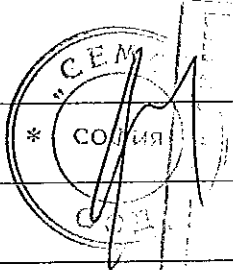
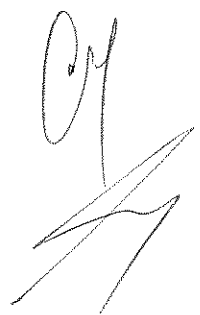


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-125S/3300	
	Sample no:	55#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	12,5 kA	
	Rated control supply voltage of closing mechanism: U _c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: U _c (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P



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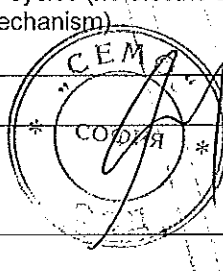
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	P
	Tightening torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	436,2 Vac 436,7 Vac 436,6 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	12,6 kA 12,8 kA 12,6 kA	P
	power factor/time constant :	0,29	P
	- Factor "n"	2,0	P
	- peak test current (A) :	26,0 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,3 kA 12,4 kA 8,2 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	573,6 kA ² s 625,4 kA ² s 264,7kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	7,2 kA 11,9 kA 12,6 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	213,0 kA ² s 757,6 kA ² s 698,3 kA ² s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,6 kA 9,6 kA 10,7 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	588,5 kA ² s 301,9 kA ² s 421,0 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	125 A	
	Maximum rated operational voltage: U _e (V)	415 Vac	
	Conductor cross-sectional area (mm ²) :	50 mm ²	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	417,4 Vac 417,9 Vac 417,8 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	129,6 A 128,9 A 129,1 A	P
	- power factor/time constant:	0,78	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	499,2 ms	P

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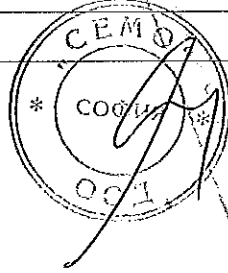
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	29,5 s	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 5	P
	Temperature rise of main circuit terminals. ≤80 K (K):	Max: 53,7 K	P
	conductor cross-sectional area (mm ²):	50 mm ²	P
	test current I _e (A):	125 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	181,3 A (1,45 x I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	4 min 11 s	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II/III (Ics=Icu):		N/A



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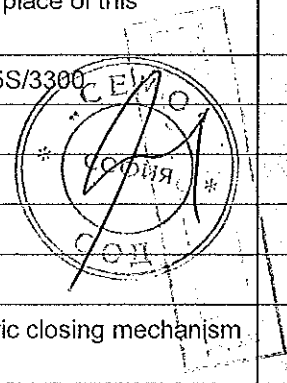
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/3300	
	Sample no:	B59#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1:	199 s	P
 L2:	157 s	
 L3:	181 s	
 N :		



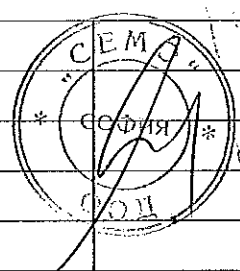
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 260 Vac	P



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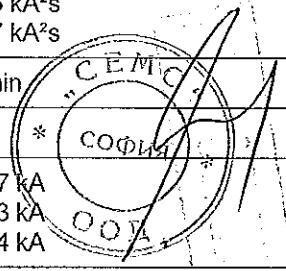
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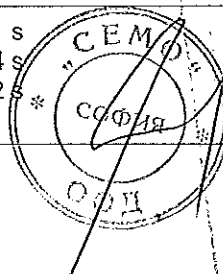
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,1 kA 11,6 kA 14,3 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	1,03 MA ² s 216 kA ² s 497 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	5,27 kA 15,3 kA 17,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	33,7 kA ² s 542 kA ² s 761 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	71 s	P
 L2:	54 s	
 L3:	62 s	
 N:		



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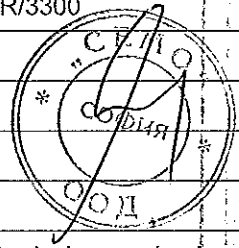
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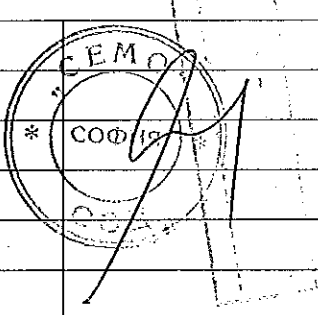


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125R/3300	
	Sample no:	60#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	3 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1:	130 s	P
 L2:	117 s	
 L3:	122 s	
 N :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50-mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 734,8 Vac L2-L3: 734,1 Vac L3-L1: 735,2 Vac	P

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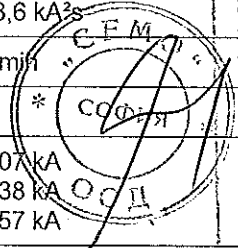
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	3,07 kA 3,02 kA 3,08 kA	P
	power factor/time constant :	0,86	P
	- Factor "n"	1,42	P
	- peak test current (Amax) :	4,51 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	3,97 kA 3,57 kA 3,23 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	82,4 kA ² s 53,1 kA ² s 38,6 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	4,07 kA 3,38 kA 3,57 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	82,1 kA ² s 65,4 kA ² s 67,0 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1:	114 s	P
 L2:	77 s	
 L3:	98 s	
 N:		



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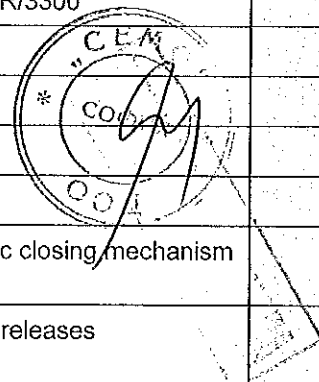
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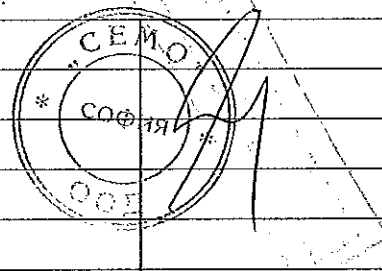
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125R/3300	
	Sample no:	B61#	
	Rated current: In (A)	16 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1:	144 s	P
 L2:	136 s	
 L3:	130 s	
 N :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2,5 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 260 Vac	P



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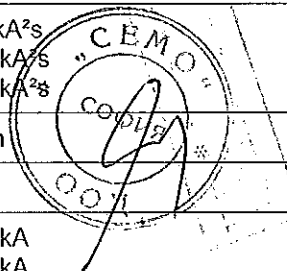
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1	42,7 kA	P
	..... L2	43,0 kA	
	..... L3	42,8 kA	
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1:	10,8 kA	P
	..... L2:	6,15 kA	
	..... L3:	6,16 kA	
	- Joule integral I ² dt (kA ² s) L1:	265 kA ² s	P
	..... L2:	54,0 kA ² s	
	..... L3:	78,0 kA ² s	
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1:	7,73 kA	P
	..... L2:	7,88 kA	
	..... L3:	662 kA	
	- Joule integral I ² dt (kA ² s) L1:	120 kA ² s	P
	..... L2:	129 kA ² s	
	..... L3:	82,8 A ² s	
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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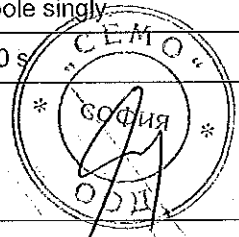
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	124 s	P
 L2:	81 s	
 L3:	104 s	
 N:		



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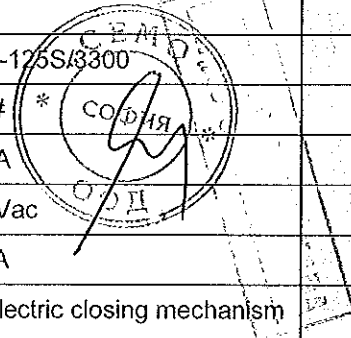
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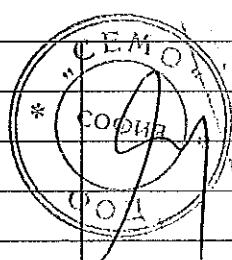
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/3300	
	Sample no:	B62#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 151 s	P
 L2:	131 s	
 L3:	201 s	
 N:		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 450 Vac L2-L3: 451 Vac L3-L1: 450 Vac	P



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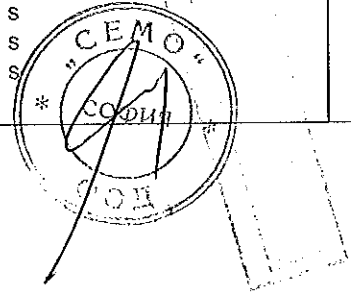
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	25,7 kA 25,1 kA 25,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	53,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	20,1 kA 9,91 kA 17,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,81 MA ² s 214 kA ² s 1,25 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	17,5 kA 19,1 kA 8,71 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,17 MA ² s 1,67 MA ² s 157 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: 68 s L2: 59 s L3: 89 s N:		P

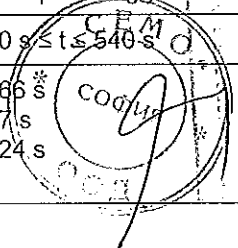


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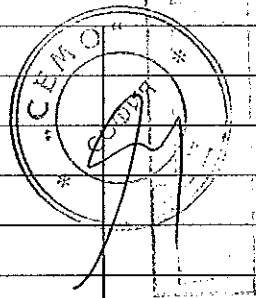
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for 3 phases	
	Sample no:	B63#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 166 s L2: 87 s L3: 124 s N :	P



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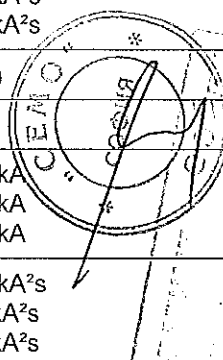
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 260 Vac	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	19,6 kA 11,7 kA 14,2 kA	P
	- Joule integral I ² dt (KA ² s) L1: L2: L3:	1,06 MA ² s 220 kA ² s 534 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	2,45 kA 16,8 kA 16,8 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	4,90 kA ² s 605 kA ² s 674 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

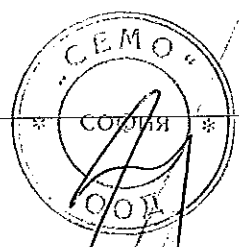


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	94 s	P
 L2:	58 s	
 L3:	64 s	
 N:		



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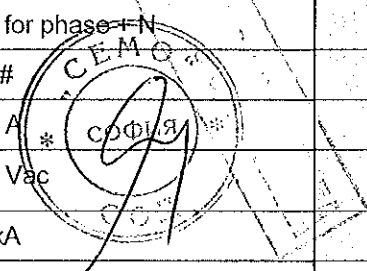
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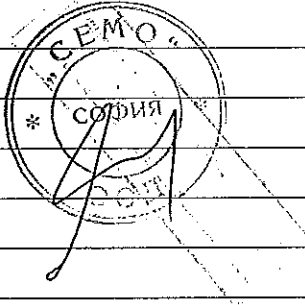
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for phase+N	
	Sample no:	183#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	78 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)L1:L2:L3:	146 Vac	P

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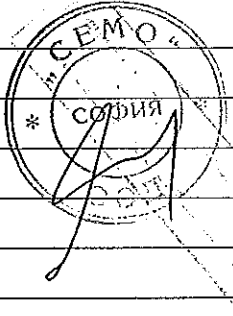
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8

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1:L2:L3:	146 Vac	P

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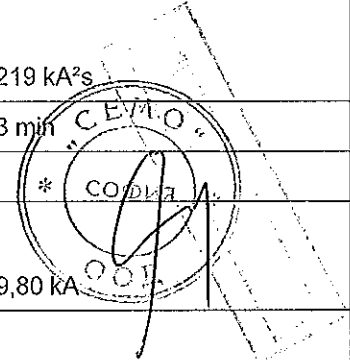
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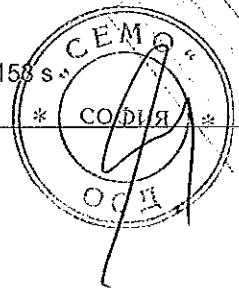
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	54,7 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	8,88 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	219 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	9,80 kA	P
	- Joule integral I ² dt (A ² s) L1: .....L2: .....L3:	212 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	153 s 	P



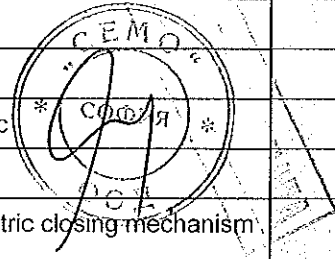


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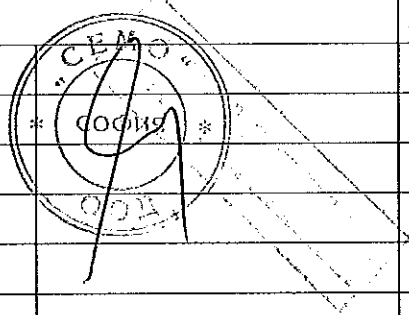
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for 3 phases	
	Sample no:	152#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	3 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$30\text{ s} \leq t \leq 540\text{ s}$	P
	- Operation time: (s) L1:	132 s	P
 L2:	100 s	
 L3:	140 s	
 N :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1-L2:L2-L3:L3-L1:	758 Vac 759 Vac 758 Vac	P



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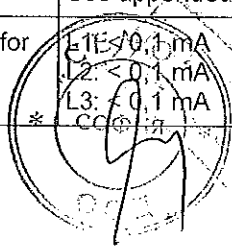
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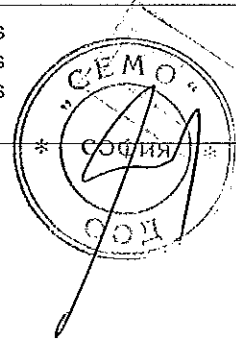
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	3,02 kA 3,10 kA 3,03 kA	P
	power factor/time constant :	0,90	P
	- Factor "n"	1,42	P
	- peak test current (Amax) :	4,43 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	3,81 kA 3,91 kA 2,64 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	66,9 kA ² s 61,8 kA ² s 34,3 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	3,77 kA 3,01 kA 3,85 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	77,5 kA ² s 55,8 kA ² s 68,3 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA CCP: #	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	75 s	P
 L2:	58 s	
 L3:	67 s	
 N:		



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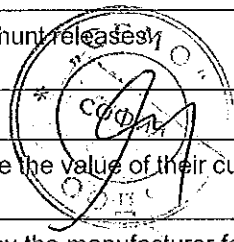
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for phase + N	
	Sample no:	180#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	3 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	82 s	P



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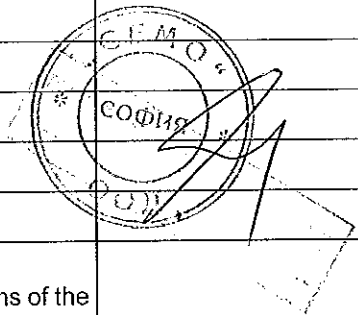
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8

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1:L2:L3:	438 Vac	P



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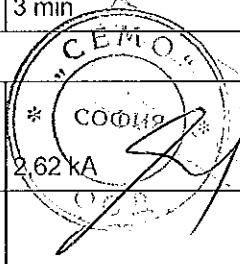
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2

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	1,86 kA	P
	power factor/time constant :	0,90	P
	- Factor "n"	1,42	P
	- peak test current (Amax) :	2,63 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: .....L2: .....L3:	2,62 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	33,6 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: .....L2: .....L3:	2,62 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	34,5 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L3: < 0,1 mA N: < 0,1 mA	P

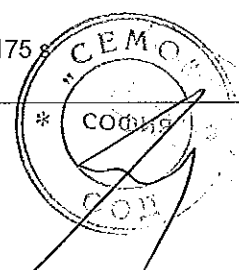


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N :	175 s	P



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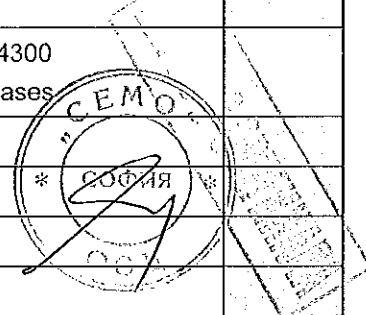
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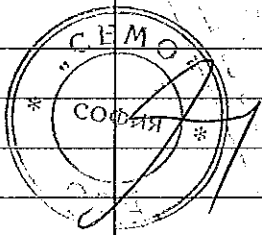
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for 3 phases	
	Sample no:	153#	
	Rated current: In (A)	16 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1:	147 s	P
 L2:	127 s	
 L3:	133 s	
 N :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2,5 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 260 Vac	P



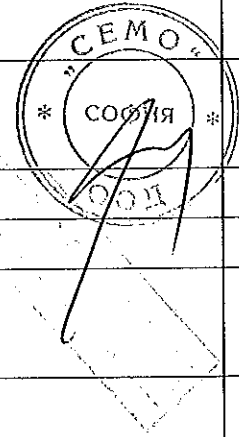
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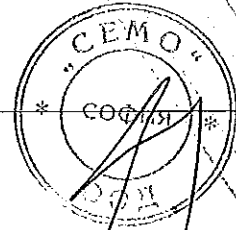
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,1 kA 6,48 kA 5,51 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	233 kA ² s 62,0 kA ² s 71,2 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	5,77 kA 6,38 kA 9,33 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	48,2 kA ² s 96,9 kA ² s 214 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1: 102 s L2: 87 s L3: 113 s N:		P



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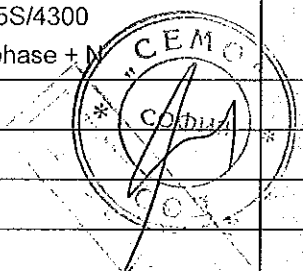
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for phase + N	
	Sample no:	181#	
	Rated current: In (A)	16 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	79 s	P



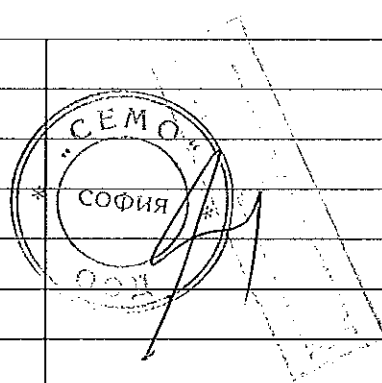
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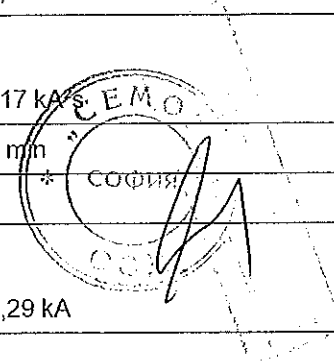
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2,5 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)L1:L2:L3:	146 Vac	P



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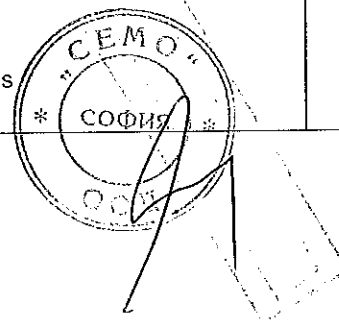
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	54,7 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	6,13 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	117 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	6,29 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	121 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L3: < 0,1 mA N: < 0,1 mA	P



EST

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	129 s	P



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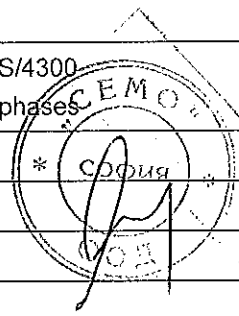
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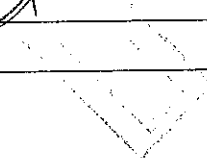
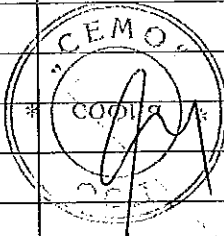
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for 3 phases	
	Sample no:	154#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 165 s	P
	L2: 94 s	
	L3: 126 s	
	N :	



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9

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)	L1-L2: 450 Vac L2-L3: 451 Vac L3-L1: 450 Vac	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	25,7 kA 25,1 kA 25,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	53,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	20,2 kA 9,77 kA 19,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,93 MA ² s 209 kA ² s 1,43 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	8,02 kA 18,2 kA 19,1 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	130 kA ² s 1,26 MA ² s 1,75 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1: 97 s L2: 37 s L3: 63 s N:		P



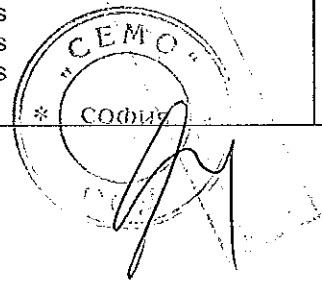
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1:	97 s	P
 L2:	37 s	
 L3:	63 s	
 N:		



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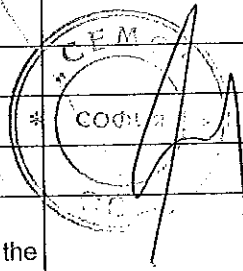
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-125S/4300 test for phase +N	
	Sample no:	182#	
	Rated current: In (A)	125 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	30 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	87 s	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	50 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	3,5 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)L1:L2:L3:	256 Vac	P

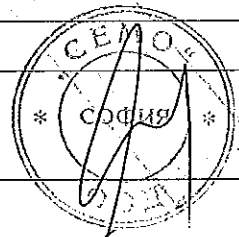


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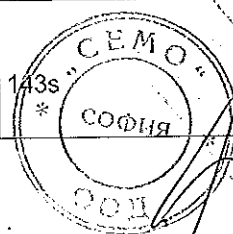
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	15,4 kA	P
	power factor/time constant :	0,30	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	30,4 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	11,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	465 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	8,72 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	284 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	143s * "СЕМО" "СФНБ" "СФНБ"	P



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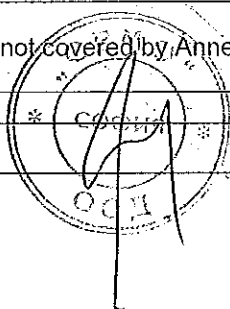
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV		N/A
8.3.7	TEST SEQUENCE V		N/A
8.3.8	TEST SEQUENCE VI: Combined test sequence		N/A
Annex B	Circuit-breakers incorporating residual current protection		N/A
Annex C	Individual pole short-circuit test sequence		N/A
Annex F	Additional tests for circuit-breakers with electronic over-current protection		N/A
Annex H	Individual pole short-circuit test sequence		N/A
Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		N/A
Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		N/A
Annex M	Modular residual current devices (without integral current breaking device)		N/A
Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		N/A
Annex O	Instantaneous trip circuit-breakers (ICB)		N/A



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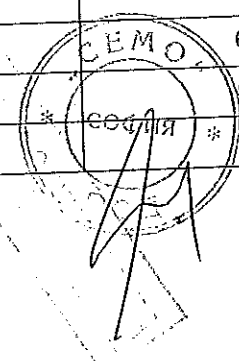
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 2: Heating Test (Seq I, 8.3.3.6, sample number 51#)			P
Test current (A):		125 A	—
Ambient (°C):		20,6 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	41,1 K	80 K	
Load side Terminal 2	42,6 K	80 K	
Line side Terminal 3	37,3 K	80 K	
Load side Terminal 4	47,2 K	80 K	
Line side Terminal 5	37,2 K	80 K	
Load side Terminal 6	41,1 K	80 K	
Line side Terminal N	45,2 K	80 K	
Load side Terminal N	43,2 K	80 K	
Side enclosure	25,8 K	60 K	
Front enclosure	16,5 K	50 K	
Actuator	14,1 K	35 K	

TABLE 3: Heating Test (Seq II, 8.3.4.4, sample number 52#) *			P
Test current (A):		125 A	—
Ambient (°C):		22,5 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	41,7 K	80 K	
Load side Terminal 2	47,7 K	80 K	
Line side Terminal 3	46,2 K	80 K	
Load side Terminal 4	50,6 K	80 K	
Line side Terminal 5	43,1 K	80 K	
Load side Terminal 6	49,4 K	80 K	

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	TABLE 1: Heating Test (Seq I, 8.3.3.6, sample number 151#)		P
	Test current (A):	125 A	—
	Ambient (°C):	22,2 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	35,4 K	80 K	
Load side Terminal 2	42,9 K	80 K	
Line side Terminal 3	40,6 K	80 K	
Load side Terminal 4	49,4 K	80 K	
Line side Terminal 5	35,2 K	80 K	
Load side Terminal 6	44,6 K	80 K	
Side enclosure	23,8 K	60 K	
Front enclosure	15,9 K	50 K	
Actuator	12,5 K	35 K	



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

TABLE 4: Heating Test (Seq II, 8.3.4.4, sample number 53#)			P
Test current (A):		125 A	—
Ambient (°C):		22,7 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	45,0 K	80 K	
Load side Terminal 2	52,4 K	80 K	
Line side Terminal 3	50,6 K	80 K	
Load side Terminal 4	56,8 K	80 K	
Line side Terminal 5	45,3 K	80 K	
Load side Terminal 6	50,7 K	80 K	

TABLE 5: Heating Test (Seq II, 8.3.4.4, sample number 55#)			P
Test current (A):		125 A	—
Ambient (°C):		23,1 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	44,3 K	80 K	
Load side Terminal 2	50,8 K	80 K	
Line side Terminal 3	48,4 K	80 K	
Load side Terminal 4	53,7 K	80 K	
Line side Terminal 5	42,9 K	80 K	
Load side Terminal 6	49,5 K	80 K	

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

TABLE 4: Heating Test (Seq II, 8.3.4.4, sample number 53#)			P
Test current (A):		125 A	—
Ambient (°C):		22,7 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	45,0 K	80 K	
Load side Terminal 2	52,4 K	80 K	
Line side Terminal 3	50,6 K	80 K	
Load side Terminal 4	56,8 K	80 K	
Line side Terminal 5	45,3 K	80 K	
Load side Terminal 6	50,7 K	80 K	

TABLE 5: Heating Test (Seq II, 8.3.4.4, sample number 55#)			P
Test current (A):		125 A	—
Ambient (°C):		23,1 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	44,3 K	80 K	
Load side Terminal 2	50,8 K	80 K	
Line side Terminal 3	48,4 K	80 K	
Load side Terminal 4	53,7 K	80 K	
Line side Terminal 5	42,9 K	80 K	
Load side Terminal 6	49,5 K	80 K	

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

TABLE 6: dielectric strength (Seq I, 8.3.3.5, sample number 151# and 51#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

TABLE 7: dielectric strength (Seq II, 8.3.4.3, sample number 52#, 54# and 55#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 8: dielectric strength (Seq II, 8.3.4.3, sample number 53#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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

TABLE 9: dielectric strength (Seq III, 8.3.5.3, sample number B59#, B61#, B62#, B63#, 153#, 154#, 180#, 181# and 183#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 10: dielectric strength (Seq III, 8.3.5.3, sample number 60#, 152# and 182#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

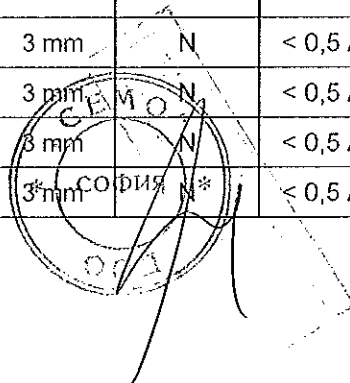
TABLE 11: clearance and creep age distance measurements							P
clearance cl and creepage distance dcr at/of:	Ui (V)	Uimp (kV)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
Between poles	800 V	8 kV	8 mm	17,5 mm	12,5 mm	36,7 mm	
Between live parts and parts intended to be earthed	800 V	8 kV	8 mm	18,5 mm	12,5 mm	18,5 mm	
Between the contacts in the open position	800 V	8 kV	8 mm	16,7 mm	12,5 mm	28,3 mm	
Between live parts and actuator	800 V	8 kV	8 mm	13,2 mm	12,5 mm	13,2 mm	

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

TABLE 12: Resistance to fire (Glow wire test)							P
No.	Description	Colour	Temp. °C	burning after t (s)	drops	support burning	—
1	Base	Black	960 °C	0 s	No	No	P
2	Cover	White	960 °C	0 s	No	No	P
3	Actuator	Black	960 °C	6 s	No	No	P
4	Leading lever	White	960 °C	2 s	No	No	P

TABLE 13: Resistance to tracking (tracking test)							P
Specimen							Verdict
Description	Colour	Drops (no.)	Thick (mm)	Burning	Current (A)	Test voltage (V)	
Base	Black	50	3 mm	N	< 0,5 A	175 V	P
Cover	White	50	3 mm	N	< 0,5 A	175 V	P
Handle	Black	50	3 mm	N	< 0,5 A	175 V	P
Leading lever	White	50	3 mm	N*	< 0,5 A	175 V	P



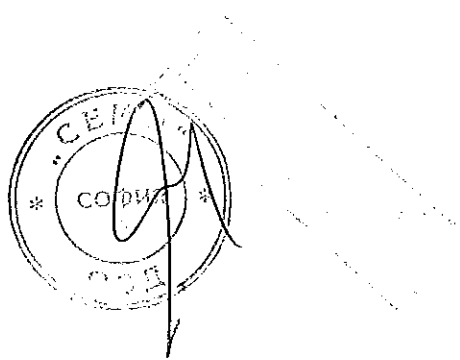
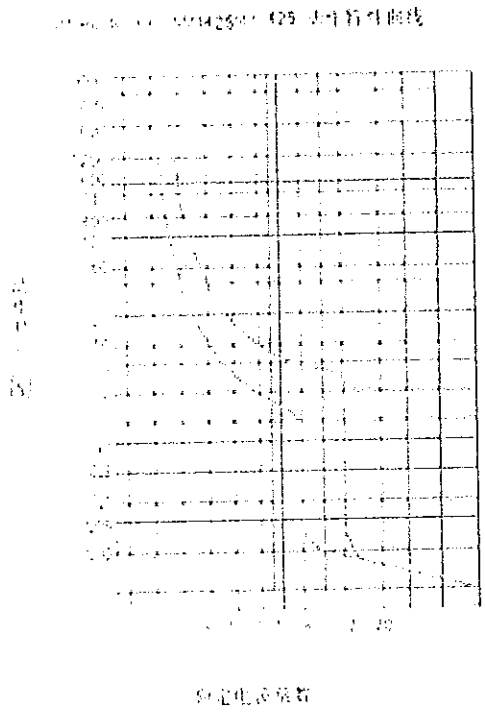
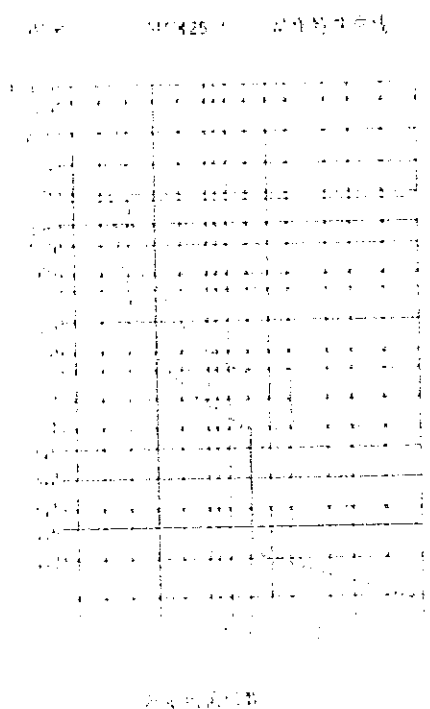
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Time current characteristics



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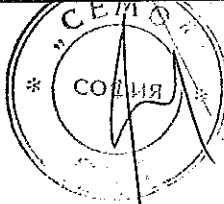
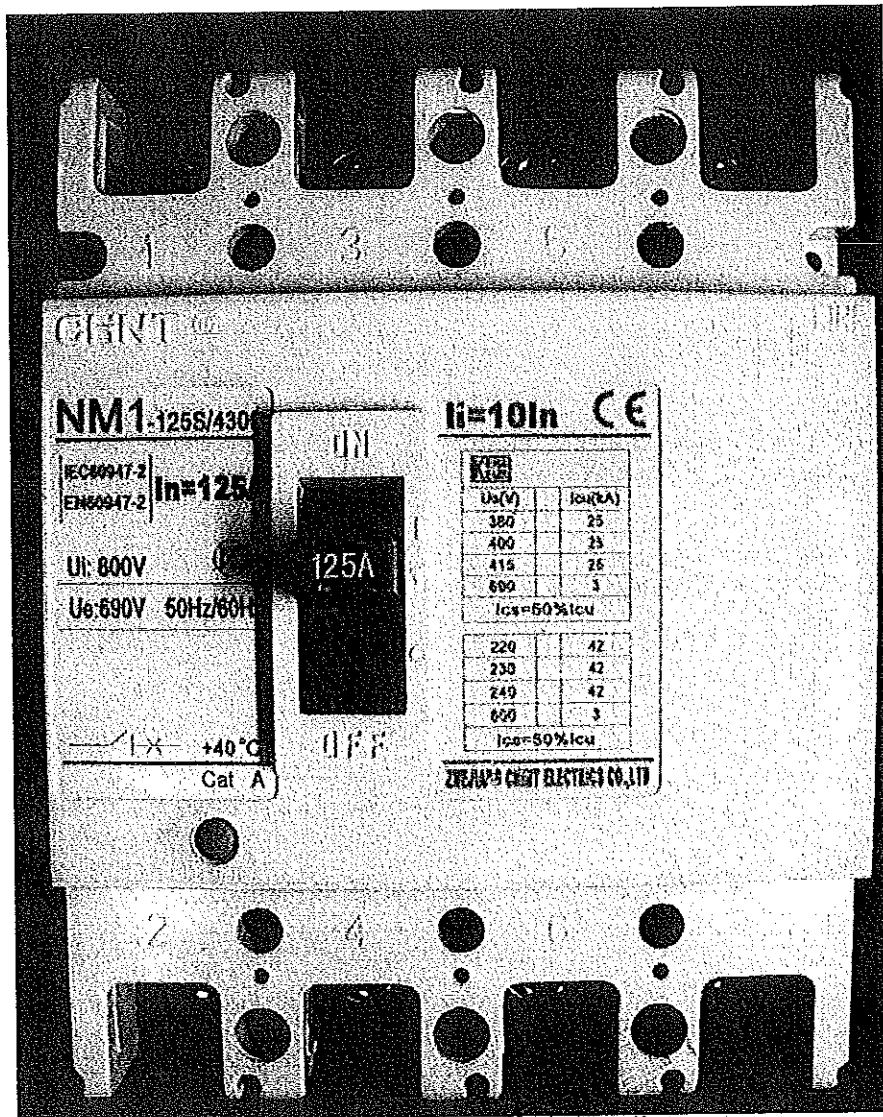
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Photographs

Front view, 3P + N MCCB

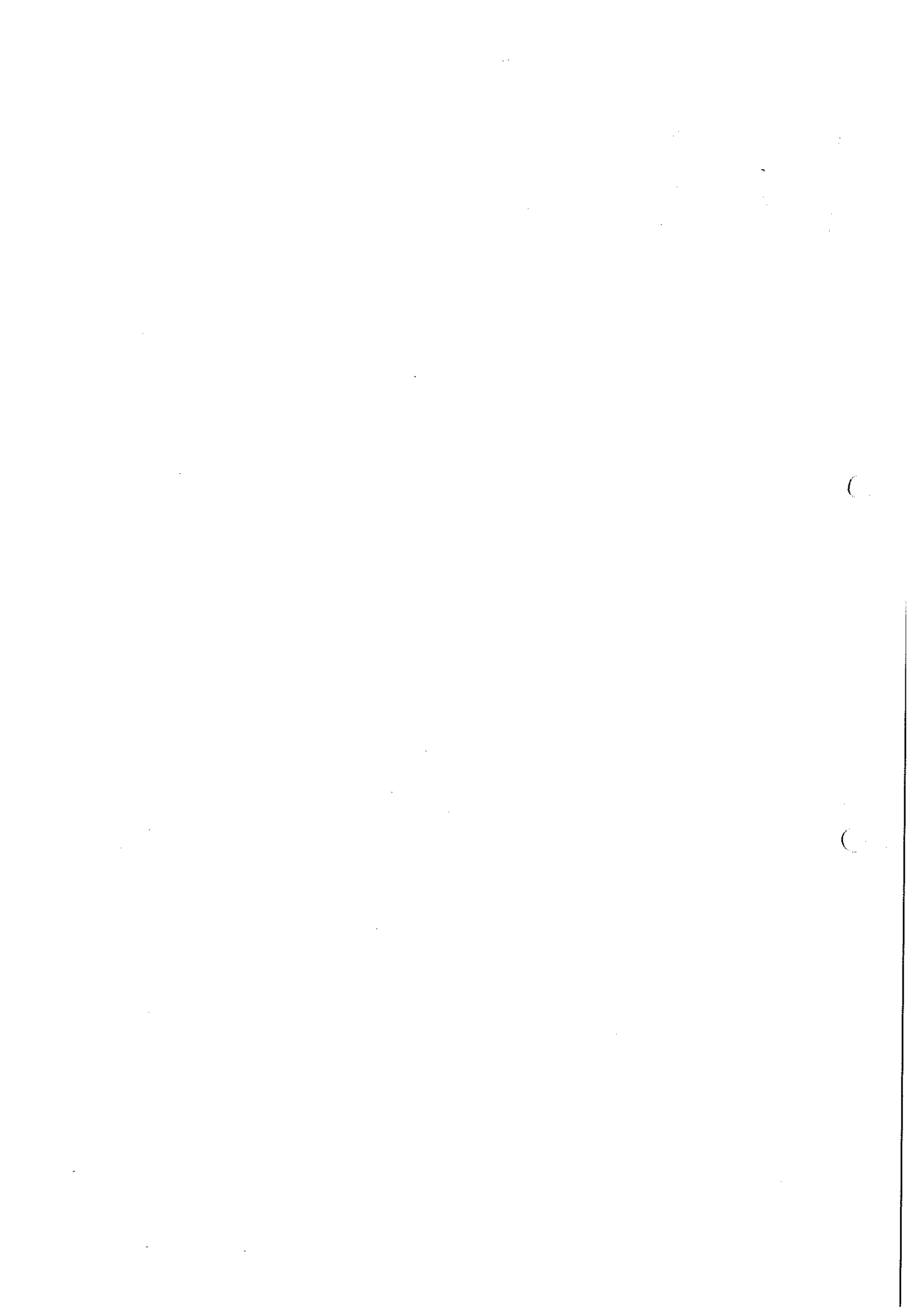


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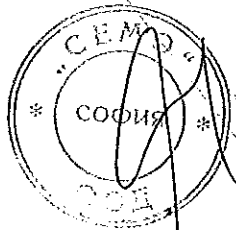
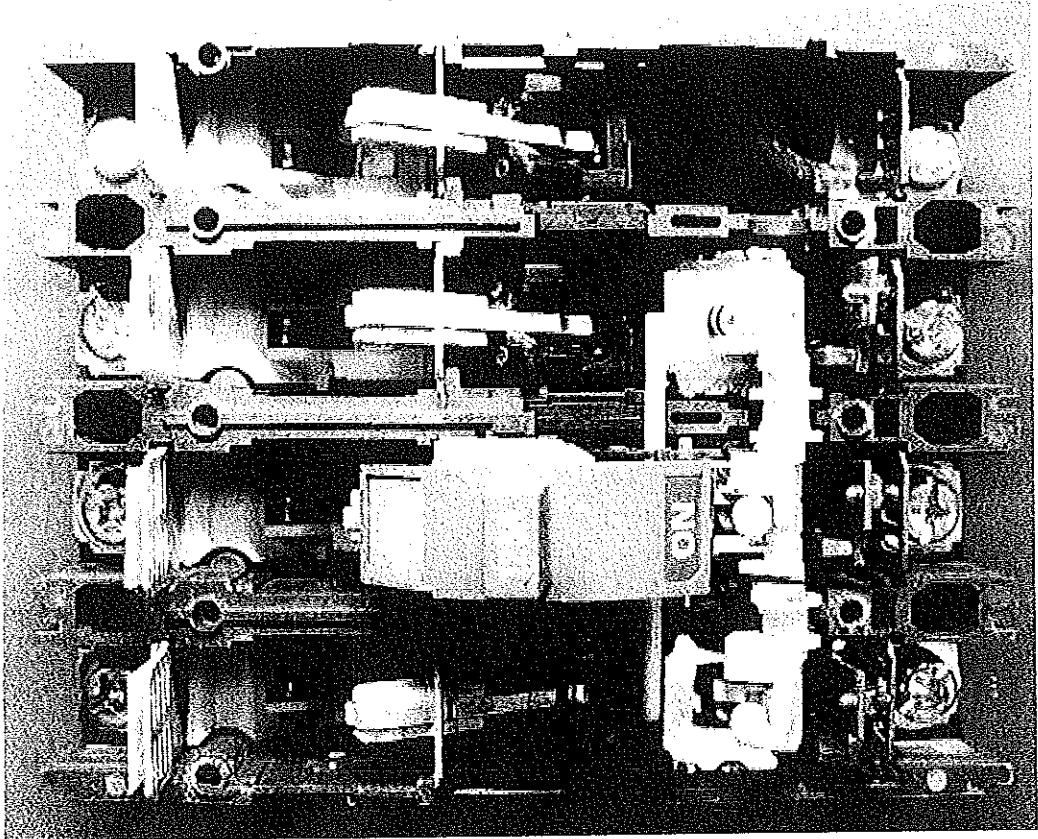
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Open view, 3P + N MCCB



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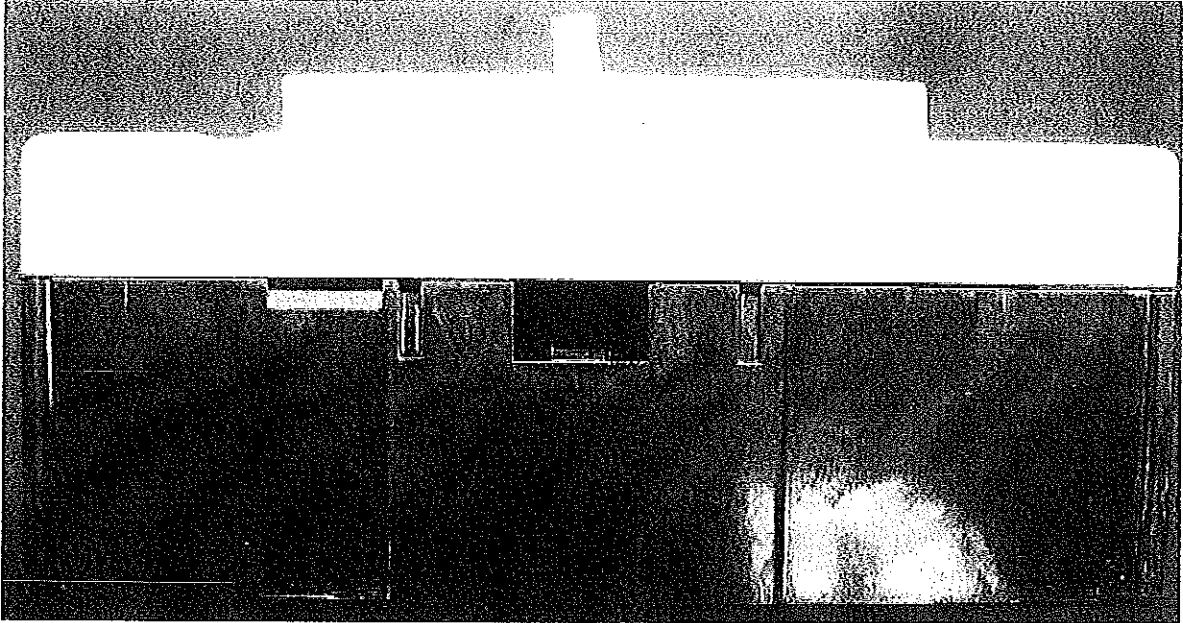
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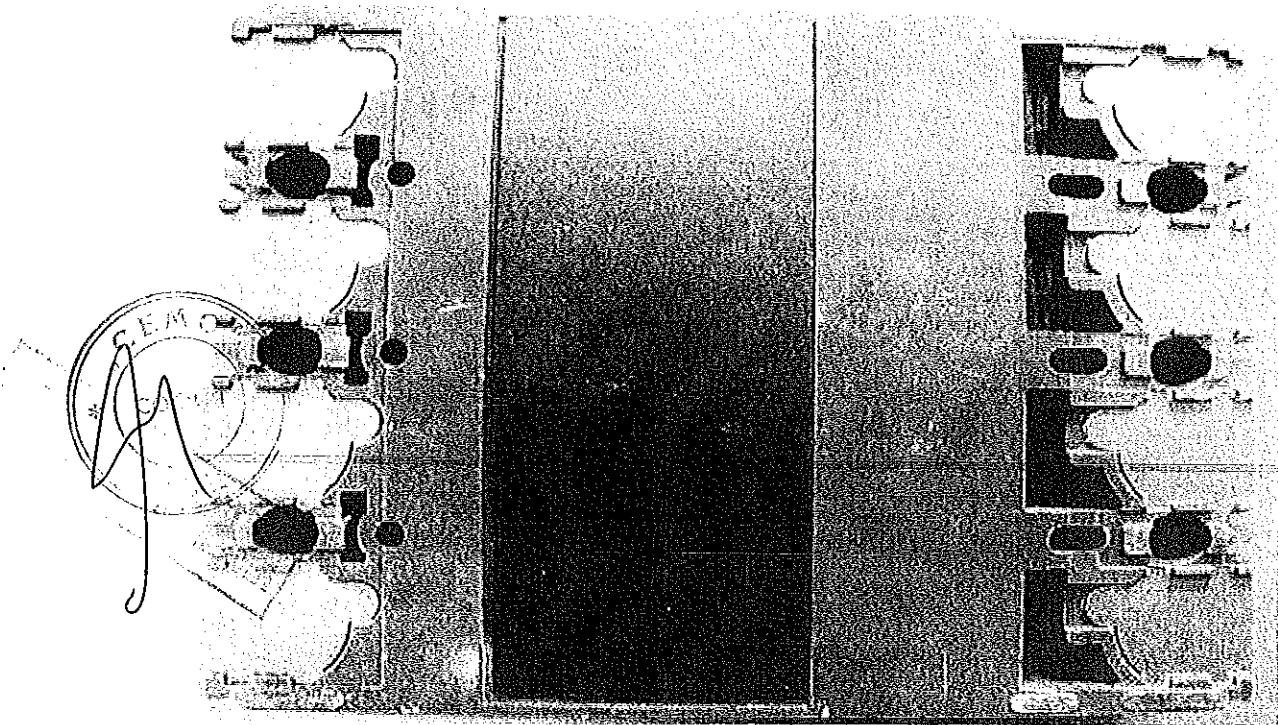
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Side view, 3P + N MCCB



Back view, 3P + N MCCB

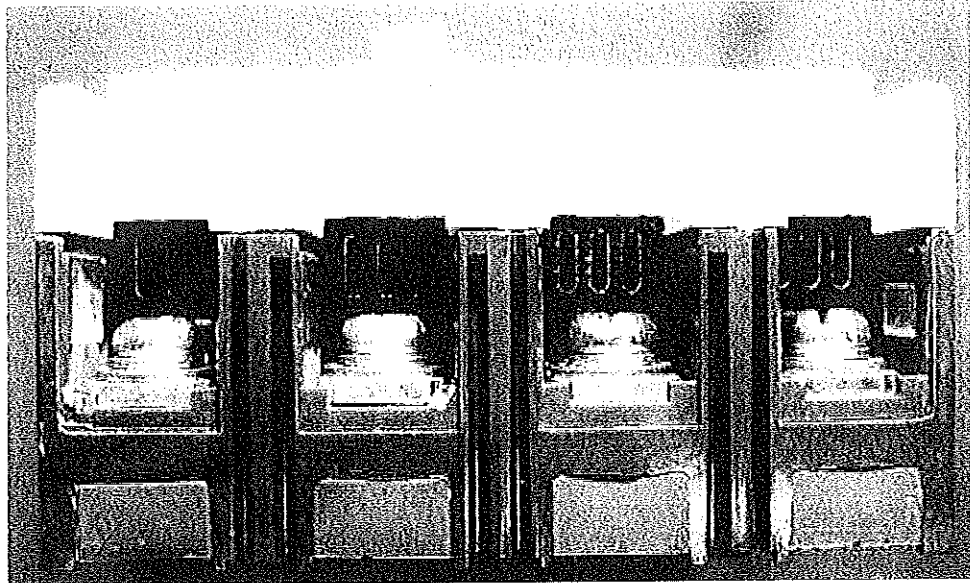


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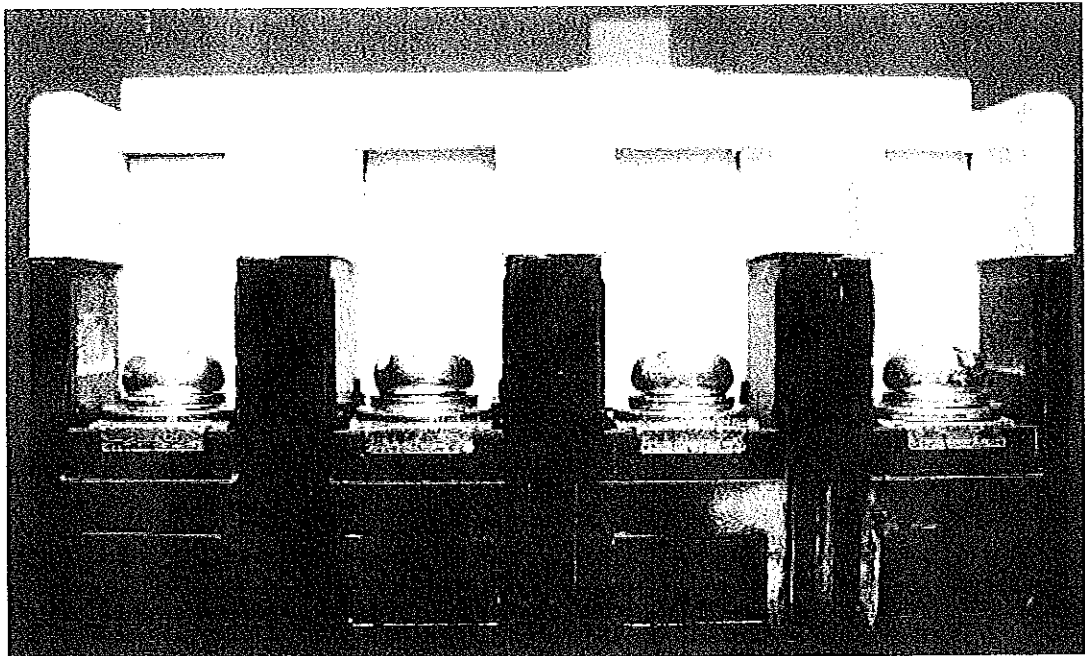
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Load terminal view, 3P + N MCCB



Line terminal view, 3P + N MCCB



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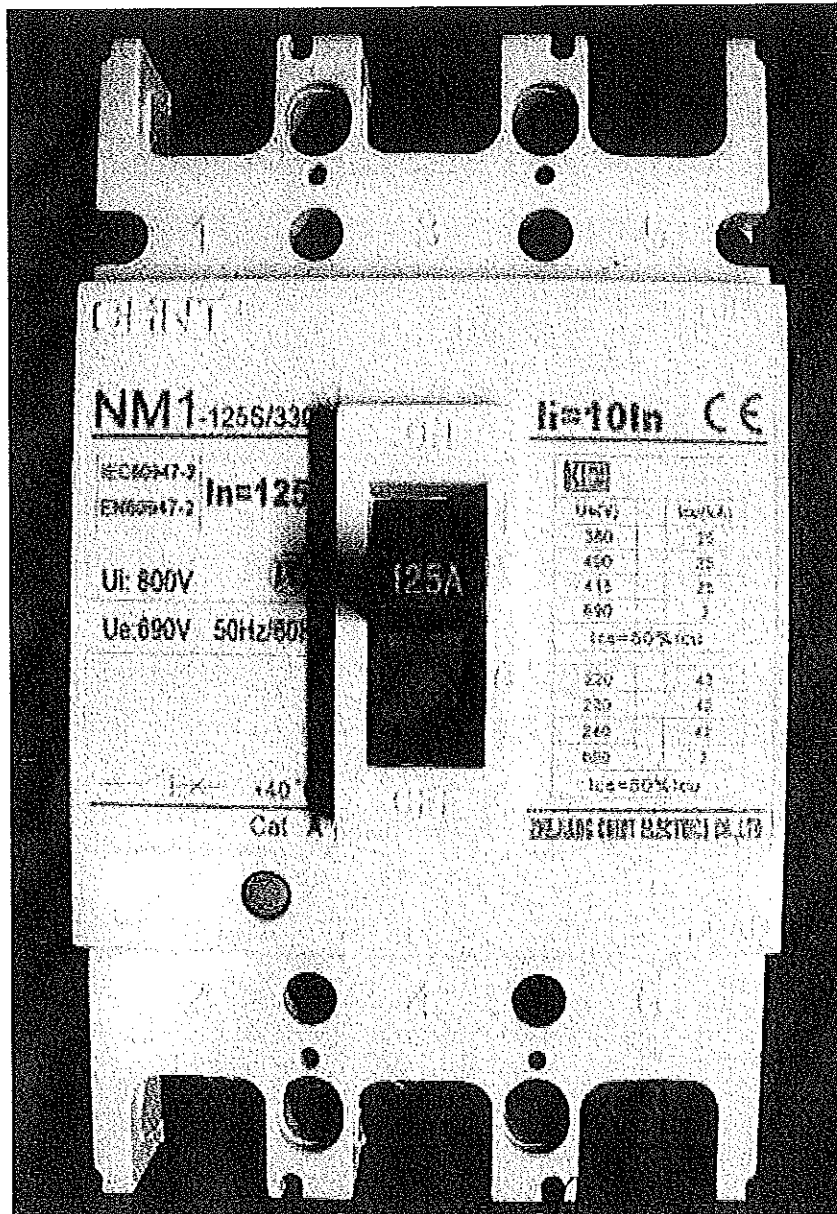
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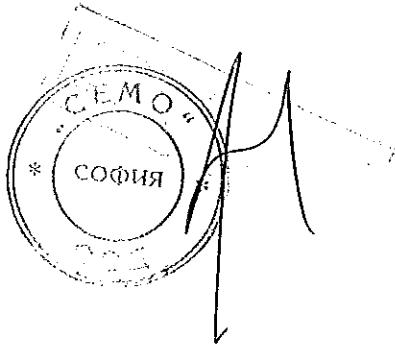
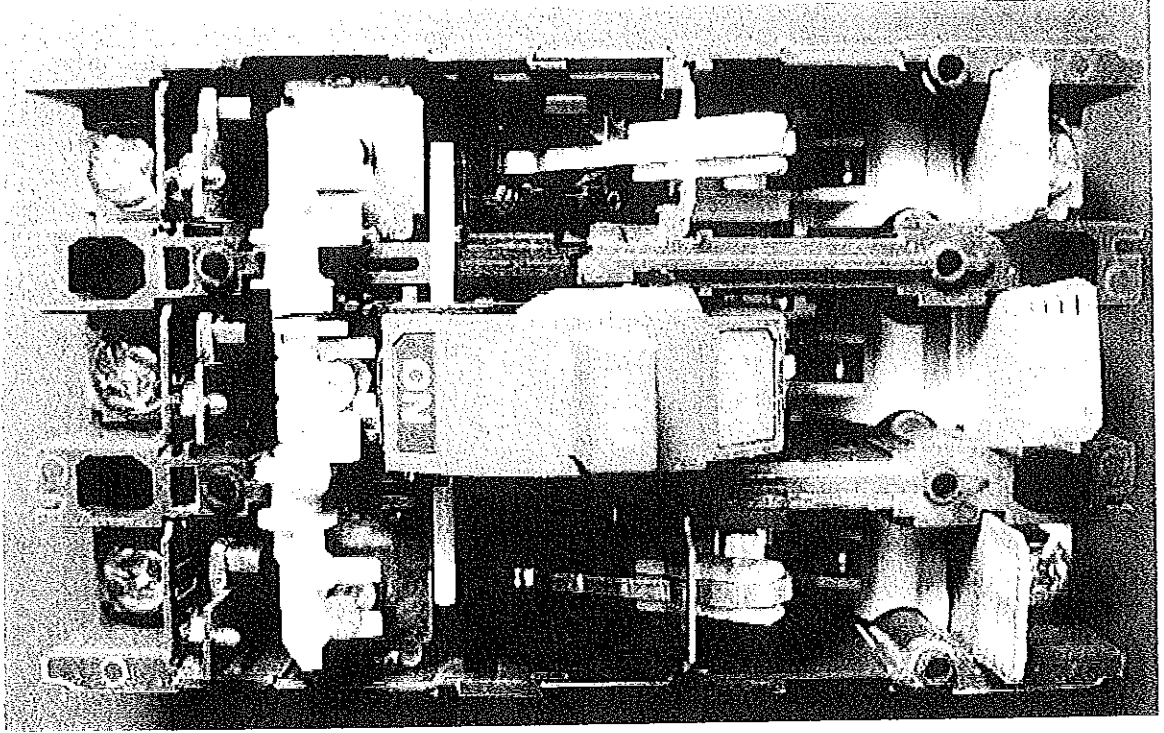
Front view, 3P MCCB



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Open view, 3P MCCB



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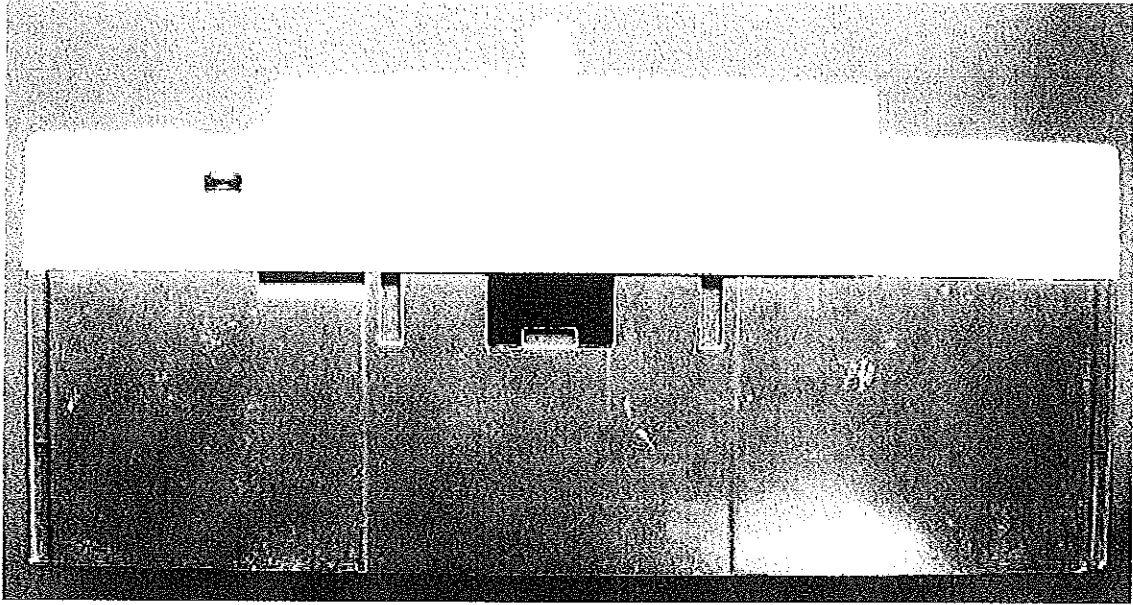
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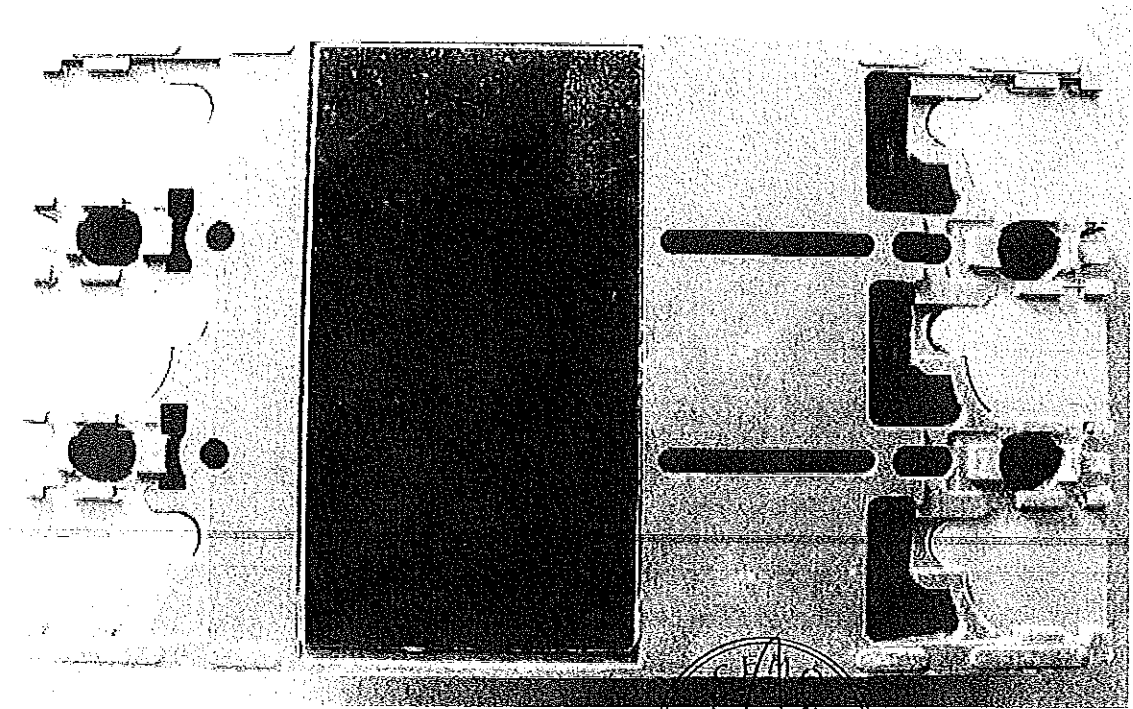
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IEC 60947-2

Side view, 3P MCCB



Back view, 3P MCCB



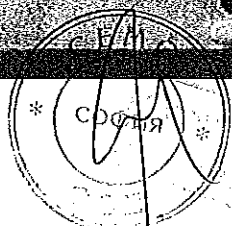
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198

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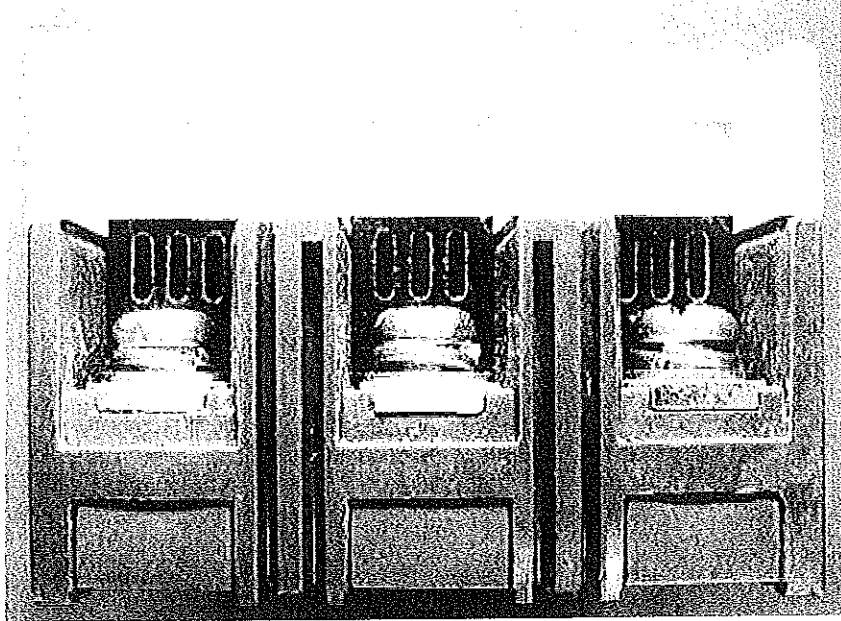
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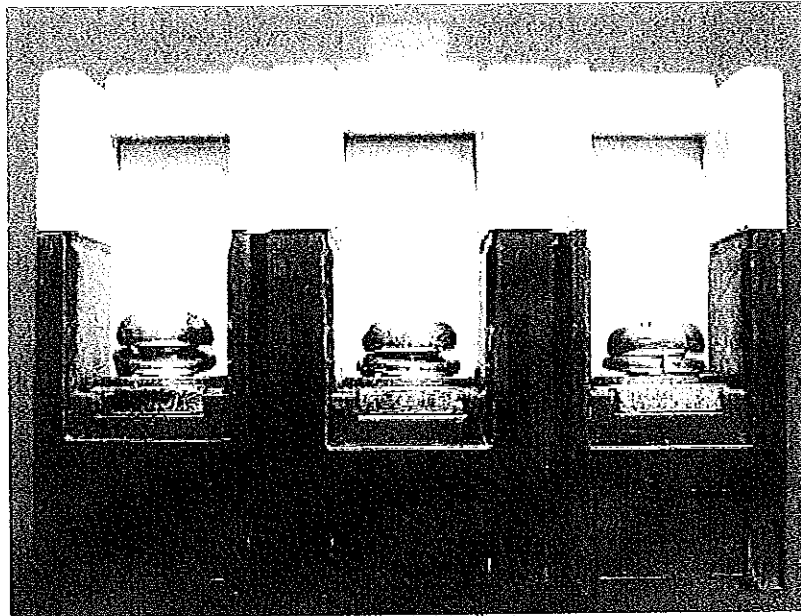
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IEC 60947-2

Load terminal view, 3P MCCB



Line terminal view, 3P MCCB

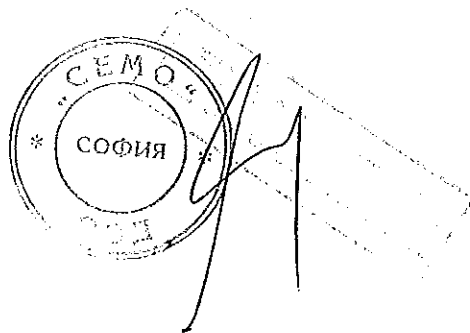
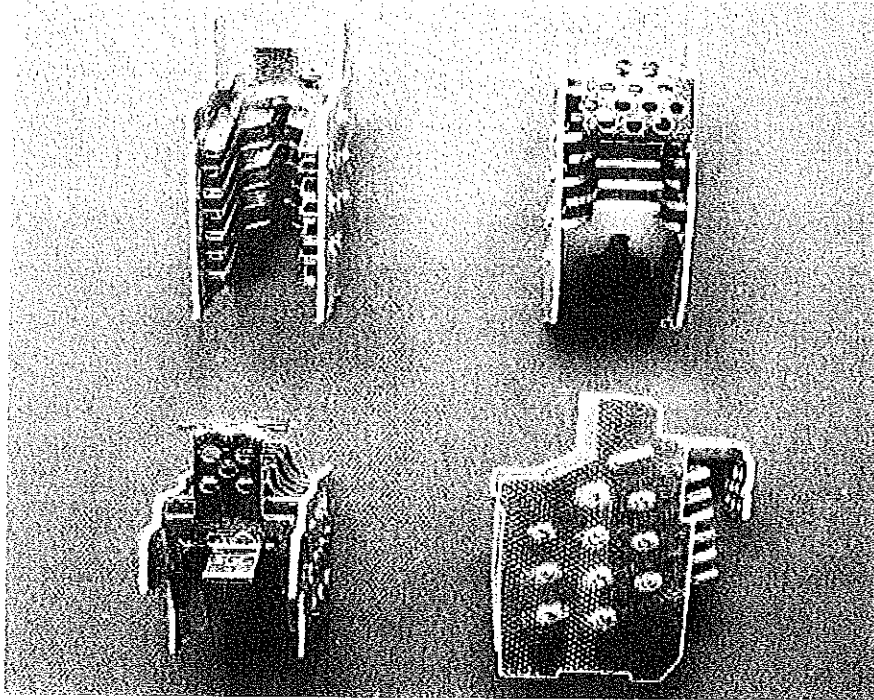


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IEC 60947-2

Arc chamber



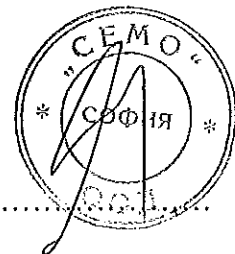
200

СПИСЪК НА ИЗПИТАНИЯТА В ТЕСТОВИ ДОКЛАД ЗА NM1-125 ~ 630

№	ОПИСАНИЕ
1	Обща информация
2	Продуктова информация
3	Тестови данни
4	Снимка на автомата
5	Кратко изложение на теста
6	Маркировка
7	Конструкция
8	Изисквания за работа
9	Тестове
10	Механични характеристики на клемите
11	Изпитателна последователност I – общо представяне, проба I-1,2 полюс
12	Изпитателна последователност I – общо представяне, проба I-2,3 полюс
13	Изпитателна последователност I – общо представяне, проба I-3,4 полюс
14	Изпитателна последователност II (Ics)
15	Изпитателна последователност II/III (Ics=Icu) – проба II-1,2 полюс
16	Изпитателна последователност II/III (Ics=Icu) – проба II-2,2 полюс
17	Изпитателна последователност II/III (Ics=Icu) – проба II-3,2 полюс
18	Изпитателна последователност II/III (Ics=Icu) – проба II-4,3 полюс
19	Изпитателна последователност II/III (Ics=Icu) – проба II-5,3 полюс
20	Изпитателна последователност II/III (Ics=Icu) – проба II-6,3 полюс
21	Изпитателна последователност II/III (Ics=Icu) – проба II-7,4 полюс
22	Изпитателна последователност III (Icu) – проба III-1,4 полюс тествани при 1P+N
23	Други
24	Топлинен тест
25	Диелектрична стабилност
26	Измерване на безопасното разстояние за монтаж
27	Сила на затягане на болтовете
28	Издържливост на пожар и оголен кабел
29	Снимков материал на тестваното изделие

Дата: 07.08.2015 г.

СЕМО ООД:.....



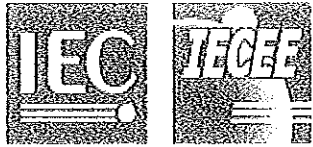
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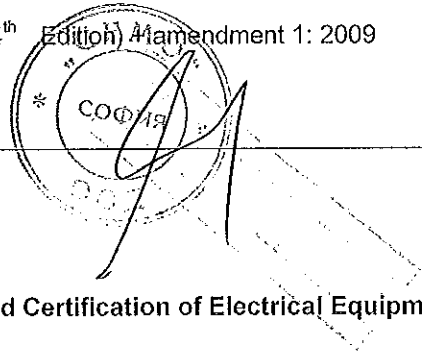
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Test Report issued under the responsibility of:

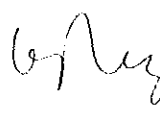
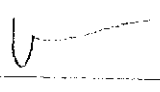
KEMA Quality
a DEKRA company

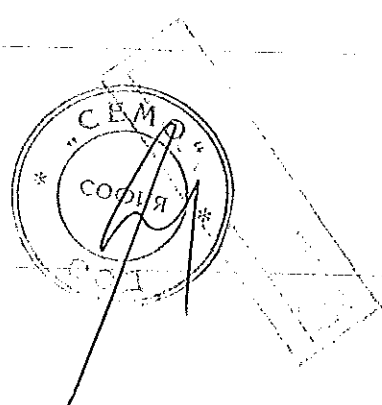
TEST REPORT IEC 60947-2 Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	
Report Reference No.	W0808102.58
Date of issue	2010-08-11
Total number of pages	150 pages
CB Testing Laboratory	KEMA Quality Testing Services (Zhejiang) Co.,Ltd.
Address	No.5 Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P. R. China
Applicant's name	Zhejiang CHINT Electrics Co., Ltd.
Address	No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China
Test specification:	
Standard	IEC 60947-2:2006 (4 th Edition) Amendment 1: 2009
Test procedure	CB
Non-standard test method	N/A
Test Report Form No.	IEC60947_2F
Test Report Form(s) Originator	KEMA Quality BV
Master TRF	Dated 2010-01
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Test item description	Moulded-case circuit-breaker
Trade Mark	CHINT
Manufacturer	Zhejiang CHINT Electrics Co., Ltd. No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China
Model/Type reference	NM1-250S/4300, NM1-250S/3300, NM1-250C/4300, NM1-250C/3300
Ratings	See Page 5, 6, 7, 8



202

Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory:	KEMA Quality Testing Services (Zhejiang)Co.,Ltd
Testing location/ address	No.5, Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P.R.China
<input type="checkbox"/> Associated CB Laboratory:	N/A
Testing location/ address	N/A
Tested by (name + signature).....	King Wang 
Approved by (+ signature).....	Fred Fu i.e. Eric Wang 
<input type="checkbox"/> Testing procedure: TMP	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: WMT	N/A
Tested by (name + signature).....	N/A
Witnessed by (+ signature).....	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: SMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: RMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A



 203  

Summary of testing:

The circuit breakers of NM1-250S and NM1-250C are fully identical except the short circuit capacities and type references marked on the labels. Therefore, the tests conducted on NM1-250S (with maximum rated short-circuit breaking capacity) are deemed to cover the tests on NM1-250C.

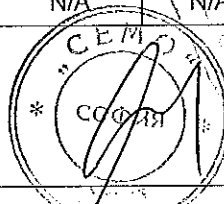
Tests performed (name of test and test clause):

Model	Rated current	Test voltage	Number of poles	Seq I	Seq II	Seq III 3 phases test	Seq III 1 phase + N test
NM1-250S/3300	250 A	690 Vac	3P	X	X	X	N/A
	250 A	415 Vac		N/A	X	X	N/A
	250 A	240 Vac		N/A	X	X	N/A
	100 A			N/A	X	X	N/A
NM1-250S/4300	250 A	690 Vac	3P + N	X	N/A	X	X
	250 A	415 Vac		N/A	N/A	X	X
	250 A	240 Vac		N/A	N/A	X	X
	100 A			N/A	N/A	X	X

Note:

X means the test was conducted

N/A means the test is not applicable



Testing location:

All tests except test of rated service short-circuit breaking capacity at 240 Vac, 415 Vac and seq III were conducted in:

KEMA Quality Testing Services (Zhejiang) Co., Ltd.

No.5 Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P. R. China.

Tests of rated service short-circuit breaking capacity at 240 Vac, 415 Vac and seq III were conducted in:

TILVA - 505 Wu Ning Road, Shanghai,

P.R. China

Summary of compliance with National Differences:

The MCCBs comply with EN Group Differences.

Handwritten signatures and initials: 04, 204, and other illegible marks.

Test item particulars: test item vs. test requirements	
3. Classification	
3.1. Utilization category: (A or B).....	A
3.2. Interruption medium: (air, vacuum, gas Break).....	Air
3.3. Design: (open construction, moulded case).....	Moulded case
3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power).....	Independent manual
3.5. Suitability for isolation: (suitable, not -suitable).....	Suitable
3.6. Provision for maintenance: (maintainable, non maintainable).....	Non-maintainable
3.7. Method of installation: (fixed, plug in, withdrawable.....)	Fixed
3.8. Degree of protection: (IP code).....	N/A
4.7. Type of release (thermo-magnetic / electronic).....	Thermo-magnetic
4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD.....	N/A
7.3 Electromagnetic compatibility (EMC) Environment A or B	A
Circuit-breaker for use on phase-earthed systems	N/A
Circuit-breaker for use in IT systems	N/A
Rated and limiting values, main circuit:	
- rated operational voltage: U_e (V).....	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac
- rated insulation voltage: U_i (V).....	800 V
- rated impulse withstand voltage: U_{imp} (kV).....	8 kV
- rated operational current: I_e (A).....	100 A, 125 A, 140 A, 150 A, 160 A, 175 A, 180 A, 200 A, 225 A, 250 A
- kind of current.....	AC
- conventional free air thermal current: I_{th} (A).....	100 A, 125 A, 140 A, 150 A, 160 A, 175 A, 180 A, 200 A, 225 A, 250 A
- conventional enclosed thermal current: I_{the} (A).....	N/A
- current rating for four-pole circuit-breakers: (A)	100 A, 125 A, 140 A, 150 A, 160 A, 175 A, 180 A, 200 A, 225 A, 250 A
- number of poles.....	3P for the MCCBs with type reference '3300' 3P + N (N pole do not have protection) for the MCCBs with type reference '4300'



E 206 *J* *AK*

Copy of marking plate:

NM1-250S/4300

IEC60947-2
EN60947-2 **In=250A**

Ui: 800V IT
Ue:690V 50Hz/60Hz

+40 °C
Cat A

Ii=10In

Ue(V)	Icu(kA)
380	25
400	25
415	25
690	5
Ics=50%Icu	

220	42
230	42
240	42
690	5
Ics=50%Icu	

ZHEJIANG CHINT ELECTRICS CO., LTD

NM1-250S/3300

IEC60947-2
EN60947-2 **In=250A**

Ui: 800V IT
Ue:690V 50Hz/60Hz

+40 °C
Cat A

Ii=10In

Ue(V)	Icu(kA)
380	25
400	25
415	25
690	5
Ics=50%Icu	

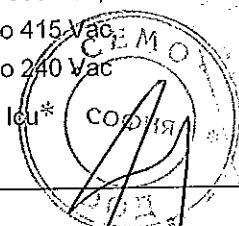
220	42
230	42
240	42
690	5
Ics=50%Icu	

ZHEJIANG CHINT ELECTRICS CO., LTD

C

(

- rated frequency: (Hz)	50 / 60 Hz
- integral fuses (rated values).....	N/A
Rated duty :	
- eight-hour duty.....	N/A
- uninterrupted duty: Iu (A)	100 A, 125 A, 140 A, 150 A, 160 A, 175 A, 180 A, 200 A, 225 A, 250 A
Short-circuit characteristic :	
rated short-time making capacity: Icm (kA)	NM1-250S: 7,5 kA up to 690 Vac, 52,5 kA up to 415 Vac, 88,2 kA up to 240 Vac NM1-250C: 7,5 kA up to 690 Vac, 40 kA up to 415 Vac, 52,5 kA up to 240 Vac
rated ultimate short-circuit breaking capacity: Icu (kA)	NM1-250S: 5 kA up to 690 Vac, 25 kA up to 415 Vac, 42 kA up to 240 Vac NM1-250C: 5 kA up to 690 Vac, 20 kA up to 415 Vac, 25 kA up to 240 Vac
rated service short-circuit breaking capacity: Ics (kA)	Ics = 50% Icu*
rated short-time withstand current: Icw (kAs)	N/A



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207

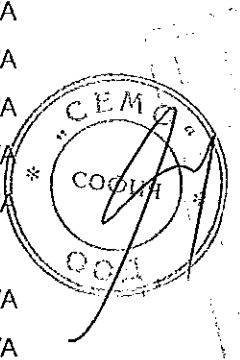
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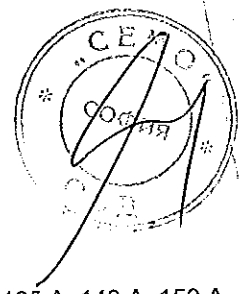
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Control circuits :	
Electrical control circuits :	
- kind of current: (AC, DC).....	: N/A
- rated frequency: (Hz)	: N/A
- rated control circuit voltage: Uc (nature, frequency, V) ..	: N/A
- rated control supply voltage: Us (nature, frequency V) ..	: N/A
Air supply control circuits: (pneumatic or electro-pneumatic) :	
- rated pressure and its limit.....	: N/A
- volumes of air, at atmospheric pressure, required for each closing and each opening operation	: N/A
Auxiliary circuits :	
Rated and limiting values, auxiliary circuits:	
- rated operational voltage Ue (V).....	: N/A
- rated insulation voltage: Ui (V).....	: N/A
- rated operational current: Ie (A).....	: N/A
- kind of current.....	: N/A
- rated frequency: (Hz)	: N/A
- number of circuits	: N/A
- number and kind of contact elements	: N/A
- rated uninterrupted current: Iu (A)	: N/A
- utilization category: (AC, DC, current and voltage).....	: N/A
Short-circuit characteristic :	
- Rated conditional short-circuit current (kA)	: N/A
- kind of protective device.....	: N/A



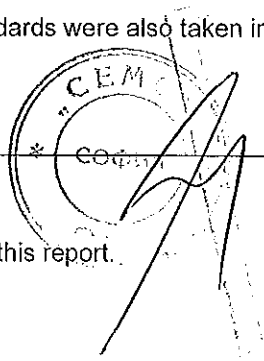
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Releases :	
1) shunt release.....	: N/A
2) Over-current release.....	: Yes
a) instantaneous.....	: Yes
b) definite time delay.....	: N/A
c) inverse time delay.....	: Yes
- independent of previous load.....	: N/A
- dependent on previous load; (for example thermal type release).....	: Yes, thermal type release
3) Undervoltage release (for opening).....	: N/A
4) Other releases.....	: N/A
Characteristics :	
1) Shunt release and undervoltage release (for opening) ..	: N/A
- rated control circuit voltage: Uc (nature, frequency, V) ..	: N/A
- kind of current ..	: N/A
- rated frequency: (if AC).....	: N/A
2) Over-current release.....	: Yes
- rated current.....	: 100 A, 125 A, 140 A, 150 A, 160 A, 175 A, 180 A, 200 A, 225 A, 250 A
- kind of current ..	: AC
- rated frequency: (if AC).....	: 50 / 60 Hz
- current setting (or range of settings) ..	: Inverse time delay release setting: 1,05 In, 1,3 In Instantaneous release setting: 10 In
- time settings (or range of settings).....	: Tripping time \geq 2 h (1,05 In) Tripping time $<$ 2 h (1,3 In) 10 In: Instantaneous

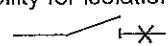

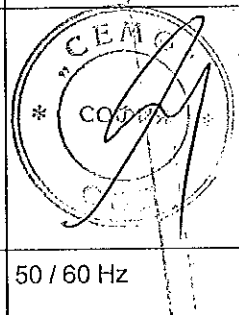


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Classification of installation and use.....	: Fixed
Supply Connection	: Prepared copper conductors (cable with lug)
Possible test case verdicts:	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
Testing	
Date of receipt of test item	: 2008-12
Date (s) of performance of tests	: 2009-02 ~ 2010-03
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 is used as the decimal separator.	
Although it is not mentioned on first page, the following standards were also taken into consideration, no deviation was found:	
- EN 60947-2: 2006 +A1: 2009	
General product information:	
The technical data of the MCCB are listed on page 5 to 8 of this report.	
The factory name and address:	
Zhejiang CHINT Electric Co., Ltd. No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China	



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		
a)	The following data shall be marked on the circuit-breaker itself or on a name plate or nameplates attached to the circuit-breaker, and located in a place such that they are visible and legible when the circuit-breaker is installed.		
	- rated current:	250 A	P
	- suitability for isolation, if applicable, with the symbol 	Suitability for isolation	P
	- indication of the open and closed position: with O and I respectively, if symbols are used		P
b)	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark	CHINT	P
	- type designation or serial number	NM1-250S	P
	- IEC 60947-2 if the manufacturer claims compliance with this standard.		P
	- utilization category	A	P
	- rated operational voltage(s) Ue	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	P
	- Circuit-breaker for use in IT systems: Circuit-breaker for which all values of rated voltage have not been tested according to annex H or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		P
	- value (or range) of the rated frequency and/or the indication DC (or symbol)	50 / 60 Hz	P
	- rated service short-circuit breaking capacity. Ics	Ics = 50% Icu	P
	- rated ultimate short-circuit breaking capacity. Icu	5 kA up to 690 Vac, 25 kA up to 415 Vac, 42 kA up to 240 Vac	P
	- rated short-time withstand current, (Icw) and associated short-time delay, for utilization category B		N/A

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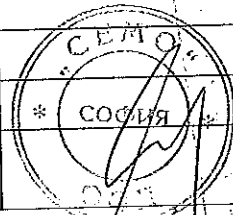
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- line and load terminals, unless their connection is immaterial	LINE / LOAD marked	P
	- neutral pole terminals, if applicable, by the letter N	N marked	P
	- protective earth terminal, where applicable, by the symbol acc. 7.1.9.3 of part 1		N/A
	- ref. temperature for non-compensated thermal releases, if different from 30°C	40 °C	P
c)	Marked on the circuit-breaker as specified in item b), or shall be made available in the manufacturer's published information:		
	- rated short-circuit making capacity (I _{cm}) (if higher than specified in 4.3.5.1)		N/A
	- rated insulation voltage. (U _i) if higher than the maximum rated operational voltage)	800 V	P
	- rated impulse withstand voltage (U _{imp}), when declared.	8 kV	P
	- pollution degree if other than 3		N/A
	- conventional enclosed thermal current (I _{the}) if different from the rated current:		N/A
	- IP Code, where applicable:		N/A
	- minimum enclosure size and ventilation data (if any) to which marked ratings apply:		N/A
	- details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure:	Front / Back: 0 mm, Left / Right : 50 mm, Top / Bottom: 50 mm	P
	- r.m.s sensing if applicable, according to F.4.1.1		N/A
	- suitability for environment A or B	A	P
d)	The following data concerning the opening and closing devices of the circuit-breaker shall be placed either on their own nameplates or on the nameplate of the circuit-breaker:		
	- rated control circuit voltage of the closing device, and rated frequency for AC:		N/A
	- rated control circuit voltage of the shunt release and/or of the under-voltage release, and rated frequency:		N/A
	- rated current of indirect over-current releases:		N/A




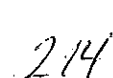



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- number and type of auxiliary contacts and kind of current, rated frequency (if AC) and rated voltages of the auxiliary switches, if different from those of the main circuit.		N/A
e)	Terminal shall be clearly and permanently identified in acc. with IEC 60445 and annex L :		
	- line terminal	LINE is marked	P
	- load terminal	LOAD is marked	P
	- neutral pole terminal "N"	N is marked	P
	- protective earth terminal 		N/A
	- terminal of coils (A/B)		N/A
	- terminal of shunt release (B)		N/A
	- terminals of under-voltage release (D)		N/A
	- terminals of interlocking electromagnets (E)		N/A
	- terminals of indicated light devices (X)		N/A
	- terminals of contact elements for switching devices (no)		N/A



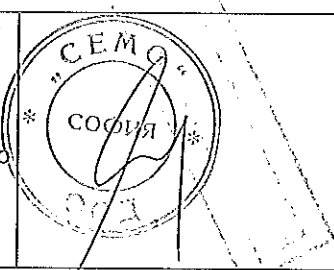
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.1	CONSTRUCTION		
7.1.1	Withdrawable circuit-breaker		N/A
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating warranted:		N/A
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		N/A
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed.		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position.		N/A
	The isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
7.1.2.1 part 1	Resistance to abnormal heat and fire	See appended table 12	P
7.1.3 part 1	Current-carrying parts and their connection		P
7.1.4	Clearances and creepage distances:		
	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		
	Clearances distances:		
	- Uimp is given as:	8 kV	
	- max. value of rated operational voltage to earth	600 V	
	- nominal voltage of supply system:	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	
	- overvoltage category:	III	
	- pollution degree:	3	
	- field-in or homogeneous:	Inhomogeneous field	
	- minimum clearances (mm):	8 mm	

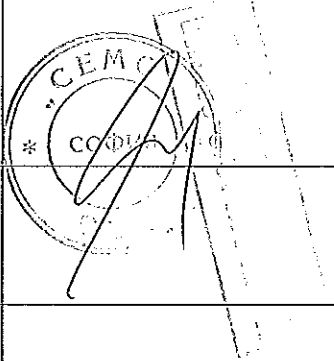





IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- measured clearances (mm):	13,9 mm	P
	Creepage distances:		
	- rated insulation voltage U_i (V)	800 V	
	- pollution degree	3	
	- comparative tracking index (V)	175 V	
	- material group	IIIa	
	- minimum creepage distances (mm)	12,5 mm	
	- measured creepage distances (mm)	16,2 mm	P
7.1.5 part 1	Actuator		
7.1.5.1 part 1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage		P
	If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation		N/A
	If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		N/A
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "I" and "O" positions and the direction of operation		P
7.1.6 part 1	Indication of contact position		
7.1.6.1 part 1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	This is done by means of a position indicating device (see 2.3.18)		N/A
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417-2:		
	- 60417-2-IEC-5007 I On (power)		P
	- 60417-2-IEC-5007 O Off (power)		P
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O"		N/A
	Red colour shall not be used for any other push-button		P
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		N/A
7.1.6.2 part 1	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		P
7.1.7	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation (Ue > 50 V):		
	Equipment suitable for isolation shall provide in the open position an isolation distance in acc. with the requirements necessary to satisfy the isolating function. Indication of the main contacts shall be provide by one or more of the following means:		
	- the position of the actuator		P
	- a separate mechanical indicator		N/A
	- visibility of the moving contacts		N/A
	When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking		P
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) :	8 mm	
	- measured clearances (mm) :	17,1 mm	P
	- test Uimp across gap (kV) :	12,3 kV	P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		
	auxiliary switch shall be rated according to IEC 60 947-5-1		N/A
	If equipment suitable for isolation is provided with an auxiliary switch for the purpose of electrical interlocking with contactor (s) or circuit-breaker(s) and intended to be used in motor circuits, the following requirements shall apply unless the equipment is rated for AC-23 utilization category		N/A
	The time interval between the opening of the contacts of the auxiliary switch and the contacts of the main poles shall be sufficient to ensure that the associated contactor or circuit-breaker interrupts the current before the main poles of the equipment open		N/A
	Unless otherwise stated in the manufacturer's technical literature, the time interval shall be not less than 20 ms when the equipment is operated according to the manufacturer instructions		N/A
	Compliance shall be verified by measuring the time interval between the instant of opening of the auxiliary switch and the instant of opening of the main poles under no-load conditions when the equipment is operated according to the manufacturer's instructions		N/A
	During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles		N/A



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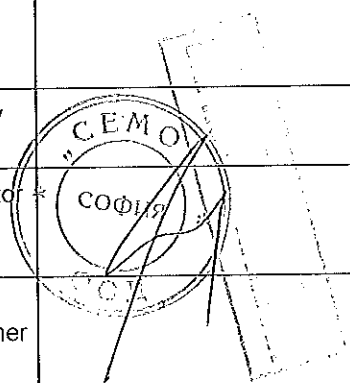



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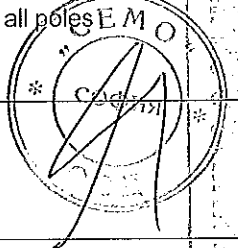
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed		N/A
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		
	the locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed		N/A
	Alternatively, the design may provide padlockable means to prevent access to the actuator		N/A
	test force F applied to the actuator in an attempt to operate to the closed position (N) :		N/A
	rated impulse withstand voltage (kV) :		N/A
	test Uimp on open main contacts at the test force		N/A
7.1.8	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Terminal connections shall be such that necessary contact pressure is maintained		P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value		P
7.1.8.2	Connection capacity		
	type of conductors :	Prepared cable (with cable lug)	P
	minimum cross-sectional area of conductor (mm ²) :	16 mm ²	P
	maximum cross-sectional area of conductor (mm ²) :	120 mm ²	P
	number of conductors simultaneously connectable to the terminal :	1	P



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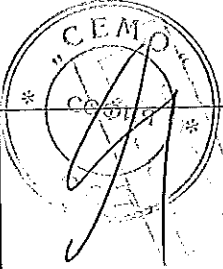

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.8.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		
	terminal intended exclusively for the neutral conductor	N is marked	P
	protective earth terminal		N/A
	other terminals		N/A
7.1.9 part 1	Additional requirements for equipment provided with a neutral pole		
	When equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.).	N is marked	P
	A switched neutral pole shall break not before and shall make not after the other poles		P
	For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles		N/A
	For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher	The value of conventional thermal current is identical for all poles	N/A
	if a pole with an appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, shall operate substantially together.		N/A
7.1.10	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor		N/A

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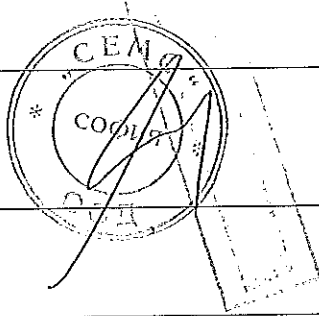
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
part 1	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly		N/A
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts		N/A
7.1.10.2 part 1	Protective earth terminal		
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 2.1.1.5 – Note). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		N/A
7.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, or PEN, as applicable, in accordance with IEC 60445, subclause 5.3, or, in the case of PEN, by a graphical symbol for use on equipment		N/A
	Graphical symbol to be used: 60417-2-IEC-5019  Protective earth (ground) in accordance with IEC 60417-2		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.11	Enclosure for equipment		
7.1.11.1	Design		
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it shall not be possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure		N/A
7.1.12	Degree of protection of enclosed equipment		
	Degree of protection.	IPXX	
	Test for first characteristic.	IPXX	

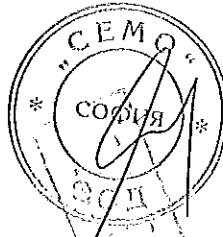
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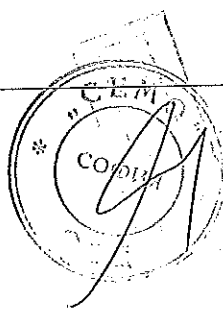
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for first numeral :	1 2 3 4 5 6	N/A
	Test for second characteristic	IPXX	
	Test for second numeral :	1 2 3 4 5 6 7 8	N/A
7.1.13 part 1	Conduit pull-out, torque and bending with metallic conduits		
	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	Performance requirements		
7.2.1	Operating condition		
7.2.1.1	Closing		
	For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity		P
7.2.1.1.1	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation		N/A
	Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA		N/A
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
7.2.1.1.2	Independent manual closing		
	A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
7.2.1.1.3	Dependent power closing		
	At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A

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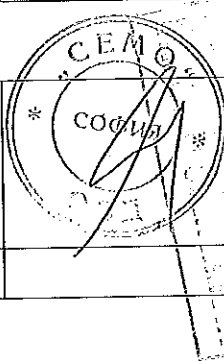
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit.		N/A
7.2.1.1.4	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		N/A
	Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification		N/A
7.2.1.1.5	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		N/A
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		N/A
	- means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control supply voltage.		N/A
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		N/A
	- by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.)		N/A
	- For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker.		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2	Opening		
7.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and, unless otherwise agreed between manufacturer and user, shall have their energy for the tripping operation stored prior to the completion of the closing operation		
7.2.1.2.2	Opening by undervoltage releases		
7.2.1.3. a part 1	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		N/A
	An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value		N/A
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		N/A
7.2.1.3. b part 1	Operating time		
	For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment		N/A
7.2.1.2.3	Opening by shunt releases		N/A
7.2.1.4 part 1	Limits of operation of shunt releases		
	A shunt release for opening shall cause tripping under all operating conditions of an equipment when the supply voltage of the shunt release measured during the tripping operation remains between 70% and 110% of the rated control supply voltage and, if a.c., at the rated frequency		N/A

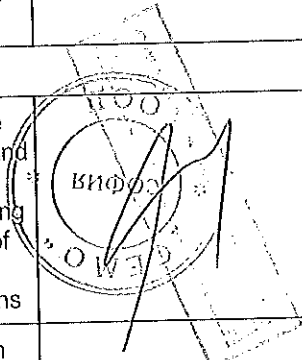





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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.5 part 1	Limits of operation of current operated relays and released		
	Limits of operation of current operated relays and releases shall be stated in the relevant product standard		P
7.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release		P
	Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing		N/A
	- maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical)		N/A
	- I^2t characteristics for circuit-breakers of utilization category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 8.3.5)		N/A
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of $\pm 10\%$ of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature		P
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later		P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K		N/A
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		N/A
7.2.4.2	Operational performance capability		
7.2.4.2 part 1	The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations		P
	The operational performance on-load during which the equipment shall make and break the specified current corresponding, where relevant, to its utilization category for the number of operations stated in the relevant product standard		P

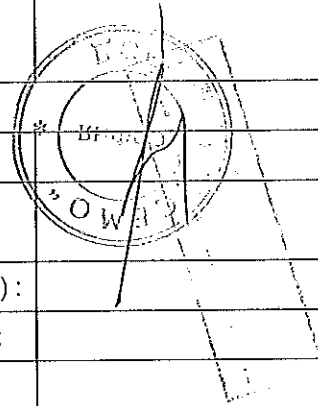
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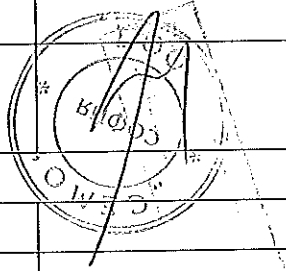
8	TESTS		
8.2.4	Mechanical properties of terminals		
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm ²) :	120 mm ²	
	diameter of thread (mm) :	8 mm	
	torque (Nm) :	6 Nm	
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest cross-sectional area (mm ²) :		
	number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		



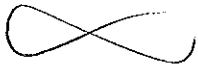
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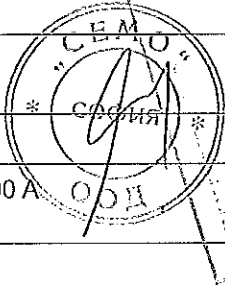
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest and smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest cross section, number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A



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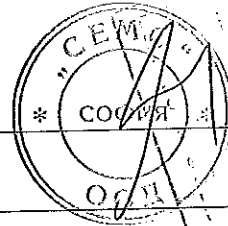


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Clause	Requirement + Test	Result - Remark	Verdict

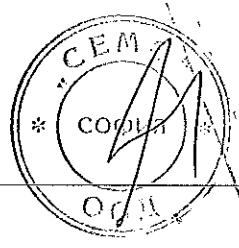
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-250S/3300	
	Sample no:	155#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	250 A	
	Ambient temperature 10-40 °C :	25,5 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 In for instantaneous tripping 12 In for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	2000 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: 0,2 s non-tripping L1-L3: 0,2 s non-tripping L2-L3: 0,2 s non-tripping N-Lx:		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	3000 A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: 8 ms L1-L3: 8 ms L2-L3: 8 ms N-Lx:		P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A



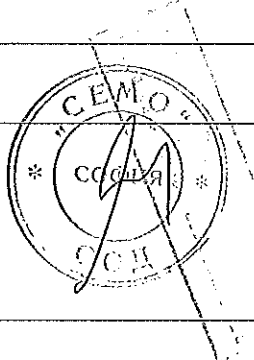
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	3000 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: 19 ms L2: 9 ms L3: 19 ms N:		P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A



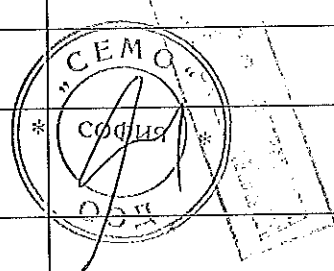


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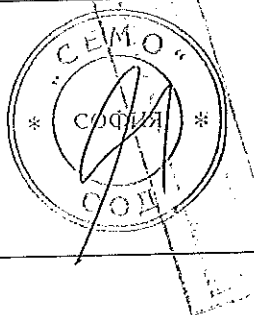
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		






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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-250S/3300	
	Sample no:	155#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	250 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermo-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermo-magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	262,5 A	P

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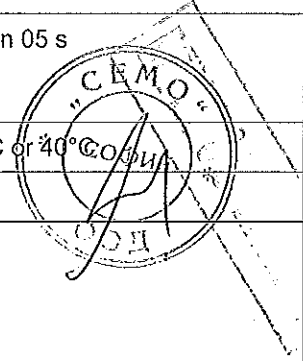
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	325 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	2 min 47 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Thermo-magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	500 A (200% I_n) specified tripping time by the manufacturer: $60 s \leq t \leq 540 s$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 05 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A



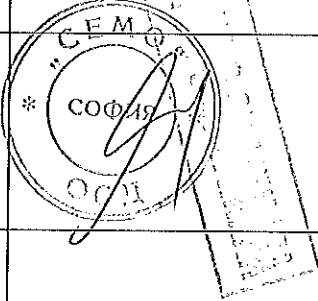
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or <u>minimum adjustable setting current</u> : (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s). L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

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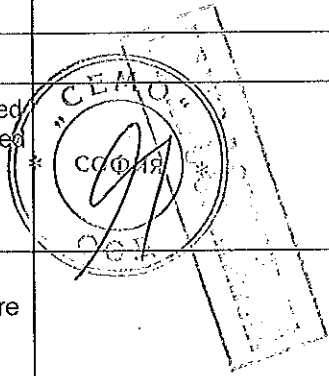
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases</u> (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A





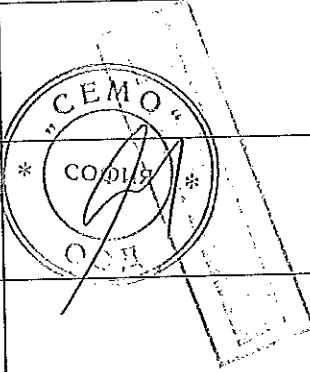
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip:</u> (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip:</u> (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	12,3 kV	P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A







IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.6		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	155#	
	Rated current I_n (A)	250 A	
	Rated operational voltage: U_e (V)	690 Vac	
	Rated control supply voltage of closing mechanism: U_c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: U_c (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: U_c (V)	No undervoltage releases	
	Ambient temperature 10-40 $^{\circ}\text{C}$:	23,7 $^{\circ}\text{C}$	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated U_c)	7000 cycles	P
	Number of cycles without current (without releases)	7000 cycles	P
	Applied voltage: closing mechanism (V)		N/A

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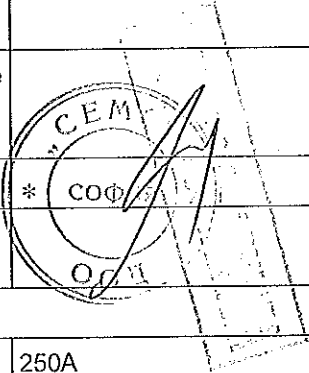
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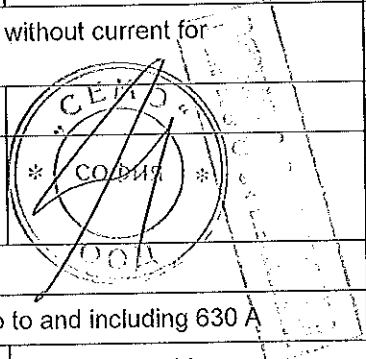
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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	250A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm^2) :	120 mm^2	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V) L1-L2: L2-L3: L3-L1:	693,4 Vac 693,7 Vac 693,7 Vac	P
	- test current $I/I_e = 1,0$ (A) L1: L2: L3:	259,4 A 260,2 A 258,9 A	P
	- power factor/time constant:	0,77	P

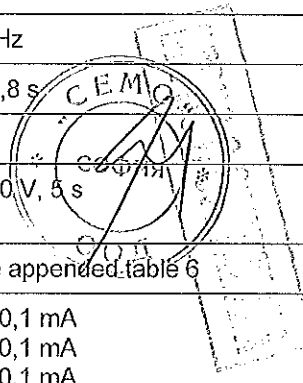


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	552,3 ms	P
	- off-time (s):	29,4 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	155#	
	Rated current In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	23,1 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Maximum rated operational voltage: Ue (V)	690 Vac	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A

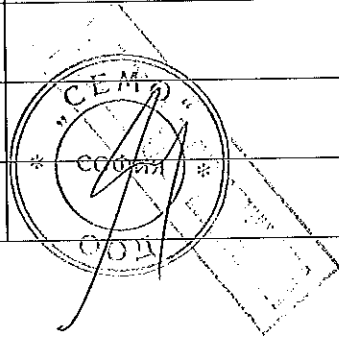


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, overload operations:		P
	- test voltage $U/U_e = 1,05$ (V) L1: L2: L3:	735,5 Vac 734,7 Vac 734,5 Vac	P
	- test current AC/DC: $I/I_e = 6,0/2,5$ (A) L1: L2: L3:	1549 A 1505 A 1512 A	P
	- power factor/time constant:	0,50	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	540,8 s	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 1	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 55,4 K	P
	conductor cross-sectional area (mm ²) :	120 mm ²	P
	test current I_e (A) :	250 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1,0 In)	P
	Conventional tripping time: <1h when $I_n < 63$ A, <2h when $I_n > 63$ A	2 min 03 s	P



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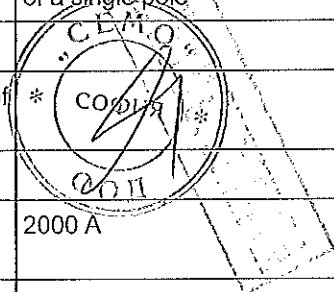
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	34 N	—
	test force with blocked main contacts for 10 s (N) :	102 N for 10 s	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P

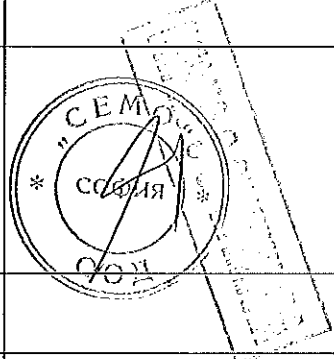


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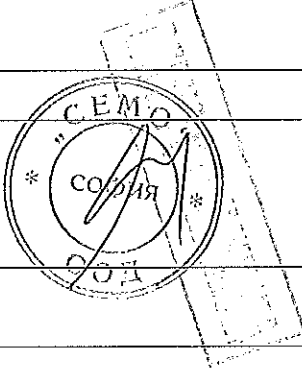
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-250S/4300	
	Sample no:	67#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	250 A	
	Ambient temperature 10-40 °C :	19,2 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 In for instantaneous tripping 12 In for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	2000 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	3000 A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: 15 ms L1-L3: 17 ms L2-L3: 10 ms N-Lx:		P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A

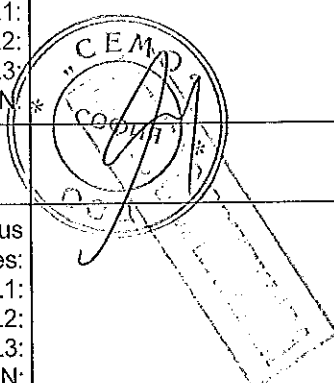
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	3000 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N:	72 ms 15 ms 18 ms	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A



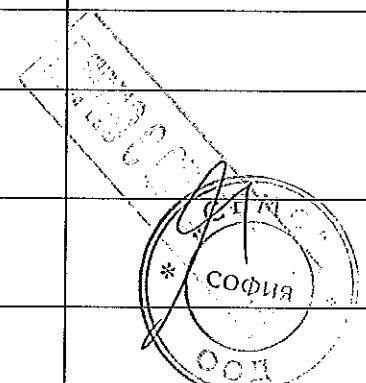



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		



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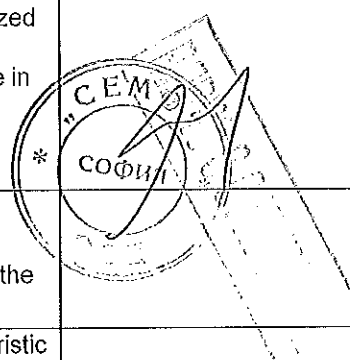
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A



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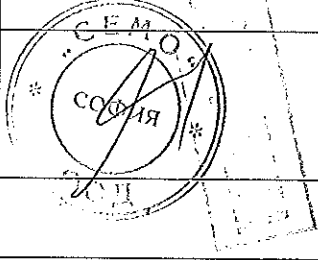
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-250S/4300	
	Sample no:	67#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	250 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermo-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermo-magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	262,5 A	P



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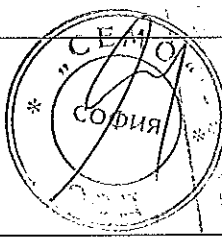
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	325 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	2 min 28 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Thermo-magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	500 A (200% I_n) specified tripping time by the manufacturer: $60 s \leq t \leq 540 s$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	3 min 51 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A

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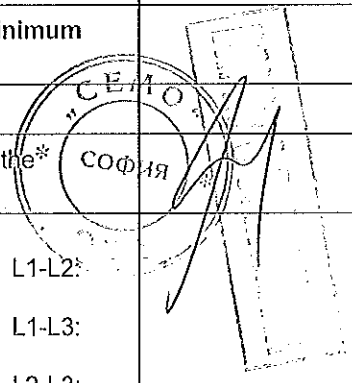
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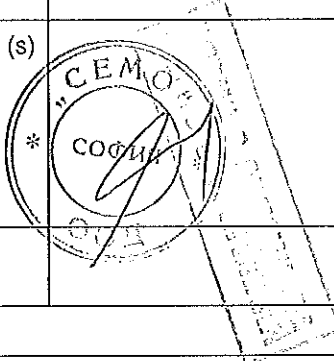
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	overload releases: (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	short-circuit releases		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

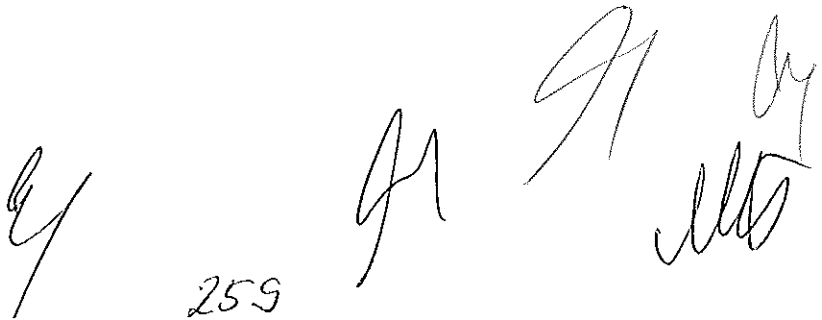


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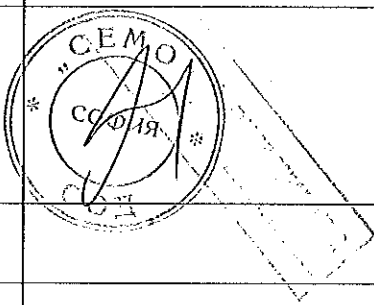
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A



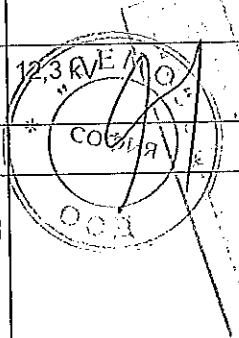
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip</u> : (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A

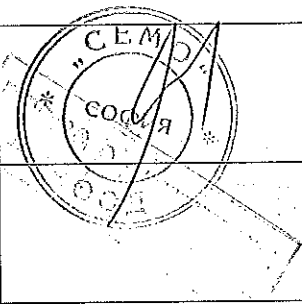







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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :		P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A

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 - A signature 'H' on the right.
 - A signature 'MS' on the far right.
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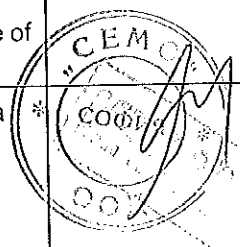
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA N: 0,1 mA	P
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A

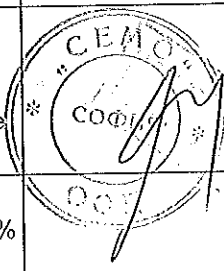





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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.6		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ °C} \pm 2\text{ °C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-250S/4300	
	Sample no:	67#	
	Rated current In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	20,4 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated Uc)	7000 cycles	P
	Number of cycles without current (without releases)	7000 cycles	P

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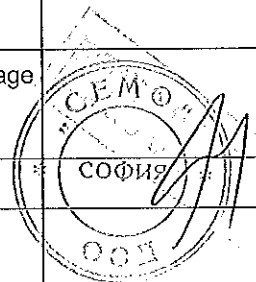
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Applied voltage: closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	250A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm^2) :	120 mm^2	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V)L1-L2:L2-L3:L3-L1:	692,5 Vac 693,6 Vac 693,5 Vac	P
	- test current $I/I_e = 1,0$ (A) L1: L2: L3:	258,4 A 257,2 A 253,9 A	P



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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant:	0,85	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	620,9 ms	P
	- off-time (s):	29,4 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-250S/4300	
	Sample no:	67#	
	Rated current In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	20,1 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Maximum rated operational voltage: Ue (V)	690 Vac	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		P
	- test voltage $U/U_e = 1,05$ (V) L1: L2: L3:	733,9 Vac 733,5 Vac 734,0 Vac	P
	- test current AC/DC: $I/I_e = 6,0/2.5$ (A) L1: L2: L3:	1509 A 1542 A 1554 A	P
	- power factor/time constant:	0,53	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	52,6 s	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U_e , and shall not exceed 2 mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA N: 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 2	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 72,1 K	P
	conductor cross-sectional area (mm ²) :	120 mm ²	P
	test current I_e (A) :	250 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1,0 I_n)	P

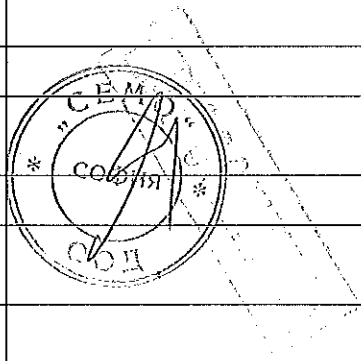




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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	2 min 24 s	P
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	50 N	—
	test force with blocked main contacts for 10 s (N) :	150 N for 10 s	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P



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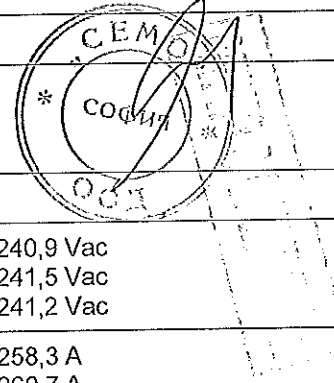
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	B68#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	21 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P






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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²):	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	260 Vac 261 Vac 260 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	21,3 kA 21,6 kA 22,0 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (A) :	45,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	19,8 kA 11,8 kA 16,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,68 MA ² s 359 kA ² s 872 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	16,7 kA 18,8 kA 9,16 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,08 MA ² s 1,29 MA ² s 325 kA ² s	P

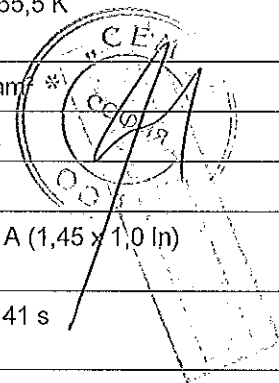
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	16,0 kA 14,8 kA 19,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	826 kA ² s 661 kA ² s 1,62 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	250 A	
	Maximum rated operational voltage: U _e (V)	240 Vac	
	Conductor cross-sectional area (mm ²) :	120 mm ²	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	240,9 Vac 241,5 Vac 241,2 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	258,3 A 260,7 A 258,0 A	P
	- power factor/time constant:	0,83	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	571,7 ms	P





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Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	29,4 s	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 3	P
	Temperature rise of main circuit terminals. ≤ 80 K (K):	Max: 65,5 K	P
	conductor cross-sectional area (mm ²):	120 mm ²	P
	test current I _e (A):	250 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 × 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	2 min 41 s	P



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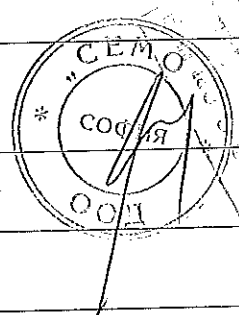
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

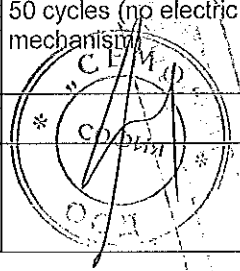
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O - t - CO - t - CO		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	69#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated service short-circuit breaking capacity: (kA)	2,5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P




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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	6 Nm	P
	Test sequence of operation: O - t - CO - t - CO		P
	- test voltage U/Ue = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	734,2 Vac 735,3 Vac 734,9 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	2549,2 A 2533,7 A 2601,6 A	P
	power factor/time constant :	0,87	P
	- Factor "n"	1,42	P
	- peak test current (A) :	3,88 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	2,19 kA 1,85 kA 3,19 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	18,7 kA ² s 11,9 kA ² s 11,8 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	2,93 kA 2,76 kA 2,49 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	15,6 kA ² s 10,6 kA ² s 10,0 kA ² s	P




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Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	2,72 kA 3,37 kA 2,31 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	9,97 kA ² s 20,5 kA ² s 7,97 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	250 A	
	Maximum rated operational voltage: U _e (V)	690 Vac	
	Conductor cross-sectional area (mm ²) :	120 mm ²	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	692,1 Vac 692,8 Vac 692,3 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	252,8 A 256,5 A 257,5 A	P
	- power factor/time constant:	0,82	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	526,5 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	29,5 s	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 8	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 4	P
	Temperature rise of main circuit terminals. ≤80 K (K) :	Max: 53,8 K	P
	conductor cross-sectional area (mm ²) :	120 mm ²	P
	test current Ie (A) :	250 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1,0 In)	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	2 min 46 s	P

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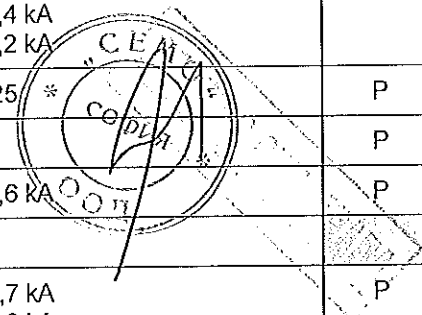
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	70#	
	Rated current: In (A)	100 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	21 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <math><30\text{mm}^2</math>		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A



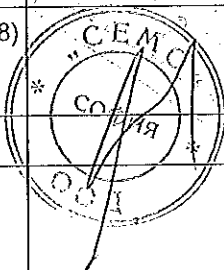


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	35 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	252 Vac 253 Vac 253 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	21,6 kA 21,4 kA 21,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (A) :	44,6 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	12,7 kA 17,3 kA 12,5 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	427 kA ² s 1,13 MA ² s 427 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	18,8 kA 16,7 kA 12,1 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	1,46 MA ² s 906 kA ² s 467 kA ² s	P
	Pause, t: (min)	3 min	P

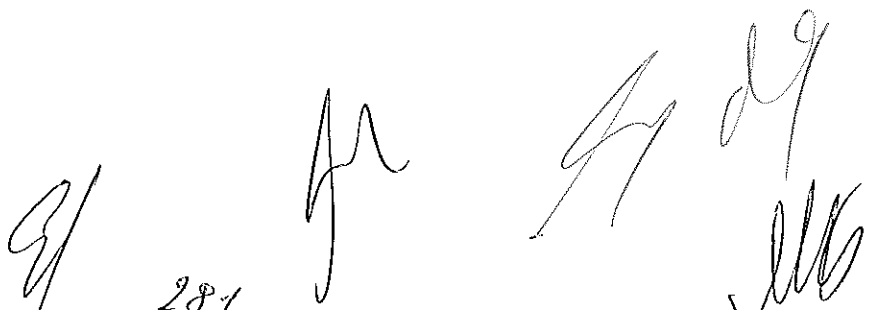


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	14,9 kA 11,3 kA 17,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	734 kA ² s 379 kA ² s 1,22 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)		
	Maximum rated operational voltage: U _e (V)		
	Conductor cross-sectional area (mm ²) :		
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)		N/A
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:		N/A
	- test current I/I _e = 1,0 (A) L1: L2: L3:		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤80 K (K) :		N/A
	conductor cross-sectional area (mm ²) :		N/A
	test current I _e (A) :		N/A
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	145 A (1,45×1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	11 min 33 s	P



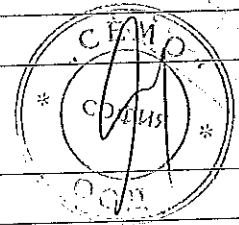
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	71#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	12,5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²):	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	435,7 Vac 436,4 Vac 437,4 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	12,56 kA 12,78 kA 12,64 kA	P
	power factor/time constant :	0,29	P
	- Factor "n"	2,0	P
	- peak test current (A) :	26,0 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	13,6 kA 14,7 kA 10,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	954,8 kA ² s 919,5 kA ² s 453,9 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	12,3 kA 12,8 kA 16,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	882,3 kA ² s 1,06 MA ² s 1,76 MA ² s	P
	Pause, t: (min)	3 min	P






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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	12,6 kA 16,7 kA 10,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	832,9 kA ² s 1,68 MA ² s 758,1 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	250 A	
	Maximum rated operational voltage: U _e (V)	415 Vac	
	Conductor cross-sectional area (mm ²) :	120 mm ²	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	416,5 Vac 417,4 Vac 417,7 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	254,3 A 257,5 A 253,2 A	P
	- power factor/time constant:	0,84	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	495,3 ms	P
	- off-time (s):	29,5 s	P

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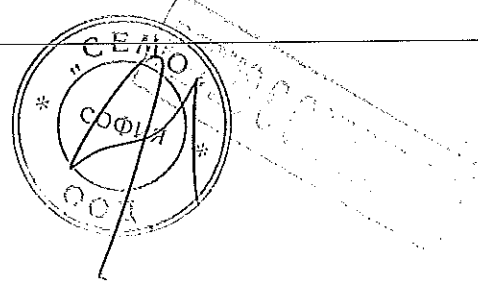
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 5	P
	Temperature rise of main circuit terminals. ≤80 K (K) :	Max: 70,7 K	P
	conductor cross-sectional area (mm ²) :	120 mm ²	P
	test current I _e (A) :	250 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	14 min 33 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II/III (Ics=Icu):		N/A



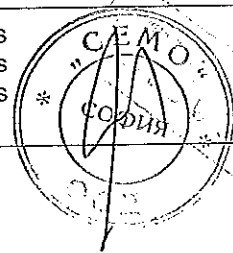
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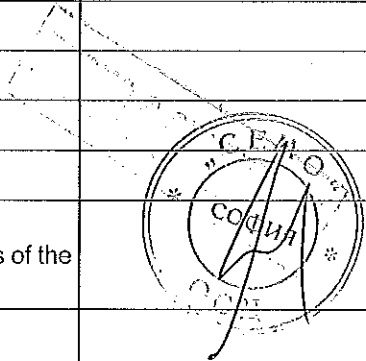
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	78#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 204 s	P
	L2: 175 s	
	L3: 188 s	
	N :	



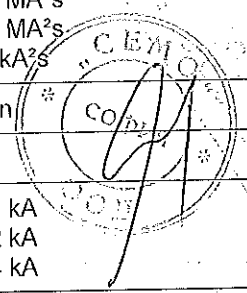
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 253 Vac L2-L3: 254 Vac L3-L1: 254 Vac	P



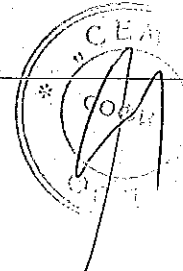
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	43,0 kA 43,7 kA 43,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (A _{max}) :	90,4 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,7 kA 27,0 kA 17,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,30 MA ² s 2,53 MA ² s 617 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	17,1 kA 22,2 kA 25,4 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	985 kA ² s 2,27 MA ² s 1,70 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 97 s L2: 79 s L3: 80 s N:	P



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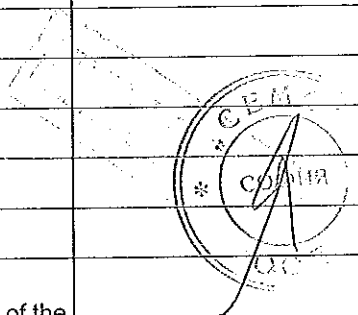
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	79#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 191 s	P
	L2: 172 s	
	L3: 189 s	
	N :	

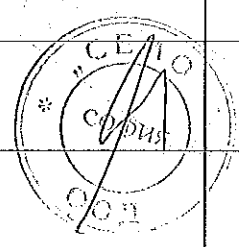


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)	L1-L2: 730,4 Vac.....L2-L3: 730,5 Vac.....L3-L1: 731,2 Vac	P

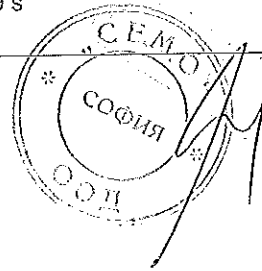


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	5,19 kA 5,23 kA 5,18 kA	P
	power factor/time constant :	0,68	P
	- Factor "n"	1,5	P
	- peak test current (Amax) :	8,11 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	7,96 kA 7,19 kA 7,31 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	327,1 kA ² s 296,5 kA ² s 277,5 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	8,04 kA 7,25 kA 7,27 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	331,6 kA ² s 311,3 kA ² s 281,4 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P



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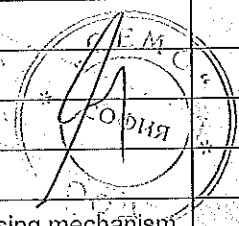
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1: 101 s L2: 83 s L3: 59 s N:		P



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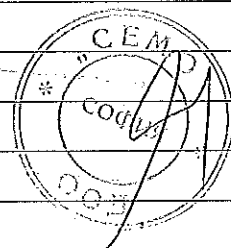
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	80#	
	Rated current: In (A)	100 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 165 s L2: 143 s L3: 153 s N:	P



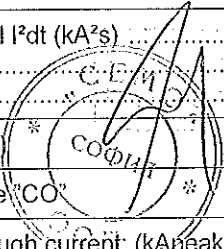
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	35 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 261 Vac	P



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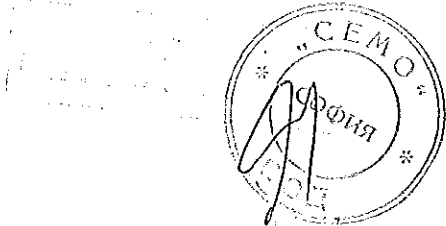
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	23,2 kA 13,0 kA 17,3 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	1,70 MA ² s 314 kA ² s 897 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	23,7 kA 18,6 kA 17,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	1,99 MA ² s 799 kA ² s 866 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 75 s L2: 59 s L3: 79 s N :	P



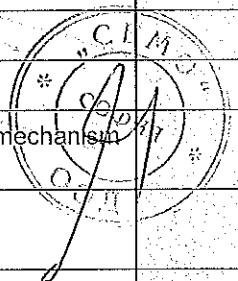
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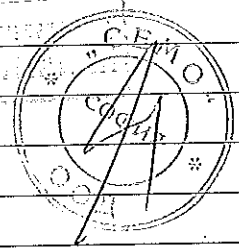
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/3300	
	Sample no:	81#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 318 s L2: 262 s L3: 288 s N :	P



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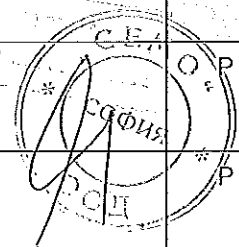
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)L1-L2:L2-L3:L3-L1:	450 Vac 450 Vac 450 Vac	P



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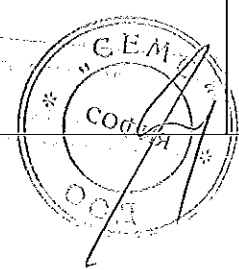
8

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	25,7 kA 25,1 kA 25,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	53,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	25,3 kA 11,5 kA 23,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,16 MA ² s 320 kA ² s 2,26 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	22,9 kA 25,1 kA 12,6 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	2,07 MA ² s 3,24 MA ² s 408 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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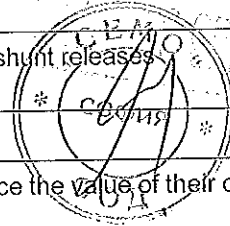
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s)		P
 L1:	285 s	
 L2:	184 s	
 L3:	211 s	
 N :		



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for 3 phases	
	Sample no:	B82#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 324 s L2: 271 s L3: 436 s N :	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1-L2:L2-L3:L3-L1:	260 Vac 260 Vac 260 Vac	P



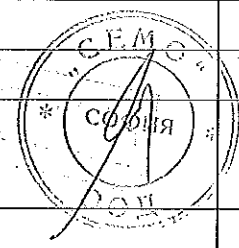
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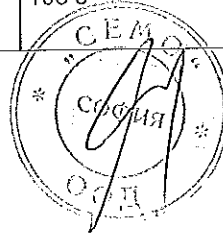
8

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	26,0 kA 14,3 kA 20,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,31 MA ² s 393 kA ² s 1,30 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	21,6 kA 19,7 kA 23,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,05 MA ² s 2,12 MA ² s 2,57 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 127 s L2: 93 s L3: 108 s N:	P



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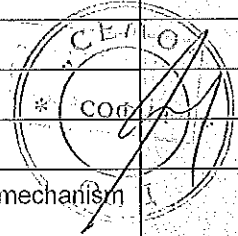
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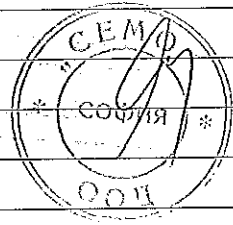
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for phase + N	
	Sample no:	187#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	232 s	P

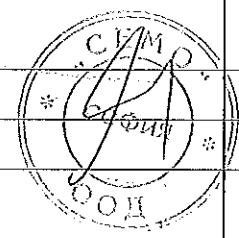


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)L1:L2:L3:	146 Vac	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	54,7 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	11,7 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	553 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	11,7 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	606 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P

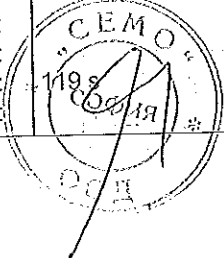


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N	119 s	P



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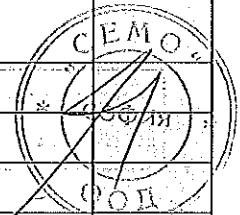
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

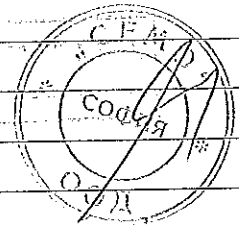
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for 3 phases	
	Sample no:	B156#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 415 s L2: 230 s L3: 232 s N :	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)	L1-L2: 726 Vac L2-L3: 725 Vac L3-L1: 726 Vac	P



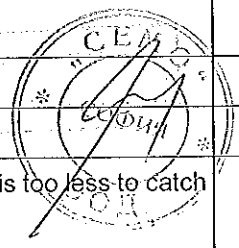
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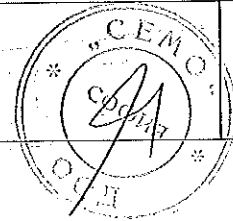
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	5,04 kA 5,10 kA 5,03 kA	P
	power factor/time constant :	0,70	P
	- Factor "n"	1,5	P
	- peak test current (Amax) :	7,81 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	6,69 kA 7,29 kA 5,98 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	218 kA ² s 290 kA ² s 246 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	The current is too less to catch	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	The current is too less to catch	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,2 mA L2: < 0,2 mA L3: < 0,2 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: 286 s L2: 92 s L3: 109 s N:		P



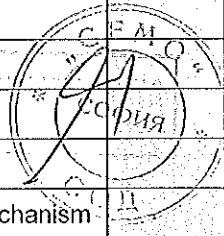
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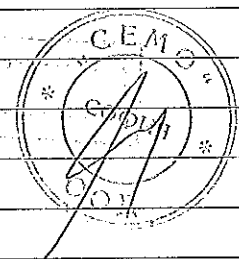
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for phase + N	
	Sample no:	184#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: L2: L3: 280 s N :	P

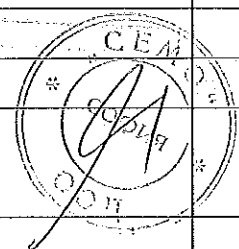


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) .....L1: .....L2: .....L3:	438 Vac	P



09

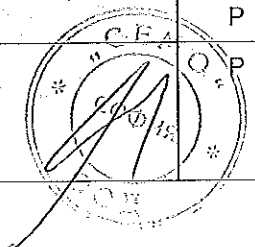
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1: .....L2: .....L3:	3,03 kA	P
	power factor/time constant :	0,90	P
	- Factor "n"	1,42	P
	- peak test current (Amax) :	4,35 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	4,30 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	185 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	4,30 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	170 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	143 s	P



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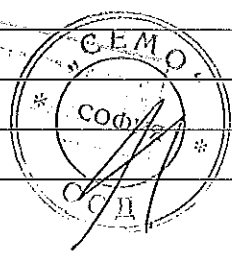
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for 3 phases	
	Sample no:	157#	
	Rated current: In (A)	100 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 206 s	P
	L2: 191 s	
	L3: 207 s	
	N :	

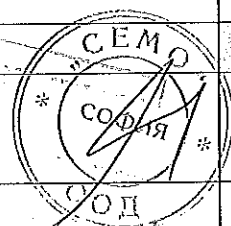
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm2		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm²) :	35 mm²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 260 Vac L2-L3: 260 Vac L3-L1: 260 Vac	P



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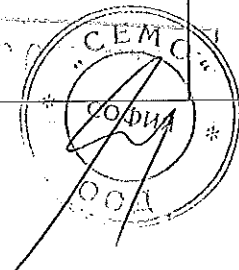
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	42,7 kA 43,0 kA 42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	22,3 kA 12,9 kA 17,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,68 MA ² s 311 kA ² s 917 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,2 kA 20,7 kA 15,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	1,79 MA ² s 1,13 MA ² s 813 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 93 s L2: 70 s L3: 84 s N:	P



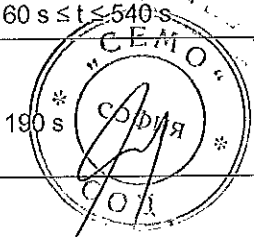
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for phase + N	
	Sample no:	185#	
	Rated current: In (A)	100 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)		P
 L1:		
 L2:		
 L3:		
 N:		

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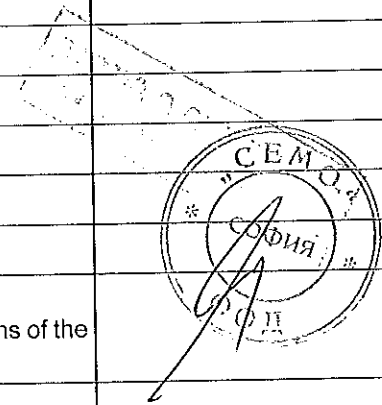
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	35 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1:L2:L3:	146 Vac	P

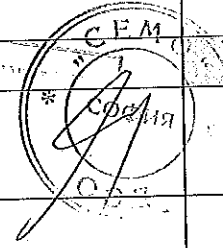


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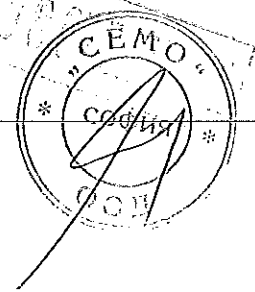
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	54,7 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	10,3 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	484 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	9,57 kA	P
	- Joule integral I ² dt (kA ² s) L1: .....L2: .....L3:	374 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	34 s	P



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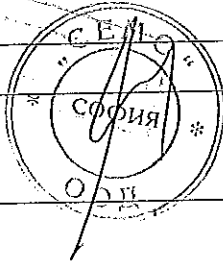
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for 3 phases	
	Sample no:	158#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 364 s	P
	L2: 534 s	
	L3: 244 s	
	N :	

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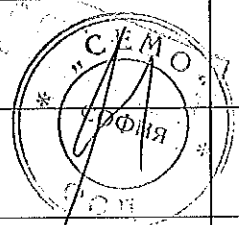
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²):	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)	L1-L2: 450 Vac L2-L3: 451 Vac L3-L1: 450 Vac	P

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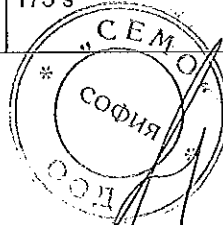
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	25,7 kA 25,1 kA 25,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	53,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	26,0 kA 12,0 kA 24,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	4,23 MA ² s 377 kA ² s 3,25 MA ² s	P
	Pause, t: (min)	3 min.	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	17,3 kA 24,8 kA 27,5 kA	P
	- Joule integral I ² dt (A ² s) L1: .....L2: .....L3:	923 kA ² s 2,51 MA ² s 4,30 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	190 s	P
 L2:	163 s	
 L3:	175 s	
 N:		



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-250S/4300 test for phase + N	
	Sample no:	B186#	
	Rated current: In (A)	250 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly		
	Time specified by the manufacturer:	60 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: L2: L3: N: 251 s	



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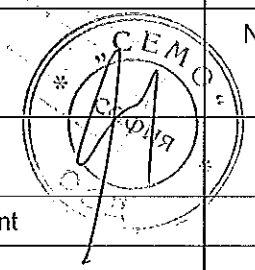
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :50 mm, Up / Down: 50 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	120 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1:L2:L3:	258 Vac	P



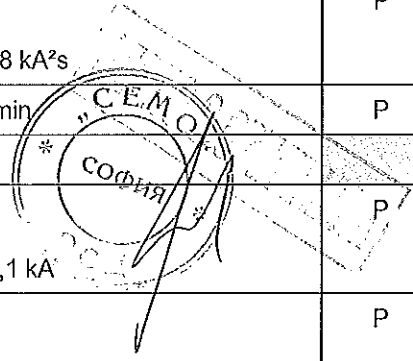
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	15,1 kA	P
	power factor/time constant :	0,30	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	30,4 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	13,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	848 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	14,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	770 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L3: < 0,2 mA N: < 0,2 mA	P



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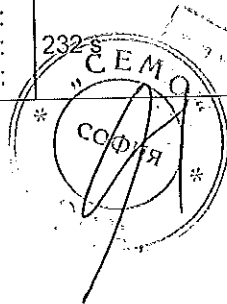
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	232 ^{ms}	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV		N/A
8.3.7	TEST SEQUENCE V		N/A
8.3.8	TEST SEQUENCE VI: Combined test sequence		N/A
Annex B	Circuit-breakers incorporating residual current protection		N/A
Annex C	Individual pole short-circuit test sequence		N/A
Annex F	Additional tests for circuit-breakers with electronic over-current protection		N/A
Annex H	Individual pole short-circuit test sequence		N/A
Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		N/A
Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		N/A
Annex M	Modular residual current devices (without integral current breaking device)		N/A
Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		N/A
Annex O	Instantaneous trip circuit-breakers (ICB)		N/A



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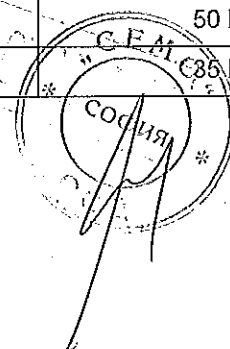
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	TABLE 1: Heating Test (Seq I, 8.3.3.6, sample number 155#)		P
	Test current (A):	250 A	—
	Ambient (°C):	22,8 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	47,9 K	80 K	
Load side Terminal 2	49,6 K	80 K	
Line side Terminal 3	53,7 K	80 K	
Load side Terminal 4	55,4 K	80 K	
Line side Terminal 5	46,3 K	80 K	
Load side Terminal 6	49,7 K	80 K	
Side enclosure	33,7 K	60 K	
Front enclosure	25,3 K	50 K	
Actuator	16,5 K	35 K	



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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 2: Heating Test (Seq I, 8.3.3.6, sample number 67#)			P
Test current (A):		250 A	—
Ambient (°C):		18,9 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	72,1 K	80 K	
Load side Terminal 2	54,9 K	80 K	
Line side Terminal 3	57,8 K	80 K	
Load side Terminal 4	51,8 K	80 K	
Line side Terminal 5	52,4 K	80 K	
Load side Terminal 6	43,4 K	80 K	
Line side Terminal N	52,4 K	80 K	
Load side Terminal N	55,9 K	80 K	
Side enclosure	31,6 K	60 K	
Front enclosure	24,2 K	50 K	
Actuator	15,4 K	35 K	

TABLE 3: Heating Test (Seq II, 8.3.4.4, sample number B68#)			P
Test current (A):		250 A	—
Ambient (°C):		20,8 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	55,8 K	80 K	
Load side Terminal 2	58,4 K	80 K	
Line side Terminal 3	63,3 K	80 K	
Load side Terminal 4	65,5 K	80 K	
Line side Terminal 5	60,7 K	80 K	
Load side Terminal 6	59,4 K	80 K	

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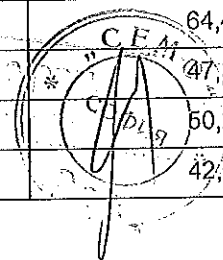
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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 4: Heating Test (Seq II, 8.3.4.4, sample number 69#)			P
Test current (A):		250 A	—
Ambient (°C):		18,9 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	53,8 K	80 K	
Load side Terminal 2	51,3 K	80 K	
Line side Terminal 3	45,2 K	80 K	
Load side Terminal 4	46,7 K	80 K	
Line side Terminal 5	44,6 K	80 K	
Load side Terminal 6	39,6 K	80 K	

TABLE 5: Heating Test (Seq II, 8.3.4.4, sample number 71#)			P
Test current (A):		250 A	—
Ambient (°C):		18,9 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	69,7 K	80 K	
Load side Terminal 2	70,7 K	80 K	
Line side Terminal 3	64,4 K	80 K	
Load side Terminal 4	47,3 K	80 K	
Line side Terminal 5	50,2 K	80 K	
Load side Terminal 6	42,1 K	80 K	



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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 6: dielectric strength (Seq I, 8.3.3.5, sample number 155# and 67#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

TABLE 7: dielectric strength (Seq II, 8.3.4.3, sample number B68#, 70# and 71#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

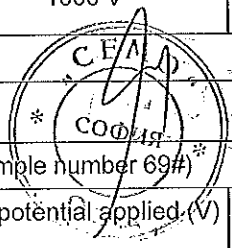


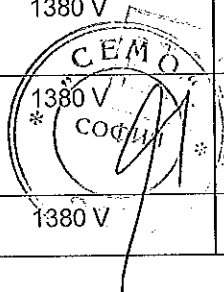
TABLE 8: dielectric strength (Seq II, 8.3.4.3, sample number 69#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 9: dielectric strength (Seq III, 8.3.5.3, sample number 78#, 80#, 81#, B82#, 157#, 158#, 185# and B186#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 10: dielectric strength (Seq III, 8.3.5.3, sample number 79#, B156# and 184#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			



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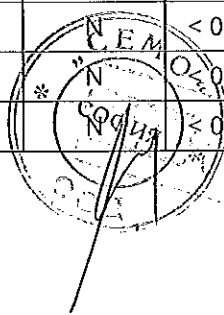
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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 11: clearance and creepage distance measurements						P
clearance cl and creepage distance dcr at/of:	Ui (V)	Uimp (kV)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Between poles	800 V	8 kV	8 mm	15,1 mm	12,5 mm	26,1 mm
Between live parts and parts intended to be earthed	800 V	8 kV	8 mm	18,2 mm	12,5 mm	18,2 mm
Between the contacts in the open position	800 V	8 kV	8 mm	17,1 mm	12,5 mm	45,0 mm
Between live parts and actuator	800 V	8 kV	8 mm	13,9 mm	12,5 mm	16,2 mm

TABLE 12: Resistance to fire (Glow wire test)							P
No.	Description	Colour	Temp. °C	burning after t (s)	drops	support burning	—
1	Base	Black	960 °C	0 s	N	N	P
2	Cover	White	960 °C.	0 s	N	N	P
3	Actuator	Black	960 °C	6 s	N	N	P
4	Leading lever	White	960 °C	2 s	N	N	P

TABLE 13: Resistance to tracking (tracking test)							P
Specimen							Verdict
Description	Colour	Drops (no.)	Thick (mm)	Burning	Current (A)	Test voltage (V)	
Base	Black	50	3 mm	N	< 0,5 A	175 V	P
Cover	White	50	3 mm	N	< 0,5 A	175 V	P
Handle	Black	50	3 mm	N	< 0,5 A	175 V	P
Leading lever	White	50	3 mm	N	< 0,5 A	175 V	P



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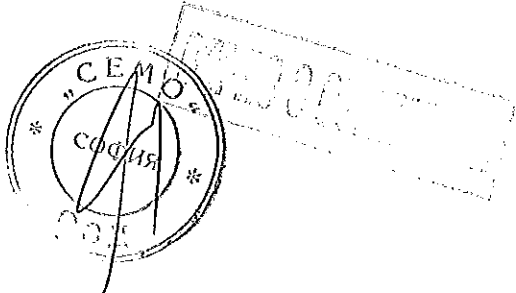
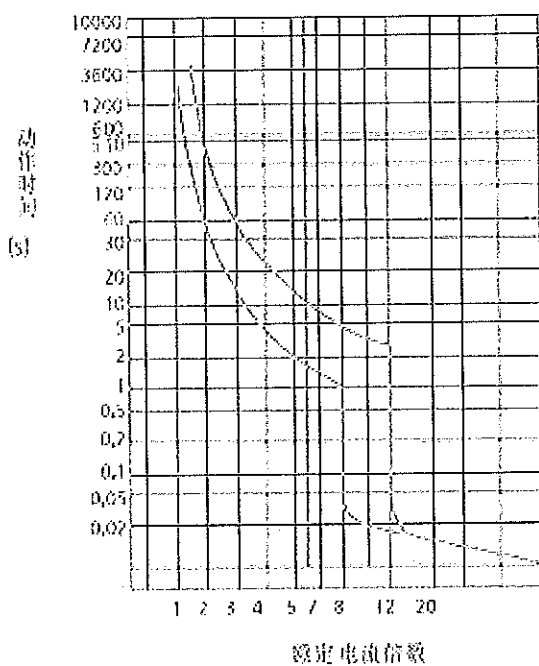
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Time current characteristics

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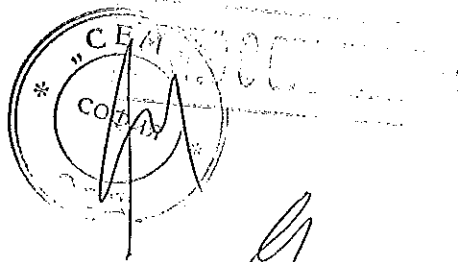
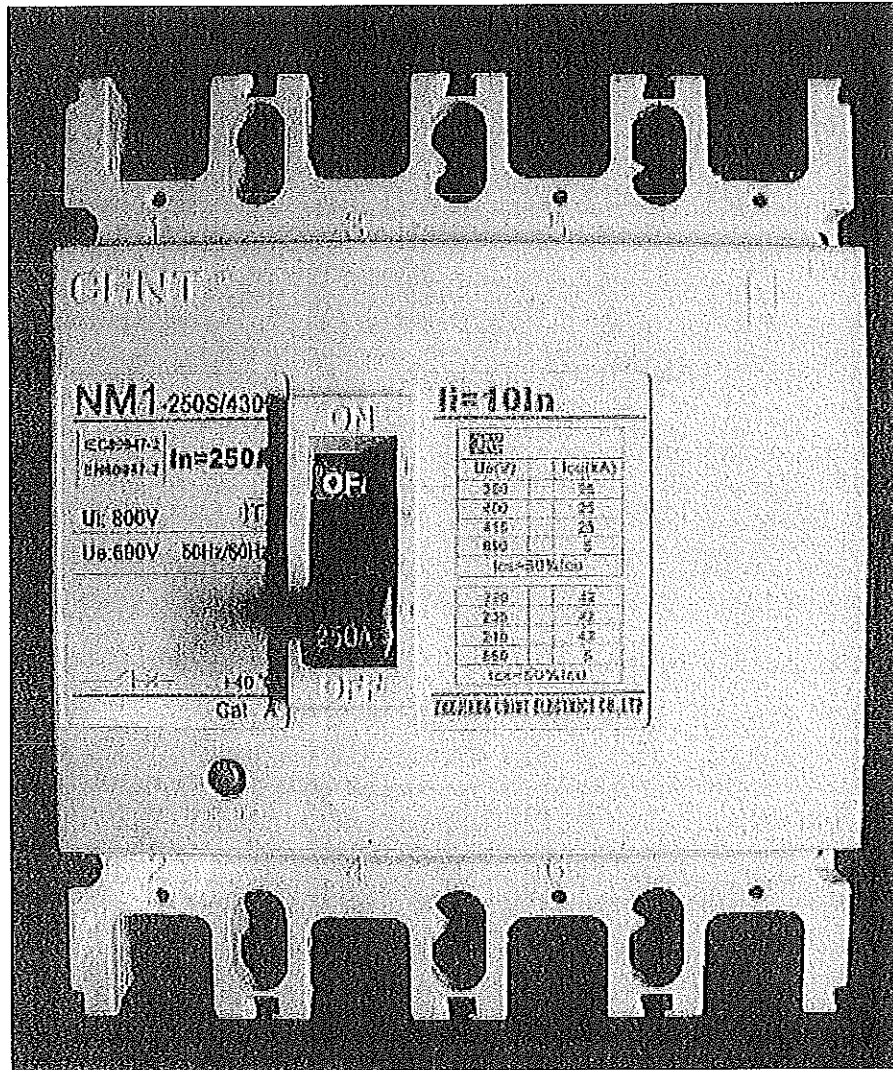
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Photographs

Front view, 3P + N MCCB



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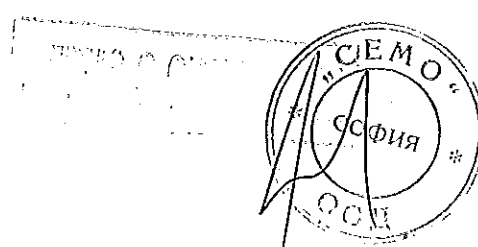
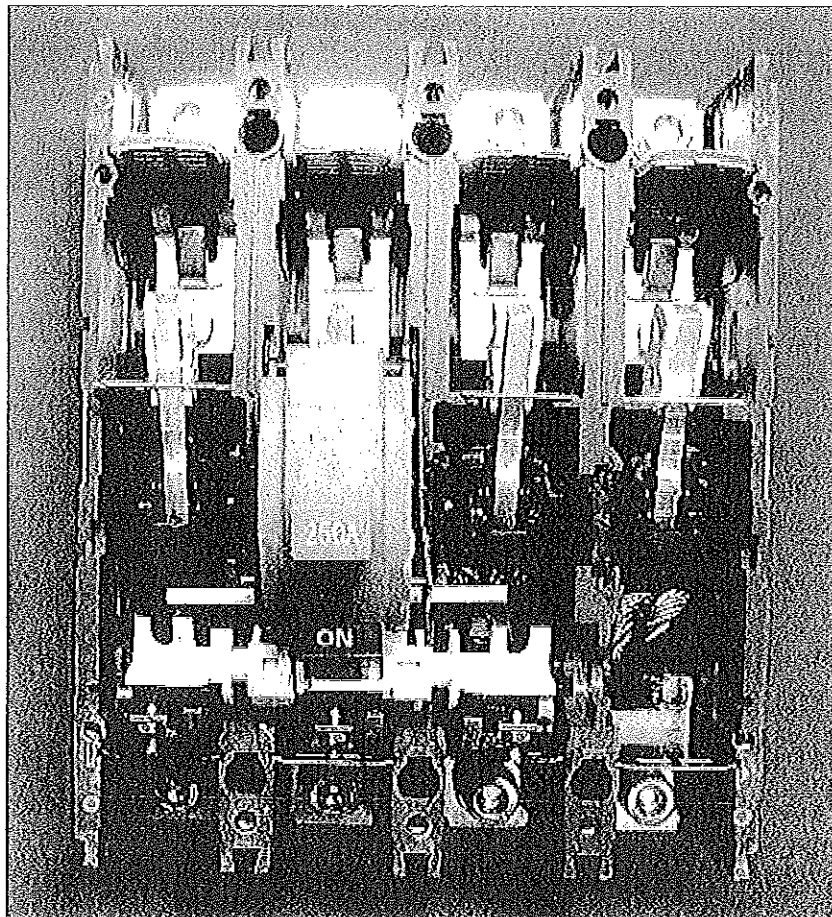
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Open view, 3P + N MCCB

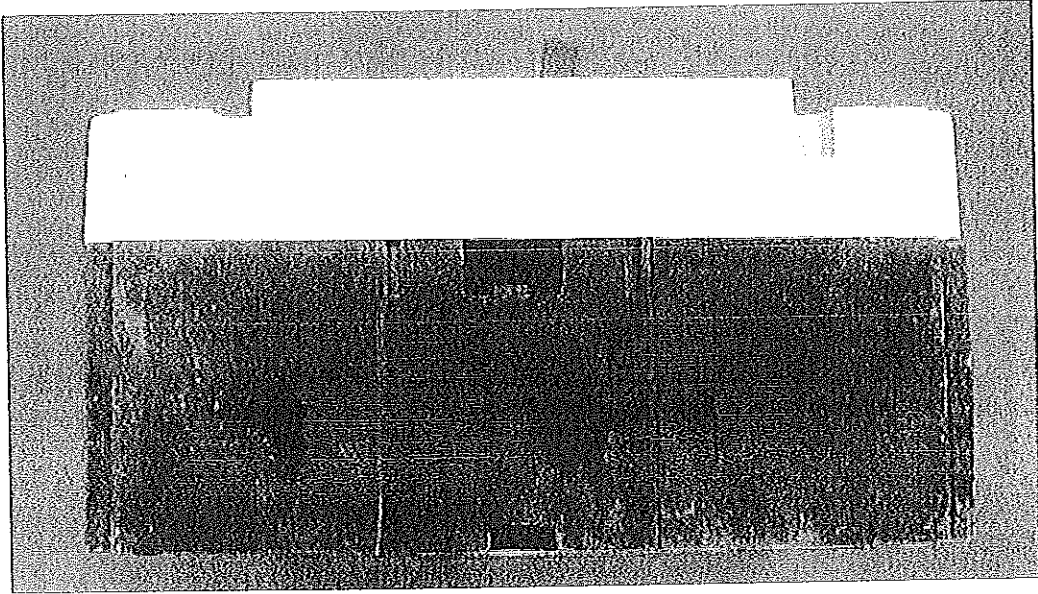


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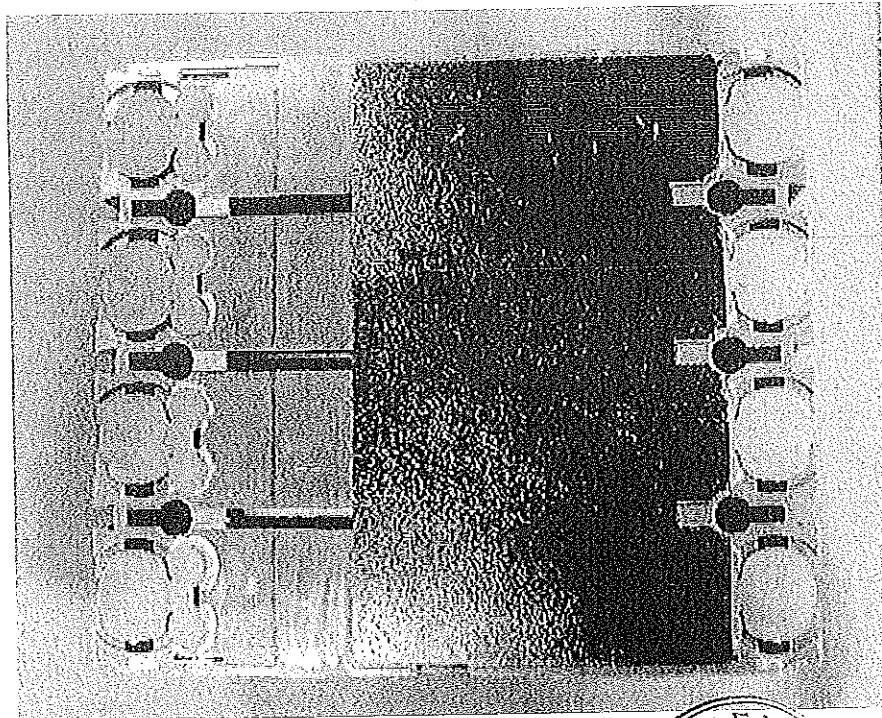
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Side view, 3P + N MCCB



Back view, 3P + N MCCB



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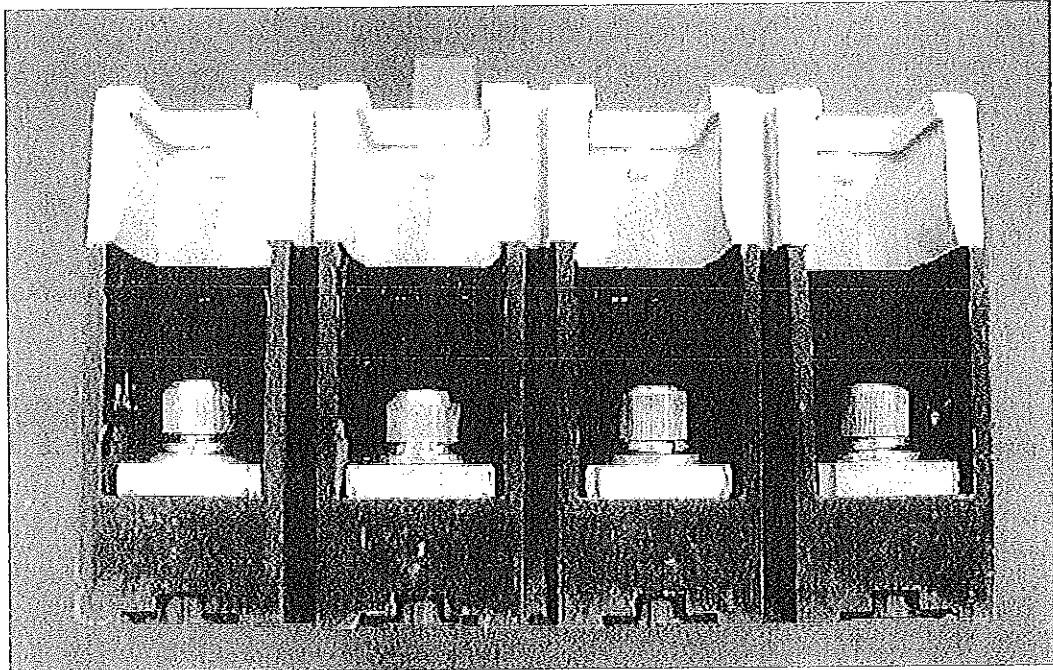


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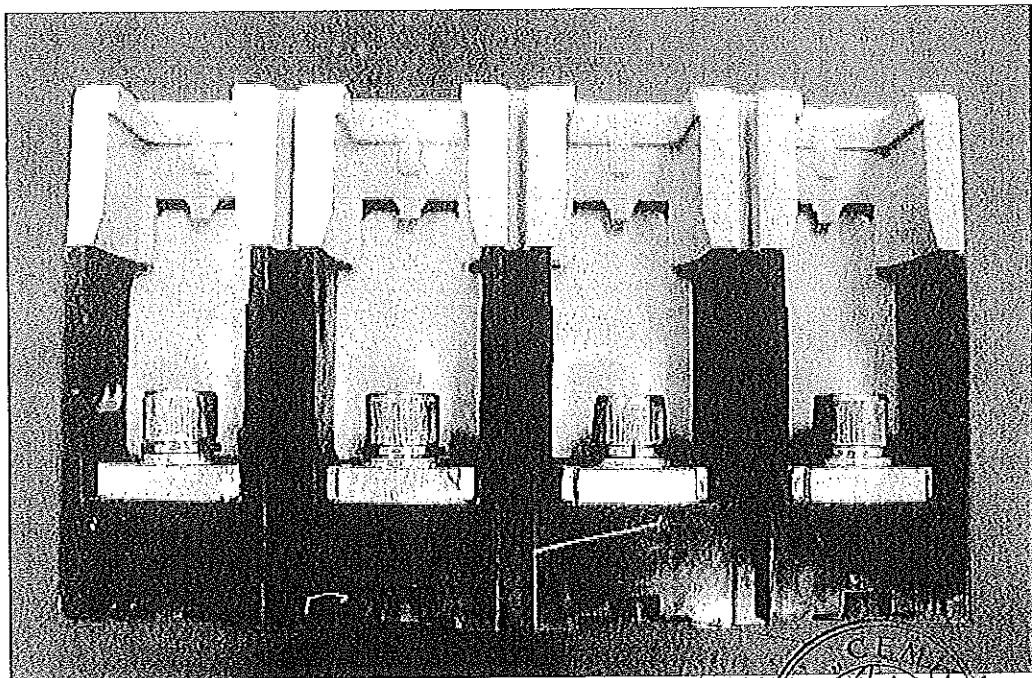
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Load terminal view, 3P + N MCCB



Line terminal view, 3P + N MCCB



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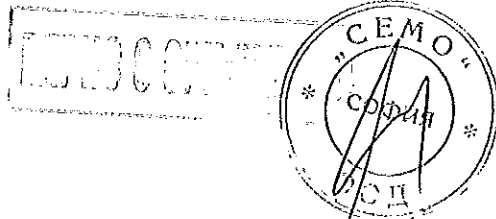
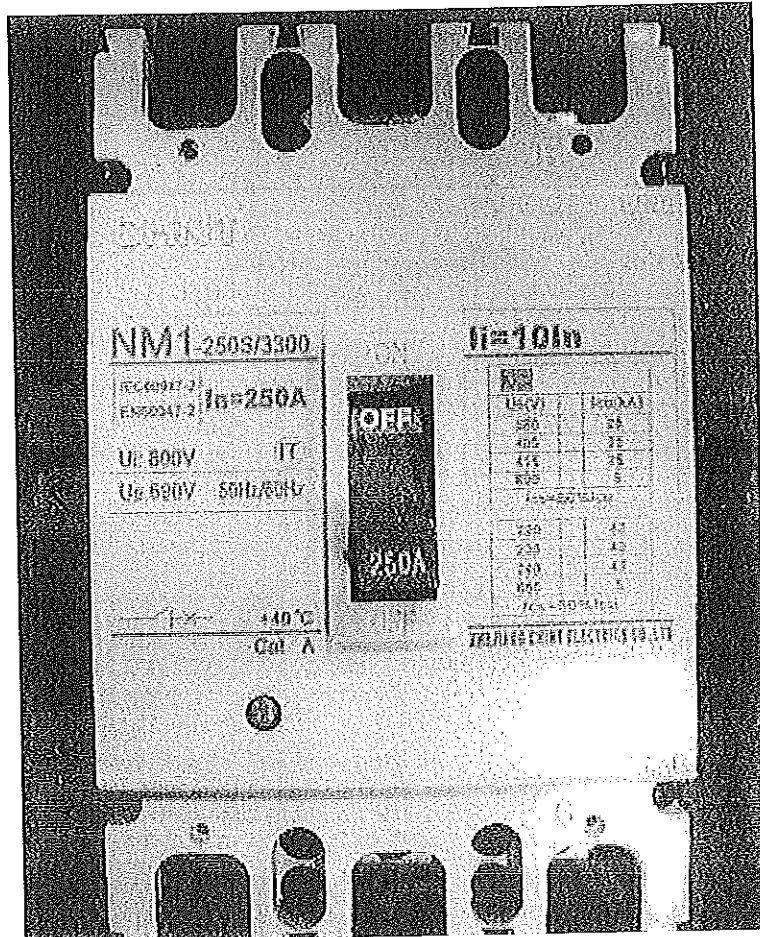
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IEC 60947-2

Front view, 3P MCCB



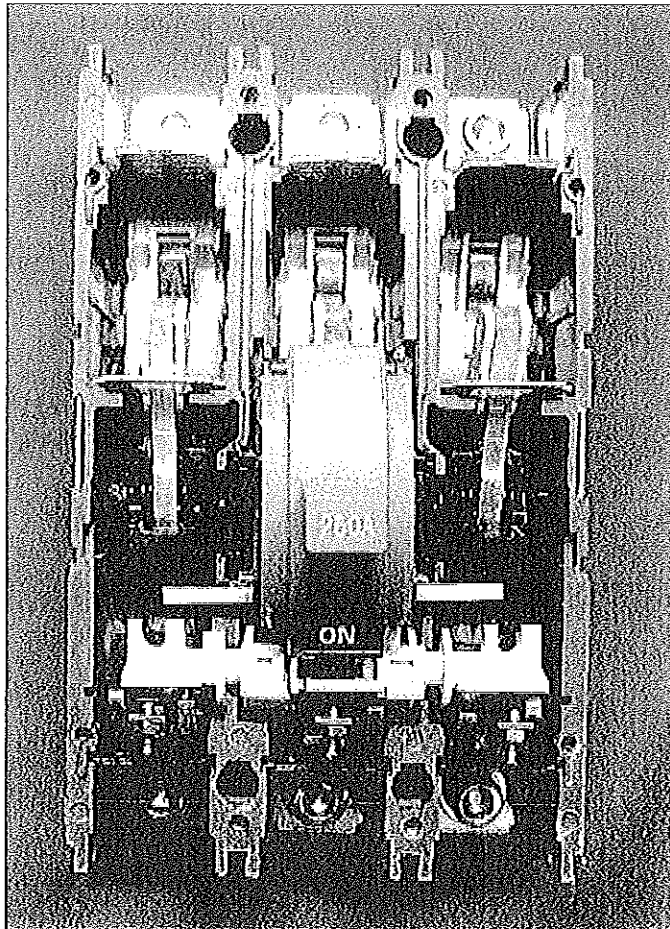
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IEC 60947-2

Open view, 3P + N MCCB



TRF No. IEC60947_2F



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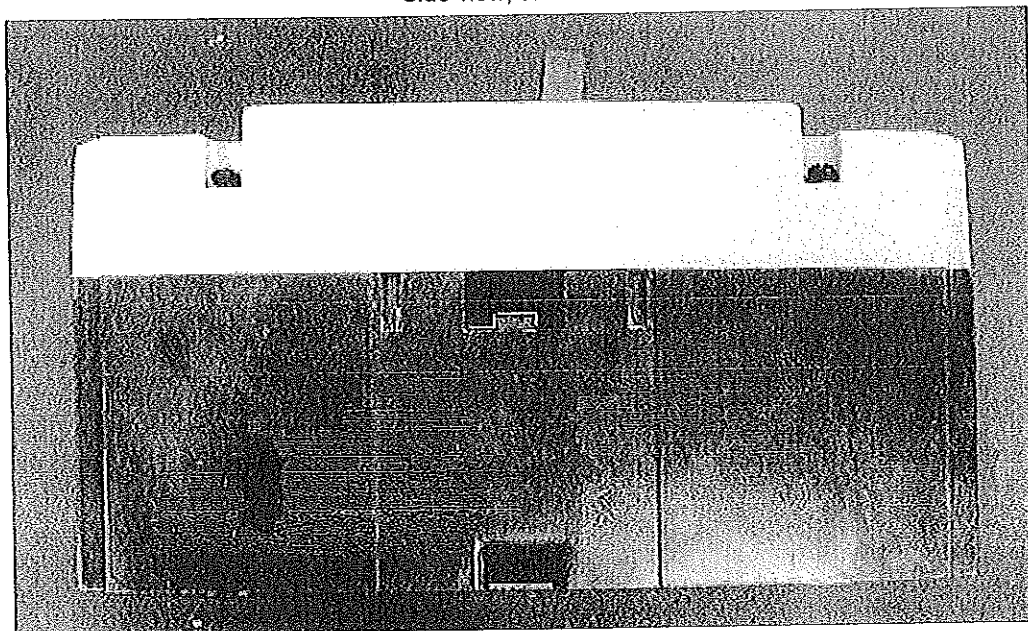
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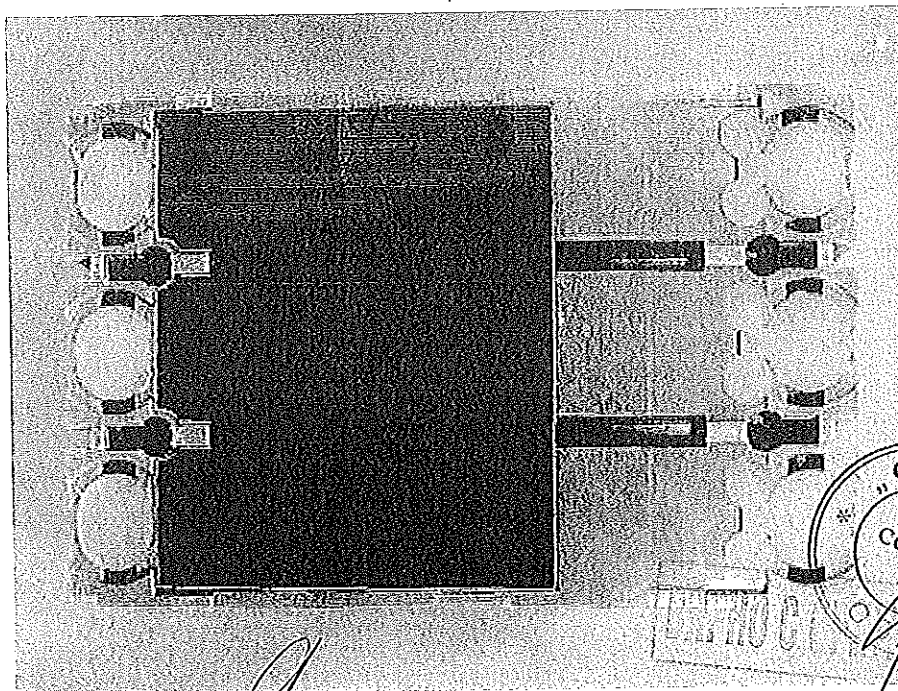
8

IEC 60947-2

Side view, 3P MCCB



Back view, 3P MCCB



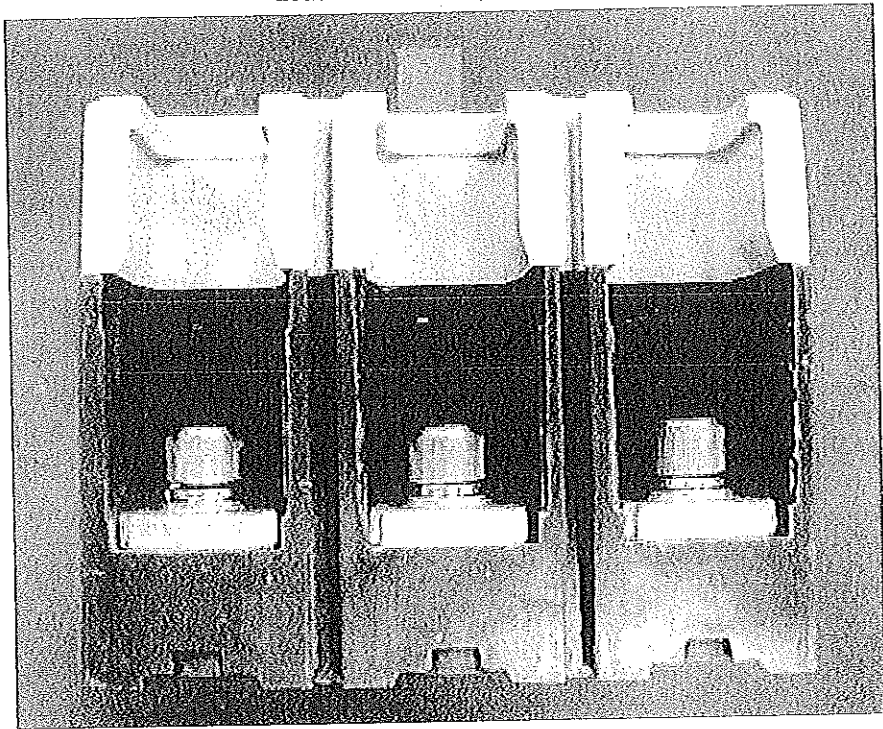
349 A

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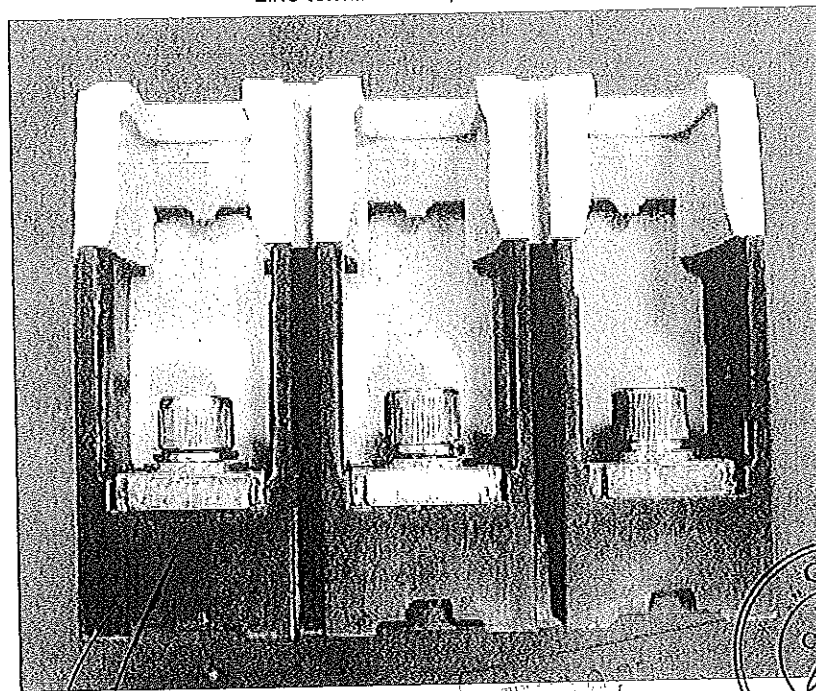
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IEC 60947-2

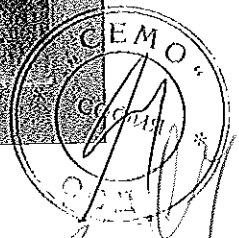
Load terminal view, 3P MCCB



Line terminal view, 3P MCCB



TRF No. IEC60947_2F



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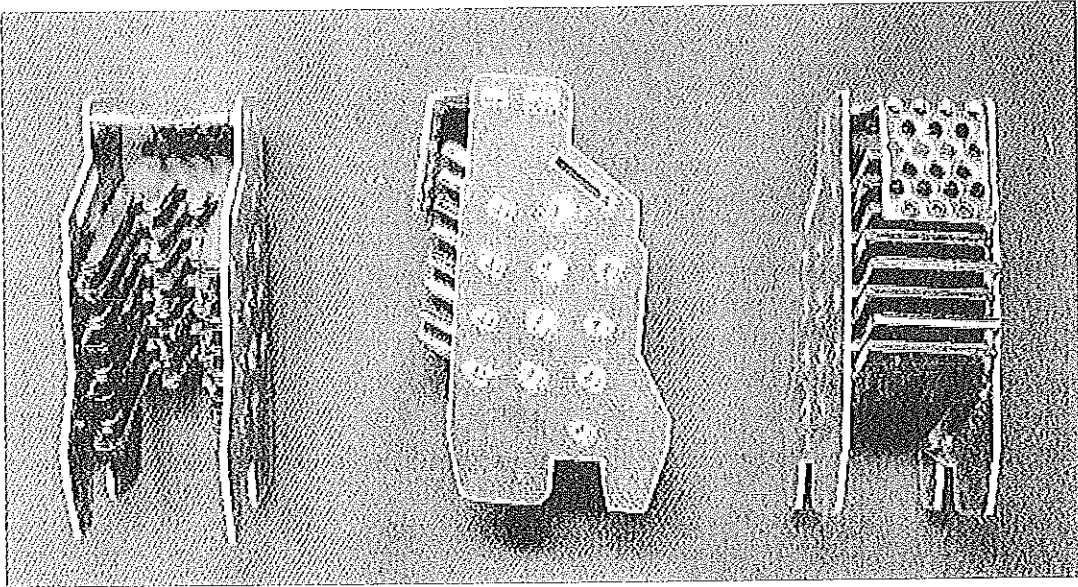
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IEC 60947-2

Arc chamber



Handwritten text and a circular stamp. The stamp contains the text "CEM.", "CDC", and "LOGE" around a central signature.

TRF No. IEC60947_2F

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351

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Faint, illegible text or markings across the middle of the page, possibly bleed-through from the reverse side.

Another set of faint, illegible text or markings located below the first set, also appearing to be bleed-through.



СПИСЪК НА ИЗПИТАНИЯТА В ТЕСТОВИ ДОКЛАД ЗА NM1-125 ~ 630

№	ОПИСАНИЕ
1	Обща информация
2	Продуктова информация
3	Тестови данни
4	Снимка на автомата
5	Кратко изложение на теста
6	Маркировка
7	Конструкция
8	Изисквания за работа
9	Тестове
10	Механични характеристики на клемите
11	Изпитателна последователност I – общо представяне, проба I-1,2 полюс
12	Изпитателна последователност I – общо представяне, проба I-2,3 полюс
13	Изпитателна последователност I – общо представяне, проба I-3,4 полюс
14	Изпитателна последователност II (Ics)
15	Изпитателна последователност II/III (Ics=Icu) – проба II-1,2 полюс
16	Изпитателна последователност II/III (Ics=Icu) – проба II-2,2 полюс
17	Изпитателна последователност II/III (Ics=Icu) – проба II-3,2 полюс
18	Изпитателна последователност II/III (Ics=Icu) – проба II-4,3 полюс
19	Изпитателна последователност II/III (Ics=Icu) – проба II-5,3 полюс
20	Изпитателна последователност II/III (Ics=Icu) – проба II-6,3 полюс
21	Изпитателна последователност II/III (Ics=Icu) – проба II-7,4 полюс
22	Изпитателна последователност III (Icu) – проба III-1,4 полюс тествани при 1P+N
23	Други
24	Топлинен тест
25	Диелектрична стабилност
26	Измерване на безопасното разстояние за монтаж
27	Сила на затягане на болтовете
28	Издържливост на пожар и оголен кабел
29	Снимков материал на тестваното изделие

Дата: 07.08.2015 г.

СЕМО ООД:.....



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1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud. The text notes that without reliable records, it would be difficult to verify the accuracy of financial statements and to identify any discrepancies or irregularities.

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2. The second part of the document focuses on the role of internal controls in ensuring the reliability of financial information. It describes how internal controls are designed to prevent errors and fraud by establishing a system of checks and balances. The text highlights that internal controls should be tailored to the specific needs of the organization and should be regularly reviewed and updated to reflect changes in the business environment. It also mentions that internal controls are a key component of the overall risk management framework.

До:

„ЧЕЗ РАЗПРЕДЕЛЕНИЕ БЪЛГАРИЯ“ АД,
гр. София, 1309,
ул. „Цар Симеон“ № 330,
Деловодство
Мариана Бецинска

ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА
ПОРЪЧКАТА

за участие в Открита процедура за възлагане на
обществена поръчка с предмет
«Доставка на прекъсвачи ниско напрежение»
реф. № PPD 15-033

Обособена позиция 2:

Доставка на триполюсни товари прекъсвач-разединители
НН с лят корпус

от

СЕМО ООД

адрес за кореспонденция:

гр. София, бул. «Ботевградско шосе» No 247

ТРАНСКАПИТАЛ, сграда 2, ет. 5, офис 2506

тел: 02 931 01 77, 02 94 24 757

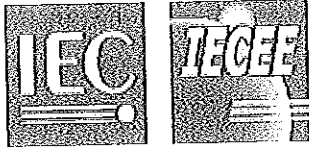
факс: 02 94 24 762

e-mail: engineering@semo.bg

10 Август 2015 г.

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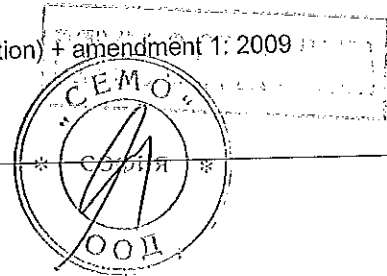
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Test Report issued under the responsibility of:

KEMA Quality
a DEKRA company

TEST REPORT IEC 60947-2	
Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	
Report Reference No.	W0808102.51
Date of issue	2010-08-11
Total number of pages	152 pages
CB Testing Laboratory	KEMA Quality Testing Services (Zhejiang) Co.,Ltd.
Address	No.5 Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P. R. China
Applicant's name	Zhejiang CHINT Electrics Co., Ltd.
Address	No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China
Test specification:	
Standard	IEC 60947-2:2006 (4 th Edition) + amendment 1: 2009
Test procedure	CB
Non-standard test method	N/A
Test Report Form No.	IEC60947_2F
Test Report Form(s) Originator	KEMA Quality BV
Master TRF	Dated 2010-01
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Test item description	Moulded-case circuit-breaker
Trade Mark	CHINT
Manufacturer	Zhejiang CHINT Electrics Co., Ltd. No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China
Model/Type reference	NM1-400R/4300, NM1-400H/4300, NM1-400S/4300, NM1-400R/3300, NM1-400H/3300, NM1-400S/3300
Ratings	See Page 5, 6, 7, 8



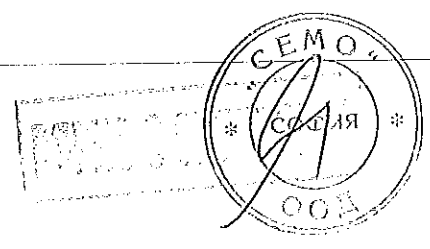
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Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory:	KEMA Quality Testing Services (Zhejiang)Co.,Ltd
Testing location/ address	No.5, Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P.R.China
<input type="checkbox"/> Associated CB Laboratory:	N/A
Testing location/ address	N/A
Tested by (name + signature).....	King Wang
Approved by (+ signature).....	Fred Fu i.e. Eric Wang
<input type="checkbox"/> Testing procedure: TMP	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: WMT	N/A
Tested by (name + signature).....	N/A
Witnessed by (+ signature)	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: SMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: RMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A



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Summary of testing:

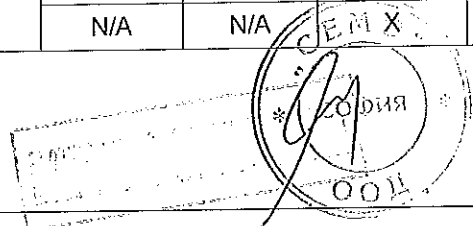
The circuit breakers of NM1-400R, NM1-400H, and NM1-400S are fully identical except the short circuit capacities and type references marked on the labels. Therefore, the tests conducted on NM1-400R (with maximum rated short-circuit breaking capacity) are deemed to cover the tests on NM1-400H, and NM1-400S.

Tests performed (name of test and test clause):

Model	Rated current	Test voltage	Number of poles	Seq I	Seq II	Seq III 3 phases test	Seq III 1 phase + N test
NM1-400R/3300	400 A	690 Vac	3P	X	X	X	N/A
	400 A	415 Vac		N/A	X	X	N/A
	400 A	240 Vac		N/A	X	X	N/A
	225 A			N/A	X	X	N/A
NM1-400R/4300	400 A	690 Vac	3P + N	X	N/A	X	X
	400 A	415 Vac		N/A	N/A	X	X
	400 A	240 Vac		N/A	N/A	X	X
	225 A			N/A	N/A	X	X

Note:

X means the test was conducted
N/A means the test is not applicable



Testing location:

All tests except test of rated service short-circuit breaking capacity at 240 Vac, 415Vac and seq III were conducted in:

KEMA Quality Testing Services (Zhejiang) Co., Ltd.
No.5 Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603,
P. R. China.

Tests of rated service short-circuit breaking capacity at 240 Vac, 415Vac and seq III were conducted in:

TILVA - 505 Wu Ning Road, Shanghai,
P.R. China

Summary of compliance with National Differences:

The MCCBs comply with EN Group Differences.

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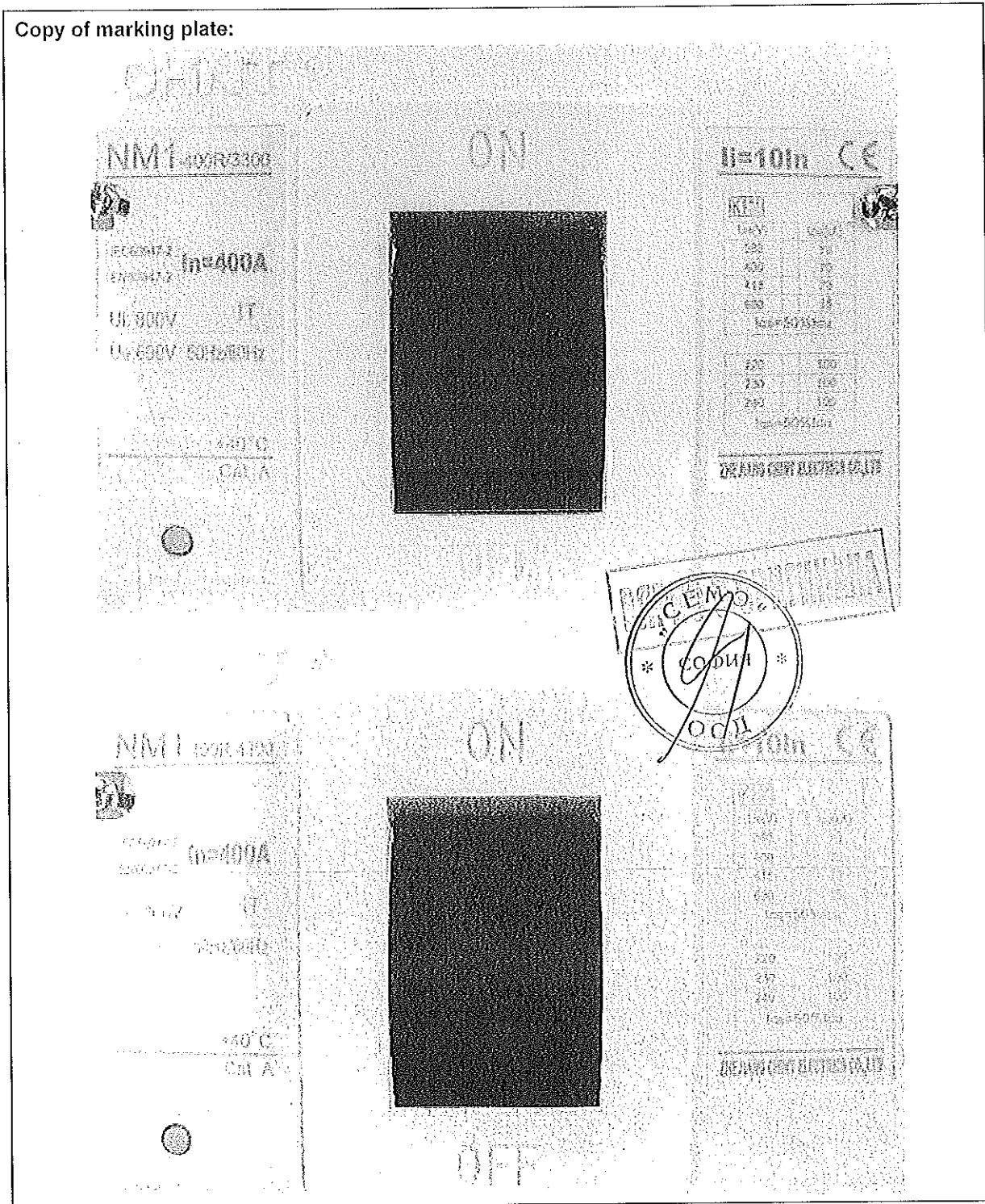
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Copy of marking plate:



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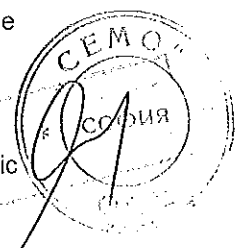
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Test item particulars: test item vs. test requirements

3. Classification

3.1. Utilization category: (A or B)	A
3.2. Interruption medium: (air, vacuum, gas Break)	Air
3.3. Design: (open construction, moulded case)	Moulded case
3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power)	Independent manual
3.5. Suitability for isolation: (suitable, not -suitable)	Suitable isolation
3.6. Provision for maintenance: (maintainable, non maintainable)	Non-maintainable
3.7. Method of installation: (fixed, plug in, withdrawable)	Fixed
3.8. Degree of protection: (IP code)	N/A
4.7. Type of release (thermo-magnetic / electronic)	Thermo-magnetic
4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD	N/A
7.3 Electromagnetic compatibility (EMC) Environment A or B	A
Circuit-breaker for use on phase-earthed systems	N/A
Circuit-breaker for use in IT systems	N/A
Rated and limiting values, main circuit:	
- rated operational voltage: U_e (V)	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac
- rated insulation voltage: U_i (V)	800 V
- rated impulse withstand voltage: U_{imp} (kV)	8 kV
- rated operational current: I_e (A)	225 A, 250 A, 300 A, 315 A, 350 A, 400 A
- kind of current	AC
- conventional free air thermal current: I_{th} (A)	225 A, 250 A, 300 A, 315 A, 350 A, 400 A
- conventional enclosed thermal current: I_{the} (A)	N/A
- current rating for four-pole circuit-breakers: (A)	225 A, 250 A, 300 A, 315 A, 350 A, 400 A
- number of poles	3P for the MCCBs with type reference '3300' 3P + N (N pole do not have protection) for the MCCBs with type reference '4300'
- rated frequency: (Hz)	50 / 60 Hz
- integral fuses (rated values)	N/A



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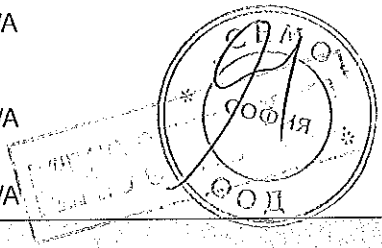
Rated duty :	
- eight-hour duty.....	: N/A
- uninterrupted duty: I _u (A)	: 225 A, 250 A, 300 A, 315 A, 350 A, 400 A
Short-circuit characteristic :	
rated short-time making capacity: I _{cm} (kA)	NM1-400R: 30 kA up to 690 Vac, 154 kA up to 415 Vac, 220 kA up to 240 Vac
	NM1-400H: 24 kA up to 690 Vac, 105 kA up to 415 Vac, 187 kA up to 240 Vac
	NM1-400S: 17 kA up to 690 Vac, 73,5 kA up to 415 Vac, 105 kA up to 240 Vac
	rated ultimate short-circuit breaking capacity: I _{cu} (kA)
	NM1-400H: 12 kA up to 690 Vac, 50 kA up to 415 Vac, 85 kA up to 240 Vac
	NM1-400S: 10 kA up to 690 Vac, 35 kA up to 415 Vac, 50 kA up to 240 Vac
rated service short-circuit breaking capacity: I _{cs} (kA).....	: I _{cs} = 50%I _{cu}
rated short-time withstand current: I _{cw} (kA/s).....	: N/A

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Control circuits :	
Electrical control circuits :	
- kind of current: (AC, DC).....	N/A
- rated frequency: (Hz)	N/A
- rated control circuit voltage: U_c (nature, frequency, V) ...	N/A
- rated control supply voltage: U_s (nature, frequency V) ..	N/A
Air supply control circuits: (pneumatic or electro-pneumatic) :	
- rated pressure and its limit.....	N/A
- volumes of air, at atmospheric pressure, required for each closing and each opening operation	N/A
Auxiliary circuits :	
Rated and limiting values, auxiliary circuits:	
- rated operational voltage U_e (V).....	N/A
- rated insulation voltage: U_i (V).....	N/A
- rated operational current: I_e (A).....	N/A
- kind of current.....	N/A
- rated frequency: (Hz)	N/A
- number of circuits	N/A
- number and kind of contact elements	N/A
- rated uninterrupted current: I_u (A)	N/A
- utilization category: (AC, DC, current and voltage).....	N/A
Short-circuit characteristic :	
- Rated conditional short-circuit current (kA)	N/A
- kind of protective device.....	N/A

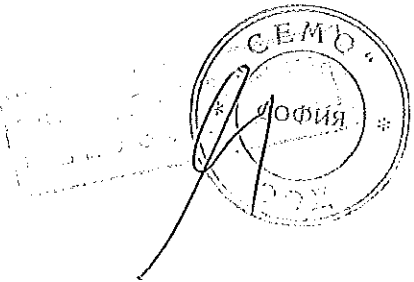


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Releases :	
1) shunt release.....	: N/A
2) Over-current release.....	: Yes
a) instantaneous.....	: Yes
b) definite time delay.....	: N/A
c) inverse time delay.....	: Yes
- independent of previous load.....	: N/A
- dependent on previous load; (for example thermal type release).....	: Yes
3) Undervoltage release (for opening).....	: N/A
4) Other releases.....	: N/A
Characteristics :	
1) Shunt release and undervoltage release (for opening) ..	: N/A
- rated control circuit voltage: U_c (nature, frequency, V) ..	: N/A
- kind of current ..	: N/A
- rated frequency: (if AC).....	: N/A
2) Over-current release.....	: Yes
- rated current.....	: 225 A, 250 A, 300 A, 315 A, 350 A, 400 A
- kind of current ..	: AC
- rated frequency: (if AC).....	: 50 / 60 Hz
- current setting (or range of settings) ..	: Inverse time delay release setting: 1,05 I_n , 1,3 I_n Instantaneous release setting: 10 I_n
- time settings (or range of settings).....	: Tripping time ≥ 2 h (1,05 I_n) Tripping time < 2 h (1,3 I_n) 10 I_n : Instantaneous

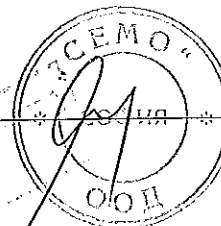


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Classification of installation and use.....	: Fixed
Supply Connection	: Prepared copper conductors (cable with lug)
Possible test case verdicts:	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
Testing	
Date of receipt of test item	: 2008-12
Date (s) of performance of tests	: 2009-02 ~ 2010-03
General remarks:	
<p>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 is used as the decimal separator.</p> <p>Although it is not mentioned on first page, the following standards were also taken into consideration, no deviation was found:</p> <ul style="list-style-type: none"> - EN 60947-2: 2006 +A1: 2009 	
General product information:	
<p>The technical data of the MCCB are listed on page 5 to 8 of this report.</p> <p>The factory name and address:</p> <p>Zhejiang CHINT Electric Co., Ltd. No.1, Chint Road, Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China</p>	

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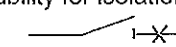


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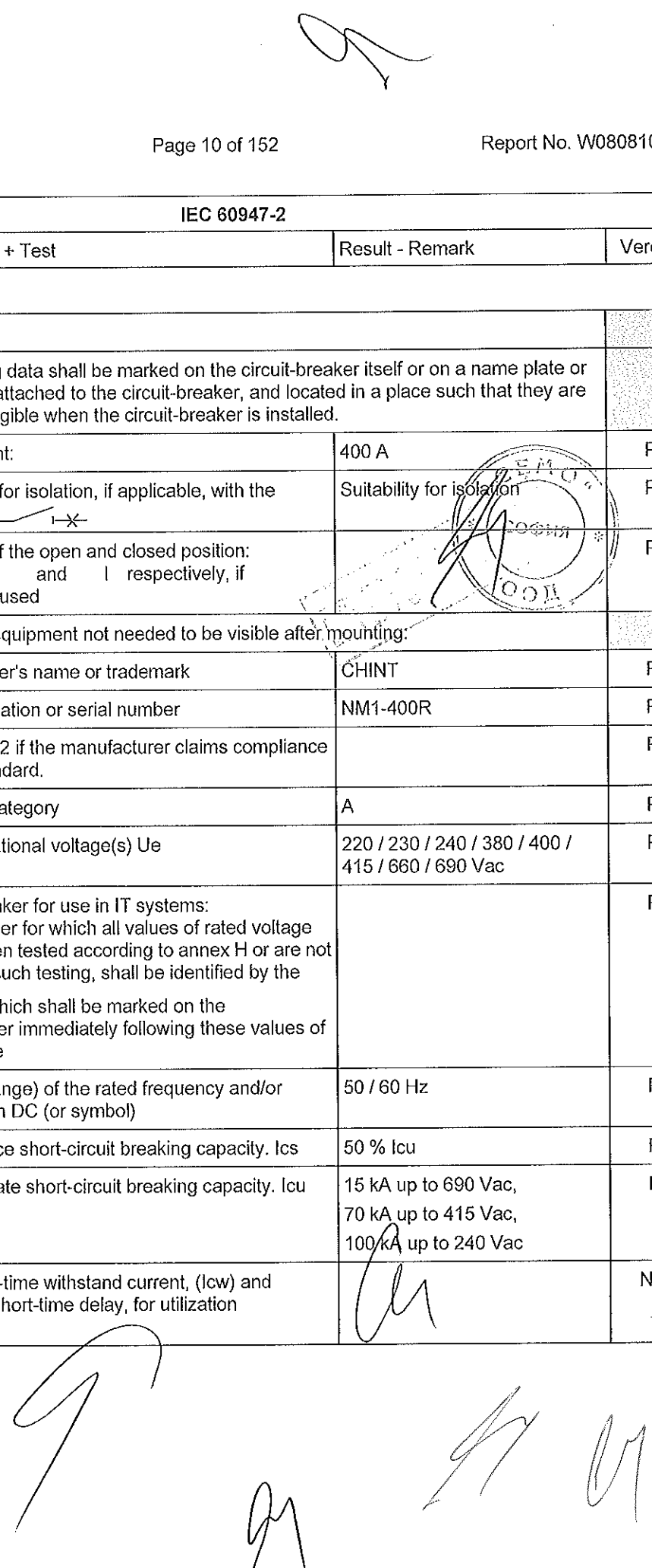
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		
a)	The following data shall be marked on the circuit-breaker itself or on a name plate or nameplates attached to the circuit-breaker, and located in a place such that they are visible and legible when the circuit-breaker is installed.		
	- rated current:	400 A	P
	- suitability for isolation, if applicable, with the symbol 	Suitability for isolation	P
	- indication of the open and closed position: with O and I respectively, if symbols are used		P
b)	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark	CHINT	P
	- type designation or serial number	NM1-400R	P
	- IEC 60947-2 if the manufacturer claims compliance with this standard.		P
	- utilization category	A	P
	- rated operational voltage(s) Ue	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	P
	- Circuit-breaker for use in IT systems: Circuit-breaker for which all values of rated voltage have not been tested according to annex H or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		P
	- value (or range) of the rated frequency and/or the indication DC (or symbol)	50 / 60 Hz	P
	- rated service short-circuit breaking capacity. Ics	50 % Icu	P
	- rated ultimate short-circuit breaking capacity. Icu	15 kA up to 690 Vac, 70 kA up to 415 Vac, 100 kA up to 240 Vac	P
	- rated short-time withstand current, (Icw) and associated short-time delay, for utilization category B		N/A




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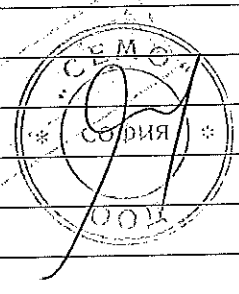
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- line and load terminals, unless their connection is immaterial	LINE / LOAD marked	P
	- neutral pole terminals, if applicable, by the letter N	N marked	P
	- protective earth terminal, where applicable, by the symbol acc. 7.1.9.3 of part 1		N/A
	- ref. temperature for non-compensated thermal releases, if different from 30°C	40 °C	P
c)	Marked on the circuit-breaker as specified in item b), or shall be made available in the manufacturer's published information:		
	- rated short-circuit making capacity (I _{cm}) (if higher than specified in 4.3.5.1)		N/A
	- rated insulation voltage. (U _i) if higher than the maximum rated operational voltage)	800 V	P
	- rated impulse withstand voltage (U _{imp}), when declared.	8 kV	P
	- pollution degree if other than 3		N/A
	- conventional enclosed thermal current (I _{the}) if different from the rated current:		N/A
	- IP Code, where applicable:		N/A
	- minimum enclosure size and ventilation data (if any) to which marked ratings apply:		N/A
	- details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure:	Front / Back: 0 mm, Left / Right : 100 mm, Top / Bottom: 100 mm	P
	- r.m.s sensing if applicable, according to F.4.1.1		N/A
	- suitability for environment A or B	A	P
d)	The following data concerning the opening and closing devices of the circuit-breaker shall be placed either on their own nameplates or on the nameplate of the circuit-breaker:		
	- rated control circuit voltage of the closing device, and rated frequency for AC:		N/A
	- rated control circuit voltage of the shunt release and/or of the under-voltage release, and rated frequency:	AC	N/A
	- rated current of indirect over-current releases:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- number and type of auxiliary contacts and kind of current, rated frequency (if AC) and rated voltages of the auxiliary switches, if different from those of the main circuit.		N/A
e)	Terminal shall be clearly and permanently identified in acc. with IEC 60445 and annex L :		
	- line terminal	LINE is marked	P
	- load terminal	LOAD is marked	P
	- neutral pole terminal "N"	N is marked	P
	- protective earth terminal 		N/A
	- terminal of coils (A/B)		N/A
	- terminal of shunt release (B)		N/A
	- terminals of under-voltage release (D)		N/A
	- terminals of interlocking electromagnets (E)		N/A
	- terminals of indicated light devices (X)		N/A
	- terminals of contact elements for switching devices (no)		N/A

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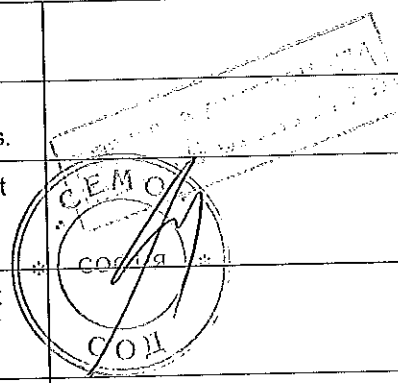
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Clause	Requirement + Test	Result - Remark	Verdict

7.1	CONSTRUCTION		
7.1.1	Withdrawable circuit-breaker		N/A
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating warranted:		N/A
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		N/A
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed.		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position.		N/A
	The isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
7.1.2.1 part 1	Resistance to abnormal heat and fire	See appended table 12	P
7.1.3 part 1	Current-carrying parts and their connection		P
7.1.4	Clearances and creepage distances:		
	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		
	Clearances distances:		
	- Uimp is given as:	8 kV	
	- max. value of rated operational voltage to earth	600 V	
	- nominal voltage of supply system:	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	
	- overvoltage category:	III	
	- pollution degree:	3	
	- field-in or homogeneous:	Inhomogeneous field	
	- minimum clearances (mm):	8 mm	



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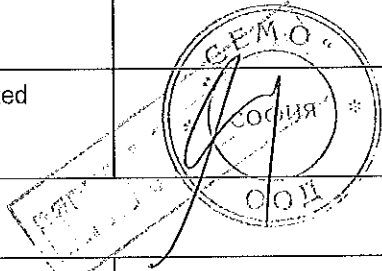
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- measured clearances (mm):	12,8 mm	P
	Creepage distances:		
	- rated insulation voltage U_i (V)	800 V	
	- pollution degree	3	
	- comparative tracking index (V)	175 V	
	- material group	III a	
	- minimum creepage distances (mm)	12,5 mm	
	- measured creepage distances (mm)	16,9 mm	P
7.1.5 part 1	Actuator		
7.1.5.1 part 1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage		P
	If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation		N/A
	If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		N/A
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "1" and "0" positions and the direction of operation		P
7.1.6 part 1	Indication of contact position		
7.1.6.1 part 1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	This is done by means of a position indicating device (see 2.3.18)		N/A
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417-2:		
	- 60417-2-IEC-5007 I On (power)		P
	- 60417-2-IEC-5007 O Off (power)		P
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O"		N/A
	Red colour shall not be used for any other push-button		P
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		N/A
7.1.6.2 part 1	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		P
7.1.7	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation (Ue > 50 V):		
	Equipment suitable for isolation shall provide in the open position an isolation distance in acc. with the requirements necessary to satisfy the isolating function. Indication of the main contacts shall be provide by one or more of the following means:		
	- the position of the actuator		P
	- a separate mechanical indicator		N/A
	- visibility of the moving contacts		N/A
	When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position		N/A

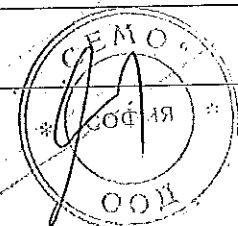
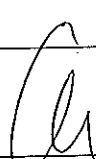


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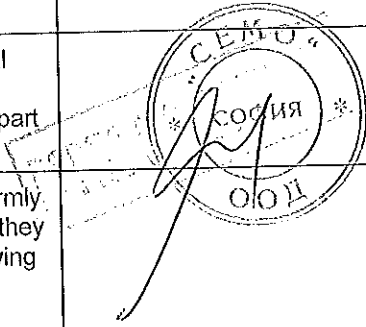
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking		P
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) :	8 mm	
	- measured clearances (mm) :	30,5 mm	P
	- test Uimp across gap (kV) :	12,3 kV	P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		
	auxiliary switch shall be rated according to IEC 60 947-5-1		N/A
	If equipment suitable for isolation is provided with an auxiliary switch for the purpose of electrical interlocking with contactor (s) or circuit-breaker(s) and intended to be used in motor circuits, the following requirements shall apply unless the equipment is rated for AC-23 utilization category		N/A
	The time interval between the opening of the contacts of the auxiliary switch and the contacts of the main poles shall be sufficient to ensure that the associated contactor or circuit-breaker interrupts the current before the main poles of the equipment open		N/A
	Unless otherwise stated in the manufacturer's technical literature, the time interval shall be not less than 20 ms when the equipment is operated according to the manufacturer instructions		N/A
	Compliance shall be verified by measuring the time interval between the instant of opening of the auxiliary switch and the instant of opening of the main poles under no-load conditions when the equipment is operated according to the manufacturer's instructions		N/A
	During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed		N/A
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		
	the locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed		N/A
	Alternatively, the design may provide padlockable means to prevent access to the actuator		N/A
	test force F applied to the actuator in an attempt to operate to the closed position (N) :		N/A
	rated impulse withstand voltage (kV) :		N/A
	test Uimp on open main contacts at the test force		N/A
7.1.8	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Terminal connections shall be such that necessary contact pressure is maintained		P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value		P
7.1.8.2	Connection capacity		
	type of conductors :	Prepared cable (with cable lug)	P
	minimum cross-sectional area of conductor (mm ²) :	50 mm ²	P
	maximum cross-sectional area of conductor (mm ²) :	240 mm ²	P
	number of conductors simultaneously connectable to the terminal :	1	P

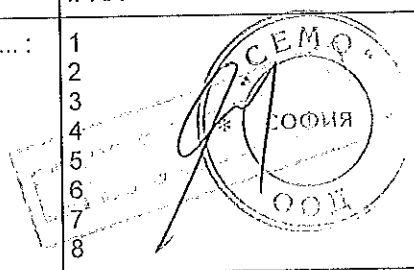
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.8.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		
	terminal intended exclusively for the neutral conductor	N is marked	P
	protective earth terminal		N/A
	other terminals		N/A
7.1.9 part 1	Additional requirements for equipment provided with a neutral pole		
	When equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.).	N is marked	P
	A switched neutral pole shall break not before and shall make not after the other poles		P
	For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles		N/A
	For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher	The value of conventional thermal current is identical for all poles	N/A
	if a pole with an appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, shall operate substantially together.		N/A
7.1.10	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor	Ca	N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
part 1	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly		N/A
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts		N/A
7.1.10.2 part 1	Protective earth terminal		
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 2.1.1.5 – Note). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		N/A
7.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, or PEN, as applicable, in accordance with IEC 60445, subclause 5.3, or, in the case of PEN, by a graphical symbol for use on equipment		N/A
	Graphical symbol to be used: 60417-2-IEC-5019  Protective earth (ground) in accordance with IEC 60417-2		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.11	Enclosure for equipment		
7.1.11.1	Design		
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it shall not be possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure	<i>CU</i>	N/A
7.1.12	Degree of protection of enclosed equipment		
	Degree of protection.	IPXX	
	Test for first characteristic.	IPXX	

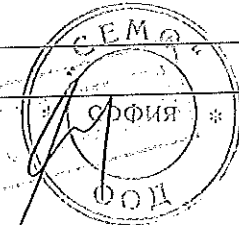
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for first numeral	1 2 3 4 5 6	N/A
	Test for second characteristic	IPXX	
	Test for second numeral	1 2 3 4 5 6 7 8	N/A
7.1.13 part 1	Conduit pull-out, torque and bending with metallic conduits		
	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending		N/A

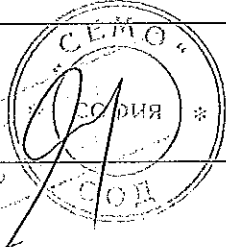
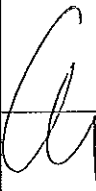


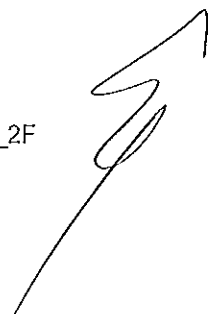
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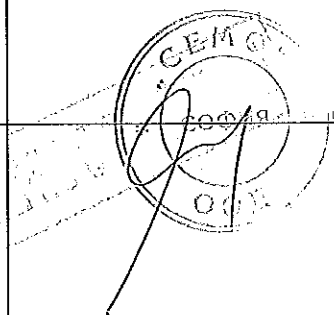
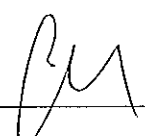
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	Performance requirements		
7.2.1	Operating condition		
7.2.1.1	Closing		
	For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity		P
7.2.1.1.1	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation		N/A
	Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA		N/A
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
7.2.1.1.2	Independent manual closing		
	A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
7.2.1.1.3	Dependent power closing		
	At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A

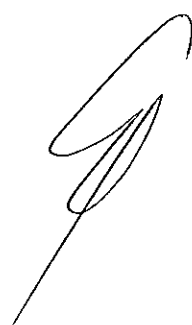

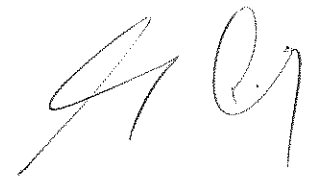


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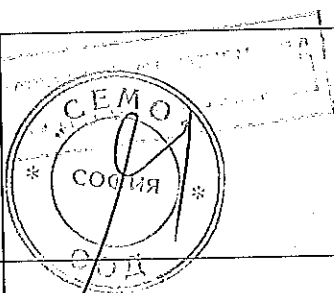
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit.		N/A
7.2.1.1.4	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		N/A
	Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification		N/A
7.2.1.1.5	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		N/A
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		N/A
	- means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control supply voltage.		N/A
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		N/A
	- by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.)		N/A
	- For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker.		N/A

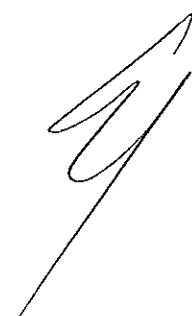



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2	Opening		
7.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and, unless otherwise agreed between manufacturer and user, shall have their energy for the tripping operation stored prior to the completion of the closing operation		
7.2.1.2.2	Opening by undervoltage releases		
7.2.1.3. a part 1	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		N/A
	An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value		N/A
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		N/A
7.2.1.3. b part 1	Operating time		
	For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment		N/A
7.2.1.2.3	Opening by shunt releases		N/A
7.2.1.4 part 1	Limits of operation of shunt releases		
	A shunt release for opening shall cause tripping under all operating conditions of an equipment when the supply voltage of the shunt release measured during the tripping operation remains between 70% and 110% of the rated control supply voltage and, if a.c., at the rated frequency		N/A

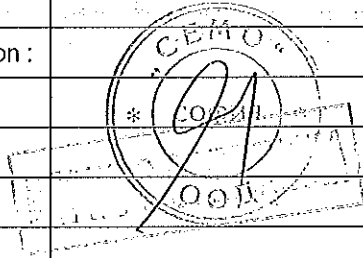
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.5 part 1	Limits of operation of current operated relays and released		
	Limits of operation of current operated relays and releases shall be stated in the relevant product standard		P
7.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release		P
	Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing		N/A
	- maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical)		N/A
	- I^2t characteristics for circuit-breakers of utilization category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 8.3.5)		N/A
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of $\pm 10\%$ of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature		P
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K		N/A
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		N/A
7.2.4.2	Operational performance capability		
7.2.4.2 part 1	The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations		P
	The operational performance on-load during which the equipment shall make and break the specified current corresponding, where relevant, to its utilization category for the number of operations stated in the relevant product standard		P





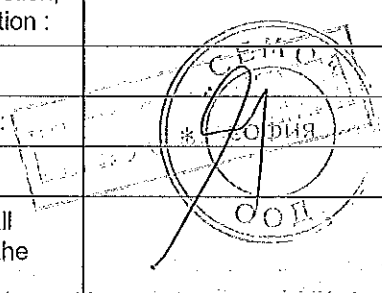

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		P
8.2.4	Mechanical properties of terminals		P
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm ²) :	240 mm ²	
	diameter of thread (mm) :	10 mm	
	torque (Nm) :	10 Nm	
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest cross-sectional area (mm ²) :		
	number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest and smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest cross section, number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A



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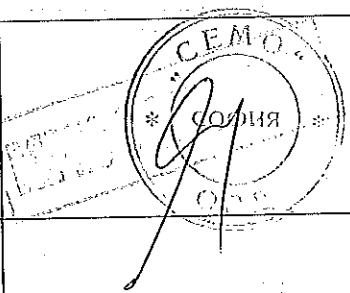
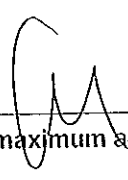
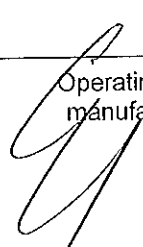
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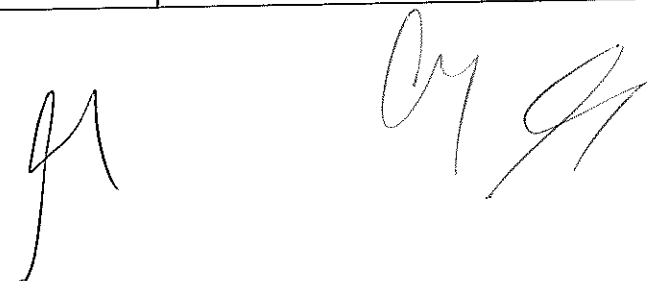
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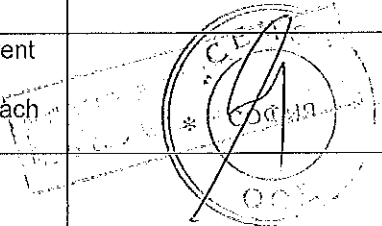
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict


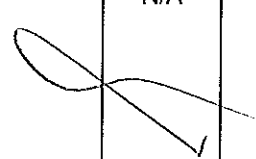
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-400R/3300	
	Sample no:	163#	
	Rated operational voltage: U_e (V)	690 Vac	
	Rated current: I_n (A)	400 A	
	Ambient temperature 10-40 °C :	21,4 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 I_n for instantaneous tripping 12 I_n for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	3200 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: > 0,2 s L1-L3: > 0,2 s L2-L3: > 0,2 s N-Lx:		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	4800 A	P

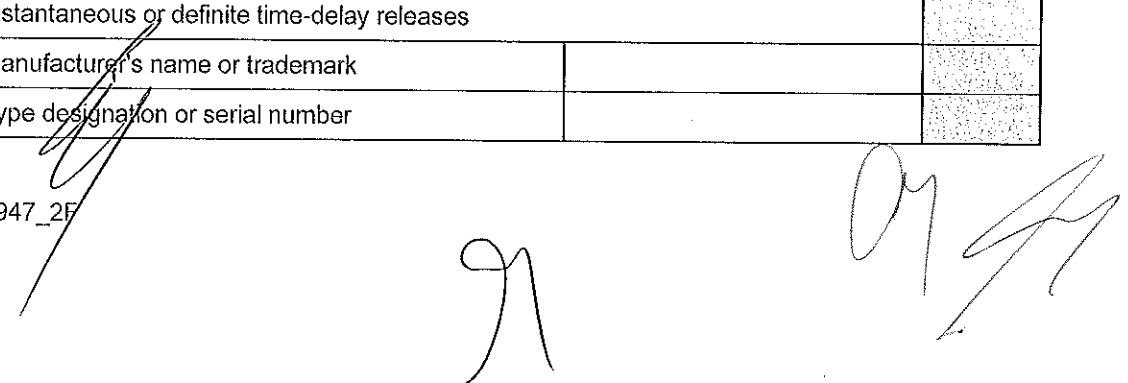
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	10 ms 22 ms 12 ms	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A



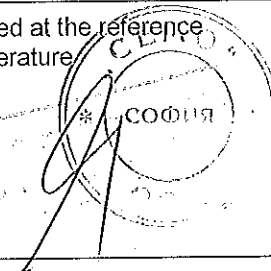
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	4800 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: 10 ms L2: 10 ms L3: 10 ms N:		P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: U_e (V)		
	Rated current: I_n (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A

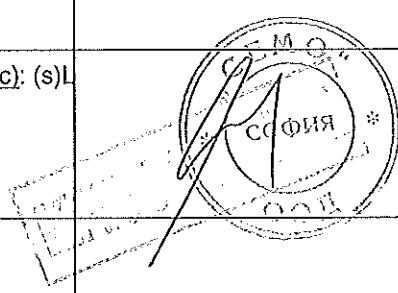
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-400R/3300	
	Sample no:	163#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	400 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data	Verified at the reference temperature 	P
	For thermo-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermo-magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	420 A	P

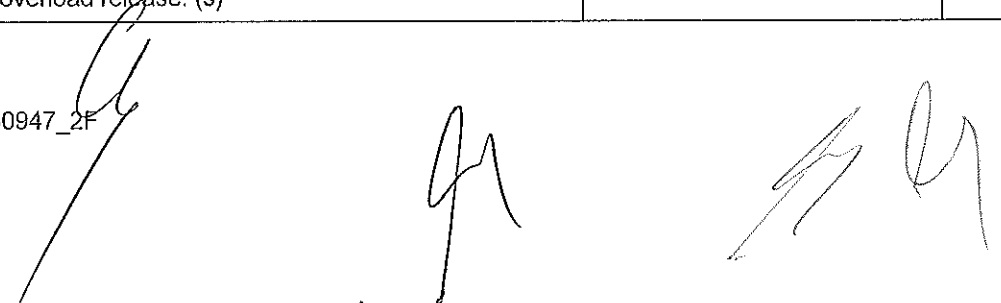
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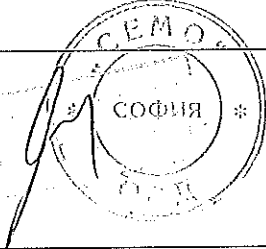
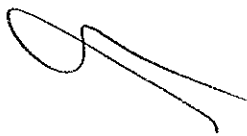
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	520 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	2 min 57 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Thermo-magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	800 A (200% I_n) specified tripping time by the manufacturer: $120 s \leq t \leq 540 s$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 07 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A

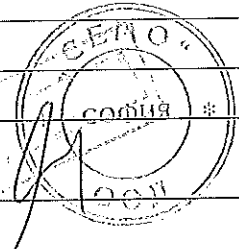
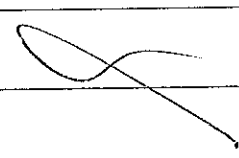
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A

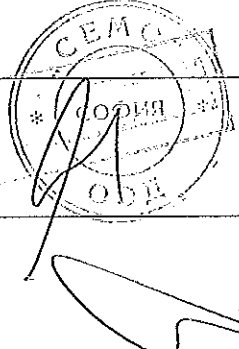


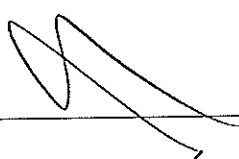
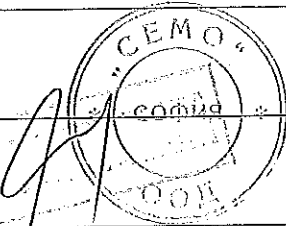
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A

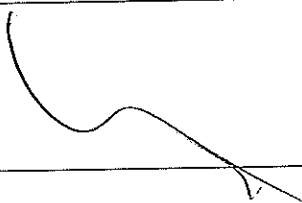
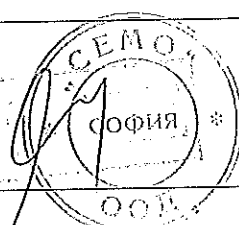
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip:</u> (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip:</u> (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	12,3 kV	P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control and auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U _e , and shall not exceed 0,5mA.	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.6		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A

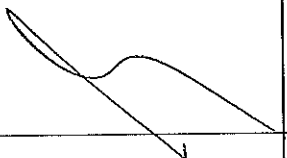
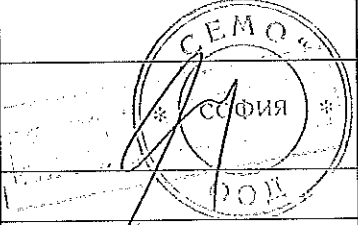
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	163#	
	Rated current In (A)	400 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	22,5 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated Uc)	4000 cycles	P
	Number of cycles without current (without releases)	4000 cycles	P
	Applied voltage: closing mechanism (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	400A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm^2) :	240 mm^2	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V) L1-L2: L2-L3: L3-L1:	694,4 Vac 694,2 Vac 695,5 Vac	P
	- test current $I/I_e = 1,0$ (A) L1: L2: L3:	404,5 A 401,2 A 405,1 A	P
	- power factor/time constant:	0,80	P



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Clause	Requirement + Test	Result - Remark	Verdict
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	535 ms	P
	- off-time (s):	59,5 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	163#	
	Rated current I_n (A)	400 A	
	Rated operational voltage: U_e (V)	690 Vac	
	Rated control supply voltage of closing mechanism: U_c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: U_c (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: U_c (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	21,9 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Maximum rated operational voltage: U_e (V)	690 Vac	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, overload operations:		P
	- test voltage $U/U_e = 1,05$ (V)	L1: 733,4 Vac L2: 733,1 Vac L3: 734,9 Vac	P
	- test current AC/DC: $I/I_e = 6,0/2.5$ (A)	L1: 2454,3 A L2: 2421,2 A L3: 2455,6 A	P
	- power factor/time constant:	0,48	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	545,6 s	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U_e , and shall not exceed 2 mA.	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 1	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 48,7 K	P
	conductor cross-sectional area (mm ²) :	240 mm ²	P
	test current I_e (A) :	400 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A (1,45 x 1,0 I_n)	P
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$	7 min 58 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	114 N	—
	test force with blocked main contacts for 10 s (N) :	342 N for 10's	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P


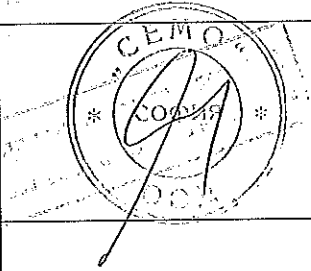
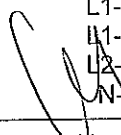
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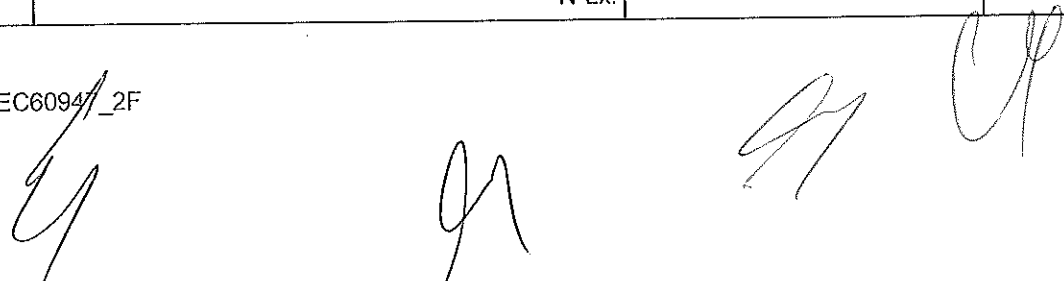
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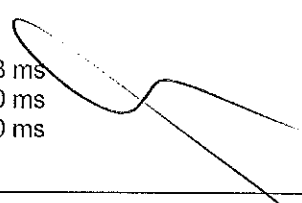
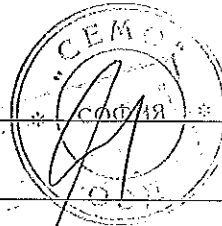
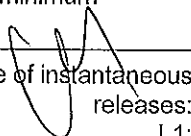
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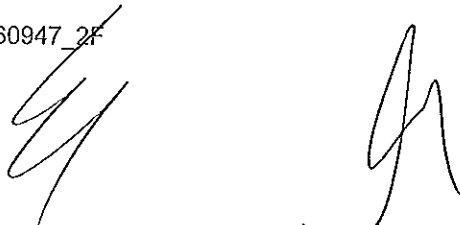
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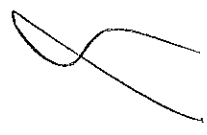
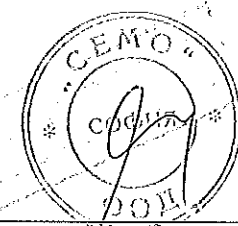
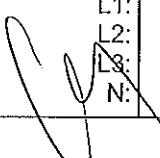
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-400R/4300	
	Sample no:	B105#	
	Rated operational voltage: U_e (V)	690 Vac	
	Rated current: I_n (A)	400 A	
	Ambient temperature 10-40 °C :	21,4 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 I_n for instantaneous tripping 12 I_n for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	3200 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: > 0,2 s L1-L3: > 0,2 s L2-L3: > 0,2 s N-Lx:		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	4800 A	P

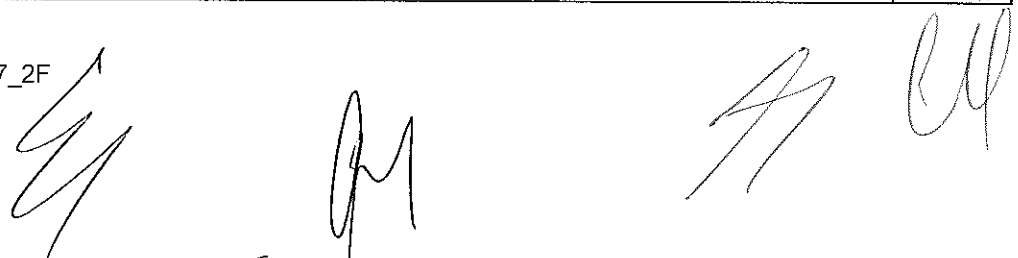
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: 14 ms L1-L3: 40 ms L2-L3: 20 ms N-Lx:		P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A

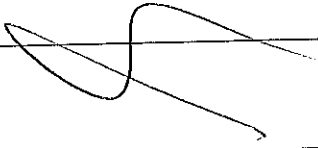
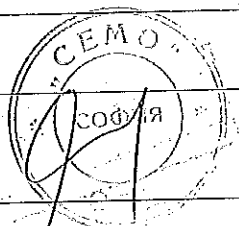
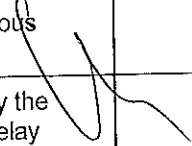


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	4800 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N:	13 ms 10 ms 10 ms 	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A

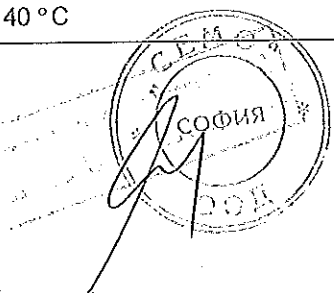


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		

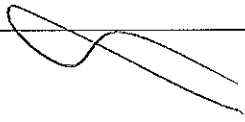
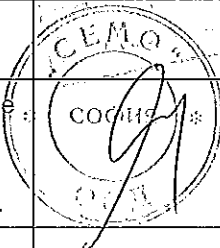


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A

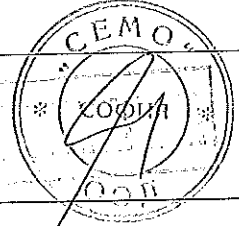


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-400R/4300	
	Sample no:	B105#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	400 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermo-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermo-magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	420 A	P

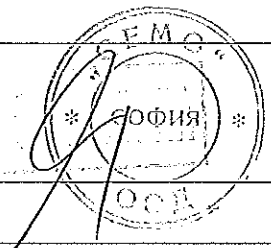
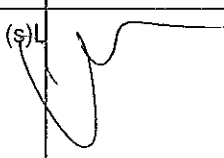
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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	520 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	20 min 25 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Thermo-magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A

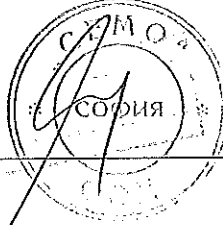
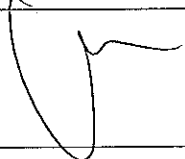
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	800 A (200% I_n) specified tripping time by the manufacturer: $120 s \leq t \leq 540 s$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	5 min 36 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A

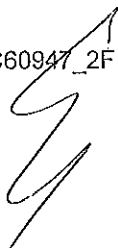


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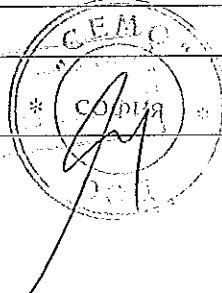
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

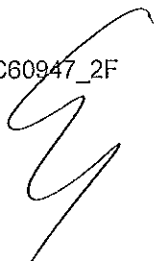


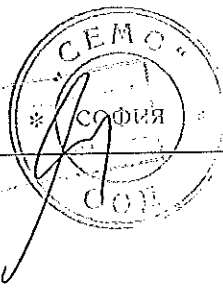
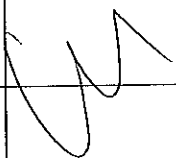
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A





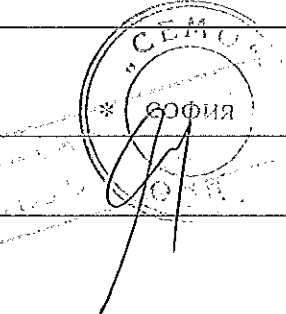
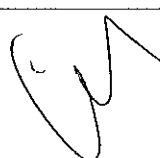
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> , shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermo-magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A



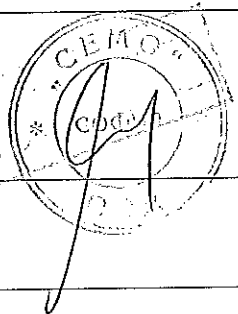

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	12,3 kV	P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A

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Clause	Requirement + Test	Result- Remark	Verdict
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA N: < 0,1 mA	P
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.6		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A

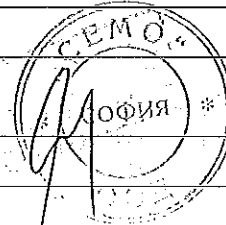
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-400R/4300	
	Sample no:	B105#	
	Rated current I_n (A)	400 A	
	Rated operational voltage: U_e (V)	690 Vac	
	Rated control supply voltage of closing mechanism: U_c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: U_c (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: U_c (V)	No undervoltage releases	
	Ambient temperature 10-40 $^{\circ}\text{C}$:	22,5 $^{\circ}\text{C}$	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated U_c)	4000 cycles	P
	Number of cycles without current (without releases)	4000 cycles	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Applied voltage: closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	400A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V) L1-L2: L2-L3: L3-L1:	694,4 Vac 694,2 Vac 695,5 Vac	P
	- test current $I/I_e = 1,0$ (A) L1: L2: L3:	404,5 A 401,2 A 405,1 A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	470,6 ms	P
	- off-time (s):	59,5 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-400R/4300	
	Sample no:	B105#	
	Rated current In (A)	400 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	21,9 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Maximum rated operational voltage: Ue (V)	690 Vac	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		P
	- test voltage $U/U_e = 1,05$ (V) L1: L2: L3:	733,4 Vac 733,1 Vac 734,9 Vac	P
	- test current AC/DC: $I/I_e = 6,0/2.5$ (A) L1: L2: L3:	2454,3 A 2421,2 A 2455,6 A	P
	- power factor/time constant:	0,48	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	476,7 s	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA N: < 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 2	P
	Temperature rise of main circuit terminals ≤ 30 K (K) :	Max: 49,3 K	P
	conductor cross-sectional area (mm ²) :	240 mm ²	P
	test current I_e (A) :	400 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A (1,45 x 1,0 In)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	9 min 21 s	P
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	150 N	—
	test force with blocked main contacts for 10 s (N) :	400 N for 10 s	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		N/A



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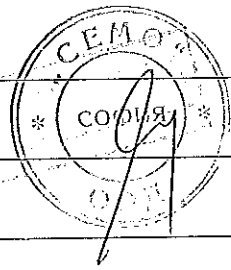
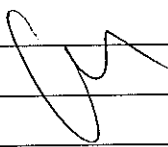
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	106#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism.	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P

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Clause	Requirement + Test	Result-Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Us = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	260 Vac 260 Vac 260 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	51,0 kA 51,2 kA 50,6 kA	P
	power factor/time constant :	0,23	P
	- Factor "n"	2,1	P
	- peak test current (A) :	110 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	23,9 kA 35,7 kA 19,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,99 MA ² s 3,22 MA ² s 1,33 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	25,7 kA 24,7 kA 35,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,62 MA ² s 1,62 MA ² s 4,31 MA ² s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	33,5 kA 27,9 kA 24,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,96 MA ² s 1,93 MA ² s 1,53 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	400 A	
	Maximum rated operational voltage: U _e (V)	240 Vac	
	Conductor cross-sectional area (mm ²) :	240 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	241,3 Vac 241,5 Vac 240,8 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	406,2 A 411,7 A 409,4 A	P
	- power factor/time constant:	0,82	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	569,7 ms	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	59,4 s	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 3	P
	Temperature rise of main circuit terminals. ≤80 K (K):	Max: 58,4 K	P
	conductor cross-sectional area (mm ²):	240 mm ²	P
	test current I _e (A):	400 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A (1,45 x 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	6 min 42 s	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	107#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated service short-circuit breaking capacity: (kA)	7,5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V).....	L1-L2: 734,6 Vac L2-L3: 734,2 Vac L3-L1: 735,3 Vac	P
	- r.m.s. test current AC/DC: (A)	L1: 7,75 kA L2: 7,73 kA L3: 7,60 kA	P
	power factor/time constant :	0,49	P
	- Factor "n"	1,7	P
	- peak test current (A) :	13,6 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak})	L1: 8,15 kA L2: 8,59 kA L3: 9,70 kA	P
	- Joule integral I ² dt (kA ² s)	L1: 401,2 kA ² s L2: 509,7 kA ² s L3: 455,7 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak})	L1: 6,82 kA L2: 9,58 kA L3: 10,4 kA	P
	- Joule integral I ² dt (kA ² s)	L1: 381,9 kA ² s L2: 449,0 kA ² s L3: 651,6 kA ² s	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	8,32 kA 8,67 kA 10,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	482,0 kA ² s 438,4 kA ² s 633,8 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	400 A	
	Maximum rated operational voltage: U _e (V)	690 Vac	
	Conductor cross-sectional area (mm ²) :	240 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	694,4 Vac 694,2 Vac 695,5 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	404,5 A 401,2 A 405,1 A	P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	544,6 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	59,5 s	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 8	P
	- the leaking current for circuit-breaker suitable for isolation: ($<2\text{mA} / 1.1 U_e$)	L1: $< 0,1 \text{ mA}$ L2: $< 0,1 \text{ mA}$ L3: $< 0,1 \text{ mA}$	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 4	P
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$:	Max: 59,3 K	P
	conductor cross-sectional area (mm^2) :	240 mm^2	P
	test current I_e (A) :	400 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A ($1,45 \times 400 \text{ A}$)	P
	Conventional tripping time: $< 1\text{h}$ when $I_n < 63\text{A}$, $< 2\text{h}$ when $I_n > 63 \text{ A}$	7 min 18 s	P

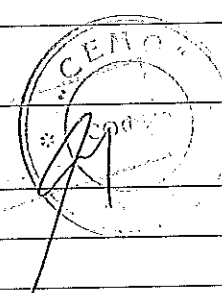
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (lcs):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	108#	
	Rated current: In (A)	225 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	95 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	260 Vac 260 Vac 260 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	51,0 kA 51,2 kA 50,6 kA	P
	power factor/time constant :	0,23 ¹	P
	- Factor "n"	2,1	P
	- peak test current (A) :	110 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	22,4 kA 34,9 kA 20,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,22 MA ² s 3,32 MA ² s 910 KA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	24,7 kA 34,3 kA 24,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	2,90 MA ² s 3,11 MA ² s 2,14 MA ² s	P
	Pause, t: (min)	3 min	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	26,7 kA 28,7 kA 36,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,83 MA ² s 1,81 MA ² s 4,68 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)		
	Maximum rated operational voltage: U _e (V)		
	Conductor cross-sectional area (mm ²):		
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)		N/A
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:		N/A
	- test current I/I _e = 1,0 (A) L1: L2: L3:		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤80 K (K) :		N/A
	conductor cross-sectional area (mm ²) :		N/A
	test current I _e (A) :		N/A
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	326,3 A (1,45 x 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	24 min 11 s	P







IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O - t - CO - t - CO		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	B109#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	35 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

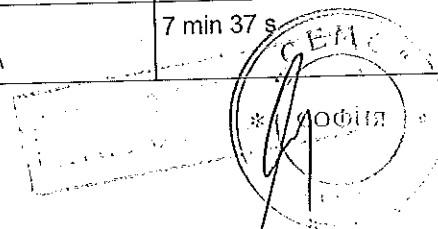
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²):	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening torques: (Nm)	10 Nm	P
	Test sequence of operation: O - t - CO - t - CO		P
	- test voltage U/Ue = 1,05 (V).....	L1-L2: 455 Vac L2-L3: 456 Vac L3-L1: 455 Vac	P
	- r.m.s. test current AC/DC: (A)	L1: 36,1 kA L2: 35,9 kA L3: 35,0 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (A) :	74,0 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak})	L1: 39,0 kA L2: 26,2 kA L3: 34,1 kA	P
	- Joule integral I ² dt (MA ² s)	L1: 5,76 MA ² s L2: 3,12 MA ² s L3: 5,57 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak})	L1: 34,0 kA L2: 41,5 kA L3: 28,4 kA	P
	- Joule integral I ² dt (MA ² s)	L1: 3,77 MA ² s L2: 8,04 MA ² s L3: 2,54 MA ² s	P
	Pause, t: (min)	3-min	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	40,1 kA 27,1 kA 33,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	7,71 MA ² s 2,28 MA ² s 3,78 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	400 A	
	Maximum rated operational voltage: U _e (V)	415 Vac	
	Conductor cross-sectional area (mm ²):	240 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	416,5 Vac 416,4 Vac 417,8 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	407,1 A 402,4 A 405,5 A	P
	- power factor/time constant:	0,84	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	498,6 ms	P
	- off-time (s):	59,5 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 5	P
	Temperature rise of main circuit terminals. ≤80 K (K) :	Max: 51,6 K	P
	conductor cross-sectional area (mm ²) :	240 mm ²	P
	test current I _e (A) :	400 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A (1,45 x 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	7 min 37 s	P



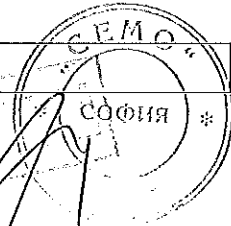
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II/III (lcs=lcu):		N/A



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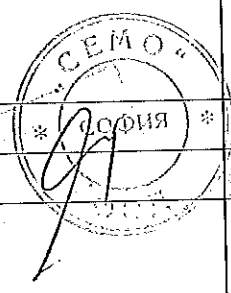
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	111#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 475 s	P
	L2: 420 s	
	L3: 443 s	
	N:	

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 254 Vac L2-L3: 254 Vac L3-L1: 254 Vac	P

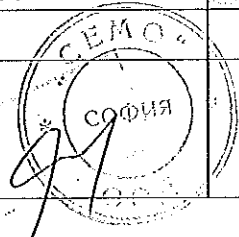
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 101 kA 104 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	225 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	39,3 kA 39,8 kA 29,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	4,32 MA ² s 2,84 MA ² s 1,99 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	40,9 kA 26,0 kA 40,4 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	3,31 MA ² s 1,28 MA ² s 4,31 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 189 s	P
	L2: 167 s	
	L3: 146 s	
	N:	



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	112#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 381 s	P
	L2: 370 s	
	L3: 443 s	
	N :	

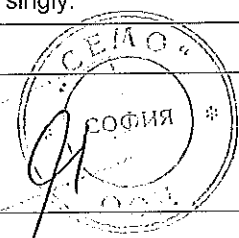
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 735,5 Vac L2-L3: 735,7 Vac L3-L1: 735,0 Vac	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	15,1 kA 15,3 kA 15,3 kA	P
	power factor/time constant :	0,29	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	30,9 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	22,4 kA 20,5 kA 17,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,59 MA ² s 2,22 MA ² s 1,47 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,9 kA 17,1 kA 23,9 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	2,26 MA ² s 1,27 MA ² s 3,06 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result-Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)	L1: 124 s L2: 89 s L3: 118 s N:	P



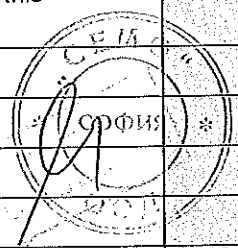
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	113#	
	Rated current: In (A)	225 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 188 s L2: 164 s L3: 191 s N :	P



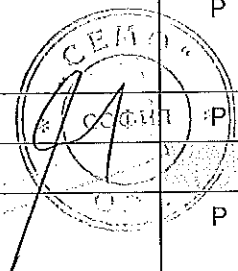
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IEC 60947-2				
Clause	Requirement + Test	Result - Remark	Verdict	
8.3.5.2	Test of rated ultimate short-circuit breaking capacity			
	The test sequence of operations is O – t – CO			
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A	
	closing mechanism energized with 85% at the rated Uc: (V)		N/A	
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P	
	Test made in free air:		P	
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P	
	The characteristics of the metallic screen:			
	- woven wire mesh		N/A	
	- perforated metal		P	
	- expanded metal		N/A	
	- ratio hole area/total area: 0,45-0,65		P	
	- size of hole: <30mm ²		P	
	- finish: bare or conductive plating		P	
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A	
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long			P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P	
	Conductor cross-sectional area (mm ²) :	95 mm ²	P	
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A	
	Tightening, torques: (Nm)	10 Nm	P	
	Test sequence of operation: O – t – CO		P	
	- test voltage U/Ue = 1,05 (V)	L1-L2: 254 Vac L2-L3: 254 Vac L3-L1: 254 Vac	P	



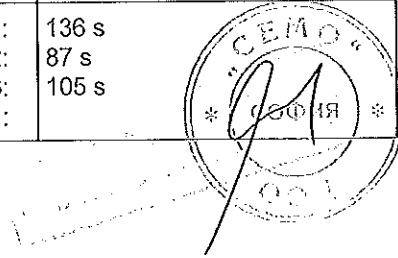


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1.....L2.....L3	101 kA 101 kA 104 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	225 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	38,6 kA 36,5 kA 26,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,99 MA ² s 2,50 MA ² s 1,44 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,4 kA 32,0 kA 39,5 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	1,36 MA ² s 3,00 MA ² s 3,12 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: 136 s L2: 87 s L3: 105 s N:		P



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/3300	
	Sample no:	C114#	
	Rated current: I _n (A)	400 A	
	Rated operational voltage: U _e (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: U _c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: U _c (V)	No shunt releases	
	This test sequence need not be made when I _{cu} = I _{cs}		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 226 s L2: 223 s L3: 218 s N :	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)	L1-L2: 447 VacL2-L3: 445 VacL3-L1: 446 Vac	P

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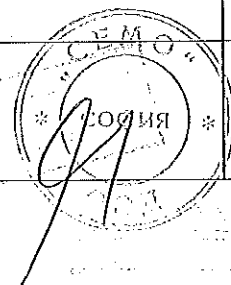
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	70,3 kA 70,5 kA 70,0 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	157 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	36,6 kA 43,5 kA 49,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,15 MA ² s 6,38 MA ² s 11,4 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	42,3 kA 52,2 kA 43,4 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	6,07 MA ² s 12,5 MA ² s 5,00 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,2 mA L2: < 0,2 mA L3: < 0,2 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: 123 s L2: 134 s L3: 124 s N:		P



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for 3 phases	
	Sample no:	110#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 424s L2: 416 s L3: 240 s N :	P

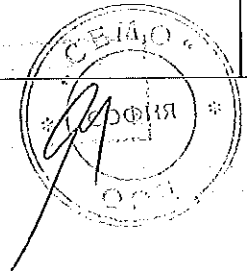
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)	L1-L2: 254 Vac L2-L3: 254 Vac L3-L1: 254 Vac	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 101 kA 104 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	225 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	38,4 kA 38,9 kA 25,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,81 MA ² s 2,71 MA ² s 1,37 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	42,2 kA 34,6 kA 25,9 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	4,62 MA ² s 2,18 MA ² s 1,48 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: 128 s L2: 148 s L3: 125 s N:		P



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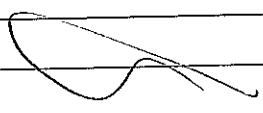
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for phase + N	
	Sample no:	110#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	240 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Us = 1,05 (V)	L1: L2: L3: 148 Vac	P







IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1: .....L2: .....L3:	60,1 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	132 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	21,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	1,39 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	23,6 kA	P
	- Joule integral I ² dt (A ² s) L1: .....L2: .....L3:	1,55 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	142 s	P



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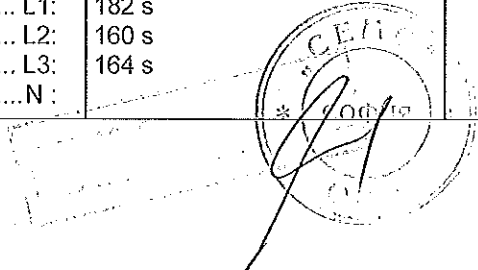
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for 3 phases	
	Sample no:	164#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	690.Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 288 s L2: 257 s L3: 273 s N :	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V)	L1-L2: 756 Vac L2-L3: 756 Vac L3-L1: 756 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	15,1 kA 15,0 kA 15,1 kA	P
	power factor/time constant :	0,29	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	30,6 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	22,6 kA 20,5 kA 25,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,06 MA ² s 2,30 MA ² s 3,53 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,4 kA 20,3 kA 26,7 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	2,65 MA ² s 2,46 MA ² s 4,81 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

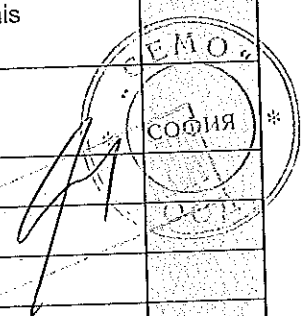
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer: _____	t ≤ 540 s	P
	- Operation time: (s)	L1: 182 s L2: 160 s L3: 164 s N :	P



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for phase + N	
	Sample no:	191#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	290 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) .....L1: .....L2: .....L3:	438 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1: .....L2: .....L3:	9,01 kA	P
	power factor/time constant :	0,50	P
	- Factor "n"	1,7	P
	- peak test current (Amax) :	15,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,8 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	824 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	11,1 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	842 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L3: < 0,1 mA N: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	208 s	P



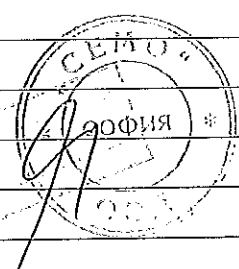
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for 3 phases	
	Sample no:	165#	
	Rated current: In (A)	225 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 191 s	P
 L2:	183 s	
 L3:	259 s	
 N :		

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U _c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	95 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U _e = 1,05 (V)L1-L2:L2-L3:L3-L1:	263 Vac 262 Vac 263 Vac	P

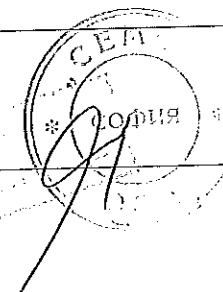


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	101 kA 103 kA 105 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	229 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	40,4 kA 23,5 kA 26,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,40 MA ² s 831 kA ² s 1,41 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	21,5 kA 35,9 kA 40,6 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	1,19 MA ² s 3,65 MA ² s 3,35 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s)		P
 L1:	144 s	
 L2:	123 s	
 L3:	132 s	
 N:		



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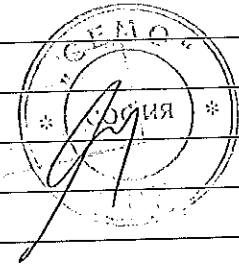
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for phase + N	
	Sample no:	192#	
	Rated current: In (A)	225 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N :	259 s	P

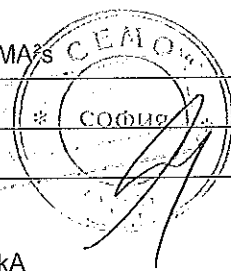
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	95 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	10 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)L1:L2:L3:	146 Vac	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	61,1 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	134 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	21,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,40 MA ² s	P
	Pause, t: (min)	3 min.	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	24,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,53 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L3: < 0,1 mA N: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1: L2: L3: N:	122 s	P



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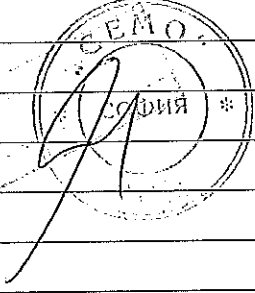
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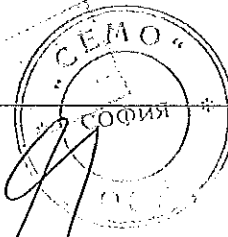
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for 3 phases	
	Sample no:	B166#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: 331 s L2: 310 s L3: 272 s N :	P

IEC 60947-2				
Clause	Requirement + Test	Result - Remark	Verdict	
8.3.5.2	Test of rated ultimate short-circuit breaking capacity			
	The test sequence of operations is O – t – CO			
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A	
	closing mechanism energized with 85% at the rated U_c : (V)		N/A	
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P	
	Test made in free air:		P	
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P	
	The characteristics of the metallic screen:			
	- woven wire mesh		N/A	
	- perforated metal		P	
	- expanded metal		N/A	
	- ratio hole area/total area: 0,45-0,65		P	
	- size of hole: <30mm ²		P	
	- finish: bare or conductive plating		P	
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long			P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P	
	Conductor cross-sectional area (mm ²) :	240 mm ²	P	
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A	
	Tightening, torques: (Nm)	10 Nm	P	
	Test sequence of operation: O – t – CO		P	
	- test voltage $U/U_e = 1,05$ (V) .....L1-L2: .....L2-L3: .....L3-L1:	447 Vac 445 Vac 446 Vac	P	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	70,3 kA 70,5 kA 70,0 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	157 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	40,2 kA 48,3 kA 24,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	5,89 MA ² s 9,47 MA ² s 1,18 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	50,5 kA 35,6 kA 42,2 kA	P
	- Joule integral I ² dt (A ² s) L1: L2: L3:	8,40 MA ² s 4,29 MA ² s 11,4 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,4 mA L2: < 0,4 mA L3: < 0,4 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 540$ s	P
	- Operation time: (s) L1:	123 s	P
 L2:	74 s	
 L3:	81 s	
 N:		



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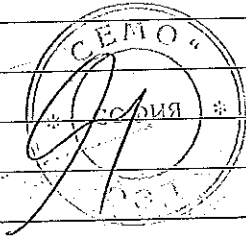
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

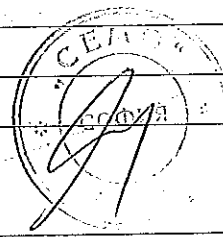
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-400R/4300 test for phase + N	
	Sample no:	193#	
	Rated current: I _n (A)	400 A	
	Rated operational voltage: U _e (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: U _c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: U _c (V)	No shunt releases	
	This test sequence need not be made when I _{cu} = I _{cs}		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 540 s	P
	- Operation time: (s)	L1: L2: L3: N: 261 s	P

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IEC 60947-2				
Clause	Requirement + Test	Result - Remark	Verdict	
8.3.5.2	Test of rated ultimate short-circuit breaking capacity			
	The test sequence of operations is O – t – CO			
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A	
	closing mechanism energized with 85% at the rated U _c : (V)		N/A	
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P	
	Test made in free air:		P	
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P	
	The characteristics of the metallic screen:			
	- woven wire mesh		N/A	
	- perforated metal		P	
	- expanded metal		N/A	
	- ratio hole area/total area: 0,45-0,65		P	
	- size of hole: <30mm ²		P	
	- finish: bare or conductive plating		P	
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long			P
	Circuit is earthed at: (load-star- or supply-star point)		Load-star point	P
	Conductor cross-sectional area (mm ²) :		240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A	
	Tightening, torques: (Nm)	10 Nm	P	
	Test sequence of operation: O – t – CO		P	
	- test voltage U/U _e = 1,05 (V)L1:L2:L3:	261 Vac	P	

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: L2: L3:	42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	29,5 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,71 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	26,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,48 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 540 s	P
	- Operation time: (s) L1: L2: L3: N:	155 s	P



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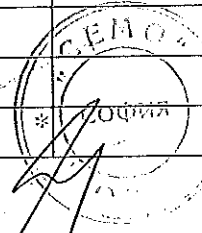
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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV		N/A
8.3.7	TEST SEQUENCE V		N/A
8.3.8	TEST SEQUENCE VI: Combined test sequence		N/A
Annex B	Circuit-breakers incorporating residual current protection		N/A
Annex C	Individual pole short-circuit test sequence		N/A
Annex F	Additional tests for circuit-breakers with electronic over-current protection		N/A
Annex H	Individual pole short-circuit test sequence		N/A
Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		N/A
Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		N/A
Annex M	Modular residual current devices (without integral current breaking device)		N/A
Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		N/A
Annex O	Instantaneous trip circuit-breakers (ICB)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 1: Heating Test (Seq I, 8.3.3.6, sample number 163#)			P
Test current (A):	400 A		—
Ambient (°C):	22,3 °C		—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	48,7 K	80 K	
Load side Terminal 2	40,5 K	80 K	
Line side Terminal 3	43,7 K	80 K	
Load side Terminal 4	44,5 K	80 K	
Line side Terminal 5	42,4 K	80 K	
Load side Terminal 6	38,6 K	80 K	
Side enclosure	33,0 K	60 K	
Front enclosure	28,9 K	50 K	
Actuator	13,1 K	35 K	



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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 2: Heating Test (Seq I, 8.3.3.6, sample number B105#)			P
Test current (A):		400 A	—
Ambient (°C):		22,3 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	44,7 K	80 K	
Load side Terminal 2	45,1 K	80 K	
Line side Terminal 3	46,2 K	80 K	
Load side Terminal 4	49,3 K	80 K	
Line side Terminal 5	47,5 K	80 K	
Load side Terminal 6	47,3 K	80 K	
Line side Terminal N	43,4 K	80 K	
Load side Terminal N	46,5 K	80 K	
Side enclosure	36,9 K	60 K	
Front enclosure	30,2 K	50 K	
Actuator	15,3 K	35 K	

TABLE 3: Heating Test (Seq II, 8.3.4.4, sample number 106#)			P
Test current (A):		400 A	—
Ambient (°C):		23,2 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	55,3 K	80 K	
Load side Terminal 2	58,4 K	80 K	
Line side Terminal 3	53,3 K	80 K	
Load side Terminal 4	57,2 K	80 K	
Line side Terminal 5	50,0 K	80 K	
Load side Terminal 6	55,5 K	80 K	

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Clause	Requirement + Test	Result - Remark	Verdict

TABLE 4: Heating Test (Seq II, 8.3.4.4, sample number 107#)			P
Test current (A):		400 A	—
Ambient (°C):		23,2 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	52,7 K	80 K	
Load side Terminal 2	48,5 K	80 K	
Line side Terminal 3	51,8K	80 K	
Load side Terminal 4	54,5 K	80 K	
Line side Terminal 5	55,4 K	80 K	
Load side Terminal 6	59,3 K	80 K	

TABLE 5: Heating Test (Seq II, 8.3.4.4, sample number B109#)			P
Test current (A):		400 A	—
Ambient (°C):		22,9 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	41,9 K	80 K	
Load side Terminal 2	45,5 K	80 K	
Line side Terminal 3	42,4K	80 K	
Load side Terminal 4	48,5 K	80 K	
Line side Terminal 5	44,4 K	80 K	
Load side Terminal 6	51,6 K	80 K	

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

TABLE 6: dielectric strength (Seq I, 8.3.3.5, sample number 163# and B105#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

TABLE 7: dielectric strength (Seq II, 8.3.4.3, sample number 106#, 108# and B109#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 8: dielectric strength (Seq II, 8.3.4.3, sample number 107#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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Clause	Requirement + Test	Result - Remark	Verdict

	TABLE 9: dielectric strength (Seq III, 8.3.5.3, sample number 110#, 111#, 113#, C114#, 165#, B166#, 192# and 193#)		P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

	TABLE 10: dielectric strength (Seq III, 8.3.5.3, sample number 112#, 164# and 191#)		P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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

TABLE 11: clearance and creepage distance measurements							P
clearance cl and creepage distance dcr at/of:	Ui (V)	Uimp (kV)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
Between poles	800 V	8 kV	8 mm	27,8 mm	12,5 mm	47,8 mm	
Between live parts and parts intended to be earthed	800 V	8 kV	8 mm	38,6 mm	12,5 mm	38,6 mm	
Between the contacts in the open position	800 V	8 kV	8 mm	30,5 mm	12,5 mm	43,6 mm	
Between live parts and actuator	800 V	8 kV	8 mm	12,8 mm	12,5 mm	16,9 mm	

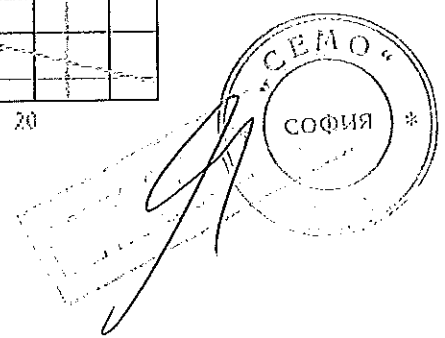
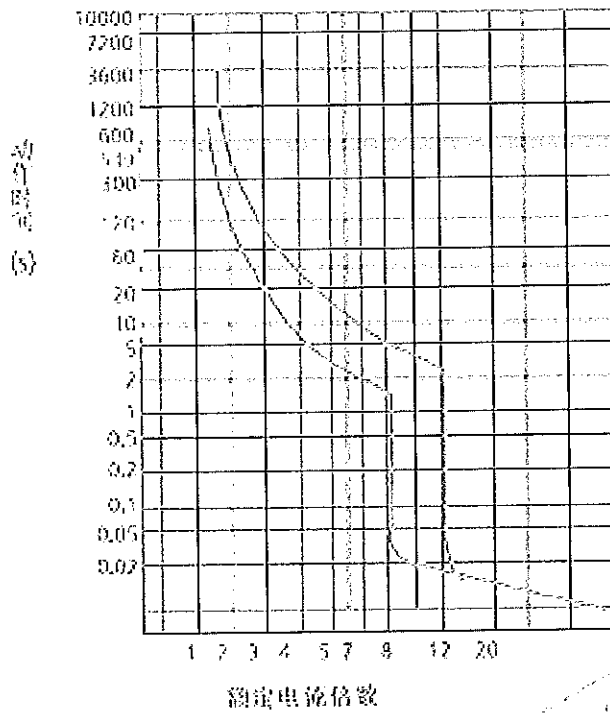
TABLE 12: Resistance to fire (Glow wire test)							P
No.	Description	Colour	Temp. °C	burning after t (s)	drops	support burning	—
1	Base	Black	960 °C	0 s	No	No	P
2	Cover	White	960 °C	0 s	No	No	P
3	Actuator	Black	960 °C	6 s	No	No	P
4	Leading lever	Yellow	960 °C	4 s	No	No	P

TABLE 13: Resistance to tracking (tracking test)							P
Specimen							Verdict
Description	Colour	Drops (no.)	Thick (mm)	Burning	Current (A)	Test voltage (V)	
Base	Black	50	3 mm	N	< 0,5 A	175 V	P
Cover	White	50	3 mm	N	< 0,5 A	175 V	P
Handle	Black	50	3 mm	N	< 0,5 A	175 V	P
Leading lever	Yellow	50	3 mm	N	< 0,5 A	175 V	P

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Time current characteristics

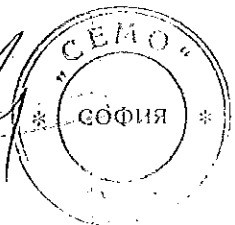
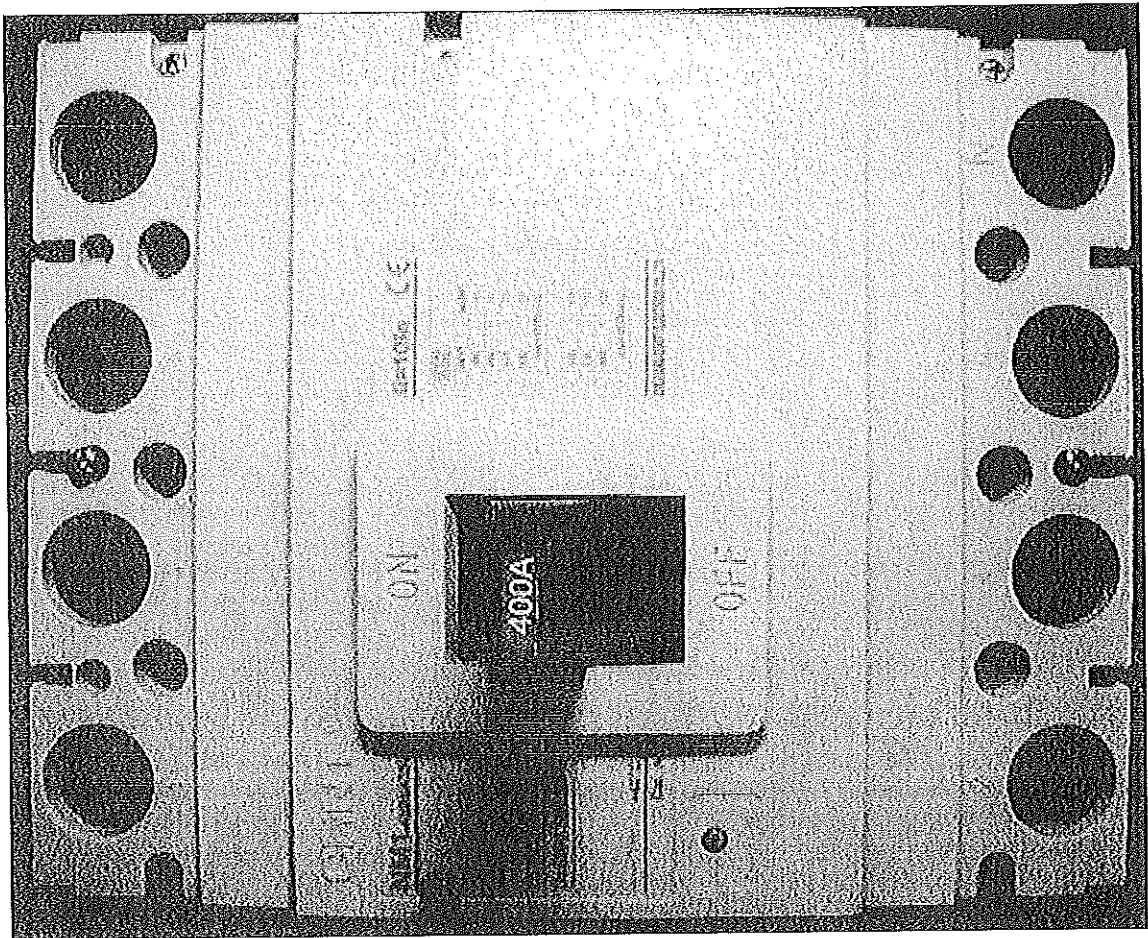
TRF-200 动作特性曲线



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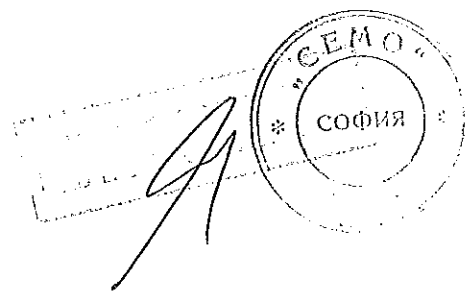
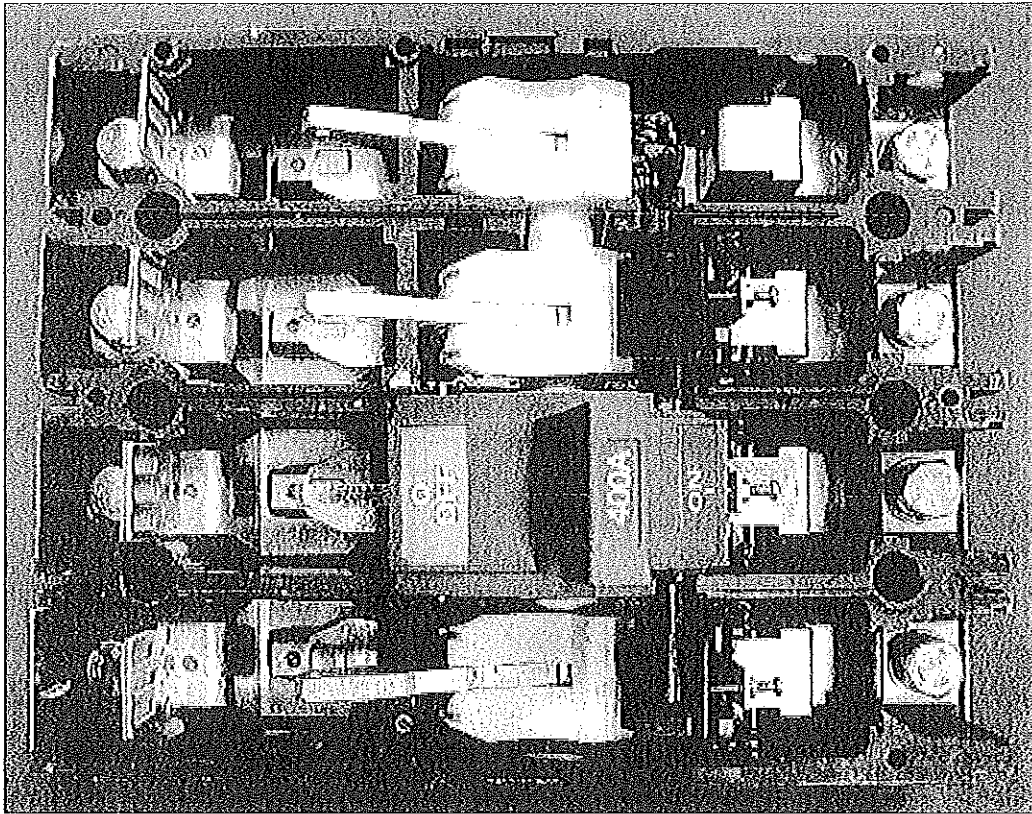
Photographs

Front view, 3P + N MCCB



IEC 60947-2

Open view, 3P + N MCCB



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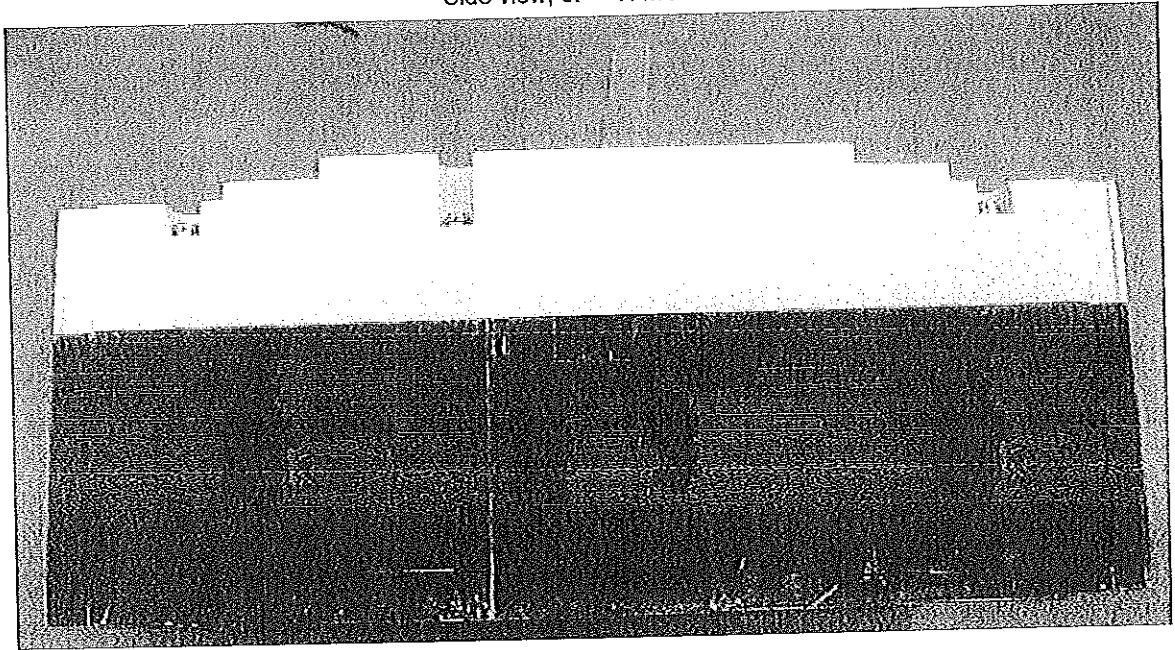
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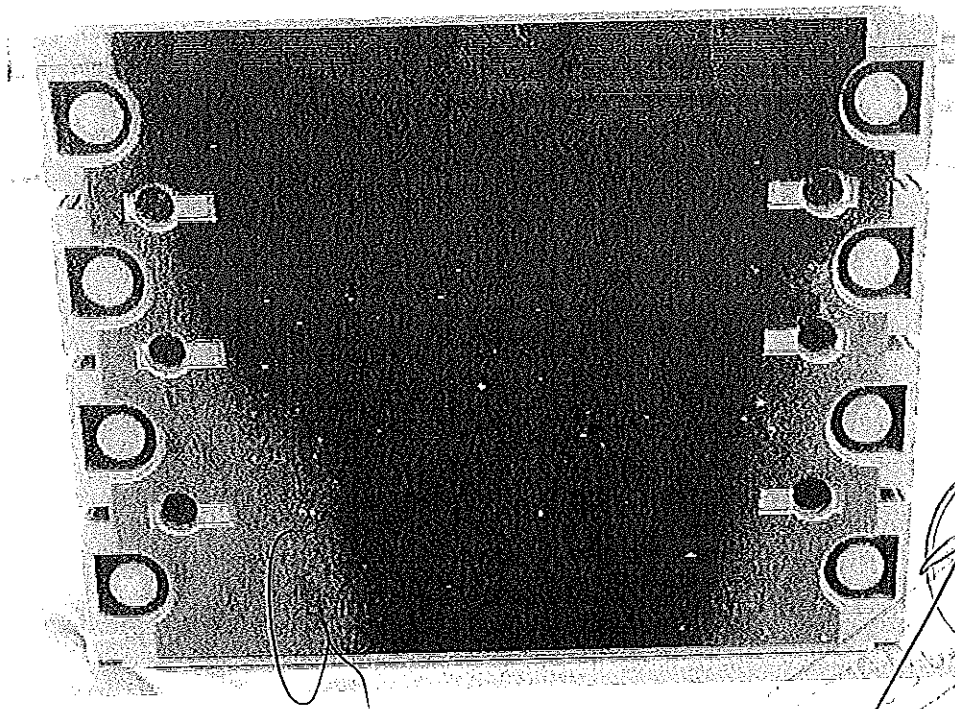
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Side view, 3P + N MCCB



Back view, 3P + N MCCB



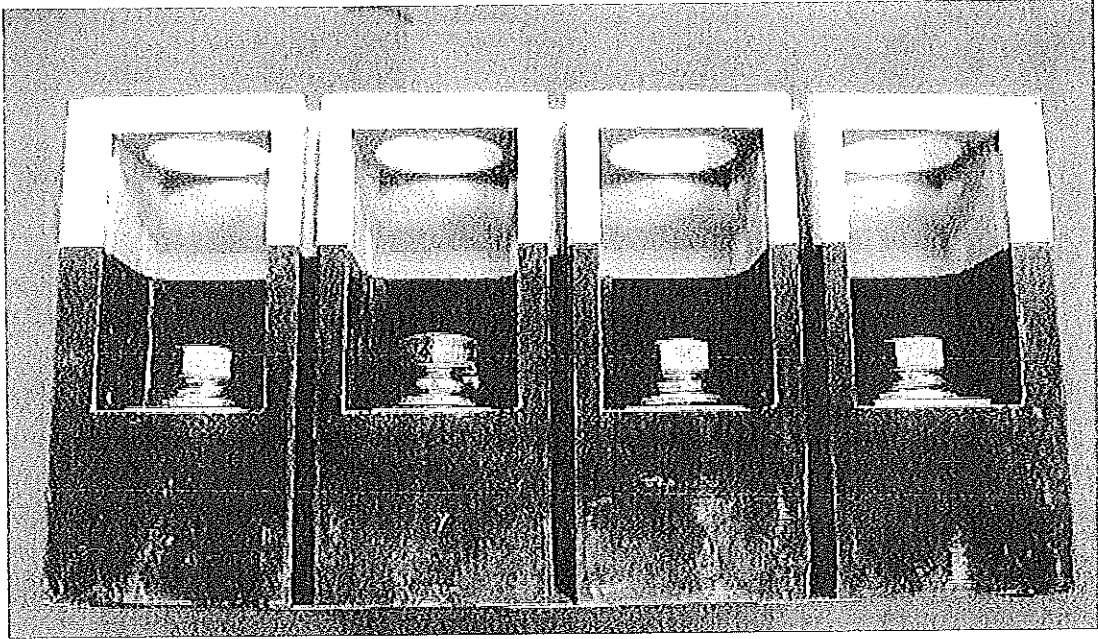
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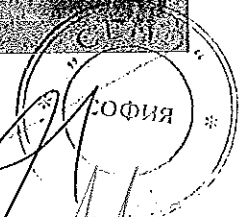
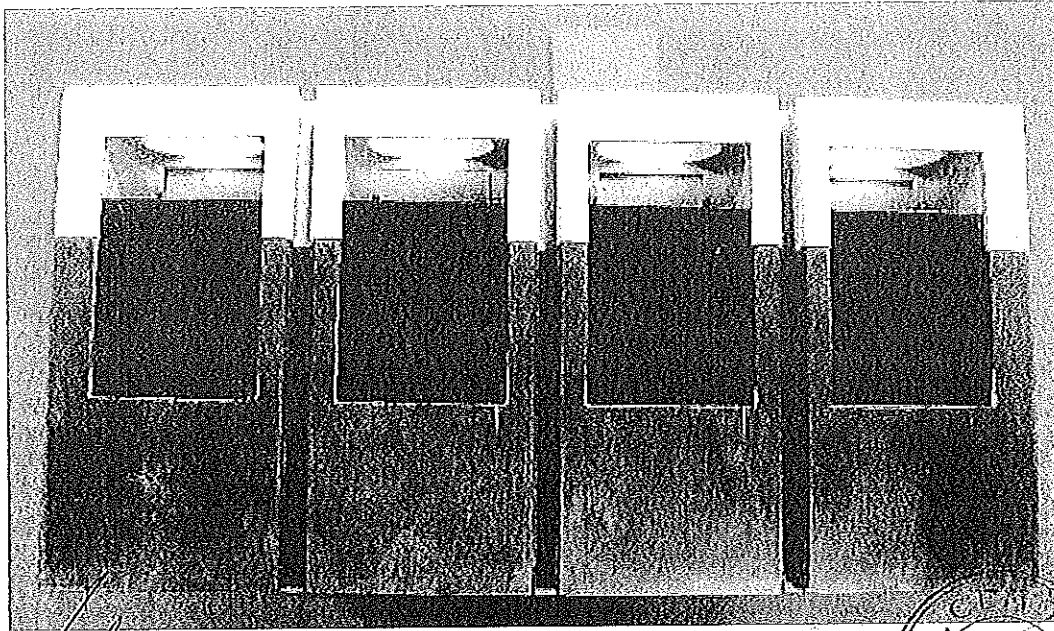
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Load terminal view, 3P + N MCCB



Line terminal view, 3P + N MCCB

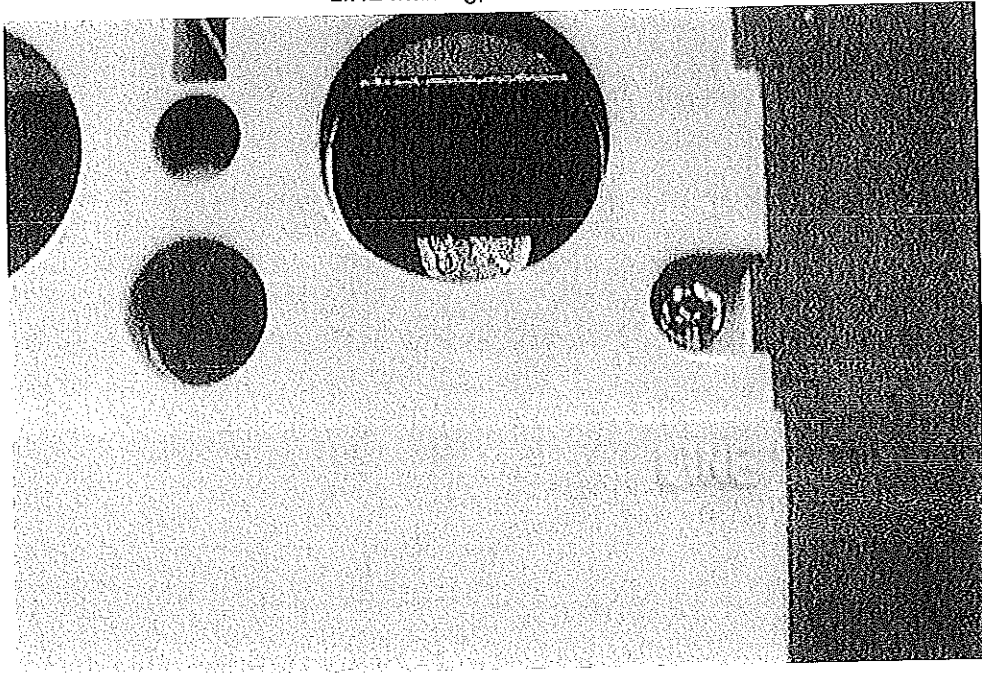


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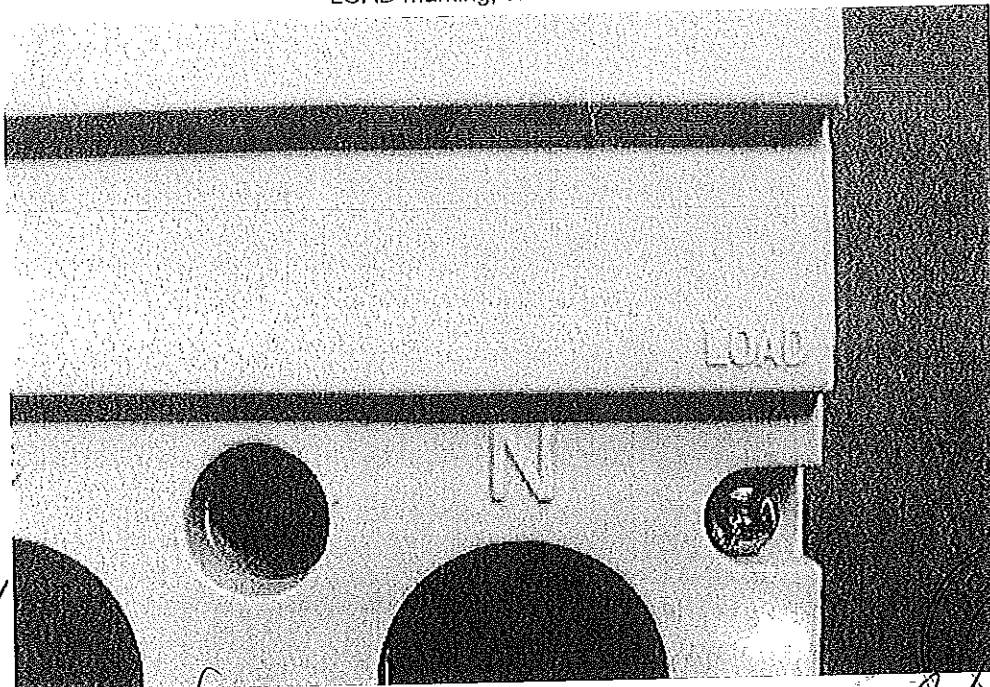
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LINE marking, 3P + N MCCB

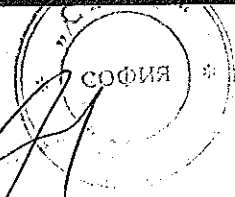
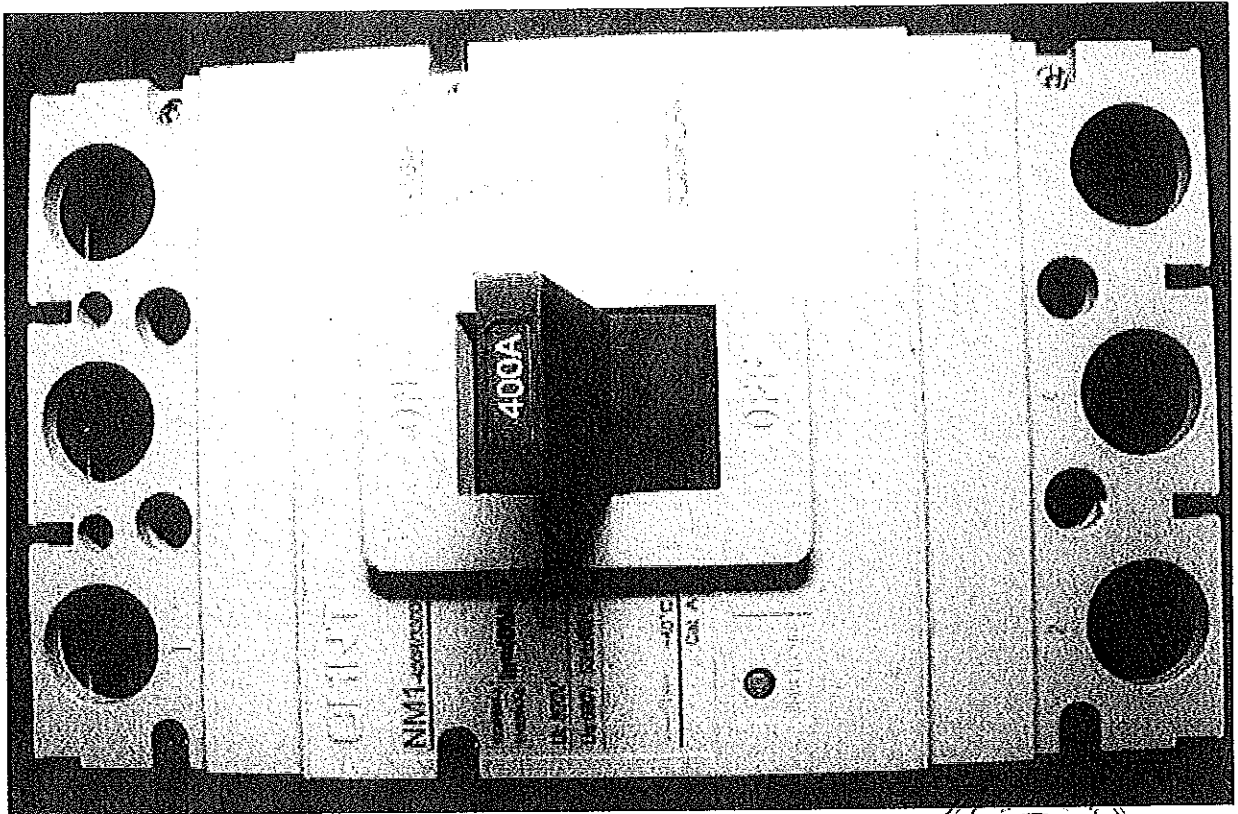


LOAD marking, 3P + N MCCB



IEC 60947-2

Front view, 3P MCCB



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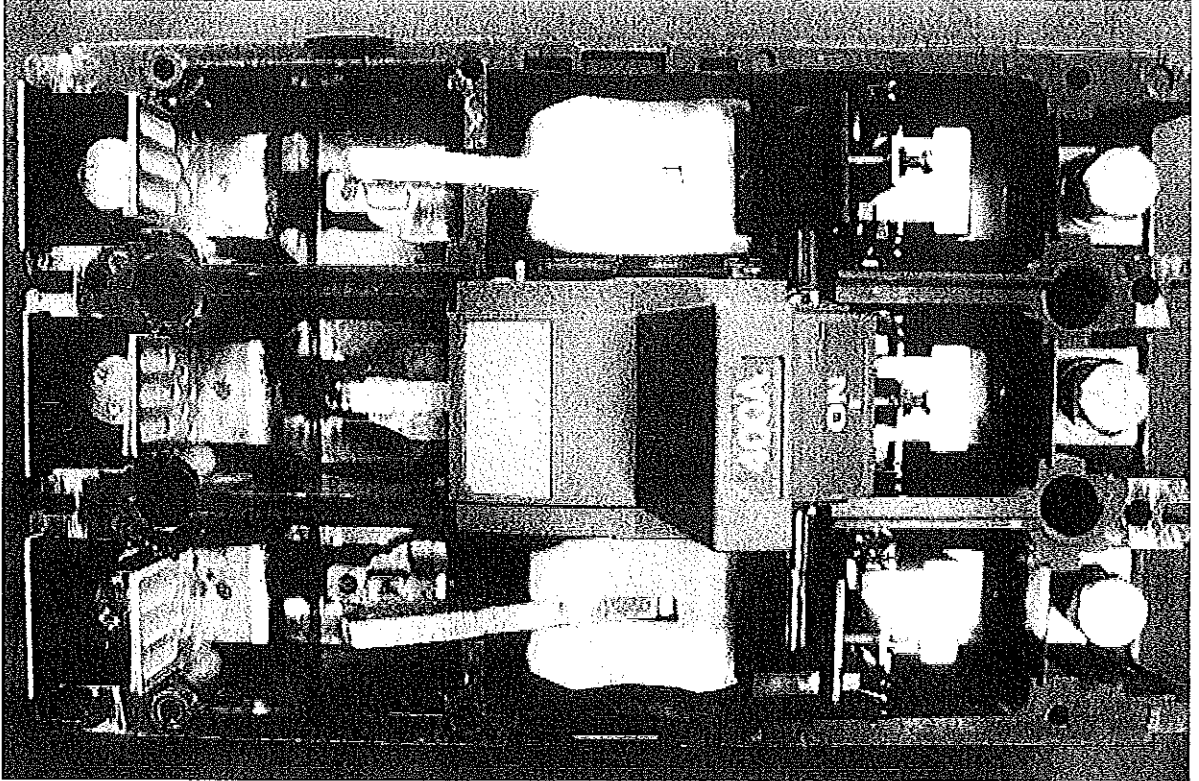
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IEC 60947-2

Open view, 3P + N MCCB



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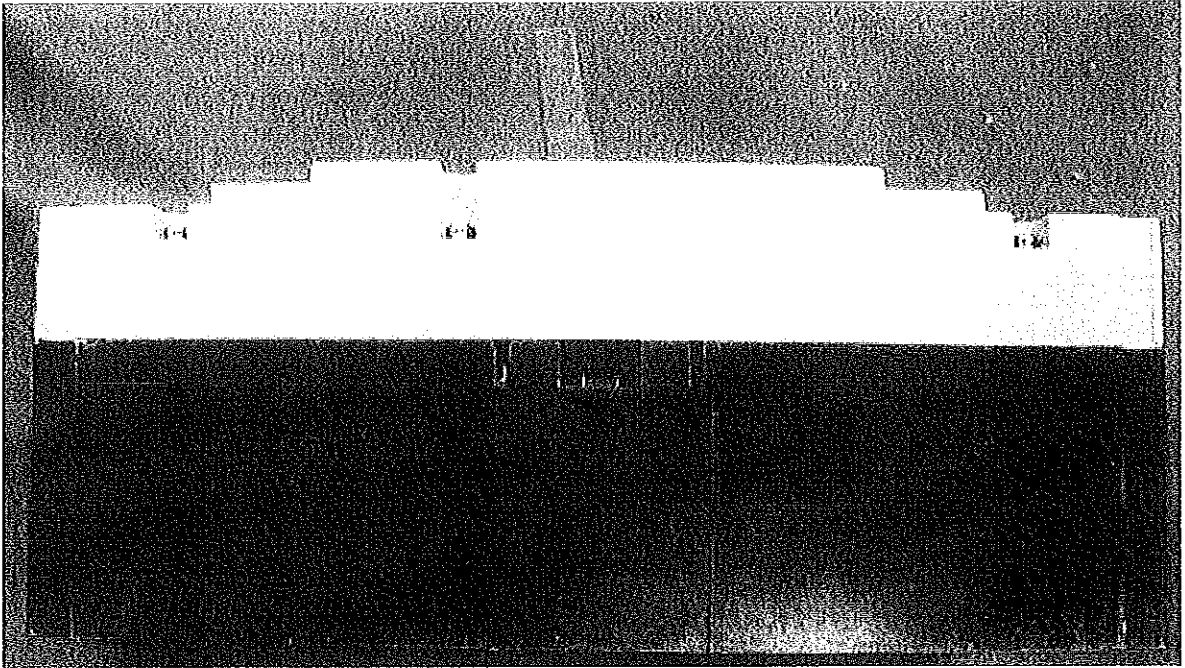
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IEC 60947-2

Side view, 3P MCCB



Back view, 3P MCCB

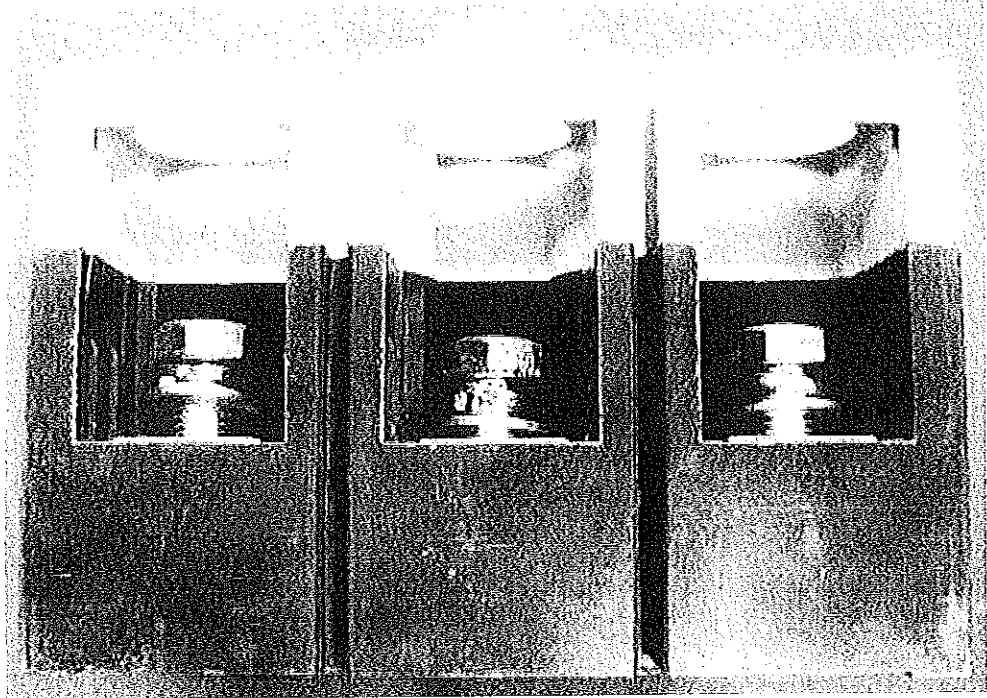


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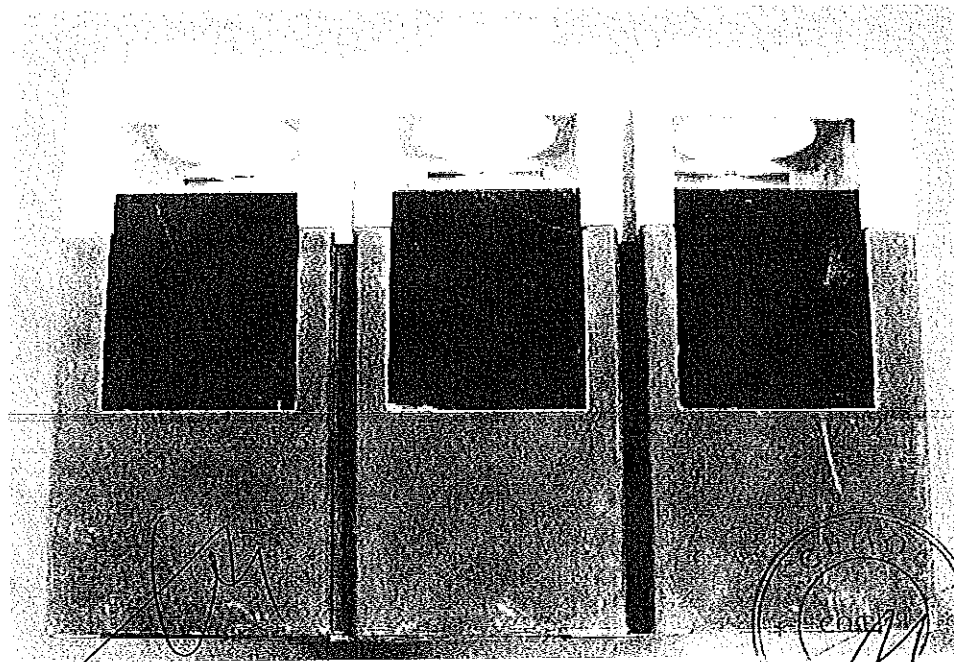
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IEC 60947-2

Load terminal view, 3P MCCB



Line terminal view, 3P MCCB



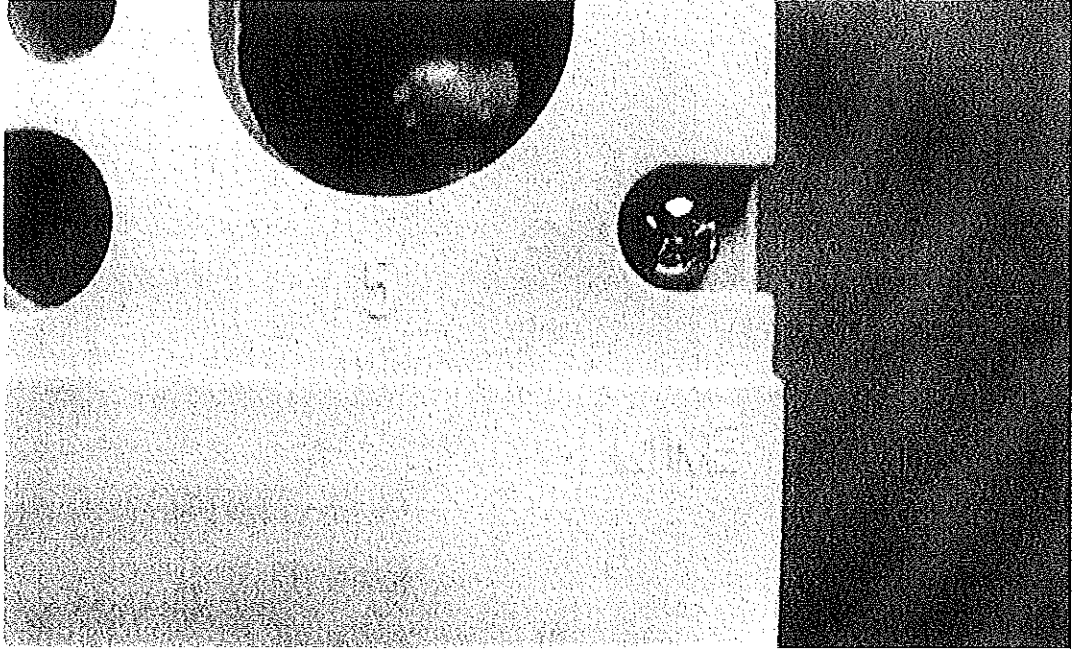
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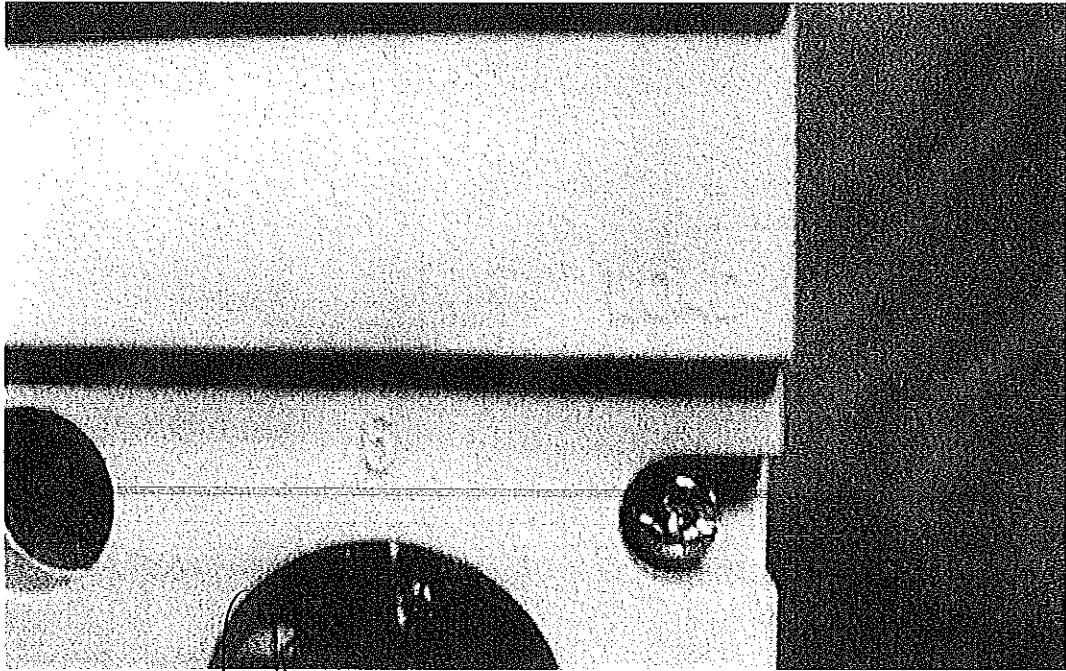
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IEC 60947-2

LINE marking, 3P MCCB



LOAD marking, 3P + N MCCB



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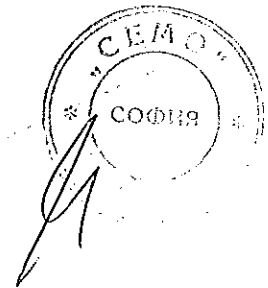
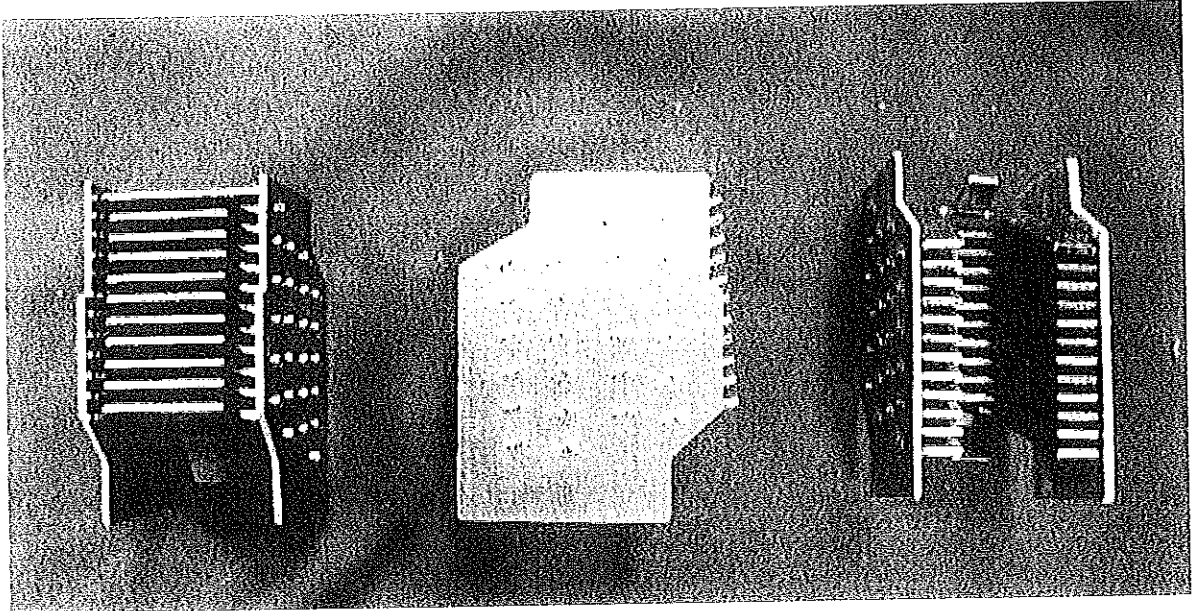
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COG17

IEC 60947-2

Arc chamber



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TRF No. IEC60947_2F

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СПИСЪК НА ИЗПИТАНИЯТА В ТЕСТОВИ ДОКЛАД ЗА NM1-125 ~ 630

№	ОПИСАНИЕ
1	Обща информация
2	Продуктова информация
3	Тестови данни
4	Снимка на автомата
5	Кратко изложение на теста
6	Маркировка
7	Конструкция
8	Изисквания за работа
9	Тестове
10	Механични характеристики на клемите
11	Изпитателна последователност I – общо представяне, проба I-1,2 полюс
12	Изпитателна последователност I – общо представяне, проба I-2,3 полюс
13	Изпитателна последователност I – общо представяне, проба I-3,4 полюс
14	Изпитателна последователност II (Ics)
15	Изпитателна последователност II/III (Ics=Icu) – проба II-1,2 полюс
16	Изпитателна последователност II/III (Ics=Icu) – проба II-2,2 полюс
17	Изпитателна последователност II/III (Ics=Icu) – проба II-3,2 полюс
18	Изпитателна последователност II/III (Ics=Icu) – проба II-4,3 полюс
19	Изпитателна последователност II/III (Ics=Icu) – проба II-5,3 полюс
20	Изпитателна последователност II/III (Ics=Icu) – проба II-6,3 полюс
21	Изпитателна последователност II/III (Ics=Icu) – проба II-7,4 полюс
22	Изпитателна последователност III (Icu) – проба III-1,4 полюс тествани при 1P+N
23	Други
24	Топлинен тест
25	Диелектрична стабилност
26	Измерване на безопасното разстояние за монтаж
27	Сила на затягане на болтовете
28	Издържливост на пожар и оголен кабел
29	Снимков материал на тестваното изделие

Дата: 07.08.2015 г.

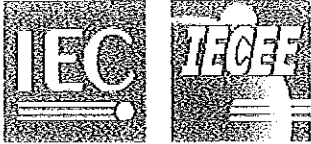


СЕМО ООД:.....





506



Test Report issued under the responsibility of:

KEMA Quality
a DEKRA company

**TEST REPORT
IEC 60947-2**

Low-voltage switchgear and controlgear - Part 2: Circuit-breakers

Report Reference No.: W0808102.63
Date of issue: 2010-08-11
Total number of pages: 150 pages

CB Testing Laboratory: KEMA Quality Testing Services (Zhejiang) Co.,Ltd.
Address: No.5 Changjiang Road Great Bridge Industrial Park North Baixiang
Wenzhou, Zhejiang, 325603, P. R. China

Applicant's name: Zhejiang CHINT Electrics Co., Ltd.
Address: No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing,
Zhejiang, P.R. China

Test specification:

Standard.....: IEC 60947-2:2006 (4th Edition) + amendment 1: 2009
Test procedure: CB
Non-standard test method.....: N/A

Test Report Form No.: IEC60947_2F
Test Report Form(s) Originator.....: KEMA Quality BV
Master TRF: Dated 2010-01

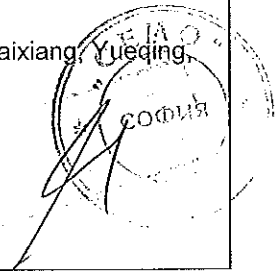
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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description: Moulded-case circuit-breaker
Trade Mark.....: CHINT
Manufacturer: Zhejiang CHINT Electrics Co., Ltd.
No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing,
Zhejiang, P.R. China
Model/Type reference: NM1-630R/4300, NM1-630R/3300,
NM1-630H/4300, NM1-630H/3300,
NM1-630S/4300, NM1-630S/3300
Ratings: See Page 5, 6, 7, 8



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Testing procedure and testing location:

<input checked="" type="checkbox"/> CB Testing Laboratory:	KEMA Quality Testing Services (Zhejiang)Co.,Ltd
Testing location/ address	No.5, Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P.R.China
<input type="checkbox"/> Associated CB Laboratory:	N/A
Testing location/ address	N/A
Tested by (name + signature).....	King Wang
Approved by (+ signature).....	Fred Fu
	F.G Eric Wang
<input type="checkbox"/> Testing procedure: TMP	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: WMT	
Tested by (name + signature).....	N/A
Witnessed by (+ signature)	N/A
Approved by (+ signature)	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: SMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature)	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: RMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature)	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A



Summary of testing:

The circuit breakers of NM1-630R, NM1-630H and NM1-630S are fully identical except the short circuit capacities and type references marked on the labels. Therefore, the tests conducted on NM1-630R (with maximum short-circuit breaking capacity) are deemed to cover the tests on NM1-630H and NM1-630S.

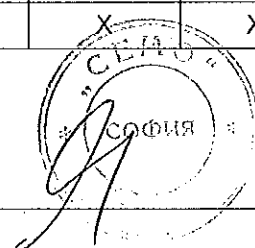
Tests performed (name of test and test clause):

Model	Rated current	Test voltage	Number of poles	Seq I	Seq II	Seq III 3 phases test	Seq III 1 phase + N test
NM1-630R/3300	630 A	690 Vac	3P	X	X	X	N/A
	630 A	415 Vac		N/A	X	X	N/A
	630 A	240 Vac		N/A	X	X	N/A
	400 A			N/A	X	X	N/A
NM1-630R/4300	630 A	690 Vac	3P + N	X	N/A	X	X
	630 A	415 Vac		N/A	N/A	X	X
	630 A	240 Vac		N/A	N/A	X	X
	400 A			N/A	N/A	X	X

Note:

X means the test was conducted

N/A means the test is not applicable



Testing location:

All tests except test of rated service short-circuit breaking capacity at 240 Vac, 415 Vac and seq III were conducted in:

KEMA Quality Testing Services (Zhejiang) Co., Ltd.

No.5 Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou, Zhejiang, 325603, P. R. China.

Tests of rated service short-circuit breaking capacity at 240 Vac, 415 Vac and seq III were conducted in:

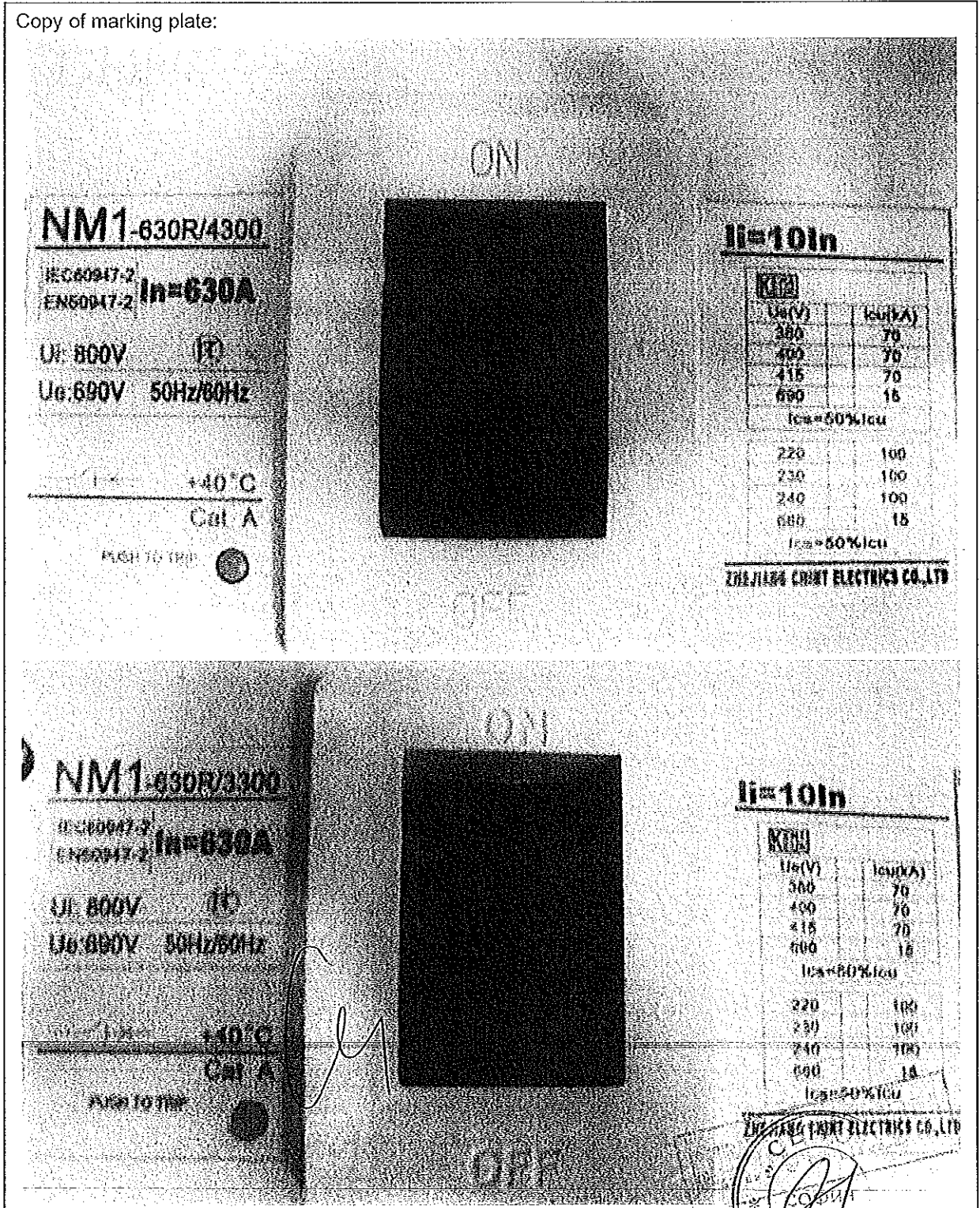
TILVA - 505 Wu Ning Road, Shanghai, P.R. China

Summary of compliance with National Differences:

The MCCBs comply with EN Group Differences.

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Copy of marking plate:

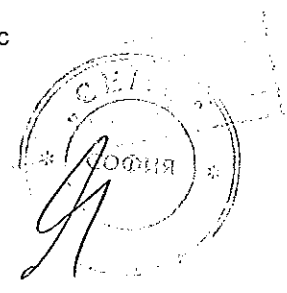


TRF No. IEC60947_2F

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Test item particulars: test item vs. test requirements	
3. Classification	
3.1. Utilization category: (A or B).....	A
3.2. Interruption medium: (air, vacuum, gas Break).....	Air
3.3. Design: (open construction, moulded case)	Moulded case
3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power)	Independent manual
3.5. Suitability for isolation: (suitable, not -suitable).....	Suitable
3.6. Provision for maintenance: (maintainable, non maintainable).....	Non-maintainable
3.7. Method of installation: (fixed, plug in, withdrawable)	Fixed
3.8. Degree of protection: (IP code)	N/A
4.7. Type of release (thermo-magnetic / electronic)	Thermo-magnetic
4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD.....	N/A
7.3 Electromagnetic compatibility (EMC) Environment A or B	A
Circuit-breaker for use on phase-earthed systems.....	N/A
Circuit-breaker for use in IT systems.....	N/A
Rated and limiting values, main circuit:	
- rated operational voltage: U_e (V)	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac
- rated insulation voltage: U_i (V)	800 V
- rated impulse withstand voltage: U_{imp} (kV):.....	8 kV
- rated operational current: I_e (A).....	400 A, 450, 500 A, 600, 630 A
- kind of current	AC
- conventional free air thermal current: I_{th} (A).....	400 A, 450, 500 A, 600, 630 A
- conventional enclosed thermal current: I_{the} (A)	N/A
- current rating for four-pole circuit-breakers: (A)	400 A, 450, 500 A, 600, 630 A
- number of poles	3P for the MCCBs with type reference '33300' 3P + N (N pole do not have protection) for the MCCBs with type reference '43300'
- rated frequency: (Hz)	50 / 60 Hz
- integral fuses (rated values)	N/A



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Rated duty :	
- eight-hour duty	: N/A
- uninterrupted duty: Iu (A)	: 400 A, 450 A, 500 A, 600, 630 A
Short-circuit characteristic :	
rated short-time making capacity: Icm (kA)	NM1-630R: 30 kA up to 690 Vac, 154 kA up to 415 Vac, 220 kA up to 240 Vac NM1-630H: 30 kA up to 690 Vac, 105 kA up to 415 Vac, 187 kA up to 240 Vac NM1-630S: 24 kA up to 690 Vac, 73,5 kA up to 415 Vac, 105 kA up to 240 Vac
rated ultimate short-circuit breaking capacity: Icu (kA)	NM1-630R: 15 kA up to 690 Vac, 70 kA up to 415 Vac, 100 kA up to 240 Vac NM1-630H: 15 kA up to 690 Vac, 50 kA up to 415 Vac, 85 kA up to 240 Vac NM1-630S: 12 kA up to 690 Vac, 35 kA up to 415 Vac, 50 kA up to 240 Vac
rated service short-circuit breaking capacity: Ics (kA)	Ics = 50% Icu
rated short-time withstand current: Icw (kA/s)	: N/A

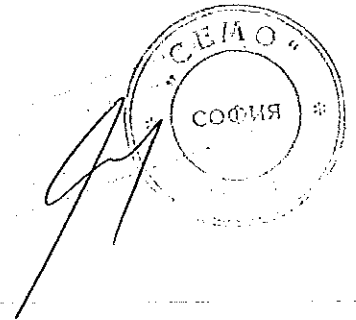


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Control circuits :
Electrical control circuits :
- kind of current: (AC, DC) : N/A
- rated frequency: (Hz) : N/A
- rated control circuit voltage: U_c (nature, frequency, V) ... : N/A
- rated control supply voltage: U_s (nature, frequency V) ... : N/A
Air supply control circuits: (pneumatic or electro-pneumatic) :
- rated pressure and its limit..... : N/A
- volumes of air, at atmospheric pressure, required for each closing and each opening operation..... : N/A
Auxiliary circuits :
Rated and limiting values, auxiliary circuits:
- rated operational voltage U_e (V) : N/A
- rated insulation voltage: U_i (V) : N/A
- rated operational current: I_e (A)..... : N/A
- kind of current : N/A
- rated frequency: (Hz) : N/A
- number of circuits..... : N/A
- number and kind of contact elements : N/A
- rated uninterrupted current: I_u (A)..... : N/A
- utilization category: (AC, DC, current and voltage) : N/A
Short-circuit characteristic :
- Rated conditional short-circuit current (kA)..... : N/A
- kind of protective device : N/A



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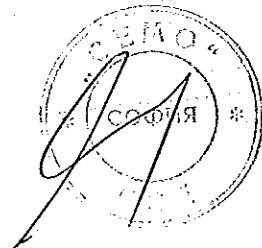
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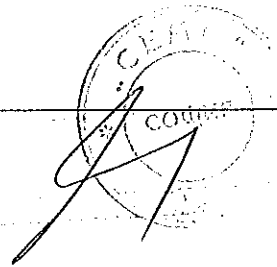
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Releases :	
1) shunt release.....	N/A
2) Over-current release.....	Yes
a) instantaneous.....	Yes
b) definite time delay.....	N/A
c) inverse time delay.....	Yes
- independent of previous load.....	N/A
- dependent on previous load; (for example thermal type release).....	Yes, thermal type release
3) Undervoltage release (for opening).....	N/A
4) Other releases.....	N/A
Characteristics :	
1) Shunt release and undervoltage release (for opening).....	N/A
- rated control circuit voltage: U_c (nature, frequency, V).....	N/A
- kind of current.....	N/A
- rated frequency: (if AC).....	N/A
2) Over-current release.....	Yes
- rated current.....	400 A, 450, 500 A, 600, 630 A
- kind of current.....	AC
- rated frequency: (if AC).....	50 / 60 Hz
- current setting (or range of settings).....	Inverse time delay release setting: 1,05 I_n , 1,3 I_n Instantaneous release setting: 10 I_n
- time settings (or range of settings).....	Tripping time ≥ 2 h (1,05 I_n) Tripping time < 2 h (1,3 I_n) 10 I_n : Instantaneous



Q

Classification of installation and use.....	: Fixed
Supply Connection	: Prepared copper conductors (cable with lug)
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	: 2008-12
Date (s) of performance of tests	: 2009-02 ~ 2010-06
General remarks:	
<p>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 is used as the decimal separator.</p> <p>Although it is not mentioned on first page, the following standards were also taken into consideration, no deviation was found:</p> <ul style="list-style-type: none"> - EN 60947-2: 2006 +A1: 2009 	
General product information:	
<p>The technical data of the MCCB are listed on page 5 to 8 of this report.</p> <p>The factory name and address:</p> <p>Zhejiang CHINT Electrics Co., Ltd. No.1, Chint Road,Chint Industrial Zone, North Baixiang, Yueqing, Zhejiang, P.R. China</p>	



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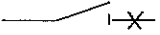

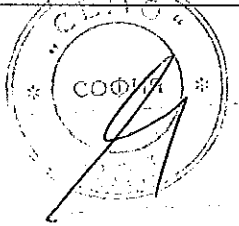
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		
a)	The following data shall be marked on the circuit-breaker itself or on a name plate or nameplates attached to the circuit-breaker, and located in a place such that they are visible and legible when the circuit-breaker is installed.		
	- rated current:	630 A	P
	- suitability for isolation, if applicable, with the symbol 	Suitability for isolation	P
	- indication of the open and closed position: with O and I respectively, if symbols are used		P
b)	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark	CHINT	P
	- type designation or serial number	NM1-630R	P
	- IEC 60947-2 if the manufacturer claims compliance with this standard.		P
	- utilization category	A	P
	- rated operational voltage(s) Ue	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	P
	- Circuit-breaker for use in IT systems: Circuit-breaker for which all values of rated voltage have not been tested according to annex H or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		P
	- value (or range) of the rated frequency and/or the indication DC (or symbol)	50 / 60 Hz	P
	- rated service short-circuit breaking capacity. Ics	Ics = 50%Icu	P
	- rated ultimate short-circuit breaking capacity. Icu	15 kA up to 690 Vac, 70 kA up to 415 Vac, 100 kA up to 240 Vac	P
	- rated short-time withstand current, (Icw) and associated short-time delay, for utilization category B		N/A

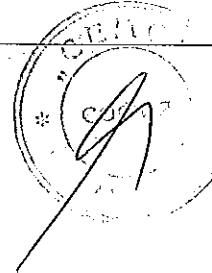




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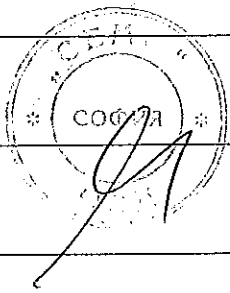
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- line and load terminals, unless their connection is immaterial	LINE / LOAD marked	P
	- neutral pole terminals, if applicable, by the letter N	N marked	P
	- protective earth terminal, where applicable, by the symbol acc. 7.1.9.3 of part 1		N/A
	- ref. temperature for non-compensated thermal releases, if different from 30°C	40 °C	P
c)	Marked on the circuit-breaker as specified in item b), or shall be made available in the manufacturer's published information:		
	- rated short-circuit making capacity (I _{cm}) (if higher than specified in 4.3.5.1)		N/A
	- rated insulation voltage. (U _i) if higher than the maximum rated operational voltage)	800 V	P
	- rated impulse withstand voltage (U _{imp}), when declared.	8 kV	P
	- pollution degree if other than 3		N/A
	- conventional enclosed thermal current (I _{the}) if different from the rated current:		N/A
	- IP Code, where applicable:		N/A
	- minimum enclosure size and ventilation data (if any) to which marked ratings apply:		N/A
	- details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure:	Front / Back: 0 mm, Left / Right : 100 mm, Top / Bottom: 100 mm	P
	- r.m.s sensing if applicable, according to F.4.1.1		N/A
	- suitability for environment A or B	A	P
d)	The following data concerning the opening and closing devices of the circuit-breaker shall be placed either on their own nameplates or on the nameplate of the circuit-breaker:		
	- rated control circuit voltage of the closing device, and rated frequency for AC:		N/A
	- rated control circuit voltage of the shunt release and/or of the under-voltage release, and rated frequency:		N/A
	- rated current of indirect over-current releases:		N/A

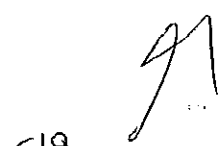
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- number and type of auxiliary contacts and kind of current, rated frequency (if AC) and rated voltages of the auxiliary switches, if different from those of the main circuit.		N/A
e)	Terminal shall be clearly and permanently identified in acc. with IEC 60445 and annex L :		
	- line terminal	LINE is marked	P
	- load terminal	LOAD is marked	P
	- neutral pole terminal "N"	N is marked	P
	- protective earth terminal		N/A
	- terminal of coils (A/B)		N/A
	- terminal of shunt release (B)		N/A
	- terminals of under-voltage release (D)		N/A
	- terminals of interlocking electromagnets (E)		N/A
	- terminals of indicated light devices (X)		N/A
	- terminals of contact elements for switching devices (no)		N/A



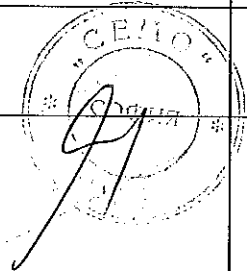
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.1	CONSTRUCTION		
7.1.1	Withdrawable circuit-breaker		N/A
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating warranted:		N/A
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		N/A
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed.		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position.		N/A
	The isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
7.1.2.1 part 1	Resistance to abnormal heat and fire	See appended table 12	P
7.1.3 part 1	Current-carrying parts and their connection		P
7.1.4	Clearances and creepage distances:		
	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage (U _{imp} .)		
	Clearances distances:		
	- U _{imp} is given as:	8 kV	
	- max. value of rated operational voltage to earth	600 V	
	- nominal voltage of supply system:	220 / 230 / 240 / 380 / 400 / 415 / 660 / 690 Vac	
	- overvoltage category:	III	
	- pollution degree:	3	
	- field-in or homogeneous:	Inhomogeneous field	
	- minimum clearances (mm):	8 mm	



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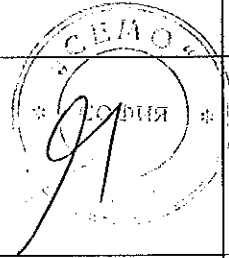
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- measured clearances (mm):	13,0 mm	P
	Creepage distances:		
	- rated insulation voltage Ui (V)	800 V	
	- pollution degree	3	
	- comparative tracking index (V)	175 V	
	- material group	IIIa	
	- minimum creepage distances (mm)	16,8 mm	
	- measured creepage distances (mm)	35,7 mm	P
7.1.5 part 1	Actuator		
7.1.5.1 part 1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage		P
	If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation		N/A
	If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		N/A
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "I" and "O" positions and the direction of operation		P
7.1.6 part 1	Indication of contact position		
7.1.6.1 part 1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		N/A

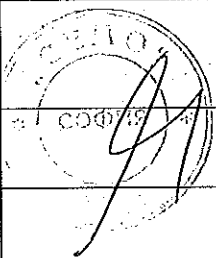
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	This is done by means of a position indicating device (see 2.3.18)		N/A
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417-2:		
	- 60417-2-IEC-5007 I On (power)		P
	- 60417-2-IEC-5007 O Off (power)		P
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O"		N/A
	Red colour shall not be used for any other push-button		P
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		N/A
7.1.6.2 part 1	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		P
7.1.7	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation (U _e > 50 V):		
	Equipment suitable for isolation shall provide in the open position an isolation distance in acc. with the requirements necessary to satisfy the isolating function. Indication of the main contacts shall be provide by one or more of the following means:		
	- the position of the actuator		P
	- a separate mechanical indicator		N/A
	- visibility of the moving contacts		N/A
	When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position		N/A

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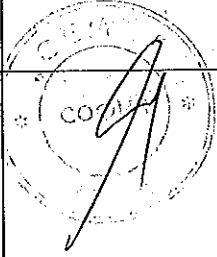

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking		P
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) :	8 mm	
	- measured clearances (mm) :	28,7 mm	P
	- test Uimp across gap (kV) :	12,3 kV	P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		
	auxiliary switch shall be rated according to IEC 60 947-5-1		N/A
	If equipment suitable for isolation is provided with an auxiliary switch for the purpose of electrical interlocking with contactor (s) or circuit-breaker(s) and intended to be used in motor circuits, the following requirements shall apply unless the equipment is rated for AC-23 utilization category		N/A
	The time interval between the opening of the contacts of the auxiliary switch and the contacts of the main poles shall be sufficient to ensure that the associated contactor or circuit-breaker interrupts the current before the main poles of the equipment open		N/A
	Unless otherwise stated in the manufacturer's technical literature, the time interval shall be not less than 20 ms when the equipment is operated according to the manufacturer instructions		N/A
	Compliance shall be verified by measuring the time interval between the instant of opening of the auxiliary switch and the instant of opening of the main poles under no-load conditions when the equipment is operated according to the manufacturer's instructions		N/A
	During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles		N/A

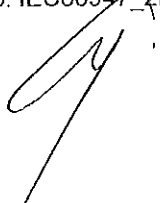
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed		N/A
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		
	the locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed		N/A
	Alternatively, the design may provide padlockable means to prevent access to the actuator		N/A
	test force F applied to the actuator in an attempt to operate to the closed position (N) :		N/A
	rated impulse withstand voltage (kV) :		N/A
	test Uimp on open main contacts at the test force		N/A
7.1.8	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Terminal connections shall be such that necessary contact pressure is maintained		P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value		P
7.1.8.2	Connection capacity		
	type of conductors :	Prepared cable (with cable lug)	P
	minimum cross-sectional area of conductor (mm ²) :	150 mm ²	P
	maximum cross-sectional area of conductor (mm ²) :	2 x 185 mm ²	P
	number of conductors simultaneously connectable to the terminal :	2	P






IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.8.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		
	terminal intended exclusively for the neutral conductor	N is marked	P
	protective earth terminal		N/A
	other terminals		N/A
7.1.9 part 1	Additional requirements for equipment provided with a neutral pole		
	When equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.).	N is marked	P
	A switched neutral pole shall break not before and shall make not after the other poles		P
	For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles		N/A
	For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher	The value of conventional thermal current is identical for all poles	N/A
	if a pole with an appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, shall operate substantially together.		N/A
7.1.10	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
part 1	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly		N/A
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts		N/A
7.1.10.2 part 1	Protective earth terminal		
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 2.1.1.5 – Note). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		N/A
7.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, or PEN, as applicable, in accordance with IEC 60445, subclause 5.3, or, in the case of PEN, by a graphical symbol for use on equipment		N/A
	Graphical symbol to be used: 60417-2-IEC-5019  Protective earth (ground) in accordance with IEC 60417-2		N/A



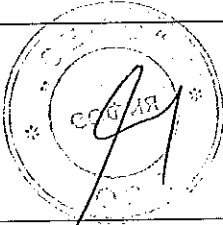
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.11	Enclosure for equipment		
7.1.11.1	Design		
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it shall not be possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure		N/A
7.1.12	Degree of protection of enclosed equipment		
	Degree of protection.	IPXX	
	Test for first characteristic.	IPXX	




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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for first numeral :	1 2 3 4 5 6	N/A
	Test for second characteristic	IPXX	
	Test for second numeral :	1 2 3 4 5 6 7 8	N/A
7.1.13 part 1	Conduit pull-out, torque and bending with metallic conduits		
	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending		N/A

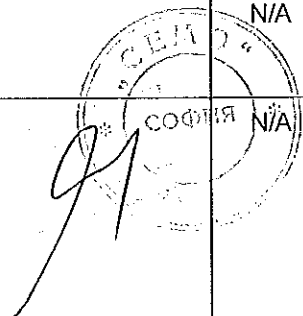
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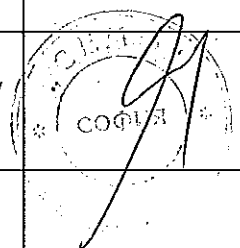
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	Performance requirements		
7.2.1	Operating condition		
7.2.1.1	Closing		
	For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity		P
7.2.1.1.1	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation		N/A
	Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA		N/A
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
7.2.1.1.2	Independent manual closing		
	A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
7.2.1.1.3	Dependent power closing		
	At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit.		N/A
7.2.1.1.4	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		N/A
	Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification		N/A
7.2.1.1.5	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		N/A
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		N/A
	- means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control supply voltage.		N/A
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		N/A
	- by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.)		N/A
	- For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker.		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2	Opening		
7.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and, unless otherwise agreed between manufacturer and user, shall have their energy for the tripping operation stored prior to the completion of the closing operation		
7.2.1.2.2	Opening by undervoltage releases		
7.2.1.3. a part 1	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		N/A
	An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value		N/A
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		N/A
7.2.1.3. b part 1	Operating time		
	For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment		N/A
7.2.1.2.3	Opening by shunt releases		N/A
7.2.1.4 part 1	Limits of operation of shunt releases		
	A shunt release for opening shall cause tripping under all operating conditions of an equipment when the supply voltage of the shunt release measured during the tripping operation remains between 70% and 110% of the rated control supply voltage and, if a.c., at the rated frequency		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.5 part 1	Limits of operation of current operated relays and released		
	Limits of operation of current operated relays and releases shall be stated in the relevant product standard		P
7.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release		P
	Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing		N/A
	- maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical)		N/A
	- I^2t characteristics for circuit-breakers of utilization category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 8.3.5)		N/A
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of $\pm 10\%$ of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature		P
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K		N/A
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		N/A
7.2.4.2	Operational performance capability		
7.2.4.2 part 1	The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations		P
	The operational performance on-load during which the equipment shall make and break the specified current corresponding, where relevant, to its utilization category for the number of operations stated in the relevant product standard		P





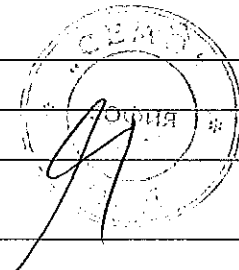
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Clause	Requirement + Test	Result - Remark	Verdict

8	TESTS		
8.2.4	Mechanical properties of terminals		
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm ²) :	2 x 185 mm ²	
	diameter of thread (mm) :	12 mm	
	torque (Nm) :	14 Nm	
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest cross-sectional area (mm ²) :		
	number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		





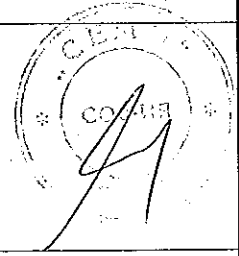
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Clause	Requirement + Test	Result - Remark	Verdict
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest and smallest cross-sectional area (mm ²) :		
	number of conductors of the smallest cross section, number of conductors 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 shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A



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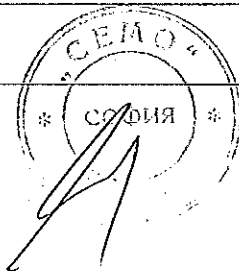
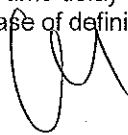
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-630R/4300	
	Sample no:	B115#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	630 A	
	Ambient temperature 10-40 °C :	21,7°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 In for instantaneous tripping 12 In for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	5040 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: 0,2 s non-tripping L1-L3: 0,2 s non-tripping L2-L3: 0,2 s non-tripping N-Lx:		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	7560 A	P



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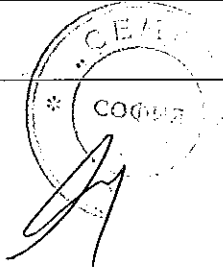




IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	19 ms 12 ms 11 ms	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A


 

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	7560 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: 45 ms L2: 19 ms L3: 13 ms N:		P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N: 		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		



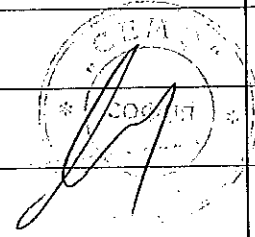
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A





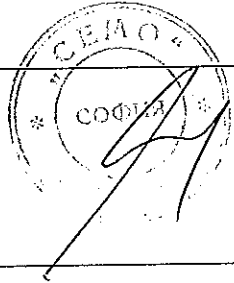
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-630R/4300	
	Sample no:	B115#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	630 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	661,5 A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	819 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$	14 min 18 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	1260 A (200% I_n) Specified tripping time by the manufacturer: 120 s $\leq t \leq$ 600 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A

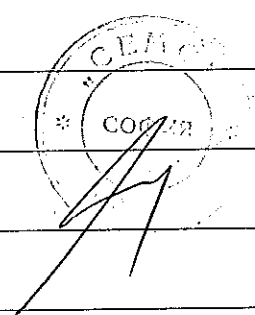
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	overload releases: (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	short-circuit releases		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A

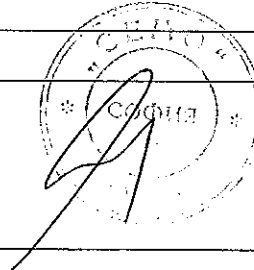
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip:</u> (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip:</u> (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	12,3 kV	P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A

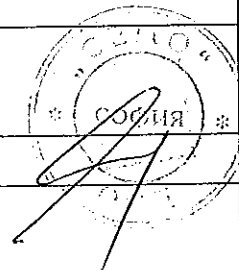


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA N: 0,1 mA	P

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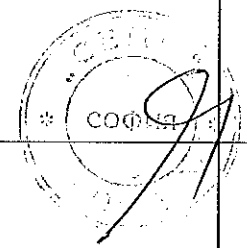
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A

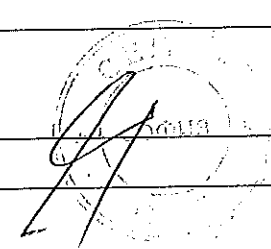
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.6		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A







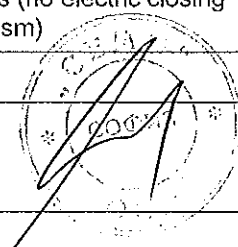
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-630R/4300	
	Sample no:	B115#	
	Rated current In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	23,4 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated Uc)	4000 cycles	P
	Number of cycles without current (without releases)	4000 cycles	P
	Applied voltage: closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated Uc		N/A
	Applied voltage: shunt releases (V)		N/A



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	630A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm^2) :	2 x 185 mm^2	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V)	L1-L2: 695,9 Vac L2-L3: 695,2 Vac L3-L1: 695,7 Vac	P
	- test current $I/I_e = 1,0$ (A)	L1: 640,4 A L2: 643,3 A L3: 635,1 A	P
	- power factor/time constant:	0,82	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	415,8 ms	P
	- off-time (s):	59,6 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A

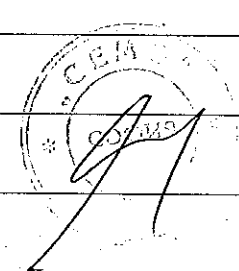
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-630R/4300	
	Sample no:	B115#	
	Rated current I _n (A)	630 A	
	Rated operational voltage: U _e (V)	690 Vac	
	Rated control supply voltage of closing mechanism: U _c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: U _c (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: U _c (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	23,9 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Maximum rated operational voltage: U _e (V)	690 Vac	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U _c)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		P
	- test voltage U/U _e = 1,05 (V)	L1: 728,4 Vac	P
	.....	L2: 728,8 Vac	
	.....	L3: 729,5 Vac	



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current AC/DC: $I_{le} = 6,0/2.5$ (A) L1: L2: L3:	3816,2 A 3797,3 A 3852,5 A	P
	- power factor/time constant:	0,50	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	414,3 ms	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA N: 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 1	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 53,5 K	P
	conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	test current I_e (A) :	630 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	913,5 A ($1,45 \times 1,0 I_n$)	P
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$	19 min 06 s	P
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	176 N	—
	test force with blocked main contacts for 10 s (N) :	400 N for 10 s	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P



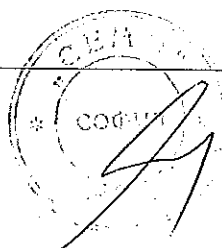
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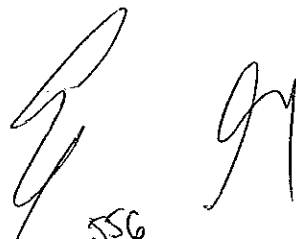
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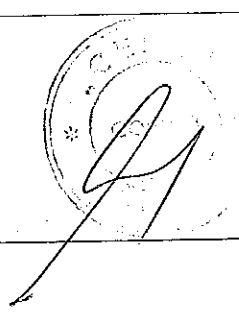
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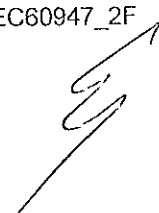
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-630R/3300	
	Sample no:	167#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	630 A	
	Ambient temperature 10-40 °C :	24,4°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 In for instantaneous tripping 12 In for instantaneous tripping of a single pole	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated, or minimum adjustable setting current: (A)	5040 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: 0,2 s non-tripping L1-L3: 0,2 s non-tripping L2-L3: 0,2 s non-tripping N-Lx:		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)	7560 A	P

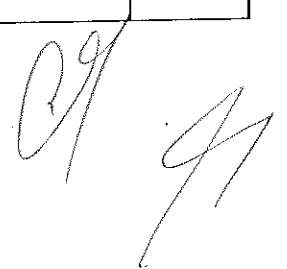
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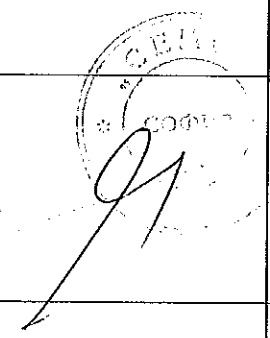
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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1-L2: 10 ms L1-L3: 12 ms L2-L3: 10 ms N-Lx:		P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A

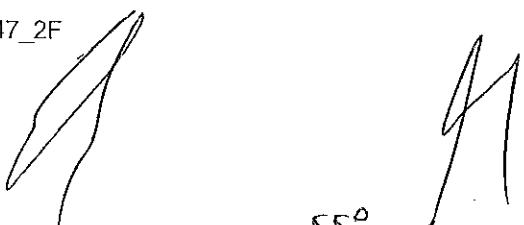



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	7560 A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: 13 ms L2: 10 ms L3: 22 ms N:		P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A

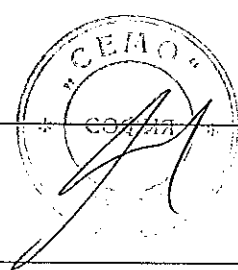




IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the maximum adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		

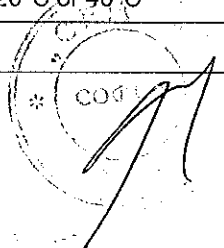


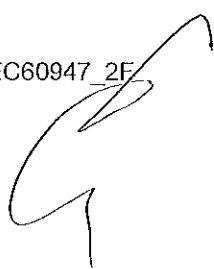
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A

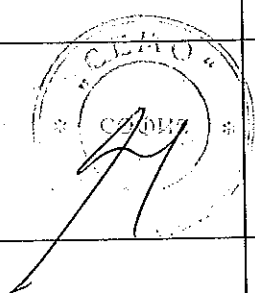

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	CHINT	
	Type designation or serial number	NM1-630R/3300	
	Sample no:	167#	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated current: In (A)	630 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)	661,5 A	P




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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$	2 h non-tripping	P
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	819 A	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$	12 min 40 s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or minimum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63A$		N/A
	Test current: 130% of the rated, or minimum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63A$		N/A
	Test current: 105% of the maximum adjustable setting current: (A)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional non-tripping time: 1h when $I_n < 63A$, 2h when $I_n > 63 A$		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	1260 A (200% I_n) Specified tripping time by the manufacturer: $120 s \leq t \leq 600 s$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	319 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A




IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	overload releases: (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	short-circuit releases		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

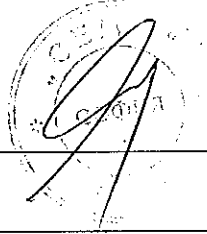
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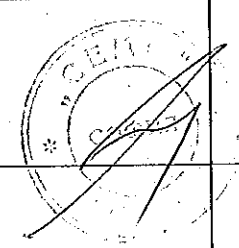
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the minimum adjustable setting current: (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip</u> : (s) L1: L2: L3:		N/A
	Test current: 1,5 times of maximum adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A

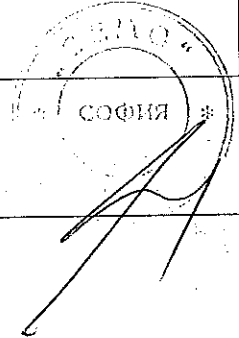
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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>short-circuit releases (electromagnetic), shall not trip:</u> (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic), shall not trip:</u> (s) L1: L2: L3:		N/A
8.3.3.2	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	9,8 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	12,3 kV	P
a)	Application of test voltage		P
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A



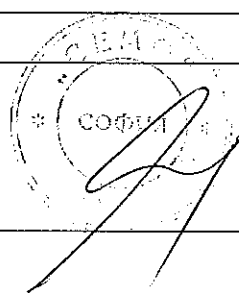



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Clause	Requirement + Test	Result - Remark	Verdict
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	800 V	P
	- main circuits, test voltage for 1 min (V)	2000 V, 5 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P
8.3.3.2	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.5 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
c)	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A

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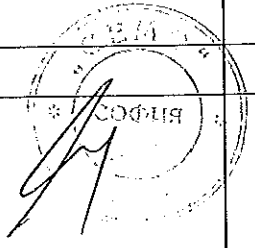
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Clause	Requirement + Test	Result - Remark	Verdict
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate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



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Clause	Requirement + Test	Result - Remark	Verdict
d)	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	167#	
	Rated current I _n (A)	630 A	
	Rated operational voltage: U _e (V)	690 Vac	
	Rated control supply voltage of closing mechanism: U _c (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: U _c (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: U _c (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	23,4 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles without current (total) (closing mechanism energized at the rated U _c)	4000 cycles	P
	Number of cycles without current (without releases)	4000 cycles	P
	Applied voltage: closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U _c		N/A
	Applied voltage: shunt releases (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: I_n (A)	630A	
	Maximum rated operational voltage: U_e (V)	690 Vac	
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		P
	- test voltage $U/U_e = 1,0$ (V) L1-L2: L2-L3: L3-L1:	695,9 Vac 695,2 Vac 695,7 Vac	P
	- test current $I/I_n = 1,0$ (A) L1: L2: L3:	640,4 A 643,3 A 635,1 A	P
	- power factor/time constant:	0,82	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	537,9 ms	P
	- off-time (s):	59,5 s	P
	Electrical components do not exceed the value indicated in tab. 7.		N/A

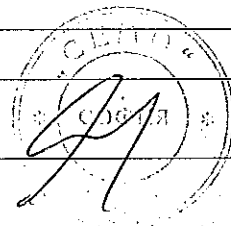
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	167#	
	Rated current In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt releases: Uc (V)	No shunt releases	
	Rated control supply voltage undervoltage releases: Uc (V)	No undervoltage releases	
	Ambient temperature 10-40 °C :	23,9 °C	P
	Number of operating cycles per hour	60 cycles per hour	P
	Maximum rated operational voltage: Ue (V)	690 Vac	P
	Number of operating cycles per hour	60 cycles per hour	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	15 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		P
	- test voltage U/Ue = 1,05 (V)	L1: 728,4 Vac	P
	L2: 728,8 Vac	
	L3: 729,5 Vac	

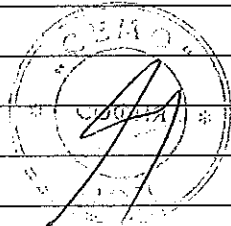
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current AC/DC: $I_{le} = 6,0/2.5$ (A) L1: L2: L3:	3816,2 A 3797,3 A 3852,5 A	P
	- power factor/time constant:	0,50	P
	- Number of cycles manually opened: 9	12 manual operations	P
	- Number of cycles automatically opened by an overload release: 3	3 (at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	558 ms	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 6	P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.3.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 2	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 54,7 K	P
	conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	test current I_e (A) :	630 A	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	913,5 A (1,45 x 1,0 I_n)	P
	Conventional tripping time: <1h when $I_n < 63$ A, <2h when $I_n > 63$ A	11 min 41 s	P
8.3.3.8	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N)	161 N	—
	test force with blocked main contacts for 10 s (N) :	400 N for 10 s	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	B116#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <math><30\text{mm}^2</math>		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	P
	Tightening torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V).....	L1-L2: 264 Vac L2-L3: 265 Vac L3-L1: 264 Vac	P
	- r.m.s. test current AC/DC: (A)	L1 50,7 kA L2 51,3 kA L3 51,2 kA	P
	power factor/time constant :	0,23	P
	- Factor "n"	2,1	P
	- peak test current (A) :	110 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak})	L1: 46,6 kA L2: 31,7 kA L3: 40,0 kA	P
	- Joule integral I ² dt (MA ² s)	L1: 9,07 MA ² s L2: 2,86 MA ² s L3: 4,32 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak})	L1: 35,3 kA L2: 42,3 kA L3: 45,2 kA	P
	- Joule integral I ² dt (MA ² s)	L1: 3,77 MA ² s L2: 7,71 MA ² s L3: 6,85 MA ² s	P
	Pause, t: (min)	3 min	P

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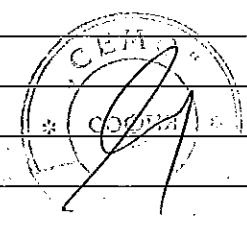
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	34,5 kA 39,7 kA 45,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	4,01 MA ² s 7,26 MA ² s 7,07 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	630 A	
	Maximum rated operational voltage: U _e (V)	240 Vac	
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	243,5 Vac 242,2 Vac 242,7 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	644,2 A 639,5 A 654,0 A	P
	- power factor/time constant:	0,78	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	533,1 ms	P
	- off-time (s):	59,5 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 8	P
	- the leaking current for circuit-breaker suitable for isolation: ($<2\text{mA} / 1.1 U_e$)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 3	P
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$:	Max: 63,3 K	P
	conductor cross-sectional area (mm^2) :	$2 \times 185 \text{ mm}^2$	P
	test current I_e (A) :	630 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	913,5 A ($1,45 \times 1,0 I_n$)	P
	Conventional tripping time: $<1\text{h}$ when $I_n < 63\text{A}$, $<2\text{h}$ when $I_n > 63 \text{ A}$	12 min 54 s	P



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	B117#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated service short-circuit breaking capacity: (kA)	7,5 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	P
	Tightening torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Us = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	735,8 Vac 736,5 Vac 735,7 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	7,63 kA 7,62 kA 7,67 kA	P
	power factor/time constant :	0,46	P
	- Factor "n"	1,7	P
	- peak test current (A) :	13,61 kA	P
	Test sequence "O"		P
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,1 kA 9,19 kA 9,97 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	776,5 kA ² s 769,1 kA ² s 630,6 kA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		P
	- max. let-through current: (kA _{peak}) L1: L2: L3:	9,47 kA 9,71 kA 10,4 kA	P
	- Joule integral I ² dt (kA ² s) L1: L2: L3:	828,8 kA ² s 445,2 kA ² s 871,1 kA ² s	P
	Pause, t: (min)	3 min	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	10,1 kA 9,98 kA 10,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	677,7 kA ² s 827,7 kA ² s 614,8 kA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	630 A	
	Maximum rated operational voltage: U _e (V)	690 Vac	
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	701,4 Vac 701,9 Vac 701,8 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	641,5 A 650,3 A 651,3 A	P
	- power factor/time constant:	0,79	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	560,6 ms	P
	- off-time (s):	59,4 s	P

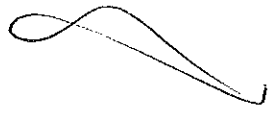
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 7	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 4	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 59,9 K	P
	conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	test current I _e (A) :	630 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	913,5 A (1,45 x 1,0 I _n)	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	15 min 17 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	118#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <math><30\text{mm}^2</math>		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A

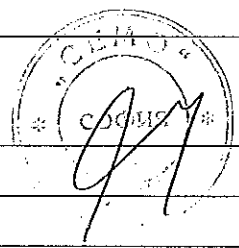


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	P
	Tightening torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	260 Vac 260 Vac 260 Vac	P
	- r.m.s. test current AC/DC: (A) L1 L2 L3	51,0 kA 51,2 kA 50,6 kA	P
	power factor/time constant :	0,23	P
	- Factor "n"	2,1	P
	- peak test current (A) :	110 kA	P
	Test sequence "O"		P
	- max. let-through current: (kA _{peak}) L1: L2: L3:	34,5 kA 45,6 kA 23,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,81 MA ² s 6,28 MA ² s 1,85 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		P
	- max. let-through current: (kA _{peak}) L1: L2: L3:	31,5 kA 44,8 kA 32,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,31 MA ² s 6,92 MA ² s 2,87 MA ² s	P
	Pause, t: (min)	3 min	P

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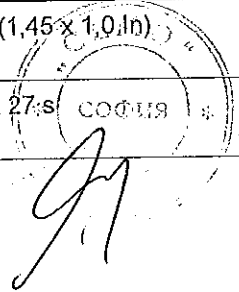


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1:	33,2 kA	P
	..... L2:	43,9 kA	
	..... L3:	27,4 kA	
	- Joule integral I ² dt (MA ² s) L1:	2,76 MA ² s	P
	..... L2:	6,61 MA ² s	
	..... L3:	1,91 MA ² s	
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)		
	Maximum rated operational voltage: U _e (V)		
	Conductor cross-sectional area (mm ²) :		
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)		N/A
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2:		N/A
	..... L2-L3:		
	..... L3-L1:		
	- test current I/I _e = 1,0 (A) L1:		N/A
	..... L2:		
 L3:		
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 8	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. < 80 K (K) :		N/A
	conductor cross-sectional area (mm²) :		N/A
	test current Ie (A) :		N/A
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580 A (1,45 x 1,0 In)	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	28 min 27s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II (Ics):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	119#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	35 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	P
	Tightening torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/U _e = 1,05 (V)..... L1-L2: L2-L3: L3-L1:	447 Vac 447 Vac 447 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	35,4 kA 35,7 kA 35,2 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (A) :	75,0 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	38,2 kA 42,5 kA 23,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	6,47 MA ² s 7,06 MA ² s 2,44 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	37,4 kA 32,8 kA 41,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	5,21 MA ² s 3,43 MA ² s 8,27 MA ² s	P
	Pause, t: (min)	3 min	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	42,6 kA 31,3 kA 34,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	8,25 MA ² s 3,89 MA ² s 4,53 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.4.2	Operational performance capability with current.		
	Rated current: I _n (A)	630 A	
	Maximum rated operational voltage: U _e (V)	415 Vac	
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	
	Number of operating cycles per hour	60 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50 cycles (no electric closing mechanism)	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage U/U _e = 1,0 (V) L1-L2: L2-L3: L3-L1:	417,0 Vac 417,1 Vac 417,5 Vac	P
	- test current I/I _e = 1,0 (A) L1: L2: L3:	632,7 A 631,2 A 638,7 A	P
	- power factor/time constant:	0,77	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	493,7 ms	P
	- off-time (s):	59,5 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 8	P
	- the leaking current for circuit-breaker suitable for isolation: ($<2\text{mA} / 1.1 U_e$)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.4.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended table 5	P
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$:	Max: 62,2 K	P
	conductor cross-sectional area (mm^2) :	$2 \times 185 \text{ mm}^2$	P
	test current I_e (A) :	630 A	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	913,5 A ($1,45 \times 1,0 I_n$)	P
	Conventional tripping time: $<1\text{h}$ when $I_n < 63\text{A}$, $<2\text{h}$ when $I_n > 63 \text{ A}$	17 min 21 s	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II/III (lcs=lcu):		N/A



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	120#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when $I_{cu} = I_{cs}$		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$120\text{ s} \leq t \leq 600\text{ s}$	P
	- Operation time: (s) L1:	383 s	P
	..... L2:	339 s	
	..... L3:	363 s	
	..... N:		
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O - t - CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) L1-L2: L2-L3: L3-L1:	254 Vac 254 Vac 254 Vac	P
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 101 kA 104 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- peak test current (Amax) :	225 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	42,4 kA 63,7 kA 36,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,97 MA ² s 9,92 MA ² s 2,44 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	34,2 kA 52,7 kA 61,5 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,33 MA ² s 8,99 MA ² s 8,54 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) L1:	154 s	P
 L2:	130 s	
 L3:	142 s	
 N:		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	E121#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1:	259 s	P
	..... L2:	247 s	
	..... L3:	261 s	
	..... N:		
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) L1-L2:	736,0 Vac	P
	..... L2-L3:	735,5 Vac	
	..... L3-L1:	735,9 Vac	
	- r.m.s. test current AC/DC: (A) L1:	15,2 kA	P
 L2:	15,3 kA	
 L3:	15,7 kA	
	power factor/time constant :	0,30	P
	- Factor "n"	2,0	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- peak test current (A _{max}) :	31,33 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	26,3 kA 24,7 kA 22,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	4,39 MA ² s 3,46 MA ² s 3,37 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	20,2 kA 27,6 kA 21,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,75 MA ² s 4,07 MA ² s 3,50 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: 0,1 mA L2: 0,1 mA L3: 0,1 mA	P
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s)	L1: 161 s	P
	L2: 165 s	
	L3: 203 s	
	N:	

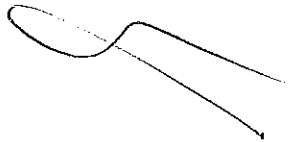


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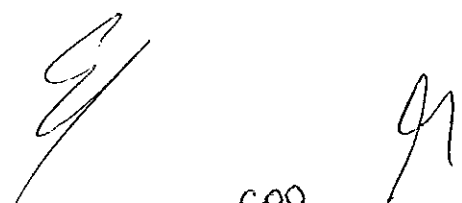
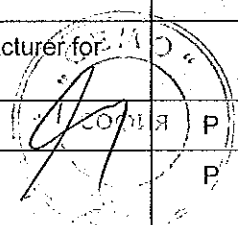
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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	122#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when $I_{cu} = I_{cs}$		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$120\text{ s} \leq t \leq 600\text{ s}$	P
	- Operation time: (s) L1:	590 s	P
 L2:	528 s	
 L3:	561 s	
 N:		

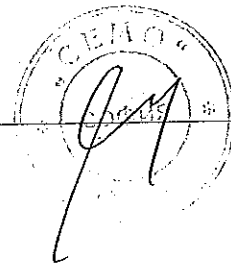


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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 254 Vac L2-L3: 254 Vac L3-L1: 254 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 101 kA 104 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	225 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	39,8 kA 61,8 kA 37,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,45 MA ² s 9,36 MA ² s 2,60 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	47,2 kA 37,3 kA 60,1 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	4,59 MA ² s 3,58 MA ² s 10,60 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1:	168 s	P
 L2:	143 s	
 L3:	156 s	
 N:		



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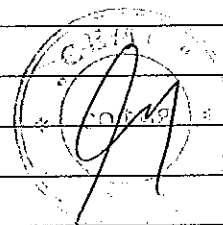
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/3300	
	Sample no:	D123#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1:	486 s	P
	..... L2:	417 s	
	..... L3:	433 s	
	..... N :		



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 446 Vac L2-L3: 446 Vac L3-L1: 446 Vac	P

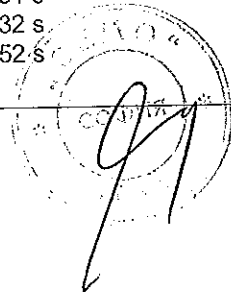


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	71,0 kA 70,7 kA 70,2 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	156 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	47,1 kA 60,6 kA 55,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	7,67 MA ² s 16,4 MA ² s 9,25MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	62,4 kA 44,1 kA 57,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	13,2 MA ² s 9,04 MA ² s 18,2 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1:	181 s	P
 L2:	132 s	
 L3:	152 s	
 N:		



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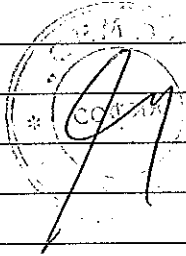
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for 3 phases	
	Sample no:	B124#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s)	L1: 454 s L2: 330 s L3: 316 s N:	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 263 Vac L2-L3: 262 Vac L3-L1: 263 Vac	P





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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 103 kA 105 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	229 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	58,8 kA 47,3 kA 45,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	12,5 MA ² s 12,3 MA ² s 12,8 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	30,0 kA 45,1 kA 59,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,86 MA ² s 8,19 MA ² s 9,71 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s)		P
 L1:	195 s	
 L2:	141 s	
 L3:	163 s	
 N:		



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

8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for phase + N	
	Sample no:	197#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s)	L1: L2: L3: 284 s N:	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U_c : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) L1: L2: L3:	146 Vac	P



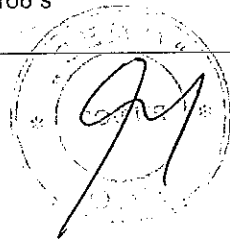


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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	61,1 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	134 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	31,5 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,33 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	30,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,36 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1: L2: L3: N :	168 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for 3 phases	
	Sample no:	F168#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1:	348 s	P
 L2:	259 s	
 L3:	302 s	
 N :		

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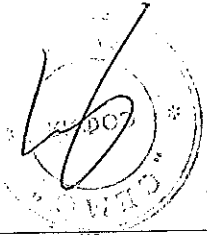
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 726 Vac L2-L3: 726 Vac L3-L1: 726 Vac	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	15,5 kA 15,3 kA 15,0 kA	P
	power factor/time constant :	0,30	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	30,9 kA	P
	Test sequence "O"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	27,4 kA 22,5 kA 23,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	4,69 MA ² s 3,27 MA ² s 2,62 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kA _{peak}) L1: L2: L3:	21,7 kA 29,1 kA 23,7 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	2,75 MA ² s 5,61 MA ² s 3,60 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U _e)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

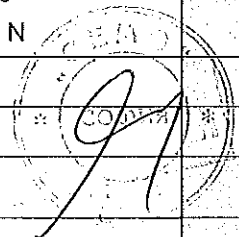
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IEC 60947-2		Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
		The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
		Time specified by the manufacturer:	$t \leq 600$ s	P
		- Operation time: (s)	L1: 139 s L2: 143 s L3: 135 s N:	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for phase + N	
	Sample no:	194#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	15 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1: L2: L3: N :	301s	P

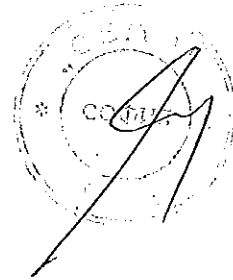


IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm2		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm²) :	2 x 185 mm²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: .....L3:	438 Vac	P



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1: .....L2: .....L3:	12,3 kA	P
	power factor/time constant :	0,30	P
	- Factor "n"	2,0	P
	- peak test current (Amax) :	24,7 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	18,2 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	2,38 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	19,0 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	2,77 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 V, 5 s	P
	- no breakdown or flashover	See appended table 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: <0,1 mA N: <0,1 mA	P

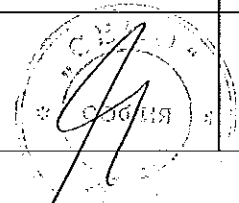
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 600$ s	P
	- Operation time: (s) L1: L2: L3: N:	175 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for 3 phases	
	Sample no:	169#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s)	L1: 214 s L2: 219 s L3: 341 s N:	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	240 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) L1-L2:	263 Vac	P
 L2-L3:	262 Vac	
 L3-L1:	263 Vac	

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	101 kA 103 kA 105 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	229 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	57,0 kA 28,0 kA 44,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	9,02 MA ² s 4,32 MA ² s 7,17 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	37,5 kA 52,6 kA 48,3 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,66 MA ² s 8,63 MA ² s 5,92 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,1 mA L2: < 0,1 mA L3: < 0,1 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1:	169 s	P
 L2:	130 s	
 L3:	143 s	
 N :		





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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for phase + N	
	Sample no:	195#	
	Rated current: In (A)	400 A	
	Rated operational voltage: Ue (V)	240 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	100 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1:		P
 L2:		
 L3:	304 s	
 N :		



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm2		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm²) :	240 mm²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: .....L3:	146 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1: .....L2: .....L3:	61,1 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	134 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	24,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	1,34 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	32,4 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	3,64 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	I _B : < 0,1 mA I _N : < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1: L2: L3: N:	164 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300	
	Sample no:	B170#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1: 248 s L2: 250 s L3: 242 s N		P

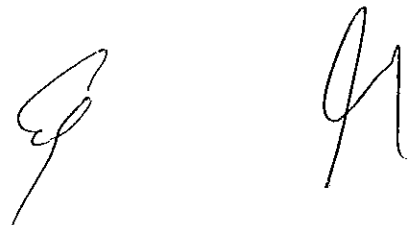
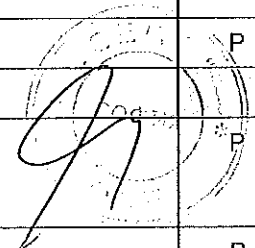
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right : 100 mm, Up / Down: 100 mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		P
	- size of hole: <30mm ²		P
	- finish: bare or conductive plating		P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm ²) :	2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A
	Tightening, torques: (Nm)	14 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V)	L1-L2: 447 Vac L2-L3: 445 Vac L3-L1: 446 Vac	P

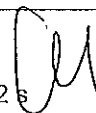
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) L1: L2: L3:	70,3 kA 70,5 kA 70,0 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,2	P
	- peak test current (Amax) :	157 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: L2: L3:	49,0 kA 61,3 kA 54,9 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	8,07 MA ² s 18,0 MA ² s 8,81 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: L2: L3:	64,4 kA 53,1 kA 53,6 kA	P
	- Joule integral I ² dt (MA ² s) L1: L2: L3:	22,3 MA ² s 14,5 MA ² s 15,7 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L1: < 0,4 mA L2: < 0,4 mA L3: < 0,4 mA	P



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	$t \leq 600$ s	P
	- Operation time: (s) L1:	134 s	P
	..... L2:	123 s	
	..... L3:	149 s	
	..... N:		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu)		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	NM1-630R/4300 test for phase + N	
	Sample no:	196#	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	70 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	No electric closing mechanism	
	Rated control supply voltage of shunt release: Uc (V)	No shunt releases	
	This test sequence need not be made when Icu = Ics		
8.3.5.1	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	120 s ≤ t ≤ 600 s	P
	- Operation time: (s) L1: L2: L3: N :	292 s 	P

 
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IEC 60947-2				
Clause	Requirement + Test	Result - Remark	Verdict	
8.3.5.2	Test of rated ultimate short-circuit breaking capacity			
	The test sequence of operations is O – t – CO			
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A	
	closing mechanism energized with 85% at the rated U_c : (V)		N/A	
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P	
	Test made in free air:		P	
	Distances of the metallic screen's: (all sides)	Front / Back: 0 mm, Left / Right :100 mm, Up / Down: 100 mm	P	
	The characteristics of the metallic screen:			
	- woven wire mesh		N/A	
	- perforated metal		P	
	- expanded metal		N/A	
	- ratio hole area/total area: 0,45-0,65		P	
	- size of hole: <30mm2		P	
	- finish: bare or conductive plating		P	
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:			N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long			P
	Circuit is earthed at: (load-star- or supply-star point)		Load-star point	P
	Conductor cross-sectional area (mm ²) :		2 x 185 mm ²	P
	If terminals unmarked: line connected at: (underside/upside)	LINE and LOAD are marked	N/A	
	Tightening, torques: (Nm)	14 Nm	P	
	Test sequence of operation: O – t – CO		P	
	- test voltage $U/U_e = 1,05$ (V)L1:L2:L3:	261 Vac	P	

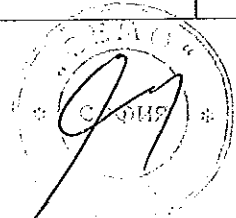
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A).....L1:L2:L3:	42,8 kA	P
	power factor/time constant :	0,25	P
	- Factor "n"	2,1	P
	- peak test current (Amax) :	90,2 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	41,5 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	6,55 MA ² s	P
	Pause, t: (min)	3 min	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) L1: .....L2: .....L3:	37,8 kA	P
	- Joule integral I ² dt (MA ² s) L1: .....L2: .....L3:	4,62 MA ² s	P
	Melting of the fusible element	No melting of the fusible element	P
	Holes in the PE-sheet for test sequence "O"	No holes observed	P
	Cracks observed	No cracks observed	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 V, 5 s	P
	- no breakdown or flashover	See appended table 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	L3: < 0,1 mA N: < 0,1 mA	P

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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 600 s	P
	- Operation time: (s) L1: L2: L3: N:	148 s	P



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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV		N/A
8.3.7	TEST SEQUENCE V		N/A
8.3.8	TEST SEQUENCE VI: Combined test sequence		N/A
Annex B	Circuit-breakers incorporating residual current protection		N/A
Annex C	Individual pole short-circuit test sequence		N/A
Annex F	Additional tests for circuit-breakers with electronic over-current protection		N/A
Annex H	Individual pole short-circuit test sequence		N/A
Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		N/A
Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		N/A
Annex M	Modular residual current devices (without integral current breaking device)		N/A
Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		N/A
Annex O	Instantaneous trip circuit-breakers (ICB)		N/A

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

TABLE 1: Heating Test (Seq I, 8.3.3.6, sample number B115#)			P
Test current (A):		630 A	—
Ambient (°C):		22,3 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	46,7 K	80 K	
Load side Terminal 2	47,4 K	80 K	
Line side Terminal 3	50,8 K	80 K	
Load side Terminal 4	53,5 K	80 K	
Line side Terminal 5	41,7 K	80 K	
Load side Terminal 6	48,2 K	80 K	
Line side Terminal N	46,6 K	80 K	
Load side Terminal N	49,7 K	80 K	
Side enclosure	35,6 K	60 K	
Front enclosure	29,2 K	50 K	
Actuator	14,3 K	35 K	

TABLE 2: Heating Test (Seq I, 8.3.3.6, sample number 167#)			P
Test current (A):		630 A	—
Ambient (°C):		22,3 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	47,4 K	80 K	
Load side Terminal 2	48,6 K	80 K	
Line side Terminal 3	54,7 K	80 K	
Load side Terminal 4	53,8 K	80 K	
Line side Terminal 5	44,9 K	80 K	
Load side Terminal 6	49,8 K	80 K	
Side enclosure	32,6 K	60 K	
Front enclosure	27,4 K	50 K	
Actuator	16,5 K	35 K	

TRF No. IEC60947_2F

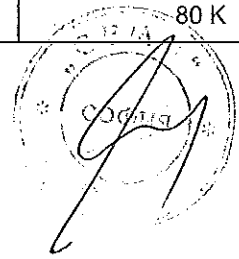
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 3: Heating Test (Seq II, 8.3.4.4, sample number B116#)			P
Test current (A):		630 A	—
Ambient (°C):		24,7 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	56,5 K	80 K	
Load side Terminal 2	62,0 K	80 K	
Line side Terminal 3	57,8 K	80 K	
Load side Terminal 4	63,3 K	80 K	
Line side Terminal 5	56,4 K	80 K	
Load side Terminal 6	57,5 K	80 K	

TABLE 4: Heating Test (Seq II, 8.3.4.4, sample number B117#)			P
Test current (A):		630 A	—
Ambient (°C):		22,8 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	52,7K	80 K	
Load side Terminal 2	57,6 K	80 K	
Line side Terminal 3	55,0 K	80 K	
Load side Terminal 4	59,9 K	80 K	
Line side Terminal 5	52,9 K	80 K	
Load side Terminal 6	53,6 K	80 K	



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

TABLE 5: Heating Test (Seq II, 8.3.4.4, sample number 119#)			P
Test current (A):		630 A	—
Ambient (°C):		24,3 °C	—
Thermocouple Locations	max. temperature rise measured, (K)	max. temperature limit, (K)	
Line side Terminal 1	52,8 K	80 K	
Load side Terminal 2	55,4 K	80 K	
Line side Terminal 3	59,6 K	80 K	
Load side Terminal 4	62,2 K	80 K	
Line side Terminal 5	57,7 K	80 K	
Load side Terminal 6	57,3 K	80 K	

TABLE 6: dielectric strength (Seq I, 8.3.3.5, sample number 167# and B115#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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

TABLE 7: dielectric strength (Seq II, 8.3.4.3, sample number B117#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

TABLE 8: dielectric strength (Seq II, 8.3.4.3, sample number B116#, 118# and 119#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 9: dielectric strength (Seq III, 8.3.5.3, sample number E121#, F168# and 194#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1380 V	No	
supplementary information: N/A			

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

TABLE 10: dielectric strength (Seq III, 8.3.5.3, sample number 120#, 122#, D123#, B124#, 169#, B170#, 195#,196# and 197#)			P
test voltage applied between:	test potential applied (V)	breakdown / flashover (Yes/No)	
Between all the terminals of the main circuit connected together and the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	1000 V	No	
Between the incoming and outgoing terminals with the circuit-breaker open	1000 V	No	
supplementary information: N/A			

TABLE 11: clearance and creepage distance measurements							P
clearance cl and creepage distance dcr at/of:	Ui (V)	Uimp (kV)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
Between poles	800 V	8 kV	8 mm	28,1 mm	12,5 mm	47,5 mm	
Between live parts and parts intended to be earthed	800 V	8 kV	8 mm	43,8 mm	12,5 mm	43,8 mm	
Between the contacts in the open position	800 V	8 kV	8 mm	28,7 mm	12,5 mm	35,7 mm	
Between live parts and actuator	800 V	8 kV	8 mm	13,0 mm	12,5 mm	16,8 mm	

TABLE 12: Resistance to fire (Glow wire test)							P
No.	Description	Colour	Temp. °C	burning after t (s)	drops	support burning	—
1	Base	Black	960 °C	0 s	No	No	P
2	Cover	White	960 °C	0 s	No	No	P
3	Actuator	Black	960 °C	6 s	No	No	P
4	Leading lever	White	960 °C	2 s	No	No	P

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

TABLE 13: Resistance to tracking (tracking test)							P
Specimen							Verdict
Description	Colour	Drops (no.)	Thick (mm)	Burning	Current (A)	Test voltage (V)	
Base	Black	50	3 mm	N	< 0,5 A	175 V	P
Cover	White	50	3 mm	N	< 0,5 A	175 V	P
Handle	Black	50	3 mm	N	< 0,5 A	175 V	P
Leading lever	White	50	3 mm	N	< 0,5 A	175 V	P



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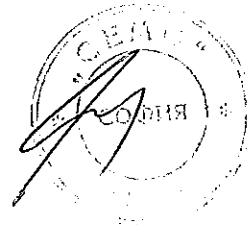
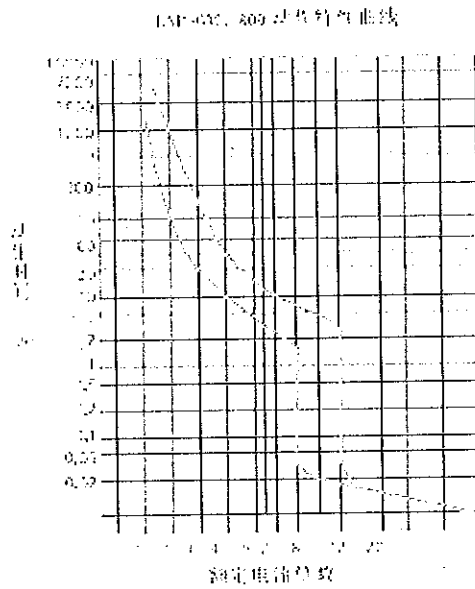
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IEC 60947-2

Time current characteristics



Ch

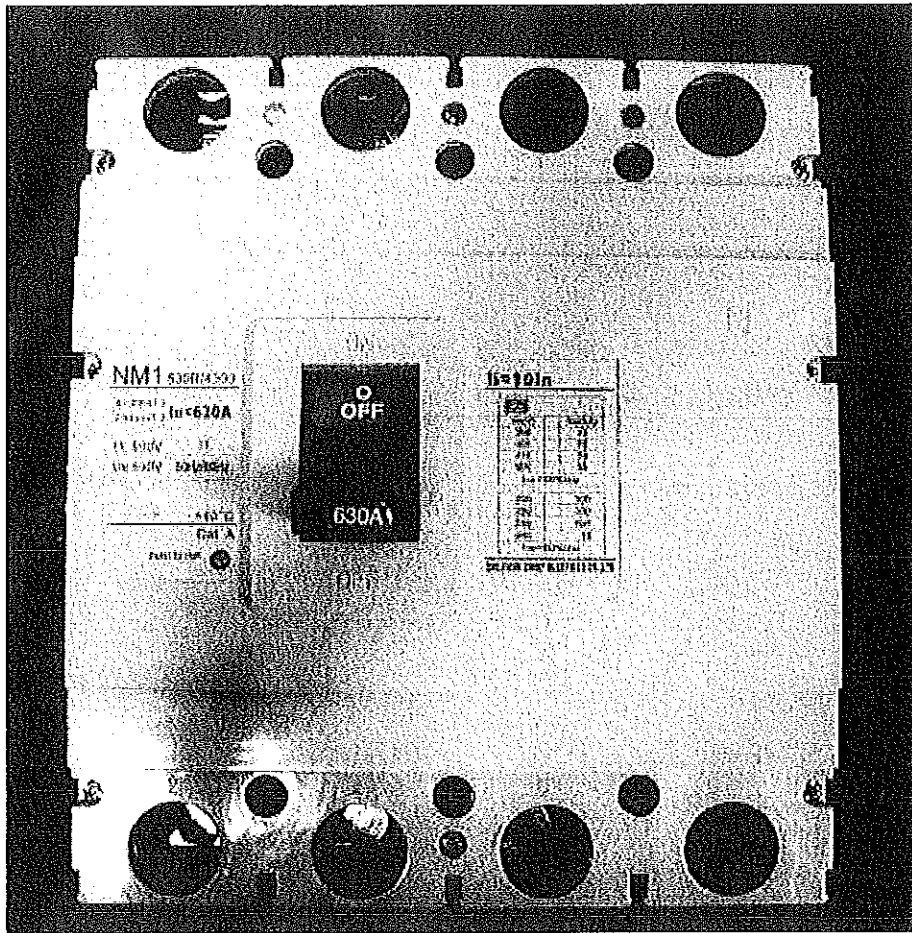
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IEC 60947-2

Photographs

Front view, 3P + N MCCB



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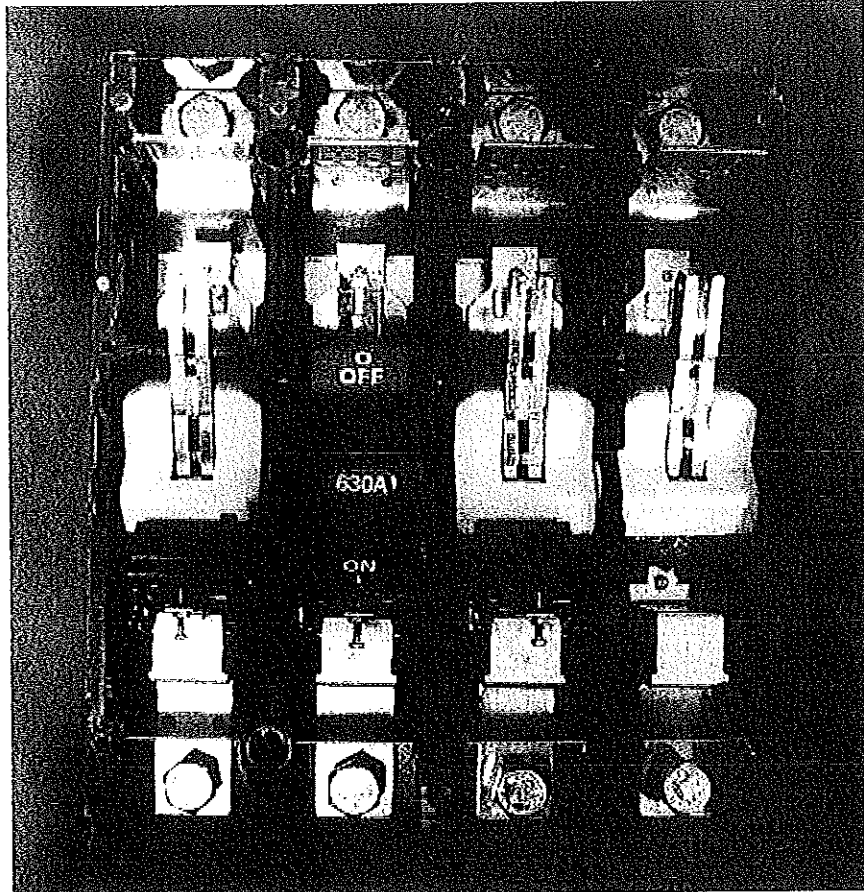
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IEC 60947-2

Open view, 3P + N MCCB



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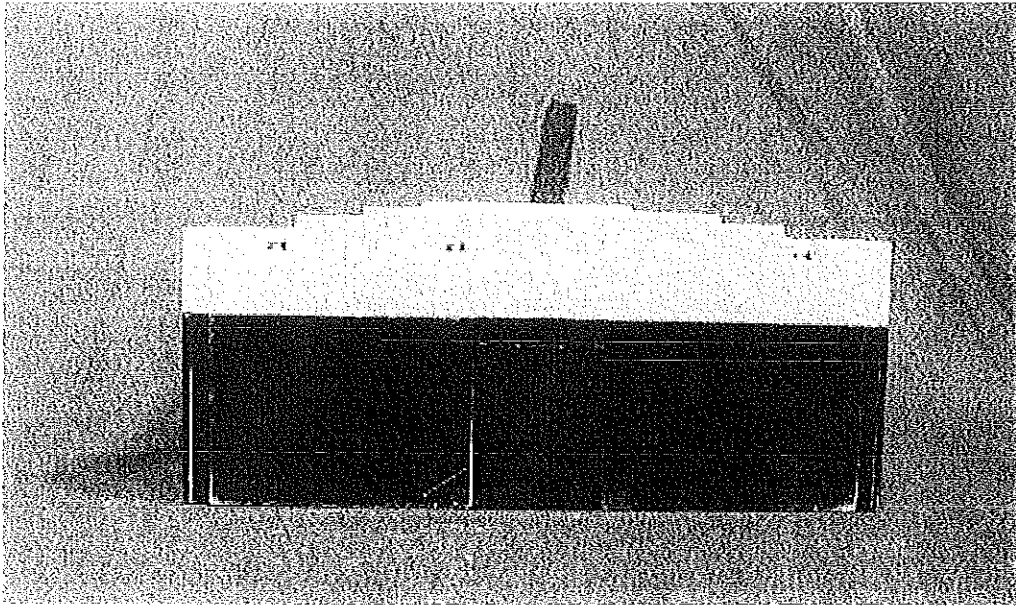
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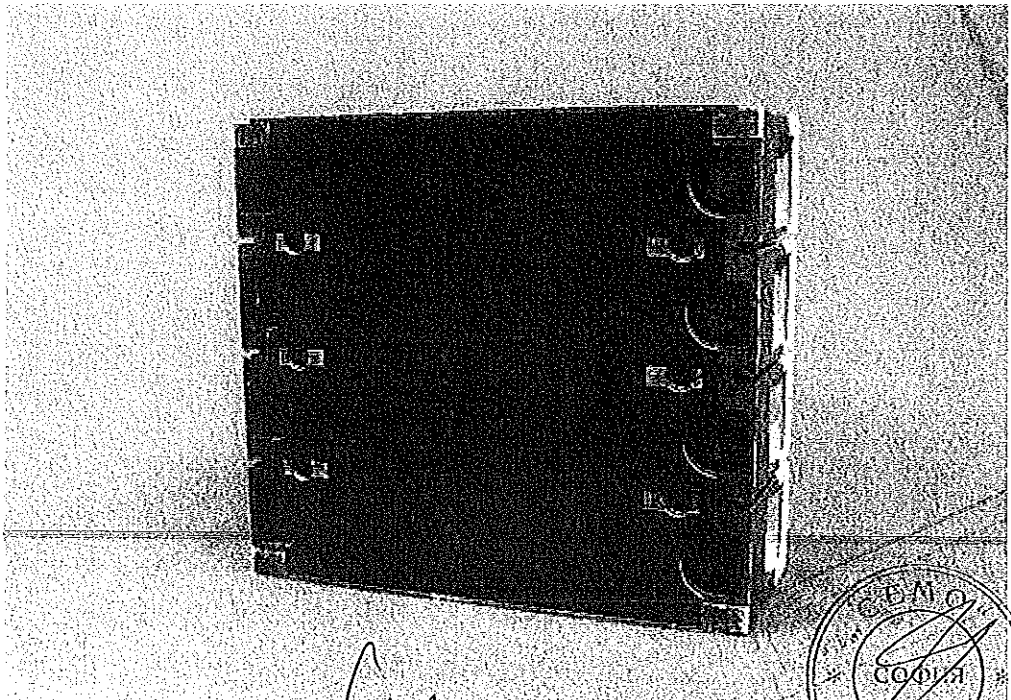
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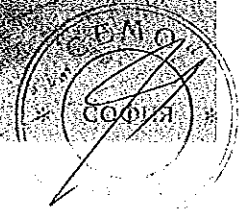
Side view, 3P + N MCCB



Back view, 3P + N MCCB



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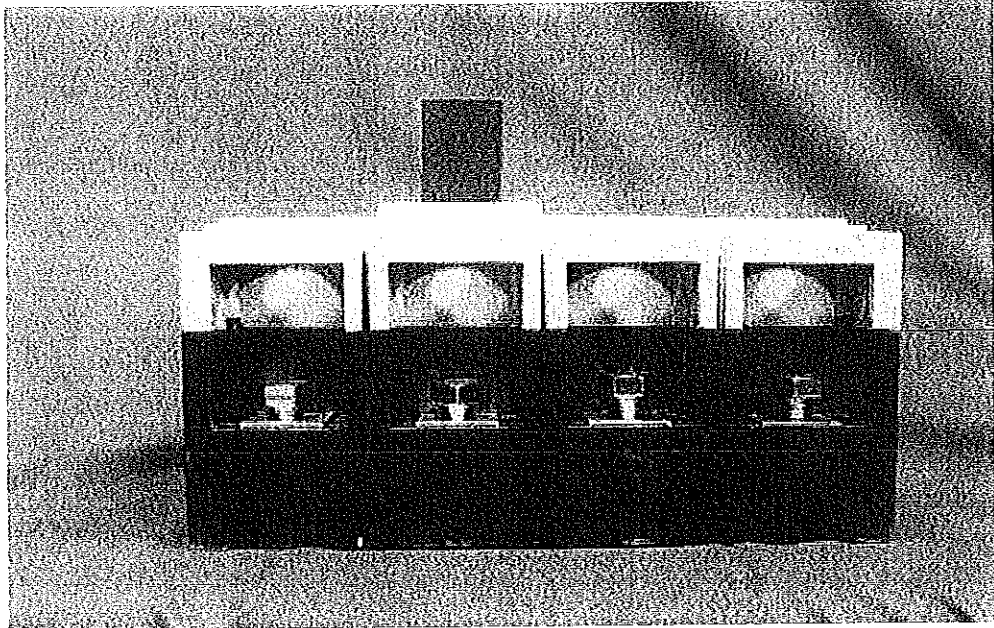
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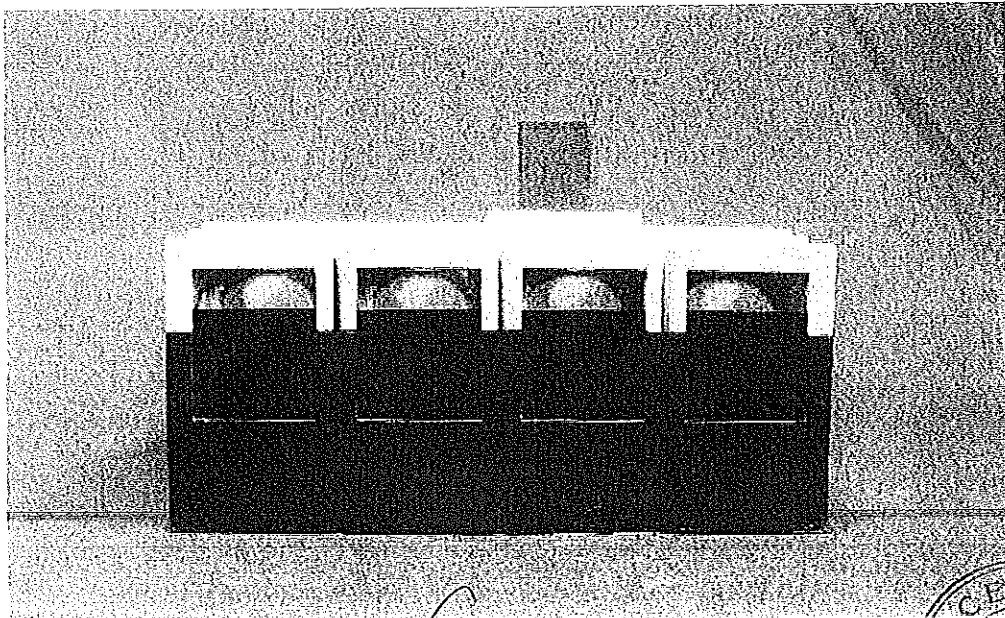
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Load terminal view, 3P + N MCCB



Line terminal view, 3P + N MCCB

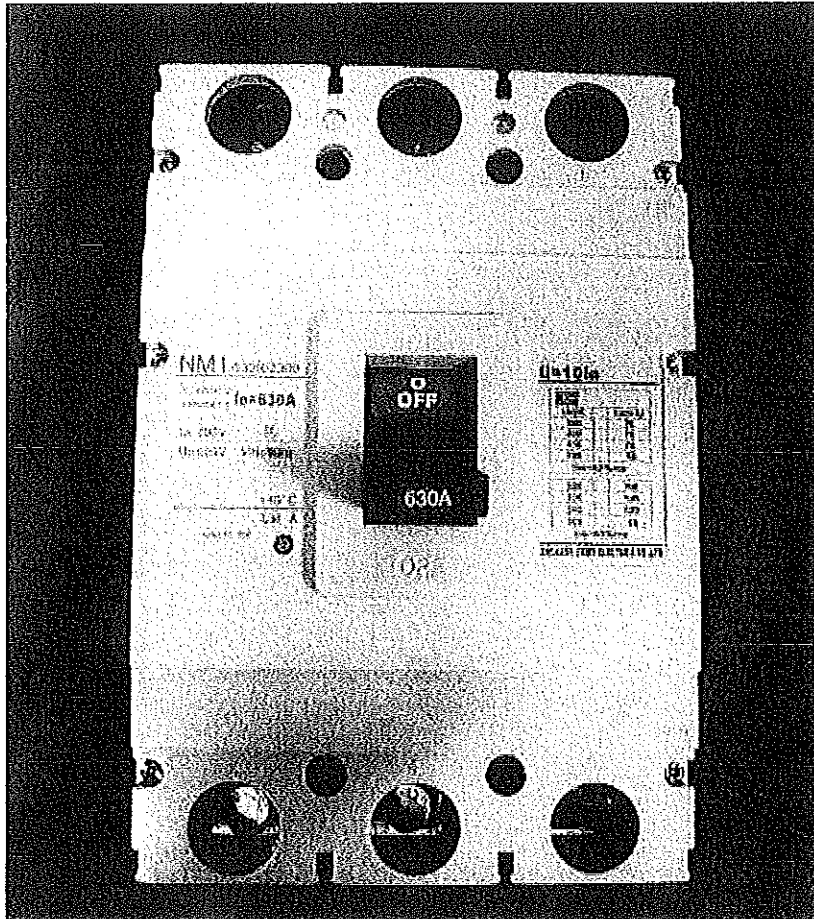


TRF No. IEC60947_2F

Handwritten signatures and stamps:
A large handwritten signature 'Ay' is centered below the line terminal view.
A circular stamp is located to the right of the 'Ay' signature, containing some illegible text.
Below the 'Ay' signature, there are several other handwritten marks, including a large '4', a '651', and several stylized signatures or initials.

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Front view, 3P MCCB



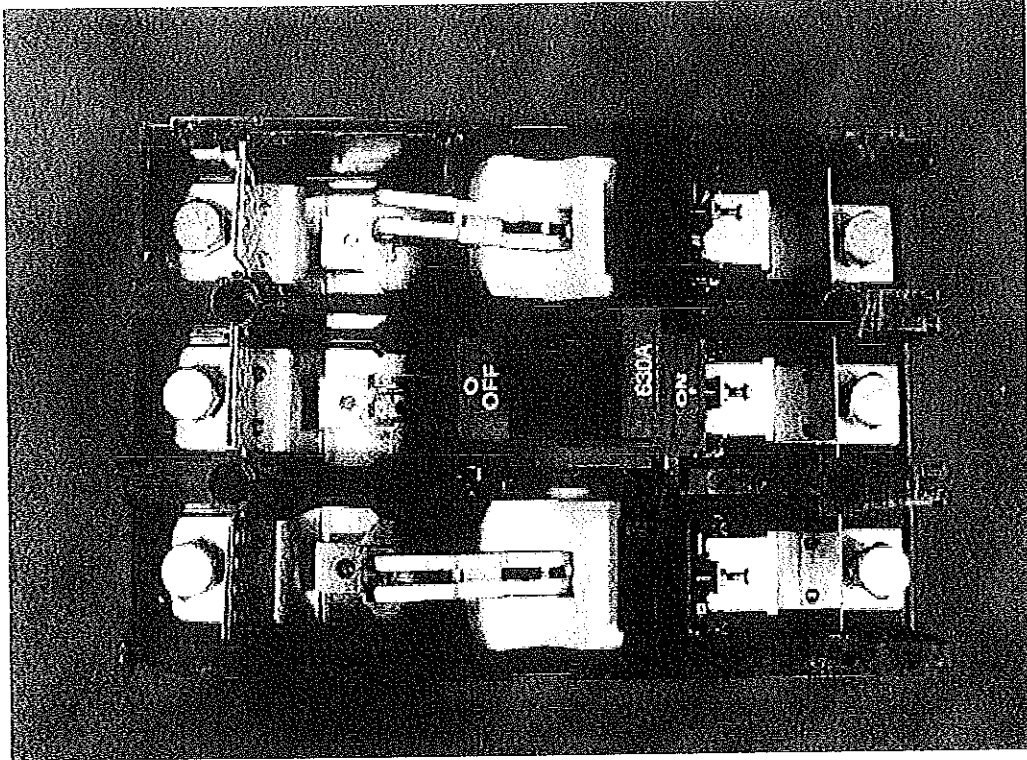
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IEC 60947-2

Open view, 3P MCCB



A handwritten signature in black ink is written over a circular stamp. The stamp contains some illegible text, possibly a date or a reference number.

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TRF No. IEC60947_2F

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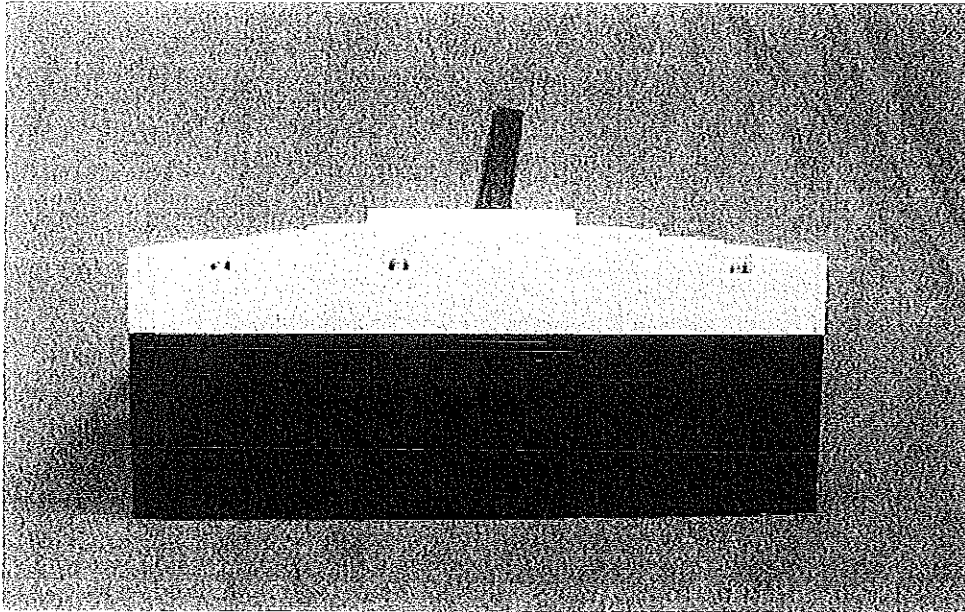
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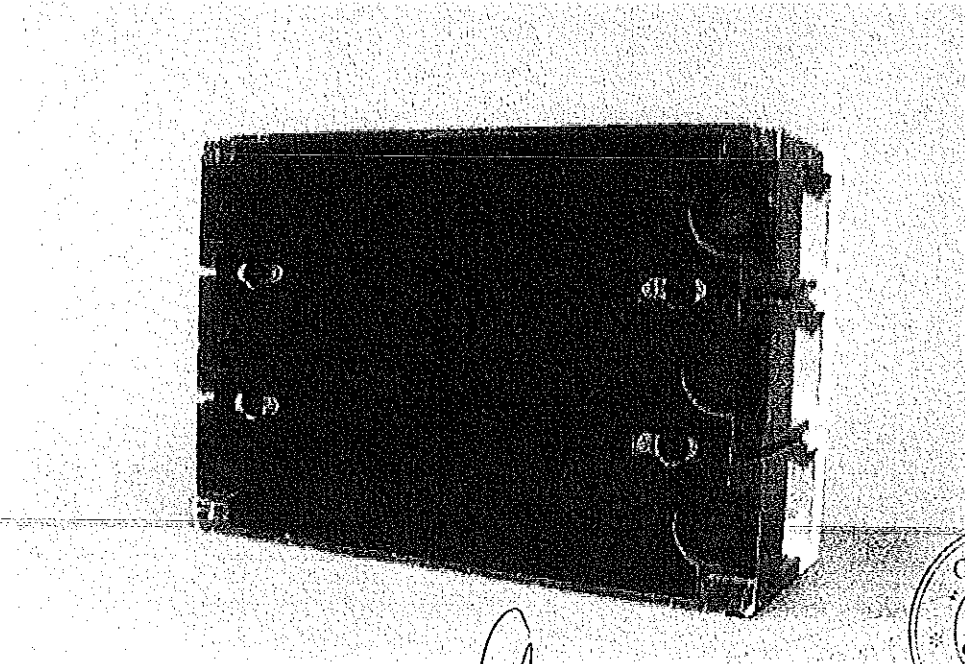
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Side view, 3P MCCB



Back view, 3P MCCB



On

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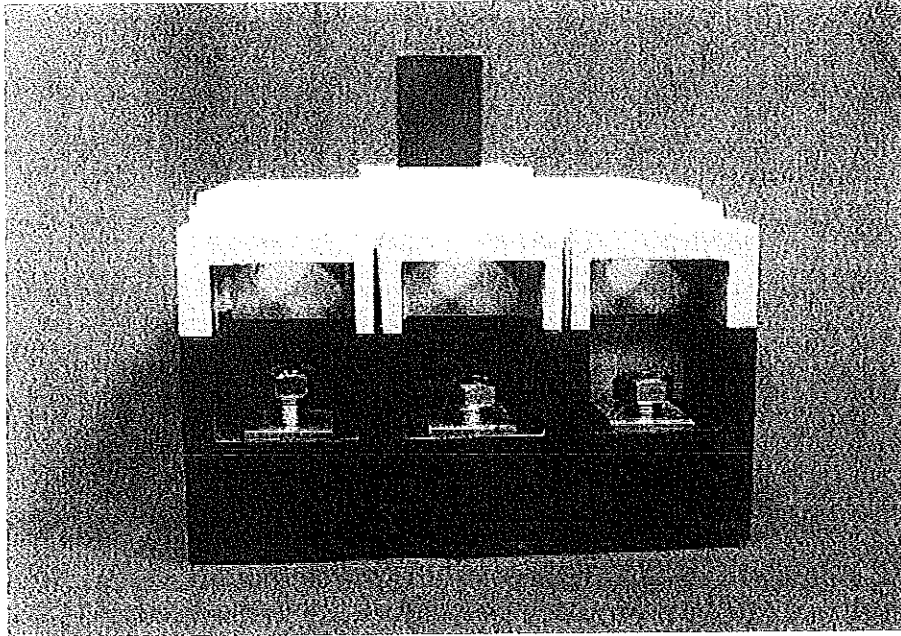
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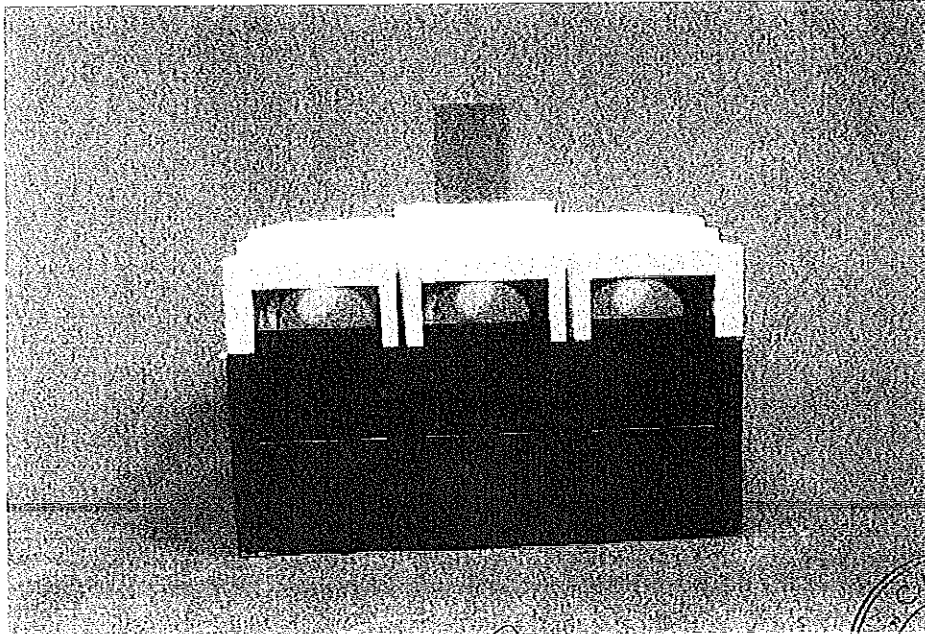
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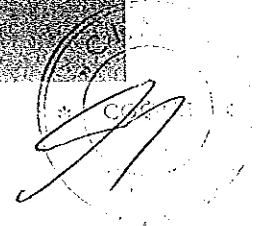
Load terminal view, 3P MCCB



Line terminal view, 3P MCCB



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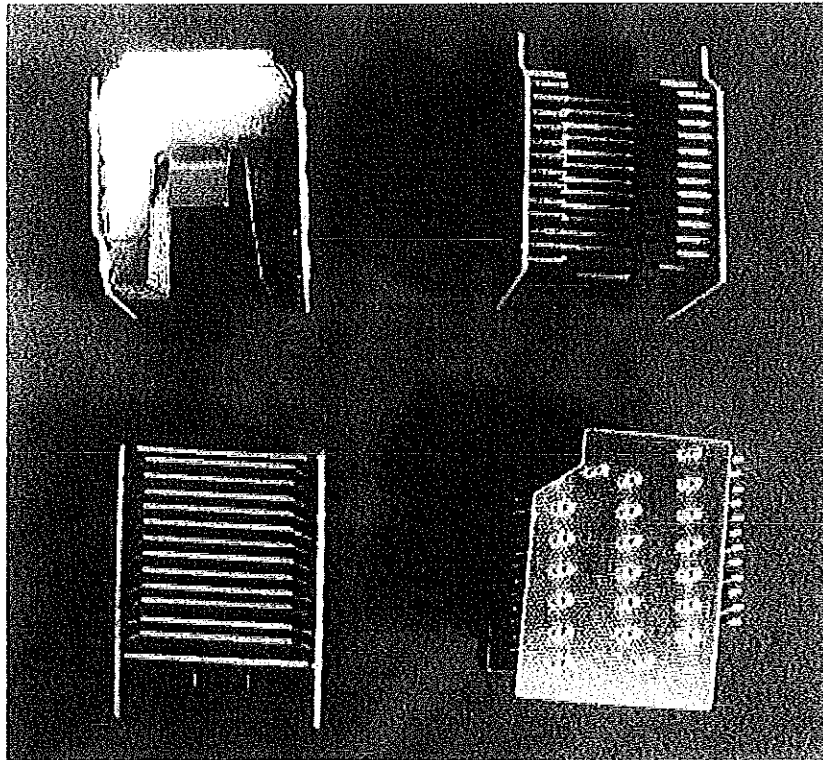
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IEC 60947-2

Arc chamber



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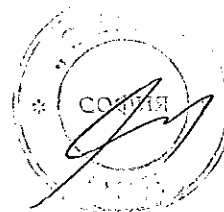


СПИСЪК НА ИЗПИТАНИЯТА В ТЕСТОВИ ДОКЛАД ЗА NM1-125 ~ 630

№	ОПИСАНИЕ
1	Обща информация
2	Продуктова информация
3	Тестови данни
4	Снимка на автомата
5	Кратко изложение на теста
6	Маркировка
7	Конструкция
8	Изисквания за работа
9	Тестове
10	Механични характеристики на клемите
11	Изпитателна последователност I – общо представяне, проба I-1,2 полюс
12	Изпитателна последователност I – общо представяне, проба I-2,3 полюс
13	Изпитателна последователност I – общо представяне, проба I-3,4 полюс
14	Изпитателна последователност II (Ics)
15	Изпитателна последователност II/III (Ics=Icu) – проба II-1,2 полюс
16	Изпитателна последователност II/III (Ics=Icu) – проба II-2,2 полюс
17	Изпитателна последователност II/III (Ics=Icu) – проба II-3,2 полюс
18	Изпитателна последователност II/III (Ics=Icu) – проба II-4,3 полюс
19	Изпитателна последователност II/III (Ics=Icu) – проба II-5,3 полюс
20	Изпитателна последователност II/III (Ics=Icu) – проба II-6,3 полюс
21	Изпитателна последователност II/III (Ics=Icu) – проба II-7,4 полюс
22	Изпитателна последователност III (Icu) – проба III-1,4 полюс тествани при 1P+N
23	Други
24	Топлинен тест
25	Диелектрична стабилност
26	Измерване на безопасното разстояние за монтаж
27	Сила на затягане на болтовете
28	Издържливост на пожар и оголен кабел
29	Снимков материал на тестваното изделие

Дата: 07.08.2015 г.

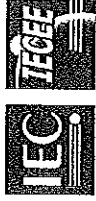
СЕМО ООД:.....











CERTIFICATE OF ACCEPTANCE

TO PARTICIPATE IN THE IECEE CB-SCHEME

DEKRA Testing Services (Zhejiang) Co., Ltd.

No. 5. Changjiang Road, Great Bridge Industrial Park, North Baixiang, Wenzhou, Zhejiang, 325603, P.R.China

has been assessed and determined to fully comply with the requirements of ISO/IEC 17025: 2005-05, The Basic Rules, IECEE 01: 2012-06 and Rules of Procedure IECEE 02: 2012-06, and the relevant IECEE CB-Scheme Operational Documents.

DEKRA Testing Services (Zhejiang) Co., Ltd.

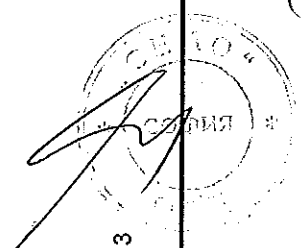
is therefore entitled to operate as a Chinese CB Testing Laboratory under the responsibility of DEKRA Certification B.V. as National Certification Body and to carry out testing within the IECEE CB Scheme for the Scope (Product Category(ies) and Standard(s)) as listed in the relevant part of the IECEE Web Site at www.iecee.org, and is subject to all other terms as set forth in the IECEE Basic Rules and Rules of Procedure

This certificate remains valid until April 3rd 2016 at which time it will be reissued by the IECEE Executive Secretary upon successful completion of the normally scheduled 3-year Reassessment Programme administered by the IECEE CB Scheme.

Signed by:

Pierre de Ruvo
IECEE EXECUTIVE SECRETARY

Date of Issue: 2013-09-13
TL241



6508



Превод от английски език

Международна Електротехническа Комисия

Световна Система за потвърждение на тестването и Сертификацията на Електротехническото Оборудване и Компоненти (IECSEC)

СЕРТИФИКАТ ЗА ПРИЕМАНЕ
за участие в IECSEC СВ Схема

ДЕКРА Услуги за тестване на качеството Зейджанг

Сграда № 5 Чанджианг Гренд Бридж Индъстриал Парк (Север), Уенджоу Зейджанг 325603, Н. Р. Китай

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ДЕКРА Услуги за тестване на качеството Зейджанг

има право да оперира като СВ Тестова Лаборатория под отговорността на ДЕКРА като национален Сертификационен Орган и може да провежда тестване в рамките на IECSEC СВ Схема за Обхвата (Продуктова Категория (ии) и Стандарт (и)) както са описани в съответната част на IECSEC Интернет сайт www.iecsec.org, и е обект на всички други условия, заложиени и IECSEC Основни правила или Условия на процедурата.

Този сертификат остава валиден до 3 Април 2016 г., до което време ще бъде преиздаден от IECSEC Изпълнителния Секретар на базата на успешно преминаване на стандартната 3 годишна, администрирана от IECSEC СВ Схема.

Дата на издаване; 2013-09-13
TL241

Подписано от: (подпис: не се чете)
Пиер де Руво
IECSEC Изпълнителен секретар

659

Моля, запазете това ръководство за работа

Серия NM1

Прекъсвачи и
разединители в лят корпус

Ръководство за работа



Моля, прочетете ръководството за работа преди
инсталиране и използване на продукта

Сч

Е

А

1. Приложение

Серията прекъсвачи в лят корпус NM1 (наричани по-долу прекъсвач) е нов тип прекъсвач, разработен от компанията ни с международни високи технологии. Неговото изолационно напрежение е до 800V. Автоматичният прекъсвач се използва главно в разпределителната мрежа на AC 50Hz/60Hz, с номинално напрежение до 690V, номинален работен ток до 1250A за разпределение на електрическа енергия и за защита на линиите и оборудването от повреди поради претоварване, късо съединение и понижено напрежение. Той може да се използва също за рядко пускане на двигател и за защита на двигателя от претоварване, късо съединение и понижено напрежение.

Прекъсвачите, в зависимост от различната им изключвателна способност при късо съединение, се разделят на три вида: S тип (стандартен), H тип (с голяма изключвателна способност), R тип (токоограничаващ тип).

Продуктът се характеризира с малък обем, голяма изключвателна способност и късо дъгогасително разстояние, така че, той е идеален продукт за потребителите.

Продуктът е в съответствие със стандарта IEC60947-2.

2. Работни условия

2.1. Околна температура

2.1.1. Горната граница на температурата на околната среда е +40°C (Ако температурата надвишава 40°C, моля свържете се с нас).

2.1.2. Средната температура за 24 часа не трябва да надвишава +35°C.

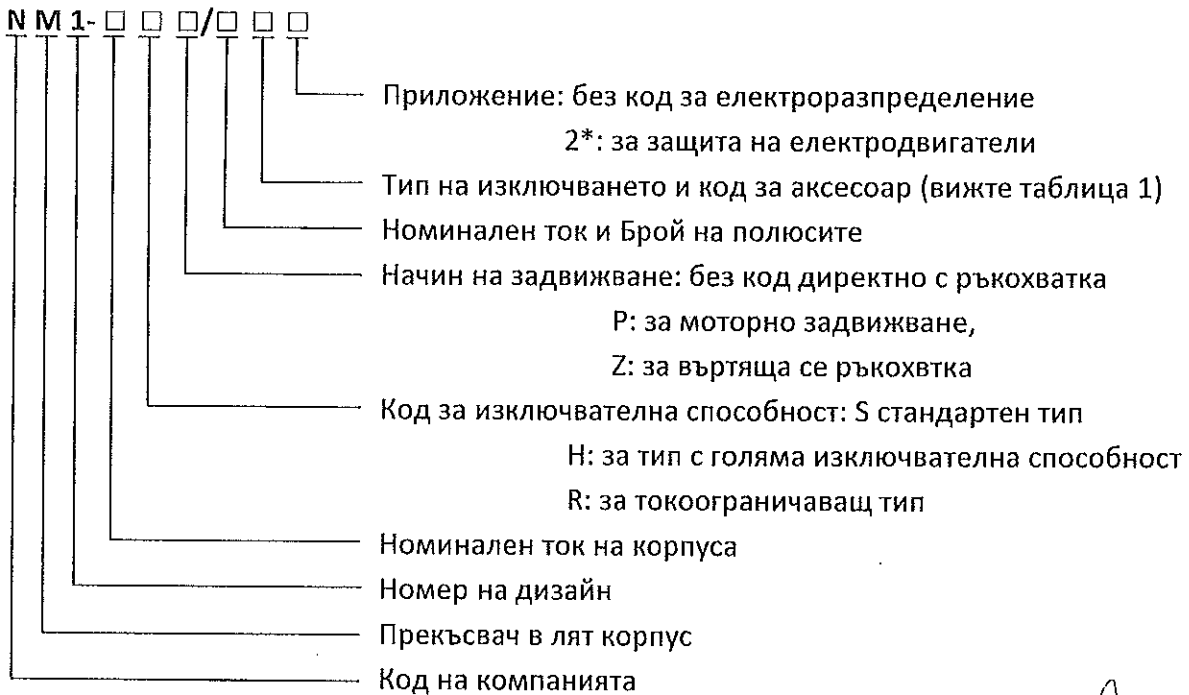
2.1.3. Долната граница на температурата на околната среда е -5°C.

2.2. Надморска височина: надморската височина в мястото на инсталацията не трябва да надвишава 2000m.

2.3. Атмосферни условия: относителната влажност на въздуха да не надвишава 50%, когато външната температура е 40°C. Относителната влажност на въздуха може да бъде по-висока при по-ниска температура. Максималната средно-месечна относителна влажност на въздуха е 90% в най-влажните месеци, с минимална средно-месечна температура от 25°C. Трябва да се вземе под внимание фактора, че може да се появи роса на повърхността на продукта в резултат на температурните промени.

2.4. Степен на замърсяване: клас III

3. Типово означение и класификация



Забележка: * След кода за приложение, А означава четириполюсен прекъсвач, неутралата е със защита от претоварване; В - без защита от претоварване.

Таблица 1 Режим на изключване и кодове за аксесоари

Наименование на аксесоар	Режим на изключване	Моментално изключване	Комбинирано изключване
Без аксесоар		200	300
Контакт за сигнализация		208	308
Дистанционен изключвател		210	310
Допълнителен контакт		220	320
Минимално напреженов изключвател		230	330
Дистанционен изключвател, допълнителен контакт		240	340
Дистанционен изключвател, минимално напреженов изключвател		250	350
Две групи допълнителни контакти		260	360
Допълнителен контакт, минимално напреженов изключвател		270	370
Дистанционен изключвател, контакт за сигнализация		218	318
Допълнителен контакт, контакт за сигнализация		228	328
Минимално напреженов изключвател, контакт за сигнализация		238	338
Дистанционен изключвател, допълнителен контакт, контакт за сигнализация		248	348
Дистанционен изключвател, минимално напреженов изключвател, контакт за сигнализация		258	358
Две групи допълнителни контакти, контакт за сигнализация		268	368
Допълнителен контакт, минимално напреженов изключвател, контакт за сигнализация		278	378

Забележка: сега няма прекъсвач тип 258 и 358.

4. Основни технически параметри

4.1. Настройката на магнитната защита на прекъсвача (за електроразпределение) е зададена на $10I_n$, за защита на двигател на $12I_n$.

4.2. Номиналните величини на прекъсвача са дадени в таблица 2.

4.3. Работните характеристики на прекъсвача (за електроразпределение) са показани в таблица 3, а характеристиките за защита на двигател в таблица 4.

Таблица 2. Номинални величини на прекъсвача

Модел	Номинален ток на корпуса I_{nm} (A)	Номинален ток I_n (A)	Номинално напрежение U_e (V)	Номинално изоляционно напрежение U_i (V)	Номинална изключвателна способност I_{cu} (kA) 415V/690V	Номинална работна изключвателна способност I_{cs} kA 415V/690V	Номинален ток на N полюса	
NM1-63S/3P	63	10, 16, 20,	380/	500	15	7.5	I_n	
NM1-63H/3P		25, 32, 40,	400/		35	17.5		
NM1-63H/4P		50, 63	415					
NM1-100S/3P	100	10, 16, 20, 25, 32, 40, 50, 63, 80, 100	380/ 400/ 415/ 690	800	25/3	12.5/1.5	= I_n (ако $I_n \leq 63A$) = 63A (ако $I_n \geq 63A$)	
NM1-100H/2P					50/8	25/4		
NM1-100H/3P								
NM1-100H/4P								
NM1-100R/3P	225	100, 125, 160, 180, 200, 225	380/ 400/ 415/ 690	800	65/10	32.5/5	= 63A (ако $I_n \leq 125A$) = $I_n/2$ (ако $I_n \geq 125A$)	
NM1-225S/3P					25/5	12.5/2.5		
NM1-225H/2P					50/8	25/4		
NM1-225H/3P								
NM1-225H/4P								
NM1-225R/3P	65/10	32.5/5						
NM1-400S/3P	400	225, 250, 315, 350, 400	380/ 400/ 415/ 690	800	35/10	17.5/5	= $I_n/2$	
NM1-400S/4P					50/12	25/6		
NM1-400H/3P								
NM1-400R/3P								70/15	35/7.5
NM1-630S/3P	630	400, 500, 630	380/ 400/ 415	500	35/12	17.5/6	= $I_n/2$	
NM1-630S/4P					50/13	25/6.5		
NM1-630H/3P								
NM1-630R/3P								70	35
NM1-800H/3P	800	630, 700, 800	380/ 400/ 415	500	60	30		
NM1-800R/3P					70	35		
NM1-1250H/3P	1250	700, 800, 900, 1000, 1250			65	32.5		



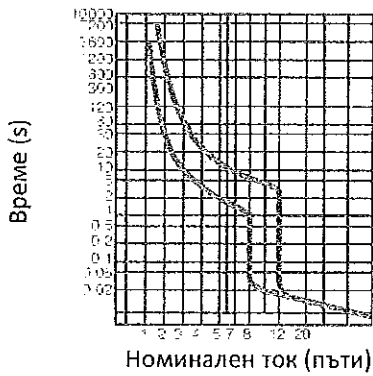
Таблица 3 Работни характеристики на изключване на прекъсвача при претоварване (за електроразпределение)

No.	Изпитвателен ток	I/In	Стандартно време	Начално състояние
1	Стандартен неизключващ ток	1.05	2 часа (In>63A), 1час (In<63A)	Студено състояние
2	Стандартен ток на изключване	1.30	2 часа (In>63A), 1час (In<63A)	Веднага след тест № 1

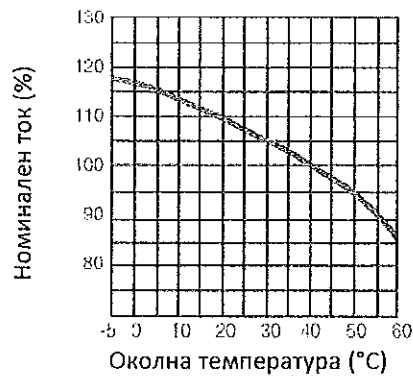
Таблица 4 Работни характеристики на изключване на прекъсвача при претоварване (за защита на двигател)

No.	Изпитвателен ток	Номинален ток	Стандартно време	Начално състояние
1	Стандартен неизключващ ток	1.0	2 часа	Студено състояние
2	Стандартен ток на изключване	1.2	2 часа	Веднага след тест № 1

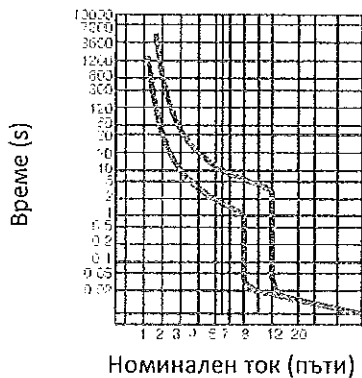
4.4. Кривите на сработване и кривите за корекция на температурата са дадени на фиг.1-12.



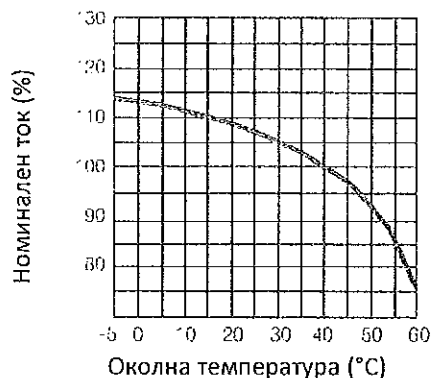
Фиг. 1 Работна характеристика на NM1-63 (10~32), NM1-100 (16 ~ 32)



Фиг. 2 Крива за компенсация на температурата на NM 1-63 (10-32), NM1-100 (16~32)

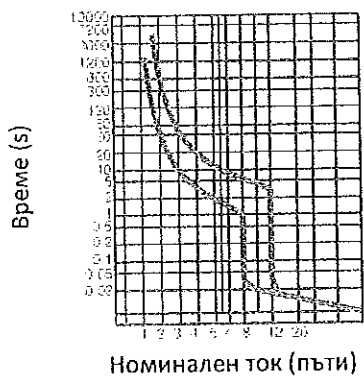


Фиг.3 Работна характеристика на NM1-63 (40~63), NM1-100 (40~100)

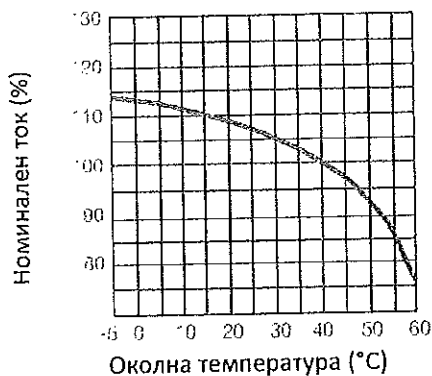


Фиг. 4 Крива за компенсация на температурата на NM1-63(40~63), NM1-100 (40~100)

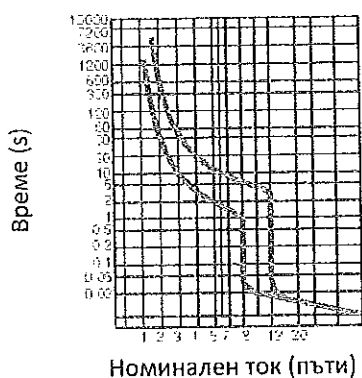
[Handwritten mark]



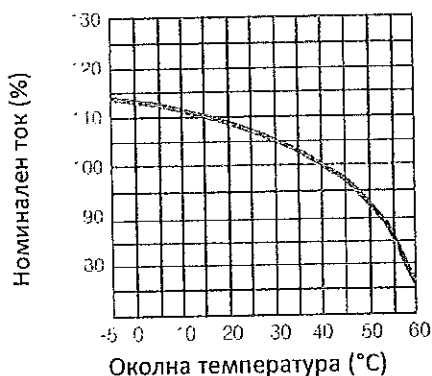
Фиг. 5 Работна характеристика на NM1-225



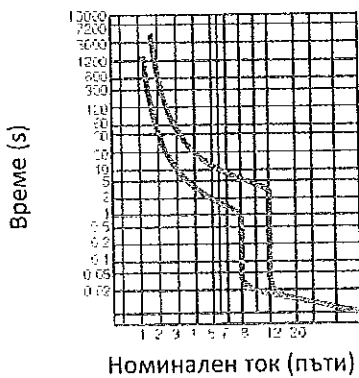
Фиг. 6 Крива за компенсация на температурата на NM1-225



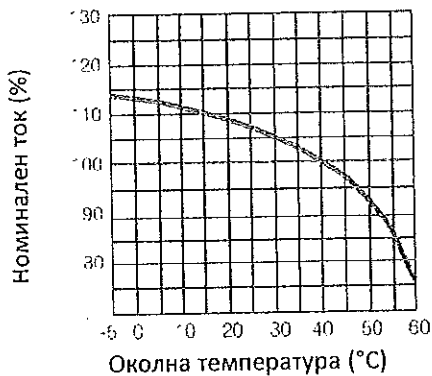
Фиг. 7 Работна характеристика на NM1-400



Фиг. 8 Крива за компенсация на температурата на NM1-400



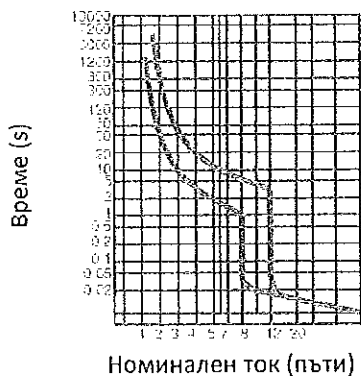
Фиг. 9 Работна характеристика на NM1-630, NM1-800



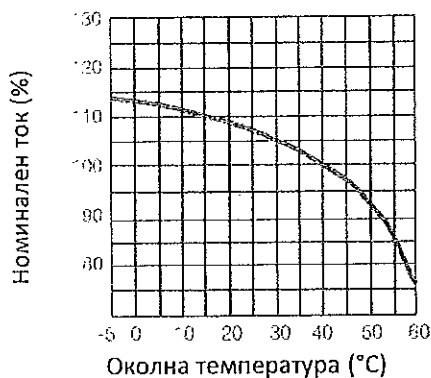
Фиг. 10 Крива за компенсация на температурата на NM1-630, NM1-800

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Фиг. 11 Работна характеристика на NM1-1250



Фиг.12 Крива за компенсация на температурата на NM1-1250

5. Вътрешни и външни аксесоари на прекъсвача

(Вътрешните и външните аксесоари на прекъсвача се инсталират в съответствие с нуждите на потребителите).

5.1 Вътрешни аксесоари на прекъсвача

5.1.1 Дистанционен изключвател

Номиналното управляващо напрежение на дистанционния изключвател е AC50Hz, 230V и 400V, и DC24V, 110V, 240V. Автоматичният прекъсвач трябва да бъде изключен надеждно при 70% - 110% от номиналното напрежение.

Забележка: когато напрежението е DC24V, тока на дистанционния изключвател трябва да бъде $5A \pm 10\%A$

5.1.2 Минимално напреженов изключвател.

Минимално напреженовият изключвател трябва да действа за да изключи прекъсвача, когато захранващото напрежение намалява (дори ако бавно намалява) до 70% - 35% от номиналното напрежение. Той трябва да предотврати повторното затваряне на прекъсвача, ако захранващото напрежение намалява до по-малко от 35% от номиналното напрежение. Той трябва да гарантира, че прекъсвача ще се затвори, ако захранващото напрежение е равно или по-голямо от 85% от номиналното напрежение.

Номиналното напрежение на минимално напреженовия изключвател е 50Hz, 230V и 400V.

Забележка: само когато на минимално напреженовия изключвател се подаде номинално напрежение, прекъсвача може да бъде затворен, в противен случай прекъсвача ще се повреди.

5.1.3 Допълнителен контакт

Допълнителният контакт на прекъсвача е разделен на две части. Електрически всяка част не се разделя. (виж таблица 5)

5.1.4 Контакт за сигнализация

Номиналното напрежение на контакта за сигнализация и свързаните с него параметри са посочени в таблица 5. Първоначалното положение на контакта за

сигнализация не се променя само когато прекъсвача е в свободна позиция или изключил повреда.

Таблица 5 Параметри на спомагателните вериги

Тип		Номинално изолационно напрежение (V)	Стандартен термичен ток (A)	AC-15			DC-13	
				Номинално напрежение (V)	Номинална честота (Hz)	Номинален ток (A)	Номинално напрежение (V)	Номинален ток (A)
Допълнителен контакт	Inm ≤ 225A	400	3	380	50	220	/	0.14
	Inm ≥ 400A		6					0.2
	Контакт за сигнализация		3					/

5.2 Външни аксесоари

5.2.1 В таблица 6 са посочени характеристиките на моторния механизъм, а в таблица 7 са показани максималните размери на дълбочината.

Таблица 6

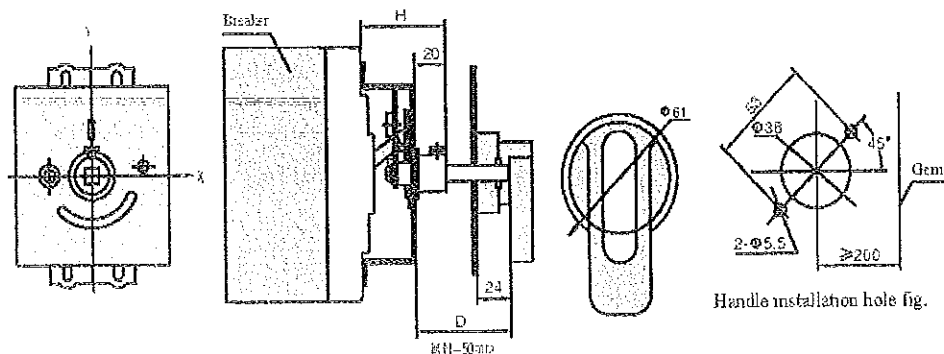
Тип	NM1-63, NM1-100, NM1-225	NM1-400, NM1-630, NM1-800
Модел		
Принцип на действие	Електромагнит	Електродвигател
Номинални напрежения	50Hz, 220V; 50Hz, 380V, DC110V; DC220V	

Таблица 7

Тип	NM1-63S	NM1-63H	NM1-100S	NM1-100H NM1-100R	NM1-225S	NM1-225H NM1-225R	NM1-400S	NM1-400H NM1-400R	NM1-630S NM1-630H	NM1-630R NM1-800H NM1-800R	NM1-1250H
Дълбочина	167	175	164	182	195	212	227	230	234	232	290
H											

Забележка: когато прекъсвач с моторен механизъм изключи, потребителите трябва да поставят прекъсвача в начално положение чрез моторния механизъм преди да затворят прекъсвача.

5.2.2 Ръкохватка за изнесено ръчно управление е показана на фиг. 13, а размерите в таблица 8

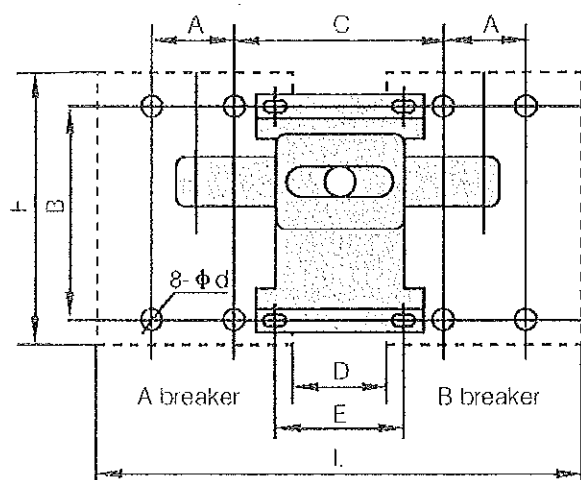


Фиг. 13

Таблица 8

Тип	NM1-63	NM1-100	NM1-225	NM1-400S	NM1-400H NM1-400R	NM1-630S	NM1-630R NM1-800H NM1-800R
Размер H	49	54	54	84	76	83	76
Y	0	0	0	0	-10	0	-20

5.2.3 Механичната блокировка е показана на фиг. 14, а в таблица 9 са дадени размерите.



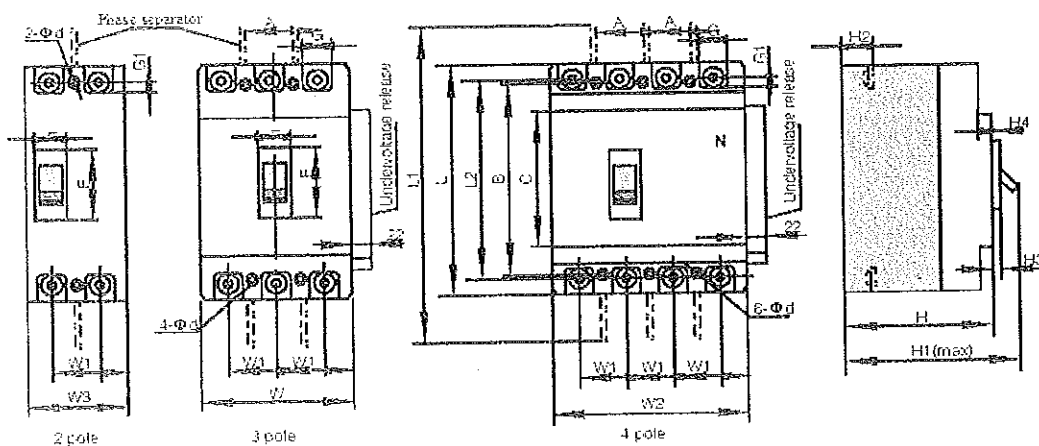
Фиг.14

Таблица 9

Model	A	B	C	D	E	F	L	Φd
NM1-63								
NM1-100	30	129	90	30	90	155	210	4.5X6
NM1-225	35	126	100	30	100	165	240	5.5
NM1-400	44	194	172	50	62	257	330	7
NM1-630	58	200	172	48	62	270	412	7
NM1-800								

6. Габаритни и инсталационни размери

- 6.1. Габаритните и инсталационните размери на прекъсвач NM1-63, 100, 225 с фиксирано свързване са дадени на фиг. 15а и в таблица 10.
- 6.2. Габаритните и инсталационните размери на прекъсвач NM1-400, 630, 800, 1250 с фиксирано свързване са дадени на фиг. 15b и в таблица 11.
- 6.3. Габаритните и инсталационните размери на прекъсвач NM1 със задно свързване и щепселно свързване са дадени на фиг. 16а, фиг. 16b, фиг. 17а, фиг.17b и в таблица 12.



Фиг. 15а NM1-63, 100, 225 с фиксирано свързване

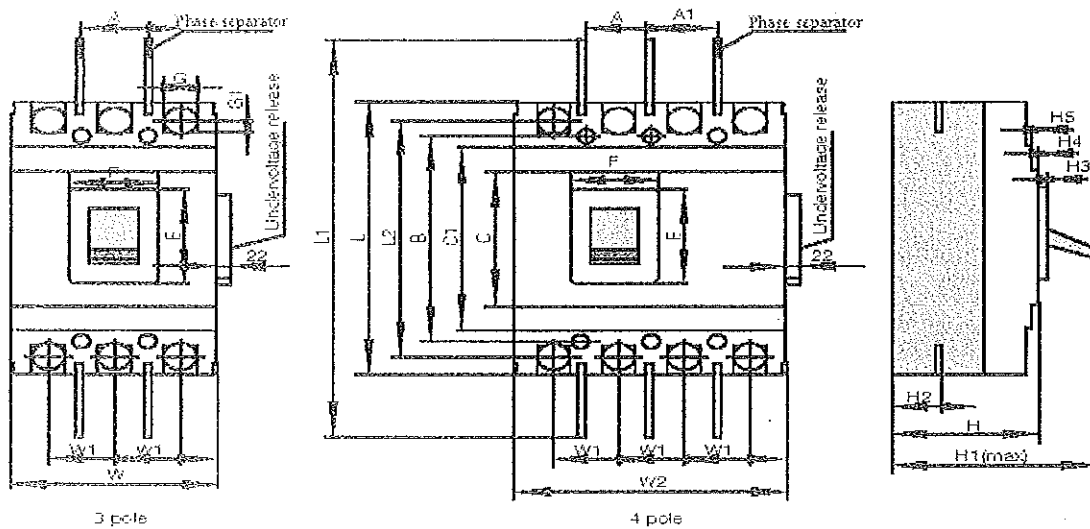
Таблица 10

Вид	Код	Тип					
		NM1-63S	NM1-63H	NM1-100S	NM1-100H NM1-100R	NM1-225S	NM1-225H NM1-225R
Габаритни размери	c	85	85	84	84	102	102
	E	48	48	50	50	50	50
	F	22	22	22	22	22	22
	G	14	14	17.5	17.5	17	17
	G1	8.5	6.5	7.5	7.5	11.5	11.5
	H	73	81	68	86	86	103
	H1	90	98.5	86	102	110	127
	H2	20	27	24	24	24	24
	H3	4	4	4	4	4	4
	H4	6	6	7	7	5	5
	L	135	135	155	155	165	165
	L1	170	173	255	255	360	360
	L2	117	117	136	136	144	144
	W	76	76	90	90	105	105
	W1	25	25	30	30	35	35
	112	-	101	-	120	-	140
W3	-	-	-	64.5	-	74.5	
Инсталационни размери	A	25	25	30	30	35	35
	B	117	117	129	129	126	126
	Φd	3.5	3.5	4.5X6	4.5X6	5.5	5.5

CA

EP

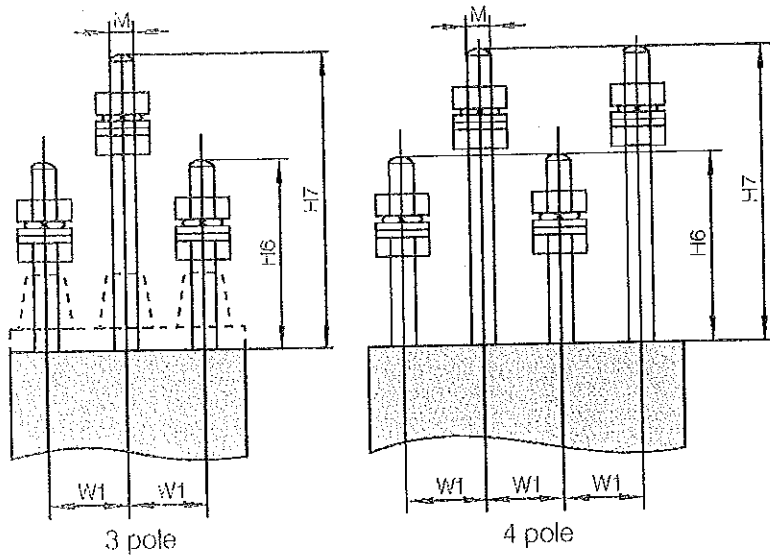
AA



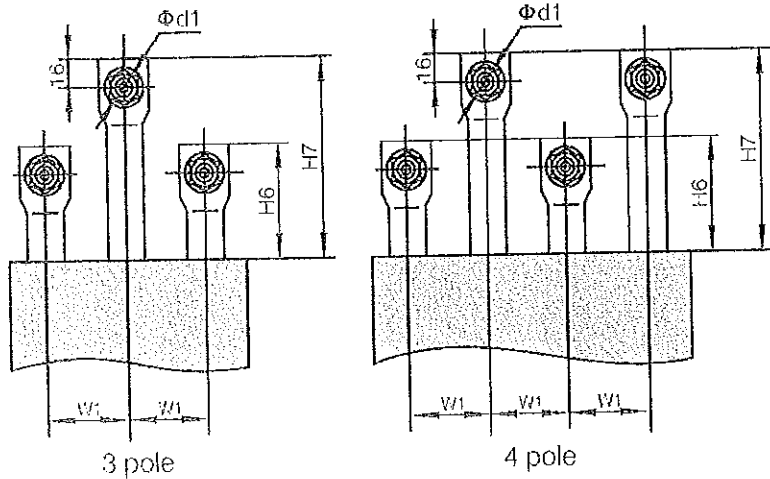
Фиг. 15b NM1-400, 630, 800, 1250 с фиксирано свързване

Таблица 11

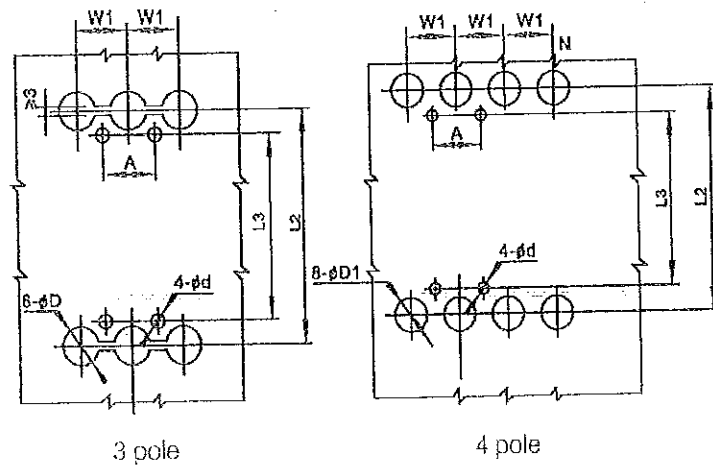
Вид	Код	Тип						
		NM1-400S	NM1-400H NM1-400R	NM1-630S	NH1-630H	NM1-630R NM1-800H/R	NM1-800H/4P	NH1-1250H
Габаритни размери	c	102	129	134	134	154	135.5	265.5
	C1	179	175	184	184	204	206.5	345.5
	E	90	89	89	89	106	91	97
	F	62	65	65	65	66	52	78
	G	28	30.5	40	44	44	45	
	G1	13	10.5	13.5	13.5	12.5	12	
	H	104	107	111	111	107	109	141
	H1	155	150	160	160	143	156	202
	HZ	38	39	44	44	33	36.5	58
	H3	6	6	6	6	4.5	5	16.5
	H4	6	4.5	3.5	3.5	4.5	6	2
	H5	2.5	4.5	4.5	4.5	8	7	4.5
	L	257	257	270	270	280	276	406
	L1	457	457	470	470	470	485	706
	L2	225	225	234	234	243	243	375
	W	140	150	182	182	210		210
	W1	44	44	58	58	70	70	70
W2	198	-	240	-	-	280	-	
Инсталационни размери	A	44	44	58	58	70	70	70
	A1	50	-	58	-	-	-	-
	B	194	194	200	200	243	243	299
	Φd	7	7	7	7	7	7	10



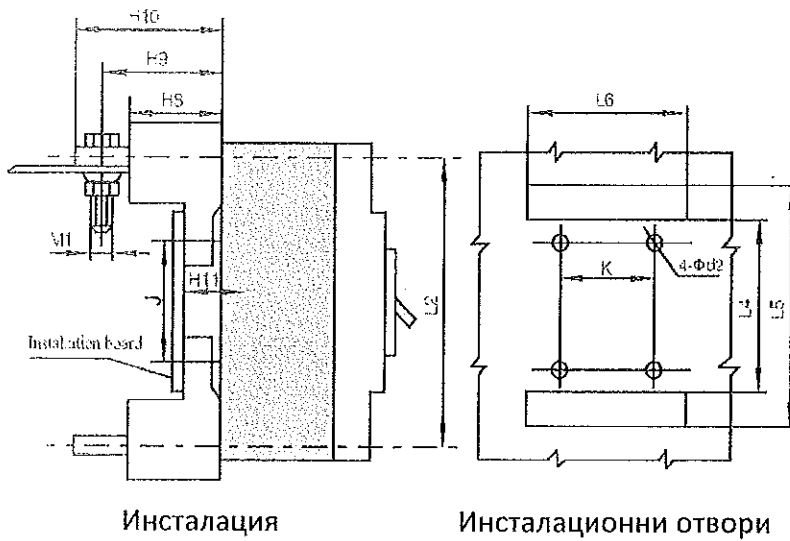
Фиг.16а NM1-63, 100, 225 със задно свързване



Фиг. 16b NM1-400, 630, 800 със задно свързване



Фиг.17а Инсталационни отвори за прекъсвачите NM1 със задно свързване



Фиг.17b plug in of NM1 series

Таблица 12 Размери на прекъсвачи със задно и щепселно свързване

Вид	Код	Type						
		NM1-63S NM1-63H	NM1-100S NM1-100H NM1-100R	NM1-225S NM1-225H NM1-225R	NM1-400S	NM1-400H NM1-400R	NM1-630S NM1-630H	NM1-630R NM1-800H NM1-800R
Размери на прекъсвачи със задно и щепселно свързване	A	25	30	35	44	44	58	70
	φd	3.5	4.5X6	5.5	7	7	7	7
	φd1				12.5	12.5	16.5	16.5
	φd2	6	8	8	8.5	9	8.5	12
	φD	8	24	26	31	33	37	37
	φD1	8	16	20	33	37	37	37
	H6	44	68	66	60	65	65	48
	H7	66	108	110	120	120	125	125
	H8	28	51	51	61	60	60	87
	H9	38	65.5	72		83.5	93	—
	H10	44	78	91	99	106.5	112	106
	H11	8.5	17.5	17.5	22	21	21	26.5
	L2	117	136	144	225	225	234	243
	L3	117	108	124	194	194	200	243
	L4	97	95	90	165	163	165	173
	L5	138	180	190	285	285	302	305
	L6	80	95	110	145	155	185	215
	M	M6	M8	M10				
	K	50.2	60	70	60	60	100	90
J	60.7	62	54	129	130	123	143	
M1	M5	M8	M8	M10	M10	M12	M14	
W1	25	30	35	44	44	58	70	



7. Транспортиране, складиране

Транспорта се извършва с конвенционални превозни средства, без режимни изисквания към тях. За подреждането в транспортното средство се спазват знаците и указанията върху фабричната опаковка. По време на траспортиране, товарене и разтоварване, не се допускат нарушаване цялостта на опаковката, силни сътресения, замърсяване, въздействие от корозиращи течности и газове, както и други агресивни влияния.

Автоматичните прекъсвачи са подходящо фиксирани и се съхраняват в опаковката с която са доставени, в закрито, сухо, естествено вентилирано помещение, спазвайки надписите върху нея. Фабричната опаковка осигурява защита на апаратите при нормални въздействия на околната среда, срещу натрупване на прах и механични повреди. Независимо от взетите мерки при опаковането в завода, в складирано състояние не се допускат силни механични сътресения, въздействия от корозиращи течности и газове, както и други агресивни влияния. След внимателно разопаковане, опаковката се съхранява за евентуално последващо опаковане, транспорт и съхранение.

Задължително се ограничава достъпа на неоторизирани лица до изделията през време на съхранението, както и разглобяването им.

В наложителни случаи е възможно съхраняване на закрито без фабричната опаковка, в разумни срокове, спазвайки добри практики, като се обърне особено внимание да няма сътресения, вибрации и удари от странични съоръжения или транспортни средства, оросяване, агресивни влияния (солена мъгла, газове, натрупване на прах и агресивна прах и др.). В такива случаи на съхранение се извършват редовни проверки за текущото състояние.

8. Монтаж, експлоатация и поддържане

8.1 Свързване на проводниците

Едножилен меден проводник с PVC изолация се използва като свързващ проводник за прекъсвача. Сечението му се избира в съответствие с таблица 13.

Таблица 13

Ток In (A)	16 20	32	40 50	63	80	100	125	160	180 200 225	250	315 350	400	500	630	700 800	900 1000 1250
Сечение на проводника mm ²	2.5	6.0	10	16	25	35	50	70	95	120	185	240	50X3	40X5	50X5	70X5
Брой	1											2				

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Моменти на затягане на клемовите съединения:

винт M6; -10Nm; винт M8; -15Nm; винт M10; 40-50Nm

8.2 Инсталация

8.2.1 Преди да инсталирате прекъсвача, първо трябва да проверите съдържанието в кутията, след това фиксирайте прекъсвача вертикално в таблото с болтове.

8.2.2 Свързване на силовата верига

8.2.2.1 Свързване на прекъсвач с фиксирано свързване

Край на проводник с PVC изолация и сечение, определено в точка 7.1, след премахване на подходяща дължина от външната PVC изолация, се вмъква в отвора на скобата. Външният край на скобата трябва да се притисне плътно и трябва проводника да се затегне, а след това свързващия отвор на скобата се свързва с терминала на прекъсвач с винтове. Ако са медни шини, първо трябва да се фиксира прекъсвача за монтажната плоча на таблото, а след това медните шини се закрепват към таблото.

8.2.2.2 Свързване на прекъсвач със задно свързване

Монтажната плоча първо трябва да се фиксира според фиг. 16, след това се затяга подходящия проводник.

8.2.3 Свързване на оперативните вериги

Оперативните вериги се свързват според схемата на съответното табло.

8.2.4 Поставяне на разделител между фазите.

8.2.5 Проверка

Преди да включите прекъсвача, трябва да го проверите в съответствие с изискванията на инсталацията. Фиксираните и свързаните части трябва да бъдат стабилни и надеждни, за да може прекъсвача да работи продължително. Неговият работен механизъм трябва да бъде също подвижен и надежден..

8.3 Използване и поддръжка

8.3.1 При избора на прекъсвачи, техните технически параметри трябва да отговарят на обективните изисквания на практиката.

8.3.2 Различните характеристики и аксесоари на прекъсвача са регулирани от специални техници, така че не може да ги коригирате.

8.3.3 След задействане на защита от претоварване и от късо съединение на прекъсвача, първо трябва да бъде отстранена повредата, след това може прекъсвача да се включи и да работи.

8.3.4 Периодично проверявайте и пазете изолацията чиста и надеждна.

8.3.5 Предпазвайте прекъсвача от влага и удари в процеса на експлоатация, съхраняване и транспортиране.



9. Начини за определяне на повреди

В процеса на работа могат да се появят различни дефекти на прекъсвача. Например, скрепителните елементи са разхлабени, проводниците не са добре свързани и механизма е блокиран. Съответните техническите параметри са разумно подбрани и в съответствие с изискванията. Тези дефекти ще бъдат разгледани и отстранени от специални техници на потребителите. Специалните техници на производителя са отговорни за анализ на причината за останалите дефекти, както и за отстраняването им, за подмяна на аксесоарите, както и за пренастройване на параметрите.

10. Други

9.1 Аксесоари, като скоби, монтажна плоча и разделител между фазите, да са произведени от производителя, освен вътрешните и външните аксесоари, описани в т. 5, в съответствие с изискванията на потребителите.

9.2 Съпътстващи продукта са сертификат за инспекция, списък със съдържание на опаковката и ръководство за обслужване.

