



„ARS” type fuse switch disconnectors
„PBS” type fuse bases



new!

VISION OF „GRUPA APATOR”

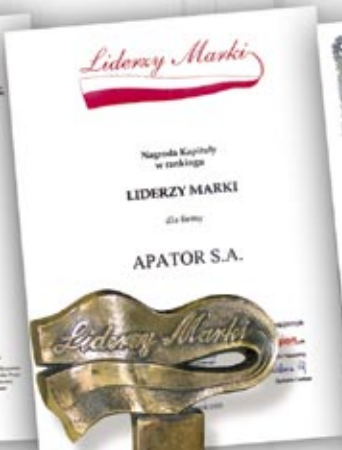
Systems, applications and switchgear apparatuses being in our offer help our customers with safe and reliable current making and breaking, providing and distributing of electricity.

Safety operation of our switchgear equipment is the key to our success and complete satisfaction of our customers. We have been so far and we will be the pioneers in segments of the market where we have been operating.

We want our metering systems to help our customers with economical management of electricity, heat, water and gas consumption. We pursue to accuracy and flexibility of configuration of our metering systems, sophisticated technologies of settlement and read out of data supported by the latest achievements in telecommunication in order to allow our customers in very easy, cheap and saved method to settle the utilities. Our offer is enriched with services that guarantee our customers to save time and money.

Manufacturing range:
SWITCHGEAR EQUIPMENT
METERING EQUIPMENT

AWARDS:



GENERAL INFORMATION:

PBS type fuse bases and ARS fuse switch disconnectors are used to distribute electric energy and protect against short circuits and overloads effects in three phase alternative current circuits. They are designed to be mounted directly on horizontal bus bars as three phase vertically mounted apparatuses that comparing with classic fuse bases take up less room in a switchboard. ARS type fuse switch disconnectors and PBS type fuse bases can be also mounted horizontally on vertical bus bar system. For all types of apparatuses vertically mounted, there is possibility of mounting by cable terminal turned up. Their design provide clearly noticeable, safety iso-

lating gap in the circuit when a fuse link is taken out. As a result of use arc chambers system for electric arc in ARS type fuse switch disconnectors it is possible to switch power on avoiding ageing of contacts. Further advantage is easy mounting of earthing devices. ARS type fuse switch disconnectors with fuse links allow to perform the following functions:

- protection,
- distribution,
- earthing,
- connecting,
- protection against the touch.

STANDARDS AND REGULATIONS:

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

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

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

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

VDE 0660

BBJ Certificate for "B" safety mark

"CE" Declaration for the conformance with 73/23/EEC European Directive

„PBS” TYPE – FUSE BASES

CONSTRUCTION:

PBS type fuse bases are adapted to be mounted on bus bars with spacing of 185 mm. Apparatuses of „00” size have the width of 50mm and are manufactured in two versions:

- PBS 00/185 mm type fuse bases – (160A) to be mounted on bus bars with spacing of 185 mm
- PBS 00/100 mm – (160A) to be mounted on bus bars with spacing of 100 mm.

The core base is made of self-extinguish polyester reinforced by glass fibre. Silver plated contacts of PBS type fuse base provide low power loss. Clamps in PBS type

fuse bases enable to connect wires with bare ends or wires with cable terminals. Fuse bases complete with covers for fuse links comply with the requirements of IP20 protection degree. Adaptors being offered in „Accessories” table enable PBS fuse base of different sizes to be mounted on common bus bar system and make their operation easier.

All PBS type fuse bases are provided complete with clamps (i.e. bolt, bridge or V types) and covers for output terminals.

PBS type fuse base 690V~

TABLE 1. Technical characteristics

DESIGNATION OF PBS	Size of fuse base acc. IEC	Rated thermal current I_{th}	Rated voltage U_n	Rated insulation voltage U_i	Rated test voltage	Rated frequency	Rated power dissipation	Mechanical endurance life	Weight	Protection degree	Size of fuse link acc. IEC
		A	V~	V	kV	Hz	W	c.p.	kg	IP	
PBS 00/100 mm	00	160	690	1000	3	40-60	12	1600	0,75	00	00
PBS 00 SM	00	160	690	1000	3	40-60	12	1600	2,00	00	00
PBS 1	1	250	690	1000	3	40-60	32	1600	4,5	20*	1
PBS 2	2	400	690	1000	3	40-60	45	1000	4,5	20*	2
PBS 3	3	630	690	1000	3	40-60	60	1000	5,0	20*	3

* with covers for fuse links



OPERATING CONDITIONS:

- to be installed indoor without any dust, aggressive or explosive gases,
- ambient temperature from -25°C to $+55^{\circ}\text{C}$,
- at altitude up to 2000 meters above sea level.,
- outdoor – in cabinets with protection degree $\geq \text{IP34}$.

PBS 00/100 mm type fuse base 160A 690V~ Spacing of bus bars 100 mm

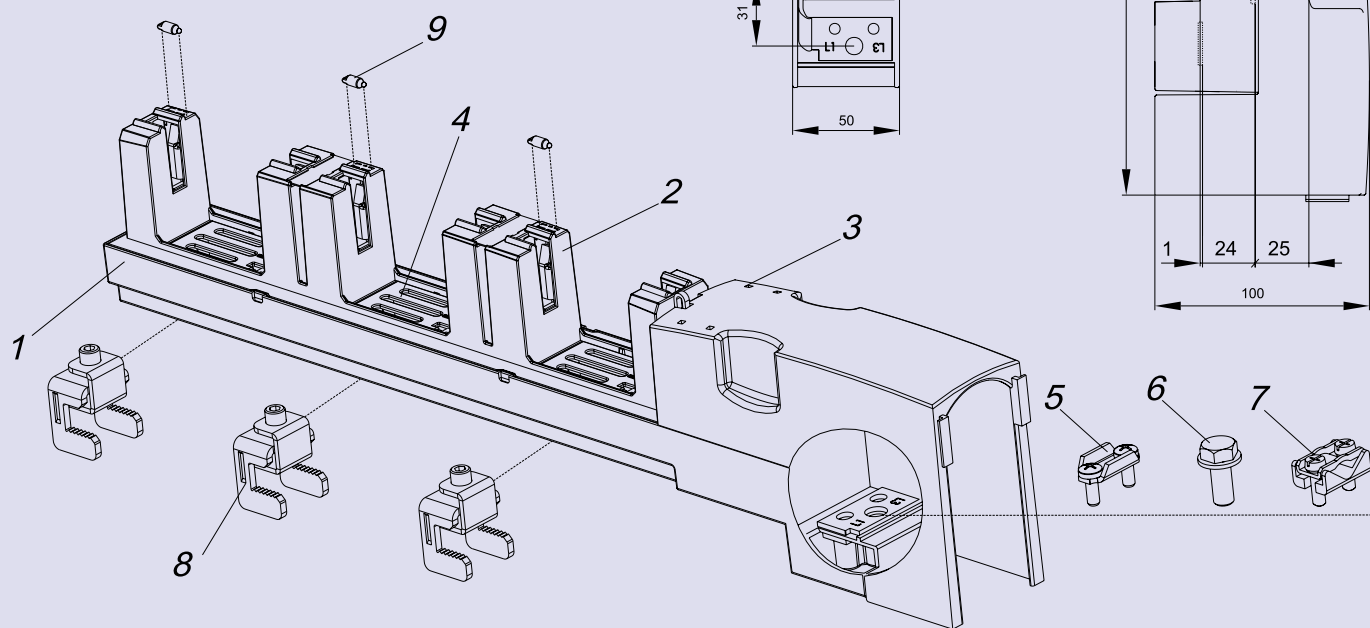

new!

TABLE 2. Output clamps

Designation of apparatus	Clamp	Drawing of clamp	Cable cross – section	Torque moment
PBS 00/100	S – bridge (2 x M5)		4-70 mm ²	6 Nm
	M – bolt M8		Cable terminal max. 185 mm ²	20 Nm

Bus bars with maximum width of 20 mm are allowed to be connected to M type clamps

1. Core base
2. Cover for terminals
3. Cover for clamps
4. Protecting covers
5. Bridge clamp 00-S
6. Bolt 00-M
7. Clamp for sector shaped conductor 00-SV
8. Hook clamp
9. Signalling element indicating a fuse link burned out





PBS 00/185 type fuse base

160A

690V~ Spacing of bus bars is 185 mm



TABLE 3. Output clamps

Designation apparatus	Clamp	Drawing of clamp	Cable cross-section	Torque moment
PBS 00/185	S – bridge (2 x M5)		4-70 mm ²	6 Nm
	M -bolt M8		Cable terminal	20 Nm

Bus bars with maximum width of 25 mm are allowed to be connected to M type clamps

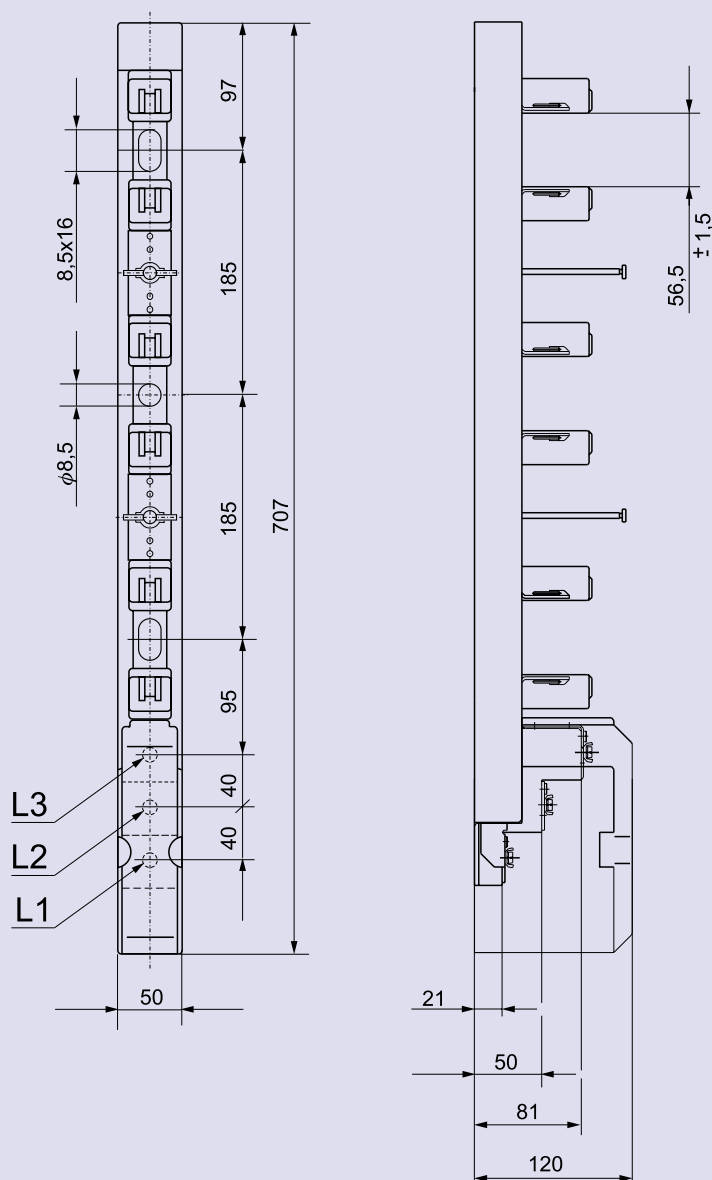














TABLE 4.
ACCESSORIES COMMON TO „PBS 00”

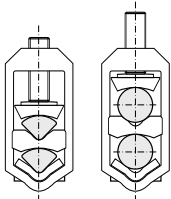
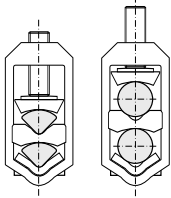
Designation / Item no.	Description	Picture
00 – M	Bolt clamp - M8 bolt to connect conductors with cable terminals.	
1361400006T	Cover for spare room on bus bars with spacing of 185 mm: width 50 mm, length 562 mm, thickness 3 mm.	
1361400001T	Isolating pin to fix cover 50mm width. M8	
00 – S	Bridge clamp – strip to be fixed to apparatus by two M5 bolts in order to mount wire with end of cross section from 4 mm ² to 70 mm ² .	
00 – SV 1115281034	Clamp for sector shaped conductor – strip + „V” washer to be fixed to apparatus by two M5 bolts in order to fix wire of sector shaped conductor with bare end and cross-section from 1,5 mm ² to 70 mm ² . In case of homogeneous wire up to 95 mm ² .	

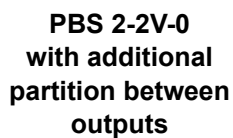
ACCESSORIES TO PBS 00/100 mm

51-823166-011	Cover for cable clamps	
111528 10 30T	Single adapter 100/185 (for one piece of PBS 00/100 mm) enabling the mounting of apparatus on bus bars with spacing of 185 mm.	
111528 10 29T	Double adapter 100/185 (for two pieces of PBS 00/100 mm) enabling the mounting of apparatuses on bus bars with spacing of 185mm and drilling of holes every 100 mm in bus bars.	
53-945361-011	Hook clamp enabling to mount PBS00/100mm type fuse base on non perforated bus bars.	

ACCESSORIES TO PBS 00/185 mm

51-945160-011	Adapter single 185/185 (for one piece of PBS 00/185 mm) enabling to come to level with the front line of casing of PBS 1,2,3.	
51-945159-011	Adapter – double 185/185 (for two pieces of PBS 00/185 mm) enabling to level with the front line of casing of PBS 1, 2, 3. with spacing of holes every 100 mm in bus bars.	
51-837437-011	Cover for cable clamps	





Designation of apparatus	Input clamp	Drawing of clamp	Cross-section of wire	Torque moment
PBS 2-2V (400A)	V – clamp No 2VO240		Two conductors 35-240 mm ² (sector shaped cable)	35 Nm
PBS 3-2V (630A)	V – clamp no 2VO240		Two conductors 35-240 mm ² (sector shaped cable)	35 Nm

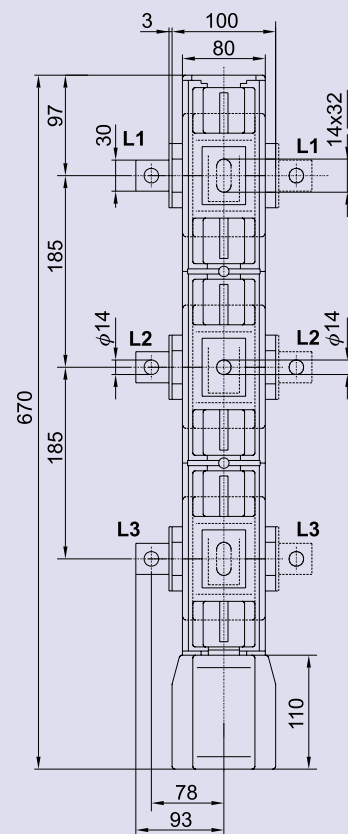


PBS type fuse base with outputs at side



TABLE 8. Designation of PBS of „coupling” type





Designation of apparatus	Clamp	Drawing of clamp	Outputs	Torque moment
PBS 2-NL (400A)	M12 bolt		Left side	32 Nm
PBS 2-NR (400A)	M12 bolt		Right side	32 Nm
PBS 3-NL (630A)	M12bolt		Left side	56 Nm
PBS 3-NR (630A)	M12 bolt		Right side	56 Nm



PBS type fuse base with outputs at rear



TABLE 9. Designation of PBS

Designation of apparatus	Clamp	Drawing of clamp	Cross-section of wire	Torque moment
PBS 2-ST (400A)	S – bridge (2 x M8)		70-240 mm ²	20 Nm
PBS 3-ST (630A)	S –bridge (2 x M8)		70-240 mm ²	20 Nm
PBS 2-NT (400A)	N – M 10 bolt		max.240 mm ²	32 Nm
PBS 3-NT (630A)	N – M 12 bolt		max.240 mm ²	56 Nm

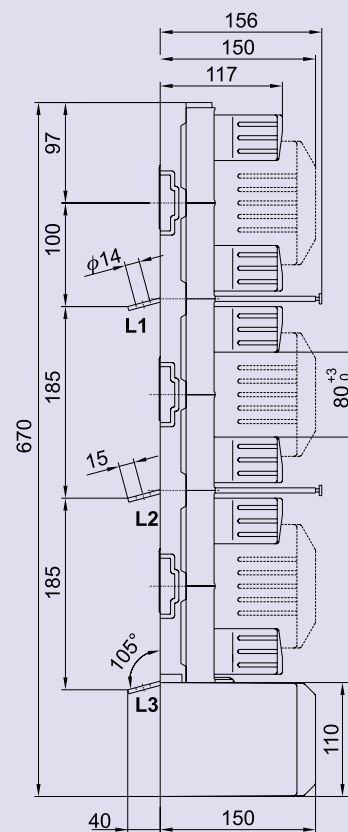













TABLE 10.

ACCESSORIES FOR PBS 1, PBS 2, PBS 3, 690V~

Designation / Item no	Description	Picture
S	Bridge clamp – strip to be fixed to apparatus by two M8 bolts in order to fix wire with bare end of cross- section from 70 mm ² to 240 mm ² .	
M	M10 bolt to connect cable terminals	
1VO240 1119510001T	V– clamp for direct connecting of a wire of cross section from 35 mm ² up to 240 mm ² .	
2VO240 1119510007T	Double clamp for direct connecting wires of cross-section from 35 mm ² up to 240 mm ² .	
VL240 1119510002T	V– terminal for direct connecting of cross section from 35 mm ² up to 240 mm ² .	
1361400006T	Cover for spare room on bus bars with spacing 185 mm – width 50 mm, length 562 mm, sickness 3 mm.	
1361400001T	Isolating pin to fix cover of width 50 mm. M8	
1361400007T	Cover for spare room on bus bars with spacing 185 mm – width 100 mm, length 562 mm, sickness 3 mm.	
1361400002T	Isolating pin to fix cover with width 100 mm. M12	
51-822438-011	Cover for cable clamps	
51-836288-011	Cover for fuse links	

„ARS” TYPE FUSE SWITCH DISCONNECTORS

CONSTRUCTION:

Fuse switch disconnectors are being manufactured in two version depending of making current :

- single pole making,
- three pole making (simultaneously).

They are furnished with independent manual control device and therefore making and breaking operations should be made by firm turn. The width of ARS fuse switch disconnectors for size „00” is 50 mm, size 1 – 250A; 2 – 400A and 3 – 630A is 100 mm. ARS type apparatuses are adapted to be mounted on bus bars with spacing of 185 mm. Apparatuses of size „00” are being manufactured in two versions:

- ARS 00/185 – (160A) to be mounted on bus bars with spacing of 185 mm
- ARS 00/100 – (160A) to be mounted on bus bars with spacing of 100 mm

The core base of fuse switch disconnectors is made of self-extinguish polyester reinforced by glass fibre. Silver plated contacts of ARS provide low power loss. Clamps in ARS type apparatuses enable to connect directly to wires with bare ends or wires with cable terminals. Cabinet of ARS type fuse switch disconnector (front part) complete with arc chambers is made of polyamide reinforced with glass fibre. ARS type apparatuses enable to use current transformers and ammeters. They comply with the requirements of IP 20 protection degree. Adaptors being offered in „Accessories” table enable ARS type apparatuses of different sizes to be mounted on common bus bar system and make their operation easier.

All sizes of ARS type fuse switch disconnectors are provided complete with clamps (i.e. bolt, bridge or V types) and covers for output terminals.

ARS type fuse switch disconnector 690V AC

TABLE 11. Technical characteristics

DESIGNATION OF ARS	Rated thermal current I _{th}	Rated making and breaking current I _e	Rated voltage U _n	Category of utility	Rated operating voltage U _e	Rated short circuit making capacity /500V~/ - I _{cm}	Rated insulation voltage U _i	Rated impulse withstand voltage.U _{imp} .	Rated test voltage	Frequency	Mechanical endurance life	Electrical endurance life	Protection degree	Weight	Size of fuse link acc. IEC
	A	V~													
ARS00/100mm	160	690	AC-21B	690	50	1000	8	3	40-60	1600	200	30	1,2	00	
			AC-22B	690											
			AC-23B	400											
ARS 00	160	690	AC-21B	690	50	1000	8	3	40-60	1600	200	20	2,6	00	
			AC-22B	500											
ARS 1	250	690	AC-21B	690	50	1000	12	3	40-60	1600	200	20	6,8	1	
			AC-22B	500											
ARS 2	400	690	AC-21B	690	50	1000	12	3	40-60	1000	200	20	6,8	2	
			AC-22B	500											
ARS 3	630	690	AC-21B	690	50	1000	12	3	40-60	1000	200	20	7,2	3	
			AC-22B	500											
2 x ARS 3	1000	690	AC-21B	690	50	1000	12	3	40-60	1000	200	20	15	3	

OPERATING CONDITIONS:



- to be installed indoor without any dust, aggressive or explosive gases,
- ambient temperature from -25°C to $+55^{\circ}\text{C}$
- at altitude up to 2000 meters above sea level.,
- outdoor – in cabinets with protection degree \geq IP34.

ARS 00/100mm type fuse switch disconnector 160A 690V~ For bus bars spacing 100 mm

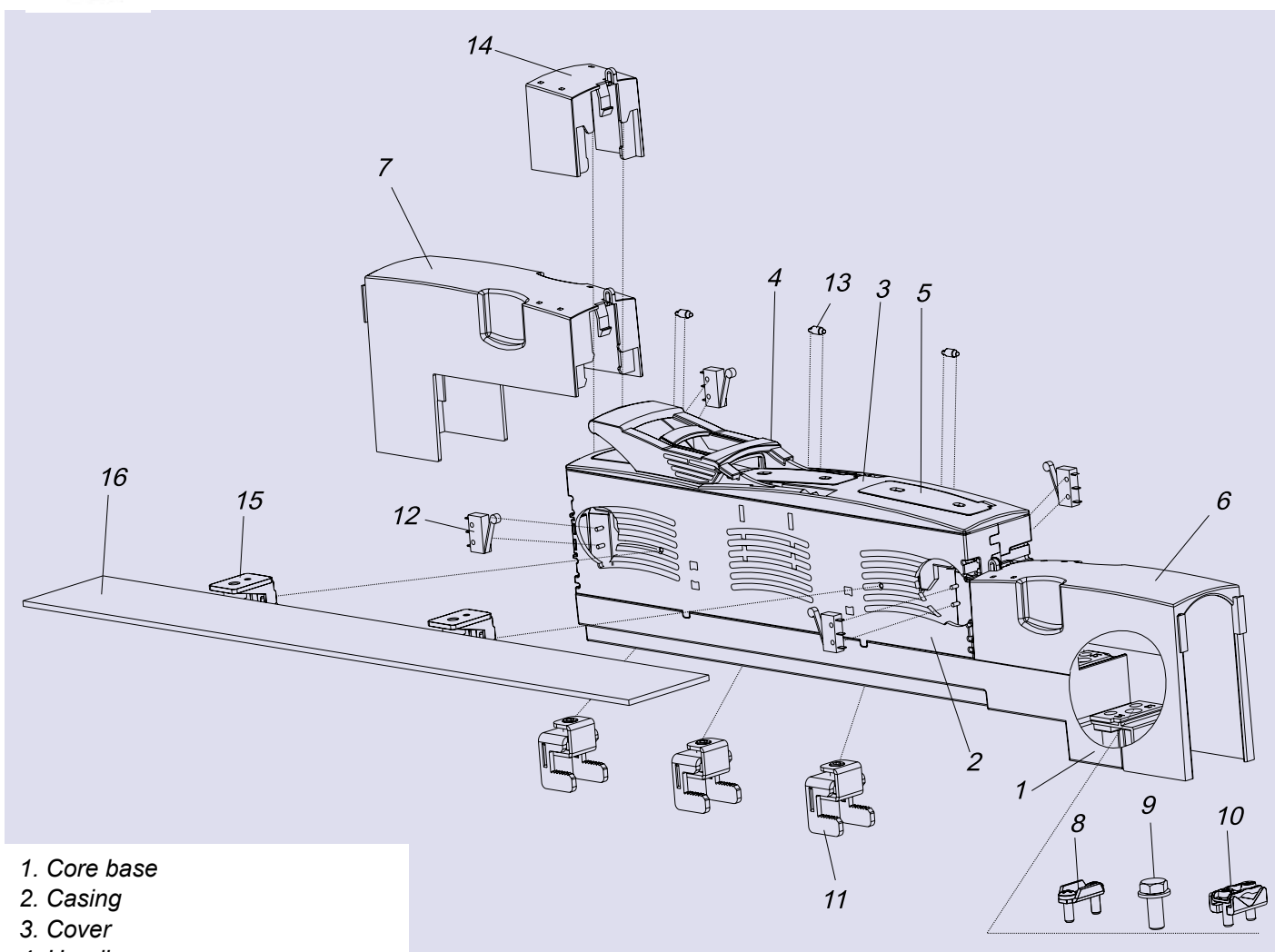


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TABLE 12. Output clamps

Designation of apparatus	Clamp	Drawing of clamp	Cross section of wire	Torque moment
ARS 00/100	S – bridge (2 x M5)		4-70 mm ²	6 Nm
	M – M8 bolt		Cable terminal max. 185 mm	20 Nm

Bus bars with maximum width of 20 mm are allowed to be connected to M type clamps



1. Core base

2. Casing

3. Cover

4. Handle

5. Window

6. Cover for clamps

7. Additional cover to level the front line

8. Bridge clamp 00-S

9. Bolt clamp 00-M

10. Clamp for sector shaped conductor 00-SV

11. Hook clamp

12. Microswitch

13. Signalling element indicating a fuse link burned out

14. Description plate

15. Angle plate for cover of spare room

16. Cover for spare room

Closed/open positions

Park position

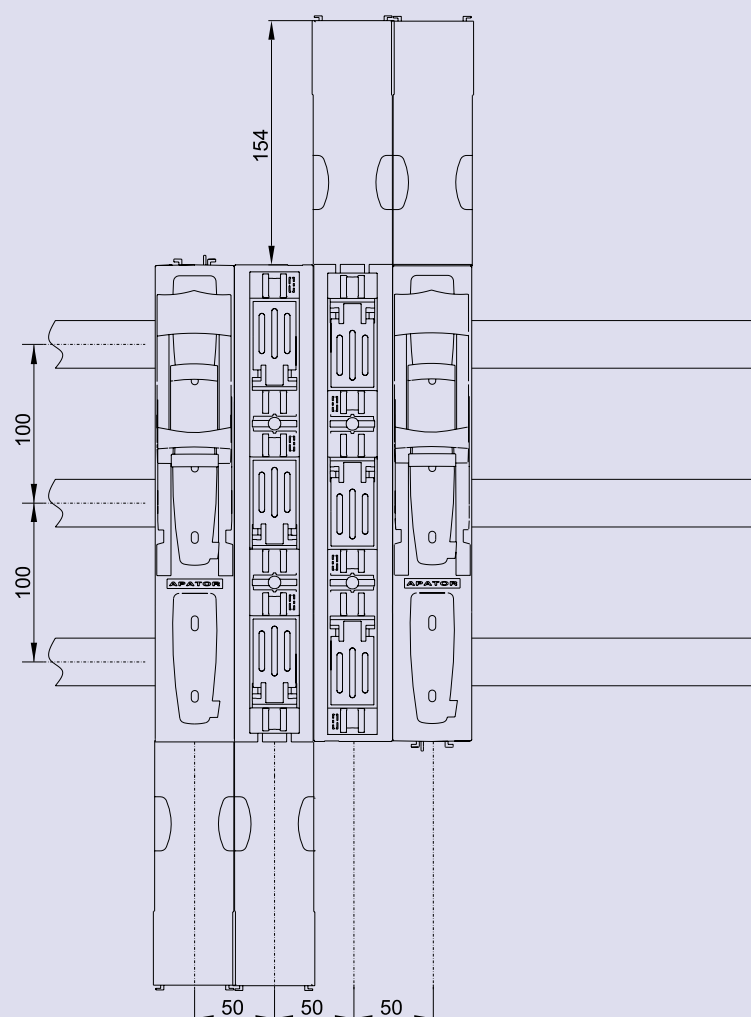
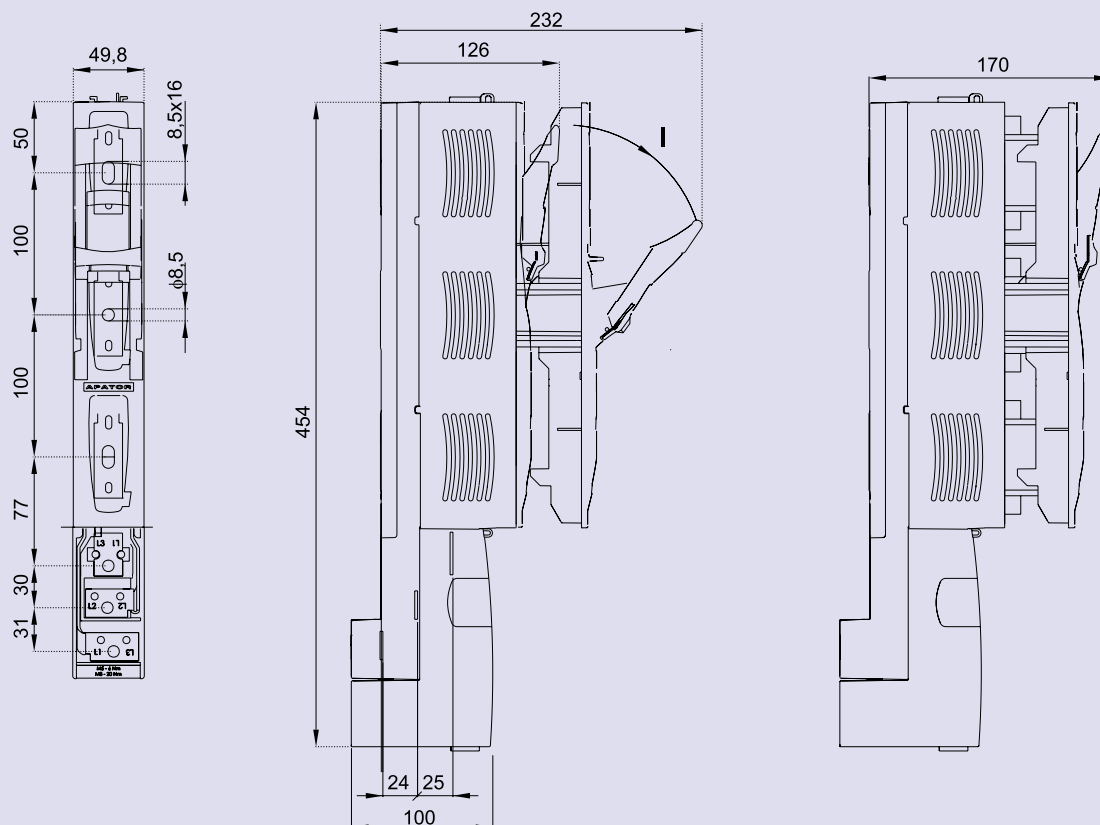





TABLE 13. Output clamps

Designation of apparatus	Clamp	Drawing of clamp	Cross section of wire	Torque moment
ARS 00/185	S – bridge (2 x M5)		4-70 mm ²	6 Nm
	M – M8 bolt		Cable terminal	20 Nm

Bus bars with maximum width of 25 mm are allowed to be connected to M type clamps.

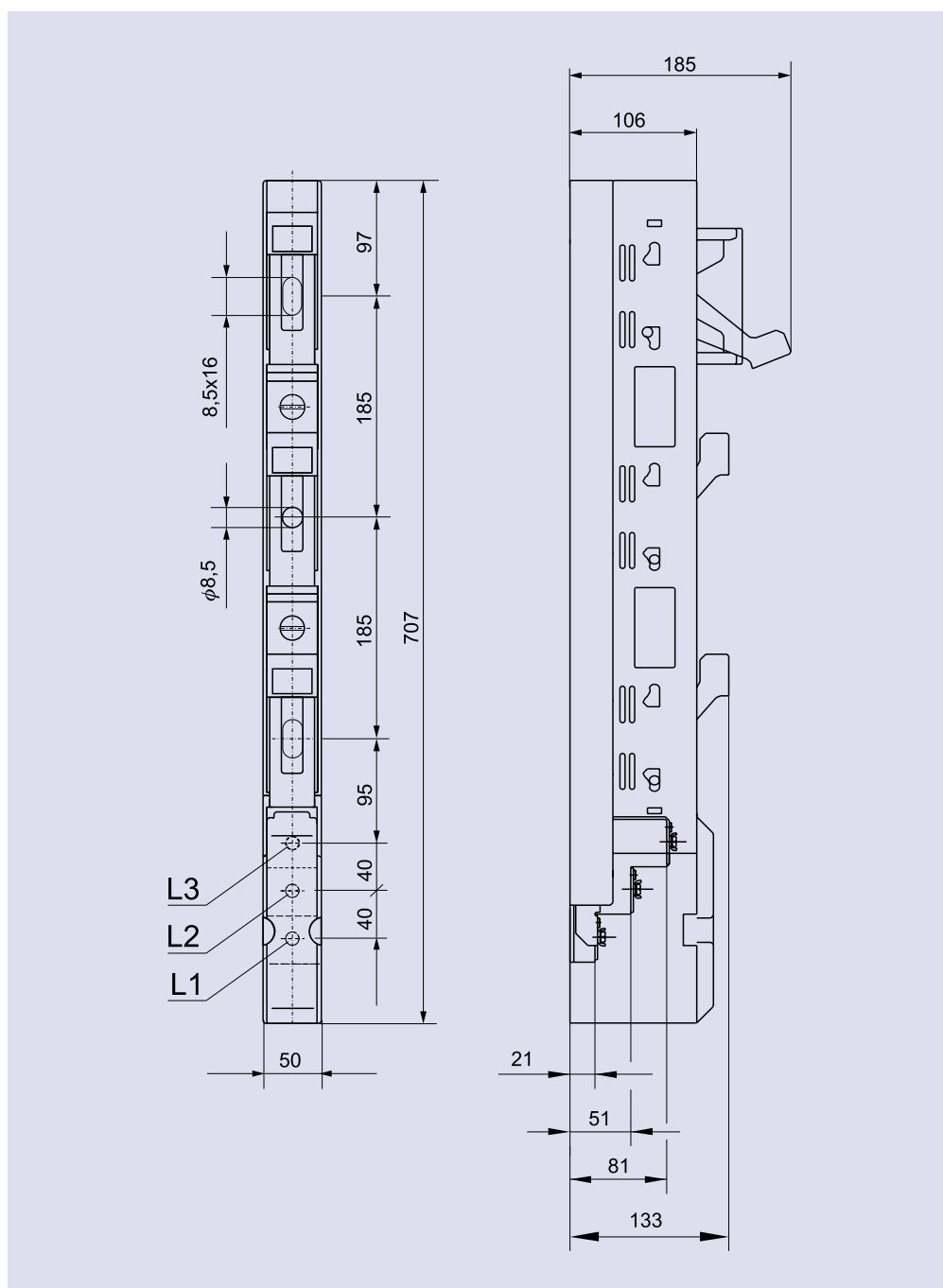
















TABLE 14.




ACCESSORIES COMMON TO ARS 00

Designation / No. of item	Description	Picture
00 – M	Bolt clamp – M8 bolt to connect wires with cable terminal.	
1361400006T	Cover for spare room on bus bars with spacing 185 mm: width 50 mm, length 562 mm, thickness 3 mm.	
1361400001T	Isolating pin to fix cover with width of 50mm. M8	
1115718003T	ASR21.3 type current transformer, accuracy class 1, current ratio: from 50/5A to 150/5A	
1115718010T	Distance sleeve for ASR21.3 type current transformers length 36mm, outer dia. Φ22,5mm, inner dia. Φ12,5mm	
00 – S	Bridge clamp – strip to be fixed to apparatus by two M5 bolts in order to fix wire with bare end and cross section from 4 mm ² to 70 mm ² .	
00 – SV 1115281034	Clamp for sector shaped wire – strip + „V” type washer to be fixed to apparatus by two M5 bolts in order to fix sector shaped cable with cross-section from 1,5 mm ² to 70 mm ² . In case of homogeneous wire cross section is up to 95 mm ² .	

ACCESSORIES TO ARS 00 / 100

51-823166-011	Cover for cable clamps	
1115281030T	Single adaptor 100/185 (for one piece of ARS 00/100 mm) enabling apparatus to be mounted on bus bars with spacing 185 mm.	
1115281029T	Double adaptor 100/185 (for two pieces of ARS 00/100 mm) enabling apparatus to be mounted on bus bars with spacing of 185 mm and drill holes in bus bars every 100 mm.	
53-945361-011	Hook clamp enabling mounting of core base of ARS00/100 mm on non perforated bus bars.	
1115296049	Micro switch to control of current making status (0 – 1) of ARS00/100 type fuse switch disconnecter.	
	Angle plate for protecting cover to be fixed	
53-945333-011	Description plate	

ACCESSORIES TO ARS 00 / 185

51-945160-011	Single adaptor 185/185 (for one piece of ARS 00/185 mm) enabling to level with the front line of casing of ARS 1,2,3.	
51-945159-011	Double adaptor 185/185 (for two pieces of ARS 00/185 mm) enabling to level with the front line of casing of ARS 1,2,3 with perforated holes every 100 mm.	
51-837437-011	Cover for cable clamps	

Fuse switch disconnecter with V type clamps – 2x240mm²/1 pole

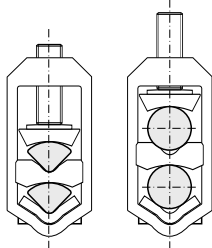
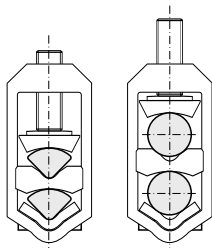
(possibility of fixing two conductors with cross section of 240mm² for each clamp)

ARS 2 400A 690V~
ARS 3 630A 690V~



ARS 2-6-2V
with additional partition
between outputs

TABLE 17. Designation of ARS 2x240 mm² according to types of output clamps

Designation of apparatus	Terminal	Drawing of terminal	Cable cross-section	Torque moment.
ARS 2 - * - 2V (400A)	Double V – clamp no 2VO240		Two wires 35-240 mm ² (sector shaped conductor)	35 Nm
ARS 3 - * - 2V (630A)	Double V – clamp no 2VO240		Two wires 35-240 mm ² (sector shaped conductor)	35 Nm

*1 or 6

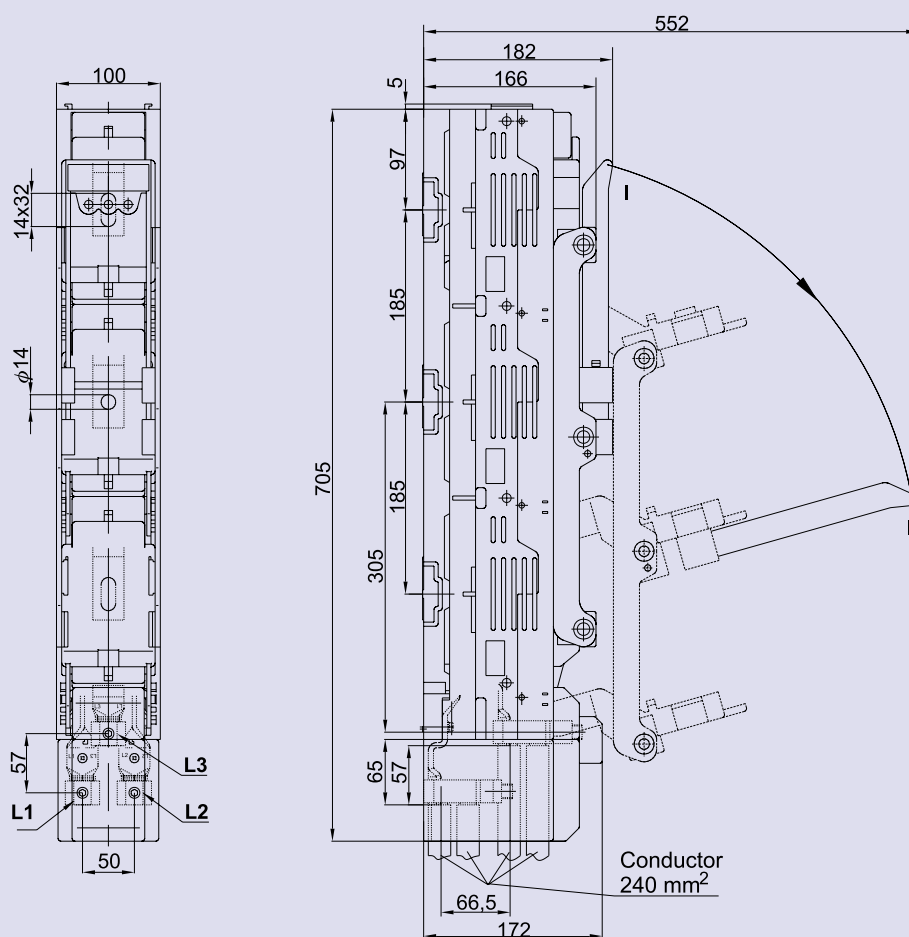




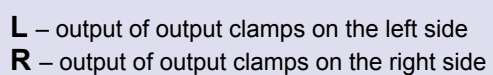




TABLE 18. Designation of ARS of „coupling” type

Designation of apparatus	Clamp	Drawing of clamp	Output	Torque moment.
ARS 2 - * - NL (400A)	M10 bolt		Left side	32 Nm
ARS 2 - * - NR (400A)	M10 bolt		Right side	32 Nm
ARS 3 - * - NL (630A)	M12 bolt		Left side	56 Nm
ARS 3 - * - NR (630A)	M12 bolt		Right side	56 Nm

*1 or 6



Fuse switch disconnecter (double) **2xARS 3 (1000A)** width of module – 200 mm

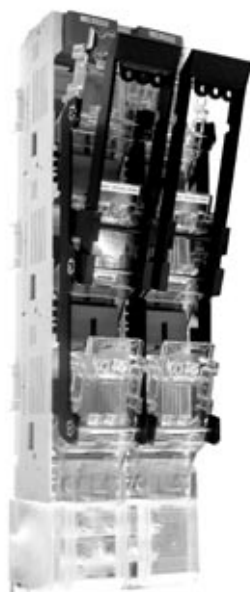

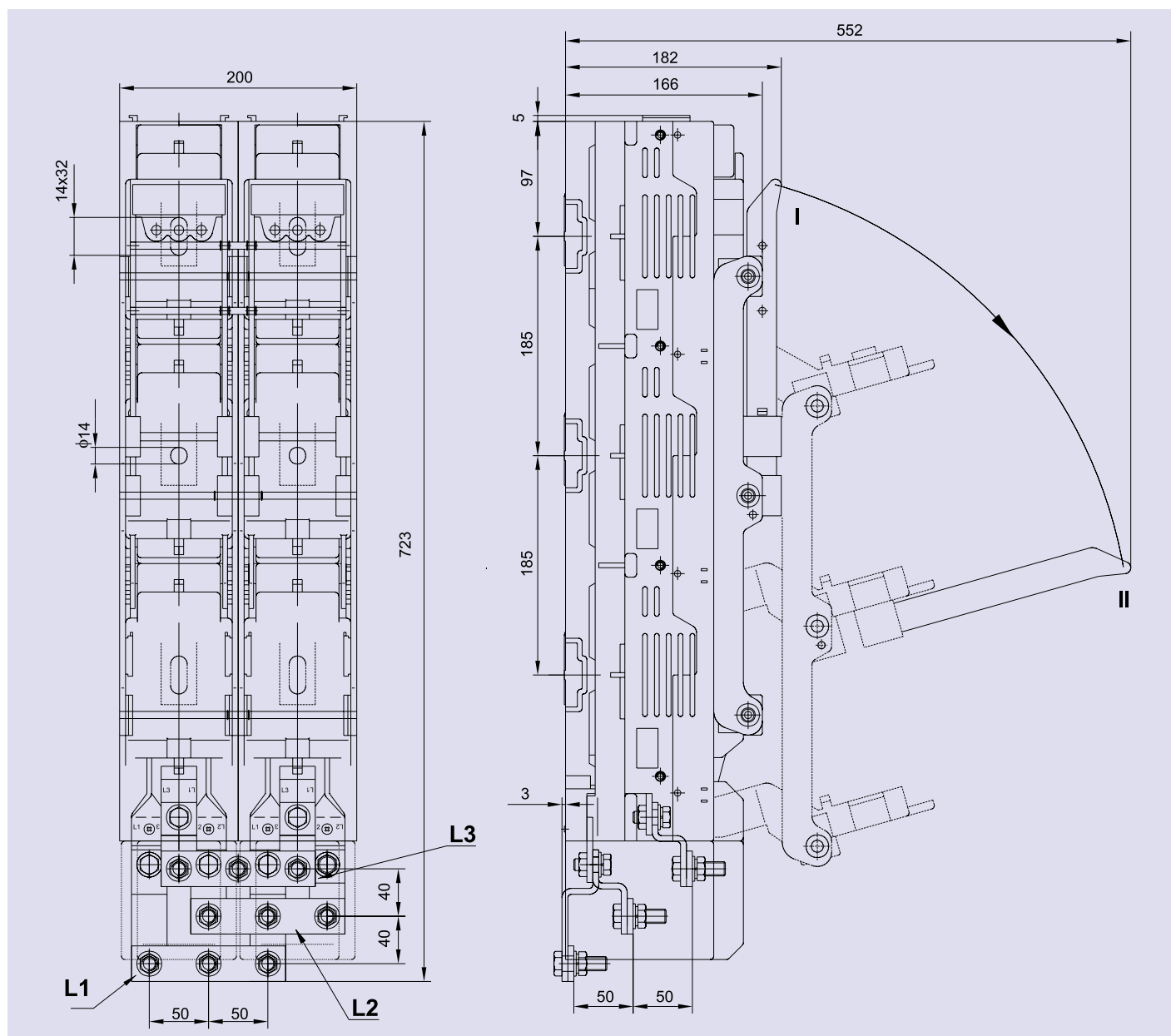






TABLE 19. Designation of 2ARS 3 according to types of output clamps

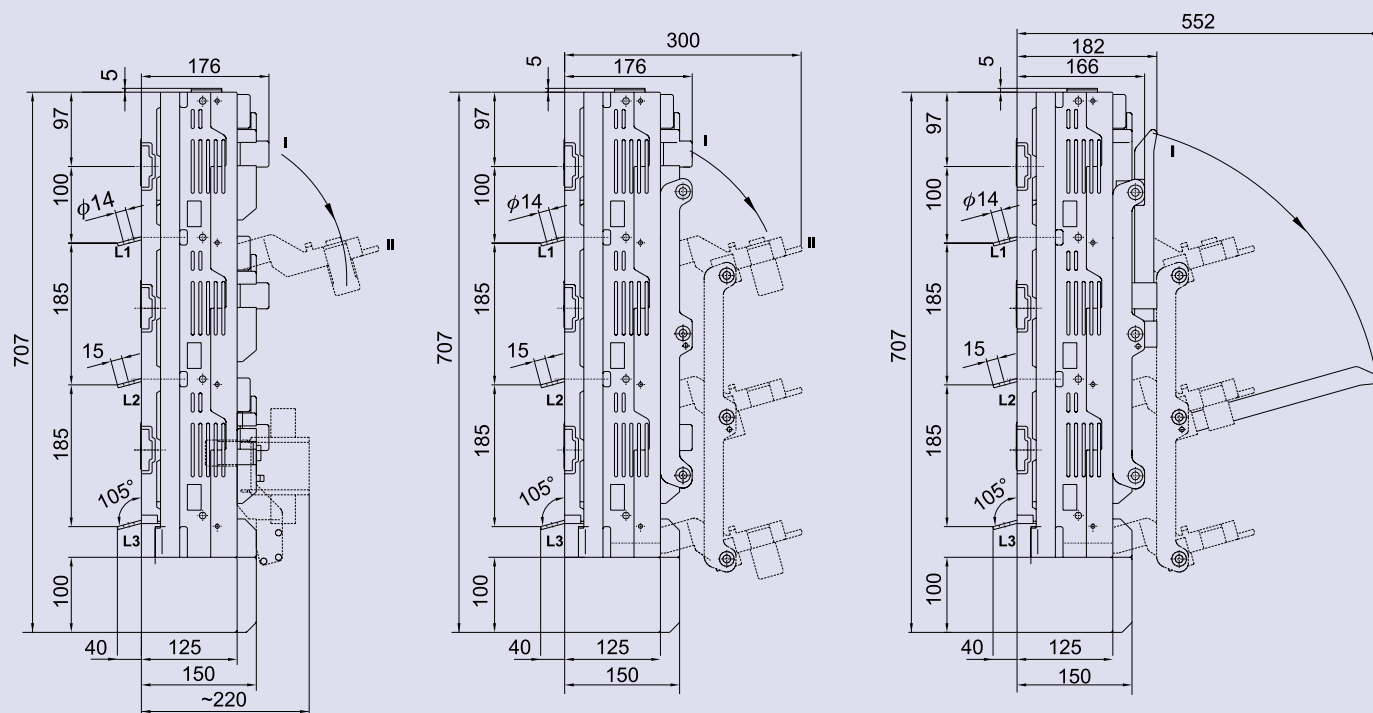
Designation of apparatus	Clamp	Drawing of clamp	Cross-section of wire	Torque moment
2ARS 3-6-M (2x630A)	M12 bolt		Cable terminals max. 300 mm ²	56 Nm



Designation of apparatus	Clamp	Drawing of clamp	Cross-section of wire	Torque moment
ARS 2 - * - ST (400A)	S –bridge (2 x M8)		70-240 mm ²	20 Nm
ARS 3 - * - ST (630A)	S –bridge (2 x M8)		70-240 mm ²	20 Nm
ARS 2 - * - NT (400A)	N – M 10 bolt		max.240 mm ²	32 Nm
ARS 3 - * - NT (630A)	N – M 12 bolt		max.240 mm ²	56 Nm

*1 or 6















ARS type fuse switch disconnecter with outputs at rear



ACCESSORIES TO:

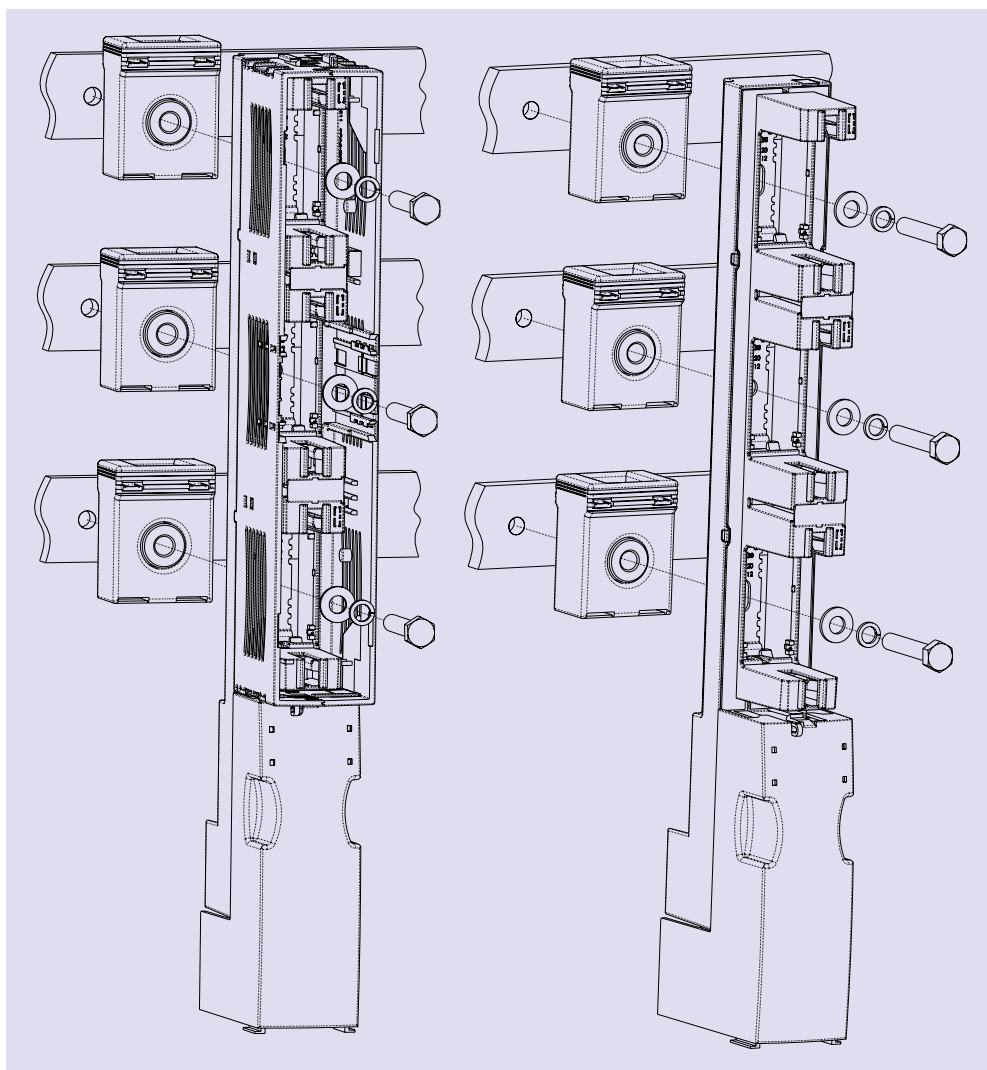
ARS 1 **250A** **690V~**
ARS 2 **400A** **690V~**
ARS 3 **630A** **690V~**

TABLE 21.

Designation/ Item no.	Description	Picture
S	Bridge clamp – strip to be fixed to apparatus by two M8 bolts in order to fix conductor with bare end and with cross-section from 70 mm ² to 240 mm ²	
M	M10 bolt to connect cable terminals	
1V0240 1119510001T	V – Clamp for direct connecting a wire of cross section from 35 mm ² up to 240 mm ² .	
2V0240 1119510007T	V – Double clamp for direct connecting wires of cross section from 35 mm ² up to 240 mm ²	
VL240 1119510002T	V – terminal for direct connecting wire of cross-section from 35mm ² up to 240 mm ²	
1361400006T	Cover for spare room on bus bars with spacing of 185 mm, width 50 mm, length 562 mm, sickness 3 mm.	
1361400001T	Isolating pin for cover to be fixed with width of 50 mm. M8	
1361400007T	Cover for spare room on bus bars with spacing of 185 mm, width 100 mm, length 562 mm, sickness 3 mm.	
1361400002T	Isolating pin for cover to be fixed with width of 100 mm. M12.	
51-822492-011 51-836413-011	Cover for cable terminals (2 parts)	
1115718005T	ASR 22.3. current transformer. Accuracy class 1 Current ratio: from 50/5A to 600/5A.	
115718010T	Distance sleeve for ASR 22.3 current transformers length 36 mm, outer dia. Φ22,5 mm., inner dia. Φ12,5 mm	
	Designation label	
63-822645-011	Earthing covers (one set)	

THREE PHASE CURRENT MEASUREMENT

„ARS”/ „PBS” fuse switch disconnecter



Fuse switch disconnectors: **ARS 1/250A; ARS 2/400A; ARS 3/630A**

CURRENT TRANSFORMER ASR22.3 with gears: 50A/5A, 100A/5A, 150A/5A, 200A/5A, 250A/5A, 300A/5A, 400A/5A, 500A/5A, 600A/5A

dimensions: a = 61 mm; b = 35 mm; c = 78,5 mm

bush: 36 mm long, ϕ inside 12,5 mm, ϕ outside 22,5 mm

accuracy class = 1

Fuse switch disconnectors: **ARS 00/160A;**

CURRENT TRANSFORMER ASR21.3 with gears: 100A/5A, 150A/5A

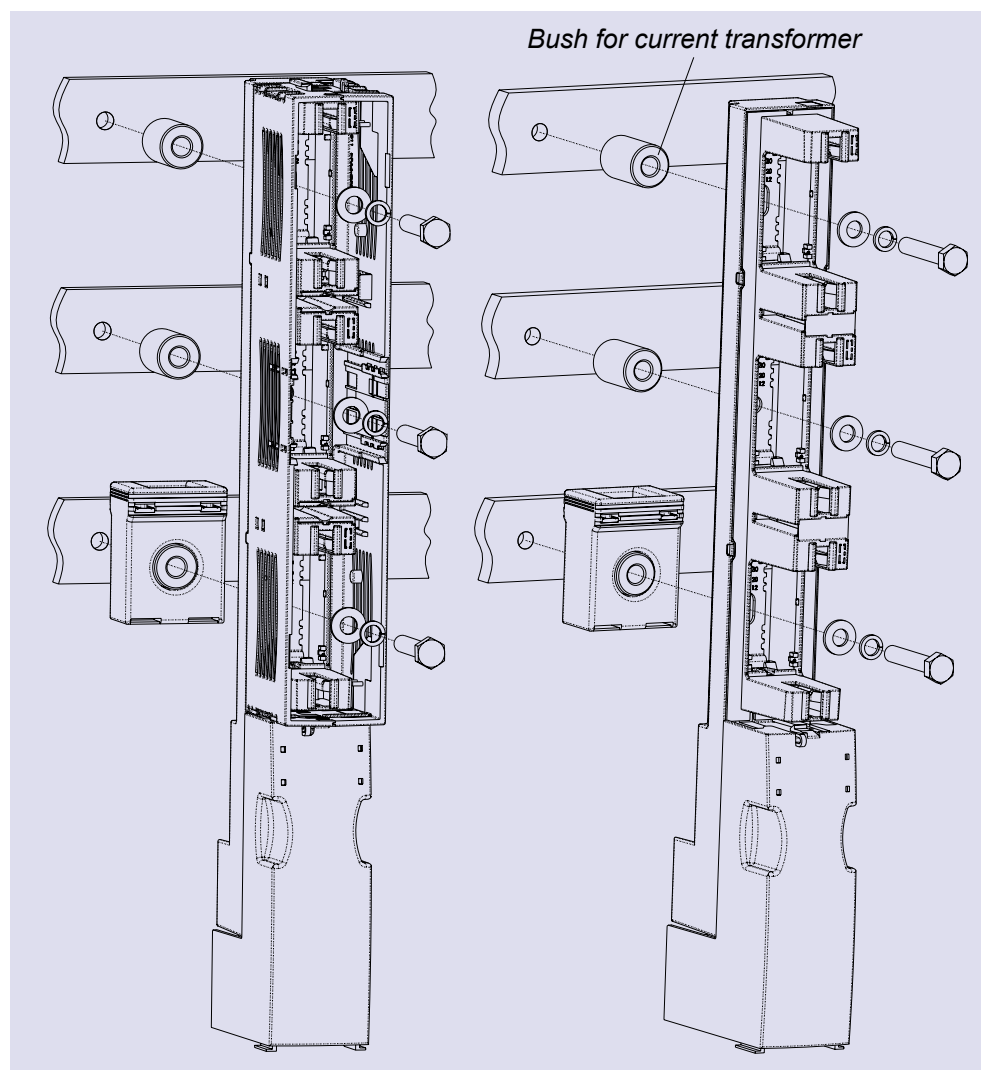
dimensions: a = 48,5 mm, b = 35 mm, c = 65 mm

bush: 36 mm long, ϕ inside 12,5 mm, ϕ outside 22,5 mm

accuracy class = 1

SINGLE PHASE CURRENT MEASUREMENT

„ARS” type fuse switch disconnecter



Fuse switch disconnectors ARS 1/250A; ARS 2/400A; ARS 3/630A

CURRENT TRANSFORMER ASR22.3 with gears: 50A/5A, 100A/5A, 150A/5A, 200A/5A, 250A/5A, 300A/5A, 400A/5A, 500A/5A, 600A/5A

dimensions: a = 61 mm; b = 35 mm; c = 78,5 mm

bush: 36 mm long, ϕ inside 12,5 mm, ϕ outside 22,5 mm

accuracy class = 1

Fuse switch disconnectors ARS 00/160A;

CURRENT TRANSFORMER ASR21.3 with gears: 100A/5A, 150A/5A

dimensions: a = 48,5 mm, b = 35 mm, c = 65 mm

bush: 36 mm long, ϕ inside 12,5 mm, ϕ outside 22,5 mm

accuracy class = 1



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