APATOR

Switchgear

Product catalogue 2019

energy
distribution

ARS 00/60 mm pro

new dimension of security

- solution for industrial low voltage distribution boards, reactive power compensation
- for installation on to 60 mm busbar system
- innovative hooked clamps able fast reversibility - top/bottom cable terminal connection
- adapted to existing assembly systems
- thermoplastics of V0 flammability class
- wide range of accessories

CONTENTS

smartARS pro

vertical fuse switch disconnectors

- thermoplastics of V0 flammability class
- double clearance between open contacts
- arc chambers with deionization plates over every contact
- fast installation using PPN technology
- remote monitoring
- built-in current transformers
- adapted to existing assembly systems
- reversibility - top/bottom cable terminal connection
- wide range of accesories

GENERAL NFORMATION

smartARS pro vertical fuse switch disconnectors are designed for distribution of electricity and protection against short circuits and overloads in three phase alternative current circuits. They are intended for direct installation on horizontal or vertical busbar systems.

smartARS pro fuse switch disconnectors meet technical requirements of polish and european electricity boards and are conformed with EN 60947-1, EN 60947-3, IEC 60947-1, IEC 60947-3 standards. **smartARS pro** fuse switch disconnectors

are dedicated for applications which require reliability and safety like low voltage distribution boards installed in transformer substations, industrial low voltage assemblies and cable cabinets. Design of **smartARS pro** fuse switch disconnectors provides clearly visible, safe gap in the current circuit after the fuse link removal.

smartARS pro fuse switch disconnectors are designed to perform the following functions:

- protection,
- energy distribution,
- earthing,
- switching,
- touch protection.

CONSTRUCTION

smartARS pro fuse switch disconnectors are manufactured in two versions:

- one pole switching (separately each pole),
- three pole switching (three poles at the same time).

They have manually operated handle therefore making and breaking operations should be done with determined movement.

smartARS pro fuse switch disconnectors are available in following sizes (according to rated current): 00 (160 A); 2 (400 A); 3(630 A).

smartARS pro fuse switch disconnectors are designed for installation on to 185 mm busbar system.

All plastic parts of fuse switch disconnector **smartARS pro** are made of halogen free, fibre glass strengthened, self extinguishing materials. Thanks to the application of flame retardants the highest flammability class – V0 was achieved. Fuse switch disconnectors made from such termoplastics self-extinguish in specified time after ignition source is removed. Also dripping of flaming parts of plastic does not occur.

Silver plated contacts provide low power loss. Depending on clamp type, **smartARS pro** fuse switch disconnectors enable user to connect circular or sector-shaped conductors with bare ends or conductors with lug terminals. Arc chambers equipped with steel deionization plates are installed over each contact. **smartARS pro** fuse switch disconnector are designed for using current transformers and ammeters. Protection degree of IP30 from the front is provided. In opened position **smartARS pro** provide protection degree IP20. Additionally offered accesories enable to install **smartARS pro** fuse switch disconnectors of different sizes on common busbar systems and facilitate operation. All sizes of **smart ARS pro** fuse switch disconnectors are provided complete with clamps (i. e. screws, V-terminals, 2Vterminals) and shrouds for cable terminals.

Table 1. Main technical data of smartARS pro

Parameter			smartARS 00 pro	smartARS 2 pro	smartARS 3 pro
Rated thermal current $I_{th}=I_n$ with fuse links		A	160	400	630
Rated voltage U_n		V	690	690	690
Utilization category	690 V		AC-22B	AC-22B	AC-21B
	500 V				AC-22B
	400 V		AC-23B	AC-23B	AC-23B
Rated switching current I_e		A	160	400	630
Rated short-circuit making current	690 V	kA	80	100	80
	500 V		100	120	120
	400 V				
Rated short-circuit withstand current	690 V	kA	80	100	80
	500 V		100	120	120
	400 V				
Rated insulation voltage U_i		V	1000	1000	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12	12	12
Rated frequency		Hz	50-60	50-60	50-60
Mechanical durability		Number of cycles	1600	1000	1000
Electrical durability			200	200	200
IP degree of protection		-	30	30	30
Fuse links size		-	00	1, 2	3

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34,
- ambient temperature from -25 °C to +55 °C,
- relative humidity of the air should not be higher than 50% at temperature of +40°.

FUNCTIONALITY

- making and breaking operations should be done with determined movement,
- parallelly moving, double contact system,
- designed for installation on 185 mm busbar system,
- two versions: single pole switching (separately each pole) or triple pole switching (three poles at the same time),
- fuse switch disconnectors width: 50 mm(smartARS00 pro), 100 mm (smartARS 2,3 pro),
- suitable for top cable terminal connection,
- possible connection of conductors with lug terminals (screw terminals) or circular/sector-shaped conductors with bare ends (V-terminals, 2V-terminals) using V-clamps,
- voltage test is performed through test holes,
- possible installation of earthing device,
- fast installation using PPN technology,
- remote monitoring,
- built-in current transformers,
- adapted to existing assembly systems.

FUSE SWITCH DISCONNECTOR smartARS 00 pro (160 A, 690 V)

For installation on to 185 mm busbar system

Fuse switch disconnector's width 50 mm

Switching: three poles simultaneously - operation with two hands or single pole switching

Table 2. Technical data

Parameter			smartARS 00 pro	
Rated thermal current $I_{th}=I_n$		A	160	
Rated thermal current $I_{th}=I_n$ with solid links		A	210	
Rated voltage U_n		V	690	
Utilization category		-	AC-22B	AC-23B
			690	400
Rated switching voltage U_e		V	690	
Rated switching current I_e		A	160	
Rated short circuit making current	690 V	kA	80	
	500 V		100	
Rated short circuit withstand current	690 V	kA	80	
	500 V		100	
Rated insulation voltage U_i		V	1000	
Rated impulse withstand voltage $U_{imp.}$		kV	12	
Rated frequency		Hz	50-60	
Mechanical durabilit		Number of cycles	1600	
Electrical durability			200	
IP degree of protection		-	30	
Fuse links size		-	00	

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smartARS 00-1 pro

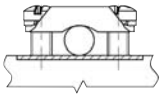
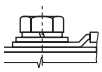
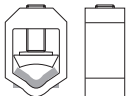
smartARS 00-3 pro

Table 3. Versions

Version		Weight	Article No.
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 00-1-V pro	cable terminals: V-terminals: V-clamps 25-150SW	2,5 kg	63-001414-001
smartARS 00-1 pro	cable terminals: bridge terminals (S) 4-70mm^2, M8 screw terminals	2,4 kg	63-001414-002
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 00-3-V pro	cable terminals: V-terminals: V-clamps 25-150SW	2,6 kg	63-001415-001
smartARS 00-3 pro	cable terminals: bridge terminals (S) 4-70mm^2, M8 screw terminals	2,5 kg	63-001415-002
smartARS 00 pro version with adjusted to front line and terminal cover of ARS 2,3 without using adapters			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 00-1-V pro	cable terminals: V-terminals: V-clamps 25-150SW	2,6 kg	63-002070-001
smartARS 00-1 pro	cable terminals: bridge terminals (S) 4-70mm^2, M8 screw terminals	2,5 kg	63-002070-002
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 00-3-V pro	cable terminals: V-terminals: V-clamps 25-150SW	2,7 kg	63-002071-001
smartARS 00-3 pro	cable terminals: bridge terminals (S) 4-70mm2, M8 screw terminals	2,6 kg	63-002071-002
smartARS 00 pro version with fast installation modules using PPN technology			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 00-1-V SM pro	cable terminals: V-terminals: V-clamps 25-150SW	2,7 kg	63-001899-001
smartARS 00-1 SM pro	cable terminals: bridge terminals (S) 4-70mm^2, M8 screw terminals	2,6 kg	63-001899-002

Version		Weight	Article No.
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 00-3-V SM pro	cable terminals: V-terminals: V-clamps 25-150SW	2,9 kg	63-001904-001
smartARS 00-3 SM pro	cable terminals: bridge terminals (S) 4-70mm², M8 screw terminals	2,8 kg	63-001904-002

Table 4. smartARS 00 pro terminal clamps

Description	smartARS 00 pro			
Clamp	S-bridge clamp 2 x M5 x 25	M8 screw*	V-clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross –section of conductors	4 - 70 mm²	Lug terminal max 185 mm²	re 16 mm² - 95 mm² se 25 mm² - 150 mm² rm 16 mm² - 95 mm² sm 25 mm² - 150 mm²	re 10 mm² - 70 mm² se 25 mm² - 120 mm² rm 10 mm² - 70 mm² sm 25 mm² - 95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

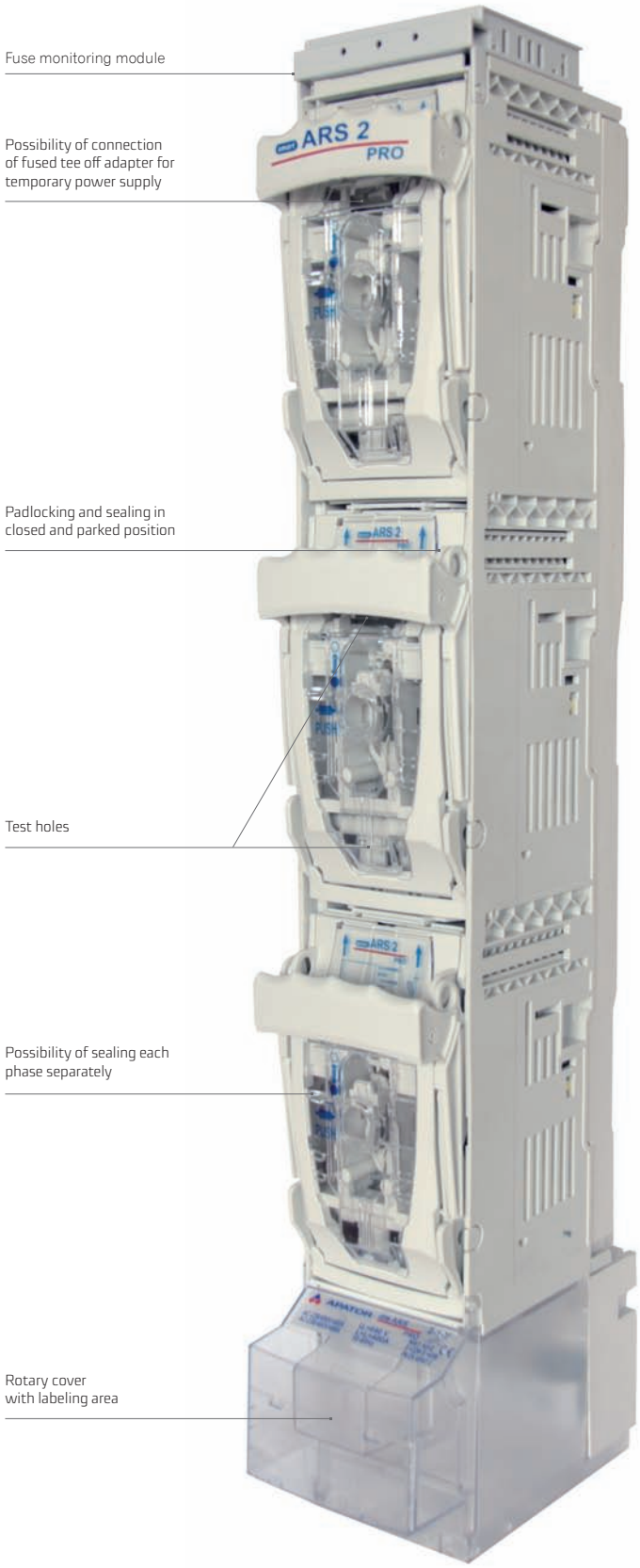
For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system – 12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE SWITCH DISCONNECTOR smartARS 2 pro (400 A, 690 V) smartARS 3 pro (630 A, 690 V)

For installation on to 185 mm busbar system

Fuse switch disconnector's width 100 mm

3- pole switching - 3 phases simultaneously or 1-pole switching - each phase separately



smartARS 2 pro (400 A, 690 V)

Fuse switch disconnector designed for operation with NH1 and NH2 fuse links

smartARS 2-1-M pro

smartARS 2-6-M pro

Table 5. Technical data

Parameter			smartARS 2 pro	
Rated thermal current I_{th} with fuse links		A	250(NH1), 400(NH2)	
Rated thermal current I_{th} with solid links		A	600	
Rated voltage U_n		V	690	
Utilization category		-	AC-22B	AC-23B
Rated switching voltage U_e		V	690	400
Rated switching current I_e		A	250(NH1), 400(NH2)	
Rated short circuit making current	U_e=690 V U_e=500 V	kA	100 120	
Rated short circuit withstand current	U_e=690 V U_e=500 V	kA	100 120	
Rated insulation voltage U_i		V	1000	
Rated impulse withstand voltage $U_{imp.}$		kV	12	
Rated frequency		Hz	50-60	
Mechanical durability		Number of cycles	1000	
Electrical durability			200	
IP degree of protection		-	30	
Fuse links size		-	1, 2	

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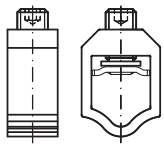
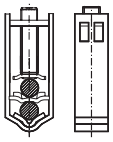
Table 6. Versions

Version		Weight	Article No.
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-001340-001
smartARS 2-1-M pro	cable terminals: screw terminals: pressed nuts M12	5,7 kg	63-001340-003
smartARS 2-1-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-001340-005
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V pro	cable terminals: V-terminals : V-clamps 240 mm²	5,8 kg	63-001341-001
smartARS 2-6-M pro	cable terminals: screw terminals: pressed nuts M12	5,7 kg	63-001341-003
smartARS 2-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-001341-005
smartARS 2 pro version equipped with modules for fast installation using PPN technology			
for installation on 185 mm busbar system, fast installation modules equipped with screws, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V SM pro	cable terminals: V-terminals: V-clamps 240 mm²	6,2 kg	63-001340-201
smartARS 2-1-M SM pro	cable terminals: screw terminals: pressed nuts M12	6,1 kg	63-001340-203
smartARS 2-1-2V SM pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,8 kg	63-001340-205
for installation on 185 mm busbar system, fast installation modules equipped with screws, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V SM pro	cable terminals: V-terminals: V-clamps 240 mm²	6,2 kg	63-001341-201
smartARS 2-6-M SM pro	cable terminals: screw terminals: pressed nuts M12	6,1 kg	63-001341-203
smartARS 2-6-2V SM pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,8 kg	63-001341-205

Version		Weight	Article No.
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V SMH pro	cable terminals: V-terminals: V-clamps 240 mm²	6,4 kg	63-001340-401
smartARS 2-1-M SMH pro	cable terminals: screw terminals: pressed nuts M12	6,3 kg	63-001340-403
smartARS 2-1-2V SMH pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,0 kg	63-001340-405
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V SMH pro	cable terminals: V-terminals: V-clamps 240 mm²	6,4 kg	63-001341-401
smartARS 2-6-M SMH pro	cable terminals: screw terminals: pressed nuts M12	6,3 kg	63-001341-403
smartARS 2-6-2V SMH pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,0 kg	63-001341-405

Table 7. smartARS 2 pro terminal clamps

Description	smartARS 2-x-V pro		smartARS 2-x-2V pro		smartARS 2-x-2V pro		smartARS 2-x-M pro
Clamp	V–clamp 35-300SW-B		V–clamp 2/50-300SW-B		V–clamp HS 2/50-240-C*		M–screw M12**
Picture of clamp							
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with crosssection of						Lug terminal
	35 - 185 mm²	35 - 240 mm²	50 - 185 mm²	50 - 240 mm²	50 - 185 mm²	50 - 240 mm²	
	35 - 240 mm²	35 - 300 mm²	50 - 240 mm²	50 - 300 mm²	50 - 240 mm²	50 - 300 mm²	
Tightening torque	30 Nm		30 Nm		40 Nm		56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

smartARS 3 pro (630 A, 690 V)

smartARS 3-1-M pro

smartARS 3-6-M pro

Table 8. Technical data

Parameter			smartARS 3 pro		
Rated thermal current I_{th} with fuse links		A	630		
Rated thermal current I_{th} with solid links		A	750		
Rated voltage U_n		V	690		
Utilization category		-	AC-23B	AC-22B	AC-21B
Rated switching voltage U_e		V	400	500	690
Rated switching current I_e		A	630		
Rated short circuit making current	690 V	kA	80		
	500 V		120		
Rated short circuit withstand current		kA	100		
Rated insulation voltage U_i		V	1000		
Rated impulse withstand voltage $U_{imp.}$		kV	12		
Rated frequency		Hz	50-60		
Mechanical durability		Number of cycles	1000		
Electrical durability			200		
IP degree of protection		-	30		
Fuse links size		-	3		

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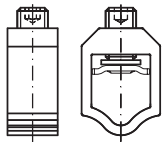
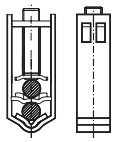
Table 9. Versions

Version		Weight	Article No.
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V pro	cable terminals: V-terminals: V-clamps 240 mm²	6,6 kg	63-001340-002
smartARS 3-1-M pro	cable terminals: screw terminals: pressed nuts M12	6,5 kg	63-001340-004
smartARS 3-1-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,2 kg	63-001340-006
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V pro	cable terminals: V-terminals: V-clamps 240 mm²	6,6 kg	63-001341-002
smartARS 3-6-M pro	cable terminals: screw terminals: pressed nuts M12	6,5 kg	63-001341-004
smartARS 3-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,2 kg	63-001341-006
smartARS 2 pro version equipped with modules for fast installation using PPN technology			
for installation on 185 mm busbar system, fast installation modules equipped with screws, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V SM pro	cable terminals: V-terminals: V-clamps 240 mm²	7,0 kg	63-001340-202
smartARS 3-1-M SM pro	cable terminals: screw terminals: pressed nuts M12	6,9 kg	63-001340-204
smartARS 3-1-2V SM pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,6 kg	63-001340-206
for installation on 185 mm busbar system, fast installation modules equipped with screws, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V SM pro	cable terminals: V-terminals: V-clamps 240 mm²	7,0 kg	63-001341-202
smartARS 3-6-M SM pro	cable terminals: screw terminals: pressed nuts M12	6,9 kg	63-001341-204
smartARS 3-6-2V SM pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,6 kg	63-001341-206
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V SMH pro	cable terminals: V-terminals: V-clamps 240 mm²	7,2 kg	63-001340-402
smartARS 3-1-M SMH pro	cable terminals: screw terminals: pressed nuts M12	7,1 kg	63-001340-404
smartARS 3-1-2V SMH pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,8 kg	63-001340-406

Version		Weight	Article No.
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V SMH pro	cable terminals: V-terminals: V-clamps 240 mm²	7,2 kg	63-001341-402
smartARS 3-6-M SMH pro	cable terminals: screw terminals: pressed nuts M12	7,1 kg	63-001341-404
smartARS 3-6-2V SMH pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,8 kg	63-001341-406

Table 10. smartARS 3 pro terminal clamps

Description	smartARS 3-x-V pro	smartARS 3-x-2V pro	smartARS 3-x-2V pro	smartARS 3-x-M pro
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M12**
Picture of clamp				
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with crosssection of			Lug terminal
	35 - 185 mm² ⊛ / 35 - 240 mm² ●	50 - 185 mm² ⊛ / 50 - 240 mm² ●	50 - 185 mm² ⊛ / 50 - 240 mm² ●	
	35 - 240 mm² ◈ / 35 - 300 mm² ◆	50 - 240 mm² ◈ / 50 - 300 mm² ◆	50 - 240 mm² ◈ / 50 - 300 mm² ◆	
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

FUSE SWITCH DISCONNECTOR smartARS pro with lateral busbar terminals

(separation, coupling of busbar systems)

smartARS 2-1-NR pro

Table 11. Technical data

Parameter			smartARS 2 pro	smartARS 3 pro
Rated thermal current I_{th} with fuse links		A	400	630
Rated voltage U_n		V	690	690
Utilization category	690 V	-	AC-22B	AC-21B
	500 V			AC-22B
	400 V		AC-23B	-
Rated switching current I_e		A	400	630
Rated short circuit making current	600 V	kA	100	80
	500 V		120	120
	400 V			
Rated short circuit withstand current	600 V	kA	100	80
	500 V		120	120
	400 V			
Rated insulation voltage U_i		V	1000	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12	12
Rated frequency		Hz	50-60	50-60
Mechanical durability		Number of cycles	1000	1000
Electrical durability			200	200
IP degree of protection		-	30	30
Fuse links size		-	1,2	3

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Table 12. Versions with lateral busbar terminals

Version		Weight	Article No.
Fuse switch disconnectors smartARS 2 pro - 400A			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 2-1 NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,1 kg	63-002045-001
smartARS 2-1 NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,1 kg	63-002045-003
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6 NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,1 kg	63-002046-001
smartARS 2-6 NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,1 kg	63-002046-003
Fuse switch disconnectors smartARS 3 pro - 630 A			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 3-1 NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,9 kg	63-002045-002
smartARS 3-1 NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,9 kg	63-002045-004
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6 NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,9 kg	63-002046-002
smartARS 3-6 NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,9 kg	63-002046-004

Table 13. smartARS 2,3 pro with lateral busbar terminals - terminal clamps

Description	smartARS 2-x-NL pro	smartARS 2-x-NR pro	smartARS 3-x-NL pro	smartARS 3-x-NR pro
Clamp	screw M12	screw M12	screw M12	screw M12
Picture of clamp				
Lateral busbar terminals	Left side	Right side	Left side	Right side
Tightening torque	56 Nm	56 Nm	56 Nm	56 Nm

Fuse monitoring module

The fuse switch disconnector can be equipped with device that allows indication of the current state of the fuse links. Information about fuse link burnout, correct operation or power failure are indicated by diode light signal or can be transferred to any automation protection system, through the relay contacts.

Description of operation of the fuse monitoring module

- diode is green - correct operation, fuse link works correctly
- diode is red - failure, fuse link operated
- diode is red; blinking - phase shift (another phase voltage was detected at the fuse link outgoing contact)
- diodes off - module switched off / no power supply

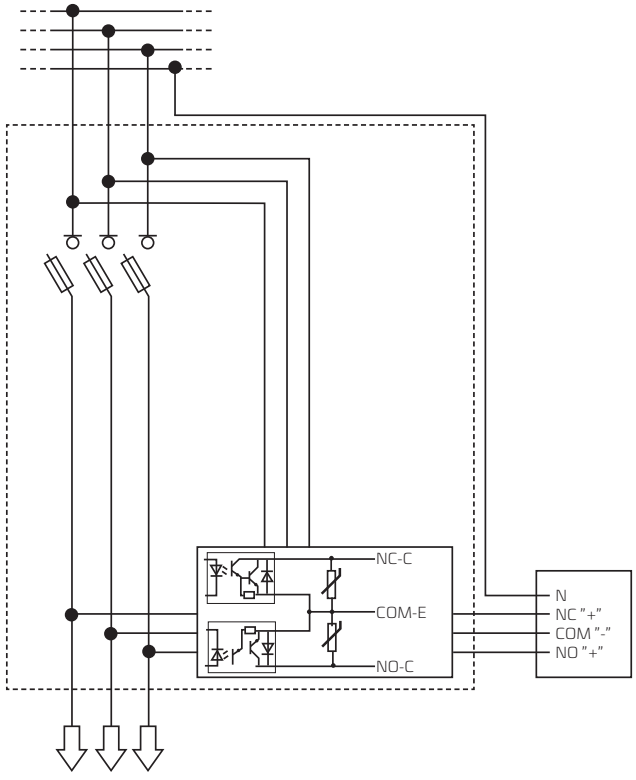
smartARS 2-1-M-X pro smartARS 00-1-V-X-E pro

Nominal parameters

Voltage value for cable test	2,5 kV DC
Minimum operating voltage	200 V
Maximum operating voltage	690 V
U_{imp} impulse withstand voltage with operated fuse link	4 kV
U_{imp} between phases	4 kV
U_{imp} between main circuit / relay contacts	3,5 kV
Temperature range	-40...+85°C
Rated insulation voltage U_i	1000 V

Module outputs:

Rated current	100 mA
Maximum switching voltage	50 V DC



Fuse links state (resultant)	output **NO**	output **NC**	diode colour
correct operation	„0" (0V)	„1" (24V)	green
failure	„1" (24V)	„0" (0V)	red

The transport outputs can be supplied with a DC voltage of up to 50 V with current limitation to max. 100mA

Minus should be connected directly to the common terminal, outputs should be connected through the load to the plus.

Table 14. Versions with electronic fuse monitoring module

Version		Weight	Article No.
Fuse switch disconnectors smartARS 00 pro - 160A			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smatARS 00-1-V-X-E pro	cable terminals: V-terminals: V-clamps 25-150SW + hooked clamps	3,1 kg	63-001606-201
Fuse switch disconnectors smartARS 2 pro - 400A			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V-X pro	cable terminals: V-terminals: V-clamps 240 mm²	5,9 kg	63-001340-601
smartARS 2-1-M-X pro	cable terminals: screw terminals: pressed nuts M12	5,8 kg	63-001340-603
smartARS 2-1-2V-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,5 kg	63-001340-605
smatARS 2-1-V-X-E pro	cable terminals: V-terminals + M12 screws for fixing to busbar system	6,0 kg	63-811830-201
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V-X pro	cable terminals: V-terminals: V-clamps 240 mm²	5,9 kg	63-001341-601
smartARS 2-6-M-X pro	cable terminals: screw terminals: pressed nuts M12	5,8 kg	63-001341-603
smartARS 2-6-2V-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,5 kg	63-001341-605
smartARS 2 pro version equipped with modules for fast installation using PPN technology			
for installation on 185 mm busbar system, fast installation modules equipped with screws, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V SM-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,3 kg	63-001340-701
smartARS 2-1-M SM-X pro	cable terminals: screw terminals: pressed nuts M12	6,2 kg	63-001340-703
smartARS 2-1-2V SM-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,9 kg	63-001340-705
for installation on 185 mm busbar system, fast installation modules equipped with screws, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V SM-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,5 kg	63-001341-701
smartARS 2-6-M SM-X pro	cable terminals: screw terminals: pressed nuts M12	6,4 kg	63-001341-703
smartARS 2-6-2V SM-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,9 kg	63-001341-705
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, ONE POLE SWITCHING - each phase independently			
smartARS 2-1-V SMH-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,5 kg	63-001340-801
smartARS 2-1-M SMH-X pro	cable terminals: screw terminals: pressed nuts M12	6,4 kg	3-001340-803
smartARS 2-1-2V SMH-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,9 kg	63-001340-805
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, THREE POLE SWITCHING - all phases simultaneously			
smartARS 2-6-V SMH-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,5 kg	63-001341-801
smartARS 2-6-M SMH-X pro	cable terminals: screw terminals: pressed nuts M12	6,4 kg	63-001341-803
smartARS 2-6-2V SMH-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,9 kg	63-001341-805

Fuse switch disconnectors smartARS 3 pro - 630A			
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,7 kg	63-001340-602
smartARS 3-1-M-X pro	cable terminals: screw terminals: pressed nuts M12	6,6 kg	63-001340-604
smartARS 3-1-2V-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,3 kg	63-001340-606
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V-X pro	cable terminals: V-terminals: V-clamps 240 mm²	6,7 kg	63-001341-602
smartARS 3-6-M-X pro	cable terminals: screw terminals: pressed nuts M12	6,6 kg	63-001341-604
smartARS 3-6-2V-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,3 kg	63-001341-606
smartARS 3 pro version equipped with modules for fast installation using PPN technology			
for installation on 185 mm busbar system, fast installation modules equipped with screws, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V SM-X pro	cable terminals: V-terminals: V-clamps 240 mm²	7,1 kg	63-001340-702
smartARS 3-1-M SM-X pro	cable terminals: screw terminals: pressed nuts M12	7,0 kg	63-001340-704
smartARS 3-1-2V SM-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,7 kg	63-001340-706
for installation on 185 mm busbar system, fast installation modules equipped with screws, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V SM-X pro	cable terminals: V-terminals: V-clamps 240 mm²	7,1 kg	63-001341-702
smartARS 3-6-M SM-X pro	cable terminals: screw terminals: pressed nuts M12	7,0 kg	63-001341-704
smartARS 3-6-2V SM-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,7 kg	63-001341-706
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, ONE POLE SWITCHING - each phase independently			
smartARS 3-1-V SMH-X pro	cable terminals: V-terminals: V-clamps 240 mm²	7,3 kg	63-001340-802
smartARS 3-1-M SMH-X pro	cable terminals: screw terminals: pressed nuts M12	7,2 kg	63-001340-804
smartARS 3-1-2V SMH-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,9 kg	63-001340-806
for installation on 185 mm busbar system, fast installation modules equipped with hooked clamps, THREE POLE SWITCHING - all phases simultaneously			
smartARS 3-6-V SMH-X pro	cable terminals: V-terminals: V-clamps 240 mm²	7,3 kg	63-001341-802
smartARS 3-6-M SMH-X pro	cable terminals: screw terminals: pressed nuts M12	7,2 kg	63-001341-804
smartARS 3-6-2V SMH-X pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,9 kg	63-001341-806

ARS pro

vertical fuse switch disconnectors

- fibre glass extra strenghtened, self extinguishing
- thermoplastics of V0 flammability class
- double clearance between open contacts
- arc chambers with deionization plates over every contact
- reversibility - top/bottom cable terminal connection
- wide range of accesories

GENERAL NFORMATION

ARS pro vertical fuse switch disconnectors are designed for distribution of electricity and protection against short circuits and overloads in three phase alternative current circuits. They are intended for direct installation on horizontal or vertical busbar systems.

ARS pro fuse switch disconnectors meet technical requirements of electricity boards and are conforming to EN 60947-1, EN 60947-3, IEC 60947-1, IEC 60947-3 standards. **ARS pro** fuse switch disconnectors are dedicated for applications which require reliability and safety like low voltage distribution boards installed in transformer substations, industrial low voltage distribution boards and cable cabinets.

Removal of the fuse links provides clearly noticeable, large isolating distances in the circuit.

ARS pro fuse switch disconnectors are designed to perform the following functions:

- protection,
- energy distribution,
- earthing,
- switching,
- touch protection.

CONSTRUCTION

ARS pro fuse switch disconnectors are manufactured in two versions:

- one pole switching (separately each pole),
- three pole switching (three poles at the same time).

ARS pro fuse switch disconnectors have manually operated handle therefore making and breaking operations should be done with determined movement.

ARS pro fuse switch disconnectors are available in following sizes (according to rated current): 00 (160 A); 2 (400 A); also available are versions 910A and 1250A.

ARS pro fuse switch disconnectors (size 2-400A; 910A ; 1250A) are designed for installation on 185 mm busbar system.

ARS 00/100 mm pro fuse switch disconnector (size 00) is designed for installation on 100 mm busbar system.

By using the adapter, it is possible to mount the ARS 00 / 100mm pro switch disconnector on busbar system with a spacing of 185 mm.

All plastic parts of fuse switch disconnector **ARS pro** are made of halogen free, fibre glass strengthened, self extinguishing materials. Thanks to the application of flame retardants the highest flammability class – V0 was achieved. Fuse switch disconnectors made from such termoplastics self-extinguish in specified time after ignition source is removed. Also dripping of flaming parts of plastic does not occur.

Silver plated contacts provide low power loss. Depending on clamp type, **ARS pro** fuse switch disconnectors enable user to connect circular or sector-shaped conductors with bare ends or conductors with lug terminals. Arc chambers equipped with steel deionization plates are installed over each contact. **ARS pro** fuse switch disconnectors are designed for using current transformers and ammeters. Protection degree of IP30 from the front is provided. In opened position **ARS pro** provide protection degree IP20. Additionally offered accesories enable to install **ARS pro** fuse switch disconnectors of different sizes on common busbar systems and facilitate operation. All sizes of **ARS pro** fuse switch disconnectors are provided complete with clamps (i. e. screws, V-terminals, 2V-terminals) and shrouds for cable terminals.

Table 15. Technical data ARS pro

Parameter			ARS 00/60 mm pro	ARS 00/100 mm pro	ARS 400 pro	ARS 630 pro	ARS 630 kVA pro	RWS 600 pro	RWS 750 pro	RWS 1250 pro	ARS 1250 pro
Rated thermal current $I_{th}=I_n$ with fuse links		A	160	160	400	630	910	-	-	-	1250
Rated thermal current I_{th} with solid links		A	-	-	-	-	-	600	750	1250	-
Rated voltage U_n		V	690	690	690	690	400	690	500	400	400
Utilization category	690 V		AC-22B	AC-22B	AC-22B	AC-22B	-	AC-22B	-	-	
	500 V						-		AC-22B	-	-
	400 V		AC-23B	AC-23B			AC-22B			AC-22B	AC-21B
Rated switching current I_e		A	160	160	400	630	910	600	750	1250	1250
Rated short-circuit making current	690 V	kA	80	25	100	100	-	-	-	-	-
	500 V		120		120	120	-				-
	400 V		-				50				100
Rated short-circuit withstand current	690 V	kA	80	100	100	100	-	-	-	-	-
	500 V		120		120	120	-				-
	400 V		-				50				100
Rated insulation voltage U_i		V	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage $U_{imp.}$		kV	8	8	12	12	12	12	12	12	12
Rated short time withstand current I_{cw}		kA	-	-	-	-	-	15[3]	15[3]	15/20[2]	-
Rated frequency		Hz	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60
Mechanical durability		Number of cycles	1600	1600	1000	1000	600	1000	1000	600	600
Electrical durability			200	200	200	200	100	200	200	100	100
IP degree of protection		IP	30	30	30	30	30	30	30	30	30
Fuse links size		-	00	00	1, 2	3	gTr 630 kVA[1]	solid-links ZN2	solid-links ZN3	solid-links ZN3 -1250 A	3

[1] fuse link gTr 630 kVA, DIN 43620, VDE 0636/2011, size NH3
[2] with mechanical lock
[3] use of mechanical lock recommended

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34,
- ambient temperature from -25 °C to +55 °C,
- relative humidity of the air should not be higher than 50% at temperature of +40°.

FUNCTIONALITY

- making and breaking operations should be done with determined movement,
- parallelly moving, double contact system,
- designed for installation on to 60 mm, 100 mm or 185 mm busbar system,
- two versions: single pole switching (separately each pole) or triple pole switching (three poles at the same time),
- width 50 mm (ARS 00/60 mm pro, ARS 00/100 mm pro); width 100 mm (ARS 400 pro, ARS 630 pro, RWS 600 pro, RWS 750 pro, RWS 1250 pro) or 200 mm (ARS 1250 pro),
- suitable for top cable terminal connection,
- possible connection of conductors with lug terminals (screw terminals) or circular/sector-shaped conductors with bare ends (V-terminals, 2V-terminals) using V-clamps,
- voltage test is performed through test holes leading to blade contacts,
- possible installation of various types of earthing devices.

FUSE SWITCH DISCONNECTOR ARS 00/60 mm pro (160 A, 690 V)

Table 16. Technical data

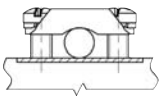
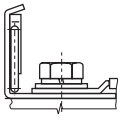
Parameter			ARS 00/60 mm pro	
Rated thermal current $I_{th}=I_n$		A	160	
Rated voltage U_n		V	690	
Utilization category		-	AC-22B	AC-23B
Rated switching voltage U_e		V	690	400
Rated switching current I_e		A	160	
Rated short circuit making current	690 V	kA	80	
	500 V		120	
Rated short circuit withstand current	690 V	kA	80	
	500 V		120	
Rated insulation voltage U_i		V	1000	
Rated impulse withstand voltage $U_{imp.}$		kV	8	
Rated frequency		Hz	50-60	
Mechanical durability		Number of cycles	1600	
Electrical durability			200	
IP degree of protection		IP	30	
Fuse links size		-	00	

ARS 00/60 mm pro

Table 17. Versions

	Version of ARS 00/60 mm pro		Article No.
APASYS 60	**three pole switching - all phases simultaneously (for installation on to 60 mm busbar system)**		
	ARS 00/60 mm pro	cable terminals: bridge terminals with bridge clamps (S) 4-70 mm² screw terminals with M8 screws	63-002354-001
	ARS 00/60 mm-T pro	cable terminals: frame clamps 2,5-70 mm²	63-002354-002

Table 18. ARS 00/60 mm pro terminal clamps

Description	ARS 00/60 mm pro		
Clamp	S-bridge clamp 2 x M5 x 20	screw M8*	frame clamps
Picture of clamp			
Drawing of clamp			
Cross –section of conductors	4 - 70 mm²	Conductor with lug termina max 95 mm²	2,5 - 70 mm²
Tightening torque	3 Nm**	10 Nm**	6 Nm**

For stranded conductors using cable ferrules is recommended

*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals

**) using tension wrench is recommended

FUSE SWITCH DISCONNECTOR ARS 00/100 mm pro (160 A, 690 V)

For installation on to 100 mm busbar system

Fuse switch disconnector's width 50 mm

Three pole switching - all phases simultaneously

ARS 00/100 mm pro (160 A, 690 V)

ARS 00/100 mm pro

Table 19. Technical data

Parameter		ARS 00/100 mm pro	
Rated thermal current $I_{th}=I_n$	A	160	
Rated voltage U_n	V	690	
Utilization category	-	AC-22B	AC-23B
Rated switching voltage U_e	V	690	400
Rated switching current I_e	A	160	
Rated short circuit making current	kA	25	
Rated short circuit withstand current	kA	100	
Rated insulation voltage U_i	V	1000	
Rated impulse withstand voltage $U_{imp.}$	kV	8	
Rated frequency	Hz	50-60	
Mechanical durability	Number of cycles	1600	
Electrical durability		200	
IP degree of protection	-	30	
Fuse links size	-	00	

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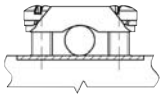
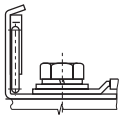
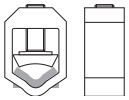
Table 20. Versions

Version		Weight	Article No.
three pole switching - all phases simultaneously (for installation on to 100 mm busbar system)			
ARS 00/100 mm pro	cable terminals: bridge terminals with bridge clamps (S) 4-70 mm², screw terminals with M8 screws	1,3 kg	63-811628-041
ARS 00/100 mm-V pro	cable terminals: V-terminals with V-clamps 25-150 SW	1,5 kg	63-811628-061

Table 21. ARS 00/100 mm pro terminal clamps

Description	ARS 00/100 mm pro			
Clamp	S-bridge clamp 2 x M5 x 20	screw M8*	V-clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross –section of conductors	4-70 mm²	Conductor with lug terminal max 185 mm²	re ● 16 mm² - 95 mm² se ◆ 25 mm² - 150 mm² rm ⊗ 16 mm² - 95 mm² sm ⊗ 25 mm² - 150 mm²	re ● 10 mm² - 70 mm² se ◆ 20 mm² - 120 mm² rm ⊗ 10 mm² - 70 mm² sm ⊗ 25 mm² - 95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

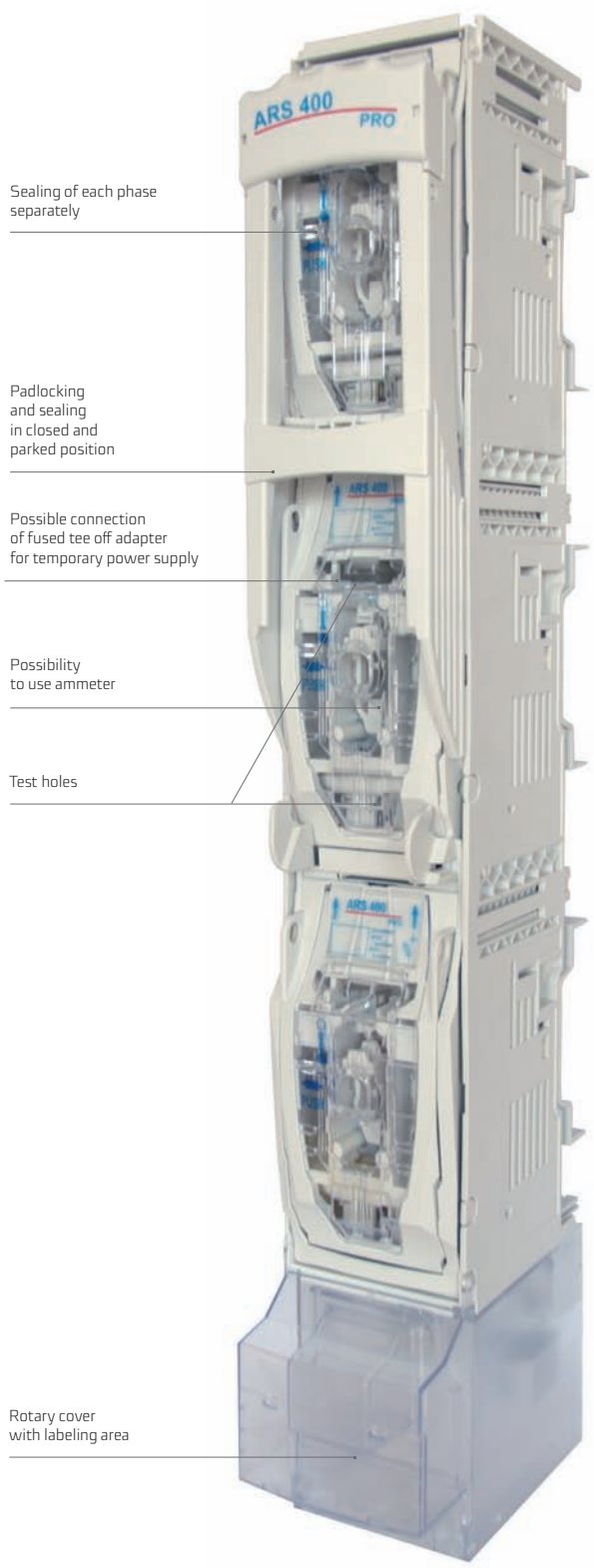
For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system –12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE SWITCH DISCONNECTOR ARS 400 pro (400 A, 690 V)
ARS 630 pro (630 A, 690 V)

For installation on to 185 mm busbar system

Fuse switch disconnector's width 100 mm

Three pole switching - all phases simultaneously or one pole switching - each phase independently



FUSE SWITCH DISCONNECTOR ARS 400 pro (400 A, 690 V)

Designed for operation with NH1 and NH2 fuse links

Table 22. Technical data

Parameter			ARS 400 pro
Rated thermal current $I_{th}=I_n$		A	250(NH1), 400(NH2)
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching voltage U_e		V	690
Rated switching current I_e		A	250(NH1), 400(NH2)
Rated short circuit making current	690 V 500 V	kA	100 120
Rated short circuit withstand current	690 V 500 V	kA	100 120
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1000
Electrical durability			200
IP degree of protection		-	30
Fuse links size		-	1, 2

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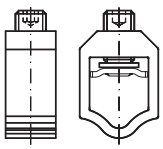
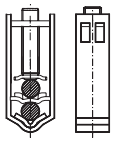
ARS 400-1-M pro

ARS 400-6-M pro

Table 23. Versions

Version		Weight	Article No.
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
ARS 400-1-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,2 kg	63-001968-011
ARS 400-1-M pro	cable terminals: screw terminals: pressed nuts M10	4,9 kg	63-001968-021
ARS 400-1-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	5,8 kg	63-001968-031
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
ARS 400-6-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,2 kg	63-001971-011
ARS 400-6-M pro	cable terminals: screw terminals: pressed nuts M10	4,9 kg	63-001971-021
ARS 400-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	5,8 kg	63-001971-031

Table 24. ARS 400 pro terminal clamps

Description	ARS 400-x-V pro		ARS 400-x-2V pro		ARS 400 2-x-2V pro		ARS 400-x-M pro
Clamp	V–clamp 35-300SW-B		V–clamp 2/50-300SW-B		V–clamp HS 2/50-240-C*		M–screw M10**
Drawing of clamp							
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with crosssection of:						Lug terminal
	35 - 185 mm²	35 - 240 mm²	50 - 185 mm²	50 - 240 mm²	50 - 185 mm²	50 - 240 mm²	
	35 - 240 mm²	35 - 300 mm²	50 - 240 mm²	50 - 300 mm²	50 - 240 mm²	50 - 300 mm²	
Tightening torque	30 Nm		30 Nm		40 Nm		32 Nm

For stranded conductors using cable ferrules is recommended

*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order

**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed

Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M10 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

FUSE SWITCH DISCONNECTOR ARS 630 pro (630 A, 690 V)

Designed for operation with NH3 fuse links

ARS 630-1-M pro

ARS 630-6-M pro

Table 25. Technical data

Parameter			ARS 630 pro
Rated thermal current $I_{th}=I_n$		A	630
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching voltage U_e		V	690
Rated switching current I_e		A	630
Rated short circuit making current	690 V 500 V	kA	100 120
Rated short circuit withstand current	690 V 500 V	kA	100 120
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1000
Electrical durability			200
IP degree of protection		-	30
Fuse links size		-	3

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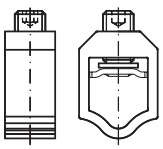
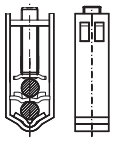
Table 26. Versions

Versions		Weight	Article No.
for installation on 185 mm busbar system, one pole switching - each phase independently			
ARS 630-1-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-011801-011
ARS 630-1-M pro	cable terminals: screw terminals: pressed nuts M12	5,5 kg	63-011801-021
ARS 630-1-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-011801-031
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
ARS 630-6-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-011802-011
ARS 630-6-M pro	cable terminals: screw terminals: pressed nuts M12	5,5 kg	63-011802-021
ARS 630-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-011802-031

Table 27. ARS 630 pro terminal clamps

Description	ARS 630-x-V pro	ARS 630-x-2V pro	ARS 630-x-2V pro	ARS 630-x-M pro
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M12**
Drawing of clamp				
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ● 35 - 240 mm² ● 35 - 240 mm² ◆ 35 - 300 mm² ◆	50 - 185 mm² ● 50 - 240 mm² ● 50 - 240 mm² ◆ 50 - 300 mm² ◆	50 - 185 mm² ● 50 - 240 mm² ● 50 - 240 mm² ◆ 50 - 300 mm² ◆	
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

FUSE SWITCH DISCONNECTOR ARS 630 kVA pro

Fuse switch disconnector ARS 630 kVA pro is dedicated for protection of transformers up to 630 kVA
Fuse switch disconnector is designed for operation with NH fuse links of size 3, with gTr characteristic

Table 28. Technical data

Parameter		ARS 630 kVA pro
Rated thermal current $I_{th}=I_n$	A	910
Rated voltage U_n	V	400
Utilization category	-	AC-22B
Rated switching voltage U_e	V	400
Rated switching current I_e	A	910
Rated short circuit making current	kA	50
Rated short circuit withstand current	kA	50
Rated insulation voltage U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	600
Electrical durability		100
IP degree of protection	-	30
Weight	kg	8,7
Fuse links size	-	gTr 630 kVA[1)]

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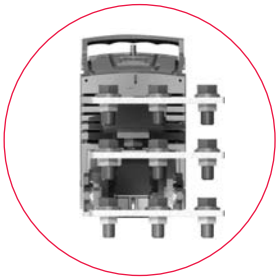
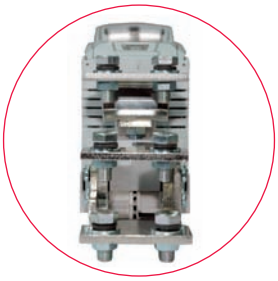
[1)] Fuse link gTr 630 kVA, DIN 43620, VDE 0636/2011, size NH3

ARS 630 kVA pro



Cable terminal:
three pressed nuts M12



Cable terminal:
two pressed nuts M12

Table 29. Versions

Versions		Article No.
for installation on 185 mm busbar system		
one pole switching - each phase independently		
ARS 630 kVA-1-2M pro	cable terminals: screw terminals with two pressed nuts M12/pole, width 100 mm	63-811860-001
ARS 630 kVA-1-3M pro	cable terminals: screw terminals with three pressed nuts M12/pole, width 200 mm	63-811860-002
three pole switching - all phases simultaneously		
ARS 630 kVA-6-2M pro	cable terminals: screw terminals with two pressed nuts M12/pole, width 100 mm	63-811722-011
ARS 630 kVA-6-3M pro	cable terminals: screw terminals with three pressed nuts M12/pole, width 200 mm	63-811722-021

Recommended tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 56Nm, screws and nuts property class 8.8.

Table 30. ARS 630 kVA pro terminal clamps

Description	ARS 630 kVA pro
Clamp	pressed nuts M12
Drawing of clamp	
Cross – section of conductors	Cable lugs, max 300 mm^2
Tightening torque	56 Nm

SWITCH DISCONNECTOR RWS 600 pro (600 A, 690 V)

Switch disconnector designed for operation with solid links of size 2

RWS 600-6-V pro

Table 31. Technical data

Parameter		RWS 600 pro
Rated thermal current $I_{th}=I_n$	A	600
Rated voltage U_n	V	690
Utilization category	-	AC-22B
Rated switching voltage U_e	V	690
Rated switching current I_e	A	600
Rated insulation voltag U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated short time withstand current I_{cw}	kA	15[1)]
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	1000
Electrical durability		200
IP degree of protection	-	30
Solid links size	-	2

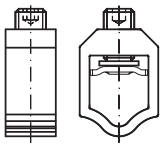
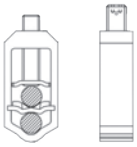
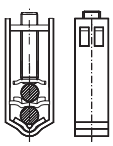
Accessories on page 54, 55

[1)] use of mechanical lock recommended

Table 32. Versions

Version		Weight	Article No
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
RWS 600-6-V pro	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-002228-001
RWS 600-6-M pro	cable terminals: screw terminals: pressed nuts M12	5,7 kg	63-002228-002
RWS 600-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-002228-003

Table 33. RWS 600 pro terminal clamps

Description	RWS 600-6-V pro		RWS 600-6-2V pro		RWS 600-6-2V pro		RWS 600-6-M pro
Clamp	V–clamp 35-300SW-B		V–clamp 2/50-300SW-B		V–clamp HS 2/50-240-C*		M–screw M12**
Drawing of clamp							
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:						Lug terminal
	35 - 185 mm²	35 - 240 mm²	50 - 185 mm²	50 - 240 mm²	50 - 185 mm²	50 - 240 mm²	
	35 - 240 mm²	35 - 300 mm²	50 - 240 mm²	50 - 300 mm²	50 - 240 mm²	50 - 300 mm²	
Tightening torque	30 Nm		30 Nm		40 Nm		56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

SWITCH DISCONNECTOR RWS 750 pro (750 A, 500 V)

Switch disconnector designed for operation with solid links of size 3

Table 34. Technical data

Parameter		RWS 750 pro
Rated thermal current $I_{th}=I_n$	A	750
Rated voltage U_n	V	500
Utilization category	-	AC-22B
Rated switching voltage U_e	V	500
Rated switching current I_e	A	750
Rated insulation voltag U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated short time withstand current I_{cw}	kA	15[1)]
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	1000
Electrical durability		200
IP degree of protection	-	30
Solid links size	-	3

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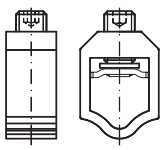
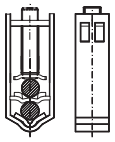
1) use of mechanical lock recommended

RWS 750-6-V pro

Table 35. Versions

Version		Weight	Article No
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
RWS 750-6-V pro	cable terminals: V-terminals: V-clamps 240 mm²	6,6 kg	63-002229-001
RWS 750-6-M pro	cable terminals: screw terminals: pressed nuts M12	6,5 kg	63-002229-002
RWS 750-6-2V pro	cable terminals: 2V-terminals: double V-clamps 240 mm²	7,2 kg	63-002229-003

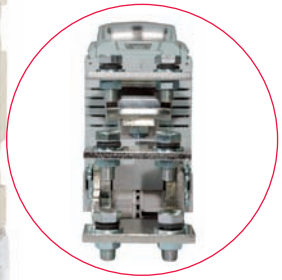
Table 36. RWS 750 pro terminal clamps

Description	RWS 750-6-V pro	RWS 750-6-2V pro	RWS 750-6-2V pro	RWS 750-6-M pro
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M12**
Drawing of clamp				
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ● 35 - 240 mm² ●	50 - 185 mm² ● 50 - 240 mm² ●	50 - 185 mm² ● 50 - 240 mm² ●	
	35 - 240 mm² ◆ 35 - 300 mm² ◆	50 - 240 mm² ◆ 50 - 300 mm² ◆	50 - 240 mm² ◆ 50 - 300 mm² ◆	
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

SWITCH DISCONNECTOR RWS 1250 pro

Main switch-disconnector 1250 A, equipped with ZN3 1250A solid-links
Switch-disconnector's width 100 mm
For installation on 185 mm busbar system



Cable terminal:
two pressed
nuts M12

RWS 1250-6-2M pro

Table 37. Technical data

Parameter		RWS 1250 pro
Rated thermal current $I_{th}=I_n$	A	1250
Rated voltage U_n	V	400
Utilization category	-	AC-22B
Rated switching voltage U_e	V	400
Rated switching current I_e	A	1250
Rated insulation voltage U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated short time withstand current I_{cw}	kA	15/20[1)]
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	600
Electrical durability		100
IP degree of protection	-	30
Weight	kg	8,7
Solid links size	-	ZN3 -1250 A

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[1)] with mechanical lock

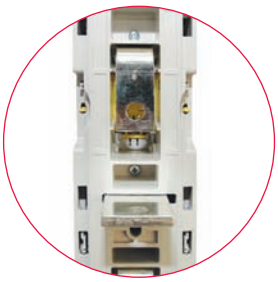
Table 38. Versions

Version		Article No.
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously		
RWS 1250 - 6 - 2M pro	cable terminals: screw terminals with two pressed nuts M12/pole, width 100 mm	63-811828-011
RWS 1250 - 6 - 3M pro	cable terminals: screw terminals with three pressed nuts M12/pole, width 200 mm	63-811828-021
RWS 1250 - 6 - T pro	power supply connection at the back of the switch disconnector, feeding rail's length = 120 mm, feeding rails designed for fixing with M12 screws	63-811861-001
RWS 1250 - 6 - T pro	power supply connection at the back of the switch disconnector, feeding rail's length = 170 mm, feeding rails designed for fixing with M12 screws	63-811861-002
RWS 1250 NL pro	coupling switch-disconnector with lateral busbar terminals; cable terminals: screw terminals with pressed nuts M12, lateral busbar terminal - left side	63-811862-005
RWS 1250 NR pro	coupling switch-disconnector with lateral busbar terminals; cable terminals: screw terminals with pressed nuts M12, lateral busbar terminal - right side	63-811862-001

Table 39. RWS 1250 pro terminal clamps

Description	RWS 1250 pro
Clamp	pressed nuts M12
Drawing of clamp	
Cross-section of conductors	Cable lugs, max 300 mm^2
Tightening torque	56 Nm

cable terminals:
screw terminals with three
pressed nuts M12/pole



RWS 1250 pro
with outgoing terminals
at the back of the switch

energy distribution

SWITCH DISCONNECTOR ARS 1250 pro

Fuse switch disconnector's width 200 mm

Table 40. Technical data

Parameter		ARS 1250 pro
Rated thermal current $I_{th}=I_n$	A	1250
Rated voltage U_n	V	400
Utilization category	-	AC-21B
Rated switching voltage U_e	V	400
Rated switching current I_e	A	1250
Rated short circuit making current	kA	100
Rated short circuit withstand current	kA	100
Rated insulation voltage U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	600
Electrical durability		100
IP degree of protection	-	30
Fuse links size	-	3

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ARS 1250-1-3M pro

ARS 1250-6-3M pro

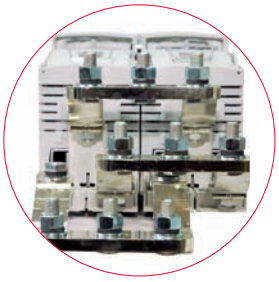
Table 41. Versions

Version		Weight	Article No.
for installation on to 185 mm busbar system, fuse disconnector's width – 200 mm			
one pole switching - each phase independently			
ARS 1250-1-3M pro	mechanically and electrically coupled two ARS 3 pro fuse switch disconnectors, cable terminals: screw terminals with three pressed screw M12/pole	16,3 kg	63-811757-011
ARS 1250-1-4M pro	mechanically and electrically coupled two ARS 3 pro fuse switch disconnectors, cable terminals: screw terminals with four pressed screw M12/pole	17 kg	63-811757-021
three pole switching - all phases simultaneously			
ARS 1250-6-3M pro	mechanically and electrically coupled two ARS 3 pro fuse switch disconnectors, cable terminals: screw terminals with three pressed screw M12/pole	16,3 kg	63-811756-011
ARS 1250-6-4M pro	mechanically and electrically coupled two ARS 3 pro fuse switch disconnectors, cable terminals: screw terminals with four pressed screw M12/pole	17 kg	63-811756-021

Recommended tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 56Nm, screws and nuts property class 8.8

Table 42. ARS 1250-x-M pro terminal clamps

Description	ARS 1250-x-3M pro	ARS 1250-x-4M pro
Clamp	three pressed nuts M12	four pressed nuts M12
Drawing of clamp		
Cross-section of conductors	Cable lugs, max 300 mm^2	Cable lugs, max 300 mm^2
Tightening torque	56 Nm	56 Nm



M3 type cable terminals: screw terminals with three pressed screw M12/pole

M3 type cable terminals: screw terminals with four pressed screw M12/pole

FUSE SWITCH DISCONNECTOR
with lateral busbar terminal

(separation, coupling of busbar systems)

ARS 400-6-NR pro

Table 43. Technical data

Parameter			ARS 400 pro
Rated thermal current $I_{th}=I_n$		A	400
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching voltage U_e		V	690
Rated switching current I_e		A	400
Rated short circuit making current	690 V 500 V	kA	100 120
Rated short circuit withstand current	690 V 500 V	kA	100 120
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1000
Electrical durability			200
IP degree of protection		-	30
Fuse links size		-	1, 2

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Table 44. Versions with lateral busbar terminal

Version		Weight	Article No
for installation on 185 mm busbar system, ONE POLE SWITCHING - each phase independently			
ARS 400-1-NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,1 kg	63-811837-011
ARS 400-1-NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,1 kg	63-811837-031
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
ARS 400-6-NL pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - left side	5,1 kg	63-811838-011
ARS 400-6-NR pro	cable terminals: screw terminals : pressed nuts M12; lateral busbar terminals - right side	5,1 kg	63-811838-031

Table 45. ARS 400 pro with lateral busbar terminals terminal clamps

Description	ARS 400-x-NL	ARS 400-x-NR
Clamp	M12 screw	M12 screw
Drawing of clamp		
Lateral busbar termina	Left side	Right side
Tightening torque	56 Nm	56 Nm

ARS

vertical fuse switch disconnectors

- fibre glass extra strenghtened, self extinguishing thermoplastics
- double clearance between open contacts
- arc chambers with deionization plates over every contact
- reversibility - top/bottom cable terminal connection
- wide range of accesories

CONSTRUCTION

ARS fuse switch disconnectors are manufactured in two versions:

- one pole switching (separately each pole),
- three pole switching (three poles at the same time).

They have manually operated handle therefore making and breaking operations should be done with determined movement.

ARS fuse switch disconnectors are available in following sizes (according to rated current): 00 (ARS 00 and ARS 00/100 mm -160 A) and 2 (ARS 400 A).

ARS fuse switch disconnectors are designed for installation on to 185 mm busbar system.

ARS of size 00 are manufactured in two versions depending on busbar system:

- ARS 00 fuse switch disconnector (160 A) for installation on to 185 mm busbar system,
- ARS 00/100 mm fuse switch disconnector (160 A) for installation on to 100 mm busbar system.
  Installation on to 185 mm busbar system is possible by using adapter.

Fuse switch disconnectors **ARS** are made of fibre glass strengthened, thermoplastic polyamides with halogen free flame retardant added. Added flame retardant provides V2 flammability class. Silver plated contacts provide low power loss. Depending on clamp type, **ARS** fuse switch disconnectors enable user to connect circular or sectorshaped conductors with bare ends or conductors with lug terminals. Arc chambers with deionization plates is installed over each contact. Such design provides efficiency of arc extinction and controlled exhaust of arc plasma. **ARS** fuse switch disconnectors are adapted for using current transformers and ammeters. Protection degree of IP30 from the front is provided. Additionally offered accesories enable to install **ARS** fuse switch disconnectors of different sizes on common busbar systems. All sizes of **ARS** fuse switch disconnectors are provided complete with clamps (i. e. screws, V-terminals, 2V-terminals) and shrouds for cable terminals.

FUNCTIONALITY

- making and breaking operations should be done with determined movement,
- parallelly moving, double contact system,
- designed for installation on to 100 mm or 185 mm busbar system,
- two versions: single pole switching (separately each pole) or triple pole switching (three poles at the same time),
- fuse switch disconnectors width: 50 mm, 100 mm, 200 mm,
- suitable for top cable terminal connection,
- possible connection of circular or sector-shaped conductors with bare ends (V-terminals, 2V-terminals or conductors with lug terminals (screw terminals).

Table 46. ARS technical data

Parameter			ARS 00/100 mm	ARS 00	ARS 400	ARS 630
Rated thermal current $I_{th}=I_n$		A	160	160	400	630
Rated voltage U_n		V	690	690	690	690
Utilization category		690 V	AC-22B	AC-22B	AC-22B	AC- 22B
Rated switching voltage U_e		V	690	690	690	690
Rated switching current I_e		A	160	160	400	630
Rated short-circuit making current	690 V	kA	25	100	100	100
	500 V				120	120
Rated short-circuit withstand current	690 V	kA	100	100	100	100
	500 V				120	120
Rated insulation voltage U_i		V	1000	1000	1000	1000
Rated impulse withstand voltage $U_{imp.}$		kV	8	12	12	12
Rated frequency		Hz	50-60	50-60	50-60	50-60
Mechanical durability		Number of cycles	1600	1600	1000	1000
Electrical durability			200	200	200	200
IP degree of protection		-	30	30	30	30
Fuse links size		-	00	00	1, 2	3

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34,
- ambient temperature from -25 °C to +55 °C,
- relative humidity of the air should not be higher than 50% at temperature of +40°,
- in case of single phase disconnector, device is dedicated to energy distribution systems;connection of primary circuits of three phase devices shouldn't be performed if switching or isolation of specific phases is required.

FUSE SWITCH DISCONNECTOR ARS 00/100 mm (160 A, 690 V)

For installation on to 100 mm busbar system
Fuse switch disconnector's width 50 mm
Three pole switching - all phases simultaneously

ARS 00/100 mm

Table 47. Technical data

Parameter		ARS 00/100 mm
Rated thermal current $I_{th}=I_n$	A	160
Rated voltage U_n	V	690
Utilization category	-	AC-22B
Rated switching voltage U_e	V	690
Rated switching current I_e	A	160
Rated short circuit making current	kA	25
Rated short circuit withstand current	kA	100
Rated insulation voltage U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	8
Rated frequency	Hz	50-60
Mechanical durability		1600
Electrical durability		200
IP degree of protection	-	30
Fuse links size	-	00

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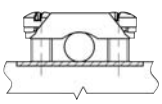
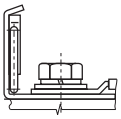
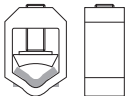
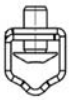
Table 48. Versions

Version		Weight	Article No.
for installation on to 100 mm busbar system ,three pole switching - all phases simultaneously			
ARS 00/100 mm	cable terminals: bridge terminals with bridge clamps (S) 4-70 mm², screw terminals with M8 screws	1,3 kg	63-811628-011
ARS 00/100 mm-V	cable terminals: V-terminals with V-clamps 25-150SW	1,5 kg	63-811628-021

Table 49. ARS 00/100 mm terminal clamps

Description	ARS 00/100 mm			
Clamp	S-bridge clamp 2 x M5 x 25	M8 screw*	V-clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross –section of conductors	4-70 mm²	Conductor with lug terminal max. 185 mm²	re ● 16 mm²-95 mm² se ◆ 25 mm²-150 mm² rm ⊗ 16 mm²-95 mm² sm ◈ 25 mm²-150 mm²	re ● 10 mm²-70 mm² se ◆ 25 mm²-120 mm² rm ⊗ 10 mm²-70 mm² sm ◈ 25 mm²-95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system – 12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE SWITCH DISCONNECTOR ARS 00 (160 A, 690 V)

For installation on to 185 mm busbar system
Three pole switching - all phases simultaneously - two-hand operation or one pole switching - each phase independently
Fuse switch disconnector's width 50 mm

Table 50. Technical data

Parameter		ARS 00
Rated thermal current $I_{th}=I_n$	A	160
Rated voltage U_n	V	690
Utilization category	-	AC-22B
Rated switching voltage U_e	V	690
Rated switching current I_e	A	160
Rated short circuit making current	kA	25
Rated short circuit withstand current	kA	100
Rated insulation voltage U_i	V	1000
Rated impulse withstand voltage $U_{imp.}$	kV	12
Rated frequency	Hz	50-60
Mechanical durability	Number of cycles	1600
Electrical durability		200
IP degree of protection	-	30
Fuse links size	-	00

Accessories on page. 52, 53

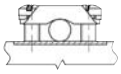
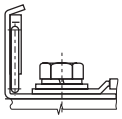
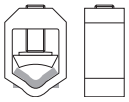
ARS 00-1

ARS 00-3

Table 51. Versions

Version		Weight	Article No.
for installation on to 185 mm busbar system, one pole switching - each phase independently			
ARS 00-1	cable terminals: bridge terminals with bridge clamps (S) 4-70 mm², screw terminals with M8 screws	2,6 kg	63-811410-011
ARS 00-1-V	cable terminals: V-terminals with V-clamps 25-150SW	2,7 kg	63-811410-021
for installation on to 185 mm busbar system, three pole switching - all phases simultaneously			
ARS 00-3	cable terminals: bridge terminals with bridge clamps (S) 4-70 mm², screw terminals with M8 screws	2,7 kg	63-811806-011
ARS 00-3-V	cable terminals: V-terminals with V-clamps 25-150SW	2,8 kg	63-811806-021

Table 52. ARS 00 terminal clamps

Description	ARS 00			
Clamp	S-bridge clamp 2 x M5 x 25	M8 screw*	V-clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross –section of conductors	4 - 70 mm²	Conductor with lug terminal max. 185 mm²	re 16 mm² - 95 mm² se 25 mm² - 150 mm² rm 16 mm² - 95 mm² sm 25 mm² - 150 mm²	re 10 mm² - 70 mm² se 25 mm² - 120 mm² rm 10 mm² - 70 mm² sm 25 mm² - 95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system – 12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE SWITCH DISCONNECTOR ARS 400 (400 A, 690 V)

For installation on to 185 mm busbar system
Three pole switching - all phases simultaneously or one pole switching - each phase independently
Fuse switch disconnector's width 100 mm
Designed for operation with NH1 and NH2 fuse links

Table 53. Technical data

Parameter			ARS 400
Rated thermal current $I_{th}=I_n$		A	250 (NH1), 400 (NH2)
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching voltage U_e		V	690
Rated switching current I_e		A	400
Rated short circuit making current	690 V	kA	100
	500 V		120
Rated short circuit withstand current	690 V	kA	100
	500 V		120
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1000
Electrical durability			200
IP degree of protection		-	30
Fuse links size		-	1, 2

Accesories on page 54, 55

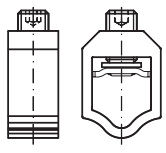
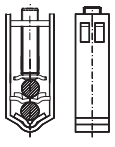
ARS 400-1-V

ARS 400-6-V

Table 54. Versions

Version		Weight	Article No.
for installation on to 185 mm busbar system, one pole switching - each phase independently			
ARS 400-1-V	cable terminals: V-terminals with V-clamps 240 mm²	5,0 kg	63-811825-011
ARS 400-1-M	cable terminals: screw terminals with pressed nuts M10	4,8 kg	63-811825-031
ARS 400-1-2V	cable terminals: 2V-terminals with double V-clamps 240 mm²	5,7 kg	63-811825-051
for installation on to 185 mm busbar system, three pole switching - all phases simultaneously			
ARS 400-6-V	cable terminals: V-terminals with V-clamps 240 mm²	5,0 kg	63-811826-011
ARS 400-6-M	cable terminals: screw terminals with pressed nuts M10	4,8 kg	63-811826-031
ARS 400-6-2V	cable terminals: 2V-terminals with double V-clamps 240 mm²	5,7 kg	63-811826-051

Table 55. ARS 400 terminal clamps

Description	ARS 400-x-V	ARS 400-x-2V	ARS 400 2-x-2V	ARS 400-x-M
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M10**
Drawing of clamp				
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ● / 35 - 240 mm² ●	50 - 185 mm² ● / 50 - 240 mm² ●	50 - 185 mm² ● / 50 - 240 mm² ●	
	35 - 240 mm² ◆ / 35 - 300 mm² ◆	50 - 240 mm² ◆ / 50 - 300 mm² ◆	50 - 240 mm² ◆ / 50 - 300 mm² ◆	
Tightening torque	30 Nm	30 Nm	40 Nm	32 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

FUSE SWITCH DISCONNECTOR ARS 630 (630 A, 690 V)

Designed for operation with NH3 fuse links

ARS 630-1-M

ARS 630-6-M

Table 58. Technical data

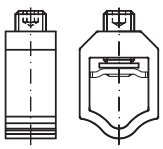
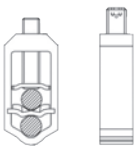
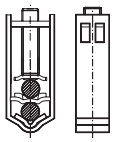
Parameter			ARS 630
Rated thermal current $I_{th}=I_n$		A	630
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching voltage U_e		V	690
Rated switching current I_e		A	630
Rated short circuit making current	690 V 500 V	kA	100 120
Rated short circuit withstand current	690 V 500 V	kA	100 120
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	12
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1000
Electrical durability			200
IP degree of protection		-	30
Fuse links size		-	3

Accessories on page 54, 55

Table 56. Versions

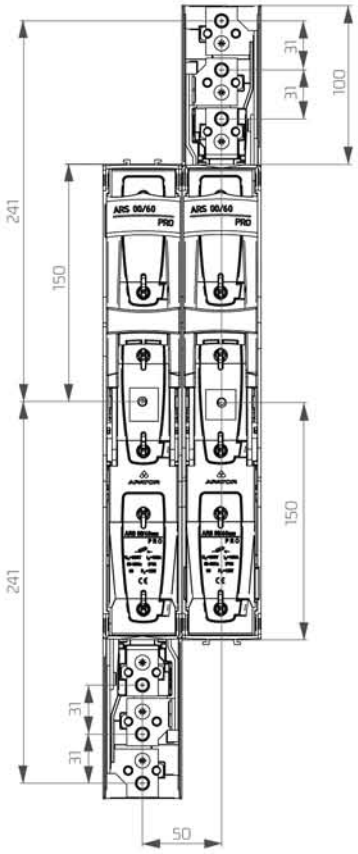
Versions		Weight	Article No.
for installation on 185 mm busbar system, one pole switching - each phase independently			
ARS 630-1-V	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-039002-011
ARS 630-1-M	cable terminals: screw terminals: pressed nuts M12	5,5 kg	63-039002-021
ARS 630-1-2V	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-039002-031
for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously			
ARS 630-6-V	cable terminals: V-terminals: V-clamps 240 mm²	5,8 kg	63-039062-011
ARS 630-6-M	cable terminals: screw terminals: pressed nuts M12	5,5 kg	63-039062-021
ARS 630-6-2V	cable terminals: 2V-terminals: double V-clamps 240 mm²	6,4 kg	63-039062-031

Table 57. ARS 630 terminal clamps

Description	ARS 630-x-V	ARS 630-x-2V	ARS 630-x-2V	ARS 630-x-M
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M12**
Drawing of clamp				
Cross – section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ⊛	35 - 240 mm² ●	50 - 185 mm² ⊛	50 - 240 mm² ●
	35 - 240 mm² ◈	35 - 300 mm² ◆	50 - 240 mm² ◈	50 - 300 mm² ◆
			50 - 185 mm² ⊛	50 - 240 mm² ●
			50 - 240 mm² ◈	50 - 300 mm² ◆
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

ARS 00/60 mm pro



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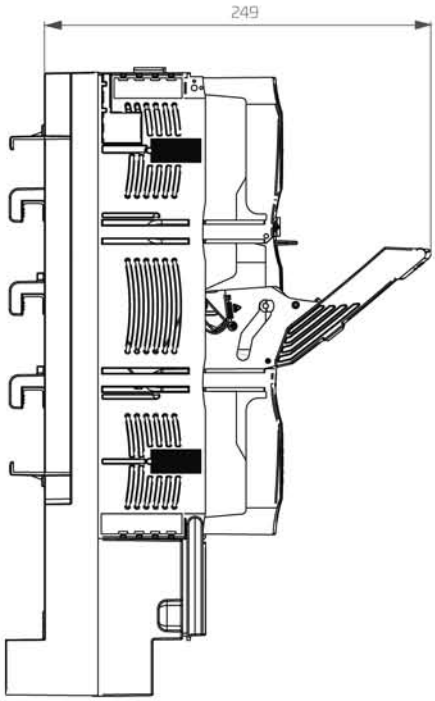

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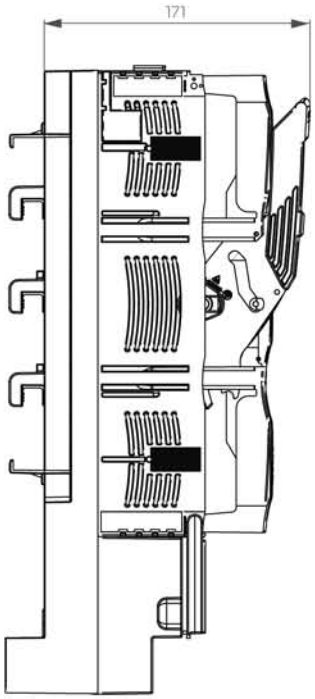

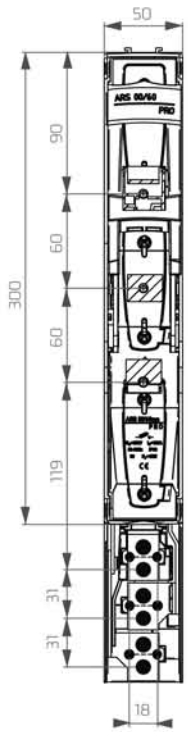

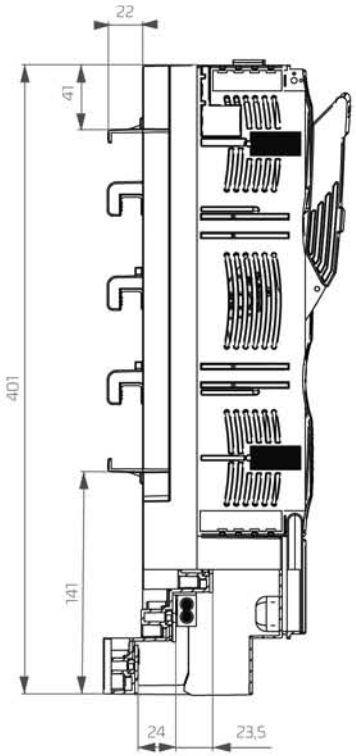

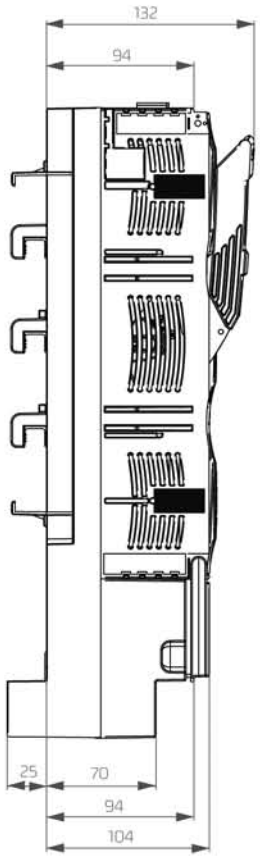

ARS 00/100 mm, ARS 00/100 mm pro

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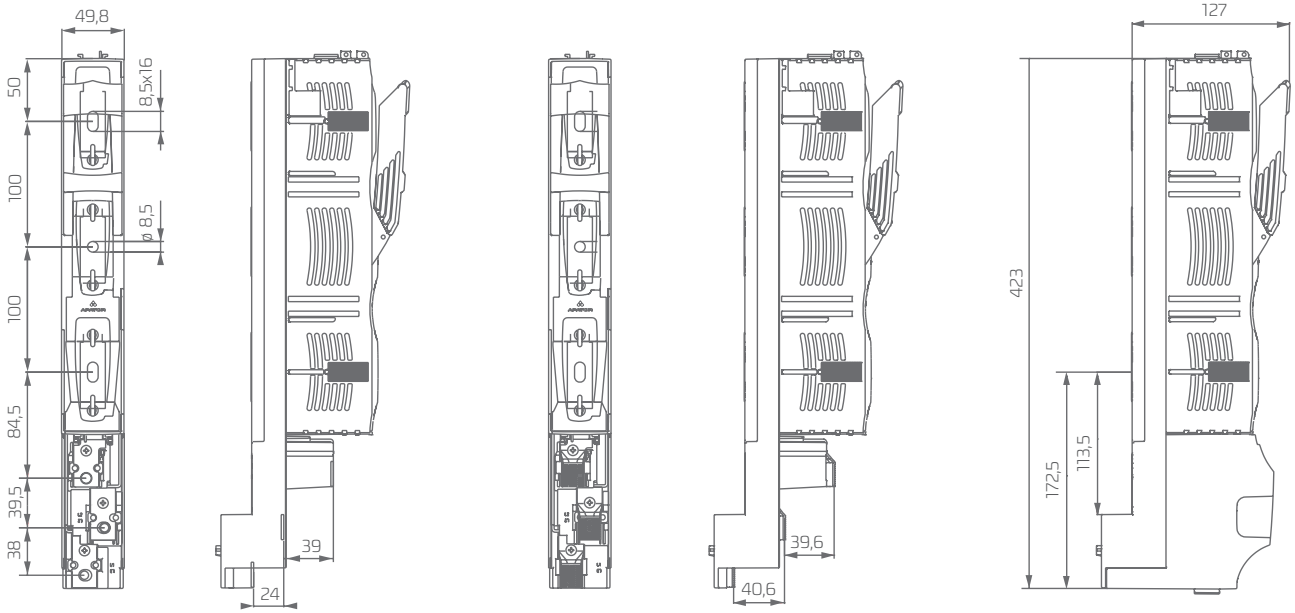

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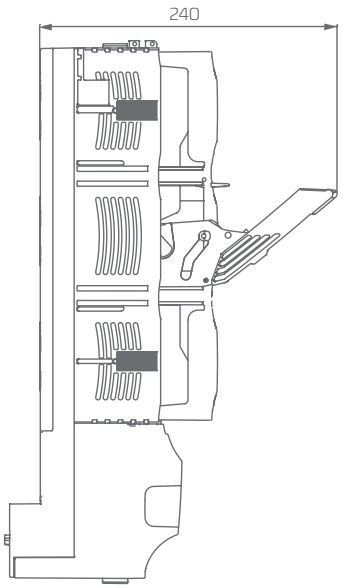

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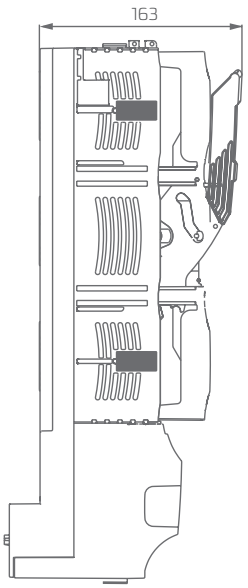

energy distribution

ARS 00, smartARS 00 pro

1-phase

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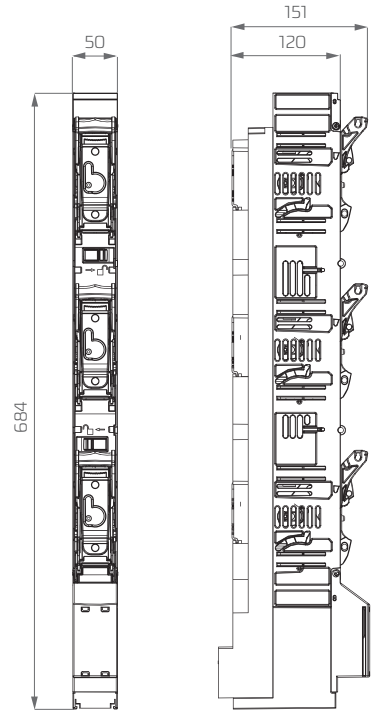

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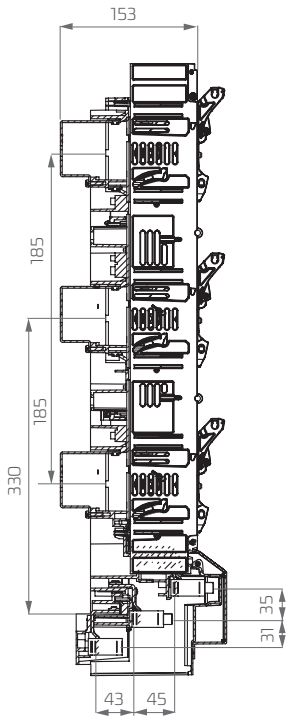

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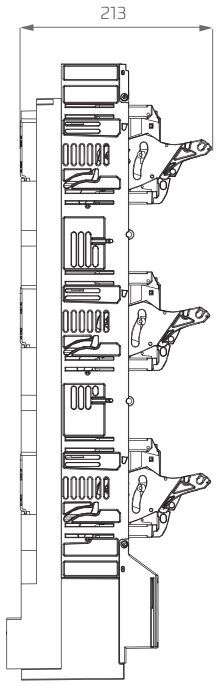

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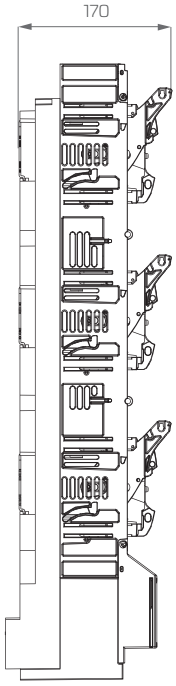

3-phase

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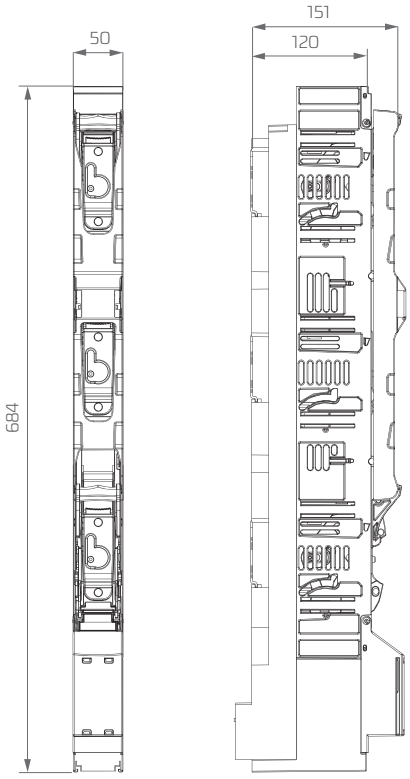

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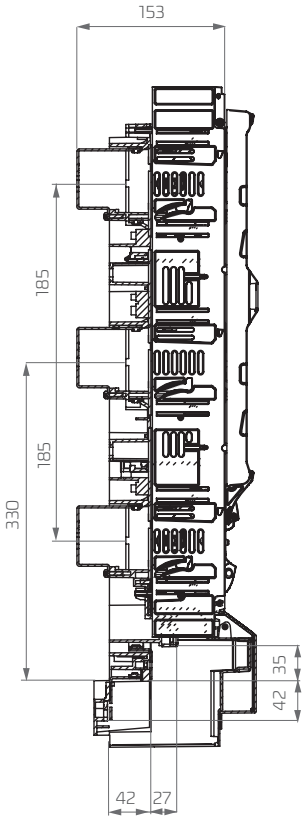

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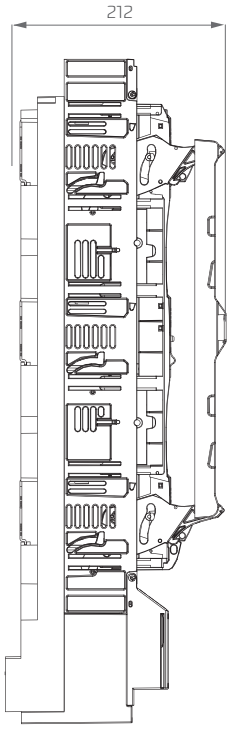

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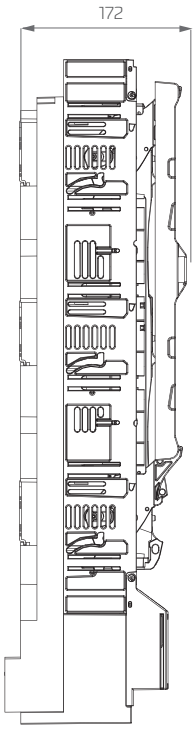
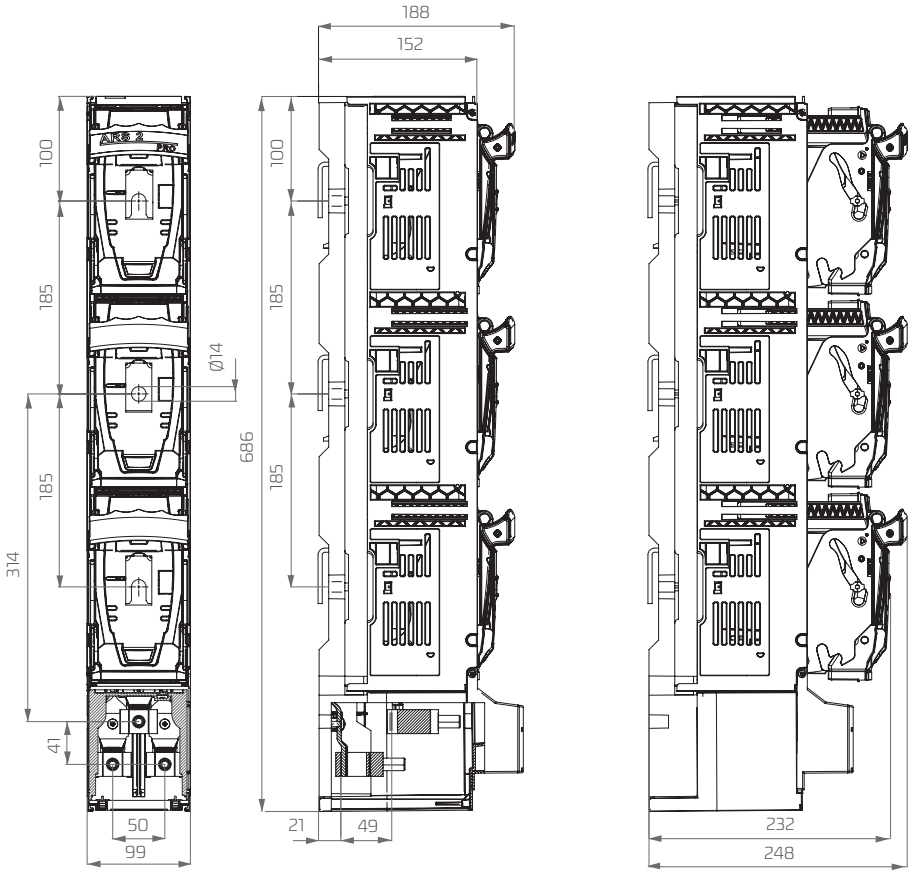
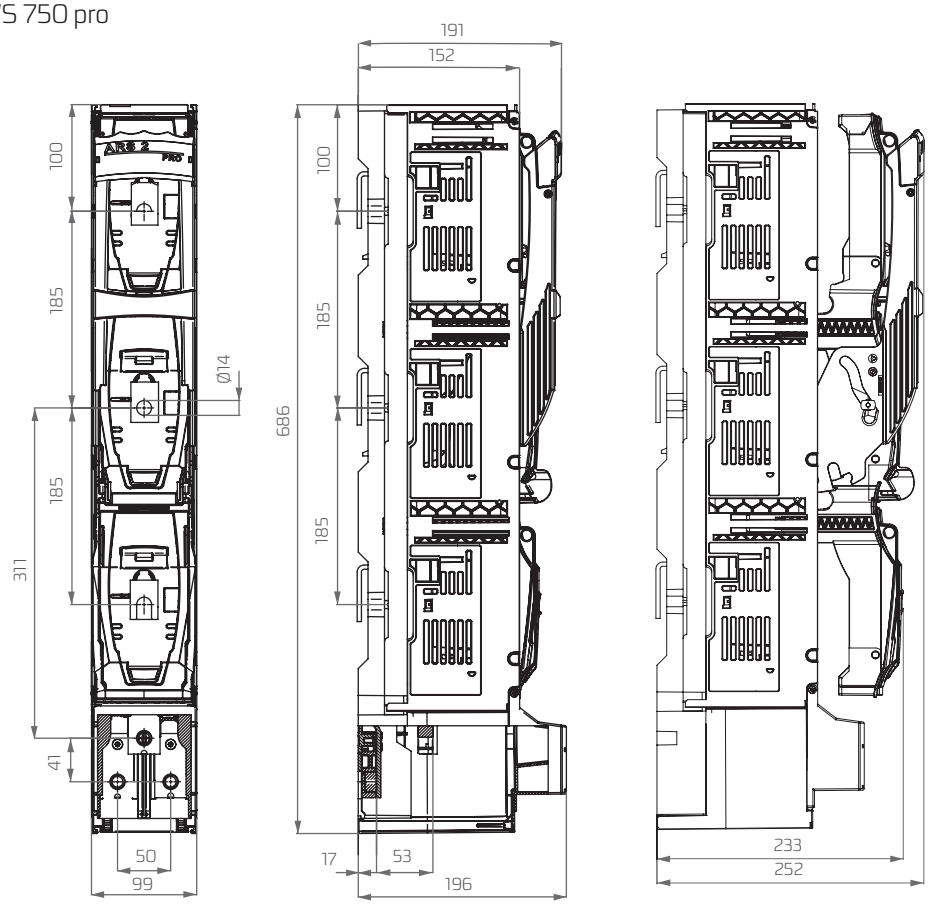


smartARS 2 pro, smartARS 3 pro (without fuse monitoring module)
1-phase

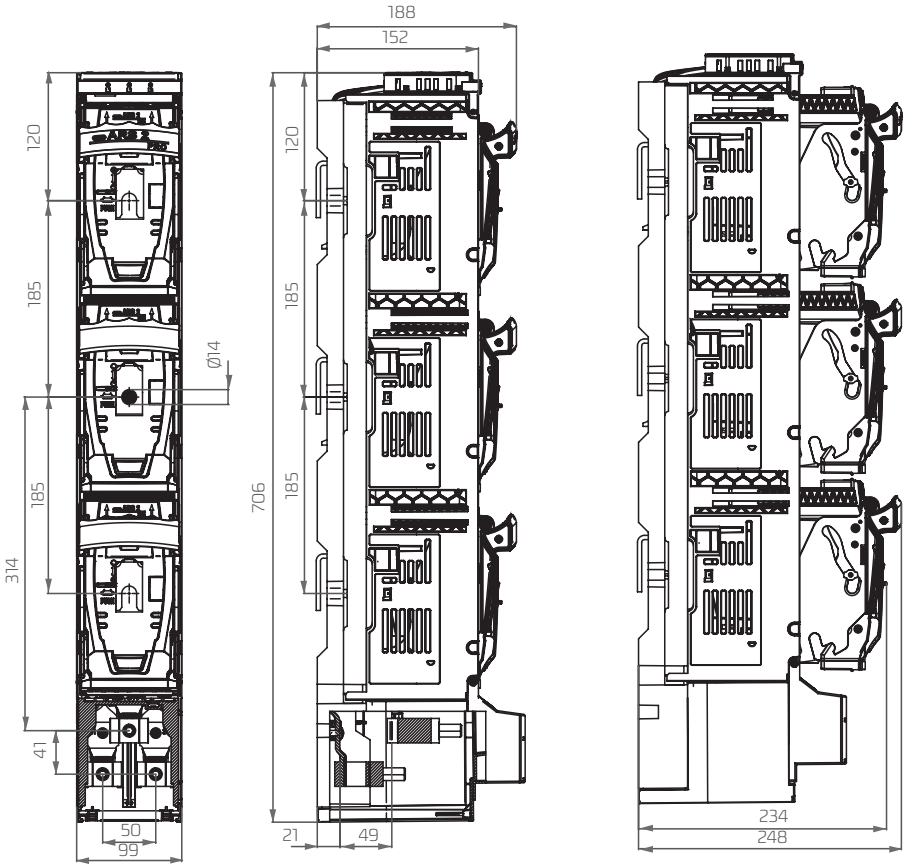


smartARS 2 pro, smartARS 3 pro (without fuse monitoring module)
RWS 600 pro, RWS 750 pro
3-phase



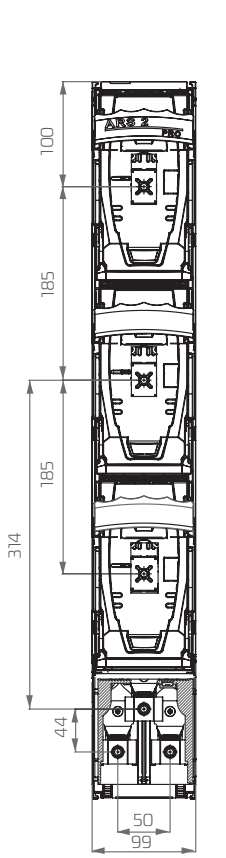
energy distribution

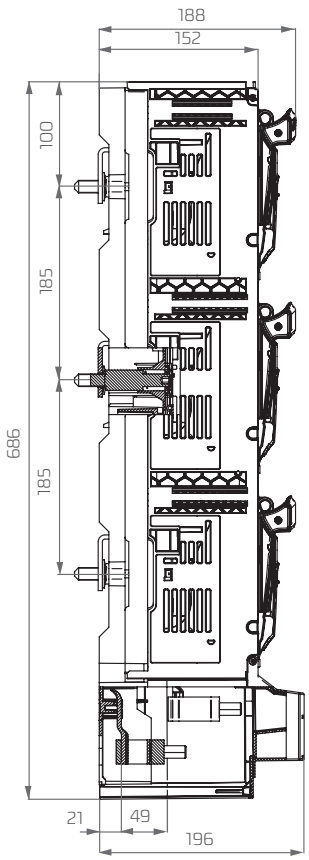
smartARS 2 pro, smartARS 3 pro with fuse monitoring module



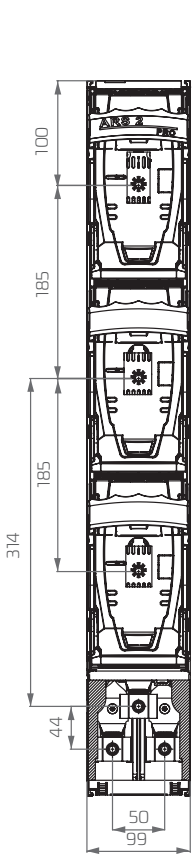
smartARS 2 pro, smartARS 3 pro equipped with modules for fast and safe installation using PPN technology

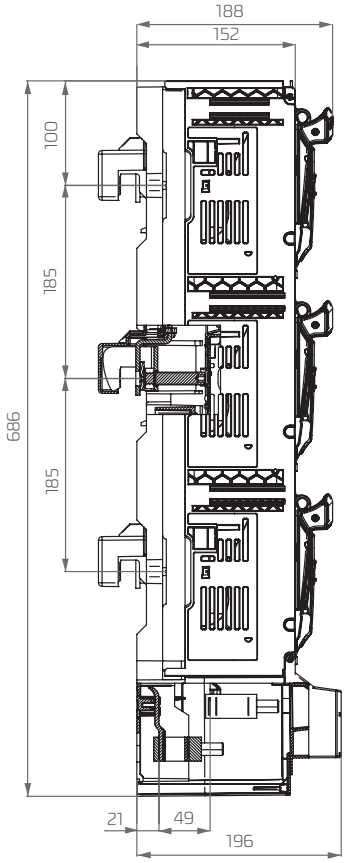
FAST INSTALLATION MODULES EQUIPPED WITH SCREWS



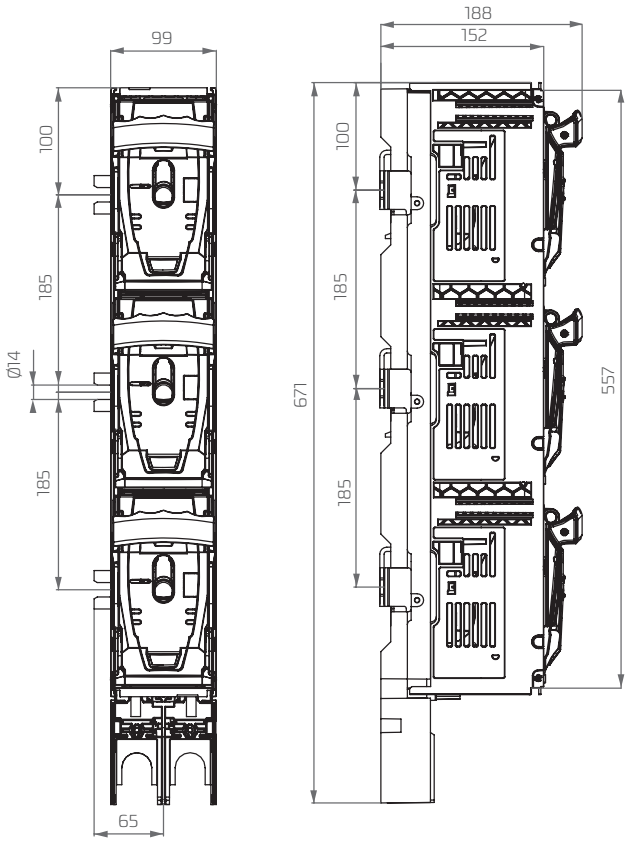


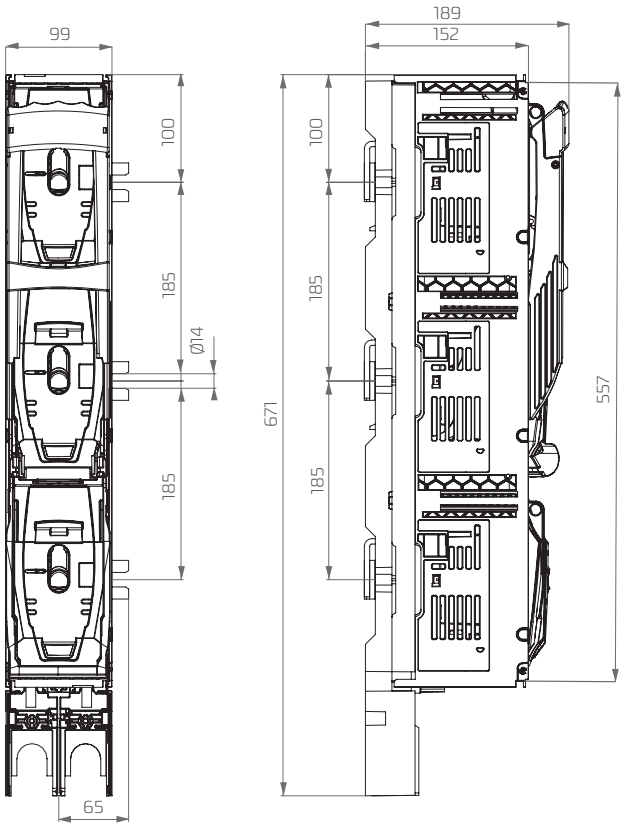
FAST INSTALLATION MODULES EQUIPPED WITH HOOKED CLAMPS





smartARS 2 pro, smartARS 3 pro with lateral busbar terminals

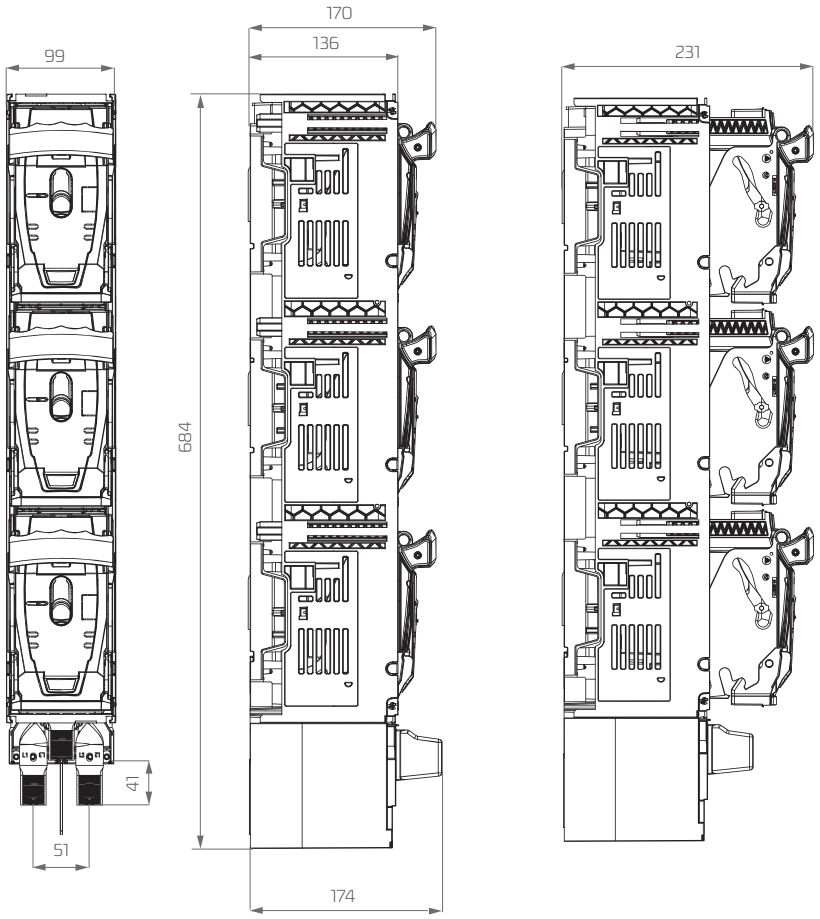




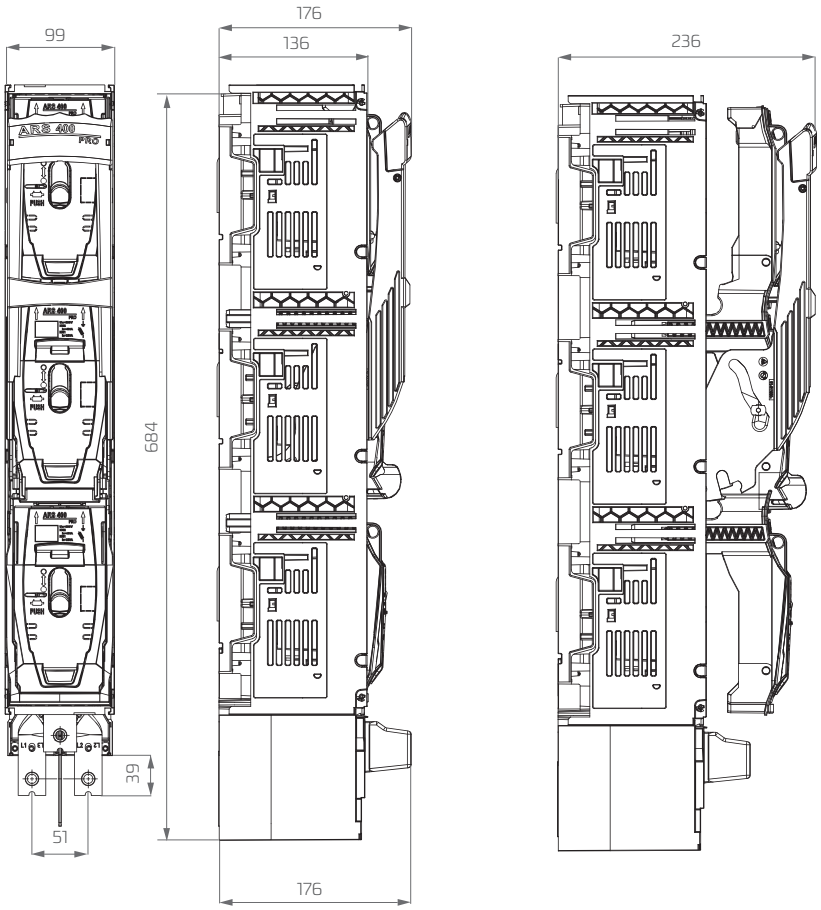
energy distribution

ARS 400 pro, ARS 630 pro, ARS 400 , ARS 630

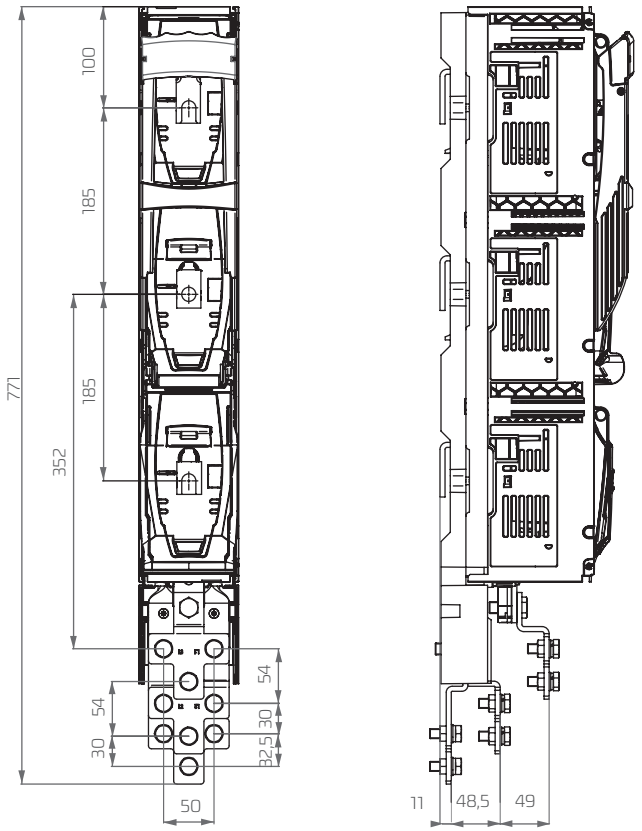
1-phase



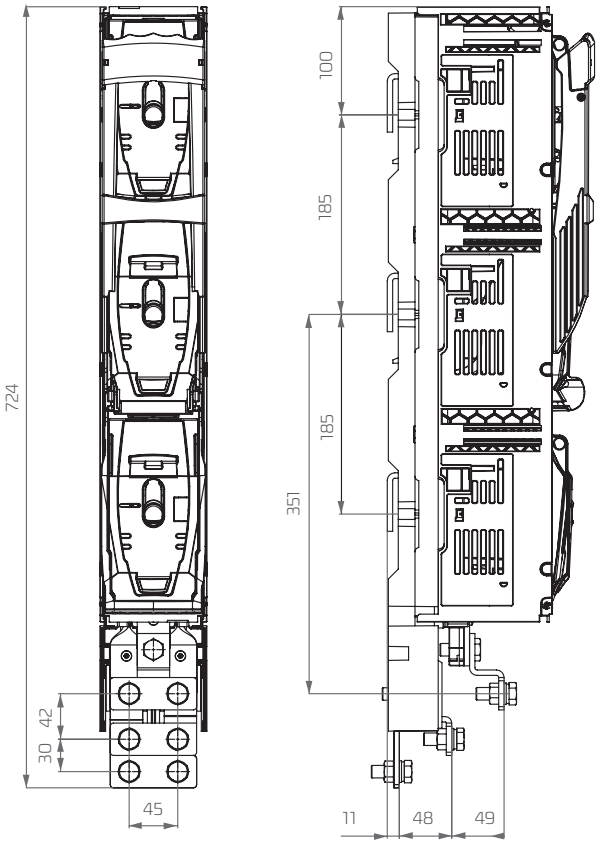
3-phase



Terminals 3x120 mm²

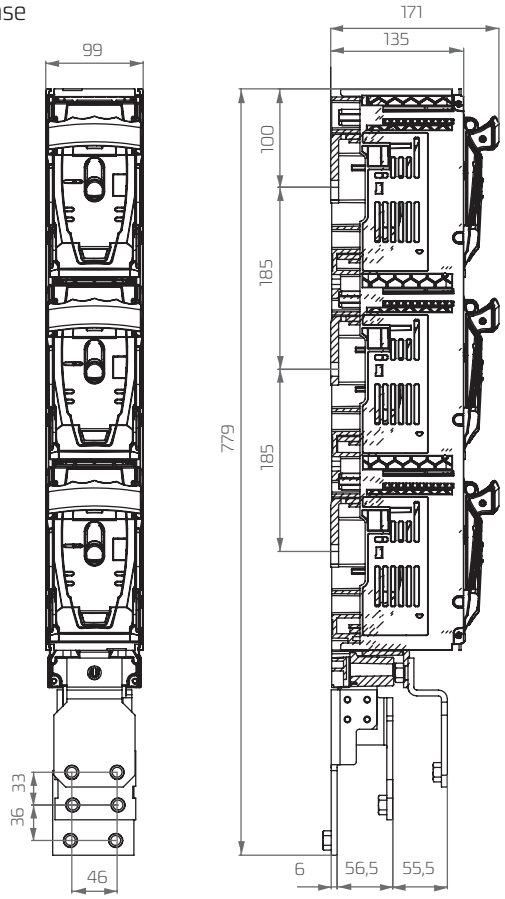


Terminals 2x240 mm²

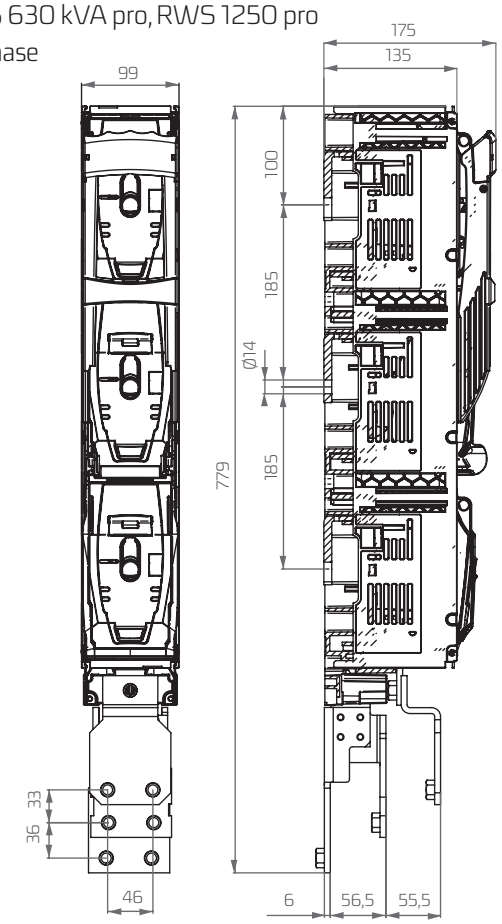


energy distribution

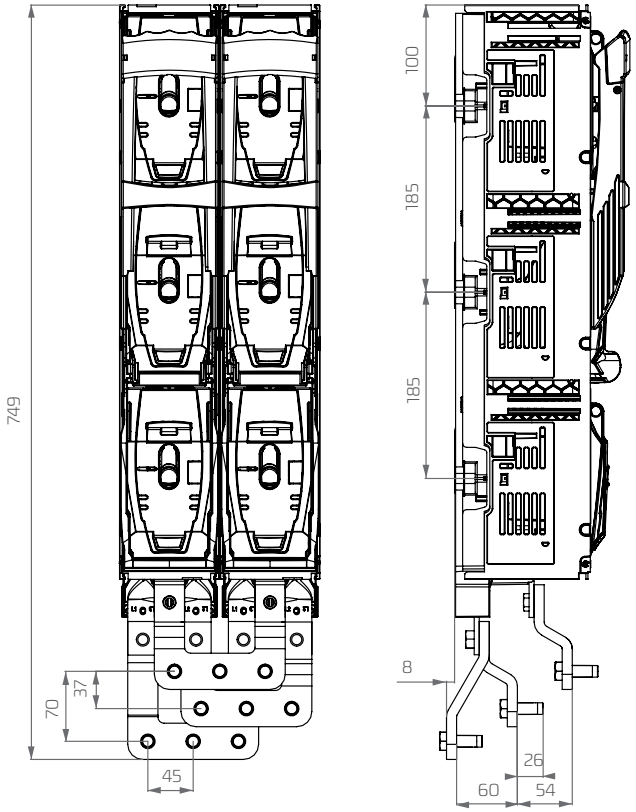
ARS 630 kVA pro
1-phase



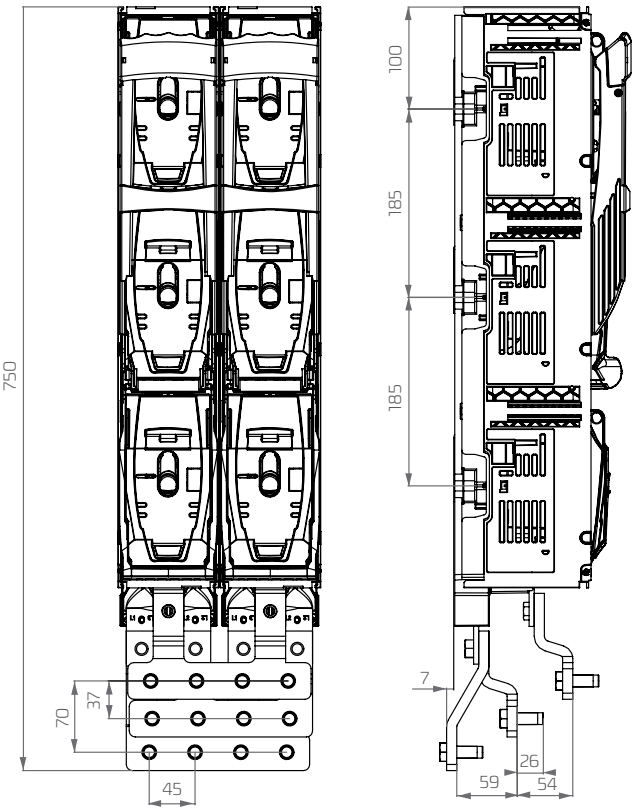
ARS 630 kVA pro, RWS 1250 pro
3-phase



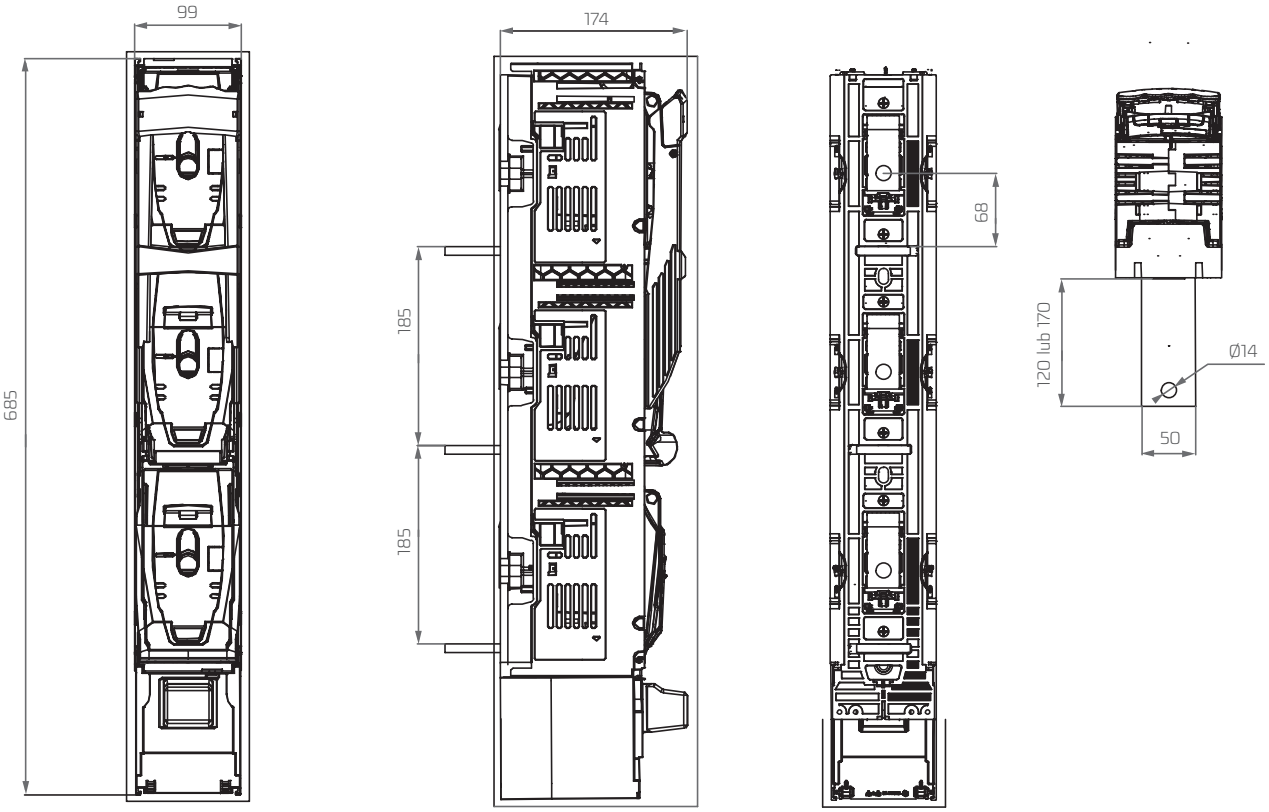
ARS 1250-6-3M pro



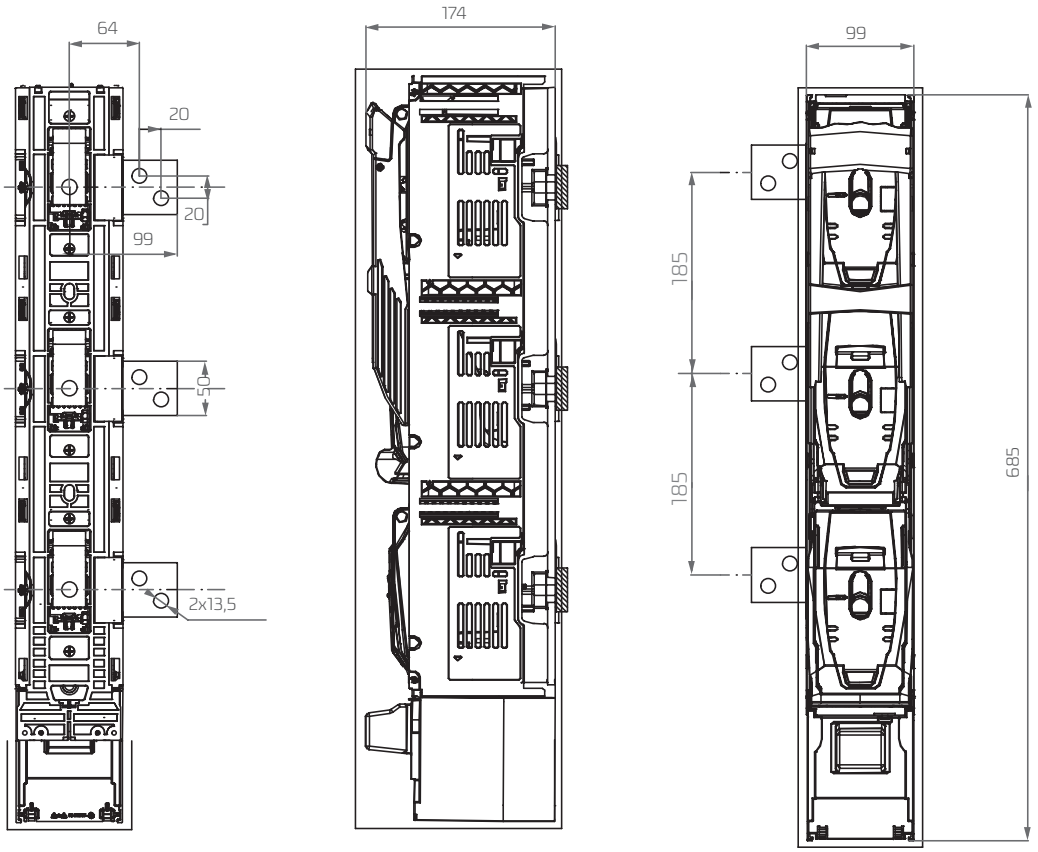
ARS 1250-6-4M pro



RWS 1250-NT pro

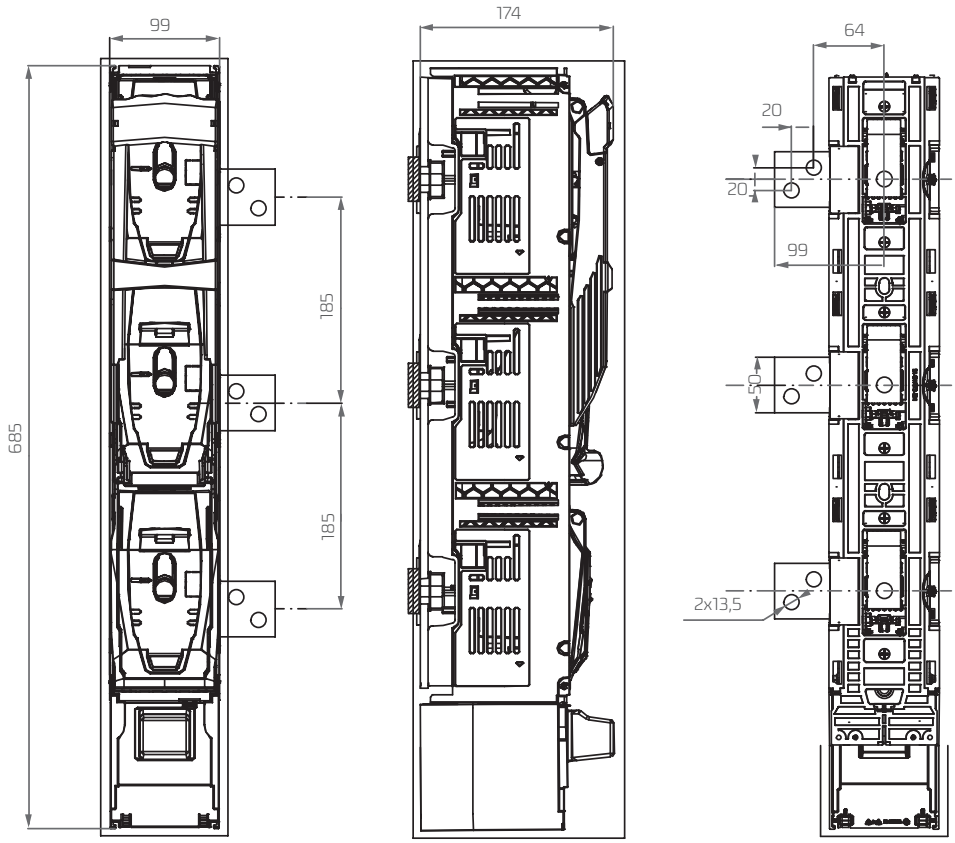


RWS 1250-NL pro



energy distribution

RWS 1250-NR pro



ARS 00, ARS 00 /100 mm, smartARS 00 pro, ARS 00/100mm pro - accessories

Description	Article No.	Picture
M8 terminal screw, for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-001	
Busbar shroud (polycarbonate) for busbar system 185 mm, Width 50 mm, length 562 mm, thickness 3 mm	1361400006T	
Isolating pin for fixing the 50 mm busbar shroud, M8 (set – 2 pcs.)	1361400001T	
Distance sleeve for current transformer APA-W10 (Length 36 mm, outer diameter = 22,5 mm, inner diameter =12,5 mm)	1115718010T	
S-bridge clamp – fixed with 2 x M5 screw - for connection of conductors with cross-section 4 mm² up to 70 mm² (set – 3 pcs.)	53-002143-001	
V-shape clamp – S-bridge clamp + V-shape saddle - for connection of sector-shaped conductors with cross-section 1,5 up to 70 mm² (stranded) or 95 mm² (solid) (set - 3 pcs.)	53-001462-001	
Universal earthing device for ARS 00, 1, 2, 3	1115281041T	
V- clamp 25-120 SW. For connection of conductor with cross-section:	1119510008T	
16 - 95 mm² ● / 16 - 95 mm² ⊗		
25 - 120 mm² ◆ / 25 - 120 mm² ◈		
V- clamp HM-10-120. For connection of conductor with cross-section:	1119510077T	
10 - 70 mm² ● / 10 - 70 mm² ⊗		
25 - 120 mm² ◆ / 25 - 95 mm² ◈		
Hooked clamps for installation of ARS on to busbar system without drilled holes. (set - 3 pcs.)	53-945361-011	

ARS 00-1

ARS 00/100 mm

smartARS 00-1 pro

ARS 00/100 mm pro

ARS 00/100 mm, ARS 00/100mm pro - accessories

Description	Article No.	Picture
Micro switch for fuse link cover position monitoring (0-1) of ARS 00/100mm	1115296049	
Support angle for installation of busbar shroud	1115281081T	

ARS 00/100 mm

ARS 00/100 mm pro

energy distribution

Description	Article No.	Picture
Labelling area	53-945333-011	
Terminal shroud/adjusting shroud	53-945924-011	
Flat terminal shroud	51-011242-001	
Flat terminal shroud in RAL 7035 (grey)	51-0011242-002	
Extended terminal shroud. Together with two flat terminal shrouds 51-011242-001 it adjusts the length of smartARS 2,3 pro, ARS 400, ARS 400 pro, ARS 630 and ARS 630 pro	51-823245-001	
Extended terminal shroud in RAL 7035 (grey). Together with two flat terminal shrouds 51-011242-002 it adjusts the length of smartARS 2,3 pro, ARS 400, ARS 400 pro, ARS 630 and ARS 630 pro	51-823245-002	
Single adapter 100/185 enabling to install ARS 00/100 mm on busbar system 185 mm	1115281021T	
Double adapter 100/185 enabling to install two ARS 00/100 mm units on busbar system 185 mm at pefroration holes in busbar system every 100 mm	1115281022T	

ARS 00, smartARS 00 pro - **accessories**

Description	Article No.	Picture
Double adapter adjusts the height of smartARS 00 pro to the height smartARS 2,3 pro	1115281023T	
Double adapter adjusts the height of smartARS 00 pro to the height ARS 400, 630	1115281024T	
Single distance adapter 185/185 for ARS 00 or smartARS 00 pro adjusts the front line to ARS 400 or ARS 400 pro (set – 3 pcs.)	51-005241-001 (no. regard 1 pc.)	
Single distance adapter 185/185 for ARS 00 or smartARS 00 pro adjusts the front line to smartARS 2,3 pro (set – 3 pcs.)	51-005242-001 (no. regard 1 pc.)	
Double distance adapter 185/185 for two units ARS 00 or smartARS 00 pro adjusts the front line to ARS 400 or ARS 400 pro at pefroration holes in busbar system every 100 mm (set – 3 pcs.)	52-005262-001 (no. regard 1 pc.)	
Double distance adapter 185/185 for two units ARS 00 or smartARS 00 pro adjusts the front line to smartARS 2,3 pro at pefroration holes in busbar system every 100 mm (set – 3 pcs.)	52-005263-001 (no. regard 1 pc.)	
Hooked clamps (set - 3 pcs.) for smartARS 00 pro with heighthened rails adjusted to front line of smart ARS 2,3 pro	53-945361-041	

ARS 00-1

smartARS 00-1 pro

ARS 400, ARS 400 pro, ARS 630, ARS 630 pro, smartARS 2 pro, smartARS 3 pro, ARS 630 kVA pro, ARS 1250 pro - accessories

Description	Article No.	Picture
M10 terminal screw, for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-002	
M12 terminal screw, for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-003	
V-clamp with tightening torque 30 Nm for connection of conductor with cross-section: 35 - 120 mm² ▩ 35 - 150 mm² ● 35 - 240 mm² ◆ 35 - 300 mm² ◆	1119510081T	
V-clamp with tightening torque 40 Nm for connection of conductor with cross-section: 35 - 185 mm² ▩ 35 - 240 mm² ● 35 - 240 mm² ◆ 35 - 300 mm² ◆	1119510084T	
Double V-clamp with tightening torque 30 Nm for connection of two conductors with cross-section: 50 - 185 mm² ▩ 50 - 240 mm² ● 50 - 240 mm² ◆ 50 - 300 mm² ◆	1119510082T	
Double V-clamp with tightening torque 30 Nm for connection of two conductors with cross-section: 50-185 mm² ▩ 50-240 mm² ● 50-240 mm² ◆ 50-300 mm² ◆	1119510085T	
Cable terminal 2x240 mm² Cable terminal for connection of two cables with lug terminals and cross-section of 240 mm² to each phase Set contains two M12 screws per terminal and cable terminal shroud. For use with ARS 2 pro, ARS 3 pro, ARS 400 with M terminals	53-931200-001	
Cable terminal 3x120 mm² Cable terminal for connection of three cables with lug terminals and cross-section of 120 mm² to each phase Set contains three M12 screws per terminal and cable terminal shroud. For use with ARS 2 pro, ARS 3 pro, ARS 400 with M terminals	53-931201-001	
Hooked clamps for installation of ARS 1, 2, 3 on to busbar system without drilled holes (set - 3 pcs.)	1115281037T	

ARS 400-1-V

ARS 400-1-M pro

ARS 630-1-M pro

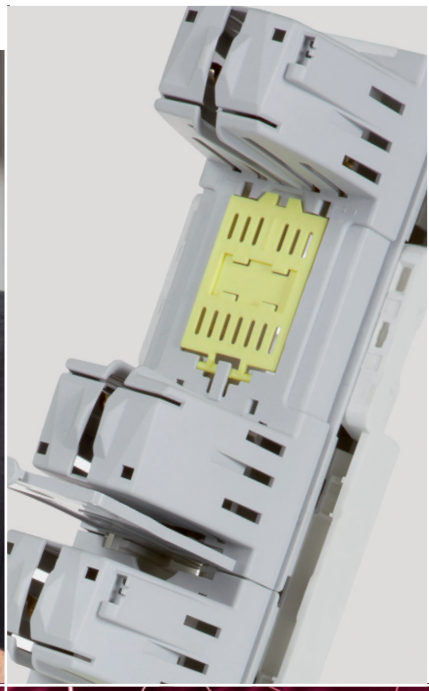
smartARS 2-1-M pro

smartARS 3-1-M pro

ARS 630 kVA pro

ARS 1250-1-3M pro

Description	Article No.	Picture
Busbar shroud (polycarbonate) for busbar system 185 mm, Width 100 mm, length 707 mm, thickness 2 mm	1361400007T	
Isolating pin for fixing the 100 mm busbar shroud, M12 (set – 2 pcs.)	1361400002T	
Terminal protective cover	51-930272-011	
Distance sleeve for current transformer APA-W12 Length 36 mm, outer diameter =22,5 mm, inner diameter =12,5 mm	1115718010T	
Universal earthing device for: 00, 1, 2, 3	1115281041T	
Fuse link cover for ARS 2 with fuse link state indication and monitoring	53-002331-001	
Fuse link cover for ARS 3 with fuse link state indication and monitoring	53-002331-002	
Rotary cover 2V	51-000487-001	



PBS
vertical fuse rails

- self extinguishing thermoplastics with flame retardant
- touch protection IP 20 with fuse link shrouds

GENERAL INFORMATION

PBS fuse rails thanks to it's high technical standards are among top such products. They are approved and recognized by polish and foreign electricity boards and distribution boards manufacturers.

APPLICATIONS

PBS fuse bases are designed for the distribution of electricity and protection against short circuits and overloads in three phase alternative current circuits with maximum operating voltage of 690 V. They are intended for direct installation on horizontal or vertical bus bar system. Due to their modern and compact design installing is easy and gives much saving of space in substations and distribution boards.
All technical parameters required by standards and requirements of the market were taken into account during design (conformity with EN 60269-1, EN 60269-2, IEC 60269). Several advices and remarks from business partners were also taken into account.

CONSTRUCTION

- plastic parts of **PBS** fuse rails are made of fibre glass strengthened, thermoplastic polyamides,
- silver plated contacts provide low power loss,
- all energized metal parts are fully protected against accidental touch.

FUNCTIONALITY

- PBS fuse rails are available in following sizes : 00 -160 A; 2 -400 A; 3-630 A,
- designed for installation on to 185 mm busbar system, (size 00-SM, 2, 3),
- PBS 00/100 mm fuse rails are designed for installation on to 100 mm busbar system, installation on to 185 mm busbar system is possible by using adapter,
- fuse rails width: size 00/100 , 00-SM - 50 mm, size 2, 3 -100 mm,
- removal of the fuse link provides clearly noticeable, large isolating gap in the circuit,
- possible installation of various earthing devices,
- possible connection of circular or sector-shaped conductors with bare ends (V-terminals, 2V-terminals or conductors with lug terminals (screw terminals),
- touch protection IP20 with fuse link shrouds for fuse rails of size 00, 2 and 3.

Table 59. PBS fuse rails technical data

Parameter		PBS 00/100 mm	PBS 00-SM	PBS 2	PBS 3
Size		00	00	2	3
Rated thermal current I_{th}	A	160	160	400	630
Rated voltage U_n	V	690	690	690	690
Rated insulation voltage U_i	V	1000	1000	1000	1000
Rated frequency	Hz	50-60	50-60	50-60	50-60
Rated power dissipation	W	12	12	45	60
Rated short-circuit withstand current	kA	100	100	100	100
Mechanical durability	Number of cycles	100	100	100	100
Weight	kg	0,75	2,00	4,50	5,00
IP degree of protection	-	00	20[1)]	20[1)]	20[1)]
Size of fuse links		00	00	1, 2	3

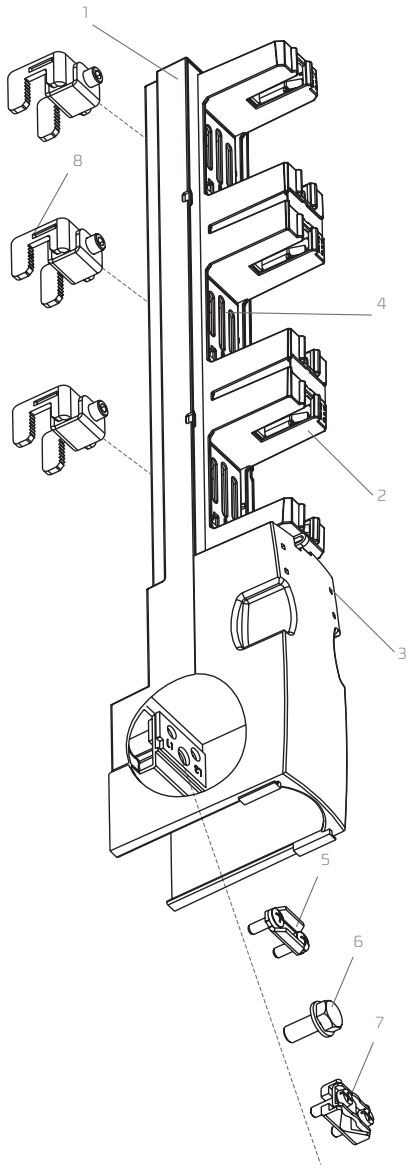
[1)] with fuse link shrouds

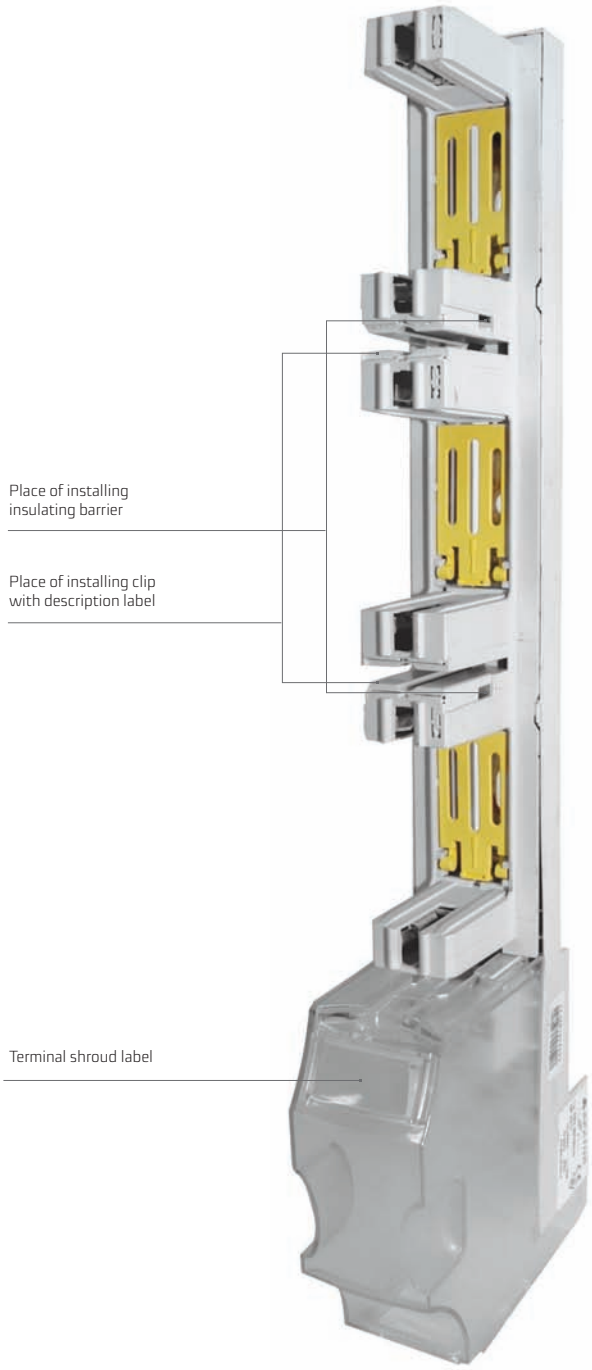
OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- ambient temperature from -25 °C to +55 °C – but in case of use of disconnectors in temperature from +41 °C to +45 °C current value Ith should be reduced by 5 % and within temperature range of +46 °C to +55 °C current value Ith should be reduced by 10 %,
- altitude up to 2000 meters above sea level,
- relative humidity of the air should not be higher than 50 % at temperature of +40 °C,
- outdoor – in cabinets with protection degree > IP 34.

FUSE RAIL PBS 00/100 mm (160 A, 690 V)

For 100 mm busbar system





DESCRIPTION

1. Main base
2. Protective contact cover
3. Terminal shroud
4. Busbar terminals acces covers
5. S-bridge clamp
6. M8 screw
7. V-shape clamp for sector-shaped conductor
8. Hooked clamp

PBS 00/100 mm (160 A, 690 V)

PBS 00/100 mm

Table 60. Technical data

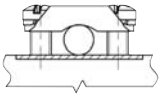
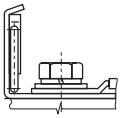
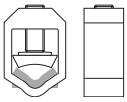
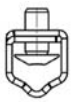
Parameter		PBS 00/100 mm
Size		00
Rated thermal current I_{th}	A	160
Rated voltage U_n	V	690
Rated insulation voltage U_i	V	1000
Rated frequency	Hz	50-60
Rated power dissipation	W	12
Rated short-circuit withstand current	kA	100
Mechanical durability	Number of cycles	100
IP degree of protection	-	00
Size of fuse links		00

Accessories on page 69

Table 61. Versions

Version		Weight	Article No.
PBS 00/100 mm	cable terminals: bridge terminals with bridgeclamps (S) 4-70 mm², screw terminals with M8 screws	1,0 kg	63-811627-011
PBS 00/100 mm-V	cable terminals: V-terminals with V-clamps 25-150SW	1,1 kg	63-811627-021

Table 62. PBS 00/100 mm terminal clamps

Description	PBS 00/100 mm			
Clamp	S-bridge clamp 2 x M5 x 25	M8 screw*	V- clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross–section of conductors	4-70 mm²	Conductor with lug termina max 185 mm²	re ● 16 mm²-95 mm² se ◆ 25 mm²-150 mm² rm ⊗ 16 mm²-95 mm² sm ⊗ 25 mm²-150 mm²	re ● 10 mm²-70 mm² se ◆ 25 mm²-120 mm² rm ⊗ 10 mm²-70 mm² sm ⊗ 25 mm²-95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system –12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE RAIL PBS 00 (160 A, 690 V)

For 185 mm busbar system

PBS 00-V

PBS 00-V-O

Table 63. Technical data

Parameter		PBS 00
Size		00
Rated thermal current I_{th}	A	160
Rated voltage U_n	V	690
Rated insulation voltage U_i	V	1000
Rated frequency	Hz	50-60
Rated power dissipation	W	12
Rated short-circuit withstand current	kA	100
Mechanical durability	Number of cycles	100
IP degree of protection without fuse links installed	-	20
IP degree of protection with fuse linksand fuse links shrouds installed *	-	20
Size of fuse links		00

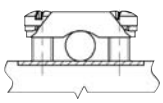
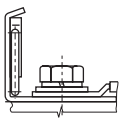
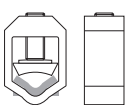
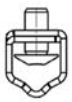
Accessories on page 69, 70

*for more information about fuse links shrouds please see accessories

Table 64. Versions

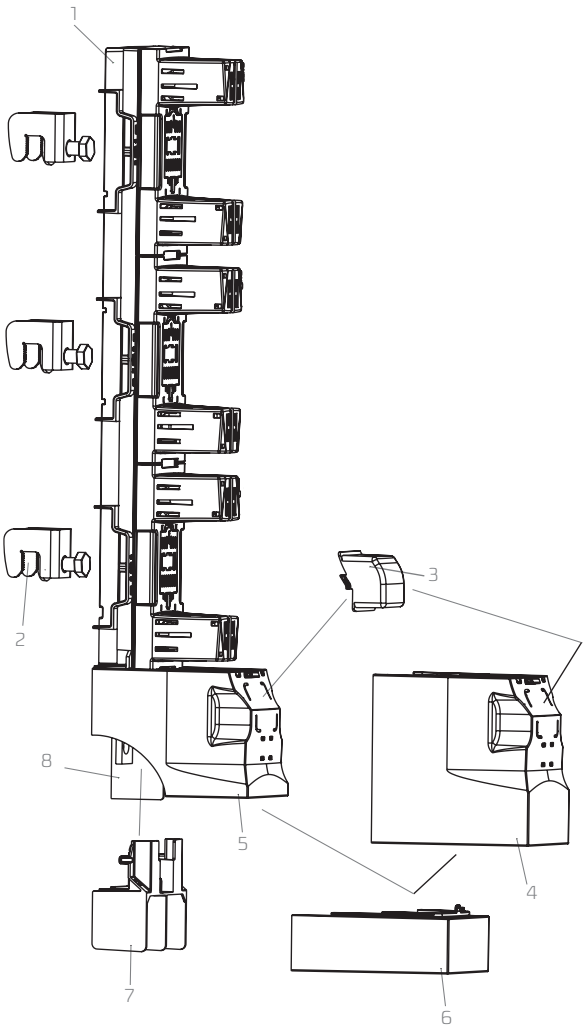
Version		Weight	Article No.
PBS 00-V	cable terminals: V-terminals with V-clamps 25-150SW	2 kg	63-001417-001
PBS 00-SM	cable terminals: bridge terminals with bridgeclamps (S) 4-70 mm², screw terminals with M8 screws	1,9 kg	63-001417-002
PBS 00-V-O	cable terminals: V-terminals with V-clamps 25-150SW with fuse link shrouds	2,1 kg	63-001417-003
PBS 00-SM-O	cable terminals: bridge terminals with bridgeclamps (S) 4-70 mm², screw terminals with M8 screws with fuse link shrouds	2 kg	63-001417-004

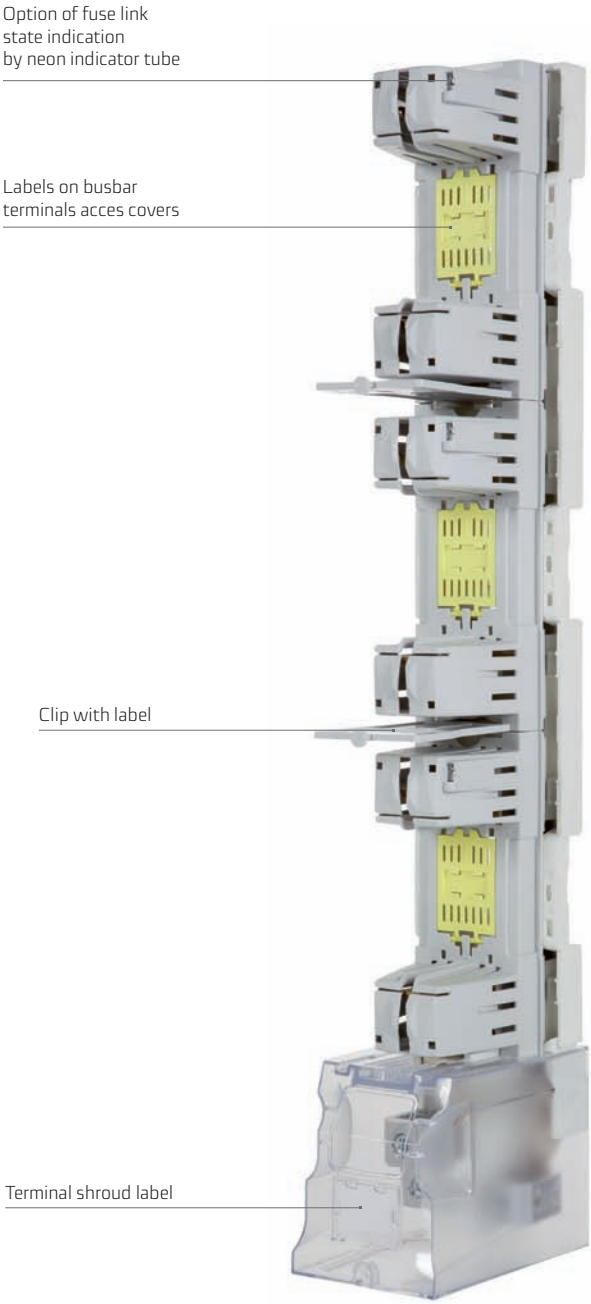
Table 65. PBS 00 terminal clamps

Description	PBS 00			
Clamp	S-bridge clamp 2 x M5 x 25	M8 screw*	V- clamp 25-150 SW	HM 10-120
Picture of clamp				 ***
Drawing of clamp				
Cross–section of conductors	4 - 70 mm²	Conductor with lug termina max 185 mm²	re 16 mm² - 95 mm² se 25 mm² - 150 mm² rm 16 mm² - 95 mm² sm 25 mm² - 150 mm²	re 10 mm² - 70 mm² se 25 mm² - 120 mm² rm 10 mm² - 70 mm² sm 25 mm² - 95 mm²
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

For stranded conductors using cable ferrules is recommended
*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals
**) using tension wrench is recommended
***) fuse switch disconnectors with V-terminals are equipped with steel V-clamp HM 10-120 on request
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M8 screw) for screws fixing fuse switch disconnector to busbar system –12 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 21 Nm.

FUSE BASE PBS 2 (400 A, 690 V) PBS 3 (630 A, 690 V)





DESCRIPTON

1. Main base
2. Hooked clamp – for installation on to busbar system 1115281037T
3. Terminal shroud for fuse switch disconnector with double V-clamps (2 x 240 mm²) 51-945480-011
4. Terminal shroud (long) 51-945480-011
5. Terminal shroud (short) 51-930271-011
6. Bottom adjusting shroud 51-930313-011
7. Cable terminal protective cover 51-930272-011
8. Protective barrier

PBS 2 (400 A, 690 V)

Fuse rail designed for operation with NH1 and NH2 fuse links

Table 66. Technical data

Parameter		PBS 2
Size		2
Rated thermal current I_{th}	A	250(NH1), 400(NH2)
Rated voltage U_n	V	690
Rated insulation voltage U_i	V	1000
Rated frequency	Hz	50-60
Rated power dissipation	W	45
Rated short-circuit withstand current	kA	100
Mechanical durability	Number of cycles	100
IP degree of protection without fuse links installed	-	20
IP degree of protection with fuse links and fuse links shrouds installed	-	20
Size of fuse links		1,2

Accessories on page 70, 71

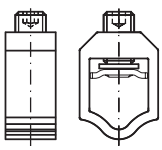
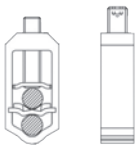
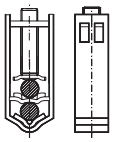
PBS 2-V

PBS 2-V
with fuse link shrouds

Table 67. Versions

Version		Weight	Article No.
PBS 2-V	cable terminals: V-terminals with V-clamps (35-300 mm²)	3,2 kg	63-811639-011
PBS 2-M	cable terminals: screw terminals with pressed nuts M10 (M10 screw)	3,1 kg	63-811639-031
PBS 2-2V	cable terminals: 2V-terminals with double Vclamps (2 x 50- 240 mm²)	3,8 kg	63-811639-051

Table 68. PBS 2 terminal clamps

Description	PBS 2-V	PBS 2-2V	PBS 2-2V	PBS 2-M
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M–screw M10**
Drawing of clamp				
Cross–section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ⊛	35 - 240 mm² ●	50 - 185 mm² ⊛	50 - 240 mm² ●	50 - 185 mm² ⊛	50 - 240 mm² ●
	35 - 240 mm² ⊛	35 - 300 mm² ◆	50 - 240 mm² ⊛	50 - 300 mm² ◆	50 - 240 mm² ⊛	50 - 300 mm² ◆
Tightening torque	30 Nm		30 Nm		40 Nm	32 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) Bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed.
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M10 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

PBS 3 (630 A, 690 V)

PBS 3-V

PBS 3-V
with fuse link shrouds

Table 69. Technical data

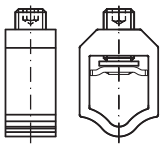
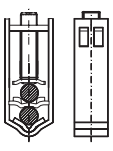
Parameter		PBS 3
Size		3
Rated thermal current I_{th}	A	630
Rated voltage U_n	V	690
Rated insulation voltage U_i	V	1000
Rated frequency	Hz	50-60
Rated power dissipation	W	60
Rated short-circuit withstand current	kA	100
Mechanical durability	Number of cycles	100
IP degree of protection without fuse links installed	-	20
IP degree of protection with fuse linksand fuse links shrouds installed	-	20
Size of fuse links		3

Accessories on page 70, 71

Table 70. Versions

Version		Weight	Article No.
PBS 3-V	cable terminals: V-terminals with V-clamps (35-300 SW)	4,0 kg	63-811639-021
PBS 3-M	cable terminals: screw terminals with pressed nuts M12 (M12 screw)	4,1 kg	63-811639-041
PBS 3-2V	cable terminals: 2V-terminals with double V-clamps (2 x 50- 240 mm²)	4,8 kg	63-811639-061

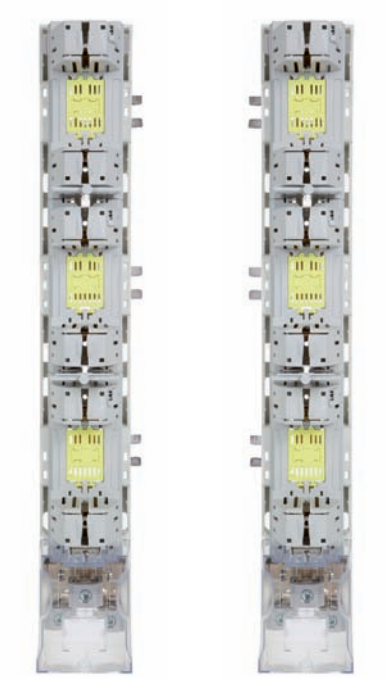
Table 71. PBS 3 terminal clamps

Description	PBS 3-V	PBS 3-2V	PBS 3-2V	PBS 3-M
Clamp	V–clamp 35-300SW-B	V–clamp 2/50-300SW-B	V–clamp HS 2/50-240-C*	M– screw M12**
Drawing of clamp				
Cross–section of conductors	V-clamp for direct fixing of conductor with bare end with cross-section of:			Lug terminal
	35 - 185 mm² ● 35 - 240 mm² ●	50 - 185 mm² ● 50 - 240 mm² ●	50 - 185 mm² ● 50 - 240 mm² ●	
	35 - 240 mm² ◆ 35 - 300 mm² ◆	50 - 240 mm² ◆ 50 - 300 mm² ◆	50 - 240 mm² ◆ 50 - 300 mm² ◆	
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended
*) if the fuse switch disconnector with a 2V-type clamp is to be equipped with a steel V-clamp HS 2/50-240-C, it should be included in the order
**) bars of maximum width of 40 mm and maximum thickness of 8 mm can be fixed to M type screw terminals when protective barrier between phases is installed
Apator takes responsibility for technical quality of V-terminals manufactured only by the company. Minimum tightening torque (M12 screw) for screws fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

PBS FUSE RAIL
with lateral busbar terminal

(separation, coupling of busbar systems)



PBS 2-NR PBS 3-NL

Table 72. Technical data

Parameter		PBS 2	PBS 3
Size		2	3
Rated thermal current I_{th}	A	400	630
Rated voltage U_n	V	690	690
Rated insulation voltage U_i	V	1000	1000
Rated frequency	Hz	50-60	50-60
Rated power dissipation	W	45	60
Rated short-circuit withstand current	kA	100	100
Mechanical durability	Number of cycles	100	100
IP degree of protection without fuse links installed	-	20	
IP degree of protection with fuse links and fuse links shrouds installed*	-	20	
Size of fuse links		2	3

Accessories on page 70, 71

*for more information about fuse links shrouds please see accessories

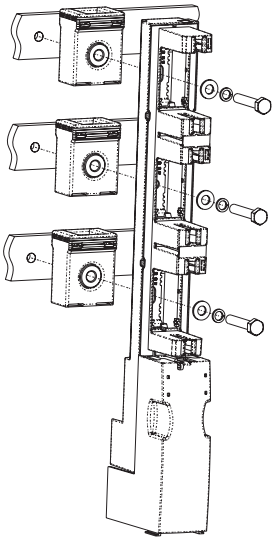
Table 73. Versions

Version		Weight	Article No.
PBS 2-NL	lateral busbar terminal - left side	2,2 kg	63-811673-011
PBS 2-NR	lateral busbar terminal - right side	2,2 kg	63-811673-031
PBS 3-NL	lateral busbar terminal - left side	3,0 kg	63-811673-021
PBS 3-NR	lateral busbar terminal - right side	3,0 kg	63-811673-041

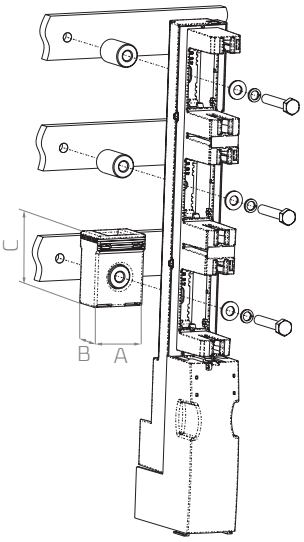
Table 74. PBS with lateral busbar terminal clamps

Description	Drawing of clamp	PBS 2-NL (400 A)	PBS 2-NR (400 A)	PBS 3-NL (630 A)	PBS 3-NR (630 A)
Clamp		M12 screw	M12 screw	M12 screw	M12 screw
Cable terminal		Left side	Right side	Left side	Right side
Tightening torque		56 Nm	56 Nm	56 Nm	56 Nm

THREE PHASE CURRENT MEASUREMENT WITH FUSE RAIL PBS



ONE PHASE CURRENT MEASUREMENT WITH FUSE FUSE RAIL PBS



PBS 00/160 A fuse rails

CURRENT TRANSFORMER

A - max. 48mm
B - max. 35 mm
C - ~ 65 mm

DISTANCE SLEEVE

length 36 mm
Ø internal = 12,5 mm
Ø external = 22,5 mm

PBS 2 i 3 fuse rails

CURRENT TRANSFORMER

A - max. 90 mm
B - max. 35 mm
C - ~ 80 mm

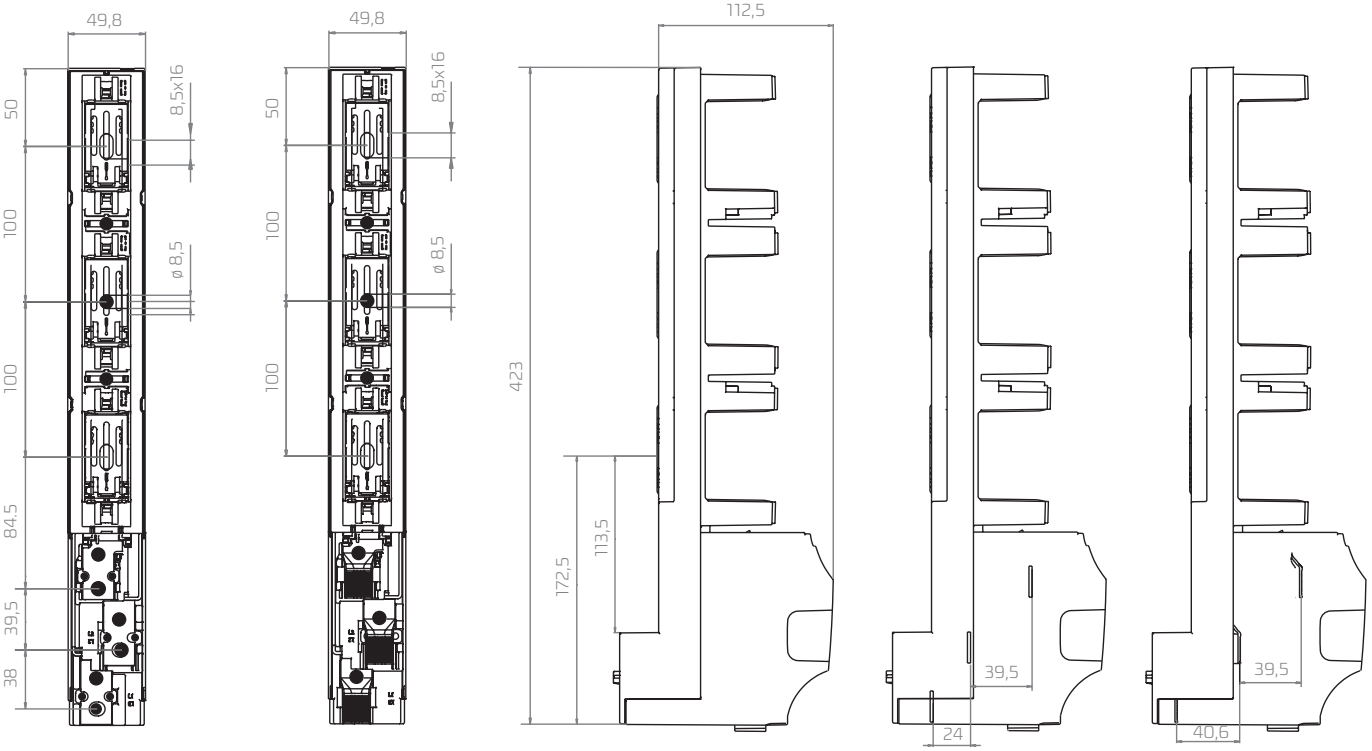
DISTANCE SLEEVE

length 36 mm
Ø internal = 12,5 mm,
Ø external = 22,5 mm

Distance sleeve

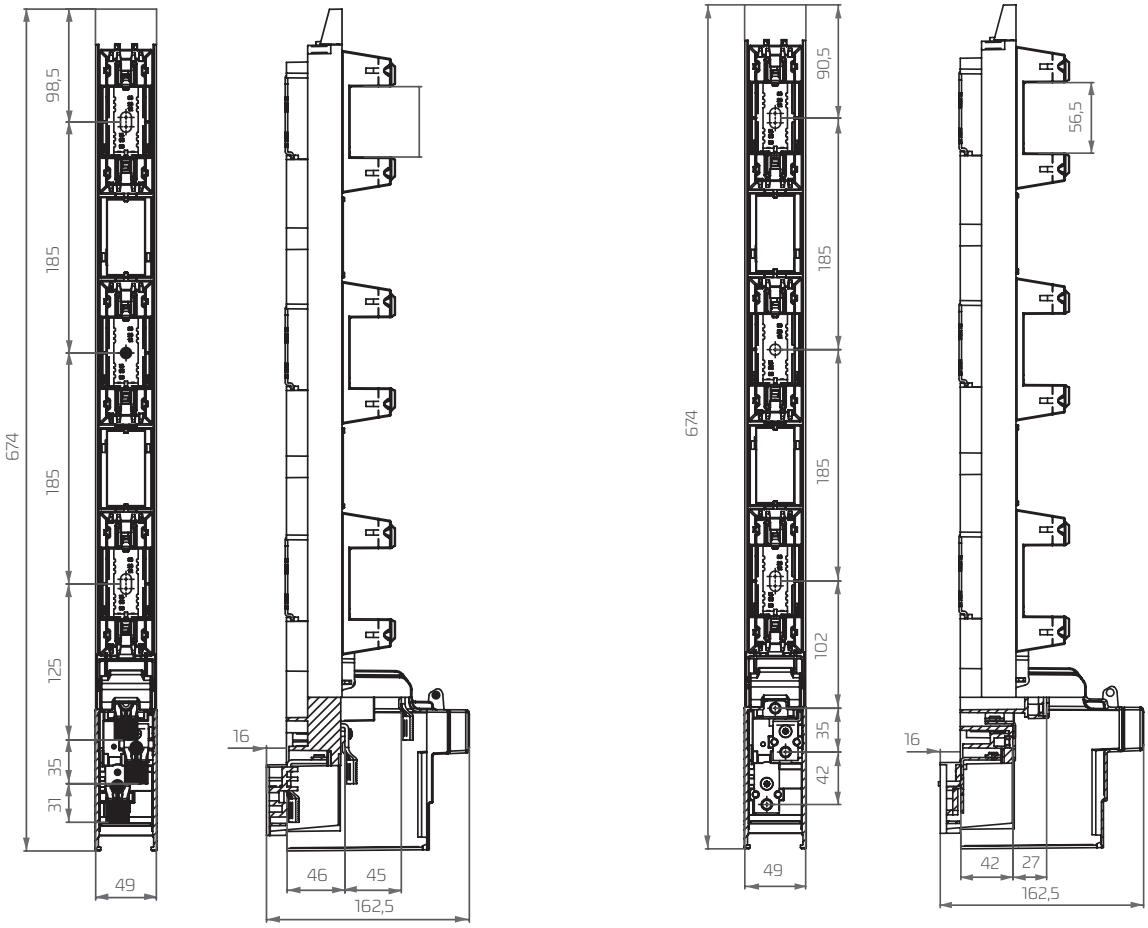
Current transformer

PBS 00/100 mm

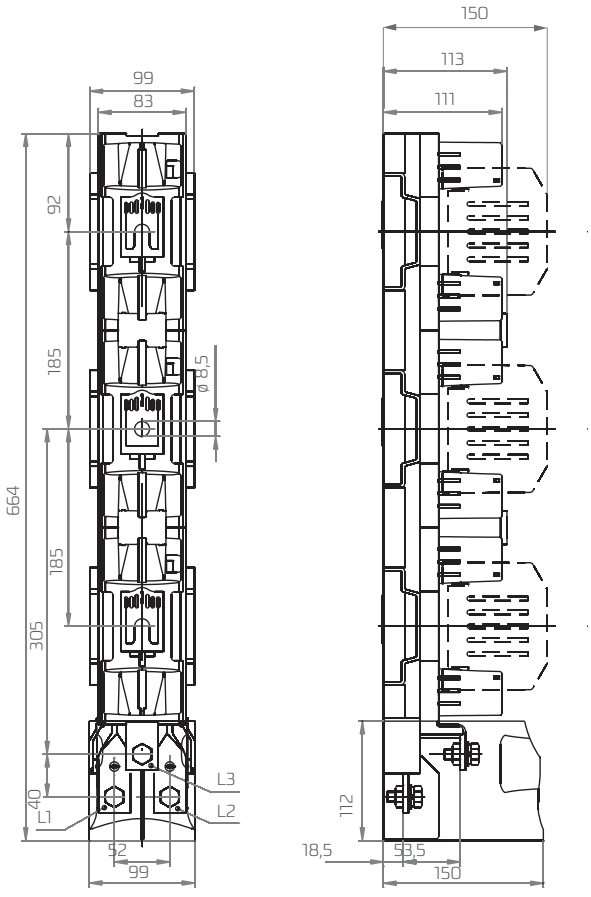


energy distribution

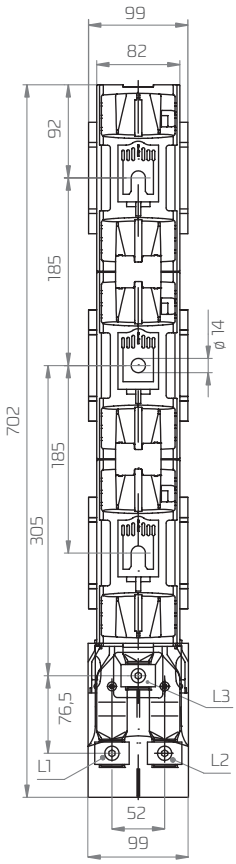
PBS 00-SM

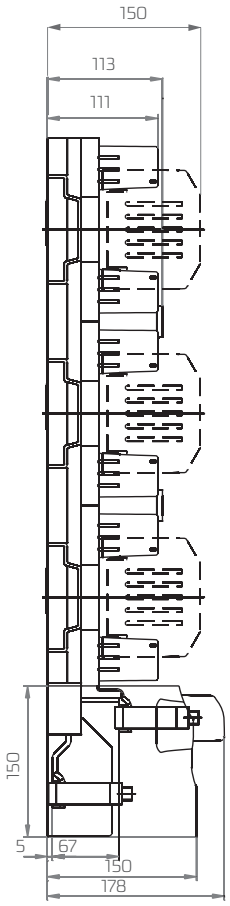


PBS 2 | PBS 3

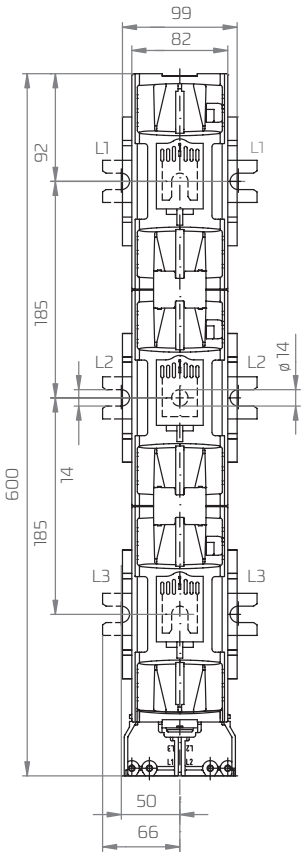


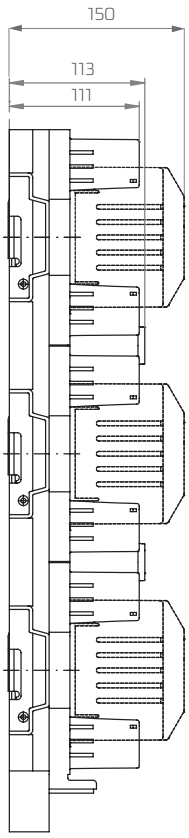
PBS 2 | PBS 3 with terminal 2V (2 x 240 mm²)





PBS 2 | PBS 3 with lateral busbar terminal





energy distribution

PBS 00, PBS 00/100 mm - accessories

Description	Article No.	Picture
M8 terminal screw, for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-001	
Busbar shroud (polycarbonate) for busbar system 185 mm, Width 50 mm, length 562 mm, thickness 3 mm	1361400006T	
Hooked clamps for installation on to busbar system without drilled holes. (set - 3 pcs.)	53-945361-011	
Isolating pin for fixing the 50 mm busbar shroud, M8 (set – 2 pcs.)	1361400001T	
Distance sleeve for current transformer APA-W10 (Length 36 mm, outer diameter =22,5 mm, inner diameter =12,5 mm)	1115718010T	
S-Bridge clamp – fixed with 2 x M5 screw - for connection of conductors with cross-section 4 mm² up to 70 mm² (set – 3 pcs.)	53-002143-001	
V-shape clamp – S-bridge clamp + V-shape saddle - for connection of sector-shaped conductors with cross-section 1,5 up to 70 mm² (stranded) or 95 mm² (solid) (set - 3 pcs.)	53-001462-001	
Universal earthing device for PBS 00, 1, 2, 3	1115281041T	
V- clamp HM-10-120. For connection of conductor with cross-section: 10 - 70 mm² ● 10 - 70 mm² ▩ 25 - 120 mm² ◆ 25 - 95 mm² ◈	11195510077T	

PBS 00-V-0

PBS 00/100 mm

PBS 00/100 mm - accessories

Description	Article No.	Picture
Terminal shroud/adjusting shroud	53-945924-011	
Single adapter 100/185 enabling to install PBS 00/100 mm on busbar system 185 mm	1115281021	
Double adapter 100/185 enabling to install two PBS 00/100 mm units on busbar system 185 mm at perforation holes on busbar system every 100 mm	1115281022T	

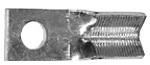
PBS 00/100 mm

PBS 00 - accessories

Description	Article No.	Picture
Double adapter adjusts the height of PBS 00 to the height PBS 2,3	1115281024T	
Single distance adapter 185/185 for PBS 00/185 adjusts the front line to PBS 1, 2, 3 (set - 3 pcs.)	51-945160-011 (no. regard 1 pc.)	
Double distance adapter 185/185 for two units PBS 00/185 adjusts the front line to PBS 1, 2, 3 at perforation holes in busbar system every 100 mm (set - 3 pcs.)	52-945158-011 (no. regard 1 pc.)	
Fuse link shroud	51-001312-001	

PBS 00-V-0

PBS 2 , PBS 3 - accessories

Description	Article No.	Picture
M10 terminal screw to PBS 2 for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-002	
M12 terminal screw to PBS 3 for connection of conductors with lug terminal (set - 3 pcs.)	53-082961-003	
V-clamp For connection of conductor with cross-section 35 - 120 mm² ⬢ 35 - 150 mm² ● 35 - 240 mm² ◆ 35 - 300 mm² ◆	1119510081T	
V-clamp For connection of conductor with cross-section 50 - 185 mm² ⬢ 50 - 240 mm² ● 50 - 240 mm² ◆ 50 - 300 mm² ◆	1119510084T	
V-clamp For connection of two conductors with cross-section 50 - 185 mm² ⬢ 50 - 240 mm² ● 50 - 240 mm² ◆ 50 - 300 mm² ◆	1119510082T	
V-terminal lug for V-clamp for connection of conductors with cross-section 35 mm² up to 240 mm²	1119510002T	

PBS 2-V

PBS 3-V

energy distribution

Description	Article No.	Picture
V-clamp HS (steel) for connection of two conductors with cross-section 35-185 mm² ⬤ 35-240 mm² ● 35-240 mm² ◆ 35-300 mm² ▬	1119510085T	
Hooked clamps for installation of PBS 1, 2, 3 on to busbar system without drilled holes (set - 3 pcs.)	1115281037T	
Busbar shroud (polycarbonate) for busbar system 185 mm, Width 100 mm, length 707 mm, thickness 2 mm	1361400007T	
Isolating pin for fixing the 100mm busbar shroud, M12 (set – 2 pcs.)	1361400002T	
Extended terminal shroud. For use with terminal shroud	51-930313-01	
Terminal protective cover	51-930272-011	
Distance sleeve for current transformer APA-W12 length 36 mm, outer diameter =22,5 mm, inner diameter =12,5 mm	115718010T	
Long terminal shroud	51-930271-021	
Fuse link shroud	51-836288-011	
Universal earthing device for ARS 00, 1, 2, 3	1115281041T	

RBK pro

Vertical fuse switch disconnectors

- designed for distribution of electricity and protection of electrical equipment against short-circuits and overloads with industrial fuse links.

APPLICATIONS

RBK pro fuse switch disconnectors are designed for distribution of electricity and protection of electrical equipment against short-circuits and overloads with industrial fuse links. They are conforming to EN 60947-1, EN 60947-3, IEC 60947-1, IEC 60947-3 standards. They are intended for installation in low voltage distribution boards, cable and metering cabinets.

CONSTRUCTION

- thermoplastic parts of **RBK pro** fuse switch disconnectors are made of fibre glass strengthened polyamide with halogen free flame retardant added and have highest possible flammability class – V0,
- **RBK pro** fuse switch disconnectors consist of following parts:
  - three pole main base with spring-loaded contacts designed for connection of circular or sector-shaped conductors, conductors with lug terminals or bars,
  - removable cover with fuse links,
- arc chambers with steel deionization plates over top contacts,
- silver plated contacts providing low power loss.

MOUNTING

- on mounting plate
  - RBK 000 pro, RBK 00 pro, RBK 1 pro, RBK 2 pro, RBK 3,
- DIN rail
  - single: RBK 000 pro,
  - double: RBK 00 pro,
- on to busbar systems:
  - 60 mm RBK 000 pro-S, RBK 00 pro-S, RBK 1 pro-S, RBK 2 pro-S, installation on to busbar system with hooked clamps, placed inside fuse,
  - 60 mm RBK 3-S installation on busbar system using adapter with three M10 screws,
  - 100 mm (RBK 2-S, RBK 1 pro-S) installation on to busbar system with hooked clamps placed inside fuse.

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34,
- ambient temperature from -25 °C to +55 °C,
- relative humidity of the air should not be higher than 50% at temperature of +40°.

FUNCTIONALITY

- making and breaking operations should be done with determined movement,
- possible connection of circular or sector-shaped conductors with bare ends (V-terminals, 2V-terminals) or conductors with lug terminals (screw terminals),
- voltage test performed through test holes in fuse link cover,
- fuse links state monitoring.

CONFORMITY WITH STANDARDS

EN 60947-1, EN 60947-3, IEC 60947-1, IEC 60947-3

Table 75. RBK pro fuse switch disconnectors technical data

Parameter			RBK 000 pro RBK 000 pro-S					RBP 000 pro			RBP 000 pro-S			RBK 00 pro			RBK 00 pro-S		
Rated thermal current I_{th} [1]		A	160					125			125			160			160		
Rated voltage U_n		V	690					690			690			690			690		
Utilization category		-	AC-23B	AC-22B	AC-22B	AC-21B	DC-21B	AC-23B	AC-21B	DC-22B	AC-23B	AC-22B	DC-22B	AC-23B	DC-22B	DC-21B	AC-23B	AC-22B	DC-22B
Rated switching current I_e		A	100	100	160	160	160	125	125	100	125	125	100	160	160	160	160	160	160
Rated switching voltage U_e		V	400	690	400	690	250	400	690	250	400	690	250	690	250	440	400	690	250
Rated short circuit withstand current	690 V	kA	25				25/250V	50		25/250V	35		25/250V	80	25/250V		100		25/250V
	500 V		80					-			-			-					
	400 V		-					80			80			100					
Rated short circuit making current	690 V	kA	25				25/250V	50		25/250V	35		25/250V	80	25/250V		100		25/250V
	500 V		80					-			-			-					
	400 V		-					80			80			100					
Rated insulation voltage U_i		V	1000					1000			1000			1000			1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8					6			6			8			8		
Rated frequency		Hz	50-60				-	50-60		-	50-60		-	50-60	-		50-60	-	
Mechanical durability		Number of cycles	2000		1600			1600			1600			1600			1600		
Electrical durability			300		200			200			200			200			200		
IP degree of protection		IP	20					20*			20*			20			20		
Weight		kg	~0,6, ~0,9					~0,5			~0,7			~0,7			~0,9		
Size of fuse links		-	000					000			000			00			00		

*from the front IP30

[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)
[2] for 60 mm busbar system

- RBK 2 switch disconnector with solid links 400 A
- rated short-time withstand current 1s Icw = 13 kA
- rated short-circuit making capacity Icm = 8 kA
- RBK 1000 - (RBK 3 switch disconnector with solid links 1000 A)
- rated short-time withstand current 1s Icw = 12,6 kA
- rated short-circuit making capacity Icm = 25,2 kA
- rated thermal current Ith = 1000 A when connected on to busbars 50x10 mm
- utilization category AC-21

Parameter			RBK 00 pro-V 120			RBK 1 pro		RBK 1 pro-S			RBK 2 pro RBK 2 pro-S			RBK 3 pro			RBK 3 pro-S		
Rated thermal current I_{th} [1]		A	160			250		250			400			630			630		
Rated voltage U_n		V	690			690		690			690			690			690		
Utilization category		-	AC-23B	AC-22B	DC-22B	AC-23B	DC-22B	AC-23B	AC-22B	DC-22B[2]	AC-23B	DC-22B	DC-21B	AC-23B	AC-22B	DC-21B	AC-23B	AC-22B	DC-21B
Rated switching current I_e		A	160	160	160	250	250	250	250	250	400	400	400	630	630	630	630	630	630
Rated switching voltage U_e		V	400	690	250	690	250	400	690	250	690	220	440	400	690	440	400	500	690
Rated short circuit withstand current	690 V	kA	100		25/250V	80	25/250V	80		25/250V	80	20/250V, 15/440V		80		35/440V	80		
	500 V					-		-						-			-		
	400 V					100		100			100			-			-		
Rated short circuit making current	690 V	kA	100		25/250V	80	25/250V	80		25/250V	80	20/250V, 15/440V		80		35/440V	80		
	500 V					-					-			-			-		
	400 V					100		100-			100			-			-		
Rated insulation voltage U_i		V	1000			1000		1000			1000			1000			1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8			8		8			12			12			12		
Rated frequency		Hz	50-60		-	50-60	-	50-60		-	50-60	-		50-60		-	50-60		
Mechanical durability		Number of cycles	1600			1600		1600			1000			1000			1000		
Electrical durability			200			200		200			200			200			200		
IP degree of protection		IP	20			20		20			20			20*			20*		
Weight		kg	~0,9			~2		~2,5			~3, ~4,5			~4,3			~4,9		
Size of fuse links		-	00			1		1			2			3			3		

*from the front IP30

[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)
[2] for 60 mm busbar system

RBK 000 pro (160 A, 690 V)

RBK 000 pro
for installation on mounting plate

Table 76. Technical data

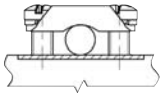
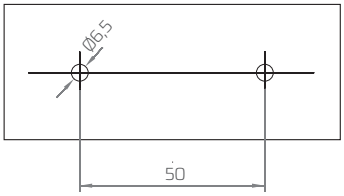
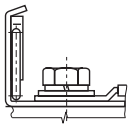
Parameter			RBK 000 pro / RBK 000 pro-S				
Rated thermal current I_{th} [1)]		A	160				
Rated voltage U_n		V	690				
Utilization category		-	AC-23B	AC-22B	AC-22B	AC-21B	DC-21B
Rated switching current I_e		A	100	100	160	160	160
Rated switching voltage U_e		V	400	690	400	690	250
Rated short circuit making current	690 V	kA	25				25/ 250V
	500 V		80				
	400 V		-				
Rated short circuit withstand current	690 V	kA	25				25/ 250V
	500 V		80				
	400 V		-				
Rated insulation voltage U_i		V	1000				
Rated impulse withstand voltage $U_{imp.}$		kV	8				
Rated frequency		Hz	50-60				-
Mechanical durability		Number of cycles	2000		1600		
Electrical durability			300		200		
IP degree of protection		IP	20				
Weight		kg	~0,6, ~0,9				
Size of fuse links		-	000				

[1)] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

Table 77. Versions

RBK 000 pro/160 A		Cable terminal	Article No.
For installation on mounting plate			
RBK 000 pro	for connection of round conductors	S-bridge clamps	63-823191-011
RBK 000 pro-E	for connection of round conductors, possible installation on DIN rail	S-bridge clamps	63-823191-051
RBK 000 pro-M	for connection of round conductors with lug terminals	M8 screws	63-823191-021
RBK 000 pro-M-E	for connection of round conductors with lug terminals, possible installation on DIN rail	M8 screws	63-823191-061
RBK 000 pro-W	for connection of round conductors,lenghtened terminal shrouds	S-bridge clamps	63-823191-071
RBK 000 pro-W-M	for connection of round conductors with lug terminals, lenghtened terminal shrouds	M8 screws	63-823191-081
APASYS 60	**For installation on to 60 mm busbar system**		
RBK 000 pro-SD	Cable terminal – bottom, for connection of round conductors	S-bridge clamps	63-823234-031
RBK 000 pro-SG	Cable terminal – top, for connection of round conductors	S-bridge clamps	63-823234-011
RBK 000 pro-SD-M	Cable terminal – bottom, for connection of conductors with lug terminals	M8 screws	63-823234-041
RBK 000 pro-SG-M	Cable terminal – top, for connection of conductors with lug terminals	M8 screws	63-823234-021

Table 78. RBK 000 pro terminal clamps

Description	Clamp	Drawing of clamp	Cross-section of conductors	Cu bar	Tightening torque	Dimensions and spacing of holes for installation of RBK 000 on mounting plate
RBK 000 pro	S-bridge clamp 2 x M5 x 16		Cu/Al conductor 1,5 ÷ 35 mm²	maximum bar width 15 mm	3 Nm*	
	M8 x 16 screw		conductor with lug terminal up to 70 mm²		10 Nm*	

For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

RBK 000 pro-E
for mounting on DIN rail

RBK 000 pro
for installation on mounting plate
with additional terminal shrouds

RBK 000 pro-W
for installation on mounting plate
with extended terminal shrouds

RBK 000 pro-SG (top cable terminals)
RBK 000 pro-SD (bottom cable terminals)
for installation on to 60 mm busbar system

RBP 000 pro (125 A, 690 V) for mounting

- on plate
- on double DIN rail

RBP 000 pro-S (125 A, 690 V) for installation onto 60 mm busbar system

- system of protective covers provides touch protection
- possible installation of distribution board's protective panel at depth of 32 mm or 70 mm
- built-in hooked clamps provide fast installation onto busbar system
- top/bottom cable terminal

RBP 000 pro-S

Table 79. Technical data

Parameter			RBP 000 pro			RBP 000 pro-S		
Rated thermal current I_{th} [1)]		A	125			125		
Rated voltage U_n		V	690			690		
Utilization category		-	AC-23B	AC-21B	DC-22B	AC-23B	AC-22B	DC-22B
Rated switching current I_e		A	125	125	100	125	125	100
Rated switching voltage U_e		V	400	690	250	400	690	250
Rated short circuit making current	690 V	kA	50		25/ 250V	35		25/ 250V
	500 V		-			-		
	400 V		80			80		
Rated short circuit withstand current	690 V	kA	50		25/ 250V	35		25/ 250V
	500 V		-			-		
	400 V		80			80		
Rated insulation voltage U_i		V	1000			1000		
Rated impulse withstand voltage U_{imp}		kV	6			6		
Rated frequency		Hz	50-60		-	50-60		-
Mechanical durability		Number of cycles	1600			1600		
Electrical durability			200			200		
IP degree of protection		IP	20*			20*		
Weight		kg	~0,5			~0,7		
Size of fuse links		-	000			000		

[1)] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

Table 80. Versions

RBP 000 pro		Cable terminal	Article No.
For mounting on plate			
RBP 000 pro	for connection of round conductors	frame clamps	63-823267-001
for mounting on double DIN rail			
RBP 000 pro-E-125 mm	double DIN rail with spacing of 125 mm	frame clamps	63-823267-002
RBP 000 pro-E-150 mm	double DIN rail with spacing of 150 mm	frame clamps	63-823267-003
APASYS 60			
RBP 000 pro-S			
For installation on to 60 mm busbar system			
RBP 000 pro-SG	cable terminal-top, for connection of conductors with bare ends	frame clamps	63-823427-001
RBP 000 pro-SD	cable terminal-bottom, for connection of conductors with bare ends	frame clamps	63-823427-002

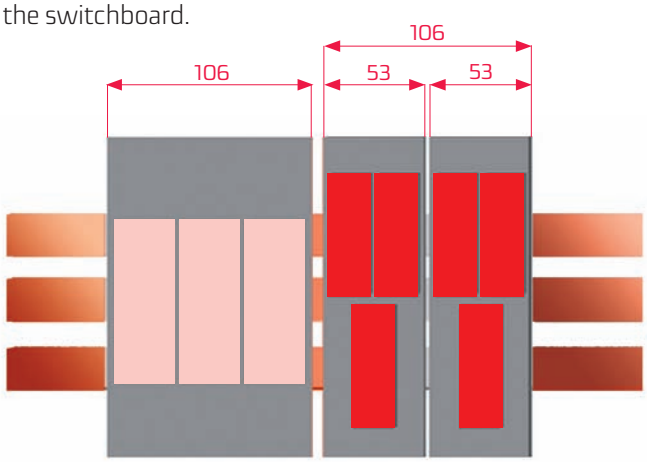
Table 81. RBP 000 pro, RBP 000 pro-S terminal clamps

Description	Cable terminal	Drawing of clamp	Cross-section of conductors	Tightening torque
RBP 000 pro RBP 000 pro-S	frame clamps		2,5 - 50 mm²	6 Nm*

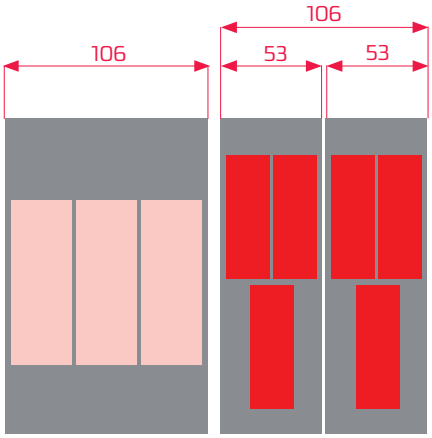
For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

Saves space in the switchboard

RBP 000 pro-S (RBP 000-pro) width dimensions is equal to half the width of **RBK 00 pro-S (RBK 00 pro)**, so we can install more disconnectors (keeping a certain width of the switchboard) to protect individual circuits in the switchboard.



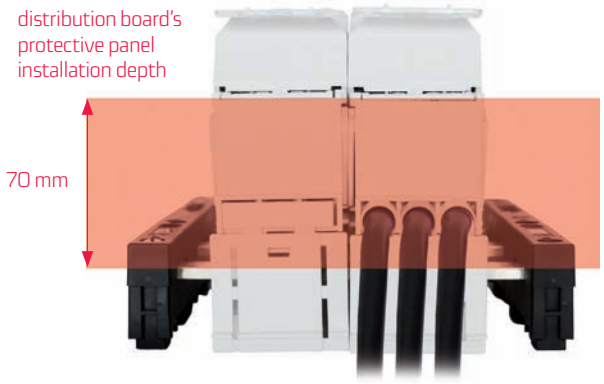
RBK 00 pro-S RBP 000 pro-S

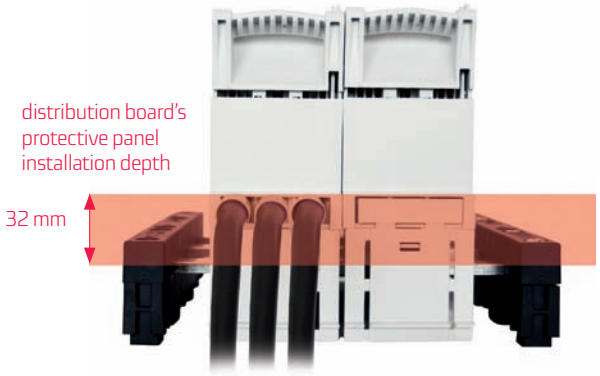


RBK 00 pro RBP 000 pro

Fuse switch disconnectors **RBP 000 pro-S** are designed for installation of distribution board's protective panels at two depths:

- covering system at 70 mm depth
- covering system at 32 mm depth





Fuse switch disconnectors **RBP 000 pro-S** are manufactured in two versions depending on type of cable terminal

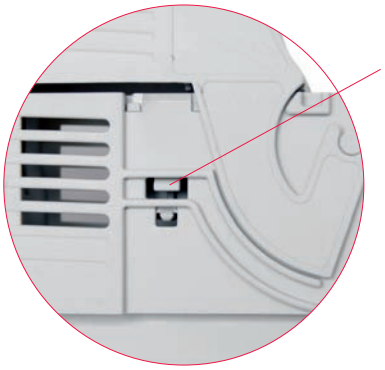
- **RBP 000 pro-SD**-with bottom cable terminal
- **RBP 000 pro-SG**-with top cable terminal

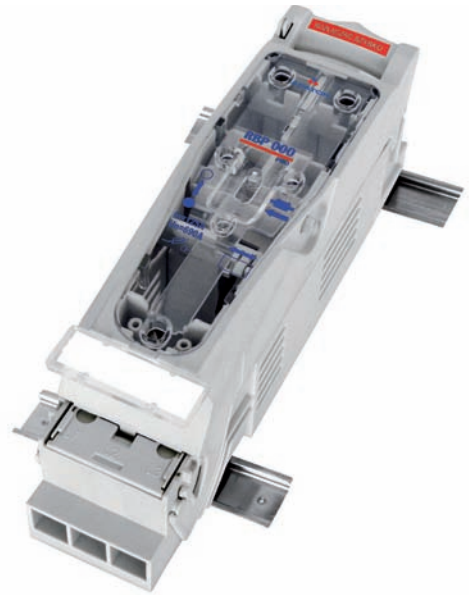
with cables connected to the top cable terminal RBP 000 pro -SG

with cables connected to the bottom cable terminal RBP 000 pro- SD

Fuse switch disconnector **RBP 000 pro-S** has special cavity in it's main base encasing busbar system's support.

It is possible to install **microswitch indicating** position open/close fuse switch disconnectors.





Fuse switch disconnector **RBP 000 pro - E 125 mm**
for mounting on double DIN rail

RBP 000 pro
mounting on plate

RBK 00 pro (160 A, 690 V)

Table 82. Technical data

Parameter			RBK 00 pro		
Rated thermal current I_{th} [1]		A	160		
Rated voltage U_n		V	690		
Utilization category		-	AC-23B	DC-22B	DC-21B
Rated switching current I_e		A	160	160	160
Rated switching voltage U_e		V	690	250	440
Rated short circuit making current	690 V	kA	80	25/250V	
	500 V		-		
	400 V		100		
Rated short circuit withstand current	690 V	kA	80	25/250V	
	500 V		-		
	400 V		100		
Rated insulation voltage U_i		V	1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8		
Rated frequency		Hz	50-60	-	
Mechanical durability		Number of cycles	1600		
Electrical durability			200		
IP degree of protection		IP	20		
Weight		kg	~0,7		
Size of fuse links		-	00		

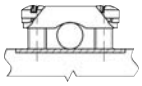
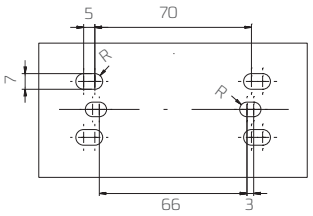
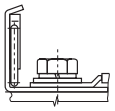
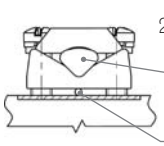
[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

RBK 00 pro

Table 83. Versions

RBK 00 pro/160 A		Cable terminal	Article No.
For installation on mounting plate			
RBK 00 pro	for connection of round conductors	S-bridge clamps	63-823256-111
RBK 00 pro-M	for connection of conductors with lug terminals	M8 screws	63-823256-121
RBK 00 pro-V	for connection of sector-shaped conductors	V-shape clamps	63-823256-131
RBK 00 pro-W	for connection of round conductors enghtened terminal shrouds	S-bridge clamps	63-823256-141
RBK 00 pro-M-W	for connection of conductors with lug terminals, lenghtened terminal shrouds	M8 screws	63-823256-151
RBK 00 pro-V-W	for connection of sector-shaped conductors, lenghtened terminal shrouds	V-shape clamps	63-823256-161
for mounting on double DIN rail			
RBK 00 pro-E-125mm	double DIN rail with spacing of 125 mm	S-bridge clamps/ M8 screws/ V-shape clamps	On request*
RBK 00 pro-E-150mm	double DIN rail with spacing of 150 mm	S-bridge clamps/ M8 screws/ V-shape clamps	On request*

Table 84. RBK 00 pro terminal clamps

Description	Clamp	Drawing of clamp	Cross-section of conductors	Cu bar	Tightening torque	Dimensions and spacing of holes for installation of RBK 00 pro on mounting plate
RBK 00 pro	S-bridge clamp 2 x M5 x 16		Cu/Al conductor 4÷50 mm²	maximum bar width 20 mm	3 Nm*	
	M8 x 16 screw		conductor with lug terminal up to 70 mm²		10 Nm*	
	V-shape clamp 2 x M5 x 20	 2) 4 mm² - 70 mm² 4 mm² - 95 mm² 1) 1,5 mm² - 2,5 mm²			3 Nm*	

For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

RBK 00 pro-W

Fuse switch disconnector **RBK 00 pro-W** with additional terminal shrouds

Fuse switch disconnector **RBK 00 pro-E** for mounting on double DIN rail

FUSE SWITCH DISCONNECTORS FOR INSTALLATION ONTO 60 mm BUSBAR SYSTEM RBK 00 pro-S

- system of protective covers provides touch protection
- possible installation of distribution board's protective panel at depth of 32 mm or 70 mm
- built-in hooked clamps provide fast installation onto busbar system
- top/bottom cable terminal

Table 85. Technical data

Parameter			RBK 00 pro-S		
Rated thermal current I_{th} [1]		A	160		
Rated voltage U_n		V	690		
Utilization category		-	AC-23B	AC-22B	DC-22B
Rated switching current I_e		A	160	160	160
Rated switching voltage U_e		V	400	690	250
Rated short circuit making current	690 V	kA	100		25/ 250V
	500 V				
	400 V				
Rated short circuit withstand current	690 V	kA	100		25/ 250V
	500 V				
	400 V				
Rated insulation voltage U_i		V	1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8		
Rated frequency		Hz	50-60	-	
Mechanical durability		Number of cycles	1600		
Electrical durability			200		
IP degree of protection		IP	20		
Weight		kg	~0,9		
Size of fuse links		-	00		

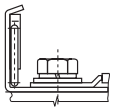
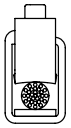
[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

RBK 00 pro-S

Table 86. Versions

APASYS 60	RBK 00 pro-S		Cable terminal	Article No.
	For installation on to 60 mm busbar system			
	RBK 00 pro-SG-M	cable terminal – top, for connection of conductors with lug terminals	M8 screws	63-823259-121
	RBK 00 pro-SD-M	cable terminal – bottom, for connection of conductors with lug terminals	M8 screws	63-823259-141
	RBK 00 pro-SG-R	cable terminal-top, for connection of conductors with bare ends	frame clamps	63-823259-151
	RBK 00 pro-SD-R	cable terminal-bottom, for connection of conductors with bare ends	frame clamps	63-823259-161

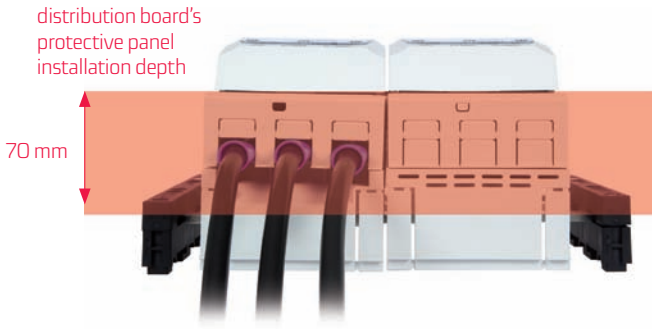
Table 87. RBK 00 pro-S terminal clamps

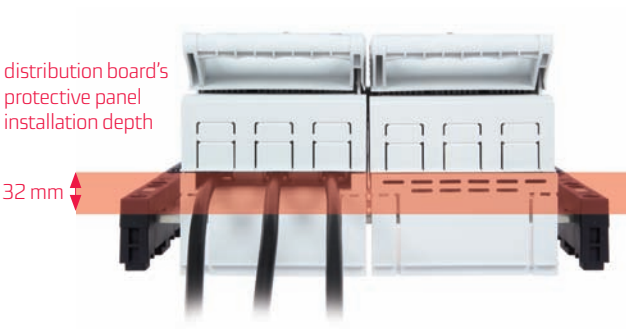
Description	Clamp	Drawing of clamp	Cross-section of conductors	Cu bar	Tightening torque
RBK 00 pro-SGM RBK 00 pro-SDM	M8 x 16 screw		conductor with lug terminal up to 70 mm^2	maximum bar width 20 mm	10 Nm*
RBK 00 pro-SGR RBK 00 pro-SDR	frame clamps		4 ÷ 95 mm^2	-	⬡ 6 Nm* 3 Nm*

For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

Fuse switch disconnectors **RBK 00pro-S** are designed for installation of distribution board's protective panels at two depths:

- covering system at 70 mm depth
- covering system at 32 mm depth

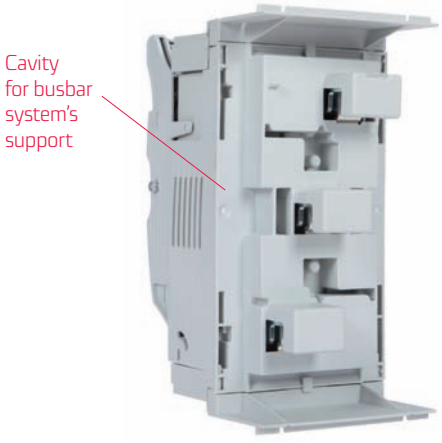




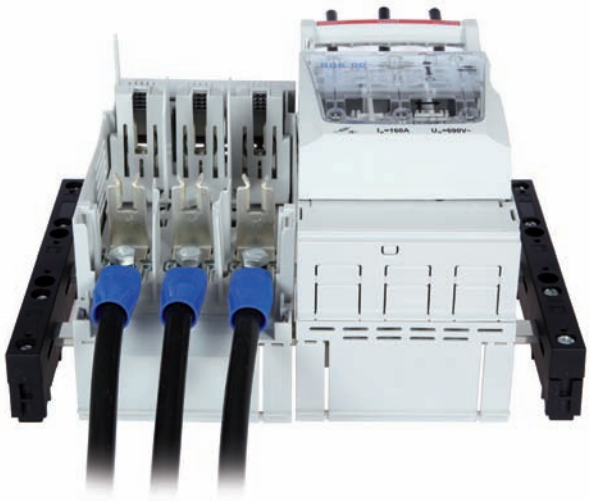
Fuse switch disconnectors **RBK 00 pro-S** are manufactured in two versions depending on type of cable terminal

- **RBK 00 pro-SD**-with bottom cable terminal
- **RBK 00 pro-SG**-with top cable terminal

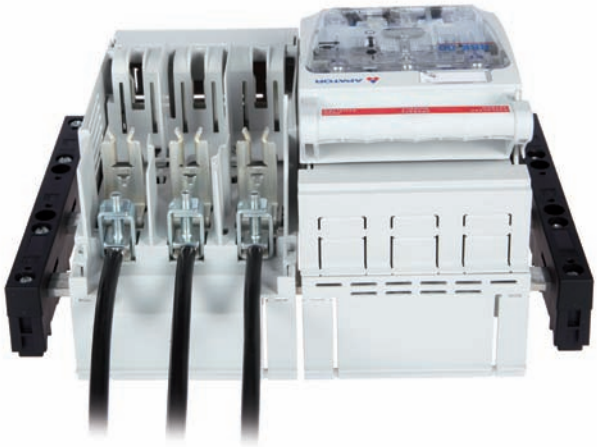
Fuse switch disconnector **RBK 00 pro-S** has special cavity in it's main base encasing busbar system's support.



Cable terminals:
M8 screw terminal **(RBK 00 pro-SDM, RBK 00 pro-SGM)**

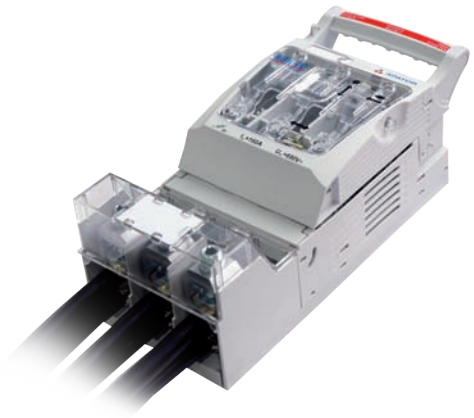


Frame clamp **(RBK 00 pro-SDR, RBK 00 pro-SGR)**



It is possible to install **microswitch indicating** position in fuse switch disconnectors **RBK 00 pro-S**.

RBK 00 pro V 120 (160 A, 690 V)



RBK 00 pro V 120

Table 88. Technical data

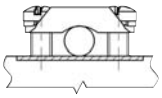
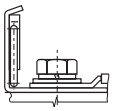
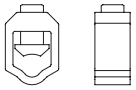
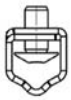
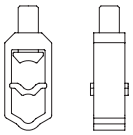
Parameter			RBK 00 pro-V 120		
Rated thermal current I_{th} [1]		A	160		
Rated voltage U_n		V	690		
Utilization category		-	AC-23B	AC-22B	DC-22B
Rated switching current I_e		A	160	160	160
Rated switching voltage U_e		V	400	690	250
Rated short circuit making current	690 V	kA	100		25/ 250V
	500 V				
	400 V				
Rated short circuit withstand current	690 V	kA	100		25/ 250V
	500 V				
	400 V				
Rated insulation voltage U_i		V	1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8		
Rated frequency		Hz	50-60		-
Mechanical durability		Number of cycles	1600		
Electrical durability			200		
IP degree of protection		IP	IP20		
Weight		kg	~0,9		
Size of fuse links		-	00		

[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

Table 89. Versions

RBK 00 pro V 120		Article No.
For installation on mounting plate		
RBK 00 pro - V120	for connection of conductors with bare ends (top terminals- S-bridge clamps, bottom terminals – V-clamps)	63-823341-011
RBK 00 pro - V120 - M	for connection of conductors with bare ends (top terminals- M8 screws, bottom terminals – V-clamps)	63-823341-021
RBK 00 pro - P	for connection of conductors with bare ends (top terminals- S-bridge clamps, bottom terminals – Prism clamps)	63-823341-031
RBK 00 pro - P - M	for connection of conductors with bare ends (top terminals- M8 screws, bottom terminals – Prism clamps)	63-823341-041
RBK 00 pro 2 x V120	for connection of conductors with bare ends (top terminals- S-bridge clamps, bottom terminals – double V-clamps)	63-823341-051
RBK 00 pro 2 x V120 - M	for connection of conductors with bare ends (top terminals- M8 screws, bottom terminals – double V-clamps)	63-823341-061

Table 90. RBK 00 pro-V120 terminal clamps

	Clamp	Picture of a clamp	Drawing of clamp	Cross-section of conductors	Cu bar	Tightening torque
terminals on the consumer side	S-bridge clamp 2 x M5 x 16			Cu/Al conductor 4 ÷ 50 mm²	maximum bar width 20 mm	3 Nm*
	M8 x 16 screw			conductor with lug terminal up to 70 mm²		10 Nm*
cable terminals	V-clamp			◆ ◆ ** 25÷150 mm²	-	20 Nm*
				● ◆ ** 16÷95 mm²		
	HM 10-120			◆ ◆ ** 10 - 70 mm²		15 Nm*
				● ◆ ** 25 - 120 mm² 25 - 95 mm²		
	double V-clamp			◆ ◆ 2 x (25÷120 mm²)		20 Nm*
				● ◆ 2 x (16÷95 mm²)		

*using of tension wrench is recommended

**for stranded conductors using cable ferrules is recommended

New features of cable terminals

- connection of one or two sector-shaped conductors with cross-section up to 120 mm^2
- connection of two round conductors with bare ends and cross-section up to 70 mm^2

Space saving

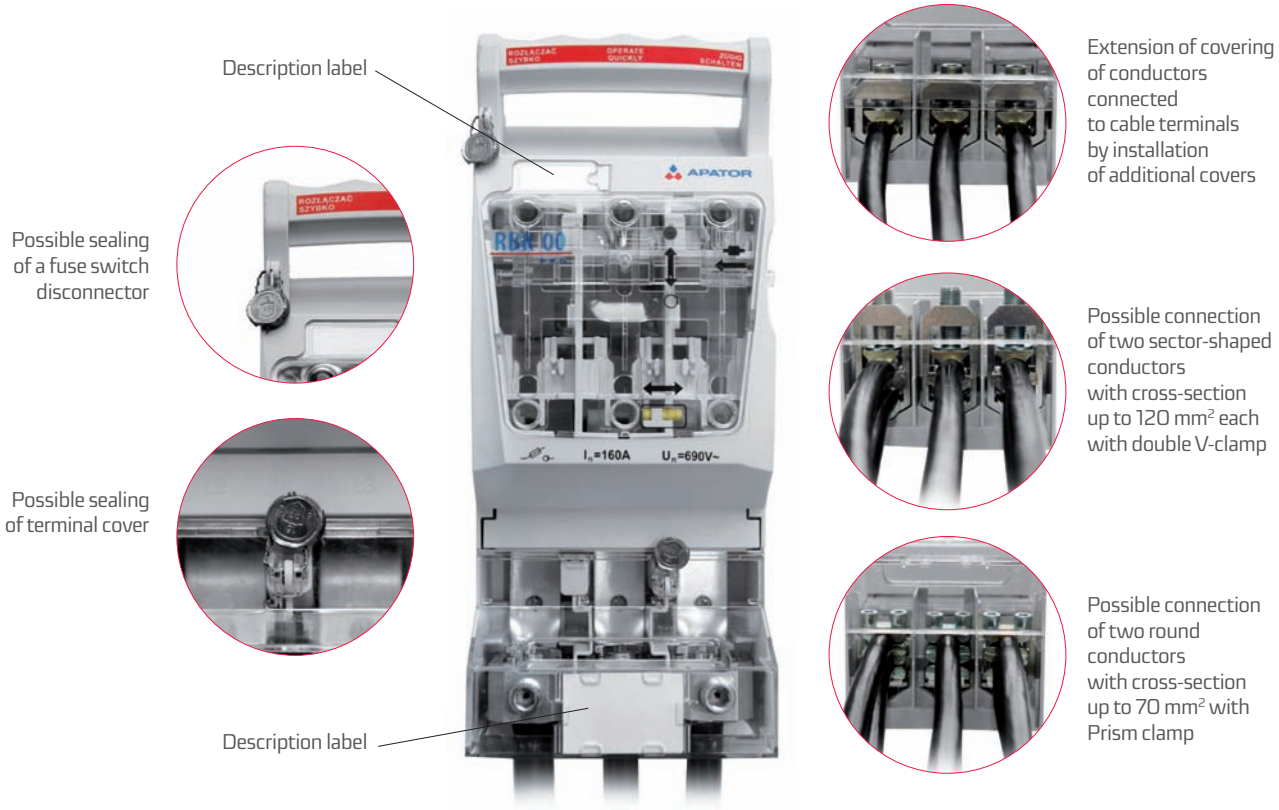
- possible reduction of external width of cable distribution cabinet to width of a fuse switch disconnector

Efficient current circuit

- no screw or riveted connection between contact and cable terminal (uniform design of current circuit ensures lower power loss and operating temperature)

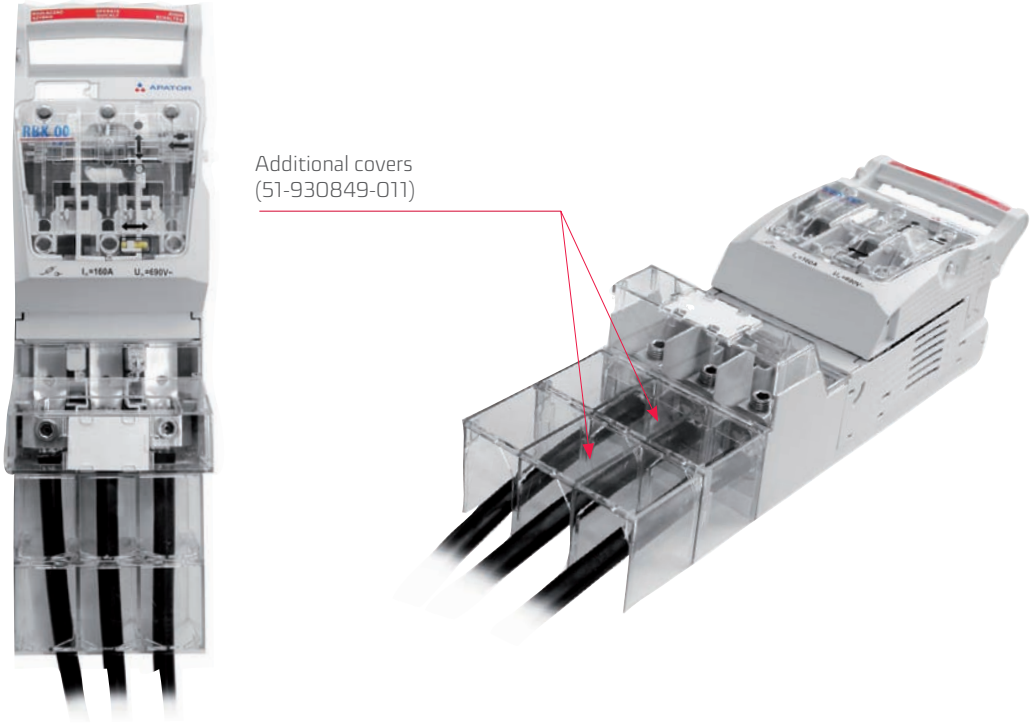
Safety

- fuse cover and cable terminal cover sealing
- extension of covering of conductors connected to cable terminals by installation of additional covers

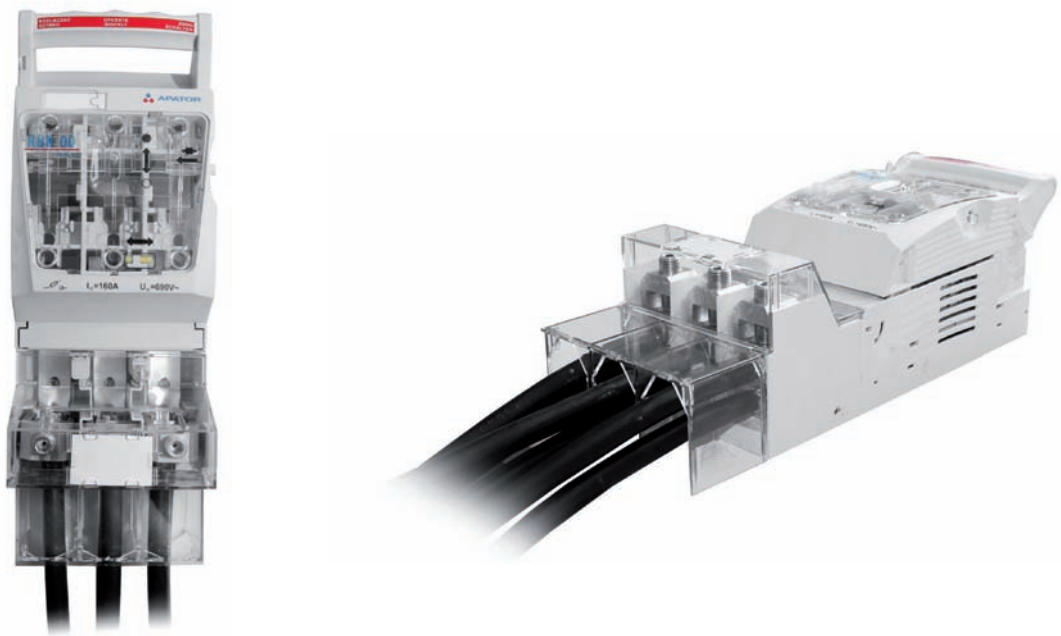


Extended covering of conductors connected to cable terminal

For extension of covering of conductors connected to cable terminals, for example: to fully cover cables in cable distribution cabinet, any required number of additional covers could be installed (article number of additional extending cover: 51-930849-011) . Cover length - 50 mm.



RBK 00 pro-V120 with V-clamp for connection of sector-shaped conductors with cross-section up to 120 mm^2



RBK 00 pro 2 x V120 with double V-clamp for connection of two sector-shaped conductors with cross-section up to 120 mm^2 each

RBK 1 pro (250 A, 690 V)

RBK 1 pro
for installation
on mounting plate

Table 91. Technical data

Parameter			RBK 1 pro		RBK 1 pro-S		
Rated thermal current I_{th} [1]		A	250		250		
Rated voltage U_n		V	690		690		
Utilization category		-	AC-23B	DC-22B	AC-23B	AC-22B	DC-22B[2]
Rated switching current I_e		A	250	250	250	250	250
Rated switching voltage U_e		V	690	250	400	690	250
Rated short circuit making current	690 V	kA	80	25/ 250V	80		25/ 250V
	500 V		-		-		
	400 V		100		100		
Rated short circuit withstand current	690 V	kA	80	25/ 250V	80		25/ 250V
	500 V		-				
	400 V		100		100-		
Rated insulation voltage U_i		V	1000		1000		
Rated impulse withstand voltage $U_{imp.}$		kV	8		8		
Rated frequency		Hz	50-60	-	50-60		-
Mechanical durability		Number of cycles	1600		1600		
Electrical durability			200		200		
IP degree of protection		IP	IP20		IP20		
Weight		kg	~2		~2,5		
Size of fuse links		-	1		1		

[1] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

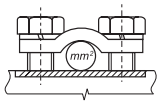
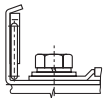
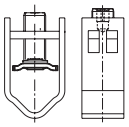
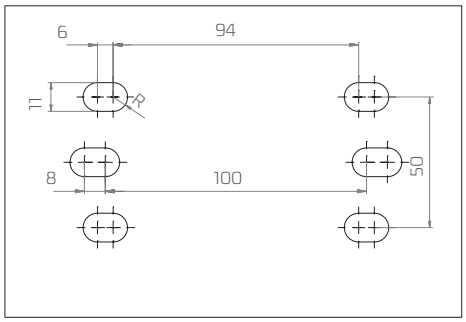
Table 92. Versions

RBK 1 pro/250 A			
For installation on mounting plate		**Cable terminals**	**Article No.**
RBK 1 pro	For connection of round conductors	S-bridge clamps	63-811748-011
RBK 1 pro-M	For connection of conductors with lug terminals	Screws	63-811748-021
RBK 1 pro-V	For connection of sector-shaped conductors	V-clamps	63-811748-031
RBK 1 pro VG	For connection of round conductors, top terminals - V-terminals, bottom terminals - S-bridge terminals	V- clamps / S-bridge clamps	63-811784-011
RBK 1 pro VG-M	For connection of round conductors, top terminals - V-terminals, bottom terminals - screw terminals	V- clamps /screws	63-811784-021
RBK 1 pro VD	For connection of round conductors, top terminals - S-bridge terminals, bottom terminals - V-terminals	S-bridge clamps / V- clamps	63-811784-031
RBK 1 pro VD-M	For connection of round conductors, top terminals - screw terminals, bottom terminals - V-terminals	Screws / V-clamps	63-811784-041
APASYS 60	**RBK 1 pro-S**		
	For installation on to busbar system	**Cable terminals**	**Article No.**
	60 mm busbar system		
RBK 1 pro-SG 60	Top cable terminals, for connection of round conductors	S-bridge clamps	63-811750-011
RBK 1 pro-SD 60	Bottom cable terminals, for connection of round conductors	S-bridge clamps	63-811750-021
RBK 1 pro-SG-M 60	Top cable terminals, for connection of sector-shaped conductors	Screws	63-811750-051
RBK 1 pro-SD-M 60	Bottom cable terminals, for connection of conductors withlug terminals	Screws	63-811750-061
RBK 1 pro-SG-V 60	Top cable terminals, for connection of sector-shaped conductors	V-clamps	63-811750-091
RBK 1 pro-SD-V 60	Bottom cable terminals, for connection of sector-shaped conductors	V-clamps	63-811750-101

Table 93. Versions

RBK 1 pro-S			
For installation on to busbar system		**Cable terminals**	**Article No.**
100 mm busbar system			
RBK 1 pro-SG 100	Top cable terminals, for connection of round conductors	S-bridge clamps	63-811750-031
RBK 1 pro-SD 100	Bottom cable terminals, for connection of round conductors	S-bridge clamps	63-811750-041
RBK 1 pro-SG-M 100	Top cable terminals, for connection of conductors with lug terminals	Screws	63-811750-071
RBK 1 pro-SD-M 100	Bottom cable terminals, for connection of conductorswith lug terminals	Screws	63-811750-081
RBK 1 pro-SG-V 100	Top cable terminals, for connection of sector-shaped conductors	V-clamps	63-811750-111
RBK 1 pro-SD-V 100	Bottom cable terminals, for connection of sector-shaped conductors	V-clamps	63-811750-121

Table 94. RBK 1 pro terminal clamps

Description	**RBK 1 pro**	**RBK 1 pro-M**	**RBK 1 pro-V**
Clamp	S-bridge clamp 2 x M8 x 30	M10x25 screw	V-clamp HS 35-300-C
Picture of a clamp			
Drawing of a clamp			
Cross-section of conductors	Cu/Al conductor 35 ÷ 120 mm²	conductor with lug terminal up to 120 mm²	V-clamp for direct fixing of conductor with bare end with cross-section of: 35 - 150 mm² 35 - 185 mm² 50 - 240mm² ** 50 - 300 mm²
Cu bar	maximum bar width 35 mm		
Tightening torque	10 Nm*	20 Nm*	30 Nm*
Dimensions and spacing of holes for installation of RBK 1 pro on mounting plate			

*using of tension wrench is recommended

**for stranded conductors using cable ferrules is recommended

RBK 1 pro
for installation on mounting plate

RBK 1 pro-SG
RBK 1 pro-SD
for installation on to busbar system

RBK 1 pro
for installation on mounting plate,
with additional terminal shrouds

RBK 1 pro VD-M
for installation on mounting plate,
picture of fuse switch disconnector
without fuse links cover and terminal shrouds,
top cable terminal - M screws,
bottom cable terminal - V-clamps,
(RBK 1 pro VG-M - bottom cable terminal - M screws,
top cable terminal - V-clamps)

RBK 2 pro (400 A, 690 V)

Table 95. Technical data

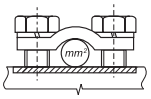
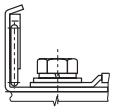
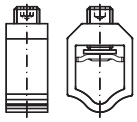
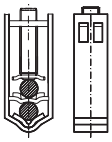
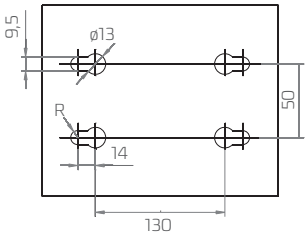
Parameter			RBK 2 pro / RBK 2 pro-S		
Rated thermal current I_{th}		A	400		
Napięcie znamionowe U_n		V	690		
Utilization category		-	AC-23B	DC-22B	DC-21B
Rated switching current I_e		A	400	400	400
Rated switching voltage U_e		V	690	220	440
Rated short circuit making current	690 V	kA	80	20/250V, 15/440V	
	500 V				
	400 V		100		
Rated short circuit withstand current	690 V	kA	80	20/250V, 15/440V	
	500 V		-		
	400 V		100		
Rated insulation voltage U_i		V	1000		
Rated impulse withstand voltage $U_{imp.}$		kV	12		
Rated frequency		Hz	50-60	-	
Mechanical durability		Number of cycles	1000		
Electrical durability			200		
IP degree of protection		IP	20		
Weight		kg	~3, ~4,5		
Size of fuse links		-	2		

RBK 2-V pro
for installation on mounting plate

Table 96. Versions

RBK 2 pro/400 A		Cable terminal	Article No.
For installation on mounting plate			
RBK 2 pro	for connection of round conductors	S-bridge clamps	63-811685-011
RBK 2 pro-V	for connection of sector-shaped conductors	V-clamps	63-811685-071
RBK 2 pro-2V	for connection of sector-shaped conductors	double V-clamps	63-811685-081
RBK 2 pro-M	or connection of conductors with lug terminals	M10 screws	63-811685-061
RBK 2 pro-VG	for connection of sector-shaped / round conductors top terminals - V-clamps, bottom terminals - S-bridge clamps	V-clamps / S-bridge clamps	63-811685-201
RBK 2 pro-VG-M	for connection of sector-shaped conductors / conductors with lug terminals top terminals - V-clamps, bottom terminals - screw terminals	V-clamps / S-bridge clamps	63-811685-202
RBK 2 pro-VD	for connection of round / sector-shaped conductors top terminals - S-bridge clamps, bottom terminals - V-clamps	V-clamps / S-bridge clamps	63-811685-203
RBK 2 pro-VD-M	for connection of conductors with lug terminals / sector-shaped conductors top terminals - screw terminals , bottom terminals - V-clamps	screws / V-clamps	63-811685-204
APASYS 60	**For installation on to 60 mm busbar system**		
	RBK 2 pro-SD-M 60 Bottom cable terminals, for connection of conductors with lug terminals	M10 screws	63-811686-061
	RBK 2 pro-SG-M 60 Top cable terminals, for connection of conductors with lug terminals	M10 screws	63-811686-051
	RBK 2 pro-SD-V 60 Bottom cable terminals, for connection of sector-shaped conductors	V-clamps	63-811686-101
	RBK 2 pro-SG-V 60 Top cable terminals, for connection of sector-shaped conductors	V-clamps	63-811686-091
	RBK 2 pro-SD-2V 60 Bottom cable terminals, for connection of sector-shaped conductors	double V-clamps	63-811686-141
	RBK 2 pro-SG-2V 60 Top cable terminals, for connection of sector-shaped conductors	double V-clamps	63-811686-131
For installation on to 100 mm busbar system			
RBK 2 pro-SD-M 100	Bottom cable terminals, for connection of conductors withlug terminals	M10 screws	63-811686-081
RBK 2 pro-SG-M 100	Top cable terminals, for connection of conductors with lug terminals	M10 screws	63-811686-071
RBK 2 pro-SD-V 100	Bottom cable terminals, for connection of sector-shaped conductors	V-clamps	63-811686-121
RBK 2 pro-SG-V 100	Top cable terminals, for connection of sector-shaped conductors	V-clamps	63-811686-111
RBK 2 pro-SD-2V 100	Bottom cable terminals, for connection of sector-shaped conductors	double V-clamps	63-811686-161
RBK 2 pro-SG-2V 100	Top cable terminals, for connection of sector-shaped conductors	double V-clamps	63-811686-151

Table 94. RBK 2 pro terminal clamps

Description	RBK 2 pro			
Clamp	S-bridge clamp 2 x M8 x 30	M10 x 30 screw	V- clamp 35-300SW-B	double V- clamp HS2/35-240-C
Drawing of clamp				
Cross-section of conductors	Cu/Al conductor 50 ÷ 185 mm²	conductor with lug terminal up to 240 mm²	V-clamp for direct fixing of conductor with bare end with cross-section: 35 - 185 mm² 35 - 240 mm² 35 - 240 mm² 35- 300 mm²	35 - 185 mm² 35 - 240 mm² 35 - 240 mm² 35 - 300 mm²
Cu bar	maximum bar width 35 mm			
Tightening torque	10 Nm*	20 Nm*	30 Nm*	40 Nm*
Dimensions and spacing of holes for installation of RBK 2 on mounting plate				

For stranded conductors using cable ferrules is recommended

*using of tension wrench is recommended

RBK 2 pro-V
for installation
on mounting plate,
cable terminals: V-clamps

RBK 2 pro-2V
for installation
on mounting plate,
cable terminals: double V-clamps

RBK 2 pro-SG (top cable terminal: M10 screws)
RBK 2 pro-SD (bottom cable terminal: M10 screws)
for installation on to busbar systems

RBK 2 pro-SG-V (top cable terminal: double V-clamp)
RBK 2 pro-SD-V (bottom cable terminal: doubleV-clamp)
for installation on to busbar systems
cable terminals: V-clamps

RBK 2 pro-SG-2V (top cable terminal: V-clamp)
RBK 2 pro-SD-2V (bottom cable terminal: V-clamp)
for installation on to busbar systems
cable terminal: double V-clamps

RBK 3 pro (630 A, 690 V)

Table 95. Technical data

Parameter			RBK 3 pro			RBK 3 pro-S		
Rated thermal current I_{th} [1)]		A	630			630		
Rated voltage U_n		V	690			690		
Utilization category		-	AC-23B	AC-22B	DC-21B	AC-23B	AC-22B	DC-21B
Rated switching current I_e		A	630	630	630	630	630	630
Rated switching voltage U_e		V	400	690	440	400	500	690
Rated short circuit making current	690 V	kA	80		35/ 440V	80		
	500 V		-			-		
	400 V		-			-		
Rated short circuit withstand current	690 V	kA	80		35/ 440V	80		
	500 V		-			-		
	400 V		-			-		
Rated insulation voltage U_i		V	1000			1000		
Rated impulse withstand voltage $U_{imp.}$		kV	12			12		
Rated frequency		Hz	50-60		-	50-60		
Mechanical durability		Number of cycles	1000			1000		
Electrical durability			200			200		
IP degree of protection		IP	20			20		
Weight		kg	~4,3			~4,9		
Size of fuse links		-	3			3		

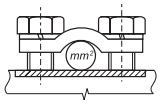
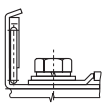
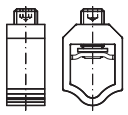
[1)] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

RBK 3 pro
main version
for installation
on mounting plate

Table 96. Versions

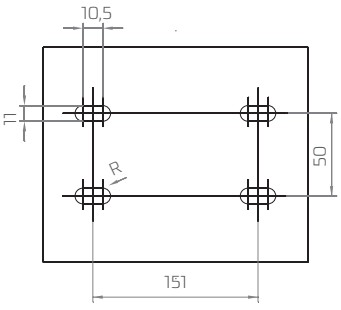
	RBK 3 pro		Cable terminal	Article No.
	For installation on mounting plate			
	RBK 3 pro	for connection of round conductors	S-bridge clamps	63-811761-011
	RBK 3 pro-M	for connection of condutors with lug terminals	M12 screws	63-811761-021
	RBK 3 pro-M-2xVD	cable terminals: for connection of conductors with lug terminals - top M screws, for connection of sector-shaped conductors - bottom V-clamps	M12 screws/V-shape terminals	63-811761-031
APASYS 60	**RBK 3 pro, RBK 3 pro-S for installation on 60 mm busbar system**			
	RBK 3 pro-SD	bottom cable terminals, for connection of round conductors	S-bridge clamps	63-028802-001
	RBK 3 pro-SG	top cable terminals, for connection of round conductors	S-bridge clamps	63-028802-002
	RBK 3 pro-SD-M	bottom cable terminals, for connection of conductors with lug terminals	M12 screws	63-028802-003
	RBK 3 pro-SG-M	top cable terminals, for connection of conductors with lug terminals	M12 screws	63-028802-004

Table 97. RBK 3 pro terminal clamps

Description	RBK 3 pro		
Version	S-bridge clamp 2 x M8 x 35	M12 x 30 screw	V- clamp 35-300SW-B
Drawing of clamp			
Cross-section of conductors	Cu/Al conductor 50 ÷ 185 mm²	conductor with lug terminal up to 240 mm²	V-clamp for direct fixing of two conductors with bare ends with cross-section of:
Cu bar	maximum bar width 35 mm		35 - 185 mm² 35 - 240 mm² 35 - 240mm² 35 - 300 mm²
Tightening torque	10 Nm*	20 Nm*	30 Nm*

For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

Dimensions and spacing of holes for installation of RBK 3 pro on mounting plate



RBK 4a (1250 A, 500 V; 1600 A, 400 V)

RBK 4a
for installation on mounting plate

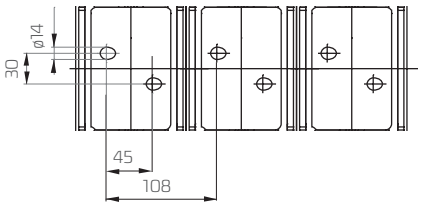
Table 98. Technical data

Parameter		RBK 4a	
Rated thermal current I_{th}	A	1250	1600
Utilization category	-	AC-22B	AC-21B
Rated switching voltage U_e	V	500	400
Rated switching current I_e	A	1250	1600
Rated short circuit withstand current	kA	50	
Rated insulation voltage U_i	V	800	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated frequency	Hz	50-60	
Mechanical durability		600	
Electrical durability		100	
IP degree of protection		IP20	
Size of fuse links		4a	

Table 99. Versions

RBK 4a		Weight	Cable terminal	Article No.
RBK 4a/1250/1	ONE POLE SWITCHING - each phase independently, for connection of conductors with lug terminals	4,2 kg	screws	63-946868-001
RBK 4a/1250/3	THREE POLE SWITCHING - all phases simultaneously, for connection of conductors with lug terminals	13,0 kg	screws	63-946868-002
RBK 4a/1600/1	ONE POLE SWITCHING - each phase independently, for connection of conductors with lug terminals	5,0 kg	screws	63-946869-001
RBK 4a/1600/3	THREE POLE SWITCHING - all phases simultaneously, for connection of conductors with lug terminals	14,0 kg	screws	63-946869-002

Table 100. RBK 4a terminal clamps

Description	RBK 4a 1250	RBK 4a 1600
Clamp	M16 x 50 screw	2 x M12 x 60 screw
Drawing of clamp		
Cross-section of conductors	conductor with lug terminal up to 800 mm²	
Cu bar	2 x 80 x 10	
Tightening torque	56 Nm*	
Dimensions and spacing of holes for installation of RBK 4a on mounting plate		

*using of tension wrench is recommended

Electronic fuse monitoring module - description

- L1, L2, L3 diodes are flashing - all three phases are supplied, all fuse links are operational. Relay contacts: [21..22] - closed; [13..14] - opened
- L1, L2, L3 diodes are blinking - all three phases are supplied, fuse links operated Relay contacts: [21..22] - opened; [13..14] - closed
- L1, L2, L3 diodes are off - two or more phases are not supplied or fuse links are removed. Relay contacts: [21..22] - opened; [13..14] - closed

RBK 00-X
with electronic fuse monitoring module

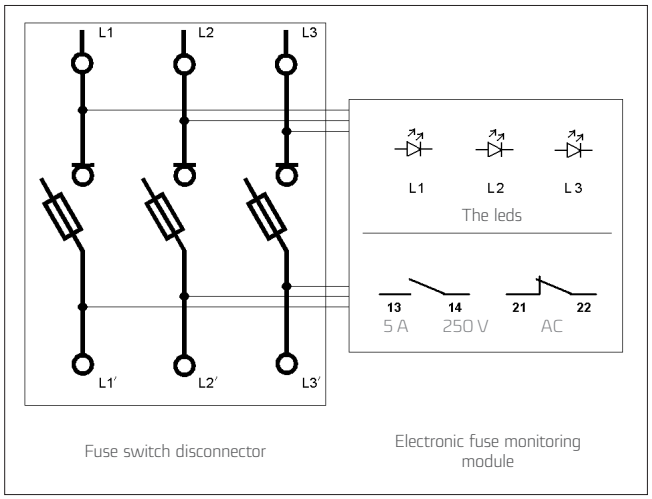
Parameters

- operating voltage AC - 400÷ 690 V, 40÷ 60 Hz;
- relay parameters 5A , 250 V~

CAUTION!
For use only with fuse-links with non-isolated gripping lugs!

Electronic fuse monitoring module versions according to power supply connection

RBK 00-XT - for RBK 00 installed on mounting plate, with power supply connected to top cable terminals
RBK 00-X - for RBK 00 installed on mounting plate, with power supply connected to bottom cable terminals
RBK 00S-X - for RBK 00 installed on to 60 mm busbar system



disconnector contact position during normal operation

Table 101. Versions

Versions with electronic fuse monitoring module, cable terminals - S-bridge clamps		
RBK 00 pro-XT	For installation on mounting plate, power supply connected to top cable terminals	63-823304-011
RBK 00 pro-X	For installation on mounting plate, power supply connected to top bottom terminals	63-823304-021
RBK 00 pro-SG-X	For installation on to 60 mm busbar system, top cable terminals, busbar power supply	63-823345-011
RBK 00 pro-SD-XT	For installation on to 60 mm busbar system, bottom cable terminals, busbar power supply	63-823345-021
RBK 1 pro-XT	For installation on mounting plate, power supply connected to top cable terminals	63-811785-011
RBK 1 pro-X	For installation on mounting plate, power supply connected to top bottom terminals	63-811785-021
RBK 1 pro-SG 60-X	For installation on to 60 mm busbar system, top cable terminals, busbar power supply	63-811787-011
RBK 1 pro-SD 60-XT	For installation on to 60 mm busbar system, bottom cable terminals, busbar power supply	63-811787-021
RBK 1 pro-SG 100-X	For installation on to 100 mm busbar system, top cable terminals, busbar power supply	63-811787-031
RBK 1 pro-SD 100-XT	For installation on to 100 mm busbar system, bottom cable terminals, busbar power supply	63-811787-041
RBK 2 pro-XT	For installation on mounting plate, power supply connected to top cable terminals	63-811786-011
RBK 2 pro-X	For installation on mounting plate, power supply connected to top bottom terminals	63-811786-021
RBK 2 pro-SG 60-X	For installation on to 60 mm busbar system, top cable terminals, busbar power supply	63-811788-011
RBK 2 pro-SD 60-XT	For installation on to 60 mm busbar system, bottom cable terminals, busbar power supply	63-811788-021
RBK 2 pro-SG 100-X	For installation on to 100 mm busbar system, top cable terminals, busbar power supply	63-811788-031
RBK 2 pro-SD 100-XT	For installation on to 100 mm busbar system, bottom cable terminals, busbar power supply	63-811788-041

RBK

Fuse switch disconnectors

- intended for distribution of electricity and protection
- of electrical equipment against short-circuits and overloads,
- with industrial fuse links

APPLICATIONS

RBK fuse switch disconnectors are designed for distribution of electricity and protection of electrical equipment against short-circuits and overloads with industrial fuse links. They are conforming to EN 60947-1, EN 60947-3, IEC 60947-1, IEC 60947-3 standards. They are intended for installation in low voltage distribution boards, cable and metering cabinets.

CONSTRUCTION

- thermoplastic parts of **RBK** fuse switch disconnectors are made of fibre glass strengthened polyamide with halogen free flame retardant added and flammability class V2,
- **RBK** fuse switch disconnectors consist of following parts:
  - three pole main base with spring-loaded contacts designed for connection of circular or sector-shaped conductors, conductors with lug terminals or bars,
  - emovable cover with fuse links,
- arc chambers with steel deionization plates over top contacts,
- silver plated contacts providing low power loss.

MOUNTING

- on mounting plate
  - RBK 00, RBK 1,
- on to 60 mm busbar system installation on to busbar system, with hooked clamps.

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34,
- ambient temperature from -25 °C to +55 °C,
- relative humidity of the air should not be higher than 50% at temperature of +40°.

FUNCTIONALITY

- making and breaking operations should be done with determined movement,
- possible connection of circular or sector-shaped conductors with bare ends (V-terminals, 2V-terminals) or conductors with lug terminals (screw terminals),
- voltage test is performed through test holes in fuse link cover.

Conformity with standards

EN 60947-1 EN 60947-3 HD 60269-2

Table 102. RBK fuse switch disconnectors technical data

Parameter			RBK 00	RBK 1
Rated thermal current I_{th} [1)]		A	160	250
Rated voltage U_n		V	690	690
Utilization category		-	AC-22B	AC-22B
Rated switching current I_e		A	160	250
Rated switching voltage U_e		V	690	690
Rated short circuit making current	690 V	kA	80	80
	500 V		-	-
	400 V		100	100
Rated short circuit withstand current	690 V	kA	80	80
	500 V		-	-
	400 V		100	100
Rated insulation voltage U_i		V	1000	1000
Rated power dissipation $U_{imp.}$		kV	8	8
Rated frequency		Hz	50-60	50-60
Mechanical durability		Number of cycles	1600	1600
Electrical durability			200	200
IP degree of protection		IP	20*	20*
Weight		kg	~0,65	~2
Size of fuse links PN/IEC		-	00	1

*from the front IP30

[1)] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors (In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

RBK 00 (160 A, 690 V)

Table 103. Technical data

Parameter			RBK 00
Rated thermal current I_{th} [1)]		A	160
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching current I_e		A	160
Rated switching voltage U_e		V	690
Rated short circuit making current	690 V	kA	80
	500 V		-
	400 V		100
Rated short circuit withstand current	690 V	kA	80
	500 V		-
	400 V		100
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	8
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1600
Electrical durability			200
IP degree of protection		IP	IP20
Weight		kg	~0,65
Size of fuse links		-	00

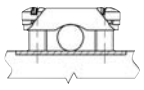
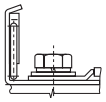
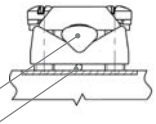
[1)] I_{th} - thermal current of fuse switch disconnector without external enclosure, installed outdoors
(In case of the installation of fuse switch disconnectors in enclosures then load factor should be considered)

RBK 00
for installation on mounting plate

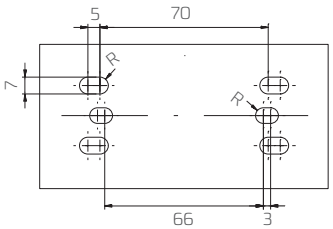
Table 104. Versions

RBK 00/160 A		Cable termina	Article No.
RBK 00	for connection of round conductors	S-bridge clamps	63-823333-111
RBK 00-M	for connection of conductors with lug terminals	M8 screws	63-823333-121
RBK 00-V	for connection of sectorshaped conductors	V-shape clamps	63-823333-131
RBK 00-W	for connection of round conductors ,lenghtened terminal shrouds	S-bridge clamps	63-823333-141
RBK 00-M-W	for connection of conductors with lug terminals, lenghtened terminal shrouds	M8 screws	63-823333-151
RBK 00-V-W	for connection of sectorshaped conductors, lenghtened terminal shrouds	V-shape clamps	63-823333-161

Table 105. RBK 00 terminal clamps

Description	RBK 00		
Clamp	S-bridge clamp 2 x M5 x 16	M8 x 16 screw	V-shape clamp 2 x M5 x 20
Drawing of clamp			
Cross-section of conductors	Cu/Al conductor 4 ÷ 50 mm²	conductor with lug terminal up to 70 mm²	① 1,5 mm² - 2,5 mm² ② 4 mm² - 70 mm² 4 mm² - 95 mm²
Cu bar	maximum bar width 20 mm		
Tightening torque	3 Nm*	10 Nm*	3 Nm*

Dimensions and spacing of holes for installation of RBK 00 on mounting plate



For stranded conductors using cable ferrules is recommended
*using of tension wrench is recommended

RBK 1 (250 A, 690 V)

RBK 1
for installation on mounting plate

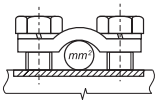
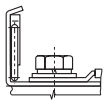
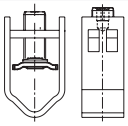
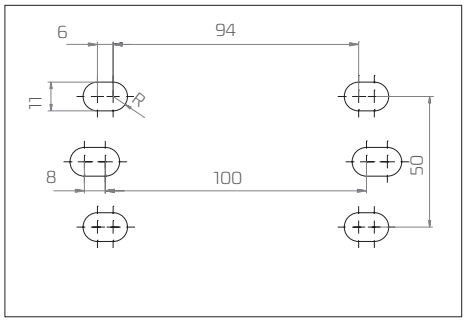
Table 106. Technical data

Parameter			RBK 1
Rated thermal current I_{th} [1)]		A	250
Rated voltage U_n		V	690
Utilization category		-	AC-22B
Rated switching current I_e		A	250
Rated switching voltage U_e		V	690
Rated short circuit making current	690 V	kA	80
	500 V		-
	400 V		100
Rated short circuit withstand current	690 V	kA	80
	500 V		-
	400 V		100
Rated insulation voltage U_i		V	1000
Rated impulse withstand voltage $U_{imp.}$		kV	8
Rated frequency		Hz	50-60
Mechanical durability		Number of cycles	1600
Electrical durability			200
IP degree of protection		IP	IP20
Weight		kg	~2
Size of fuse links		-	1

Table 107. Versions

RBK 1/250 A		Cable terminals	Article No.
RBK 1	For connection of round conductors	S-bridge clamps	63-811779-011
RBK 1-M	For connection of conductors with lug terminals	Screws	63-811779-021
RBK 1-V	For connection of sector-shaped conductors	V-clamps	63-811779-031
RBK 1 VG	For connection of round conductors, top terminals -V-terminals, bottom terminals - S-bridge terminals	V-clamps / S-bridge clamps	63-811784-051
RBK 1 VG-M	For connection of round conductors, top terminals -V-terminals, bottom terminals - screw terminals	V- clamps / screws	63-811784-061
RBK 1 VD	For connection of round conductors, top terminals -S-bridge terminals, bottom terminals - V-terminals	S-bridge clamps / V-clamps	63-811784-071
RBK 1 VD-M	For connection of round conductors, top terminals-screw terminals, bottom terminals - V-terminals	screw terminals / V-clamps	63-811784-081

Table 108. RBK 1 terminal clamps

Description	RBK 1	RBK 1-M	RBK 1-V
Clamp	S-bridge clamp 2 x M8 x 30	M10x25 screw	V-clamp V HS 35-300-C
Picture of a clamp			
Drawing of a clamp			
Cross-section of conductors	Cu/Al conductor 35 ÷ 120 mm²	conductor with lug terminal up to 120 mm²	V-clamp for direct fixing of conductor with bare end with cross-section of: 35 - 185 mm² ** 35 - 240 mm² 35 - 240 mm² ** 35 - 300 mm²
Cu bar	maximum bar width 35 mm		
Tightening torque	10 Nm*	20 Nm*	30 Nm*
Dimensions and spacing of holes for installation of RBK 1 on mounting plate			

*using of tension wrench is recommended

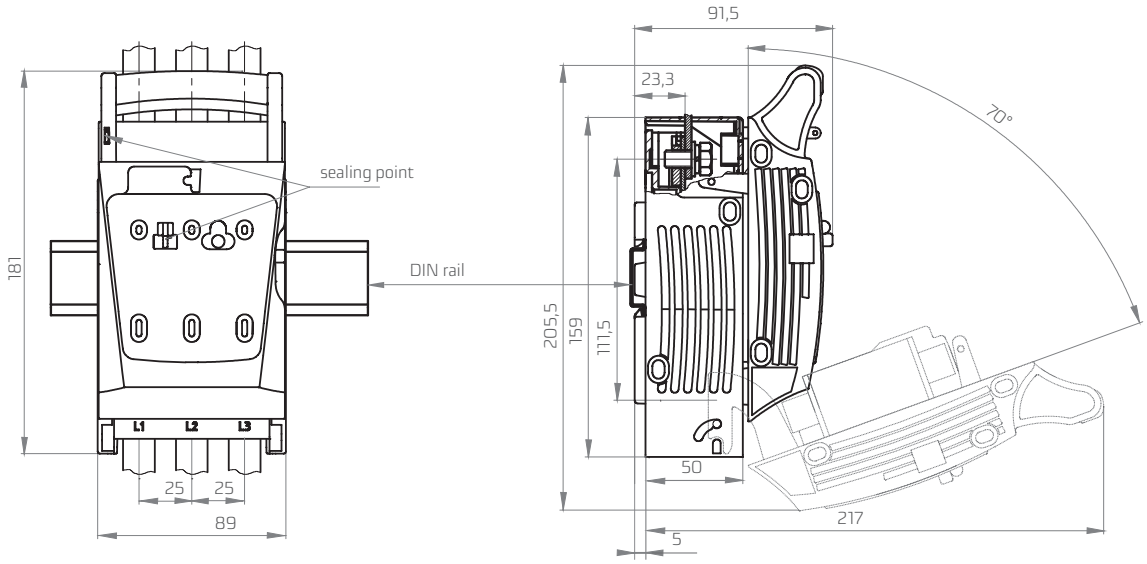
**for stranded conductors using cable ferrules is recommended

RBK 1
for installation on mounting plate

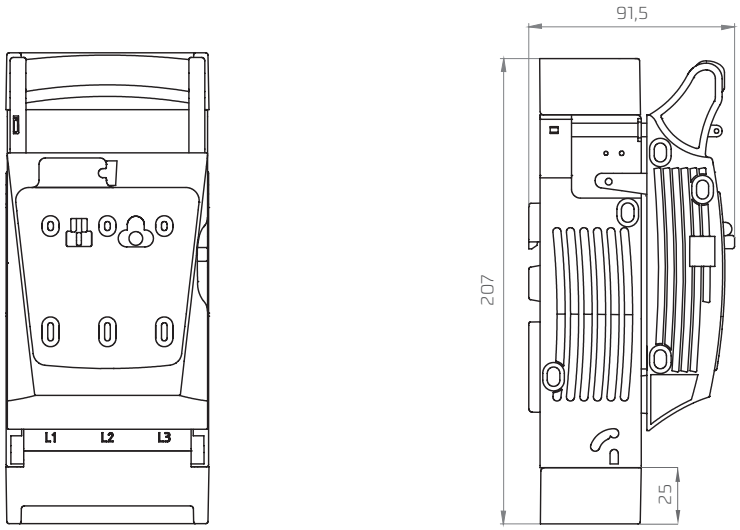
RBK 1
for installation on mounting plate, with additional terminal shrouds

RBK 1 VD-M
for installation on mounting plate, picture of fuse switch disconnector without fuse links cover and terminal shrouds, top cable terminal - M screws, bottom cable terminal - V-clamps, (RBK 1 VG-M - bottom cable terminal - M screws, top cable terminal - V-clamps)

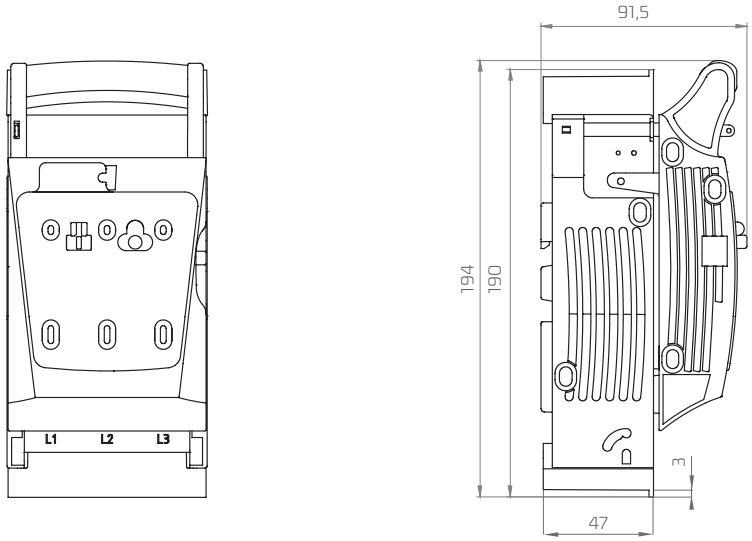
RBK 000 pro
RBK 000 pro-E



RBK 000 pro-O

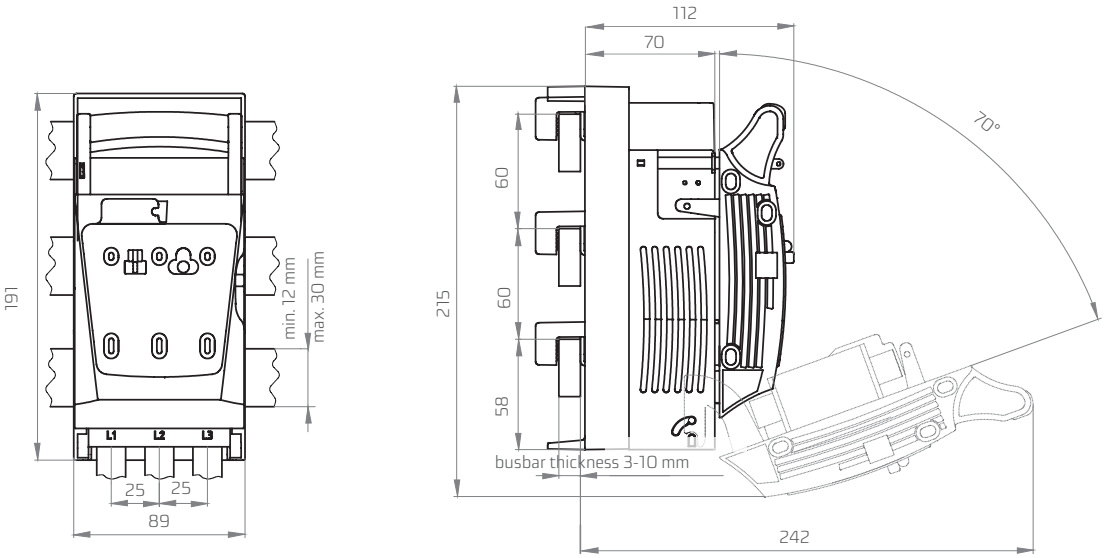


RBK 000 pro-W

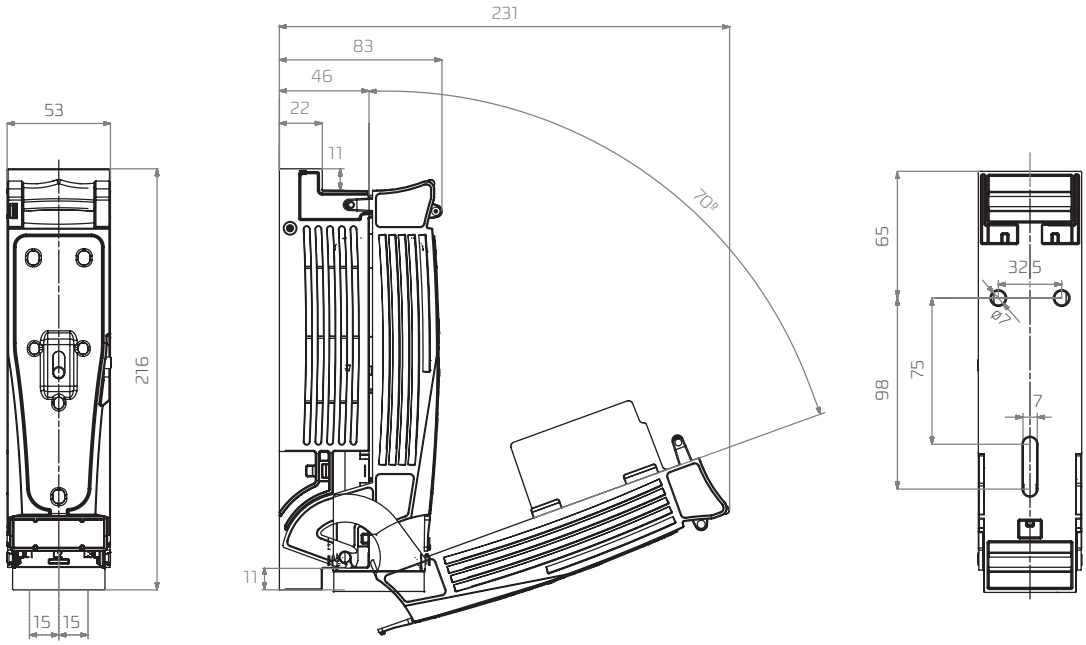


energy distribution

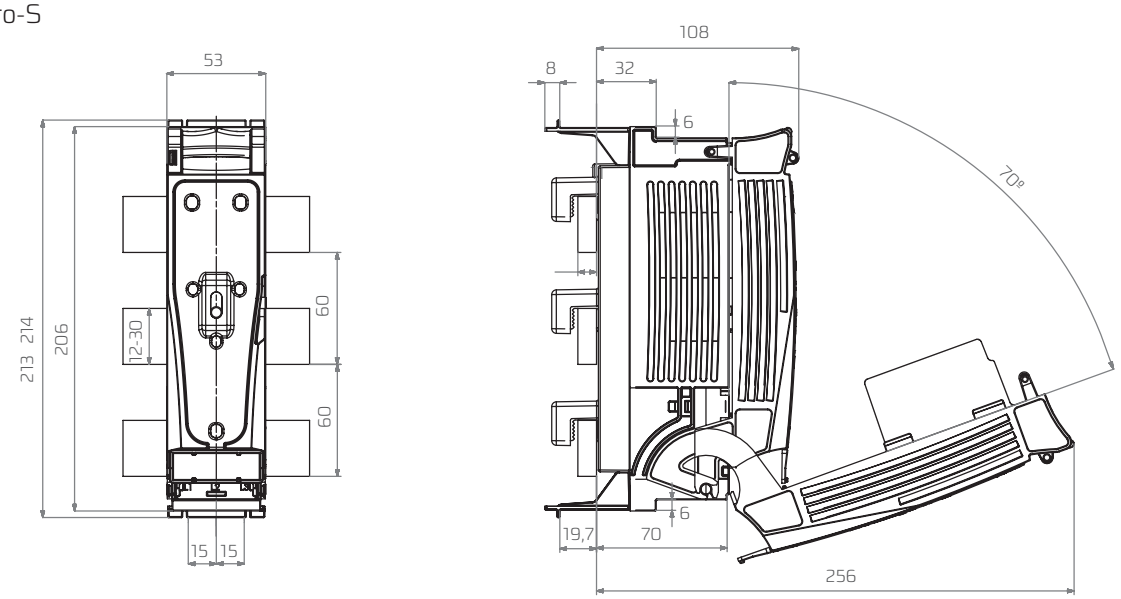
RBK 000 pro-SG top cable terminal
RBK 000 pro-SD bottom cable terminal



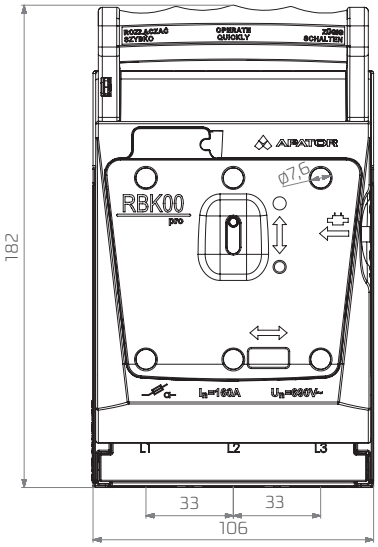
RBP 000 pro



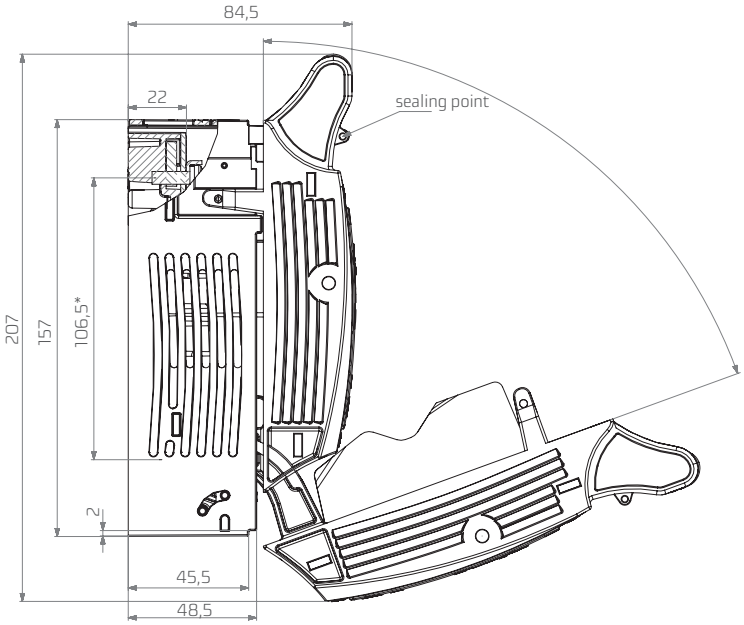
RBP 000 pro-S



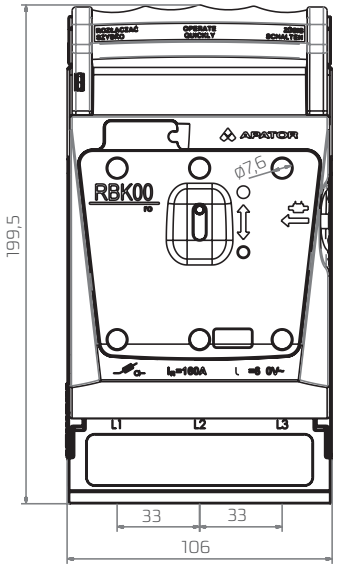
RBK 00 / RBK 00 pro



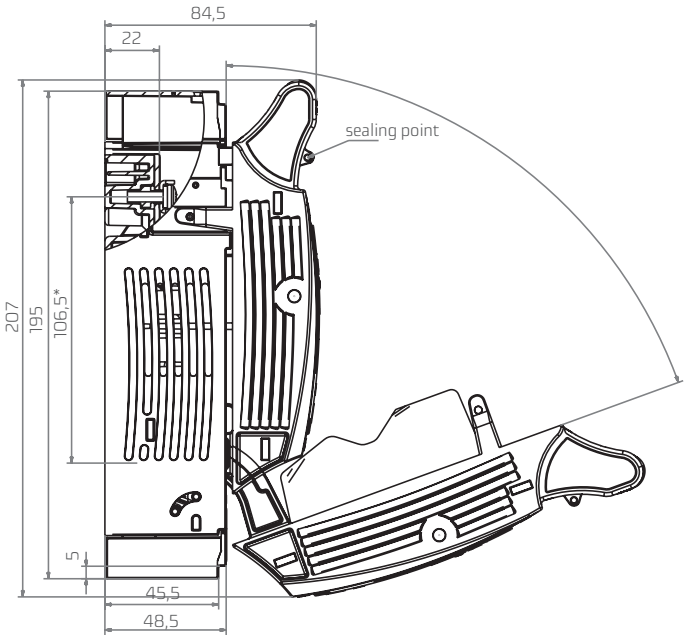
*122.5 mm for M screw terminal (for busbar and lug terminal)



RBK 00-W / RBK 00 pro-W,

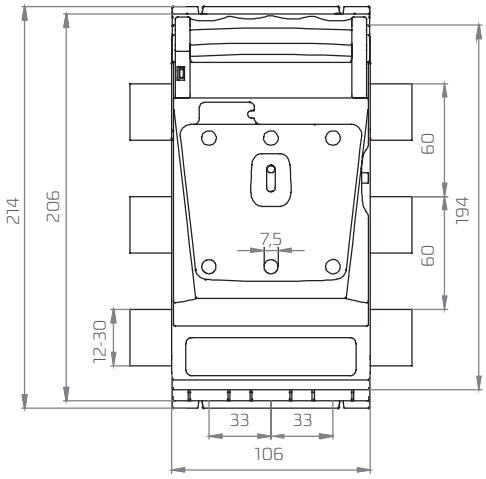


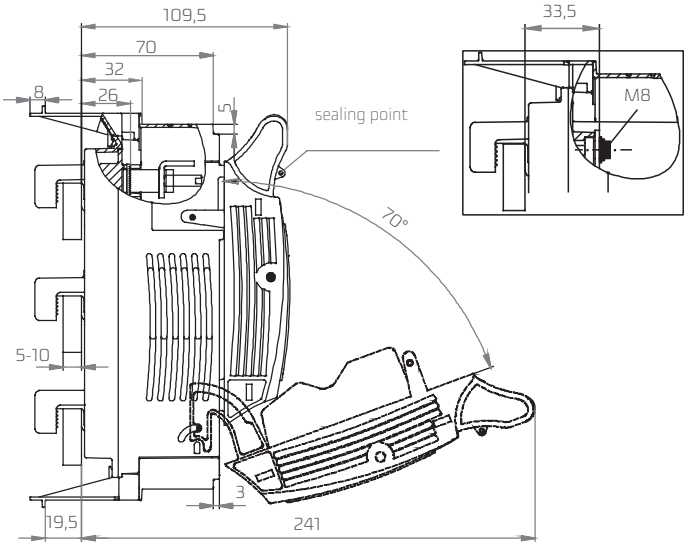
*122.5 mm for M screw terminal (for busbar and lug terminal)



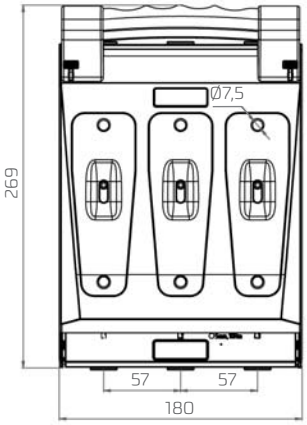
energy distribution

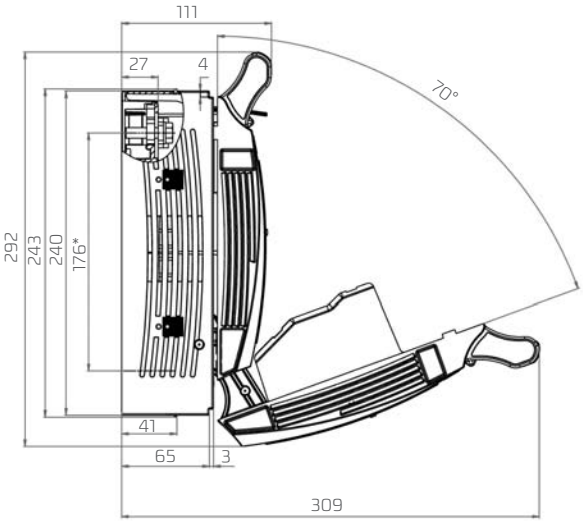
RBK 00 pro-S





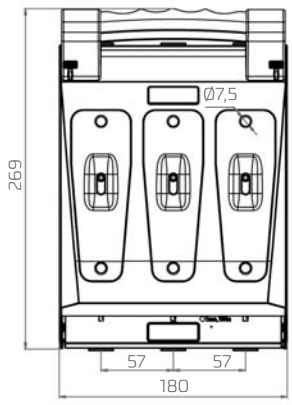
RBK 1, RBK 1 pro

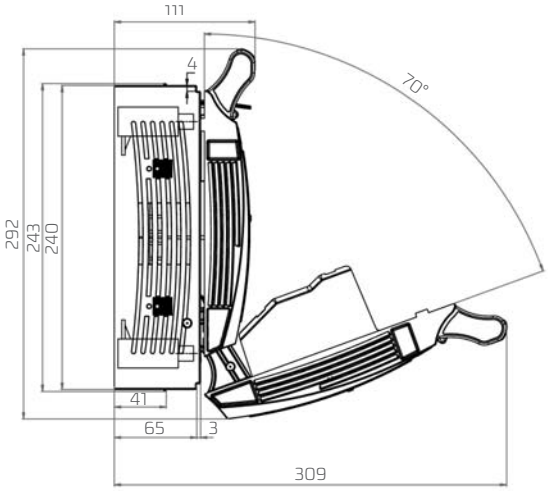




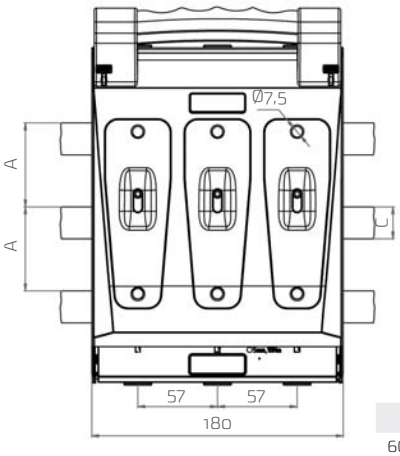
*197 mm for M type clamp

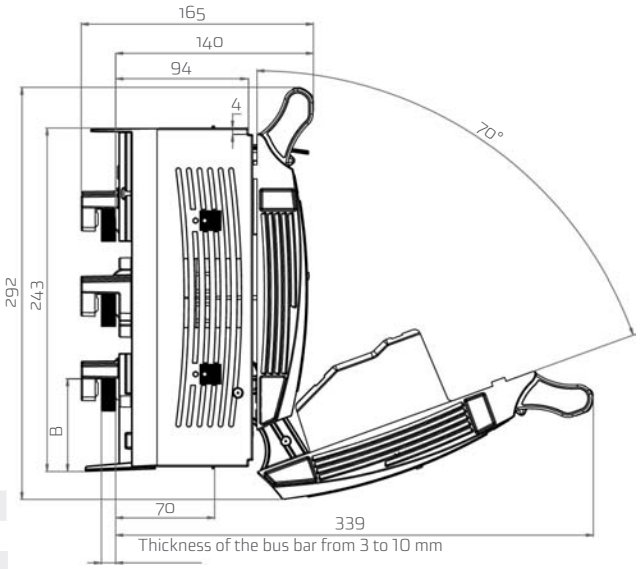
RBK 1 pro-V





RBK 1 pro-SD, RBK 1 pro-SG

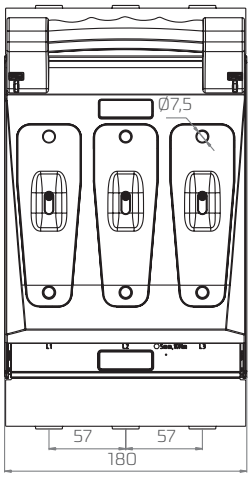


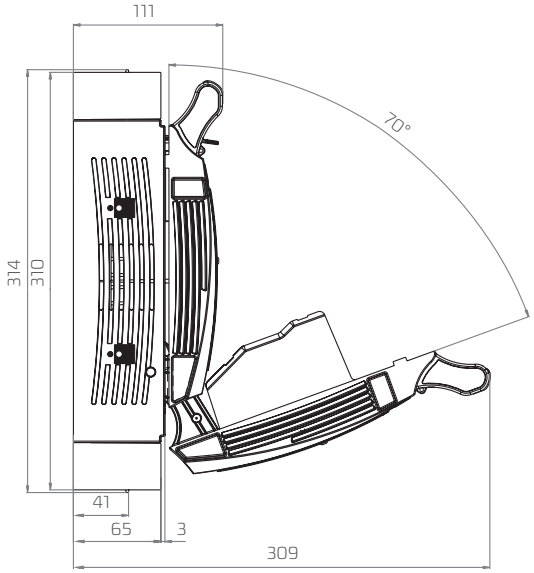


A	B	C
60 mm	66 mm	maks. 30 mm
100 mm	27-66 mm	maks. 60 mm

M,S,V types of clamps

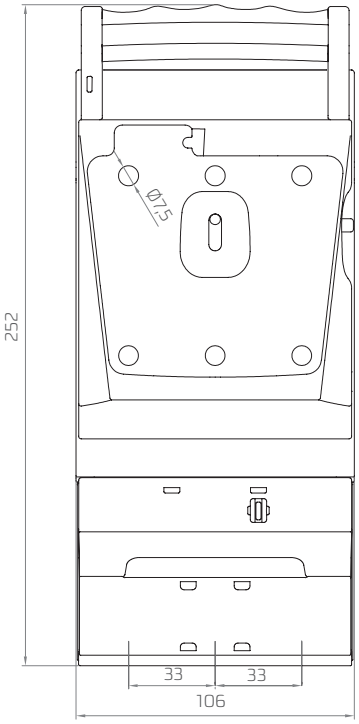
RBK 1 pro-O

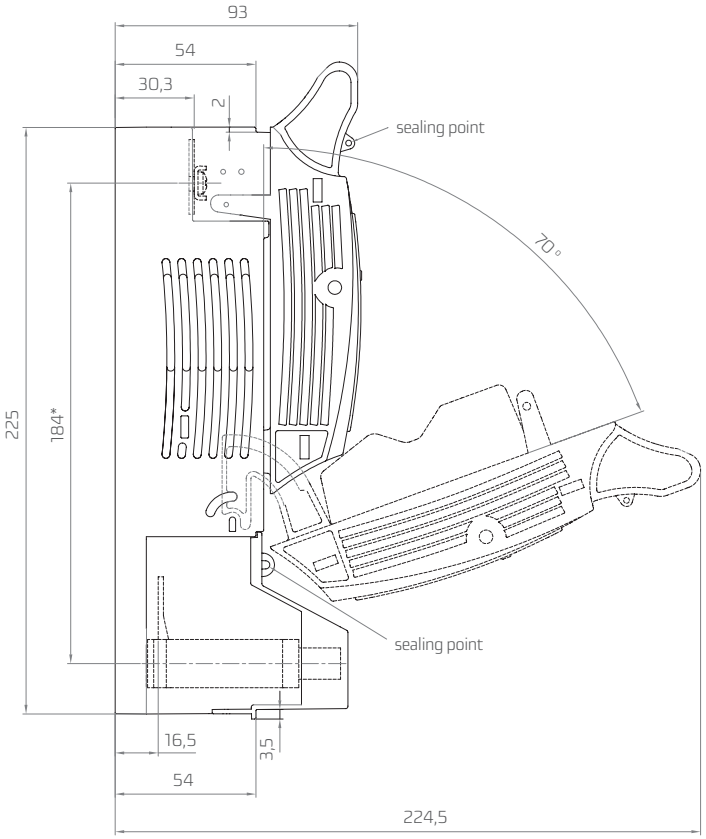




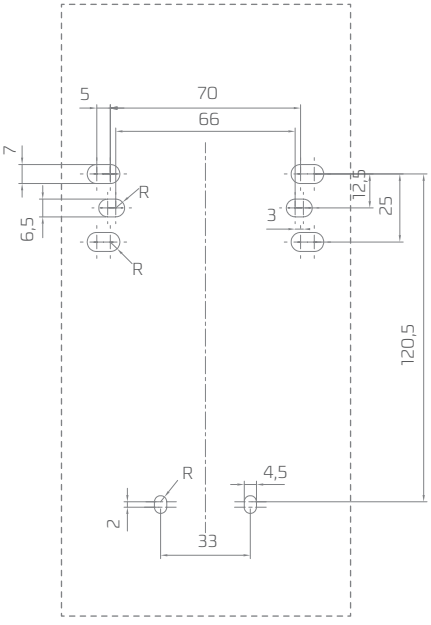
energy distribution

RBK 00 pro-V 120



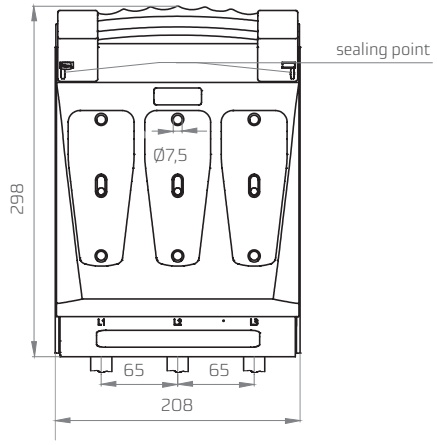


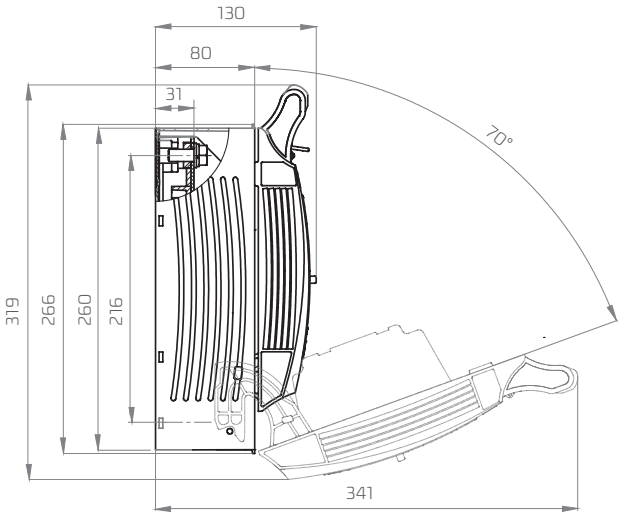
*197 mm for M screw terminal
(for busbar and lug terminal)



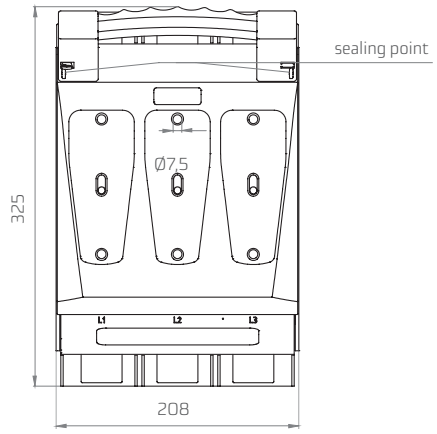
spacing of holes for installation
of RBK 00 pro-V120 on mounting plate

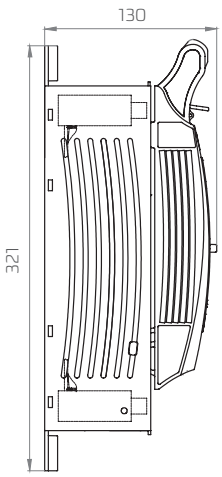
RBK 2 pro



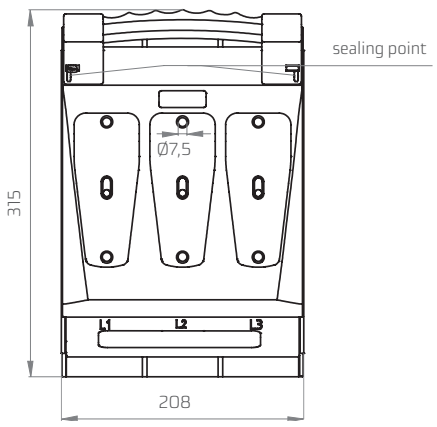


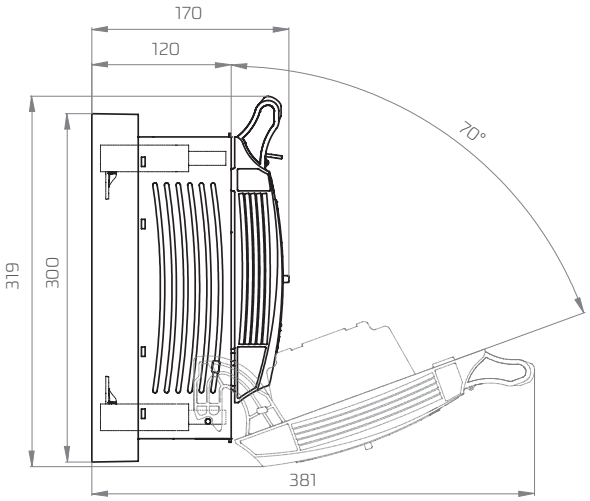
RBK 2 pro-V





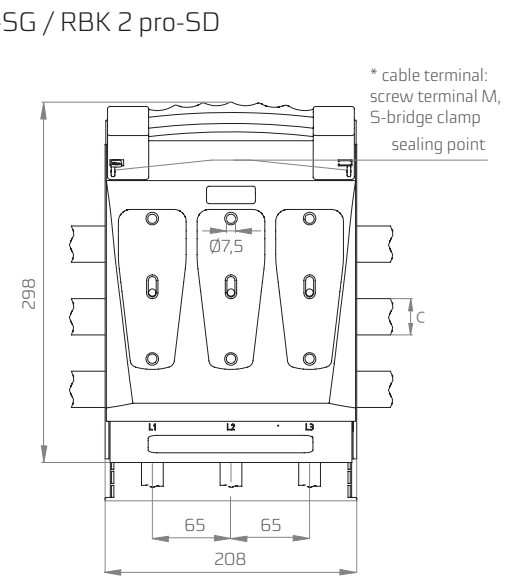
RBK 2 pro-2V

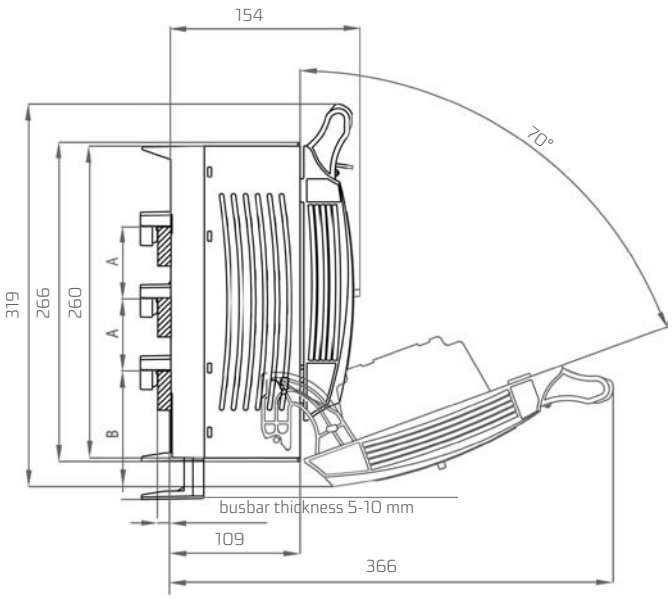




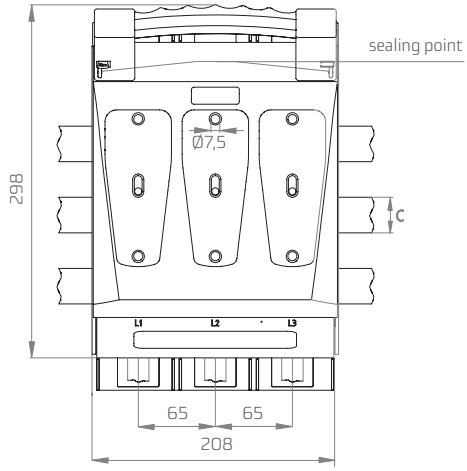
energy distribution

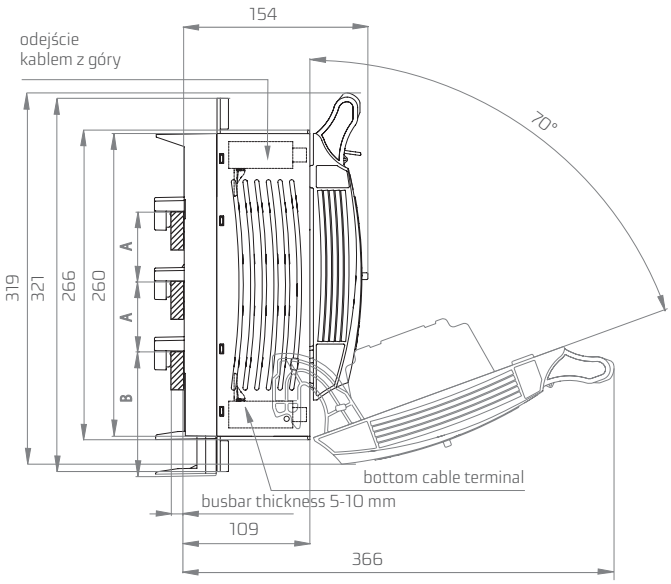
RBK 2 pro-SG / RBK 2 pro-SD



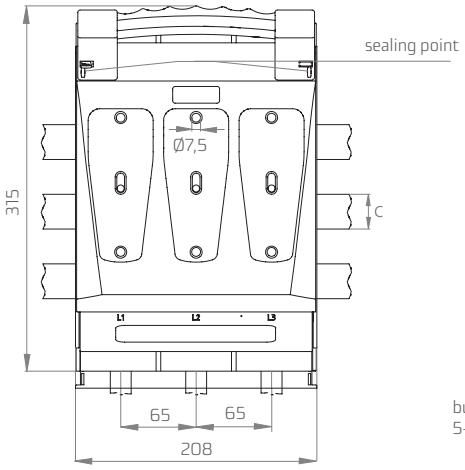


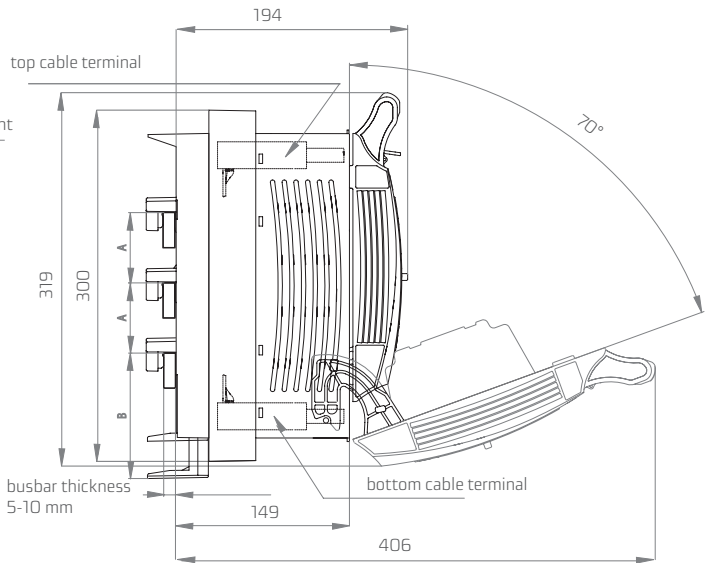
RBK 2 pro-SG-V / RBK 2 pro-SD-V





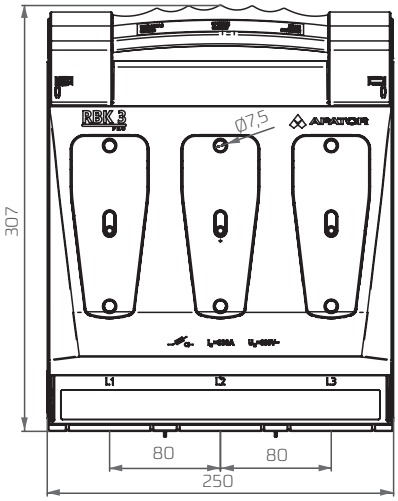
RBK 2 pro-SG-2V / RBK 2 pro-SD-2V

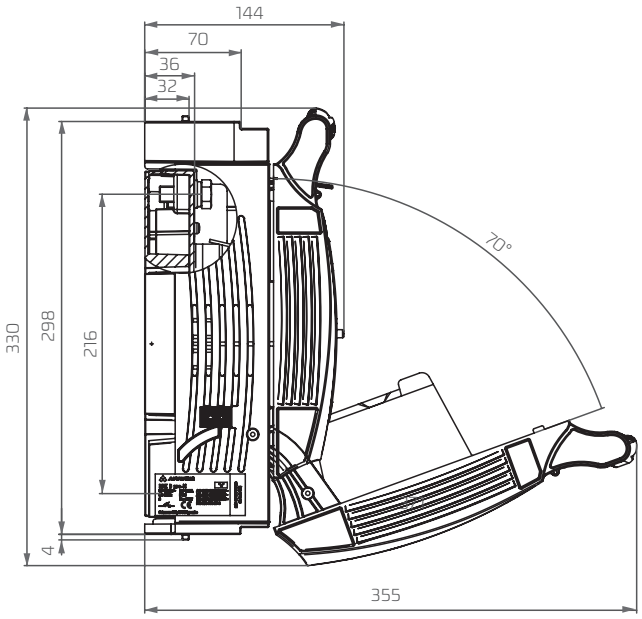




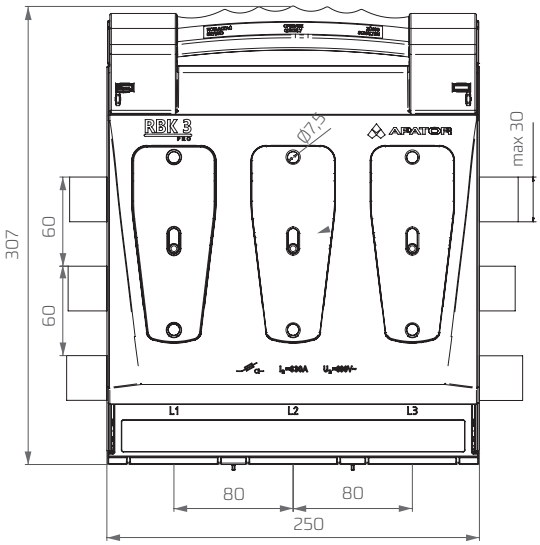
A	B	C
60 mm	75 mm	max. 30 mm
100 mm	35-67 mm	max. 60 mm

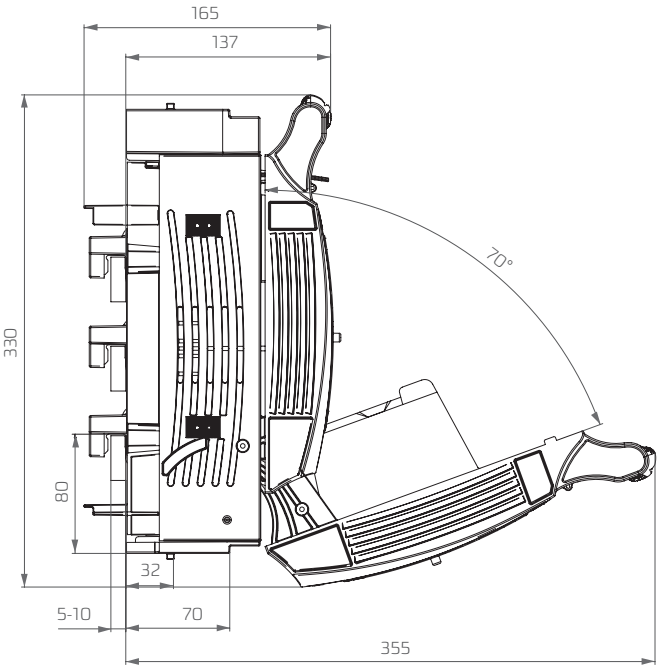
RBK 3 pro





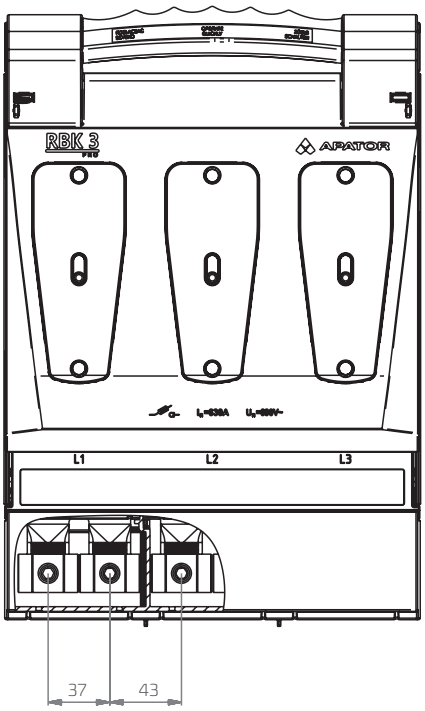
RBK 3 pro-S

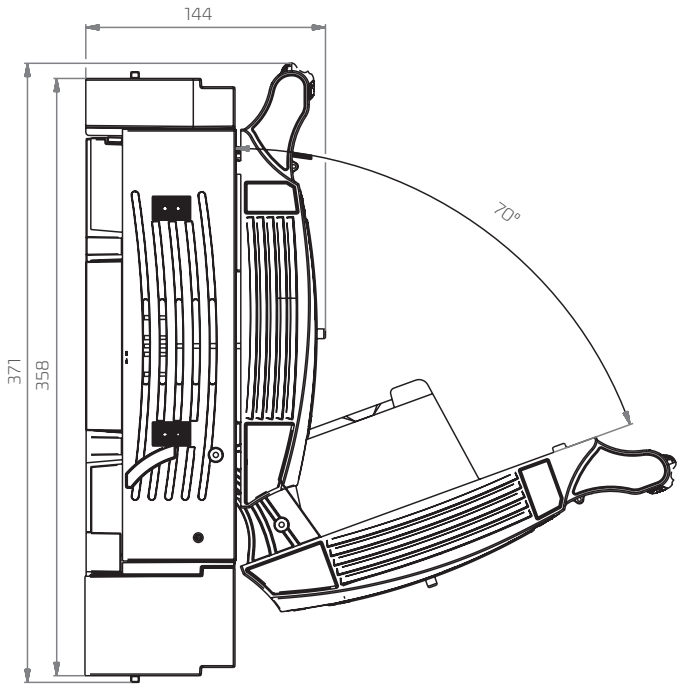




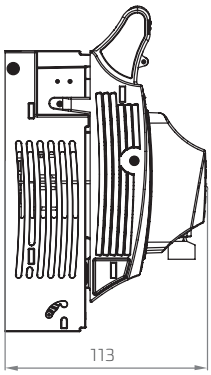
energy distribution

RBK 3 pro M-2xVD

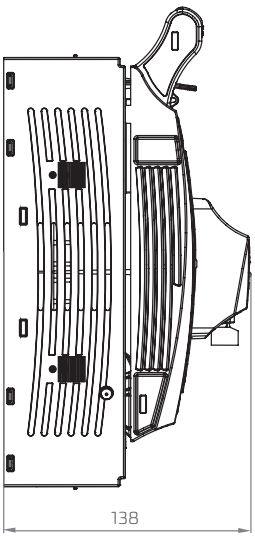




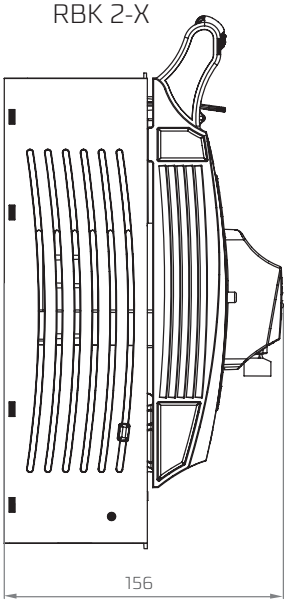
RBK 00-X



RBK 1-X

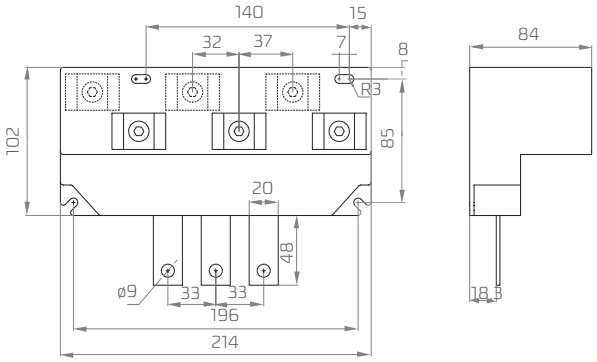


RBK 2-X

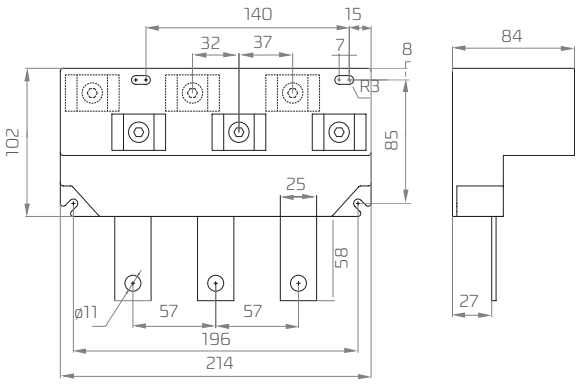


Terminal adapters:

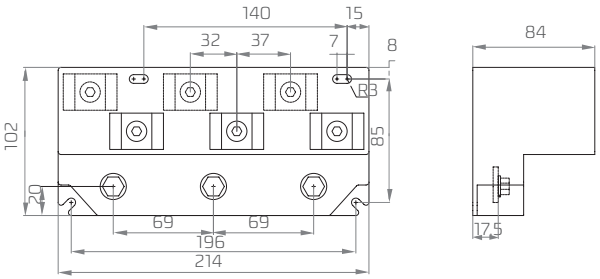
RBK 00



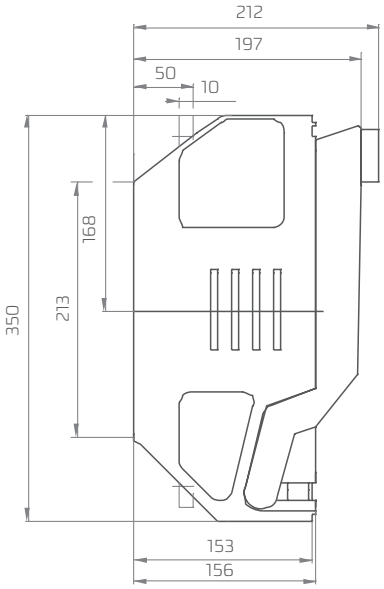
RBK 1



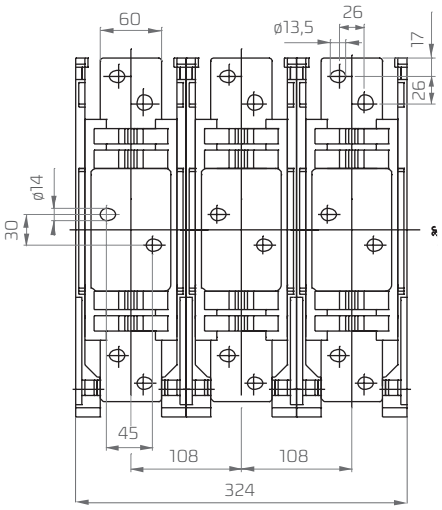
RBK 2



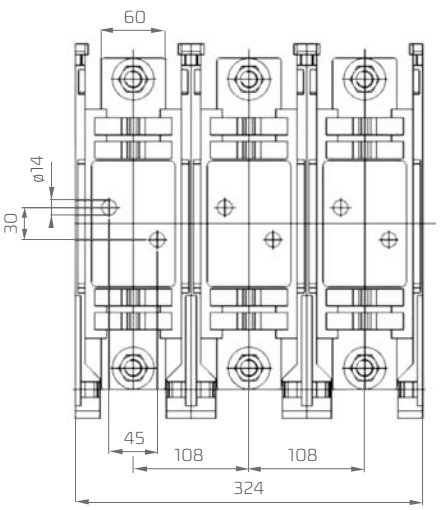
RBK 4a



RBK 4a 1600



RBK 4a 1250



energy distribution

Table 109. RBP 000 pro - accessories

Description	Size	Article No.	Picture
Auxiliary contacts (microswitch) AC-15 U_e 230 V~ I_e 2,5 A DC-13 U_e 230 V~ I_e 0,3 A	000	1115296311T	
Microswitch shroud 1115296311T	000	51-946806-001	

RBK 000

Table 110. RBK 000 pro - accessories

Description	Size	Article No.	Picture
Feeding bridge 2 x RBK 000, 35 mm²	000	1119510055T	
Feeding bridge 3 x RBK 000, 35 mm²	000	1119510056T	
Feeding bridge 4 x RBK 000, 35 mm²	000	1119510057T	
Feeding bridge 5 x RBK 000, 35 mm²	000	1119510058T	
Feeding bridge 2 x RBK 000, 50 mm²	000	1119510059T	
Feeding bridge 3 x RBK 000, 50 mm²	000	1119510060T	
Feeding bridge 4 x RBK 000, 50 mm²	000	1119510061T	
Feeding bridge 5 x RBK 000, 50 mm²	000	1119510062T	
Feeding bridge RBK 000 25-95 mm² (1 set - 3 pcs.) for connection of conductor of cross-section 25-70 mm² ⊗ 25-95 mm² ●	000	1119510071T	
Auxiliary contacts (microswitch) AC-15 U_e 230 V~ I_e 2,5 A DC-13 U_e 230 V~ I_e 0,3 A	000	1115296311T	
Microswitch shroud 1115296311T	000	51-000148-001	
Additional terminal shroud „0" extends shroud length of 25 mm	000	51-930160-011	

Table 111. RBK 00, RBK 00 pro - accessories

Description	Size	Article No.	Picture
Feeding bridge 2 x RBK 00, 35 mm²	00	1119510063T	
Feeding bridge 3 x RBK 00, 35 mm²	00	1119510064T	
Feeding bridge 4 x RBK 00, 35 mm²	00	1119510065T	
Feeding bridge 5 x RBK 00, 35 mm²	00	1119510066T	
Feeding bridge 2 x RBK 00, 50 mm²	00	1119510067T	
Feeding bridge 3 x RBK 00, 50 mm²	00	1119510068T	
Feeding bridge 4 x RBK 00, 50 mm²	00	1119510069T	
Feeding bridge 5 x RBK 00, 50 mm²	00	1119510070T	
Feeding bridge clampRBK 00 25-95 mm² (1 set - 3 pcs.) for connection of conductor of cross-section 25-70 mm² ▩ 25-95 mm² ●	00	1119510072T	
Clamp for RBK 00 2x25 mm² 1x16 mm²	00	1119510073T	
Clamp for RBK 00 4x10 mm²	00	1119510074T	

RBK 00

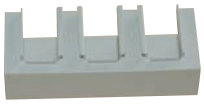
Description	Size	Article No.	Picture
Auxiliary contacts (microswitch) AC-15 U_e 230 V~ I_e 2,5 A DC-13 U_e 230 V~ I_e 0,3 A	00	1115296311T	
Microswitch shroud 1115296311T	00	51-000148-001	
Additional terminal shroud extends shroud length of 25 mm	00	51-930499-011	
Terminal adapter + 3 x V-clamp + terminal shroud	RBK 00	1119510048T	 
	RBK 00 W	1119510043T	

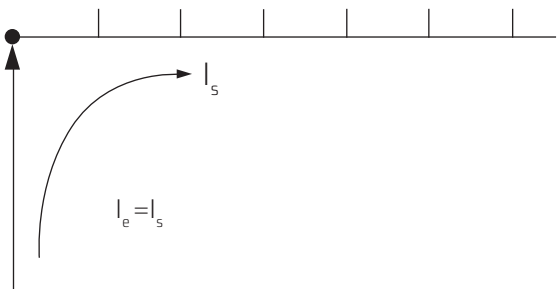
Table 112. RBK 1, RBK 1 pro, RBK 2 pro, RBK 3 pro - accessories

Description	Size	Article No.	Picture
Auxiliary contacts (microswitch) AC-15 U_e 230 V~ I_e = 2,5 A DC-13 U_e 230 V~ I_e = 0,3 A	RBK 1 RBK 1 pro RBK 2 RBK 3	1115296316	
Additional terminal shroud extends shroud length of 35 mm	RBK 1 pro-O	51-823278-011	
Additional terminal shroud „O" extends shroud length of 60 mm	RBK 2-O	51-822405-011	
Additional terminal shroud extends shroud length of 60 mm	RBK 3-O	51-823329-011	
Terminal adapter RBK 1 + 3 x V-clamp + terminal shroud	RBK 1	1119510038T	 
Terminal adapter RBK 2 + 3 x V-clamp + terminal shroud	RBK 2	1119510047T	 

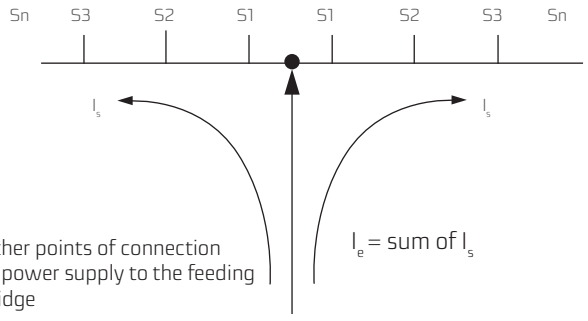
Table 113. RBK 000, RBK 00 feeding bridges technical data

Materials	Cu busbar Insulating parts, pressed PC/ABS RAL7035 Cover, injection molded PC/ABS RAL7035 Shroud, injection molded PC/ABS RAL7035
Temperature range	>80 °C UL94V0
Glow wire flammability index	pressed PC/ABS 960 °C / 3.2 mm 850 °C / 1 mm injection molded PC/ABS 960 °C / 1 mm
Insulation properties	Overvoltage category III/Pollution degree rating II
CTI	pressed PC/ABS 600 V injection molded PC/ABS 250 V
Short-circuit strength	25 kA/0.1 s
Dielectric strength	>32 kV / mm
Rated impulse withstand voltage 35 mm²/ 50 mm²	>6.5 kV / >8.5 kV
Minimal insulating distance in air 35 mm²/ 50 mm²	>6 mm / >8 mm
Minimal creepage distance 35 mm²/ 50 mm²	>8.5 mm / >9 mm
Rated switching voltage	690 V

Feeding bridge length	**max. 1000 mm**	**max. 300 mm**	**max. 1000 mm**	**max. 300 mm**
Cross-section	35 mm²	35 mm²	50 mm²	50 mm²
Power supply connection point at the end or at the beginning of feeding bridge				
Maximum I_s current / phase	125 A	200 A	160 A	250 A
Feeding conductors cross-section	35 mm²	70 mm²	50 mm²	95 mm²
Other points of connection of power supply to the feeding bridge				
Maximum feeding current I_e	160 A	250 A	160 A	250 A
Feeding conductors cross-section	70 mm²	95 mm²	70 mm²	95 mm²



Power supply connection point
at the end or at the beginning of bridge

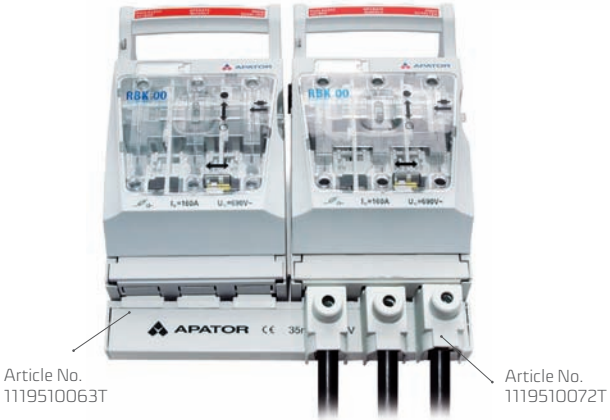


Other points of connection
of power supply to the feeding
bridge

In case of connection of power
supply in the middle of feeding
bridge sum of output currents
S_1,..., S_n
cannot be greater than corresponding
maximum current I_s.

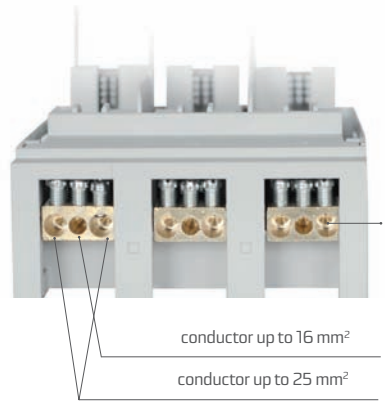
APPLICATION EXAMPLES

Fuse switch disconnectors **RBK 00** connected with feeding bridge , power supply cables connected to feeding bridge clamps



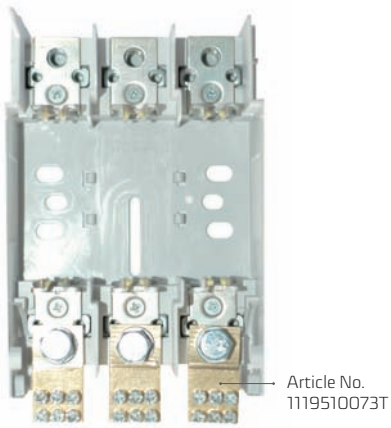
RBK 00-W with terminal adapter for connection of sectorshaped conductors with cross-section up to 240 mm²

35 - 95 mm²		35 - 120 mm²	
50 - 185 mm²		50 - 240 mm²	



RBK 00-W with terminal clamp 1x16 mm², 2x25 mm² (view of fuse swith disconnector without fuse-link cover)

RBK 000 for installation on mounting plate, version with additional terminal shrouds



RBK 00-W with terminal clamp 1x16 mm², 2x25 mm² (view of fuse swith disconnector without fuse-link cover and terminal shrouds)

RBK 00 for installation on mounting plate, version with additional terminal shrouds

RBK 1 for installation on mounting plate, version with additional terminal shrouds

Terminal adapter for RBK 00 i RBK 1

Covering of RBK fuse switch disconnectors (rear installation)

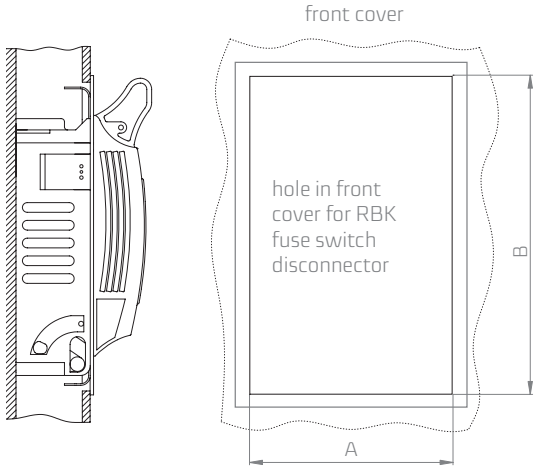
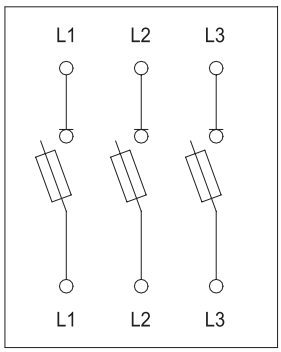


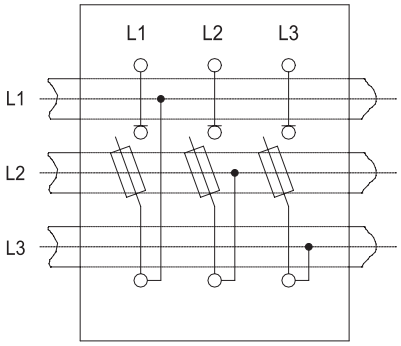
Table 114. Front cover dimensions

Type	A	B
RBK 000	91	156
RBK 000-S, RBK 000-W	91	195
RBK 00, RBK 00 pro, RBK 00 pro-S	108	154
RBK 00-W	108	184
RBK 1, RBK 1-S, RBK 1 pro	184	232
RBK 2, RBK 2-S	210	255
RBK 2-V, RBK 2-2V	210	255
RBK 3, RBK 3-S	258	316

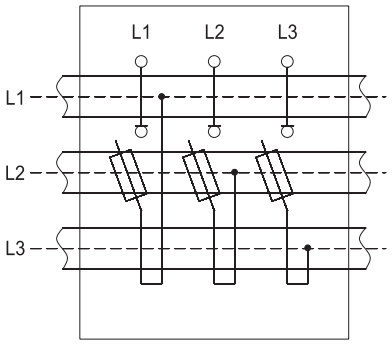
Electrical diagrams (RBK 1-S, RBK 3-S - possible bottom cable terminal connection)



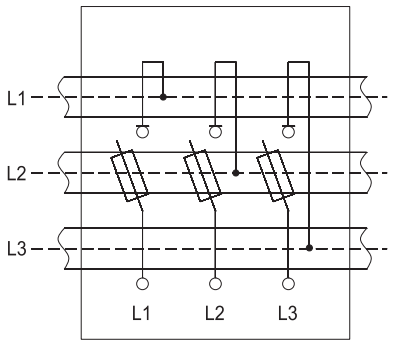
RBK 000
RBK 00
RBK 00 pro
RBK 1
RBK 2
RBK 3
RBK 1 pro
RBK 2 pro
RBK 3 pro



RBK 3 pro-S



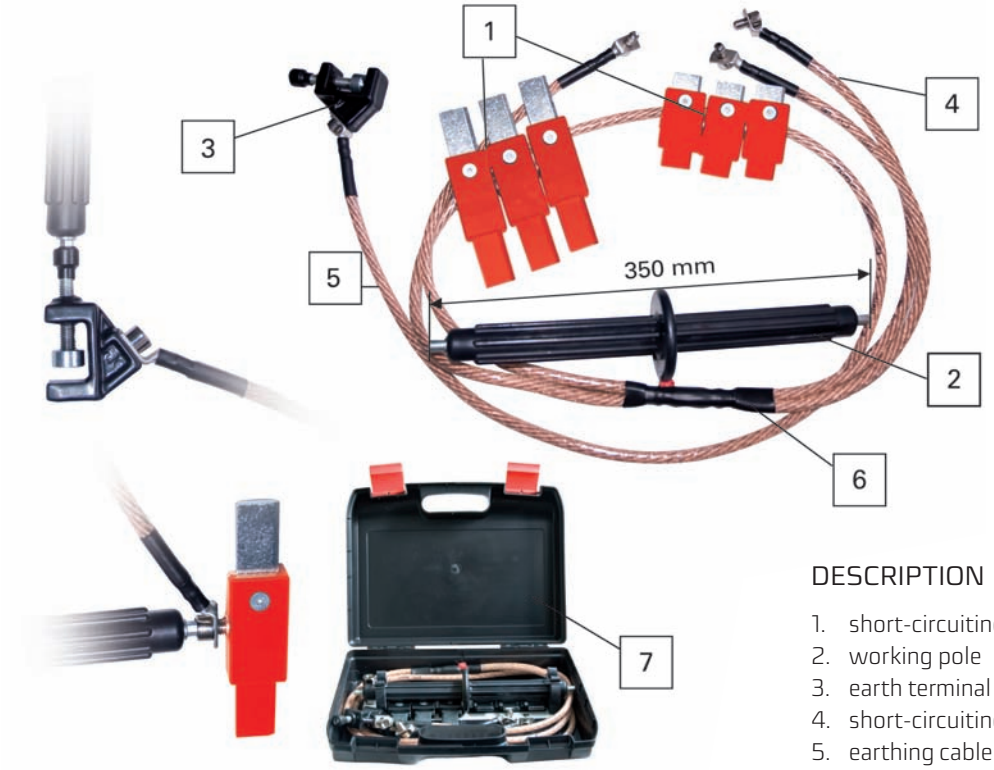
RBK 000-SG
RBK 00 proSG
RBK 1 pro-SG
RBK 2 pro-SG



RBK 000-SD
RBK 00 pro-SD
RBK 1 pro-SD
RBK 2pro-SD
RBK 3 pro-S

Universal earthing device for RBK 000, 00, 1, 2, 3

Article No 1119510032T



DESCRIPTION

1. short-circuiting links
2. working pole
3. earth terminal
4. short-circuiting cable
5. earthing cable
6. cable connection point
7. case

Example of the order of RBK 2-SD-V-100

Fuse switch disconnector	160 A	RBK 000, RBK 00, RBK 00 pro	
	250 A	RBK 1, RBK 1 pro	
	400 A	**RBK 2 pro**	**RBK 2 pro**
	630 A	RBK 3 pro	
Terminal clamps	**S**		**S**
For installation on to busbar system	**D**	**bottom**	**D**
	G	top	
Cable terminal	**V**	**V-clamp**	**V**
	2V	double V-clamp	
	M	screw terminal	
	S	S-bridge clamps	
Busbar system	60 mm	60	
	100 mm	**100**	**100**

PBD
fuse bases

- designed for distribution of electricity and protection of electrical equipment against short-circuits and overloads with industrial fuse links

CONSTRUCTION & APPLICATIONS

PBD fuse base consist of flame retardant thermoplastic base with spring-loaded contacts designed to be engaged with the blade contacts of NH fuse link. Contacts of sizes 00, 1, 2 are tin plated, contacts of size 3 are silver plated. On request contacts of sizes 00, 1, 2 are plated with silver.

PBD fuse-bases are designed for installation indoors, in environment free of dust, aggresive or explosive gases:

- juction boxes,
- supply points,
- distribution boards,
- capacitor bank protection.

OPERATING CONDITIONS

- altitude up to 2000 meters above sea level,
- ambient temperature from -25°C to +55°C,
- for outdoors installation PBD fuse basess should be mounted in cabinets with protection degree IP34 or higher.

CONFORMITY WITH STANDARDS

IEC 60269-1, PN-HD 60269-2:2008, PN-EN 60269-1:2010

VERSIONS

PBD fuse bases are designed for fuse links size 00-3. There are following versions:

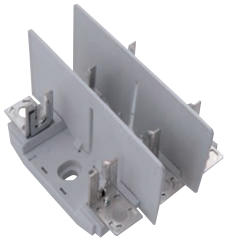
- size 00 - 160 A
  - with double side screw terminals for lug terminal or busbar - fuse base 1-pole PBD 00, fuse base 3-poles PBD 003 HH,
  - with V-terminal from one side and screw terminal from opposite side - fuse base 1-pole PBD 00-1V, fuse base 3-poles PBD 00 3-1V,
  - with both sides V-terminals - fuse base 1-pole PBD 00-2V, fuse base 3-poles PBD 00 3-VV,
  - the possibility of using fuse links size 00 and 000.
- size 1 – 250 A
  - with double side screw terminals for lug terminal or busbar - fuse base 1-pole PBD 1, fuse base 3-poles PBD 13,
  - with V-terminal from one side and screw terminal from opposite side - fuse base 1-pole PBD 1-1V, fuse base 3-poles PBD 13-1V,
  - with both sides V-terminals - fuse base 1-pole PBD 1-2V, fuse base 3-poles PBD 13-2V.
- size 2 – 400 A
  - with double side screw terminals for lug terminal - fuse base PBD 2,
  - with V-terminal from one side and screw terminal from opposite side - fuse base PBD 2-1V,
  - with both sides V-terminals - fuse base PBD 2-2V.
- size 3 – 630 A
  - with double side screw terminals for lug terminal - fuse base PBD 3.

V-terminals with V-clamps enable connection of circular or sector-shaped conductors.

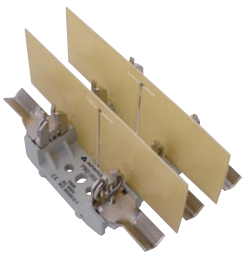
PBD 1-2V

PBD 2-1V

PBD 3

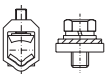
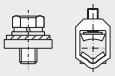
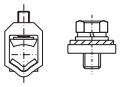
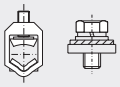
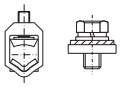


PBD 003 HH



PBD 003 VV

Table 115. PBD fuse bases for WTNH fuse links

Article	Size	Rated current	Rated shortcircuit withstand current	Cable terminal	Rated power dissipation	Max crosssection of cable conductors	Weight [g]	Article No.
PBD 00	00	160 A	25 kA	screw terminals 	12 W	70 mm²	90	1115281070T
PBD00VV	00	160 A	25 kA	V-terminals 	12 W	120 mm²	90	1115281071T
PBD 00-1V	00	160 A	25 kA	Screw terminal, V-terminal 	12 W	70 mm² 120 mm²	90	1115281073T
PBD 003 HH	00	160 A	25 kA	screw terminals 	3 x 12 W	50 mm²	500	1115 2810 42T
PBD 003 + shroud	00	160 A	25 kA	screw terminals 	3 x 12 W	50 mm²	500	1115 2810 72T
PBD 003 1-V	00	160 A	25 kA	Screw terminal, V-terminal 	3 x 12 W	50 mm²	500	1115 2810 80T
PBD 003 VV	00	160 A	25 kA	V-terminals 	3 x 12 W	120 mm²	400	1115 2810 43T
PBD 1	1	250 A	40 kA	screw terminals 	32 W	120 mm²	370	63-820991-011
PBD 1-1V	1	250 A	40 kA	Screw terminal, V-terminal 	32 W	120 mm²	370	63-820991-021
PBD 1-2V	1	250 A	40 kA	V-terminals 	32 W	120 mm²	370	63-820991-031
PBD 13	1	250 A	40 kA	screw terminals 	3 x 32 W	120 mm²	1140	63-820995-011
PBD 13-1V	1	250 A	40 kA	Screw terminal, V-terminal 	3 x 32 W	120 mm²	1120	63-820995-021
PBD 13-2V	1	250 A	40 kA	V-terminals 	3 x 32 W	120 mm²	1140	63-820995-031
PBD 2	2	400 A	50 kA	screw terminals 	45 W	240 mm²	520	63-820992-011
PBD 2-1V	2	400 A	50 kA	Screw terminal, V-terminal 	45 W	240 mm²	520	63-820992-021
PBD 2-2V	2	400 A	50 kA	V-terminals 	45 W	240 mm²	520	63-820992-031
PBD 3	3	630 A	65 kA	screw terminals 	60 W	240 mm²	810	63-820998-011

PBD fuse bases are made of self extinguishing, fibre glass strenghtened polyester. Mechanical durability: 250 cycles.

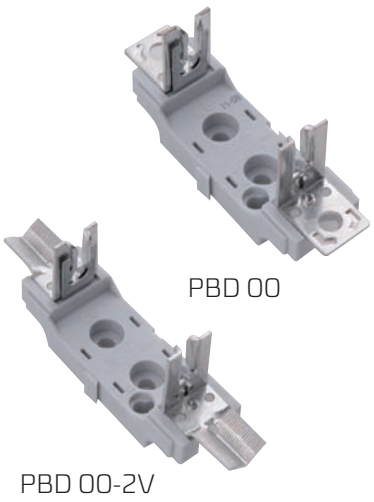
Delivered with set of:

- screws for screw terminals insulation barriers
- for 3 - pole fuse bases e.g. PBD 003, PBD13

PBD fuse base size	Tightening torque (Nm) 	
00 \ 003	10	20
1	32	30
2	32	30
3	56	30

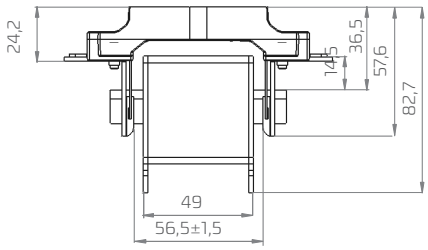
DIMENSIONS OF PBD FUSE BASES

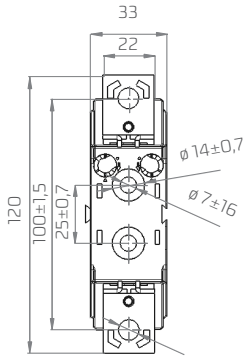
PBD fuse bases of size 00 - 1 - pole



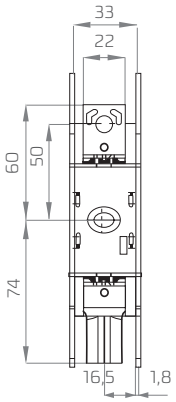
PBD 00

PBD 00-2V



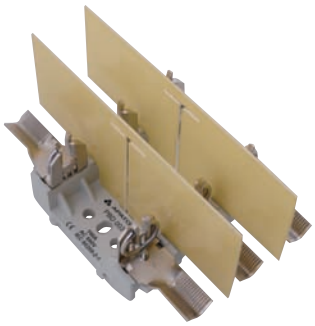


PBD 00

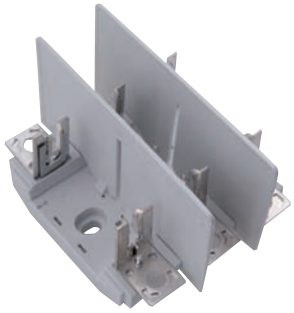


PBD 00-1V

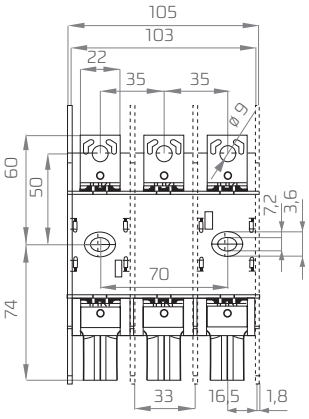
PBD fuse bases of size 00 - 3 - pole

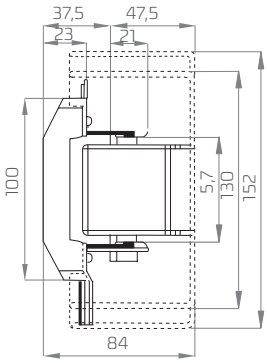


PBD 003 VV



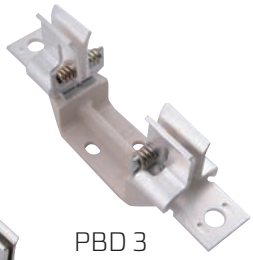
PBD 003 HH





PBD 003-1V

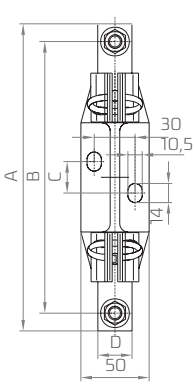
PBD fuse bases of size 1, 2, 3 - 1- pole

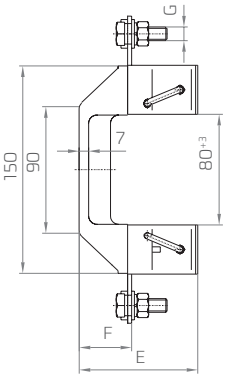


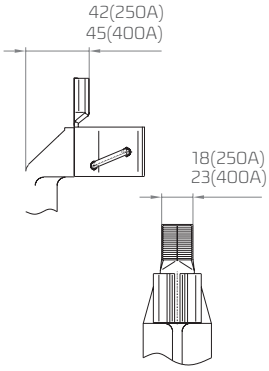
PBD 3

PBD 2-2V

PBD 1-1V



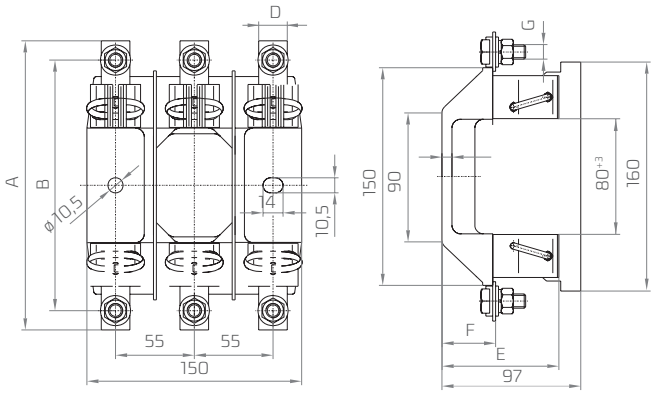


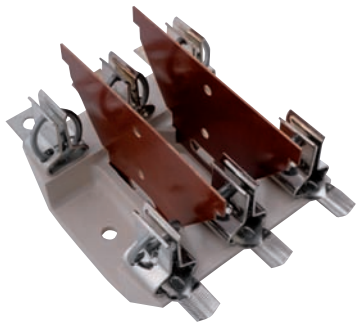


energy distribution

Article	Dimension [mm]						
	A	B	C	D	E	F	G
PBD 1	200	175	23	25	82	37	M10
PBD 1-1V	200	–	23	25	82	37	M10
PBD 1-2V	200	–	23	–	82	–	–
PBD 2	225	200	23	25	88	38	M10
PBD 2-1V	225	–	23	25	88	38	M10
PBD 2-2V	225	–	23	–	88	–	–
PBD 3	240	210	23	40	95	39	M12

PBD fuse bases of size 1, 2, 3 - 3 - poles

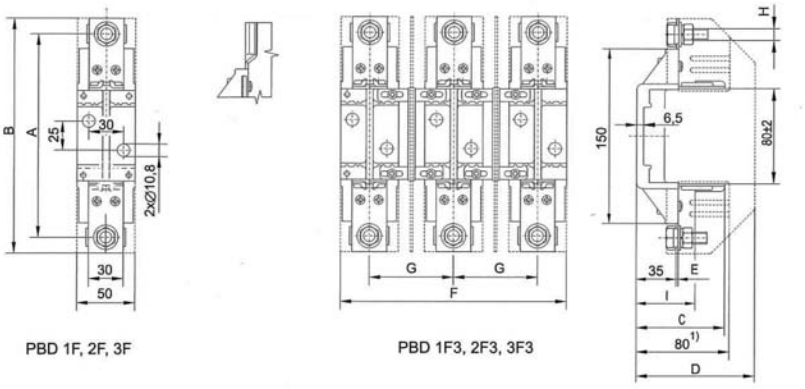




PBD 13-1V

Article	Dimension [mm]						
	A	B	C	D	E	F	G
PBD 13	200	175	–	–	82	37	M10
PBD 13-1V	–	–	–	–	82	37	M10
PBD 13-2V	–	–	–	–	82	–	–

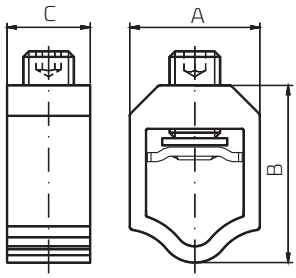
PBD F fuse bases of size 1, 2, 3 - 1 pole and 3 poles



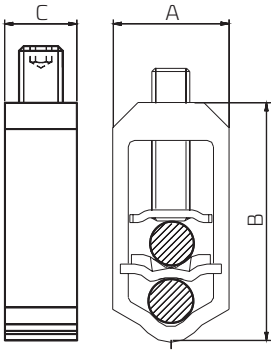
Article No.	Article	Dimension [mm]								
		A	B	C	D	E	F	G	H	I
63-822369-011	PBD 1F	175	202	76	-	2	-	-	M10	48
63-822369-021	PBD 1F3				102		165	57,5		
63-822266-011	PBD 2F	200	230	84	-	2,5	-	-		
63-822266-021	PBD 2F3				110		180	65		
63-822268-011	PBD 3F	210	238	93	-	5	-	-	M12	50,5
63-822268-021	PBD 3F3				126		210	80		

ACCESORIES FOR PBD FUSE BASES

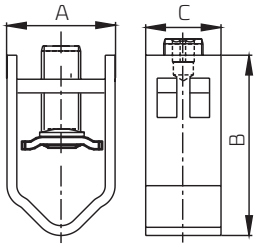
V-clamps, HS V-clamps (steel)



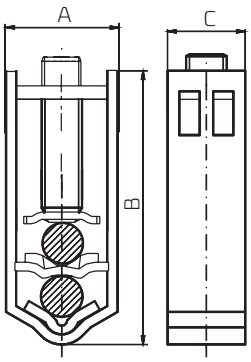
35-300SW-B



2/50-300SW-B



HS35-300-C



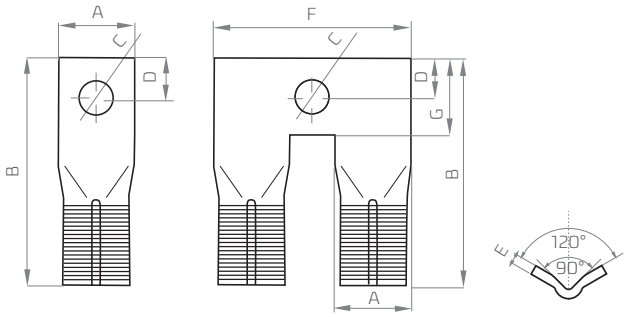
HS2/50-240-C

Table 116. V-clamps

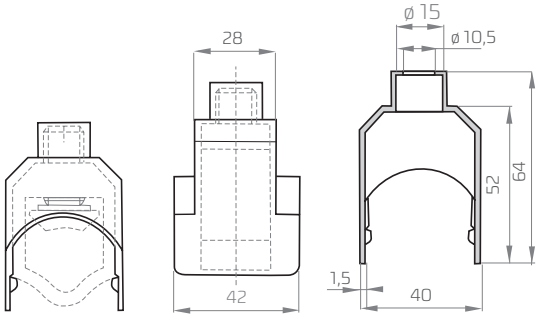
	Article	Cross-section of cable conductor [mm²]				Dimension [mm]			Tightening torque	Material	Weight [g]	Article No.
		re ●	se ◆	rm	sm	width [A]	height [B]	depth [C]				
	25-150 SW	16÷95	25÷150	16÷95	25÷150	28	38	18,5	20 Nm	alu.	48	1119510091T
	HM 10-120	10÷70	25÷120	10÷70	25÷95	28	38	18,5	15 Nm	steel	48	1119510077T
	2/25-120SW	16÷95	25÷120	16÷95	25÷120	27,5	58	18,5	30 Nm	alu.	87	1119510006T
	35-300SW-B	35÷240	35÷300	35÷185	35÷240	36	49	23	30 Nm	alu.	90	1119510081T
	2/50-300 SW-B	50÷240	50÷300	50÷185	50÷240	37	76	23	30 Nm	alu.	177	1119510082T
	HS 35-300-C	35÷240	35÷300	35÷185	35÷240	35	55	22	40 Nm	steel		1119510084T
	HS2/50-240-C	50÷240	50÷300	50÷185	50÷240	35	81	22	40 Nm	steel	228	1119510085T

Table 117. V-terminal lugs

	Article	Dimension [mm]							Material	Weight [g]	Article No.
		A	B	C	D	E	F	G			
	V-terminal lug VL120	20	65	10,5	10	3	–	–	Cu	32	1119510005T
	V-terminal lug VL240	25	75	13	11,5	5	–	–	Cu	75	1119510002T
	Double V-terminal lug C	25	75	10,7	12,5	3	65	25	Cu	107	1119510028T



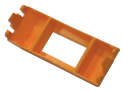
Shrouds for V-clamps



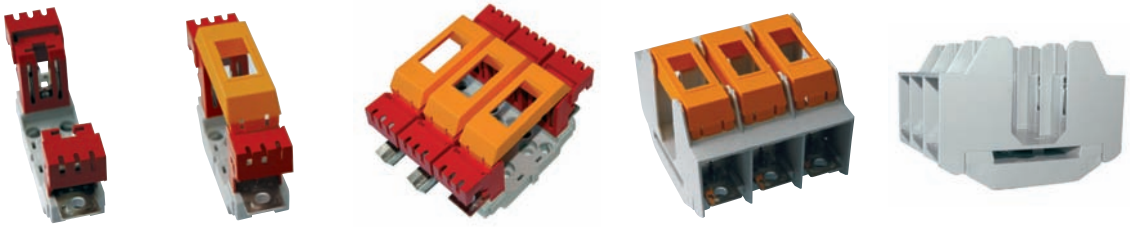
Shrouds for V-clamps 50-240SW i 70-300SW are available in colours: blue, red, black, yellow and green.

1119510018T-blue, 1119510019T-red, 1119510026T-black,
1119510044T-yellow, 1119510045T-green.

Table 118. PBD 00 accessories

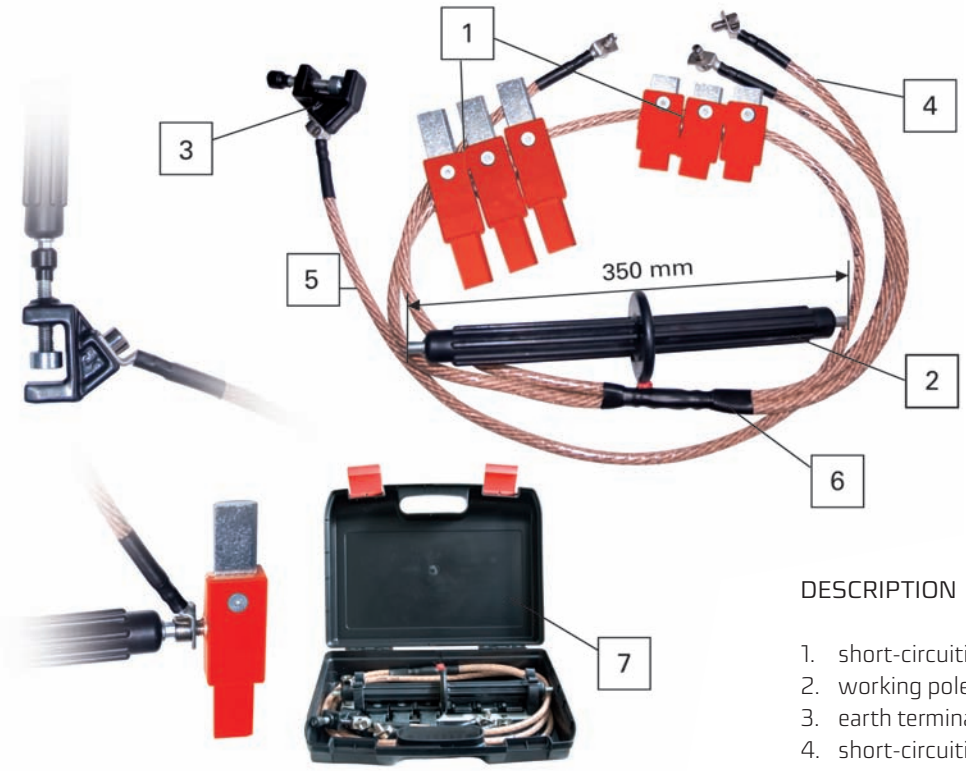
Picture of Article	Description	Article No.
	Fuse-link shroud,	1115281078T
	Short shroud for contact and screw terminal	1115281076T
	Long shroud for contact and Vterminal clamp	1115281077T
	Shroud for 3-pole,size 00 fuse base with screw terminals	1115281079T
	Long insulation barrier for 3-pole fuse base with V-terminals	1115281074T

Examples of application



Universal earthing device UU00-3

Universal earthing device **UU00-3** is a portable device for temporary short-circuiting and earthing three phase AC low voltage circuit. Universal earthing device **UU00-3** is designed for earthing of solidly earthed neutral three phase systems or indirectly earthed neutral three phase systems. It is designed for mounting in place of fuse-links or for fixing to termination points with M10 thread.
Universal earthing device is designed for use with PBD fuse bases of all sizes (00 - 3).
Article No. : 1115281041T.



DESCRIPTION

1. short-circuiting links
2. working pole
3. earth terminal
4. short-circuiting cable
5. earthing cable
6. cable connection point
7. case

Pressed nuts

Available in sizes: M8, M10, M12
Article No. :

- M8 (for hole with diameter 10 H11) 0653518082T
- M10 (for hole with diameter 12,5 H11) 0653518084T
- M12 (for hole with diameter 14,5 H11) 0653518083T

Universal replacement handle for WTNH fuse links

Sizes 00, 1, 2, 3 according to DIN 43.620 part 1
Replacement handle is designed for replacement and handling of NH fuse-links.
Fireproof insulating sleeve attached to replacement handle allows safe fuse link replacement and handling under live or load conditions.

Article	Article No.	Pcs.
Replacement handle for WTNH 00, 1, 2, 3 fuse links	1115282186T	10
Replacement handle with sleeve	1115282187T	10

Solid links

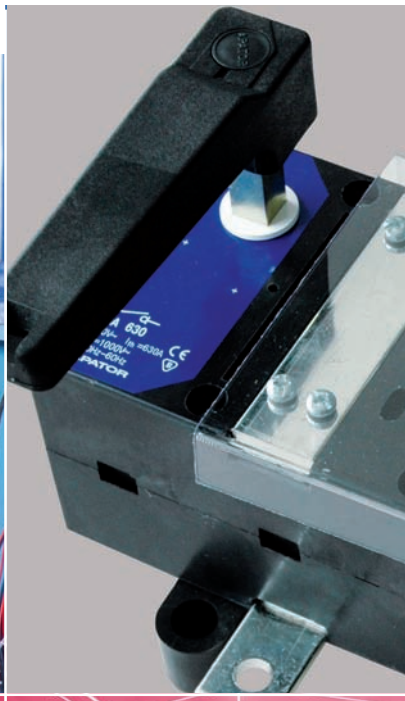
Dimensions according to PN/EN 60269/DIN 43 620. Standard version - silver plated copper.

Article	Article No.	Pcs.
Solid link size ZN 00 - 160A	1115282188T	3
Solid link size ZN 1 - 250A	1115282189T	3
Solid link size ZN 2 - 400A	1115282190T	3
Solid link size ZN 3 - 630A	1115282191T	3

Replacement handle with sleeve for WTNH fuse links

Replacement handle

Solid link

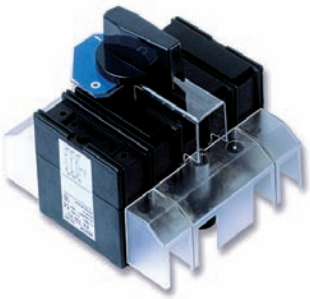


RA
switch disconnectors

RAB
switch disconnectors fuses

- RA switch disconnectors and RAB switch disconnectors fuses are designed for distribution of electricity, making and breaking currents and protection of electrical equipment against shortcircuits and overloads with industrial fuse links.

RA100P3/OHB
+cable terminal shrouds



RA100P3/R
+cable terminal shrouds

RAB1P3/OHY
+fuse link shroud

RAB2P3/OHY
+fuse link shroud

R type series is divided into two groups:

- RA switch disconnectors
  – 3-pole with optional neutral (N) 4th pole
  – RA100 - 4th pole switchable
- RAB switch disconnectors fuses
  – 3-pole with optional neutral (N) 4th pole
  – RAB000 - 4th pole switchable

GENERAL INFORMATION

- safety of service and easy installation,
- self-extinguishing thermoplastics (V0 flammability class),
- silver plated parts of current circuits,
- self-tightening and self-cleaning contacts,
- high electrical and mechanical endurance,
- high short-circuit making and breaking capacity,
- double, safe clearance between open contacts,
- complete isolation of fuse links in „off" position,
- manually operated drive (spring powered),
- wide range of accesories.

APPLICATIONS

Switch disconnectors series **R** are designed for distribution of electricity and protection against short circuits and overloads in three phase alternative current circuits. They can be used as:

- main switch disconnector in distribution boards,
- switch disconnector,
- switch disconnector for motor control and protection.

OPERATING CONDITIONS

- to be installed in the room free of any dust, aggressive or explosive gases,
- for moderate, marine and tropical climate,
- ambient temperature from -25°C to +55°C,
- altitude up to 2000 meters above sea level,
- outdoor – in cabinets with protection degree > IP 34.

CONSTRUCTION AND OPERATION

RA switch disconnectors and **RAB** switch disconnectors fuses consists of following parts:

- bottom part of the body with fitted current circuits (stationary contacts, cable terminals)
- top part of the body with fitted contacts (**RA**) or spring loaded contacts for fuse link blades (**RAB**)
- traverse with moving contacts
- manually operated drive (spring powered)

Current circuit of each phase has four cleareances between contacts in switched off position(double cleareance for each pair of contacts, two pairs of contacts for each phase phase) ensuring required isolatingdistance and safe replacement of fuse links in **RAB** switch disconnectors fuses. Manually triggered, springpowered drive delivers rapid switching. **RA** switch disconnectors and **RAB** switch disconnectors fuses can be equipped with two types of handles:

- R type - installed on disconnector's shaft
- OHB, OHY type - for installation on distribution board's door

Handle position indicates disconnector's state - switched on or switched off. OHB and OHY handles are designed for locking by up to three padlocks in OFF („O") position. Handles are available in colours black and yellow-red. Wide range of accesories is available for **RA** switch disconnectors and **RAB** switch disconnectors fuses like additional shafts, shaft joints, auxiliary switches, cable terminal shrouds, fuse link shrouds, etc.

INSTALLATION

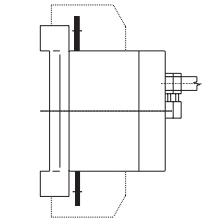
RA switch disconnectors and **RAB** switch disconnectors fuses are designed for operation in horizontal or vertical position with permissible deviation of 30° in any direction. **RA** switch disconnectors and **RAB** switch disconnectors fuses should be mounted to support structure with screws with spring washers.

Table 119. Screw terminals tightening torque

Screw	M6	M8	M10	M12
Tightening torque	7 Nm	14 Nm	24 Nm	38 Nm

Table 120. RA technical data

Article		**Unit**	**RA 100**	**RA 160**	**RA 250**	**RA 400**	**RA 630**	**RA 1250**
Parameter			**Value**					
Rated thermal current	I_{th}	A	100	160	250	400	630	1250
Rated insulation voltage	U_i	V	1000					
Rated impulse withstand voltage	U_{imp}	kV	8					
Rated frequency		Hz	50 ÷ 60					
Rated switching current for AC 22A U_e = 690 V	I_e	A	100	125	125	250	400	-
Rated switching current for AC 22B U_e = 690 V	I_e	A	-	-	-	400	630	-
Rated switching current for AC 22A U_e = 500 V	I_e	A	-	-	-	-	-	1250
Rated switching current for AC 22B U_e = 415 V	I_e	A	-	-	250	-	-	-
Rated switching current for AC 23A U_e = 500 V	I_e	A		160	160	-	-	-
Rated switching current for AC 23A U_e = 690 V	I_e	A	40	-	-	-	-	-
Rated short-circuit making capacity	I_{cm}	kA_{max}	7	9	20	25	35	100
Rated short-time withstand current 1 s	I_{cw}	kA	2,5	8	8	15	15	50
Mechanical durability		number of cycles	10000	8000	8000	5000	5000	3000
Electrical durability at utilization category AC 22 A			1500	1000	1000	1000	1000	500
Duty		-	Continuous duty					
Protection degree IP		-	IP 00					
Weight		kg	0,95	1,7	1,85	3,3	4,3	12,5
Busbar cross-section		mm^2	15 x 2	20 x 4	25 x 4	2 x 25 x 4	2 x 30 x 5	60 x 10
Cable conductor cross-section		mm^2	35	95	120	240	2 x 185	-



RA 100 P3

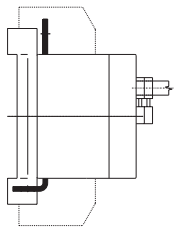
RA 100 P3/R

Table 121. RA switch disconnectors with standard cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RA 100	100 A	3	-	RA 100 P3	on request
		3 + N	-	RA 100 P3 N	63-823064-091
		4	-	RA 100 P4	on request
		3	R1	RA 100 P3/R	on request
		3 + N	R1	RA 100 P3 N/R	63-823064-211
		4	R1	RA 100 P4/R	on request
RA 160	160 A	3	-	RA 160 P3	63-822982-011
		3 + N	-	RA 160 P3 N	on request
		3	R1	RA 160 P3/R	63-822982-051
		3 + N	R1	RA 160 P3 N/R	on request
RA 250	250 A	3	-	RA 250 P3	63-822982-021
		3 + N	-	RA 250 P3 N	on request
		3	R1	RA 250 P3/R	63-822982-061
		3 + N	R1	RA 250 P3 N/R	on request
RA 400	400 A	3	-	RA 400 P3	63-811593-011
		3 + N	-	RA 400 P3 N	on request
		3	R1	RA 400 P3/R	63-811593-051
		3 + N	R1	RA 400 P3 N/R	on request
RA 630	630 A	3	-	RA 630 P3	63-811593-021
		3 + N	-	RA 630 P3 N	on request
		3	R1	RA 630 P3/R	63-811593-061
		3 + N	R1	RA 630 P3 N/R	on request
RA 1250	1250 A	3	-	RA 1250 P3	63-811601-011
		3 + N	-	RA 1250 P3 N	63-811601-021
		3	R1	RA 1250 P3/R	63-811601-031
		3 + N	R1	RA 1250 P3 N/R	63-811601-041

* R1 - handle mounted on shaft
CAUTION! N - 4th pole unswitchable, switchable 4th pole available only for RA100 type switch disconnectors

A



RA 250 P3 A

Table 122. RA switch disconnectors with „A" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RA 100	100 A	3	-	RA 100 P3 A	63-823064-021
		3 + N	-	RA 100 P3 NA	63-823064-101
		4	-	RA 100 P4 A	63-823064-061
		3	R1	RA 100 P3 A/R	63-823064-141
		3 + N	R1	RA 100 P3 NA/R	63-823064-221
		4	R1	RA 100 P4 A/R	63-823064-181
RA 160	160 A	3	-	RA 160 P3 A	63-823165-011
		3 + N	-	RA 160 P3 NA	63-823165-021
		3	R1	RA 160 P3 A/R	63-823165-131
		3 + N	R1	RA 160 P3 NA/R	63-823165-141
RA 250	250 A	3	-	RA 250 P3 A	63-823165-031
		3 + N	-	RA 250 P3 NA	63-823165-041
		3	R1	RA 250 P3 A/R	63-823165-151
		3 + N	R1	RA 250 P3 NA/R	63-823165-161
RA 400	400 A	3	-	RA 400 P3 A	63-811618-011
		3 + N	-	RA 400 P3 NA	63-811618-031
		3	R1	RA 400 P3 A/R	63-811618-131
		3 + N	R1	RA 400 P3 NA/R	63-811618-151
RA 630	630 A	3	-	RA 630 P3 A	63-811618-021
		3 + N	-	RA 630 P3 NA	63-811618-041
		3	R1	RA 630 P3 A/R	63-811618-141
		3 + N	R1	RA 630 P3 NA/R	63-811618-161

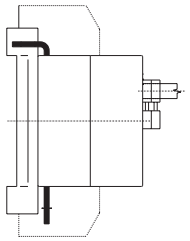
* R1 - handle mounted on shaft

Table 123. RA switch disconnectors with „B" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RA 100	100 A	3	-	RA 100 P3 B	63-823064-031
		3 + N	-	RA 100 P3 NB	63-823064-111
		4	-	RA 100 P4 B	63-826064-071
		3	R1	RA 100 P3 B/R	63-823064-151
		3 + N	R1	RA 100 P3 NB/R	63-823064-231
		4	R1	RA 100 P4 B/R	63-823064-191
RA 160	160 A	3	-	RA 160 P3 B	63-823165-051
		3 + N	-	RA 160 P3 NB	63-823165-061
		3	R1	RA 160 P3 B/R	63-823165-171
		3 + N	R1	RA 160 P3 NB/R	63-823165-181
RA 250	250 A	3	-	RA 250 P3 B	63-823165-071
		3 + N	-	RA 250 P3 NB	63-823165-081
		3	R1	RA 250 P3 B/R	63-823165-191
		3 + N	R1	RA 250 P3 NB/R	63-823165-201
RA 400	400 A	3	-	RA 400 P3 B	63-811618-051
		3 + N	-	RA 400 P3 NB	63-811618-071
		3	R1	RA 400 P3 B/R	63-811618-171
		3 + N	R1	RA 400 P3 NB/R	63-811618-191
RA 630	630 A	3	-	RA 630 P3 B	63-811618-061
		3 + N	-	RA 630 P3 NB	63-811618-081
		3	R1	RA 630 P3 B/R	63-811618-181
		3 + N	R1	RA 630 P3 NB/R	63-811618-201

* R1 - handle mounted on shaft

B



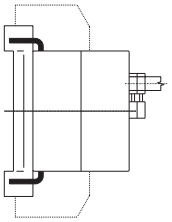
RA 250 P3 B

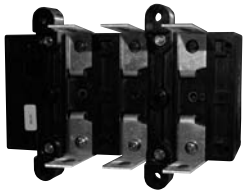
Table 124. RA switch disconnectors with „C" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RA 100	100 A	3	-	RA 100 P3 C	63-823064-041
		3 + N	-	RA 100 P3 NC	63-823064-121
		4	-	RA 100 P4 C	63-823064-081
		3	R1	RA 100 P3 C/R	63-823064-161
		3 + N	R1	RA 100 P3 NC/R	63-823064-241
		4	R1	RA 100 P4 C/R	63-823064-201
RA 160	160 A	3	-	RA 160 P3 C	63-823165-091
		3 + N	-	RA 160 P3 NC	63-823165-101
		3	R1	RA 160 P3 C/R	63-823165-211
		3 + N	R1	RA 160 P3 NC/R	63-823165-221
RA 250	250 A	3	-	RA 250 P3 C	63-823165-111
		3 + N	-	RA 250 P3 NC	63-823165-121
		3	R1	RA 250 P3 C/R	63-823165-231
		3 + N	R1	RA 250 P3 NC/R	63-823165-241
RA 400	400 A	3	-	RA 400 P3 C	63-811618-091
		3 + N	-	RA 400 P3 NC	63-811618-111
		3	R1	RA 400 P3 C/R	63-811618-211
		3 + N	R1	RA 400 P3 NC/R	63-811618-231
RA 630	630 A	3	-	RA 630 P3 C	63-811618-101
		3 + N	-	RA 630 P3 NC	63-811618-121
		3	R1	RA 630 P3 C/R	63-811618-221
		3 + N	R1	RA 630 P3 NC/R	63-811618-241

* R1 - handle mounted on shaft

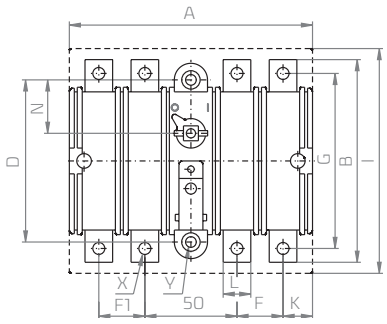
C

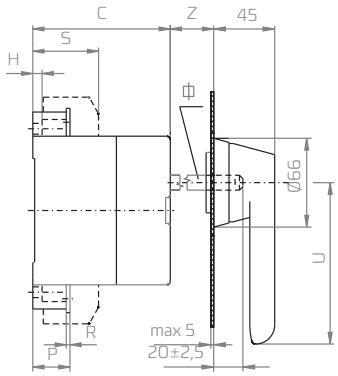




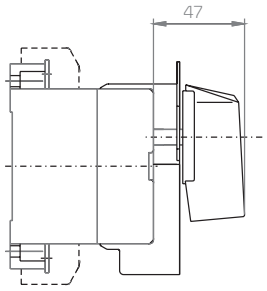
RA 250 P3 C

Dimensions of RA100





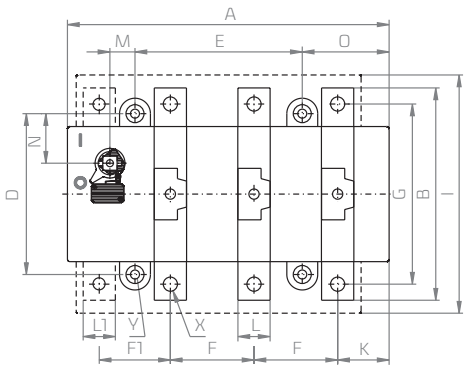
Version with handle mounted on distribution board's door

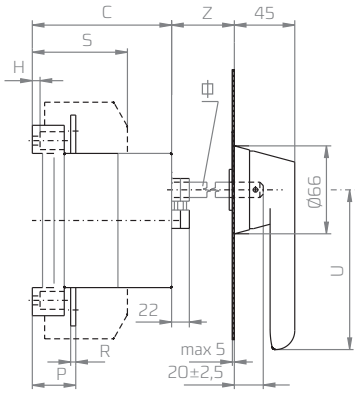


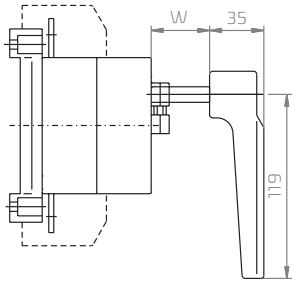
Version with knob mounted on shaft

Dimension [mm]	A	B	C	D	E	F	F1	G	H	I	K	L	L1	M	N	O	P	R	S	U	X	Y	Z	⌀	W
RA 100	132	110	74	88	–	25	25	95	5	150	16	15	–	–	29	–	20	2	50	65	6,5	5,8	20	8	–

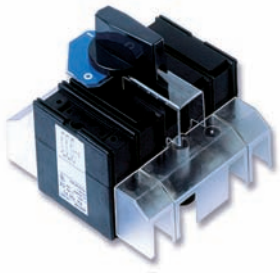
Dimensions of RA 160, RA 250, RA 400, RA 630







Dimension [mm]	A	B	C	D	E	F	F1	G	H	I	K	L	L1	M	N	O	P	R	S	U	X	Y	Z	⌀	W
RA 160 RA 250	176	132	88	110	84	42	42	115	5	170	30	20	20	16	36	51	26	3 3,5	61	95	8,8	5,8	43	10	32
RA 400 RA 630	250	174	109	125	130	65	55	149	8	225	40	25	25	20	38,5	67,5	34 30	4 5	86	125	11	7	47	12	32



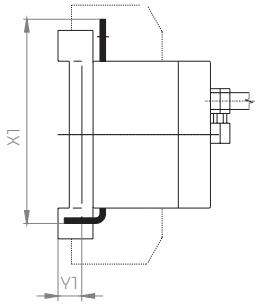
RA 100 P3/R
with additional terminal shroud

RA 160 P3/R
with additional terminal shroud

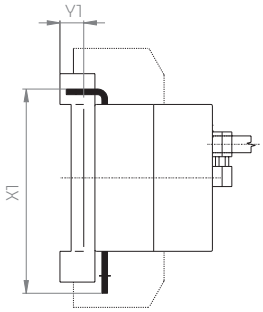
RA 160 P3/OHB
with additional terminal shroud

CABLE TERMINALS OF TYPE A, B, C

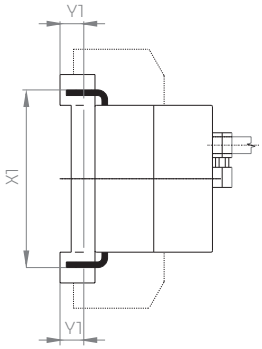
A



B

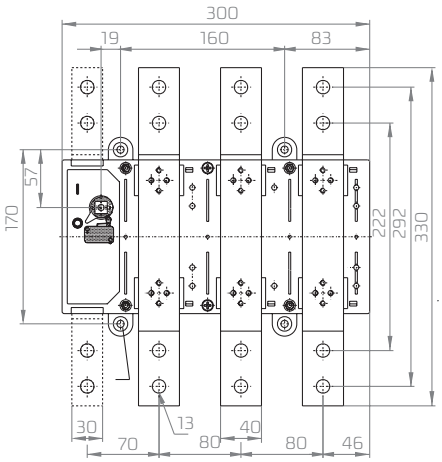


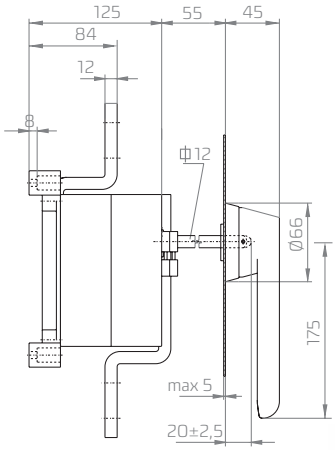
C

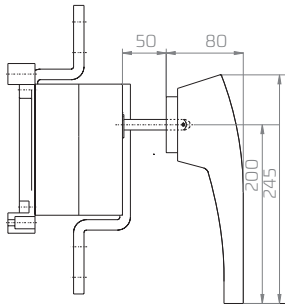


Dimensions of cable terminals [mm]	RA 160			RA 250			RA 400			RA 630		
	A	B	C	A	B	C	A	B	C	A	B	C
X1	111	111	90	111	111	90	140,5	140,5	116	146	146	127
Y1	8,5	8,5	8,5	8,5	8,5	8,5	13	13	13	13	13	13

Dimensions of RA1250



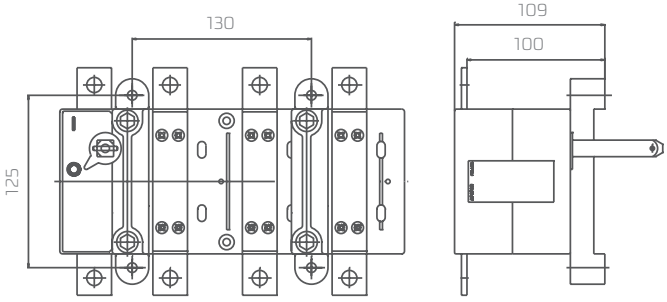




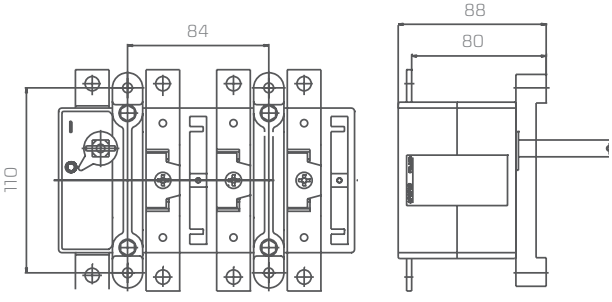
RA 1250 P3/OHB

For installation behind assembly panel

RA 160/250



RA 400/630



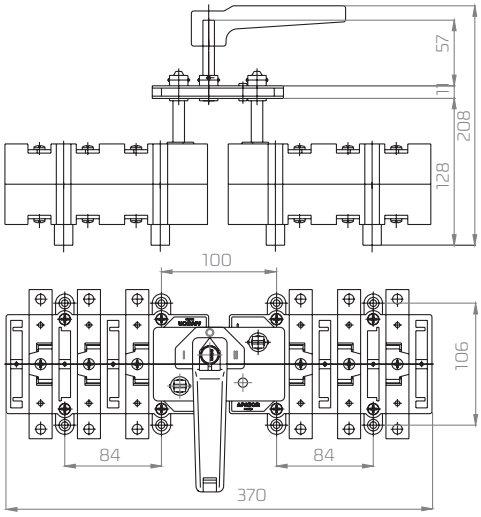
CAUTION!
lengthening of shaft is possible by adding second shaft, connected by shaft link (see Accesories)

CHANGE-OVER SWITCHES I-0-II

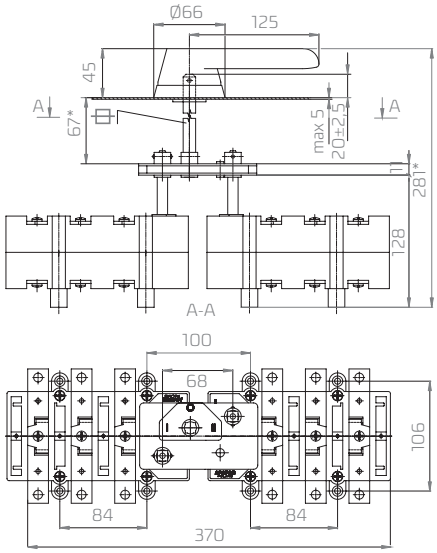
2 x RA 160 P3

I - 0 - II	Poles	I_n	Article No. of RA switch	Article No. of coupling mechanism	
				handle mounted on shaft	handle OHB mounted on distribution board's door
160	3	160 A	2 x RA 160 P3 (63-822982-011)	+63-839949-011	+63-839949-021
250	3	250 A	2 x RA 250 P3 (63-822982-021)	+63-839949-011	+63-839949-021
400	3	400 A	2 x RA 400 P3 (63-811593-011)	+63-839972-011	+63-839972-021
630	3	630 A	2 x RA 630 P3 (63-811593-021)	+63-839972-011	+63-839972-021
1250	3	1250 A	2 x RA 1250 P3 (63-811601-011)	+63-930893-011	+63-930893-021

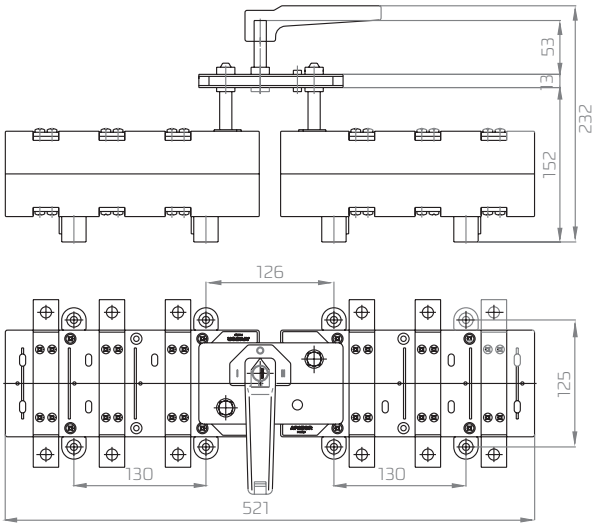
Dimensions of change-over switch I-0-II



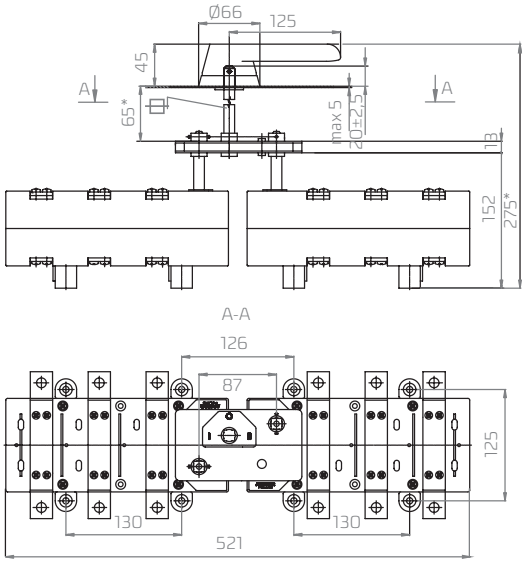
160 A – 250 A



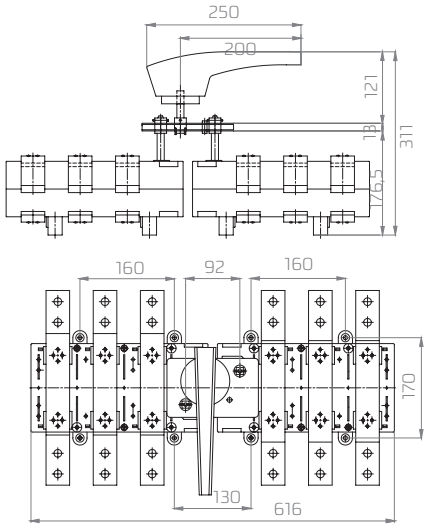
160 A – 250 A



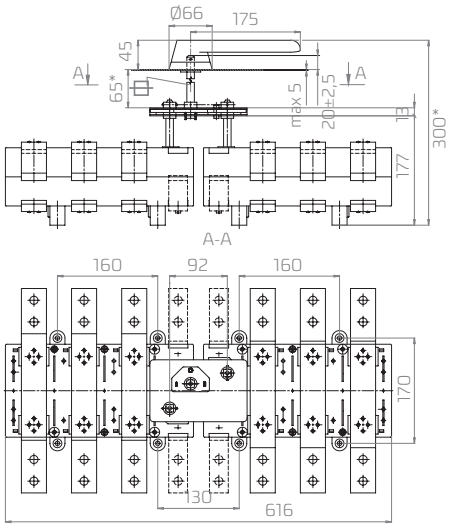
400 A – 630 A



400 A – 630 A



1250 A
handle mounted on shaft

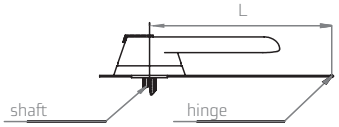


1250 A
handle mounted on distribution board's door

Enclosures for RA type switch disconnectors	Order No.	
	ENSTO	HENSEL
For RA 100..., RAB 000...		
Enclosure with gray cover	OABP 203013 G	Mi 80101
Enclosure with transparent cover	OABP 203013 T	Mi 80100
Mounting plate	OMP 2030	
Distance parts	OELA 1.04	
Mounting plate	OMP 2030	
Distance parts	OELA 1.04	
For RA 160..., 250...		
Enclosure with gray cover	OABP 303018 G	Mi 80201
Enclosure with transparent cover	OABP 303018 T	Mi 80200
Mounting plate	OMP 3030	
Distance parts	OELA 1.04	
For RA 400..., 630...		
Enclosure with gray cover	OABP 304018 G	Mi 80211
Enclosure with transparent cover	OABP 304018 T	Mi 80210
Mounting plate	OMP 3040	
Distance parts	OELA 1.04	

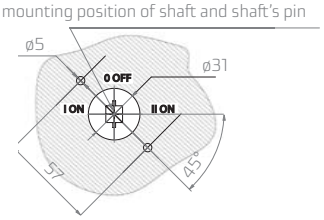
* R1 handle mounted on shaft

L-minimal distance between shaft and door's hinge



hole in enclosure's cover for mounting of OHB handles

mounting position of shaft and shaft's pin

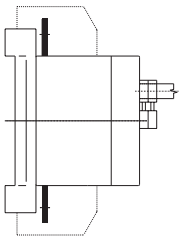


Switch disconnector	Length [mm]	Handle
RA 100 RAB 000	80	OH...65 J8
RA 160/250 RAB 00	120	OH...95 J10
RA 400/630 RAB 1/2	150	OH...125 J12
RAB 3	200	OH...145 J12
RA 1250	200	OH...175 J12

RAB switch disconnectors fuses

Table 125. RAB technical data

Article / Parameter		Unit	RAB 000	RAB 00	RAB 1	RAB 2	RAB 3
			Value				
Rated thermal current	I_{th}	A	100	160	250	400	630
Rated insulation voltage	U_i	V			1000		
Rated impulse withstand voltage	U_{imp}	kV			8		
Rated frequency		Hz			50 ÷ 60		
Rated switching current for AC 22A U_e = 690 V	I_e	A	100	125	250	400	-
Rated switching current for AC 22B U_e = 690 V	I_e	A	-	-	-	-	630
Rated switching current for AC 23A U_e = 690 V	I_e	A	40	-	-	-	-
Rated switching current for AC 23A U_e = 500 V	I_e	A	-	160	-	-	-
Rated switching current for AC 23A U_e = 415 V	I_e	A	-	-		-	630
Rated power dissipation		W	7,5	12	32	45	60
Fused short-circuit current $I_n = I_{th}$		kA			100		
Mechanical durability		number of cycles	10000	8000	8000	5000	5000
Electrical durability at utilization category AC 22 A			1500	1000	1000	1000	1000
Duty		-			Praca ciągła		
Protection degree IP		-			IP 00		
Weight		kg	1,05	2,0	3,65	4,2	7,5
Busbar cross-section		mm²	15 x 2	25 x 4	2 x 25 x 4	2 x 30 x 5	2 x 40 x 60
Cable conductor cross-section		mm²	35	120	240	2 x 185	-



RAB 00 P3

RAB 00 P3/OHB

Table 126. RAB switch disconnectors fuses with standard cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RAB 000	100 A	3	-	RAB 000 P3	on request
		3 + N	-	RAB 000 P3 N	on request
		4	-	RAB 000 P4	63-823063-051
		3	R1	RAB 000 P3/R	on request
		3 + N	R1	RAB 000 P3 N/R	on request
		4	R1	RAB 000 P4/R	on request
RAB 00	160 A	3	-	RAB 00 P3	on request
		3 + N	-	RAB 00 P3 N	on request
		3	R1	RAB 00 P3/R	on request
		3 + N	R1	RAB 00 P3 N/R	on request
RAB 1	250 A	3	-	RAB 1 P3	on requestr
		3 + N	-	RAB 1 P3 N	on request
		3	R1	RAB 1 P3/R	on request
		3 + N	R1	RAB 1 P3 N/R	on request
RAB 2	400 A	3	-	RAB 2 P3	on request
		3 + N	-	RAB 2 P3 N	on request
		3	R1	RAB 2 P3/R	63-811529-061
		3 + N	R1	RAB 2 P3 N/R	on request
RAB 3	630 A	3	-	RAB 3 P3	on request
		3 + N	-	RAB 3 P3 N	on request
		3	R1	RAB 3 P3/R	63-811564-031
		3 + N	R1	RAB 3 P3 N/R	on request

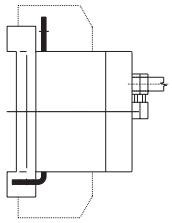
*R1 - handle mounted on shaft
CAUTION!
N - 4th pole unswitchable, switchable 4th pole available only for RA100 type switch disconnectors!

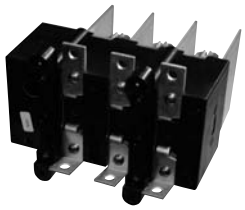
Table 127. RAB switch disconnectors fuses with „A" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RAB 000	100 A	3	-	RAB 000 P3 A	kofigurator
		3 + N	-	RAB 000 P3 NA	63-823063-101
		4	-	RAB 000 P4 A	63-823063-061
		3	R1	RAB 000 P3 A/R	on request
		3 +N	R1	RAB 000 P3 NA/R	on request
		4	R1	RAB 000 P4 A/R	on request
RAB 00	160 A	3	-	RAB 00 P3 A	on request
		3 + N	-	RAB 00 P3 NA	on request
		3	R1	RAB 00 P3 A/R	on request
		3 + N	R1	RAB 00 P3 NA/R	on request
RAB 1	250 A	3	-	RAB 1 P3 A	on request
		3 + N	-	RAB 1 P3 NA	on request
		3	R1	RAB 1 P3 A/R	on request
		3 + N	R1	RAB 1 P3 NA/R	on request
RAB 2	400 A	3	-	RAB 2 P3 A	on request
		3 + N	-	RAB 2 P3 NA	on request
		3	R1	RAB 2 P3 A/R	on request
		3 + N	R1	RAB 2 P3 NA/R	on request
RAB 3	630 A	3	-	RAB 3 P3 A	on request
		3 + N	-	RAB 3 P3 NA	on request
		3	R1	RAB 3 P3 A/R	on request
		3 + N	R1	RAB 3 P3 NA/R	on request

*R1 - handle mounted on shaft

A





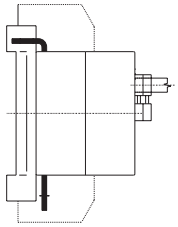
RAB 00 P3 A

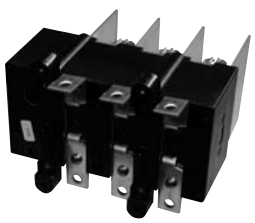
Table 128. RAB switch disconnectors fuses with „B" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RAB 000	100 A	3	-	RAB 000 P3 B	on request
		3 + N	-	RAB 000 P3 NB	63-823063-111
		3 + N	-	RAB 000 P4 B	63-823063-071
		3	R1	RAB 000 P3 B/R	on request
		3 + N	R1	RAB 000 P3 NB/R	on request
		4	R1	RAB 000 P4 B/R	on request
RAB 00	160 A	3	-	RAB 00 P3 B	on request
		3 + N	-	RAB 00 P3 NB	on request
		3	R1	RAB 00 P3 B/R	on request
		3 + N	R1	RAB 00 P3 NB/R	on request
RAB 1	250 A	3	-	RAB 1 P3 B	on request
		3 + N	-	RAB 1 P3 NB	on request
		3	R1	RAB 1 P3 B/R	on request
		3 + N	R1	RAB 1 P3 NB/R	on request
RAB 2	400 A	3	-	RAB 2 P3 B	on request
		3 + N	-	RAB 2 P3 NB	on request
		3	R1	RAB 2 P3 B/R	on request
		3 + N	R1	RAB 2 P3 NB/R	on request
RAB 3	630 A	3	-	RAB 3 P3 B	on request
		3 + N	-	RAB 3 P3 NB	on request
		3	R1	RAB 3 P3 B/R	on request
		3 + N	R1	RAB 3 P3 NB/R	on request

*R1 - handle mounted on shaft

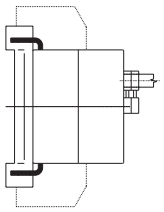
B

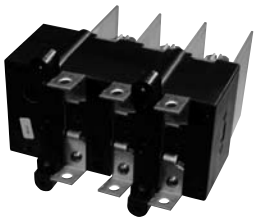




RAB 00 P3 B

C





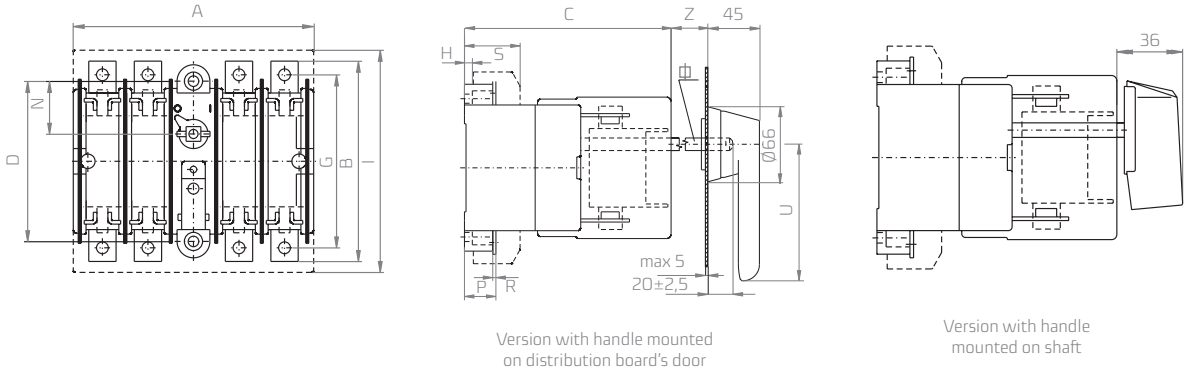
RAB 00 P3 C

Table 129. RAB switch disconnectors fuses with „C" type cable terminals

Type	I_n	Number of poles	Accessories*	Article	Article No.
RAB 000	100 A	3	-	RAB 000 P3 C	63-823063-041
		3 + N	-	RAB 000 P3 NC	63-823063-121
		4	-	RAB 000 P4 C	63-823063-081
		3	R1	RAB 000 P3 C/R	on request
		3 + N	R1	RAB 000 P3 NC/R	on request
		4	R1	RAB 000 P4 C/R	on request
RAB 00	160 A	3	-	RAB 00 P3 C	on request
		3 + N	-	RAB 00 P3 NC	on request
		3	R1	RAB 00 P3 C/R	on request
		3 + N	R1	RAB 00 P3 NC/R	on request
RAB 1	250 A	3	-	RAB 1 P3 C	on request
		3 + N	-	RAB 1 P3 NC	on request
		3	R1	RAB 1 P3 C/R	on request
		3 + N	R1	RAB 1 P3 NC/R	on request
RAB 2	400 A	3	-	RAB 2 P3 C	on request
		3 + N	-	RAB 2 P3 NC	on request
		3	R1	RAB 2 P3 C/R	on request
		3 + N	R1	RAB 2 P3 NC/R	on request
RAB 3	630 A	3	-	RAB 3 P3 C	on request
		3 + N	-	RAB 3 P3 NC	on request
		3	R1	RAB 3 P3 C/R	on request
		3 + N	R1	RAB 3 P3 NC/R	on request

*R1 - handle mounted on shaft

Dimensions of RAB 000 (100 A)

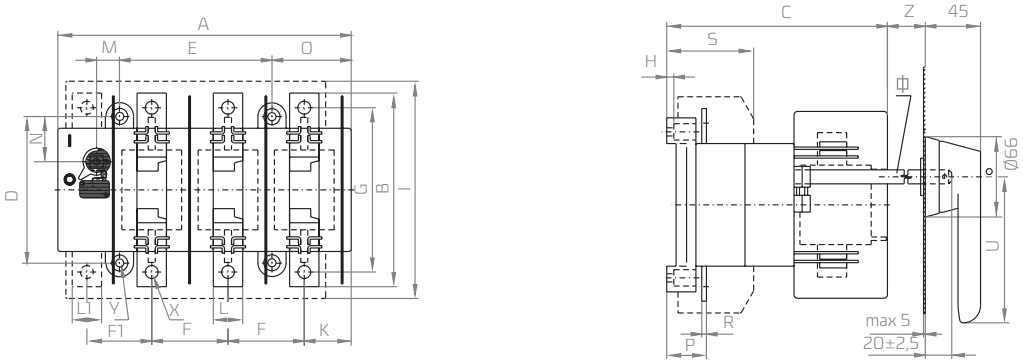


Version with handle mounted on distribution board's door

Version with handle mounted on shaft

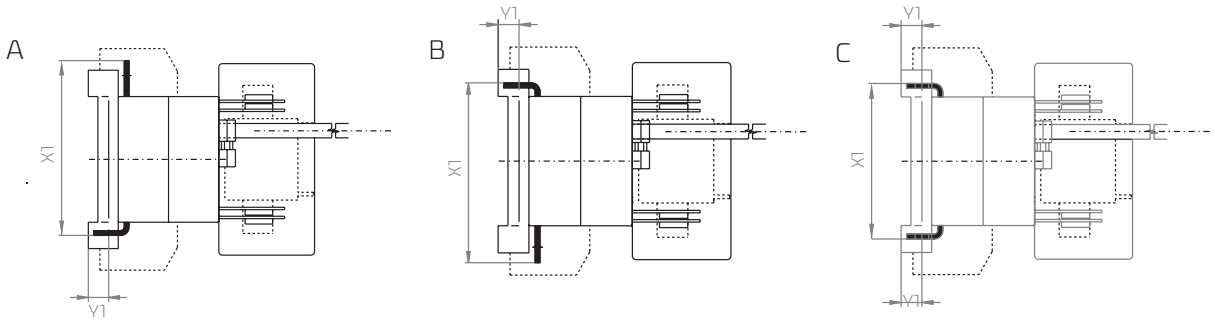
Dimension [mm]	A	B	C	D	E	G	H	I	L1	M	N	O	P	R	S	U	Z	⌀	W
RAB 000	132	110	132	88	–	95	5	150	–	–	29	–	20	2	50	65	20	8	–

Dimensions of RAB 00, RAB 1, RAB 2, RAB 3



Dimension [mm]	A	B	C	D	E	F	F1	G	H	I	K	L	L1	M	N	O	P	R	S	U	X	Y	Z	⌀	W
RAB 00	176	132	150	110	84	42	42	115	5	170	30	20	20	16	36	51	26	3,5	61	95	8,5	5,8	15	10	20
RAB 1	250	174	189	125	130	65	55	149	8	225	40	25	25	20	38,5	67,5	34	4	86	125	11	7	15	12	25
RAB 2																	30	5							
RAB 3	300	240	215	170	160	80	70	200	8	270	45,5	40	30	19	56,5	83	40	6	97	145	13	7	20	12	–

Cable terminals of type A, B, C

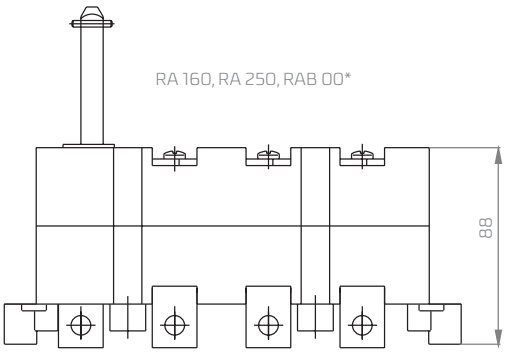


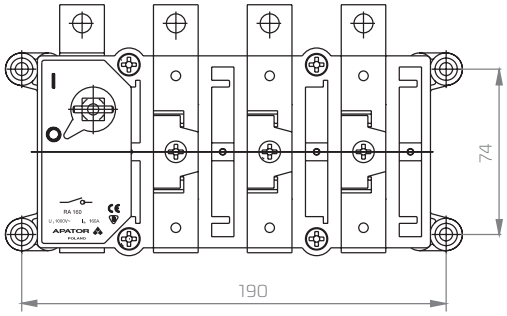
Dimensions of cable terminals [mm]	RAB 00			RAB 1			RAB 2		
	A	B	C	A	B	C	A	B	C
X1	111	111	90	140,5	140,5	116	146	146	127
Y1	8,5	8,5	8,5	8,5	8,5	8,5	13	13	13

CAUTION!
lengthening of shaft is possible by adding second shaft, connected by shaft link (see Accesories)

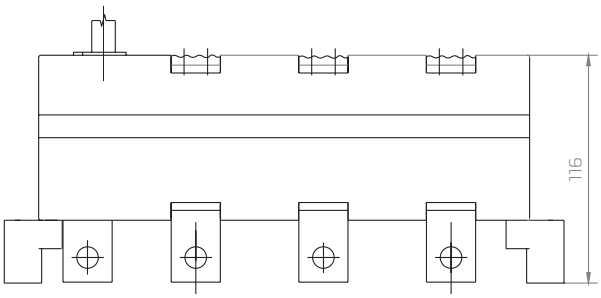
Dimensions of RA switch disconnectors, RAB switch disconnectors fuses (with cable terminals of type A, B, C) with side support element for mounting

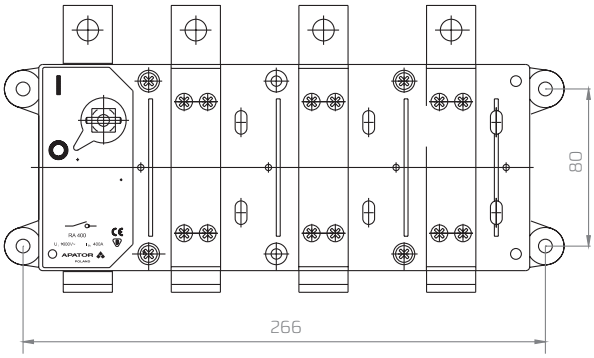
RA 160, RA 250, RAB 00*





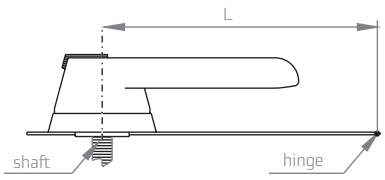
RA 400, RA 630, RAB 1, RAB 2*



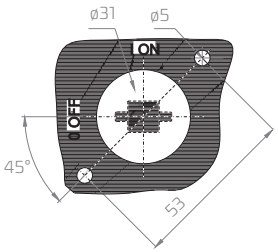


* ordered with switch

L-minimal distance between shaft and door's hinge



hole in enclosure's cover or door for mounting of OHB handles



Switch disconnector	Length [mm]	Handle
RA 100 RAB 000	80	OH...65 J8
RA 160/250 RAB 00	120	OH...95 J10
RA 400/630 RAB 1/2	150	OH...125 J12
RAB 3	200	OH...145 J12
RA 1250	200	OH...175 J12

RIN SWITCH DISCONNECTORS

Type	I_n	Description	Article	Article No.
RIN 250/RA	250 A	replacement for RIN 250-11	RA 250 P3N/RIN	63-823151-071
RIN 400	400 A	RIN - switch disconnector	RIN 400-11	63-811200-011
		change-over switch I - 0 - II	RIN 400 P	63-811293-011
ŁR 400/RIN	400 A	RIN - replacement for ŁR 400	RIN 400 S	63-811226-011
RIN 630/RA	630 A	replacement for RIN 630-11	RA 630 P3/RIN	63-811687-011

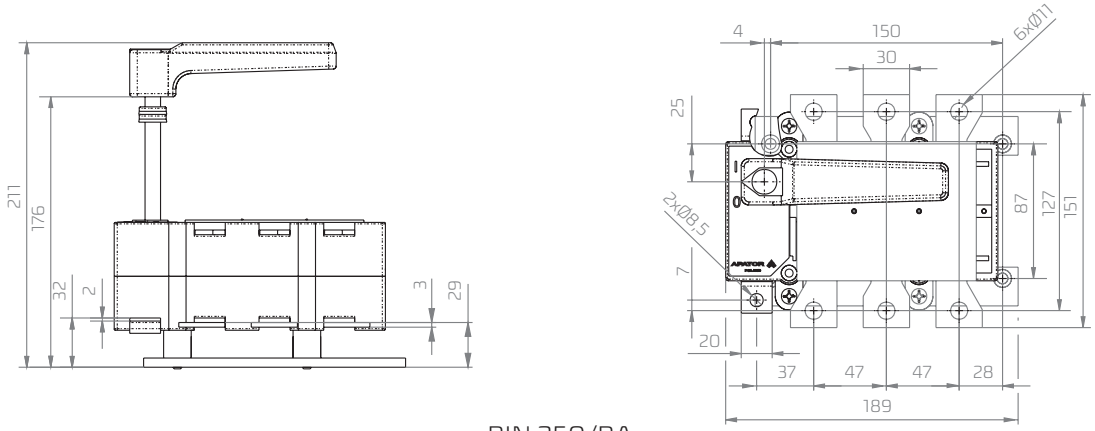
RA 250 P3N/RIN

RIN 400-11

RIN 400 S

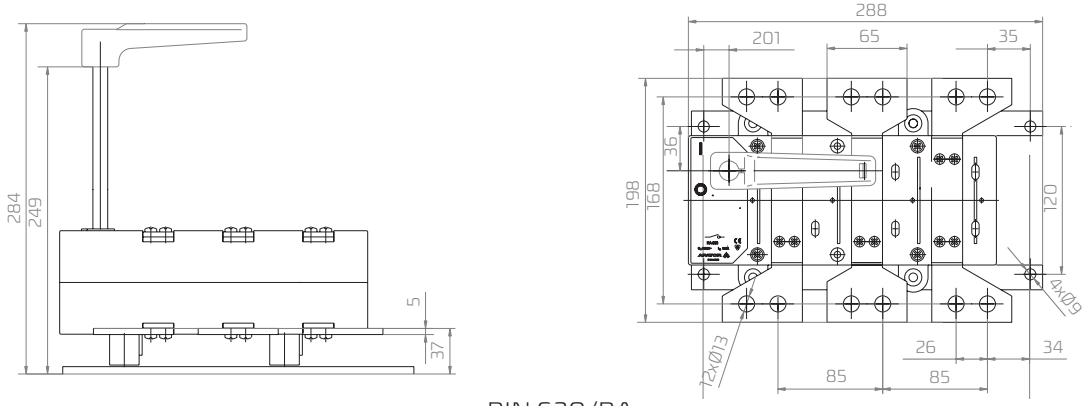
RA 630 P3/RIN

Replacement for RIN
Dimensions of switch disconnectors RA 250 P3N/RIN



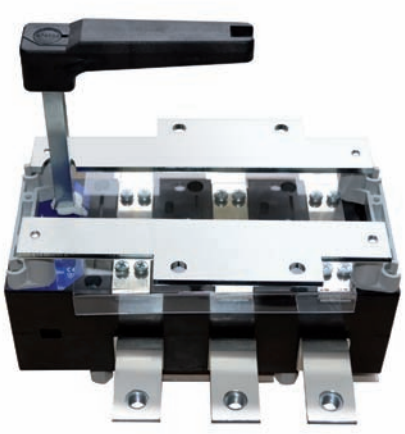
RIN 250/RA

Replacement for RIN
Dimensions of switch disconnectors RA 630 P3/RIN



RIN 630/RA

REPLACEMENT FOR 400 A SWITCH DISCONNECTOR - RA 400/0



RA 400/0
Article number: 63-811866-001

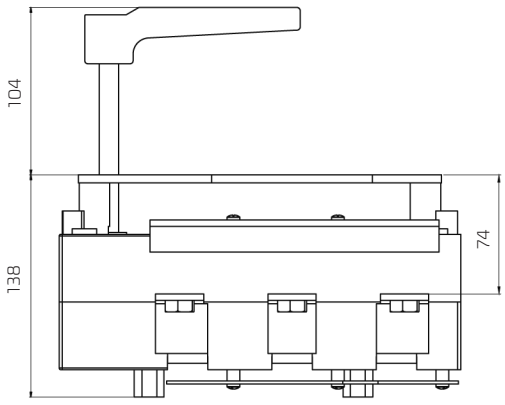
Table 130. Technical data

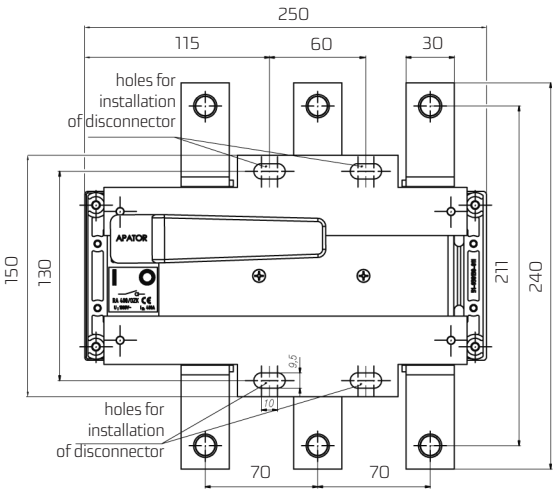
Article		Jedn.	RA 400/0
Parameter			
Rated thermal current	I_{th}	A	400
Rated insulation voltage	U_i	V	1000
Rated impulse withstand voltage	U_{imp}	kV	8
Rated frequency		Hz	50-60 Hz
Rated switching current for AC 22A U_e = 690 V	I_e	A	250
Rated switching current for AC 22B U_e = 690 V	I_e	A	400
Rated short-circuit making capacity	I_{cm}	kA_{max}	25
Rated short-time withstand current 1s	I_{cw}	kA	15
Mechanical durability		number of cycles	5000
Electrical durability at utilization category AC22A			1000
Duty		-	continuous work
IP degree of protection		-	IP 00
Weight		kg	3,3
Busbar cross-section		mm^2	2 x 25 x 4
Conductor cross-section		mm^2	240

ADVANTAGES

- switching on/switchng off of circuits under load
- AC 22B utilization category
- greater mechanical durability

Dimensions





Fuse link shrouds

Article No.	For use with switch of type	Number of shrouds mounted on switch	Number of shrouds in package	Additional informations
53-944921-011	RAB 000	1	1	3 – poles
53-944921-021				4 – poles
53-944921-031	RAB 00	1	1	
53-944921-041	RAB 1; RAB 2	1	1	
53-944921-051	RAB 3	1	1	

Handles

Handle for mounting on doors with IP65, ON/OFF position marking, designed for locking by up to three padlocks in OFF („O") position, door interlock with release mechanism for opening in position I/ON, RA../R, RAB../R - handle mounted on shaft

Article	Colour	Handle length [mm]	For shaft with side length of [mm]	For use with switch of type	Set (pcs.)
OHB 65J8 OHY 65J8	black yellow-red	65	8	RA 100 RAB 000	1
OHB 95J10 OHY 95J10	black yellow-red	95	10	RA 160/250 RAB 00	1
OHB 125J12 OHY 125J12	black yellow-red	125	12	RA 400/630 RAB 1/2	1
OHB 145J12 OHY 145J12	black yellow-red	145	12	RAB 3	1
OHB 175J12 OHY 175J12	black yellow-red	175	12	RA 1250	1

Shafts

Shafts of various length for switch disconnectors mounted in distribution boards.

Article No.	Shaft size [mm]	Length [mm]	For use with switch of type	Set (pcs.)
51-943952-011	⌀8	100	RA 100 RAB 000	1
51-943952-021		200		
51-943952-031		400		
51-943952-041		600		
51-944280-011	⌀10	100	RA 160/250 RAB 00	1
51-944280-021		200		
51-944280-031		400		
51-944280-041		600		
51-943953-011	⌀12	100	RA 400/630/1250 RAB 1/2/3	1
51-943953-021		200		
51-943953-041		400		
51-943953-031		600		

Extension shafts for use with coupling mechanism for change-over switch disconnectors:
- handle mounted on shaft - shaft with side length of 10 mm with shaft link
- handle mounted on distribution board's door - shaft with side length of 12 mm with shaft link

Shaft links

For fixing extension shaft to switch disconnector's shaft

Article No.	Shaft size [mm]	For use with switch of type	Set (pcs.)
53-944917-011	⌀8	RA 100, RAB 000	1
53-944917-021	⌀10	RA 160/250, RAB 00	1
53-944917-031	⌀12	RA 400/630/1250, RAB 1/2/3	1

Extension shafts with shaft links				
Article No.	**Shaft size [mm]**	**Length**	**For use with switch of type**	**Set (pcs.)**
63-946239-011	⌀8	100	RA 100 RAB 000	1
63-946239-021		200		1
63-946239-031		400		1
63-946239-041		600		1
63-946240-011	⌀10	100	RA 160/250 RAB 00	1
63-946240-021		200		1
63-946240-031		400		1
63-946240-041		600		1
63-946241-011	⌀12	100	RA 400/630/1250 RAB 1/2/3	1
63-946241-021		200		1
63-946241-041		400		1
63-946241-031		600		1

Terminal shrouds			
Article No.	**For use with switch of type**	**Number of shrouds mounted on switch**	**Number of shrouds in package**
51-839842-011	RA 100, RAB 000	2	1
51-838546-011	RA 160/250, RAB 00	2	1
51-839843-011	RA 400/630, RAB 1/2/3	6 (8)*	1

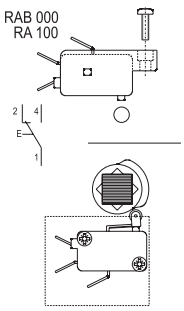
*for 3-pole switch disconnectors - 6 pcs., for 3-pole switch disconnectors with N-bar - 8 pcs.

Support element for mounting on support structure		
Article No.	**For use with switch of type**	**Number of pcs. in package (set)**
On request	RAB 00, RA 160, RA 250	1
On request	RA 400, RA 630, RAB 1, RAB 2	1

Coupling mechanism for change-over switch disconnectors		
Three positions: I-O-II. Mounted on shafts of switch disconnectors		
Article No.	**Handle mounted on shaft**	
	For use with switch of type	**Number of pcs. in package (set)**
63-839949-011	RA 160/250	1
63-839972-011	RA 400/630	1
63-930893-011	RA 1250	1

Article No.	**Handle OHB mounted in distribution board**	
	For use with switch of type	**Number of pcs. in package (set)**
63-839949-021	RA 160/250	1
63-839972-021	RA 400/630	1
63-930893-021	RA 1250	1

Auxiliary contacts				
For signalling of position of switch disconnectors contacts (ON/OFF).				
Article No.	**Auxiliary switch parameters**	**For use with switch of type**	**Number of pcs.in package**	**Additional information**
53-944915-011	AC – 11 U_e 220 V~ I_e 1 A DC – 13 U_e 220 V~ I_e 0,25 A	RA 100 RAB 000	1	one switch
53-944916-011	AC – 11 U_e 220 V~ I_e 1 A DC – 13 U_e 220 V= I_e 0,25 A	RA 160/250 RAB 00	1	one switch
53-944916-031		RA 400/630 RAB 1/2/3		
53-944916-021	AC – 11 U_e 220 V~ I_e 1 A DC – 13 U_e 220 V= I_e 0,25 A	RA 160/250 RAB 00	1	two switches
53-944916-041		RA 400/630 RAB 1/2/3		



for remaining switch disconnectors

4G
Cam switches

GENERAL INFORMATION

4G-series cam switches are low voltage switches, designed according to the latest knowledge about switchgear and using the achievements of modern engineering. Only high quality insulation and contact materials have been used in these products. Basic components and units are standardized and massproduced, making it possible to make switches performing any switching programs, and short delivery terms.

Switches can be produced in many versions and have various applications. They conform all requirements for low voltage switches in industry, mining, shipbuilding, etc. They can be used as handoperated switches in transformer stations, control switchboxes and boards, switchgears made of cast iron or other metals, welding machines and similar devices.

4G-series switches are characterized by small external dimensions, powerful switching capabilities, long contact life and high mechanical stability, and resistance to short-lasting overloads. When additionally protected with fuses, they are also resistant to dynamic effects of short-circuit currents.

APPLICATION

Cam switches can be used in main and auxiliary circuits, especially:

- as switches for electric motors for switching and controlling the drives with single- and three-phase motors, as stardelta switches, reversing switches and switches for changing the rotational speed, etc.,
- in auxiliary, controlling, signalling and measuring circuits, manufactured according to the required switching program,
- as breaker switches, change-over switches and tap switches, for example for transformers and electric welding machines,
- as switchgroups, for example to connect resistors and heating elements,
- as change-over switches working as push-buttons with automatic returning to an off position,
- as switch disconnectors.

CONFORMITY WITH STANDARDS

4G-series cam switches fully comply with the requirements of the following standards: 93/E-06150/10, 93/E-06150/30, IEC 947-1, IEC 947-3.

These switches have Recognition Certificate of the Polish Register of Shipping, and CE Declaration of conformity of the European directive 73/23/EEC.

DIVISION

Basic division of switches and their marking is based on the rated current. Further division, based on external dimensions of the switches, enables to distinguish three groups characterized by overall dimensions. Each group has the same knobs, front plates and spacing for mounting holes.

Table 131. Division into groups

Group	A0	A1		A2			A3
Switch type	4G10	4G16	4G25	4G40	4G63	4G80	4G100
Rated current I_e [A]	10	16	25	40	63	80	100

DESIGN

Depending on the switching program, every cam switch consists of a certain number of switching elements, which can be easily assembled together. Switching elements' bodies are made of plastics based on melamine, especially resistant to the effects related to creep currents and electric arcs.
A switching element has one or two current circuits arranged at the angle of 180º and equipped with contact with a double contact gap. Each of them consists of two stationary contacts and one movable contact bridge. The contact bridge is switched on (pressed) by contact springs, and opened by a cam inside the switching element. The cams in individual switching elements are firmly coupled together, ensuring practically simultaneous switching (on and off) of all contacts. Thanks to the double gap contact assembly and contact tips made of special alloy containing silver and very resistant to effects of an electric arc, high switching capabilities and contact life have been obtained. Good clicking mechanism of a motion work ensures unfailing switching of moving contacts in respective fixed positions. The power springs of the clicking mechanism are different, depending on the number of the switching elements. According to individual requirements, cam switches can be made with the switching angles given in table 132.

Table 132. Connection angles

Group		A0	A1	A2	A3	Maximum number of handle positions
Connection angle	30°	•	•	•	•	12
	45°	•	•	•		8
	60°	•	•	•	•	6
	90°	•	•	•	•	4

Special stops are used to fix proper positions. Switching elements, driving mechanism and a rear plate (mounting plate) are connected into one unit with insulating bolts.
Special versions of cam switches can have more than 12 switching elements.

SUB-ASSEMBLIES

Front plate
Complete front plate consists of:

- a front plate with a place with black frame for a text; - an indicating plate cover (transparent),
- indicating plate (under the cover, standard version is white with black signs).

According to requirements, this plate can be black, yellow or silver.

HANDLE

The handle is used to control the switch. Black is a standard colour. According special to requirements, the handles can be supplied in red colour.

Table 133. Handle types

Group	A0	A1	A2	A3
	R012 red R014 black (standard)	R112 red R114 black (standard)	R212 red R214 black (standard)	R312 red R314 black (standard)
		R122 red R124 black	R222 red R224 black	R322 red R324 black

Table 134. Technical data

Parameter			Switch type											
			4G10	4G16	4G25	4G40	4G63	4G80	4G100	4G200	4G400	4G630	4G800	4G1200
Rated insulation voltage U_i		V	690	690	690	690	690	690	690	690	690	690	690	690
Rated impulse withstand voltage U_{imp}		kV	4	4	4	6	6	6	6	8	8	8	8	8
Rated thermal current I_{th}		A	16	20	25	50	63	80	125	200	400	630	800	1200
Short-circuit protection Rated breaking capacity of fuse links with high breaking capacity	10 kA_{sk}	A	–	25	25	50	63	80	125	200	400	630	2x400	2x630
	25 kA_{sk}	A	–	25	25	50	63	80	125	160	315	500	2x400	2x630
	40 kA_{sk}	A	–	25	25	50	63	80	125	160	315	400	500	2x400
	63 kA_{sk}	A	–	25	25	36	50	63	100	160	250	355	400	630
	75 kA_{sk}	A	–	25	25	36	50	63	100					
Mechanical durability (number of cycles)			$3x10^6$	$3x10^6$	$3x10^6$	$3x10^6$	$3x10^6$	$3x10^6$	$3x10^6$	$2x10^5$	$2x10^5$	$2x10^5$	$2x10^5$	$2x10^5$
Terminal bolts Maximum cross-section of connecting conductors		mm^2	M3 2 x 2,5	M4 2 x 4	M4 2 x 6	M5 2 x 10	M5 2 x 10	M6 25	2 x M6 50	M6 –	M10 –	M12 –	M16 –	M16 –
Short duration load capacity	1 s	A	220	430	690	920	1600	1600	2600	3300	6500	9500	12000	18000
	10 s	A	70	145	240	290	600	650	850	1100	2000	3000	4000	6100
	30 s	A	40	90	160	200	375	400	500	640	1200	1800	2400	3500
	60 s	A	30	75	125	155	285	300	360	460	850	1250	1600	2450
Breaking capacity	660 V - cosφ = 0,65	A	–	190	–	–	–	–	–	640	–	–	–	–
	660 V - cosφ = 0,35	A	–	–	250	490	500	500	650	–	–	–	–	–
	600 V - cosφ = 0,35	A	–	200	260	500	610	610	–	–	–	–	–	–
	500 V - cosφ = 0,35	A	100[1)]	–	–	–	–	–	900	900	–	–	–	–
	500 V - cosφ = 0,75	A	–	–	–	–	–	–	–	–	1100	1100	1200	1800
Switch disconnectors Utilization category AC2 Rated power of three-phase loads	3 x 220 V~	kW	5,2	7	9	14	23	29	37	72	150	150	150	150
	3 x 380 V~	kW	9	12,5	15,5	24	39	50	63	125	260	260	260	260
	3 x 500 V~	kW	11,8	17	20	33	52	66	84	165	340	340	340	340
	3 x 660 V~	kW	15,5	22	27	43	69	86	110	210	400	400	400	400
Switch disconnectors for motors Utilization category AC3, AC23 Rated power of three-phase motors	3 x 220 V~	kW	3	4,5	7,5	12,5	18,5	21	–	27,5	27,5	27,5	27,5	27,5
	3 x 380 V~	kW	5	8	13	21	32	37	–	47	47	47	47	47
	3 x 500 V~	kW	6	11	17	27	42	48	–	62	62	62	62	62
	3 x 660 V~	kW	6	11	17	27	55	60	–	80	80	80	80	80
Switch disconnectors for motors Utilization category AC23 Rated power of three-phase motors	3 x 220 V~	kW	–	–	–	–	–	–	27,5	27,5	27,5	27,5	27,5	27,5
	3 x 380 V~	kW	–	–	–	–	–	–	47	47	47	47	47	47
	3 x 500 V~	kW	–	–	–	–	–	–	62	62	62	62	62	62
	3 x 660 V~	kW	–	–	–	–	–	–	80	80	80	80	80	80
Switch disconnector for motors, category of utility AC3, AC23 (30 connections/h). Rated power of one-phase (dipolar) motors.	110 V~	kW	0,8	1,3	2,1	3,6	5,3	6	–	–	–	–	–	–
	220 V~	kW	1,7	2,6	4,3	7,2	10,6	12,1	–	–	–	–	–	–
	380 V~	kW	2,8	4,6	7,5	12	18,5	21,1	–	–	–	–	–	–
Auxiliary switch disconnectors Utilization category AC14 Rated swit-ching current I_e (1 pole)	110 V~	A	11	20	25	50	63	72	–	–	–	–	–	–
	220 V~	A	8	20	25	40	50	50	–	–	–	–	–	–
	380 V~	A	3,5	16	20	40	45	45	–	–	–	–	–	–
	660 V~	A	2,5	8	8,5	10	10	10	–	–	–	–	–	–
Type of operation		–	Continuous duty											

1) - cosφ = 0,65

BREAKING CAPACITY FOR DIRECT CURRENT

Breaking capacity for direct current operation depends on current intensity, voltage and inductance.
Time constant T = L/R represents inductance values in a current circuit.
T = 1 ms – active power or lightly inductive power predominates, for example resistance furnaces.
T = 15 ms – inductive power predominates, for example relay coils. For direct current and voltage above 60 V, switch contacts must be connected in parallel to obtain higher breaking capacity.

Table 135. Rated breaking capacity of one contact

Switch type	Rated breaking capacity of one contact											
	24 V		60 V		110 V		220 V		440 V		600 V	
	T = 1 ms	T = 15 ms	T = 1 ms	T = 15 ms	T = 1 ms	T = 15 ms	T = 1 ms	T = 15 ms	T = 1 ms	T = 15 ms	T = 1 ms	T = 15 ms
4G10	40	40	40	20	17	3	1,1	0,5	0,5	0,2	0,5	0,1
4G16	100	100	38	18	5,5	3	0,95	0,4	0,5	0,25	0,3	0,2
4G25	100	100	38	18	5,5	3	0,95	0,4	0,5	0,25	0,3	0,2
4G40	252	252	95	40	15	3,5	1,2	0,4	0,6	0,25	0,45	0,2
4G63	252	252	95	40	15	3,5	1,2	0,4	0,6	0,25	0,45	0,2
4G100	800	800	400	400	35	7,5	2,5	0,75	0,9	0,3	0,5	0,25

Table 136 shows a number of contacts which can be connected in series for rated making currents at specific constant voltages for category of utility DC 1.

Table 136. Number of contacts connected in series

Switch type	Number of contacts connected in series			
	110 V	220 V	440 V	600 V
4G10	1	3	6	8
4G16	2	4	6	9
4G25	2	4	6	9
4G40	2	3	6	9
4G63	2	4	6	9
4G100	2	3	6	–

DC1 - main noninductive or low voltage load
T = 1 ms breaking capacity I = 1,5 I_e

Note: Breaking capacity for a 4G25 switch with two contacts connected in series is 2A at 220V; T = 15 ms.
In table 137 the rated making current values (Ie) for category of utility DC 11 (according to EC 337-1, 337-1A) have been shown.

Table 137. Rated switching current

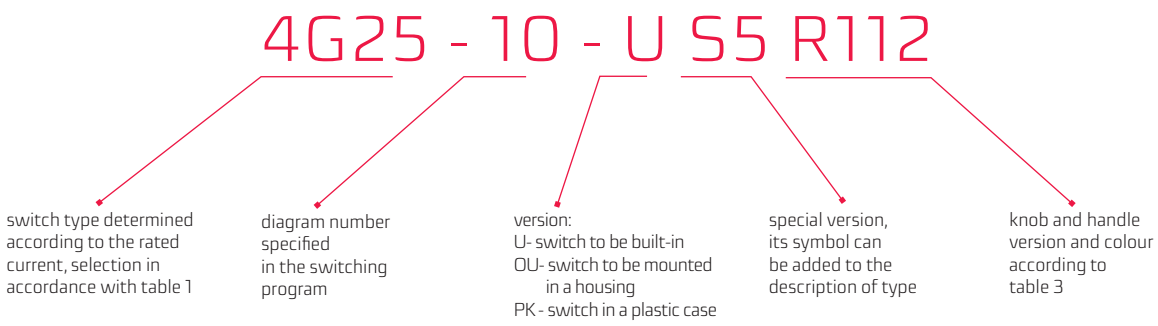
Switch type	Rated switching current I_e [A]					
	24 V	60 V	110 V	220 V	440 V	600 V
4G10	10	2	1	0,27	0,16	0,14
4G16	20	2,2	1	0,3	0,22	0,16
4G25	25	2,2	1	0,3	0,22	0,16
4G40	50	5	2	0,4	0,23	0,2
4G63	63	5	2	0,4	0,23	0,2

SWITCHING PROGRAMS

Switching program		Diagram number	Page
Switch disconnectors with "0" (0-1) position			
1-pole		90	163
2-pole		91	
3-pole		10	
multi-pole		92	
		100	
		528	
		659	
Switch disconnectors with quick-connecting contacts (0-1)			
with 30° contact lead	1-pole	270	163
	2-pole	271	
	3-pole	63	
with 30° contact lead on three contacts and 60° on one contact	4-pole	272	
with 30° contact lead on three contacts and 60° on two contacts	5-pole	273	
with 30° contact lead	6-pole	274	
Switches with "0"(1-0-2) position			
1-pole		51	164
2-pole		52	
3-pole		53	
multi-pole		75	
		76	
		77	
		78	
		79	
		80	
		81	
Switches for current transformers (1-2)			
		57	164
Switches without "0" (1-2) position			
1-pole		54	165
2-pole		55	
3-pole		56	
multi-pole		69	
		70	
		71	
		72	
		73	
		74	
		62	
Multiposition switches with "0" (0-1-2...) position			
1-pole	3-position	107	166
	4-position	108	
	5-position	109	
	6-position	110	

Switching program		Diagram number	Page
Multiposition switches with "0" (0-1-2...) position			
1-pole	7-position	111	166
	8-position	112	
	9-position	113	
	10-position	114	
	11-position	115	
	12-position	116	
2-pole	3-position	123	167
	4-position	124	
	5-position	125	
	6-position	126	
	7-position	127	
	8-position	128	
	9-position	129	
	10-position	130	
	11-position	131	
	12-position	132	
3-pole	3-position	135	168
	4-position	136	
	5-position	137	
	6-position	138	
	7-position	139	
	8-position	140	
multi-pole	3-position	145	168
	4-position	146	
	5-position	147	
	6-position	148	
	3-position	151	
	4-position	152	
	5-position	153	169
	3-position	156	
	4-position	157	
	5-position	158	
	3-position	160	
	4-position	161	
	3-position	163	
	4-position	164	
Multiposition switches without "0" position			
1-pole	3-position	82	170
	4-position	83	
	5-position	84	
	6-position	85	
	7-position	101	
	8-position	102	
	9-position	103	
	10-position	104	
	11-position	105	
	12-position	106	

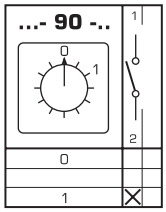
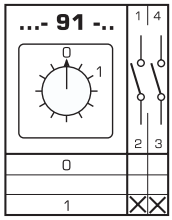
AN ORDER EXAMPLE



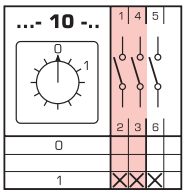
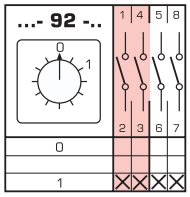
NOTES:
1. every order on devices for rated current 100A requires arrangements with the manufacturer related to the technical details and delivery date.
2. devices in PK housings can be made only for those switching programs which require not more than four segments (protection class IP 55/IP 65).

EXPRES SERVICE 24 h or 48 h - There is the ability to perform cam switches in 24 or 48 h (additional fee)

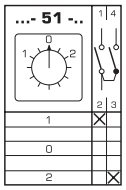
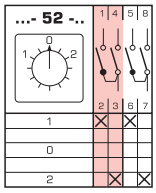
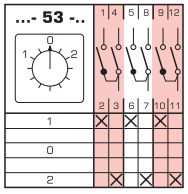
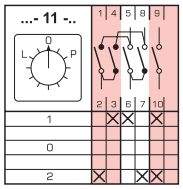
STANDARD CONNECTION DIAGRAMS

Diagram number	Number of poles	Rated switching current	Rated voltage	Number of packs	Symbol Article No.	Handle	Protection degree IP from the front	Maximum conductor cross-section [mm²]	Installation
Switch disconnector with "0" (0-1) position									
	1	10	690	1	4G10-90-U 63-840390-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	1	16	690	1	4G16-90-U 63-840390-021	R114	IP40	2 x 4	to be mounted behind the panel
	1	25	690	1	4G25-90-U 63-840390-031	R114	IP40	2 x 6	to be mounted behind the panel
	1	10	690	1	4G10-90-PK 63-840392-011	R014	IP55	2 x 2,5	in a housing
	1	25	690	1	4G10-90-PK IP65 63-840392-111	R114	IP65	2 x 6	in a housing
	1	16	690	1	4G16-90-PK 63-840392-021	R114	IP55	2 x 4	in a housing
	1	25	690	1	4G25-90-PK 63-840392-031	R114	IP55	2 x 6	in a housing
	2	10	690	1	4G10-91-U 63-840393-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	2	16	690	1	4G16-91-U 63-840393-021	R114	IP40	2 x 4	to be mounted behind the panel
	2	10	690	1	4G10-91-PK 63-840395-011	R014	IP55	2 x 2,5	in a housing
	2	25	690	1	4G10-91-PK IP65 63-840395-111	R114	IP65	2 x 6	in a housing
	2	16	690	1	4G16-91-PK 63-840395-021	R114	IP55	2 x 4	in a housing
	2	25	690	1	4G25-91-PK 63-840395-031	R114	IP55	2 x 6	in a housing

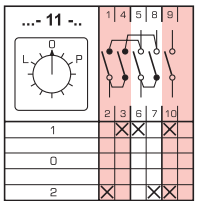
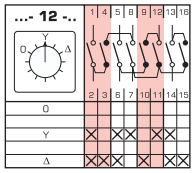
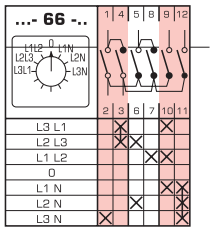
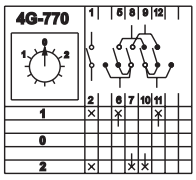
* See dimensions on pages 181-184

Diagram number	Number of poles	Rated switching current	Rated voltage	Number of packs	Symbol Article No.	Handle	Protection degree IP from the front	Maximum conductor cross-section [mm²]	Installation
Switch disconnector with "0" (0-1) position									
	3	10	690	2	4G10-10-U 63-840304-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	3	16	690	2	4G16-10-U 63-840304-021	R114	IP40	2 x 4	to be mounted behind the panel
	3	25	690	2	4G25-10-U 63-840304-031	R114	IP40	2 x 6	to be mounted behind the panel
	3	40	690	2	4G40-10-U 63-840304-041	R214	IP40	2 x 10	to be mounted behind the panel
	3	63	690	2	4G63-10-U 63-840304-051	R214	IP40	2 x 10	to be mounted behind the panel
	3	80	690	2	4G80-10-U 63-840304-061	R214	IP40	25	to be mounted behind the panel
	3	10	690	2	4G10-10-PK 63-840306-011	R014	IP55	2 x 2,5	in a housing
	3	10	690	2	4G10-10-PK IP65 63-840306-111	R014	IP65	2 x 2,5	in a housing
	3	16	690	2	4G16-10-PK 63-840306-021	R114	IP55	2 x 4	in a housing
	3	25	690	2	4G25-10-PK 63-840306-031	R114	IP55	2 x 6	in a housing
	3	40	690	2	4G40-10-PK 63-840306-041	R214	IP55	2 x 10	in a housing
	3	63	690	2	4G63-10-PK 63-840306-051	R214	IP55	2 x 10	in a housing
	3	80	690	2	4G80-10-PK 63-840306-061	R214	IP55	25	in a housing
	4	10	690	2	4G10-92-U 63-840396-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	4	16	690	2	4G16-92-U 63-840396-021	R114	IP40	2 x 4	to be mounted behind the panel
	4	25	690	2	4G25-92-U 63-840396-031	R114	IP40	2 x 6	to be mounted behind the panel
	4	40	690	2	4G40-92-U 63-840396-041	R214	IP40	2 x 10	to be mounted behind the panel
	4	63	690	2	4G63-92-U 63-840396-051	R214	IP40	2 x 10	to be mounted behind the panel
	4	80	690	2	4G80-92-U 63-840396-061	R214	IP40	25	to be mounted behind the panel
	4	10	690	2	4G10-92-PK 63-840398-011	R014	IP55	2 x 2,5	in a housing
	4	10	690	2	4G10-92-PK IP65 63-840398-111	R014	IP65	2 x 2,5	in a housing
	4	16	690	2	4G16-92-PK 63-840398-021	R114	IP55	2 x 4	in a housing
	4	25	690	2	4G25-92-PK 63-840398-031	R114	IP55	2 x 6	in a housing
	4	40	690	2	4G40-92-PK 63-840398-041	R214	IP55	2 x 10	in a housing
	4	63	690	2	4G63-92-PK 63-840398-051	R214	IP55	2 x 10	in a housing
	4	80	690	2	4G80-92-PK 63-840398-061	R214	IP55	25	in a housing

* See dimensions on pages 181-184

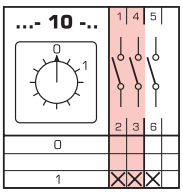
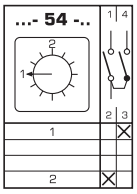
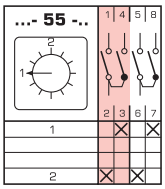
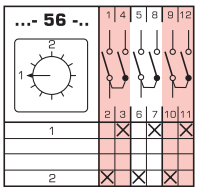
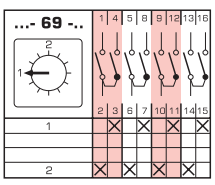
Diagram number	Number of poles	Rated switching current	Rated voltage	Number of packs	Symbol Article No.	Handle	Protection degree IP from the front	Maximum conductor cross-section [mm²]	Installation
„Mains-unit" switch (1-0-2)									
	1	10	690	1	4G10-51-U 63-840338-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	1	10	690	1	4G10-51-PK 63-840340-011	R014	IP55	2 x 2,5	in a housing
	1	10	690	1	4G10-51-PK IP65 63-840340-111	R014	IP65	2 x 2,5	in a housing
	2	10	690	2	4G10-52-U 63-840341-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	3	10	690	3	4G10-53-U 63-840343-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	3	16	690	3	4G16-53-U 63-840343-021	R114	IP40	2 x 4	to be mounted behind the panel
	3	25	690	3	4G25-53-U 63-840343-031	R114	IP40	2 x 6	to be mounted behind the panel
	3	40	690	3	4G40-53-U 63-840343-041	R214	IP40	2 x 10	to be mounted behind the panel
	3	63	690	3	4G63-53-U 63-840343-051	R214	IP40	2 x 10	to be mounted behind the panel
	3	80	690	3	4G80-53-U 63-840343-061	R214	IP40	25	to be mounted behind the panel
	3	10	690	3	4G10-53-PK 63-840345-011	R014	IP55	2 x 2,5	in a housing
	3	10	690	3	4G10-53-PK IP65 63-840345-111	R014	IP65	2 x 2,5	in a housing
	3	16	690	3	4G16-53-PK 63-840345-021	R114	IP55	2 x 4	in a housing
	3	25	690	3	4G25-53-PK 63-840345-031	R114	IP55	2 x 6	in a housing
	3	40	690	3	4G40-53-PK 63-840345-041	R214	IP55	2 x 10	in a housing
	3	63	690	3	4G63-53-PK 63-840345-051	R214	IP55	2 x 10	in a housing
	3	80	690	3	4G80-53-PK 63-840345-061	R214	IP55	25	in a housing
„Rotation direction change" switch (L-0-P)									
	3	10	690	3	4G10-11-U 63-840307-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	3	16	690	3	4G16-11-U 63-840307-021	R114	IP40	2 x 4	to be mounted behind the panel
	3	25	690	3	4G25-11-U 63-840307-031	R114	IP40	2 x 6	to be mounted behind the panel
	3	40	690	3	4G40-11-U 63-840307-041	R214	IP40	2 x 10	to be mounted behind the panel
	3	63	690	3	4G63-11-U 63-840307-051	R214	IP40	2 x 10	to be mounted behind the panel
	3	80	690	3	4G80-11-U 63-840307-061	R214	IP40	25	to be mounted behind the panel

* See dimensions on pages 181-184

Diagram number	Number of poles	Rated switching current	Rated voltage	Number of packs	Symbol Article No.	Handle	Protection degree IP from the front	Maximum conductor cross-section [mm²]	Installation
„Rotation direction change" switch (L-0-P)									
	3	10	690	3	4G10-11-PK 63-840309-011	R014	IP55	2 x 2,5	in a housing
	3	10	690	3	4G10-11-PK IP65 63-840309-111	R014	IP65	2 x 2,5	in a housing
	3	16	690	3	4G16-11-PK 63-840309-021	R114	IP55	2 x 4	in a housing
	3	25	690	3	4G25-11-PK 63-840309-031	R114	IP55	2 x 6	in a housing
	3	40	690	3	4G40-11-PK 63-840309-041	R214	IP55	2 x 10	in a housing
	3	63	690	3	4G63-11-PK 63-840309-051	R214	IP55	2 x 10	in a housing
	3	80	690	3	4G80-11-PK 63-840309-06	R214	IP55	25	in a housing
„Star-delta" (Y-0-Δ) motor control switch									
	3	10	690	4	4G10-12-U 63-840310-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	3	16	690	4	4G16-12-U 63-840310-021	R114	IP40	2 x 4	to be mounted behind the panel
	3	25	690	4	4G25-12-U 63-840310-031	R114	IP40	2 x 6	to be mounted behind the panel
	3	40	690	4	4G40-12-U 63-840310-041	R214	IP40	2 x 10	to be mounted behind the panel
	3	63	690	4	4G63-12-U 63-840310-051	R214	IP40	2 x 10	to be mounted behind the panel
	3	80	690	4	4G80-12-U 63-840310-061	R214	IP40	25	to be mounted behind the panel
	3	10	690	4	4G10-12-PK 63-840591-011	R014	IP55	2 x 2,5	in a housing
	3	10	690	4	4G10-12-PK IP65 63-840591-111	R014	IP65	2 x 2,5	in a housing
	3	16	690	4	4G16-12-PK 63-840591-021	R114	IP55	2 x 4	in a housing
	3	25	690	4	4G25-12-PK 63-840591-031	R114	IP55	2 x 6	in a housing
	3	40	690	4	4G40-12-PK 63-840591-041	R214	IP55	2 x 10	in a housing
	3	63	690	4	4G63-12-PK 63-840591-051	R214	IP55	2 x 10	in a housing
	3	80	690	4	4G80-12-PK 63-840591-061	R214	IP55	25	in a housing
Voltmeter switch (L3L1, L2L3, L1L2 - 0 - L1N, L2N, L3N)									
	4	10	690	3	4G10-66-U 63-840360-011	R014	IP40	2 x 2,5	to be mounted behind the panel
Switch for forklift trucks(1-0-2)									
	5	80	690	6	4G80-770-U 63-841838-061	R214	IP40	25	to be mounted behind the panel

the contact (terminal 1-2) should be switched on in the control circuit coil of the contactor relay

* See dimensions on pages 181-184

Diagram number	Number of poles	Rated switching current	Rated voltage	Number of packs	Symbol Article No.	Handle	Protection degree IP from the front	Maximum conductor cross-section [mm²]	Installation
Main (emergency) switch connectors									
	3	16	690	2	4G16-10-PK S6 63-241669-021	R114	IP55	2 x 4	in a housing
	3	16	690	2	4G16-10-OU S8 S25 63-241670-021	R114	IP40	2 x 4	mounting plate
	3	16	690	2	4G16-10-U S25 63-241671-021	R114	IP40	2 x 4	to be mounted behind the panel
	3	25	690	2	4G25-10-OU S8 S25 63-241672-031	R114	IP40	2 x 6	mounting plate
	3	25	690	2	4G25-10-PK S6 63-241673-031	R114	IP55	2 x 6	in a housing
	3	25	690	2	4G25-10-U S25 63-241674-031	R114	IP40	2 x 6	to be mounted behind the panel
	3	40	690	2	4G40-10-OU S8 S25 63-241675-041	R214	IP40	2 x 10	mounting plate
	3	40	690	2	4G40-10-PK S6 63-241676-041	R214	IP55	2 x 10	in a housing
	3	40	690	2	4G40-10-U S25 63-241677-041	R214	IP40	2 x 10	to be mounted behind the panel
	3	63	690	2	4G63-10-U S25 63-241678-051	R214	IP40	2 x 10	to be mounted behind the panel
	3	80	690	2	4G80-10-U S6 63-241858-061	R214	IP40	25	to be mounted behind the panel
Switches (1-2)									
	1	10	690	1	4G10-54-U 63-840346-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	1	10	690	1	4G10-54-PK 63-840347-011	R014	IP55	2 x 2,5	in a housing
	1	10	690	1	4G10-54-PK IP65 63-840347-111	R014	IP65	2 x 2,5	in a housing
	2	10	690	2	4G10-55-U 63-840348-011	R014	IP40	2 x 2,5	to be mounted behind the panel
	2	10	690	2	4G10-55-PK 63-840350-011	R014	IP55	2 x 2,5	in a housing
	2	10	690	2	4G10-55-PK IP65 63-840350-111	R014	IP65	2 x 2,5	in a housing
	3	10	690	3	4G10-56-PK konfigurator	R014	IP40	2 x 2,5	in a housing
	4	10	690	4	4G10-69-U 63-840367-011	R014	IP40	2 x 2,5	to be mounted behind the panel

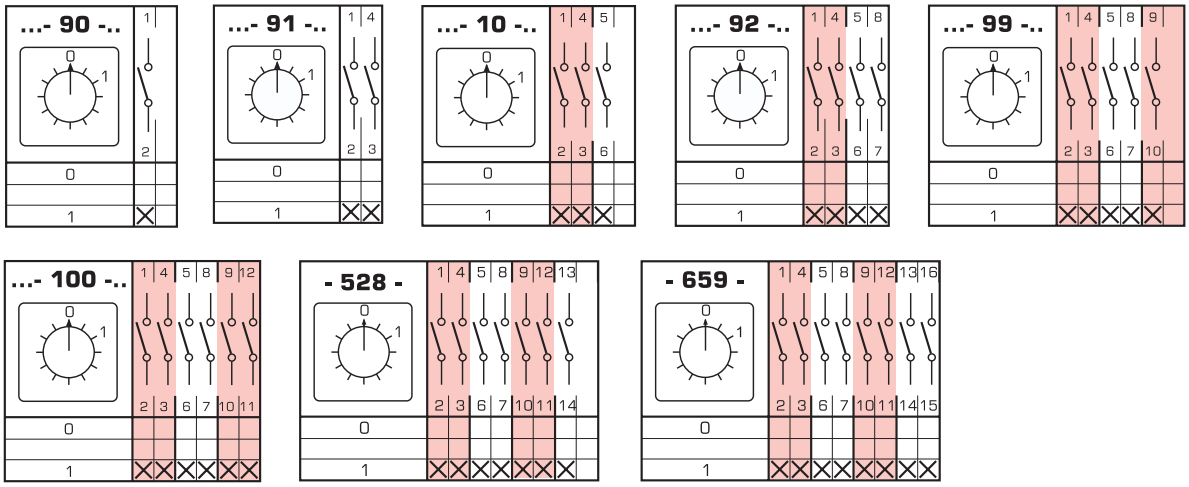
* Special versions S6 i S8 see on pages 186, S25 see on page 191
* See dimensions on pages 181-184

SWITCHING PROGRAMS

Switch disconnector with “0” (0-1) position

Table 138.

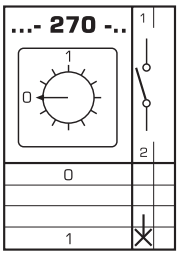
Switching program	Diagram number
1-pole	90
2-pole	91
3-pole	10
multi-pole	92
	99
	100
	528
	659

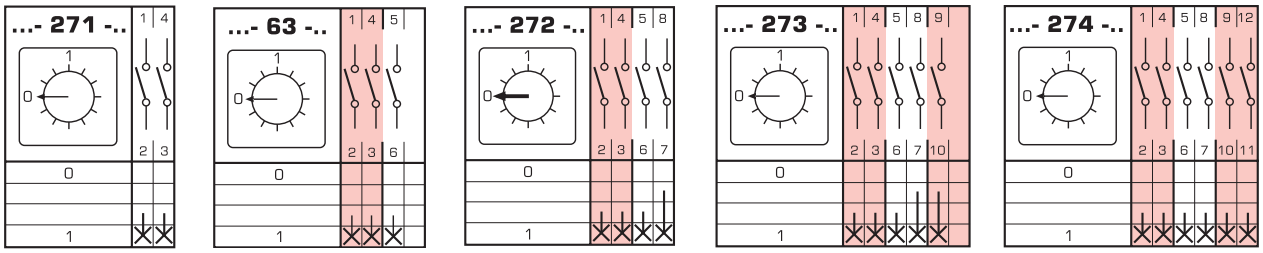


Switch disconnectors with quick-connecting contacts (0-1)

Table 139.

Switching program		Diagram number
with 30° contact lead 30°	1-pole	270
with 30° contact lead 30°	2-pole	271
with 30° contact lead 30°	3-pole	63
with 30° contact lead on three contacts and 60° on one contact	4-pole	272
with 30° contact lead on three contacts and 60° on two contacts	5-bpole	273
with 30° contact lead 30°	6-pole	274





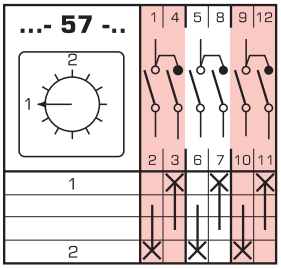
* See dimensions on pages 181-184

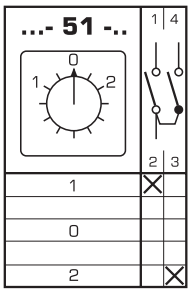
Switches with “0”(1-0-2) position

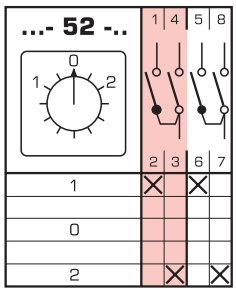
Table 140.

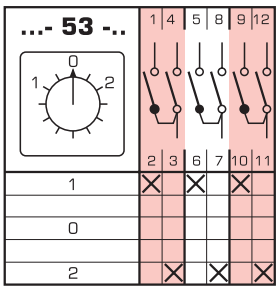
Switching program	Diagram number
1-pole	51
2-pole	52
3-pole	53
multi-pole	75
	76
	77
	78
	79
	80
	81

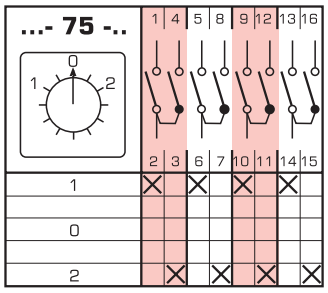
Switches for current transformers (1-2)

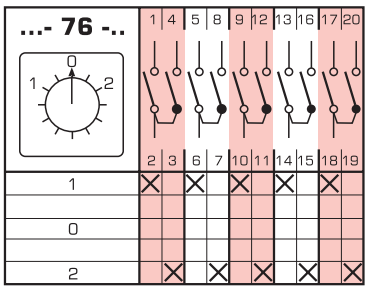


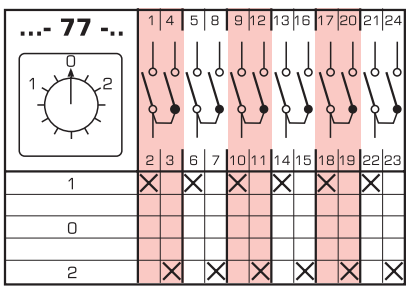


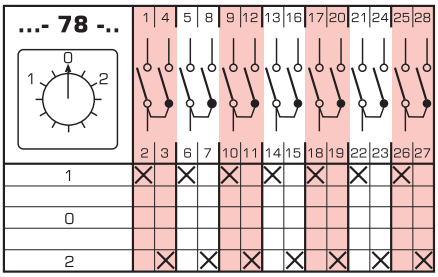


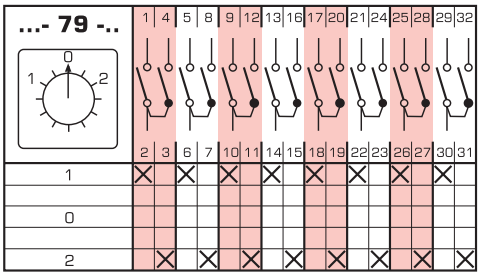


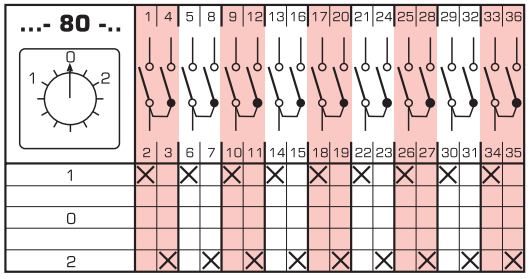


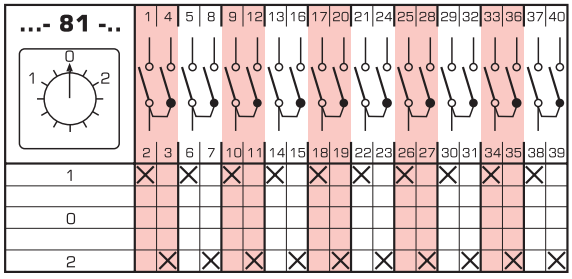
* 

* 

* 

* 

* 

* 

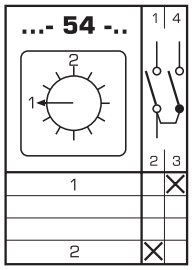
* Only in versions U, OU

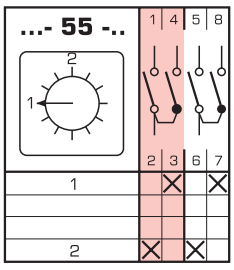
* See dimensions on pages 181-184

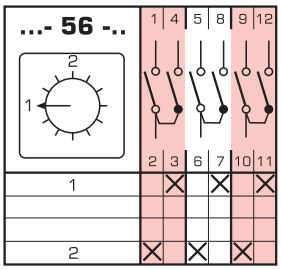
SWITCHES WITHOUT "0"(1-2) POSITION

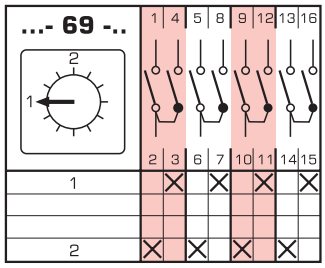
Table 141.

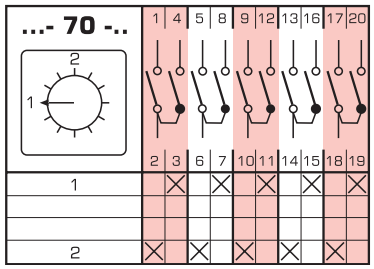
Switching program	Diagram number
1-pole	54
2-pole	55
3-pole	56
multi-pole	69
	70
	71
	72
	73
	74
	62

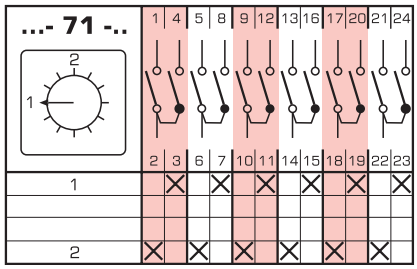


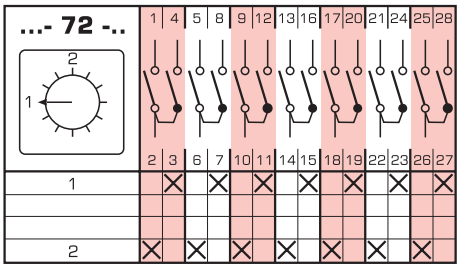


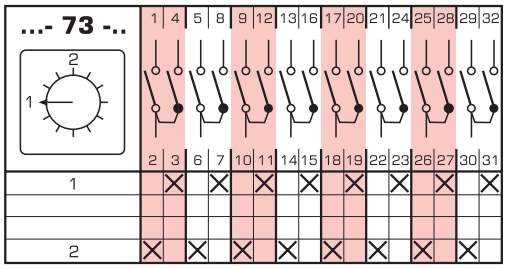


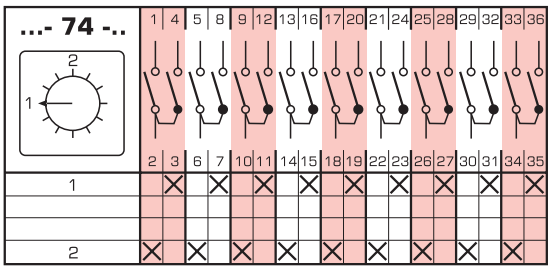


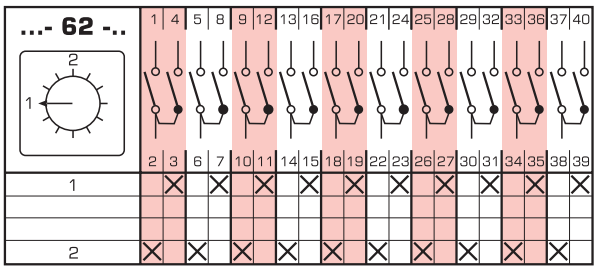
* 

* 

* 

* 

* 

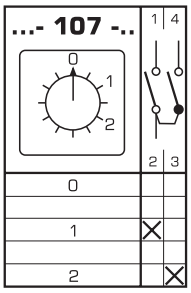
* 

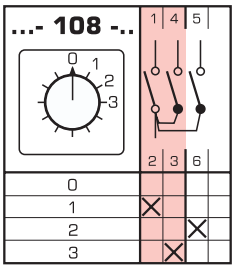
* Only in versions U, OU
* See dimensions on pages 181-184

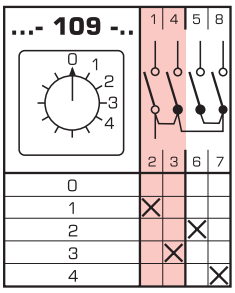
Multiposition switches with “0” (0-1-2...) position

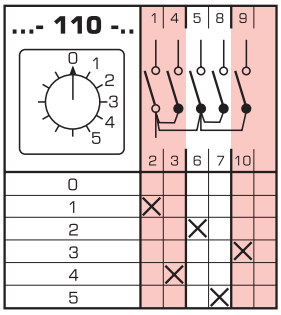
Table 142.

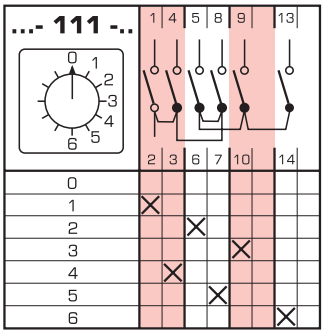
Switching program		Diagram number
1-pole	3-position	107
	4-position	108
	5-position	109
	6-position	110
	7-position	111
	8-position	112
	9-position	113
	10-position	114
	11-position	115
	12-position	116
2-pole	3-position	123
	4-position	124
	5-position	125
	6-position	126
	7-position	127
	8-position	128
	9-position	129
	10-position	130
	11-position	131
	12-position	132
3-pole	3-position	135
	4-position	136
	5-position	137
	6-position	138
	7-position	139
	8-position	140
multi-pole	3-position	145
	4-position	146
	5-position	147
	6-position	148
	3-position	151
	4-position	152
	5-position	153
	3-position	156
	4-position	157
	5-position	158
	3-position	160
	4-position	161
	3-position	163
	4-position	164

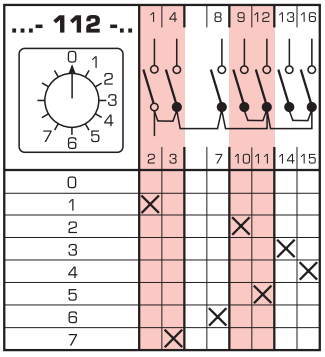


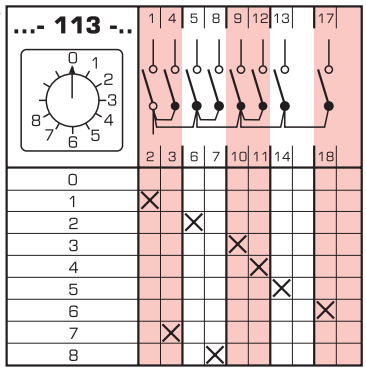


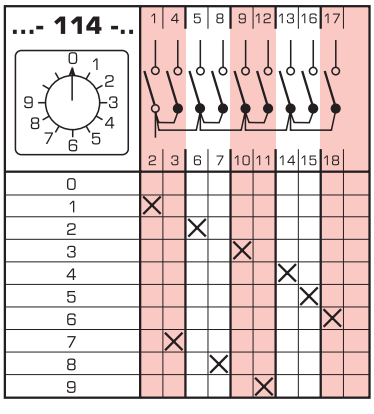


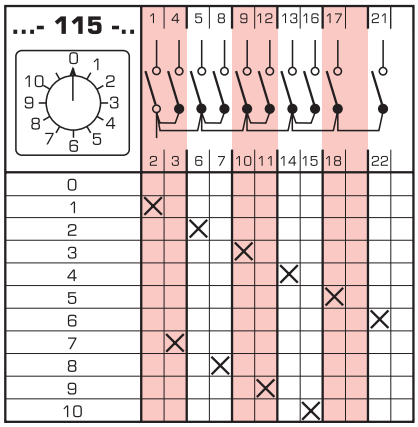


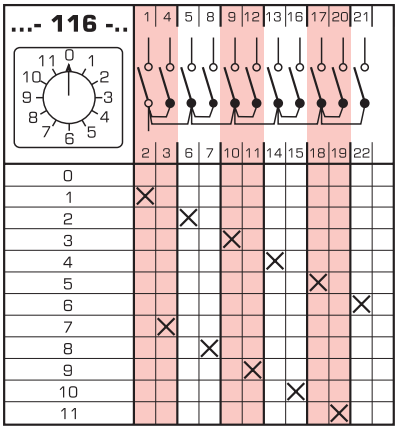




* 

* 

* 

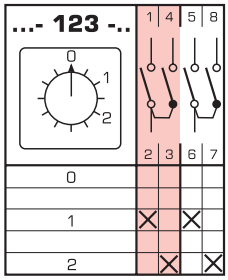
* 

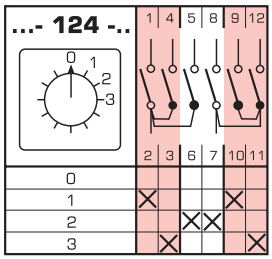
* Only in versions U, OU

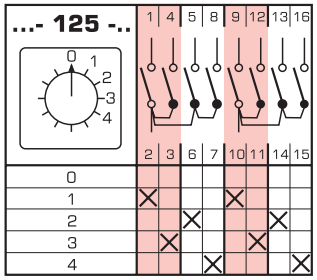
* See dimensions on pages 181-184

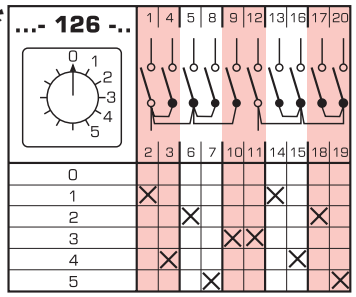
energy distribution

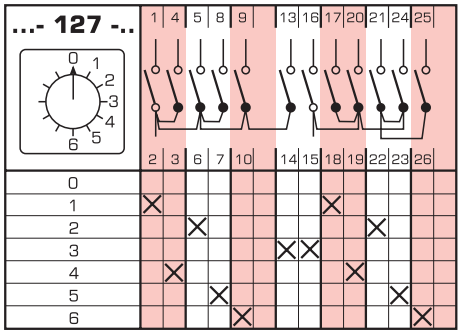
Multiposition switches with “0” (0-1-2...) position

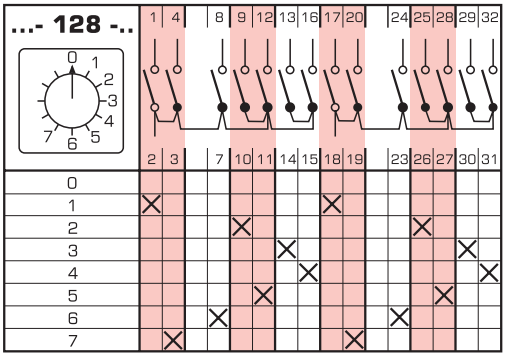


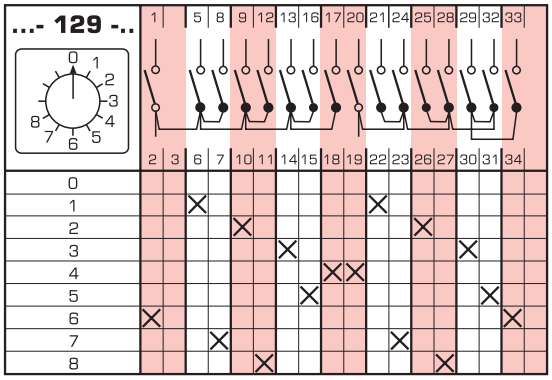


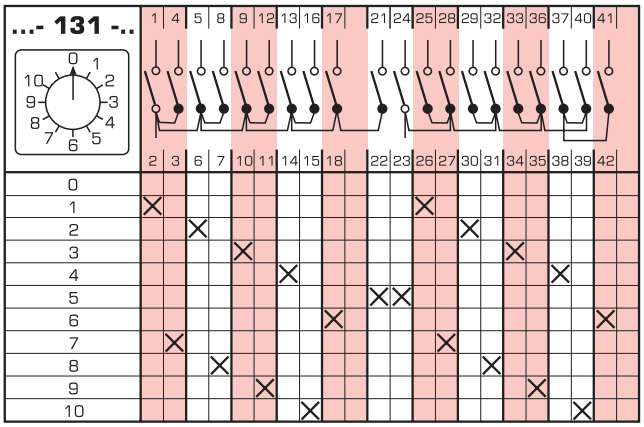


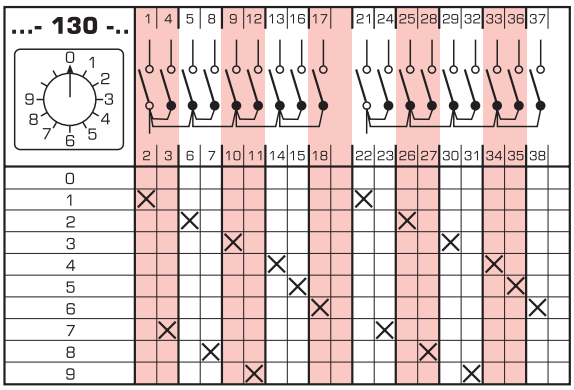
* 

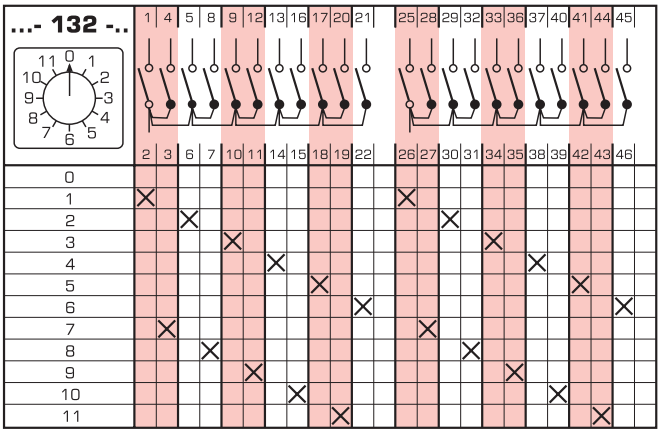
* 

* 

* 

* 

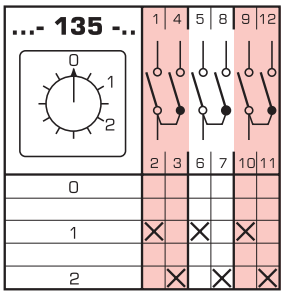
* 

* 

* Only in versions U, OU

* See dimensions on pages 181-184

Multiposition switches with “0” (0-1-2...) position



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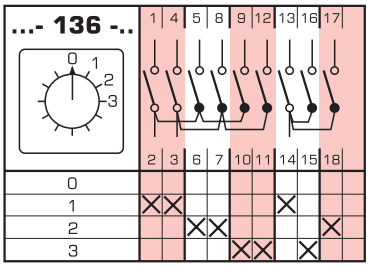

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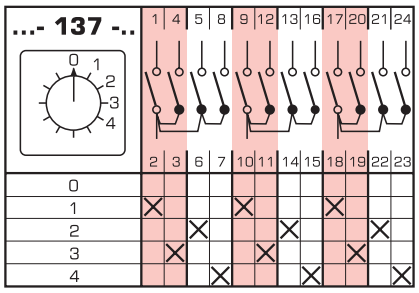

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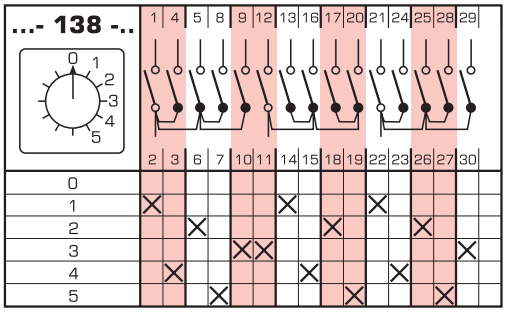

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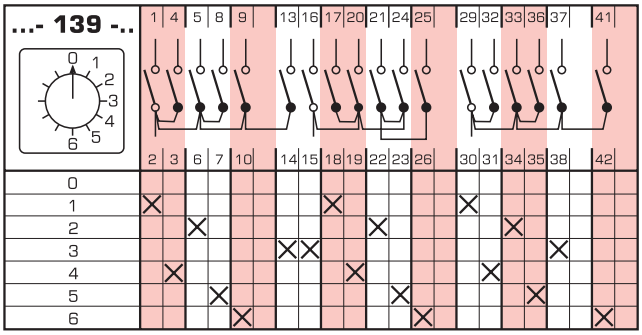

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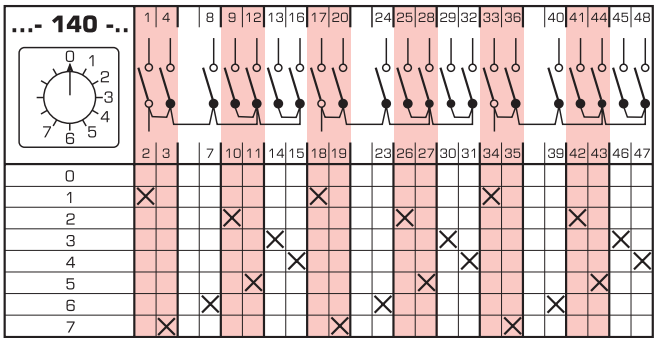

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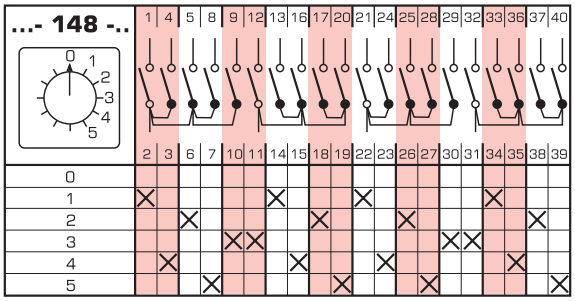

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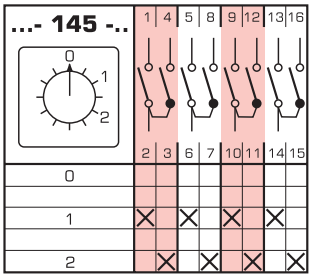

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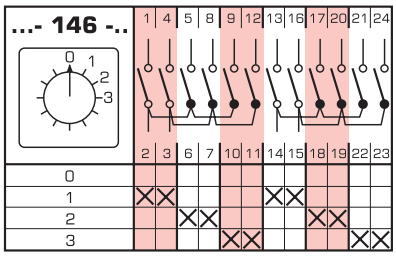

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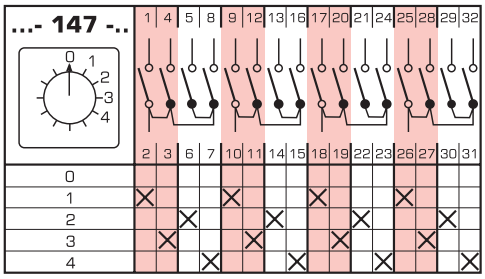

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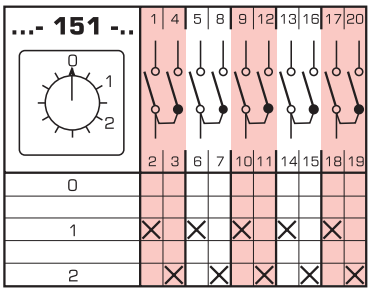

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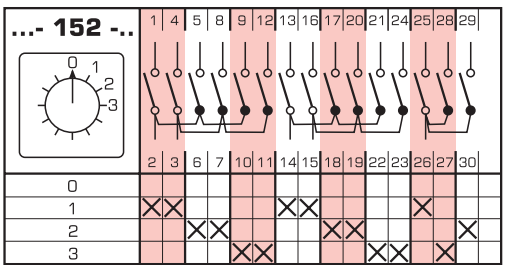
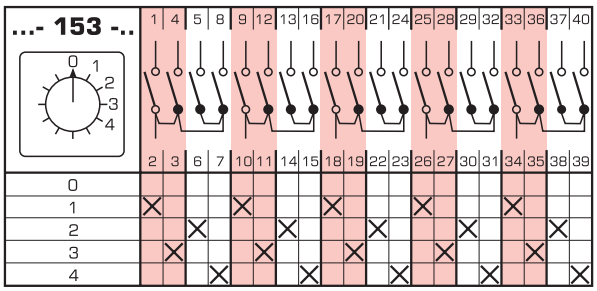


* Only in versions U, OU

* See dimensions on pages 181-184

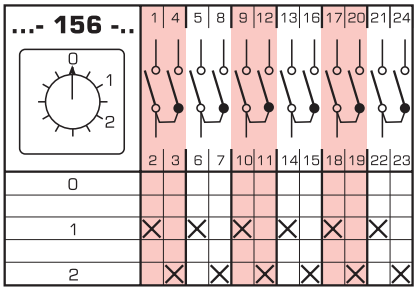
Multiposition switches with “0” (0-1-2...) position

* ...- 153 -..



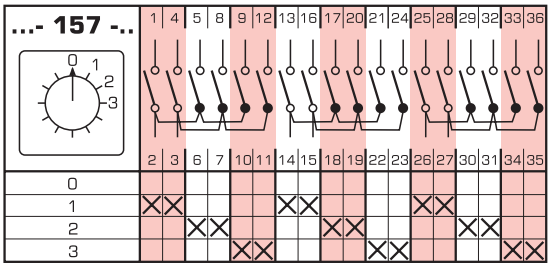
0																			
1	X				X				X				X				X		
2			X				X				X				X				X
3		X				X				X				X				X	
4				X				X				X				X			X

* ...- 156 -..



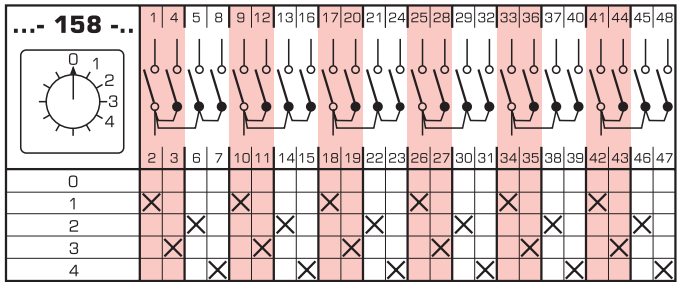
0												
1	X		X		X		X		X		X	
2		X		X		X		X		X		X

* ...- 157 -..



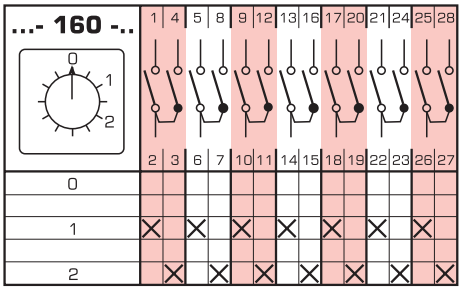
0																	
1	X	X				X	X				X	X					
2			X	X				X	X				X	X			
3					X	X				X	X				X	X	

* ...- 158 -..



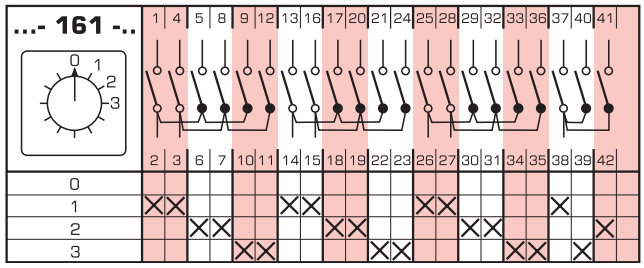
0																								
1	X			X			X				X				X									
2		X			X			X				X				X				X				
3			X			X			X				X				X				X				
4				X			X			X				X				X				X		

* ...- 160 -..



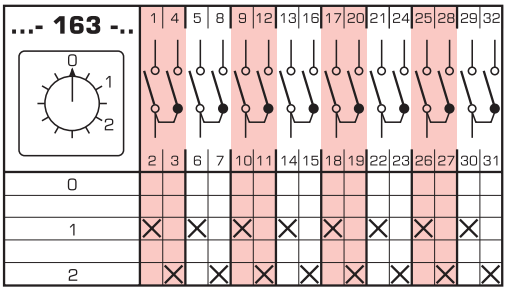
0													
1	X		X		X		X		X		X		
2		X		X		X		X		X		X	

* ...- 161 -..



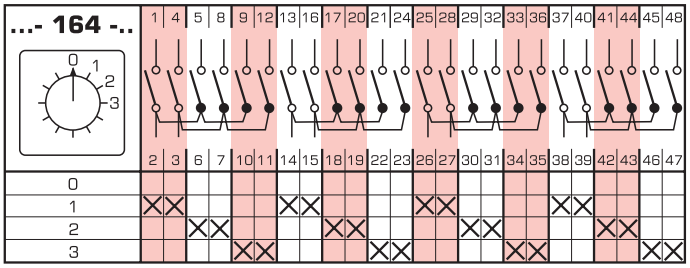
0																								
1	X	X				X	X				X	X												
2			X	X				X	X				X	X										
3					X	X				X	X				X	X								

* ...- 163 -..



0																
1	X		X		X		X		X		X		X			
2		X		X		X		X		X		X		X		

* ...- 164 -..



0																								
1	X	X				X	X				X	X												
2			X	X				X	X				X	X										
3					X	X				X	X				X	X								

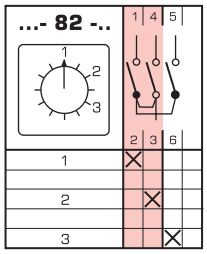
* Only in versions U, OU

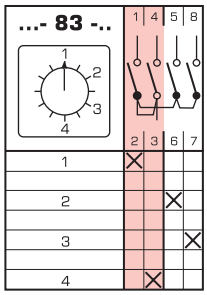
* See dimensions on pages 181-184

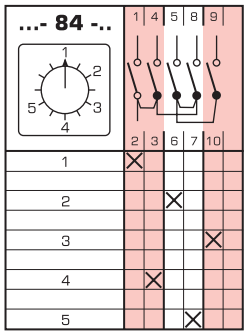
Multiposition switches without “0” position

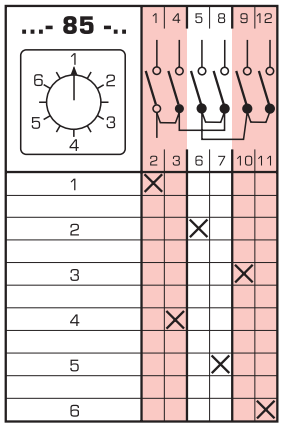
Table 143.

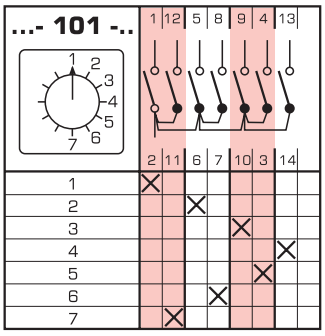
Switching program		Diagram number
1-pole	3-position	82
	4-position	83
	5-position	84
	6-position	85
	7-position	101
	8-position	102
	9-position	103
	10-position	104
	11-position	105
	12-position	106
2-pole	3-position	86
	4-position	87
	5-position	88
	6-position	89
	7-position	117
	8-position	118
	9-position	119
	10-position	120
	11-position	121
	12-position	122
3-pole	3-position	93
	4-position	94
	5-position	95
	6-position	96
	7-position	133
	8-position	134
multi-pole	3-position	141
	4-position	142
	5-position	143
	6-position	144
	3-position	149
	4-position	150
	3-position	154
	4-position	155
	3-position	159
	3-position	162

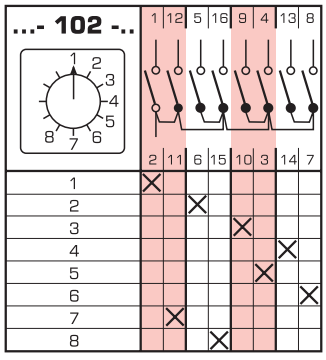


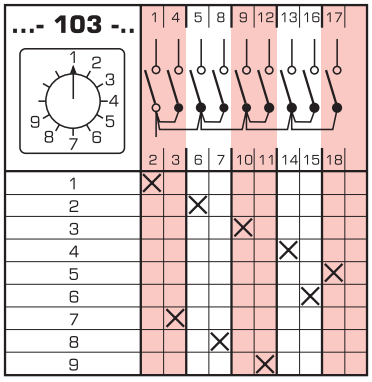


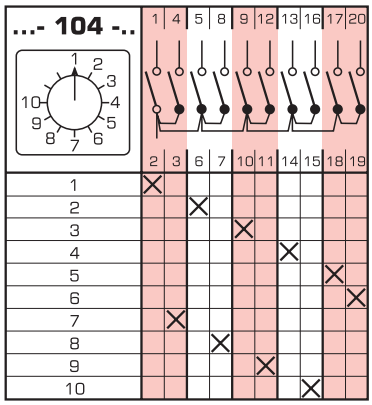


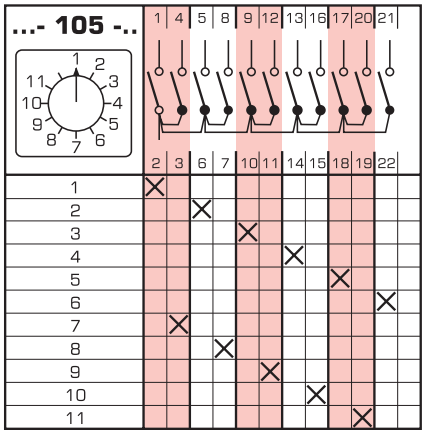


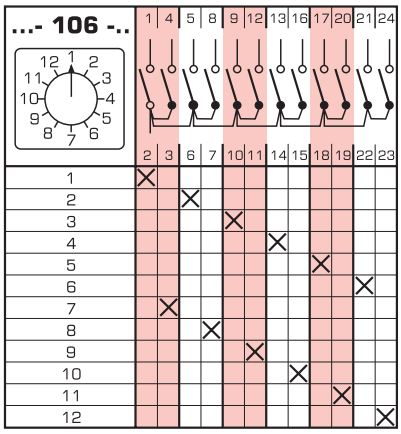




* 

* 

* 

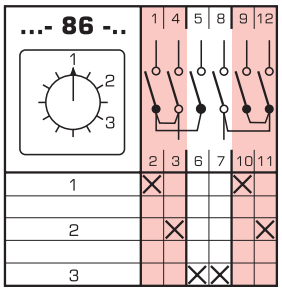
* 

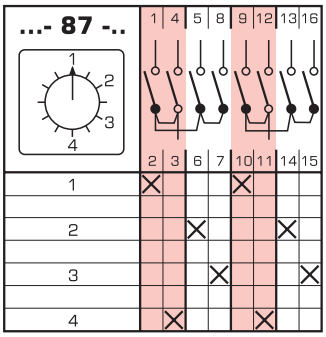
* Only in versions U, OU

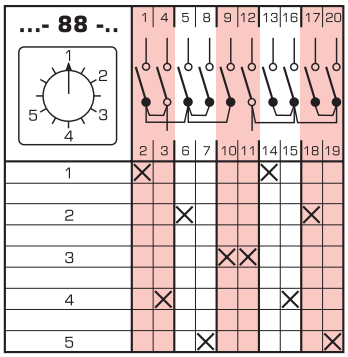
* See dimensions on pages 181-184

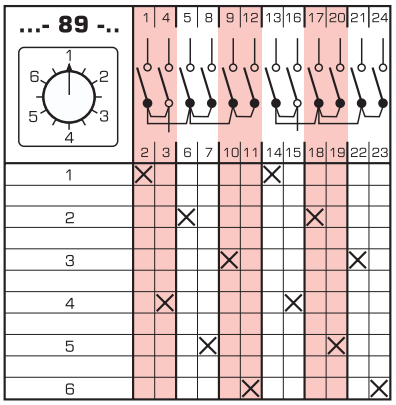
energy distribution

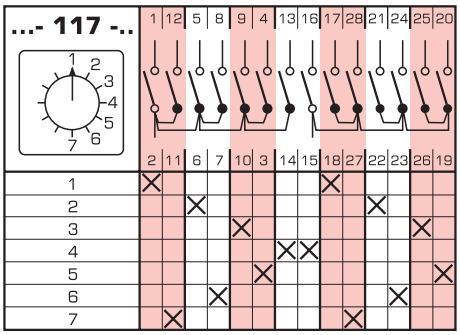
Multiposition switches without "0" position

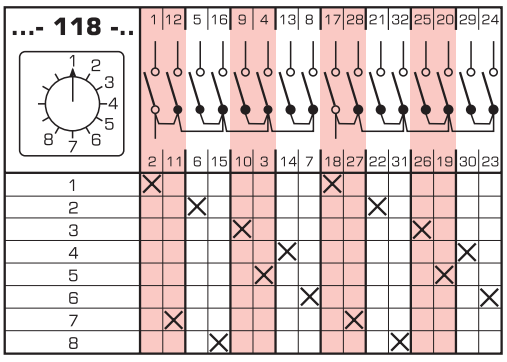


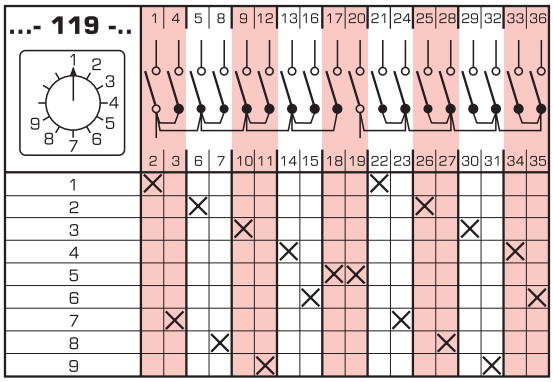


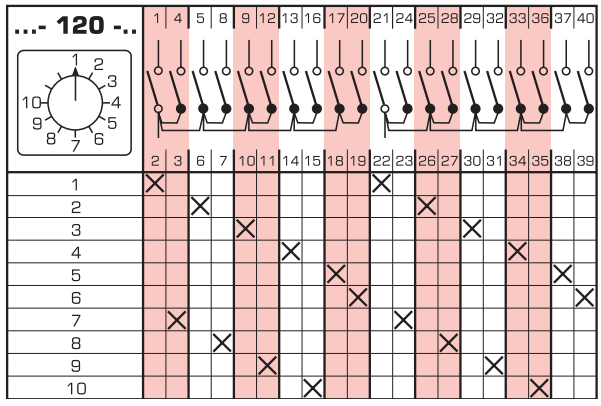
* 

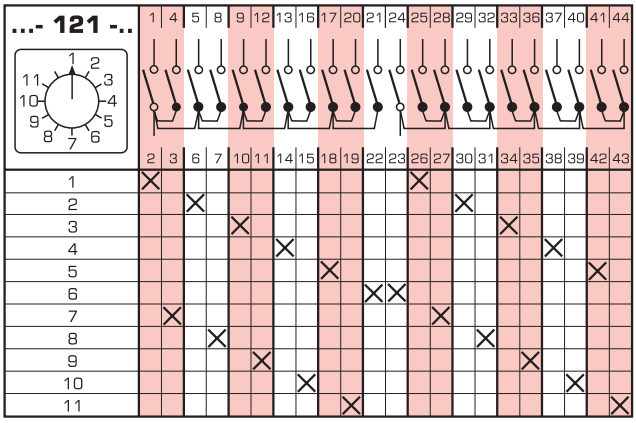
* 

* 

* 

* 

* 

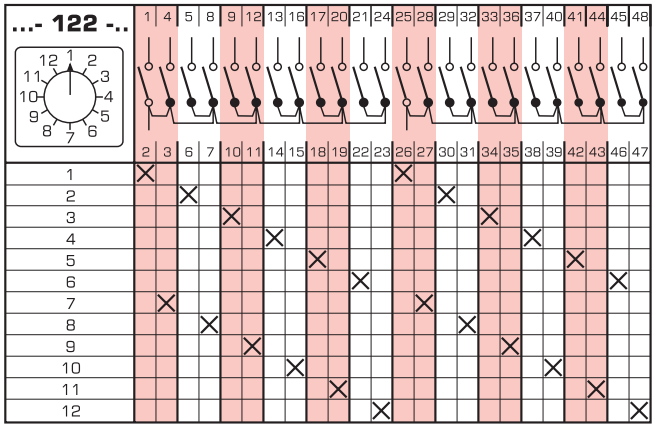
* 

* Only in versions U, OU

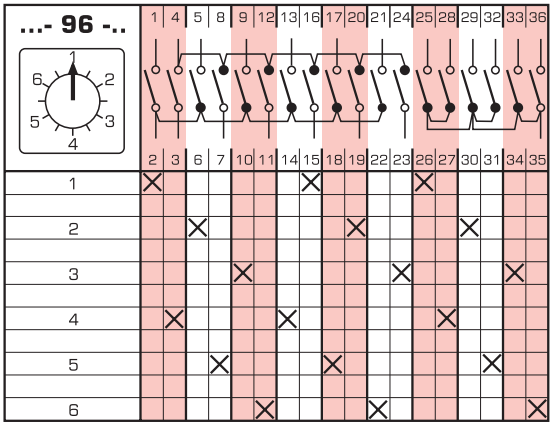
* See dimensions on pages 181-184

Multiposition switches without “0” position

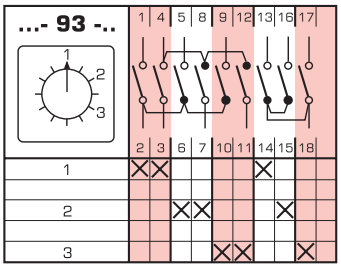
* ...- 122 -..



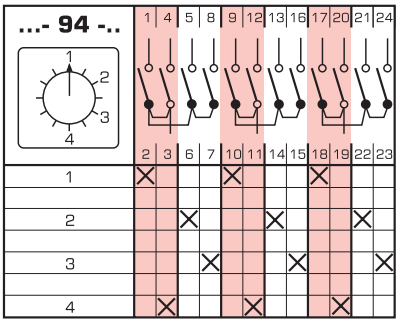
* ...- 96 -..



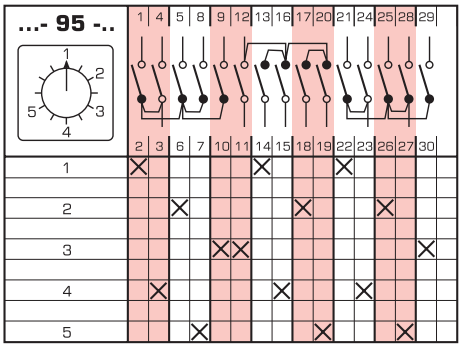
* ...- 93 -..



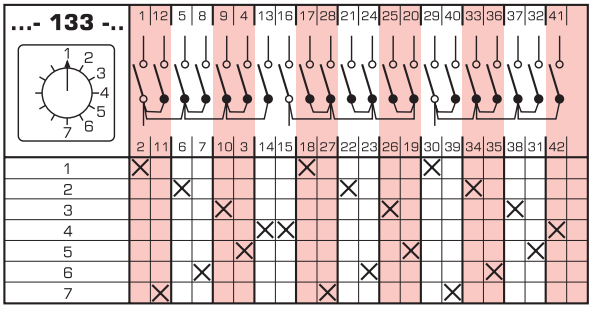
* ...- 94 -..



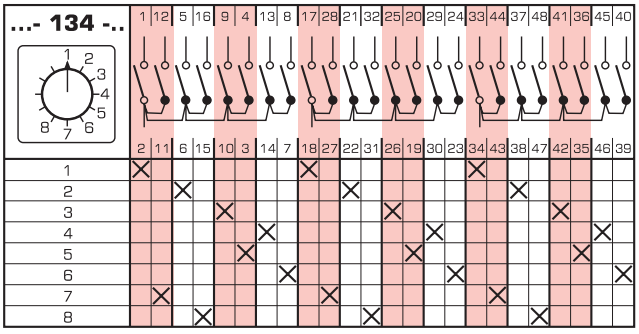
* ...- 95 -..



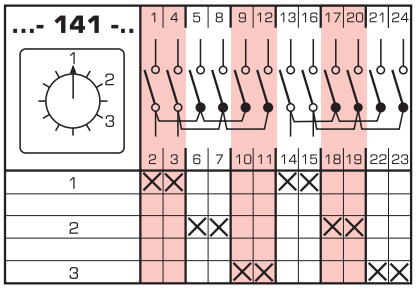
* ...- 133 -..



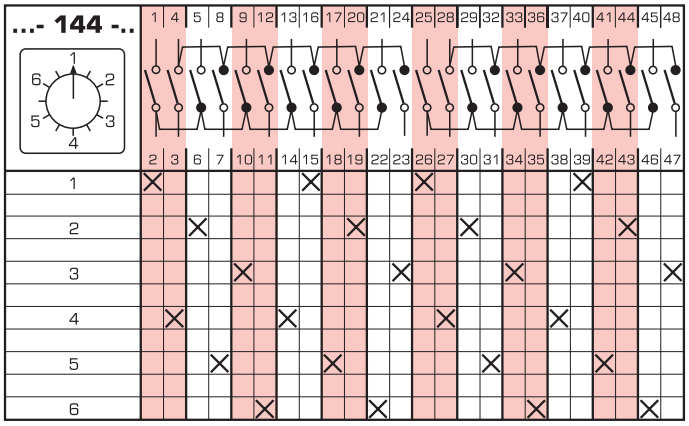
* ...- 134 -..



* ...- 141 -..



* ...- 144 -..



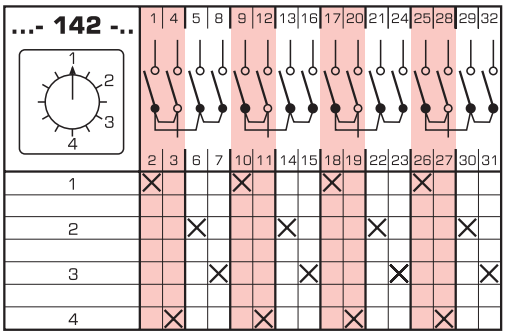
* Only in versions U, OU

* See dimensions on pages 181-184

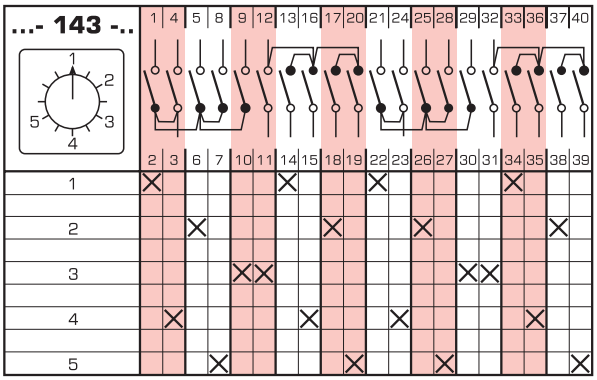
energy distribution

Multiposition switches without “0” position

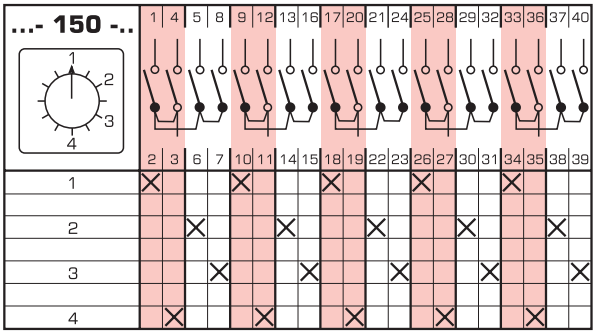
* ...- 142 -..



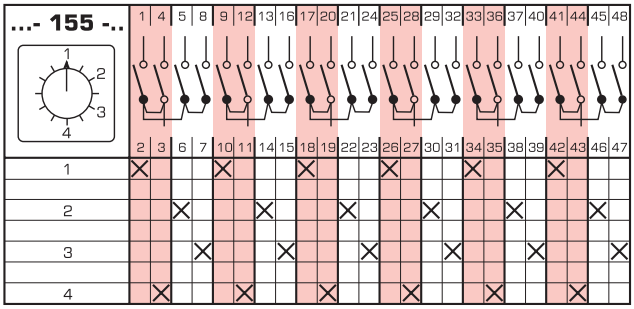
* ...- 143 -..



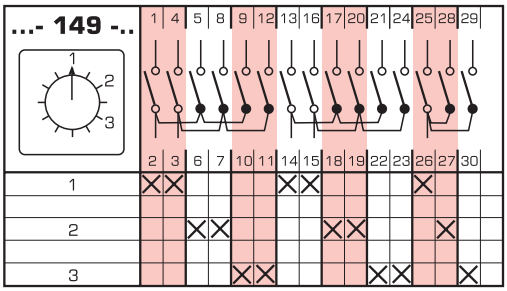
* ...- 150 -..



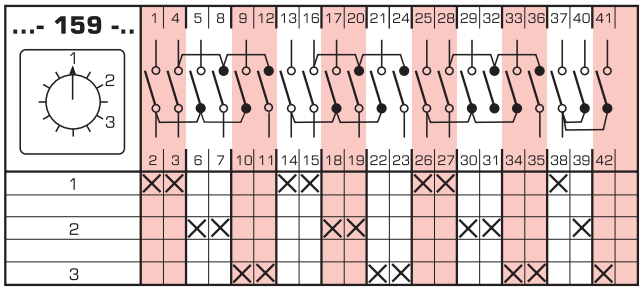
* ...- 155 -..



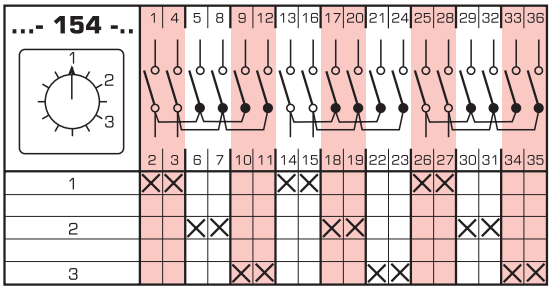
* ...- 149 -..



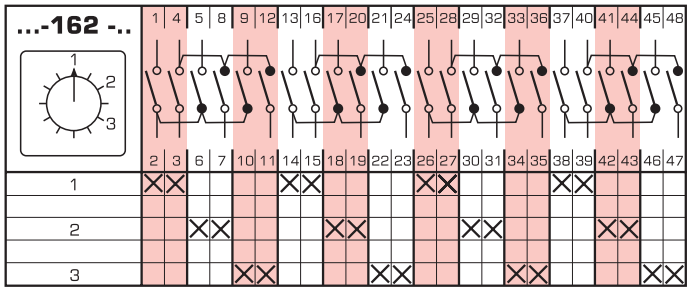
* ...- 159 -..



* ...- 154 -..



* ...-162 -..



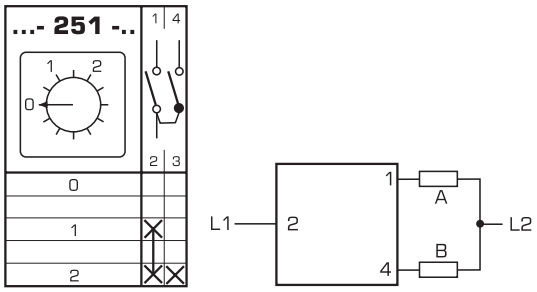
* Only in versions U, OU

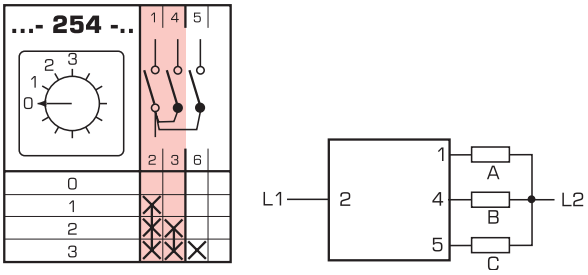
* See dimensions on pages 181-184

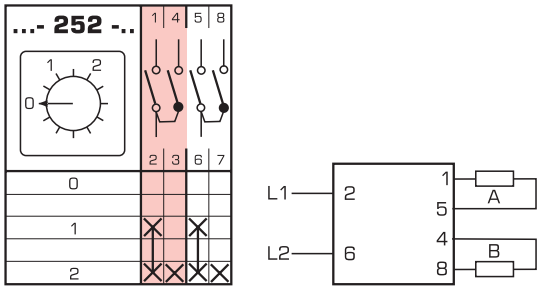
Switchgroups with “0” position

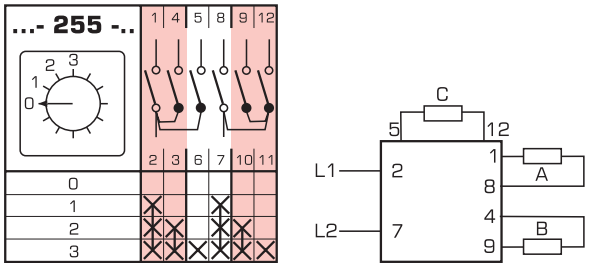
Table 144.

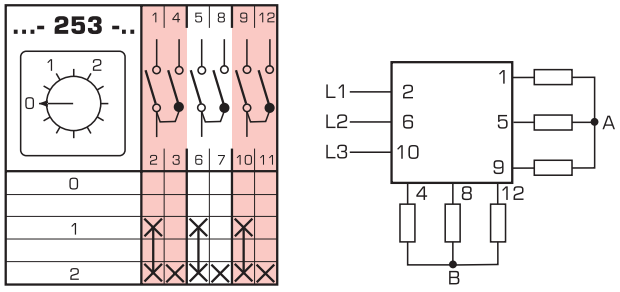
Switching program		Diagram number
1-pole	2-group	251
	3-group	254
2-pole	2-group	252
	3-group	255
3-pole	2-group	253
	3-group	256

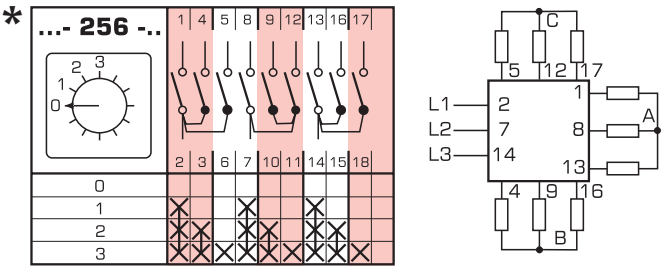








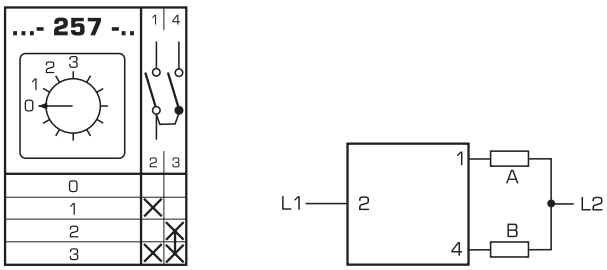


* 

Serial switches

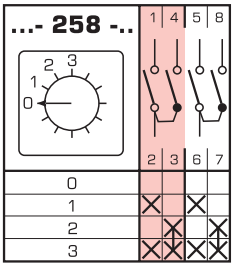
Table 145.

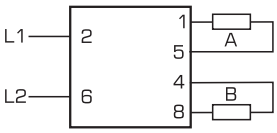
Switching program	Diagram number
1-pole	257
2-pole	258
3-pole	259

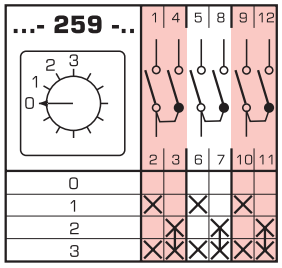


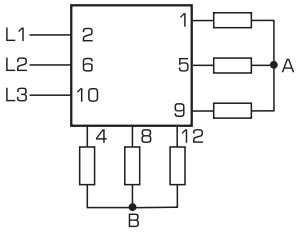
* Only in versions U, OU
* See dimensions on pages 181-184

Serial switches





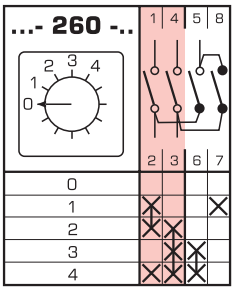


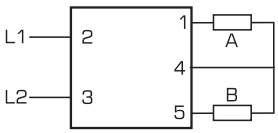


Serial-parallel switches

Table 146.

Switching program	Diagram number
2-pole	260





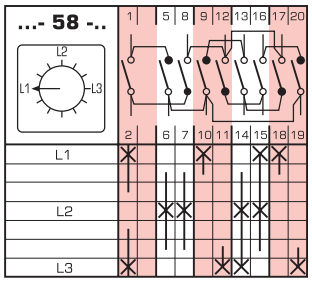
MEASUREMENT SWITCHES FOR VOLTAGE AND CURRENT

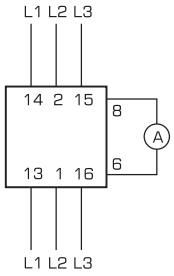
Ammeter switches

Table 147.

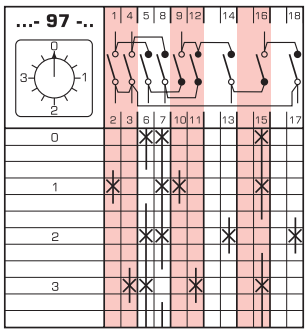
Switching program		Diagram number
phase measurement	L1–L2–L3	58
phase measurement	0–1–2–3	97
phase measurement with grounding	0–1–2–3	98

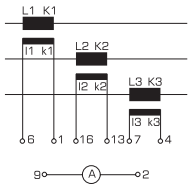
*

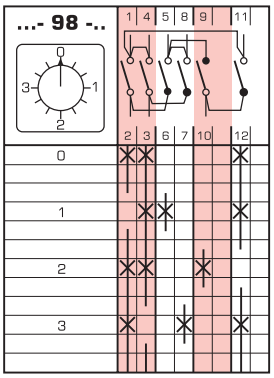


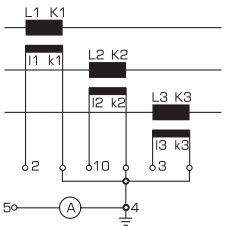


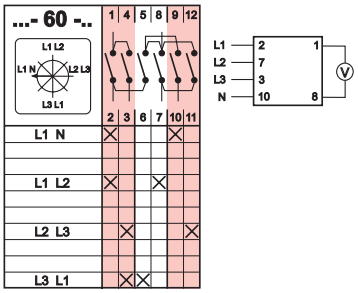
*











* Only in versions U, OU

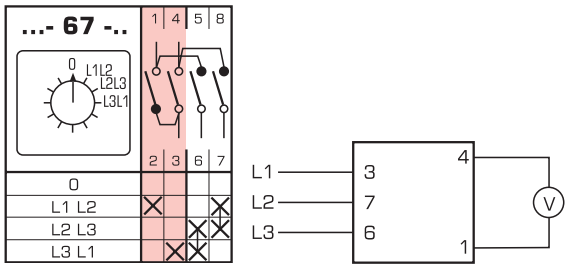
* See dimensions on pages 181-184

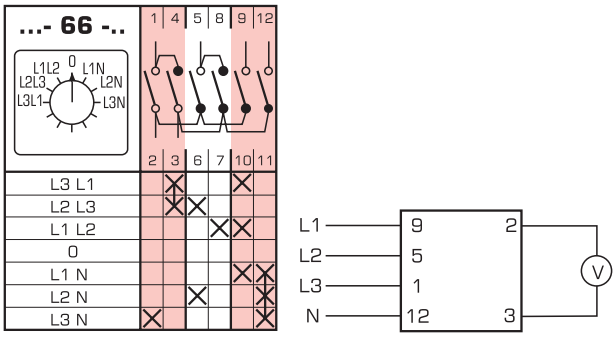
MEASUREMENT SWITCHES FOR VOLTAGE AND CURRENT

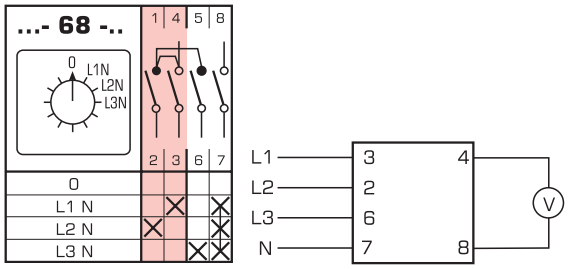
Measurement switches for voltage and current, voltmeter switches without “0” position

Table 148.

Switching program	Diagram number
3 phase voltages	68
3 phase-to-phase voltages	67
3 phase-to-phase voltages+ phase voltage	66





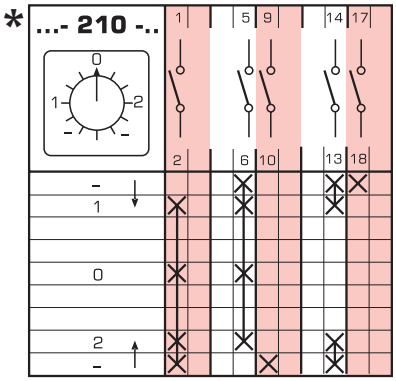


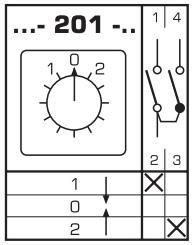
SWITCHES WITH SELF-RELING BACK TO THE OUTPUT POSITION

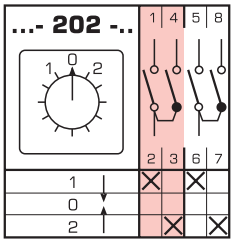
Switch with “0” position (1-0-2), return to “0” from both sides

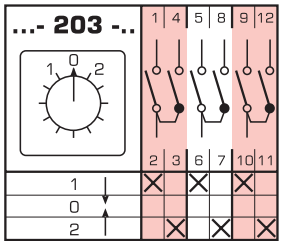
Table 149.

Switching program	Diagram number
switches with automatic return to initial position, switch with function of left - right pushbuttons	210
switch with “0” position (1-0-2) return to “0” from both sides	
1-pole	201
2-pole	202
3-pole	203









* Only in versions U, OU

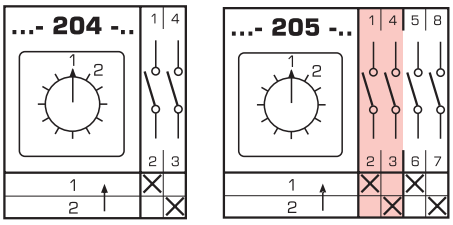
* See dimensions on pages 181-184

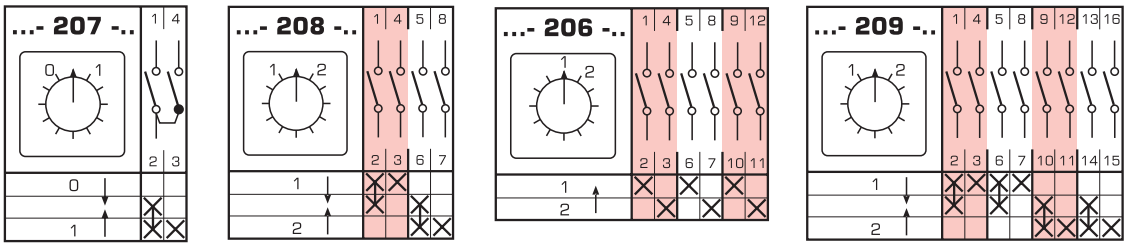
SWITCHES WITH AUTOMATIC RETURN TO INITIAL POSITION

Switches without "0" (0-2) position

Table 150.

Switching program	Diagram number
1 normally closed contact + 1 normally open contact	204
2 normally closed contacts + 2 normally open contacts	205
3 normally closed contacts + 3 normally open contacts	206
to control a contactor – 1 normally open contact (turn right) and 1 normally closed contact (turn left)	207
1 normally open contact and 1 normally closed contact, when turning left and right	208
2 normally open contacts and 2 normally closed contacts, when turning left and right	209



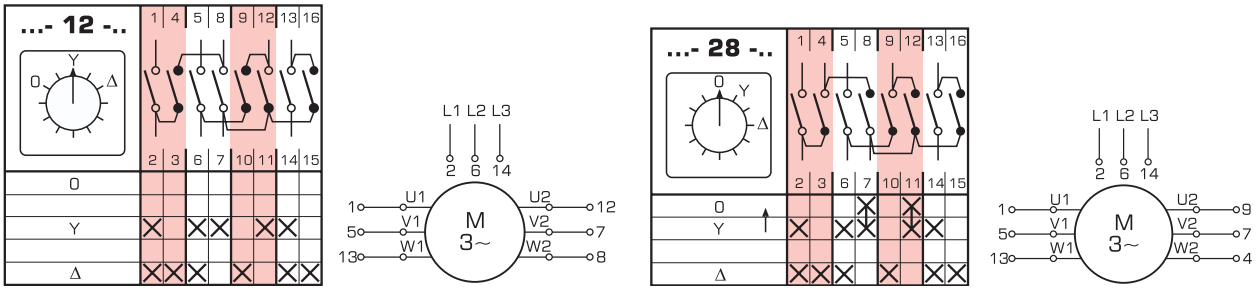


SWITCH DISCONNECTORS FOR MOTOR CONTROLLING

Star-delta switch disconnectors

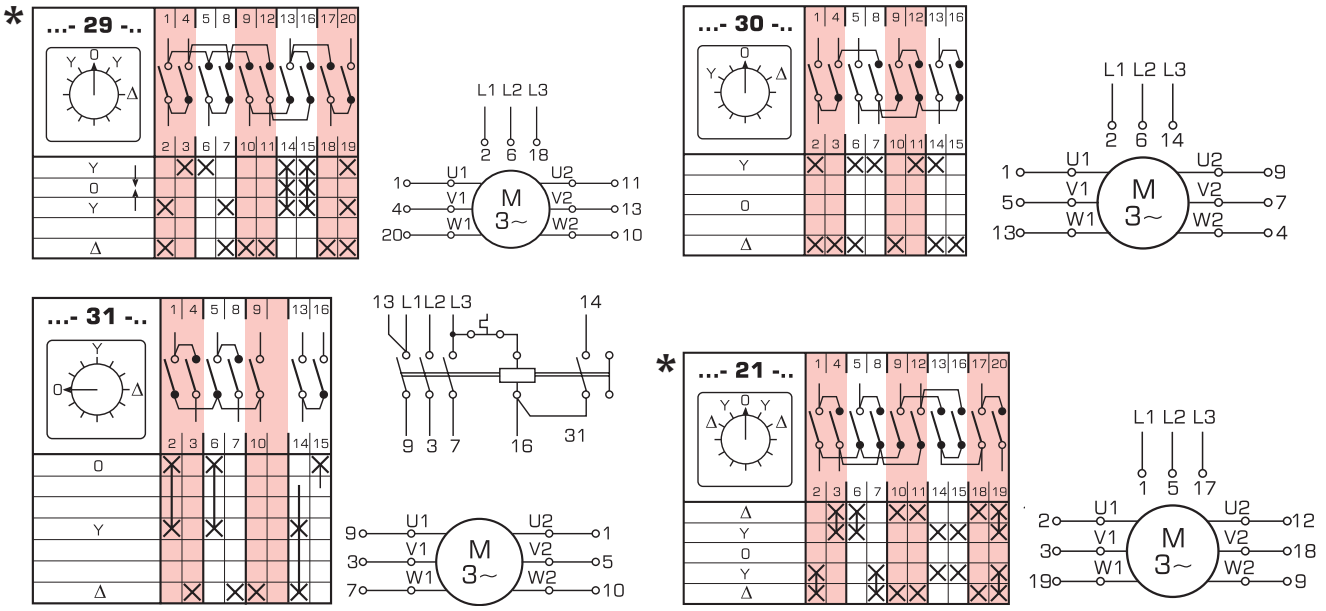
Table 151.

Switching program	Diagram number
basic version	12
Y/Δ back from Y to 0	28
with counter-current braking back from Y to 0	29
as a voltage switch	30
for operaction with contactor	31
bidirectional (left-right)	21



* See dimensions on pages 181-184

Star-delta switch disconnectors

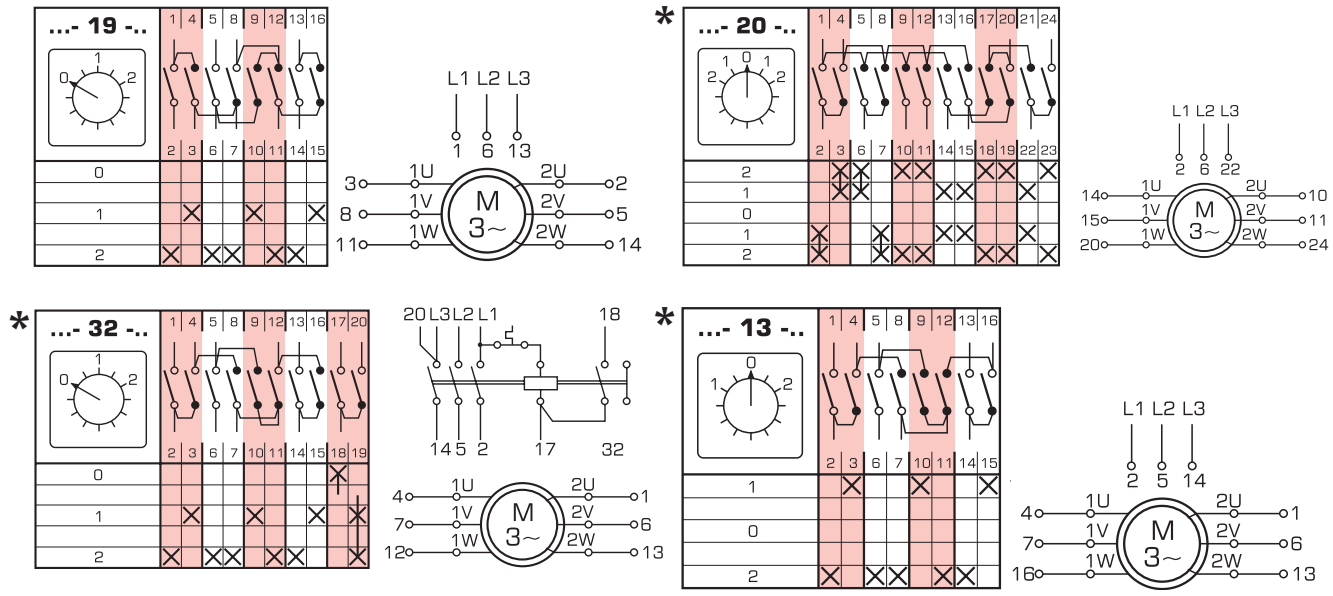


* Only in versions U, OU

Switch disconnectors in a Dahlander's system

Table 152.

Switching program	Diagram number
Switch disconnectors for motor controlling, switch disconnectors in a Dahlander's system dipolar Δ-0-YY	13
Dipolar 0-Δ-YY	19
Dipolar bidirectional YY-Δ-0-Δ-YY	20
Dipolar and contactor controlling	32



* Only in versions U, OU

* See dimensions on pages 181-184

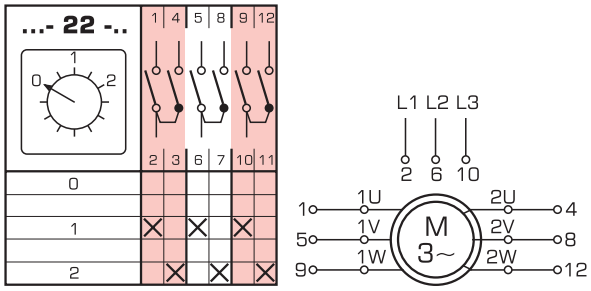
energy distribution

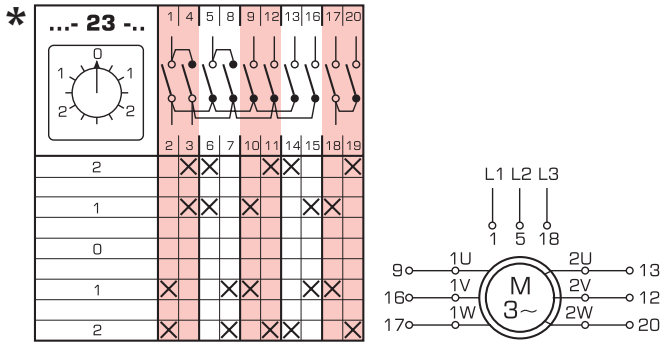
SWITCH DISCONNECTORS FOR MOTOR CONTROLLING

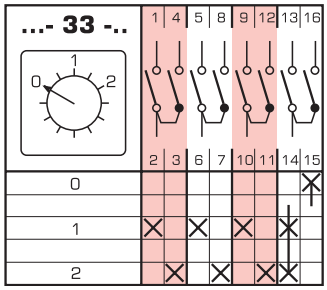
Switch disconnectors for two-winding motors

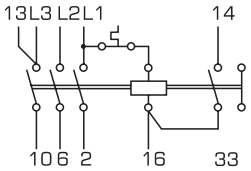
Table 153.

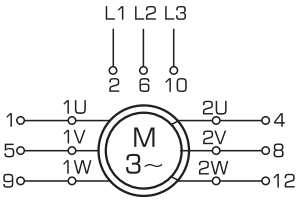
Switching program	Diagram number
0-1-2	22
bidirectional	23
to control the contactors	33









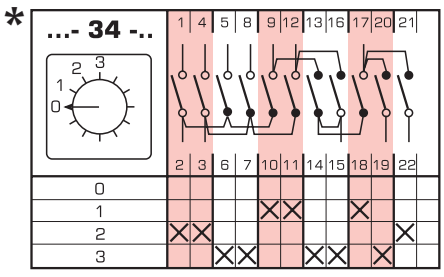


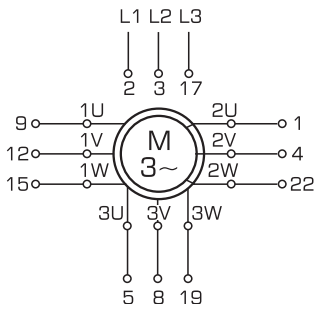
* Only in versions U, OU
* See dimensions on pages 181-184

Switch disconnectors for three-speed motors

Table 154.

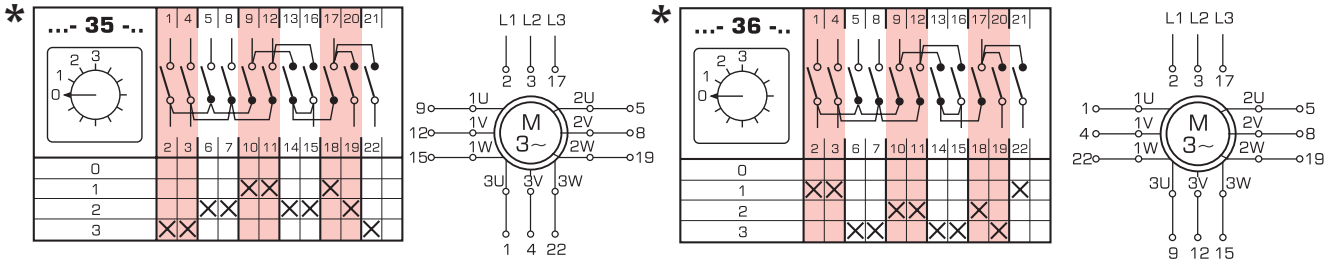
Switching program	Diagram number
2 windings 0-Δ-Y-YY (with 3 speeds in a Dahlander's system)	34
2 windings 0-Δ-YY-Y (1 and 2 speeds in a Dahlander's system)	35
2 windings 0-Y-Δ-YY (2 and 3 speeds in a Dahlander's system)	36





* Only in versions U, OU
* See dimensions on pages 181-184

Switch disconnectors for three-speed motors



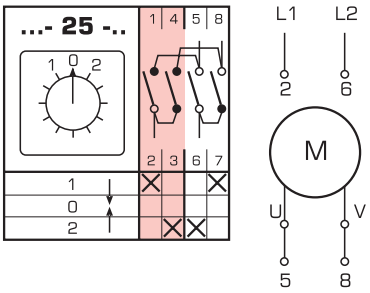
* Only in versions U, OU

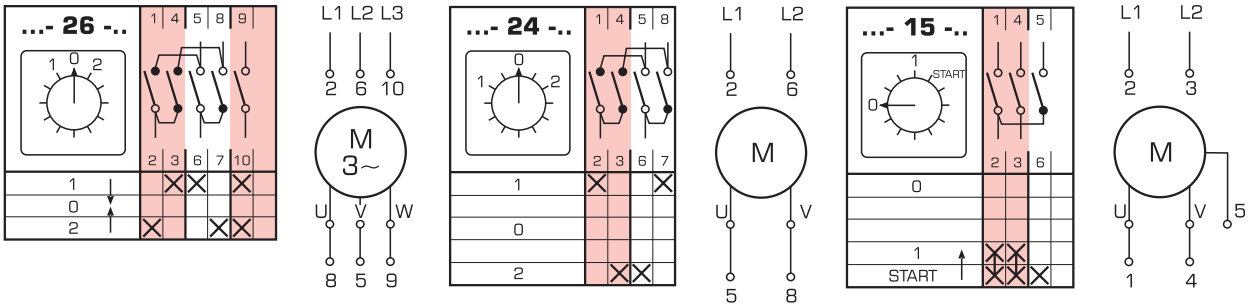
SWITCH DISCONNECTORS FOR MOTOR CONTROLLING

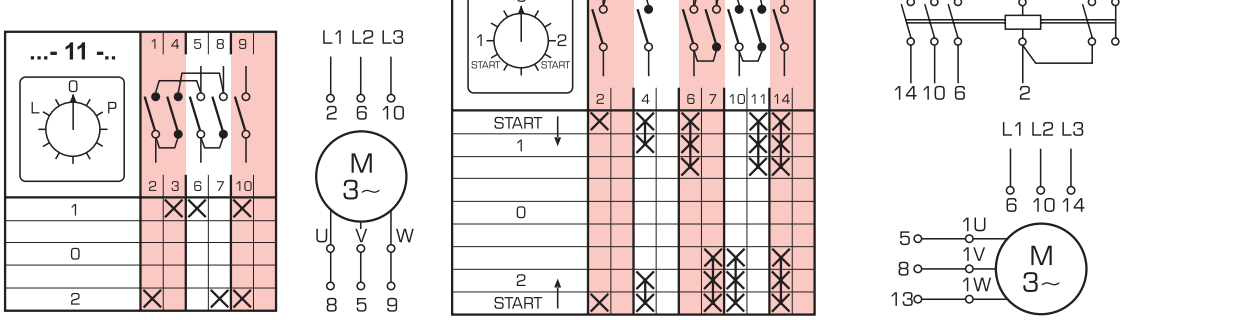
Reversing switches

Table 155.

Switching program	Diagram number
2-pole	24
2-pole, return to "0" position	25
3-pole	11
3-pole, return to "0" position	26
to control a contactor	27
starting switches for 1-phase motors	15







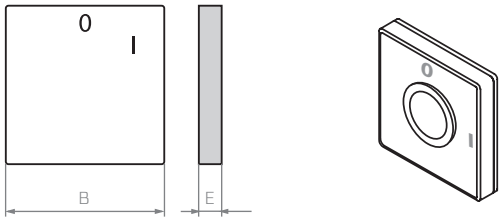
* Only in versions U, OU
* See dimensions on pages 181-184

energy distribution

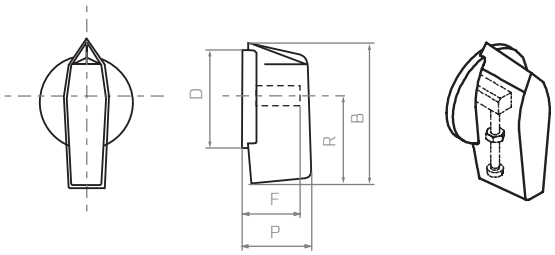
OVERALL DIMENSIONS

Standard version front plate

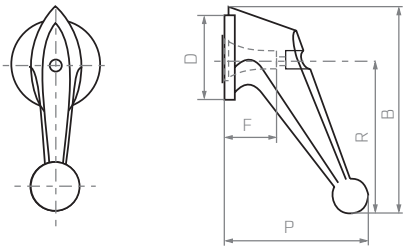
Group	B ø	E
A0	48	7,5
A1	65	9,5
A2	90	9,5
A3	132	10



Group	D ø	P	R	B	F
A0	27,5	19	23,5	39,5	16
A1	35	25	32	53	20
A2	48	32	43,5	70,5	26
A3	75	46,5	63,5	104	39

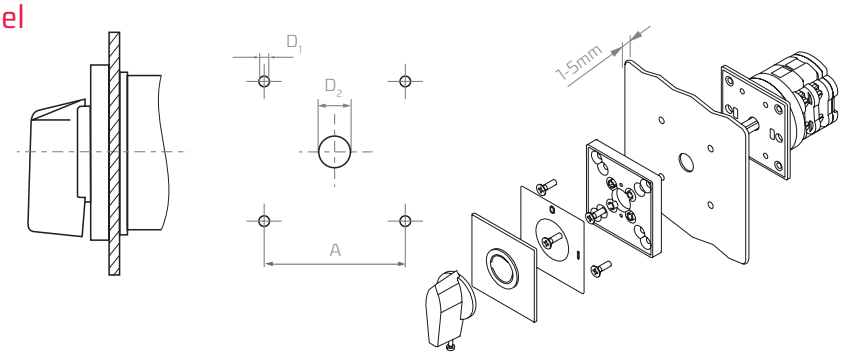


Group	D ø	P	R	B	F
A1	35	51	61,5	81,5	15
A2	48	64	79,5	105,5	19
A3	75	88	115	155,5	28



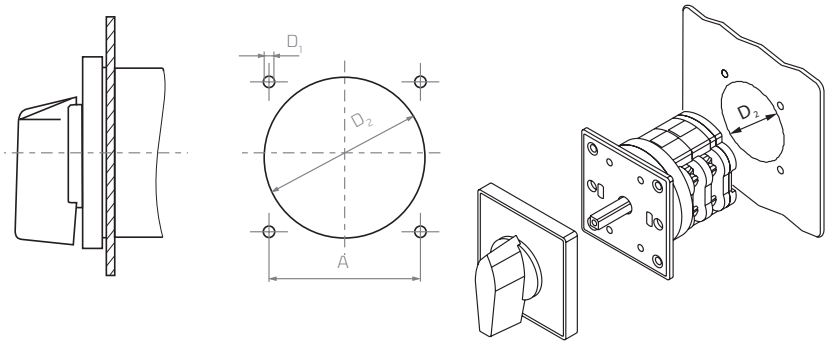
Switches installed under the panel

Group	D1 ø	D2 ø	A ⌀
A0	5	14	36
A1	5	14	48
A2	6	16	72
A3	6	18	104



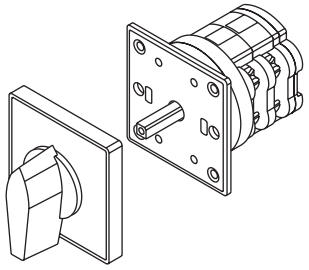
Switches installed on the panel

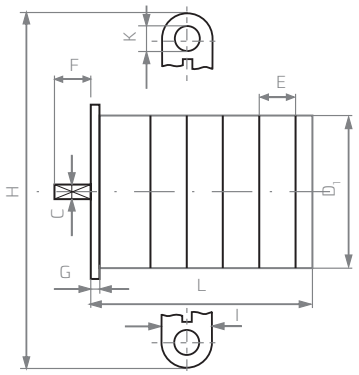
Group	D1 ø	D2 ø	A ⌀
A0	5	42,5	36
A1	5	59	48
A2	6	82	72

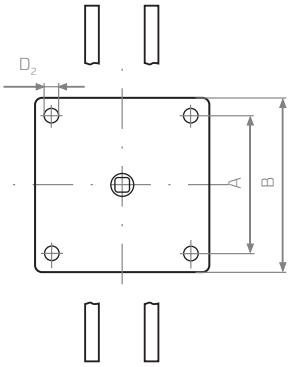


OVERALL DIMENSIONS

U switches to be built-in







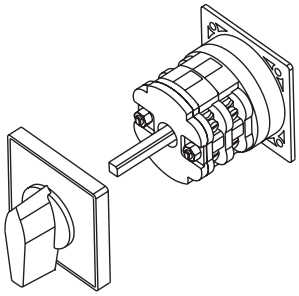
Group	Switch type	D_1	D_2	A	B	C	E	F	G	H	I	K
		ø	ø	ф	ф	ф						
A0	4G 10	38	4,3	36	48	6	9,6	22	4	–	–	–
A1	4G 16	57	4,3	48	65	6	13,5	26	3	–	–	–
	4G 25	57	4,3	48	65	6	13,5	26	3	–	–	–
A2	4G 40	80	5,3	72	90	8	18	31	5	–	–	–
	4G 63, 80	80	5,3	72	90	8	18	31	5	–	–	–
A3	4G 100	120	5,3	104	132	10	29	37,5	6	–	–	–
	4G 200	120	5,3	104	132	10	29	37,5	6	145	20	10,5
	4G 400	120	5,3	104	132	10	29	37,5	6	170	45	13
	4G 630	120	5,3	104	132	10	29	37,5	6	190	74	17,5
	4G 800	120	5,3	104	132	10	29	37,5	6	260	50	17,5
	4G 1200	120	5,3	104	132	10	29	37,5	6	260	80	17,5

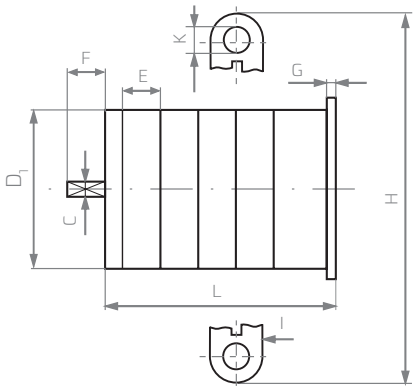
Group	Switch type	L (depending on the number of switching elements)											
		1	2	3	4	5	6	7	8	9	10	11	12
A0	4G 10	33	42,5	52	61,5	71	81	90,5	100	109,5	119	129	138,5
A1	4G 16	46,5	60	73,5	87,5	101	114,5	128,5	143	156	169,5	183	196,5
	4G 25	46,5	60	73,5	87,5	101	114,5	128,5	143	156	169,5	183	196,5
A2	4G 40	56,5	74,5	92,5	110,5	128,5	146,5	164,5	182,5	200,5	218,5	236,5	254,5
	4G 63, 80	56,5	74,5	92,5	110,5	128,5	146,5	164,5	182,5	200,5	218,5	236,5	254,5
A3	4G 100	77	107	136	166	196	226	284	314	343	373	402	432
	4G 200	77	107	136	166	196	226	284	314	343	373	402	432
	4G 400	–	107	–	166	–	226	–	314	–	373	–	432
	4G 630	–	–	136	–	–	226	–	–	343	–	–	432
	4G 800	–	107	–	166	–	226	–	314	–	373	–	432
	4G 1200	–	–	136	–	–	226	–	–	343	–	–	432

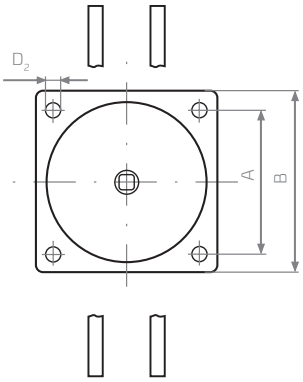
protection degree IP40 (from the front plate side), IP55 in a special version – S1

OVERALL DIMENSIONS

OU switches to be built in a housing







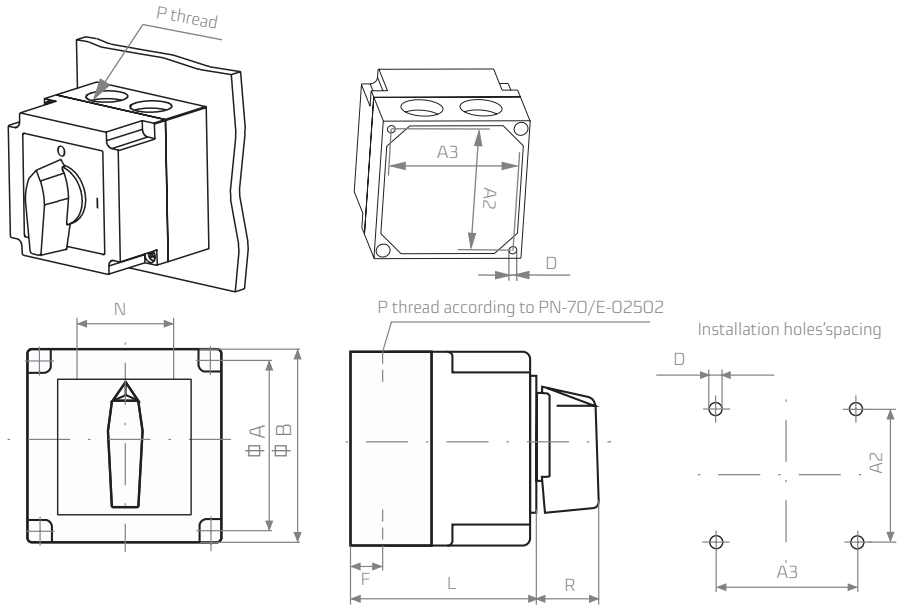
Group	Switch type	D_1	D_2	A	B	C	E	F	G	H	I	K
		ø	ø	⌀	⌀	⌀						
A0	4G 10	38	4,3	36	48	6	9,6	32	4	–	–	–
A1	4G 16	57	4,3	48	65	6	13,5	35	3	–	–	–
	4G 25	57	4,3	48	65	6	13,5	35	3	–	–	–
A2	4G 40	80	5,3	72	90	8	18	40	5	–	–	–
	4G 63, 80	80	5,3	72	90	8	18	40	5	–	–	–
A3	4G 100	120	5,3	104	132	10	29	50	6	–	–	–
	4G 200	120	5,3	104	132	10	29	50	6	145	20	10,5
	4G 400	120	5,3	104	132	10	29	50	6	170	45	13
	4G 630	120	5,3	104	132	10	29	50	6	190	74	17,5
	4G 800	120	5,3	104	132	10	29	50	6	260	50	17,5
	4G 1200	120	5,3	104	132	10	29	50	6	260	80	17,5

Group	Switch type	L (depending on the number of switching elements)											
		1	2	3	4	5	6	7	8	9	10	11	12
A0	4G 10	33	46,5	56	65,5	75	85	94,5	104	113,5	123	133	142,5
A1	4G 16	46,5	60	73,5	87,5	101	114,5	128,5	143	156	169,5	183	196,5
	4G 25	46,5	60	73,5	87,5	101	114,5	128,5	143	156	169,5	183	196,5
A2	4G 40	56,5	74,5	92,5	110,5	128,5	146,5	164,5	182,5	200,5	218,5	236,5	254,5
	4G 63, 80	56,5	74,5	92,5	110,5	128,5	146,5	164,5	182,5	200,5	218,5	236,5	254,5
A3	4G 100	77	107	136	166	196	226	284	314	343	373	402	432
	4G 200	77	107	136	166	196	226	284	314	343	373	402	432
	4G 400	–	107	–	166	–	226	–	314	–	373	–	432
	4G 630	–	–	136	–	–	226	–	–	343	–	–	432
	4G 800	–	107	–	166	–	226	–	314	–	373	–	432
	4G 1200	–	–	136	–	–	226	–	–	343	–	–	432

protection degree IP40 (from the front plate side), IP55 in a special version – S1

INSTALLATION DIMENSIONS

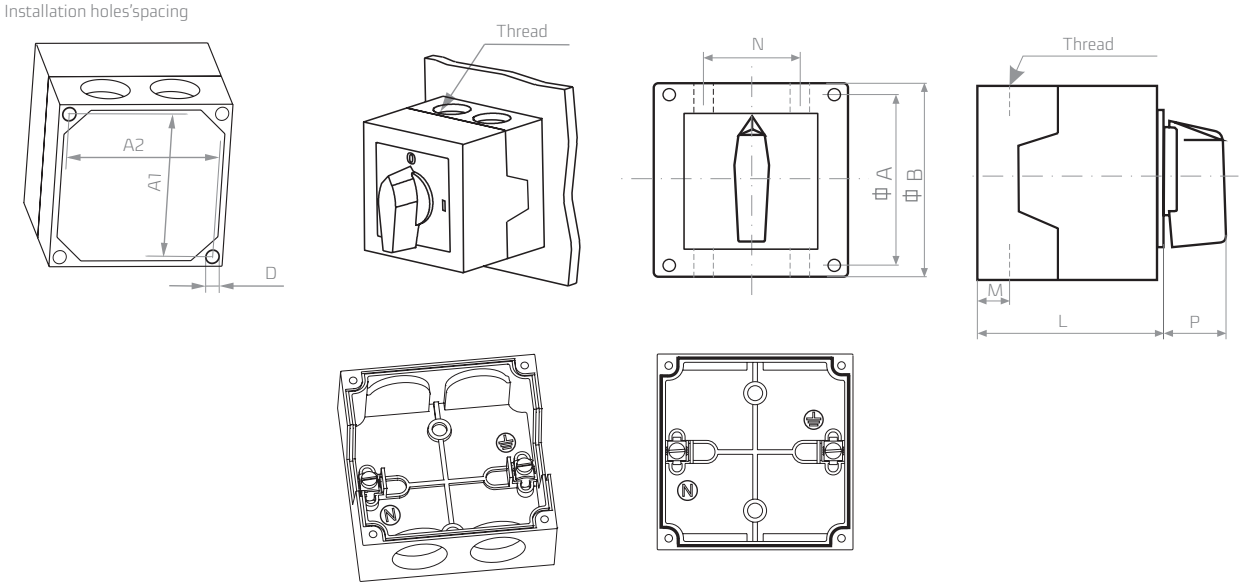
PK switches in a plastic housing - protection degree IP 55



Group	Switch type	D	A	A2	A3	B	F	N	R	Thread		L (depending on the number of the switching elements)			
										P	M				
		ø	ϕ			ϕ						1	2	3	4
A0	4G 10	4,3	55	38	54	64	13	25	19	11	-	55,5	55,5	75	75
A1	4G 16	4,3	75	75	75	85	19	34	25	16	20	77	77	104	104
	4G 25	4,3	75	75	75	85	19	34	25	16*	20	77	77	104	104
A2	4G 40	5,3	109	91	107	120	29	45	32	21*	-	95	95	132	132
	4G 63, 4G 80	5,3	109	91	107	120	29	45	32	21	-	95	95	132	132

* to order

PK cam switches in thermoplastic enclosures with IP 65 degree of protection



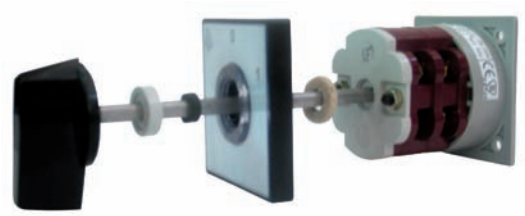
Group	Switch type	D	A	B	A1	A2	M	N	P	Thread	L (depending on the number of the switching elements)	
		ø	ϕ	ϕ							1 or 2	3 or 4
A0	4G 10	4,5	64	75	50	64	14	28	19	M20	60	81,5

energy distribution

SPECIAL VERSIONS

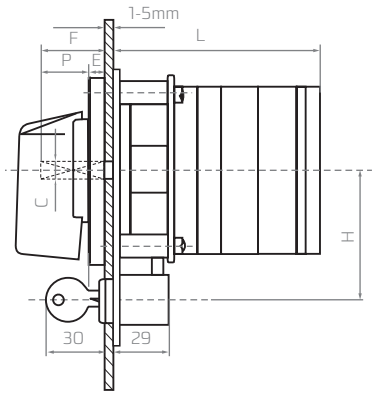
S1 switch with a sealed shaft /protection class IP 55/

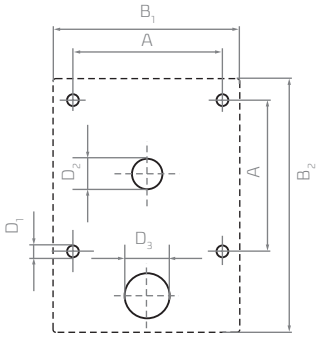
Group A0, A1, A2 version U, OU
The difference between standard and special versions is the use of a sealing ring on the driving shaft, which guarantees achieving an IP 55 housing tightness.



S5 switch with a cylindrical lock

Group A1, A2 version U
Blocking when ordered.



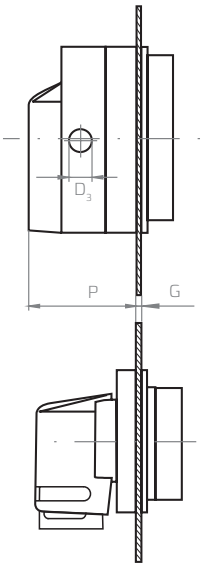


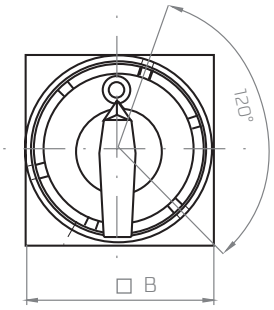
Group	D_1	D_2	D_3	A	B_1	B_2	C	E	F	H	P
							ϕ				
A1	5	14	21,5	48	65	98	6	9,5	26	48	25
A2	6	16	21,5	72	90	122	8	9,5	31	60	32

Group	L (depending on the number of the switching elements)											
	1	2	3	4	5	6	7	8	9	10	11	12
A1	72,5	86	99,5	113,5	127	140,5	154,5	169	182	195,5	209	222,5
A2	82,5	100,5	118,5	136,5	154,5	172,5	190,5	208,5	226,5	244,5	262,5	280,5

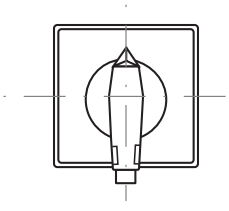
S6 Switch with padlock blocking

Group A0, A1, A2 version U, OU, PK
Blocking only in 0 position





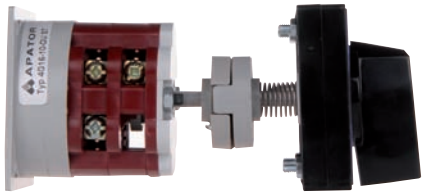
Locking in every
60° degrees position
for group A1, A2

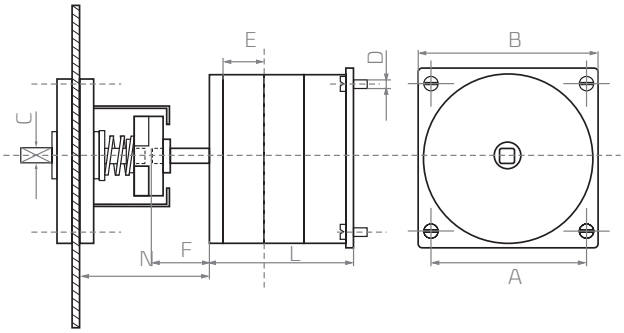


Group	P	D_3	G
A0	35	-	2÷5 mm
A1	35	Ø=7	1÷5 mm
A2	44	Ø=8	1÷5 mm

S7 Switch with a door coupling

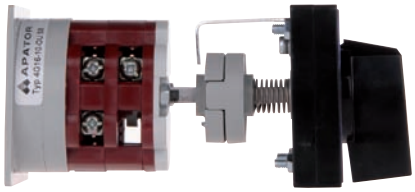
Group A1, A2 version OU
The switch for installation on the back wall of the housing /cubicle/. The knob with a front plate is placed on the cover or on the door.
The shaft may be lengthened and sealed.





S8 Switch with a door coupling and a door blocking

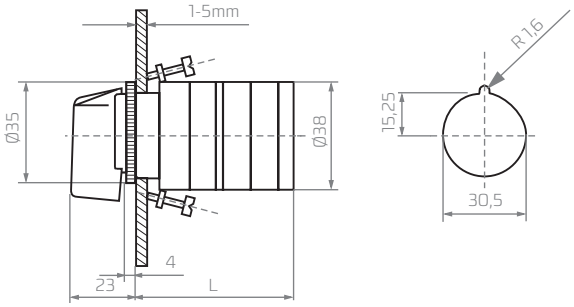
Group A1, A2 version OU
The features are like for S7, but the door can be opened in a 0 position, for example.



Group	D	A	B	C	E	F	N	L (depending on the number of the switching elements)											
		ф	ф	ф				1	2	3	4	5	6	7	8	9	10	11	12
A1	4	48	65	6	13,5	16,5	54	46,5	60	73,5	87,5	101	114,5	128,5	143	156	169,5	183	196,5
A2	5	72	90	8	18	17	60	56,5	74,5	95,5	110,5	128,5	146,5	164,5	182,5	200,5	218,5	236,5	254,5

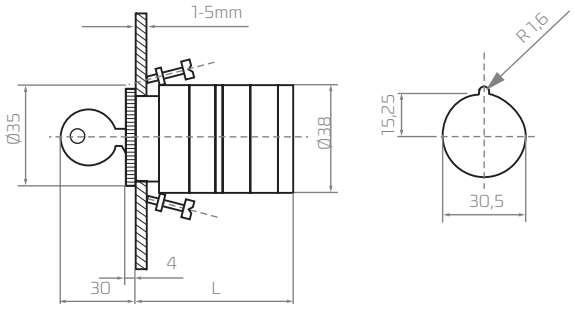
S9 Switch for installation in ø30,5 (in control boards witch standard holes)

Group A0 version U



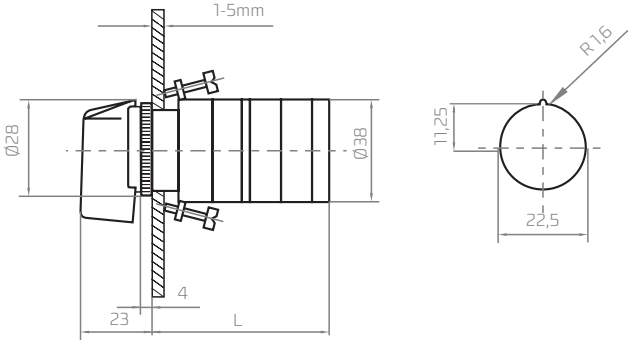
S10 Switch for installation in a ø30,5 hole

Group A0 version U
(Like for S9), the key operates as a knob. Closing in positions 3, 6, 9, 12 /like on a clock/. The key can be removed in the same positions.



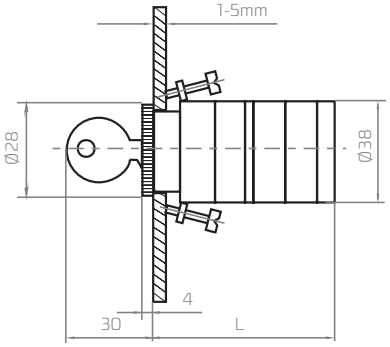
S11 Switch for installation in a ø22,5 hole (control boards)

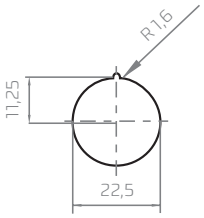
Group A0 version U



S12 switch for installation in a ø22,5 hole (like for s11)

Group A0 version U
The key operates as a knob. Closing and removing the key in positions like for S10.

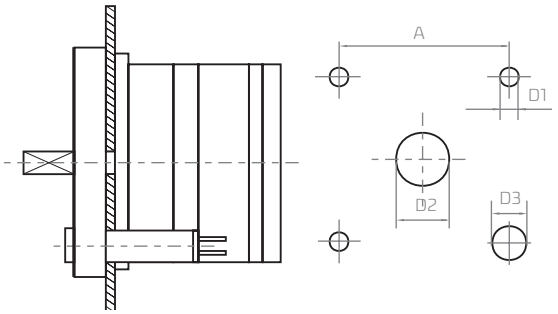




Version: S9, S10, S11, S12	L (dependent on the number of switching elements)											
	1	2	3	4	5	6	7	8	9	10	11	12
	47	56,5	66	75,5	85	95	104,5	114	123,5	133	143	152,5

S15 Switch with a signal lamp

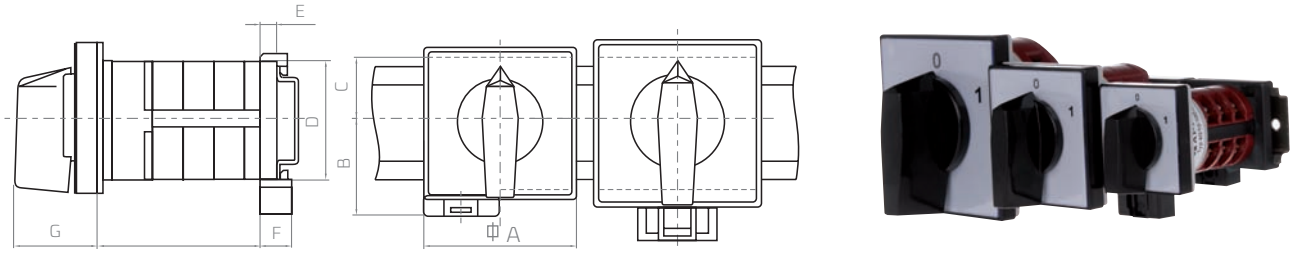
Group A0, A1, A2 version U, OU, PK*)
*protection degree IP52
(Standard colour – red; 220 V).



Group	A	D_1	D_2	D_3
	ф	ø	ø	ø
A0	35	5	14	9
A1	48	5	14	9
A2	72	6	16	9

S18 Switch for installation on din rail (according to 35 DIN EN 50022)

Group A0, A1, A2 version U

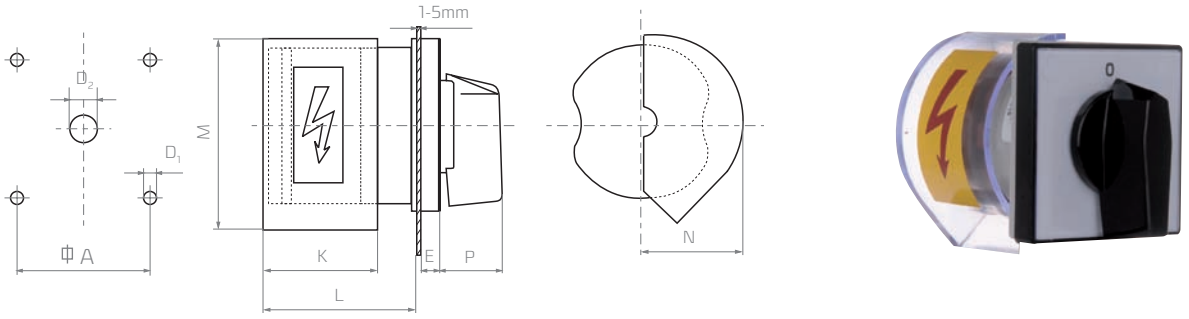


Group	A	B	C	D	E	F	G
	ϕ						
A0	48	30	21	35	5	10,5	26,5
A1	65	48,5	21	35	9	15	34,5
A2	90	48,5	21	35	9	15	41,5

S19 Switch with a protective housing (up to two packs)

Group A1, A2 version U, OU

Protection to prevent from touching the terminals.



Group	D_1	D_2	A	E	P	K	M	N	L
	ø	ø	ϕ						
A1	5	14	48	9,5	25	51	78	36	69
A2	6	16	72	9,5	32	58	99	53	78

S21 Main switch disconnector according to IEC 204 and VDE 0113

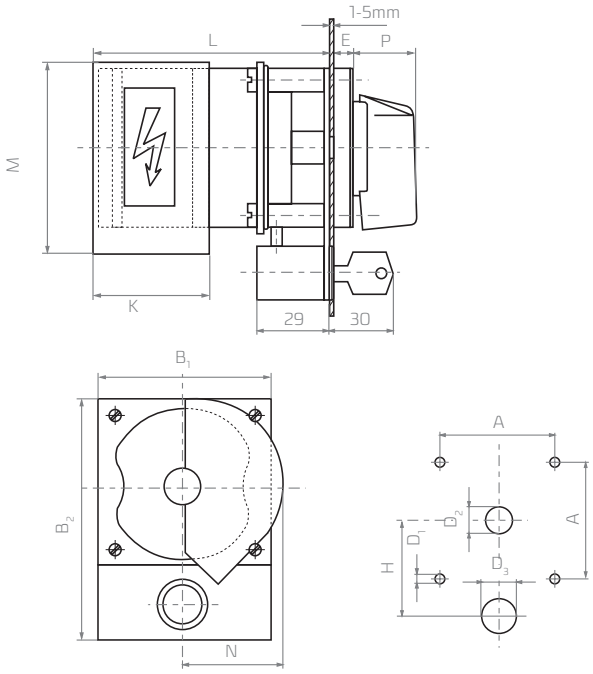
Group A1, A2, A3 version U

Black knob, front plate and indicating plate, white markings. Protecting housing like in S19. Blocking lock. Blocking according to order.

S22 Emergency and main switch disconnector (for two packs)

Group A1, A2, A3 version U

Red knob, yellow background of an indicating plate, black markings. Protecting housing like in S19. Blocking lock. Blocking according to order.



Group	D_1	D_2	D_3	A	B_1	B_2	P	K	M	N	L	E	H
	ø	ø	ø										
A1	5	14	21,5	48	65	98	25	51	78	36	95	9,5	48
A2	6	16	21,5	72	90	122	32	58	99	53	104	9,5	60
A3	6	18	21,5	104	132	168	46,5	88	132	78	137	10	85

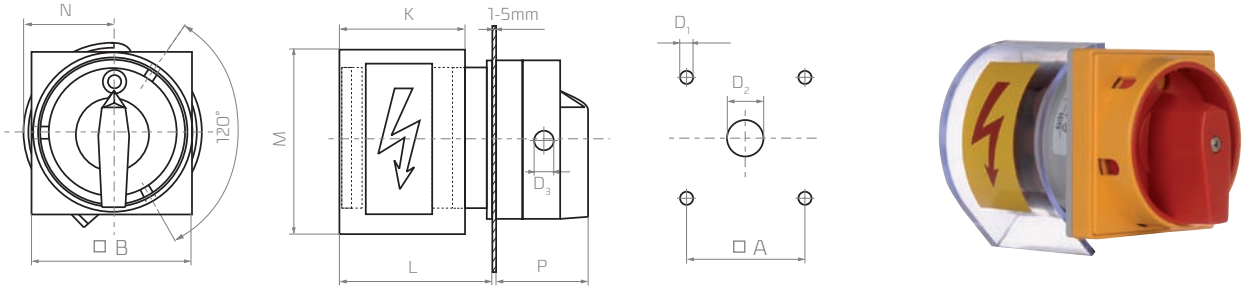
S24 Emergency switch disconnector according to IEC 204 and VDE 0113

Group A0, A1, A2 version U, OU, PK

Red knob, yellow background of an indicating plate, black markings.
The difference between standard and special versions is in different colours of a knob and a plate (red knob, yellow plate, black signs).

S25 Main and emergency switch disconnector (for two packs)

Group A1, A2 version U, OU
The blocking position should be specified (red knob, yellow front plate) in the order. Blocking only in 0 position.



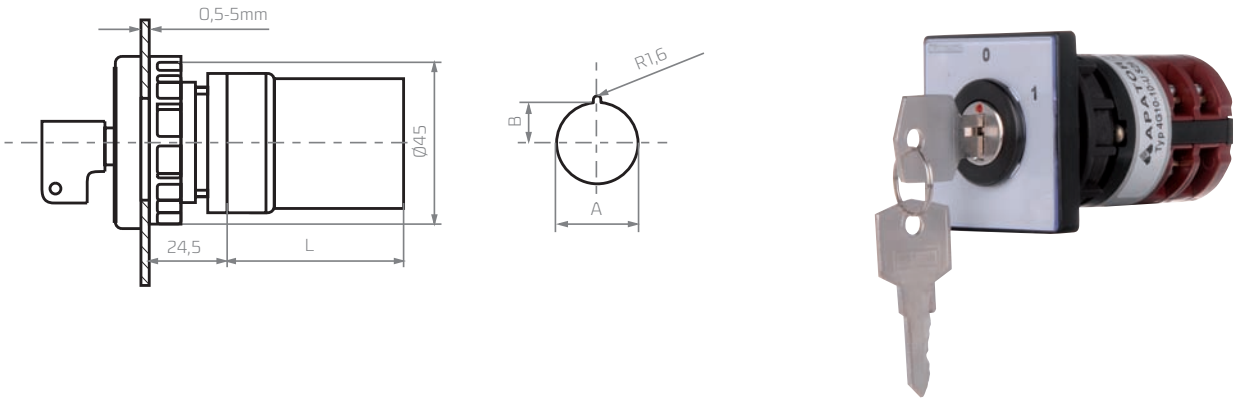
Group	D_1	D_2	D_3	A	B	P	K	M	N	L
	ø	ø	ø	ф	ф					
A1	5	14	7	48	65	35	51	78	36	69
A2	6	16	8	72	90	44	58	99	53	78

S29 Switch for installation in a ø22,5 hole /in control boards/

Group A0 version U
The key operates as a knob. Closing in positions 3, 6, 9, 12 /like on a clock /. The key can be removed in the same positions. It is possible to remove the key in the same positions.

S30 Switch for installation in a ø30,5 hole with a front plate /in control boards/

Group A0 version U
The key operates as a knob. Closing in positions 3, 6, 9, 12 /like on a clock/. The key can be removed in the same positions.
It is also possible to remove the key in any position.



Group	S29	S30
A	22,5	30,5
B	11,25	15,25

The number of the switching elements	1	2	3	4	5	6	7	8	8	10	11	12
L	29	38,5	48	57,5	67	77	86,5	96	105,5	115	125	134

THE CHOICE OF THE MOTOR SWITCHES

Contact life depends on loading conditions. In AC-1 utilization category, where making currents and breaking currents are the same and equal the rated current, the contact life of the switches up to 4G 63 size reaches one million of switching operations.

In more difficult operating conditions the contact life becomes lower. The diagram presented below can be used to make an approximate choice of motor switches, depending on voltage, motor power, number of switching operations per hour and usage class.

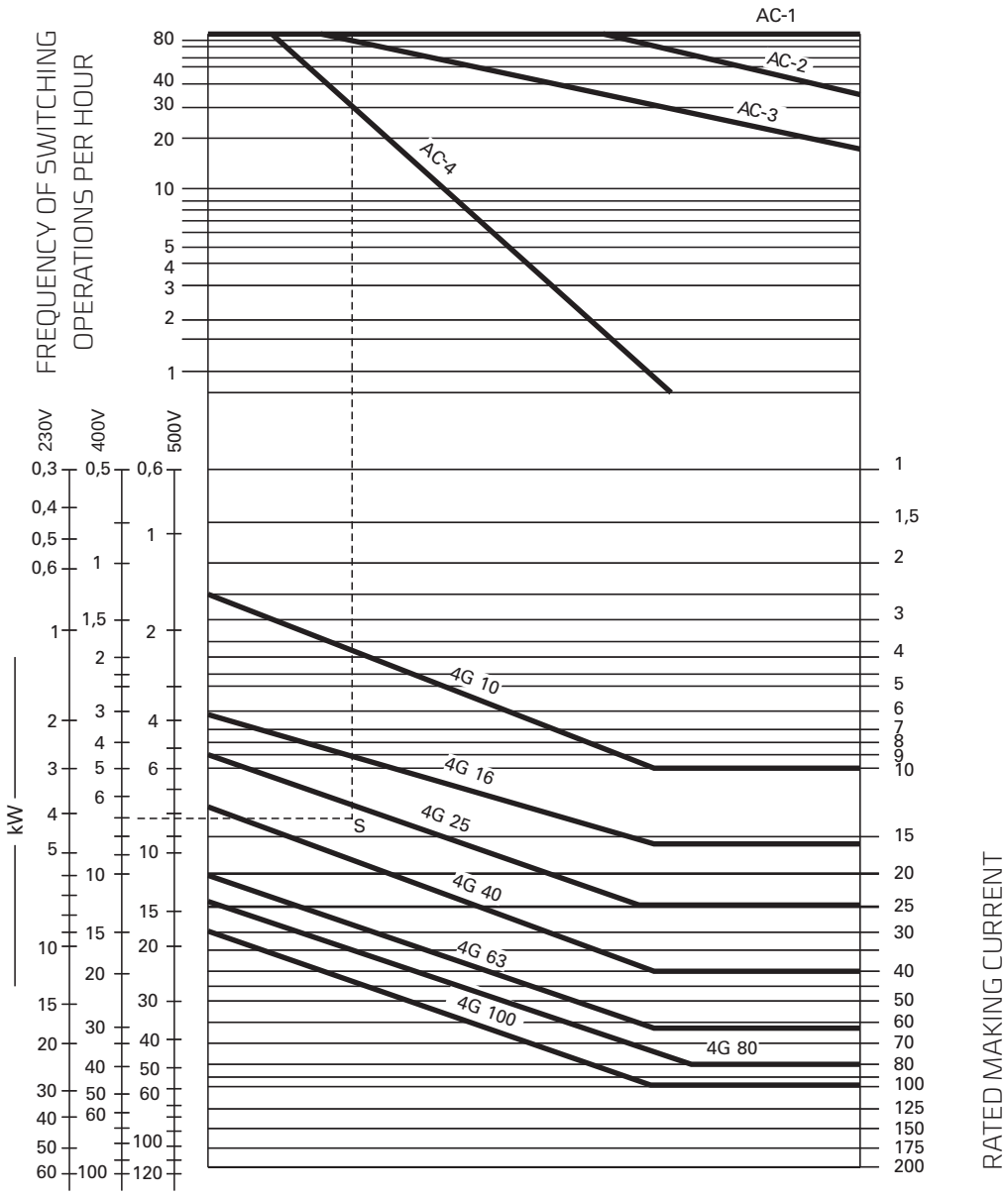


Diagram application example:

The task is to select a cam switch for direct switching and counter-current braking of a squirrel-cage motor characterized by the rated power 7 kW, 380 V and 30 switching operations per hour:

1. Utilization category: AC-4.
2. Find the number of switching operations in the diagram: 30 per hour /in the top part of the diagram/.
3. Draw a horizontal line from the point you have found from the point of intersection with relevant utilization category (AC-4).
4. In the bottom part of the diagram, find the motor power (7 kW, 380 V) on the scale of proper voltage and draw a horizontal line to the right.
5. Draw a perpendicular line down from the point of intersection of the top horizontal line with the utilization category line (AC-4).
6. The point of intersection with the bottom horizontal line "S" lies in the area related to the switch type you are looking for (4G 40).

ORDER FORM

87-100 Toruń, ul. Gdańska nr 4a lok. C4
SWITCHING EQUIPMENT SALES OFFICE
Phones: 48 (56) 61 91 627, 48 (56) 61 91 316
e-mail: trade@apator.com
www.apator.com

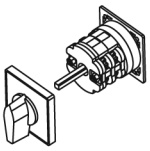
Contracting party:
Address:
Phone:
Fax: e-mail:

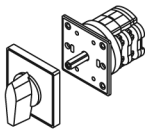
Technical data

Ue.....V~
Ue.....V=
Ie.....A

Number of pices

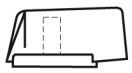
Type of assembly

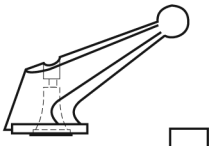

☐ OU


☐ U

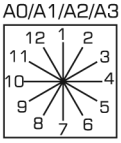

☐ PK

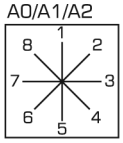
Type and colour of a knob or a handle

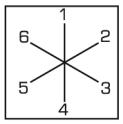

Black ☐
Red ☐

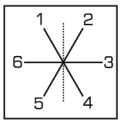

Black ☐
Red ☐

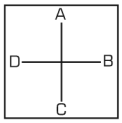
Knob rotation angle

☐ 30° A0/A1/A2/A3 

☐ 45° A0/A1/A2 

☐ 60° A0/A1/A2/A3 

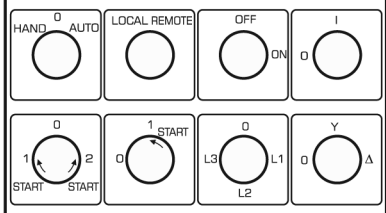
☐ 60° A0/A1/A2/A3 


☐ 90° A0/A1/A2/A3

Special version

S1		S17	
S5		S18	
S6		S19	
S7		S21	
S8		S22	
S9		S24	
S10		S25	
S11		S29	
S12		S30	
S15			

Indicating plate description example



Position descriptions on the indicating plate, according to the angle of rotation.

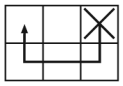
Notes:

Switching diagram:

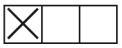
1	4	5	8	9	12	13	16	17	20	21	24	25	28	29	32	33	36	37	40	41	44	45	48
2	3	6	7	10	11	14	15	18	19	22	23	26	27	30	31	34	35	38	39	42	43	46	47

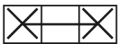
Description of the indicating plate according to customer's requirements. (to be entered in the adjacent fields)

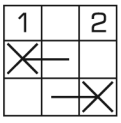
1	A																						
2																							
	B																						
3																							
4	C																						
5																							
	D																						
6																							
7																							
8																							
9																							
10																							
11																							
12																							


automatic return (only after turning by 30° from the stable position)

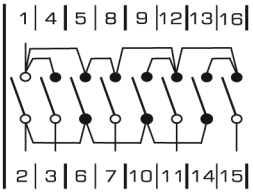

impulse instantaneous contact)


closed contact


closed contact without breaking



"overlap ping" contacts



Example of connecting the contacts with bridges

Order from (to be copied)

APASYS 60

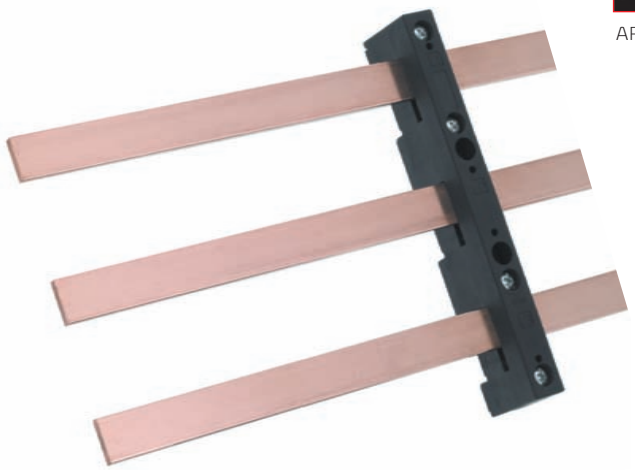
60 mm busbar system

- APASYS 60 is a modular energy distribution system for currents up to 630 A
- the snap-on clip of all components provides great flexibility for the installation and expansion of solutions based on it

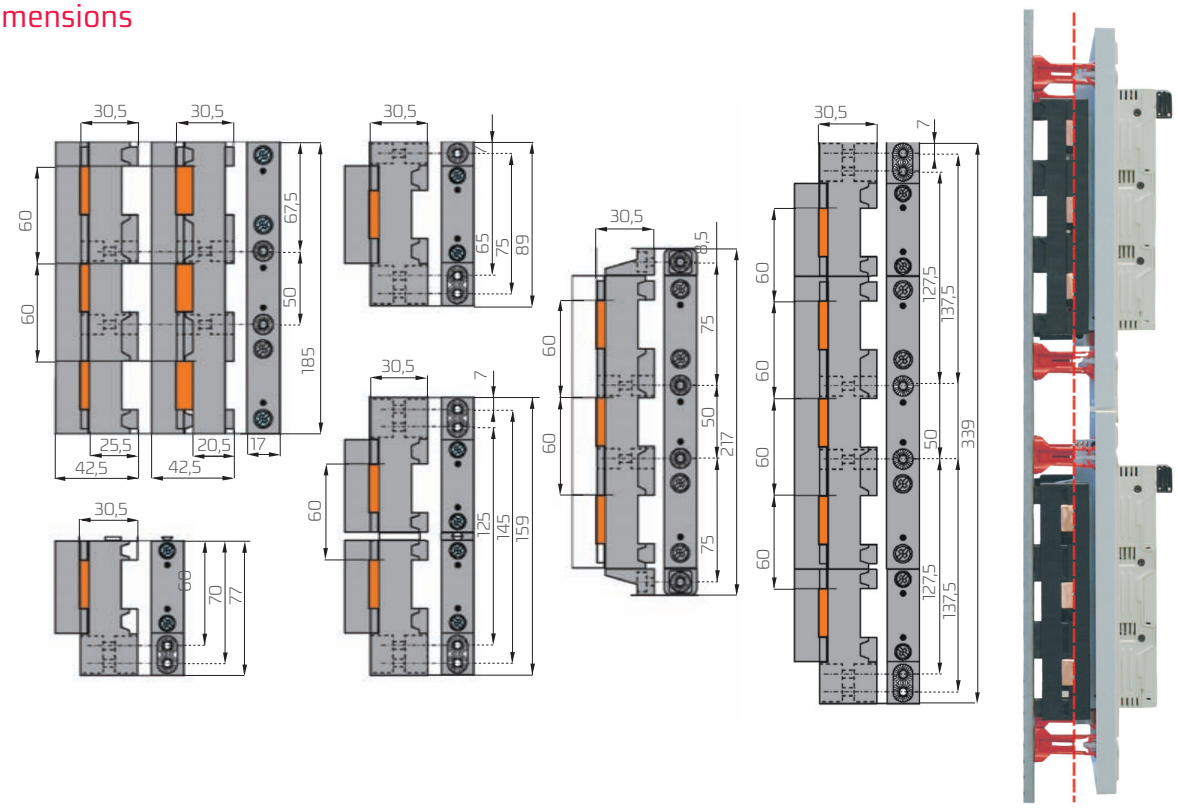
BUSBAR SUPPORTS for the 60 mm system

APASYS 60

For busbars 12, 15, 20, 25 and 30 mm wide and 5 or 10 mm thick. Extremely versatile: the minimum number of components makes it possible to achieve a very large number of supporting set combinations.



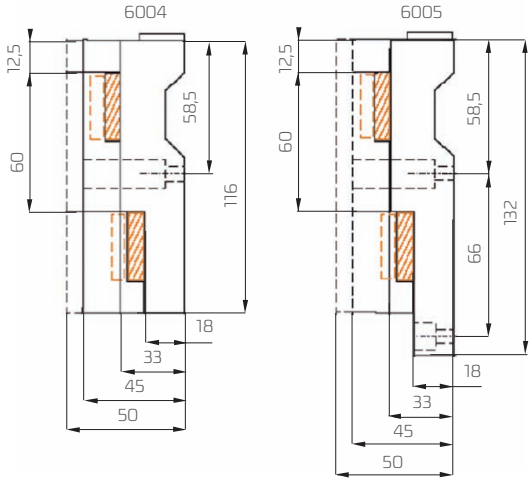
Dimensions

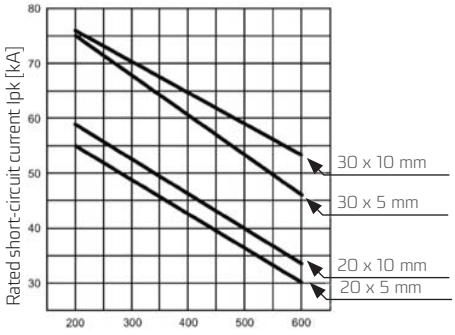


APASYS 60 ACCESSORIES

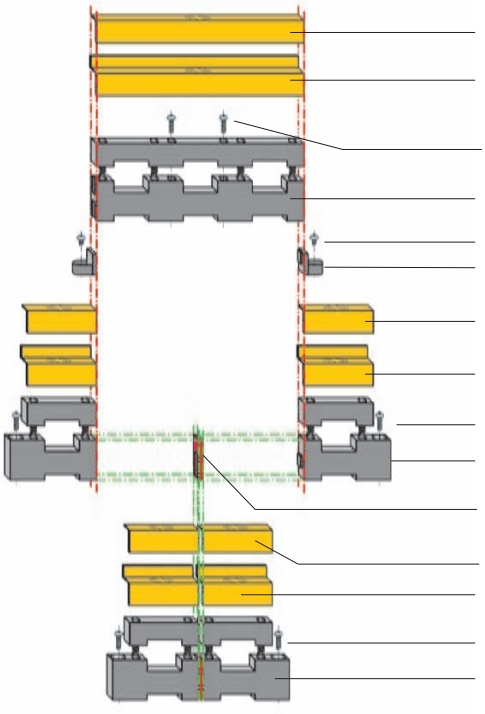
Table 156. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
3-pole, 2 mounting holes inside, washers and screws included	0000106300T	0,121	20
Component included with 0000106300T, with a mounting hole for devices requiring 4 mounting holes, screws included	0000106301T	0,006	10
1-pole, included with 0000106300T or to build a 2-pole support, washers and screws included	0000106302T	0,048	10
1-pole for a single device, washers and screws included	0000106304T	0,056	10
Connector, allows mounting 2 x 0000106302T to receive 2-pole support	0000106307T	0,004	10
3-pole terminal cover, yellow with a warning triangle	0000106303T	0,019	10
3-pole terminal cover, Z type, yellow with a warning triangle	0000106308T	0,024	10
1-pole terminal cover	0000106310T	0,006	10
1-pole terminal cover, Z type	0000106311T	0,007	20
Screw 25 mm	0000106309T	0,004	20
Screw 10 mm	0000106312T	0,002	10
2-pole Busbar support; 1 mounting hole	0000106004T	0,08	10
2-pole Busbar support; 2 mounting holes	0000106005T	0,09	10





Short-circuit resistance diagram according to DIN EN 60439
60 mm busbar system
Rated operating voltage: 690 V, Rated frequency: 50 Hz



0000106303T pole terminal cover

0000106308T 3-pole Z type terminal cover
can also be used as a side cover for the fuse substrcuture for mounting on a busbar

0000106309T screw 25 mm

0000106300T 3-pole busbar support,
2 mounting holes inside

0000106312T screw 10 mm

0000106301T component included with the mouting hole
for devices requiring 4 mounting holes

0000106310T 1-pole terminal cover

0000106311T 1-pole terminal cover, Z type

0000106309T screw 25 mm

0000106302T busbar support included with the 3-pole support
for the expansion of a 4-pole or 5-pole support

0000106307T connector, allows mounting 2 x 0000106302T to receive 2-pole support

0000106310T 1-pole terminal cover

0000106311T 1-pole terminal cover Z type

0000106309T screw 25 mm

2 x 0000106302T 2-pole busbar support,
for devices with 2 mounting holes

For the 100 mm and 185 mm system

- Busbar mouting without openings
- Busbar width 30 – 120 mm (185 mm system)
- Busbar width 30 – 60 mm (100 mm system)
- Busbar thickness: 10 mm

Table 157. Technical data

Classification	
Rated operating voltage	1000 V AC
Rated insulation voltage	2000 V AC
Frequency	50 Hz
Flammability	UL 94 V40
Track resistance	CTI 600
Continuous operation	150°
Glowing wire attempt	960°

Dimensions

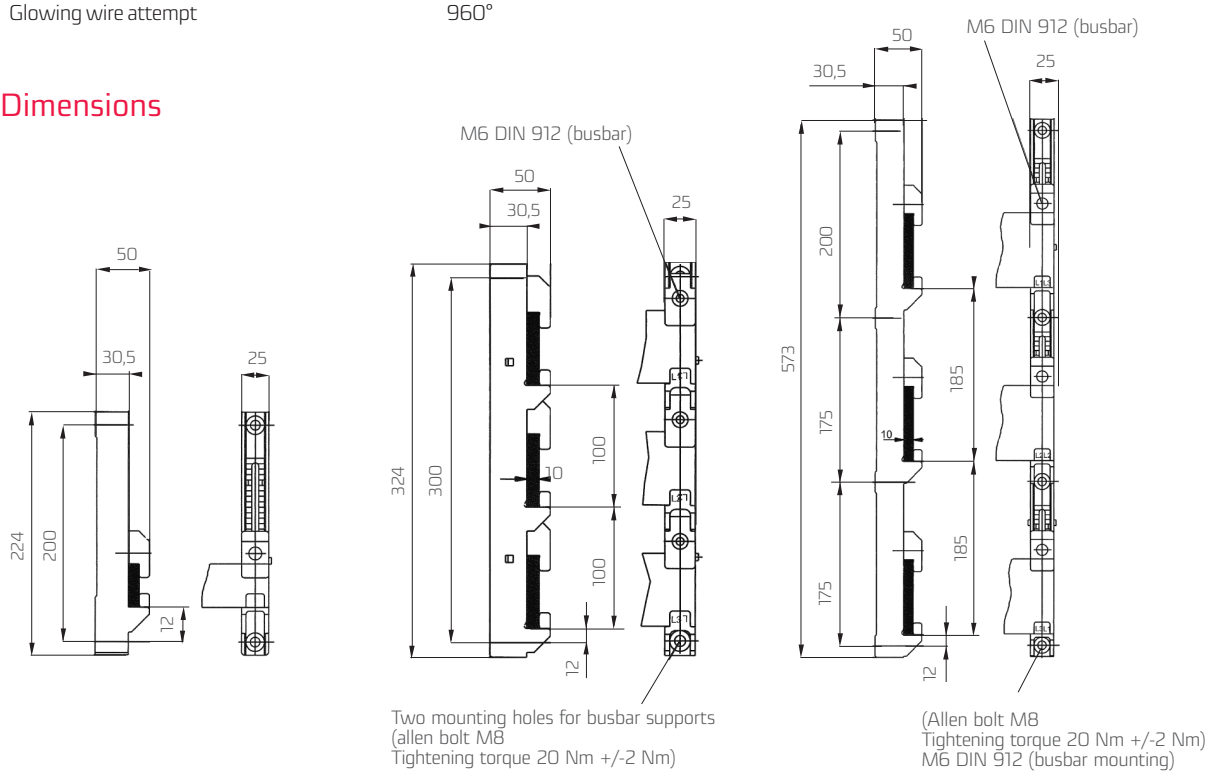


Table 158. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
3-pole busbar support, spacing 100 mm	0000188100T	0,36	1
3-pole busbar support, spacing 185 mm	0000188101T	0,54	1
1-pole busbar support	0000188102T	0,20	1
3-pole terminal cover, spacing 100 mm	0000188103T	0,07	1
3-pole terminal cover, spacing 185 mm	0000188104T	0,12	1

For the 60 mm, 100 mm and 185 mm system

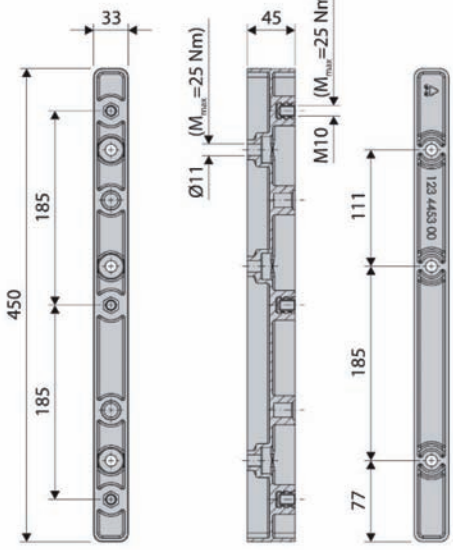
APASYS 60

- The supports are characterised by a robust construction and insulating properties, thanks to which they are used in electrical switchboards as support elements for current busbars.
- The supports allow you to mount a busbar with spacing of 60, 100, 185 mm.
- The body is made of insulating material (polyester reinforced with glass fibre), in which M10 threads are embedded (maximum tightening torque: 25 Nm).

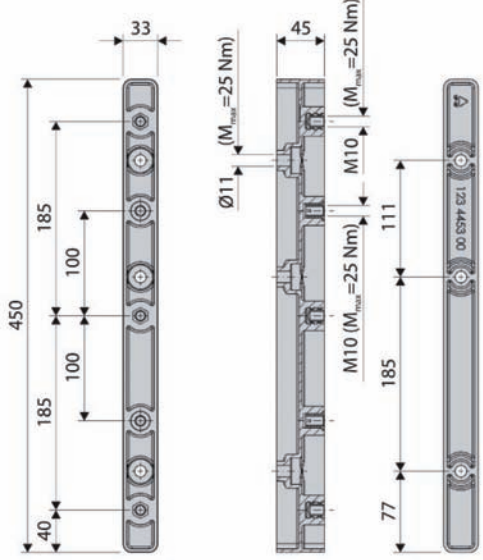
Table 159. Technical data

Classification	
Flammability class	V0
Track resistance	CTI 600
Heat resistance	960°C

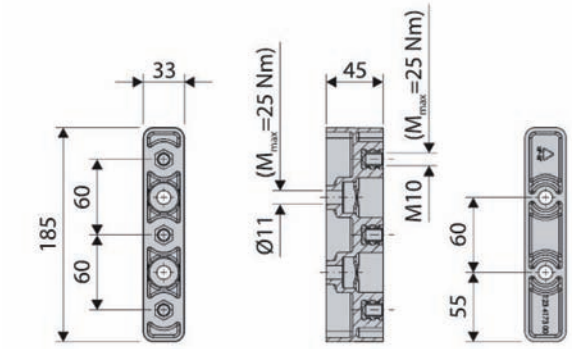
Dimensions



M10 185
0000188105T



M10 185/100
0000188106T



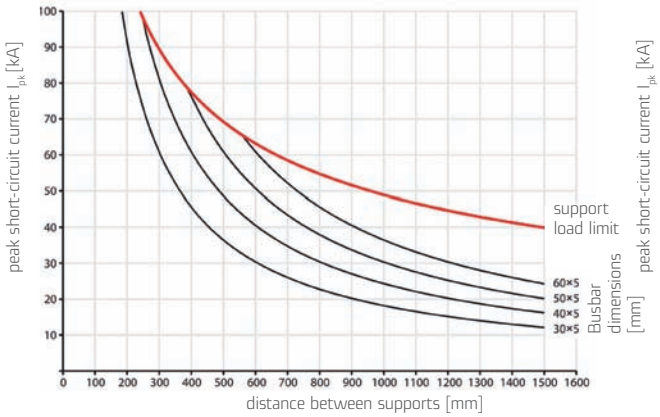
M10 60
0000188107T

energy distribution

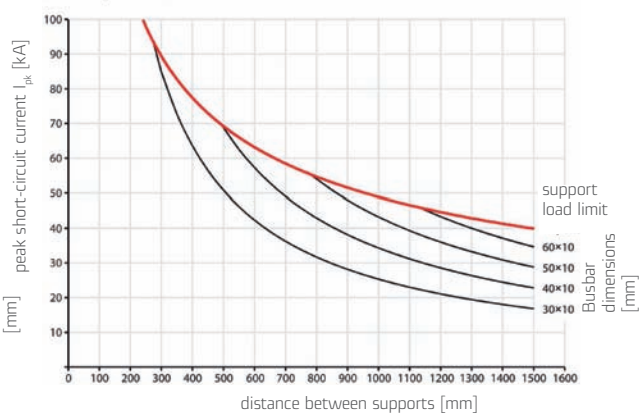
Table 160. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
Busbar spacing 60 mm, 3-pole busbar support, with seated M10 nuts (M10 60)	0000188107T	0,23	1
Busbar spacing 100 mm, 3-pole busbar support, with seated M10 nuts (M10 185/100 mm)	0000188106T	0,48	1
Busbar spacing 185 mm, 3-pole busbar support, with seated M10 nuts (M10 185 mm)	0000188105T	0,46	1

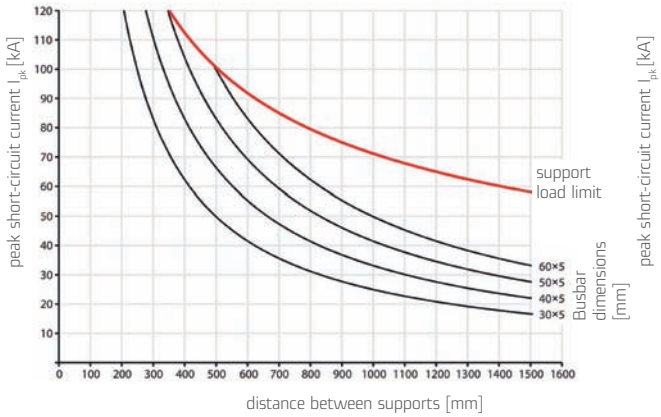
Short-circuit resistance of 5 mm thick busbar depending on the distance between supports (busbar spacing 100 mm)



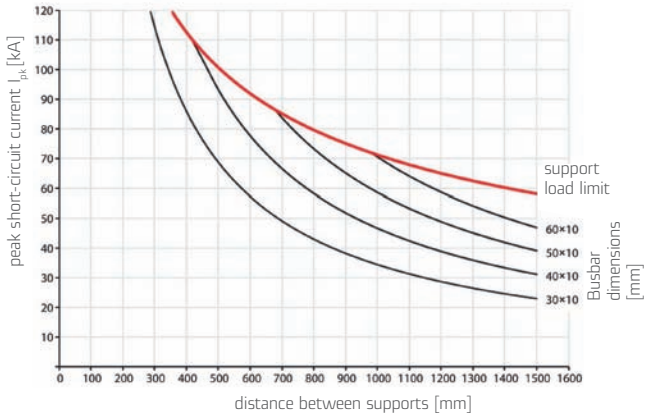
Short-circuit resistance of 10 mm thick busbar depending on the distance between supports (busbar spacing 100 mm)



Short-circuit resistance of 5 mm thick busbar depending on the distance between supports (busbar spacing 185 mm)



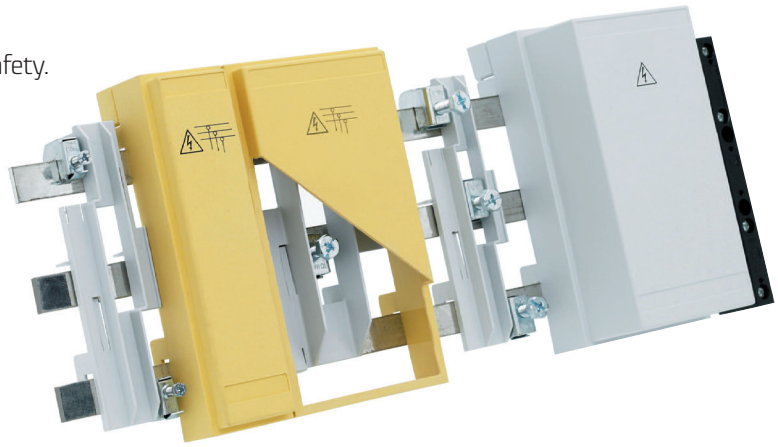
Short-circuit resistance of 10 mm thick busbar depending on the distance between supports (busbar spacing 185 mm)



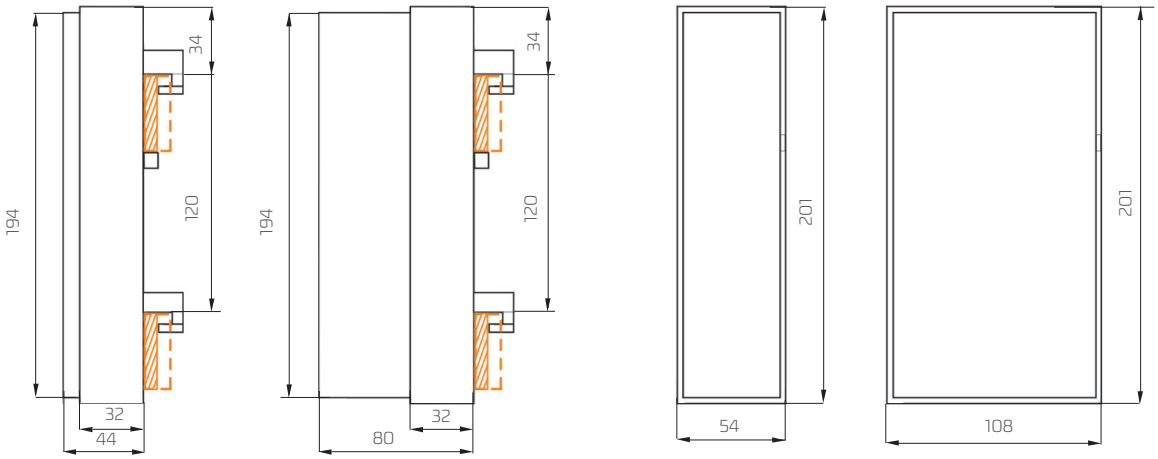
POWER ADAPTER

APASYS 60

The APASYS 60 power supply connections
are implemented using a universal hook terminal
that adapts to the busbar section.
Protective covers provide the required level of safety.



Dimensions



APASYS 60 ACCESSORIES

Table 161. Power adapters (without hook terminals) with warning triangle for busbar and cable protection

Versions (yellow colour)	Index no.	Weight [kg]	Package [pcs.]
Width 54 mm, internal height 42 mm, for terminals 16..50 mm²	0000106090T	0,11	2
Width 108 mm, internal height 42 mm, for terminals 16..70 mm²	0000106091T	0,17	1
Width 108 mm, internal height 78 mm, for terminals 16..185 mm²	0000106092T	0,22	1
Versions (gray colour)	**Index no.**	**Weight [kg]**	**Package [pcs.]**
Width 54 mm, internal height 42 mm, for terminals 16..50 mm²	0000106096T	0,11	2
Width 108 mm, internal height 42 mm, for terminals 16..70 mm²	0000106097T	0,17	1
Width 108 mm, internal height 78 mm, for terminals 16..185 mm²	0000106098T	0,22	1

Table 162. Busbar bridge cover, grey colour

Versions	Index no.	Weight [kg]	Package [pcs.]
Width 54 mm, internal height 42 mm	0000106033T	0,09	2
Width 108 mm, internal height 42 mm	0000106034T	0,12	1
Width 108 mm, internal height 78 mm	0000106035T	0,12	1

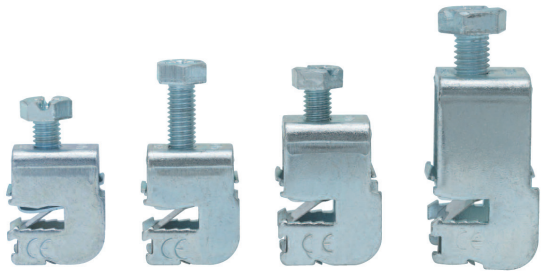


Table 163. Hook terminals

Versions for 5 mm thick busbars	Index no.	Weight [kg]	Package [pcs.]
1,5...16 mm²	0000116051T	0,03	100
1,5...35 mm²	0000116052T	0,04	50
1,5...50 mm²	0000116053T	0,05	50
16...70 mm²	0000116054T	0,06	10
16...120 mm²	0000116055T	0,09	10
16...185 mm²	0000116056T	0,10	10
Versions for 10 mm thick busbars			
1,5...16 mm²	0000116061T	0,03	100
1,5...35 mm²	0000116062T	0,04	50
1,5...50 mm²	0000116063T	0,05	50
16...70 mm²	0000116064T	0,06	10
16...120 mm²	0000116065T	0,09	10
16...185 mm²	0000116066T	0,10	10

E18 FUSE BASE
for mounting on a busbar

APASYS 60

- Ability to add a description of each phase.
- Stainless steel connection terminals with low power loss.
- Side insulation covers to protect against accidental contact.
- Snap-on rear insulation cover.

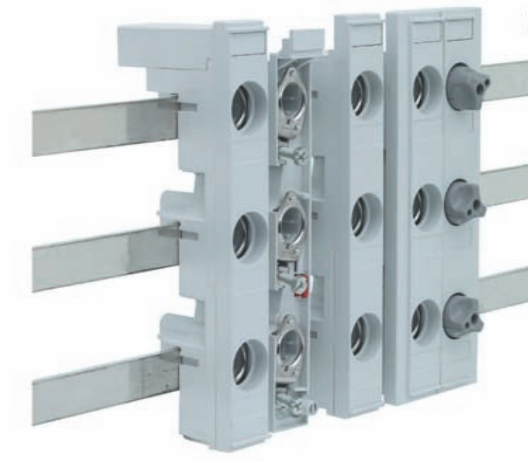


Table 164. Technical data

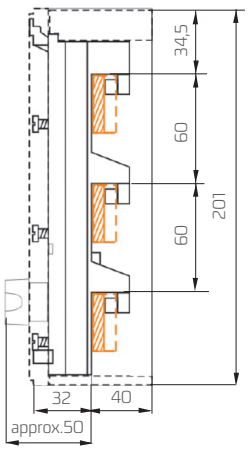
3-POLE ; DIN 49524	
For DO fuse links	2...63A DIN 49522
Adapter - holder	DO2 DIN 49523 400 V AC/250 DC 50 kA_{eff}
Steel frame terminal	1,5...25 mm^2, 3-4 Nm
Track resistance	CTI 600
Flammability class	UL 94-V0
Heat resistance	200 °C
Glowing wire attempt	960 °C

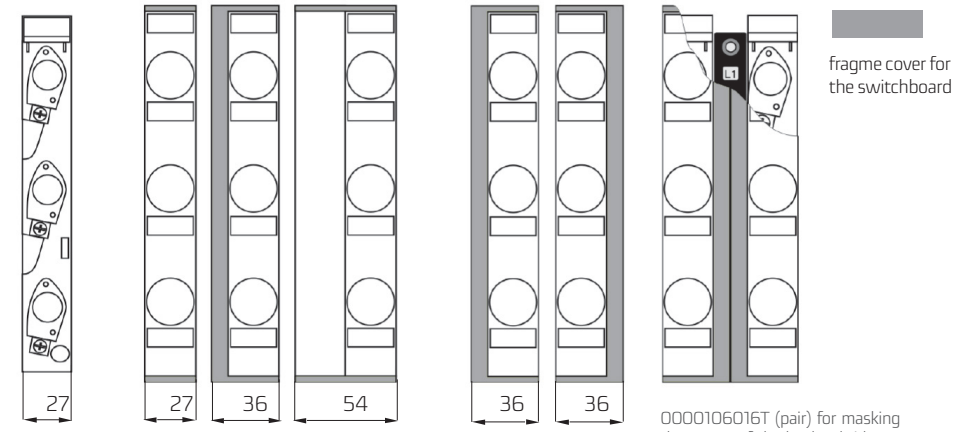
Table 165. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
Fuse substructure for mounting on a busbar 27 mm, without cover	0000106022T	0,15	10
Fuse substructure for mounting on a busbar 27 mm, with cover	0000106023T	0,17	10
Fuse substructure for mounting on a busbar 36 mm, with cover and side widener	0000106028T	0,19	10
Fuse substructure for mounting on a busbar 54 mm, with coverandside widener	0000106029T	0,21	10
Cover 27 mm	0000106011T	0,02	10
Cover 36 mm, includes side widener	0000106012T	0,03	10
Cover 54 mm, includes side widener	0000106013T	0,05	10
Pair of covers	0000106016T	0,05	10
Single cover left	0000106017T	0,02	10
Single cover right	0000106018T	0,02	10
Snap-on cover providing protection against contact	0000106026T	0,01	10

Fuse substructure should be equipped with fuse carriers (see Table 44. Accessories)

Dimensions





0000106022T 0000106011T 0000106012T 0000106013T 0000106017T 0000106018T
0000106016T (pair)

fragme cover for the switchboard

0000106016T (pair) for masking the centre of the busbar bridge supports or as a frame cover for the supports at the end or the beginning of the busbar

ADAPTER FOR COMPONENT ASSEMBLY

APASYS 60 component adapter with infinitely adjustable mounting support and double terminals with low power loss

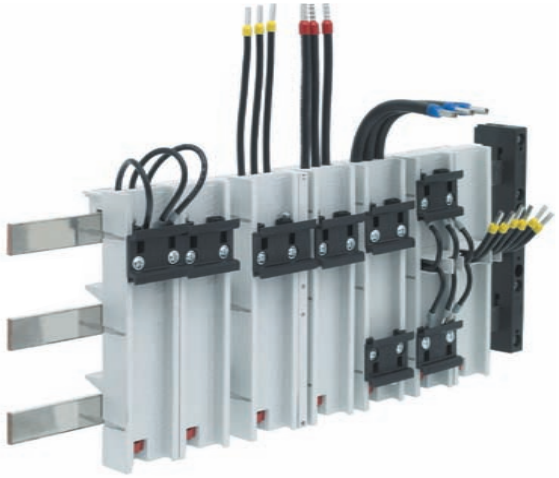
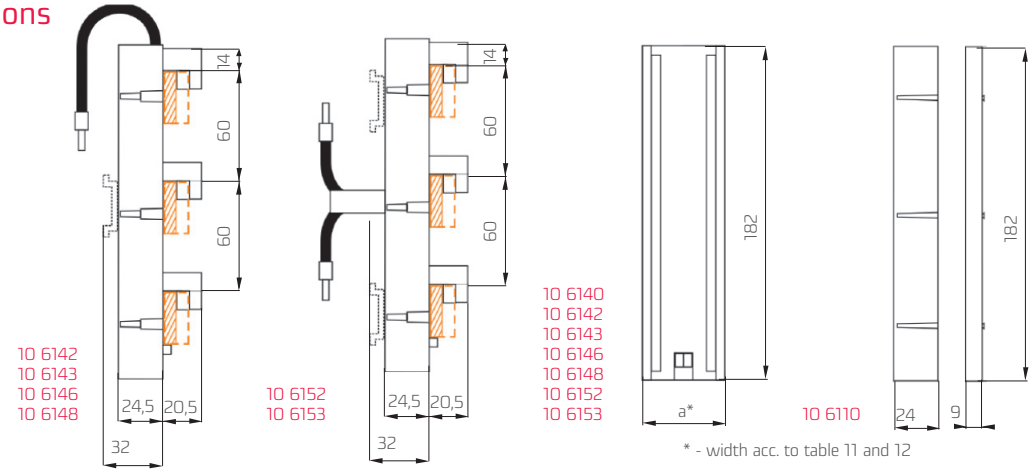


Table 166. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
I_e=25 A section of the connection cable AWG 12 / 4 mm²			
1 universal mounting rail, width 45 mm	0106142451T	0,21	2
2 universal mounting rails, width 45 mm	0106142452T	0,23	2
1 universal mounting rail, width 54 mm	0106142541T	0,22	2
2 universal mounting rails, width 54 mm	0106142542T	0,24	2
I_e=35 A section of the connection cable AWG 10 / 6 mm²			
1 universal mounting rail, width 45 mm	0106143451T	0,22	2
2 universal mounting rails, width 45 mm	0106143452T	0,24	2
1 universal mounting rail, width 54 mm	0106143541T	0,23	2
2 universal mounting rails, width 54 mm	0106143542T	0,25	2
1 universal mounting rail, width 63 mm	0106143631T	0,27	2
1 universal mounting rail, width 72 mm	0106143721T	0,29	2
2 universal mounting rails, width 81 mm	0106143812T	0,31	2
I_e=63 A section of the connection cable AWG 8 / 10 mm²			
1 universal mounting rail, width 54 mm	0106146541T	0,26	2
2 universal mounting rails, width 54 mm	0106146542T	0,28	2
1 universal mounting rail, width 63 mm	0106146631T	0,30	2
1 universal mounting rail, width 72 mm	0106146721T	0,32	2
2 universal mounting rails, width 81 mm	0106146812T	0,34	2
I_e=63 A section of the connection cable AWG 6 / 16 mm²			
1 universal mounting rail, width 54 mm	0106148541T	0,29	2
2 universal mounting rails, width 54 mm	0106148542T	0,31	2
1 universal mounting rail, width 63 mm	0106148631T	0,33	2
1 universal mounting rail, width 72 mm	0106148721T	0,35	2
2 universal mounting rails, width 81 mm	0106148812T	0,37	2

Dimensions



* - width acc. to table 11 and 12

COMPONENTS MOUNTING ADAPTER

Table 167. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
I_e= 25 A; 4 mm² section of the connection cable, AWG 12 width 45 mm	0000106142T	0,19	4
I_e= 35 A; 6 mm² section of the connection cable, AWG 10 width 45 mm	0000106143T	0,20	4
I_e= 63 A; 10 mm² section of the connection cable, AWG 8 width 45 mm	0000106146T	0,23	4
I_e = 80 A; 16 mm² section of the connection cable, AWG 6 width 45 mm	0000106148T	0,26	4
I_e = 25A; double central terminal 4 mm², AWG 12 width 45 mm	0000106152T	0,20	4
I_e = 35A; double central terminal 6 mm², AWG 10 width 45 mm	0000106153T	0,25	4
Without terminals, contains connector X forsideextension or single mounting	0000106140T	0,15	4

ACCESSORIES

Table 168. Versions

Position	Index no.	Weight [kg]	Package [pcs.]
Side element for adapter expansion, width 9 mm	0000106110T	0,02	10
Universal mounting rail, width 45 mm, stepless adjustment	0000106104T	0,02	10
Universal mounting rail, width 54 mm, stepless adjustment	0000106105T	0,02	10
Universal mounting rail, width 63 mm, stepless adjustment	0000106106T	0,02	10
Universal mounting rail, width 72 mm, stepless adjustment	0000106107T	0,02	10
Universal mounting rail, width 81 mm, stepless adjustment	0000106108T	0,02	10

The mounting rails are steplessly adjustable.

Adapter base

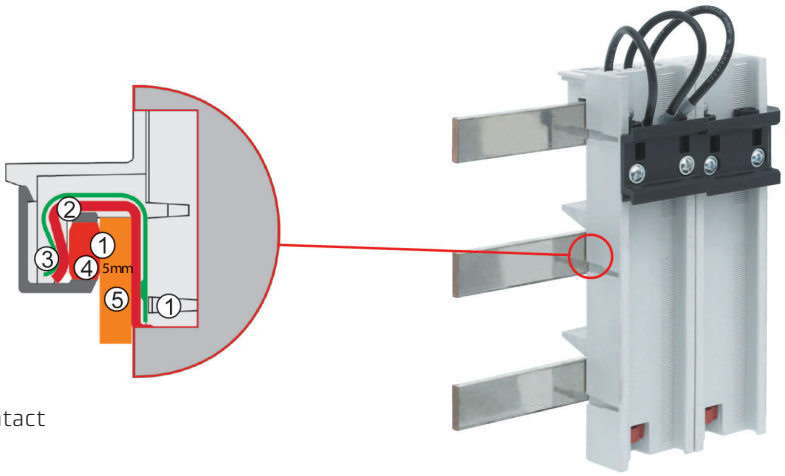
Side element, width 9 mm allows to expand adapter base by 9 mm

Mounting rail installed on the base by means of a double wedge element

Set up the mounting rail in the correct position and tighten the screws

1. Place the APASYS 60 component on the top mounting rail and connect the power supply
2. Place the second component on the bottom mounting rail. Adjust the mounting rail to match the position of the component and connect it

Tighten the bottom mounting rail



Double contact area

1. Double contact area
2. Terminal
3. Steel spring loaded terminal block
4. 5 mm connection terminal with CuAg contact
5. Busbar

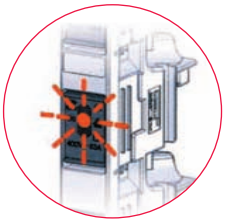
Double contact area design provides low power loss.
The pressure is applied only by the metal parts and not the plastic.

RBDO/60
Fuse switch disconnector for DO fuse links for busbar mounting

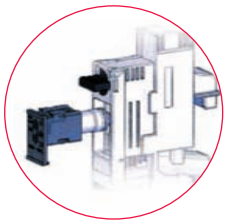

APASYS 60

RBDO/60
Disconnector with DO2 fuse switches for installation on a busbar with fuse switches holders with an optoelectrical light indicator

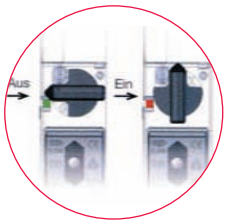
RBDO/60 primary security
with relay for monitoring fuse link condition and temperature



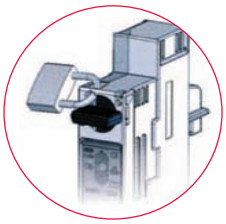
Light indicator
Damage to the fuse link is reliably detected and indicated by an optoelectrical indicator



Quick and easy replacement of the fuse link
Fuse switch holder allows for quick and easy replacement of the DO fuse link



Operating status indicator
The colour of the operating status indicator enables an immediate evaluation of the operating status of the connector



Padlock
The padlock prevents unauthorized change of the disconnector switch-on status

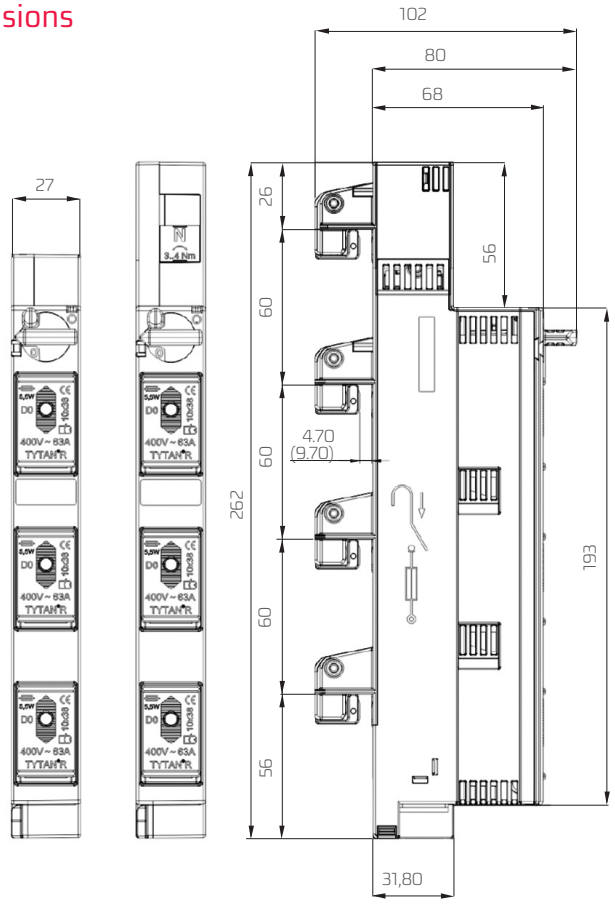
Table 169. Technical data

Classification	Fuse switch disconnector
Standard	IEC 947-3
Adapted to DO fuse links DIN 49522	DO1: 2, 4, 6, 10, 16 AgL, gG, aM DO2: 20, 25, 32, 35, 40, 50, 63 AgL, gG, aM
Adapted to cylindrical fuse links IEC 60269-1	10 x 38 mm: 2, 4, 6, 8, 10, 12, 16, 20, 25, 32A
Flammability class/track resistance	UL94 / V0, glowing wire attempt 960 °C / CTI 600
Degree of protection/touch protection	IP 20 / protection against finger and palm touch
Rated switching voltage U_e	
-DO	400 V AC
-10 x 38	500 V AC
Rated switching current I_e	DO: 63A; 10 x 38: 32 A
Overvoltage category/pollution degree	IV/3 (DIN VDE 0110)
Rated impulse withstand voltage U_{imp}	6000 V
Terminal type	stainless steel frame terminal 1,5...25 mm^2; M_D 3,5 Nm, cross recess
Rated short-circuit switch-on capability I_{cm}	50 kA_{eff}
Utilization category	AC 22B
Busbar dimensions	width: 12 mm-30 mm; thickness: 5 mm and 10 mm

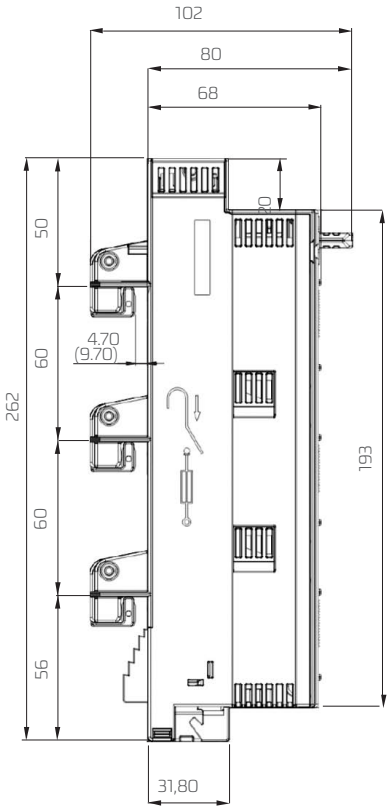
Table 170. RBDO - Versions

Position	Index no.	Weight [kg]	Package [pcs.]
400 V~, D0:2...63 A; 10x38: 2...32 A 400 V~,			
3-pole	0000106601T	0,40	3
3-pole + neutral pole N	0000106602T	0,40	3
3-pole with microswitch for switching status signalising	0000106603T	0,40	3
3-pole + neutral pole N with microswitch for switching status signalising	0000106604T	0,40	3
500 V~, 10x38: 2...25 A			
3-pole	0000106631T	0,40	3
3-pole + neutral pole N	0000106632T	0,40	3
3-pole with microswitch for switching status signalising	0000106633T	0,40	3
3-pole + neutral pole N with microswitch for switching status signalising	0000106634T	0,40	3
Rear contact guard, top and bottom	0000106626T	0,01	10
Adapter reducing spring for the D01 and D02 fuse link	0000101774T	0,01	12
Padlock in busbar snap-on container	0000104664T	0,05	1
Pin used as a solid link	0000101780T	0,01	3

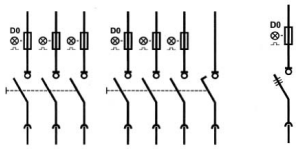
Dimensions



3-pole+N



3-pole



RBDO/60

Primary security

APASYS 60

RBDO - main protection switch indicates fuse breaks and has the capability of transmitting a floating signal via an RJ-connection cable on the external relay. A dangerous overheating of the fuse switch can be reliably identified and reported. The serial interface on each relay has a floating signal via a relay contact. For collective disturbance monitoring it is possible to put 12 fuse switches together.

Table 171. RBDO/60 - main protection with control of the fuse link status and temperature

Versions	Index no.	Weight [kg]	Package [pcs.]
400 V~, D0:2...63A; 10x38: 2...32A			
RBDO/60 H1 3-pole	0000106701T	0,40	3
RBDO/60 H1 3-pole + neutral pole N	0000106702T	0,40	3
500 V~, 10x38: 2...25A			
RBDO/60 H1 3-pole	0000106731T	0,40	3
RBDO/60 H1 3-pole + neutral pole N	0000106732T	0,40	3
Relay module of the primary security HR11; 3 -terminals (indicates fuse link burnout, overtemperature, turning on/off)	0000103711T	0,12	1
Relay module of the primary security HR12; 2 -terminals (indicates fuse link burnout, overtemperature)	0000103712T	0,12	1
Relay module of the primary security HR13; 1 -terminal (indicates fuse link burnout, overtemperature)	0000103713T	0,12	1
RJ cable, length 200 mm	0000103730T	0,01	1
RJ cable, length 500 mm	0000103731T	0,01	1
RJ cable, length 1000 mm	0000103732T	0,01	1
Network adapter 100-240 V AC/24 V DC 10 W	0000103700T	0,10	1
Network adapter 100-240 V AC/24 V DC 30 W	0000103701T	0,25	1

RBDO/60 main protection signalises the fuse activation and transmits information by means of an RJ cable to externally placed safety automatics devices.
At the same time, unsafe overheating of the device is shown and reported.

Interface - a voltage-free connection terminal is available in the relay section.
There is a possibility of collective signalling of any irregularities through serial connection of devices.
The collective signal can handle up to 12 devices.

Power supply for the relay part: 24 V DC

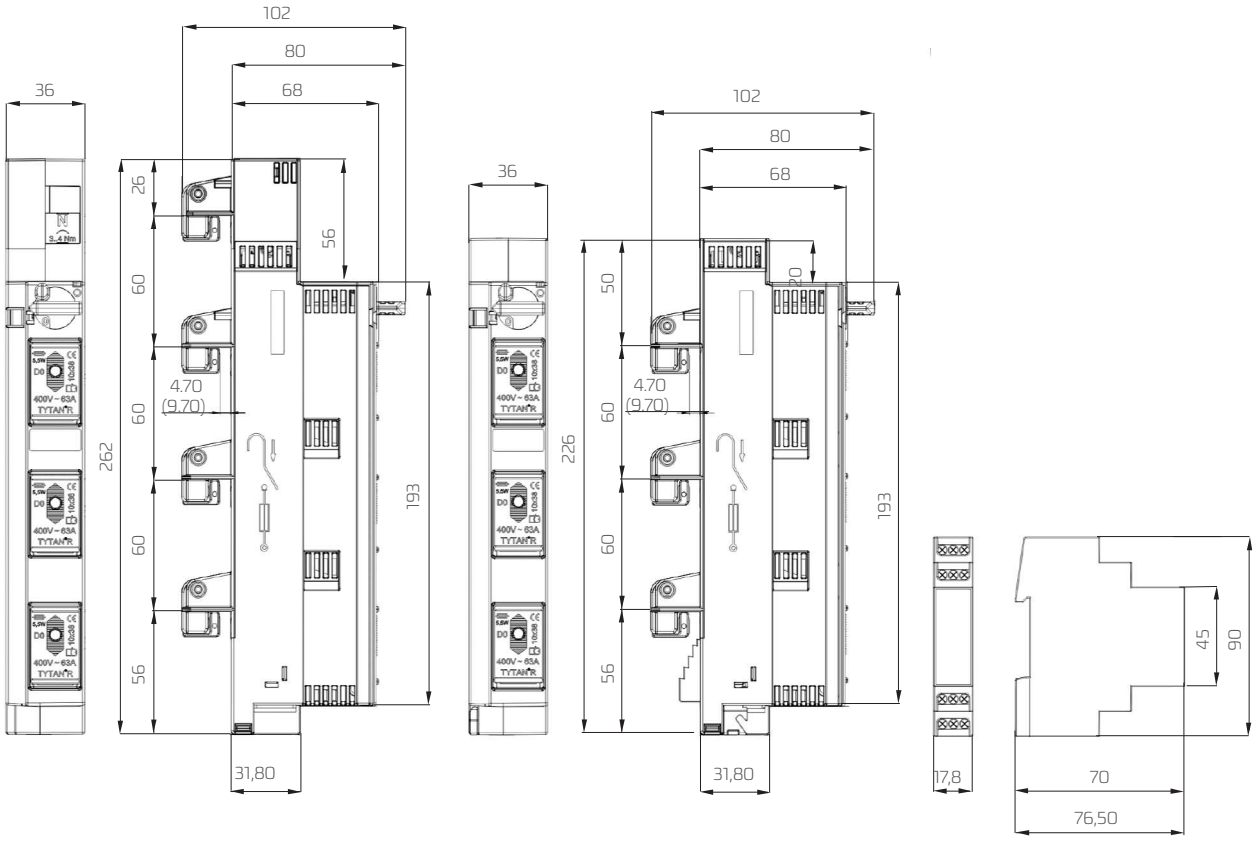
Outputs of the relay part:
- 1 terminal for the fuse link burnout
- 1 terminal for overtemperature
- 1 terminal for the on/off position

Correct operating status

Fuse link burnout

Overtemperature in the device

Dimensions



RBDO/60

PARTITIONS AND SHROUDS

APASYS 60

The partition and shroud system offers comprehensive contact protection for the APASYS 60

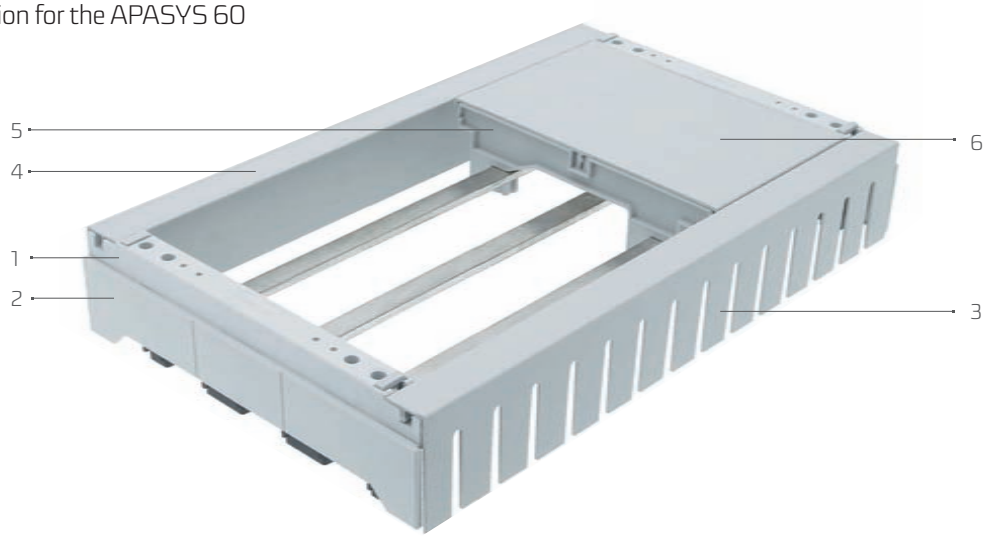


Table 172. Cover system

Versions		Index no.	Weight [kg]	Package [pcs.]
1. Cover shroud for the busbar support 00001063007		0000126070T	0,06	10
2. Side cover for the busbar support 00001063007		0000126071T	0,03	10
3. Slitted shroud	length 2000 mm	0000126072T	0,47	5
	length 1000 mm	0000126076T	0,24	
4. Closed shroud	length 2000 mm	0000126073T	0,53	5
	length 1000 mm	0000126077T	0,26	
5. Panel mount, support edge 32 mm		0000126074T	0,04	10
6. Panel cover, length 1000 mm		0000126075T	0,64	2

Table 173. Busbar covers length 1000 mm, for copper rails up to 30 mm wide

Versions	Index no.	Weight [kg]	Package [pcs.]
Covers for busbar 5 mm thick, 1000 mm long	0000156076T	0,07	10
Covers for busbar 10 mm thick, 1000 mm long	0000156077T	0,09	10

Modular equipment

Mounted on DIN 35 mm rail

DO - TYTAN® II FUSE SWITCH DISCONNECTOR

35 mm DIN rail

- flashing response indicator (in the fuse sleeve)
- full coding for all current values of the fuse link
- possibility of sealing
- possibility of blocking

Table 174. Technical data

Classification	Fuse switch disconnector
Standard	IEC/EN 60947-3
Adapted to fuse switch disconnectors	DO1: 1, 2, 4, 6, 10, 13, 16 A DO2: 20, 25, 32, 35, 40, 50, 63 A gL, gG, aM class
flammability class/track resistance	V0, glowing wire testing 960°C / CTI 600
Degree of protection/touch protection	IP 20 / protection against finger and palm touch
Rated operating voltage U_e	
-AC	400 V
-DC	1-pole 110 V, 2-pole 220 V
Rated switching current I_e	63 A
Rated impulse withstand voltage U_{imp}	6 kA
Rated short-circuit current I_{cm}	50 kA_{eff}
Utilization category	AC 22B, DC 21 B
Overvoltage category/pollution degree	IV/3 (DIN VDE 0110)
Terminal type	stainless steel cage terminals 1.5...35 mm^2; MD 4 Nm

TYTAN II fuse switch disconnector should be equipped with a fuse sleeve (see Table 30)

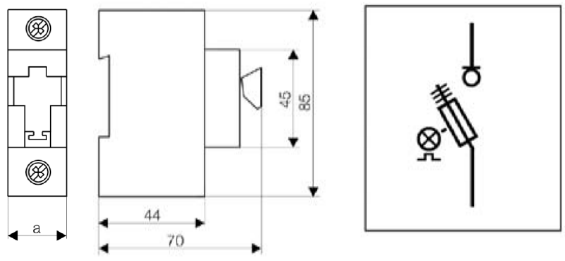


Table 175. Construction width

Article no.	Construction width a [mm]
0000102651T	27
0000102652T	54
0000102653T	81
0000102641T	54
0000102643T	108

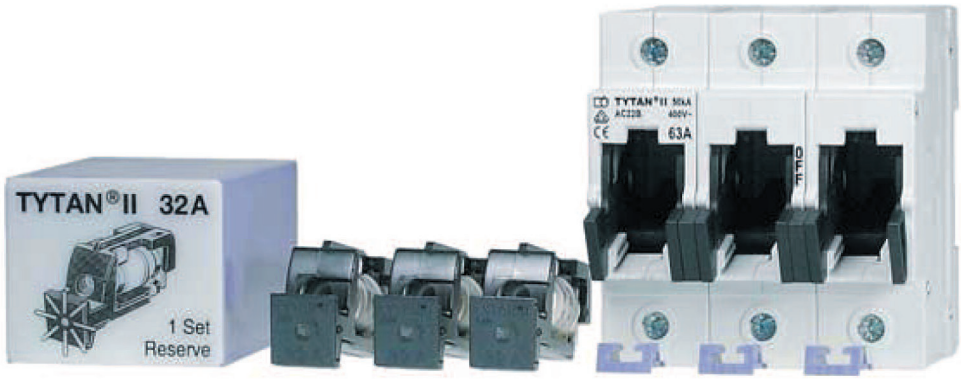


Table 176. TYTAN II Fuse switch disconnector

Versions	Index no.	Weight [kg]	Package [pcs.]
1-pole	0000102651T	0,12	12
2-pole	0000102652T	0,23	6
3-pole	0000102653T	0,35	4
1-pole + N	0000102641T	0,25	6
3-pole + N	0000102643T	0,48	3

TYTAN II fuse switch disconnector should be equipped with a fuse sleeve (see Table 30)

Flawless differentiation of rated current due to full coding

The TYTAN® system codes the nominal current with coloured fuse links for each current stage.

e.g.: 13 A diameter 1,5 mm²

e.g.: 32 A CEE connector

e.g.: 40A for the ground-fault circuit

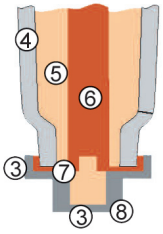
TYTAN® II FUSE LINKS

35 mm DIN rail

D0 - Fuse link with an integrated flashing response indicator for use with the **TYTAN® II** fuse sleeve disconnector

Low loss due to the fuse sleeve

1. Independent constant terminal pressure
2. Spring loaded terminal
3. Double contact saves 0.8 W per pole
4. Ceramic tube
5. Quartz sand
6. Fuse wire
7. Base contact
8. Cover for closing sand



The set for TYTAN II fuse switch disconnector consists of:

- 3 x D0 fuse link
- 3 x fuse sleeve
- box for reserve fuse links

Table 177. TYTAN II fuse sleeves

Versions	colour	Index no.	Weight [kg]	Package [pcs.]
1A set	orange	0000102601T	0,13	1/12
2A set	pink	0000102602T	0,13	1/12
4A set	brown	0000102604T	0,13	1/12
6A set	green	0000102606T	0,13	1/12
10A set	red	0000102610T	0,13	1/12
13A set	ochre	0000102613T	0,13	1/12
16A set	grey	0000102616T	0,13	1/12
20A set	blue	0000102620T	0,13	1/12
25A set	yellow	0000102625T	0,13	1/12
32A set	lilac	0000102632T	0,13	1/12
35A set	black	0000102635T	0,13	1/12
40A set	purple	0000102640T	0,13	1/12
50A set	white	0000102650T	0,13	1/12
63A set	copper	000010 2663T	0,13	1/12

TYTAN II ACCESSORIES

Set of three jumpers in sleeves in a box for mounting on a mounting rail

Table 178. TYTAN II fuse sleeves with jumpers

Versions	Index no.	Weight [kg]	Package [pcs.]
Jumper set	0002102300T	0,2	1/12

After installation in the device, the set transforms it into a switch disconnector

Lock against restarting in the mounting rail box

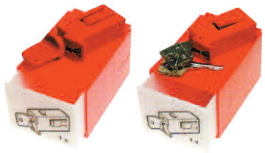


Table 179. TYTAN II fuse sleeves with jumpers

Versions	colour	Index no.	Weight [kg]	Package [pcs.]
5A5 cylindrical lock	black	0001020071T	0,09	1/12
5A4 cylindrical lock	blue	0001020072T	0,09	1/12
5A3 cylindrical lock	green	0001020073T	0,09	1/12
5A1 cylindrical lock	yellow	0001020074T	0,09	1/12
5A2 cylindrical lock	red	0001020075T	0,09	1/12
Plastic lock	black	0001020081T	0,06	1/12
Plastic lock	blue	0001020082T	0,06	1/12
Plastic lock	green	0001020083T	0,06	1/12
Plastic lock	yellow	0001020084T	0,06	1/12
Plastic lock	red	0001020085T	0,06	1/12

D01 - TYTAN® I FUSE SWITCH DISCONNECTOR

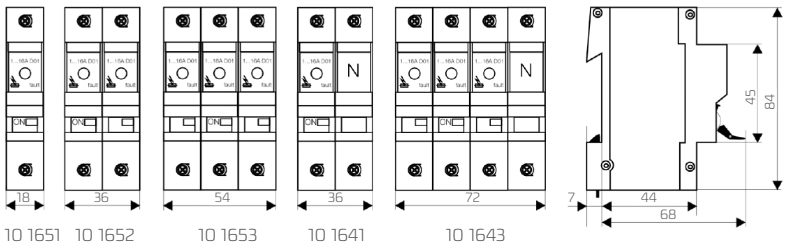
35 mm DIN rail

- flashing response indicator
- automatic coding for current values of the fuse link
- possibility of sealing

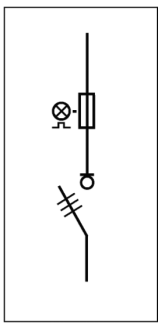
Table 180. Technical data

Classification	Fuse switch disconnector
Standard	IEC/EN 60947-3
Adapted to fuse switch disconnectors	D01: 1, 2, 4, 6, 10, 13, 16; gL, gG, aM classes
flammability class/track resistance	V0, glowing wire testing 960 °C / CTI 600
Degree of protection/touch protection	IP 20 / protection against finger and palm touch
Rated operating voltage U_e -AC -DC	 400 V 1-pole 110 V, 2-pole 220 V
Rated switching current I_e	16A
Rated impulse withstand voltage U_{imp}	6kA
Rated short-circuit current I_{cm}	50 kA_{eff}
Utilization category AC	22B
Overvoltage category/pollution degree	IV/3 (DIN VDE 0110)
Terminal type	stainless steel cage terminals 1.5...25 mm^2; MD 2.5 Nm

Dimensions



10 1651 10 1652 10 1653 10 1641 10 1643



Fuse sleeve

- it has a built-in optoelectrical flashing signalling device of the fuse response
- flashing error light replaces the unreliable mechanical indicators. As a result, a control opening is not usually required, the protective insulation remains intact
- protects the operator. When heated up to 100°C, the fuse is not directly touched by fingers during replacement

Table 181. TYTAN I Fuse switch disconnector

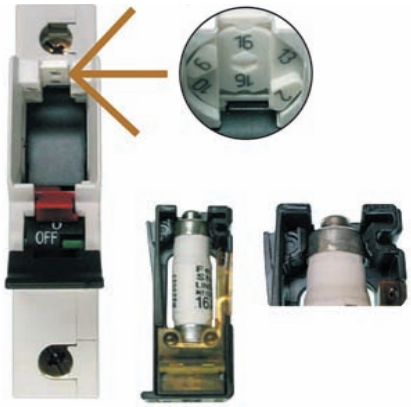
Versions	Index no.	Weight [kg]	Package [pcs.]
1-pole	0000101651T	0,09	12
2-pole	0000101652T	0,18	6
3-pole	0000101653T	0,27	4
1-pole + N	0000101641T	0,17	6
3-pole + N	0000101643T	0,35	3

Automatic coding

TYTAN® I structurally codes the power of the rated fuse current. The system is operated with one fuse sleeve for all current powers.

The coding of the maximum applicable rated fuse current in the fuse disconnector is done by setting the appropriate value on the belt pulley.

By inserting the fuse in the fuse sleeve, the coding spring is ejected depending on its rated current value.



DO - TYTAN® T FUSE SWITCH DISCONNECTOR

35 mm DIN rail

- flashing response indicator
- for DO and cylindrical 10x38 mm fuse switches
- universal fuse sleeve
- only 4TE width
- possibility of sealing

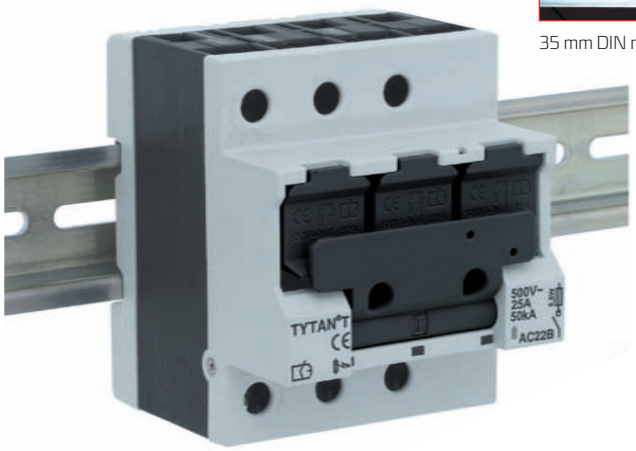


Table 182. Technical data

Classification	Fuse switch disconnector
Standard	IEC/EN 60947-3
Adapted to fuse switch disconnectors	DO1: 1, 2, 4, 6, 10, 13, 16 A DO2: 20, 25, 32, 35, 40, 50, 63 A gL, gG, aM class
Adapted to fuse switch disconnectors	Cylindrical 10x38 mm 2, 4 ,6, 8, 10, 12, 16, 20, 25, 32A
flammability class/track resistance	V0, glowing wire testing 960°C / CTI 600
Degree of protection/touch protection	IP 20 / protection against finger and palm touch
Rated operating voltage U_e	400 V AC
Rated switching current I_e	DO: 63A; 10x38: 32A
Rated impulse withstand voltage U_{imp}	6 kA
Rated short-circuit current I_{cm}	50 kA_{eff}
Utilization category AC	22B
Overvoltage category/pollution degree	IV/3 (DIN VDE 0110)
Terminal type	stainless steel cage terminals 1.5...25 mm^2; MD 3.5 Nm

Dimensions

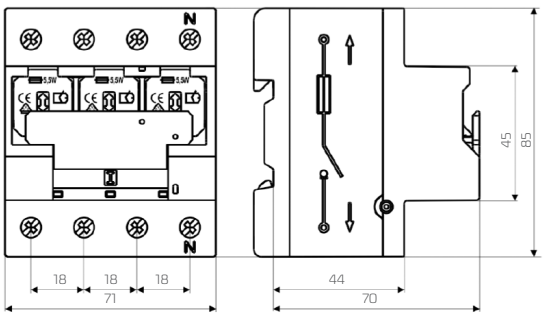


Table 183. TYTAN T Fuse switch disconnector

Versions	Index no.	Weight [kg]	Package [pcs.]
3-pole	0000104213T	0,40	3
3-pole + N	0000104215T	0,40	3
Reducing spring of the DO2 fuse sleeve to DO1 and for 10x38 mm	0000101774T	0,01	12

energy distribution

DO - CORON® 2 FUSE SWITCH DISCONNECTOR

35 mm DIN rail

- flashing response indicator
- universal fuse sleeve
- possibility of sealing
- possibility of padlocking (padlock handle up to Ø 5mm)

Table 184. Technical data

Classification	Fuse switch disconnector
Standard	IEC/EN 60947-3
Adapted to fuse switch disconnectors	DO1: 1, 2, 4, 6, 10, 13, 16 A DO2: 20, 25, 32, 35, 40, 50, 63 A gL, gG, aM class
flammability class/track resistance	V0, glowing wire testing 960 °C / CTI 600
Degree of protection/touch protection	IP 20 / protection against finger and palm touch
Rated operating voltage U_e -AC -DC	400 V 1-pole 110 V, 2-pole 220 V
Rated switching current I_e	63 A
Rated impulse withstand voltage U_{imp}	6 kA
Rated short-circuit current I_{cm}	50 kA_{eff}
Utilization category	AC 22B
Overvoltage category/pollution degree	IV/3 (DIN VDE 0110)
Terminal type	stainless steel cage terminals 1.5...35 mm^2; MD 4 Nm

Dimensions

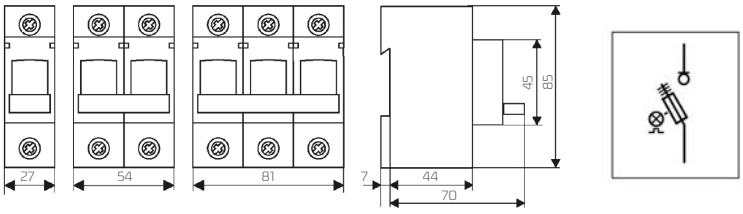


Table 185. CORON 2 Fuse switch disconnector

Versions	Index no.	Weight [kg]	Package [pcs.]
1-pole	0000104651T	0,13	12
2-pole	0000104652T	0,26	6
3-pole	0000104653T	0,40	4
1-pole + N	0000104641T	0,26	6
3-pole + N	0000104643T	0,53	3
Reducing spring of the DO2 fuse sleeve to DO1	0000104601T	0,01	12

D0-E18 FUSE SUBSTRUCTURE

35 mm DIN rail

Technical data

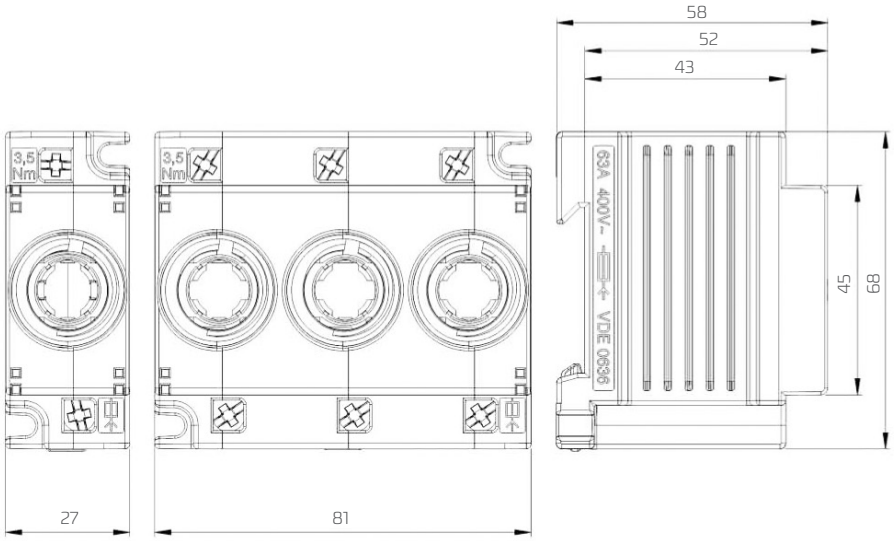
- 1 - 3 pole; DIN 49524
- for D02 fuses 63 A
- 400 V AC/250 V/DC
- mounting: DIN busbar - snap-on or board with screws
- connection terminals: stainless steel frame terminal 1.5-35 mm^2

Table 186. Versions

Versions	Index no.	Package
1-pole	0000104011T	20
3-pole	0000104013T	6

Fuse head: Table 44. Accessories
For D01-size fuse, the reduction insert no. 0000121401T must be used

Dimensions



DO FUSE LINKS

400 V~/250 V-; DIN 49522 DIN VDE 0636 IEC 60269

A snap-on spare parts container installed in the switchboard allows for immediate replacement of inserts and re-connection of the circuit.

Table 187. Fuse links in the snap-on container for the TH busbar

Versions	Index no.	Weight [kg]	Package [pcs.]
12X 2A D01 in the 1.5TE container	0000101202T	0,10	1/24
12X 4A D01 in the 1.5TE container	0000101204T	0,10	1/24
12X 6A D01 in the 1.5TE container	0000101206T	0,10	1/24
12X 10A D01 in the 1.5TE container	0000101210T	0,11	1/24
12X 13A D01 in the 1.5TE container	0000101213T	0,11	1/24
12X 16A D01 in the 1.5TE container	0000101216T	0,11	1/24
12X 20A D02 in the 3TE container	0000101220T	0,18	1/12
12X 25A D02 in the 3TE container	0000101225T	0,18	1/12
12X 32A D02 in the 3TE container	0000101232T	0,19	1/12
12X 35A D02 in the 3TE container	0000101235T	0,21	1/12
12X 40A D02 in the 3TE container	0000101240T	0,21	1/12
12X 50A D02 in the 3TE container	0000101250T	0,22	1/12
12X 63A D02 in the 3TE container	0000101263T	0,22	1/12
13x set of 12 fuse switch disconnectors The set contains all fuse switch disconnectors from the range 2..63	0000101200T	2,10	1

Table 188. Fuse links

Versions	Index no.	Weight [kg]	Package [pcs.]
D01 2A	0000100202T	0,10	50
D01 4A	0000100204T	0,10	50
D01 6A	0000100206T	0,10	50
D01 10A	0000100210T	0,11	50
D01 13A	0000100213T	0,11	50
D01 16A	0000100216T	0,11	50
D02 20A	0000100220T	0,18	50
D02 25A	0000100225T	0,18	50
D02 32A	0000100232T	0,19	50
D02 35A	0000100235T	0,21	50
D02 40A	0000100240T	0,21	50
D02 50A	0000100250T	0,22	50
D02 63A	0000100263T	0,22	50

CALIBRE INSERT

DIN 49523 DIN VDE 0636 IEC 60269

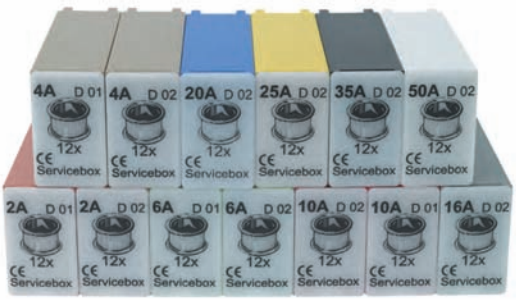


Table 189. Calibre insert in the snap-on container for the TH rail

Versions	Index no.	Weight [kg]	Package [pcs.]
12X 2A D01 in the 1.5TE container	0000101302T	0,03	1/24
12X 4A D01 in the 1.5TE container	0000101304T	0,03	1/24
12X 6A D01 in the 1.5TE container	0000101306T	0,03	1/24
12X 10A D01 in the 1.5TE container	0000101310T	0,03	1/24
12X 2A D02 in the 3TE container	0000101402T	0,03	1/24
12X 4A D02 in the 3TE container	0000101404T	0,03	1/24
12X 6A D02 in the 3TE container	0000101406T	0,03	1/24
12X 10A D02 in the 3TE container	0000101410T	0,03	1/24
12X 16A D02 in the 3TE container	0000101416T	0,03	1/24
12X 20A D02 in the 3TE container	0000101420T	0,03	1/24
12X 25A D02 in the 3TE container	0000101425T	0,03	1/24
12X 35A D02 in the 3TE container	0000101435T	0,03	1/24
12X 50A D02 in the 3TE container	0000101450T	0,03	1/24
Full set of 13x12 calibre inserts from the range 2-50 A	0000101300T	0,39	1

Table 190. Calibre insert

Versions	Index no.	Weight [kg]	Package [pcs.]
D01 E14 2A	0000100302T	0,001	50
D01 E14 4A	0000100304T	0,001	50
D01 E14 6A	0000100306T	0,001	50
D01 E14 10A	0000100310T	0,001	50
D02 E18 2A	0000100402T	0,001	50
D02 E18 4A	0000100404T	0,001	50
D01 E18 6A	0000100406T	0,001	50
D01 E18 10A	0000100410T	0,001	50
D01 E18 16A	0000100416T	0,001	50
D01 E18 20A	0000100420T	0,001	50
D01 E18 25A	0000100425T	0,001	50
D01 E18 35A	0000100435T	0,001	50
D01 E18 50A	0000100450T	0,001	50

Table 191. Accessories

Versions	Index no.	Weight [kg]	Package [pcs.]
Key for mounting the calibre insert	0000101400T	0,02	1/12
Plastic D02 fuse head with a measuring hole	0000126024T	0,01	20
Reduction insert for fuse switch disconnectors D01	0000121401T	0,01	20
Porcelain D02 fuse head with a measuring hole	0000127024T	0,01	20
Porcelain D01 fuse head with a measuring hole	0000127025T	0,01	20

0000121401T

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