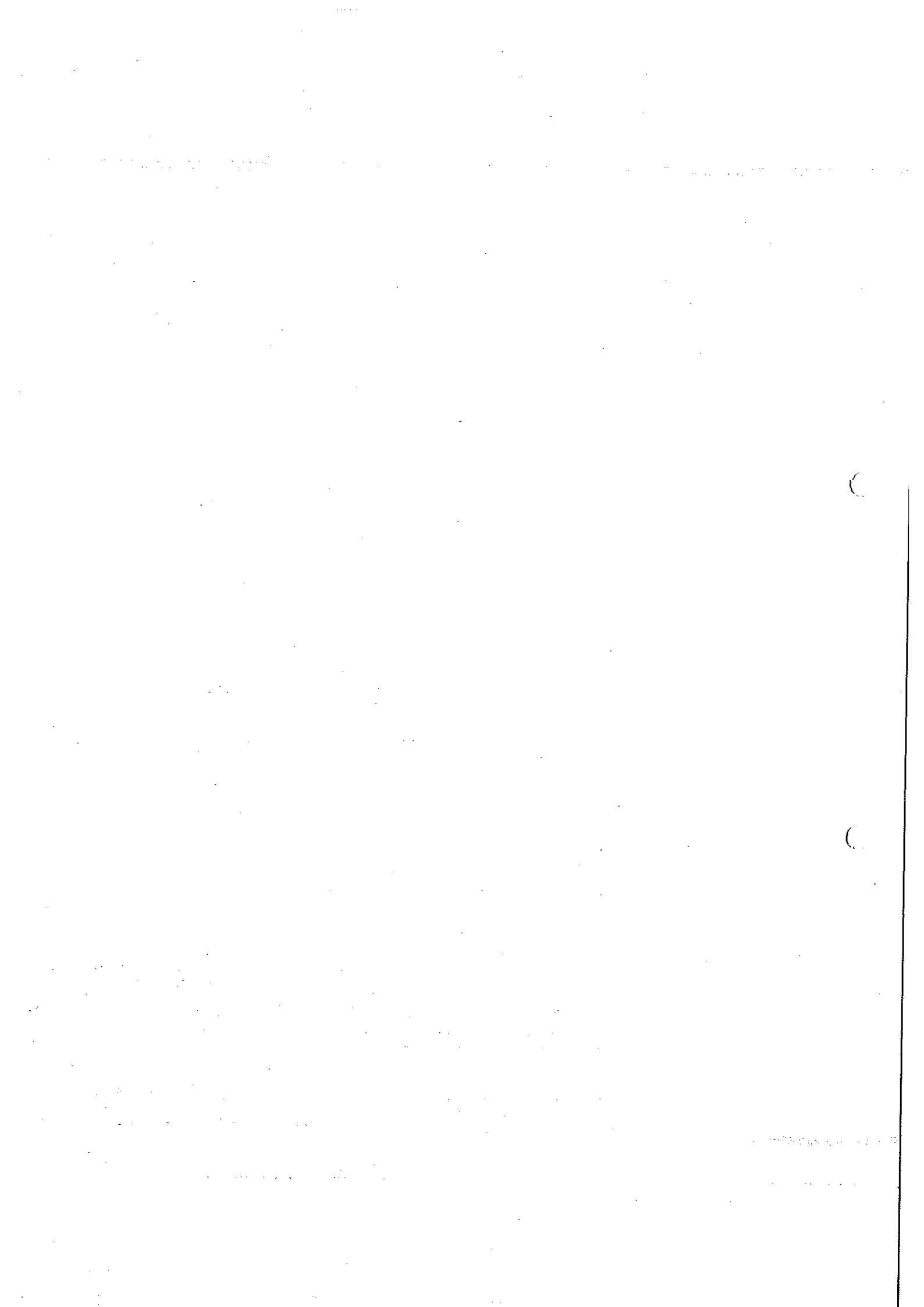
Процеса на рециклиране е определен и следва стандартите и предписанията на:
DIN ISO 11469 Общо идентифициране и обозначаване на продуктите от пластмаса;
Указания IEC 109 Екологични страни – включително в електротехническите стандарти
ISO 14001 Система за управление и опазване на околната среда- Спецификация
ISO 14040 Life Cycle Assessment - General Principles and Practices
SN 36350-2 Екологично съвместими продукти;
SN 36350-3 Екологично съвместими продукти; Полимери, Polymers, оценка на възможността за рециклиране и смесване на термопластични полимери;
SN 36350-4 Екологично съвместими продукти; Материали от метал, определяне свойствата за рециклиране и смесване;
SN 36350-5 Екологично съвместими продукти; Екологични изисквания за опаковане;
SN 36351 Правила за маркетинг на опасните субстанции в продуктите;

Известно ми е, че при деклариране на неверни данни, нося наказателна отговорност по чл. 313 от НК.

23.10.2015 г.

Декларатор:.....



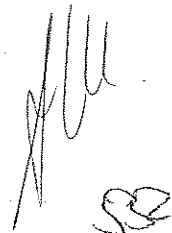
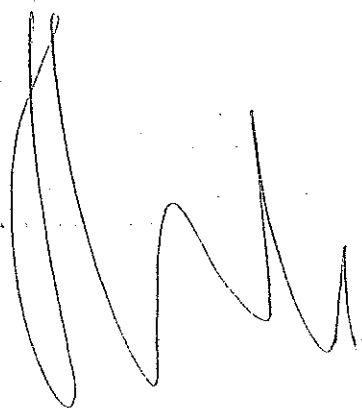


Триполюсни и еднополюсни

стопяем цилиндричен

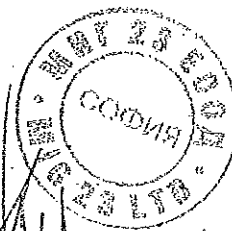
предпазител-прекъсвач-

разединители, размер 10x38 mm



Наименование на материала: Триполюсни и еднополюсни стопяем цилиндричен предпазител-прекъсвач-разединители, размер 10x38 mm

| № по ред | Документ | Приложение № или текст |
|----------|---|---|
| 1. | Точно означение на типа, производителя и страната на производство (произход) и последно издание на каталога на производителя | OPV10S-1 OPV10S-3 OEZ Чехия Приложение 1 |
| 2. | Техническо описание и чертежи с нанесени на тях размери | Приложение 1 |
| 3. | ЕО декларация за съответствие | Приложение 2 |
| 4. | Протоколи от типови изпитвания на английски или български език, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език | Приложение 3 |
| 5. | Сертификат/акредитация на независимата изпитвателна лаборатория, провели типовите изпитвания по т. 4 – заверено копие | Приложение 4 |
| 6. | Инструкции за транспортиране, складиране, монтиране, вкл. въртящия момент на затягане на клемовите съединения, обслужване и поддържане | Приложение 5 |
| 7. | Описание на потенциалната заплаха за увеличаване опасността и рисковете от замърсяване на околната среда и класификация на отпадъците съгласно Наредба №3/2004 г. за класификация на отпадъците, издадена от министъра на околната среда и водите и министъра на здравеопазването, обн. ДВ, бр. 44 от 25.05.2004 г. | Приложение 6 |
| 8. | Декларация за възможността за рециклиране на използваните материали или за начина на ликвидацията им | Приложение 7 |



FUSE SWITCH-DISCONNECTORS FOR CYLINDRICAL FUSE-LINKS UP TO 32 A

Fuse switch-disconnectors OPV10 are intended for cylindrical fuse-links PV10 size 10x38. They can safely switch off rated current and overcurrent up to 1.5 rated current and meet the requirements for safe disconnection. Inverse connection is permissible and it affects neither the technical parameters nor the safety of the operator.

- Switch-disconnectors OPV can be sealed in the closed state.
- The devices are designed as modular for 45 mm cutout in the switchboard.
- Optional light indication of fuse state.
- Mounted on „U“ rail of type TH35 according to EN 60715 or on the panel (steel rail recommended).
- Fuse-link state can be indicated by means of electronic signalling, see page D17.

Fuse switch-disconnectors

| Type | Product code | I _n (A) | Number of poles | Weight (kg) | Package (pcs) |
|-----------|--------------|--------------------|-----------------|-------------|---------------|
| OPV10S-1 | 38819 | 32 | 1 | 0.100 | 12 |
| OPV10-N | 38825 | | N | 0.107 | 12 |
| OPV10S-1H | 38820 | | 1+H | 0.187 | 6 |
| OPV10S-2 | 38821 | | 2 | 0.180 | 6 |
| OPV10S-3 | 38822 | | 3 | 0.280 | 4 |
| OPV10S-3H | 38823 | | 3+H | 0.360 | 3 |
| OPV10S-4 | 38824 | | 4 | 0.360 | 3 |

¹⁾ OPV10-N design is without the possibility of signalling of fuse state.

Accessories

| Description | Type | Product code | Weight (kg) | Package (pcs) |
|--|-------------------|--------------|-------------|---------------|
| Light indication, operating voltage 100 ÷ 500 V a.c., d.c. | S-OPV10 | 08703 | 0.002 | 1 |
| Light indication, operating voltage 12 ÷ 48 V d.c., a.c. (+ pole up) | S-OPV10/48 | 11812 | 0.002 | 1 |
| Light indication, operating voltage 12 ÷ 48 V d.c., a.c. (- pole down) | S-OPV10/48PD | 18234 | 0.002 | 1 |
| 1-pole interconnecting busbar, cross-section 12 mm ² , max. current 65 A, rated operating voltage 415 V, max. operating voltage 500 V, length 1 m | G1L-1000-12 | 37355 | 0.300 | 1 |
| 2-pole interconnecting busbar, cross-section 16 mm ² , max. current 80 A, rated operating voltage 415 V, max. operating voltage 500 V, length 1 m | G2L-1000-16 | 37361 | 0.477 | 20 |
| 3-pole interconnecting busbar, cross-section 10 mm ² , max. current 63 A, rated operating voltage 415 V, max. operating voltage 500 V, length 1 m | G3L-1000-10C | 37365 | 0.300 | 1 |
| End cap, for 1-pole busbars with diameter 10, 12, 16 mm ² | EKC-1 | 37383 | 0.0005 | 10 |
| End cap, for 3-pole busbars with diameter 10 mm ² | EKC-3 | 37385 | 0.001 | 10 |
| End cap, for 2-pole and 3-pole busbars with diameter 16 mm ² | EKC-2+3 | 37384 | 0.001 | 10 |
| Terminal extension, for connection of conductor of cross-section up to 25 mm ² | AS-25-G | 37390 | 0.012 | 10 |
| Terminal extension, for connection of Cu/Al conductor of cross-section 2.5 ÷ 50 mm ² | AS-50-S-AL01 | 38749 | 0.02 | 1 |
| Adapter for busbars with spacing 60 mm, busbar thickness 5 or 10 mm, busbar width 12 ÷ 30 mm, cable outlet bottom, max. current 63 A | GA-60/63/54-1x7,5 | 11883 | 0.560 | 1 |

Specifications

| | | |
|--------------------------------------|-----------------|------------|
| Rated operating current | I _n | 32 A |
| Rated operating voltage (a.c./d.c.) | U _e | 690 V |
| Utilization category | 690 V a.c. | AC-21B |
| | 250 V d.c. | DC-21B |
| | 700 V d.c. | DC-20B |
| Rated thermal current with fuse-link | I _{th} | 32 A |
| Rated frequency | f _n | 40 ÷ 60 Hz |
| Rated insulation voltage | U _i | 800 V a.c. |



FUSE SWITCH-DISCONNECTORS FOR CYLINDRICAL FUSE-LINKS UP TO 32 A

Specifications

| | | | |
|--|-------------------|-------|--|
| Rated conditional short-circuit current with fuse-links PV (RMS) | I_{cs} | 690 V | 110 kA |
| Rated pulse withstand voltage | U_{imp} | | 4 kV |
| Fuse-link size | diameter x length | | 10x38 |
| Max. rated current of the fuse-link | I_n | | 32 A |
| Max. power losses of the fuse-link** | P_f | | 3.5 W |
| Rated short-time withstand current | $I_{cs} 1s$ | | 1.6 kA |
| Rated short-circuit making capacity at 400 V a.c. | I_{cm} | | 4 kA |
| Electrical endurance | | | 300 |
| Mechanical endurance | | | 1700 |
| Degree of protection, cover closed | | | IP20 |
| Degree of protection, cover opened | | | IP20 |
| Connection cross-section | | | Cu/0.5 ÷ 25 mm ² (2x 16 mm ²) |
| Torque | | | 2 Nm |
| Operating ambient temperature | t | | -25 ÷ +55 °C |
| Max. sea level | | | 2000 m |
| Seismic resistance according to VE ŠKODA | | | 3 g/8 ÷ 50 Hz |
| Overvoltage category/Rated voltage | | | I (II*)/690 V a.c., II (III*)/500 V a.c., III/400 V a.c. |
| Standards | | | IEC 60947-1, -3; EN 60947-1, -3 |



* For underground cable distribution systems with overvoltage protection or for exposure to a low thunderstorm electricity (table H2 EN 60947-1, IEC 60947-1).

** Conditions for the use of fuse-links for semiconductor protection PV510 in chapter „Conditions for the use of fuse-links in fuse switch-disconnectors“ see page H33.

EN 60947-3 ed. 2/A2, p. C.5 Instructions for the use of 1-pole controlled devices states:

These devices are intended for distribution systems, with possible necessity of switching and/or safe disconnection of individual phases, and must not be used for switching a primary circuit of a three-phase equipment.

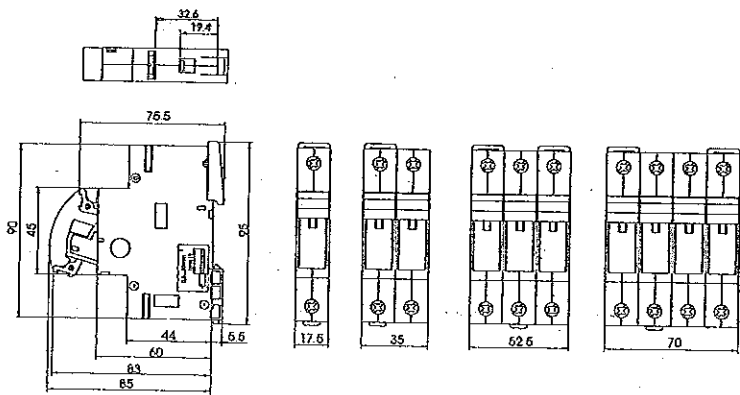
Reduction of rated current of fuse-links PV gG, aM according to the number of poles

| Type | Reduced rated current (A) | | | | | |
|-------|---------------------------|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 10 |
| OPV10 | 32 | 32 | 32 | 32 | 32 | 32 |

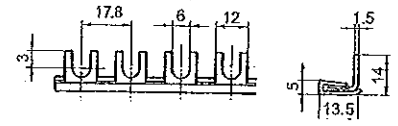
Neutral pole

| | | OPV10 |
|---|---------------|--------------------------|
| Rated operating current | I_n | 32 A |
| Thermal current with disconnecting link ZPV10 | I_{th} | 110 A/25 mm ² |
| Utilization category of the neutral pole at I_n | | AC-20B |
| Rated short-time withstand current | $I_{cs} 1s$ | 1.6 kA |
| Rated short-circuit making capacity at 690 V a.c. | I_{cm} [kA] | 5 kA |
| Rated short-circuit making capacity at 250 V d.c. | I_{cm} [kA] | 5.1 kA |
| Power losses with disconnecting link at I_n | P_f [W] | 4.8 W |
| Connection cross-section | | 0.5 ÷ 25 mm ² |

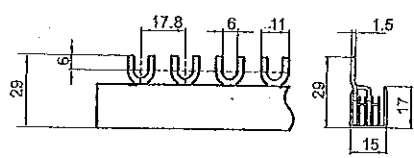
Dimensions



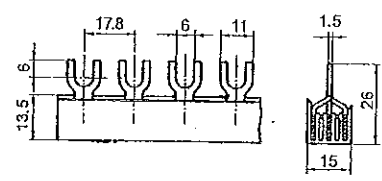
G1L-1000-12



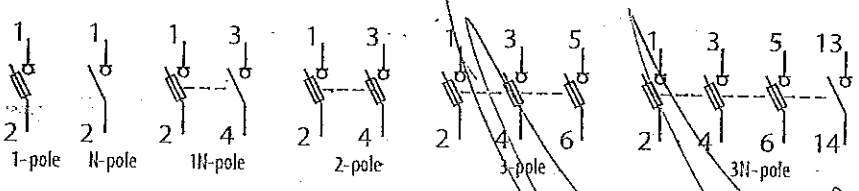
G2L-1000-16



G3L-1000-10C



Diagram



MINIMAL CONNECTING CROSS-SECTION OF FUSE SWITCH-DISCONNECTORS

Minimal connecting cross section of cables of fuse switch-disconnectors for cylindrical fuse-links

| Fuse-links I (A) | Fuse switch-disconnectors for cylindrical fuse-links | | | Cable S (mm ²) | |
|---------------------|---|-------|-------|-------------------------------|----|
| | OPV10 | OPV14 | OPV22 | Cu | Al |
| 0.25 | x | x | | 1 | - |
| 0.5 | x | x | | 1 | - |
| 1 | x | x | | 1 | - |
| 2 | x | x | | 1 | - |
| 4 | x | x | | 1 | - |
| 6 | x | x | | 1 | - |
| 8 | x | x | | 1 | - |
| 10 | x | x | | 1.5 | - |
| 12 | x | x | | 1.5 | - |
| 16 | x | x | x | 2.5 | - |
| 20 | x | x | x | 2.5 | - |
| 25 | x | x | x | 4 | - |
| 32 | x | x | x | 4 | - |
| 40 | | x | x | 10 | - |
| 50 | | x | x | 10 | 16 |
| 63 | | x | x | 16 | 25 |
| 80 | | | x | 25 | 35 |
| 100 | | | x | 35 | 50 |
| 125 | | | x | 50 | 70 |

Notes:

- 1) Applies to ambient temperature of switch-disconnectors max. 40 °C
- 2) Applies to HRC fuse-links PV10, PV14, PV22

Minimal connecting cross-section of cables and busbars of fuse switch-disconnectors and fuse rails

| Fuse-links I (A) | Fuse switch-disconnectors and fuse rails | | | | | | | | | | Cable S (mm ²) | | Busbar width | |
|---------------------|--|------|-----|-----|-----|--------------|------------|------------|------------|-------|-------------------------------|--------|-----------------|--|
| | FR000 | FR00 | FR1 | FR2 | FR3 | FD00 FR00 | FD1 FR1 | FD2 FR2 | FD3 FR3 | Cu | Al | Cu | Al | |
| 4 | x | x | | | | x | | | | 1 | - | - | - | |
| 6 | x | x | x | | | x | x | | | 1 | - | - | - | |
| 8 | x | x | x | | | x | x | | | 1 | - | - | - | |
| 10 | x | x | x | | | x | x | | | 1.5 | - | - | - | |
| 12 | x | x | x | | | x | x | | | 1.5 | - | - | - | |
| 16 | x | x | x | | | x | x | | | 2.5 | - | - | - | |
| 20 | x | x | x | | | x | x | | | 2.5 | - | - | - | |
| 25 | x | x | x | | | x | x | | | 4 | - | - | - | |
| 32 | x | x | x | x | | x | x | x | | 4 | - | - | - | |
| 35 | x | x | x | x | | x | x | x | | 6 | - | - | - | |
| 40 | x | x | x | x | | x | x | x | | 10 | - | - | - | |
| 50 | x | x | x | x | | x | x | x | | 10 | 16 | - | - | |
| 63 | x | x | x | x | | x | x | x | | 16 | 25 | - | - | |
| 80 | x | x | x | x | x | x | x | x | x | 25 | 35 | - | - | |
| 100 | x | x | x | x | x | x | x | x | x | 35 | 50 | 20x2 | 25x2 | |
| 125 | x | x | x | x | x | x | x | x | x | 50 | 70 | 25x2 | 25x3 | |
| 160 | x | x | x | x | x | x | x | x | x | 70 | 95 | 25x3 | 25x4 | |
| 200 | | | x | x | x | | x | x | x | 95 | 120 | 25x4 | 25x5 | |
| 224 | | | x | x | x | | x | x | x | 95 | 120 | 25x4 | 25x5 | |
| 250 | | | x | x | x | | x | x | x | 120 | 150 | 25x5 | 25x6 | |
| 315 | | | | x | x | | | x | x | 150 | 185 | 32x5 | 32x6 | |
| 350 | | | | x | x | | | x | x | 185 | 240 | 32x6 | 32x8 | |
| 400 | | | | x | x | | | | x | 240 | 2x150 | 32x8 | 40x8 | |
| 500 | | | | | x | | | | x | 2x150 | 2x185 | 2x30x5 | 2x40x5 | |
| 630 | | | | | x | | | | x | 2x185 | 2x240 | 2x40x5 | 2x40x8 | |

Notes:

- 1) Applies to ambient temperature of switch-disconnectors max. 40 °C
- 2) Applies to HRC fuse-links PHA, PH1A

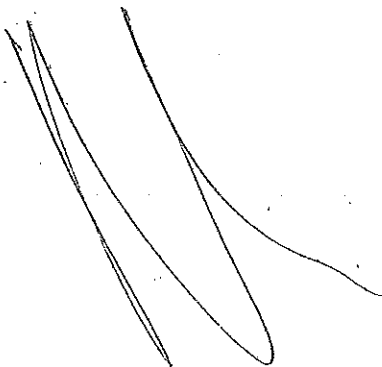
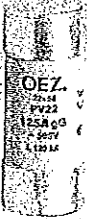
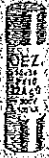


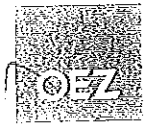
FUSE-LINKS PV

- Small dimensions.
- High limiting and breaking capacity.
- Low power losses.
- The fuse-links do not contain harmful substances according to the RoHS Regulation (cadmium, lead and other).
- Utilization category gG for protection of lines, cables and other equipment against overload and short-circuit.
- Utilization category aM for protection of motors, overcurrent relays, contactors and similar devices only against short-circuit.

Fuse-links PV

| I _n (A) | Type | Utilization category gG | | | | Utilization category aM | | | | Weight (kg) | Package (pcs) |
|--------------------|--------------|-------------------------|--------------|-----------|---------------|-------------------------|--------------|-----------|-------|-------------|---------------|
| | | U _n (V) | Product code | Power (W) | Type | U _n (V) | Product code | Power (W) | | | |
| 0,25 | - | - | - | - | PV10 0,25A aM | 500 | 06688 | 0.11 | 0.011 | 20 | |
| 0,5 | - | - | - | - | PV10 0,5A aM | 500 | 06689 | 0.17 | 0.011 | 20 | |
| 1 | - | - | - | - | PV10 1A aM | 500 | 06690 | 0.29 | 0.011 | 20 | |
| 2 | PV10 2A gG | 500 | 06691 | 0.72 | PV10 2A aM | 500 | 06692 | 0.92 | 0.011 | 20 | |
| 4 | PV10 4A gG | 500 | 06693 | 1.17 | PV10 4A aM | 500 | 06694 | 0.25 | 0.011 | 20 | |
| 6 | PV10 6A gG | 500 | 06695 | 0.88 | PV10 6A aM | 500 | 06696 | 0.31 | 0.011 | 20 | |
| 8 | PV10 8A gG | 500 | 06697 | 1.04 | PV10 8A aM | 500 | 06698 | 0.46 | 0.011 | 20 | |
| 10 | PV10 10A gG | 500 | 06699 | 1.29 | PV10 10A aM | 500 | 06700 | 0.46 | 0.011 | 20 | |
| 12 | PV10 12A gG | 500 | 06701 | 1.48 | PV10 12A aM | 500 | 06702 | 0.47 | 0.011 | 20 | |
| 16 | PV10 16A gG | 500 | 06703 | 1.86 | PV10 16A aM | 500 | 06704 | 0.67 | 0.011 | 20 | |
| 20 | PV10 20A gG | 500 | 06705 | 2.20 | PV10 20A aM | 400 | 06706 | 0.87 | 0.011 | 20 | |
| 25 | PV10 25A gG | 500 | 06707 | 2.58 | PV10 25A aM | 400 | 06708 | 1.05 | 0.011 | 20 | |
| 32 | PV10 32A gG | 500 | 06709 | 2.54 | PV10 32A aM | 400 | 06710 | 1.50 | 0.011 | 20 | |
| 0,25 | - | - | - | - | PV14 0,25A aM | 690 | 06711 | 0.12 | 0.020 | 10 | |
| 0,5 | - | - | - | - | PV14 0,5A aM | 690 | 06712 | 0.18 | 0.020 | 10 | |
| 1 | - | - | - | - | PV14 1A aM | 690 | 06713 | 0.30 | 0.020 | 10 | |
| 2 | PV14 2A gG | 690 | 06714 | 0.95 | PV14 2A aM | 690 | 06715 | 0.99 | 0.020 | 10 | |
| 4 | PV14 4A gG | 690 | 06716 | 1.57 | PV14 4A aM | 690 | 06717 | 0.31 | 0.020 | 10 | |
| 6 | PV14 6A gG | 690 | 06718 | 2.24 | PV14 6A aM | 690 | 06719 | 0.34 | 0.020 | 10 | |
| 8 | PV14 8A gG | 690 | 06720 | 1.20 | PV14 8A aM | 690 | 06721 | 0.45 | 0.020 | 10 | |
| 10 | PV14 10A gG | 690 | 06722 | 1.58 | PV14 10A aM | 690 | 06723 | 0.56 | 0.020 | 10 | |
| 12 | PV14 12A gG | 690 | 06724 | 1.49 | PV14 12A aM | 690 | 06725 | 0.63 | 0.020 | 10 | |
| 16 | PV14 16A gG | 690 | 06726 | 2.0 | PV14 16A aM | 500 | 06727 | 1.01 | 0.020 | 10 | |
| 20 | PV14 20A gG | 690 | 06728 | 2.24 | PV14 20A aM | 500 | 06729 | 1.04 | 0.020 | 10 | |
| 25 | PV14 25A gG | 690 | 06730 | 2.70 | PV14 25A aM | 500 | 06731 | 1.30 | 0.020 | 10 | |
| 32 | PV14 32A gG | 690 | 06732 | 3.33 | PV14 32A aM | 500 | 06733 | 1.94 | 0.020 | 10 | |
| 40 | PV14 40A gG | 500 | 06734 | 3.86 | PV14 40A aM | 500 | 06735 | 2.04 | 0.020 | 10 | |
| 50 | PV14 50A gG | 500 | 06736 | 4.10 | PV14 50A aM | 400 | 06737 | 2.91 | 0.020 | 10 | |
| 63 | PV14 63A gG | 500 | 06738 | 5.35 | PV14 63A aM | 400 | 06739 | 3.69 | 0.020 | 10 | |
| 16 | PV22 16A gG | 690 | 06740 | 2.23 | PV22 16A aM | 690 | 06741 | 0.92 | 0.060 | 10 | |
| 20 | PV22 20A gG | 690 | 06742 | 2.24 | PV22 20A aM | 690 | 06743 | 1.06 | 0.060 | 10 | |
| 25 | PV22 25A gG | 690 | 06744 | 2.90 | PV22 25A aM | 690 | 06745 | 1.43 | 0.060 | 10 | |
| 32 | PV22 32A gG | 690 | 06746 | 4.10 | PV22 32A aM | 690 | 06747 | 2.03 | 0.060 | 10 | |
| 40 | PV22 40A gG | 690 | 06748 | 4.52 | PV22 40A aM | 690 | 06749 | 2.50 | 0.060 | 10 | |
| 50 | PV22 50A gG | 690 | 06750 | 6.45 | PV22 50A aM | 690 | 06751 | 2.55 | 0.060 | 10 | |
| 63 | PV22 63A gG | 500 | 06752 | 5.82 | PV22 63A aM | 500 | 06753 | 4.05 | 0.060 | 10 | |
| 80 | PV22 80A gG | 500 | 06754 | 6.82 | PV22 80A aM | 500 | 06755 | 4.85 | 0.060 | 10 | |
| 100 | PV22 100A gG | 500 | 06756 | 7.81 | PV22 100A aM | 500 | 06757 | 5.59 | 0.060 | 10 | |
| 125 | PV22 125A gG | 500 | 18271 | 10.5 | PV22 125A aM | 400 | 06758 | 6.31 | 0.060 | 10 | |








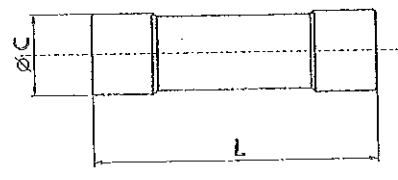
Cylindrical fuses

FUSE-LINKS PV

Parameters

| | | |
|-------------------------------|-------|--|
| Rated voltage | U_n | 400 ÷ 690 V a.c. 250 V d.c. |
| Rated breaking capacity (rms) | I_n | 120 kA/400 ÷ 690 V a.c. (100 kA/PV10 32A gG, 60 kA/PV14 63A gG) 50 kA/250 V d.c. |
| Utilization category | | gG aM |
| Discrimination | | 1:1.6 |
| Standards | | IEC 60269 EN 60269 |
| Approval marks | |    |

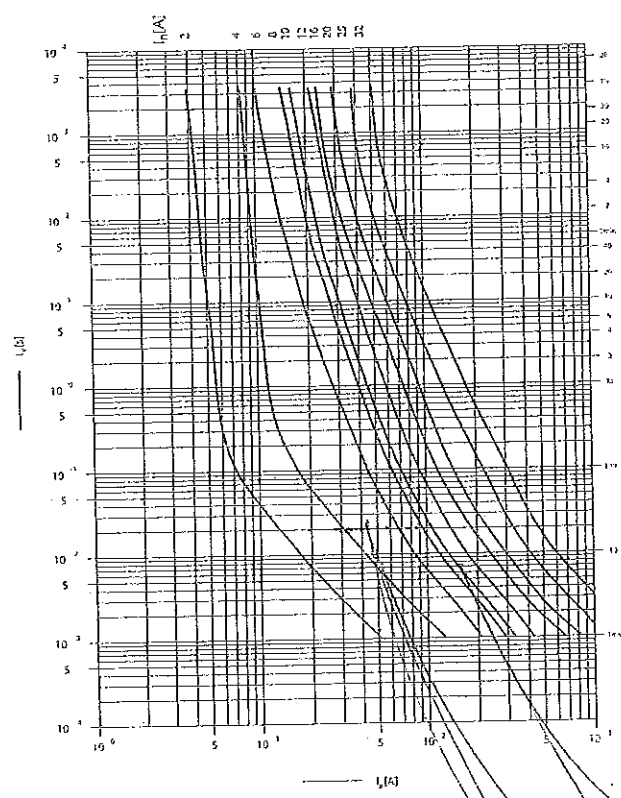
Dimensions



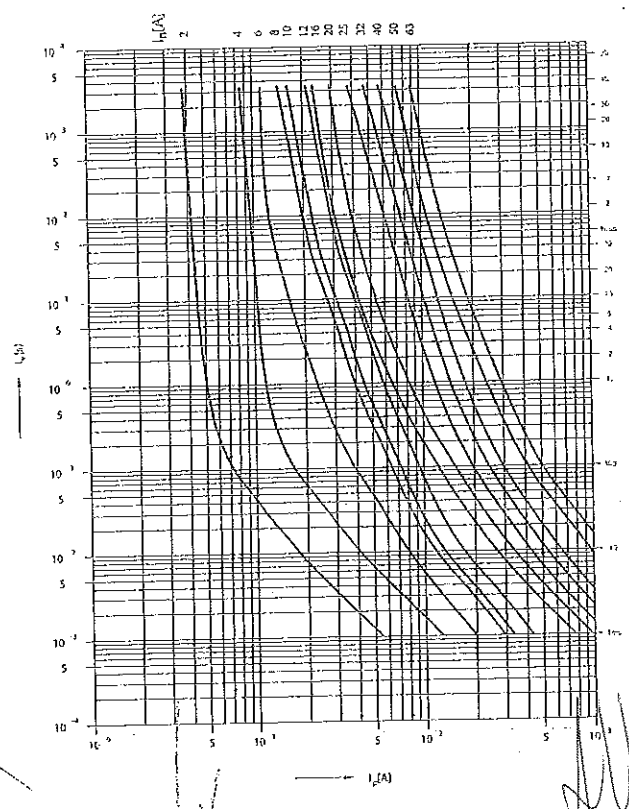
| Type | ϕC | L |
|------|------------|----------------------------------|
| PV10 | 10.3 ± 0.1 | 38 ± 0.6 |
| PV14 | 14.3 ± 0.1 | 51 ^{+0.6} ₋₁ |
| PV22 | 22.2 ± 1 | 58 ^{+0.1} ₋₂ |

Characteristics

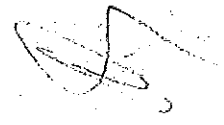
Pre-arcing time/current characteristic
PV10 gG



Pre-arcing time/current characteristic
PV14 gG



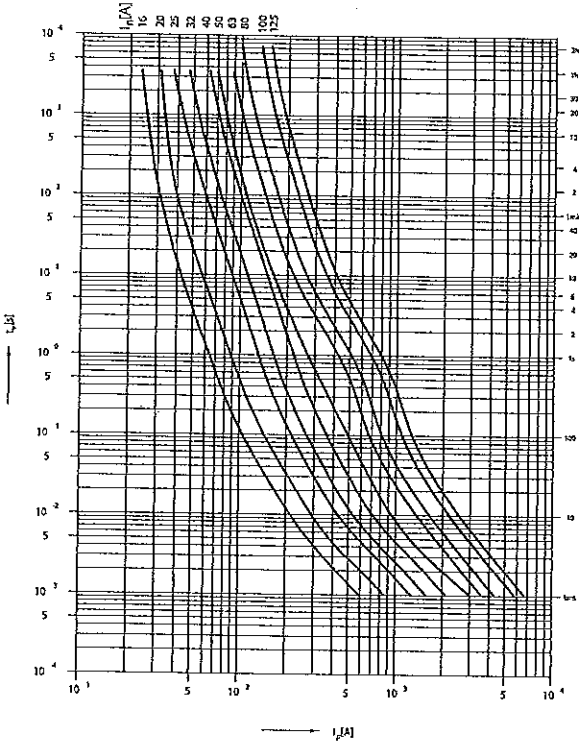
Handwritten signature and date: 05/08



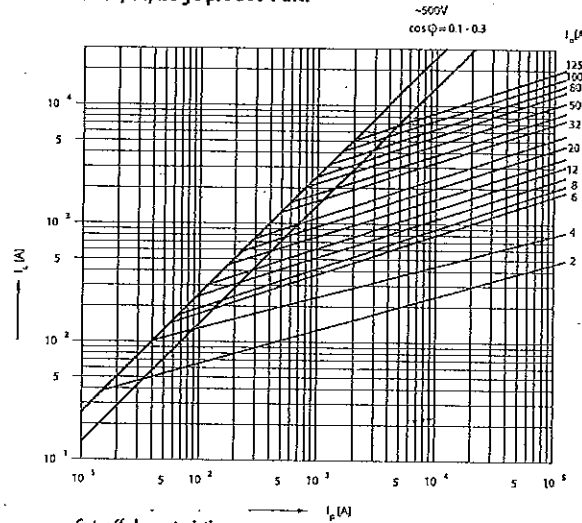
FUSE-LINKS PV

Characteristics

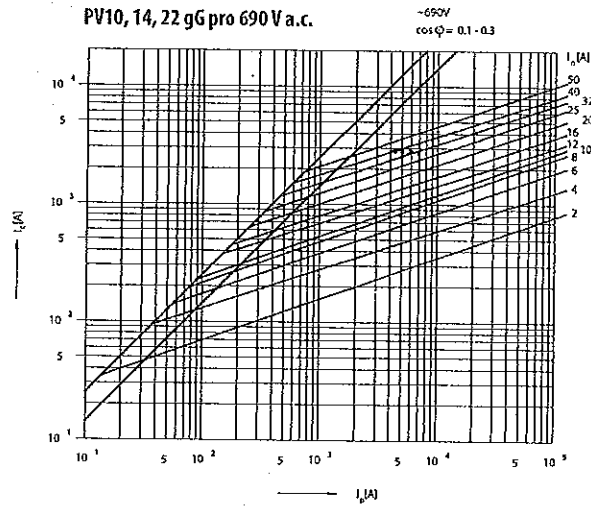
Prearcing time/current characteristic
PV22 gG



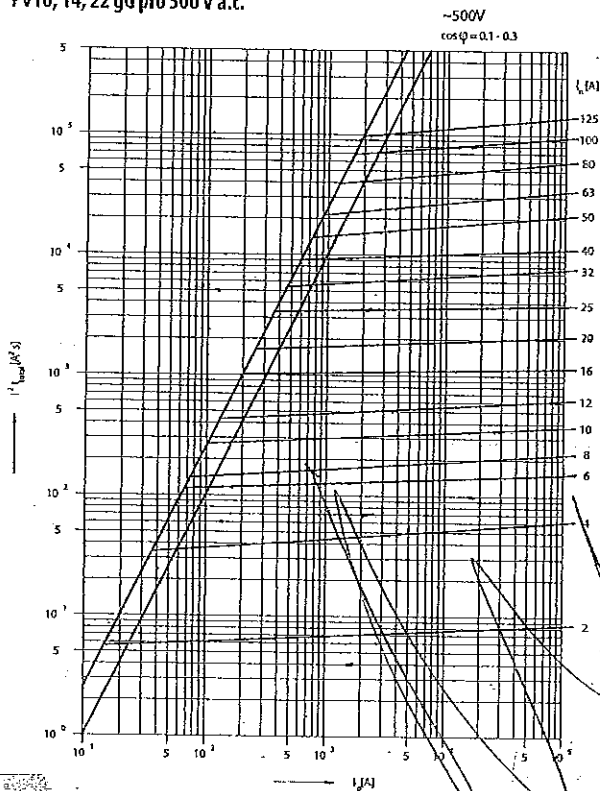
Cut-off characteristic
PV10, 14, 22 gG pro 500 V a.c.



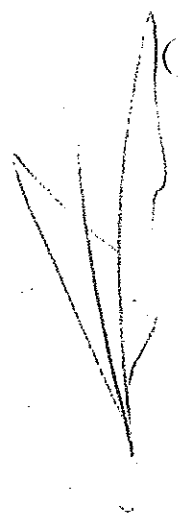
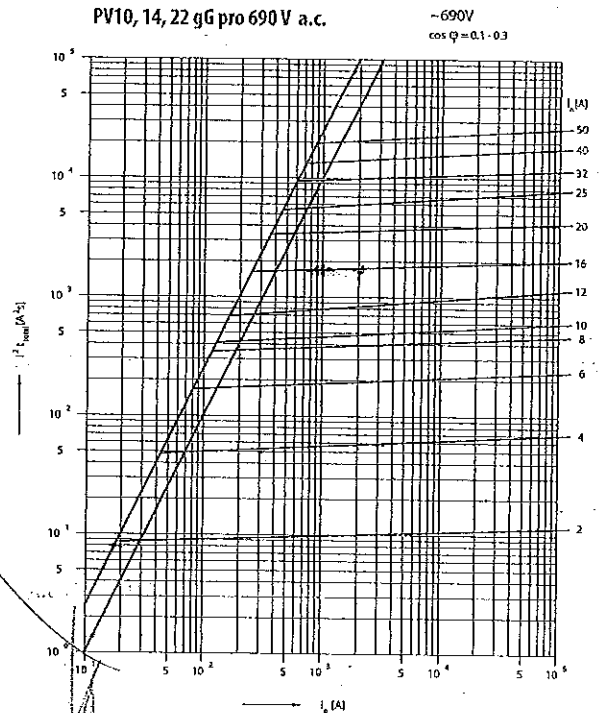
Cut-off characteristic
PV10, 14, 22 gG pro 690 V a.c.



Pt characteristic
PV10, 14, 22 gG pro 500 V a.c.



Pt characteristic
PV10, 14, 22 gG pro 690 V a.c.





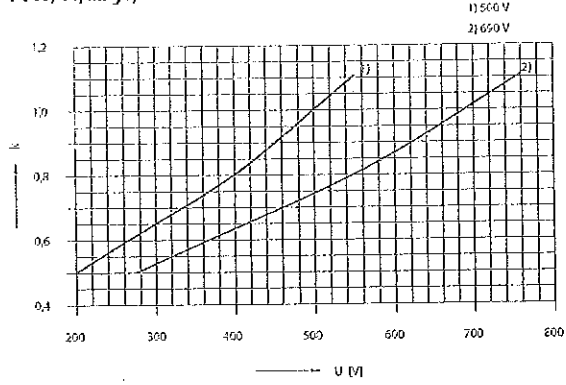
FUSE-LINKS PV

Characteristics

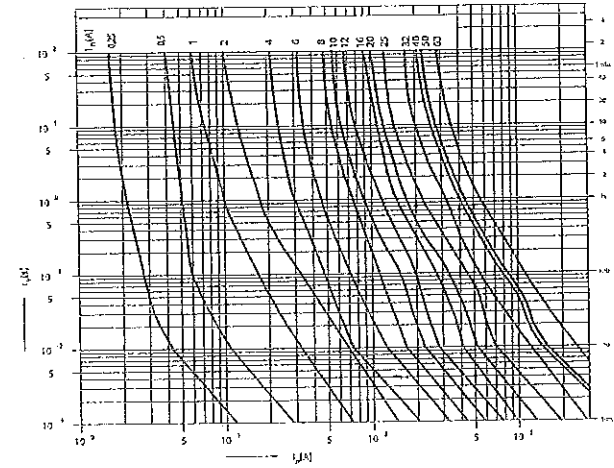
Correction factor, k' of Pt dependence on operating voltage U

$$(Pt_{(U)})_{k'} = k' \cdot Pt_{220V}$$

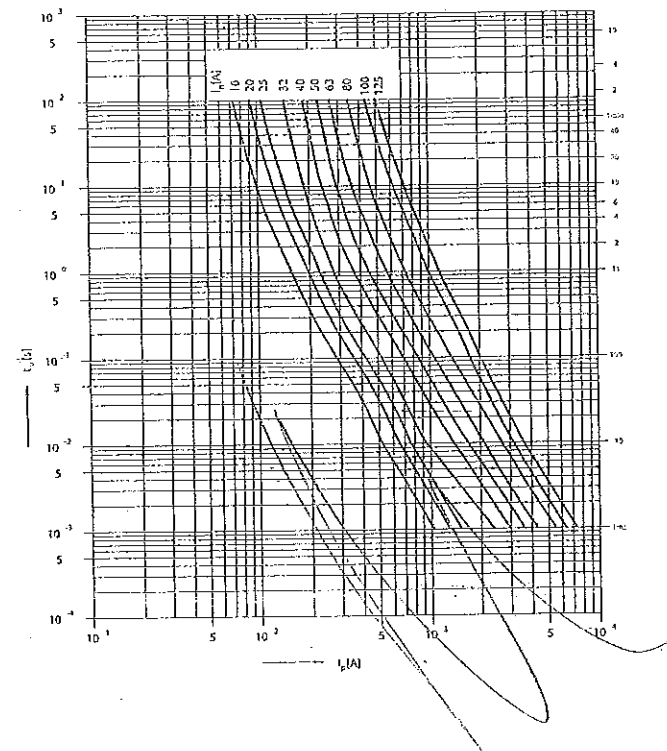
PV10, 14, 22 aA



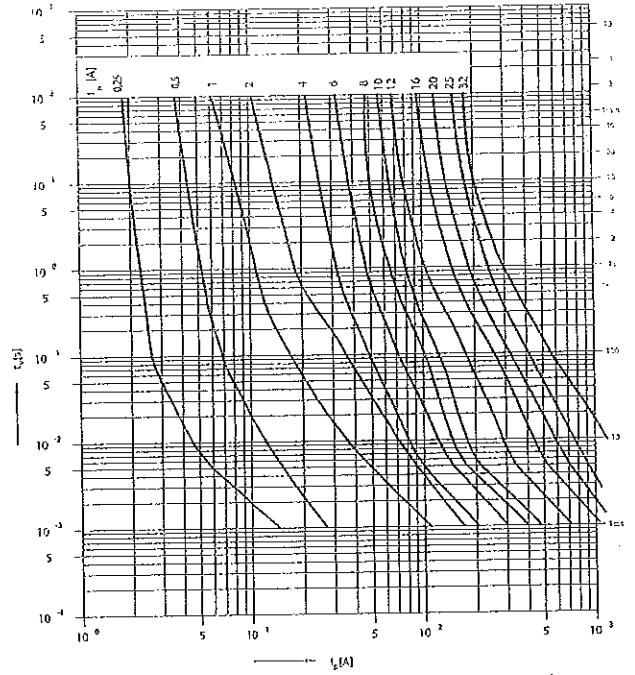
Prearing time/current characteristic
PV14 aA



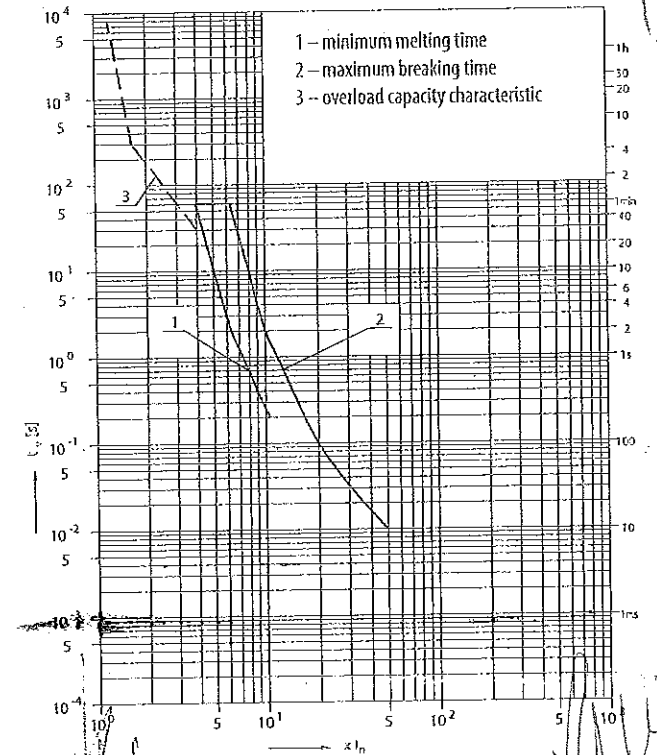
Prearing time/current characteristic
PV22 aA



Prearing time/current characteristic
PV10 aA



Time/current ranges
PV10, 14, 22 aA



Handwritten signature and date: 06/06

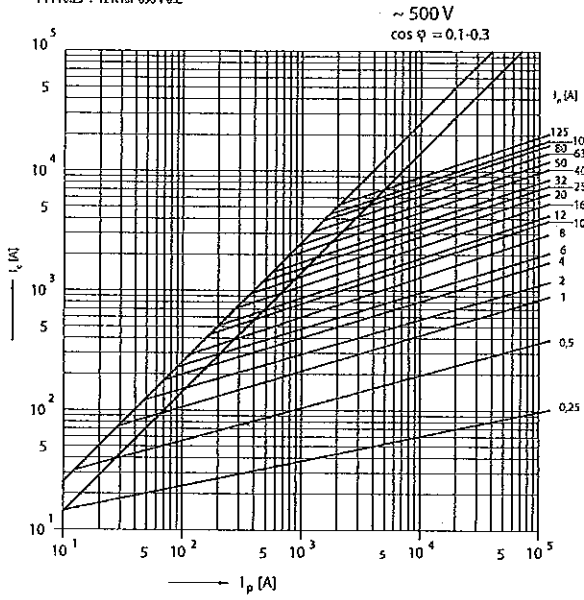


FUSE-LINKS PV

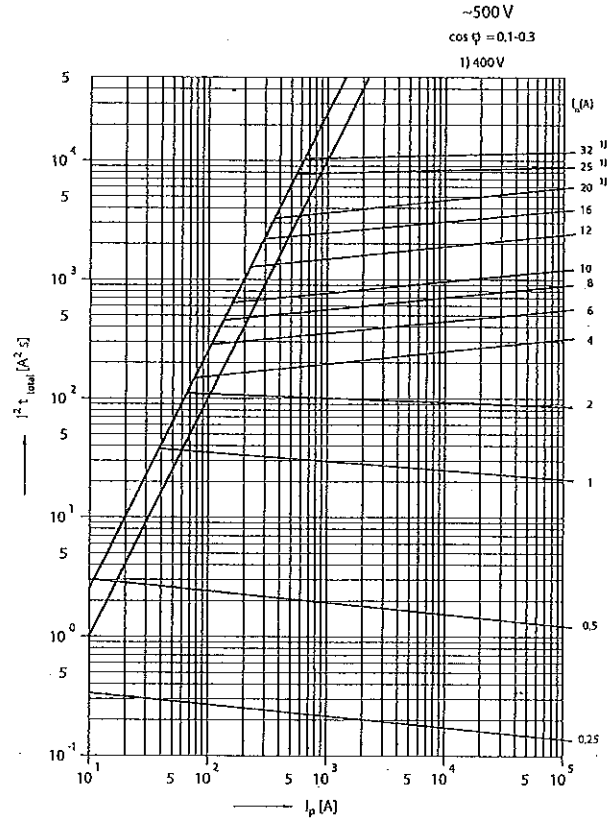
Characteristics

Cut-off characteristic PV10, 14, 22 aM

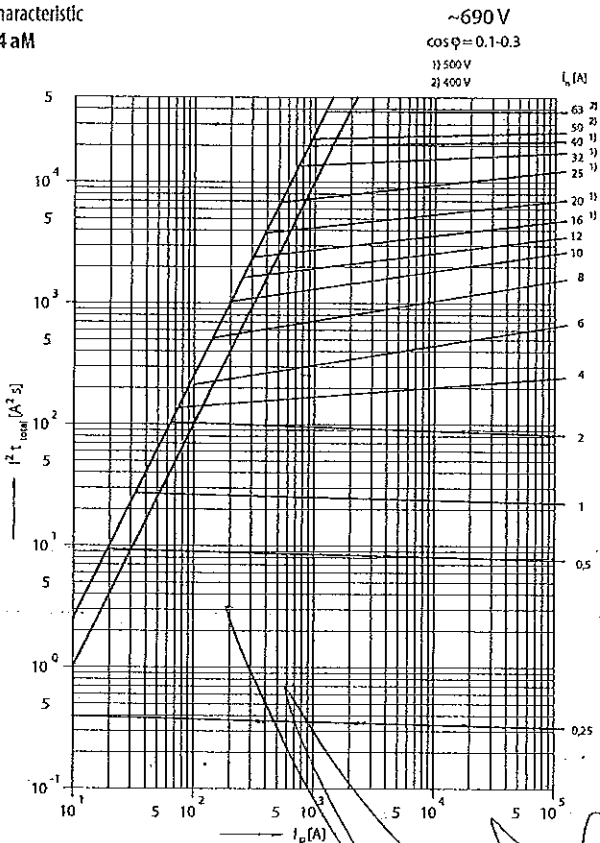
PV10 20 ± 32 A for 400 V a.c. PV22 125 A for 400 V a.c.
 PV14 50 ± 63 A for 400 V a.c. PV22 16 ± 50 A for 690 V a.c.
 PV14 0.25 ± 12 A for 690 V a.c.



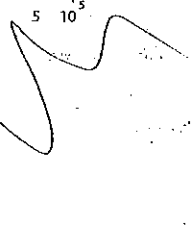
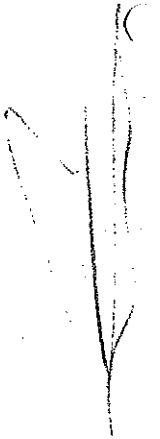
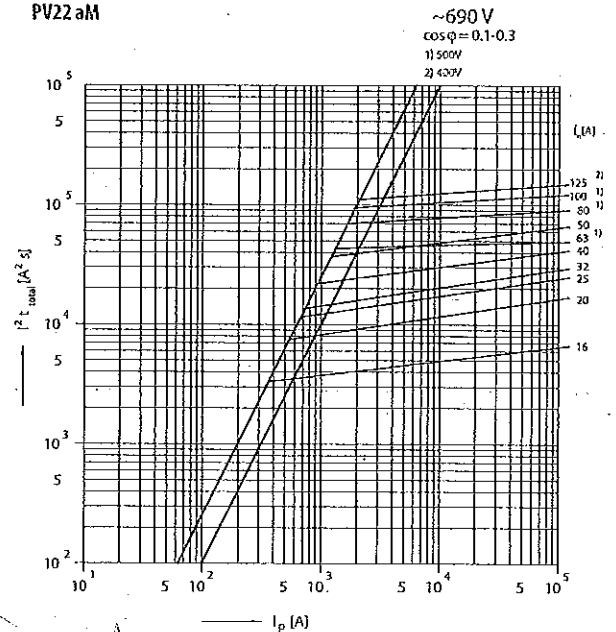
Pt characteristic PV10 aM



Pt characteristic PV14 aM



Pt characteristic PV22 aM



FUSE SWITCH-DISCONNECTORS OPVP10 UP TO 32 A

- ☒ Fuse switch-disconnectors OPVP10 are intended for cylindrical fuse-links size 10x38.
- ☒ They can safely switch off rated current and overcurrent. Devices meet the requirements for safe disconnection.
- ☒ Inverse connection is permissible and it affects neither the technical parameters nor the safety of the operator.
- ☒ Fuse switch-disconnectors OPVP10 can be sealed in the closed state.

- ☒ The devices are designed as modular for 45 mm cutout in the switchboard.
- ☒ Mounted on „U” rail of type TH35 according to EN 60715.
- ☒ Switch-Disconnector design ...-S features LED signalization of the state of fuse-link for each pole.
- ☒ Fuse-link state can also be indicated by means of IAD-IA3 electronic signalling.

Fuse switch-disconnectors

| Type | Order code | I (A) | Number of poles | Weight (kg) | Package (pcs) |
|------------|------------|-------|-----------------|-------------|---------------|
| OPVP10-1 | OEZ-41013 | | 1 | 0.063 | 12 |
| OPVP10-1-S | OEZ-43683 | | 1 | 0.058 | 12 |
| OPVP10-1H | OEZ-43686 | | 1+H | 0.133 | 6 |
| OPVP10-2 | OEZ-41014 | 32 | 2 | 0.128 | 6 |
| OPVP10-2-S | OEZ-43684 | | 2 | 0.137 | 6 |
| OPVP10-3 | OEZ-41015 | | 3 | 0.193 | 4 |
| OPVP10-3-S | OEZ-43685 | | 3 | 0.193 | 4 |
| OPVP10-3H | OEZ-43687 | | 3+H | 0.271 | 3 |

Accessories

| Description | Type | Order code | Weight (kg) | Package (pcs) |
|--|-------------------|------------|-------------|---------------|
| 1-pole interconnecting busbar, cross-section 10 mm ² , max. current 63 A rated operating voltage AC 690 V / DC 1 000 V, length 210 mm | S1L-210-10 | OEZ-38475 | 0.047 | 50 |
| 1-pole interconnecting busbar, cross-section 16 mm ² , max. current 80 A rated operating voltage AC 690 V / DC 1 000 V, length 1 m | S1L-1000-16 | OEZ-37375 | 0.302 | 50 |
| 2-pole interconnecting busbar, cross-section 10 mm ² , max. current 63 A rated operating voltage AC 415 V, length 210 mm | S2L-210-10 | OEZ-38476 | 0.110 | 20 |
| 2-pole interconnecting busbar, cross-section 16 mm ² , max. current 80 A rated operating voltage AC 415 V, length 1 m | S2L-1000-16 | OEZ-37378 | 0.447 | 20 |
| 3-pole interconnecting busbar, cross-section 10 mm ² , max. current 63 A rated operating voltage AC 415 V, length 210 mm | S3L-210-10 | OEZ-38482 | 0.110 | 25 |
| 3-pole interconnecting busbar, cross-section 16 mm ² , max. current 80 A rated operating voltage AC 415 V, length 1 m | S3L-1000-16 | OEZ-37379 | 0.737 | 20 |
| End cap, for single-pole busbars of cross-section 10, 16 mm ² | EKC-1 | OEZ-37383 | 0.0005 | 10 |
| End cap, for 2-pole and 3-pole rails 16 mm ² | EKC-2+3 | OEZ-37384 | 0.001 | 10 |
| End cap, for 3-pole rails of cross-section 10 mm ² | EKC-3 | OEZ-37385 | 0.001 | 10 |
| Terminal extension, with long terminal, cross-section Cu 6 ÷ 50 mm ² | AL-50-S-L | OEZ-63149 | 0.033 | 1 |
| Connection block, enables power supply of interconnecting busbars by conductors of cross-section up to 35 mm ² , the use of the block extends the mounting with by additional H-poles | ES-35-GS | OEZ-37388 | 0.03 | 10 |
| Adapter on „U” rail TH35, for OPVP10 | OD-OPV-AD45 | OEZ-43148 | 0.008 | 1 |
| Adapter for busbar system with spacing 60 mm, busbar thickness 5 or 10 mm, busbar width 12 ÷ 30 mm, cable outlet bottom, max. current 63 A | GA-60/63/54-1x7,5 | OEZ-11883 | 0.56 | 1 |

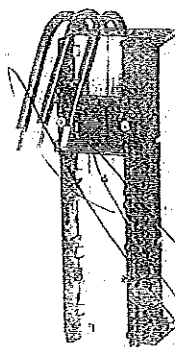
Specifications

Rated operating current
Rated operating voltage
LED signalling voltage range

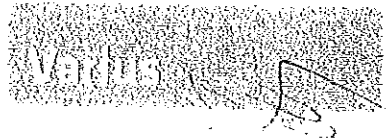
Utilization category

Rated thermal current with fuse-link
Rated frequency
Rated insulation voltage
Rated conditional short-circuit current with fuse-links PV (RMS)
Rated impulse withstand voltage
Fuse-link size
Max. power losses of the fuse-link
Rated short-time withstand current
Rated short-circuit making capacity at DC 440 V

| | |
|---|---------------------|
| I_n | 32 A |
| U_n | AC 690 V / DC 440 V |
| | AC/DC 110 ÷ 690 V |
| | AC 400 V AC-21B |
| | AC 690 V AC-20B |
| | DC 250 V DC-21B |
| I_{th} | 32 A |
| f_n | 50 ÷ 60 Hz |
| U_i | AC 800 V |
| | AC 400 V 100 kA |
| | AC 690 V 50 kA |
| U_{imp} | 6 kV |
| Fuse-link size | 10x38 |
| Max. power losses of the fuse-link | 4.3 W |
| Rated short-time withstand current | 1.6 kA |
| Rated short-circuit making capacity at DC 440 V | 3.5 kA |



Handwritten signature and initials, including '062'.



FUSE SWITCH-DISCONNECTORS OPVP10 UP TO 32 A

Specifications

| | | |
|---|------------------|---|
| Electrical endurance | operating cycles | 300 |
| Mechanical endurance | operating cycles | 2 000 |
| Degree of protection from front side, built-in device, cover closed | | IP20 |
| Connection cross-section | | Cu / 0.75 ÷ 25 mm ² 2x (6 ÷ 16) stranded in the same size |
| Torque | | 2 ± 2.5 Nm |
| Operating ambient temperature | t | -25 ÷ +55 °C |
| Max. sea level | | 2 000 m |
| Seismic resistance according to VE ŠKODA | | 3 g / 8 ÷ 50 Hz |
| Overvoltage category / Rated voltage | | I (II ²) / AC 690 V, II (II ²) / AC 500 V, III / AC 400 V |
| Standards | | IEC 60947-1, -3; EN 60947-1, -3 |
| Approval marks | | |

* For underground cable distribution systems with overvoltage protection or for exposure to a low thunderstorm electricity (table H2 EN 60947-1, IEC 60947-1).
EN 60947-3 ed. 2/A2, p. C.5 Instructions for the use of 1-pole controlled devices states:

These devices are intended for distribution systems, with possible necessity of switching and/or safe disconnection of individual phases, and must not be used for switching a primary circuit of a three-phase equipment.

Reduction of rated current of fuse-links PV gG, aM according to the number of poles

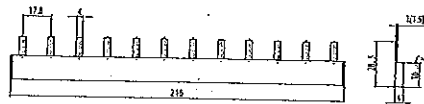
| Type | Reduced rated current (A) (number of poles) | | | | | | |
|--------|--|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 10 |
| OPVP10 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |

Fuse switch-disconnector with disconnecting link

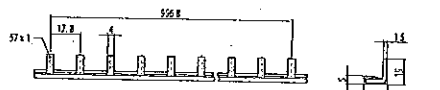
| | | |
|--|--------------------------|---------------------------|
| Rated operating current | I _n | 32 A |
| Thermal current with disconnecting link ZPV10 | I _t | 100 / 25 mm ² |
| Utilization category | | AC-20B |
| Rated short-time withstand current | I _{cr} 1s | 1.6 kA |
| Rated short-circuit making capacity | I _{cs} AC 690 V | 3.5 kA |
| | DC 440 V | 4 kA |
| Power losses with disconnecting link at I _n | P _v | 4.5 W |
| Connection cross-section | | 0.75 ÷ 25 mm ² |

Interconnecting busbars

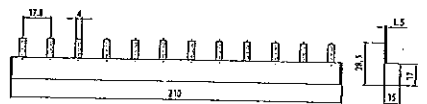
S1L-210-10



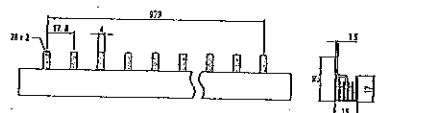
S1L-1000-16



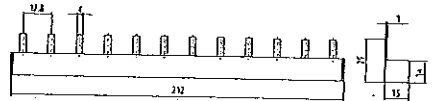
S2L-210-10



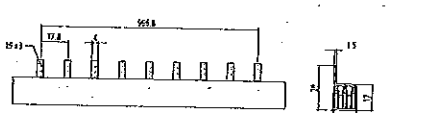
S2L-1000-16



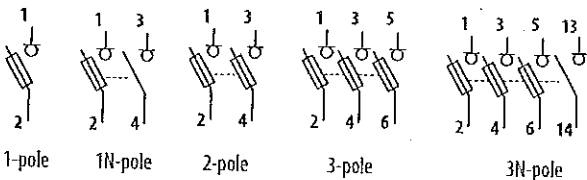
S3L-210-10



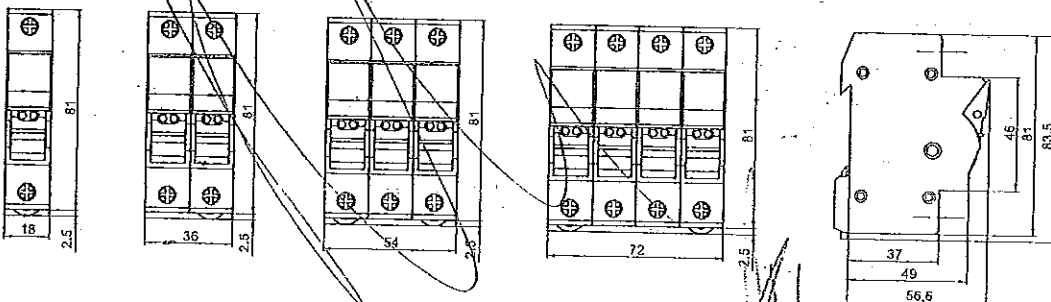
S3L-1000-16



Diagram



Dimensions



ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV



ELECTROTECHNICAL TESTING INSTITUTE - CZECH REPUBLIC
ELEKTROTECHNISCHE PRÜFANSTALT - TSCHECHISCHE REPUBLIK
INSTITUT ELECTROTECHNIQUE D'ESSAIS - REPUBLIQUE TCHÈQUE
ЕЛЕКТРОТЕХНІЧНИЙ ДОСЛІДНИЙ ІНСТИТУТ - ПЕРШКА ПРОВІСІВКА

Pod Lisem 129, 171 02 Praha 8 - Troja

CERTIFICATE

No.: 1140839

Product: Fuse-disconnector

Type: OPVP10, 14, 22

Rating: 32 A, 50 A, 100 A; 690 V AC, 440 V DC

Ordering firm: OEZ s. r. o.
Sedivská 339, 561 51 Letohrad, Czech Republic.

Manufacturer: OEZ s. r. o.
Sedivská 339, 561 51 Letohrad, Czech Republic

Trade mark:

The test results are stated in the test-report No.: 403929-01/01 of: 30.09.2014

A sample of the product was found to be in conformity with:
ČSN EN 60947-3 ed. 3:10+A1:12, ČSN EN 60947-1 ed.4:08+A1:11

The validity of the certificate is limited to: 31.10.2017

7.10.2014

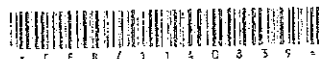
Prague

Miroslav Sedláček
Head of Certification Body

ВЕРНО С
ОРИГИНАЛОМ



Stamp



403929-01

567

ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV



ELECTROTECHNICAL TESTING INSTITUTE - CZECH REPUBLIC
ELEKTROTECHNISCHE PRÜFANSTALT - TSCHECHISCHE REPUBLIK
INSTITUT ELECTROTECHNIQUE D'ESSAIS - RÉPUBLIQUE TCHÈQUE
ЭЛЕКТРОТЕХНИЧЕСКИЙ ИСПЫТАТЕЛЬНЫЙ ИНСТИТУТ - ЧЕШСКАЯ РЕСПУБЛИКА

Pod Lisem 129, 171 02. Praha 8 - Troja

CERTIFICATE

No.: 1120754

Product: Fuse switch-disconnector

Type: OPVA10,14,22 / OPVP10,14,22
(variants see enclosure)

Rating: 32 A, 50 A, 100 A for OPVA; 32 A, 63 A, 125 A for OPVP; 690 V AC, 440 V DC

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

Manufacturer: Wöhlner GmbH & Co. KG
Mönchhorödener Strasse 10, D-96472 Rödental, Germany

Trade mark:

The test results are stated in the test-report No.: 204265-01/01 of: 21.09.2012

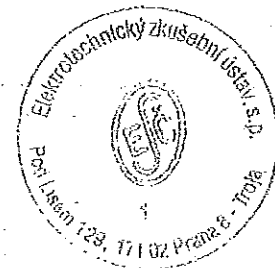
A sample of the product was found to be in conformity with:
ČSN EN 60947-3 ed.3:10, ČSN EN 60947-1 ed.4:08+A1:11

The validity of the certificate is limited to: 30.9.2015

26.9.2012

Prague

Miroslav Sedláček
Head of Certification Body



Stamp



204265-01

568

| marking | type design |
|------------|---------------|
| OPVA10-1 | 1-pól |
| OPVA10-1N | 1+N pól |
| OPVA10-2 | 2-pól |
| OPVA10-3 | 3-pól |
| OPVA10-3N | 3+N pól |
| OPVA14-1 | 1-pól |
| OPVA14-1N | 1+N pól |
| OPVA14-2 | 2-pól |
| OPVA14-3 | 3-pól |
| OPVA14-3N | 3+N pól |
| OPVA22-1 | 1-pól |
| OPVA22-1N | 1+N pól |
| OPVA22-2 | 2-pól |
| OPVA22-3 | 3-pól |
| OPVA22-3N | 3+N pól |
| OPVA10-1-S | 1-pól+signal. |
| OPVA10-2-S | 2-pól+signal. |
| OPVA10-3-S | 3-pól+signal. |
| OPVA14-1-S | 1-pól+signal. |
| OPVA14-2-S | 2-pól+signal. |
| OPVA14-3-S | 3-pól+signal. |
| OPVA22-1-S | 1-pól+signal. |
| OPVA22-2-S | 2-pól+signal. |
| OPVA22-3-S | 3-pól+signal. |
| OPVP10-1 | 1-pól |
| OPVP10-2 | 2-pól |
| OPVP10-3 | 3-pól |
| OPVP14-1 | 1-pól |
| OPVP14-2 | 2-pól |
| OPVP14-3 | 3-pól |
| OPVP22-1 | 1-pól |
| OPVP22-2 | 2-pól |
| OPVP22-3 | 3-pól |

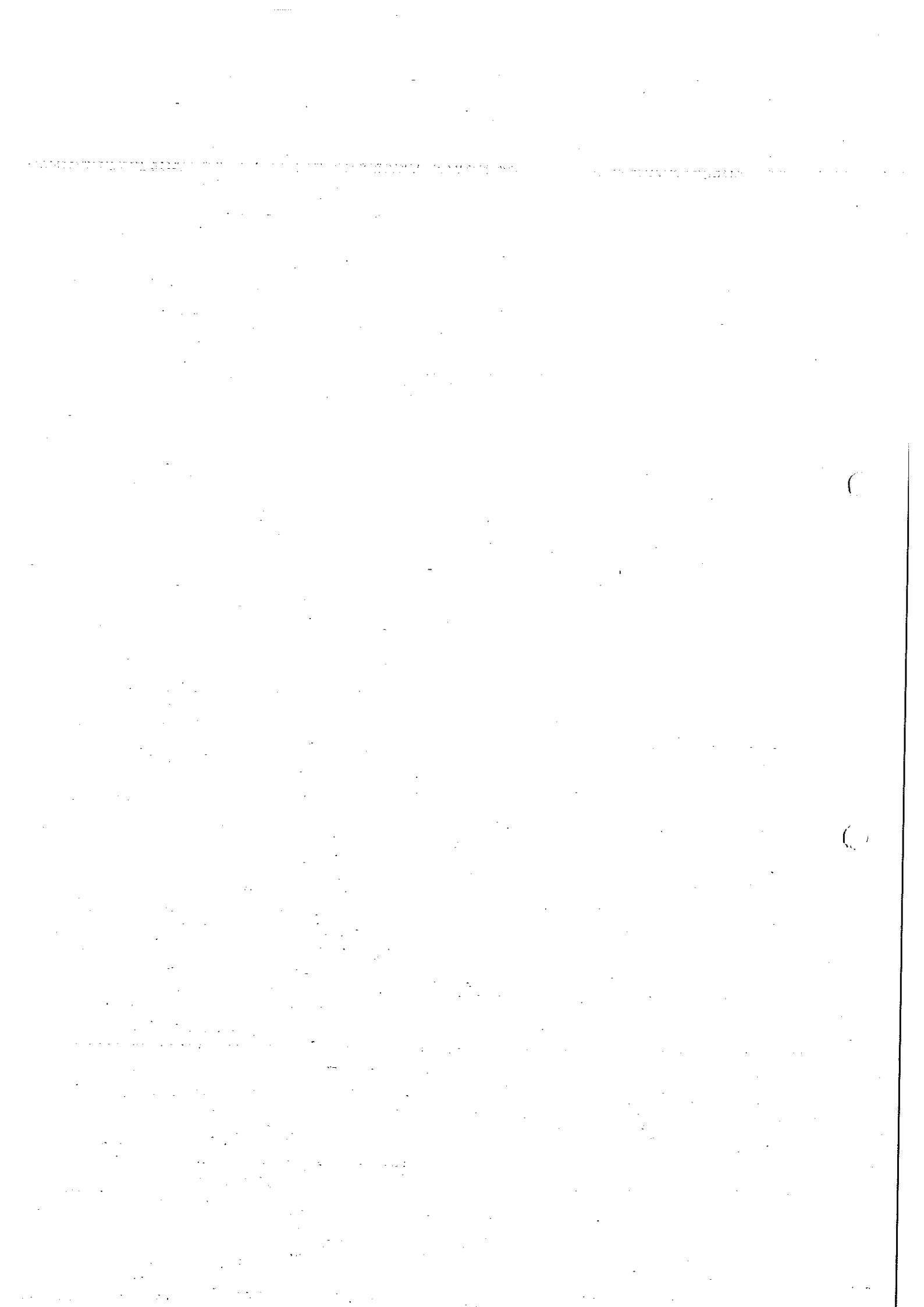


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168





ES PROHLÁŠENÍ O SHODĚ / CE DECLARATION OF CONFORMITY
EU PROHLÁŠENÍ O SHODĚ / EU DECLARATION OF CONFORMITY

Číslo / No.: 503002/1412

My / We, OEZ s.r.o.
Šedivská 339, 561 51 Letohrad, Česká republika

prohlašujeme na svou výlučnou odpovědnost, že
declare on our own responsibility that

Výrobek: Odpínače válcových pojistek velikosti 10x38
Product: Fuse switch-disconnectors for cylindrical fuse-links size 10x38

Typ / Type: OPVP10

Příslušenství / Accessory:

je ve shodě s následujícími normami:
complies with the following standards:

| České normy / Czech standards | Evropské normy / European standards |
|-------------------------------|-------------------------------------|
| ČSN EN 60947-1:08ed.4 +A1:11 | EN 60947-1:07 |
| ČSN EN 60947-3:10ed.3+A1:12 | EN 60947-3:09 |

a následujícími nařízeními vlády, ve znění pozdějších předpisů (NV)
and the following government regulations (NV), as amended

| | |
|---|--|
| NV 17/2003 Sb. v platném znění NV 481/2012 Sb. v platném znění | 2006/95/ES - including amendments 2011/65/EU - including amendments |
|---|--|

Elektrotechnický zkušební ústav, Pod Lisem 129, 171 02 Praha 71, Česká republika
zkoušel / certifikoval daný výrobek a vydal:
tested / certified the product and issued:

EZU Certifikát / EZU Certificate: 1140839 ze dne 7.10.2014
EZU zkušební protokol / EZU test report: 403929-01/01 ze dne 30.09.2014

Poslední dvojčíslí roku, v němž bylo označení CE na výrobek umístěno: 14
Last two digits of the year in which the CE mark was placed on the product:

Místo vydání: Letohrad
Place of issue:
signature:

Datum vydání: 04.12.2014
Date of issue:

Zástupce výrobce a podpis:
Manufacturer's representative and

Funkce: generální ředitel
Position: general director

Ing. Roman Schiffer

OEZ

OEZ s.r.o.
Šedivská 339, Letohrad 561 51
Česká republika
IČO: 49810146, DIČ: CZ49810146

5
Превод от чешки език

CE Декларация за съответствие на

Císlo / No.: 209706/1407

Нме / Nme, OEZ s.r.o.

Šedivská 339, 561 51 Letohrad, Чехия

Декларирам, на нашата собствена отговорност, че

Продукт: На разединители за цилиндрични предпазители размер 10x38

Продукт: Fuse преминаване sdisconnectors за цилиндрични предпазител-връзки размер 10x38

Вид / Тип: OPVP10 Prfslusenstv / аксесоари:

Тя е в съответствие със следните стандарти:

отговаря на стандарти:

Чешките стандарти / Чешките стандарти на европейските стандарти / Европейски стандарти

EN 60947-1: 08ed.4 + A1: 11 CSN EN 60947-3: 10ed.3 + A1: 12 EN 60947-1: 07 EN 60947-3: 09

и след parzenfimi правителство, както е изменена (NV) и Правилника за държавен seuraavilla (NV),

както е изменен

NV 17/2003 Coll. както е изменен, NV 481/2012 Coll. изменена 2006/95 / EO - включително изменения

2011/65 / EC - включително изменения

EZU, Pod Lisem 129, 171 02 Prague 71, Чешка република опитан / сертифициран продукт и издава:

тестван / сертифициран продукт и издава:

EZU Сертификат / Удостоверение EZU: 1140839 с дата 07.10.2014

/ Доклад за тест EZU тест протокол EZU: 403929-01 / 01 от 30 септември 2014

Последните две цифри на годината, в която маркировка CE: 14



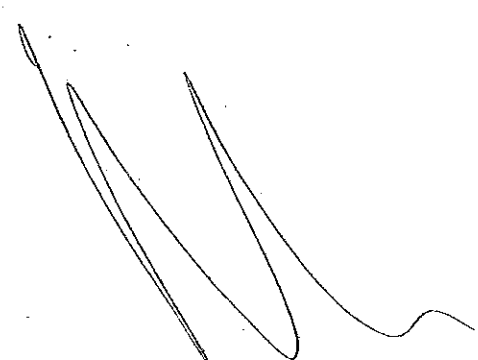
Последните две цифри на годината, през която маркировката се поставя обект на продукта:

Място на издаване: Letohrad

Място на издаване:

подпис:

Дата на издаване: 04 Декември 2014



IEC

IECEE
CB
SCHEME

Ref. Certif. No.

DE1-49452

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

Fuse-switch-disconnector

Name and address of the applicant
Nom et adresse du demandeur

Wöhner GmbH & Co. KG Elektrotechnische Systeme
Mönchrödener Straße 10, 96472 Rödentel
GERMANY

Name and address of the manufacturer
Nom et adresse du fabricant

Wöhner GmbH & Co. KG Elektrotechnische Systeme
Mönchrödener Straße 10, 96472 Rödentel
GERMANY

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

Wöhner GmbH & Co. KG Elektrotechnische Systeme
Mönchrödener Straße 10, 96472 Rödentel
GERMANY

Note: When more than one factory, please report on page 2
Nota: Lorsque il y a plus d'une usine, veuillez utiliser la 2^{ème} page

Ratings and principal characteristics
Valeurs nominales et caractéristiques principales

Additional information on page 2
Utilization category: AC-21B, AC-22B
Rated voltage: 400 V, 500 V, 690 V a.c.
Rated current: 10 A, 25 A, 32 A

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

wöhner

Type of Manufacturer's Testing Laboratories used
Type de programme du laboratoire d'essais constructeur

Model / Type Ref.
Ref. De type

AES 10x38

Additional information (if necessary may also be reported on page 2)
Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2^{ème} page)

Numbers of poles: 1/2/3-pol. and 1/3-pol.+Neutral

Additional information on page 2

PUBLICATION

EDITION

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

IEC 60947-1(ed.5);am1:2010-12
IEC 60947-3(ed.3)

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

249800-4402-0705/152633

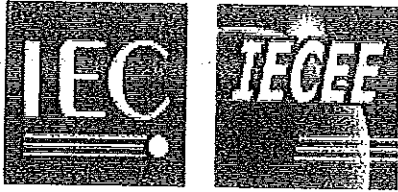
This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Zertifizierungsstelle / Certification

M. Bausch
M. Bausch

Date: 2011-12-13


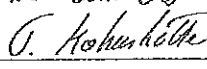
Signature:

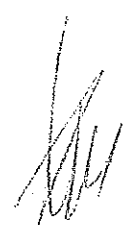
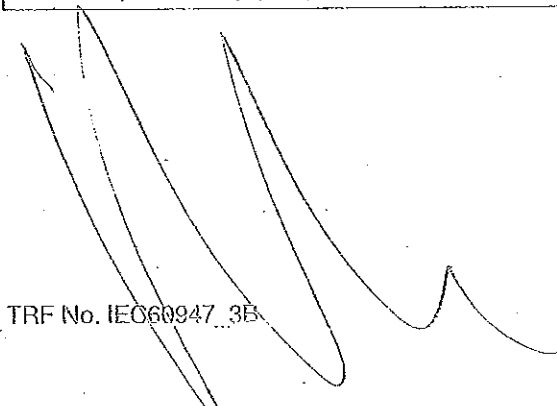


Test Report issued under the responsibility of:



| TEST REPORT | |
|--|--|
| IEC 60947-3 | |
| Low-voltage switchgear and controlgear | |
| Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units | |
| Report Reference No. | 249800-4402-0705/152633 |
| Date of Issue..... | 2011-12-12 |
| Total number of pages | 116 |
| CB Testing Laboratory..... | VDE Prüf- und Zertifizierungsinstitut GmbH VDE Testing and Certification Institute |
| Address | Merianstraße 28 · 63069 Offenbach , Germany |
| Applicant's name..... | Wöhner GmbH & Co. KG Elektrotechnische Systeme |
| Address | Mönchrödener Straße 10, 96472 Rödental, Germany |
| Test specification: | |
| Standard..... | IEC 60947-3: 3 rd Edition (2008) in conjunction with IEC 60947-1: 5 th Edition (2007) |
| Test procedure | CB |
| Non-standard test method..... | N/A |
| Test Report Form No. | IEC60947_3B |
| Test Report Form(s) Originator | OVE |
| Master TRF | Dated 2009-08 |
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| If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed. | |
| This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02. | |
| Test item description | Fuse-switch-disconnector |
| Trade Mark..... | wöhner |
| Manufacturer | Wöhner GmbH & Co. KG Elektrotechnische Systeme |
| Model/Type reference..... | AES 10x38 |
| Ratings | See page 6 and 7 |

| | |
|---|--|
| Testing procedure and testing location: | |
| <input checked="" type="checkbox"/> CB Testing Laboratory: | VDE Prüf- und Zertifizierungsinstitut GmbH VDE Testing and Certification Institute |
| Testing location/ address | Merianstraße 28 , 63069 Offenbach , Germany |
| <input checked="" type="checkbox"/> Associated CB Test Laboratory: | IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH |
| Testing location/ address | Landsberger Allee 378 A , 12681 Berlin , Germany |
| Tested by (name + signature) | H. Schmidt  |
| Approved by (+ signature) | T. Kohushölter  |
| <input type="checkbox"/> Testing procedure: TMP | |
| Testing location/ address | |
| Tested by (name + signature) | |
| Approved by (+ signature) | |
| <input type="checkbox"/> Testing procedure: WMT | |
| Testing location/ address | |
| Tested by (name + signature) | |
| Witnessed by (+ signature) | |
| Approved by (+ signature) | |
| <input type="checkbox"/> Testing procedure: SMT | |
| Testing location/ address | |
| Tested by (name + signature) | |
| Approved by (+ signature) | |
| Supervised by (+ signature) | |
| <input type="checkbox"/> Testing procedure: RMT | |
| Testing location/ address | |
| Tested by (name + signature) | |
| Approved by (+ signature) | |
| Supervised by (+ signature) | |



Summary of testing:

The tests are carried-out according to IEC 60947-1 (ed.5);am1:2010-12 and IEC 60947-3 (ed.3).

Tests performed (name of test and test clause):**Testing location:****Clause 7.1 (Construction)****VDE Testing and Certification Institute****Test sequence I:****IPH Institut**

Sample No.1: AC-21B, 500 V, 25 A, 1-pole

see page 16 - 20

Sample No.2: AC-21B, 690 V, 10 A, 1-pole

see page 21 - 25

Sample No.3: AC-22B, 400 V, 32 A, 1-pole

see page 26 - 30

Sample No.4: AC-22B, 400 V, 32 A, 2-pole

see page 31 - 35

Sample No.5: AC-22B, 500 V, 25 A, 2-pole

see page 36 - 40

Sample No.6: AC-22B, 690 V, 10 A, 2-pole

see page 41 - 45

Sample No.7: AC-22B, 690 V, 32 A, 3-pole+N

see page 46 - 50

Test sequence II:**IPH Institut**

Sample No.8: AC-21B, 500 V, 25 A, 1-pole

see page 51 - 52

Sample No.9: AC-21B, 690 V, 10 A, 1-pole

see page 53 - 54

Sample No.10: AC-22B, 400 V, 32 A, 1-pole

see page 55 - 56

Sample No.11: AC-22B, 400 V, 32 A, 2-pole

see page 57 - 58

Sample No.12: AC-22B, 500 V, 25 A, 2-pole

see page 59 - 60

Sample No.13: AC-22B, 690 V, 10 A, 2-pole

see page 61 - 62

Sample No.14: AC-22B, 690 V, 32 A, 3-pole+N

see page 63 - 64

Test sequence IV:**IPH Institut**Sample No.15: 400 V a.c., 100 kA, 1-pole
(with fuse-link 32 A / 400 V)

see page 68 - 69

Sample No.16: 400 V a.c., 100 kA, 1-pole+N
(with fuse-link 32 A / 400 V)

see page 70 - 71

Sample No.17: 400 V a.c., 100 kA, 2-pole
(with fuse-link 32 A / 400 V)

see page 72 - 73

Sample No.18: 400 V a.c., 100 kA, 3-pole+N
(with fuse-link 32 A / 400 V)

see page 74 - 75

Summary of testing: (Continuation)

The tests are carried-out according to IEC 60947-1 (ed.5);amf:2010-12 and IEC 60947-3 (ed.3).

| Tests performed (name of test and test clause): | Testing location: |
|---|-------------------|
| Test sequence IV: | IPH Institut |
| Sample No.19: 500 V a.c., 100 kA, 1-pole (with fuse-link 25 A / 500 V) | see page 76 - 77 |
| Sample No.20: 500 V a.c., 100 kA, 1-pole+N (with fuse-link 25 A / 500 V) | see page 78 - 79 |
| Sample No.21: 500 V a.c., 100 kA, 2-pole (with fuse-link 25 A / 500 V) | see page 80 - 81 |
| Sample No.22: 500 V a.c., 100 kA, 3-pole+N (with fuse-link 25 A / 500 V) | see page 82 - 83 |
| Sample No.23: 690 V a.c., 50 kA, 1-pole (with fuse-link 10 A / 690 V) | see page 84 - 85 |
| Sample No.24: 690 V a.c., 50 kA, 1-pole+N (with fuse-link 10 A / 690 V) | see page 86 - 87 |
| Sample No.25: 690 V a.c., 50 kA, 2-pole (with fuse-link 10 A / 690 V) | see page 88 - 89 |
| Sample No.26: 690 V a.c., 50 kA, 3-pole+N (with fuse-link 32 A / 400 V) | see page 90 - 91 |
| Test sequence V: | IPH Institut |
| Sample No.27: 690 V, 32 A, 1-pole (with fuse-link 32 A / 400 V) | see page 92 - 93 |
| Sample No.28: 690 V, 32 A, 2-pole (with fuse-link 32 A / 400 V) | see page 94 - 95 |
| Sample No.29: 690 V, 32 A, 3-pole+N (with fuse-link 32 A / 400 V) | see page 96 - 97 |

Summary of compliance with National Differences:

Not applicable

Copy of marking plate

Front printing: (for example a single pole device)

wöhner

AES10x38


32A 10x38

31 110 1P

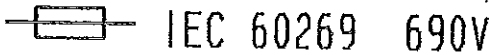


Side printing:

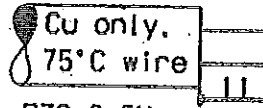
IEC 60947-3 AC-22B 32A 400V 50/60Hz Ui:AC800V

 **US**
 30A 600V
 Do not operate
 under load

| | | | |
|-------|---------|-------------|------|
| gG | 32A | 6 \square | 3,0W |
| aM | 32A | 6 \square | 1,2W |
| aR/gR | consult | | |



18...4AWG
0.75...25mm²



PZ2 2,5Nm
22lb-in

When two conductors per terminal are used,
only stranded wires of the same size
within the range of 18-6AWG, may be used

Picture of the fuse-switch-disconnector: (for example a single pole device)



Test item particulars

- method of operation: Dependent manual operation
- suitability for isolation: Suitable / not suitable
- degree of protection: IP20
- number of poles.....: 1; 2; 3; 1+N; 3+N
- kind of current.....: a.c.
- number of positions of the main contacts.....: 2 (open and closed)

Rated and limiting values, main circuit:

- rated operational voltage U_e (V): 400 V a.c.
500 V a.c.
690 V a.c.
- rated insulation voltage U_i (V): 800 V
- rated impulse withstand voltage U_{imp} (kV): 6 kV
- conventional free air thermal current I_{th} (A): 32 A
- conventional enclosed thermal current I_{the} (A): ---
- rated operational current I_e (A): See utilization category
- rated uninterrupted current I_u (A).....: See utilization category
- rated frequency (Hz).....: 50/60 Hz
- utilization category.....:

| | U_e [V] | I_e [A] | Number of poles |
|------------------|-----------|------------------|-------------------|
| AC-21B | 500 | 25 ^{*)} | 1; 1+N |
| | 690 | 10 ^{*)} | 1; 1+N |
| AC-22B | 400 | 32 ^{*)} | 1; 2; 3; 1+N; 3+N |
| | 500 | 25 ^{*)} | 2; 3; 3+N |
| | | 32 ^{*)} | 3; 3+N |
| | 690 | 10 ^{*)} | 2 |
| 32 ^{*)} | | 3; 3+N | |

^{*)} Corresponding short circuit current: 50 kA
^{**)} Corresponding short circuit current: 100 kA

Short-circuit characteristic:

- rated short-time withstand current I_{cw} (kA): ---
- rated short-time making capacity I_{cm} (kA): ---
- rated conditional short-circuit current.....: 50 kA; 100 kA (See utilization category)

Control circuits.....: ---
 Auxiliary circuits.....: ---
 Relays and releases.....: ---

Co-ordination of short-circuit protective devices:

- kind of protective device.....: Fuse-links with cylindrical contact caps for fuse system F (size 10,3 x 38)
Rated currents: 10 A (gR),
25 A (gG) and
32 A (gG)

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.....: 2011-06
Date (s) of performance of tests.....: 2011-06 up to 2011-11

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

General product information:

The fuse-switch-disconnectors of type AES10x38 are available for DIN-rail mounting with cable connection on the line and load side.

The cable connection is possible by screw terminals (box terminal connection).
The box terminal connection is suitable for cable cross-sections between 0,75mm² and 25mm².

Upon the tests of the making and breaking capacities and the performance under short-circuit conditions the distances between the metallic screen and the test items were 0 mm to the sides and 0 mm to the top.

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.2 | MARKING | | P |
| | Marking on equipment itself or on nameplate or nameplates attached to the equipment and legible from the front after mounting | | — |
| | - indication of the open and closed position | | P |
| | - suitability for isolation | | P |
| | - disconnectors AC-20 and DC-20 only: marked "Do not operate under load" | | N/A |
| | Marking on equipment not needed to be visible after mounting: | | — |
| | - manufacturer's name or trademark | wöhner | P |
| | - type designation or serial number | AES 10x38 | P |
| | - rated operational currents | 10 A, 25 A, 32 A | P |
| | - rated operational voltage | 400 V, 500 V, 690 V a.c. | P |
| | - utilization category | See page 6 | P |
| | - rated frequency | 50/60 Hz | P |
| | - manufacturer's claim for compliance with IEC 60947-3 | | P |
| | - degree of protection | IP20 | P |
| | Marking on fuse-combination units: | | — |
| | - fuse type | Fuse System F (size 10,3x38) | P |
| | - maximum rated current | 32 A | P |
| | - power loss of the fuse-link | < 3 W | P |
| | Identification of terminals: | | — |
| | - line terminals, unless connection is immaterial | Not labelled, free line and load connection choice | P |
| | - load terminals, unless connection is immaterial | | P |
| | - neutral pole terminal | | N/A |
| | - protective earth terminal | | N/A |
| | Data in the manufacturer's published information: | | — |
| | - rated insulation voltage | 800 V | P |
| | - rated impulse withstand voltage for equipment suitable for isolation or when determined | 6 kV | P |
| | - pollution degree, if different from 3 | 3 | P |
| | - rated duty | uninterrupted | P |
| | - rated short-time withstand current and duration | | N/A |
| | - rated short-circuit making capacity | | N/A |

| IEC 60947-3 | | | |
|-----------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - rated conditional short-circuit current | 50 kA, 100 kA | P |
| 5.3 | Instructions for installation, operation and maintenance | | P |
| 6 | Normal service, mounting and transport conditions | | P |
| 7.1 | CONSTRUCTIONAL AND PERFORMANCE REQUIREMENTS | | P |
| 7.1.2 | Materials | | P |
| 7.1.2.2 | Resistance to abnormal heat and fire | | P |
| | Test performed on | - the equipment - sections taken from the equipment - samples of identical material | P |
| | Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11 | | P |
| | Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C | | P |
| | No visible flame and no sustained glowing | | P |
| | Flames and glowing extinguish within 30 s | | P |
| | No ignition of the tissue paper | | P |
| | Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C | | P |
| | No visible flame and no sustained glowing | | P |
| | Flames and glowing extinguish within 30 s | | P |
| | No ignition of the tissue paper | | P |
| 7.1.3 of Part 1 | Current-carrying parts and their connection | | P |
| 7.1.4 | Clearances | see appended table 7.1.4 on page 103 | P |
| | Creepage distances | see appended table 7.1.4 on page 103 | P |
| | Pollution degree | 3 | — |
| | Comparative tracking index (V) | CTI 600 (housing) CTI 575 (actuator) | — |
| | Material group | II | — |

| IEC 60947-3 | | | |
|-----------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1.5 of Part 1 | Actuator | | P |
| 7.1.5.1 | Insulation | | — |
| | Actuator insulated from live parts for | | — |
| | - rated insulation voltage | 800 V | P |
| | - rated impulse withstand voltage | 6 kV | P |
| | Actuator made of metal | | — |
| | - connected to a protective conductor or provided with an additional insulation | | P |
| | Actuator made of or covered by insulating material : | | — |
| | - internal metal parts, which might become accessible in the event of an insulation failure, are also insulated from live parts for the rated insulation voltage | | P |
| 7.1.5.2 | Direction of movement | | P |
| | The direction of operation for actuators shall where applicable conform to IEC 60447 | | P |
| | There is no doubt of the "I" and "O" position and the direction of operation | | P |
| 7.1.6 of Part 1 | Indication of contact position | | P |
| 7.1.6.1 | Indicating means | | N/A |
| 7.1.6.2 | Indication by the actuator | | P |
| 7.1.7 | Additional safety requirements for equipment suitable for isolation | | P |
| 7.1.7.1 | Additional constructional requirements | | P |
| | - marking according to 5.2.1b | | P |
| | - indication of the position of the contacts | | N/A |
| | - construction of the actuating mechanism | | P |
| | - minimum clearances across open contacts (see Table 13, Part 1) (mm) | 2 mm | — |
| | - measured clearances (mm) | > 5,5 mm | P |
| | - test Uimp across gap (kV) | 9,8 kV | P |

| IEC 60947-3 | | | |
|-----------------|---|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1.7.2 | Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers: | | N/A |
| | Auxiliary switch is rated according to IEC 60947-5-1 (unless the equipment is rated AC-23) | | N/A |
| | Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: ≥ 20 ms | | — |
| | Measured time interval (ms) | | N/A |
| | During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles | | N/A |
| 7.1.7.3 | Supplementary requirements for equipment provided with means for padlocking the open position: | | N/A |
| | The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed | | N/A |
| | Test force F applied to the actuator in an attempt to operate to the closed position (N) | | — |
| | Rated impulse withstand voltage (kV) | | — |
| | Test Uimp on open main contacts at the test force | | N/A |
| 7.1.8 of Part 1 | Terminals | | P |
| 7.1.8.1 | All parts of terminals which maintain contact and carry current are of metal having adequate mechanical strength | (see 8.2.4 below) | P |
| | Terminal connections are such that necessary contact pressure is maintained | (see 8.2.4 below) | P |
| | Terminals are so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal | (see 8.2.4 below) | P |
| | Terminals do 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 is not reduced below the rated value | (see 8.2.4 below) | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.4 | Mechanical properties of terminals (box terminal connection) | | P |
| | Mechanical strength of terminals | | P |
| | Maximum cross-sectional area of conductor (mm ²) | | — |
| | Diameter of thread (mm) | Screw M5 | — |
| | Torque (Nm) | 2,75 Nm (manufacturer indicates: 2 – 2,5 Nm) | — |
| | 5 times on 2 separate clamping units | | P |
| | Testing for damage to and accidental loosening of conductor (flexion test) | | P |
| | Conductor of the smallest cross-sectional area (mm ²) | 0,75 mm ² | — |
| | Number of conductor of the smallest cross section : | 1 | — |
| | Diameter of bushing hole (mm) | 6,5 mm | — |
| | Height between the equipment and the platen | 260 mm | — |
| | Mass at the conductor(s) (kg) | 0,4 kg | — |
| | 135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit | | P |
| | Pull-out test | | P |
| | Force (N), applied for 1 min. | 30 N | — |
| | During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit | | P |
| | Conductor of the largest cross-sectional area (mm ²) | 25 mm ² | — |
| | Number of conductor of the largest cross section .. | 1 | — |
| | Diameter of bushing hole (mm) | 13 mm | — |
| | Height between the equipment and the platen | 300 mm | — |
| | Mass at the conductor(s) (kg) | 4,5 kg | — |
| | 135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit | | P |
| | Pull-out test | | P |
| | Force (N), applied for 1 min. | 135 N | — |
| | During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit | | P |

| IEC 60947-3 | | | |
|-------------|---|-----------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conductor of the largest and smallest cross-sectional area (mm ²) | | — |
| | Number of conductor of the smallest cross section, number of conductor of the largest cross section .. | | — |
| | Diameter of bushing hole (mm) | | — |
| | Height between the equipment and the platen | | — |
| | Mass at the conductor(s) (kg) | | — |
| | 135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit | | N/A |
| | Pull-out test | | N/A |
| | Force (N), applied for 1 min..... | | — |
| | During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit | | N/A |
| 7.1.8.2 | Connection capacity | | P |
| | Type of conductors | Rigid, stranded or flexible | — |
| | Minimum cross-sectional area of conductor (mm ²) : | 0,75 mm ² | — |
| | Maximum cross-sectional area of conductor (mm ²) | 25 mm ² | — |
| | Number of conductors simultaneously connectable to the terminal | | — |
| 7.1.8.3 | Connection | | P |
| | Terminals for connection to external conductors are readily accessible during installation | | P |
| | Clamping screws and nuts do not serve to fix any other component | | P |
| 7.1.8.4 | Terminal identification and marking | | P |
| | Terminal intended exclusively for the neutral conductor | Only if applicable | P |
| | Protective earth terminal | | N/A |
| | Other terminals | | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1.9 | Additional requirements for equipment provided with a neutral pole | | P |
| | Equipment provided with a pole intended for the connection of neutral, this pole shall be clearly marked by the letter "N" | | P |
| | The switched neutral pole does not break before and does not make after the other poles except | | N/A |
| | - a pole having the appropriate short-circuit breaking and making capacity is used as neutral pole, all poles may operate together | The connection is given by a dummy (piece of copper), which is inside the actuator. | P |
| | Conventional thermal current of neutral pole | 32 A | P |
| 7.1.10 | Provisions for protective earthing | | N/A |
| 7.1.10.1 | The exposed conductive parts are electrically interconnected and connected to a protective earth terminal | | N/A |
| 7.1.10.2 | Protective earth terminal is readily accessible | | N/A |
| | Protective earth terminal is suitably protected against corrosion | | N/A |
| | Electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors | | N/A |
| | Protective earth terminal has no other functions | | N/A |
| 7.1.10.3 | Protective earth terminal marking and identification | | N/A |
| 7.1.11 | Enclosure for equipment | | N/A |
| 7.1.11.1 | Design | | N/A |
| | When the enclosure is opened, all parts requiring access for installation and maintenance are readily accessible | | N/A |
| | Sufficient space is provided inside the enclosure | | N/A |
| | The fixed parts of a metal enclosure are 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 a removable metal part of the enclosure is insulated from the part carrying the earth terminal when the removable part is in place | | N/A |
| | The removable parts of the enclosure are 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 |

| IEC 60947-3 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | When an enclosure is so designed as to allow the covers to be opened without the use of tools, means is provided to prevent loss of the fastening devices | | N/A |
| | If the enclosure is used for mounting push-buttons, it is not possible to remove the buttons from the outside of the enclosure | | N/A |
| 7.1.11.2 | Insulation | | N/A |
| | 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 is securely fixed to the enclosure | | N/A |
| 7.1.12 | Degree of protection of enclosed equipment | | N/A |
| | Degree of protection : IP | | N/A |
| 7.1.13 | Conduit pull-out, torque and bending with metallic conduits | | N/A |
| | Withstand the stress occurring during its installation : IP | | N/A |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 1: AC-21B, 500 V, 25 A, 1-pole) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 25 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) .. | 4 mm ² cables / 1000 mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 103 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page ___ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

| IEC 60947-3 | | | |
|-------------|--|---------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage 1,1 Ue (V) | 550 V (tested with 759 V) | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-21B | — |
| | - rated operational voltage Ue (V) | 500 V | — |
| | - rated operational current Ie (A) or power (kW) | 25 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | power factor | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | P |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 525 V L2: — L3: — | — |
| | - test current, $I =$ $1,5 \times I_e$ (A): | L1: 38 A L2: — L3: — | — |
| | - power factor/ time-constant | 0,91 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 70 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | N/A |
| | - oscillatory frequency (kHz) | | — |
| | - measured oscillatory frequency (kHz) | L1: L2: L3: | N/A |
| | - factor γ | L1: L2: L3: | N/A |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 13,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

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| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage ($1,1 U_e$) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Busmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 103 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | — |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 10,2 N | — |
| | - test force with blocked main contacts (N) | 50 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

89

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 2: AC-21B, 690 V, 10 A, 1-pole) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 10 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) ... | 1,5 mm ² cables / 1000mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 104 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page ___ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage $1,1 U_e$ (V) | 759 V | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-21B | — |
| | - rated operational voltage U_e (V) | 690 V | — |
| | - rated operational current I_e (A) or power (kW) | 10 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, $U = 1,05 U_e$ | L1: L2: L3: | — |
| | - test current, $I =$ x I_e (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, $U = 1,05 U_e$ | L1: L2: L3: | — |
| | - test current, $I =$ x I_e (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | P |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 725 V L2: — L3: — | — |
| | - test current, $I =$ $1,5 \times I_e$ (A): | L1: 15,3 A L2: — L3: — | — |
| | - power factor/ time constant | 0,95 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 70 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | N/A |
| | - oscillatory frequency (kHz) | | — |
| | - measured oscillatory frequency (kHz) | L1: L2: L3: | N/A |
| | - factor γ | L1: L2: L3: | N/A |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 17,6 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage ($1,1 U_e$) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current I_e (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 104 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 11 N | — |
| | - test force with blocked main contacts (N) | 50 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

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| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 3: AC-22B, 400 V, 32 A, 1-pole) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 32 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) .. | 6 mm ² cables / 1000mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 104 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page __ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

| IEC 60947-3 | | | |
|-------------|--|---------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage 1,1 Ue (V) | 440 V (tested with 759 V) | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage Ue (V) | 400 V | — |
| | - rated operational current Ie (A) or power (kW) | 32 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | P |
| | - test voltage, U = 1,05 Ue (V): | L1: 420 V L2: — L3: — | — |
| | - test current, I = 3 x Ie (A): | L1: 98 A L2: — L3: — | — |
| | - power factor/ time constant | 0,66 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 90 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | P |
| | - oscillatory frequency (kHz) | 41,29 kHz | — |
| | - measured oscillatory frequency (kHz) | L1: 40,5 kHz L2: — L3: — | P |
| | - factor γ | L1: 1,1 L2: — L3: — | P |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 8,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 105 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | — |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 10,4 N | — |
| | - test force with blocked main contacts (N) | 50 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 4: AC-22B, 400 V, 32 A, 2-poles) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 32 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) .. | 6 mm ² cables / 1000mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 105 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page __ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

| IEC 60947-3 | | | |
|-------------|--|---------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage $1,1 U_e$ (V) | 440 V (tested with 759 V) | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage U_e (V) | 400 V | — |
| | - rated operational current I_e (A) or power (kW) | 32 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, $U = 1,05 U_e$ | L1: L2: L3: | — |
| | - test current, $I =$ | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, $U = 1,05 U_e$ | L1: L2: L3: | — |
| | - test current, $I =$ | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | P |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 420 V (242,5 V x $\sqrt{3}$) L2: 420 V (242,5 V x $\sqrt{3}$) L3: — | — |
| | - test current, $I =$ 3 x I_e (A): | L1: 98 A L2: 98 A L3: — | — |
| | - power factor/ time constant | 0,66 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 70 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | P |
| | - oscillatory frequency (kHz) | 41,29 kHz | — |
| | - measured oscillatory frequency (kHz) | L1: 40,5 kHz L2: 40,5 kHz L3: — | P |
| | - factor γ | L1: 1,1 L2: 1,1 L3: — | P |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 17,8 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

ВЕРНО С
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602

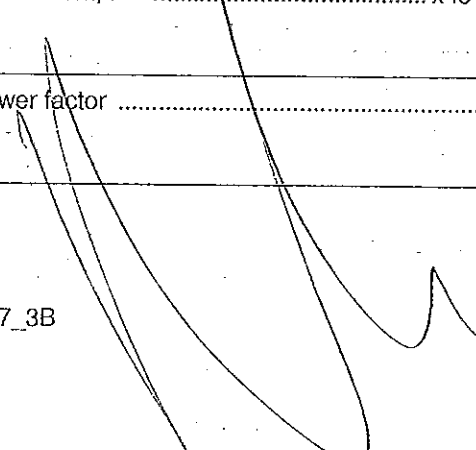
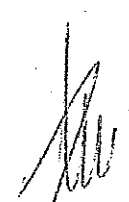
| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 105 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 22 N | — |
| | - test force with blocked main contacts (N) | 66 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 5: AC-22B, 500 V, 25 A, 2-pole) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 25 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) ... | 4 mm ² cables / 1000 mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 106 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page __ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

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| IEC 60947-3 | | | |
|-------------|--|---------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage 1,1 Ue (V) | 550 V (tested with 759 V) | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage Ue (V) | 500 V | — |
| | - rated operational current Ie (A) or power (kW) | 25 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |


| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 525 V ($303 V \times \sqrt{3}$) L2: 525 V ($303 V \times \sqrt{3}$) L3: — | — |
| | - test current, $I =$ $3 \times I_e$ (A): | L1: 78 A L2: 78 A L3: — | — |
| | - power factor/ time constant | 0,68 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 70 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | P |
| | - oscillatory frequency (kHz) | 32,88 kHz | — |
| | - measured oscillatory frequency (kHz) | L1: 32,2 kHz L2: 32,2 kHz L3: — | P |
| | - factor γ | L1: 1,1 L2: 1,1 L3: — | P |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 20,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 106 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | — |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 22,6 N | — |
| | - test force with blocked main contacts (N) | 67,8 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 6: AC-22B, 690 V, 10 A, 2-pole) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 10 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) | 1,5 mm ² cables / 1000mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 106 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page __ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

ВЯРНО С
ОРИГИНАЛА

| IEC 60947-3 | | | |
|-------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage 1,1 Ue (V) | 759 V | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage Ue (V) | 690 V | — |
| | - rated operational current Ie (A) or power (kW) | 10 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue (V): | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue (V): | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |

ВАННО С
ОРИГИНАЛА

64

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 725 V (418,5 V x $\sqrt{3}$) L2: 725 V (418,5 V x $\sqrt{3}$) L3: — | — |
| | - test current, $I =$ 3x I_e (A): | L1: 31 A L2: 31 A L3: — | — |
| | - power factor/ time constant | 0,65 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 80 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | P |
| | - oscillatory frequency (kHz) | 21,15 kHz | — |
| | - measured oscillatory frequency (kHz) | L1: 21,0 kHz L2: 21,0 kHz L3: | P |
| | - factor γ | L1: 1,1 L2: 1,1 L3: | P |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 22,5 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

ВЯРНО С
ОРИГИНАЛА

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current I_e (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 107 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 24,4 N | — |
| | - test force with blocked main contacts (N) | 73,2 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

ВЕРНО С
ОПИСАНИЕ

5

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

ВЯРНО С
ОРИГИНАЛА

6/12

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3 | TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 7: AC-22B, 690 V, 32 A, 3-pole+N) | | P |
| 8.3.3.1 | Temperature-rise | | P |
| | ambient temperature 10-40 °C | 22,7 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | | — |
| | material of enclosure | | — |
| | Main circuits, test conditions: | | — |
| | - rated operational current I _e (A) | 32 A | — |
| | - cable/busbar cross-section (mm ²) / length (mm) | 6 mm ² cables / 1000mm long | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page 107 | P |
| | Auxiliary circuits, test conditions: | | N/A |
| | - rated operation current (A) | | — |
| | - cable cross-section (mm ²) | | — |
| | Measured temperature-rise | see appended table 8.3.3.1 on page ___ | N/A |
| 8.3.3.2 | Test of dielectric properties | | P |
| | Rated impulse withstand voltage (kV) | 6 kV | — |
| | - test U _{imp} main circuits (kV) | 7,3 kV | P |
| | - test U _{imp} auxiliary circuits (kV) | | N/A |
| | - test U _{imp} on open main contacts (equipment suitable for isolation) (kV) | 9,8 kV | P |
| | Power-frequency withstand voltage (V) | 800 V | — |
| | - main circuits, test voltage for 5 sec. (V) | 2000 V | P |
| | - control and auxiliary circuits, test voltage for 5 sec. (V) | | N/A |

| IEC 60947-3 | | | |
|-------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices, which have been disconnected for the power-frequency withstand voltage test | | N/A |
| | Equipment suitable for isolation, leakage current not exceed 0,5 mA | | — |
| | Test voltage 1,1 Ue (V) | 759 V | — |
| | Measured leakage current (mA) | 0,001 mA | P |
| 8.3.3.3 | Making and breaking capacity | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage Ue (V) | 690 V | — |
| | - rated operational current Ie (A) or power (kW) | 32 A | — |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Conditions for make/break operations or make operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |
| | Conditions for break operation, AC-23A and AC-23B only: | | N/A |
| | - test voltage, U = 1,05 Ue | L1: L2: L3: | — |
| | - test current, I = x Ie (A): | L1: L2: L3: | — |
| | - power factor | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conditions for make/break operations, other than AC-23A/B: | | |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: 725 V (418,5 V $\times \sqrt{3}$) L2: 725 V (418,5 V $\times \sqrt{3}$) L3: 725 V (418,5 V $\times \sqrt{3}$) | — |
| | - test current, $I =$ 3 x I_e (A): | L1: 99 A L2: 98 A L3: 100 A | — |
| | - power factor/ time constant | 0,63 | — |
| | Number of make/break or make and break operations | 5 | P |
| | - recovery voltage duration (≥ 50 ms) | > 50 ms | P |
| | - current duration (ms) | 70 ms | — |
| | - time interval between operations | 30 s | P |
| | Characteristic of transient recovery voltage for AC-22 and AC-23 only | | P |
| | - oscillatory frequency (kHz) | 26,69 kHz | — |
| | - measured oscillatory frequency (kHz) | L1: 27,5 kHz L2: 27,5 kHz L3: 27,5 kHz | P |
| | - factor γ | L1: 1,1 L2: 1,1 L3: 1,1 | P |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 46,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.4 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.3.5 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | < 2 mA | P |
| 8.3.3.6 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.3.6 on page 107 | P |
| 8.3.3.7 | Strength of actuator mechanism | | P |
| 8.2.5 | Verification of the strength of actuator mechanism and position indicating device | | |
| | - actuator type (fig.) | figure 1b (one-finger operated) | — |
| 8.2.5.2.1 | Dependent and independent manual operation | dependent manual operation | P |
| | - actuating force for opening (N) | 41,2 N | — |
| | - test force with blocked main contacts (N) | 123,6 N | — |
| | - used method to keep the contact closed | Fuse-links were held tight with a piece of wire | — |
| | During and after the test, open position not indicated | | P |
| | Equipment with locking mean, no locking in the open position while test force is applied | | P |

| IEC 60947-3 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2.5.2.2 | Dependent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - 110% of the rated supply voltage applied to the equipment (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |
| 8.2.5.2.3 | Independent power operation | | N/A |
| | - main contacts fixed together in the closed position: | | N/A |
| | - used method to keep the contact closed | | N/A |
| | - stored energy of the power operator released (3 times) | | N/A |
| | During and after the test, open position not indicated | | N/A |
| | Equipment show no damage impairing its normal operation | | N/A |
| | Equipment with locking mean, no locking in the open position while test force is applied | | N/A |

| IEC 60947-3 | | | |
|-------------|---|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 8: AC-21B, 500 V, 25 A, 1-pole) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-21B | — |
| | - rated operational voltage (V) | 500 V | — |
| | - rated operational current (A) | 25 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 506 V L2: — L3: — | — |
| | - test current (A) | L1: 25,6 A L2: — L3: — | — |
| | - power factor/time-constant | L1: 0,95 L2: — L3: — | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 515 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 11,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | < 2 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 108 | P |

5

| IEC 60947-3 | | | |
|-------------|---|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 9: AC-21B, 690 V, 10 A, 1-pole) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-21B | — |
| | - rated operational voltage (V) | 690 V | — |
| | - rated operational current (A) | 10 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 690 V L2: — L3: — | — |
| | - test current (A) | L1: 10,2 A L2: — L3: — | — |
| | - power factor/time-constant | L1: 0,95 L2: — L3: — | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 1125 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

Core

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 8,0 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,005 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current I_e (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 108 | P |

| IEC 60947-3 | | | |
|-------------|--|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 10: AC-22B, 400 V, 32 A, 1-pole) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage (V) | 400 V | — |
| | - rated operational current (A) | 32 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 414 V L2: - L3: — | — |
| | - test current (A) | L1: 32,1 A L2: - L3: — | — |
| | - power factor/time constant | L1: 0,79 L2: - L3: — | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 315 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 11,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,006 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 108 | P |

3

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 11: AC-22B, 400 V, 32 A, 2-poles) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage (V) | 400 V | — |
| | - rated operational current (A) | 32 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 414 V (239 V x $\sqrt{3}$) L2: 414 V (239 V x $\sqrt{3}$) L3: — | — |
| | - test current (A) | L1: 32,2 A L2: 32,2 A L3: — | — |
| | - power factor/time constant | L1: 0,8 L2: 0,8 L3: — | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 315 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 21,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,006 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 109 | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 12: AC-22B, 500 V, 25 A, 2-poles) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage (V) | 500 V | — |
| | - rated operational current (A) | 25 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 510 V (294,4 V x $\sqrt{3}$) L2: 510 V (294,4 V x $\sqrt{3}$) L3:— | — |
| | - test current (A) | L1: 24,9 A L2: 24,9 A L3: — | — |
| | - power factor/time-constant | L1: 0,78 L2: 0,78 L3: — | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 315 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 21,6 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | < 2 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 109 | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 13: AC-22B, 690 V, 10 A, 2-poles) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage (V) | 690 V | — |
| | - rated operational current (A) | 10 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 690 V (398,4 V x $\sqrt{3}$) L2: 690 V (398,4 V x $\sqrt{3}$) L3:— | — |
| | - test current (A) | L1: 10 A L2: 10 A L3:— | — |
| | - power factor/time-constant | L1: 0,78 L2: 0,78 L3:— | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 315 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 21,8 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,008 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current I_e (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 109 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4 | TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 14: AC-22B, 690 V, 32 A, 3-poles+N) | | P |
| 8.3.4.1 | Operational performance test | | P |
| | - utilization category | AC-22B | — |
| | - rated operational voltage (V) | 690 V | — |
| | - rated operational current (A) | 32 A | — |
| | Test conditions for electrical operation cycles: | | |
| | - test voltage (V) | L1: 690 V (398,4 V x $\sqrt{3}$) L2: 690 V (398,4 V x $\sqrt{3}$) L3: 690 V (398,4 V x $\sqrt{3}$) | — |
| | - test current (A) | L1: 33 A L2: 33 A L3: 33 A | — |
| | - power factor/time constant | L1: 0,8 L2: 0,8 L3: 0,8 | — |
| | Number of cycles with current | 300 | P |
| | Number of cycles without current | 1700 | P |
| | First test sequence (with/without current) | Without current | — |
| | Second test sequence (with/without current) | With current | — |
| | - time interval between first and second test sequence | 315 minutes | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 44,6 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.4.2 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No breakdown or flashover | | P |
| 8.3.4.3 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,01 mA | P |
| 8.3.4.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.4.4 on page 110 | P |

| IEC 60947-3 | | | |
|-------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.5 | TEST SEQUENCE III: SHORT-CIRCUIT PERFORMANCE CAPABILITY | | N/A |
| 8.3.5.1 | Short-time withstand current test | | N/A |
| | Rated short-time withstand current I _{sw} (A) (>12 I _e max) | | N/A |
| | test voltage (V) | L1: L2: L3: | — |
| | r.m.s. test current (A) | L1: L2: L3: | — |
| | peak test current (A) | L1: L2: L3: | — |
| | power factor/time constant | L1: L2: L3: | — |
| | test duration (s) | | — |
| 8.3.5.1.5 | Behaviour of the equipment during the test | | N/A |
| | Test performed without: | | — |
| | - endanger to the operator | | N/A |
| | - cause damage to adjacent equipment | | N/A |
| | No permanent arcing | | N/A |
| | No flash over between poles and poles and frame | | N/A |
| | No melting of the fuse in the detection circuit | | N/A |
| 8.3.5.1.6 | Condition of the equipment after making and breaking capacity tests | | N/A |
| | Immediately after the test equipment must work satisfactorily | | N/A |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | | N/A |
| | - equipment is able to carry its rated current after normal closing operation | | N/A |

632

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.5.2 | Short-circuit making capacity | | N/A |
| | Rated short-circuit making capacity I _{cm} (A) | | N/A |
| | test voltage (1.05xU _e) (V): | L1: L2: L3: | — |
| | r.m.s. test current (A) | L1: L2: L3: | — |
| | maximum peak test current (factor n) | | N/A |
| | power factor/time constant | L1: L2: L3: | N/A |
| | current duration (s) | | — |
| | Time interval between the cycles | | — |
| 8.3.5.2.5 | Behaviour of the equipment during the test | | N/A |
| | Test performed without: | | — |
| | - endanger to the operator | | N/A |
| | - cause damage to adjacent equipment | | N/A |
| | No permanent arcing | | N/A |
| | No flash over between poles and poles and frame | | N/A |
| | No melting of the fuse in the detection circuit | | N/A |
| 8.3.5.2.6 | Condition of the equipment after making and breaking capacity tests | | N/A |
| | Immediately after the test equipment must work satisfactorily | | N/A |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | | N/A |
| | - equipment is able to carry its rated current after normal closing operation | | N/A |
| 8.3.5.3 | Dielectric verification | | N/A |
| | test voltage: 2*U _e with a minimum of 1000V~ | | — |
| | No flashover or breakdown | | N/A |

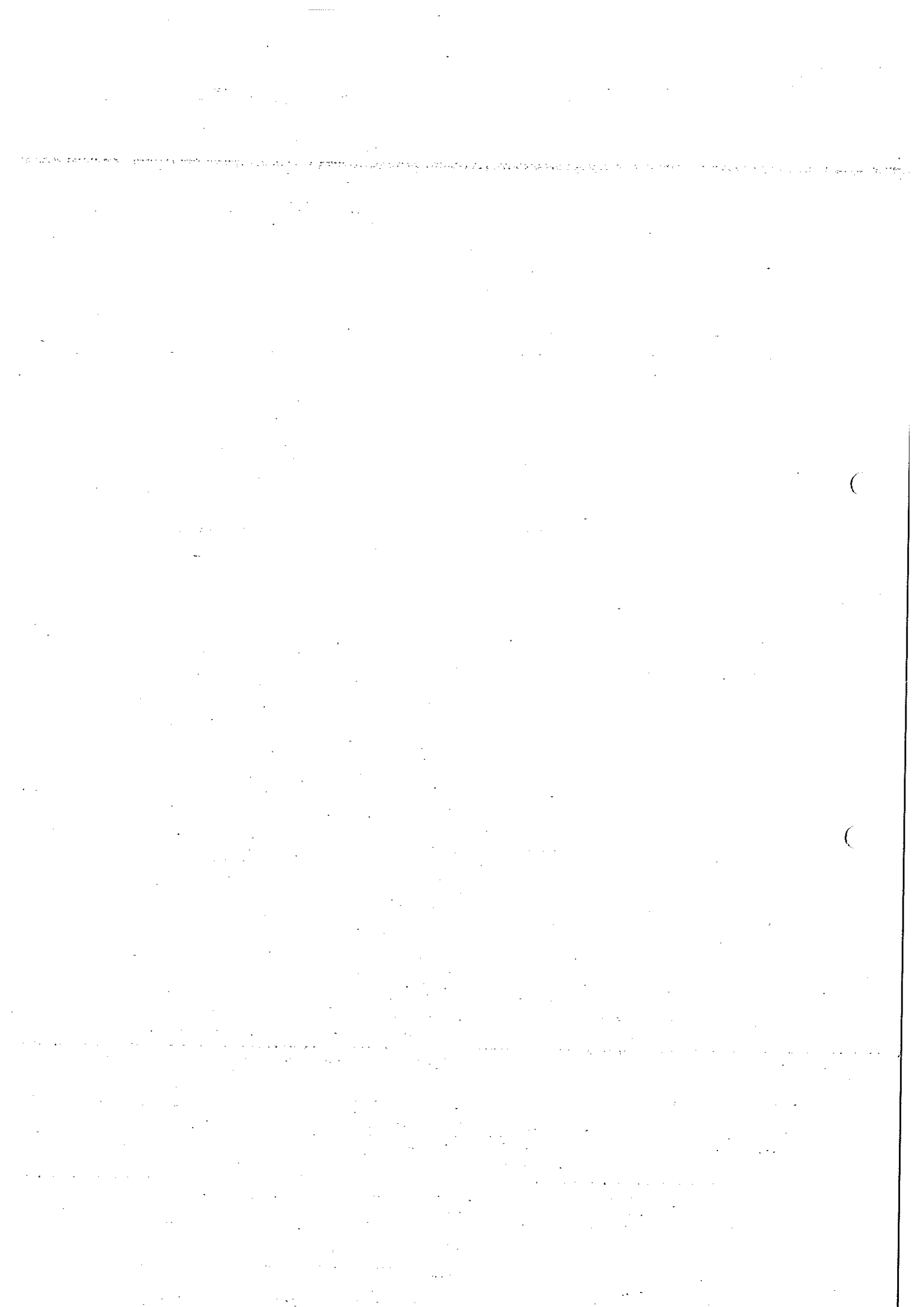
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| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.5.4 | Leakage current | | N/A |
| | test voltage (1,1 Ue) (V) | | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2,0 mA/pole | | N/A |
| 8.3.5.5 | Temperature-rise verification | | N/A |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | | — |
| | - manufacturer's model or type reference | | — |
| | - rated current (A) | | — |
| | - power loss (W) | | — |
| | - rated breaking capacity (kA) | | — |
| | - conductor cross-section (mm ²) | | — |
| | - test current I _e (A) | | — |
| | Measured temperature-rise | see appended table 8.3.5.5 on page ___ | N/A |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 15: 400 V, 32 A, 1-pole) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated voltage (V) | 400 V | — |
| | - rated current (A) | 32 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 420 V L2: — L3: — | — |
| | test current (kA) | L1: 101 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,19 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 6,5 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 7000 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 4,94 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 5000 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 8,7 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,008 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 110 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 16: 400 V, 32 A, 1 pole+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated voltage (V) | 400 V | — |
| | - rated current (A) | 32 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 420 V L2: — L3: — | — |
| | test current (kA) | L1: 101 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,19 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 6,54 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 7000 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 3,7 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 4000 A ² s L2: — L3: — | — |



| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 24,8 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,002 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 111 | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 17: 400 V, 32 A, 2-poles) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated voltage (V) | 400 V | — |
| | - rated current (A) | 32 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 U _e) (V) | L1: 420 V (242,5 V x √3) L2: 420 V (242,5 V x √3) L3: — | — |
| | test current (kA) | L1: 101 kA L2: 101 kA L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,19 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | — |
| | - max. let-through current (kA) | L1: 6,35 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 5000 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 6,15 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 5000 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 22 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,001 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_p (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 111 | P |

| IEC 60947-3 | | | |
|-------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 18: 400 V, 32 A, 3-poles+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated voltage (V) | 400 V | — |
| | - rated current (A) | 32 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 420 V (242,5 V x √3) L2: 420 V (242,5 V x √3) L3: 420 V (242,5 V x √3) | — |
| | test current (kA) | L1: 103 kA L2: 100 kA L3: 101 kA | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,19 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | — |
| | - max. let-through current (kA) | L1: 0,4 kA L2: 4,8 kA L3: 4,8 kA | — |
| | - Joule integral I²dt (A²s) | L1: 0 A²s L2: 4000 A²s L3: 4000 A²s | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 1,6 kA L2: 4,2 kA L3: 4,4 kA | — |
| | - Joule integral I²dt (A²s) | L1: 0 A²s L2: 4000 A²s L3: 4000 A²s | — |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 49,1 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 440 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,001 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 111 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 19: 500 V, 25 A, 1-pole) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated voltage (V) | 500 V | — |
| | - rated current (A) | 25 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 U _e) (V) | L1: 537 V L2: — L3: — | — |
| | test current (kA) | L1: 107 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,2 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 2,59 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 1000 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 3,56 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 2000 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 11,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,001 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 112 | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 20: 500 V, 25 A, 1-pole+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated voltage (V) | 500 V | — |
| | - rated current (A) | 25 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 537 V L2: — L3: — | — |
| | test current (kA) | L1: 107 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,2 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 3,8 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 2000 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 2,22 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 1000 A ² s L2: — L3: — | — |

695

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 20,6 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,001 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 112 | P |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 21: 500 V, 25 A, 2-poles) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated voltage (V) | 500 V | — |
| | - rated current (A) | 25 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 537 V (310 V x √3) L2: 537 V (310 V x √3) L3: — | — |
| | test current (kA) | L1: 107 kA L2: 107 kA L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,2 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 3,71 kA L2: — L3: — | — |
| | - Joule integral I²dt (A²s) | L1: 1000 A²s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 3,64 kA L2: — L3: — | — |
| | - Joule integral I²dt (A²s) | L1: 1000 A²s L2: — L3: — | — |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 31,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,005 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 112 | P |

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| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 22: 500 V, 25 A, 3-poles+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated voltage (V) | 500 V | — |
| | - rated current (A) | 25 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 730 V (421,5 V x $\sqrt{3}$) L2: 730 V (421,5 V x $\sqrt{3}$) L3: 730 V (421,5 V x $\sqrt{3}$) | — |
| | test current (kA) | L1: 102 kA L2: 102 kA L3: 101 kA | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,2 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 1,9 kA L2: 3,8 kA L3: 2,0 kA | — |
| | - Joule integral I ² dt (A ² s) | L1: 1000 A ² s L2: 2000 A ² s L3: 1000 A ² s | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,4 m/s | — |
| | - max. let-through current (kA) | L1: 0 kA L2: 3,16 kA L3: 3,16 kA | — |
| | - Joule integral I ² dt (A ² s) | L1: 0 A ² s L2: 1000 A ² s L3: 1000 A ² s | — |

| IEC 60947-3 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 46,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1000 V (tested with 1380 V) | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 550 V (tested with 759 V) | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,002 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G25 | — |
| | - rated current (A) | 25 A (gG) | — |
| | - power loss (W) | 2,6 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 4 mm ² | — |
| | - test current I_e (A) | 25 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 113 | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 23: 690 V, 10 A, 1-pole) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated voltage (V) | 690 V | — |
| | - rated current (A) | 10 A (gR) | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 725 V L2: — L3: — | — |
| | test current (kA) | L1: 52,7 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,13 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 2,0 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 0,77 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 18,8 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,002 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 113 | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 24: 690 V, 10 A, 1-pole+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated voltage (V) | 690 V | — |
| | - rated current (A) | 10 A (gR) | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05.Ue) (V) | L1: 726 V L2: — L3: — | — |
| | test current (kA) | L1: 52,7 kA L2: — L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,13 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | — |
| | - max. let-through current (kA) | L1: 1,02 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 0,78 kA L2: — L3: — | — |
| | - Joule integral I^2dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 25,4 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,001 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current I_e (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 113 | P |

| IEC 60947-3 | | | |
|-------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 25: 690 V, 10 A, 2-poles) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated voltage (V) | 690 V | — |
| | - rated current (A) | 10 A (gR) | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 U _e) (V) | L1: 726 V (419,16 V x $\sqrt{3}$) L2: 726 V (419,16 V x $\sqrt{3}$) L3: — | — |
| | test current (kA) | L1: 52,7 kA L2: 52,7 kA L3: — | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,13 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | |
| | - max. let-through current (kA) | L1: 0,61 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,5 m/s | — |
| | - max. let-through current (kA) | L1: 0,55 kA L2: — L3: — | — |
| | - Joule integral I ² dt (A ² s) | L1: 0 A ² s L2: — L3: — | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 34,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,003 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | SIBA | — |
| | - manufacturer's model or type reference | 50 179 06.10 | — |
| | - rated current (A) | 10 A (gR) | — |
| | - power loss (W) | 2,3 W | — |
| | - rated breaking capacity (kA) | 200 kA | — |
| | - conductor cross-section (mm ²) | 1,5 mm ² | — |
| | - test current (A) | 10 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 114 | P |

| IEC 60947-3 | | | |
|-------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6 | TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 26: 690 V, 32 A, 3-poles+N) | | P |
| | Protective device details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated voltage (V) | 400 V | — |
| | - rated current (A) | 32 A (gG) | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| 8.3.6.2 | Fuse protected short-circuit withstand | | P |
| | test voltage (1,05 Ue) (V) | L1: 726 V (419,16 V x $\sqrt{3}$) L2: 726 V (419,16 V x $\sqrt{3}$) L3: 726 V (419,16 V x $\sqrt{3}$) | — |
| | test current (kA) | L1: 50,9 kA L2: 52,2 kA L3: 51,0 kA | — |
| | rated frequency (Hz) | 50 Hz | — |
| | power factor | 0,23 | — |
| | Time constant (ms) | — | — |
| | Fuse protected short-circuit withstand (equipment in closed position) | | — |
| | - max. let-through current (kA) | L1: 0,9 kA L2: 5,6 kA L3: 5,6 kA | — |
| | - Joule integral I ² dt (A ² s) | L1: 2000 A ² s L2: 8000 A ² s L3: 6000 A ² s | — |
| | Fuse protected short-circuit making | | P |
| | - mean velocity of 15 manually under no-load conditions operations (m/s) | 1,6 m/s | — |
| | - point at which the measurement is made | point of rotation | — |
| | - test speed during the fuse protected short-circuit making (m/s) | 1,4 m/s | — |
| | - max. let-through current (kA) | L1: 5,3 kA L2: 5,3 kA L3: 0 kA | — |
| | - Joule integral I ² dt (A ² s) | L1: 5000 A ² s L2: 5000 A ² s L3: 0 A ² s | — |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.2.5 | Behaviour of the equipment during the test | | P |
| | Test performed without: | | — |
| | - endanger to the operator | | P |
| | - cause damage to adjacent equipment | | P |
| | No permanent arcing | | P |
| | No flash over between poles and poles and frame | | P |
| | No melting of the fuse in the detection circuit | | P |
| 8.3.6.2.6 | Condition of the equipment after making and breaking capacity tests | | P |
| | Immediately after the test equipment must work satisfactorily | | P |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | 51,6 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | - equipment is able to carry its rated current after normal closing operation | | P |
| 8.3.6.3 | Dielectric verification | | P |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.6.4 | Leakage current | | P |
| | test voltage (1,1 U_e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) $\leq 2,0$ mA/pole | 0,002 mA | P |
| 8.3.6.5 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I_e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.6.5 on page 114 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7 | TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 27: 690 V, 32 A, 1-pole) | | P |
| 8.3.7.1 | Overload test | | P |
| | ambient temperature 10-40 °C | 25,6 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | — | — |
| | material of enclosure | — | — |
| | test current 1,6xI _{th} or 1,6xI _{th} (A) | 52 | — |
| | cable/busbar cross-section (mm ²) / length (mm) | 6 mm ² cable / 1000 mm long | — |
| | Fuse-link details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - time duration of the overload test (s) | 824 s | — |
| | Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed | | P |
| | Required opening force not greater than the test force of 8.2.5.2 and table 8 | 14 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | The equipment has not undergone any impairment hindering such operation | | P |
| 8.3.7.2 | Dielectric verification | | P |
| | test voltage: 2*U _e with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.7.3 | Leakage current | | P |
| | test voltage (1,1 U _e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,002 mA | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Busmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Fuse links aged during the overload test are replaced by new fuse-links | | P |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I _e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.7.4 on page 114 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7 | TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 28: 690 V, 32 A, 2-poles) | | P |
| 8.3.7.1 | Overload test | | P |
| | ambient temperature 10-40 °C | 23,6 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | — | — |
| | material of enclosure | — | — |
| | test current 1,6xI _{th} e or 1,6xI _{th} (A) | 52 | — |
| | cable/busbar cross-section (mm ²) / length (mm) ... | 6 mm ² cable / 1000 mm long | — |
| | Fuse-link details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - time duration of the overload test (s) | 573 s | — |
| | Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed | | P |
| | Required opening force not greater than the test force of 8.2.5.2 and table 8 | 17,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | The equipment has not undergone any impairment hindering such operation | | P |
| 8.3.7.2 | Dielectric verification | | P |
| | test voltage: 2*U _e with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.7.3 | Leakage current | | P |
| | test voltage (1,1 U _e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,001 mA | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Fuse links aged during the overload test are replaced by new fuse-links | | P |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I _e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.7.4 on page 115 | P |

| IEC 60947-3 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7 | TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 29: 690 V, 32 A, 3-poles+N) | | P |
| 8.3.7.1 | Overload test | | P |
| | ambient temperature 10-40 °C | 23,6 °C | — |
| | test enclosure W x H x D (mm x mm x mm) | — | — |
| | material of enclosure | — | — |
| | test current 1,6xI _{th} or 1,6xI _{th} (A) | 52 | — |
| | cable/busbar cross-section (mm ²) / length (mm) ... | 6 mm ² cable / 1000 mm long | — |
| | Fuse-link details: | | P |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | - time duration of the overload test (s) | 540 s | — |
| | Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed | | P |
| | Required opening force not greater than the test force of 8.2.5.2 and table 8 | 35,2 N (required opening force) 150 N (test force acc. tab. 8) | P |
| | The equipment has not undergone any impairment hindering such operation | | P |
| 8.3.7.2 | Dielectric verification | | P |
| | test voltage: 2*U _e with a minimum of 1000V~ | 1380 V | — |
| | No flashover or breakdown | | P |
| 8.3.7.3 | Leakage current | | P |
| | test voltage (1,1 U _e) (V) | 759 V | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | 0,001 mA | P |

| IEC 60947-3 | | | |
|-------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7.4 | Temperature-rise verification | | P |
| | Fuse-link details (fuse-combination units only): | | — |
| | - manufacturer's name, trademark or identification mark | Bussmann | — |
| | - manufacturer's model or type reference | C10G32 | — |
| | - rated current (A) | 32 A (gG) | — |
| | - power loss (W) | 2,9 W | — |
| | - rated breaking capacity (kA) | 120 kA | — |
| | Fuse links aged during the overload test are replaced by new fuse-links | | P |
| | - conductor cross-section (mm ²) | 6 mm ² | — |
| | - test current I _e (A) | 32 A | — |
| | Measured temperature-rise | see appended table 8.3.7.4 on page 115 | P |

| | | | |
|---------|--|-----------|-----|
| 8.4 | ELECTROMAGNETIC COMPATIBILITY TESTS | | N/A |
| 8.4.1 | Immunity | | N/A |
| 8.4.1.1 | Equipment not incorporating electronic circuits: no tests necessary | | N/A |
| 8.4.1.2 | Equipment incorporating electronic circuits: | | N/A |
| | Equipment utilizing circuits in which all components are passive are not required to be tested | | N/A |
| | All other equipment, requirements according to 7.3.3.2 and limits according table 6 apply | | N/A |
| | Performed tests..... | see _____ | N/A |
| | No unintentional separation or closing of contacts has occurred during these tests | | N/A |
| 8.4.2 | Emission | | N/A |
| 8.4.2.1 | Equipment not incorporating electronic circuits: no tests necessary | | N/A |
| 8.4.2.2 | Equipment incorporating electronic circuits: | | N/A |
| | Equipment utilizing circuits in which all components are passive are not required to be tested | | N/A |
| | All other equipment, requirements according to 7.3.3.2 and limits according table 7 apply | | N/A |
| | Performed tests..... | see _____ | N/A |

| IEC 60947-3 | | | |
|---------------------|---|-----------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex A (normative) | | | N/A |
| A | Equipment for direct switching of a single motor | | N/A |
| A.1 | Additional rated duties.....: | | N/A |
| A.1.1 | - intermittent periodic duty | | N/A |
| | - intermittent duty | | N/A |
| A.1.1.1 | Classes of intermittent duty | | N/A |
| | -class 1: up to 1 operating cycle per hour | | N/A |
| | -class 3: up to 3 operating cycle per hour | | N/A |
| | -class 12: up to 12 operating cycles per hour | | N/A |
| | -class 30: up to 30 operating cycles per hour | | N/A |
| | -class 120: up to 120 operating cycles per hour | | N/A |
| A.1.2 | Temporary duty | | N/A |
| A.5 | Mechanical durability: | | N/A |
| | Equipment mounted according to manufacturer's instruction | | N/A |
| | Preferred number of no-load operating cycles expressed in millions.....: | | N/A |
| | 0,001 – 0,003 – 0,01 – 0,03 – 0,1 – 0,3 - 1 | | N/A |
| | If no mechanical endurance is stated by the manufacturer, a minimum mechanical endurance according to the class of intermittent duty shall be tested. | Class of intermittent duty: | N/A |
| | Number of no-load operating cycles performed.....: | | N/A |
| A.6 | Electrical durability: | | N/A |
| | - test according to manufacturer's instruction | | N/A |
| A.7 | Verification of making and breaking capacities: | | N/A |
| | - utilization category | | — |
| | - rated operational voltage U_e (V) | | — |
| | - rated operational current I_e (A) or power (kW) | | — |
| | Conditions for make/break operations or make operations: | | — |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: L2: L3: | — |
| | - test current, $I =$ x I_e (A): | L1: L2: L3: | — |

| IEC 60947-3 | | | |
|-------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - power factor | L1: L2: L3: | — |
| | Conditions for make/break operations: | | N/A |
| | - test voltage, $U = 1,05 U_e$ (V): | L1: L2: L3: | — |
| | - test current, $I =$ x I_e (A): | L1: L2: L3: | — |
| | - power factor/ time constant | L1: L2: L3: | — |
| | Number of make/break or make and break operations | | N/A |
| | - recovery voltage duration (≥ 50 ms) | | N/A |
| | - current duration (ms) | | — |
| | - time interval between operations | | N/A |
| | Characteristic of transient recovery voltage if necessary: | | N/A |
| | - oscillatory frequency (kHz) | | — |
| | - measured oscillatory frequency (kHz) | L1: L2: L3: | N/A |
| | - factor γ | L1: L2: L3: | N/A |
| 8.3.3.3.5 | Behaviour of the equipment during making and breaking capacity tests | | N/A |
| | Test performed without: | | — |
| | - endanger to the operator | | N/A |
| | - cause damage to adjacent equipment | | N/A |
| | No permanent arcing | | N/A |
| | No flash over between poles and poles and frame | | N/A |
| | No melting of the fuse in the detection circuit | | N/A |

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| IEC 60947-3 | | | |
|-------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.3.3.6 | Condition of the equipment after making and breaking capacity tests | | N/A |
| | Immediately after the test equipment must work satisfactorily | | N/A |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | | N/A |
| | - equipment is able to carry its rated current after normal closing operation | | N/A |
| 8.3.3.4 | Dielectric verification | | N/A |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | | — |
| | No flashover or breakdown | | N/A |
| 8.3.3.5 | Leakage current | | N/A |
| | test voltage (1,1 U_e) (V) | | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories): ≤ 2 mA/pole) | | N/A |
| 8.3.3.6 | Temperature-rise verification | | N/A |
| | - conductor cross-section (mm ²) | | — |
| | - test current I_e (A) | | — |
| | Measured temperature-rise | see ___ | N/A |
| A.8 | Operational performance test: | | N/A |
| | - utilization category | | — |
| | - rated operational voltage (V) | | — |
| | - rated operational current (A) | | — |
| | Test conditions for electrical operation cycles: | | N/A |
| | - test voltage (V) | L1: L2: L3: | — |
| | - test current (A) | L1: L2: L3: | — |
| | - power factor/time constant | L1: L2: L3: | — |
| | Number of cycles with current | | N/A |
| | Number of cycles without current | | N/A |

| IEC 60947-3 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | First test sequence (with/without current) | | — |
| | Second test sequence (with/without current) | | — |
| | - time interval between first and second test sequence | | — |
| 8.3.4.1.5 | Behaviour of the equipment during the operational performance test | | N/A |
| | Test performed without: | | — |
| | - endanger to the operator | | N/A |
| | - cause damage to adjacent equipment | | N/A |
| | No permanent arcing | | N/A |
| | No flash over between poles and poles and frame | | N/A |
| | No melting of the fuse in the detection circuit | | N/A |
| 8.3.4.1.6 | Condition of the equipment after making and breaking capacity tests | | N/A |
| | Immediately after the test equipment must work satisfactorily | | N/A |
| | - required opening force not greater than the test force of 8.2.5.2 and table 8 | | N/A |
| | - equipment is able to carry its rated current after normal closing operation | | N/A |
| 8.3.4.2 | Dielectric verification | | N/A |
| | test voltage: $2 \cdot U_e$ with a minimum of 1000V~ | | — |
| | No breakdown or flashover | | N/A |
| 8.3.4.3 | Leakage current | | N/A |
| | test voltage (1,1 U_e) (V) | | — |
| | Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) $\leq 0,5$ mA/pole | | N/A |
| | Leakage current (other utilization categories) ≤ 2 mA/pole | | N/A |
| 8.3.4.4 | Temperature-rise verification | | N/A |
| | - conductor cross-section (mm ²) | | — |
| | - test current I_e (A) | | — |
| | Measured temperature-rise | see __ | N/A |
| A.9 | Special tests: | see __ | N/A |

| IEC 60947-3 | | | |
|----------------------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex C (normative) | | | N/A |
| C | Single pole operated three pole switches | | N/A |
| C.1 | Three pole operated switches of fundamentally the same design, already successfully tested are deemed to satisfy the requirements of individually operated three pole devices. | | N/A |
| C.2 | Additional-tests to be performed on single pole operated three pole switches | | N/A |
| | Test "8.3.3.3 Making and breaking capacities" according to test sequence I with following modifications | | N/A |
| | L1 and L2 are closed, L3 is subjected to the required make-break operation cycle | | N/A |
| | L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle | | N/A |
| | Test performed in a three phase circuit | | N/A |
| | Test "8.3.4.1 Operational performance" according to test sequence II with following modifications | | N/A |
| | L1 and L2 are closed, L3 is subjected to the required make-break operation cycle | | N/A |
| | L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle | | N/A |
| | Test performed in a three phase circuit | | N/A |
| | Test "8.3.6.2 Fuse protected short circuit test" according to test sequence IV with following modifications | | N/A |
| | For the making test L1 shall be open and L2 closed, L3 is subjected to the required make operation cycle | | N/A |
| | L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle | | N/A |
| | Test performed in a three phase circuit | | N/A |
| C.5 | Instruction for use | | N/A |
| | The product literature includes following statement : | | N/A |
| | These devices are intended for power distribution systems where switching and/or isolating of an individual phase may be necessary and shall not be used for the switching of the primary circuit of three-phase equipment. | | N/A |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 7.1.4 | TABLE: Clearance and creepage distance measurements | | | | | | |
|---|---|--------------|------------------|---------|-------------------|----------|--|
| clearance cl and creepage distance dcr at/of: | Up (V) | U r.m.s. (V) | required cl (mm) | cl (mm) | required dcr (mm) | dcr (mm) | |
| Between active parts and parts intended to be touched | 7300 | 800 | 2 | >5,5 | 11 | >11 | |
| Between active parts and enclosure | 7300 | 800 | 2 | >5,5 | 11 | >11 | |
| Between active parts and fuse-link with the contacts in open position | 9800 | 800 | 2 | >5,5 | 11 | >11 | |
| supplementary information: | | | | | | | |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 1: I _e = 25 A) | | P |
|--|---|-----------------|---|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Above terminals (cable connection) | 39,3 | 70 | |
| Below terminals (cable connection) | 35,3 | 70 | |
| Manual operating means: metallic / non-metallic | 4,3 | 25 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 8,5 | 40 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 12,8 | 50 | |
| supplementary information: | Ambient temperature: 22,7 °C | | |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 1: I _e = 25 A) | | P |
|--|---|-----------------|---|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 37,2 | 80 | |
| Manual operating means: metallic / non-metallic | 4,6 | 35 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 6,1 | 50 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 17,0 | 60 | |
| supplementary information: | Ambient temperature: 22,9 °C | | |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 2: $I_b = 10\text{ A}$) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Above terminals (cable connection) | 31,7 | 70 | |
| Below terminals (cable connection) | 29,8 | 70 | |
| Manual operating means: metallic / non-metallic | 5,0 | 25 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 8,8 | 40 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 15,3 | 50 | |
| supplementary information: | | Ambient temperature: | 22,7 °C |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 2: $I_b = 10\text{ A}$) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 32,9 | 80 | |
| Manual operating means: metallic / non-metallic | 3,7 | 35 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 5,4 | 50 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 19,4 | 60 | |
| supplementary information: | | Ambient temperature: | 23,8 °C |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 3: $I_b = 32\text{ A}$) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Above terminals (cable connection) | 45,0 | 70 | |
| Below terminals (cable connection) | 37,5 | 70 | |
| Manual operating means: metallic / non-metallic | 5,5 | 25 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 13,8 | 40 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 12,0 | 50 | |
| supplementary information: | | Ambient temperature: | 22,7 °C |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 3: $I_e = 32$ A) | | P |
|--|--|----------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 39,0 | 80 |
| Manual operating means: metallic / non-metallic | | 4,8 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 5,4 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 21,1 | 60 |
| supplementary information: | | Ambient temperature: | 24,3 °C |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 4: $I_e = 32$ A) | | P |
|--|--|----------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Above terminals (cable connection) | | 48,5 | 70 |
| Below terminals (cable connection) | | 47,3 | 70 |
| Manual operating means: metallic / non-metallic | | 7,8 | 25 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 21,8 | 40 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 14,5 | 50 |
| supplementary information: | | Ambient temperature: | 22,7 °C |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 4: $I_e = 32$ A) | | P |
|--|--|----------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 49,0 | 80 |
| Manual operating means: metallic / non-metallic | | 8,8 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 12,9 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 26,9 | 60 |
| supplementary information: | | Ambient temperature: | 24,4 °C |

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ОРИГИНАЛ

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 5: $I_b = 25$ A) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Above terminals (cable connection) | 44,3 | 70 | |
| Below terminals (cable connection) | 42,9 | 70 | |
| Manual operating means: metallic / non-metallic | 10,6 | 25 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 13,3 | 40 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 15,2 | 50 | |
| supplementary information: | | Ambient temperature: | 22,7 °C |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 5: $I_b = 25$ A) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 47,5 | 80 | |
| Manual operating means: metallic / non-metallic | 8,9 | 35 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 16,2 | 50 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 22,8 | 60 | |
| supplementary information: | | Ambient temperature: | 22,9 °C |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 6: $I_b = 10$ A) | | P |
|--|--|----------------------|---------|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Above terminals (cable connection) | 44,5 | 70 | |
| Below terminals (cable connection) | 40,8 | 70 | |
| Manual operating means: metallic / non-metallic | 9,3 | 25 | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | 19,5 | 40 | |
| Parts which need not be touched during normal operation: metallic / non-metallic | 14,8 | 50 | |
| supplementary information: | | Ambient temperature: | 22,7 °C |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 6: $I_b = 10$ A) | | P |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 50,4 | 80 |
| Manual operating means: metallic / non-metallic | | 6,3 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 13,8 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 27,0 | 60 |
| supplementary information: | | Ambient temperature: 23,8 °C | |

| 8.3.3.1 | TABLE: Temperature-rise (measurements) (Sample No. 7: $I_b = 32$ A) | | P |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Above terminals (cable connection) | | 63,8 | 70 |
| Below terminals (cable connection) | | 63,9 | 70 |
| Manual operating means: metallic / non-metallic | | 16,9 | 25 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 32,8 | 40 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 22,3 | 50 |
| supplementary information: | | Ambient temperature: 22,7 °C | |

| 8.3.3.6 | TABLE: Temperature-rise (measurements) (Sample No. 7: $I_b = 32$ A) | | P |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 59,9 | 80 |
| Manual operating means: metallic / non-metallic | | 11,2 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 23,7 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 27,6 | 60 |
| supplementary information: | | Ambient temperature: 24,4 °C | |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 8: $I_e = 25$ A) | | P |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 39,6 | 80 |
| Manual operating means: metallic / non-metallic | | 5,5 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 17,6 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 25,9 | 60 |
| supplementary information: | | Ambient temperature: 25,3 °C | |

| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 9: $I_e = 10$ A) | | P |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 43,1 | 80 |
| Manual operating means: metallic / non-metallic | | 3,3 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 14,0 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 20,3 | 60 |
| supplementary information: | | Ambient temperature: 25,3 °C | |

| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 10: $I_e = 32$ A) | | P |
|--|---|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 47,5 | 80 |
| Manual operating means: metallic / non-metallic | | 10,8 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 24,4 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 26,1 | 60 |
| supplementary information: | | Ambient temperature: 25,3 °C | |

| IEC 60947-3 | | | |
|--|---|----------------------|--------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 11: $I_b = 32$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 42,5 | 80 |
| Manual operating means: metallic / non-metallic | | 9,2 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 22,1 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 22,5 | 60 |
| supplementary information: | | Ambient temperature: | 25,3 °C |

| | | | |
|--|---|----------------------|--------------------|
| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 12: $I_b = 25$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 48,9 | 80 |
| Manual operating means: metallic / non-metallic | | 8,4 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 28,8 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 30,4 | 60 |
| supplementary information: | | Ambient temperature: | 25,3 °C |

| | | | |
|--|---|----------------------|--------------------|
| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 13: $I_b = 10$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 43,8 | 80 |
| Manual operating means: metallic / non-metallic | | 9,3 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 28,5 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 28,7 | 60 |
| supplementary information: | | Ambient temperature: | 25,3 °C |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.4.4 | TABLE: Temperature-rise (measurements) (Sample No. 14: $I_e = 32$ A) | | P |
|--|---|----------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 44,1 | 80 |
| Manual operating means: metallic / non-metallic | | 14,5 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 34,0 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 23,3 | 60 |
| supplementary information: | | Ambient temperature: | 25,3 °C |

| 8.3.5.5 | TABLE: Temperature-rise (measurements) | | N/A |
|--|--|--------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | | |
| Manual operating means: metallic / non-metallic | | | |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | | |
| Parts which need not be touched during normal operation: metallic / non-metallic | | | |
| supplementary information: | | | |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 15: $I_e = 32$ A) | | P |
|--|---|----------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 53,5 | 80 |
| Manual operating means: metallic / non-metallic | | 6,0 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 16,8 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 26,3 | 60 |
| supplementary information: | | Ambient temperature: | 23,5 °C |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 16: $I_b = 32$ A) | | P |
|---|---|--------------------|---|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 58,5 | 80 | |
| Manual operating means: metallie / non-metallic | 10,2 | 35 | |
| Parts intended to be touched but not hand-held: metallie / non-metallic | 21,8 | 50 | |
| Parts which need not be touched during normal operation: metallie / non-metallic | 40,5 | 60 | |
| supplementary information: | Ambient temperature: | 24,9 °C | |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 17: $I_b = 32$ A) | | P |
|---|---|--------------------|---|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 65,9 | 80 | |
| Manual operating means: metallie / non-metallic | 14,1 | 35 | |
| Parts intended to be touched but not hand-held: metallie / non-metallic | 28,4 | 50 | |
| Parts which need not be touched during normal operation: metallie / non-metallic | 44,7 | 60 | |
| supplementary information: | Ambient temperature: | 24,6 °C | |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 18: $I_b = 32$ A) | | P |
|---|---|--------------------|---|
| Temperature rise dT of part: | dT (K) measured | dT (K) required | |
| Terminals | 60,3 | 80 | |
| Manual operating means: metallie / non-metallic | 16,6 | 35 | |
| Parts intended to be touched but not hand-held: metallie / non-metallic | 35,0 | 50 | |
| Parts which need not be touched during normal operation: metallie / non-metallic | 33,5 | 60 | |
| supplementary information: | Ambient temperature: | 24,2 °C | |

| IEC 60947-3 | | | |
|--|--|----------------------|--------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 19: $I_e = 25$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 35,6 | 80 |
| Manual operating means: metallic / non-metallic | | 6,5 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 15,7 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 22,0 | 60 |
| supplementary information: | | Ambient temperature: | 24,6 °C |

| | | | |
|--|--|----------------------|--------------------|
| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 20: $I_e = 25$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 42,1 | 80 |
| Manual operating means: metallic / non-metallic | | 8,6 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 19,1 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 24,3 | 60 |
| supplementary information: | | Ambient temperature: | 24,6 °C |

| | | | |
|--|--|----------------------|--------------------|
| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 21: $I_e = 25$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 46,6 | 80 |
| Manual operating means: metallic / non-metallic | | 12,9 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 26,5 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 28,2 | 60 |
| supplementary information: | | Ambient temperature: | 24,6 °C |

| IEC 60947-3 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 22: I _e = 25 A) | P | |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 57,7 | 80 |
| Manual operating means: metallic / non-metallic | | 16,8 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 33,8 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 30,6 | 60 |
| supplementary information: | | Ambient temperature: 24,6 °C | |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 23: I _e = 10 A) | P | |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 33,5 | 80 |
| Manual operating means: metallic / non-metallic | | 3,5 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 13,0 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 19,0 | 60 |
| supplementary information: | | Ambient temperature: 23,3 °C | |

| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 24: I _e = 10 A) | P | |
|--|--|------------------------------|--------------------|
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 31,9 | 80 |
| Manual operating means: metallic / non-metallic | | 6,1 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 17,1 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 19,3 | 60 |
| supplementary information: | | Ambient temperature: 23,3 °C | |

| IEC 60947-3 | | | |
|---|--|----------------------|--------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 25: $I_e = 10\text{ A}$) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 45,7 | 80 |
| Manual operating means: metallie / non-metallic | | 8,4 | 35 |
| Parts intended to be touched but not hand-held: metallie / non-metallic | | 24,1 | 50 |
| Parts which need not be touched during normal operation: metallie / non-metallic | | 25,3 | 60 |
| supplementary information: | | Ambient temperature: | 23,3 °C |

| | | | |
|---|--|----------------------|--------------------|
| 8.3.6.5 | TABLE: Temperature-rise (measurements) (Sample No. 26: $I_e = 32\text{ A}$) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 56,8 | 80 |
| Manual operating means: metallie / non-metallic | | 13,5 | 35 |
| Parts intended to be touched but not hand-held: metallie / non-metallic | | 33,0 | 50 |
| Parts which need not be touched during normal operation: metallie / non-metallic | | 30,8 | 60 |
| supplementary information: | | Ambient temperature: | 24,6 °C |

| | | | |
|---|--|----------------------|--------------------|
| 8.3.7.4 | TABLE: Temperature-rise (measurements) (Sample No. 27: $I_e = 32\text{ A}$) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 42,5 | 80 |
| Manual operating means: metallie / non-metallic | | 2,8 | 35 |
| Parts intended to be touched but not hand-held: metallie / non-metallic | | 14,0 | 50 |
| Parts which need not be touched during normal operation: metallie / non-metallic | | 21,6 | 60 |
| supplementary information: | | Ambient temperature: | 22,6 °C |

| IEC 60947-3 | | | |
|--|---|----------------------|--------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.3.7.4 | TABLE: Temperature-rise (measurements) (Sample No. 28: $I_b = 32$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 46,8 | 80 |
| Manual operating means: metallic / non-metallic | | 11,7 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 31,8 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 35,4 | 60 |
| supplementary information: | | Ambient temperature: | 23,4 °C |

| | | | |
|--|---|----------------------|--------------------|
| 8.3.7.4 | TABLE: Temperature-rise (measurements) (Sample No. 29: $I_b = 32$ A) | | P |
| Temperature rise dT of part: | | dT (K) measured | dT (K) required |
| Terminals | | 53,6 | 80 |
| Manual operating means: metallic / non-metallic | | 17,5 | 35 |
| Parts intended to be touched but not hand-held: metallic / non-metallic | | 33,4 | 50 |
| Parts which need not be touched during normal operation: metallic / non-metallic | | 41,5 | 60 |
| supplementary information: | | Ambient temperature: | 23,8 °C |

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List of test equipment used:

(Note: This is an example of the required attachment. Other forms with a different layout but containing similar information are also acceptable.)

| Clause | Measurement / testing | Testing / measuring equipment / material used | Range used | Calibration date |
|--------|-----------------------|---|------------|------------------|
| | | Not applicable, | | |
| | | only required for the MT programs | | |
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Handwritten signature or scribble in the bottom right area.

Handwritten mark resembling a stylized 'S' or '5' at the bottom right corner.

Herstellereklärung

zur Baumusterkonformität der Sicherungshalter für zylindrische Sicherungen in den Bauartausführungen der Hersteller Wöhner GmbH & Co. KG und OEZ, s.r.o.,

| Wöhner GmbH & Co. KG | OEZ s.r.o. | |
|----------------------|------------|------------|
| Wöhner Nr. | ID code | ITEM |
| 31.971.062 | 41003 | OPVF10-1 |
| 31.974.062 | 41004 | OPVF10-2 |
| 31.110.162 | 41005 | OPVA10-1 |
| 31.130.162 | 41006 | OPVA10-1-S |
| 31.111.162 | 41007 | OPVA10-1N |
| 31.112.162 | 41008 | OPVA10-2 |
| 31.132.162 | 41009 | OPVA10-2-S |
| 31.113.162 | 41010 | OPVA10-3 |
| 31.133.162 | 41011 | OPVA10-3-S |
| 31.114.162 | 41012 | OPVA10-3N |
| 31.275.062 | 41013 | OPVP10-1 |
| 31.276.062 | 41014 | OPVP10-2 |
| 31.277.062 | 41015 | OPVP10-3 |
| 31.115.162 | 41016 | OPVA14-1 |
| 31.135.162 | 41017 | OPVA14-1-S |
| 31.116.162 | 41018 | OPVA14-1N |
| 31.117.162 | 41019 | OPVA14-2 |
| 31.137.162 | 41020 | OPVA14-2-S |
| 31.118.162 | 41021 | OPVA14-3 |
| 31.138.162 | 41022 | OPVA14-3-S |
| 31.119.162 | 41023 | OPVA14-3N |
| 31.278.062 | 41024 | OPVP14-1 |
| 31.279.062 | 41025 | OPVP14-2 |
| 31.280.062 | 41026 | OPVP14-3 |
| 31.120.162 | 41027 | OPVA22-1 |
| 31.140.162 | 41028 | OPVA22-1-S |
| 31.121.162 | 41029 | OPVA22-1N |
| 31.122.162 | 41030 | OPVA22-2 |

| | | |
|------------|-------|------------|
| 31.142.162 | 41031 | OPVA22-2-S |
| 31.123.162 | 41032 | OPVA22-3 |
| 31.143.162 | 41033 | OPVA22-3-S |
| 31.124.162 | 41034 | OPVA22-3N |
| 31.281.062 | 41035 | OPVP22-1 |
| 31.282.062 | 41036 | OPVP22-2 |
| 31.283.062 | 41037 | OPVP22-3 |

Fertigungsstätte für die oben genannten Sicherungshalter:

Wöhner GmbH & Co. KG
Mönchrödener Strasse 10
D - 96472 Rödental

VDE-Aktenzeichen

DE1-49452 249800-4402-0705/152633 (10x38)
DE1-29569 249800-4402-0705/26504 (14x51)
DE1-50312 249800-4402-0708/158641 (22x58)

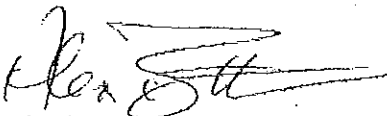
Zurzeit noch in Bearbeitung (10x38 PV)

Hiermit erklären wir, dass die oben genannten Sicherungshalter der Hersteller Wöhner GmbH & Co. KG und OEZ, s.r.o. in der angegebenen Fertigungsstätte nach denselben Zeichnungen gefertigt werden.

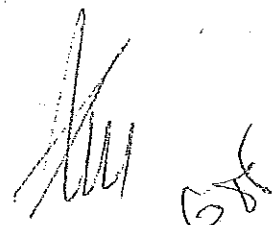
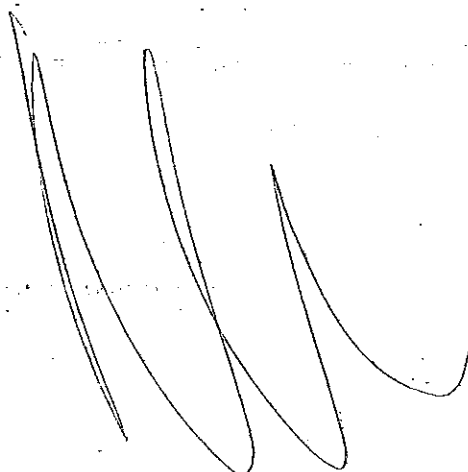
Wir bestätigen, dass die Sicherungshalter auch unter dem Firmennamen OEZ, s.r.o. vertrieben werden können.

Beide Geräteausführungen besitzen einen identischen Aufbau bezüglich der Konstruktion und des verwendeten Materials und unterscheiden sich nur im äußeren Design und in den Aufschriften.

Rödental, den 28.06.2012



Alex Büttner
(Geschäftsleitung)



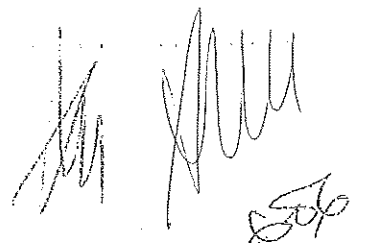
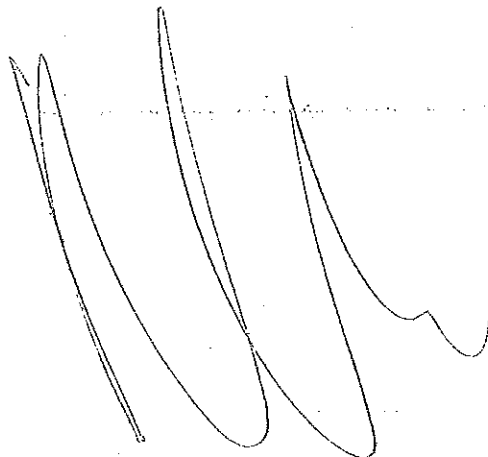
СПИСЪК НА ИЗПИТВАНИЯТА ОТ ТИПОВИ ИЗПИТВАНИЯ:

• Техническа характеристика

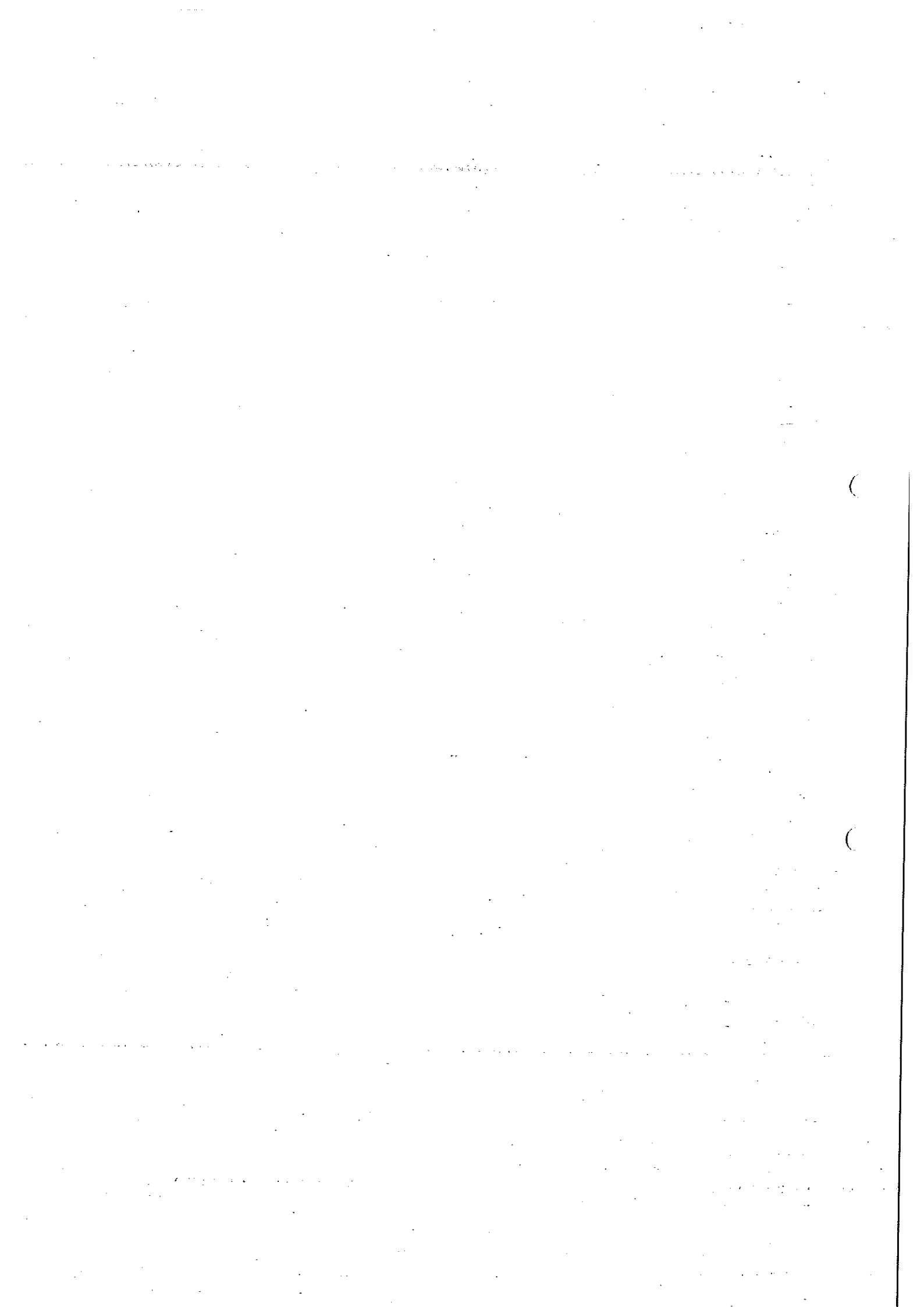
- Тип Код;
- Номинално напрежение;
- Номинален ток;
- Номинална честота;
- Номинална изключвателна възможност;
- Размер.

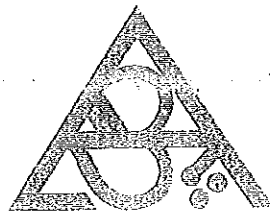
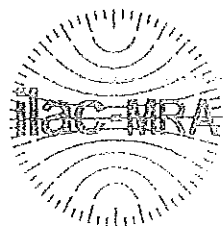
• Типов тест;

- Рутинен тест;
- Тестване на образци;
- Съответствие с изискванията за конструкции;



20/0





NÁRODNÍ AKREDITAČNÍ ORGÁN

Signatář EA MLA

Český institut pro akreditaci, o.p.s.
Olšanská 54/3, 130 00 Praha 3

vydává

v souladu s § 16 zákona č. 22/1997 Sb., o technických požadavcích na výrobky, ve znění pozdějších předpisů

OSVĚDČENÍ O AKREDITACI

č. 15 / 2015

Elektrotechnický zkušební ústav, s.p.
se sídlem Pod Lisem 129, 171 02 Praha 8 - Troja, IČ 00001481

pro zkušební laboratoř č. 1056
Zkušební laboratoř

Rozsah udělené akreditace:

Zkoušení výrobků, dílů, součástí, materiálů a pomůcek vymezené přílohou tohoto osvědčení.

Toto osvědčení je dokladem o udělení akreditace na základě posouzení splnění akreditačních požadavků podle

ČSN EN ISO/IEC 17025:2005


Subjekt posuzování shody je při své činnosti oprávněn odkazovat se na toto osvědčení v rozsahu udělené akreditace po dobu její platnosti, pokud nebude akreditace pozastavena, a je povinen plnit stanovené akreditační požadavky v souladu s příslušnými předpisy vztahujícími se k činnosti akreditovaného subjektu posuzování shody.

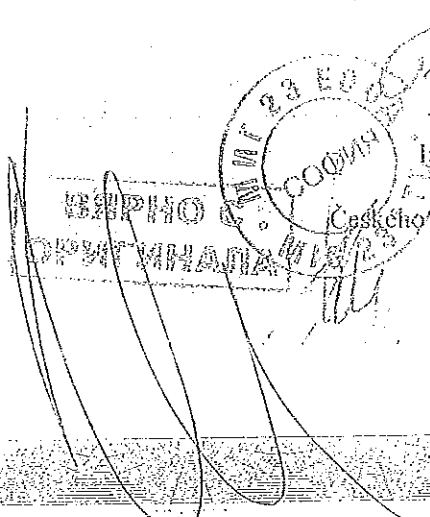
Toto osvědčení o akreditaci nahrazuje v plném rozsahu osvědčení č.: 744/2013 ze dne 19.12.2013, popřípadě správní akty na ně navazující.

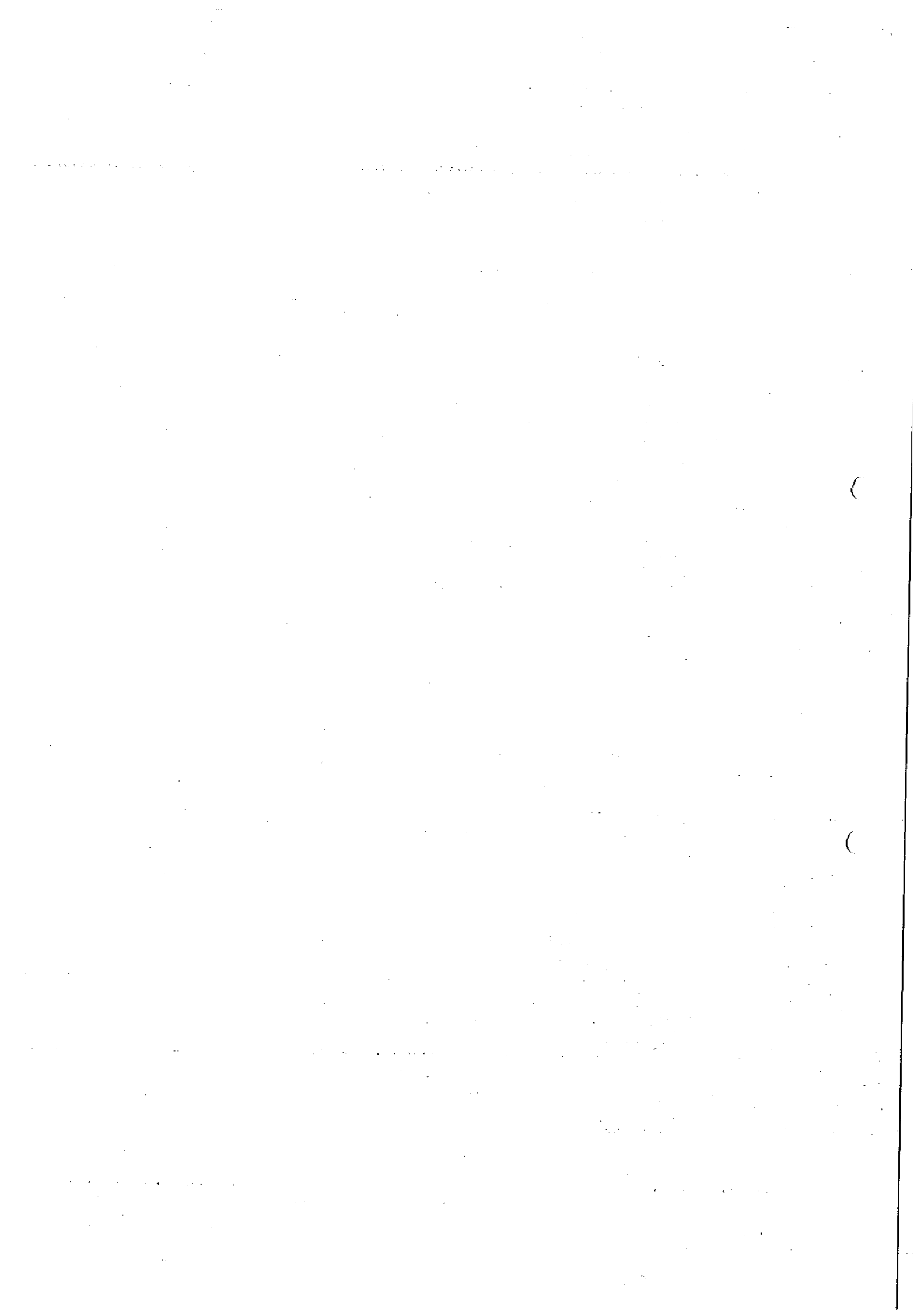
Udělení akreditace je platné do 15.10.2017

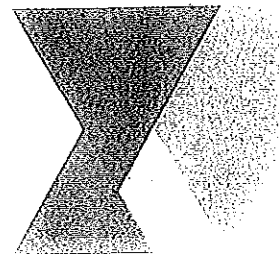
V Praze dne 08.01.2015




Ing. Jiří Růžička, MBA
ředitel
Českého institutu pro akreditaci, o.p.s.







GENERAL RECOMMENDATIONS FOR OEZ DEVICES

Preventive inspections of OEZ devices

1. General characteristic of OEZ devices

OEZ devices are designed as maintenance-free devices, however there are plants, where general or local safety regulations require regular preventive inspections of the devices in switchboards. Before putting new devices in service or in course of switchboard shutdown, we recommend checking whether the devices have operating conditions ensured as necessary for their correct functioning. The device operation and handling instructions are stated in the operation manual which is delivered together with the devices. The operation manuals can also be downloaded from www.oez.cz. Installation of the devices in the switchboard and the tests of correct function of the control circuits, if the device is equipped with them, can only be performed by persons with appropriate electrical qualification. The tests and prescribed inspections of the switchboard or of the entire plant can only be performed by persons with corresponding electrical qualification and relevant certification.

Electronic function of releases including their setting shall be verified by the personnel of the OEZ service department or by specialized firms. The condition of these activities is ownership of special test equipment.

Unless local operating regulations state otherwise, we recommend performing preventive inspections in intervals:

- once a year or
- after 1000 switching operations or
- after switching off a heavy short-circuit

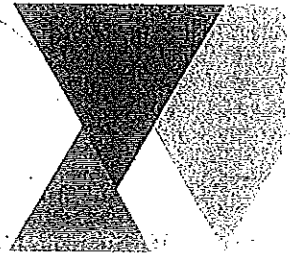
1.1 Activities before putting a switchboard into operation

- Check of correct installation of the device in the switchboard according to documentation.
- Removal of foreign objects (filings, wire residues, tools, etc.), possibly evacuation of dust and conductive particles from insulating parts of the device.
- Check of tightening of terminal screws by tightening torque according to instructions for use.
- Check of fastening of inlet and outlet conductors against effect of electrodynamic forces.
- Check of marking of the device with reverse connection by a warning table (with circuit breaker switched off, voltage is present on lower terminals of the circuit breaker).

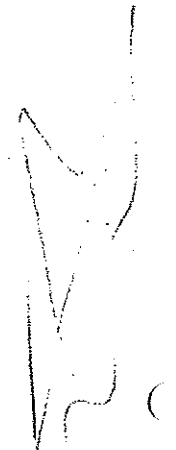
1.2 Activities that can be performed by trained operator of the user in preventive inspection

- Check of device contamination, possibly evacuation of dust, both from conductive and insulating parts of the device.
- Check of insulating covers and their replacement, if damaged.
- Measuring insulation state. The most serious failure in operation is switching the circuit breaker or fuse off due to short circuit (on the device or in the switchboard there are visible traces left by the





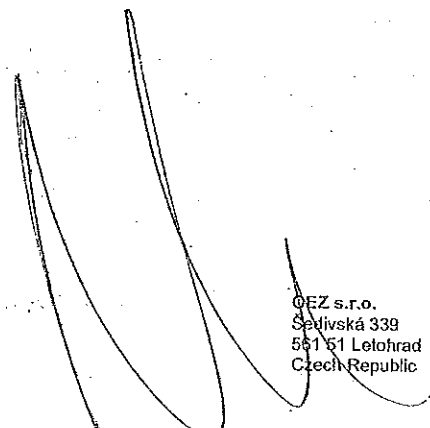
interrupted column of the arc). After switching off the short-circuit current the device must not be further used, if its insulation resistance R_{isol} drops under 2 M Ω Insulation resistance is measured:

- with disconnected contacts between terminals 1-2, 3-4, 5-6
 - with connected contacts between terminals 1-3 and 3-5
 - Measuring temperature rise of the device terminals and connections of power conductors in the switchboard during operation. With rated load, according to standard $\check{C}SN EN 947-1,2$ temperature rise of the terminals must not exceed 70 K . If temperature rise of a connection is higher than
 - 70 K, it is necessary to demount the connection, clean contact surfaces, and tighten the connection by prescribed torque. (Terminal temperature rise = terminal temperature – ambient temperature [K, °C, °C] catalogue reference temperature is 40 °C).
 - Check of tightening of terminal screws by tightening torque according to instructions for use.
- 


1.3 Complete overhaul - shall be performed by the OEZ service

Once in 5 years in important and continuous processes.

The check of function is performed and the service report is issued by the OEZ service. Diagnostics and maintenance is performed in one-time operation.

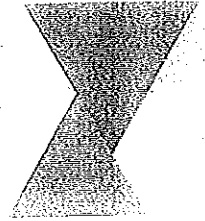
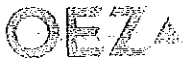


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E mail:





OEZ s.r.o
Sedivska 339, Letohrad,
Czech Republic

Letohrad, 25. 6. 2012

INSTRUCTIONS FOR STORAGE FOR THE DEVICES DELIVERED BY OEZ s.r.o.

The devices must not be stored in the environment with high humidity, presence of corrosive substances or rapid changes of temperature and condensing vapours. The devices are delivered and must be stored in disengaged condition.

The device must be store in an environment with the following parameters as ČSN EN 60721-3-1: 1K2/1Z1/1B1/1C2/1S2/1M2.



OEZ s. r. o.
Sedivská 339, Letohrad 561 51
Česká republika
IČO: 49810146, DIČ: CZ49810146
73

Ivan Hanzl
Regional Export Manager

OEZ s.r.o., Sedivska 339, 561 51 Letohrad, Czech Republic
phone: +420 465 672 268, fax: +420 465 672 398, e-mail: ivan.hanzl@oez.com . www.oez.com

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69

ОЕЗ s.r.o

Седивска 339, Летоград

Чехия

Летоград, 18.02.2009

Инструкции за монтаж на апаратурата доставена от ОЕЗ s.r.o

ПРЕВОД

Общи препоръки за апаратура на ОЕЗ
Превантивни проверки на ОЕЗ устройства

1. Обща характеристика на ОЕЗ устройствата

ОЕЗ устройствата са конструирани като устройства без специална поддръжка, но има фабрики, където общите или местните правилата за безопасност изискват редовни превантивни проверки на устройствата в таблата.

Преди да поставите нови устройства в експлоатация или в хода на табло за изключване, ние препоръчваме да се провери дали устройствата са експлоатирани в работни условия, необходими за правилното им функциониране.

Инструкции за експлоатация и работа са посочени в ръководството за експлоатация, което се доставя заедно с устройствата. Оперативните ръководства могат да бъдат изтеглени също така и от www.oez.cz.

Инсталиране на устройствата в таблото и тестове на правилното функциониране на управляващите вериги, ако устройството е оборудвано с тях, могат да се извършват само от лица с подходяща електрическа квалификация и съответния сертификат.

Тестовите и предписаните инспекции на таблото или на цялата инсталация може да се извършва само от лица със съответната квалификация и сертификат.

Електронното функциониране на защитите, включително тяхното настройка трябва да бъдат проверени от сервизния отдел на ОЕЗ или от специализирани фирми.

Състоянието на тези дейности е обхванато от специален тест оборудване.

Освен ако местните разпоредби за експлоатационно състояние не предписват друго, ние препоръчваме извършване на превантивни проверки на интервали:

- веднъж годишно или
- след 1000 превключвания или
- след изключване на тежко късо съединение

1.1 Дейности преди поставяне на табло в експлоатация

- проверка на правилния монтаж на устройството в табло по документацията

- Премахване на чужди предмети (стружки, кабели остатъци, инструменти и т.н.), евентуално отстраняване на прах и проводими частици от изолационни части на устройството.
- Проверка на затягане на винтовете на клемите с момент на затягане в съответствие с инструкциите за употреба.
- проверка на закрепването на входните и изходните проводници срещу ефекта на електродинамични сили.
- Проверка на маркировката на устройството с обратно свързване с предупредителна табела с изключен прекъсвач, напрежението присъства на долните клеми на прекъсвача.

1.2 Дейности, които могат да бъдат извършвани от обучен оператор на потребителя в превантивна инспекция

- проверка на замърсяване на устройството, евентуално отстраняване на прах, както от проводящите и изолацираните части на устройството.
- Проверка на изолиращи прегради и тяхната подмяна, ако са повредени.
- Измерване на изолационното състояние. Най-сериозната повреда в експлоатация е изключване на прекъсвача или предпазител поради късо съединение (в устройството или в разпределително табло има видими следи, оставени от прекъсвача или прекъсвачи секции на дъгата). След изключване на тока на късо съединение устройството не трябва да бъде използвано по-нататък, ако неговото R_{isul} изолационното съпротивление се понижи под $2\text{ M}\Omega$. Съпротивление на изолацията се измерва:
 - с несвързани контакти между клеми 1-2, 3-4, 5-6
 - със свързани контакти между клеми 1-3 и 3-5
- Измерване на повишаване на температурата на устройството на клемите и връзките на силовите проводници в таблото по време на работа. С номинално натоварване, съгласно стандарта ČSN EN 947-1,2 покачване на температурата на клемите не трябва да надвишава 70 K . Ако покачването на температурата на връзка е по-висока от 70 K е необходимо да се демонтира връзката, почистване на контактни повърхности, и затегане на връзката с предписания въртящ момент. (повишаване на температурата на клемата = температура на клемата - температурата на околната среда) каталожната референтна температура е $40\text{ }^\circ\text{C}$.
- Проверка на затягане на винтовете на клемите със момент на затягане, в съответствие с инструкциите за употреба.

1.3 Цялостен ремонт се извършва от отдел на OEZ

Веднъж на 5 години във важни и непрекъснати процеси.

Извършва се проверка на функционирането и се издава сервизен доклад от OEZ.

Диагностиката и поддръжката се извършва по едно и също време

Хана Ваврова

Регионален мениджър експорт

OEZ s.r.o, Седивска 339, Летоhrad, Чехия

тел.: +420 465 672 268, факс: +420 465 672 398 e-mail: hana.vavrova@oez.com,

www.oez.com

Handwritten signatures and initials are present at the bottom of the page, including a large signature on the left and several smaller ones on the right, some with numbers like '2' and '69'.

OEZ s.r.o
Седивска 339, Летоград
Чехия

Летоград, 25.06.2012

Инструкции за съхранение на апаратурата доставена от OEZ s.r.o

Устройствата не трябва да се съхраняват в среда с висока влажност на въздуха , наличието на корозивни вещества или резки промени на температурата и кондензни изпарения. Устройствата са доставени и трябва да се съхраняват в разединено състояние.

Устройството трябва да се съхранява в среда със следните параметри като CSN EN 60721-3-1 : 1K2 / 1Z1 / 1B1 / 1C2 / 1S2 / 1M2 .

Иван Ханзал
Регионален мениджър експорт

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hana.vavrova@oez.com, www.oez.com

692

OEZ s.r.o
Седивска 339, Летоград
Чехия

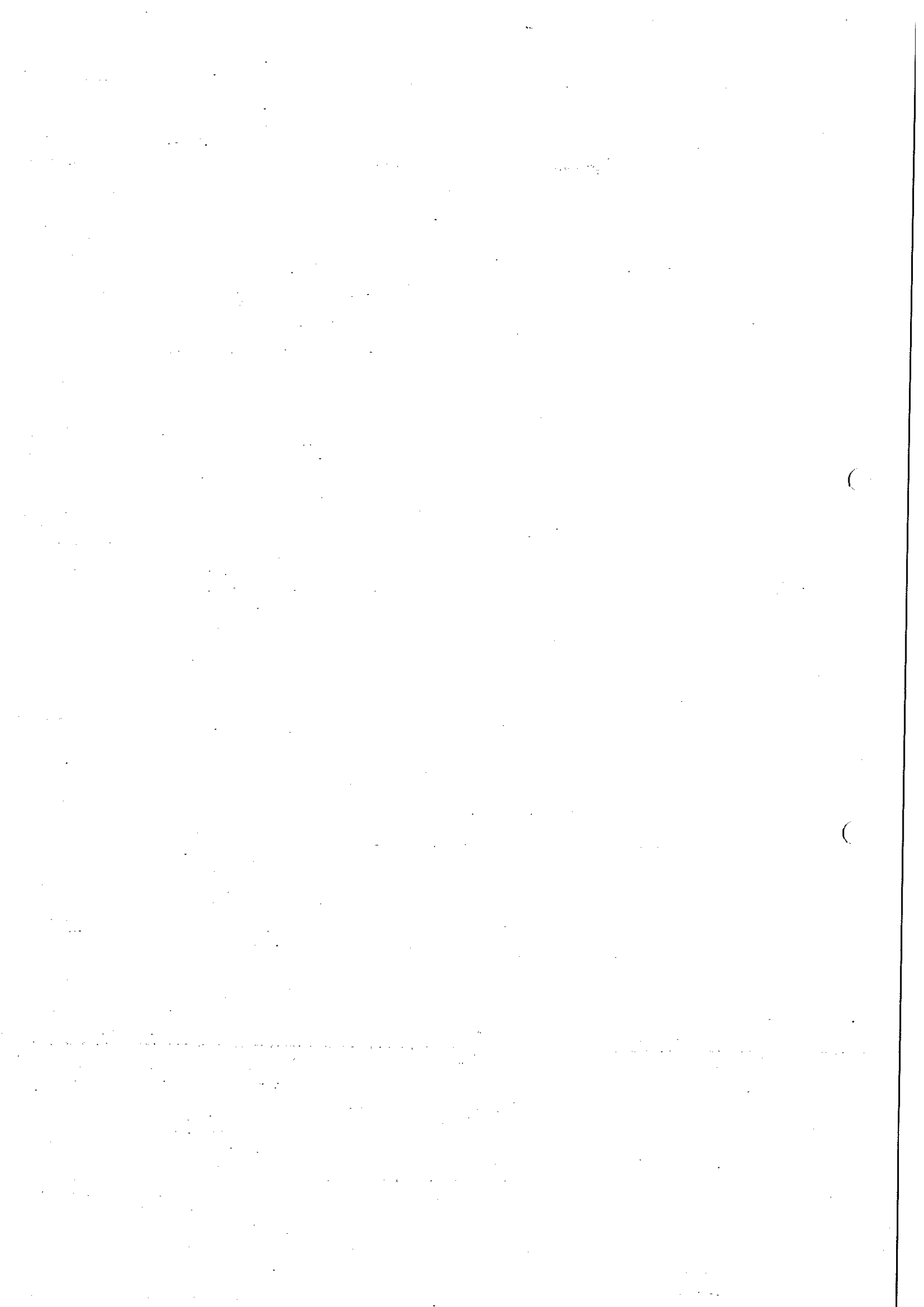
Летоград, 25.06.2012.

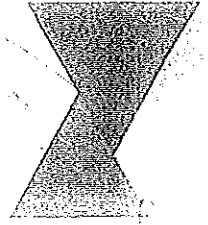
Инструкции за транспорт на апаратурата доставена от OEZ s.r.o

Условията на транспортиране са в съответствие с Инкотермс 2000, подразделени и публикувани от Международната камера за търговия. Всяка търговска фактура, издадена от OEZ s.r.o точно спесифицира предварително уговорените условия на доставка.

Иван Ханзал
Регионален мениджър експорт

OEZ s.r.o, Седивска 339, Летоград, Чехия
тел.: +420 465 672 268, факс: +420 465 672 398 e-mail:
hana.vavrova@oez.com, www.oez.com





OEZ Declaration to REACH and RoHS Directive

OEZ Declaration to REACH and RoHS Directive

We declare that the Company OEZ s.r.o. meets the necessary requirements of the European Parliament and Council Regulation (EC) No 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94, Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2006/121/ES

Company OEZ s.r.o. is not obliged to register substances.
Company OEZ s.r.o. is not a chemical manufacturer.

Packaging and labelling provides under Council Directive 67/548/EEC.

The European Parliament and Council have adopted the Directive 2002/95/EC (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment. The purpose of the Directive is to reduce the content of hazardous substances in waste electrical and electronic equipment, to increase recycling and disposal of components and materials. It is closely linked with the Waste Electrical and Electronic Equipment Directive (WEEE) 2002/96/EC which sets collection, recycling and recovery targets for electrical goods and is part of a legislative initiative to solve the problem of huge amounts of toxic e-waste.

The RoHS 2 directive (2011/65/EU) is an evolution of the original directive and became law on 21 July 2011 and took effect 2 January 2013. It addresses the same substances as the original directive while improving regulatory conditions and legal clarity. It requires periodic reevaluations that facilitate gradual broadening of its requirements to cover additional electronic and electrical equipment, cables and spare parts.

Pursuant to paragraph 1 of Article 2, OEZ products are not electrical equipment falling under the scope of the Directive 2002/95/EC (RoHS) and 2011/65/EU (RoHS 2).

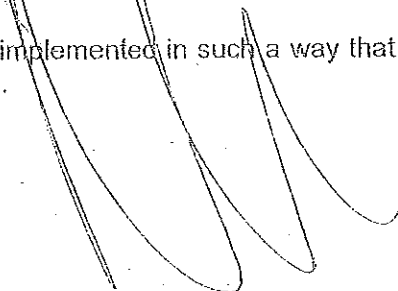
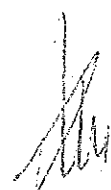

OEZ is aware of its liability for the environment, health of its customers as well as employees. Therefore it voluntarily guarantees and declares that OEZ products launched on the market will comply with the requirements of the RoHS Directive by 1 July 2006.

All OEZ products are modified not to contain substances specified in RoHS:

- lead (Pb) (0,1 wt %) – all solders are replaced by leadless ones
- mercury (Hg) (0,1 wt %) – is not used in OEZ equipment
- cadmium (Cd) (0,01 wt %) – not used for surface finish and in solders used for fuses
- hexavalent chromium (Cr^{VI}) (0,1 wt %) – change of surface finish
- polybrominated biphenyls (PBB) (0,1 wt %) – change of plastics used for all products
- polybrominated diphenyl ethers (PBDE) (0,1 wt %) – change of plastics used for all products

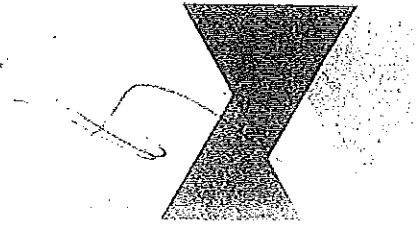
These modifications are implemented in such a way that they shall not have an adverse effect on the equipment parameters.



 GG

OEZ▲



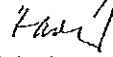
OEZ Declaration to REACH and RoHS Directive

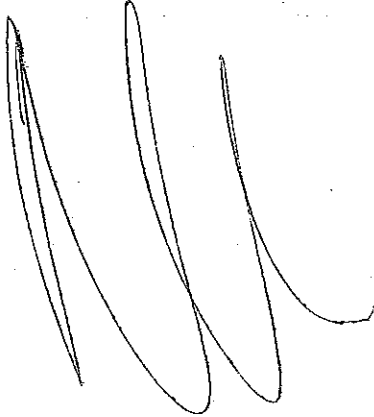
In OEZ products are used materials with low negative impact on the environment. The products do not contain hazardous substances. For their production are used materials that can be recycled. To the maximum extent they are used in plastic products, that means reducing the number of necessary metal parts to a minimum and thus the subsequent burden reduction in waste, cutting and lubricating liquids, effluents and the consumption of paints and thinners.

In Letohrad August 1, 2014

OEZ▲

OEZ s.r.o.
Šedivská 339, 561 51 Letohrad
Česká republika
IČO: 49810146, DIČ: CZ49810146

Ing. Jaroslava Havlová 
Head of Environment, Health and Safety



690



Декларация OEZ да достигне и Директива RoHS

Декларация OEZ за да достигне REACH Директива

Ние заявяваме, че SRO на фирма OEZ отговаря на необходимите изисквания на регламент на Европейския парламент и на Съвета (ЕО) № 1907/2006 от 18 декември 2006 г. относно регистрацията, оценката, разрешаването и ограничаването на химикали, за създаване на Европейска агенция по химикали и Европейския парламент и на Съвета 2006/121 / ЕС. Фирма OEZ и обратна осмоза Не е задължена да регистрира вещества. Фирма OEZ и обратна осмоза не е химически производител. Опаковка и етикетирание осигурява по силата на Директива 67/548 / ЕИО

Европейския Парламент и Съвет приеха директивата 2002/95/EC / RoHS / за ограничение употребата на някои опасни вещества в електрическото и електронно оборудване. Целта на директивата е да се намали съдържанието на вредни вещества в отпадъчното електрическо и електронно оборудване и да се увеличи рециклирането и пласирането на елементите и материалите.

Съгласно параграф 1 от чл.2, продуктите на OEZ не са електрическо оборудване липсващо в обхвата на Директива 2002/95/EC / RoHS /.

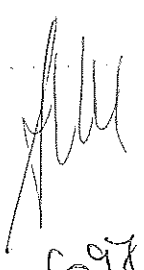
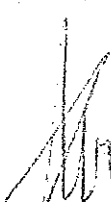
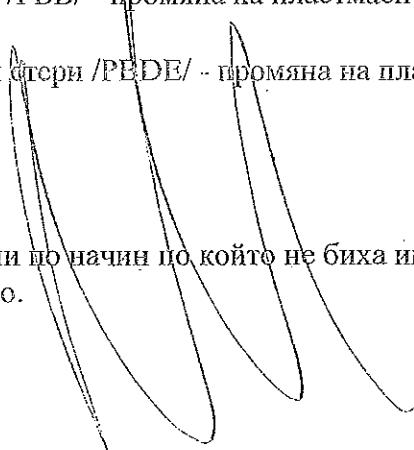
OEZ осъзнава отговорността си към околната среда, здравето на клиентите си, както и това на служителите си.

Следователно OEZ доброволно гарантира, че продуктите на OEZ, които се пласират на пазара ще изпълняват изискванията на Директива RoHS от 01 юли 2006.

Всички продукти на OEZ са видоизменени да не съдържат специфицираните вещества по RoHS:

- Олово /Pb/ - всички спойки са заменени с безоловни такива
- Живак /Hg/ - не се ползва в оборудване на OEZ
- кадмий /Cd/ - не се ползва за завършек на повърхности и при спойките ползвани за предпазители
- шествалентен хром /Cr/ - промяна завършека на повърхности
- полибромнен бифенил /PBV/ - промяна на пластмасите ползвани за всички продукти
- полибромни дифенил етери /PBDE/ - промяна на пластмасите ползвани за всички продукти

Тези изменения са направени по начин по който не биха имали страничен ефект върху параметрите на оборудването.



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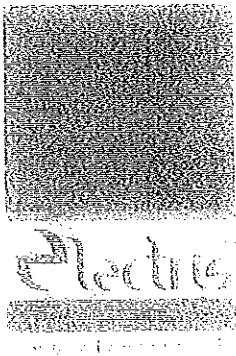
ОЕЗ продукти се използват материали с ниска степен на негативно въздействие върху околната среда .
Продуктите не съдържат опасни вещества . За производството им се използват материали, които могат да
бъдат рециклирани . До максималната степен, те се използват в пластмасови продукти , това означава, че
намаляването на броя на необходимите метални части до минимум и по този начин последващото
намаление на тежестта в отпадъци , рязане и смазочни течности , отпадъчните води и консумацията на
бон и разредители .

Летоград, 01.08.2014

инж.. Ярослава Хавлова
ръководител на Околна среда ,
здравеопазване и безопасност

ВЯРНО С
ОРИГИНАЛА

098



000 София бул. Александър Стамболийски 755
тел./факс: (02) 920 24 45 527 35 80 e-mail: sales@electus.bg
9010 Варна, ул. "Осми промислен пост" 123, етаж 3, офис
тел./факс: (052) 301 456, e-mail: sales.varna@electus.bg

ЕЛЕКТРИКЪТ

ЕЛЕКТРИКЪТ

ДЕКЛАРАЦИЯ

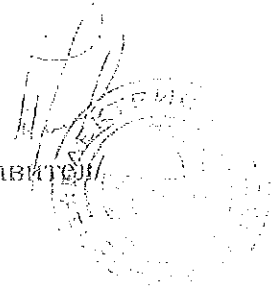
За възможността за рециклиране на употребените материали или за начина
им на ликвидиране

С настоящето декларираме, че предлаганата от нас апаратура НН,
производство на OEZ s.r.o.; Sedivska 339, 561 51 Letohrad, Czech
Republic не може да бъде рециклирана. Продуктите могат да бъдат
депонирани за обезвреждане и/или бракуване при оторизираните за целта
фирми.

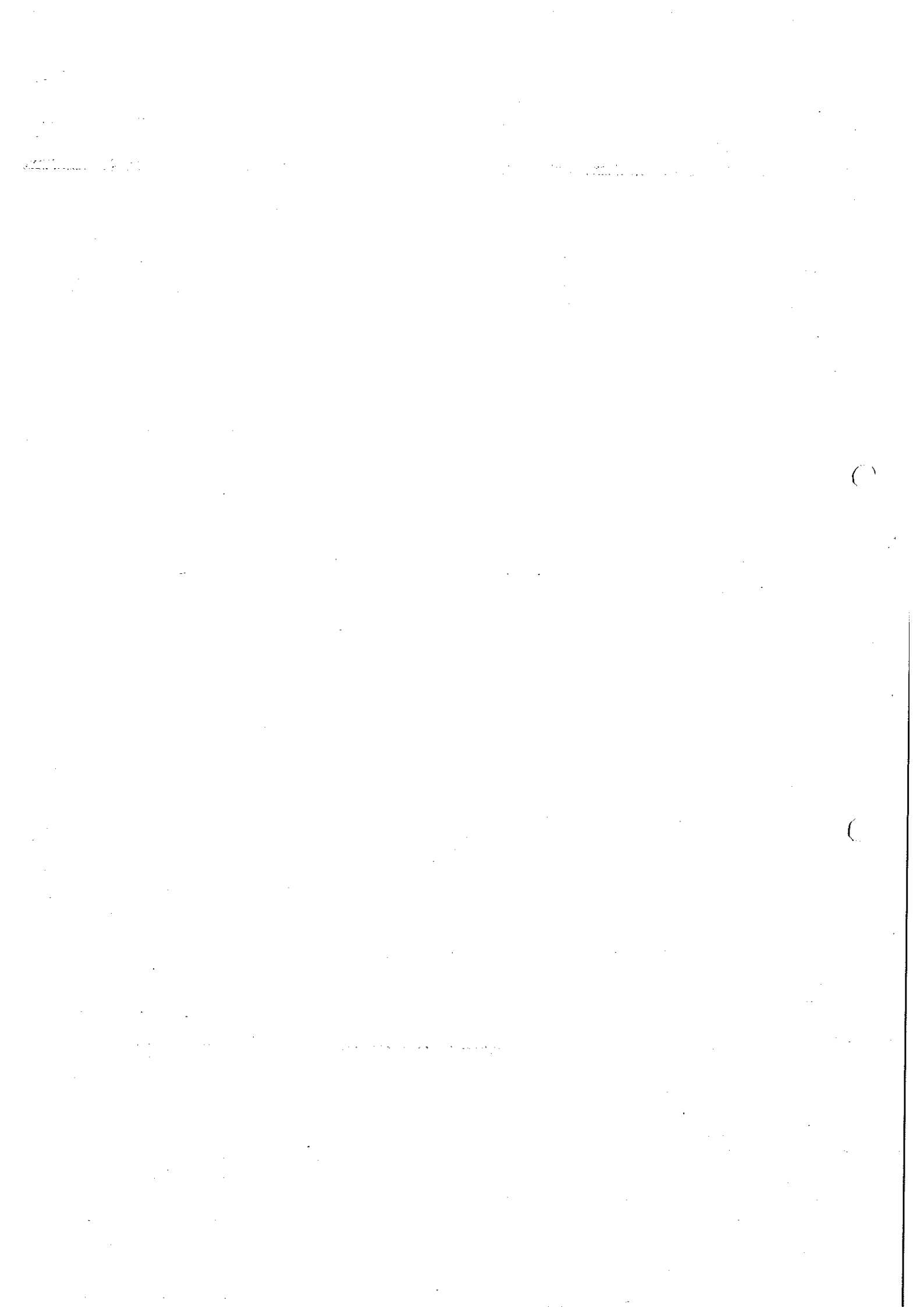
Дата: 26.06.2012

Борис Зарев:

/Управител/



601



5

Наименование на материала:

Комплект измервателен клемен блок
с клеми за медни проводници от
проходен тип и 1P, 3P или 3P+N
стопяеми цилиндрични предпазител-
прекъсвач-разединители

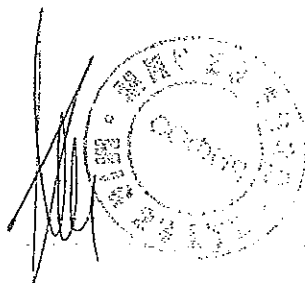

Номер на техническа спецификация на
стандарт - 20 14 0001 ZZ КЪМ

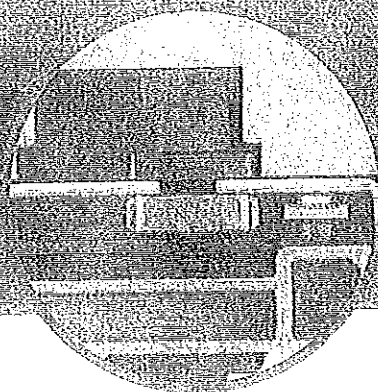
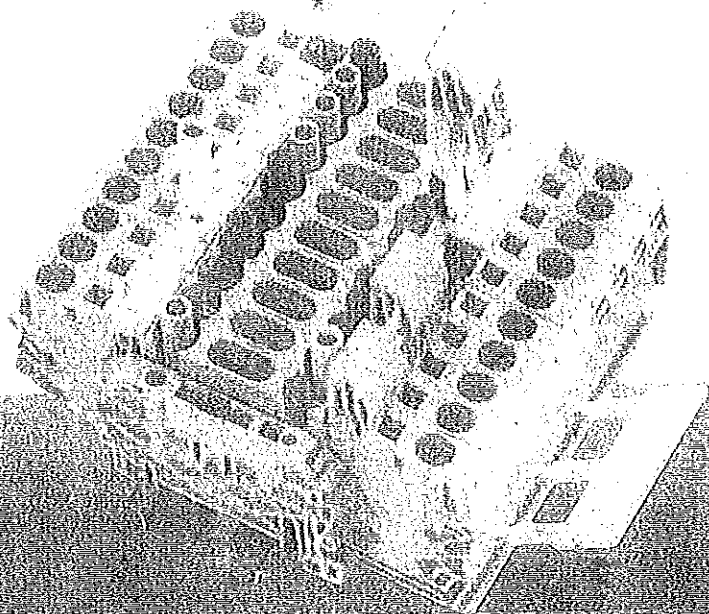
МТТ20/100, Д – отпред и отстрани



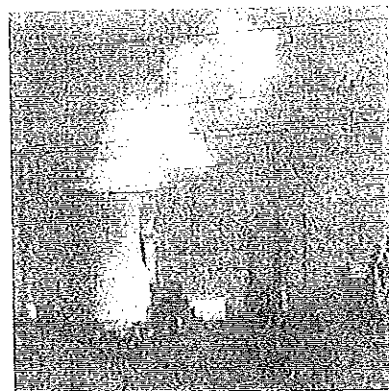
2

| № по ред | Документ | Приложение № или текст |
|----------|--|--|
| 1. | Точно означение на типа, производителя и страната на производство (произход) и последно издание на каталога на производителя | WTL 6/1 WTL 6/3 Weidmüller Германия Приложение № 1 |
| 2. | Техническо описание и чертежи с нанесени на тях размери | Приложение № 2 |
| 3. | ЕО декларация за съответствие | Приложение № 3 |
| 4. | Протоколи от типови изпитвания на английски или български език съответно за 1P, 3P или 3P+N стопяеми цилиндрични предпазител-прекъсвач-разединители и клемните блокове, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език | Приложение № 4 |
| 5. | Сертификат/акредитация на независимата изпитвателна лаборатория, провела типовите изпитвания по т. 4 – заверено копие | Приложение № 5 |





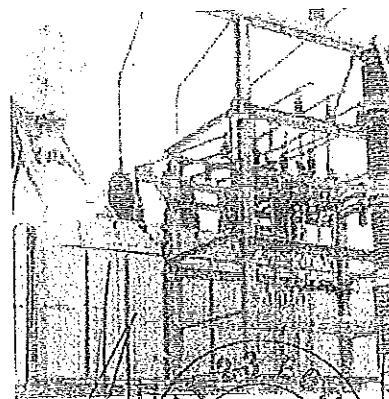
ИЗМЕРВАТЕЛНИ КЛЕМИ В ЕЛЕКТРОСНАБДЯВАНЕТО



Неточности при измерванията биха довели до големи загуби за предприятията.

Клемите на **Weidmüller**, с богатата гама от принадлежности, далеч надхвърлят тези високи изисквания.

Weidmüller, като водещ производител на клеми, е разработил, в тясно сътрудничество с потребителите, специални големи измервателни клеми. Тези клеми дават възможност да се оптимизират схемите за измерване на ток, напрежение и енергия.



www.weidmuller.com

Вашият партньор в интерфейсната техника

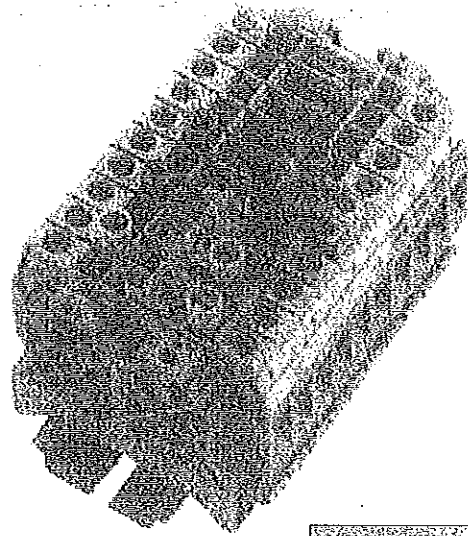
ВАШИО СЪЛЪС
ОРИГИНАЛ
СОФИЯ
23.11.2010

Лесно измерване

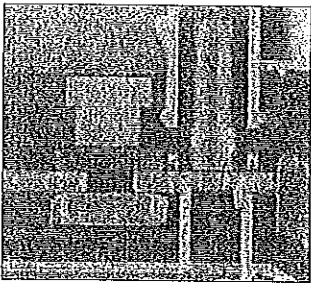
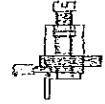
Токовете трансформатори трябва да бъдат свързани накъсо или да работят с нискожни товарни съпротивления, защото отворените преобразуватели „изгарят“ и се разрушават. Освен това, съпротивленията на товарите водят до неточности при мерене на енергията и оттам – до загуба на приходи за предприятието.

Много схеми могат да бъдат осъществени прегледно и икономично с делимите измервателни клеми WTL 6/1, проходните редови клеми WTD 6/1 и делимите чрез мост клеми WTQ 6/1.

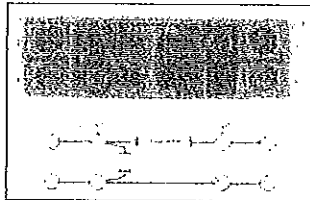
Винтовете за закрепване на проводниците са достъпни само когато токовият трансформатор бъде свързан накъсо с помощта на окъсяващия плъзгач. Това предпазва от неволно разединяване на измервателния прибор и свързаната вторична верига.



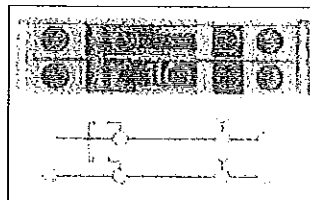
WTL 6/1
WTD 6/1
WTQ 6/1



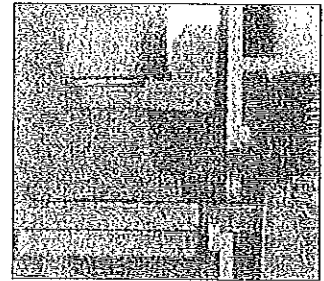
Лесна за обслужване плъзгаща връзка (WTL 6/1)



Един окъсяващ плъзгач на клема (WTL 6/1)



Един окъсяващ плъзгач на клема (WTQ 6/1)



Обезопасена мостова връзка (WTQ 6/1)

Надеждността на делимите измервателни клеми е доказана не само на теория, а в агресивна промишлена среда

Това е потвърдено от лабораторни тестове!

Дори в тежки промишлени условия (SO_2), ниското съпротивление на делимите клеми с плъзгаща връзка на **Weidmüller** се запазва постоянно.

Изследван е механичният живот, съгласно DIN IEC 512, част 5 05.94 в нормална атмосфера и след десетдневно съхранение в агресивна промишлена атмосфера, съгласно DIN V 40 046, част 36 03.87 (25° C, 75 % относителна влажност, 1 % SO_2).

Преходните съпротивления на различни делими клеми с плъзгаща връзка са определени чрез измерване пада на напрежение.

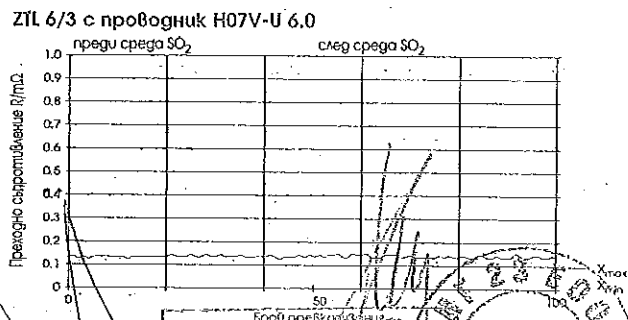
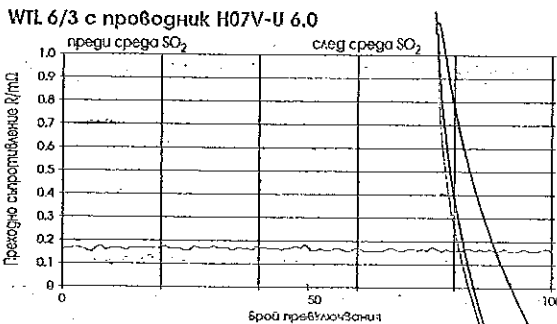
Измерено е преходното съпротивление на клемите при 50 превключвания (виж графиките). След това образците са престояли 10 дни в агресивна атмосфера и изпитанието е повторено.

В началото на измерването, преходните съпротивления на делимите клеми с плъзгаща връзка на **Weidmüller** са показали константни ниски стойности.

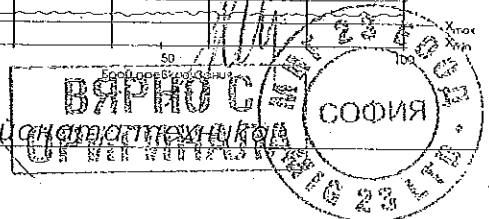
Даже след десетдневно съхранение в среда на SO_2 , тези клеми са осигурили постоянни ниски стойности на съпротивлението.

Отличните резултати, постигнати от делимите клеми, се дължат на специално избраната от **Weidmüller** система.

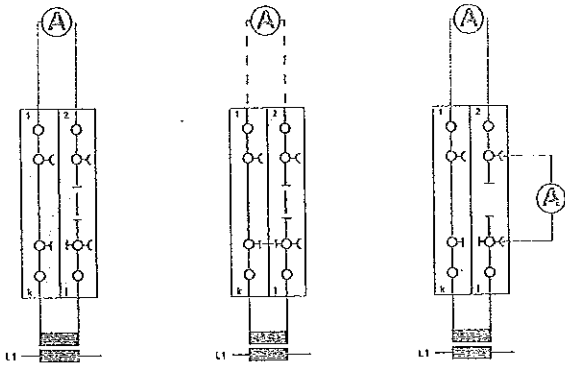
Плъзгачът не надгравква тоководещата шина (дори при често превключване), а я заглажда. По този начин ниското съпротивление се запазва и при работа в агресивна промишлена среда.



Вашият партньор в интерфейса на статичния ток



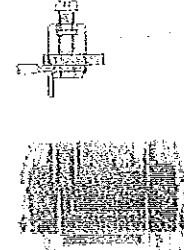
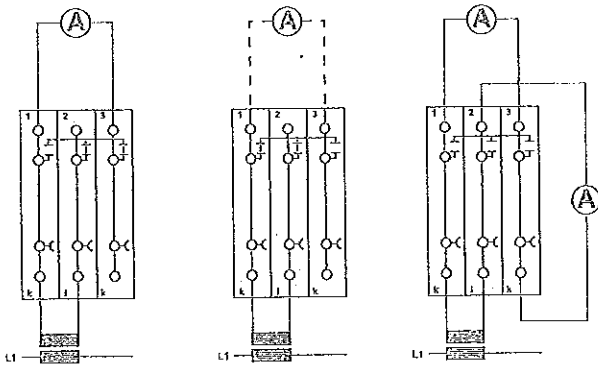
Лесносъществуващи схеми с измервателни клети



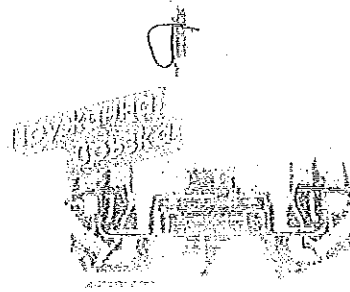
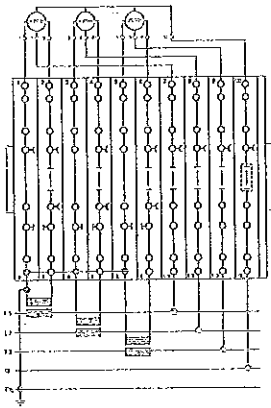
WTL 6/1/STB



WTD 6/1



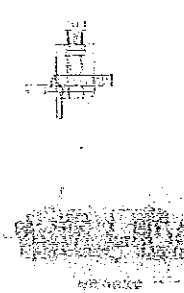
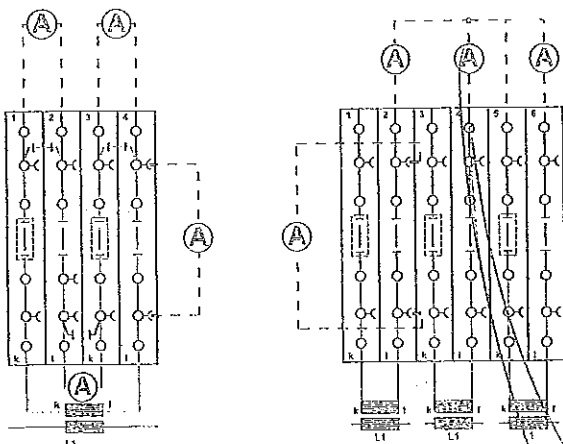
WTQ 6/1/STB




ZTL 6/1/STB



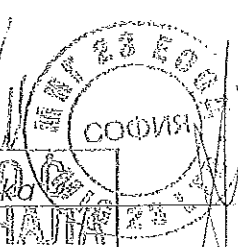
ZTD 6/1/STB



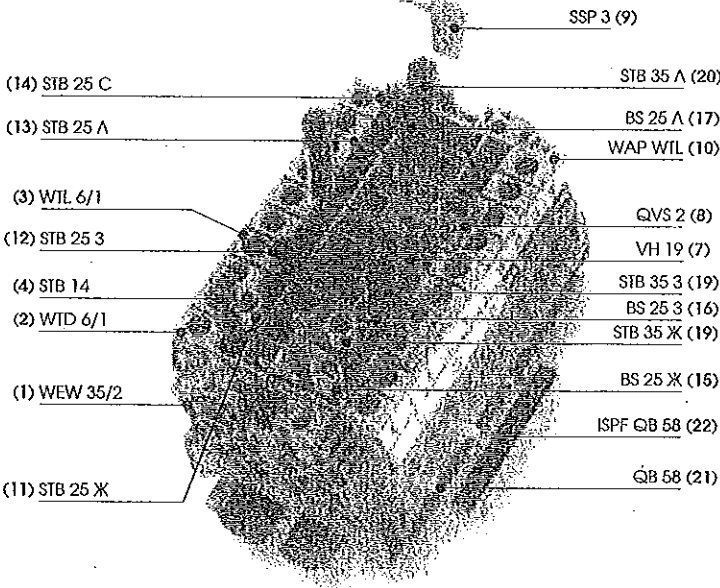
WTL 6/3

 Вашият партньор в интерфейсната техника

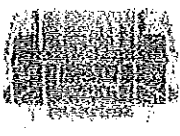
ВАШИЯТ
ОРИГИНАЛ



Блок с делими измервателни клеми WTL 6/1



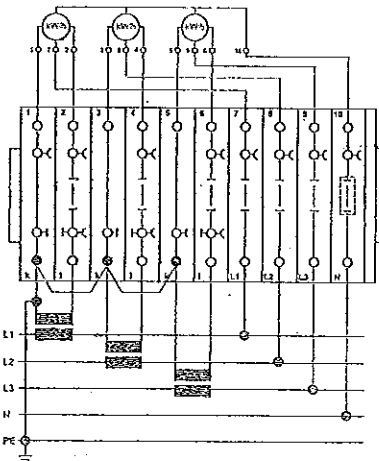
WTL 6/1/STB



WTD 6/1

Изходно положение

(с външен мост за точка k)



| Поз. Тип | Кат. ном. | Кат. ном. | Бр. |
|--------------------------|------------|------------|-----|
| 1 WEW 35/2 | 1061200000 | 0206160000 | 2 |
| 2 WTD 6/1 | 1017100000 | 1017200000 | 3 |
| 3 WTL 6/1 | 1016700000 | 1016800000 | 7 |
| 4 STB 14 | 0169900000 | 0169900000 | 8 |
| 5 BS 25 Ч ¹⁾ | 0335200000 | 0335200000 | 3 |
| 6 STB 35 Ч ²⁾ | 0388500000 | 0388500000 | 3 |
| 7 VH 19 | 0318000000 | 0318000000 | 6 |
| 8 QVS 2 | 0307300000 | 0307300000 | 3 |
| 9 SSP 3 | 0531760000 | 0531760000 | 1 |
| 10 WAP WTL | 1068300000 | 1068300000 | 1 |

Вариант: за по-добро маркиране (цветно) (вместо 8 х поз. 4, 3 х поз. 5 и 3 х поз. 6)

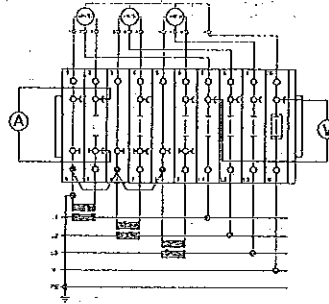
| Поз. Тип | Кат. ном. | Кат. ном. | Бр. |
|-------------|------------|------------|-----|
| 4 STB 14 | 0169900000 | 0169900000 | 4 |
| 11 STB 25 Ж | 0267200000 | 0267200000 | 1 |
| 12 STB 25 3 | 0271200000 | 0271200000 | 1 |
| 13 STB 25 A | 0271300000 | 0271300000 | 1 |
| 14 STB 25 C | 0343400000 | 0343400000 | 1 |
| 15 BS 25 Ж | 0335700000 | 0335700000 | 1 |
| 16 BS 25 3 | 0335600000 | 0335600000 | 1 |
| 17 BS 25 A | 0335800000 | 0335800000 | 1 |
| 18 STB 35 Ж | 0389000000 | 0389000000 | 1 |
| 19 STB 35 3 | 0388900000 | 0388900000 | 1 |
| 20 STB 35 A | 0389100000 | 0389100000 | 1 |

Вариант: допълнително за обща точка k (заземнителен краиц).

| Поз. Тип | Кат. ном. | Кат. ном. | Бр. |
|---------------------------------|------------|------------|-----|
| 21 QB 58 ¹⁾ пог. към | 0545300000 | 0545300000 | 1 |
| 22 ISPFQB 58 Ч ²⁾ | 0546000000 | 0546000000 | 1 |

¹⁾ Отрязали 3 полуса.
²⁾ Поз. 5 – както поз. 15, но с черна изолация;
³⁾ Поз. 6 – както поз. 18, но с черна изолация.

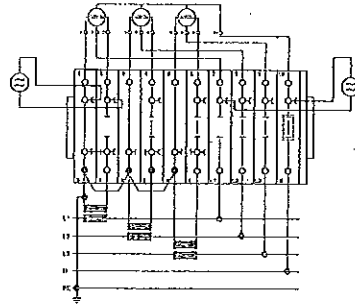
Проверка на електромер за фаза L1



Последователност на действията от изходно положение:

1. Включете амперметра към измервателните гнезда (букси) на клема 2;
2. Отворете плъзгащата връзка на клема 2;
3. Включете волтметра към измервателните гнезда на клеми 7 и 10.

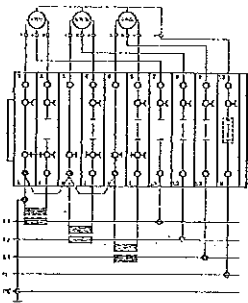
Проверка на електромер чрез външно захранване за фаза L1



Последователност на действията от изходно положение:

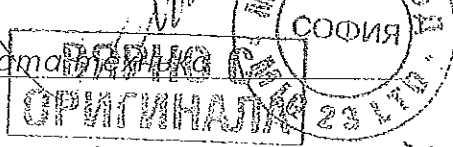
1. Затворете окъсяващия плъзгач на клеми 1 и 2;
2. Отворете плъзгащата връзка на клеми 2 и 7;
3. Свържете външно захранване към гнездата на клеми 1, 2 и 7, 10.

Смяна на електромер за фаза L1



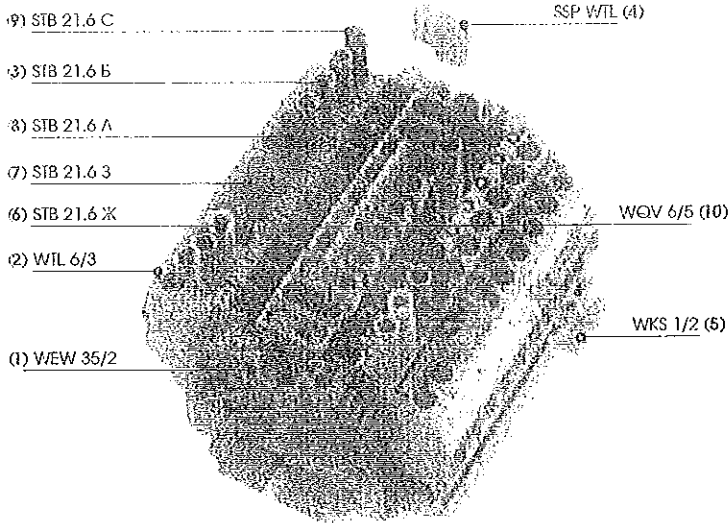
Последователност на действията от изходно положение:

1. Затворете окъсяващия плъзгач на клеми 1 и 2;
2. Отворете плъзгаща връзка на клеми 2 и 7;
3. Откачете електромера за L1 от клеми 1, 2 и 7, 10.



705

Блок с делими измервателни клеми WTL 6/3



| Поз. | Тип | Кат. ном. | Кат. ном. | Бр. |
|------|------------|------------|------------|-----|
| 1 | WEV 35/2 | 1061200000 | 0206160000 | 2 |
| 2 | WTL 6/3 | 1018800000 | 1018900000 | 10 |
| 3 | STB 21.6 Б | 1071000000 | 1071000000 | 14 |
| 4 | SSP WTL | 1604200000 | 1604200000 | 4 |
| 5 | WKS 1/2 | 1604270000 | 1604270000 | 3 |

Вариант: за по-добро маркиране (цветно)
(вместо 14 x поз.3)

| Поз. | Тип | Кат. ном. | Кат. ном. | Бр. |
|------|------------|------------|------------|-----|
| 3 | STB 21.6 Б | 1071000000 | 1071000000 | 7 |
| 6 | STB 21.6 Ж | 1071010000 | 1071010000 | 2 |
| 7 | STB 21.6 3 | 1071020000 | 1071020000 | 2 |
| 8 | STB 21.6 A | 1071030000 | 1071030000 | 2 |
| 9 | STB 21.6 C | 1071080000 | 1071080000 | 1 |

Вариант: допълнително за обща точка К
(заземителна трайца)

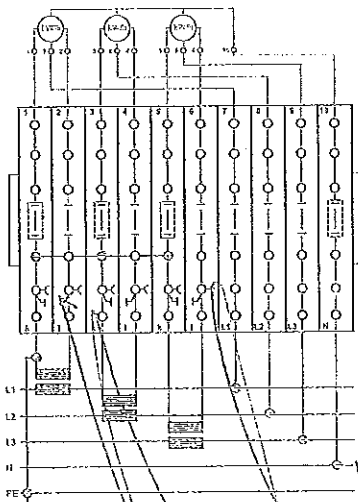
| Поз. | Тип | Кат. ном. | Кат. ном. | Бр. |
|------|-------------------------|------------|------------|-----|
| 10 | WQV 6/5 | 1062660000 | 1062660000 | 1 |
| | STB 21.6 Ч ₂ | 1778990000 | 1778990000 | |
| | STB 21.6 Ч ₁ | 1071040000 | 1071040000 | |

WTL 6/3/STB

Изходно положение

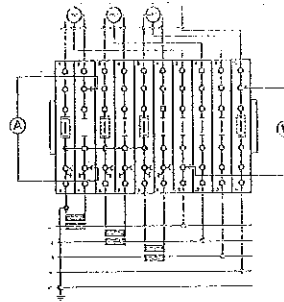
(с външен мост за точка К)

Благодарение на специално оформените гнезда (букси) за сонди, могат да се използват както обикновени измервателни щекери, така и специалните обезопасени щекери за клемата WTL 6/3.



Вашият партньор в интерфейса на техника

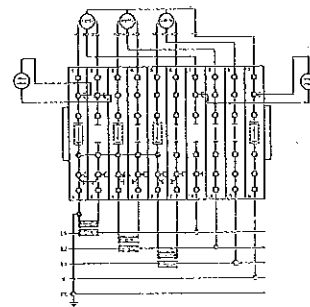
Проверка на електромер за фаза L1



Последователност на действията от изходно положение:

1. Включете амперметра към измервателните гнезда (букси) на клемата 2;
2. Отворете плъзгащата връзка на клемата 2;
3. Включете волтметра към измервателните гнезда на клемите 7 и 10.

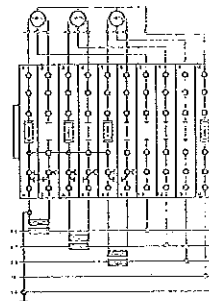
Проверка на електромер чрез външно захранване за фаза L1



Последователност на действията от изходно положение:

1. Затворете окъсяващия плъзгач на клемите 1 и 2;
2. Отворете плъзгащата връзка на клемите 2 и 7;
3. Свържете външно захранване към гнездата на клемите 1, 2 и 7, 10.

Смяна на електромер за фаза L1



Последователност на действията от изходно положение:

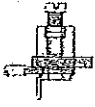
1. Затворете окъсяващия плъзгач на клемите 1 и 2;
2. Отворете плъзгащата връзка на клемите 2 и 7;
3. Откачете електромера за L1 от клемите 1, 2 и 7.

ОРИГИНАЛ

206

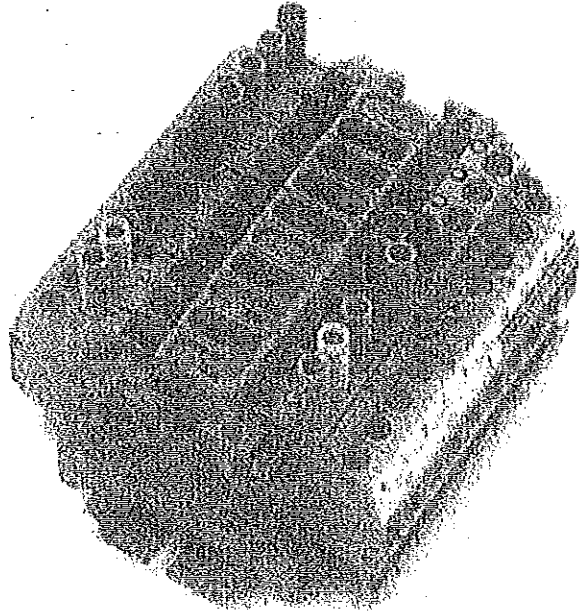
Компактен измервателен клемен блок

WTL 6/3

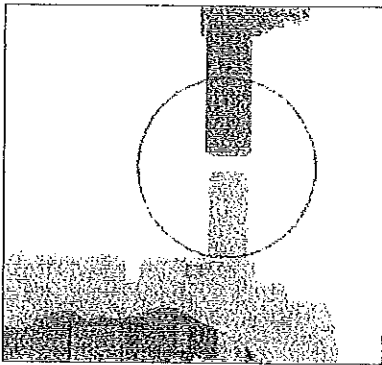


С клемите WTL 6/3, допълнени с някои аксесоари, могат да се осъществят всички срещани се в практиката схеми.

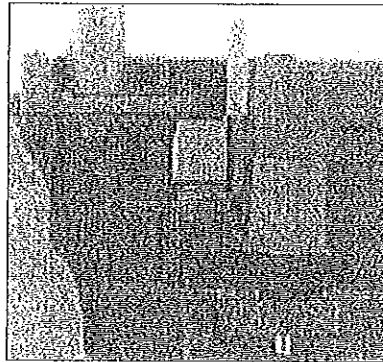
Оксяващите плъзгачи са обезопасени при допир. Възможно е да се поставят и два моста, например – за вътрешното разпределение на точка k (заземения край на намотките). Мостовете са стандартните WQV 6/... от W-серията. Чрез тях могат и да бъдат „прескачани“ клемите.



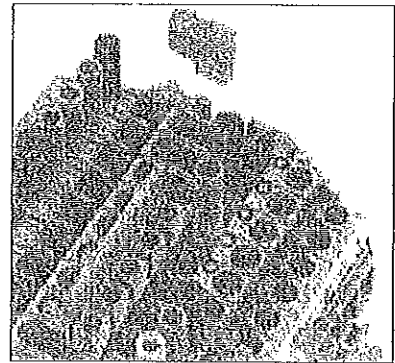
Клемата WTL 6/3/STB е обезопасена при допир. Благодарение на специално оформените гнезда (букси) за сонди, могат да се използват обикновени измервателни щекери или специалните обезопасени такива. Допълнително предимство на WTL 6/3/STB: за работа с всички винтчета, както и с гнездата за сонди, е необходима само една отвертка.



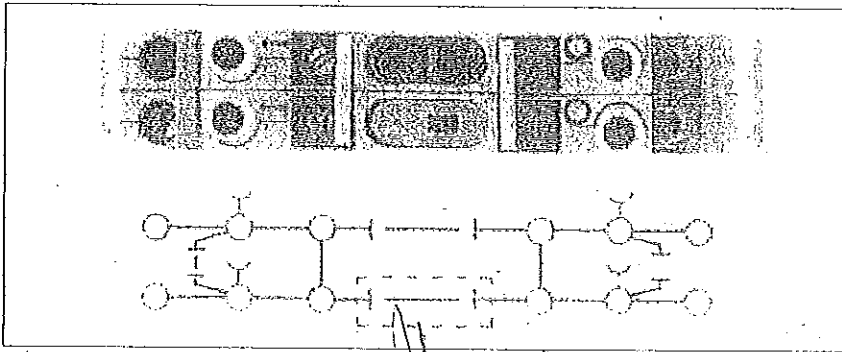
Точки на измерване, обезопасени при допир (по VBG 4)



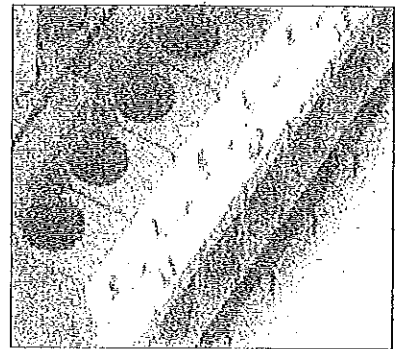
Компактна конструкция: разделящ плъзгач, мост, оксяващ плъзгач



Оптимизирани аксесоари за всички варианти на схеми



Максимално възможно окомплектоване (два моста и два оксяващи плъзгача)



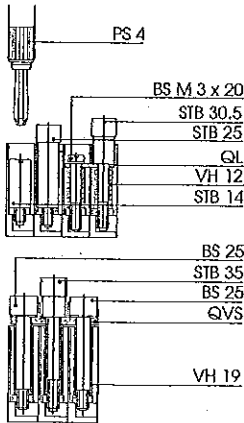
По две маркировки DEK за всяка точка на свързване



707

Принадлежности

за WPL 6/1, W/Q 6/1, WTD 6/1



Оксяващ пълзгач QVS

Измервателните гнезда тип STB се завиват в резьбата на отвора в токоведещата шина на клемите. В тях могат да се вкачат щекери тип PS 4 или оксяващи щекери QS2.

Мостът WKB се монтира в горния край на напречно-делимателните клеми W/Q 6/1. Съединяването и разделянето става чрез свързване / разделяне на пълзгачите на клемите към моста WKB.

Мостове WQV и QL

Мостовете WQV позволяват безопасно при наличие (по VBG 4) свързване на съседни клеми.

Номинално напрежение

| | |
|----------------------|----------|
| При съседни QVS | 63 V |
| При съседни STB 35 | 63 V |
| При съседни WQV | до 400 V |
| При съседни QL | 250 V |
| При съседни STB 25 | 63 V |
| При съседни STB 30.5 | 63 V |

За спазване на номиналното напрежение, трябва да се използват разделители TW или разделители TSch (за оксяващите пълзгачи). Не са необходими разделители при мостовете WQV.

STB 35

| Тип | Цвят | Кат. ном. | Опак. |
|--------|--------|------------|-------|
| STB 35 | жълт | 0388900000 | 50 |
| STB 35 | зелен | 0388900000 | 50 |
| STB 35 | лилав | 0389100000 | 50 |
| STB 35 | черен | 0388500000 | 50 |
| STB 35 | сив | 0388600000 | 50 |
| STB 35 | син | 0388700000 | 50 |
| STB 35 | червен | 0388800000 | 50 |
| STB 14 | | 0169900000 | 50 |

STB 14

BS 25

Закрепващ винт

| Тип | Цвят | Кат. ном. | Опак. |
|-------|--------|------------|-------|
| BS 25 | жълт | 0335700000 | 50 |
| BS 25 | зелен | 0335500000 | 50 |
| BS 25 | лилав | 0335800000 | 50 |
| BS 25 | черен | 0335200000 | 50 |
| BS 25 | сив | 0335300000 | 50 |
| BS 25 | син | 0335400000 | 50 |
| BS 25 | червен | 0335600000 | 50 |
| BS 25 | | 0334700000 | 50 |

VH 19

Съединителна втулка

| Тип | Цвят | Кат. ном. | Опак. |
|----------------|------|------------|-------|
| VH 19 | | 0318000000 | 50 |
| CuZn 39 | | | |
| (сплав месинг) | | | |

QVS, WKB

Оксяващи пълзгачи и мостове

| Тип | Кат. ном. | Опак. |
|----------|------------|-------|
| QVS 2 | 0307300000 | 20 |
| QVS 2 | 1670300000 | 20 |
| QVS 3 | 0329300000 | 20 |
| QVS 4 | 0307400000 | 20 |
| QVS 2S | 0358400000 | 20 |
| WKB 1/2 | 1604200000 | 50 |
| WKB 1/3 | 1604300000 | 50 |
| WKB 1/4 | 1604320000 | 50 |
| WKB 1/10 | 1604330000 | 20 |

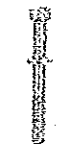
STB 30.5

STB 25

| Тип | Цвят | Кат. ном. | Опак. |
|----------|--------|------------|-------|
| STB 30.5 | жълт | 0341500000 | 50 |
| STB 30.5 | зелен | 0341400000 | 50 |
| STB 30.5 | лилав | 0341600000 | 50 |
| STB 30.5 | черен | 0341000000 | 50 |
| STB 30.5 | сив | 0341100000 | 50 |
| STB 30.5 | син | 0341200000 | 50 |
| STB 30.5 | червен | 0341300000 | 50 |
| STB 25 | жълт | 0267200000 | 50 |
| STB 25 | зелен | 0271200000 | 50 |
| STB 25 | лилав | 0271300000 | 50 |
| STB 25 | черен | 0271500000 | 50 |
| STB 25 | сив | 0271400000 | 50 |
| STB 25 | син | 0343400000 | 50 |
| STB 25 | червен | 0343300000 | 50 |

BS

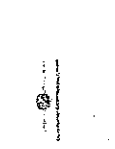
Закрепващ винт



| Тип | Кат. ном. | Опак. |
|----------------|------------|-------|
| BS M 3 x 20 | 0377100000 | 100 |
| CuZn 60 | | |
| (сплав месинг) | | |
| VH 12 | | |
| | 0249000000 | 100 |
| E-Cu 57 | | |
| (сплав месинг) | | |

VH 12

Съединителна втулка



WQV

Мост (комплект)

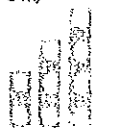
WQV (само за WPL 6/3)



| Тип | Кат. ном. | Опак. |
|---------------|------------|-------|
| WQV 6/2 | 1052360000 | 50 |
| WQV 6/3 | 1054760000 | 50 |
| WQV 6/4 | 1054860000 | 50 |
| WQV 6/5 | 1052660000 | 50 |
| WQV 6/7 | 1052670000 | 50 |
| WQV 6/10 | 1052260000 | 20 |
| E-Cu 57 | | |
| (медно сплав) | | |

QL

Пластина за мост (необходими допълнително BS и VH)



| QL 2 | 2 пол. | 0194300000 | 50 |
|---------------|---------|------------|----|
| QL 3 | 3 пол. | 0194400000 | 50 |
| QL 4 | 4 пол. | 0194500000 | 50 |
| QL 5 | 5 пол. | 0220500000 | 50 |
| QL 6 | 6 пол. | 0220600000 | 50 |
| QL 10 | 10 пол. | 0338300000 | 20 |
| QL 15 | 15 пол. | 0221200000 | 10 |
| E-Cu 57 | | | |
| (медно сплав) | | | |

WTW

Разделителна плочка, монтаж върху шина TS

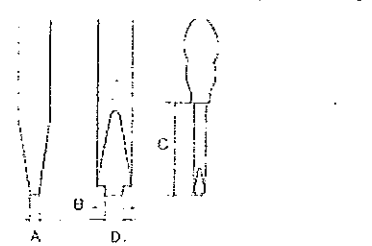


Ширина/гъвкавина/височина (мм)

| | |
|------------------|---------|
| with TS 32 | 3/60/63 |
| with TS 35 x 7.5 | 3/60/63 |

SDIZ

Изолирана отвертка със зъб за измервателни гнезда



| Тип | Размери (мм) | | | | Кат. ном. | Опак. |
|----------|--------------|-----|------|---|------------|-------|
| | A | B | C | D | | |
| SDIZ 0.6 | 3.5 | 100 | 2.25 | | 9088450000 | 50 |
| SDIZ 0.8 | 4.0 | 50 | 2.15 | | 9088460000 | 50 |
| SDIZ 0.8 | 5.5 | 150 | 3.50 | | 9002160000 | 50 |

Централен офис
София 1113

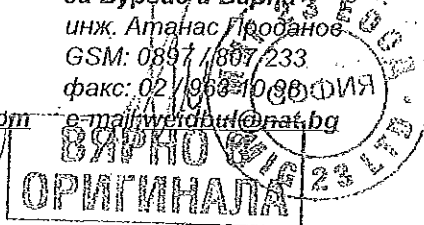
ул. "Незабравка" 33А, бл. 315
тел.: 02 / 963 25 60, 963 10 25
факс: 02 / 963 10 98
e-mail: weidbul@nat.bg

Офис Пловдив
Пловдив 4002

ул. "Любен Каравелов" 15
тел.: 032 / 63 64 00, 25 32 28
факс: 032 / 63 64 01
e-mail: weid_pd@plovdiv.techno-link.com

Регионален представител
за Бургас и Варна

инж. Атанас Проданов
GSM: 0897 7807 233
факс: 02 / 963 10 98
e-mail: weidbul@nat.bg



<http://www.weidbul.com>

709

Означение на типа, производителя и страната на производство (произход)

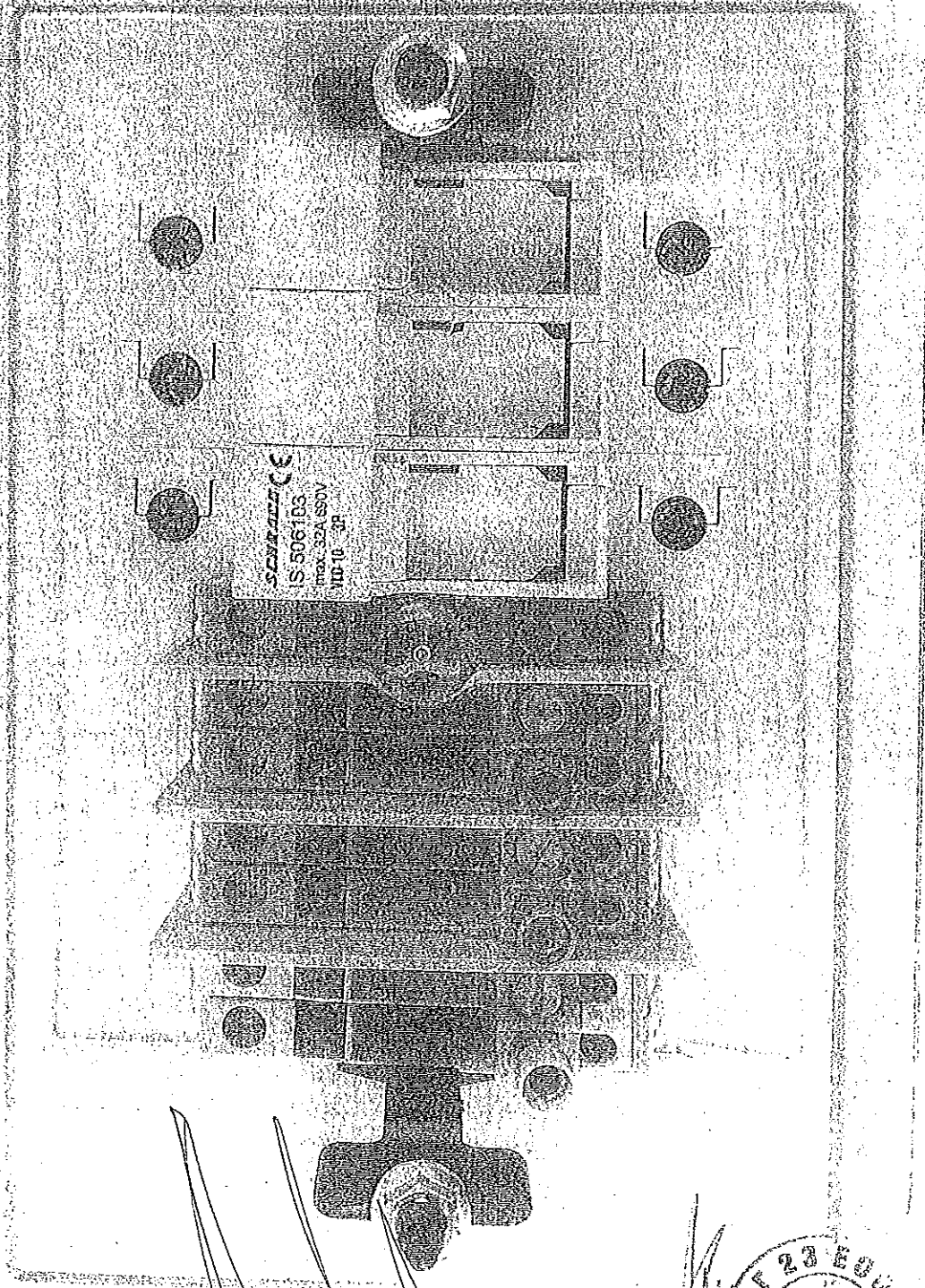
Тип 0055 - Комплект измервателен клемен блок с клеми за медни проводници от проходен тип и 1P, 3P или 3P+N стопяеми цилиндрични предпазител-прекъсвач-разединители

| № | ТИП | КАТ. № | ПРОИЗВОДИТЕЛ | СТРАНА - ПРОИЗХОД |
|----|---|-------------|--------------|-------------------|
| 1 | WTL 6/1 Клема измервателна, делима | 1016700000 | Вайдмюлер | Чехия |
| 2 | WAP WTL 6/1 Крайна плочка | 1068300000 | Вайдмюлер | Румъния |
| 3 | WTW WTL 6/1 Разделителна стена | 1068400000 | Вайдмюлер | Румъния |
| 4 | QVS 2 Двуполюсен мост подвижен | 0307300000 | Вайдмюлер | Германия |
| 5 | VH 19 Втулка | 0318000000 | Вайдмюлер | Германия |
| 6 | STB35 Гнездо за сонда жълто | 0389000000 | Вайдмюлер | Германия |
| 7 | STB35 Гнездо за сонда зелено | 0388900000 | Вайдмюлер | Германия |
| 8 | STB35 Гнездо за сонда червено | 0388800000 | Вайдмюлер | Германия |
| 9 | BS 25 Винт за мост | 0334700000 | Вайдмюлер | Германия |
| 10 | Stb 25 SW Гнездо за сонда черно | 0271500000 | Вайдмюлер | Германия |
| 11 | Stb 14 Гнездо за сонда | 0169900000 | Вайдмюлер | Чехия |
| 12 | DEK 5 GW K Маркировка за клема | 0522761031 | Вайдмюлер | Германия |
| 13 | DEK 5 GW N Маркировка за клема | 0522761034 | Вайдмюлер | Германия |
| 14 | DEK 5/5 MC-10 NEUT. WS Маркировка за клема, бяла, надписана | 1609801044 | Вайдмюлер | Германия |
| 15 | TS35 Шина симетрична, перфорирана 35/7,5/2000 | 0514500000 | Вайдмюлер | Италия |
| 16 | Основа за предпазител 10x38 3P 32A 690V | OPVP10-3 | OEZ | Чехия |
| 17 | Предпазител вложка gG10x38 4A 500V | PVA10 4A gG | OEZ | Чехия |
| 18 | Краен притискач с винтове | P60228 | Вайд-Бул | България |
| 19 | Защитен монолитен капак IP4x | K1008000 | Вайд-Бул | България |



Handwritten signature and initials.

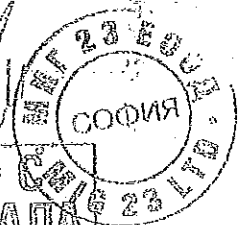
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SCARLETT
S 506183
max. 324 SS0V
YD 10 3p

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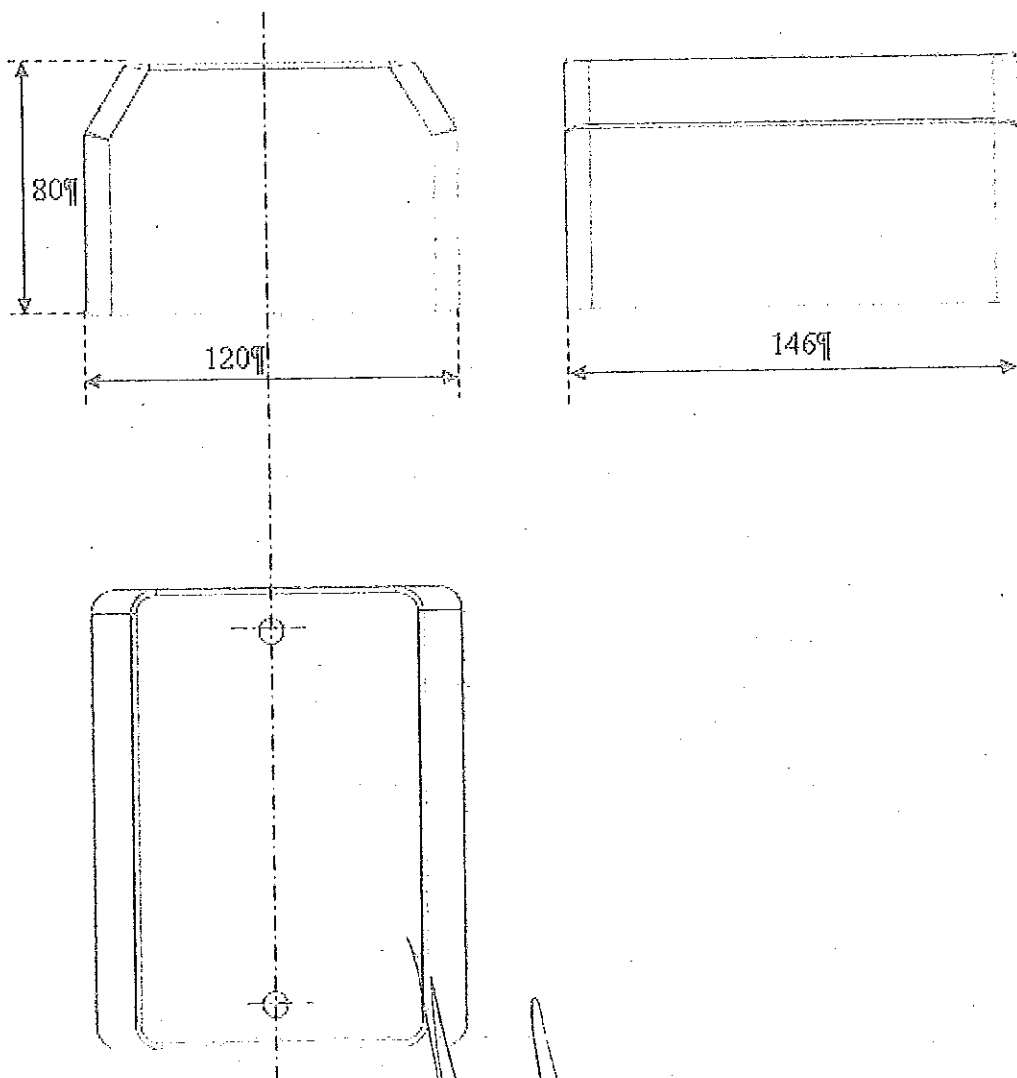
ВЯРНО
ОРИГИНАЛА



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ЧЕРТЕЖ С НАНЕСЕНИ РАЗМЕРИ

Комплект измервателен клемен блок с клеми за медни проводници от проходен тип и 1P, 3P или 3P+N стопяеми цилиндрични предпазител-прекъсвач-разединители



ЗАБЕЛЕЖКА: Нанесените размери са в мм.

ВЯРНО ІС
ОРИГИНАЛ

МАЙ 23 2012
СОФИЯ

712

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Аз (Ние)

„ВАЙД БУЛ“ ЕООД
(наименование на доставчика)

гр. София 1756 бул. „Свети Климент Охридски“ № 13
(адрес)

декларирам(е) на собствена отговорност, че продуктът

Измервателни токови и напреженови клеми тип WTL и аксесоари към тях
(наименование, тип или модел, номер на партидата, извадката)

Производство на: Weidmüller Interface GmbH & Co. KG- Германия
(пробата) или серията, евентуално произход и брой на екземплярите)

за който се отнася тази декларация, е в съответствие със следния(те)
стандарт(и)
IEC60947-7-1, EN 60079-7, VDE 0100-537

или друг(и) нормативен(ни) документ(и):

ISO 9001:2008

(наименование и/или номер и дата на издаване на стандарта(тите)
или друг(и) нормативен(ни) документ(и))

03.09.2015 г., гр. Пловдив
(място и дата на издаване)

(инж. Божидар Здравков)

ВЯРНО
ОРИГИНАЛ





ES PROHLÁŠENÍ O SHODĚ / CE DECLARATION OF CONFORMITY
EU PROHLÁŠENÍ O SHODĚ / EU DECLARATION OF CONFORMITY

Číslo / No.: 503002/1412

My / We, OEZ s.r.o.
Šedivská 339, 561 51 Letohrad, Česká republika

prohlašujeme na svou výlučnou odpovědnost, že
declare on our own responsibility that

Výrobek: Odpínače válcových pojistek velikosti 10x38
Product: Fuse switch-disconnectors for cylindrical fuse-links size 10x38

Typ / Type: OPVP10

Příslušenství / Accessory:

je ve shodě s následujícími normami:
complies with the following standards:

| České normy / Czech standards | Evropské normy / European standards |
|-------------------------------|-------------------------------------|
| ČSN EN 60947-1:08ed.4 +A1:11 | EN 60947-1:07 |
| ČSN EN 60947-3:10ed.3+A1:12 | EN 60947-3:09 |

a následujícími nařízeními vlády, ve znění pozdějších předpisů (NV)
and the following government regulations (NV), as amended

| | |
|---|--|
| NV 17/2003 Sb. v platném znění NV 481/2012 Sb. v platném znění | 2006/95/ES - including amendments 2011/65/EU - including amendments |
|---|--|

Elektrotechnický zkušební ústav, Pod Lisem 129, 171 02 Praha 71, Česká republika
zkoušel / certifikoval daný výrobek a vydal:
tested / certified the product and issued:

EZU Certifikát / EZU Certificate: 1140839 ze dne 7.10.2014
EZU zkušební protokol / EZU test report: 403929-01/01 ze dne 30.09.2014

Poslední dvojčíslí roku, v němž bylo označení CE na výrobek umístěno: 14
Last two digits of the year in which the CE mark was placed on the product:

Místo vydání: Letohrad
Place of issue:
signature:

Datum vydání: 04.12.2014
Date of issue:

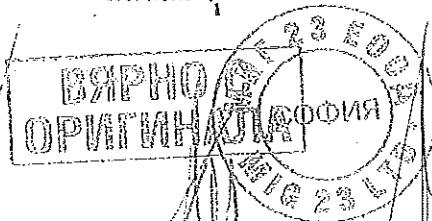
Zástupce výrobce a podpis:
Manufacturer's representative and

Funkce: generální ředitel
Position: general director

Ing. Roman Schiffer

OEZ

OEZ s.r.o.
Šedivská 339, Letohrad 561 51
Česká republika
IČO: 49810145, DIČ: CZ49810145



117

Превод от чешки език

CE Декларация за съответствие на
Cislo / No.: 209706/1407
Hne / Hne, OEZ s.r.o.

Šedivská 339, 561 51 Letohrad, Чехия

Декларирам, на нашата собствена отговорност, че

Продукт: На разединители за цилиндрични предпазители размер 10x38

Продукт: Fuse преминаване sdisconnectors за цилиндрични предпазител-връзки размер 10x38

Вид / Тип: OPVP10 Prfslusenstvf / аксесоари:

Тя е в съответствие със следните стандарти:

отговаря на стандарти:

Чешките стандарти / Чешките стандарти на европейските стандарти / Европейски стандарти
EN 60947-1: 08ed.4 + A1: 11 CSN EN 60947-3: 10ed.3 + A1: 12 EN 60947-1: 07 EN 60947-3: 09
и след narzenfini правителство, както е изменена (NV) и Правилника за държавен seuraavilla (NV),
както е изменен
NV 17/2003 Coll. както е изменен, NV 481/2012 Coll. изменена 2006/95 / EO - включително изменения
2011/65 / EC - включително изменения

EZU, Pod Lisem 129, 171 02 Prague 71, Чешка република опитах / сертифициран продукт и издава:

тестван / сертифициран продукт и издава:

EZU Сертификат / Удостоверение EZU: 1140839 с дата 07.10.2014

/ Доклад за тест EZU тест протокол EZU: 403929-01 / 01 от 30 септември 2014

Последните две цифри на годината, в която маркировка CE: 14

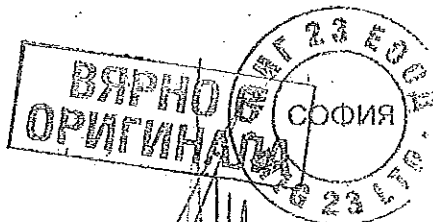
Последните две цифри на годината, през която маркировката се поставя обект на продукта:

Място на издаване: Letohrad

Място на издаване:

подпис:

Дата на издаване: 04 Декември 2014



17/5

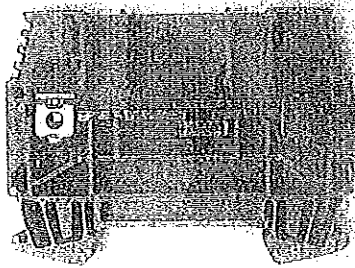


LAB 12138
 Page 1 (26)
 Date 17th of October 2003

Task:

WTL 6/1 - Type test taken pattern from DIN EN 60947-7-1 and LPP1129

Test objects:



WTL 6/1

Cat.-no. 10167000000

Materials:

- | | |
|-----------------------------|---------------------|
| housing: | Wemid beige |
| current bar: | Cu-ETP gal. Sn |
| clamping yoke: | steel gal. ZnC |
| clamping screw: | M3,5 steel gal. ZnC |
| leading plate of discon.: | steel gal. ZnC |
| contact element of discon.: | E-CU57 gal. Sn |
| insulation of disconnecter: | PA 66 orange |
| screw of disconnecter: | M3 steel gal. ZnC |

de

E-Mail:
 DGS
 Hr.Roß

MEEK
 Hr.Strate

Manufacturer:

Weidmüller Interface

Date of manufacture:

Q 03-00009030-030221-00

Receipt of test objects:

51st week 2002

Period of test performance:

14th and 38th -- 39th week 2003

copy:

Conclusion of result:

The type test has been passed.

O. Despang
 (tester)

F. Maris
 (approved)

W 041.00

F_LAB_IEC947-7-1S2:0

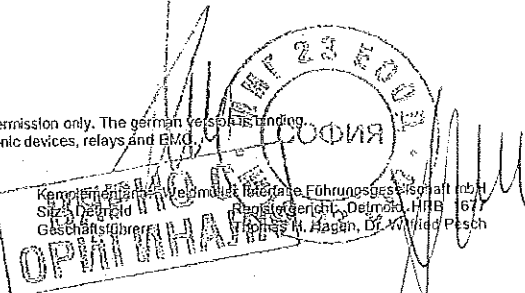
All test results only apply to the objects tested. Reproduction of this laboratory report by extract with written permission only. The german tests are binding. Accreditation only applies to special standards for connectors, terminal blocks, safety requirements for electronic devices, relays and EMD.

Weidmüller Interface GmbH & Co. KG
 Ohmstraße 9
 D-32 758 Detmold

Telefon (05231) 14-0
 Sitz: Detmold
 Telefax (05231) 14-1689

Rechtsform: Kommanditgesellschaft
 Registergericht: Detmold HRA 248

Kennzeichen: W 041.00
 Sitz: Detmold
 Geschäftsführer: Dr. Wilfried Pesch



Handwritten initials

Summary: The following technical data apply to WTL 6/1:

Rated voltage: 630 V using as measuring disconnecting terminal
500 V using as disconnecting terminal
(disconnect-function in conditions without load resp. voltage)

Rated impulse voltage: 6 kV using as measuring disconnecting terminal
8 kV using as disconnecting terminal

Pollution degree: 3

Overvoltage category: III

Rated current: 41 A

Clampable cross sections:

| | |
|-----------------------|--------------------------|
| solid | 0,5 - 10 mm ² |
| stranded | 1,5 - 10 mm ² |
| flexible | 0,5 - 10 mm ² |
| flexible with ferrule | 0,5 - 6 mm ² |

AWG 20 - AWG 8

Gauge size: A 5

Length of insulation stripping: 12 mm

Test torques: 1,0 Nm for the fixing screw in clamping yoke as manufacturer's data
0,5 Nm for the fixing screw of disconnecter

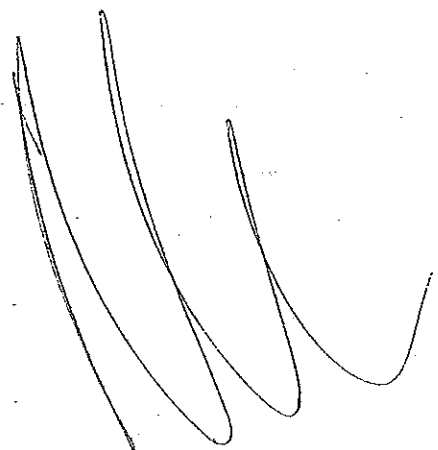
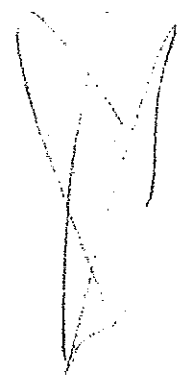
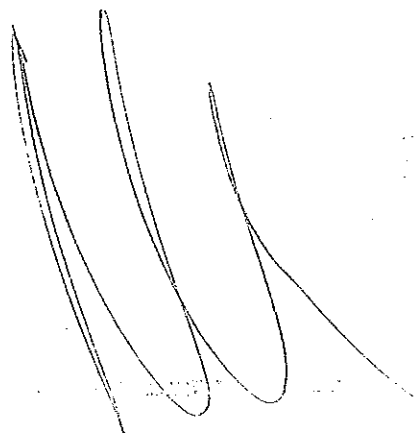
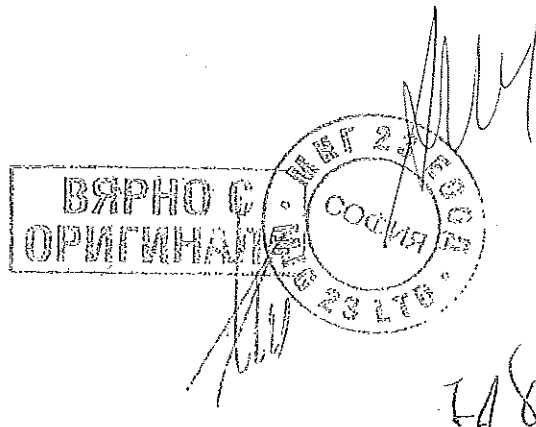


Table of content:

| Tests | Page |
|----------|---|
| 1 | Electrical tests |
| 1.1.1 | Clearance and creepage distance with closed disconnecter (in assembly) 4 |
| 1.1.3 | Clearance and creepage distance with opened disconnecter (in assembly) 5 |
| 1.2.1 | Dielectric strength with closed disconnecter 6 |
| 1.2.1.1 | Breakthrough or flashover voltage with closed disconnecter 6 |
| 1.2.2 | Dielectric strength with opened disconnecter (within terminal) 7 |
| 1.2.2.1 | Breakthrough or flashover voltage with opened disconnecter (within terminal) .. 7 |
| 1.3.1 | Rated impulse voltage with closed disconnecter 8 |
| 1.3.2 | Rated impulse voltage with opened disconnecter (within terminal) 9 |
| 1.4 | Temperature rise test 10 |
| 1.5 | Short-time withstand current 12 |
| 1.6 | Life time test (additional test) 13 |
| 2 | Mechanical tests |
| 2.1 | Attachment of the terminal block on its support 15 |
| 2.2 | Mechanical strength of clamping units 16 |
| 2.3 | Test for damage to and accidental loosening of conductors (flexion test) 19 |
| 2.5 | Pull-out force 19 |
| 2.6 | Connecting capacity 23 |
| 2.7 | Rated cross-section (gauge size) 23 |
| 2.8 | Type identification and marking 24 |
| 3 | Thermal characteristics |
| 3.1 | Needle flame test 25 |
| 4 | Miscellaneous tests |
| 4.1 | General function 26 |

ВЯРНО С
 ОРИГИНАЛ

КМГ 2.3.00
 СОДМЯ
 23 ЛТБ

748

- 1 **Electrical tests**
- 1.1.1 **Clearance and creepage distance with closed disconnecter (in assembly)**
- 1.1.2 **Length of insulation stripping**

Standard: IEC 60947-1 section 8.3.3.4 / 12.01
DIN VDE 0110-1 / 04.97
LPV 2005

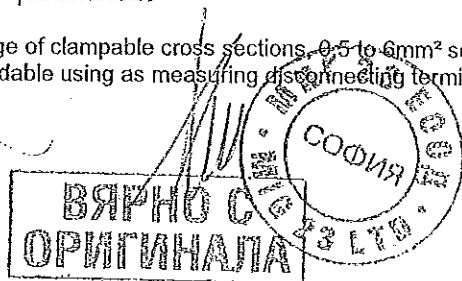
Test performance: Clearance and creepage distances have been measured on 5 new specimen, taking into account the worst case of connected conductors. Screws are tightened with IEC-torque. Clearance and creepage distances are measured between two adjacent terminal blocks and between a terminal block and the metal support to which the terminal block is attached.

Test equipment 215134 gauge CD-15CP Mitutoyo

| Test | Unit | Req. | Results |
|---|------|--------|------------------------------------|
| clearance and creepage distance between adjacent terminal blocks | | | |
| with H07V-U10 | | | path: |
| shortest clearance | mm | ≥ 5,5* | 11 conductor - conductor |
| shortest creepage dist. | mm | ≥ 8* | 11 conductor - conductor |
| with H07V-K6+ferrule | | | |
| shortest clearance | mm | ≥ 5,5* | 9,5 conductor - conductor |
| shortest creepage dist. | mm | ≥ 8* | 9,5 conductor - conductor |
| with H07V-U6 | | | |
| shortest clearance | mm | ≥ 5,5* | 12,6 conductor - conductor |
| shortest creepage dist. | mm | ≥ 8* | 14,0 conductor - conductor |
| clearance and creepage distance between terminal blocks and their support | | | |
| with H07V-U10 | | | path: |
| shortest clearance | mm | ≥ 5,5* | 15,5 clamping yoke - mounting rail |
| shortest creepage dist. | mm | ≥ 8* | 17,2 conductor - mounting rail |
| with H07V-K6+ferrule | | | |
| shortest clearance | mm | ≥ 5,5* | 15,5 clamping yoke - mounting rail |
| shortest creepage dist. | mm | ≥ 8* | 17,2 conductor - mounting rail |
| * Req. for 630V/ 6kV/3 | | | |
| comparative tracking index | CTI | 600 | 600 für Wemid |
| length of insulation stripping | mm | - | 12 ± 0,5 |

Evaluation: The test objects met the requirements.

Note: Taking into account a limited range of clampable cross sections, 0,5 to 6mm² solid, an insulation voltage of 800V is leadable using as measuring disconnecting terminal.



Handwritten initials: RA98

1.1.3 Clearance and creepage distance with opened disconnecter
 (in assembly)
 additional test

Standard: IEC 60947-1 section 8.3.3.4 / 12.01
 DIN VDE 0110-1 / 04.97
 LPV 2005

Test performance: Clearance and creepage distances are measured with opened
 disconnecter across the separating-distance.

Test equipment 215134 gauge CD-15CP Mitutoyo

| Test | Unit | Req. | Results | |
|--|------|------|---------|------------------------------------|
| clearance and creepage distance across the separating distance | | | | |
| shortest clearance | mm | -- | 4,5 | path: current bar - current bar |
| shortest creepage dist. | mm | -- | 4,5 | current bar - current bar |

Evaluation: Data only for information.



Handwritten signature and official stamps. The stamps include:

- A rectangular stamp with the text: ВЯРНО С ОРИГИНАЛА
- A circular stamp with the text: ММГ 2003 СОС/ММГ 2003

1.2.1 Dielectric strength with closed disconnecter

Standard: IEC 60947-1 section 8.3.3.4.1 / 12.01
 IEC 60947-7-1 section 8.4.3 / 07.02
 LPV 2203

1.2.1.1 Breakthrough or flashover voltage with closed disconnecter (additional test)

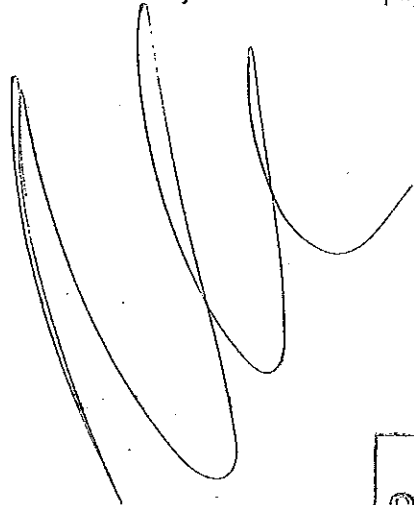
Standard: LPV 2204

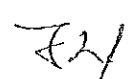
Test performance: Five new terminal blocks are mounted on a rail and wired with the most unfavourable type(s) and cross-section(s) of conductors. Screws are tightened with IEC-torque. The sinusoidal test voltage (50 Hz) is according to IEC 60947-1 table 12A and is applied first between adjacent terminal blocks and then between all terminal blocks connected together and the mounting rail. The test voltage increases with a slew rate of not more than 200V/s and then keeps constant for at least 5s. The voltage then is increased with the same slew rate until breakdown or flashover.

Test equipment: E197 High-voltage test automat RMG500 Sefelec
 M035 Torque driver Stahlwille

| Test | Unit | Req. | Results |
|--|------|------|--|
| dielectric strength with H07V-U10 | kV | 2 | test passed |
| breakdown or flashover voltage - closed disconnecter | kV | > 2 | 7,9 flash over plug socket – plug socket |

Evaluation: The test objects met the requirements.



1.2.2 1.2.2 Dielectric strength with opened disconnectors
 (within the terminals)

Standard: IEC 60947-1 section 8.3.3.4.1 / 12.01
 IEC 60947-7-1 section 8.4.3 / 07.02
 LPV 2203

1.2.2.1 Breakthrough or flashover voltage with opened disconnectors
 (within the terminals)
 (additional test)

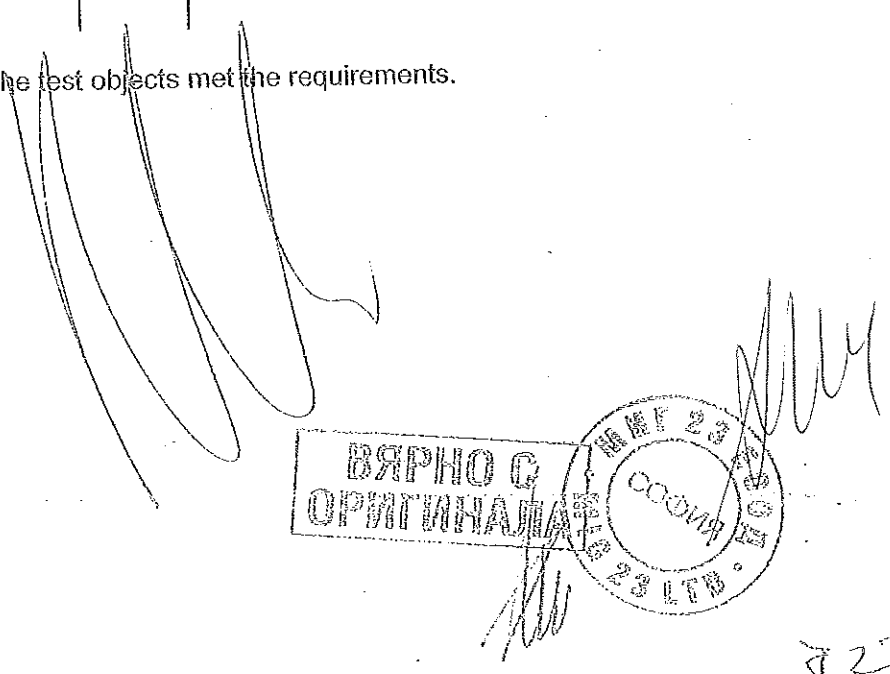
Standard: LPV 2204

Test performance: Five new terminal blocks are mounted on a rail and wired with the most unfavourable type(s) and cross-section(s) of conductors. Screws are tightened with IEC-torque. The sinusoidal test voltage (50 Hz) is according to IEC 60947-1 table 12A and is applied first between adjacent terminal blocks and then between all terminal blocks connected together and the mounting rail. The test voltage increases with a slew rate of not more than 200V/s and then keeps constant for at least 5s. The voltage then is increased with the same slew rate until breakdown or flashover.

Test equipment: E197 High-voltage test automat RMG500 Sefelec
 M035 Torque driver Stahlwille

| Test | Unit | Req. | Results |
|---|------|------|--|
| dielectric strength with H07V-U10 | kV | 2 | test passed |
| breakdown or flashover voltage - opened disconnectors | kV | > 2 | 4,3 flashover: current bar – current bar within the terminal |

Evaluation: The test objects met the requirements.



Handwritten signatures and stamps are present at the bottom of the page. A rectangular stamp contains the text 'ВЯРНО С ОПРИТНАТА' (Correctly with the certificate). A circular stamp contains the text 'ИМФ 23' and 'СООНЯ' (Sofia). There are several handwritten signatures and scribbles over these stamps.

1.3.1 Rated impulse voltage with closed disconnector

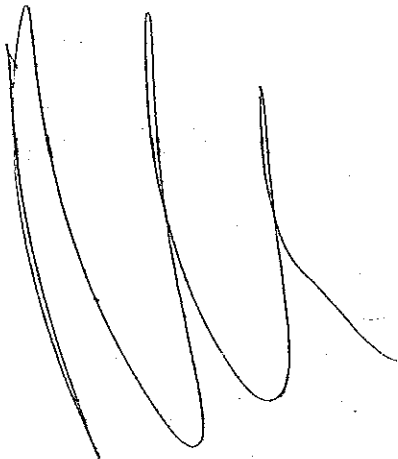
Standard: IEC 60947-7-1 section 8.4.3 / 07.02
 LPV 2226

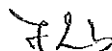
Test performance: Five new terminal blocks are mounted on a rail and wired with the most unfavourable type(s) and cross-section(s) of conductors. Screws are tightened with IEC-torque. The test voltage is applied first between adjacent terminal blocks and then between all terminal blocks connected together and the mounting rail. The test is performed with a waveform 1.2/50µs with at least 1s pause between the pulses and each 10 pulses with alternating polarity.

Test equipment: E119 Transient voltage generator PU12 Haefely

| Test | Unit | Req. | Results |
|---|------|------|----------------------|
| rated impulse voltage with H07V-U10 - closed disconnector | kV | 7,25 | test passed with 7,5 |

Evaluation: The test objects met the requirements.





1.3.2 Rated impulse voltage with opened disconnector
 (within the terminals)

Standard: IEC 60947-7-1 section 8.4.3 / 07.02
 LPV 2226

Test performance: Five new terminal blocks are mounted on a rail and wired with the most unfavourable type(s) and cross-section(s) of conductors. Screws are tightened with IEC-torque. The test voltage is applied first between adjacent terminal blocks and then between all terminal blocks connected together and the mounting rail. The test is performed with a waveform 1.2/50µs with at least 1s pause between the pulses and each 10 pulses with alternating polarity.

Test equipment: E119 Transient voltage generator PU12 Haefely

| Test | Unit | Req. | Results |
|--|------|------|-------------|
| rated impulse voltage with H07V-U10 across separating distance | | | |
| - function as measuring disconnecting terminal | kV | 6* | test passed |
| - function as disconnecting terminal | kV | 8** | test passed |

* on the basis of 630 V rated voltage
 ** on the basis of 500 V rated voltage

Evaluation: The test objects met the requirements.




- 1.4 Temperature rise test
- 1.4.1 Temperature rise with the rated cross-section
- 1.4.2 Temperature rise with the largest cross-section (additional test)

Standard: IEC 60947-7-1 section 7.2.1 / 07.02
 LPV 2040

Test performance: Each five terminal blocks are mounted on a rail and wired in series with the rated resp. the largest cross-section. The minimum length of each conductor is 1m up to 10mm² cross-section resp. 2m for larger cross-sections. Screws are tightened with IEC-torque or with a higher value specified by the manufacturer. Temperatures are measured with Ni-CrNi thermocouples at the 3 centre terminals. A load current acc. to table 4 or table 5 of IEC 60947-7-1 is applied until steadily temperature is reached.

Test equipment:

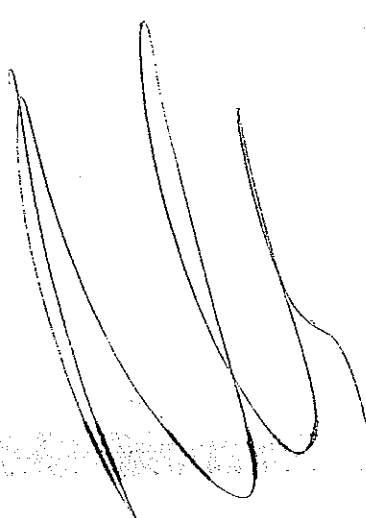
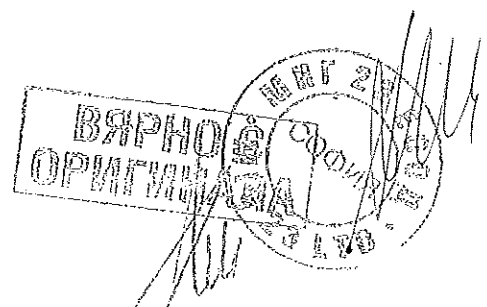
| | | |
|------|---------------------------------|-------------------|
| E042 | Current transformer TIL05 600/6 | H & B |
| E087 | Thermometer Comark 2001 | Testem |
| E017 | DMM Typ 169 | Keithley |
| M104 | Torque meter TM 2001 A | Holger Clasen |
| E166 | Voltage drop measuring device | self construction |

| Test | Unit | Req. | Results | | | |
|--|------|-------|--|------------------|------------------|-------|
| temperature rise test with rated cross-section | | | H07V-U6 | | | |
| torque used | Nm | - | clamping units: 0,8 disconnecter: 0,5 | | | |
| voltage drop conductor - conductor at I = 4,1 A | | | | | | |
| | | | X _{avg} | X _{min} | X _{max} | s |
| before test | mV | ≤ 3,2 | 0,99 | 0,92 | 1,13 | 0,089 |
| after test | mV | - | 1,00 | 0,87 | 1,30 | 0,179 |
| max. change | % | ≤ 50 | +15,0 | | | |
| of one terminal | mV | - | +0,17 (1,13 → 1,30) | | | |
| temperature rise | K | ≤ 45 | 44 | | | |
| at I _N = 41 A | | | | | | |
| visual examination | - | - | no damages visible | | | |



| Test | Unit | Req. | Results | | | |
|---|------|-------|--------------------|---------------|-----------|-------|
| temperature rise test with largest cross-section H07V-U10 | | | | | | |
| voltage drop conductor - conductor at I = 5,7 A | | | | | | |
| | | | X_{avg} | X_{min} | X_{max} | s |
| before test | mV | ≤ 3,2 | 1,09 | 0,97 | 1,32 | 0,149 |
| after test | mV | - | 1,05 | 0,95 | 1,25 | 0,124 |
| max. change | % | ≤ 50 | -6,9 | | | |
| of one terminal | mV | - | -0,08 | (1,16 → 1,08) | | |
| temperature rise at I _N = 57 A | K | ≤ 45 | 37 | | | |
| visual examination | - | - | no damages visible | | | |

Evaluation: The test objects met the requirements.

Stamp: ВЯРНОЕ КОПИЕ
 ОРИГИНАЛА
 КОМПЕТЕНТНОЕ
 ЦЕНТРОМ
 17.10.2003

- 1.5 Short-time withstand current
- 1.5.1 Short-time withstand current with the rated cross-section
- 1.5.2 Short-time withstand current with the largest cross-section (additional test)

Standard: IEC 60947-7-1 section 7.2.3 / 07.02

Test performance: Each five terminal blocks are mounted on a rail and wired in series with the rated resp. the largest cross-section. Screws are tightened with IEC-torque or with a higher value specified by the manufacturer. Specimens are loaded with a current pulse of 120 A/mm² corresponding to the connected cross-section for 1s.

Test equipment:

| | | |
|------|------------------------------------|-------------------|
| E078 | High current transformer 20kA/4kA | Ruhstrat |
| E149 | Current transformer GSA 200/50 | KWK |
| E166 | Voltage drop measuring device | self construction |
| E160 | 4-Channel-Oscilloscope Kombigraf 4 | Gould |
| E017 | DMM Typ 169 | Keithley |
| M104 | Torque meter TM 2001 A | Holger Clasen |

| Test | Unit | Req. | Results | | | | | | | | | | | | | | | | | | | | |
|---|------------------|------------------|---|------------------|------------------|------------------|---|-------------|----|-------|----------------------------|------------|----|---|----------------------------|-------------|---|------|-------|-----------------|----|---|---------------------|
| short-time withstand current with rated cross-section H07V-U6 | | | | | | | | | | | | | | | | | | | | | | | |
| torque used | Nm | - | clamping units: 0,8 disconnecter: 0,5 | | | | | | | | | | | | | | | | | | | | |
| applied test current | A | ≥ 720 | 735 | | | | | | | | | | | | | | | | | | | | |
| voltage drop conductor - conductor at I = 4,1 A | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>before test</td> <td>mV</td> <td>≤ 3,2</td> <td>1,07 0,92 1,35 0,192</td> </tr> <tr> <td>after test</td> <td>mV</td> <td>-</td> <td>1,23 0,91 1,88 0,436</td> </tr> <tr> <td>max. change</td> <td>%</td> <td>≤ 50</td> <td>+39,2</td> </tr> <tr> <td>of one terminal</td> <td>mV</td> <td>-</td> <td>+0,53 (1,35 → 1,88)</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | before test | mV | ≤ 3,2 | 1,07 0,92 1,35 0,192 | after test | mV | - | 1,23 0,91 1,88 0,436 | max. change | % | ≤ 50 | +39,2 | of one terminal | mV | - | +0,53 (1,35 → 1,88) |
| X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | | | | | | | | | |
| before test | mV | ≤ 3,2 | 1,07 0,92 1,35 0,192 | | | | | | | | | | | | | | | | | | | | |
| after test | mV | - | 1,23 0,91 1,88 0,436 | | | | | | | | | | | | | | | | | | | | |
| max. change | % | ≤ 50 | +39,2 | | | | | | | | | | | | | | | | | | | | |
| of one terminal | mV | - | +0,53 (1,35 → 1,88) | | | | | | | | | | | | | | | | | | | | |
| visual examination | - | - | no damages visible | | | | | | | | | | | | | | | | | | | | |
| short-time withstand current with largest cross-section H07V-U10 | | | | | | | | | | | | | | | | | | | | | | | |
| applied test current | A | ≥ 200 | 1330 | | | | | | | | | | | | | | | | | | | | |
| voltage drop conductor - conductor at I = 5,7 A | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>before test</td> <td>mV</td> <td>≤ 3,2</td> <td>0,93 0,90 0,97 0,029</td> </tr> <tr> <td>after test</td> <td>mV</td> <td>-</td> <td>0,92 0,89 0,96 0,030</td> </tr> <tr> <td>max. change</td> <td>%</td> <td>≤ 50</td> <td>-5,3</td> </tr> <tr> <td>of one terminal</td> <td>mV</td> <td>-</td> <td>-0,05 (0,94 → 0,89)</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | before test | mV | ≤ 3,2 | 0,93 0,90 0,97 0,029 | after test | mV | - | 0,92 0,89 0,96 0,030 | max. change | % | ≤ 50 | -5,3 | of one terminal | mV | - | -0,05 (0,94 → 0,89) |
| X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | | | | | | | | | |
| before test | mV | ≤ 3,2 | 0,93 0,90 0,97 0,029 | | | | | | | | | | | | | | | | | | | | |
| after test | mV | - | 0,92 0,89 0,96 0,030 | | | | | | | | | | | | | | | | | | | | |
| max. change | % | ≤ 50 | -5,3 | | | | | | | | | | | | | | | | | | | | |
| of one terminal | mV | - | -0,05 (0,94 → 0,89) | | | | | | | | | | | | | | | | | | | | |
| visual examination | - | - | no damages visible | | | | | | | | | | | | | | | | | | | | |

Evaluation: The test objects met the requirements.



1.6 Life time test (additional test)

Standard: ---

Test performance: Each five terminal blocks are mounted on a rail and wired in series with the rated cross-section. Screws are tightened with IEC-torque. After measuring the voltage drops, the disconnectors were actuated 50 cycles in conditions without load and voltage. Then the complete test assembly was stored for 168h in 130°C dry heat. Finally the test samples have to pass the voltage drop test, after cooling to ambient temperature. The voltage drop was measured with the help of the plug sockets.

Test equipment: E166 Voltage drop-Messplatz Eigenbau
M104 Torque meter TM 2001 A Holger Clasen

| Test | Unit | Req. | Results | | | | | | | | |
|---|------------------|------------------|--|------------------|------------------|------------------|-------|------|------|------|-------|
| Life time test 130°C / 168h with rated cross-section H07V-U6 | | | | | | | | | | | |
| torque used | Nm | - | clamping units: 0,8 disconnecter: 0,5 | | | | | | | | |
| actuating cycles disconnecter | - | 50 | 50 test passed | | | | | | | | |
| voltage drop left clamping unit conductor – plug-socket at I = 4,1 A | | | | | | | | | | | |
| before test | mV | ≤ 1,6 | <table border="1"> <tr><th>X_{avg}</th><th>X_{min}</th><th>X_{max}</th><th>s</th></tr> <tr><td>0,24</td><td>0,21</td><td>0,25</td><td>0,015</td></tr> </table> | X _{avg} | X _{min} | X _{max} | s | 0,24 | 0,21 | 0,25 | 0,015 |
| X _{avg} | X _{min} | X _{max} | s | | | | | | | | |
| 0,24 | 0,21 | 0,25 | 0,015 | | | | | | | | |
| after test | mV | - | <table border="1"> <tr><td>0,20</td><td>0,18</td><td>0,20</td><td>0,009</td></tr> </table> | 0,20 | 0,18 | 0,20 | 0,009 | | | | |
| 0,20 | 0,18 | 0,20 | 0,009 | | | | | | | | |
| max. change of one terminal | % | ≤ 50 | -20,0 | | | | | | | | |
| | mV | - | -0,05 (0,25 → 0,20) | | | | | | | | |
| voltage drop right clamping unit conductor – plug-socket at I = 4,1 A | | | | | | | | | | | |
| before test | mV | ≤ 1,6 | <table border="1"> <tr><th>X_{avg}</th><th>X_{min}</th><th>X_{max}</th><th>s</th></tr> <tr><td>0,24</td><td>0,21</td><td>0,27</td><td>0,022</td></tr> </table> | X _{avg} | X _{min} | X _{max} | s | 0,24 | 0,21 | 0,27 | 0,022 |
| X _{avg} | X _{min} | X _{max} | s | | | | | | | | |
| 0,24 | 0,21 | 0,27 | 0,022 | | | | | | | | |
| after test | mV | - | <table border="1"> <tr><td>0,21</td><td>0,19</td><td>0,24</td><td>0,018</td></tr> </table> | 0,21 | 0,19 | 0,24 | 0,018 | | | | |
| 0,21 | 0,19 | 0,24 | 0,018 | | | | | | | | |
| max. change of one terminal | % | ≤ 50 | -22,2 | | | | | | | | |
| | mV | - | -0,06 (0,27 → 0,21) | | | | | | | | |

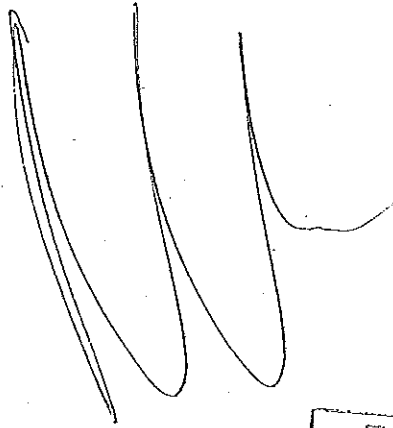


728

LAB 12138
 Page 14 (26)
 Date 17th of October 2003

| Test | Unit | Req. | Results | | | | | | | | | | | | |
|---|------------------|------------------|--|------------------|------------------|------------------|---|------|------|------|-------|------|------|------|-------|
| Life time test 130°C / 168h with rated cross-section H07V-U6 | | | | | | | | | | | | | | | |
| torque used | Nm | - | clamping units: 0,8 disconnecter: 0,5 | | | | | | | | | | | | |
| actuating cycles disconnecter | - | 50 | 50 test passed | | | | | | | | | | | | |
| voltage drop disconnecter plug-socket - plug-socket at I = 4,1 A | | | | | | | | | | | | | | | |
| before test | mV | ≤ 3,2 | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0,30</td> <td>0,28</td> <td>0,33</td> <td>0,019</td> </tr> <tr> <td>0,30</td> <td>0,28</td> <td>0,31</td> <td>0,013</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | 0,30 | 0,28 | 0,33 | 0,019 | 0,30 | 0,28 | 0,31 | 0,013 |
| X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | |
| 0,30 | 0,28 | 0,33 | 0,019 | | | | | | | | | | | | |
| 0,30 | 0,28 | 0,31 | 0,013 | | | | | | | | | | | | |
| after test | mV | - | | | | | | | | | | | | | |
| max. change | % | ≤ 50 | +3,3 | | | | | | | | | | | | |
| of one terminal | mV | - | +0,01 (0,30 → 0,31) | | | | | | | | | | | | |
| visual examination | - | - | no damages visible | | | | | | | | | | | | |

Evaluation: The test objects met the requirements.




032

2
 2.1

Mechanical tests
Attachment of the terminal block on its support

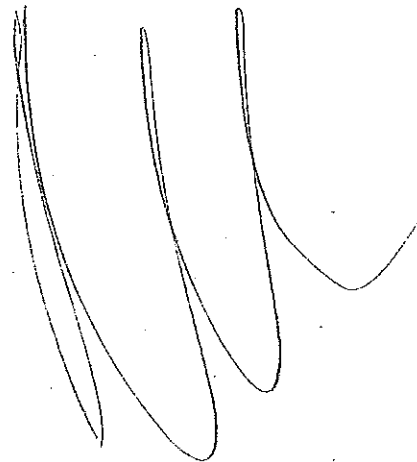
Standard: IEC 60947-7-1 section 8.3.2 / 07.02

Test performance: Five new terminal blocks are mounted on a test rail with min. dimensions. A steel pin with a diameter acc. to table 3 of IEC 60947-7-1 is clamped successively in each clamping unit. Screws are tightened with IEC-torque resp. 110% of the torque stated by the manufacturer. In a distance of 100 mm to the clamping point a force acc. to table 3 of IEC 60947-7-1 is applied to the pin regularly and without shocks in both vertical directions. During the test, no terminal block shall work free from its rail or support, nor suffer any other damage.

Test equipment: M123 Push-/pull-force meter Erichsen
 695805/2 Test rail mounting rail 35/7,5 min Weidmüller
 M029 Torque driver Stahlwille

| Test | Unit | Req. | Results |
|---|------|------|--------------------|
| torque used | Nm | - | 0,8 |
| fixing of the terminal block on its support | N | ≥ 5 | test passed |
| visual examination | - | - | no damages visible |

Evaluation: The test objects met the requirements.




LAB 12138
Page 16 (26)
Date 17th of October 2003

2.2 Mechanical strength of clamping units
2.2.1 Test with nominal torque

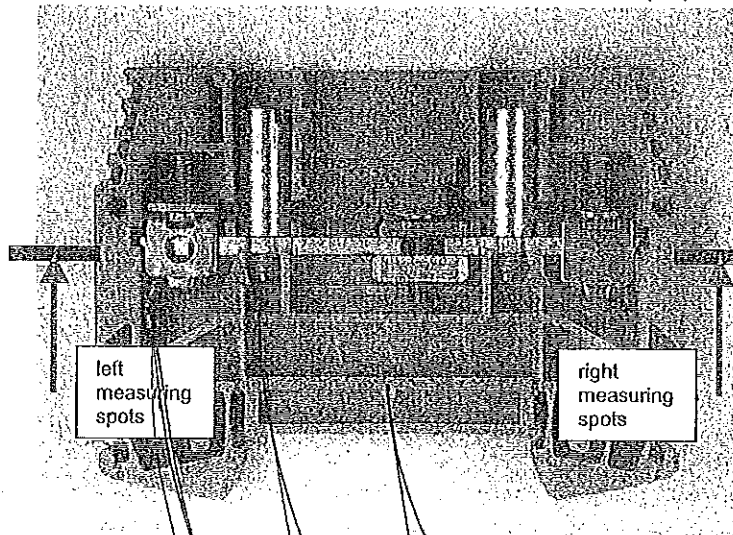
Standard: IEC 60947-7-1 section 8.3.3.1 / 07.02
LPV 2201

Test performance: Five new terminal blocks are mounted on a rail. Conductors of the rated cross-section are connected and disconnected five times. Screws are tightened with IEC-torque resp. 110% of the torque stated by the manufacturer. After every loosening a new conductor will be used.
Voltage drop is measured before and after the test with the smallest flexible and the rated rigid cross-section.

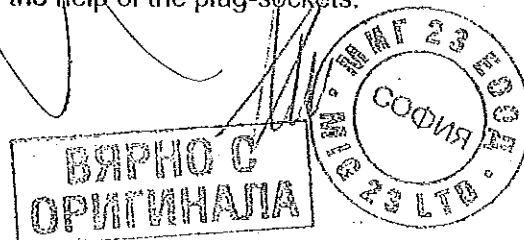
| | |
|--|--------------|
| size of thread: | M 3,5 |
| IEC- torque clamping screw: | 0,8 Nm |
| torque acc. manufacturer clamping screw: | 1,0 Nm |
| test torque + 10%: | 1,1 Nm |
| size of thread: | M 3 |
| IEC- torque disconnecter screw: | 0,5 Nm |
| smallest cross-section, flexible: | H05V-K0,5 |
| test conductor, rigid: | H07V-U10 |

Test equipment: E166 Voltage drop-Messplatz self construction
M104 Torque meter TM 2001 Clasen

Measuring spots:



Note: Voltage drops are measured with the help of the plug-sockets.



732

| Test | Unit | Req. | Results | | | | | | | | | | | | | |
|---|------------------|------------------|--|--|------------------|------------------|------------------|------|------|------|-------|-------|------|------|-------|-------|
| voltage drop conductor - current bar, left with H05V-K0,5 at I= 0,6A before test after test max. change of one terminal H07V-U10 at I = 5,7 A before test after test max. change of one terminal five connections and disconnections visual examination | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0,24</td> <td>0,23</td> <td>0,25</td> <td>0,009</td> </tr> <tr> <td>0,26</td> <td>0,24</td> <td>0,28</td> <td>0,016</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | 0,24 | 0,23 | 0,25 | 0,009 | 0,26 | 0,24 | 0,28 | 0,016 | |
| | X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | |
| | 0,24 | 0,23 | 0,25 | 0,009 | | | | | | | | | | | | |
| | 0,26 | 0,24 | 0,28 | 0,016 | | | | | | | | | | | | |
| | mV | ≤ 1,6 | | | | | | | | | | | | | | |
| | mV | - | | | | | | | | | | | | | | |
| | % | ≤ 50 | +17,3 | | | | | | | | | | | | | |
| | mV | - | +0,04 | (0,23 → 0,27) | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0,28</td> <td>0,25</td> <td>0,31</td> <td>0,022</td> </tr> <tr> <td>0,28</td> <td>0,27</td> <td>0,30</td> <td>0,011</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | 0,28 | 0,25 | 0,31 | 0,022 | 0,28 | 0,27 | 0,30 | 0,011 |
| | X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | |
| 0,28 | 0,25 | 0,31 | 0,022 | | | | | | | | | | | | | |
| 0,28 | 0,27 | 0,30 | 0,011 | | | | | | | | | | | | | |
| mV | ≤ 1,6 | | | | | | | | | | | | | | | |
| mV | - | | | | | | | | | | | | | | | |
| % | ≤ 50 | +8,0 | | | | | | | | | | | | | | |
| mV | - | +0,02 | (0,25 → 0,27) | | | | | | | | | | | | | |
| - | - | - | test passed | | | | | | | | | | | | | |
| - | - | - | no damages visible | | | | | | | | | | | | | |

| Test | Unit | Req. | Results | | | | | | | | | | | | | |
|--|------------------|------------------|--|--|------------------|------------------|------------------|------|------|------|-------|-------|------|------|-------|-------|
| voltage drop conductor - current bar, right with H05V-K0,5 at I= 0,6A before test after test max. change of one terminal H07V-U10 at I = 5,7 A before test after test max. change of one terminal five connections and disconnections visual examination | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0,26</td> <td>0,23</td> <td>0,29</td> <td>0,026</td> </tr> <tr> <td>0,24</td> <td>0,23</td> <td>0,25</td> <td>0,008</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | 0,26 | 0,23 | 0,29 | 0,026 | 0,24 | 0,23 | 0,25 | 0,008 | |
| | X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | |
| | 0,26 | 0,23 | 0,29 | 0,026 | | | | | | | | | | | | |
| | 0,24 | 0,23 | 0,25 | 0,008 | | | | | | | | | | | | |
| | mV | ≤ 1,6 | | | | | | | | | | | | | | |
| | mV | - | | | | | | | | | | | | | | |
| | % | ≤ 50 | +8,6 | | | | | | | | | | | | | |
| | mV | - | +0,02 | (0,23 → 0,25) | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>X_{avg}</th> <th>X_{min}</th> <th>X_{max}</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0,30</td> <td>0,28</td> <td>0,35</td> <td>0,029</td> </tr> <tr> <td>0,28</td> <td>0,27</td> <td>0,31</td> <td>0,018</td> </tr> </tbody> </table> | X _{avg} | X _{min} | X _{max} | s | 0,30 | 0,28 | 0,35 | 0,029 | 0,28 | 0,27 | 0,31 | 0,018 |
| | X _{avg} | X _{min} | X _{max} | s | | | | | | | | | | | | |
| 0,30 | 0,28 | 0,35 | 0,029 | | | | | | | | | | | | | |
| 0,28 | 0,27 | 0,31 | 0,018 | | | | | | | | | | | | | |
| mV | ≤ 1,6 | | | | | | | | | | | | | | | |
| mV | - | | | | | | | | | | | | | | | |
| % | ≤ 50 | +10,7 | | | | | | | | | | | | | | |
| mV | - | +0,03 | (0,28 → 0,31) | | | | | | | | | | | | | |
| - | - | - | test passed | | | | | | | | | | | | | |
| - | - | - | no damages visible | | | | | | | | | | | | | |

Evaluation:

The test objects met the requirements.



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LAB 12138
 Page 18 (26)
 Date 17th of October 2003

2.2.2 Test with twice the nominal torque (additional test)

Standard: taken pattern from IEC 60947-7-1 section 8.3.3.1 / 07.02 LPV 2201

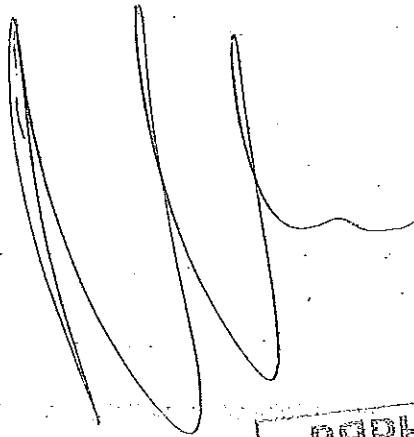
Test performance: Five new terminal blocks are mounted on a rail. Conductors of the largest cross section are connected and disconnected five times. Screws are tightened with twice the nominal torque acc. to A 1040. After every loosening a new conductor will be used. After the test the torque with no load shall not be more than 0,05Nm for threads up to size M 3.5 resp. 0,1Nm for larger sizes.

thread of clamping screw: M 3,5
 thread of disconnector screw: M 3
 2x nominal torque acc. to A 1040
 clamping screw: 1,6 Nm
 max. torque of screw of disconnector: 0,8 Nm

Test equipment: M104 Torque meter TM 2001 Clasen

| Test | Unit | Req. | Results | | | |
|-------------------------------------|------|--------|-------------|-----------|-----------|------|
| Five connections and disconnections | | | | | | |
| - clamping screw | Nm | 1,6 | test passed | | | |
| - screw of disconnector | Nm | 0,8 | test passed | | | |
| torque with no load after the test | | | X_{avg} | X_{min} | X_{max} | s |
| - clamping screw | Nm | ≤ 0,05 | 0,03 | 0,02 | 0,05 | 0,01 |
| - screw of disconnector | Nm | ≤ 0,05 | 0,01 | 0,01 | 0,01 | 0 |

Evaluation: The test objects met the requirements.



ВЯРНО С
 ОРИГИНАЛА

МНГ 23 МОС
 СОФИЯ
 10 23 170

- 2.3 Test for damage to and accidental loosening of conductors (flexion test)
- 2.4 Pull-out test
- 2.5 Pull-out force

Standard: IEC 60947-7-1 section 8.3.3.2 / 07.02
 LPV 2202

Test performance: The test is performed on each five new clamping units with every clampable type of conductor and

- with the smallest clampable cross-section,
- with the rated cross-section,

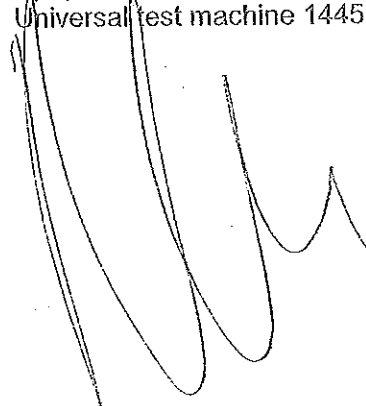
and, if applicable

- with the largest clampable cross-section, if larger than the rated cross-section,
- with the maximum number of conductors of the smallest cross-section simultaneously connectable,
- with the maximum number of conductors of the largest cross-section simultaneously connectable,
- with the maximum number of conductors of the smallest and largest cross-section simultaneously connectable.

Screws are tightened with IEC-torque. Each conductor is subjected to circular motions with a mass suspended from its end.
 After the flexion test a static pull-force is applied to every conductor for 1 min. Then the pull-out force is determined at a speed of 30mm/min.
 Ferrules of the following type have been crimped with PZ 6/5:

| | | | |
|-----------------------|-----------|----------|------------|
| conductor H05V-K0,5: | H 0,5/10 | Cat.-no. | 9004050000 |
| conductor H05V-K0,75: | H 0,75/10 | Cat.-no. | 0542500000 |
| conductor H05V-K1: | H 1,0/10 | Cat.-no. | 0282800000 |
| conductor H07V-K 1,5 | H 1,5/12 | Cat.-no. | 9004060000 |
| conductor H07V-K 2,5 | H 2,5/12 | Cat.-no. | 0186100000 |
| conductor H07V-K 6 | H 6/12 | Cat.-no. | 0191900000 |

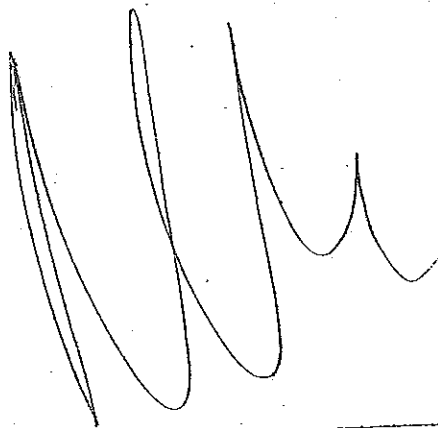
Test equipment: M104 Torque meter TM 2001 Clasen
 M093 Universal test machine 1445 Zwick



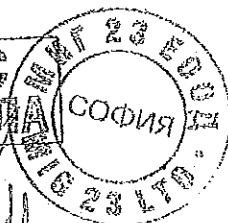

735

| Test | Unit | Req. | Results |
|--------------------------|------|------|-------------|
| flexion test | | | |
| 1 × H05V-U0,5 | kg | 0,3 | test passed |
| 1 × H05V-K0,5 | kg | 0,3 | test passed |
| 1 × H07V-K10 (*) | kg | 2,0 | test passed |
| 1 × H07V-U10 | kg | 2,0 | test passed |
| 1 × H07V-R10 (*) | kg | 2,0 | test passed |
| 1 × H07V-K6 + ferrule | kg | 1,4 | test passed |
| 1 × AWG 20/1 | kg | 0,3 | test passed |
| 1 × AWG 20/7 | kg | 0,3 | test passed |
| 1 × AWG 20/19 | kg | 0,3 | test passed |
| 1 × AWG 8/7 (*) | kg | 2,0 | test passed |
| 2 × H05V-U0,5 | kg | 0,3 | test passed |
| 2 × H05V-K0,5 | kg | 0,3 | test passed |
| 2 × H05V-K0,5 + ferrule | kg | 0,3 | test passed |
| 2 × H05V-U0,75 | kg | 0,4 | test passed |
| 2 × H05V-K0,75 | kg | 0,4 | test passed |
| 2 × H05V-K0,75 + ferrule | kg | 0,4 | test passed |
| 2 × H05V-U1,0 | kg | 0,4 | test passed |
| 2 × H05V-K1,0 | kg | 0,4 | test passed |
| 2 × H05V-K1,0 + ferrule | kg | 0,4 | test passed |
| 2 × H07V-U1,5 | kg | 0,4 | test passed |
| 2 × H07V-K1,5 | kg | 0,4 | test passed |
| 2 × H07V-K1,5 + ferrule | kg | 0,4 | test passed |
| 2 × H07V-U 2,5 | kg | 0,7 | test passed |
| 2 × H07V-K2,5 | kg | 0,7 | test passed |
| 2 × H07V-K2,5 + ferrule | kg | 0,7 | test passed |

(*) torque raised up to 1,0 Nm



ВЯРНО С
 ОПРИГНИНАЛА



258

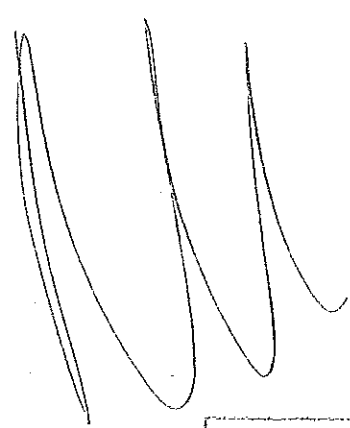
Laboratory Report

Weidmüller 

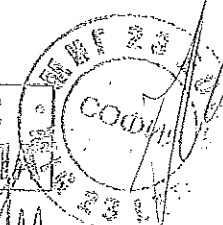
LAB 12138
 Page 21 (26)
 Date 17th of October 2003

| Test | Unit | Req. | Results |
|--------------------------|------|------|-------------|
| pull-out test | | | |
| 1 × H05V-U0,5 | N | 30 | test passed |
| 1 × H05V-K0,5 | N | 30 | test passed |
| 1 × H07V-U10 | N | 90 | test passed |
| 1 × H07V-R10 (*) | N | 90 | test passed |
| 1 × H07V-K10 (*) | N | 90 | test passed |
| 1 × H07V-K6 + ferrule | N | 80 | test passed |
| 1 × AWG 20/1 | N | 30 | test passed |
| 1 × AWG 20/7 | N | 30 | test passed |
| 1 × AWG 20/19 | N | 30 | test passed |
| 1 × AWG 8/7 (*) | N | 90 | test passed |
| 2 × H05V-U0,5 | N | 30 | test passed |
| 2 × H05V-K0,5 | N | 30 | test passed |
| 2 × H05V-K0,5 + ferrule | N | 30 | test passed |
| 2 × H05V-U0,75 | N | 30 | test passed |
| 2 × H05V-K0,75 | N | 30 | test passed |
| 2 × H05V-K0,75 + ferrule | N | 30 | test passed |
| 2 × H05V-U1,0 | N | 35 | test passed |
| 2 × H05V-K1,0 | N | 35 | test passed |
| 2 × H05V-K1,0 + ferrule | N | 35 | test passed |
| 2 × H07V-U1,5 | N | 40 | test passed |
| 2 × H07V-K1,5 | N | 40 | test passed |
| 2 × H07V-K1,5 + ferrule | N | 40 | test passed |
| 2 × H07V-U2,5 | N | 50 | test passed |
| 2 × H07V-K2,5 | N | 50 | test passed |
| 2 × H07V-K2,5 + ferrule | N | 50 | test passed |

(*) torque raised up to 1,0 Nm



ВЯРНО С
 ОРИГИНАЛА



758

LAB 12138

Page 22 (26)

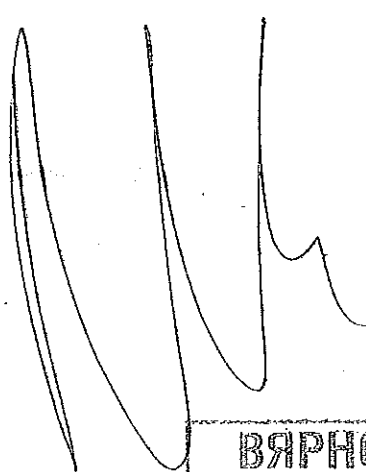
Date 17th of October 2003

| Test | Unit | Req. | Results | | | |
|--------------------------|------|------|------------------|------------------|------------------|-------|
| | | | X _{avg} | X _{min} | X _{max} | s |
| pull-out force | | | | | | |
| 1 × H05V-U0,5 | N | > 30 | 115 | 100 | 121 | 8,9 |
| 1 × H05V-K0,5 | N | > 30 | 84 | 71 | 100 | 10,8 |
| 1 × H07V-U10 | N | > 90 | 240 | 202 | 306 | 41,6 |
| 1 × H07V-R10 (*) | N | > 90 | 357 | 262 | 466 | 85,7 |
| 1 × H07V-K10 (*) | N | > 90 | 397 | 248 | 589 | 139,4 |
| 1 × H07V-K 6 + ferrule | N | > 80 | 268 | 198 | 462 | 110 |
| 1 × AWG 20/1 | N | > 30 | 133 | 131,8 | 134 | 0,89 |
| 1 × AWG 20/7 | N | > 30 | 121 | 94 | 138 | 20,3 |
| 1 × AWG 20/19 | N | > 30 | 140 | 129 | 146 | 7,3 |
| 1 × AWG 8/7 (*) | N | > 90 | 377 | 190 | 505 | 129,3 |
| 2 × H05V-U0,5 | N | > 30 | 92 | 57 | 126 | 31,9 |
| 2 × H05V-K0,5 | N | > 30 | 80 | 57 | 105 | 18,5 |
| 2 × H05V-K0,5 + ferrule | N | > 30 | 105 | 84 | 117 | 84,1 |
| 2 × H05V-U0,75 | N | > 30 | 182 | 167 | 191 | 12,2 |
| 2 × H05V-K0,75 | N | > 30 | 127 | 88 | 145 | 23,3 |
| 2 × H05V-K0,75 + ferrule | N | > 30 | 120 | 92 | 141 | 25,2 |
| 2 × H05V-U1,0 | N | > 35 | 178 | 122 | 201 | 31,9 |
| 2 × H05V-K1,0 | N | > 35 | 131 | 110 | 149 | 19,8 |
| 2 × H05V-K1,0 + ferrule | N | > 35 | 184 | 126 | 218 | 40,3 |
| 2 × H07V-U1,5 | N | > 40 | 231 | 206 | 258 | 21,6 |
| 2 × H07V-K1,5 | N | > 40 | 278 | 200 | 327 | 52,8 |
| 2 × H07V-K1,5 + ferrule | N | > 40 | 274 | 242 | 299 | 21,5 |
| 2 × H07V-U2,5 | N | > 50 | 351 | 293 | 406 | 45,5 |
| 2 × H07V-K2,5 | N | > 50 | 299 | 247 | 339 | 36,3 |
| 2 × H07V-K2,5 + ferrule | N | > 50 | 214 | 147 | 221 | 56,0 |

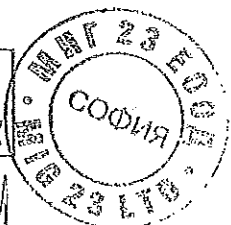
(*) torque raised up to 1,0 Nm

Evaluation:

The test objects met the requirements.



ВЯРНО С
ОРИГИНАЛА



832


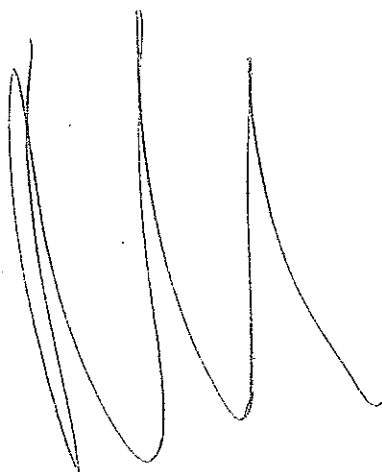
2.6 **Connecting capacity**
2.7 **Rated cross-section (gauge size)**

Standard: IEC 60947-7-1 section 7.1.6 / 07.02

Test performance: The appropriate gauge shall be inserted by its inherent weight.

| Test | Req. | Results |
|---------------------|------|------------|
| connecting capacity | | |
| gauge size | A5 | insertable |

Evaluation: The test objects met the requirements.



ВЕРНО
ОРИГИНАЛ

СООФИЯ

737


2.8 Type identification and marking

Standard: IEC 60947-7-1 section 5 und 7.1.4 / 07.02

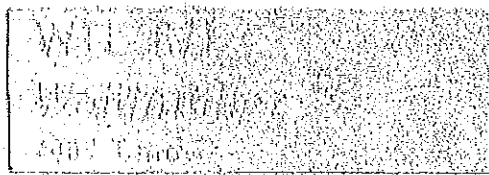
Test performance: A terminal block shall be marked in a durable and legible manner with

- the name of the manufacturer or a trade mark by which the manufacturer can be readily identified
- a type reference permitting its identification in order to obtain relevant information from the manufacturer or his catalogue.

A terminal block shall have provision, or at least space, for identification marks or numbers for each clamping unit or terminal assembly related to the circuit of which it forms a part.

| Test | Req. | Results |
|---|-----------|---|
| inscriptions | | |
| mark of origin | necessary | Weidmüller  |
| type identification | necessary | WTL 6/1 |
| relevant standard | - | --- |
| rated cross-section | - | 6 mm ² |
| rated insulation voltage | - | 400V (caused by the results of the insulation tests, a changing to 500V is possible) |
| marking | | |
| area for inscriptions or grooves and the like to fix labels | present | present |

Inscriptions:



Evaluation:

The test objects met the requirements.



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LAB 12138
 Page 25 (26)
 Date 17th of October 2003

3 Thermal characteristics
3.1 Needle flame test

Standard: IEC 60947-7-1 section 7.1.5 / 07.02
 IEC 60695-2-2 / 04.91

Test performance: The test flame is applied for 10s. For insulation walls <1mm and/or area <100mm² the flame is applied for 5s. After flame is removed, the duration of burning in the case of ignition is measured. The test is passed if duration of burning is <30s and if burning or glowing particles falling down cause no ignition of the tissue paper.

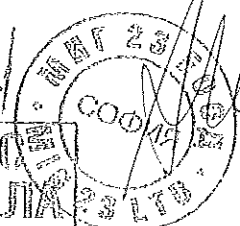
Test equipment: E177 Thermometer T202KC Digitron

| Test | Unit | Req. | Results |
|--------------------------|------|------|---------|
| flame application time | s | 10 | 10 |
| duration of burning | s | < 0 | 0 |
| ignition of tissue paper | - | none | none |

Evaluation: The test objects met the requirements.



ВЯРНО СЕ
 ОПРИТНАЛНА

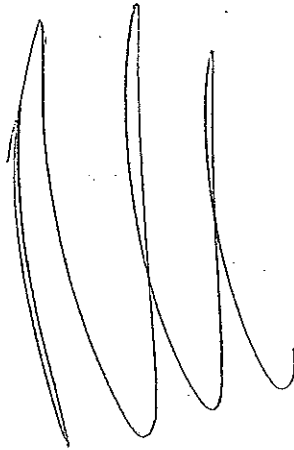


- 4 **Miscellaneous tests**
- 4.1 **General function**
- 4.1.1 **Handling (additional test)**
- 4.1.2 **Function of accessory**

Standard: Taking pattern from LPV 2224

Test performance: The general function, handling and function of accessory are criticised subjectively.

| Test | Results |
|--|--|
| General function | no complaints |
| Handling | |
| mounting and dismounting | no complaints |
| connection and disconnection of conductors | no complaints with screw driver SD 0,8 x 4 |
| Function of accessory | no complaints with screw driver DIN 5264-A 0,8 x 4 |
| screw driver | SD 0,8 x 4 usable (cat.-no. 9024030000) DIN 5264-A 0,6 x 3,5 usable (cat.-no. 9008340000) |
| cross connector | QL 2 - 10 |
| cover | WAP/WTL |
| labels | DEK8 and WS 12/6,5 |
| end brackets | WEW 35/2 |




772

ПРЕВОД

Лабораторен отчет

Weidmüller

DAR – рег. номер: DAT – P – 008/91-02

LAB 12138

Германски акредитационен съвет

Страница 1 (26)

Дата 17.10.2003

Задача: WTL 6/1 Типово изпитание съгласно DIN EN 60947-7-1 и LPP1129

Образец за изпитание: Снимка

WTL 6/1

Кат. № 1016700000

Материал: Корпус на клемата: Вемид бежов
Тоководеща шина: Електролитна Cu галв. покритие Sn
Стягаща скоба Zugbügel: Стомана галванично покритие Zn и Cr
Винтове на клемата: M 3,5 стомана галв. покритие Zn и Cr
Водеща планка на плъзгача: Стомана галванично покритие Zn и Cr
Контактен елемент на плъзгача: E-CU57 галв. покритие Sn
Изолац. елемент плъзгач: PA 66 оранжев
Винт на плъзгача: M 3 стомана галв. покритие Zn и Cr

Производител: Weidmüller Interface

Дата на производство: Q 03-00009030-020916-00

Дата на получаване на образеца за изпитания: 51 седмица на 2002

Период на изпитания: 14-та и 38 – 39-та седмица на 2003

Заклучение: Типовите изпитания са издържани

O. Desprang
(подпис)

F. Maris
(подпис)

Weidmüller Interface GmbH & Co. KG
Klingenbergstrasse 16
32758 Detmold
(печат)
26.08.04

W041.00 Този резултат от изпитанията се отнася само за изпитаните мостри. Размножаването на извадки от този отчет за изпитания е възможно само с писмено разрешение.

Във всички случаи на превод е валидна германската версия

Вайдмюлер Интерфейс ГмбН & Со.КГ
Адрес и телефон

Командитно дружество
Седалище: Детмолд
Регистрационен съд: Детмолд

Регистрация



792

Общи данни: За WTL 6/1 са в сила следните данни:

Номинално напрежение: 630 V при използване като делими измервателни клеми
500 V при използване като делими редови клеми
(функцията разделяне е без товар и напрежение)

Номинално импулсно напрежение: 6 kV при използване като делими измервателни клеми
8 kV при използване като делими редови клеми

Степен на замърсеност: 3

Категория на свръхнапрежение: III

Номинален ток: 41 A

Номинално сечение на проводника: - едножилен: 0,5 - 10 mm²
- многожилен: 1,5 - 10 mm²
- многожилен гъвкав: 0,5 - 10 mm²
- многожилен гъвкав с накрайник: 0,5 - 6 mm²
AWG 20 - AWG 8

Размер на калибъра: A 5

Дължина на зачистване: 12 mm

Въртящ момент [на притягане]: 1,0 Nm за закрепване на проводника – указание на
производителя
0,5 Nm за закрепване на плъзгача



1.3.1

Устойчивост на номинално импулсно напрежение при затворен плъзгач (клемата свързана)

Стандарт:

EN 60947-7-1 раздел 8.4.3./07.02 и LPV 2226

Провеждане на изпитанието:

Пет нови клеми се монтират върху шина TS 35/7,5 и се опроводяват с най-неблагоприятната комбинация от типове проводник(ци) и сечение(я). Винтовете на клемите се стягат с въртящ момент съгл. IEC. Напрежението се прилага отначало между съседни клеми и след това между всички свързани една с друга клеми и повърхността на закрепване. Импулсното напрежение е с форма на вълната 1,2/50 μ s и се прилага през минимум 1 s пауза между импулсите. Подават се по десет импулса с алтернативен поляритет.

Изпитателно оборудване:

E119

Импулсен генератор PU 12

Haefely

| Изпитание | Единица | Изискване | Резултати от измерването |
|---|---------|-----------|--------------------------|
| Изпитание с импулсно напрежение с H07V-U10 – затворен плъзгач | kV | 7,25 | Издържал на 7,5 |

Заключение: Изискването е изпълнено



745

1.3.2 Устойчивост на номинално импулсно напрежение при отворен плъзгач (вътре в клемата)

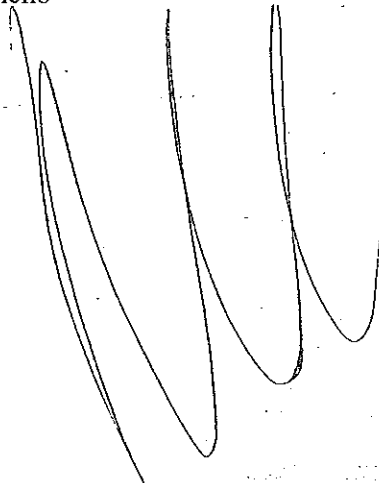
Стандарт: EN 60947-7-1 раздел 8.4.3./07.02 и LPV 2226

Провеждане на изпитанието: Пет нови клеми се монтират върху шина TS 35/7,5 и се опроводяват с най-неблагоприятната комбинация от типове проводник(ци) и сечение(я). Винтовете на клемите се стягат с въртящ момент съгл. IEC. Напрежението се прилага вътре в клемата през отворената междина на клемата и повърхността на закрепване. Импулсното напрежение е с форма на вълната 1,2/50 μ s и се прилага през минимум 1 s пауза между импулсите. Подават се по десет импулса с алтернативен поляритет.

Изпитателно оборудване: E119 Импулсен генератор PU 12 Haefely

| Изпитание | Единица | Изискване | Резултати от измерването |
|---|---------|-----------|--------------------------|
| Изпитание с импулсно напрежение с H07V-U10 през затворена междина на плъзгача | | | |
| - функция делима измервателна клема | kV | 6* | Издържал |
| - функция делима клема | kV | 8** | Издържал |

Заклучение: Изискването е изпълнено



Лабораторен отчет



1.6 Изпитание на живот (ресурс) (допълнително изпитание)

Стандарт: ---

Провеждане на: Пет нови клеми се монтират една до друга върху носеща шина и се изпитанието опроводяват с проводник с номинално сечение. Винтовете на клемите се стягат с въртящ момент съгл. IEC. След установяване на пада на напрежението с плъзгачите на образците се извършват 50 цикъла без подадено напрежение и товар. След това изпитателната установка комплект се остава 168 h при суха топлина при 130⁰ C. Накрая на изпитанието мострите трябва да се охладят до околна температура и да се установи падът на напрежение. Гнездата за сонди служат като помощно средство за измерване на пада на напрежение.

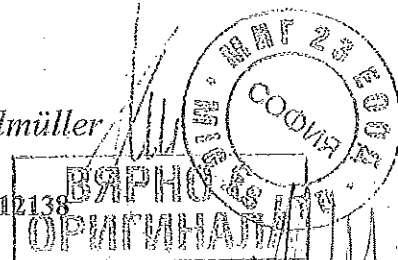
Изпитателно оборудване: E166 Стенд за измерване пад на напрежение вграден
M104 Уред за мерене на въртящ момент TM2001A Holger Clasen

| Изпитание | Единица | Изискване | Резултати | | | |
|--|---------|-----------|--|----------------------|--------------|----------|
| Върт. момент на винтовете | Nm | - | Клема: 0,8 Плъзгач: 0,5 50 издържани | | | |
| Цикли на превключване на плъзгача | - | 50 | | | | |
| Пад на напрежение лява част клема с проводник – гнездо за сонда STB при I = 4,1 A | | | | | | |
| – преди изпитанието | mV | ≤ 1,6 | <u>X ср.</u> | <u>X min</u> | <u>X max</u> | <u>S</u> |
| – след изпитанието | mV | - | 0,24 | 0,21 | 0,25 | 0,015 |
| – максимална промяна на една клема | % | ≤ 50 | 0,20 | 0,18 | 0,20 | 0,009 |
| | mV | - | -20,00 | 0,05 (0,25 -- 0,20) | | |
| Пад на напрежение дясна част клема с проводник – гнездо за сонда STB при I = 4,1 A | | | | | | |
| – преди изпитанието | mV | ≤ 1,6 | <u>X ср.</u> | <u>X min</u> | <u>X max</u> | <u>S</u> |
| – след изпитанието | mV | - | 0,24 | 0,21 | 0,27 | 0,022 |
| – максимална промяна на една клема | % | ≤ 50 | 0,21 | 0,19 | 0,24 | 0,018 |
| | mV | - | -22,20 | -0,06 (0,27 -- 0,21) | | |

Лабораторен отчет

Weidmüller

LAB 12138



748

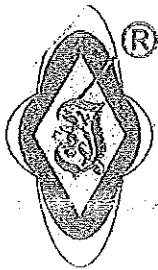
Изпитание на живот [ресурс] 130 С / 168h с номинално сечение Н07V-U6

| Изпитание | Единица | Изискване | Резултати | | | |
|--|---------|-----------|------------------------------|----------------------|----------------------|-------------------|
| Върт. момент на винтовете | Nm | - | Клема: 0,8 Плъзгач: 0,5 | | | |
| Цикли на превключване на плъзгача | - | 50 | 50 издържани | | | |
| Пад на напрежение гнездо за сонда STB - гнездо за сонда STB при I = 4,1 A | | | | | | |
| - преди изпитанието | mV | ≤ 3,2 | <u>X ср.</u> 0,30 | <u>X min</u> 0,28 | <u>X max</u> 0,33 | <u>S</u> 0,019 |
| - след изпитанието | mV | - | 0,30 | 0,28 | 0,31 | 0,013 |
| - максимална промяна на една клема | % | ≤ 50 | +3,3 | | | |
| | mV | - | 0,01 (0,30 -- 0,31) | | | |
| Външен оглед | - | - | Не се виждат никакви повреди | | | |

Заклучение: Изискванията са изпълнени

ВЯРНО С
ОРИГИНАЛА

748



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Превод от немския и английския оригинал на българския оригинал

DATEch Немска акредитираща служба Техника в TGA GmbH
Подписалият по-долу многостранното споразумение от EA и ILAC за взаимно признаване

представен в

Немския акредитационен съвет

герб на Федерална Република Германия

Акредитация

TGA GmbH, представена от DATEch, немската акредитираща служба Техника, в TGA GmbH с настоящото потвърждава, че изпитателната лаборатория

Weidmüller Interface GmbH & Co. KG
Лаборатория с адрес: Am Stoppelkamp 17
D-32758 Detmold

е компетентна да извършва изпитания по DIN EN ISO/IEC 17025:2005 в областта на редови клеми, куплунги, безопасност на електронни средства за производство, включително и за електромагнитна съвместимост, както и изпитания на околната среда

съгласно посочените в приложението норми на спецификации.

Акредитацията е валидна до: 2014-08-11

Приложението е съставна част на документа и се състои от 6 страници.

DAR- регистрационен номер: DAT - PLI: 008/91-14

Frankfurt/Main, 2009-08-12

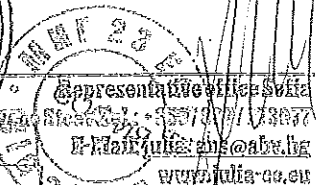
Коректността на английски превод е потвърдена: Frankfurt/Main, 2009-09-08

(подпис - не се чете)

подписал д-р Томас Фоклам,
управител на акредитиращата служба

Член на EA, ILAC, IAF

Representative office Varna
10 Angel Georgiev Str.,
Tel.: 859 886 / 638 887; 359 /52 / 618 826
E-Mail: rosiralava@hotmail.com, julia_ans@hotmail.com



ВЯРНО С
ОРИГИНАЛА

749

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DATEch Немската акредитираща служба Техника в
TGA GmbH – Немска Асоциация за Акредитация ООД
Гартенщрасе 6
D- 60594 Франкфурт на Майн

Тази акредитация е получена на базата на оценка и съгласно споразумение сключено с акредитационната организация, предвид акредитацията на проверяващата лаборатория в съгласие с правилата и процедурите на Германската Акредитационна Система и в съответствие на Европейските стандарти DIN EN ISO/IEC 17025:2005 и DIN EN ISO/IEC 17011:2005.

Изискванията от гледище на материали и персонал както са установени в DIN EN ISO/IEC 17025 за специфичните тестове, посочени в акредитационния сертификат, както и процедурите, описани в приложението към акредитационния сертификат, са изпълнени.

Детайли по обхвата на акредитацията (тестови полета, процедури и спецификации) са посочени в приложението към този акредитационен сертификат.

Приема се, че приложението и документите, предоставени във връзка с акредитацията, ще оформят съществена част от нея. Всякакви корекции трябва да бъдат извършени в писмена форма.

Акредитацията е обект на анулиране по всяко време, свързано с фундаментална промяна или невалидност на което и да е от условията, описани в споразумението и в приложението към този акредитационен сертификат.

Акредитационният сертификат и приложението не трябва да се разпространяват в каквато и да е форма, различна от настоящата. Публикацията на извадки е обект на одобрение от страна на акредитационната организация.

Не трябва да се създава впечатление, че инспектирането на тестващата лаборатория също се простира върху продукти и услуги на притежателя на сертификата, които не са покрити от тази акредитация. Ако такова впечатление се създаде, акредитационната организация има правото да поиска да се направят промени.

**Забележка: Превод/НЕ-БГ/ Договор с Консулски отдел на МВНР № 664/95-00-150 / 2001, актуализиран на 14.05.2003*

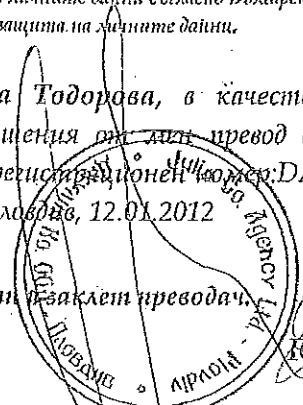
<http://www.mfo.bg/en/pages/view/75>. Всички имена са изписани съгласно стандарт И. ISO9: 1995(E) и стандарт ISO9: 1995(E).

Преводачът и преводаческата къща не носят наказателна отговорност за истинността на приложения към превода документи.

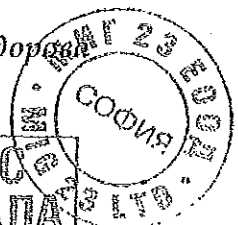
Фирмата е подписала декларация за поверителност на личните данни съгласно Българското законодателство и директивата на ЕС за защита на личните данни.

Аз, долуподписаната, **Юлия Иванова Тодорова**, в качеството си на официален преводач удостоверявам истинността на извършения от мен превод от немски и английски език на български език на акредитация **DAR- регистрационен номер: DAT – PL – 008/91-14**. Настоящият превод съдържа 2 (две) страници. 4000 Пловдив, 12.01.2012

Оторизиран и заклет преводач.



Юлия Иванова Тодорова



**ВЯРНО СЪДЪРЖА
ОРИГИНАЛА**

700

DATech Deutsche Akkreditierungsstelle Technik in der TGA GmbH
Signatory of the Multilateral Agreement of EA and ILAC for the mutual recognition

represented in the

Deutschen Akkreditierungsrat



Akkreditierung

The TGA GmbH, represented by the DATech Deutsche Akkreditierungsstelle Technik in der TGA GmbH, confirms that the Testing Laboratory

Weidmüller Interface GmbH & Co. KG

Labor

Am Stoppelkamp 17

D-32758 Detmold

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out testing in the fields of

Line-up Terminals, Plug Connector,
Safety of Electrical Appliances including
Electromagnetic Compatibility (EMC) and Environmental Tests

according to the annexed list of standards and specifications.

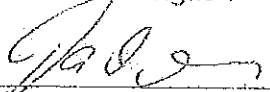
The accreditation is valid until: 2014-08-11

The annex is deemed part of this certificate and comprises 6 pages.

DAR-Registration No.: DAT-PL-008/91-14

Frankfurt/Main, 2009-08-12

Correctness of the english translation confirmed: Frankfurt/Main, 2009-09-08


Dr. Thomas Facklam
Managing Director

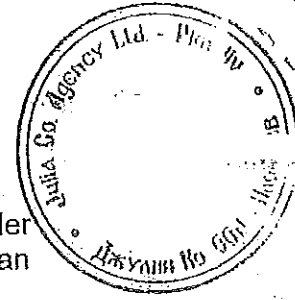
Member in EA, ILAC, IAF

Translation for information purposes only. The German Accreditation Certificate is authoritative




751

DATEch Deutsche Akkreditierungsstelle Technik in der
TGA – Trägergemeinschaft für Akkreditierung German
Association for Accreditation GmbH
Gartenstrasse 6
D-60594 Frankfurt am Main



This accreditation has been awarded on the basis of an assessment and pursuant to the agreement concluded with the accreditation bodies with respect to the accreditation of a testing laboratory in accordance with the rules and procedures of the German Accreditation System, in conformity with the European standards DIN EN ISO/IEC 17025:2005 and DIN EN ISO/IEC 17011:2005.

The requirements in terms of materials and personnel as specified in DIN EN ISO/IEC 17025 for the specific tests indicated in the accreditation certificate, as well as for the procedures described in the annex to the accreditation certificate, have been met.

Details on the scope of the accreditation (test fields, procedures and specifications) are given in the annex to this accreditation certificate.

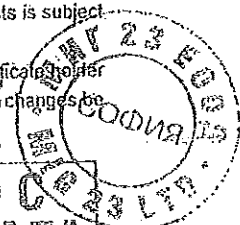
The annex and the documents submitted in connection with the accreditation are deemed to form an integral part of it. Any amendments are to be made in writing.

The accreditation is awarded subject to revocation at any time on the fundamental change or lapse of any conditions defined in the agreement and in the annex to this accreditation certificate.

Accreditation certificate and annex are not to be disseminated in any form other than the present one. The publication of extracts is subject to approval from the accreditation bodies.

The impression shall not be given that the inspection of the testing laboratory also extends to products and services of the certificate holder which are not covered by this accreditation. If such an impression is given, the accreditation bodies are entitled to demand that changes be made.

ВЯРНО СЪДЪРЖА
ОРИГИНАЛА



782