IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: L3:	L1: 734,8 V L2: 734,8 V L3: 733,0 V	P
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	L1: 45,3 kA L2: 45,0 kA L3: 45,3 kA	P
	power factor/time constant :	0,24	P
	- Factor "n"	2,13	P
	- peak test current (Amax) :	96,6 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 95,8 kA L2: 74,1 kA L3: 79,1 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 52,1 MA^2s L2: 33,8 MA^2s L3: 32,0 MA^2s	P
	Pause, t: (min)	10	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 94,3 kA L2: 86,4 kA L3: 69,1 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 48,9 MA^2s L2: 43,5 MA^2s L3: 28,0 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	1 380 V	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 0,78 mA / 759 V	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:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	127 s 126 s 126 s	P
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	TS1600H 4P	
	Sample no:	S3-1	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	240 V	
	Rated ultimate short-circuit breaking capacity: (kA)	75 kA	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	152~317 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	226 s 215 s 214 s	P
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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	< 30mm^2	P
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm²) :	2CX50X10 mm²	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: L3:	L1: 253,4 V L2: 253,3 V L3: 253,5 V	P
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	L1: 75,9 kA L2: 76,3 kA L3: 74,8 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,28	P
	- peak test current (Amax) :	172,9 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 142,2 kA L2: 126,1 kA L3: 65,5 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 102,1 MA^2s L2: 80,0 MA^2s L3: 19,5 MA^2s	P
	Pause, t: (min)	4	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 111,1 kA L2: 77,6 kA L3: 80,5 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 64,0 MA^2s L2: 41,1 MA^2s L3: 33,6 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 0,1 mA / 264 V	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:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	123 s 128 s 121 s	P
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	TS1600H 4P	
	Sample no:	S3-2	
	Rated current: In (A)	630 A	
	Rated operational voltage: Ue (V)	240 V	
	Rated ultimate short-circuit breaking capacity: (kA)	75 kA	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	152~317 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	222 s 224 s 220 s	P
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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	<30mm^2	P
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm^2) :	2CX40X5 mm^2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	L1: 253,4 V L2: 253,3 V L3: 253,5 V	P
	- r.m.s. test current AC/DC: (A).....L1: .....L2: L3:	L1: 75,9 kA L2: 76,3 kA L3: 74,8 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,28	P
	- peak test current (Amax) :	172,9 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 99,3 kA L2: 100,6 kA L3: 65,4 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 71,2 MA^2s L2: 66,2 MA^2s L3: 19,7 MA^2s	P
	Pause, t: (min)	6	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 121,8 kA L2: 148,7 kA L3: 58,4 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 69,5 MA^2s L2: 106,2 MA^2s L3: 18,4 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 0,45 mA / 264 V	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:	92~182 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	130 s 127 s 125 s	P
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	TS1600H 4P	
	Sample no:	S3-3	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	460 V	
	Rated ultimate short-circuit breaking capacity: (kA)	65 kA	
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt release: Uc (V)	-	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	152~317 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	217 s 226 s 221 s	P
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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	< 30mm^2	P
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm^2) :	2CX50X10 mm^2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: L3:	L1: 484,8 V L2: 485,4 V L3: 484,8 V	P
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	L1: 67,0 kA L2: 65,7 kA L3: 65,8 kA	P
	power factor/time constant :	0,2	
	- Factor "n"	2.23	
	- peak test current (Amax) :	149,3 kA	
	Test sequence "O"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 99,3 kA L2: 100,7 kA L3: 100,4 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 68,1 MA^2s L2: 59,8 MA^2s L3: 48,1 MA^2s	P
	Pause, t: (min)	2	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 127,7 kA L2: 134,2 kA L3: 80,0 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 77,3 MA^2s L2: 91,8 MA^2s L3: 40,0 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 0,78 mA / 506 V	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:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	124 s 120 s 121 s	P

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	TS1600H 4P	
	Sample no:	S3-4Rev	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	690 V	
	Rated ultimate short-circuit breaking capacity: (kA)	45 kA	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	152~317 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	218 s 218 s 224 s	P
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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	< 30mm^2	P
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm^2) :	2CX50X10 mm^2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: L3:	L1: 735,6 V L2: 732,7 V L3: 732,8 V	P
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	L1: 45,3 kA L2: 45,0 kA L3: 45,3 kA	P
	power factor/time constant :	0,24	P
	- Factor "n"	2,14	P
	- peak test current (Amax) :	96,8 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 95,5 kA L2: 73,9 kA L3: 79,3 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 52,1 MA^2s L2: 38,1 MA^2s L3: 36,8 MA^2s	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 79,1 kA L2: 75,3 kA L3: 95,3 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 43,3 MA^2s L2: 37,9 MA^2s L3: 57,8 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 1,0 mA / 759 V	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:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	127 s 127 s 127 s	P
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	TS1600H 4P	
	Sample no:	S3-5	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	240 V/√ 3	
	Rated ultimate short-circuit breaking capacity: (kA)	75 kA	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	152~317 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	230 s - - 230 s	P
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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	< 30mm^2	P
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm^2) :	2CX50X10 mm^2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: L3:	L1: 145,8 V	P
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	L1: 77,7 kA	P
	power factor/time constant :	0,20	P
	- Factor "n"	2,15	P
	- peak test current (Amax) :	167,5 kA	P
	Test sequence "O"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 122,9 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 67,9 MA^2s	P
	Pause, t: (min)	4	
	Test sequence "CO"		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	L1: 110,2 kA	P
	- Joule integral I^2dt (A^2s) ..... L1: ..... L2: L3:	L1: 56,4 MA^2s	P
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	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	P
	- no breakdown or flashover	No	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	≤ 0,77 mA / 264 V	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:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	122 s - - 129 s	P
8.3.6	TEST SEQUENCE IV		
	Rated short-time withstand current		
	Except where the combined test sequence applies, this test sequence applies to circuit-breakers of utilization category B and to those circuit-breaker of category A covered by note 3 of table 4, and comprises the following tests:		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	TS1600H 3P	
	Sample no:	S4-1	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	690 V	
	Rated short-time withstand current: (kA/s)	25 kA 1s	
	Rated frequency: (Hz)	60 Hz	
8.3.6.1	Verification of overload releases		
	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:	152~317 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	223 s 229 s 211 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2	Test of rated short-time withstand current.		
	For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative.		
	- test frequency: (Hz)	60 Hz	P
	- duration of the test: (s)	1 s	P
	- test frequency: (Hz)	60 Hz	P
	- power factor / time constant (ms):	0,25	P
	- factor "n"	2,09	P
	- test voltage: (V) .....L1: .....L2: L3:	L1: 724,9 V L2: 724,6 V L3: 724,9 V	P
	- r.m.s. test current: (kA).....L1: .....L2: L3:	L1: 25,5 kA L2: 25,6 kA L3: 25,4 kA	P
	- highest peak current: (kA)	53,5 kA	P
8.3.6.3	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See table S4-1 (3P)	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	≤ 67,0 K	P
	conductor cross-sectional area (mm²) :	500 mm² X 2	P
	test current Ie (A) :	1600 A	P
8.3.6.4	Test of short-circuit breaking capacity at the max. short-time withstand current.		
	Rated short-time withstand current: (kA/s)		
	Test sequence: O – t – CO		
	max. available time setting of the short–time delay short-circuit release. (s)	0,4 s	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	L1: 724,9 V L2: 724,6 V L3: 724,9 V	P
	- r.m.s. test current AC/DC: (A).....L1: .....L2: L3:	L1: 25,5 kA L2: 25,6 kA L3: 25,4 kA	P
	- test frequency: (Hz)	60 Hz	P
	- power factor / time constant (ms):	0,25	P
	- factor "n"	2,09	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 51,1 kA L2: 40,7 kA L3: 44,8 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 266,6 MA^2s L2: 260,4 MA^2s L3: 257,8 MA^2s	P
	Pause, t: (min)	5	P
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	-pause: t (s)		
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 49,8 kA L2: 38,4 kA L3: 46,3 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 7,8 MA^2s L2: 8,3 MA^2s L3: 1,2 MA^2s	P
	Pause, t: (min)		
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	- if the circuit-breaker has a making current release, this requirement does not apply to the CO operation, if the prospective current exceeds the pre-determined value, since it will then operate.		P
8.3.6.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V	P
	- no breakdown or flashover	No	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 Ue, and shall not exceed 2 mA.	≤ 0,03 mA / 759 V	P
8.3.6.6	Verification of overload releases		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 maximum value stated by the manufacturer for twice the value of the current setting, at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	132 s 130 s 129 s	P
8.3.6	TEST SEQUENCE IV		
	Rated short-time withstand current		
	Except where the combined test sequence applies, this test sequence applies to circuit-breakers of utilization category B and to those circuit-breaker of category A covered by note 3 of table 4, and comprises the following tests:		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	TS1600H 4P	
	Sample no:	S4-1	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	690 V/√ 3	
	Rated short-time withstand current: (kA/s)	25 kA 1s	
	Rated frequency: (Hz)	60 Hz	
8.3.6.1	Verification of overload releases		
	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:	152~317 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	222 s 221 s 230 s 227 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2	Test of rated short-time withstand current.		
	For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative.		
	- test frequency: (Hz)	60 Hz	P
	- duration of the test: (s)	1 s	P
	- test frequency: (Hz)	60 Hz	P
	- power factor / time constant (ms):	0,25	P
	- factor "n"	2,09	P
	- test voltage: (V) .....L1: .....L2: L3:	L1: 420,8 V	P
	- r.m.s. test current: (kA) .....L1: .....L2: L3:	L1: 25,5 kA	P
	- highest peak current: (kA)	53,3 kA	P
8.3.6.3	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
8.3.6.4	Test of short-circuit breaking capacity at the max. short-time withstand current.		
	Rated short-time withstand current: (kA/s)		
	Test sequence: O – t – CO		
	max. available time setting of the short–time delay short-circuit release. (s)	0,4 s	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	L1: 420,8 V	P
	- r.m.s. test current AC/DC: (A).....L1: .....L2: L3:	L1: 25,0 kA	P
	- test frequency: (Hz)	60 Hz	P
	- power factor / time constant (ms):	0,25	P
	- factor "n"	2,12	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 52,2 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 255,9 MA^2s	P
	Pause, t: (min)	3	P
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	-pause: t (s)		P
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	L1: 38,7 kA	P
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	L1: 249,8 MA^2s	P
	Pause, t: (min)		
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	- if the circuit-breaker has a making current release, this requirement does not apply to the CO operation, if the prospective current exceeds the pre-determined value, since it will then operate.		P
8.3.6.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V	P
	- no breakdown or flashover	No	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 Ue, and shall not exceed 2 mA.	≤ 0,03 mA / 759 V	P
8.3.6.6	Verification of overload releases		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 maximum value stated by the manufacturer for twice the value of the current setting, at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	92~182 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	123 s 127 s 122 s 124 s	P
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		P
F4 and F5	Verification of electromagnetic compatibility (EMC)		P
	See report:	**R410-1375 (A-Type)**	P
F6	Suitability for multiple frequencies		N/A
	The tests shall be performed at each rated frequency or, when a range of rated frequencies is declared, at the lowest and the highest rated frequencies.		N/A
F.6.2	Tests shall be performed on any pair of phase-poles chosen at random at any convenient voltage. Under-voltage releases, if any, shall either be energized or disabled. All other auxiliaries shall be disconnected during the test.		N/A
	The short-time and instantaneous trip current settings shall each, if relevant, be adjusted to 2,5 times the current setting. If this setting is not available, the next closest higher setting shall be used.	-	N/A
	A current of 0,95 times the conventional non-tripping current (see Table 6) is applied for a time equal to 10 times the tripping time which corresponds to 2,0 times the current setting.	-	N/A
	Immediately following the test of a), a current of 1,05 times the conventional tripping current (see Table 6) is applied.	-	N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A further test starting from the cold state is made at 2,0 times the current setting.	-	N/A
	For each test frequency, the overload tripping characteristics shall comply with the following requirements: – for test a) no tripping shall occur; – for test b) tripping shall occur within the conventional time (see Table 6); – for test c) tripping shall occur within 1,1 times the maximum and 0,9 times the minimum values of the manufacturer's stated time-current characteristic.	-	N/A
F.7.	Dry heat test		P
F.7.1	The test shall be performed on the circuit-breaker in accordance with 7.2.2 at the maximum rated current for a given frame size, on all phase poles, at an ambient temperature of 40 °C	In= _____ A	N/A
	The duration of the test, once temperature equilibrium is reached, shall be 168 h		N/A
	Tightening torques applied to the terminals shall be in accordance with the manufacturers' instructions. In absence of such instructions, table 4 of IEC 60947-1 shall apply	Torque= _____ Nm	N/A
	As an alternative, the test may be performed as follows:	compliance	P
	- measure and record the highest temperature rise of the air surrounding the electronic components, during the temperature rise verification of test sequence 1	Ambient temperature during temperature rise test: 36.1 °C	P
	- install the electronic controls in the chamber	compliance	P
	- supply the electronic controls which there input energizing value	compliance	P
	- adjust the temperature of the test chamber to a value of 40 K above the temperature rise recorded for the surrounding the electronic components and maintain this temperature for 168 h	Chamber temperature: 76.1 °C	P
	Test carried out.....:	☐ normal ☒ alternative	P
F.7.2	Test results		P
	The circuit-breaker and the electronic controls shall meet the following requirements:	compliance	P
	- no tripping of the circuit-breaker shall occur	compliance	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- no operating of the electronic controls which would cause the circuit-breaker to trip shall occur	compliance	P
F.7.3	Verification of the overload releases		P
	Following the test F.7.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	compliance	P
b)	Opening under overload conditions		N/A
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation		P
	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	No tripping	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	792 s	P
	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	compliance	P
F.8.	Damp heat test		P
F.8.1	Test procedure	compliance	P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)	compliance	P
	Test Db temperature cycle between 25°C and upper temperature	compliance	P
	The upper temperature shall be 55°C ± 2 °C (variant 1) and number of cycles shall be six.	compliance	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The relative humidity is maintained at a high level at the upper temperature	compliance	P
	The test may be performed with only the electronic controls in the test chamber	compliance	P
	Test result.....:	compliance	P
F.8.2	Verification of the overload releases		P
	Following the test F.8.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	compliance	P
b)	Opening under overload conditions		N/A
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation		P
	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	No tripping	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	786 s	P
	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	compliance	P
F.9.	Temperature variation cycles at a specified rate of change		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be submitted to temperature variation cycles in according with figure F.15	Compliance	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The rise and fall of temperature during the rate of variation shall be 1 K/min ± 0,2 K/min.	Compliance	P
	Their temperature, once reached, shall be maintained for at least 2 h.	Compliance	P
	The number of cycles shall be 28.	compliance	P
F.9.2	Test procedure		P
	The test shall be carried out according IEC 60068-2-14.	compliance	P
	For the these test, the electronic controls may be mounted inside the circuit-breaker or separately.	compliance	P
	The electronic controls shall be energized to simulate service conditions.	Compliance	P
	Where the electronics controls are mounted inside the circuit-breaker, the main circuit shall not be energized.	compliance	P
F.9.3	Test results		P
	The electronic controls shall meet the following requirement.	compliance	P
	No operation of the electronic controls which would cause the circuit-breaker to trip during the 28 cycles shall occur.	Compliance	P
F.9.4	Verification of overload releases	compliance	P
	Following the test F.9.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	Compliance	P
b)	Opening under overload conditions	Compliance	P
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation	Compliance	P
	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	No tripping	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	754 s	P
	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	compliance	P

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

Annex F	Additional tests for circuit-breakers with electronic over-current protection		P
F4 and F5	Verification of electromagnetic compatibility (EMC)		P
	See report:	**R410-1376 (S-Type)**	P
F6	Suitability for multiple frequencies		N/A
	The tests shall be performed at each rated frequency or, when a range of rated frequencies is declared, at the lowest and the highest rated frequencies.		N/A
F.6.2	Tests shall be performed on any pair of phase-poles chosen at random at any convenient voltage. Under-voltage releases, if any, shall either be energized or disabled. All other auxiliaries shall be disconnected during the test.		N/A
	The short-time and instantaneous trip current settings shall each, if relevant, be adjusted to 2,5 times the current setting. If this setting is not available, the next closest higher setting shall be used.	-	N/A
	A current of 0,95 times the conventional non-tripping current (see Table 6) is applied for a time equal to 10 times the tripping time which corresponds to 2,0 times the current setting.	-	N/A
	Immediately following the test of a), a current of 1,05 times the conventional tripping current (see Table 6) is applied.	-	N/A
	A further test starting from the cold state is made at 2,0 times the current setting.	-	N/A
	For each test frequency, the overload tripping characteristics shall comply with the following requirements: – for test a) no tripping shall occur; – for test b) tripping shall occur within the conventional time (see Table 6); – for test c) tripping shall occur within 1,1 times the maximum and 0,9 times the minimum values of the manufacturer's stated time-current characteristic.	-	N/A
F.7.	Dry heat test		P
F.7.1	The test shall be performed on the circuit-breaker in accordance with 7.2.2 at the maximum rated current for a given frame size, on all phase poles, at an ambient temperature of 40 °C	In= _____ A	N/A
	The duration of the test, once temperature equilibrium is reached, shall be 168 h		N/A
	Tightening torques applied to the terminals shall be in accordance with the manufacturers' instructions. In absence of such instructions, table 4 of IEC 60947-1 shall apply	Torque= _____ Nm	N/A
	As an alternative, the test may be performed as	compliance	P

TRF No. IEC60947_2F

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	follows:		
	- measure and record the highest temperature rise of the air surrounding the electronic components, during the temperature rise verification of test sequence 1	Ambient temperature during temperature rise test: 36.1 °C	P
	- install the electronic controls in the chamber	compliance	P
	- supply the electronic controls which there input energizing value	compliance	P
	- adjust the temperature of the test chamber to a value of 40 K above the temperature rise recorded for the surrounding the electronic components and maintain this temperature for 168 h	Chamber temperature: 76.1 °C	P
	Test carried out.....:	☐ normal ☒ alternative	P
F.7.2	Test results		P
	The circuit-breaker and the electronic controls shall meet the following requirements:	compliance	P
	- no tripping of the circuit-breaker shall occur	compliance	P
	- no operating of the electronic controls which would cause the circuit-breaker to trip shall occur	compliance	P
F.7.3	Verification of the overload releases		P
	Following the test F.7.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	compliance	P
b)	Opening under overload conditions		N/A
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation		P
	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	No tripping	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	768 s	P
	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	compliance	P
F.8.	Damp heat test		P
F.8.1	Test procedure	compliance	P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)	compliance	P
	Test Db temperature cycle between 25°C and upper temperature	compliance	P
	The upper temperature shall be 55°C ± 2 °C (variant 1) and number of cycles shall be six.	compliance	P
	The relative humidity is maintained at a high level at the upper temperature	compliance	P
	The test may be performed with only the electronic controls in the test chamber	compliance	P
	Test result.....:	compliance	P
F.8.2	Verification of the overload releases		P
	Following the test F.8.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	compliance	P
b)	Opening under overload conditions		N/A
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	No tripping	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	779 s	P
	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	compliance	P
F.9.	Temperature variation cycles at a specified rate of change		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be submitted to temperature variation cycles in according with figure F.15	Compliance	P
	The rise and fall of temperature during the rate of variation shall be 1 K/min ± 0,2 K/min.	Compliance	P
	Their temperature, once reached, shall be maintained for at least 2 h.	Compliance	P
	The number of cycles shall be 28.	compliance	P
F.9.2	Test procedure		P
	The test shall be carried out according IEC 60068-2-14.	compliance	P
	For the these test, the electronic controls may be mounted inside the circuit-breaker or separately.	compliance	P
	The electronic controls shall be energized to simulate service conditions.	Compliance	P
	Where the electronics controls are mounted inside the circuit-breaker, the main circuit shall not be energized.	compliance	P
F.9.3	Test results		P
	The electronic controls shall meet the following requirement.	compliance	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	No operation of the electronic controls which would cause the circuit-breaker to trip during the 28 cycles shall occur.	Compliance	P
F.9.4	Verification of overload releases	compliance	P
	Following the test F.9.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I test: 1680 A(1, 0 In x 1,05) I test: 2080 A(1, 0 In x 1,30) Ambient temperature: 20 °C	P
7.2.1.2.4	Opening by over-current releases	Compliance	P
b)	Opening under overload conditions	Compliance	P
1)	Instantaneous or definite time-delay operation	-	N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release	-	N/A
2)	Inverse timer-delay operation	Compliance	P
	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	No tripping	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	782 s	P
	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	compliance	P

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

Annex H	Individual pole short-circuit test sequence		
	Circuit-breaker for use in IT systems		
H.2	Test of individual pole short-circuit breaking capacity		
	A short-circuit test is made on the individual poles of a multipole circuit-breaker at a value of prospective current (I_{IT}) equal to 1,2 times the maximum setting of the short-time delay release tripping current or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release, or, where relevant 1,2 times the maximum setting of the definite time delay release tripping current, but not less than 500 A nor exceeding 50kA.		
	Type designation or serial number	TS1600H 3P	
	Sample no:	H-1	
	Rated current: In (A)	1600 A	
	Rated operational voltage: Ue (V)	690 V	
	Rated ultimate short-circuit breaking capacity: (kA)	45 kA	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
	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.	Compliance	P
	closing mechanism energized with 85% at the rated Uc: (V)	-	N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.	Compliance	P
	Test made in free air:	Compliance	P
	Distances of the metallic screen's: (all sides)	Side : 73.5 mm, Front : 0 mm Top bottom : no screen	P
	The characteristics of the metallic screen:		
	- woven wire mesh	-	N/A
	- perforated metal	Compliance	P
	- expanded metal	-	N/A
	- ratio hole area/total area: 0,45-0,65	0,5	P
	- size of hole: <30mm^2	<30mm^2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- finish: bare or conductive plating	Compliance	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	Compliance	P
	Circuit is earthed at: (load-star- or supply-star point)	Load-star point	P
	Conductor cross-sectional area (mm²):	2CX50X10 mm²	P
	If terminals unmarked: line connected at: (underside/upside)	-	N/A
	Tightening torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO	Compliance	P
	Test circuit according figure: 9	Compliance	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	L1: 735,3 V	P
	Short-circuit test current (I_{IT}): equal to 1,2 times the max. setting of the short-time delay release tripping current,	19,2 kA	P
	or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release,	Compliance	P
	or, where relevant 1,2 times the max. setting of the definite time delay release tripping current, but not exceeding 50kA.	-	N.A.
	- r.m.s. test current AC/DC: (A)	19,2 kA	P
	power factor/time constant:	0,30	P
	- Factor "n"	2,01	P
	- peak test current (Amax) :	38,6 kA	P
	Test sequence "O" L1		
	- max. let-through current: (kApeak) L1:	37,7 kA	P
	- Joule integral I²dt (A²s) L1:	154,7 MA²s	P
	Pause, t: (min)	3	P
	Test sequence "CO" L1		
	- max. let-through current: (kApeak) L1:	32,7 kA	P
	- Joule integral I²dt (A²s) L1:	150,9 MA²s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O" L2		
	- max. let-through current: (kApeak) L2:	37,4 kA	P
	- Joule integral I^2dt (A^2s) L2:	154,3 MA^2s	P
	Pause, t: (min)	4	P
	Test sequence "CO" L2		
	- max. let-through current: (kApeak) L2:	31,1 kA	P
	- Joule integral I^2dt (A^2s) L2:	150,6 MA^2s	P
	Test sequence "O" L3		
	- max. let-through current: (kApeak) L3:	37,6 kA	P
	- Joule integral I^2dt (A^2s) L3:	154,2 MA^2s	P
	Pause, t: (min)	5	P
	Test sequence "CO" L3		
	- max. let-through current: (kApeak) L3:	33,9 kA	P
	- Joule integral I^2dt (A^2s) L3:	150,8 MA^2s	P
	For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by √3. This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles.	-	N.A.
	Test sequence "O" N		
	- max. let-through current: (kApeak) ..... N:	-	N.A.
	- Joule integral I^2dt (A^2s) ..... N:	-	N.A.
	Pause, t: (min)	-	N.A.
	Test sequence "CO" N		
	- max. let-through current: (kApeak) ..... N:	-	N.A.
	- Joule integral I^2dt (A^2s) ..... N:	-	N.A.
	Melting of the fusible element	Compliance	P
	Holes in the PE-sheet for test sequence "O"	-	N/A
	Cracks observed	Compliance	P
H.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V	P
	- no breakdown or flashover	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
H.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:	92~182 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	133 s 129 s 129 s	P
H.5	Marking		
	Circuit-breaker for which all values of rated voltage have not been tested according to this annex or are not covered by such testing, shall be identified by the symbol (DF) which shall be market on the circuit-breaker immediately following these values of rated voltage	Compliance	P
Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers: see report no. EMC-PW-6538		P
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

IEC 60947-2

	TABLE: Heating Test		S1-1 (3P)
	Test voltage (V):		—
	Ambient (°C):	24,1 °C	—

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	63,2	80
LINE L2	67,2	80
LINE L3	69,8	80
LOAD L1	63,5	80
LOAD L2	68,1	80
LOAD L3	73,3	80
Manual operating means: non-metallic	19,7	35
Parts intended to be touched but not hand-held: non-metallic	19,3	50
Parts which need not be touched during no rmal operation	40,9	60
OCR (Over current relay)	32,9	N/A

8.3.4.4	TABLE: Heating Test		S2-1R (3P)
	Test voltage (V):		
	Ambient (°C):	27,2 °C	

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	63,9	80
LINE L2	74,8	80
LINE L3	63,9	80
LOAD L1	67,6	80
LOAD L2	75,3	80
LOAD L3	66,1	80

IEC 60947-2

8.3.4.4	**TABLE: Heating Test**		S2-3 (3P)
	Test voltage (V):		
	Ambient (°C):	27,9 °C	

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	67,0	80
LINE L2	72,5	80
LINE L3	66,9	80
LOAD L1	69,7	80
LOAD L2	78,4	80
LOAD L3	74,9	80

8.3.4.4	**TABLE: Heating Test**		S2-4R (3P)
	Test voltage (V):		
	Ambient (°C):	25,9 °C	

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	63,7	80
LINE L2	70,7	80
LINE L3	62,9	80
LOAD L1	67,0	80
LOAD L2	78,9	80
LOAD L3	69,0	80

	TABLE: Heating Test		S4-1 (3P)
	Test voltage (V):		—
	Ambient (°C):	23,2 °C	—

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	60,0	80
LINE L2	66,8	80
LINE L3	61,4	80
LOAD L1	58,1	80
LOAD L2	67,0	80
LOAD L3	63,3	80

TRF No. IEC60947_2F

IEC 60947-2

	TABLE: clearance and creepage distance measurements					3P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
P-P		690	8	40,3	16	49
L-A		690	8	32,9	16	32,9
C-O		690	8	31,3	16	65,79

supplementary information:

P-P : Pole to Pole, L-A : Live part to accessible part, C-O : across open contacts.

IEC 60947-2

	TABLE: Heating Test		S1-1 (4P)
	Test voltage (V):		—
	Ambient (°C):	25,5 °C	—

Thermocouple Locations	max. temperature measured, (°C)	max. temperature limit, (°C)
LINE L1	67,9	80
LINE L2	66,2	80
LINE L3	64,6	80
LOAD L1	68,0	80
LOAD L2	69,1	80
LOAD L3	65,4	80
Manual operating means: non-metallic	18,0	35
Parts intended to be touched but not hand-held: non-metallic	17,1	50
Parts which need not be touched during no rmal operation	36,7	60
OCR (Over current relay)	36,1	N/A

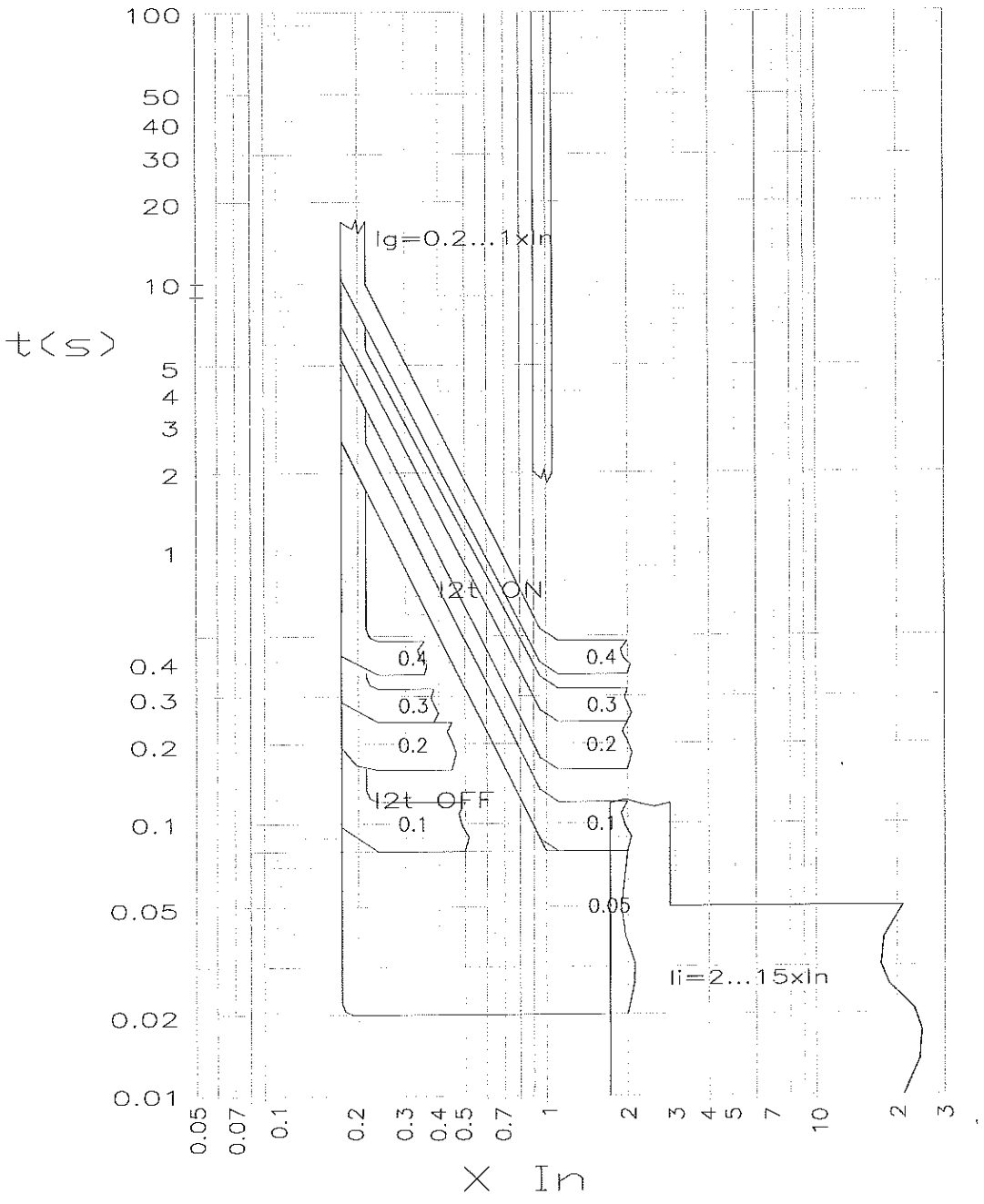
	TABLE: clearance and creepage distance measurements						4P
clearance cl and creepage distance dcr at/of:		Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
P-P			690	8	40,3	16	49
L-A			690	8	32,9	16	32,9
C-O			690	8	31,3	16	65,79

supplementary information:

P-P : Pole to Pole, L-A : Live part to accessible part, C-O : across open contacts.

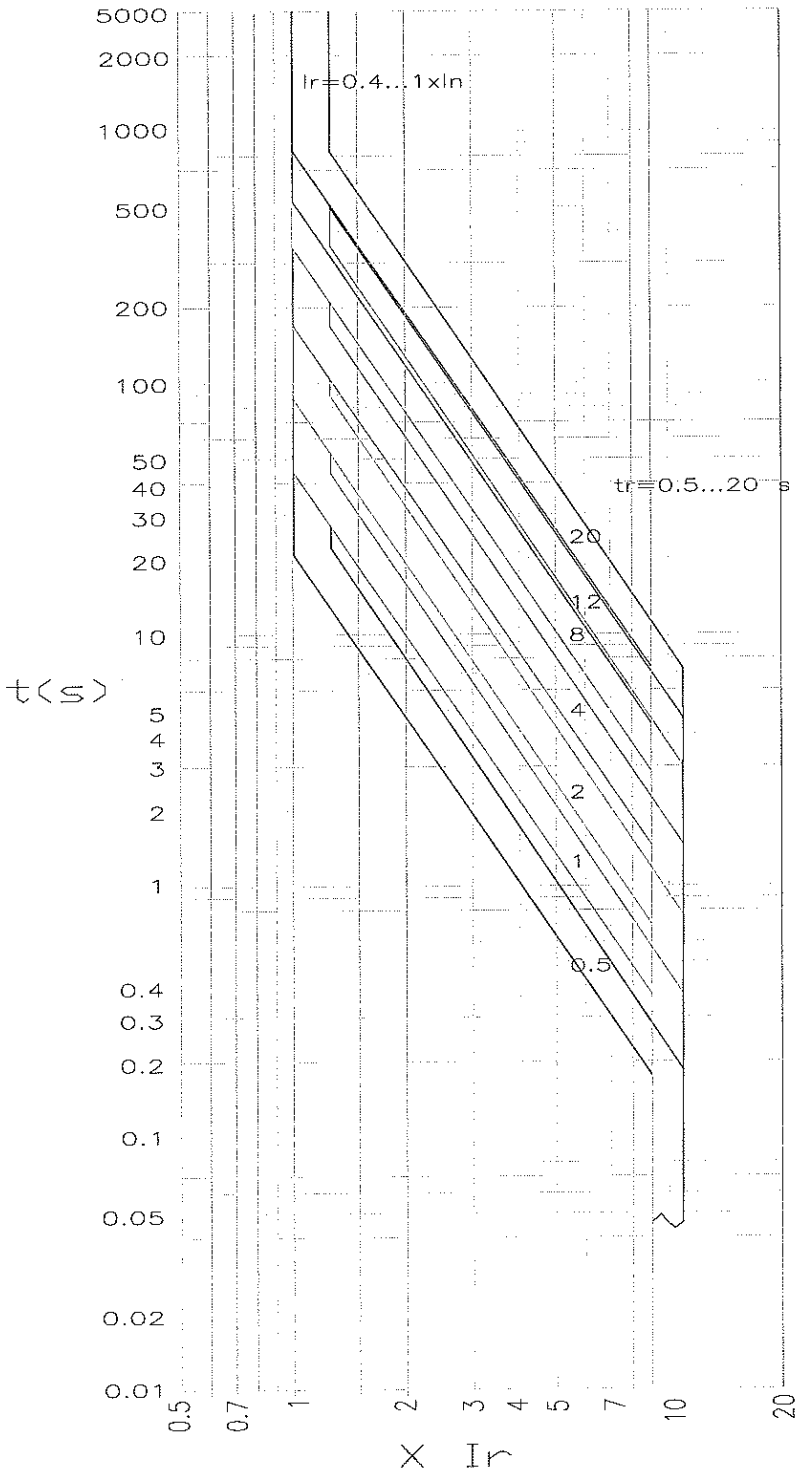
Time current characteristics

1. Instantaneous/Ground fault

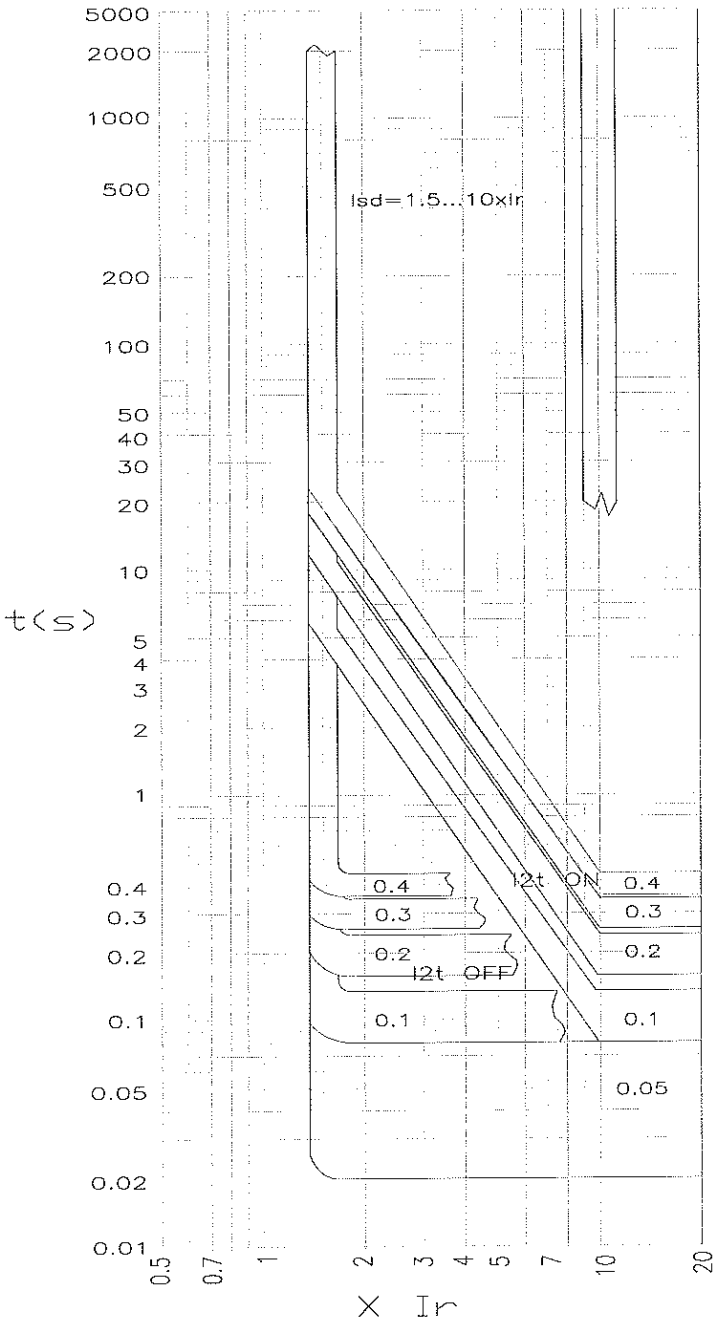


IEC 60947-2

2. Long time delay

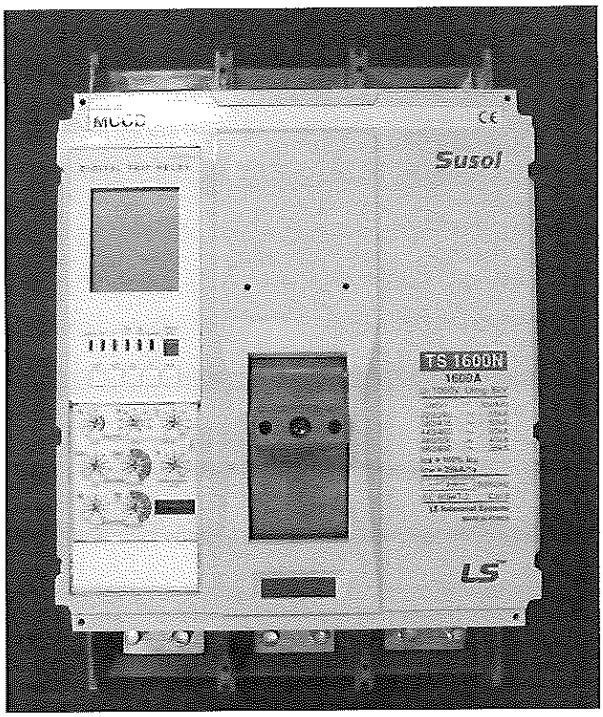


3. Short time delay

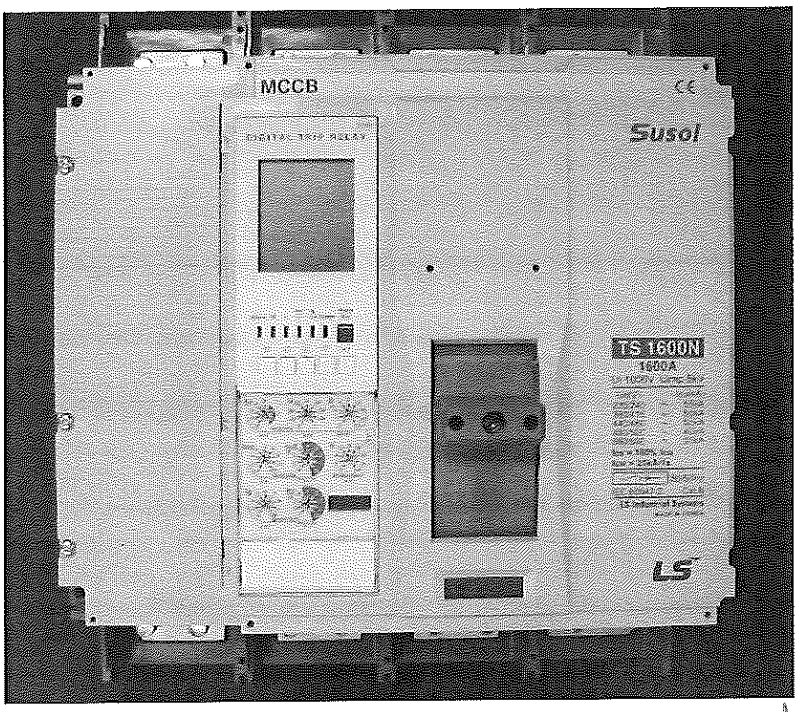


Photographs

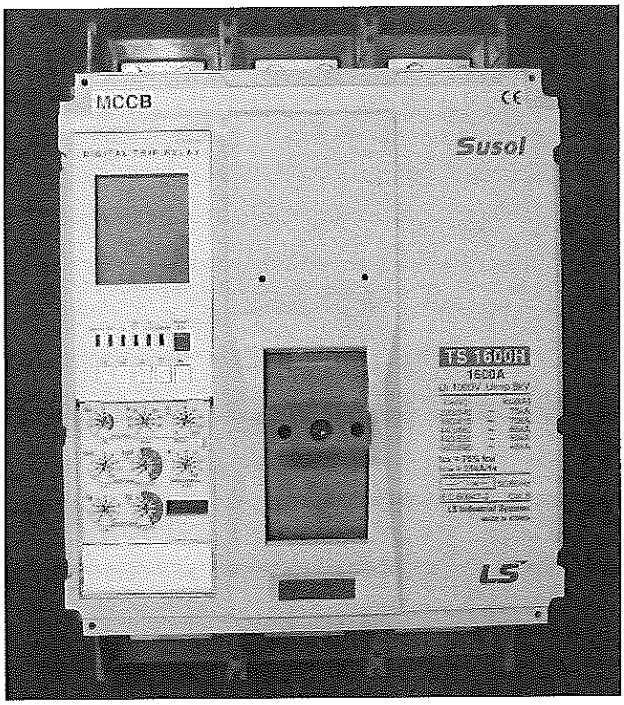
TS1600N 3P



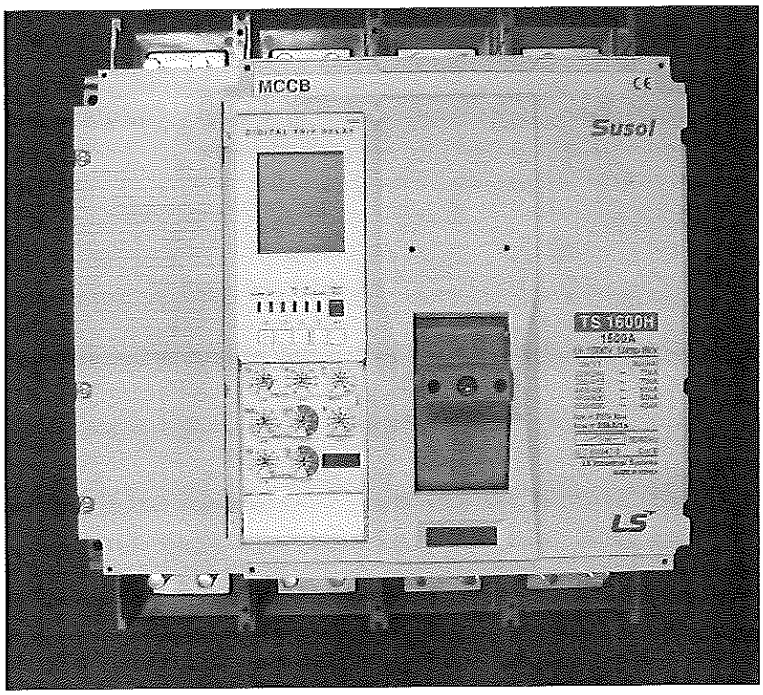
TS1600N 4P



TS1600H 3P



TS1600H 4P



СПИСЪК

на типовите изпитвания, проведени от независима изпитвателна лаборатория,
за предлаганите триполюсни автоматични прекъсвачи, както следва:

Марка: LS Industrial Systems Co., Ltd
Продукт: триполюсен автоматичен прекъсвач
Серия: TS

5.2 Маркировка
7.1 Конструкция
8.3.3 Основни характеристики
8.3.3.1 Изключващи граници и характеристики
8.3.3.2 Диелектрични свойства
8.3.3.3 Механични характеристики
8.3.3.4 Характеристики при претоварване
8.3.3.5 Проверка на диелектрична издръжливост
8.3.3.6 Проверка при повишаване на температурата
8.3.3.7 Проверка на сработване при претоварване
8.3.4 Характеристики при късо съединение
8.3.4.1 Работна изключвателна възможност при късо съединение
8.3.4.2 Работни характеристики
8.3.4.3 Проверка на диелектрична издръжливост
8.3.4.4 Проверка при повишаване на температурата
8.3.4.5 Проверка на сработване при претоварване
8.3.5 Характеристики при късо съединение
8.3.5.1 Издържан импулсен ток
8.3.5.2 Изключвателна възможност при късо съединение
8.3.5.3 Проверка на диелектричните свойства
8.3.5.4 Проверка сработване при претоварване
8.3.6 Условен ток на късо съединение
8.3.6.1 Проверка сработване при претоварване
8.3.6.2 Издържан ток на късо съединение
8.3.6.3 Проверка при повишаване на температурата
8.3.6.4 ПРоверка на изключвателната възможност при максимален ток на късо съединение
8.3.6.5 Проверка на диелектричните свойства
8.3.6.6 Проверка на сработване при претоварване

ВЯРНО С ОРИГИНАЛА

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** to **30-11-2020** Replaces annex dated: **13-09-2017**

Location(s) where activities are performed under accreditation

Head Office

Meander 1051
6825 MJ
Arnhem
The Netherlands

No.	Material or product	Type of activity	Internal reference number
		Electrical Safety Tests	
1.	Cables and cords **(CABL)**	Type test of cables and cords according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	HD 21 HD 22 HD 603 HD 604 HD 605 EN 13501, EN 50143; EN 50214; EN 50267; EN 50525; EN 50288; EN 50399; EN 50618 NEN/EN 50200 NEN/EN/IEC 60228 NEN-EN 50525 NEN/EN 50266 NEN/EN 50362 NEN/EN /IEC 61034

This annex has been approved by the Board of the Dutch Accreditation Council, on its behalf,

J.A.W.M. de Haas
Director of Operations

Annex to declaration of accreditation (scope of accreditation)
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No.	Material or product	Type of activity	Internal reference number
1.	Cables and cords **(CABL)**	Type test of cables and cords according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC 60092; IEC 60227[3]; IEC 60245[3]; IEC 60331; IEC 60332; IEC 60502-1; IEC 60502-2; IEC 60754; IEC 60800; IEC 60840; IEC 62067 DEKRA K 42; DEKRA K 102 DEKRA K 145; DEKRA K 146 DEKRA K 151; DEKRA K 152 DEKRA K 156; DEKRA K 157 DEKRA K 158; DEKRA K160 DEKRA K 161; DEKRA K 162 DEKRA K 163; DEKRA K 164 DEKRA K 165; DEKRA K 167 DEKRA K 168; DEKRA K 169 DEKRA K 170; DEKRA K 171 DEKRA K 175; DEKRA K 176 DEKRA K 177; DEKRA K 178 DEKRA K 179 BS 6004; BS 6007; BS 4553; BS 5467; BS 6231; BS 6346; BS 6387; BS 6500; BS 6622; BS 6724; BS 6883; BS 7211; BS 7629; BS 7835; BS 7846; BS 7889; BS 8491; BS EN 50288-7 BS EN 50525 DIN VDE0815; DIN VDE0250
2.		Test methods for non-metallic materials	IEC 60811-201; IEC 60811-202 IEC 60811-203; IEC 60811-401 IEC 60811-402; IEC 60811-403 IEC 60811-404; IEC 60811-405 IEC 60811-406; IEC 60811-408 IEC 60811-409; IEC 60811-411 IEC 60811-412; IEC 60811-501 IEC 60811-502; IEC 60811-503 IEC 60811-504; IEC 60811-505 IEC 60811-506; IEC 60811-507 IEC 60811-508; IEC 60811-509 IEC 60811-510; IEC 60811-511 IEC 60811-605; IEC 60811-606 IEC 60811-607

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
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This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
3.		Electrical test methods for low voltage energy cables	NEN-EN 50395
4.		Non electrical test methods for low voltage energy cables	NEN-EN 50396
5.	Conduits	Type test of conduits according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	NEN/EN/IEC 61386 DEKRA K24 EN 50086
6.	Installation systems Cable trays Cable ladders	Type test of cable trays and cable ladders, according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	KEMA 55 NEN/EN 50085 NEN/IEC/EN 61537 BS EN 61537
7.	Boxes and enclosures for electrical installations	Type test of boxes and enclosures for electrical installations, according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	NEN/EN/IEC 60670

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
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of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
8.	Switches for appliances and automatic controls for electrical household appliances **(CONT)**	Type test of switches according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests.	IEC/EN 60730[3], 61095[3] IEC/EN 60691, 60934, 61058[3], 60529, IEC 60265, 62271-1, 62271-100, 62271-101, 62271-102, 62271-105, 62271-110, 62271-200, 62271-201, 62271-202, 62271-203, EN 50152-1 IEEE Std C37.09, C37.081, 37.60, C37.013, C37.34, ANSI C37.41, C37.73, C37.20.2, C37.122 ANSI/IEEE C37.21 ANSI C37.54, C37.55, C37.20.2, C37.72
9.	Household and similar equipment **(HOUS)**	Type test of household equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60335[3] IEC/EN 61770 IEC/EN 62233 EN 50366 IEC/EN 60204 IEC/EN 60730-1/ 2-8 / 2-9 IEC/EN 61558-1/ 2-3 / 2-6 / 2-5 / 2-6 / 2-16 IEC/EN 62061 EN/ISO 13849-1
10.		Low power measurements	IEC/EN 62301

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
11.	Installation accessories and connection devices **(INST)**	Type test of installation accessories and connection devices according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60309[3], 60320[3], 60669[3], 60670[3], 60799[3], 60884[3], 60998[3], 61058[3], 61242[3], 61534[3], 61984[3], 62208[3]; IEC/EN 60335-2-76, 60974, 61316, 61386, 62094 EN 50075, 50066, 50146, 50250, 50393 NEN 1251, IEC 60884[3], 61238, 62080 BS 1363-1, BS 1363-2, BS 1363-3, BS 1363-4 SS 145 BS 546, BS 4573, BS 5733 NEN 1020 NF C61-314 DIN VDE 0620-1, DIN VDE 0620-2-1 CEI 23-50 NBN C 61-112-1 NEK IEC 60884-1, NEK 502 ÖVE/ÖNORM E 8684-1 ÖVE/ÖNORM E 8620-2(-3,-4, -5) SFS 5610 SS 428 08 34 DS 60884-2-D1 SEV 1011 UNE 20315-1-1; UNE 20315-1-2 IEC/EN 61535 EN 50428 required with 60669
12.	Luminaires **(LITE)**	Type test of luminaires according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60155[3], 60238[3], 60400[3], 60570[3], 60598[3], 60838[3], 60921[3], 60968[3], 60969[3], 61347[3], 62471[3] IEC/EN 60929, 61184, 62031, 62035, 60923, 60925, 60927, 61047, 62384, 62560, 61195, 62493

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
13.	Measurement, control and laboratory equipment **(MEAS)**	Type test of measurement-, control- and laboratory equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 61010[3] IEC/EN 60044 IEC/EN 61243 IEEE Std C57.13
14.	Electrical equipment for medical use **(MED)**	Type test of electrical equipment for medical use according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60601[3] IEC/EN/ISO 80601 HD 395
15.	Miscellaneous equipment **(MISC)**	Type test of miscellaneous equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60825[3]

ВЯРНО С ОРИГИНАЛА

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
16.	IT and office equipment **(OFF)**	Type test of IT and office equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60950[3] IEC/EN 62040[3] IEC/EN 60825 IEC 62368 EN 41003
17.	Low voltage, high power switching equipment **(POW)**	Type test of low voltage, high power switching equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60439[3], 61439, IEC/EN 60947[3] IEC/EN 60282, 62208 EN 50178, IEC 60470, 60549, 60644, EN 60282-1 IEEE Std C37.41, C37.60 ANSI C37.44 IEC 61921
18.	Installation protective equipment **(PROT)**	Type test of installation protective equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60127[3], 60269[3], 60529[3], 60898[3], 61008[3], 61009[3], 61643[3], 60755, 62019 IEC 60099, 60137, 60168, 60383, 60507, 60660, 61109, 60815 HD 630, 639, 60269 IEEE Std 62.11 ANSI C29 CAN/CSA C411.1
19.	Safety transformers and similar equipment **(SAFE)**	Type test of safety transformers and simillar equipment according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60044[3], IEC/EN 61558[3] IEC/EN 62040, IEC/EN 60076, IEC/EN 60353 EN 50091, EN 50464-1 HD 538.1 IEEE Std. C57.12.90, C57.21 NEMA 107 CISPR 16

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
20.	Electric tools **(TOOL)**	Type test of electric tools according to the tests in the standard, among others: - electrical safety tests - mechanical tests - environmental tests	IEC/EN 60745[3] IEC/EN 61029[3] IEC/EN 60335[3] (Gardening) IEC/EN 62233, IEC/EN 60204 EN 50144 EN 50260-2-7 EN 792 EN/ISO 1114 IEC/EN 62061 EN/ISO 13849-1
21.	Electronics, entertainment equipment **(TRON)**	Type test according to the tests as mentioned in the standard, except the following tests which are subcontracted: 60065, cl. 20.1.3 Pre-conditioning of printed circuit boards 60065, cl. 12.1.2 Vibration-sine	IEC / EN 60065[3] IEC / EN 60491 IEC 62368
22.	Products within the scope of the EMC Directive 2004/108/EC **(EMC)**	Type test according to the tests as mentioned in the standard	CISPR11; CISPR12; CISPR13; CISPR14-[3]; CISPR15; CISPR16-*-[3]; CISPR20; CISPR22; CISPR24; CISPR25; IEC60601-*-[3]; IEC60945; IEC60947-*-[3]; IEC61000-*-[3]; IEC61008-1; IEC61009-1; IEC61131-2; IEC61204-3; IEC61326-[3]; IEC61543; IEC61547; IEC61800-[3]; IEC62040-2; IEC62052-[3]; IEC62053-[3]; IEC62054-[3];
	Electromagnetic Compatibility (EMC): Automotive tests		
23.	Vehicles, Motorcycles, Motorboats and Spark-ignited engine-driven devices	Radiated emission 30 to 1000 MHz OATS	European Directives 2004/104/EC, 97/24/EC European regulation ECE-R10.04 EN 55012, CISPR 12

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
24.	Vehicles, Motorcycles, Motorboats and Spark-ignited engine-driven devices	Radiated immunity up to 30 V/m 20 to 2000 MHz OATS	European Directive 2004/104, 97/24/EC European regulation ECE-R10.04
25.	Electrical/ electronic sub-assembly	Pulse emission for ESA's along supply lines 12V and 24V	European Directive 2004/104/EC European regulation ECE-R10.04 ISO 7637-1 ISO 7637-2
26.		Conducted emission for ESA's (V–method, LISN) 150 kHz to 108 MHz	European Directive 2004/104/EC European regulation ECE-R10.04 CISPR25
27.		Radiated emission for ESA's Anechoic Chamber method 30 to 1000 MHz	European Directive 2004/104/EC European regulation ECE-R10.04 CISPR25
28.		Radiated immunity for ESA's Anechoic Chamber method and GTEM method 20 to 2000 MHz up to 30V/m	European Directive 2004/104/EC European regulation ECE-R10.04 ISO 11452-1, ISO 11452-2, ISO 11452-3

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
29.	Electrical/ electronic sub-assembly	Bulk Current Injection for ESA's 20 to 400 MHz up to 100 mA	European Directive 2004/104/EC European regulation ECE-R10.04 ISO 11452-1, ISO 11452-4
30.		Pulse immunity for ESA's along supply lines 12V and 24V	European Directive 2004/104/EC European regulation ECE-R10.04 ISO 7637-1 ISO 7637-2
	Electromagnetic Compatibility (EMC): EMF tests		
31.	Electrical and electronic equipment	EMF measurements: 0-400 kHz	EN 62233 EN 62493
	Electromagnetic Compatibility (EMC): Emission tests		
32.	Electrical and electronic equipment	Conducted emission 9 kHz to 30 MHz	EN 55011, CISPR 11 EN 55013, CISPR 13 EN 55014-1, CISPR 14-1 EN 55015, CISPR 15 EN 55022, CISPR 22
33.		Radiated Emission Electric (EM) Field 30 MHz to 18 GHz	EN 55011, CISPR 11 EN 55014-1, CISPR 14-1 EN 55022, CISPR 22
34.		Disturbance power 30 MHz to 300 MHz	EN 55014-1, CISPR 14-1
35.		Click disturbances 150 kHz to 30 MHz	EN 55011, CISPR 11 EN 55014-1, CISPR 14-1

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
36.		Radiated Emission Magnetic Field 9 kHz to 30 MHz	EN 55011, CISPR 11 EN 55015, CISPR 15
37.		Harmonic current emissions 0 Hz to 2 kHz up to 16 A per phase	IEC / EN 61000-3-2
38.		Pulse magnetic field immunity up to 1000 A/m	IEC/EN 61000-4-9
39.		Limitation of voltage fluctuations and flicker up to 16 A per phase	IEC / EN 61000-3-3
	Electromagnetic Compatibility (EMC): FCC tests (USA legislation)		
40.	Radio-Frequency Devices Industrial, Scientific and Medical Equipment	Emission 9 kHz to 3 GHz	47 CFR FCC Part 15, Part 18 ANSI C63.4:2014 FCC MP-5:1986
	Electromagnetic Compatibility (EMC): Immunity test		
41.	Electric and electronic equipment	Electrostatic discharge immunity up to 30 kV	IEC/EN 61000-4-2
42.		Radiated EM field immunity up to 2,5 GHz up to 30 V/m	IEC/EN 61000-4-3
43.		EFT Burst immunity up to 4 kV	IEC/EN 61000-4-4
44.		Surge immunity up to 10 kV	IEC/EN 61000-4-5
45.		Immunity to conducted RF disturbances up to 230 MHz, up to 30 Vrms	IEC/EN 61000-4-6

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
46.		Power frequency magnetic field immunity up to 100 A/m	IEC/EN 61000-4-8
47.		Voltage dips and interruptions Single phase equipment up to 16 A	IEC/EN 61000-4-11
48.		Ring wave immunity test	IEC/EN 61000-4-12
	Electromagnetic Compatibility (EMC): MISC		
49.	Railway applications - Electromagnetic compatibility	Electromagnetic compatibility testing according the listed product standards	EN 50121-1 to -5
50.	Road traffic signal systems	Electromagnetic compatibility testing according the listed product standard	EN 50293
	Photometric Tests (all tests are in accordance with the reference method)		
51.	Headlamps low and high beams and front fog lamps	All tests as mentioned in the ECE Regulations stated under Test method[1] Photometry Colorimetry Heat tests Plastic tests	ECE Regulations Nos. 1, 5, 8, 19, 20, 31, 56, 57, 72, 76, 82, 98, 112, 113 and 123; European Directives 76/761, 76/762 and 97/24
52.	Headlamps low and high beams and front fog lamps	All tests as mentioned in de FMVSS, CMVSS and SAE (methods) Photometry Colorimetry	FMVSS108 (49CFR 571.108); CMVSS 108, 108.1, 1201; SAE J578, J581, J582, J583, J591, J852, J1383, J1735, J2595; SAE (Methods) J575, J2139, J1889, J2650, J1306, J1623

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
53.	Signalling lamps	All tests as mentioned in the ECE Regulations stated under Test method Photometry Colorimetry Heat test	ECE Regulations Nos. 6, 7, 23, 38, 50, 77, 87 and 91 and European Directives 76/757, 76/759, 76/758, 77/538, 77/539, 77/540 and 97/24 ECE Regulation 38 (rear fog lamps only)
54.		All tests as mentioned in de FMVSS, CMVSS and SAE(methods) Photometry Colorimetry	FMVSS108 (49CFR 571.108); CMVSS 108, 108.1, 1201; SAE J222, J578, J585, J586, J587, J588, J592, J593, J914, J1319, J1373, J1395, J1398, J1424, J1432, J1957, J2039, J2040, J2042, J2087, J2261, J131, J584;
55.	Devices for the illumination of rear registration plates	All tests as mentioned in the ECE Regulations stated under Test method Luminance Colorimetry	ECE Regulations Nos. 4 and 50 European Directives 76/760 and 97/24
56.		All tests as mentioned in de FMVSS, CMVSS and SAE (methods) Luminance Colorimetry	FMVSS 108 (49 CFR 571.108); CMVSS 108; SAE J578, J587;
57.	Retro-reflective devices	All tests as mentioned in the ECE Regulations stated under Test method[2] Retro-reflection Colorimetry Water resistance test Corrosion Fuel and oil resistance Heat test UV resistance	ECE Regulations Nos. 3, 27, 69, 70, 88 and 104 European Directive 76/757
58.		All tests as mentioned in de FMVSS, CMVSS and SAE (methods) Retro-reflection Colorimetry	FMVSS 108 (49 CFR 571.108), CMVSS 108, 108.1, SAE J578, J594, J774, J1967, J2041

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
59.	Light Sources	All tests as mentioned in the ECE Regulations stated under Test method Geometry Photometry Colorimetry Optical quality Mechanical tests	ECE Regulations Nos. 37, 99 IEC 60809 IEC 60810 IEC 60983 IEC 60061
60.	Special warning lamps (beacons and flash lights)	All tests as mentioned in the ECE Regulations stated under Test method Photometry Colorimetry Water resistance test	ECE Regulation No. 65
61.	Cornering Lamps	All tests as mentioned in the ECE Regulations stated under Test method Photometry Colorimetry	ECE Regulation No.119
62.		All tests as mentioned in de FMVSS, CMVSS and SAE (methods) Photometry Colorimetry	FMVSS108 (49CFR 571.108); CMVSS 108, 108.1, 1201; SAE J578, J852 SAE (Methods) J575, J2139, J1889, J2650, J1306, J1623;
63.	Non-directional Solid State Luminaires and Subcomponents	Electrical and Photometric Measurements of Solid-State Lighting Products (section 10 not required for non-directional or subcomponents): - Efficacy, - Light Output, - Lumen Maintenance, - CCT, CRI, - Color Maintenance	IES LM-79

Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2005
Registration number: **L 022**

of **DEKRA Certification B.V.**

This annex is valid from: **12-04-2018** tot **30-11-2020** Replaces annex dated: **13-09-2017**

No.	Material or product	Type of activity	Internal reference number
64.		Characterization of LED Light Engines and LED Lamps for Electrical and Photometric Properties as a Function of: - Temperature, -Efficacy, - Light Output, - Lumen Maintenance, - CCT , CRI, - Color Maintenance, - Light Source Life	IES LM-82
65.	LED Directional Lamps	Electrical and Photometric Measurements of Solid-State Lighting Products, - Efficacy, - Light Output, -Lumen Maintenance, - Lifetime, - CCT, CRI, - Color Maintenance	IES LM-79 (excluding par. 9.3, 10.0 en 12.5)
66.	LED Omnidirectional and Decorative Lamps	Electrical and Photometric Measurements of Solid-State Lighting Products, - Efficacy, - Light Output, -Lumen Maintenance, - Lifetime, - CCT, CRI, - Color Maintenance	IES LM-79 (excluding par. 9.3, 10.0 en 12.5)
67.	All Lamps (Light Bulbs)	- Efficacy, - Light Output, - Lumen Maintenance, - CCT, CRI, - Color Maintenance	IES LM-79
68.	All Luminaire and Subcomponents	- Efficacy, - Light Output, - Lumen Maintenance, - CCT, CRI, - Color Maintenance	IES LM-79 IES LM-82

[1] Weather-beaten tests of synthetic lenses is subcontracted
[3] See current list of sub set of standards on the IECEE CBTL website

Инструкция за транспорт и съхранение

1. Транспорт

Автоматичните и товарови прекъсвачи трябва да се транспортират опаковани в оригиналната опаковка.

Няма специфични изисквания към начина на транспорт.

2. Съхранение

Автоматичните и товарови прекъсвачи трябва да се съхраняват в сухи, закрити помещения опаковани в оригиналната опаковка.

Температура на съхранение: от -30 до +55 °C.

Няма специфични изисквания към начина на съхранение.

3. Монтиране

Автоматичните и товарови прекъсвачи могат да бъдат монтирани директно върху монтажната плоча на електрическото табло. Въртящият момент при затягане на клемите не трябва да превишава:

- За Susol TD100 и TD160 – 7.65 N.m
- За Susol TS250 – 14.41 N.m
- За Susol TS400 и TS630 – 48.02 N.m
- За Susol TS1000 и TS1250 – 55.27 N.m

При монтажа трябва да се спазват отстоянията приложени по-долу:

Табл.1 – минимално разстояние до разположена отгоре изолационна преграда

	A(mm)	
	415V	240V
TD100N, TD160N	35	30
TD100H, TD160H	35	30
TD100L, TD160L	35	30
TS100N, TS160N, TS250N	35	30
TS100H, TS160H, TS250H	35	30
TS100L, TS160L, TS250L	35	30
TS400N, TS630N	60	50
TS400H, TS630H	60	50
TS400L, TS630L	60	50
TS800N	100	80
TS800H	100	80
TS800L	100	80

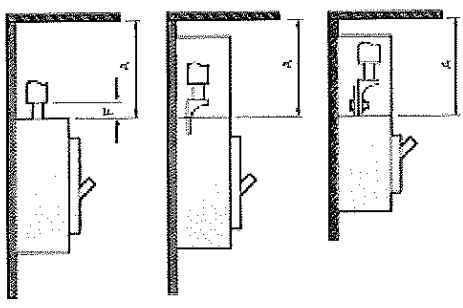


Табл.2 – минимални разстояния между прекъсвачи разположени един под друг

ВЯРНО С ОРИГИНАЛА

	C1(mm)		C(mm)
	415V	240V	
TD100N, TD160N	35	30	The dimension of exposed conduct
TD100H, TD160H	35	30	
TD100L, TD160L	35	30	
TS 100N, TS160N, TS250N	35	30	
TS100H, TS160H, TS250H	35	30	
TS100L, TS160L, TS250L	35	30	
TS400N, TS630N	60	50	
TS400H, TS630H	60	50	
TS400L, TS630L	60	50	
TS800N	100	80	
TS800H	100	80	
TS800L	100	80	

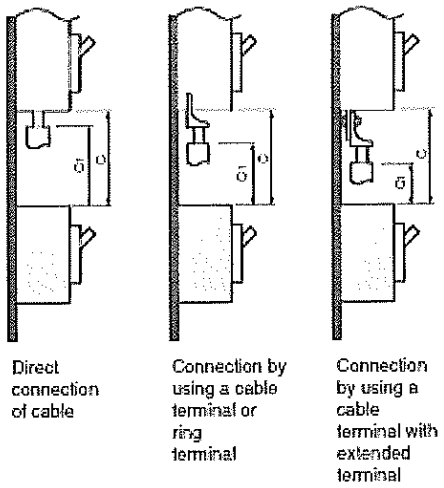


Табл.3 – минимални изолационни отстояния при клемите на прекъсвача

	D1 (mm)	D2 (mm)	D3 (mm)	D4 (mm)
TD100N, TD160N	The dimension of exposed conduct + 20	50	The dimension of exposed conduct + 20	50
TD100H, TD160H		50		50
TD100L, TD160L		50		50
TS100N, TS160N, TS250N		100		100
TS100H, TS160H, TS250H		100		100
TS100L, TS160L, TS250L		100		100
TS400N, TS630N		100		100
TS400H, TS630H		200		200
TS400L, TS630L		200		200
TS800N		100		100
TS800H		200		200
TS800L		200		200

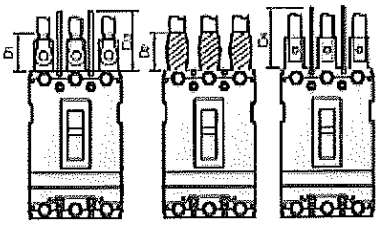


Табл.4 – минимални изолационни разстояния до странично разположена изолационна преграда

	E(mm)	
	415V	240V
TD100N, TD160N	25	15
TD100H, TD160H	25	15
TD100L, TD160L	25	15
TS100N, TS160N, TS250N	25	15
TS100H, TS160H, TS250H	25	15
TS100L, TS160L, TS250L	25	15
TS400N, TS630N	20	15
TS400H, TS630H	20	15
TS400L, TS630L	20	15
TS800N	45	20
TS800H	45	20
TS800L	45	20

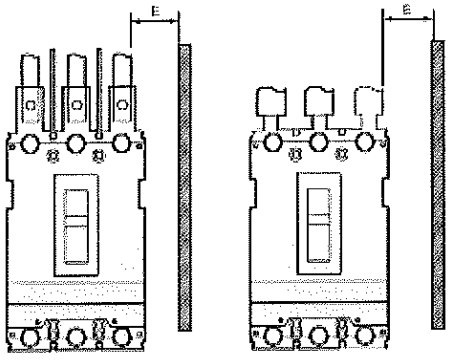
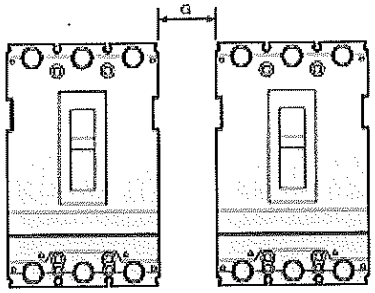


Табл.5 – минимално отстояния на два съседни прекъсвача

	G (mm)
TD100N, TD160N	0
TD100H, TD160H	0
TD100L, TD160L	0
TS100N, TS160N, TS250N	0
TS100H, TS160H, TS250H	0
TS100L, TS160L, TS250L	0
TS400N, TS630N	0
TS400H, TS630H	0
TS400L, TS630L	0
TS800N	0
TS800H	0
TS800L	0

Note) In case of using long or short terminal covers.



4. Обслужване и поддържане

- След като е инсталиран прекъсвача се изпълняват следните дейности за неговото обслужване и поддръжка:

1) Прекъсвачът трябва да се пази в чисто състояние.
2) Периодично се прави проверка на съответствието на номинално работно напрежение.
3) Проверка на текущите настройки на защитите от претоварване и късо съединение.
4) Периодичо се почиства всяко прекомерно натрупване на прах, за да бъде изолацията на прекъсвач в добро състояние.
5)Проверяват се условията за експлоатация на прекъсвача след всяко кратко прекъсване на напрежението.

София

Управител: / Антон И

на основание чл. 2 от ЗЗЛД

Наименование на материала:

Вертикален предпазител-разединител НН 400 А, с триполюсно управление

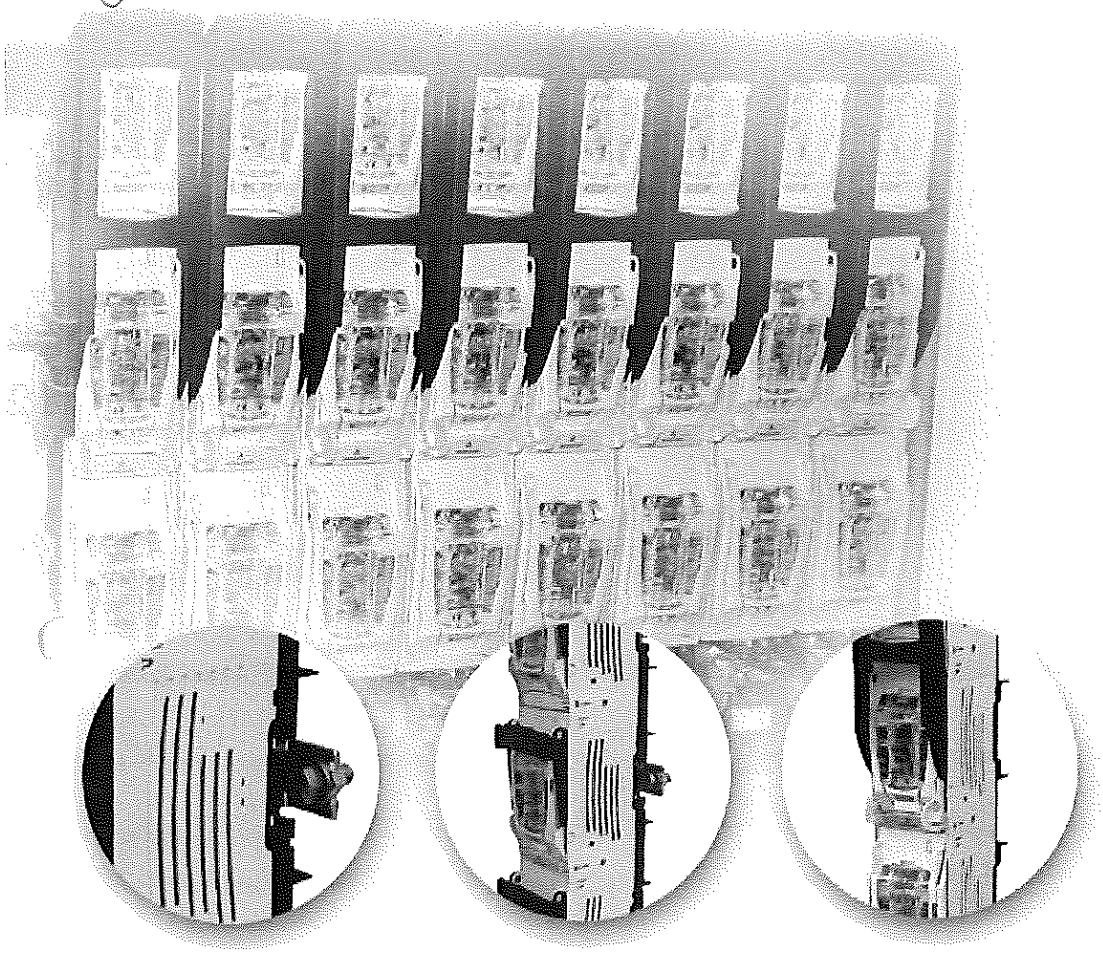
№ по ред	Документ	Приложение № или текст
1.	Точно означение на типа, производителя и страната на производство (произход) и последно издание на каталога на производителя	ARS 2 АПАТОР Полша Приложение 1
2.	Техническо описание и чертежи с нанесени на тях размери	Приложение 1
3.	Протоколи от типови изпитвания на английски или български език, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	Приложение 2
4.	Сертификат/акредитация на независимата изпитвателна лаборатория, провела типовите изпитвания по т. 3 – заверено копие	Приложение 3
5.	ЕО декларация за съответствие	Приложение 4
6.	Декларация за съответствие на предлаганото изпълнение с изискванията на техническата спецификация на този стандарт за материал, вкл. на параграфи „Характеристика на материала" и „Съответствие на предложеното изпълнение с нормативно-техническите документи" по-горе	Приложение 5
7.	Инструкции за транспортиране, складиране, монтиране, поддържане и експлоатация	Приложение 6

на основание чл. 2 от ЗЗЛД

Управител:.....

/Ан...

APATOR

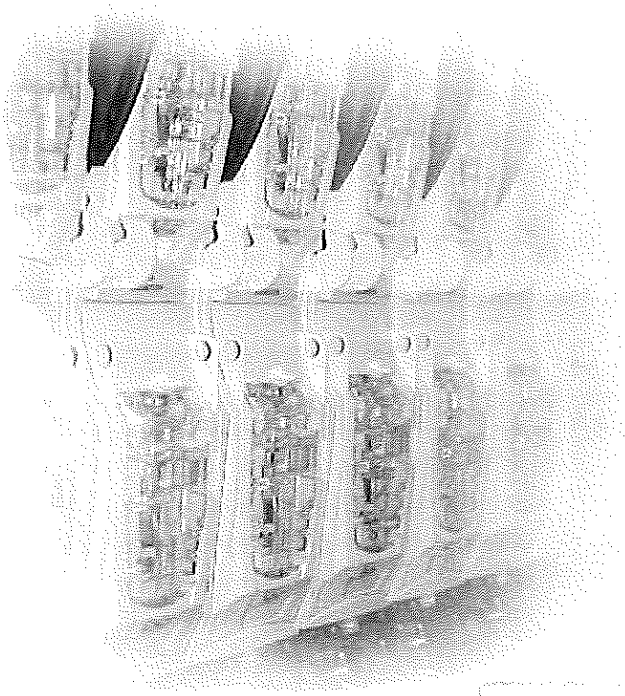


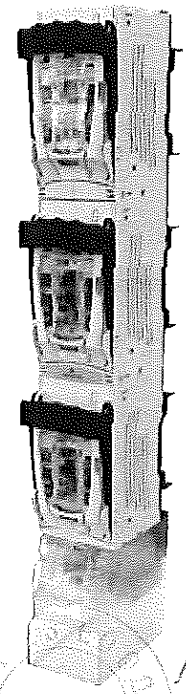
Najbardziej innowacyjna firma

EURO LEADER

RZETELNY PARTNER

Вертикални предпазител-разединители ARS
Основи за предпазители PBS





НОВО!

ВЯРНО С ОРИГИНАЛА

GRUPA APATOR

ПОЛСКА КАПИТАЛОВА ГРУПА

ПРЕДСТАВЯНЕ НА ГРУПА АПАТОР

ГРУПА АПАТОР е лидер в Централно-източна Европа в областта на измервателната и превключвателната апаратура

Производствена област:
ПРЕВКЛЮЧВАТЕЛНА АПАРАТУРА
ЗАЩИТА ОТ ПРЕНАПРЕЖЕНИЕ
ИЗМЕРВАТЕЛНА АПАРАТУРА

НАГРАДИ:

ОБЩА ИНФОРМАЦИЯ:

Основите за предпазители тип PBS и вертикалните предпазител-разединители ARS се използват за разединяване на електрически съоръжения и обезопасяване от влиянието на къси съединения и претоварвания в трифазните вериги за променлив ток. Предназначени са за директен монтаж на хоризонтални или вертикални системи шини като трифазни вертикални апарати, което в сравнение с класическите основи за предпазители позволява голяма икономия на място в разпределителните уредби. Във всички типове апарати има възможност да се монтира захранващия кабел и отгоре. Конструкцията им осигурява голяма видимост, безопасно прекъсване на веригата след изваждане на предпазителната вложка. Предпазител-разединителите ARS имат категория на експлоатация - AC21B, AC22B, AC23B. Допълнително предимство е лекотата на монтиране на заземителните устройства. Предпазител-разединителите ARS позволяват да се изпълняват следните функции:

- обезопасяване;
- разединяване;
- заземяване;
- включване;
- защита от допир.

СТАНДАРТИ И ПРЕДПИСАНИЯ:

IEC 947-3, EN 60947-3, PN-93/E-06150/30

IEC 947-1, EN 60947-1, PN-90/E-06150/10

IEC 60269-2-1, PN-91/E-06160/21

IEC 60269-1, PN-91/E-06160/10

VDE 0660; BBJ CERTIFICATE за знак за безопасност „B"

"CE" декларация за съответствие с Европейска директива 73/23/EED

ОСНОВИ ЗА ПРЕДПАЗИТЕЛИ „PBS"

КОНСТРУКЦИЯ:

Основите за предпазители се предлагат в следните големини: 00 – 160A; 1 – 250A; 2 – 400A; 3 – 630A. Ширината на основите за предпазители PBS 1 – 250A, 2 – 400A и 3 – 400A е 100 mm. Основите за предпазители PBS са предназначени за монтаж на шини на разстояния 185 mm. Апаратите с големина „00" са с широчина 50 mm и се произвеждат в две изпълнения:

- основи PBS 00 – (160A) за монтаж на шини с разстояния между тях 185 mm
- основи PBS 00/100 mm – (160A) за монтаж на шини с разстояния между тях 100 mm.

Основата за предпазители (част от PBS с токови вериги) се произвеждада от самогасящ се полиестер усилен със стъклено влакно. Сребърното галванично покритие на контактите на основите PBS осигурява ниски загуби.

Кабелните клеми в основите PBS осигуряват директно свързване, както на изолирани жила от кабелите, така и на кабелни жила със запресовани кабелни накрайници. Основите с големина от 1 до 3 могат да бъдат оборудвани с капаци за предпазителите, което им осигурява степен на защита IP20. Допълнително предлаганите аксесоари позволяват да се монтират различни големини PBS на обща система от шини и облекчават експлоатацията.

Съществуват също така и специални изпълнения:

- PBS 2/400A и 3/630A с възможност за директно свързване на два кабела с диаметър 240 mm^2 на всяка клема

Всички основи PBS са доставят комплектовани с кабелни клеми (например винтови, мостови или тип V) и капаци за свързващите клеми.

Основа за предпазители PBS 690V~

Таблица 1. Технически характеристики

ОЗНАЧЕНИЕ НА PBS	Големина на основата PN/IEC	Номинален термичен ток I_{th}	Номинално напрежение U_n	Номинално изолационно напрежение U_i	Номинално напрежение на изпитване	Номинална честота	Номинална разсеяна мощност	Ток ограничен, на който издържат предпазителите	Механична износоустойчивост	Тегло	Степен на защита	Големина на вложките на предпазителите PN/IEC
		A	V~	V	kV	Hz	W	kA	бр. цикли	kg	IP	
PBS 00/100mm	00	160	690	1000	3	40-60	12	100	1600	0,75	00	00
PBS 00 SM	00	160	690	1000	3	40-60	12	100	1600	2,00	00	00
PBS 1	1	250	690	1000	3	40-60	32	100	1600	4,00	20*	1
PBS 2	2	400	690	1000	3	40-60	45	100	1000	4,50	20*	2
PBS 3	3	630	690	1000	3	40-60	60	100	1000	5,00	20*	3

**с капак на предпазителите*

УСЛОВИЯ НА РАБОТА

- инсталиране в помещения несъдържащи прах, разяждащи и взривоопасни газове;
- околна температура от -25°C до +55°C - в случай на използване на основите при температура от +41°C до +45°C трябва да се намали стойността на тока I_{th} с 5%, а температурния интервал от +46°C до +55°C стойността на тока I_{th} трябва да се намали с 10%;
- до височина над 2000 метра над морското равнище;
- вън от помещенията – в табла със степен на защита ≥ IP 34.

Основа за предпазители PBS 00/100 mm 160A **690 V ~** разстояния между шините 100 mm
НОВО!

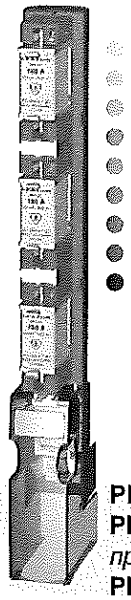
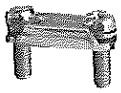
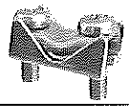


Таблица 2. Означение на PBS 00 съгласно вида на клемите

Означение на апарата	Клема	Снимка на клемата	Сечение на кабелните жила	Момент на затягане
PBS 00/100 mm	S – мостова (2xM5)		4 - 70 mm²	6 Nm
	M- винтова M8		Кабелен накрайник до 185mm²	20 Nm
	V-секторна (2xM5)		1,5 - 95 mm²	6 Nm

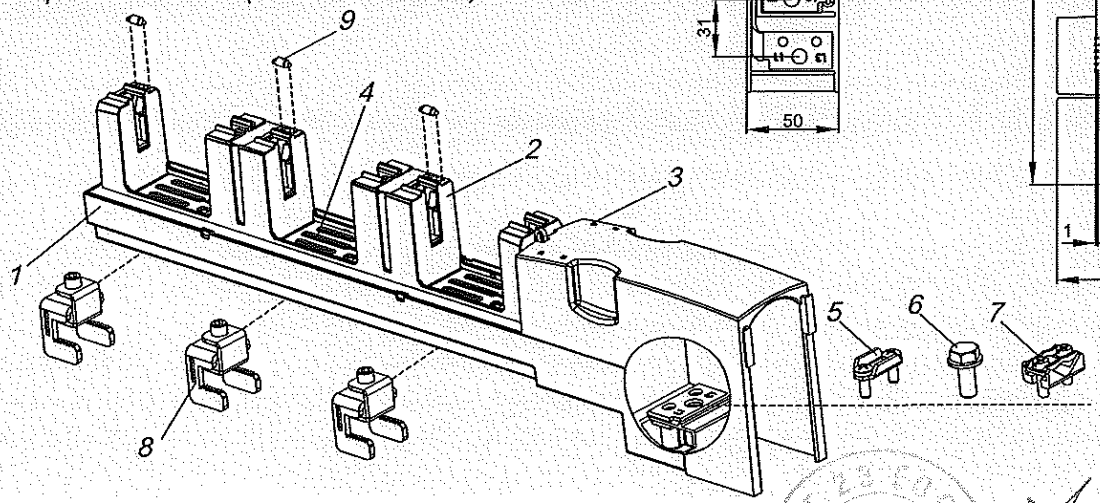
Към клемите тип M могат да се свържат шини с максимална ширина 20 mm.

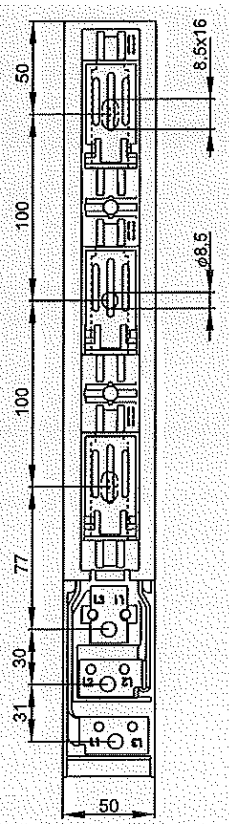
PBS 00/100mm
PBS 00/100mm-W – *означение на основи оборудвани със светлинна сигнализация за изгаряне на предпазителя*
PBS 00/100mm-V

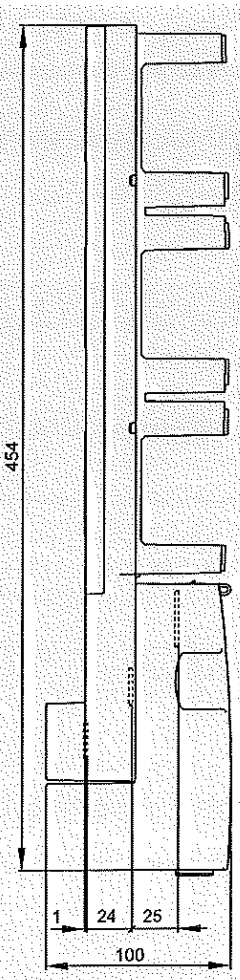
Таблица 3. Основа PBS 00 / 160 A 690 V ~

Изпълнение	Означение	Артикул №
PBS 00-160 A разстояния между шините 100 mm, клеми S – мостови (4-70 mm²) + M-винтови (M8)	PBS 00/100mm	63-811627-011
PBS 00-160 A разстояния между шините 100 mm, клеми S – мостови (4-70 mm²) + M-винтови (M8)+ сигнализация за предпазителните вложки	PBS 00/100mm-W	63-811627-021
PBS 00-160 A разстояния между шините 100 mm, клеми V-секторни (1,5-95 mm²)	PBS 00/100mm-V	63-811627-031

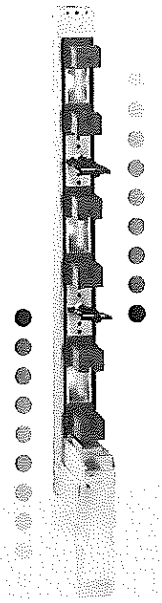
1. Основа
2. Капак на контактите
3. Капак на клемите
4. Защитни плочки
5. Клема мост 00-S
6. Клема винтова 00-M
7. Клема на секторен проводник 00-SV
8. Клема кука
9. Сигнализиращ елемент за стопяването на предпазителите (PBS 00/100 mm-W)





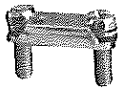
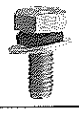
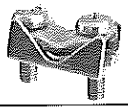


Основа за предпазители PBS 00-SM 160A 690 V~ разстояния между шините 185 mm



PBS 00-SM
PBS 00-V

Таблица 4. Означение на PBS 00 съгласно вида на клемите

Означение на апарата	Клема	Снимка на клемата	Сечение на кабелните жила	Момент на затягане
PBS 00-SM	S – мостова (2xM5)		4 - 70 mm²	6 Nm
	M - винтова M8		Кабелен накрайник до 185 mm²	20 Nm
PBS 00-V	V-секторна (2xM5)		1,5 - 95 mm²	6 Nm

Към изходящите могат да се свържат шини с максимална ширина 25 mm.

Таблица 5. Основа PBS 00 / 160 A 690 V ~

Изпълнение	Означение	Артикул №
PBS 00-160 A с клеми тип S (4-70 mm²) и винтове M8 за кабелни накрайници	PBS 00-SM	63-811411-011
PBS 00-160 A с клеми тип V (1,5-95 mm²)	PBS 00-V	63-811411-021

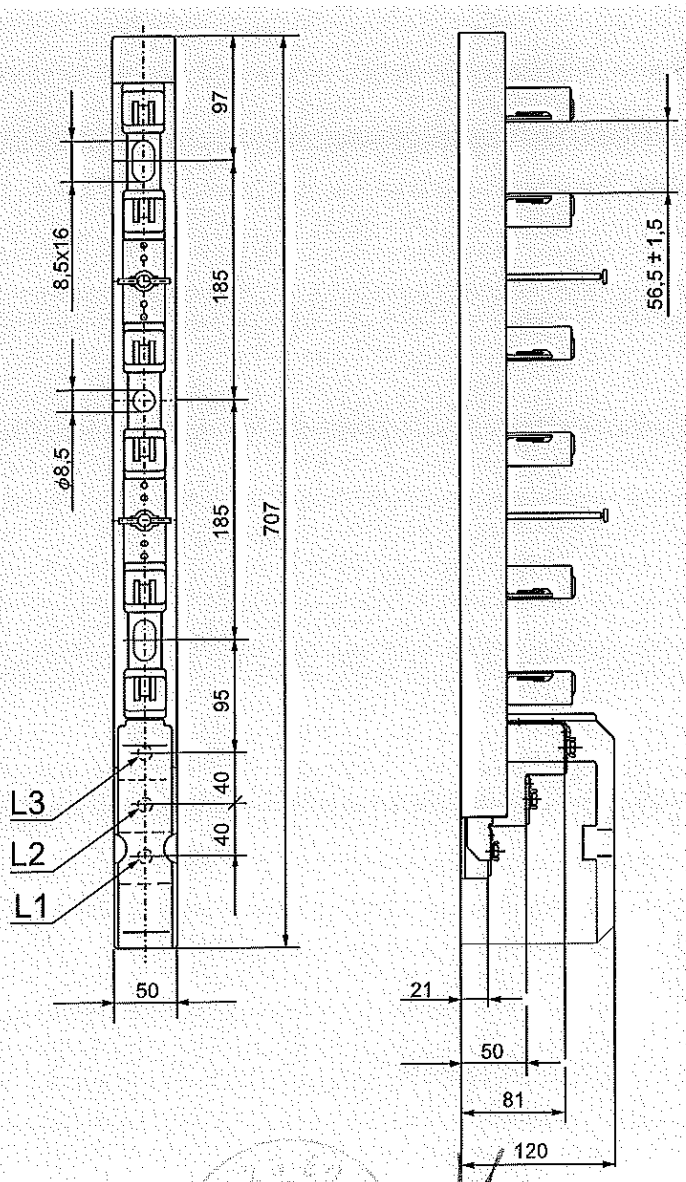


Таблица 6. Общи аксесоари за PBS 00 и PBS 00/100 mm

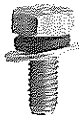
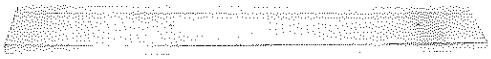
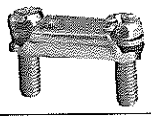
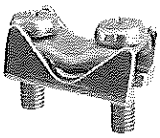
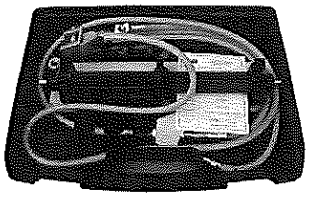
Означение / № на артикула	Описание	Снимка
00 – M	Винтова клема – винт M8 за свързване на проводници с кабелен накрайник (компл. - 3 бр.)	
1361400006T	Капак за резервното място на шините за разстояние 185 mm, шир.50 mm, дълж. 562 mm, деб. 3 mm	
1361400001T	Изолационен щифт за монтиране на капака с ширина 50 mm M8 (компл. - 2 бр.)	
00 – S	Клема мостова завита към апарата посредством 2 винта M5 за свързване на почистените от изолацията жила със сечение от 4 mm² до 70 mm². (компл. - 3 бр.)	
1115281034T	Клема за секторен проводник + подложка „V" завита към апарата посредством 2 винта M5 за свързване на почистените от изолацията жила на секторния кабел с диаметър 1,5 mm² до 70 mm². При еднородни жила до 95 mm² (компл. - 3 бр.)	
U.U. 00÷3	Заземител универсален за големини: 00, 1, 2, 3	

Таблица 7. Аксесоари за PBS 00/100 mm

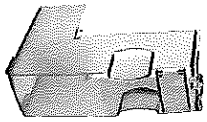
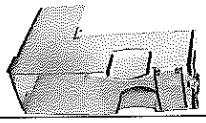
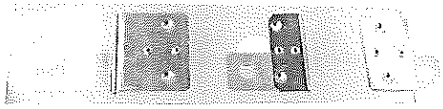
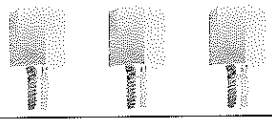
51-823166-011	Капак на кабелните клеми	
51-930282-011	Капак изравнителен долен	
1115281030T	Единичен адаптор 100/185 mm (за един брой PBS 00/100) позволяващ монтаж на апарата върху шини с разстояние 185 mm.	
1115281029T	Двоен адаптор 100/185 mm (за два броя PBS 00/100) позволяващ монтаж на апаратите върху шини с разстояние 185 mm и перфорация на отворите в шините на 100 mm	
53-945361-011	Притискаща клема тип кука позволяваща монтаж на PBS 00/100 върху неперфорирани шини (компл. - 3 бр.).	

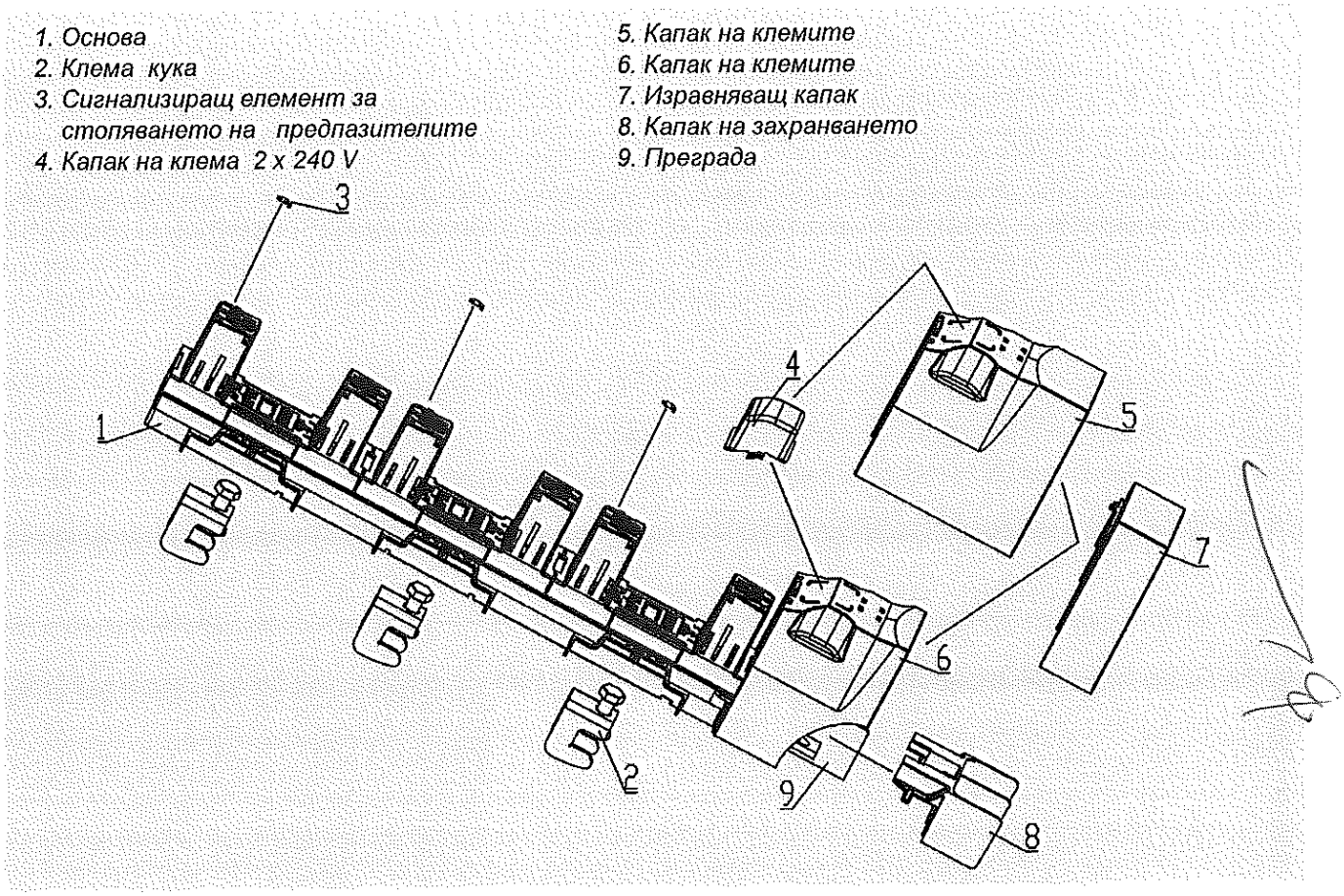
Таблица 8. Аксесоари за PBS 00

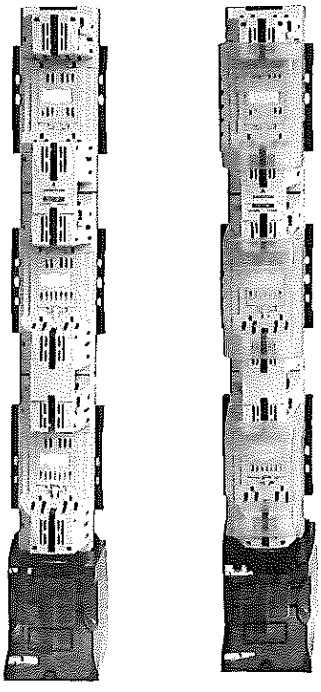
51-945116-011 (№ се отнася за 1 бр.)	Единичен адаптор дистанционен 185/185 mm (за един брой PBS 00/185) позволяващ изравняването към предната линия на таблото PBS 1, 2, 3 (компл. - 3 бр.)	
51-945158-011 (№ се отнася за 1 бр.)	Двоен адаптор дистанционен 185/185 mm (за два броя PBS 00/185) позволяващ изравняването към предната линия на таблото PBS 1, 2, 3 при разстояние на отворите в шините на всеки 100 mm. (компл. - 3 бр.)	
51-837437-011	Капак на кабелните клеми	

Основа за предпазители

PBS 1 250A 690 V~
PBS 2 400A 690 V~
PBS 3 630A 690 V~

1. Основа
2. Клема кука
3. Сигнализиращ елемент за стопяването на предпазителите
4. Капак на клема 2 x 240 V
5. Капак на клемите
6. Капак на клемите
7. Изравняващ капак
8. Капак на захранването
9. Преграда



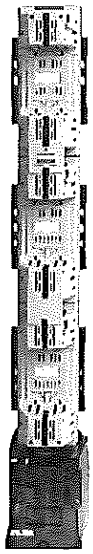


PBS 2-V **PBS 2-V-O**

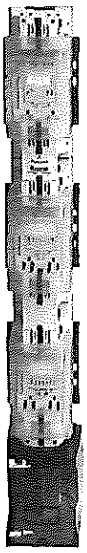
Таблица 9. Означение на PBS 1, 2 съгласно вида на клемите

Означение на апарата	Клема	Чертеж на клемата	Сечение на кабелните жила	Момент на затягане
PBS 1-V (250 A) PBS 2-V (400 A)	V – клема 50-240 SW		V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 95 mm² / 35 - 120 mm² 50 - 185 mm² / 50 - 240 mm²	30 Nm
PBS 1-M (250 A) PBS 2-M (400 A)	M - винтова M10		Кабелен накрайник до 240 mm²	32 Nm

Към клемите тип M могат да се свържат шини с максимална ширина 40 mm.



PBS 2-V



PBS 2-V-O

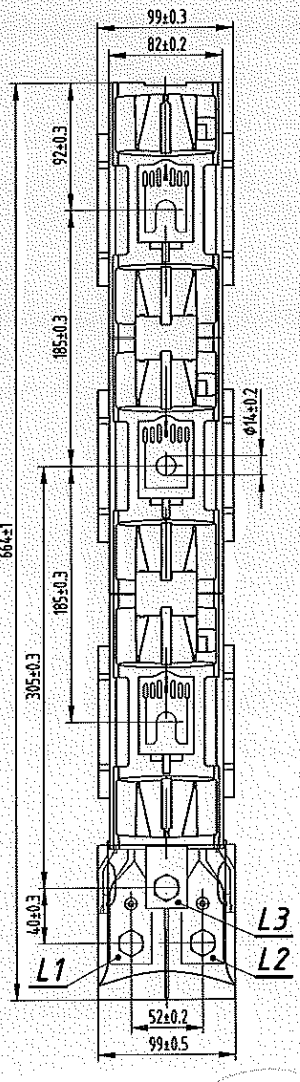
Таблица 10. Означение на PBS 3 съгласно вида на притискащите клеми

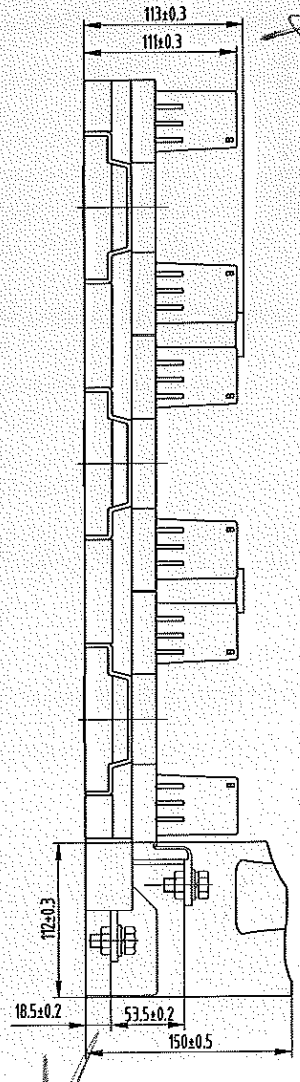
Означение на апарата	Клема	Чертеж	Сечение на кабелните жила	Момент на затягане
PBS 3-V (630 A)	V – клема 50 - 240 SW		V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 95 mm² ⬤ | 35 - 120 mm² ⬤ 50 - 185 mm² ⬤ | 50 - 240 mm² ⬤	30 Nm
PBS 3-M (630 A)	M - клема M12		Кабелен накрайник до 240 mm²	56 Nm

Към клемите тип М могат да се свържат шини с максимална ширина 40 mm.

Таблица 11. Основа PBS 1 / 250A PBS 2 / 400 A и PBS 3 / 630A 690 V~

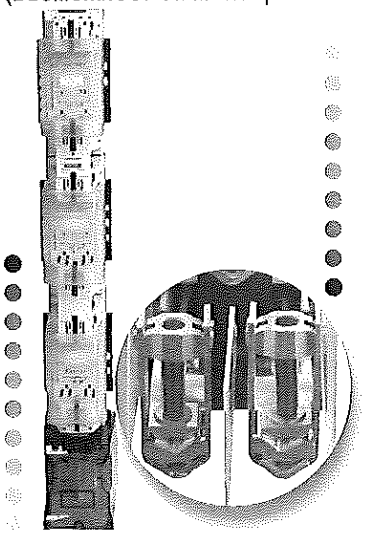
Изпълнение	Означение	Артикул №
PBS 1-250 A с клеми тип V (V клема 35-240 mm²)	PBS 1-V	63-811639-071
PBS 1-250 A с клеми тип M (винт M10)	PBS 1-M	63-811639-081
PBS 1-250 A с клеми тип V (V клема 35-240 mm²) с капаци на предпазителите	PBS 1-V-O	конфигурация
PBS 1-250 A с клеми тип M (винт M10) с капаци на предпазителите	PBS 1-M-O	конфигурация
PBS 2-400 A с клеми тип V (V клема 35-240 mm²)	PBS 2-V	63-811639-011
PBS 2-400 A с клеми тип M (винт M10)	PBS 2-M	63-811639-031
PBS 2-400 A с клеми тип V (V клема 35-240 mm²) с капаци на предпазителите	PBS 2-V-O	конфигурация
PBS 2-400 A с клеми тип M (винт M10) с капаци на предпазителите	PBS 2-M-O	конфигурация
PBS 3-630 A с клеми тип V (V клема 35-240 mm²)	PBS 3-V	63-811639-021
PBS 3-630 A с клеми тип M (винт M12)	PBS 3-M	63-811639-041
PBS 3-630 A с клеми тип V (V клема 35-240 mm²) с капаци на предпазителите	PBS 3-V-O	конфигурация





Основа за предпазители PBS с V клема 2 x 240 mm² / 1 полюс

(възможност за монтиране на 2 жила със сечение 240 mm² във всяка клема)



PBS 3-2V-O

Таблица 12. Означение на PBS 2 x 240 mm² съгласно вида на клемите

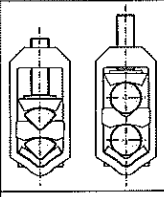
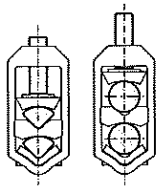
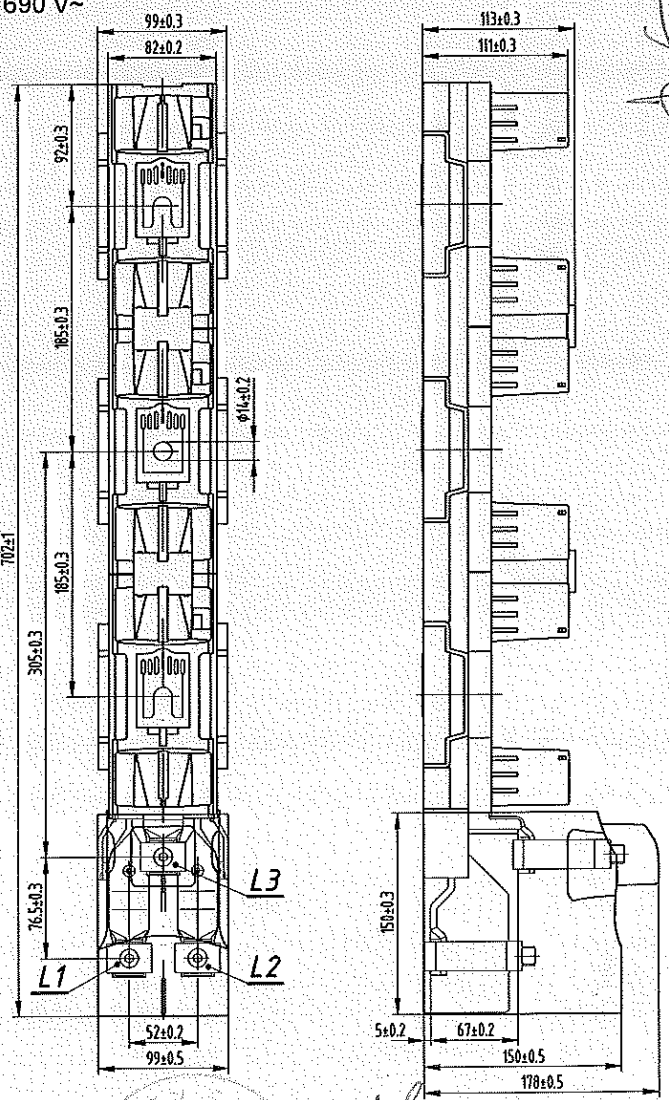
Означение на апарата	Клема	Чертеж на клемата	Сечение на кабелните жила	Момент на затягане
PBS 2-2V (400 A)	V – клема № 2V0240 2150 – 240SW		Два проводника 35-240 mm² V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 120 mm² ● 35 - 150 mm² ● 50 - 185 mm² ◆ 50 - 240 mm² ◆	30 Nm
PBS 3-2V (630 A)	V – клема № 2V0240 2150 – 240SW		V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 120 mm² ● 35 - 150 mm² ● 50 - 185 mm² ◆ 50 - 240 mm² ◆	30 Nm

Таблица 13. Основа PBS 2 / 400 A и PBS 3 / 630A 690 V~

Изпълнение	Означение	Артикул №
PBS 2-400 A с двойни клеми тип V (V клема 2x50-240 mm²)	PBS 2-2V	63-811639-051
PBS 2-400 A с двойни клеми тип V (V клема 2x50-240 mm²) с капаци на предпазителите	PBS 2-2V-O	конфигурация
PBS 3-630 A С двойни клеми тип V (V клема 2x50-240 mm²)	PBS 3-2V	63-811639-061
PBS 3-630 A С двойни клеми тип V (V клема 2x50-240 mm²) с капаци на предпазителите	PBS 3-2V-O	конфигурация



Основа за предпазители PBS със странично отвеждане на изводите

(разделяне, съединяване на шините)

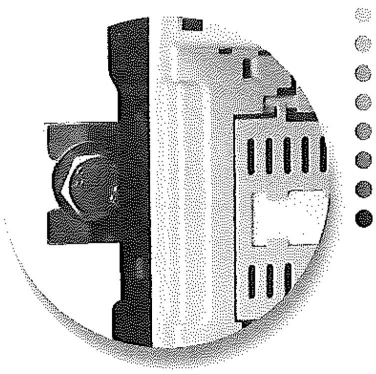
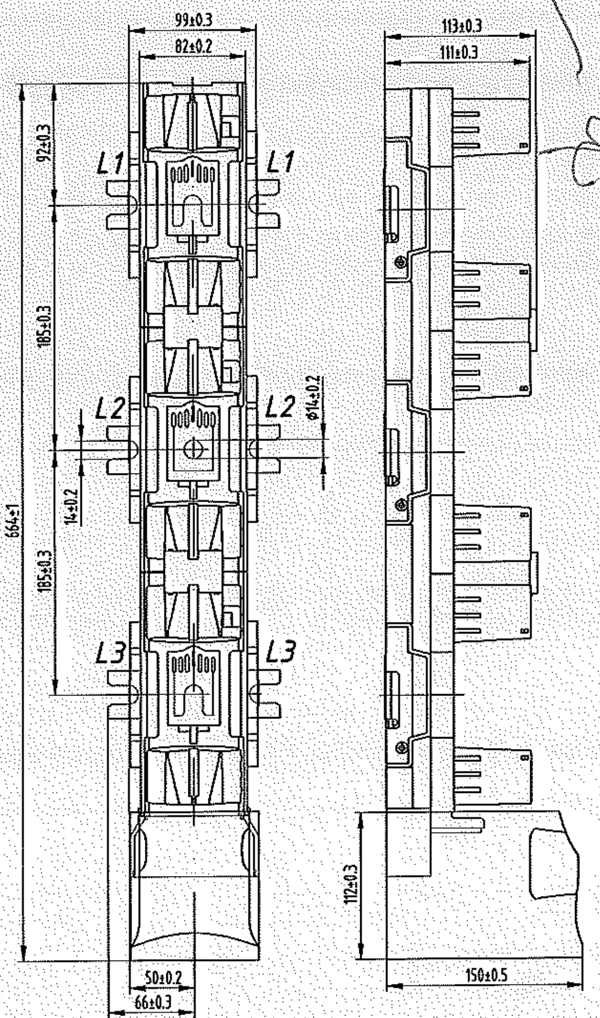


Таблица 14. Означение на PBS тип „съединител"

Означение на апарата	Клема	Чертеж на клемата	Извод	Момент на затягане
PBS 2-NL (400 A)	M – винтова M12		Лява страна	32 Nm
PBS 2-NR (400 A)	M – винтова M12		Дясна страна	32 Nm
PBS 3-NL (630 A)	M – винтова M12		Лява страна	56 Nm
PBS 3-NR (630 A)	M – винтова M12		Дясна страна	56 Nm

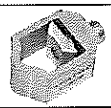
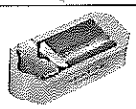
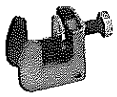
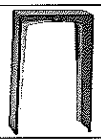
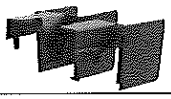
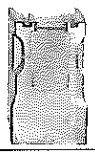
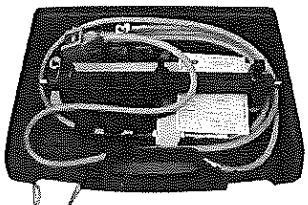
Таблица 15. Основа PBS 1 / 250A PBS 2 / 400 A и PBS 3 / 630A 690 V~

Изпълнение	Означение	Артикул №
PBS 1-250 A с отвеждане на изводите от лявата страна	PBS 1-NL	63-811673-051
PBS 1-250 A с отвеждане на изводите от дясната страна	PBS 1-NR	63-811673-061
PBS 1-250 A с отвеждане на изводите от лявата страна с капаци на предпазителите	PBS 1-NL-O	конфигурация
PBS 1-250 A с отвеждане на изводите от дясната страна с капаци на предпазителите	PBS 1-NR-O	конфигурация
PBS 2-400 A с отвеждане на изводите от лявата страна	PBS 2-NL	63-811673-011
PBS 2-400 A с отвеждане на изводите от дясната страна	PBS 2-NR	63-811673-031
PBS 2-400 A с отвеждане на изводите от лявата страна с капаци на предпазителите	PBS 2-NL-O	конфигурация
PBS 2-400 A с отвеждане на изводите от дясната страна с капаци на предпазителите	PBS 2-NR-O	конфигурация
PBS 3-630 A с отвеждане на изводите от лявата страна	PBS 3-NL	63-811673-021
PBS 3-630 A с отвеждане на изводите от дясната страна	PBS 3-NR	63-811673-041
PBS 3-630 A с отвеждане на изводите от лявата страна с капаци на предпазителите	PBS 3-NL-O	конфигурация
PBS 3-630 A с отвеждане на изводите от дясната страна с капаци на предпазителите	PBS 3-NR-O	конфигурация



Основа за предпазители PBS със странично разположение на изводите

ТАБЛИЦА 16. Аксесоари до PBS 1, PBS 2, PBS 3 690V~

Означение / Артикул №	Описание	Снимка
M	Винтова клема – M10 за PBS 1 и PBS 2, M12 за PBS 3 за свързване на кабели оборудвани с кабелни накрайници . (компл. - 3 бр.)	
50-40SW 1119510001T	V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 95 mm² | 35 - 120 mm² | 50 - 185 mm² | 50 - 240 mm²	
70-300SW 1119510013T	V-клема за директно свързване на почистените от изолация жила със сечение: 50 - 120 mm² | 70 - 150 mm² | 70 - 240 mm² | 95 - 300 mm²	
2150-240SW 1119510007T	V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 120 mm² | 35 - 150 mm² | 50 - 185 mm² | 50 - 240 mm²	
VL240/ 1119510002T	Присъединителна шина към V- клема за монтаж на жила със сечение от 35 mm² до 240 mm²	
HS 50-240	V- клема HS (стоманена) за монтаж на проводник със сечение 50 - 240 mm² „se"	
HS 2/50-240	V- клема двойна HS (стоманена) за монтаж на 2 проводника със сечение 50 - 240 mm² „se"	
	Притискаща клема тип кука позволяваща монтаж на PBS 1,2,3 върху неперфорирани шини (компл.=3 бр.).	
1361400006T	Капак на резервното място на шините на разстояние 185 mm – ширина: 50 mm, дължина: 562 mm, дебелина: 3 mm	
1361400001T	Изолационен щифт за монтаж на капак с ширина 50 mm, M8 (компл. - 2 бр.)	
1361400007T	Капак на резервното място на шините на разстояние 185 mm – ширина: 100 mm, дължина: 562 mm, дебелина: 3 mm	
1361400002T	Изолационен щифт за монтаж на капак с ширина 100 mm, M12 (компл. - 2 бр.)	
51-930313-01	Капак изравнителен, допълнителен капак за изравняване на удължаването от капаците на кабелните клеми	
51-930272-011	Капак на присъединителната шина, преграда отделяща шините на кабелната клема	
51-930271-021	Капак на кабелните клеми	
51-836288-011	Капак на предпазителите	
U.U. 00÷3	Заземител универсален за големини: 00, 1, 2, 3	

ВЕРТИКАЛНИ ПРЕДПАЗИТЕЛ- РАЗЕДИНИТЕЛИ - ARS

КОНСТРУКЦИЯ:

Предпазител-разединителите се произвеждат в две версии:

- еднополюсно включване/изключване (отделно всяка фаза)
- триполюсно включване/изключване (трите фази едновременно)

Конструкцията е със зависимо задвижване (ръчно), поради което операциите на включване и изключване трябва да се извършват с резки движения.

Разединителите ARS се предлагат в три големини:
00 – 160A; 1 – 250A; 2 – 400A; 3 – 630A.

Ширината на разединителите ARS с големина „00" е 50 mm, а на големините 1 – 250A, 2 – 400A и 3 – 400A е 100 mm. Разединителите ARS са предназначени за монтаж на шини на разстояния 185 mm между тях. Апаратите с ширина „00" и се произвеждат в две разновидности:

- основи ARS 00/185 – (160A) за монтаж на шини с разстояния 185 mm;
- основи ARS 00/100 – (160A) за монтаж на шини с разстояния 100 mm.

Основата на предпазител-разединителя е произведена от негорим стъклонапълнен полиестер. Сребърното галванично покритие на контактите на ARS осигурява ниски загуби. Кабелните клеми в апаратите ARS осигуряват директно свързване, както на почистените от изолацията жила от кабелите, така и на кабелни жила със запресовани кабелни накрайници. Корпусът на ARS с дъгогасителните камери е изпълнен от негорим полиамид усилен със стъклено влакно. В стандартното си изпълнение има контролни отвори за измерване на напрежението. Апаратите ARS позволяват използването на токови трансформатори и амперметри. Разединителите имат степен на защита IP20. Предлаганите допълнително аксесоари позволяват да се монтират различни големини ARS на обща система от шини и улесняват експлоатацията.

Съществуват също така и специални изпълнения между които:

- ARS 2/400A и 3/630A с възможност за директно свързване на два кабела с диаметър 240 mm² на всяка клема;
- 2 x ARS 3-6-M – двоен разединител 2 x 630A с ширина 200 mm позволяващи включване и изключване на ток до 1250 A.

Всички големини разединители са доставяни в комплект с клеми (например винтови, мостови или тип V) и капаци за захранващите клеми.

Разединител с предпазители ARS 690V AC

Таблица 17. Технически характеристики

ОЗНАЧЕНИЕ НА ARS	Номинален термичен ток $I_{th}=I_e$	Номинално напрежение U_n	Категория на експлоатация	Ном. захранващо напрежение U_e	Ном. ток на късо съединение подаван условно	Ном. ток на късо съединение задържан условно	Ном. изолационно напрежение на U_i	Устойчивост на импулсно напрежение $U_{imp.}$	Номинална честота	Механична износоустойчивост	Електрическа изосоустойчивост	Степен на защита	Тегло	Големина на вложките на предпазителите PN/IEC
	A	V~	-	V	kA	kA	V	kV	Hz	бр. цикли.	бр. цикли	IP	kg	-
ARS 00/100mm	160	690	AC-21B	690	25	100	1000	8	40-60	1600	200	30	1,2	00
			AC-22B	690										
			AC-23B	400										
ARS 00	160	690	AC-21B	690	25	100	1000	12	40-60	1600	200	20	2,6	00
			AC-22B	500										
ARS 1	250	690	AC-21B	690	50	100	1000	12	40-60	1600	200	20	6,8	1
			AC-22B	500										
ARS 2	400	690	AC-21B	690	50	100	1000	12	40-60	1000	200	20	6,8	2
			AC-22B	500										
ARS 3	630	690	AC-21B	690	50	100	1000	12	40-60	1000	200	20	7,2	3
			AC-22B	500										
2ARS 3	1250	690	AC-21B	690	50	100	1000	12	40-60	1000	200	20	15	3

УСЛОВИЯ НА РАБОТА

- инсталиране в помещения, несъдържащи прах, разяждащи и взривоопасни газове;
- до височина над 2000 метра над морското равнище
- вън от помещенията – в табла със степен на защита ≥ IP 34.
- околна температура от -25°C до +55°C - при използване на разединителите при температура от +41°C до +45°C трябва да се намали стойността на тока I_{th} с 5%, а в температурния интервал от +46°C до +55°C стойността на тока I_{th} трябва да се намали с 10%.

Вертикален предпазител-разединител ARS 00/100 mm 160A 690 V ~

разстояния между шините 100 mm

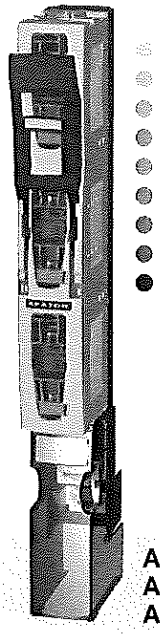
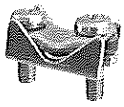


Таблица 18. Означение на ARS 00 съгласно вида на клемите

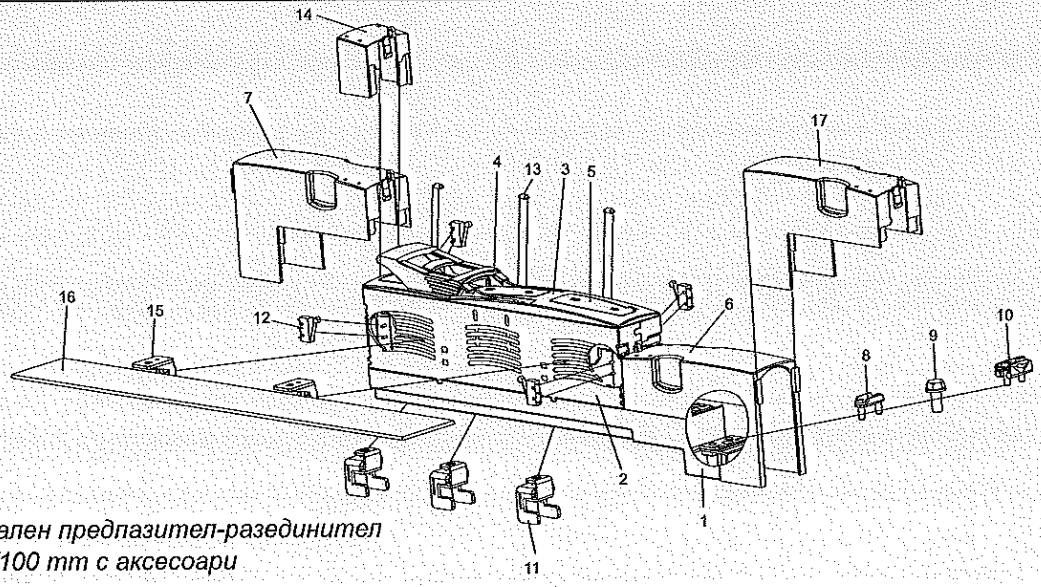
Означение на апарата	Клема	Снимка на клемата	Сечение на кабелните жила	Момент на затягане
ARS 00/100mm (160 A)	S – мостова (2xM5)		4 - 70 mm²	6 Nm
	M – винтова M8		Кабелен накрайник до 185 mm²	20 Nm
	V – секторна (2xM5)		1,5 - 95 mm²	6 Nm

Към клемите тип M могат да се свържат шини с максимална ширина 20 mm.

ARS 00/100mm
ARS 00/100mm-W – *означение на апарат оборудван със свелинна сигнализация за изгаряне на предпазителя*
ARS 00/100mm-V

Таблица 19. Разединител ARS 00 / 160 A 690 V ~

Изпълнение	Означение	Артикул №
ARS 00-160 A включване на 3 фази едновременно с една дръжка (разстояния между шините 100 mm, клеми S – мостови (4-70 mm²) + M-винтови (M8) .	ARS 00/100mm-W	63-811628-021
ARS 00-160 A включване на 3 фази едновременно седна дръжка (разстояния между шините 100 mm + капак, клеми S – мостови (4-70 mm²) + M-винтови (M8)	ARS 00/100mm	63-811628-011
ARS 00-160 A разстояния между шините 100 mm + капак, V-клеми секторни (1,5 - 95 mm²)	ARS 00/100mm-V	63-811628-031

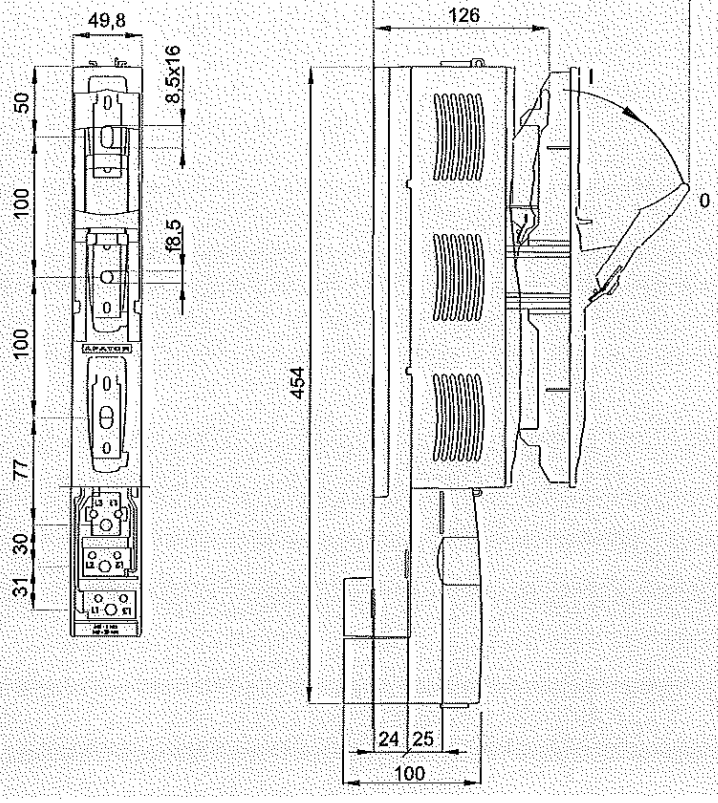


Вертикален предпазител-разединител ARS 00/100 mm с аксесоари

1. *Основа*
2. *Корпус*
3. *Капак*
4. *Дръжка*
5. *Прозорче*
6. *Капак на клемите*
7. *Горен капак изравняващ*
8. *Клема мостова 00-S*
9. *Клема винтова 00-M*
10. *Клема секторна 00-SV*
11. *Клема кука*
12. *Микропревключвател за положението капака на разединителя*
13. *Елемент сигнализиращ изгарянето на предпазителя W*
14. *Табелка информационна*
15. *Опора под капака за резервното място*
16. *Капак за резервното място*
17. *Долен капак изравняващ*

ARS 00/100mm
ARS 00/100mm-W

Положение отворено / затворено



Положение паркиране

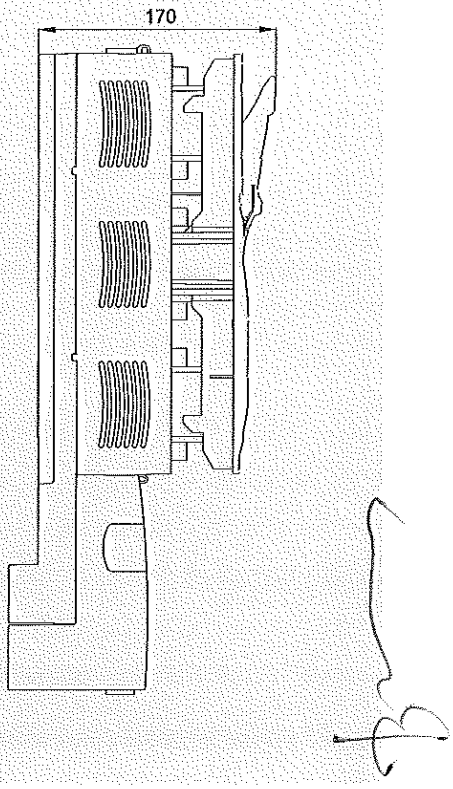
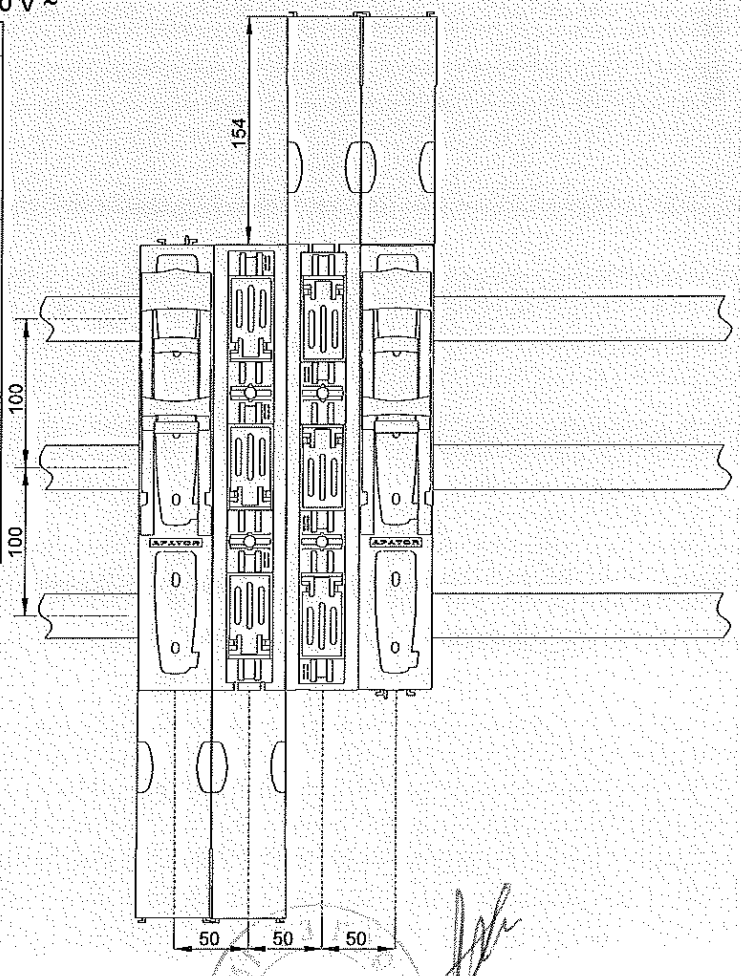


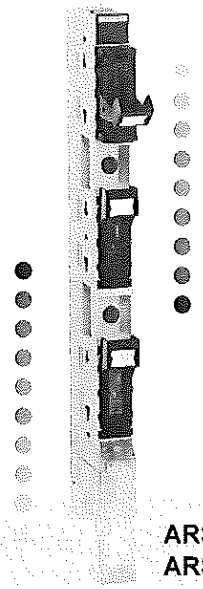
Таблица 19. Разединител ARS 00 / 160 A 690 V ~

Изпълнение	Означение	Артикул №
ARS 00-160 A включване на 3 фази едновременно с една дръжка (разстояния между шините 100 mm), клеми M и S (4-70 mm²) + сигнализация за предпазителите	ARS 00/100mm-W	63-811628-021
ARS 00-160 A включване на 3 фази едновременно а една дръжка (разстояния между шините 100 mm) + капак на клемите S – мостови (4-70 mm²) + M винтови (M8)	ARS 00/100mm	63-811628-011
ARS 00-160 A включване на 3 фази едновременно а една дръжка (разстояния между шините 100 mm) + капак на V-клемите секторни (1,5 - 95 mm²)	ARS 00/100mm-V	63-811628-031



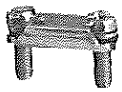
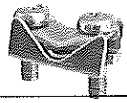
Разединители ARS 00-SM 160A 690 V~

разстояния между шините 185 mm



ARS 00-SM
ARS 00-V

Таблица 20. Означение на ARS 00 съгласно вида на клемите

Означение на апарата	Клема	Снимка на клемата	Сечение на кабелните жила	Момент на затягане
ARS 00-SM (160 A)	S – мостова (2xM5)		4 - 70 mm²	6 Nm
	M - винтова M8		Кабелен накрайник до 185 mm²	20 Nm
ARS 00-V (160 A)	V-секторна (2xM5)		1,5 - 95 mm²	6 Nm

Към изходящите могат да се свържат шини с максимална ширина 25 mm.

Таблица 21. Разединители ARS 00 / 160 A 690 V ~

Изпълнение	Означение	Артикул №
ARS 00-160 A Включване на фазите – поединично, кабелни накрайници с мостови клеми тип S (4-70 mm²) капак	ARS 00-SM	63-811410-011
ARS 00-160 A Включване на фазите – поединично, кабелни накрайници със секторни клеми проводник (1,5-95 mm²)	ARS 00-V	63-811410-021

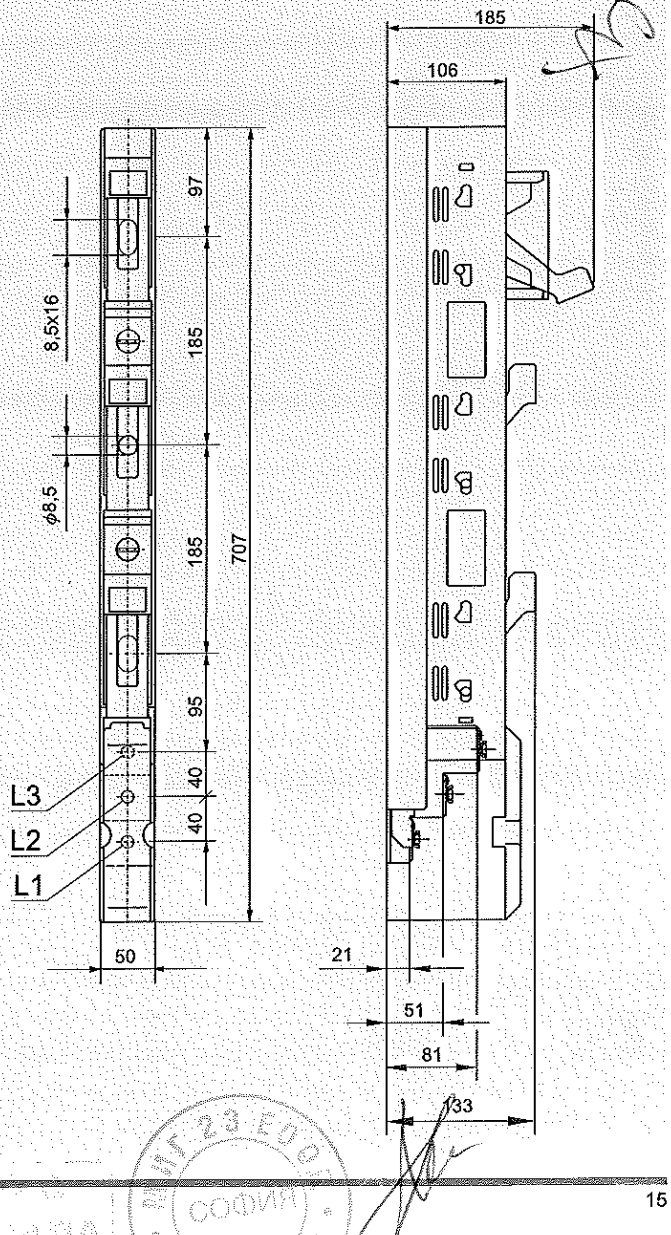


Таблица 22. Общи аксесоари за ARS 00 и ARS 00/100 mm

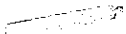
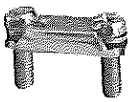
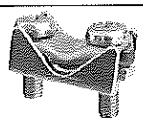
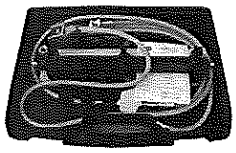
Означение / Артикул №	Описание	Снимка
00 – M	Винтова клема – винт M8 за свързване на проводници с кабелен накрайник (компл. - 3 бр.)	
1361400006T	Капак за резервното място на шините за разстояние 185 mm, ширина 50 mm, дължина 562 mm, дебелина 3 mm	
1361400001T	Изолационен щифт за монтиране на капака с ширина 50 mm M8 (компл. - 2 бр.)	
1115718002T	Токов трансформатор ASR21.3, клас на точност 1 Преводно отношение:от 50/5 A до 150/5 A	
1115718010T	Дистанционна втулка за токов трансформатор ASR21.3, дълж. 36 mm, външен диаметър Ф22,5 mm, вътрешен Ф12,5 mm	
00 – S	Клема мостова завита към апарата посредством 2 винта M5 за свързване на почистените от изолацията жила със сечение от 4 mm² до 70 mm². (компл. - 3 бр.)	
00 – SV 1115281034	Притискаща клема – линейна + подложка „V" завита към апарата посредством 2 винта M5 за свързване на почистените от изолацията жила на секторния кабел с диаметър 1,5 mm² до 70 mm². При еднородни жила до 95 mm² (компл. - 3 бр.)	
U.U. 00÷3	Заземител универсален за големини: 00, 1, 2, 3	

Таблица 23. Аксесоари за ARS 00/100 mm

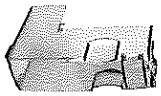
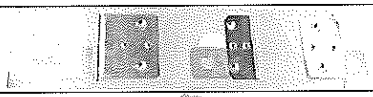
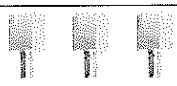
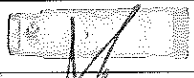
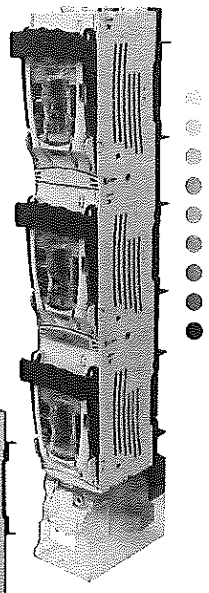
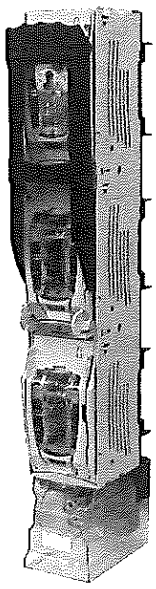
51-823166-011	Горен капак изравняващ височината на ARS 00/100 mm до ARS 1, 2, 3	
51-930282-011	Капак изравняващ долен	
1115281030T	Единичен адаптор 100/185 mm (за един брой ARS 00/100) позволяващ монтаж на апарата върху шини с разстояние 185 mm.	
1115281029T	Двоен адаптор 100/185 mm (за два броя ARS 00/100) позволяващ монтаж на апаратите върху шини с разстояние 185 mm и перфорация на отворите в шините на 100 mm	
53-945361-011	Притискаща клема тип кука позволяваща монтаж на ARS 00/100 върху неперфорирани шини (компл. - 3 бр.).	
1115296049	Микропревключвател за контрол на включването (0-1) на разединител ARS 00/100	
	Опора под капака на резервното място	
53-945333-011	Табелка информационна	

Таблица 24. Аксесоари за ARS 00

51-945160-011 (№ се отнася за 1 бр.)	Единичен адаптор дистанционен 185/185 mm (за един брой ARS 00/185) позволяващ изравняването към предната линия на таблото ARS 1, 2, 3 (компл. - 3 бр.)	
52-945158-011 (№ се отнася за 1 бр.)	Двоен адаптор дистанционен 185/185 mm (за два броя ARS 00/185) позволяващ изравняването към предната линия на таблото ARS 1, 2, 3 при разстояние на отворите в шините на всеки 100 mm. (компл. - 3 бр.)	
51-837437-011	Капак на кабелните клеми	



ARS 2-1-V



ARS 2-6-V

Вертикален предпазител-разединител

ARS 1 250 A 690V~

ARS 2 400 A 690V~

Таблица 25. Означение на ARS 1 и ARS 2 съгласно вида на клемите

Означение на апарата	Клема	Чертеж на клемата	Сечение на кабелните жила	Момент на затягане
ARS 1-V (250 A) ARS 2-V (400 A)	V – клема 50-240 SW		V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 95 mm² ● / 50 - 185 mm² ◆ | 35 - 120 mm² ● / 50 - 240 mm² ◆	30 Nm
ARS 1-M (250 A) ARS 2-M (400 A)	M - винтова M10		Кабелен накрайник max 240 mm²	32 Nm

Към клемите тип M могат да се свържат шини с максимална ширина 40 mm.

Вертикален предпазител-разединител

ARS 3 630 A 690V~

Таблица 26. Означение на ARS 3 съгласно вида на притискащите клеми

Означение на апарата	Клема	Чертеж на клемата	Сечение на кабелните жила	Момент на затягане
ARS 3-V (630 A)	V – клема 50-240 SW		V-клема за директно свързване на почистените от изолация жила със сечение: 35 - 95 mm² ● / 50 - 185 mm² ◆ | 35 - 120 mm² ● / 50 - 240 mm² ◆	30 Nm
ARS 3-M (630 A)	M - винтова M12 (пресована гайка)		Кабелен накрайник max 240 mm²	56 Nm

Към клемите тип M могат да се свържат шини с максимална ширина 40 mm.

1. Основа
2. Клема кука
3. Сигнализиращ елемент за стопяването на предпазителите
4. Капак на клема 2 x 240 V
5. Капак на клемите
6. Капак на клемите
7. Изравняващ капак
8. Капак на захранването
9. Преграда

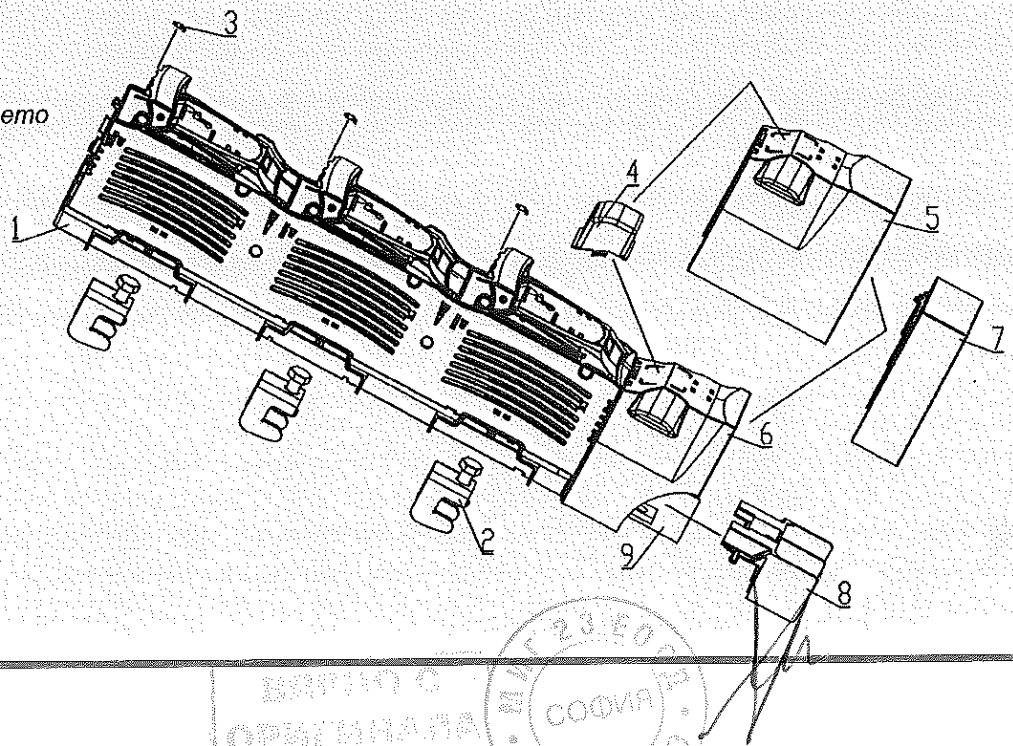
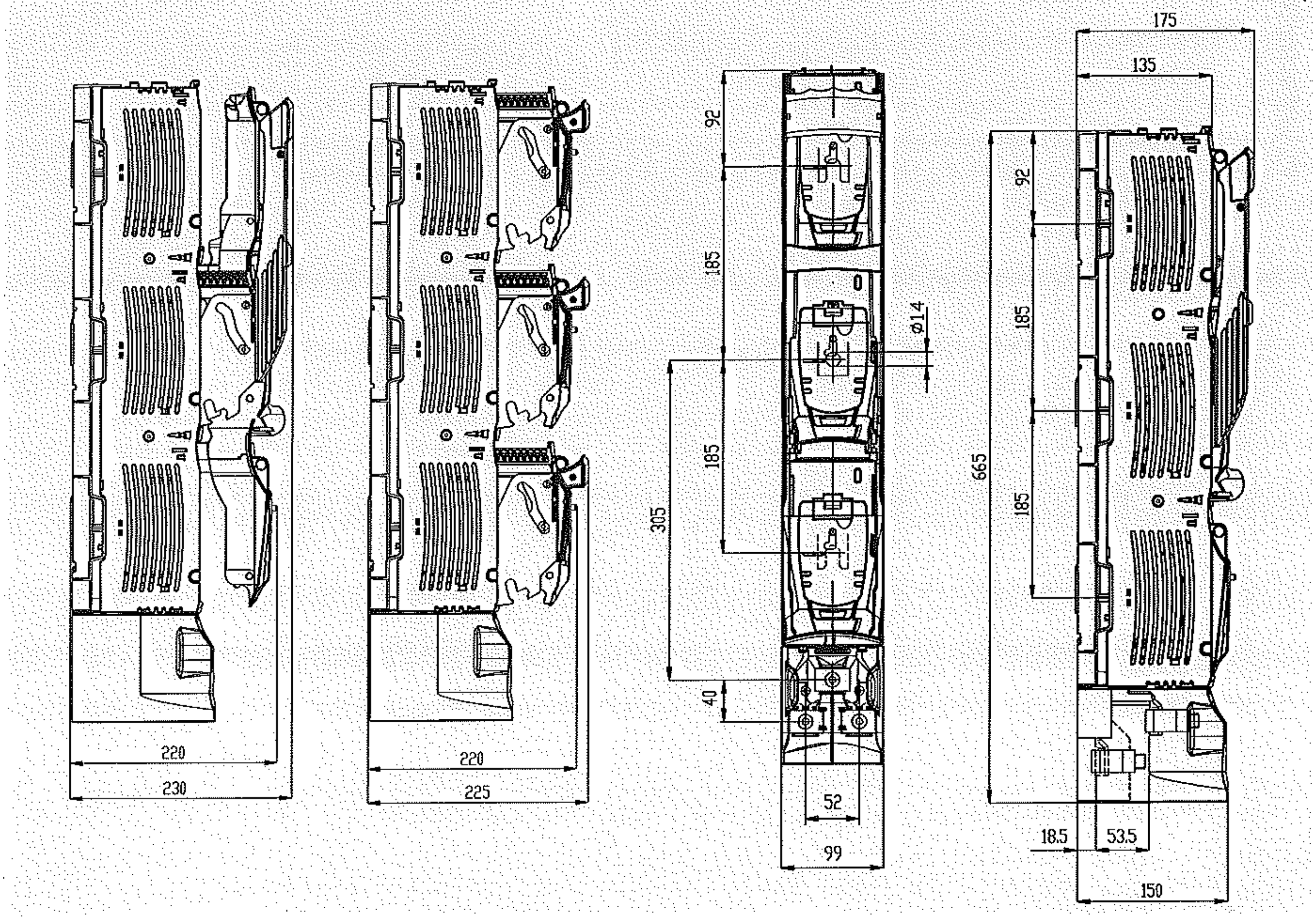
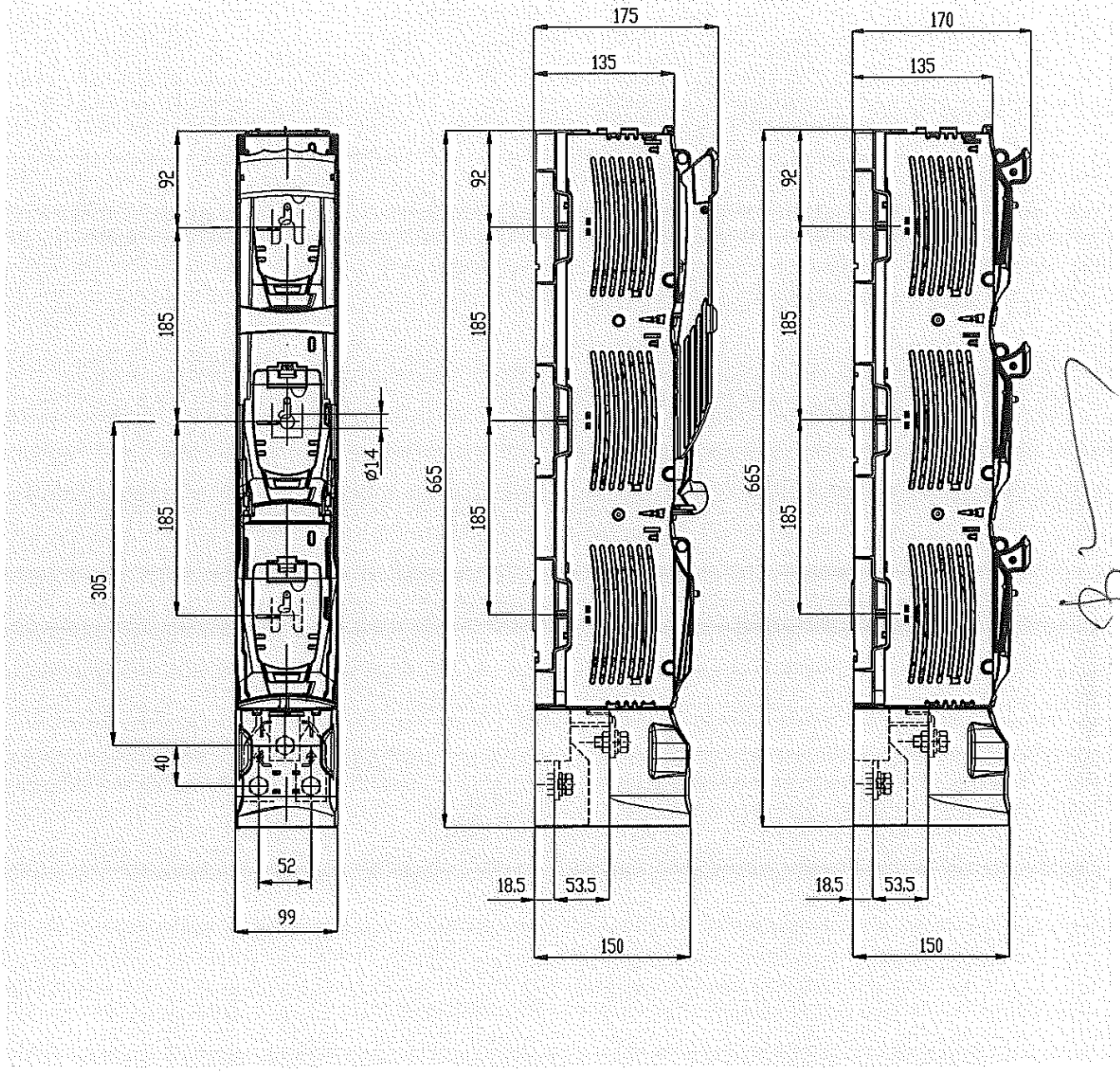


Таблица 27. Разединител ARS 1 / 250A ARS 2 / 400 A и ARS 3 / 630A 690 V~

Изпълнение	Означение	Артикул №
ARS 1-250 A включване на фазите - отделно кабелни накрайници, пресовани гайки M10, капак	ARS 1-1-M	63-811706-111
ARS 1-250 A включване на фазите – трите фази едновременно, кабелни накрайници, пресовани гайки M10, капак	ARS 1-6-M	63-811707-111
ARS 1-250 A включване на фазите – отделно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 1-1-V	63-811706-121
ARS 1-250 A включване на фазите – едновременно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 1-6-V	63-811707-121
ARS 2-400 A включване на фазите - отделно кабелни накрайници, пресовани гайки M10, капак	ARS 2-1-M	63-811706-031
ARS 2-400 A включване на фазите – трите фази едновременно, кабелни накрайници, пресовани гайки M10, капак	ARS 2-6-M	63-811707-031
ARS 2-400 A включване на фазите – отделно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 2-1-V	63-811216-011
ARS 2-400 A включване на фазите – едновременно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 2-6-V	63-811463-011
ARS 3-630 A включване на фазите - отделно кабелни накрайници, пресовани гайки M10, капак)	ARS 3-1-M	63-811706-041
ARS 3-630 A включване на фазите – трите фази едновременно, кабелни накрайници, пресовани гайки M10, капак	ARS 3-6-M	63-811707-041
ARS 3-630 A включване на фазите – отделно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 3-1-V	63-811706-021
ARS 3-630 A включване на фазите – трите фази едновременно, кабелни накрайници тип V, V клема 240 mm², капак	ARS 3-6-V	63-811707-021



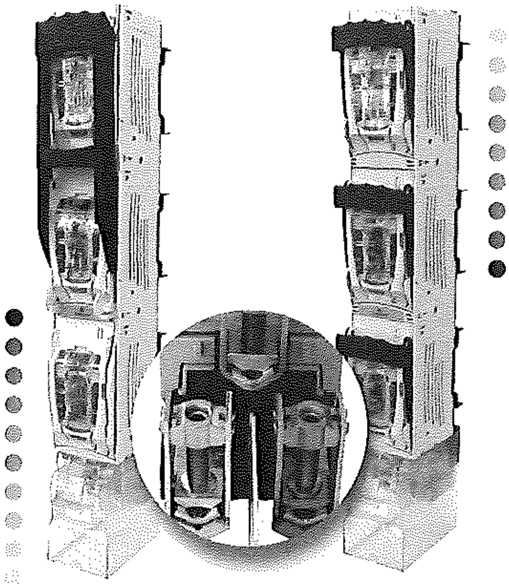

92
185
185
305
40
ø14
52
99
175
135
665
18.5
53.5
150
170
135
665
18.5
53.5
150

Предпазител-разединители с ARS с V клема 2 x 240 mm²

(възможност за монтиране на 2 жила със сечение 240 mm² във всяка клема)

ARS 2 400 A 690V~

ARS 3 630 A 690V~



ARS 3-6-2V **ARS 3-1-2V**

Таблица 28. Означение на ARS 2 x 240 mm² съгласно вида на клемите

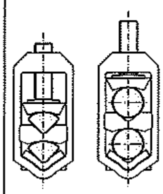
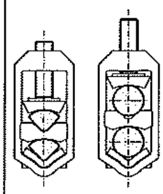
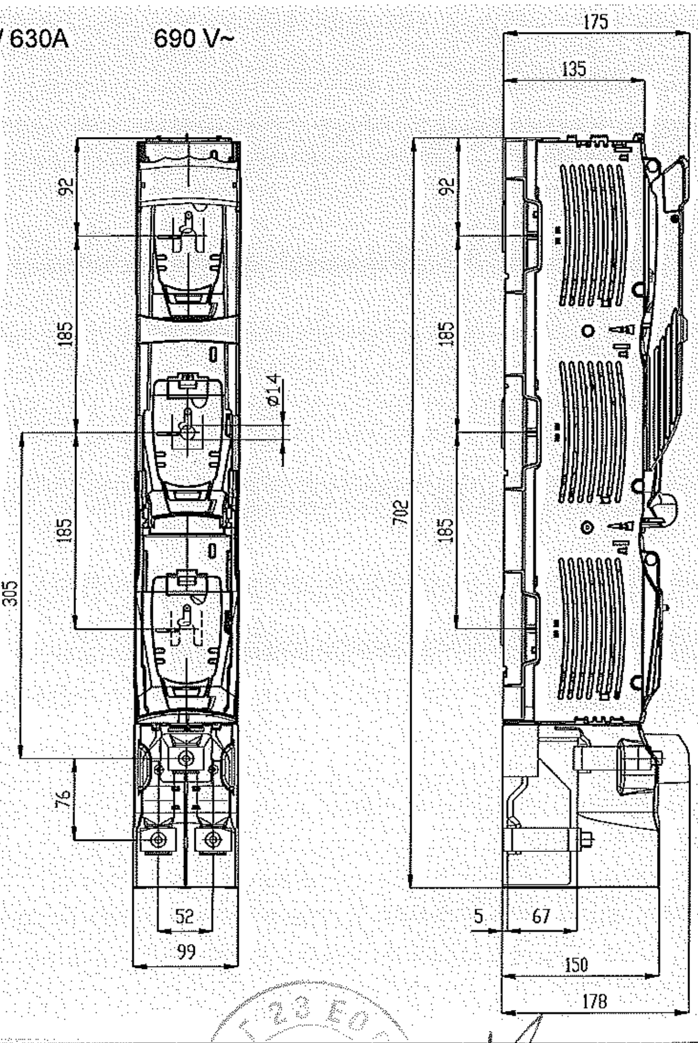
Означение на апарата	Клема	Чертеж на клемата	Сечение на кабелните жила	Момент на затягане
ARS 2-2V (400 A)	V – клема № 2V0240		V-клема за директно свързване на почистените от изолация 2 жила със сечение: 35 - 120 mm² 35 - 150 mm² 50 - 185 mm² 50 - 240 mm	30 Nm
ARS 3-2V (630 A)	V – клема № 2V0240		V-клема за директно свързване на почистените от изолация 2 жила със сечение: 35 - 120 mm² 35 - 150 mm² 50 - 185 mm² 50 - 240 mm²	30 Nm

Таблица 29. Разединител ARS 2 / 400 A и ARS 3 / 630A 690 V~

Изпълнение	Означение	Артикул №
ARS 2-400 A включване на фазите – отделно, кабелни накрайници тип 2 V + V клема 2 x 35 - 240 mm², капак	ARS 2-1-V	63-811706-011
ARS 2-400 A включване на фазите – 3 фази едновременно с една дръжка, кабелни накрайници тип 2 V + V клема 2 x 35 - 240 mm², капак V	ARS 2-6-2V	63-811707-051
ARS 3-630 A включване на фазите – отделно, кабелни накрайници тип 2 V + V клема 2 x 35 - 240 mm², капак	ARS 3-1-2V	63-811706-061
ARS 3-630 A включване на фазите – 3 фази едновременно с една дръжка, кабелни накрайници тип 2 V + V клема 2 x 35 - 240 mm² + капак	ARS 3-6-2V	63-811707-061



Предпазител-разединител ARS със странично отвеждане на изводите
(разделяне, съединяване на шините)

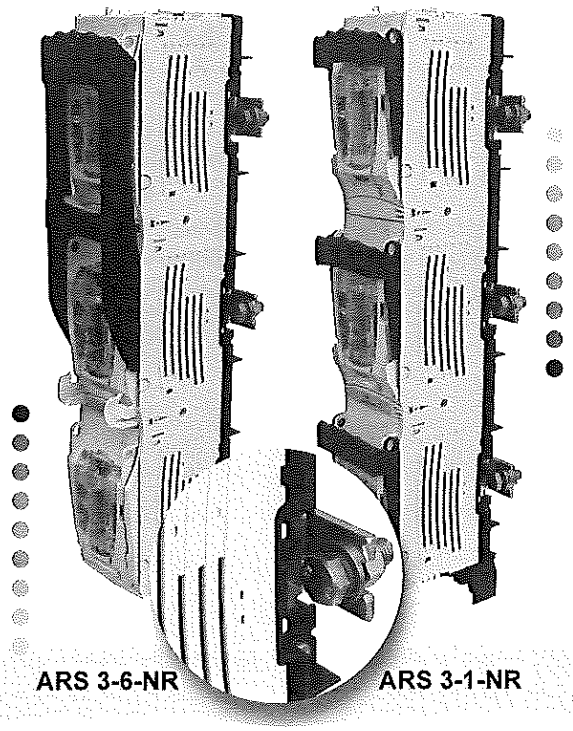
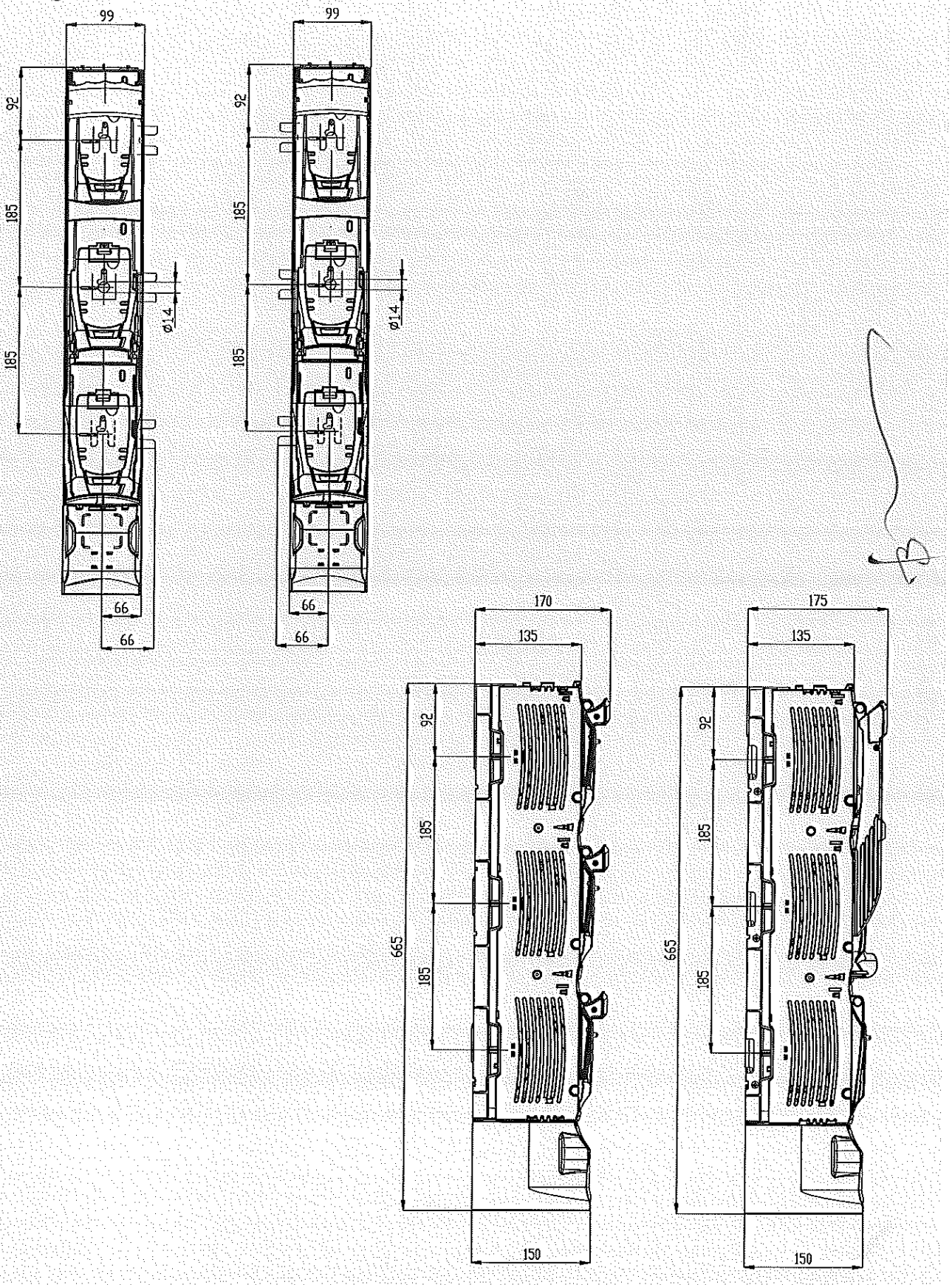


Таблица 30. Означение на ARS тип „съединител"

Означение на апарата	Клема	Чертеж на клемата	Извод	Момент на затягане
ARS 2-NL (400 A)	M – винтова M10		Лява страна	32 Nm
ARS 2-NR (400 A)	M – винтова M10		Дясна страна	32 Nm
ARS 3-NL (630 A)	M – винтова M12		Лява страна	56 Nm
ARS 3-NR (630 A)	M – винтова M12		Дясна страна	56 Nm

Таблица 31. Разединител ARS 1 / 250A, ARS 2 / 400 A и ARS 3 / 630A 690 V~

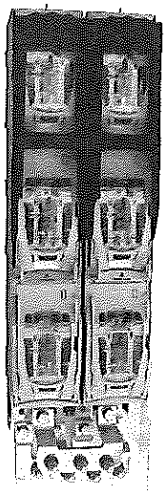
Изпълнение	Означение	Артикул №
ARS 2-400 A включване на фазите – отделно, отвеждане на изводите от лявата страна, клеми винтови M10, капак	ARS 2-1-NL	63-811706-071
ARS 2-400 A включване на фазите – отделно, с отвеждане на изводите от дясната страна, клеми винтови M10, капак	ARS 2-1-NR	63-811706-091
ARS 2-400 A включване на фазите – едновременно с една дръжка, отвеждане на изводите от лявата страна, клеми винтови M10, капак	ARS 2-6-NL	63-811707-071
ARS 2-400 A включване на фазите – едновременно с една дръжка, отвеждане на изводите от дясната страна, клеми винтови M10, капак	ARS 2-6-NR	63-811707-091
ARS 3-630 A включване на фазите – отделно, отвеждане на изводите от лявата страна, клеми винтови M12, капак	ARS 3-1-NL	63-811706-081
ARS 3-630 A включване на фазите – отделно, отвеждане на изводите от дясната страна, клеми винтови M12, капак	ARS 3-1-NR	63-811706-101
ARS 3-630 A включване на фазите – едновременно с една дръжка, отвеждане на изводите от лявата страна, клеми винтови M12, капак	ARS 3-6-NL	63-811707-081
ARS 3-630 A включване на фазите – едновременно с една дръжка, отвеждане на изводите от дясната страна, клеми винтови M1, капак	ARS 3-6-NR	63-811707-101

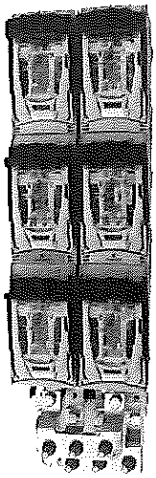


Вертикален предпазител-разединител ARS със странично разположение на изводите

Вертикален предпазител-разединител (двоен)

2ARS 3 **2 x 630 A** ширина на модула – 200 mm





2ARS 3-6-M **2ARS 3-1-M**

Таблица 32. Означение на 2 ARS 3 съгласно вида на клемите

Означение на апарата	Клема	Чертеж на клемата	Сечение на жилото	Момент на затягане
2ARS 3-1-M 2ARS 3-6-M (2 x 630 A)	M12 винт		Кабелни накрайници до 300 mm²	56 Nm

Таблица 33. Разединител 2 ARS 3 x 630A (1250A) 690 V~

Изпълнение	Означение	Артикул №
включване на фазите – едновременно трите фази, механично и електрически свързани два разединителя ARS 3	2ARS 3-6 M	63-811644-1
включване на фазите – отделно, механично и електрически свързани два разединителя ARS 3	2ARS 3-1 M	конфигурация