



# 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
- remote monitoring
- built-in current transformers
- adapted to existing assembly systems
- reversibility - top/bottom cable terminal connection
- wide range of accessories

## GENERAL INFORMATION

**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 switchgear 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 thermoplastics 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 accessories enable to install **smartARS pro** fuse switch disconnectors of different sizes on common busbar systems and facilitate operation. All sizes of **smartARS pro** fuse switch disconnectors are provided complete with clamps (i. e. screws, V-terminals, 2Vterminals) and shrouds for cable terminals.

## smartARS-X pro

Vertical fuse switch disconnecter with fuse monitoring module



smartARS 2-6-V-X pro

### Applications

The fuse switch disconnecter can be equipped with a device that allows indication of the current state of the fuse links. Information about fuse link burnout, correct operation or power failure is 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 burnout
- diode is red; blinking – phase shift (another phase voltage was detected at the fuse link outgoing contact)
- diodes off – no power supply

### Nominal parameters

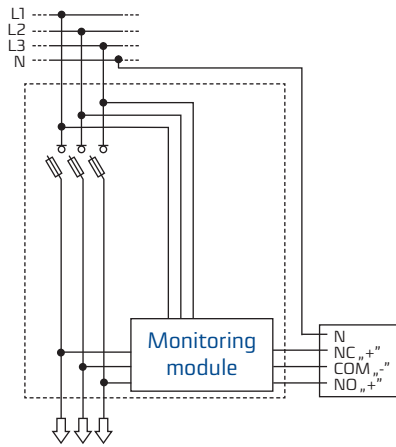
- Voltage value for cable test 2,5 kV DC
- Minimum operating voltage 200 V
- Maximum operating voltage 450 V
- $U_{imp}$  impulse withstand voltage with operated fuse link 4 kV
- $U_{imp}$  between phases 4 kV
- $U_{imp}$  between main circuit / relay contacts 3,5 kV
- Temperature range -40...+85°C
- Rated insulation voltage  $U_i$  1000 V

Table 9. Technical data

Parameters		smartARS 00-X pro	smartARS 2-X pro	smartARS 3-X pro
Rated thermal current $I_{th}$ with knife-blade fuses	A	160	250 (NH1), 400 (NH2)	630
Rated thermal current $I_{th}$ with knife links	A	210	600	750
Rated insulation voltage $U_n$	V	500	500	500
Rated insulation voltage	-	AC-22B	AC-22B	AC-22B
Rated switching voltage $U_e$	V	690	500	500
Rated switching current $I_e$	A	160	250 (NH1), 400 (NH2)	630
Rated short circuit making current	$U_e=690\text{ V}$ $U_e=500\text{ V}$ kA	80 100	100 120	80 120
Rated short circuit withstand current	$U_e=690\text{ V}$ $U_e=500\text{ V}$ kA	80 100	100 120	100
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	connecting cycles	200	200	200
IP degree of protection	-	30	30	30
Size of fuse links	-	00	1,2	3

## FUSE SWITCH DISCONNECTOR WITH LATERAL BUSBAR TERMINALS

smartARS 00-X-E pro – connection diagram



Fuse monitoring module:

- information about the blown fuse links
- information about correct work
- version with communication output, NO NC contact

### 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

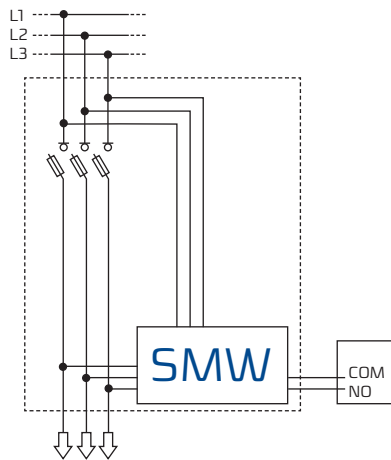
### smartARS 2-X pro, smartARS 3-X pro

– connection diagram

### Module outputs:

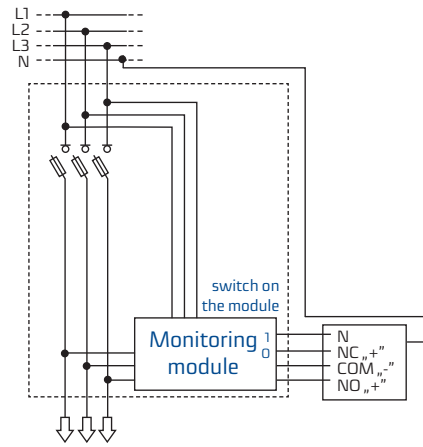
Rated current 100 mA

Maximum switching voltage 50 V DC



smartARS 00-X pro

– connection diagram (version with a switch)



The module is equipped with a single-pole switch responsible for fuse monitoring module:

I – module turned on

O – module switched off

Signaling of blown fuse - **output communication NO, NC contact**

### Switch operation states

O – the device is in the reserve field

O – the switch disconnecter is without fuse links

I – basic operating status of a switch disconnecter with fuse links

Fuse state (resultant)	NO output	NC output	diode colour
Correct operation	„0” (0 V)	„1” (24 V)	green
Failure	„1” (24 V)	„0” (0 V)	red

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

### SMW module

- phase-to-phase powered module
- communication output: normally open NO contact

Fuse state (resultant)	NO output	diode colour
Correct operation	„0”	green
Failure	„1”	red

Table 10. smartARS 00-X pro, smartARS 2-X pro, smartARS 3-X pro terminal clamps

Description	smartARS 00-X pro	
Clamp	V-clamp 25-150 SW	HM 10-120
Drawing of clamp		
Cross-section of conductors	re ● 16 mm <sup>2</sup> - 95 mm <sup>2</sup>	re ● 10 mm <sup>2</sup> - 70 mm <sup>2</sup>
	se ◆ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>	se ◆ 25 mm <sup>2</sup> - 120 mm <sup>2</sup>
	rm ⊗ 16 mm <sup>2</sup> - 95 mm <sup>2</sup>	rm ⊗ 10 mm <sup>2</sup> - 70 mm <sup>2</sup>
	sm ⊕ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>	sm ⊕ 25 mm <sup>2</sup> - 95 mm <sup>2</sup>
Tightening torque	20 Nm*	15 Nm*

For stranded conductors using cable ferrules is recommended.

\*) using tension wrench is recommended

\*\*) if the fuse switch disconnecter with a V-type clamp is to be equipped with a steel V-clamp HM 10-120, it should be included in the order. Apator takes responsibility for technical quality of V-terminals manufactured only by the company.

Description	smartARS 2-x-V-X pro smartARS 3-x-V-X pro	smartARS 2-x-2V-X pro smartARS 3-x-2V-X pro	smartARS 2-x-2V-X pro smartARS 3-x-2V-X pro	smartARS 2-x-M-X pro smartARS 3-x-M-X 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 of bare end with cross-section of:			
	35 - 185 mm <sup>2</sup> ⊗	35 - 240 mm <sup>2</sup> ●	50 - 185 mm <sup>2</sup> ⊗	50 - 240 mm <sup>2</sup> ●
	35 - 240 mm <sup>2</sup> ⊕	35 - 300 mm <sup>2</sup> ◆	50 - 240 mm <sup>2</sup> ⊕	50 - 300 mm <sup>2</sup> ◆
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended.

\*) fuse switch disconnectors with 2V-terminals are equipped with steel V-clamp HS 2/35-240-C on request

\*\*) 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 screw fixing fuse switch disconnecter to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

Table 11. Versions with electronic fuse monitoring module (SMW version)

Version	Weight	Article no.
<b>Disconnectors smartARS 00-X pro - 160 A</b>		
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>		
smartARS 00-1-V-X-E pro cable terminal; V-terminals; V-clamp 25-150 SW + hook clamps	3,1 kg	63-001606-201
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 00-3-V-X pro cable terminal; V-terminals; V-clamp 25-150 SW	3,1 kg	63-001358-021
<b>Disconnectors smartARS 2-X pro - 400 A</b>		
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 2-1-V-X pro cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	5,9 kg	63-200400-461
smartARS 2-1-M-X pro cable terminals: pressed nuts M12	5,8 kg	63-200400-463
smartARS 2-1-2V-X pro cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	6,5 kg	63-200400-465
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 2-6-V-X pro cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	5,9 kg	63-200401-461
smartARS 2-6-M-X pro cable terminals: pressed nuts M12	5,8 kg	63-200401-463
smartARS 2-6-2V-X pro cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	6,5 kg	63-200401-465
<b>Disconnectors smartARS 3-X pro - 630 A</b>		
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>		
smartARS 3-1-V-X pro cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,7 kg	63-200400-462
smartARS 3-1-M-X pro cable terminals: pressed nuts M12	6,6 kg	63-200400-464
smartARS 3-1-2V-X pro cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,3 kg	63-200400-466
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 3-6-V-X pro cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,7 kg	63-200401-462
smartARS 3-6-M-X pro cable terminals: pressed nuts M12	6,6 kg	63-200401-464
smartARS 3-6-2V-X pro cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,3 kg	63-200401-466

## smartARS-XT pro

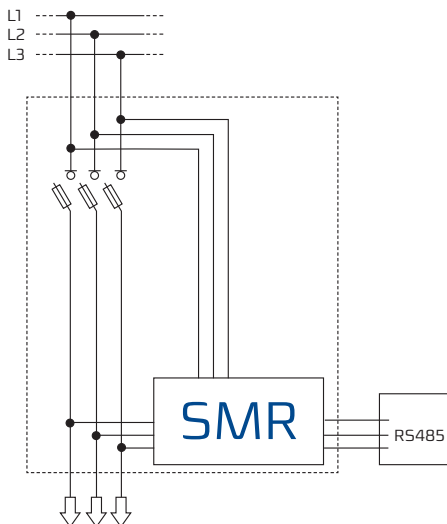
Vertical fuse switch disconnecter with fuse monitoring module



smartARS 2-6-V-XT pro

### Module outputs:

Communication protocol RS 485  
MODBUS communication protocol



### Moduł SMR

- wyjście komunikacyjne
- złącze RS485 (komunikacja z wykorzystaniem protokołu MODBUS)

### Applications

The fuse switch disconnecter 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 an automation protection system, directly from the module through the RS485 communication module.

### Description of operation of the fuse monitoring module

- diode is green - correct operation, all fuse links work correctly
- diode is red - failure, fuse link burnout
- 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

### 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

Table 12. Technical data

Parametr		smartARS 2-XT pro	smartARS 3-XT pro
Rated thermal current $I_{th}$ with knife-blade fuses	A	250 (NH1), 400 (NH2)	630
Rated thermal current $I_{th}$ with knife links	A	600	750
Rated insulation voltage $U_n$	V	500	500
Rated insulation voltage	-	AC-22B	AC-22B
Rated switching voltage $U_e$	V	500	500
Rated switching current $I_e$	A	250 (NH1), 400 (NH2)	630
Rated short circuit making current	$U_e=690$ V	100	80
	$U_e=500$ V	120	120
Rated short circuit withstand current	$U_e=690$ V	100	100
	$U_e=500$ V	120	100
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	connecting cycles	200	200
IP degree of protection	-	30	30
Size of fuse links	-	1,2	3

Table 13. smartARS 2-XT pro, smartARS 3-XT pro terminal clamps

Description	smartARS 2-x-V-XT pro smartARS 3-x-V-XT pro	smartARS 2-x-2V-XT pro smartARS 3-x-2V-XT pro	smartARS 2-x-2V-XT pro smartARS 3-x-2V-XT pro	smartARS 2-x-M-XT pro smartARS 3-x-M-XT pro
	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 of bare end with cross-section of:			Lug terminal
	35 - 185 mm <sup>2</sup> 35 - 240 mm <sup>2</sup>	50 - 185 mm <sup>2</sup> 50 - 240 mm <sup>2</sup>	50 - 185 mm <sup>2</sup> 50 - 240 mm <sup>2</sup>	
	35 - 240 mm <sup>2</sup> 35 - 300 mm <sup>2</sup>	50 - 240 mm <sup>2</sup> 50 - 300 mm <sup>2</sup>	50 - 240 mm <sup>2</sup> 50 - 300 mm <sup>2</sup>	
Tightening torque	30 Nm	30 Nm	40 Nm	56 Nm

For stranded conductors using cable ferrules is recommended.

\*) fuse switch disconnectors with 2V-terminals are equipped with steel V-clamp HS 2/35-240-C on request

\*\*) 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 screw fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

Table 14. Versions with electronic fuse monitoring module (SMR version)

Version	Weight	Article no.
<b>Disconnectors smartARS 2 pro – 400A</b>		
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>		
smartARS 2-1-V-XT pro	cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	5,9 kg 63-200400-561
smartARS 2-1-M-XT pro	cable terminals: pressed nuts M12	5,8 kg 63-200400-563
smartARS 2-1-2V-XT pro	cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	6,5 kg 63-200400-565
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 2-6-V-XT pro	cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	5,9 kg 63-200401-561
smartARS 2-6-M-XT pro	cable terminals: pressed nuts M12	5,8 kg 63-200401-563
smartARS 2-6-2V-XT pro	cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	6,5 kg 63-200401-565
<b>Disconnectors smartARS 3 pro - 630 A</b>		
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>		
smartARS 3-1-V-XT pro	cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,7 kg 63-200400-562
smartARS 3-1-M-XT pro	cable terminals: pressed nuts M12	6,6 kg 63-200400-564
smartARS 3-1-2V-XT pro	cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,3 kg 63-200400-566
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>		
smartARS 3-6-V-XT pro	cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,7 kg 63-200401-562
smartARS 3-6-M-XT pro	cable terminals: pressed nuts M12	6,6 kg 63-200401-564
smartARS 3-6-2V-XT pro	cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,3 kg 63-200401-566

# Vertical fuse switch disconnector smartARS P pro with current transformers

Disconnectors adjusted to current metering



smartARS 2-6-M P pro



smartARS 2-6-M P pro



smartARS 3-6-V SMP pro

Table 15. Technical data

Parameters	smartARS 2 P pro			smartARS 3 P pro		
		AC-22B	AC-23B	AC-23B	AC-22B	AC-21B
Rated thermal current I <sub>th</sub> with knife-blade fuses	A	250(NH1), 400(NH2)		630		
Rated thermal current I <sub>th</sub> with knife links	A	600		750		
Rated insulation voltage U <sub>n</sub>	V	690		690		
Utilisation category	-	AC-22B	AC-23B	AC-23B	AC-22B	AC-21B
Rated switching voltage U <sub>e</sub>	V	690	400	400	500	690
Rated switching current I <sub>e</sub>	A	250(NH1), 400(NH2)		630		
Rated short circuit making current	U <sub>e</sub> =690 V	kA	100		80	
	U <sub>e</sub> =500 V		120		120	
Rated short circuit withstand current	U <sub>e</sub> =690 V	kA	100		100	
	U <sub>e</sub> =500 V		120		120	
Rated insulation voltage U <sub>i</sub>	V	1000		1000		
Rated impulse withstand voltage U <sub>imp.</sub>	kV	12		12		
Rated frequency	Hz	50-60		50-60		
Mechanical durability	c.p.	1000		1000		
Electrical durability	c.†.	200		200		
IP degree of protection	-	30		30		
Size of fuse links	-	1,2		3		

Transformers used for current metering in **smartARS P pro** disconnectors 160 A, 400 A and 630 A are incorporated in the base of the device and do not increase its size, it makes it possible to save space in a switchgear a cabinet.

Technical parameters of the applied transformers:

- in smartARS 00 P pro - 150/5/0,5S/2,5VA
- in smartARS 2 P pro – 400/5/0.5s 2.5VA
- in smartARS 3 P pro – 600/5/0.5s 2.5VA

Disconnectors have contact terminals enabling connecting signal cables from transformers.

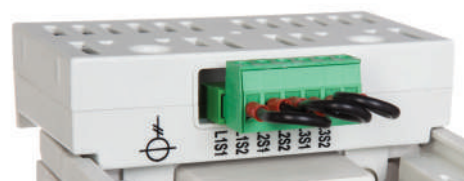



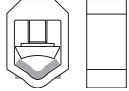


Table 16. Versions

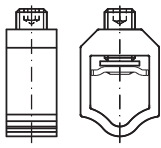
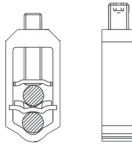
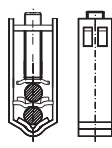

Version		Weight	Article no.
<b>Disconnectors smartARS 00 P pro - 160A</b>			
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>			
smartARS 00-3-V P pro	Cable terminal; V-terminals; V-clamp 25-150 SW	3,1 kg	63-001415-301
smartARS 00-3-M P pro	Cable terminals: M8 screw terminals	3 kg	63-001415-302
<b>Disconnectors smartARS 2 P pro – 400 A</b>			
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>			
smartARS 2-1-V P pro	Cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,8	63-001340-301
smartARS 2-1-M P pro	Cable terminals: pressed nuts M12	6,7	63-001340-303
smartARS 2-1-2V P pro	Cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,4	63-001340-305
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>			
smartARS 2-6-V P pro	Cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	6,8	63-001341-301
smartARS 2-6-M P pro	Cable terminals: pressed nuts M12	6,7	63-001341-303
smartARS 2-6-2V P pro	Cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	7,4	63-001341-305
<b>Disconnectors smartARS 3 P pro – 630 A</b>			
<b>Installation on to 185 mm busbar system; ONE-POLE SWITCHING - each phase independently</b>			
smartARS 3-1-V P pro	Cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	7,6	63-001340-302
smartARS 3-1-M P pro	Cable terminals: pressed nuts M12	7,5	63-001340-304
smartARS 3-1-2V P pro	Cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	8,2	63-001340-306
<b>for installation on 185 mm busbar system, THREE POLE SWITCHING - all phases simultaneously</b>			
smartARS 3-6-V P pro	Cable terminal; V-terminals; V-clamp 240 mm <sup>2</sup>	7,6	63-001341-302
smartARS 3-6-M P pro	Cable terminals: pressed nuts M12	7,5	63-001341-304
smartARS 3-6-2V P pro	Cable terminal; 2V-terminals; double V-clamps 240 mm <sup>2</sup>	8,2	63-001341-306

The above versions are sold without bolts to install the device on a busbar. Versions of disconnectors with incorporated quick-assembly modules are available e.g. smartARS 3-6-M SMP pro 63-001341-904.

Table 17. smartARS 2 P pro and smartARS 3 P pro terminal clamps

Description		smartARS 00 P pro	
Clamp	M8 screw*	V-clamp 25-150 SW	
Picture of clamp			
Drawing of clamp			
Cross-section of conductors	Conductor with lug terminal max. 185 mm <sup>2</sup>	re ● 16 mm <sup>2</sup> - 95 mm <sup>2</sup>	rm ● 16 mm <sup>2</sup> - 95 mm <sup>2</sup>
		se ◊ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>	sm ◊ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>
Tightening torque	12 Nm**	20 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

Description	smartARS 2-x-V P pro smartARS 3-x-V P pro	smartARS 2-x-2V P pro smartARS 3-x-2V P pro	smartARS 2-x-2V P pro smartARS 3-x-2V P pro	smartARS 2-x-MP pro smartARS 3-x-MP 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 of bare end with cross-section of:				Lug terminal		
	35 - 185 mm <sup>2</sup> ◊	35 - 240 mm <sup>2</sup> ●	50 - 185 mm <sup>2</sup> ◊	50 - 240 mm <sup>2</sup> ●		50 - 185 mm <sup>2</sup> ◊	50 - 240 mm <sup>2</sup> ●
Tightening torque	30 Nm		30 Nm		40 Nm	56 Nm	

For stranded conductors using cable ferrules is recommended.

\*) fuse switch disconnectors with 2V-terminals are equipped with steel V-clamp HS 2/35-240-C on request

\*\*) 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 screw fixing fuse switch disconnector to busbar system – 32 Nm, recommended tightening torque for screws and nuts with property class 8.8 – 56 Nm.

## New smartARS pro-PV AC 800 V

A safe step into the future with Apator



smartARS 00  
pro-PV



smartARS 2  
pro-PV



smartARS 3  
pro-PV

The new switch fuse disconnecter smartARS in the AC800V product line is a device which has been developed to meet the needs and requirements of the future.

Solar power systems and a new generation of inverters are assembled on AC800V correctly and safely under load. In the future AC800V will be extended by the smartARS family; moreover, it can be modified to facilitate the digitization of the energy transition.

High-quality materials and years of experience of APATOR Group in the NH disconnectors sector ensure excellent cost-benefit ratio.





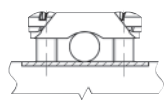
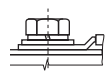
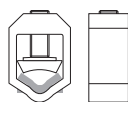
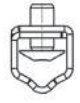
Table 18. Technical data

Parameter			smartARS 00 pro-PV	smartARS 2 pro-PV	smartARS 3 pro-PV
For NH fuse-links acc. to DIN VDE 0636-2	Size		00	1, 2	3
Rated operational voltage	$U_e$	V	AC800	AC800	AC800
Rated operational current	$I_e$	A	80	200	400
Conv. free air thermal current with fuse-links	$I_{th}$	A	80	200	400
Rated frequency	f	Hz	50 - 60	50 - 60	50 - 60
Rated insulation voltage	$U_i$	V	AC1000	AC1000	AC1000
Rated impulse withstand voltage	$U_{imp}$	kA	8	12	12
Utilization category			AC21B 80 A/ 800 V	AC21B 200 A/800 V	AC21B 400 A/ 800 V
Fuse protected short circuit withstand		kA	100 <sup>1)</sup>	120 <sup>1)</sup>	120 <sup>1)</sup>
Fuse protected short circuit making		kA	100 <sup>1)</sup>	120 <sup>1)</sup>	120 <sup>1)</sup>
Max. permis. power loss per fuse-link	$P_a$	W	11	21	41
Pollution degree			3	3	3
IP degree of protection		IP		30	
Ambient temperature		°C		-25 °C to + 55 °C	
Attitude		m		up to 2000 meters above sea level	
Busbar system		mm		for installation on 185 mm busbar system	
Actuation		-		manual	
Rated operating mode		-		continuous operation	

Table 19. Versions

Version		Weight	Article No.
<b>for installation on to 185 mm busbar system, three pole switching - all phases simultaneously</b>			
smartARS 00-3 pro-PV	cable terminals: bridge terminals with bridge clamps (5) 4-70mm <sup>2</sup> , screw terminals with M8 screws	2,5 kg	63-073821-001
smartARS 00-3-V pro-PV	cable terminals: V-terminals with V-clamps 25-150 SW	2,6 kg	63-073821-002
smartARS 2-6-V pro-PV	cable terminals: V-terminals with V-clamps 240 mm <sup>2</sup>	5,8 kg	63-073822-001
smartARS 3-6-V pro-PV	cable terminals: V-terminals with V-clamps 240 mm <sup>2</sup>	6,6 kg	63-073822-002
smartARS 2-6-M pro-PV	cable terminals: screw terminals with pressed nuts M12	5,7 kg	63-073822-003
smartARS 3-6-M pro-PV	cable terminals: screw terminals with pressed nuts M12	6,5 kg	63-073822-004
smartARS 2-6-2V pro-PV	cable terminals: 2V-terminals with double V-clamps 240 mm <sup>2</sup>	6,4 kg	63-073822-005
smartARS 3-6-2V pro-PV	cable terminals: 2V-terminals with double V-clamps 240 mm <sup>2</sup>	7,2 kg	63-073822-006

**Table 20. smartARS 00 pro-PV terminal clamps**

Description	smartARS 00 pro-PV			
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 mm <sup>2</sup>	Lug terminal max 185 mm <sup>2</sup>	re ● 16 mm <sup>2</sup> - 95 mm <sup>2</sup>	re ● 10 mm <sup>2</sup> - 70 mm <sup>2</sup>
			se ◆ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>	se ◆ 25 mm <sup>2</sup> - 120 mm <sup>2</sup>
			rm ⊗ 16 mm <sup>2</sup> - 95 mm <sup>2</sup>	rm ⊗ 10 mm <sup>2</sup> - 70 mm <sup>2</sup>
			sm ⊕ 25 mm <sup>2</sup> - 150 mm <sup>2</sup>	sm ⊕ 25 mm <sup>2</sup> - 95 mm <sup>2</sup>
Tightening torque	3 Nm**	12 Nm**	20 Nm**	15 Nm**

For stranded conductors using cable ferrules is recommended

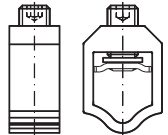
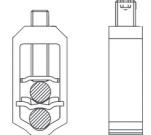
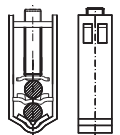

\*) bars of maximum width of 20 mm and maximum thickness of 5 mm can be fixed to M type screw terminals

\*\*\*) 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.

**Table 21. smartARS 2,3 pro-PV terminal clamps**

Description	smartARS 2,3-x-V pro-PV	smartARS 2,3-x-2V pro-PV	smartARS 2,3-x-2V pro-PV	smartARS 2,3-x-M pro-PV
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			
	35 - 185 mm <sup>2</sup> ⊗	35 - 240 mm <sup>2</sup> ●	50 - 185 mm <sup>2</sup> ⊗	50 - 240 mm <sup>2</sup> ●
35 - 240 mm <sup>2</sup> ⊕	35 - 300 mm <sup>2</sup> ◆	50 - 240 mm <sup>2</sup> ⊕	50 - 300 mm <sup>2</sup> ◆	
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.

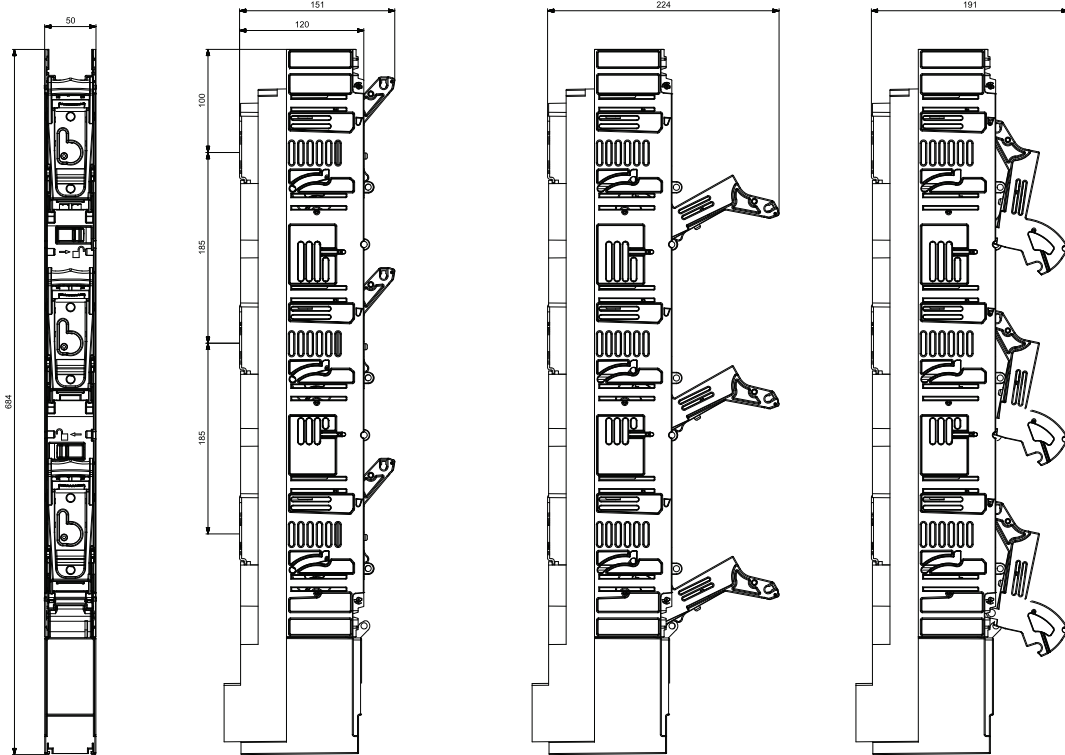
DIMENSIONS

ARS 00-1 evo

CLOSED POSITION

OPEN POSITION

PARKING POSITION

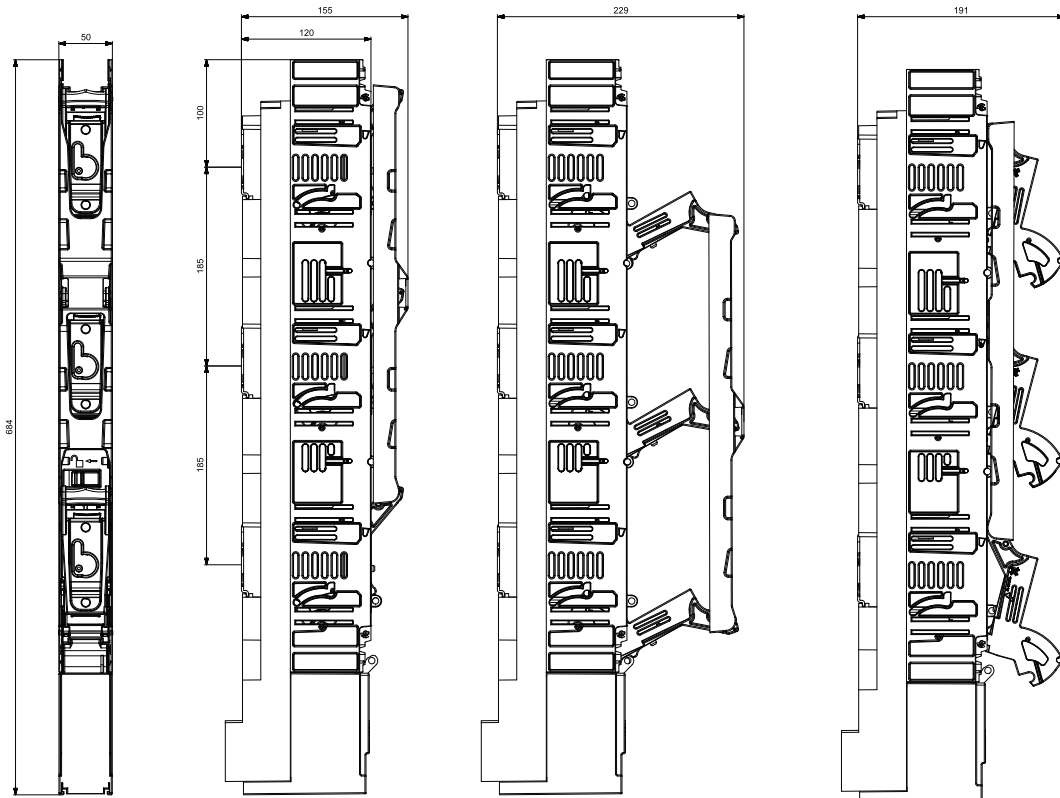


ARS 00-3 evo

CLOSED POSITION

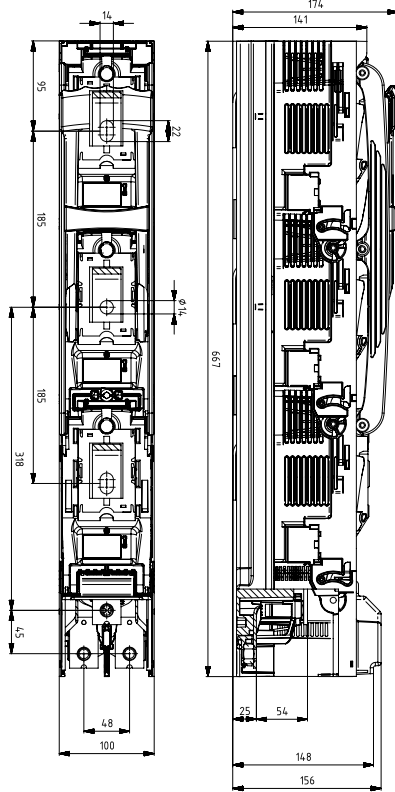
OPEN POSITION

PARKING POSITION

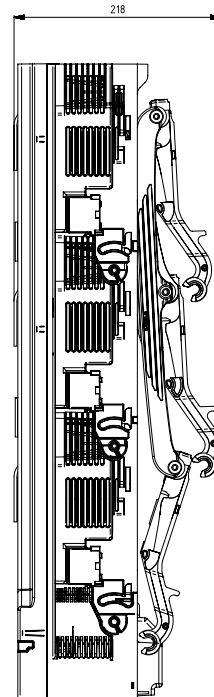


ARS 2-6-M evo, ARS 3-6-M evo

CLOSED POSITION

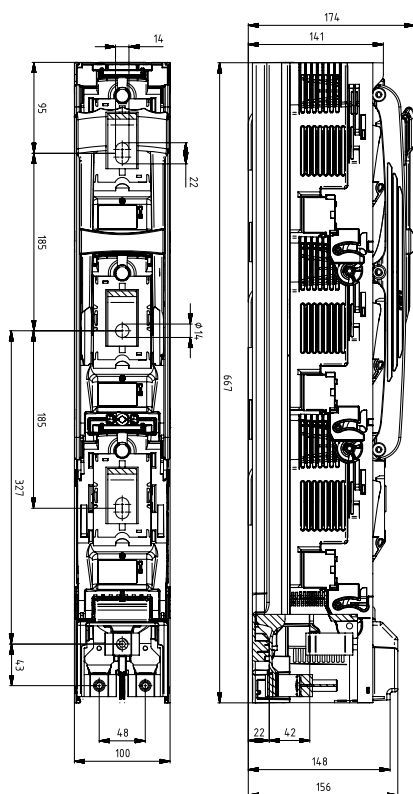


PARKING POSITION

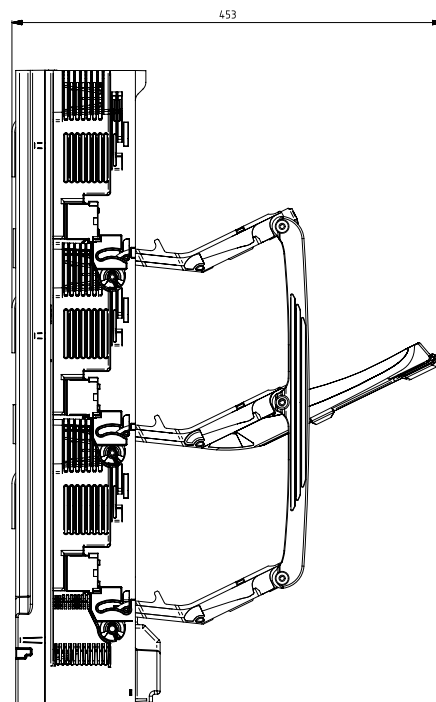


ARS 2-6-V evo, ARS 3-6-V evo

CLOSED POSITION



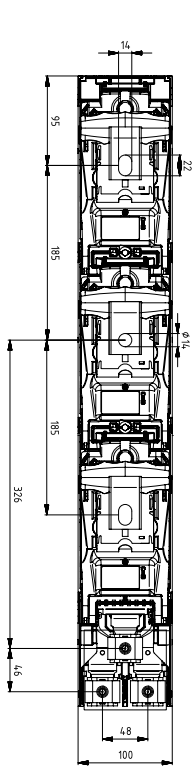
OPEN POSITION



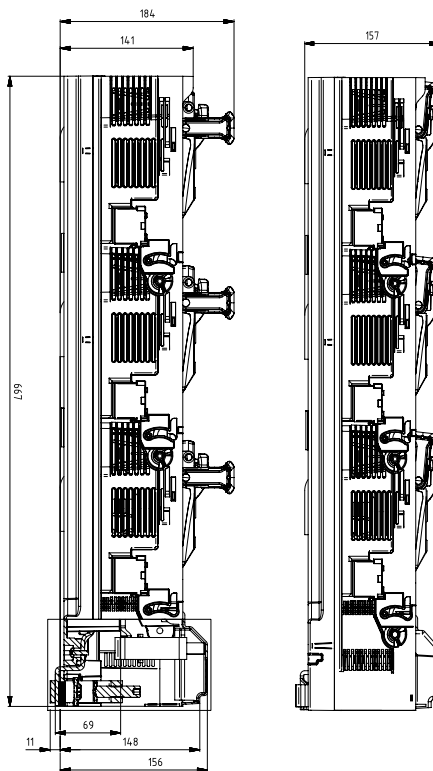
ARS 2-1-2V evo, ARS 3-1-2V evo

ARS 2,3 evo 210

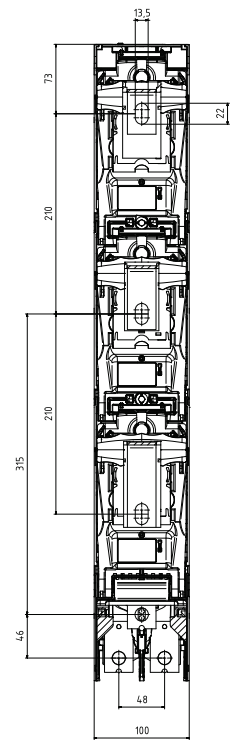
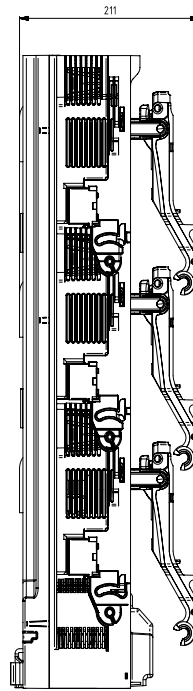
CLOSED POSITION



CLOSED POSITION WITH RETRACABLE HANDLES

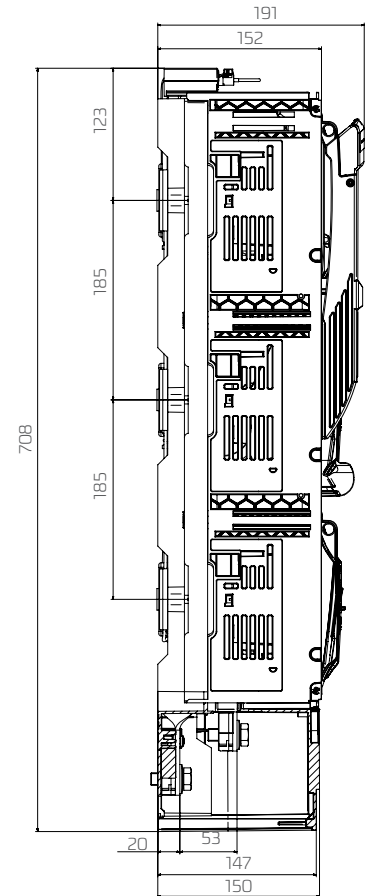
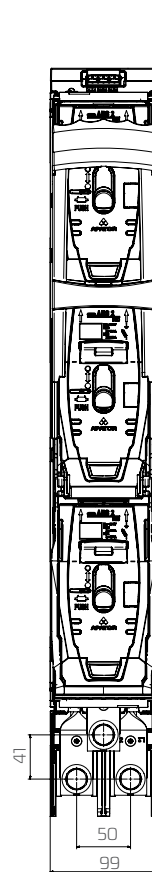
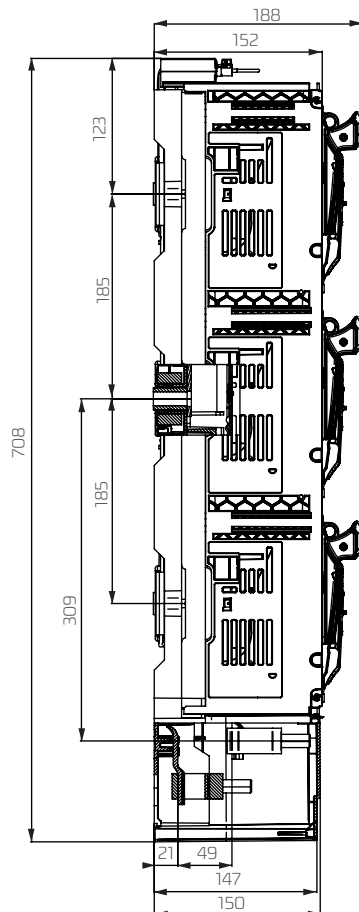
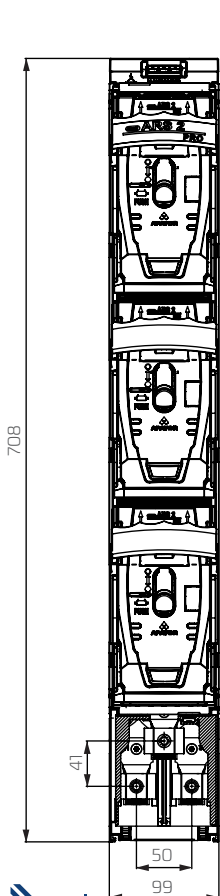


PARKING POSITION

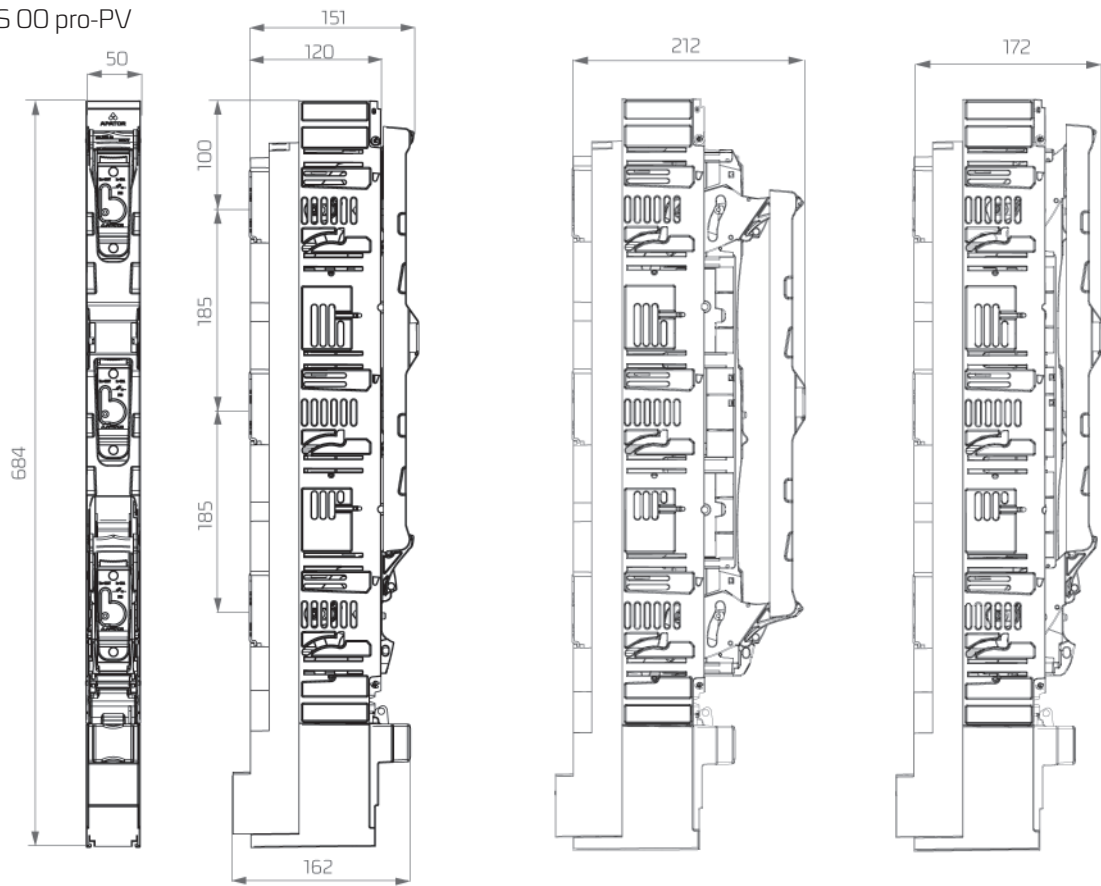


smartARS 2 P pro, smartARS 3 P pro  
1-phase

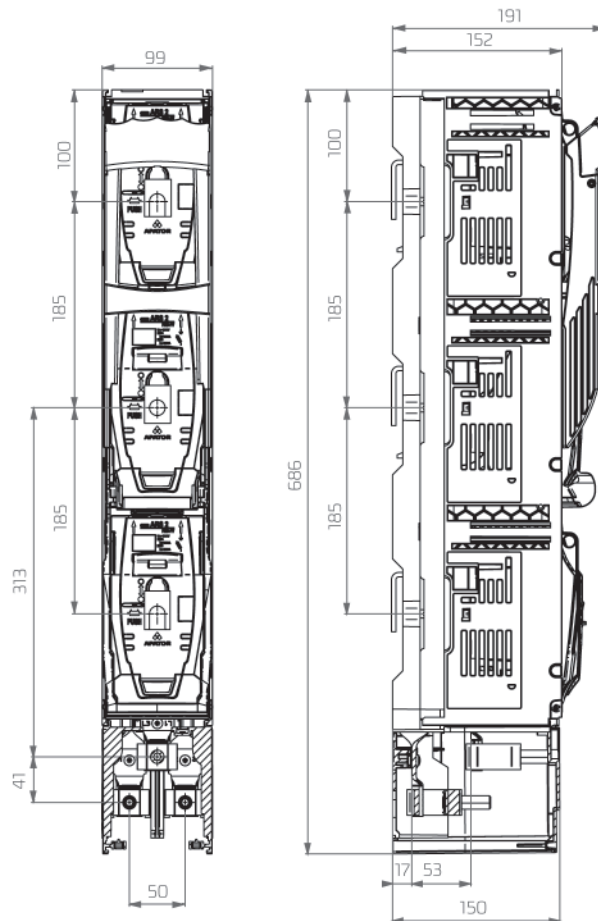
3-phase



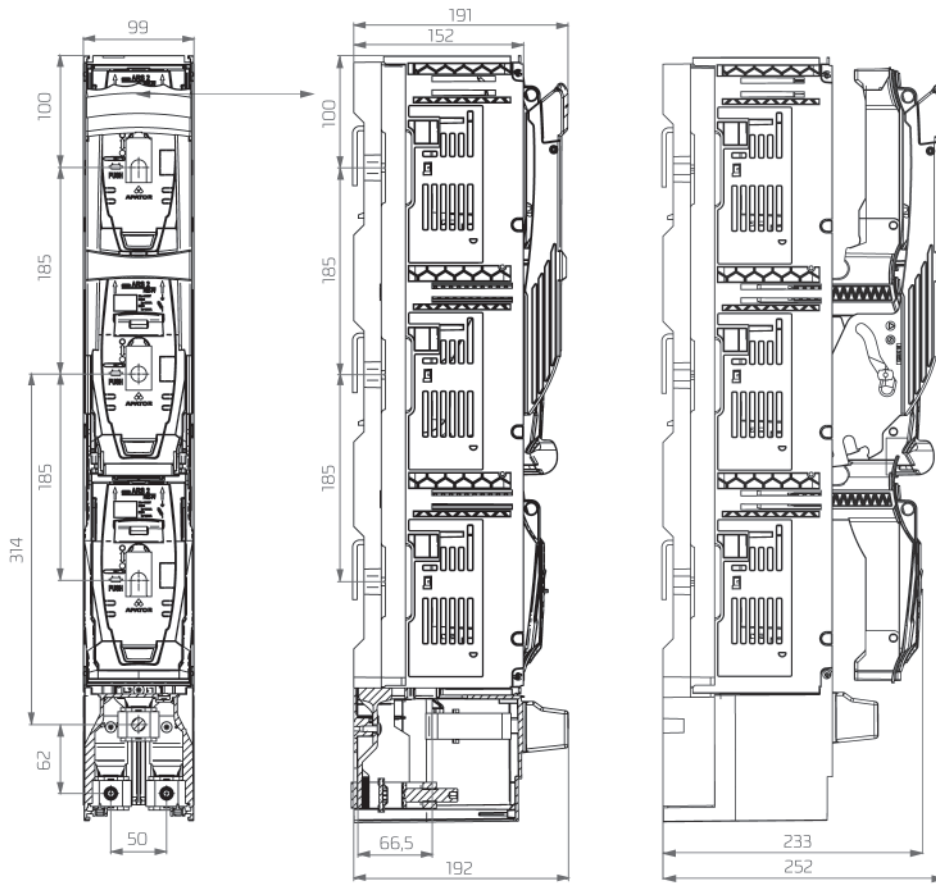
smartARS 00 pro-PV



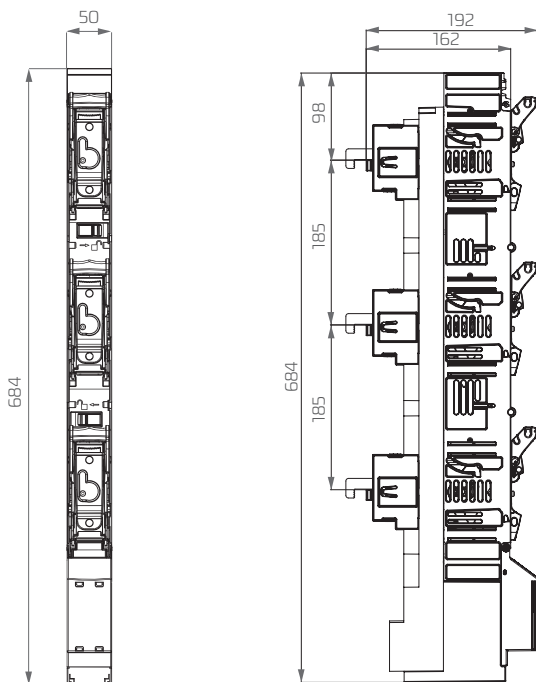
smartARS 2,3 -M,-V pro-PV



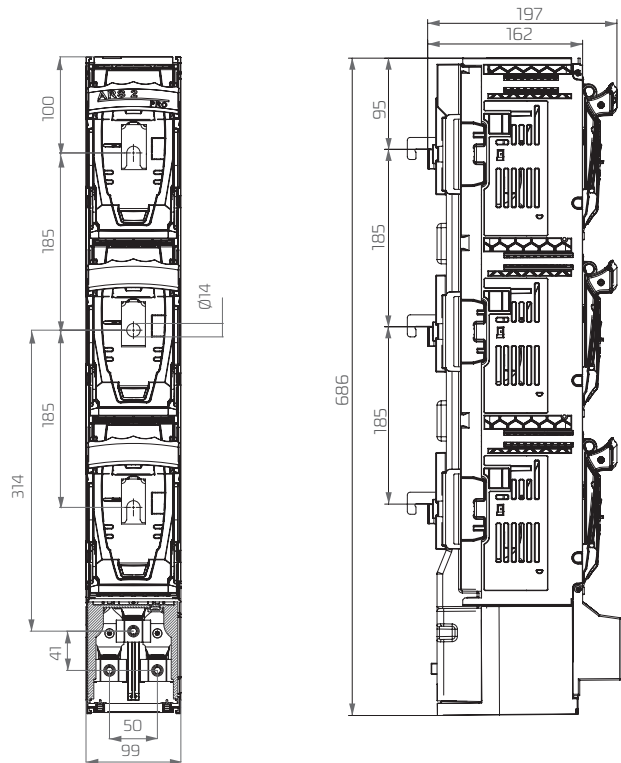
smartARS 2,3 -2V pro-PV



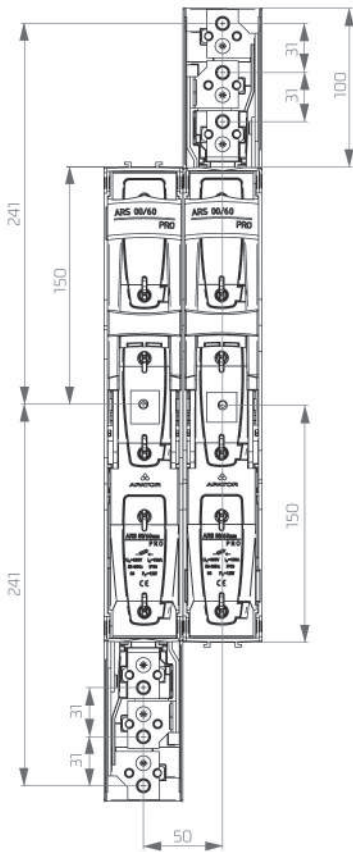
smartARS 00-W-H pro



smartARS 2,3-H pro

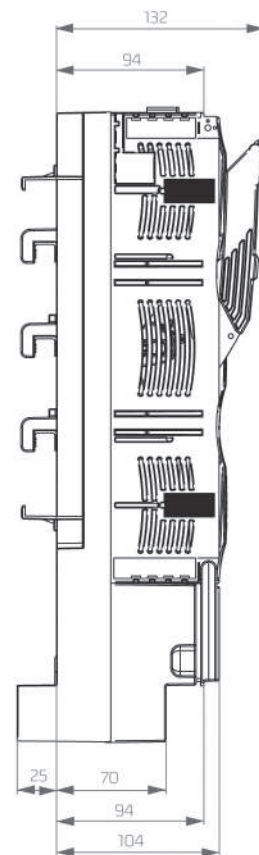
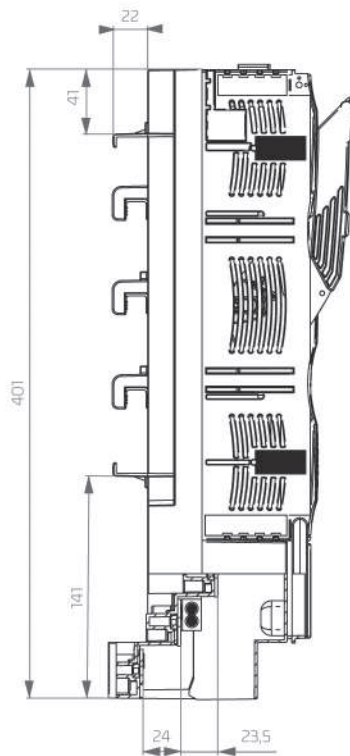
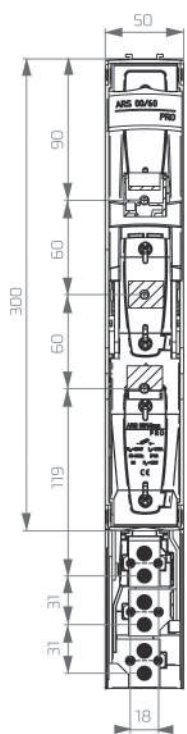
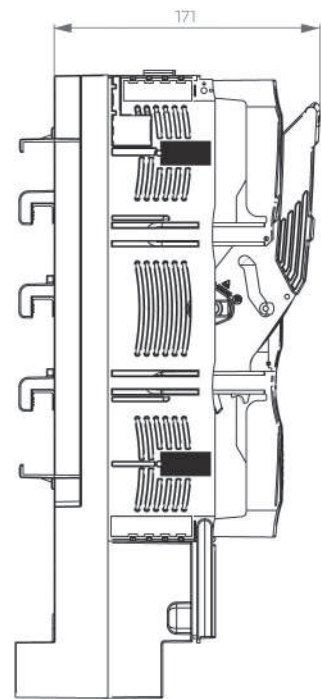
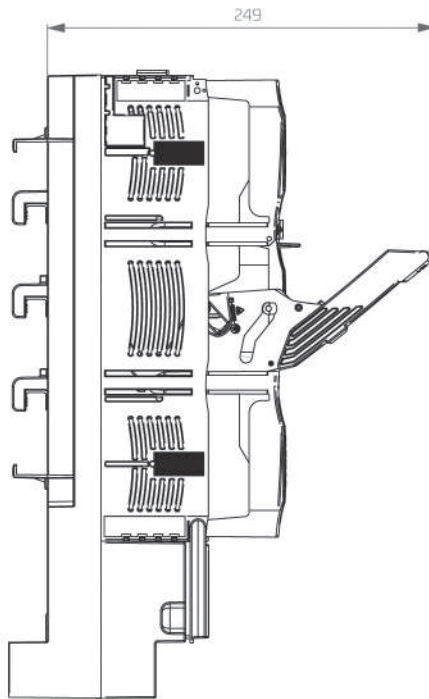


ARS 00/60 mm pro

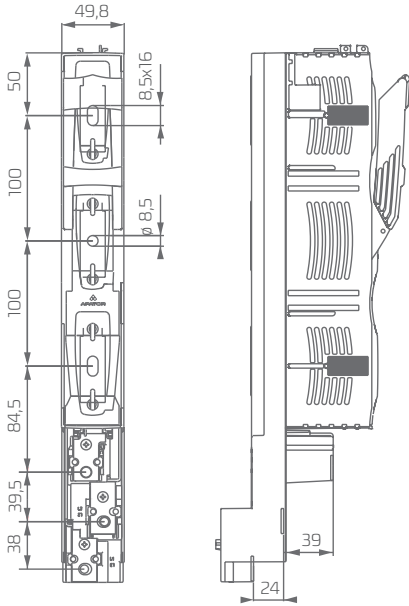


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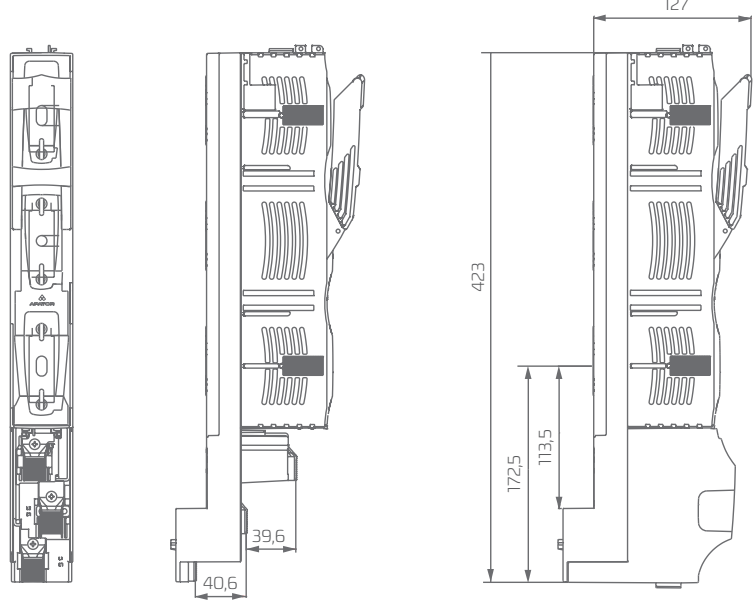
PARKED



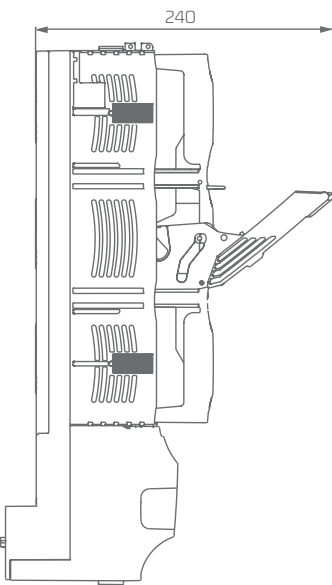
ARS 00/100 mm, ARS 00/100 mm pro



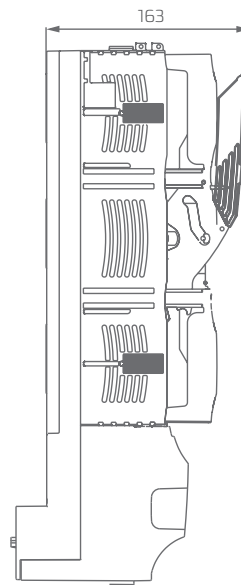
CLOSED



OPENED



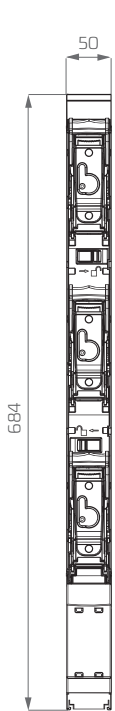
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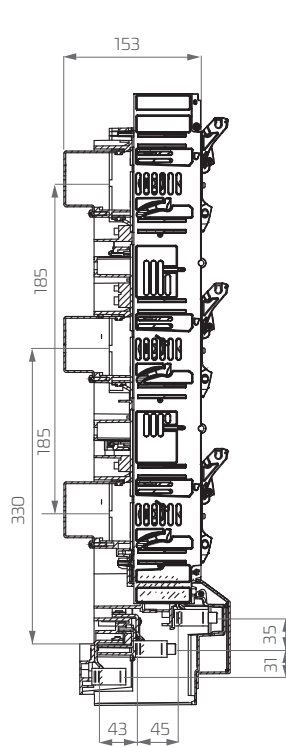
ARS 00, smartARS 00 pro

1-phase

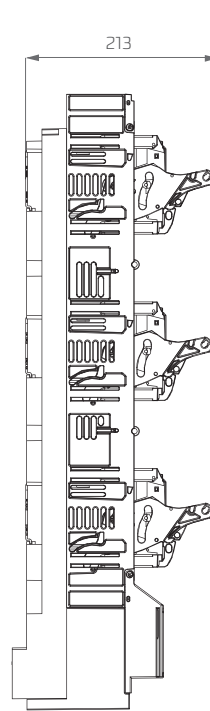
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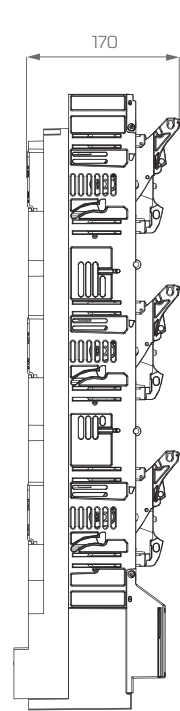
HEIGHTENED



OPENED

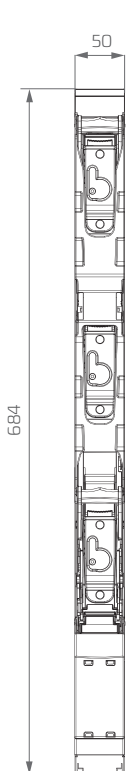


PARKED

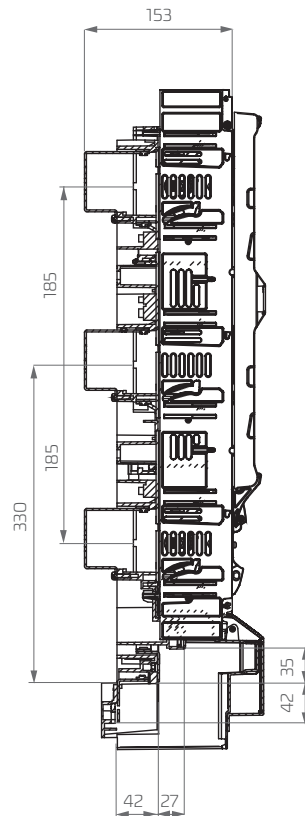


3-phase

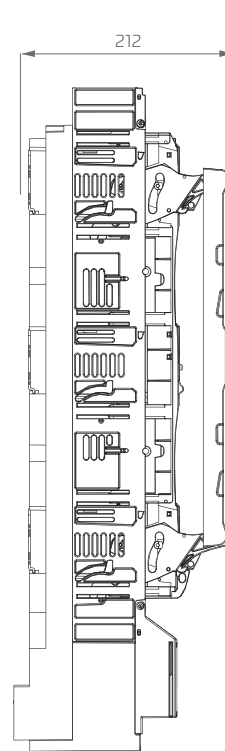
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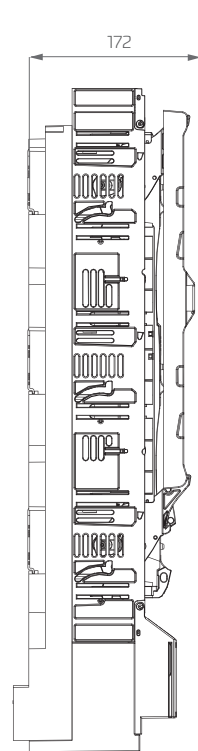
HEIGHTENED



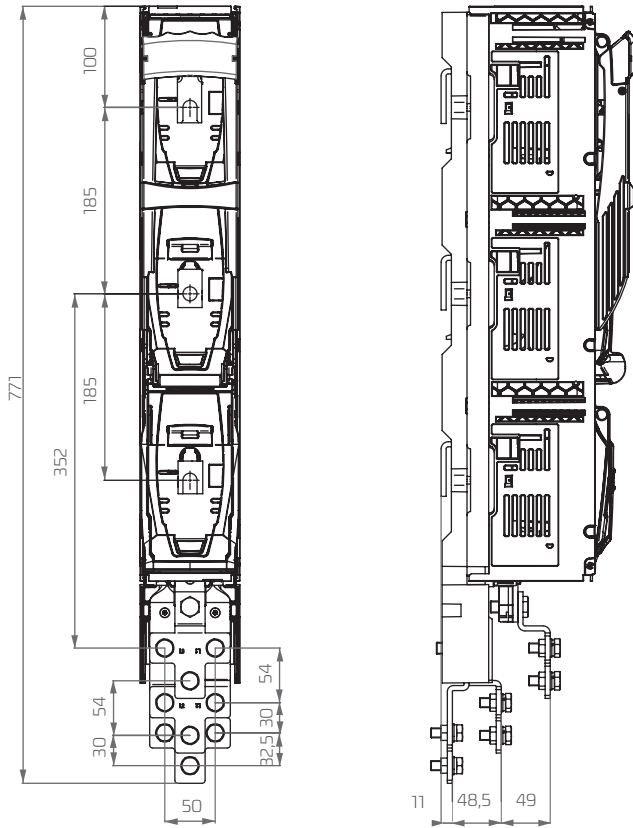
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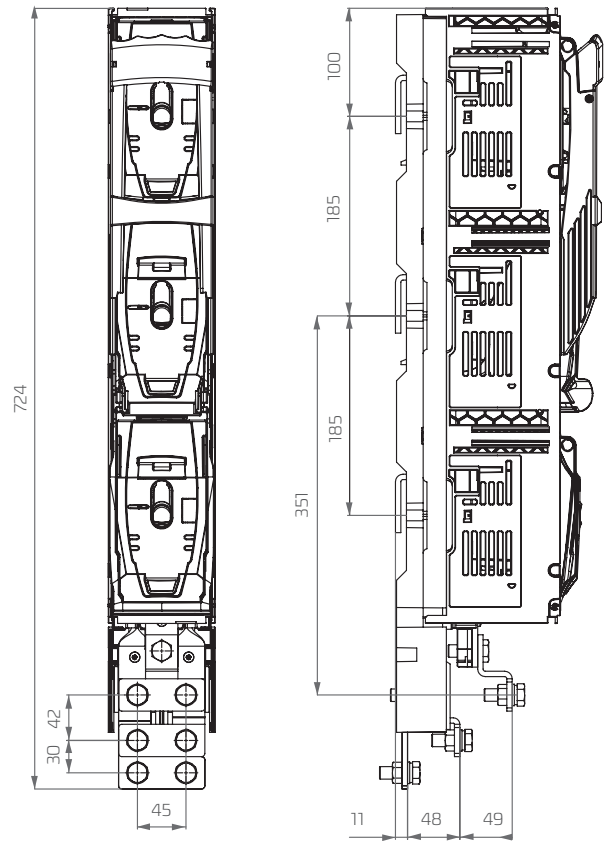
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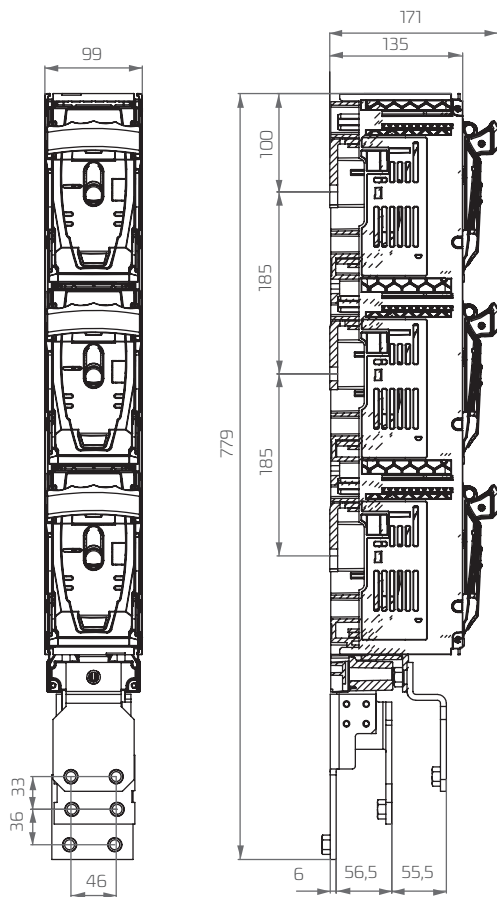
Terminals 3x120 mm<sup>2</sup>



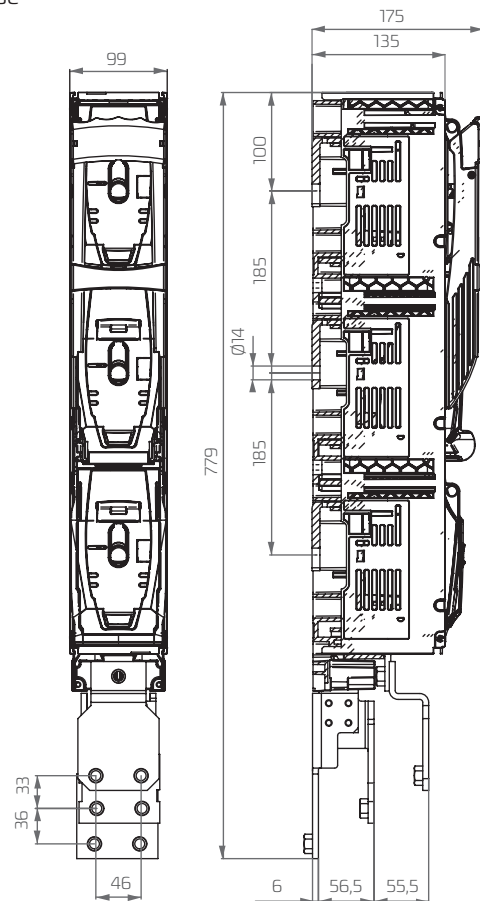
Terminals 2x240 mm<sup>2</sup>



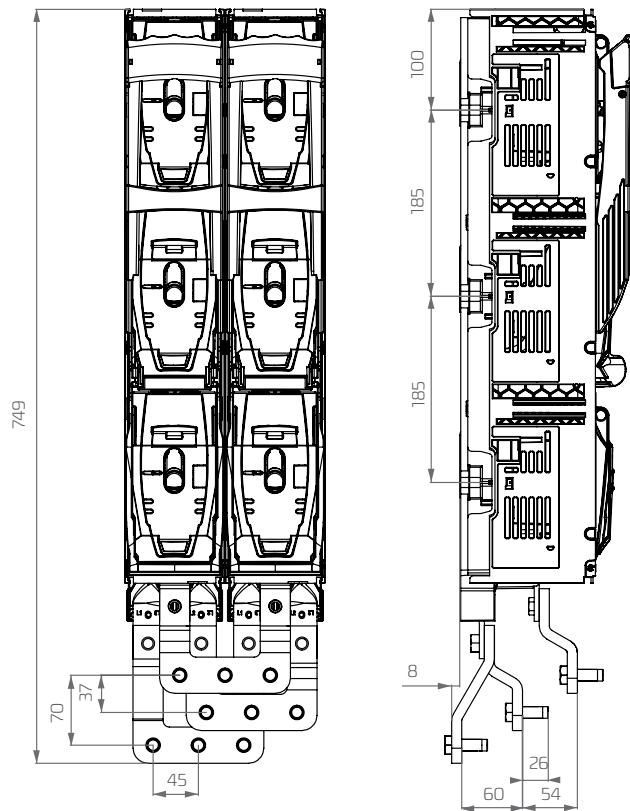
ARS 630 kVA pro  
1-phase



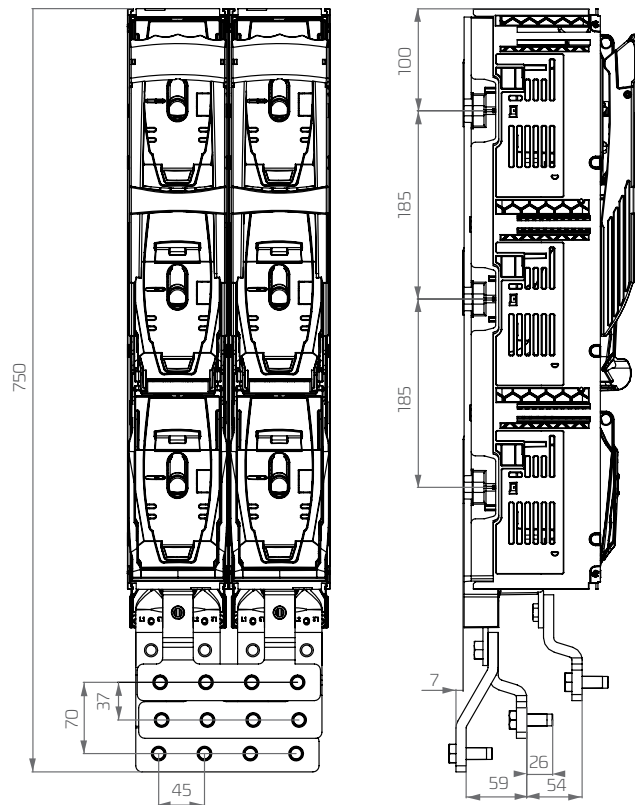
ARS 630 kVA pro, RWS 1250 pro  
3-phase



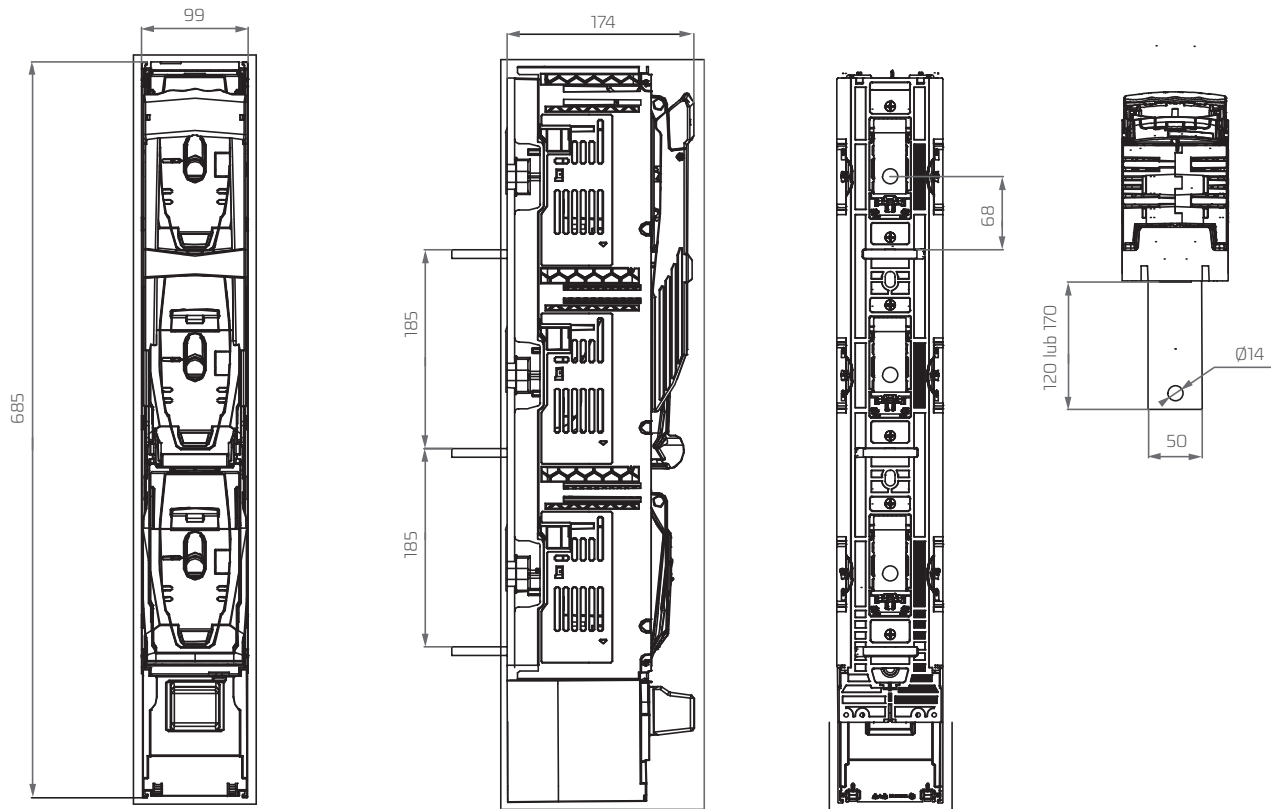
ARS 1250-6-3M pro



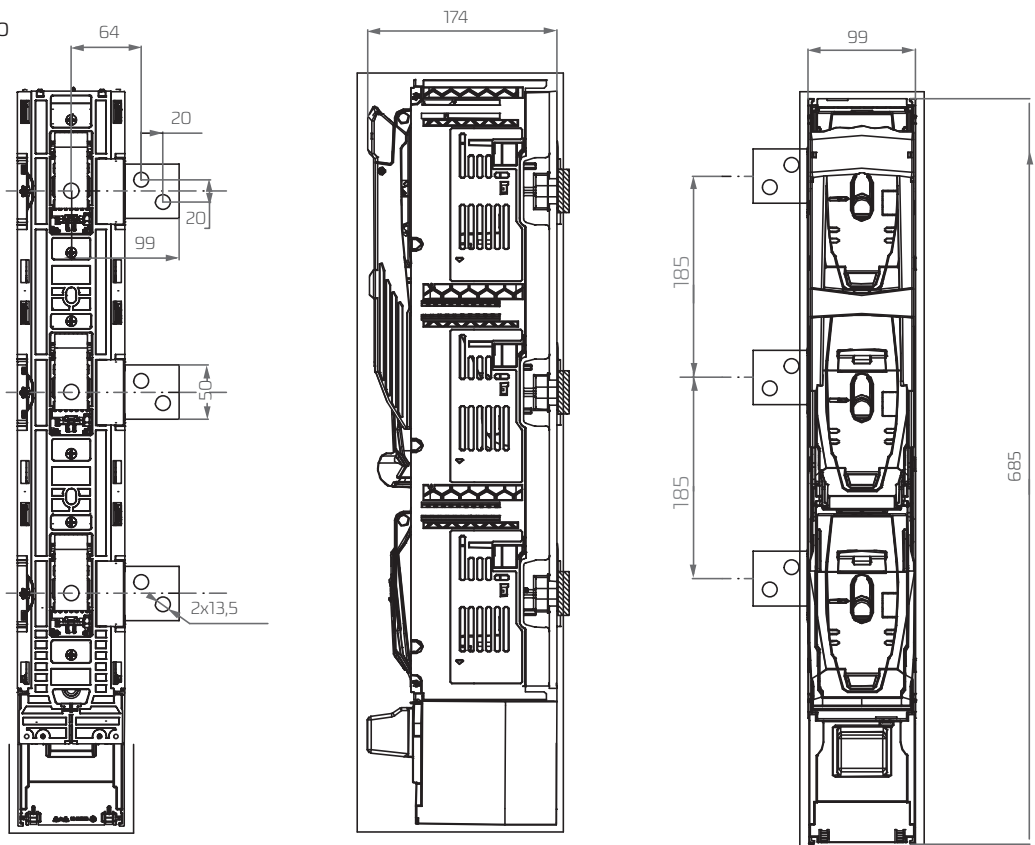
ARS 1250-6-4M pro



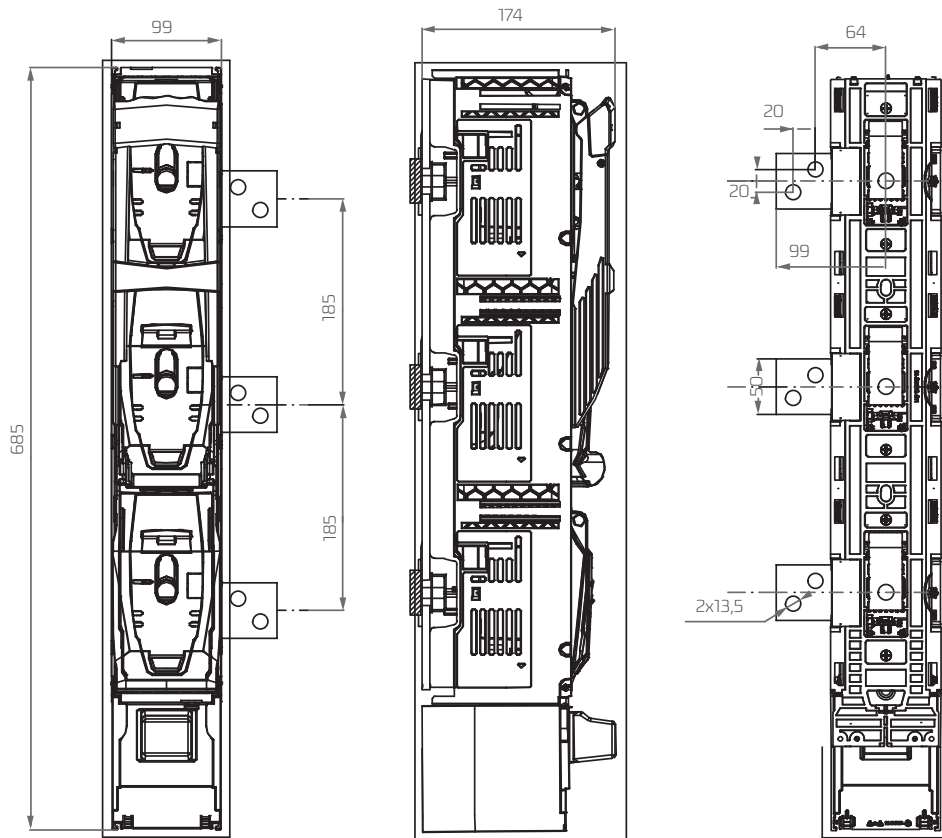
RWS 1250-NT pro



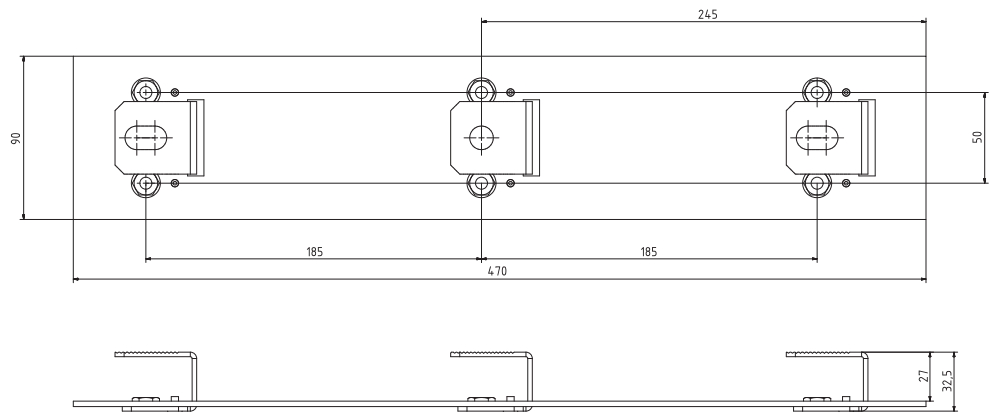
RWS 1250-NL pro



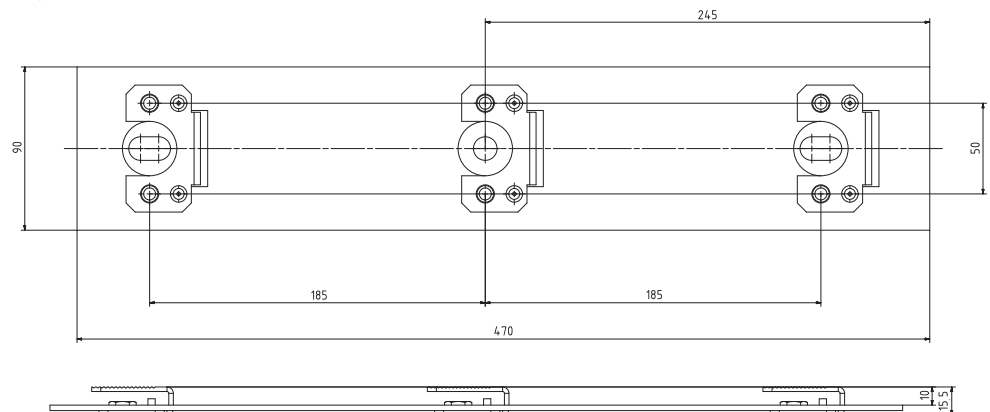
### RWS 1250-NR pro



Double adapter adjusts the height of smartARS 00 pro to the height smartARS 2,3 pro - article No. 1115281023T



Double adapter adjusts the height of ARS 00 evo to the height ARS 2,3 evo - article No.1115281024T





smartARS 00 pro, ARS 00/100mm pro, ARS 00 evo - 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 mm <sup>2</sup> up to 70 mm <sup>2</sup> (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 mm <sup>2</sup> (stranded) or 95 mm <sup>2</sup> (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 mm <sup>2</sup>  16 - 95 mm <sup>2</sup> 		
25 - 120 mm <sup>2</sup>  25 - 120 mm <sup>2</sup> 		
V- clamp HM-10-120. For connection of conductor with cross-section:	1119510077T	
10 - 70 mm <sup>2</sup>  10 - 70 mm <sup>2</sup> 		
25 - 120 mm <sup>2</sup>  25 - 95 mm <sup>2</sup> 		
Hooked clamps for installation of ARS on to busbar system without drilled holes. (set - 3 pcs.)	53-945361-011	











smartARS 00-1 pro ARS 00/100 mm pro

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 pro













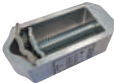












Description	Article No.	Picture
Labelling area	53-945333-011	
Terminal shroud/adjusting shroud	53-945924-011	
Flat terminal shroud	51-011242-001	
Flat terminal shroud in RAL 7035 (grey)	51-0011242-002	
Extended terminal shroud. Together with two flat terminal shrouds 51-011242-001 it adjusts the length 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 perforation holes in busbar system every 100 mm	1115281022T	

## smartARS 00 pro, ARS 00 evo - 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 perforation 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 perforation 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	



smartARS 00-1 pro

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:	1119510081T	
35 - 120 mm <sup>2</sup>  35 - 150 mm <sup>2</sup> 		
35 - 240 mm <sup>2</sup>  35 - 300 mm <sup>2</sup> 		
V-clamp with tightening torque 40 Nm for connection of conductor with cross-section:	1119510084T	
35 - 185 mm <sup>2</sup>  35 - 240 mm <sup>2</sup> 		
35 - 240 mm <sup>2</sup>  35 - 300 mm <sup>2</sup> 		
Double V-clamp with tightening torque 30 Nm for connection of two conductors with cross-section:	1119510082T	
50 - 185 mm <sup>2</sup>  50 - 240 mm <sup>2</sup> 		
50 - 240 mm <sup>2</sup>  50 - 300 mm <sup>2</sup> 		
Double V-clamp with tightening torque 30 Nm for connection of two conductors with cross-section:	1119510085T	
50-185 mm <sup>2</sup>  50-240 mm <sup>2</sup> 		
50-240 mm <sup>2</sup>  50-300 mm <sup>2</sup> 		
Cable terminal 2x240 mm <sup>2</sup> Cable terminal for connection of two cables with lug terminals and cross-section of 240 mm <sup>2</sup> 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 mm <sup>2</sup> Cable terminal for connection of three cables with lug terminals and cross-section of 120 mm <sup>2</sup> 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 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	
Rotary cover 2V	51-000487-001	