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2 Protecting and Switching Power Equipment

High performance circuit breakers
Moulded Case Circuit Breakers VA88

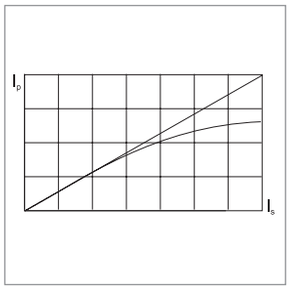
VA88 moulded case circuit breakers are designed for conducting current in the normal mode and cutting current in case of short circuits, overload and inadmissible voltage falls as well as for the prompt switching the electrical circuit sections on/off.
They are intended for usage in the electric installations with the rated voltage up to 400V and the rated currents ranging from 12,5 to 1600 A.
These switches meet the requirements of GOST R 50030.2. They are produced in accordance with the technical requirements TU 3422 001 18461115 2009.

The moulded case circuit breakers were awarded silver medal of the 16th International Exhibition «Electro 2007» in nomination “Best electrical equipment”.

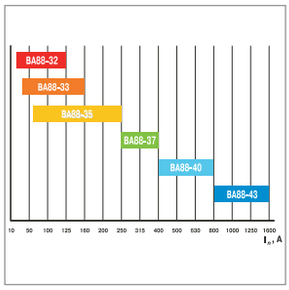
Advantages

- Easy independent installation of complementary devices:
  - signal contact;
  - auxiliary contact;
  - shunt trip;
  - undervoltage release;
  - manual rotary actuator;
  - electric drive;
  - plug-in panel;
  - slide-out panel.
- Basic configuration of any circuit breaker consists of transitional buses or cable lugs, interphase barriers, a set of screws and nuts for connecting the wires, a set of screws for fastening the switch to the mounting panel.
- Using special brackets VA88-32 and VA88-33 switches can be mounted to the DIN-rail.
- Weight and dimensions of this switch are 10–20% less than those of similar devices produced by other home manufacturers. This allows mounting the equipment in smaller distribution cabinets and DBUs. Besides, small size allows replacing old moulded case circuit breakers with those of VA88 series.

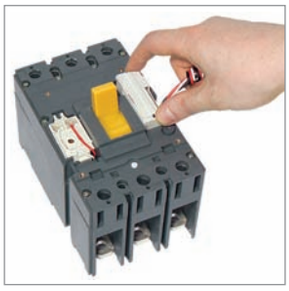
Design Features



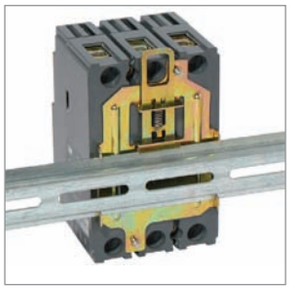
Cutoff current parameters, i.e. the actual short circuit current is much lower that the estimated one. It was reached by increasing contacts separation speed. Dynamic action of the magnetic field and the blowout chamber structure eliminate the arch within the shortest time possible.



Full range of thermal cut-offs ensures selectiveness within a multistage protection system.



Design of VA88 switch allows independent installation of auxiliary devices.



VA88-32 and VA88-33 can be mounted onto a DIN-rail using a special RCS bracket.

Plastic casing details are made of glass-nylon composite ensuring the switches' resistance to deformations caused by short circuits.

VA88 switches can be installed in any position without changing their nominal parameters. VA88 switches can be powered through the upper or the lower connection terminals without performance impairment.

Devices are provided with a double insulation: full division of power and auxiliary circuits. Casing of each complementary device is located in a separate housing eliminating the risk of contact with the active parts and increasing the safety of servicing and testing.

High values of the maximum rated limited breaking capacity (up to 50 kA).

Components

Connecting busbars and lugs

Phase separators

Mounting panel fixing set

External wires fixing set

Selection tables




Circuit breaker types	VA88-32		VA88-33		VA88-35	VA88-35 with MR211release
Release type	Thermal	Electro-magnetic	Thermal	Electro-magnetic	Thermal, electromagnetic	Electronic
Rated current I_n, A	12,5 16 25 32 40	50 63 80 100 125	16 32 40	50 63 80 100 125 160	63 80 100 125 160 200 250	Adjustable: 250×(0,4÷1)
Electromagnetic release setting, A	500	$10I_n$	500	$10I_n$	$10I_n$	Adjustable: 250×(1,5÷12)
NP / No. of poles	3		3		3	3
Service short-circuit breaking capacity I_{cs}, kA	12,5		17,5		25	25
Ultimate short-circuit breaking capacity I_{cu}, kA	25		35		35	35
Auxiliary elements						
Rotary handle drive	PRP-1 125 A (PRP- 32)		PRP-1 160 A (PRP-33)		PRP-1 250 A (PRP-35)	PRP-1 250 A (PRP-35)
DIN rail mounting bracket type	RCS-1 bracket		RCS-2 bracket			
Signal auxiliary contact	AK-125/160 (AK-32/33)		AK-125/160 (AK-32/33)		AK-250/400 (AK-35/37)	AK-250/400 (AK-35/37)
Auxiliary contact	DK-125/160 (DK-32/33)		DK-125/160 (DK-32/33)		DK-250/400 (DK-35/37)	DK-250/400 (DK-35/37)
Shunt trip	PH–125/160 (RN-32/33)		PH–125/160 (RN-32/33)		RN-250/400 (RN-35/37)	RN-250/400 (RN-35/37)
Undervoltage release	RM-125/160 (RM-32/33)		RM-125/160 (RM-32/33)		RM-250/400 (RM-35/37)	RM-250/400 (RM-35/37)
Electric drive	EP-32/33		EP-32/33		EP-35/37	EP-35/37
Mounting panel (for front plug-in)	PM1/P-32		PM1/P-33		PM1/P-35	–
Mounting panel (for rear plug-in)	PM1/R-32		PM1/R-33		PM1/R-35	–
Mounting panel (for front pull-out)	–		–		PM2/P-35	–
Mounting panel (for rear pull-out)	–		–		PM2/R-35	–





VA88-37	VA88-37 with MR211 release	VA88-40	VA88-40 with MR211 release	VA88-43 with MR211 release
Thermal, electromagnetic	Electronic	Thermal, electromagnetic	Electronic	Electronic
250 315 400	Adjustable:: 400×(0,4÷1)	400 500 630 800	Adjustable: 800×(0,4÷1)	Adjustable: 1000×(0,4÷1) 1250×(0,4÷1) 1600×(0,4÷1)
$10I_n$	Adjustable: 400×(1,5÷12)	$10I_n$	Adjustable: 800×(1,5÷12)	Adjustable: 1000×(1,5÷12) 1250×(1,5÷12) 1600×(1,5÷12)
3	3	3	3	3
35	35	35	35	50
35	35	35	35	50
PRP-1 400 A (PRP-37)	PRP-1 400 A (PRP-37)	PRP-1 800 A (PRP-40)	PRP-1 800 A (PRP-40)	–
AK-250/400 (AK-35/37)	AK-250/400 (AK-35/37)	AK-800/1600 (AK-40/43)	AK-800/1600 (AK-40/43)	AK-800/1600 (AK-40/43)
DK-250/400 (DK-35/37)	DK-250/400 (DK-35/37)	DK-800/1600 (DK-40/43)	DK-800/1600 (DK-40/43)	DK-800/1600 (DK-40/43)
RN-250/400 (RN-35/37)	RN-250/400 (RN-35/37)	RN-800/1600 (RN-40/43)	RN-800/1600 (RN-40/43)	RN-800/1600 (RN-40/43)
RM-250/400 (RM-35/37)	RM-250/400 (RM-35/37)	RM-800/1600 (RM-40/43)	RM-800/1600 (RM-40/43)	RM-800/1600 (RM-40/43)
EP-35/37	EP-35/37	EP-40	EP-40	EP-43
PM1/P-37	PM1/P-37	–	–	–
ПМ1/R-37	PM1/R-37	–	–	–
PM2/P-37	PM2/P-37	PM2/P-40	PM2/P-40	PM2/P-43
PM2/R-37	PM2/R-37	PM2/B-40	PM2/B-40	PM2/B-43

Range of Moulded Case Circuit Breakers VA88

	Name	Rated current, A	Number of poles	Rate ultimate short-circuit breaking capacity, I_{cu}	PCS/ package	PCS/CTN	Article
	VA88-32 3P 12,5 A 25 kA	12,5	3	25	1	20	SVA10-3-0012
	VA88-32 3P 16 A 25кA	16	3	25	1	20	SVA10-3-0016
	VA88-32 3P 25 A 25 kA	25	3	25	1	20	SVA10-3-0025
	VA88-32 3P 32 A 25 kA	32	3	25	1	20	SVA10-3-0032
	VA88-32 3P 40 A 25 kA	40	3	25	1	20	SVA10-3-0040
	VA88-32 3P 50 A 25 kA	50	3	25	1	20	SVA10-3-0050
	VA88-32 3P 63 A 25 kA	63	3	25	1	20	SVA10-3-0063
	VA88-32 3P 80 A 25 kA	80	3	25	1	20	SVA10-3-0080
	VA88-32 3P 100 A 25 kA	100	3	25	1	20	SVA10-3-0100
	VA88-32 3P 125 A 25 kA	125	3	25	1	20	SVA10-3-0125
	VA88-33 3P 16 A 35 kA	16	3	35	1	16	SVA20-3-0016
	VA88-33 3P 32 A 35 kA	32	3	35	1	16	SVA20-3-0032
	VA88-33 3P 40 A 35 kA	40	3	35	1	16	SVA20-3-0040
	VA88-33 3P 50 A 35 kA	50	3	35	1	16	SVA20-3-0050
	VA88-33 3P 63 A 35 kA	63	3	35	1	16	SVA20-3-0063
	VA88-33 3P 80 A 35 kA	80	3	35	1	16	SVA20-3-0080
	VA88-33 3P 100 A 35 kA	100	3	35	1	16	SVA20-3-0100
	VA88-33 3P 125 A 35 kA	125	3	35	1	16	SVA20-3-0125
	VA88-33 3P 160 A 35 kA	160	3	35	1	16	SVA20-3-0160
	VA88-35 3P 63 A 35кA	63	3	35	1	6	SVA30-3-0063
	VA88-35 3P 80 A 35кA	80	3	35	1	6	SVA30-3-0080
	VA88-35 3P 100 A 35кA	100	3	35	1	6	SVA30-3-0100
	VA88-35 3P 125 A 35 kA	125	3	35	1	6	SVA30-3-0125
	VA88-35 3P 160 A 35 kA	160	3	35	1	6	SVA30-3-0160
	VA88-35 3P 200 A 35 kA	200	3	35	1	6	SVA30-3-0200
	VA88-35 3P 250 A 35 kA	250	3	35	1	6	SVA30-3-0250
	VA88-35 3P 250 A 35 kA with MR211 electronic release	250	3	35	1	6	SVA31-3-0250
	VA88-37 3P 250 A 35 kA	250	3	35	1	4	SVA40-3-0250
	VA88-37 3P 315 A 35 kA	315	3	35	1	4	SVA40-3-0315
	VA88-37 3P 400 A 35 kA	400	3	35	1	4	SVA40-3-0400
	VA88-37 3P 400 A 35 kA with MR211 electronic release	400	3	35	1	4	SVA41-3-0400

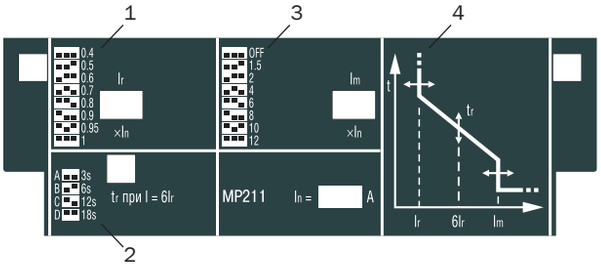
	Name	Rated current, A	Number of poles	Rate ultimate short-circuit breaking capacity, I_{cu}	PCS/ package	PCS/CTN	Article
	VA88-40 3P 400 A 35 kA	400	3	35	1	2	SVA50-3-0400
	VA88-40 3P 500 A 35 kA	500	3	35	1	2	SVA50-3-0500
	VA88-40 3P 630 A 35 kA	630	3	35	1	2	SVA50-3-0630
	VA88-40 3P 800 A 35 kA	800	3	35	1	2	SVA50-3-0800
	VA88-40 3P 800 A 35 kA with MR211 electronic release	800	3	35	1	2	SVA51-3-0800
	VA88-43 3P 1000 A 50 kA with MR211 electronic release	1000	3	50	1	1	SVA61-3-1000
	VA88-43 3P 1250 A 50 kA with MR211 electronic release	1250	3	50	1	1	SVA61-3-1250
	VA88-43 3P 1600 A 50 kA with MR211 electronic release	1600	3	50	1	1	SVA61-3-1600

VA88 Supply set

Name	VA88-32		VA88-33		VA88-35	VA88-35 with electronic release	VA88-37	VA88-37 with electronic release	VA88-40	VA88-40 with electronic release	VA88-43 with electronic release
	10÷50	63÷125	32÷50	63÷160							
MCCB VA88 43	+		+		+	+	+	+	+	+	+
Packing box	+		+		+	+	+	+	+	+	+
Certificate	+		+		+	+	+	+	+	+	+
Adapter lug	–	+	–	+	–	–	+	+	+	+	+
Cable lug	+	–	+	–	–	+	–	–	–	–	–
Phase separators	+		+		+	+	+	+	+	+	+
External wires fixing set	–		–		+	+	+	+	+	+	+
Mounting panel fixing set	+		+		+	+	+	+	+	+	+

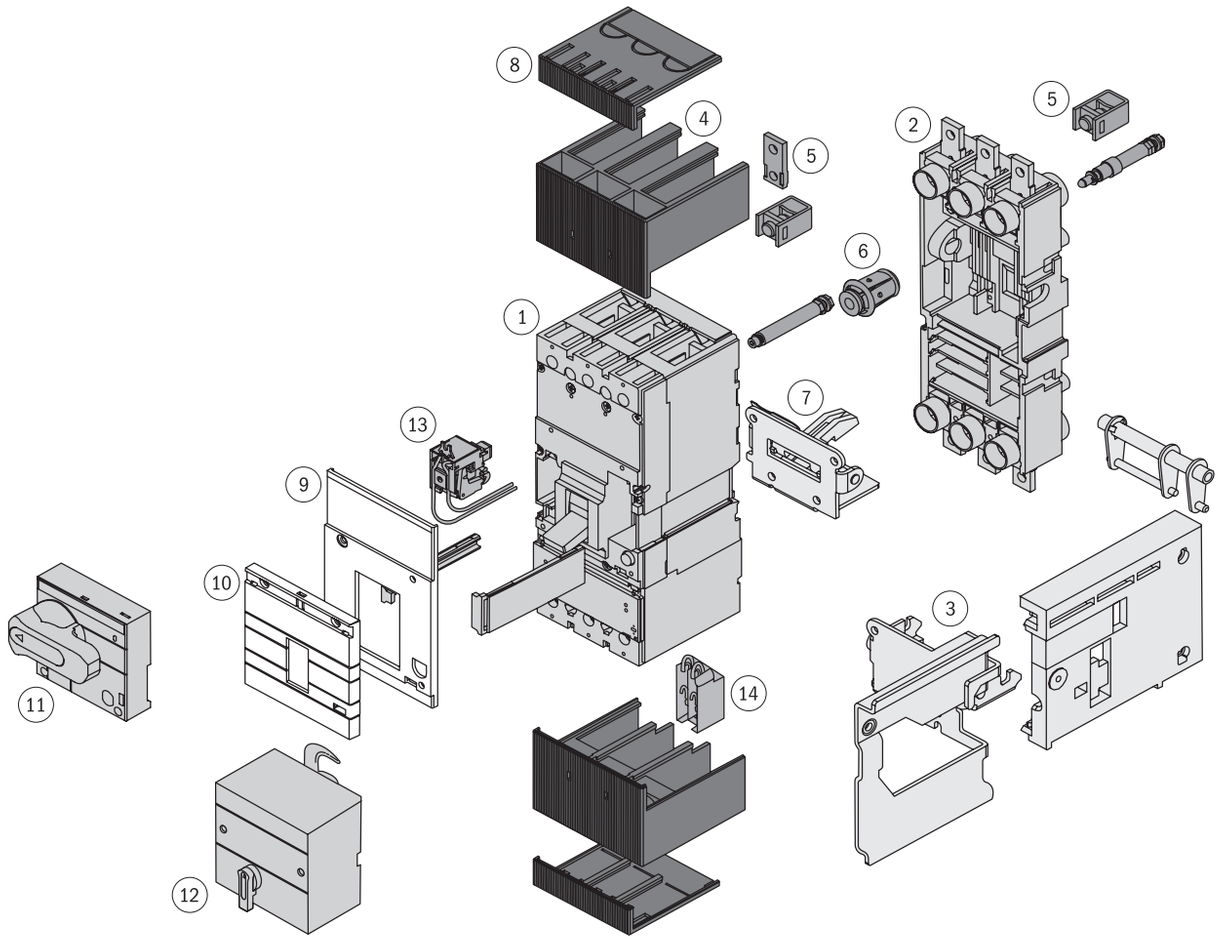
Moulded Case Circuit Breakers VA88 with MR211 electronic release

Moulded case circuit breakers with an electronic release ensure overload and short circuit protection by an electronic overcurrent release. This ensurs high reliability, response accuracy and independence from the environment conditions.
The electronic release does not require a separate supply and guarantees exact operation of protection at a load current amounting up to 15% of the rated value even if only one phase is energized. Protection unit includes three current transformers, an electronic module and a trip electromagnet that controls directly the switch mechanism. The current transformers installed inside the release's casing ensure the power supply of its electronic circuit and produce signals necessary for the protection function Protection parameters (pickup settings) are chosen by the user directly on the front panel of the circuit breaker by setting the DIP-switches in accordance with the introduced mnemocircuit. For more details see the technical catalogue "Moulded case circuit breakers of VA88 series".
Due to a wider range of pickup settings' adjustment MR211 electronic release can be used for any kind of switching networks requiring stability and accuracy of response.



1 – Overload protection setting circuit breaker
2 – Overload protection trigger line circuit breaker
3 – Short circuit protection setting circuit breaker
4 – Current parameter timing schedule

MCCB VA88 Auxiliary elements



1 – High performance circuit breaker
2 – Mounting panel (plug-in / pull-out)
3 – Side panels for pull-out option
4 – Phase separators
5 – Connecting busbars
6 – Plug-in contacts
7 – Blocking unit
8 – Terminal cover
9 – Case cover
10 – Detachable case cover
11 – Rotary handle drive
12 – Electric drive
13 – Shunt trip / undervoltage release
14 – Signal/Auxiliary contacts

EP Electric drive

EP electric drive is designed for remote turning the moulded case circuit breakers of VA88 series on/off. Electric drives are stationary general-purpose electrical devices designed for completing the moulded case circuit breakers installed in the main DBUs, IDDs, control boards etc.
Moulded case circuit breakers with an electric drive can be used for completing the automatic transfer circuit breakers.

Technical features

Feature name	ЭП32/33	ЭП35/37	ЭП40	ЭП43
Rated voltage U_e, V	230	230	230	230
Rated voltage range U, V	(0,85÷1,1) U_e	(0,85÷1,1) U_e	(0,85÷1,1) U_e	(0,85÷1,1) U_e
Rated frequency, Hz	50	50	50	50
Maximum starting power, W	2000	510	660	660
Rated power consumption, W	–	360	180	180
Turn-on time, max., sec.	0,1	0,1	0,1	0,1
Turn-off time, max., sec.	0,1	0,1	1,1	1,1
Durability, not less than, cycles	8000	15 000	1500	1500
Weight, max., kg	0,84	1,6	3,65	3,65

Range

	Name	MCCB type	PCS/package	Article
	EP-32/33	VA88-32, VA88-33	16	SVA10D-EP
	EP-35/37	VA88-35, VA88-37	8	SVA30D-EP
	EP-40	VA88-40	4	SVA50D-EP
	EP-43	VA88-43	4	SVA60D-EP

Mounting panel (plug-in/pull-out)

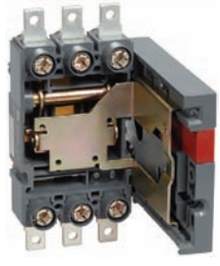
These panels are intended for completing the moulded case circuit breakers of VA88 series installed in the main DBUs, IDDs, control boards etc. They allow performing a single minute exchange of switches and ensure creating a visible break during routine line maintenance.

Mounting panels are intended for transforming stationary VA88 switches into plug-in (PM1) and slide-out (PM2) items.

Technical features

Feature name	PM1/P-32, PM1/R-32	PM1/P-33, PM1/R-33	PM1/P-35, PM1/R-35	PM2/P-35, PM2/R-35	PM1/P-37, PM1/R-37	PM2/P-37, ПМ2/R-37	PM2/P-40, ПМ2/B-40	PM2/B-43, PM2/P-43
Rated voltage U_e, V				400				
Rated voltage range U, V				(0,2÷1,2) U_e				
Rated frequency, Hz				50				
Dissipated power, max., W	5	10	15	15	30	20	30	30
Durability, not less than, cycles	6000	6000	5000	5000	4000	4000	3500	4000
Weight, max., kg	0,9÷1,1	1,2÷1,3	1,7÷2,7	2,3÷6,0	3,7÷4,3	2,8÷9,5	9,5÷11,0	24,0÷22,5

Range

	Name		MCCB type	PCS/package	Article
	Plug-in front-connected panel PM1	PM1/P-32	VA88-32	24	SVA10D-PM1-P
		PM1/P-33	VA88-33	24	SVA20D-PM1-P
		PM1/P-35	VA88-35	16	SVA30D-PM1-P
		PM1/P-37	VA88-37	8	SVA40D-PM1-P
	Plug-in back screw connected panel PM1	PM1/R-32	VA88-32	12	SVA10D-PM1-R
		PM1/R-33	VA88-33	12	SVA20D-PM1-R
		PM1/R-35	VA88-35	12	SVA30D-PM1-R
		PM1/R-37	VA88-37	4	SVA40D-PM1-R
	Slide out front-connected panel PM2	PM2/P-35	VA88-35	8	SVA30D-PM2-P
		PM2/P-37	VA88-37	4	SVA40D-PM2-P
		PM2/P-40	VA88-40	2	SVA50D-PM2-P
		PM2/P-43	VA88-43	1	SVA60D-PM2-P
	Slide-out back screw connected panel PM2	PM2/R-35	VA88-35	8	SVA30D-PM2-R
		PM2/R-37	VA88-37	2	SVA40D-PM2-R
	Slide-out vertical bus-connected panel PM2	PM2/B-40	VA88-40	2	SVA50D-PM2-V
		PM2/B-43	VA88-43	1	SVA60D-PM2-V

Signal auxiliary contact

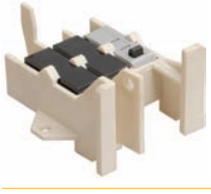
Signal auxiliary contact is intended for sending out signals on the automatic switch response from:
– overcurrent (overload or short circuit);
– shunt trip;
– undervoltage release;
– “TEST” button.

When the contacts are returned in the “turn-on” position the alarm is switched off.

Technical features

Contact type	Conventional thermal current, A	Rated current, A (Rated voltage, U)		
		230 V, 50 Hz	400 V, 50 Hz	220 V, DC
AK-125/160 (AK-32/33) AK-250/400 (AK-35/37) AK-800/1600 (AK-40/43)	2	2	2	0,2

Range

	Name	MCCB type	PCS/package	PCS/CTN	Article
	AK-125/160 (AK-32/33)	VA88-32, VA88-33	20	480	SVA10D-AK-1
	AK-250/400 (AK-35/37)	VA88-35, VA88-37	10	240	SVA30D-AK-1
	AK-800/1600 (AK-40/43)	VA88-40, VA88-43	5	120	SVA50D-AK-1

Auxiliary contact

Auxiliary contact is intended for sending out signals on the switch power contacts’ position (on/off).

Technical features

Contact type	Conventional thermal current, A	Rated current, A		
		230 V, 50 Hz	400 V, 50 Hz	220 V, DC
DK-125/160 (DK-32/33)	4	3	–	0,14
DK-250/400 (DK-35/37)	8	6	3,5	0,2
DK-800/1600 (DK-40/43)	8	6	3,5	0,2

Range

	Name	MCCB type	PCS/package	PCS/CTN	Article
	DK-125/160 (DK-32/33)	VA88-32, VA88-33	20	480	SVA10D-DK-1
	DK-250/400 (DK-35/37)	VA88-35, VA88-37	10	240	SVA30D-DK-1
	DK-800/1600 (DK-40/43)	VA88-40, VA88-43	5	120	SVA50D-DK-1

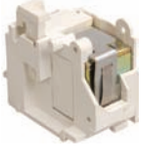
Shunt trip RN

Shunt trip RN is used for distantly turning the switch off.

Technical features

Rated voltage U_e (50 Hz), V	230
Rated voltage range U, V	(0,7÷1,1) U_e
Power consumption, VA	150

Range

	Name	MCCB type	PCS/package	PCS/CTN	Article
	RN-125/160 (RN-32/33)	VA88-32, VA88-33	20	480	SVA10D-RN
	RN-250/400 (RN-35/37)	VA88-35, VA88-37	10	240	SVA30D-RN
	RN-800/1600 (RN-40/43)	VA88-40, VA88-43	5	120	SVA50D-RN

Undervoltage release

Undervoltage release encourages the circuit breaker to turn off if the phase of linear voltage at its input falls to 70% of the rated values. It also prevents its activation if the circuit voltage is below 85% of the rated value.

Technical features

Rated voltage U_e (50 Hz), V	230
Turn-on voltage range	(0,85÷1,1) U_e
Holding voltage range	(0,7÷1,1) U_e
Turn-off voltage	< 0,7 U_e
Power consumption, VA	10

Range

	Name	MCCB type	PCS/package	PCS/CTN	Article
	RM-125/160 (RM-32/33)	VA88-32, VA88-33	20	480	SVA10D-RM
	RM-250/400 (RM-35/37)	VA88-35, VA88-37	10	240	SVA30D-RM
	RM-800/1600 (RM-40/43)	VA88-40, VA88-43	5	120	SVA50D-RM

Rotary handle drive

Rotary handle drive is intended for transforming the rotary motion into the translational one for controlling the circuit breaker. The actuator is fixed onto the distribution device's door for manipulating the circuit breaker through the said door or directly on the circuit breaker.

Range

Name	MCCB type	PCS/package	PCS/CTN	Article
PRP-1 125 A (PRP-32)	VA88-32	–	48	SVA10D-PRP-1-1
PRP-1 160 A (PRP-33)	VA88-33	–	48	SVA20D-PRP-1-1
PRP-1 250 A (PRP-35)	VA88-35	–	16	SVA30D-PRP-1-1
PRP-1 400 A (PRP-37)	VA88-37	–	16	SVA40D-PRP-1-1
PRP-1 800 A (PRP-40)	VA88-40	–	12	SVA50D-PRP-1-1

DIN rail mounting bracket

Range

Name	MCCB type	PCS/package	PCS/CTN	Article
RCS-1	VA88-32	–	270	SVA10D-S35-3
RCS-2	VA88-33		270	SVA20D-S35-3

Lugs

Range

Name	MCCB type	PCS/package	PCS/CTN	Article
lugs	VA88-32	6	400	SVA10D-N-3
lugs	VA88-33	6	400	SVA20D-N-3

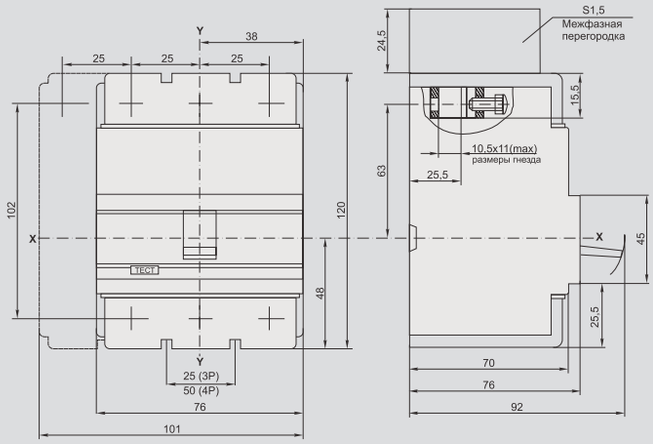
Технические характеристики

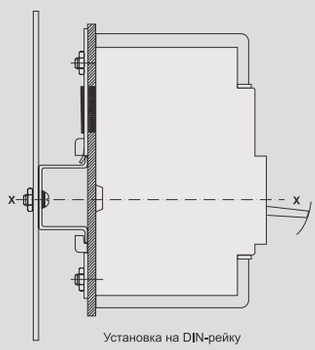
Name		VA88-32		VA88-33		VA88-35	VA88-35*	VA88-37	VA88-37*	VA88-40	VA88-40*	VA88-43*
Peak rated current I_{nm}, A (for each modification type)		125		160		250	250	400	400	800	800	1600
Rated current (thermal release setting), A		12.5, 16, 25, 32, 40	50, 63, 80, 100, 125	16, 25, 32, 40	50, 63, 100, 125, 160	63, 80, 100, 125, 160, 200, 250	250 (0,4 ÷ 1)	250, 315, 400	400 (0,4 ÷ 1)	400, 500, 630, 800	800 (0,4 ÷ 1)	1000, 1250, 1600
Electromagnetic release setting I_m, A		500	10 I_n	500	10 I_n	10 I_n	adjustable (1,5 ÷ 12) I_n	10 I_n	adjustable (1,5 ÷ 12) I_n	10 I_n	adjustable (1,5 ÷ 12) I_n	adjustable (1,5 ÷ 12) I_n
Overcurrent release		heat and electromagnetic		heat and electromagnetic		heat and electro-magnetic	electronic	heat and electro-magnetic	electronic	heat and electro-magnetic	electronic	electronic
MR 110												•
MR 211							•		•		•	•
Service short-circuit breaking capacity I_{cs}, kA		12,5		17,5		25	25	35	35	35	35	50
Ultimate short-circuit breaking capacity I_{cu}, kA (220 V)		25		35		35	35	35	35	35	35	50
Ultimate short-circuit breaking capacity I_{cu}, kA (690 V)		4		6		14	14	18	18	20	20	20
Mechanical durability, not less than, cycles		8500		7000		7000	7000	4000	4000	4000	4000	2500
Electrical durability, not less than, cycles		2500		2000		2000	2000	2000	2000	2000	2000	1500
Type	plug-in	•		•		•		•	•			
	pull-out					•		•	•	•	•	•
External wires connection	front plug-in	•		•		•		•	•	•	•	•
	rear plug-in	•		•		•		•	•	•	•	•
Type of drive	electric	•		•		•	•	•	•	•	•	•
	rotary handle	•		•		•	•	•	•	•	•	•
Overall dimensions, mm	width	76		90		105	105	140	140	210	210	210
	height	120		120		170	218	254	254	268	268	422
	depth	70		70		101,5	101,5	101,5	101,5	101,5	101,5	141
Climatic type		MRC3		MRC3		MRC3	MRC3	MRC3	MRC3	MRC3	MRC3	MRC3
Weight, max., kg		0,92		1,2		4,1	4,1	5,1	5,1	9,6	9,6	17,2
Durability, not less than, years		15		15		15	15	15	15	15	15	15

* Supplied with an electric release MR211.

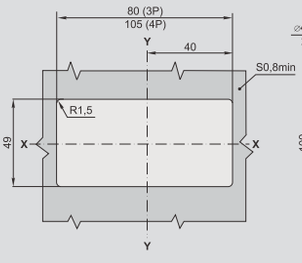
Overall and setting dimensions

VA88-32

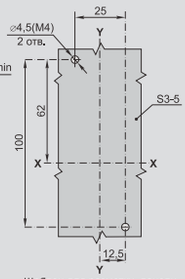




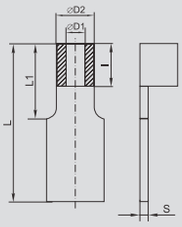
Установка на DIN-рейку



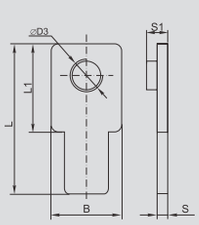
Шаблон для разметки двери



Шаблон для разметки панели



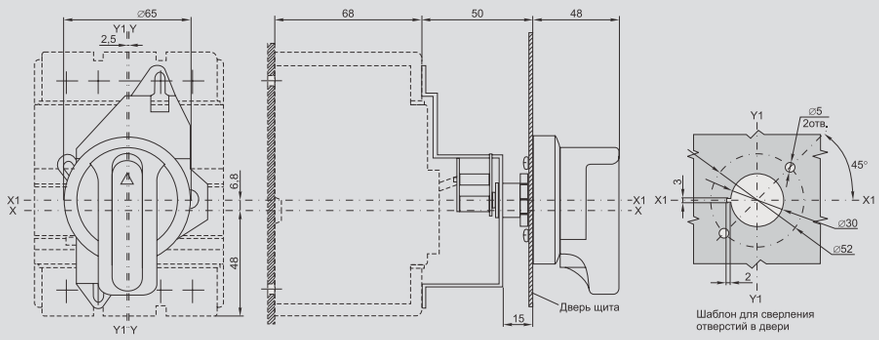
Наконечник-переходник
для ВА88-32 с In от 12,5 А до 100 А



Наконечник-переходник
для ВА88-32 с In 125 А

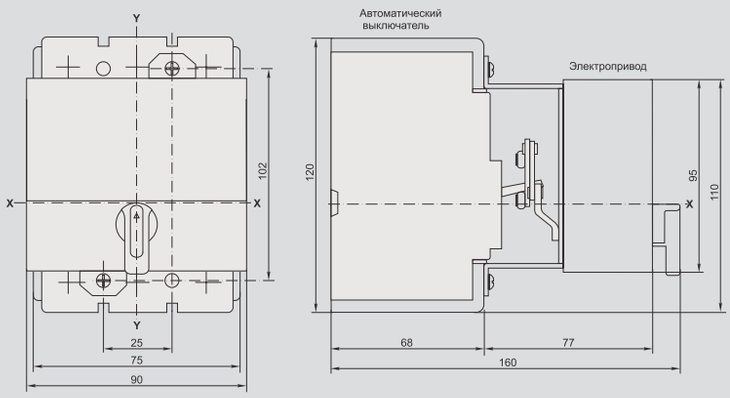
Rated current In, A	Dimensions, mm								
	B	⌀D1	⌀D2	⌀D3	l	L	L1	S	S1
12,5		3	5		6	26	12	1	
16		3	5		6	26	12	1	
25		3	5		6	26	12	1	
32		5	8		10	30	15	1,5	
40		5	8		10	30	15	1,5	
50		5	8		10	30	15	1,5	
63		6	9		10	30	15	1,8	
80		8	13		10	30	15	2,5	
100		8	13		10	30	15	2,5	
125	18			M8		35	20	2,4	4,5

VA88-32 с ПРП-32

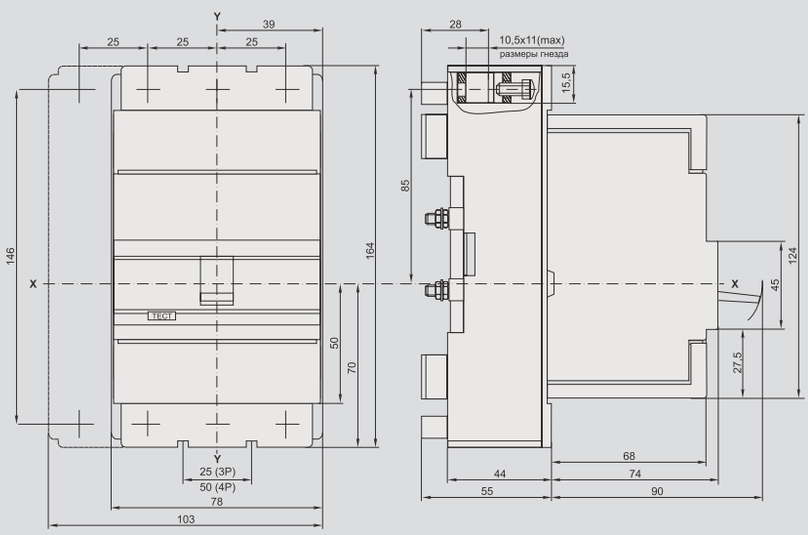


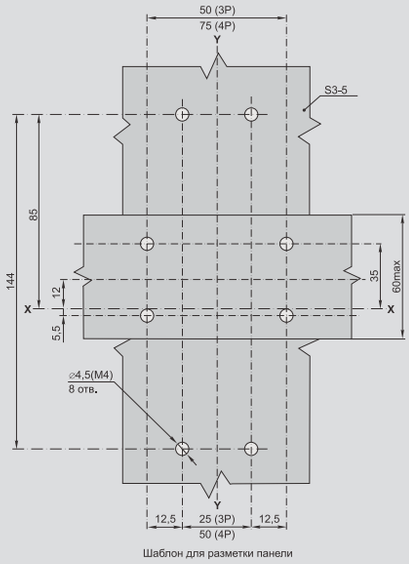
Шаблон для сверления
отверстий в двери

VA88-32 with electric drive EP-32/33



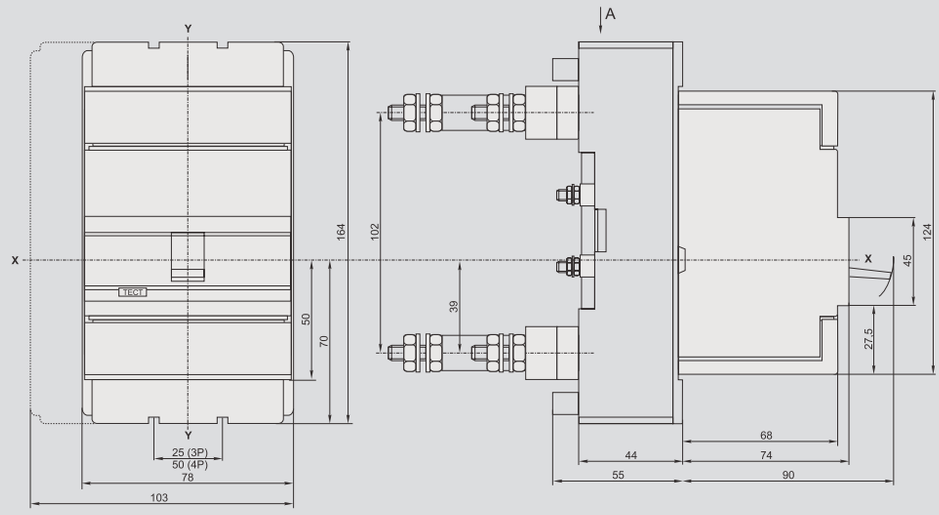
VA88-32 with plug-in front-connected panels PM1/P-32

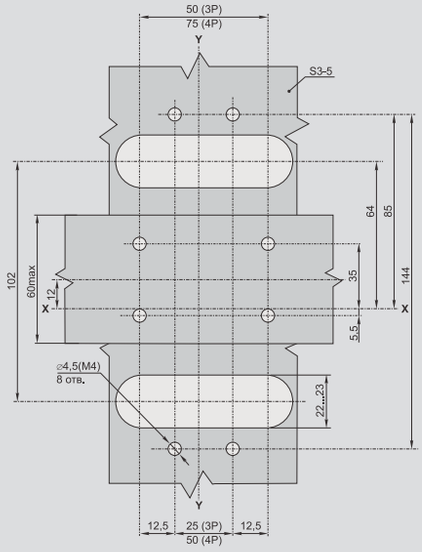




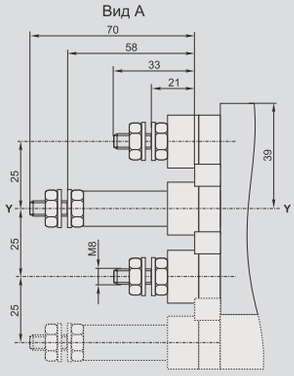
Шаблон для разметки панели

VA88-32 with plug-in back screw-connected panels PM1/R-32

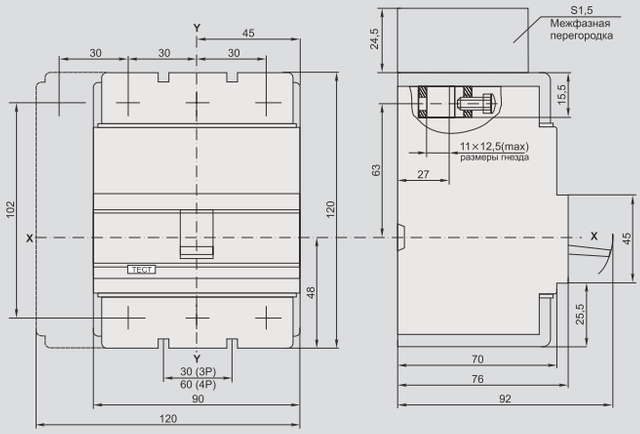


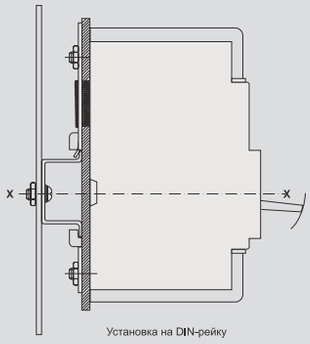


Шаблон для разметки панели

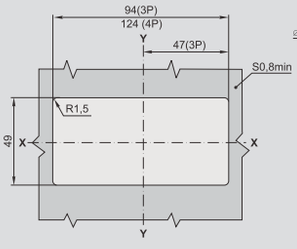


VA88-33

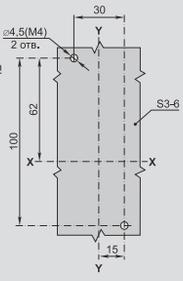




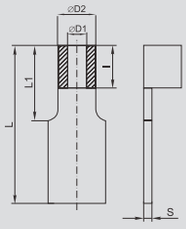
Установка на DIN-рейку



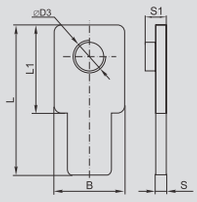
Шаблон для разметки двери



Шаблон для разметки панели



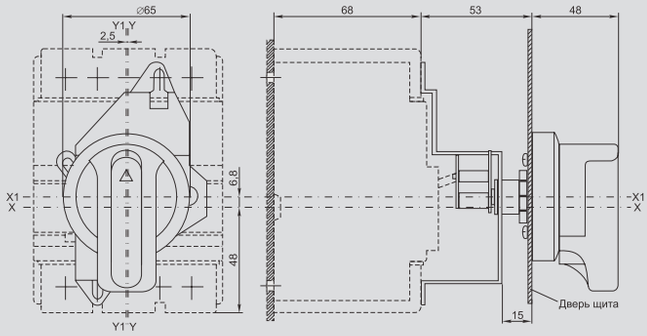
Наконечник-переходник
на ВА88-33 с I_n от 16 А до 100 А

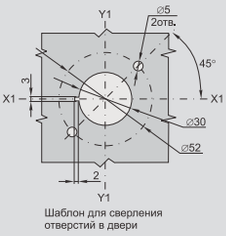


Наконечник-переходник
на ВА88-33 с I_n 125 А и 160 А

Rated current I_n, A	Dimensions, mm								
	B	⌀D1	⌀D2	⌀D3	I	L	L1	S	S1
16		3	5		6	26	12	1	
25		3	5		6	26	12	1	
32		4	6		8	26	12	1	
40		6	10		10	30	15	2	
50		6	10		10	30	15	2	
63		6	10		10	30	15	2	
80		6	10		10	30	15	2	
100		8	12		11	30	15	2	
125	16			M8		35	20	2,4	4,5
160	18			M8		35	20	2,4	4,5

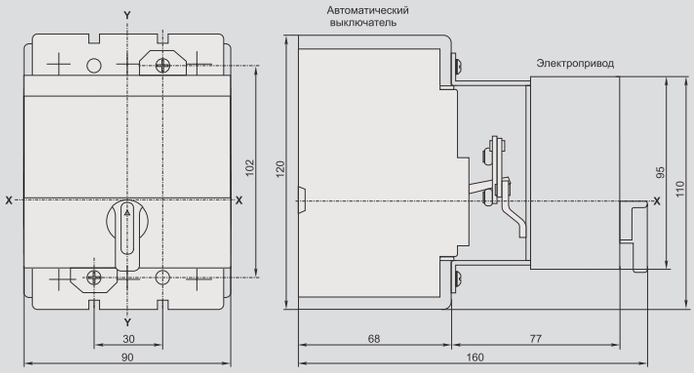
VA88-33 with PRP-33



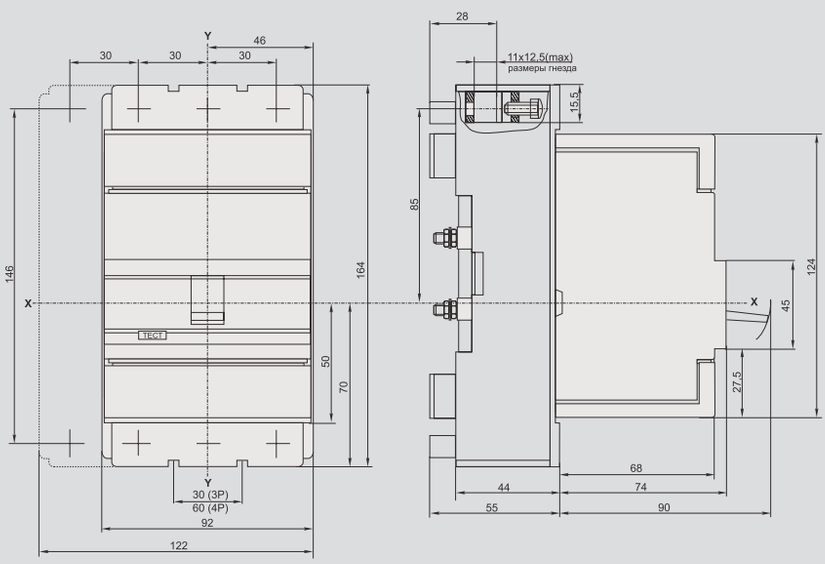


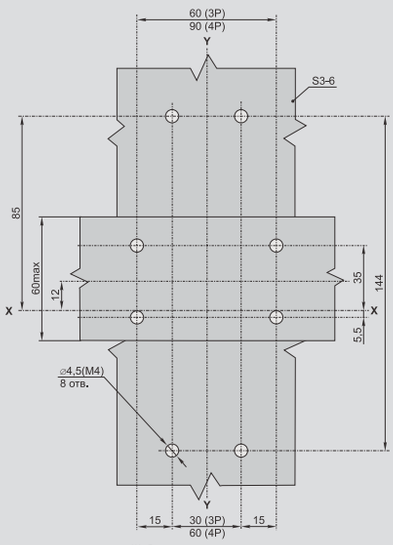
Шаблон для сверления
отверстий в двери

VA88-33 with electric drive EP-32/33



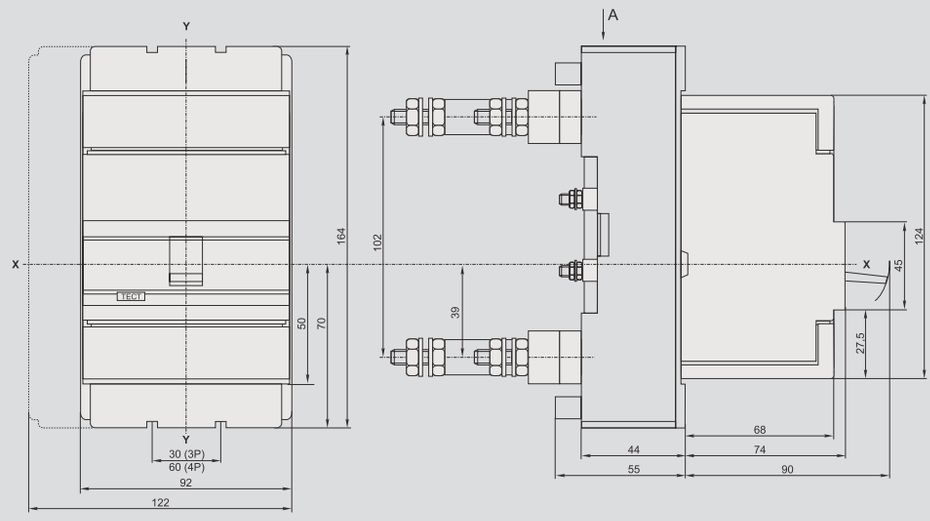
VA88-33 with plug-in front-connected panels PM1/P-33

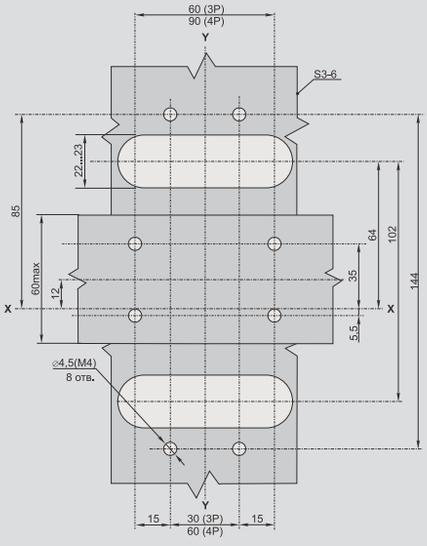




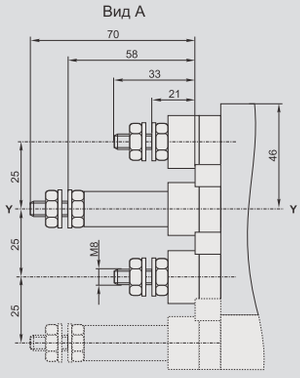
Шаблон для разметки панели

VA88-33 with plug-in back screw-connected panels PM1/R-33

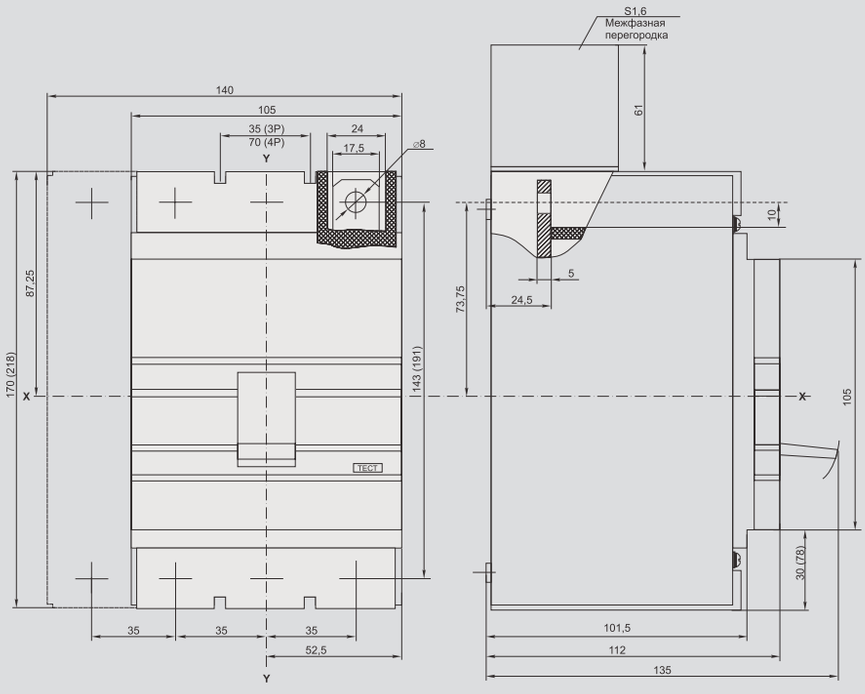


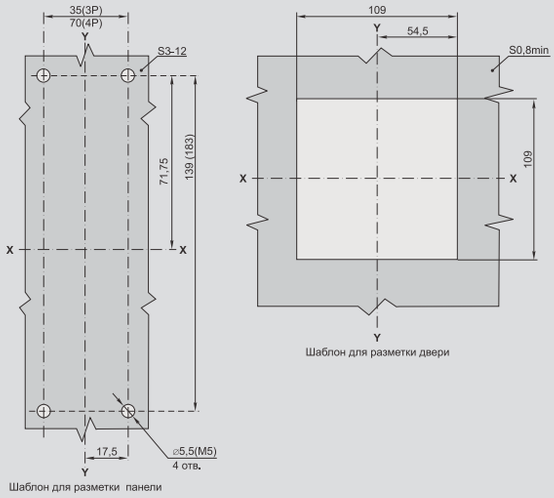


Шаблон для разметки панели



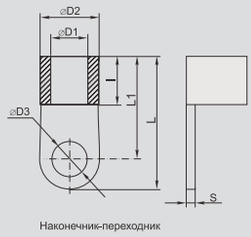
VA88-35





Шаблон для разметки панели

Шаблон для разметки двери

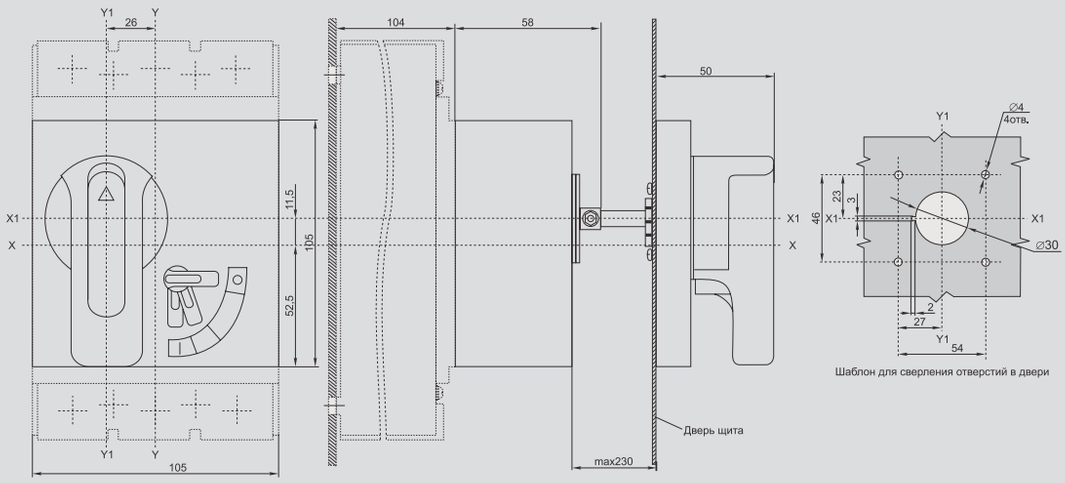


Наконечник-переходник

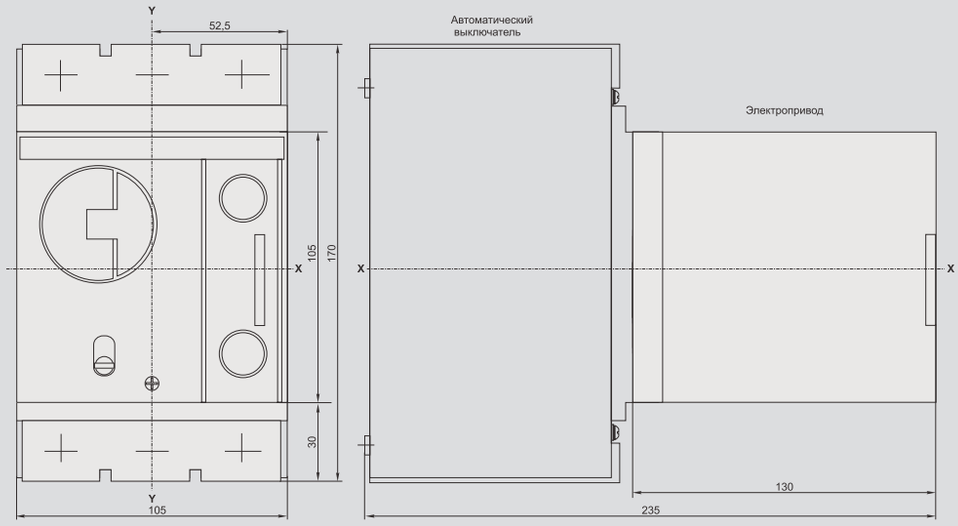
Parenthesized dimensions are stated for items provided with an electronic release

Rated current In, A	Dimensions, mm						
	⌀D1	⌀D2	⌀D3	l	L	L1	S
63	7	9	8	10	31	24	1
80	8	11	8	10	32	25	1,5
100	10	13	10	13	38	28	1,5
125	10	13	10	13	38	28	1,5
160	14	18	10	14	39	30	2
200	14	18	10	14	39	30	2
250	16	20	10	15	40	31	2

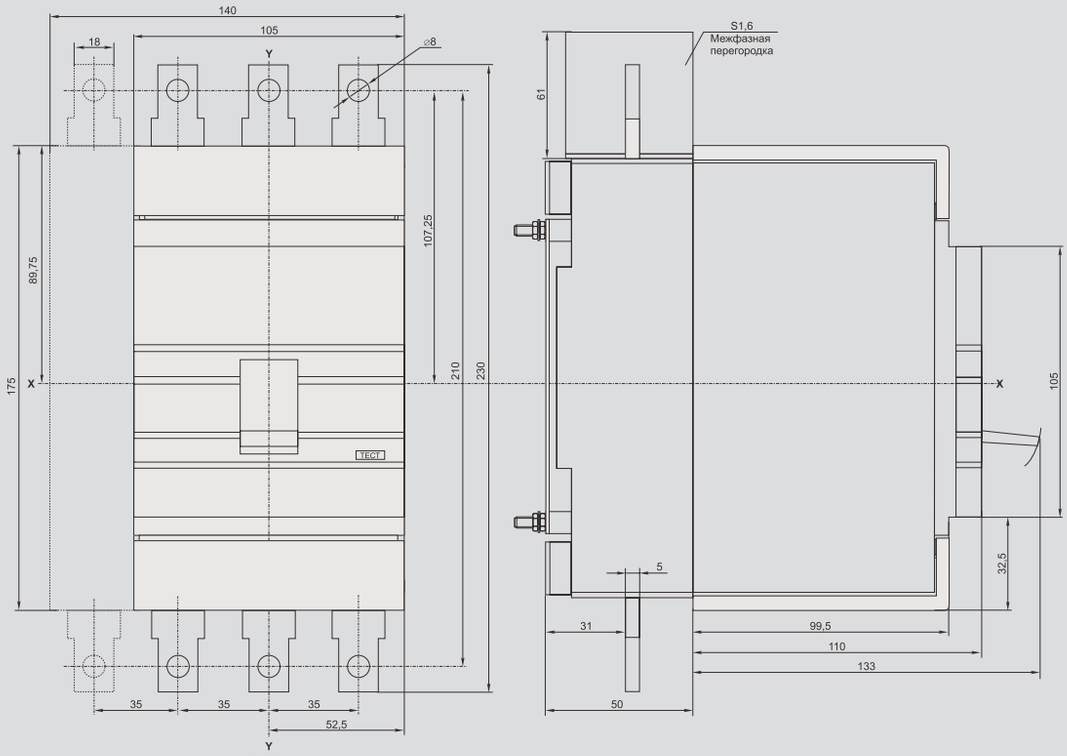
VA88-35 with PRP-35

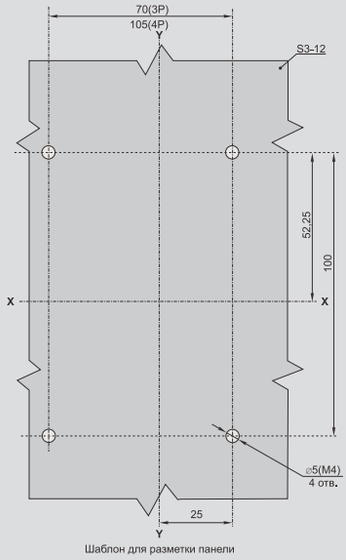


VA88-35 with electric drive EP-35/37



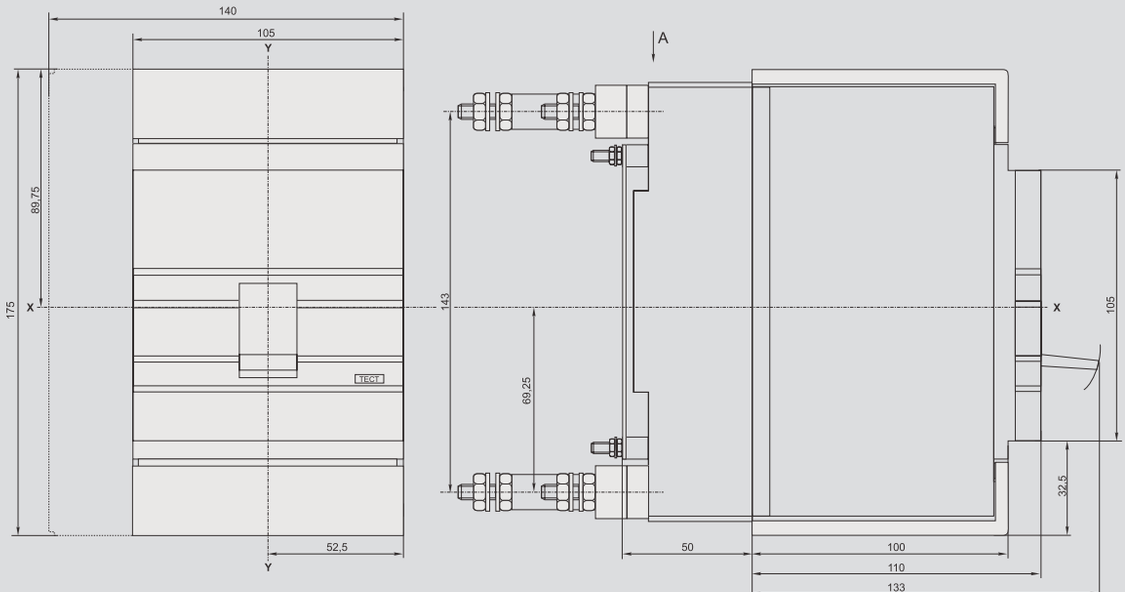
VA88-35 with plug-in front-connected panels PM1/P-33

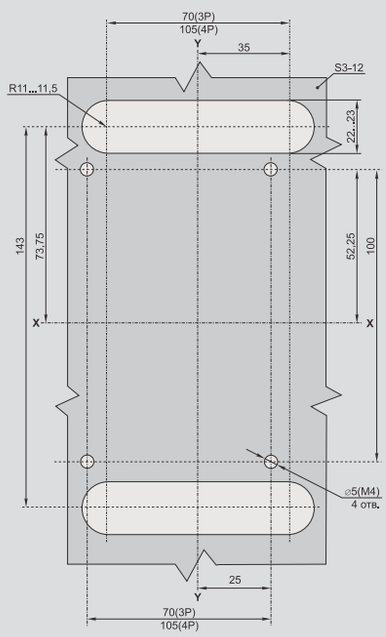


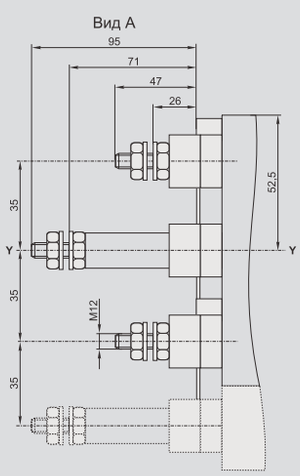


Шаблон для разметки панели

VA88-35 with plug-in back screw-connected panels PM1/P-35

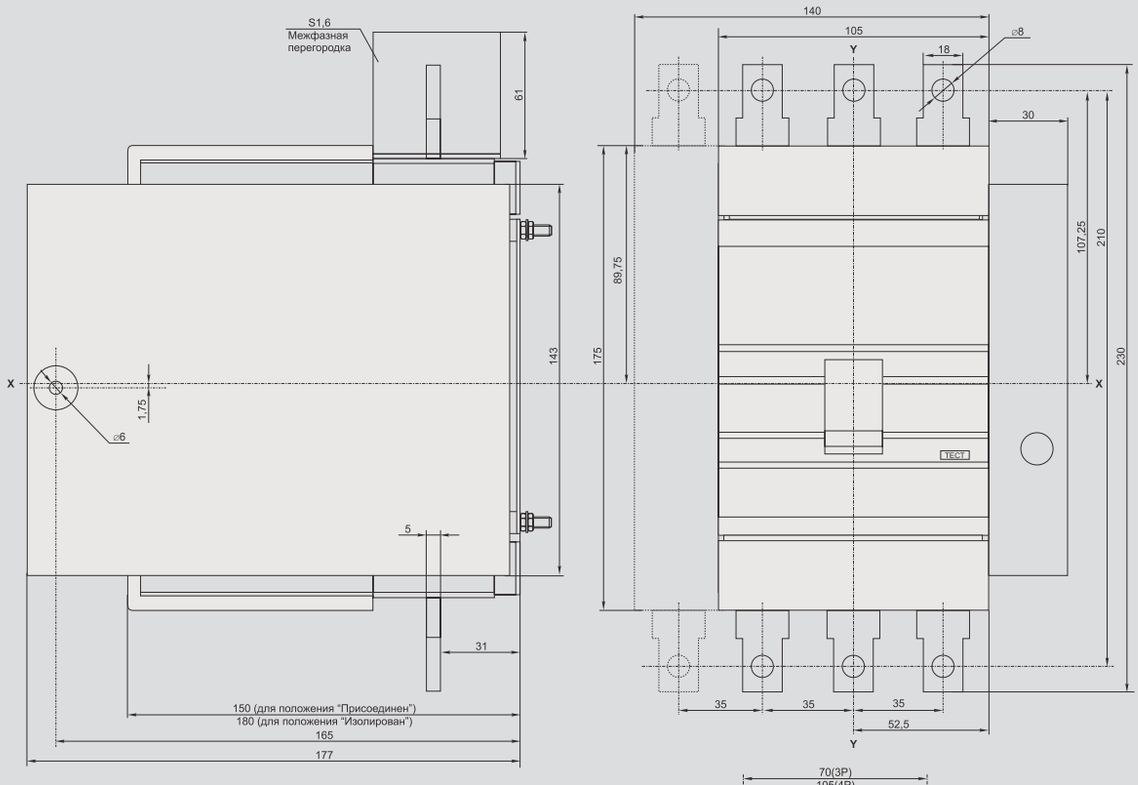


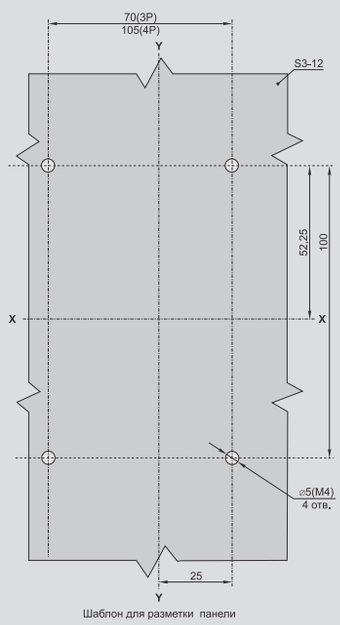




Шаблон для разметки панели

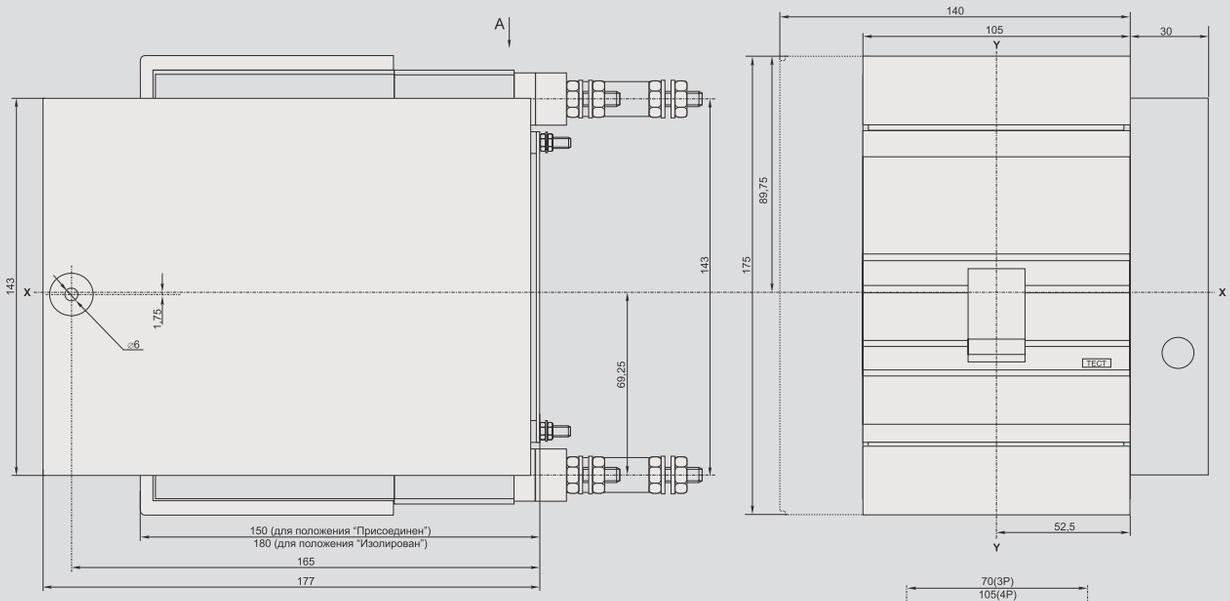
VA88-35 with slide-out front connected panels PM2/P-35

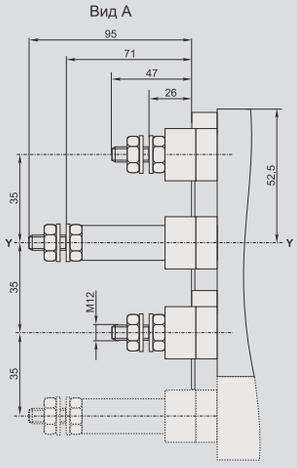


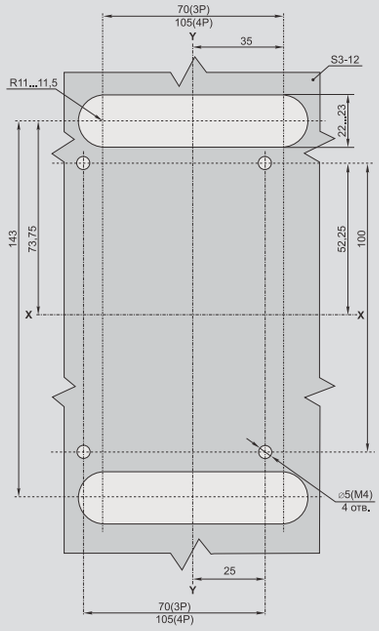


Шаблон для разметки панели

VA88-35 with slide-out back screw-connected panels PM2/R-35

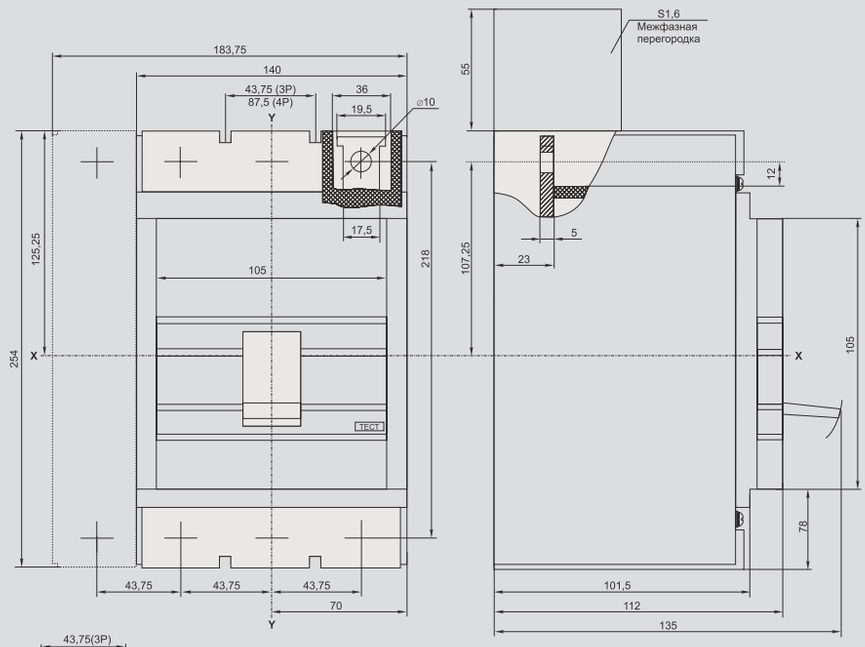


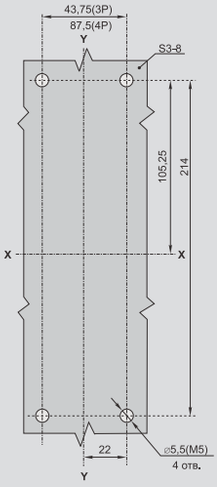




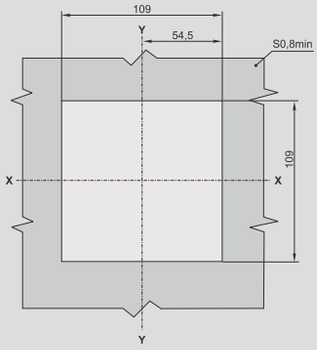
Шаблон для разметки панели

VA88-37

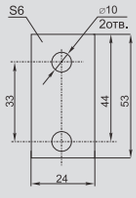




Шаблон для разметки панели

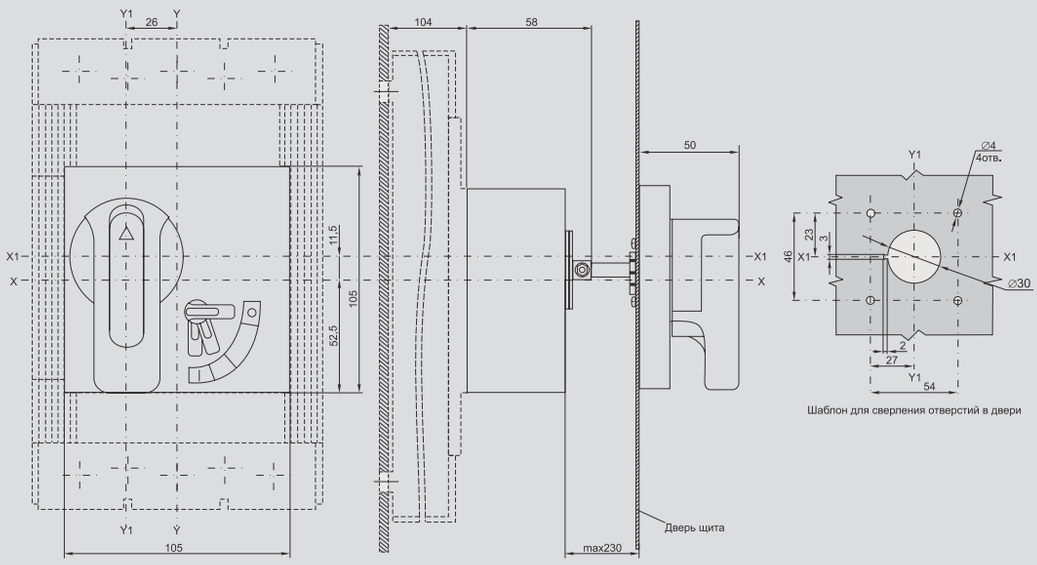


Шаблон для разметки двери

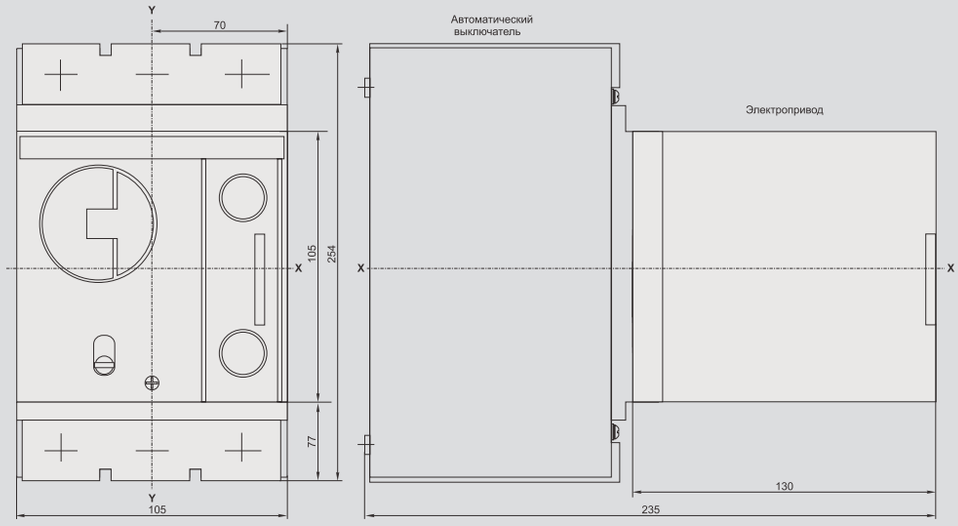


Наконечник-переходник

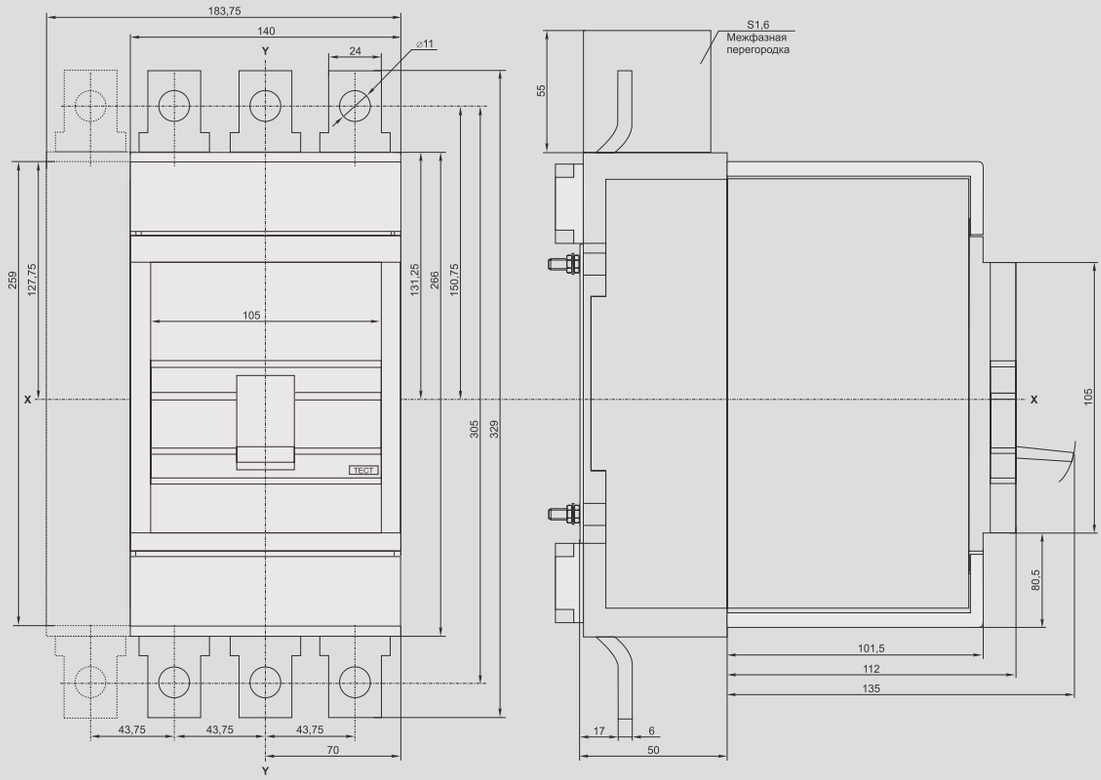
VA88-37 with manual rotary actuator PRP-37

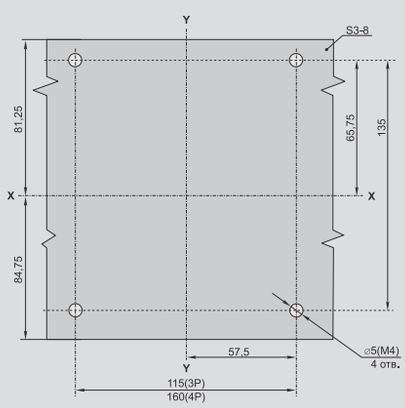


VA88-37 with electric drive EP-35/37



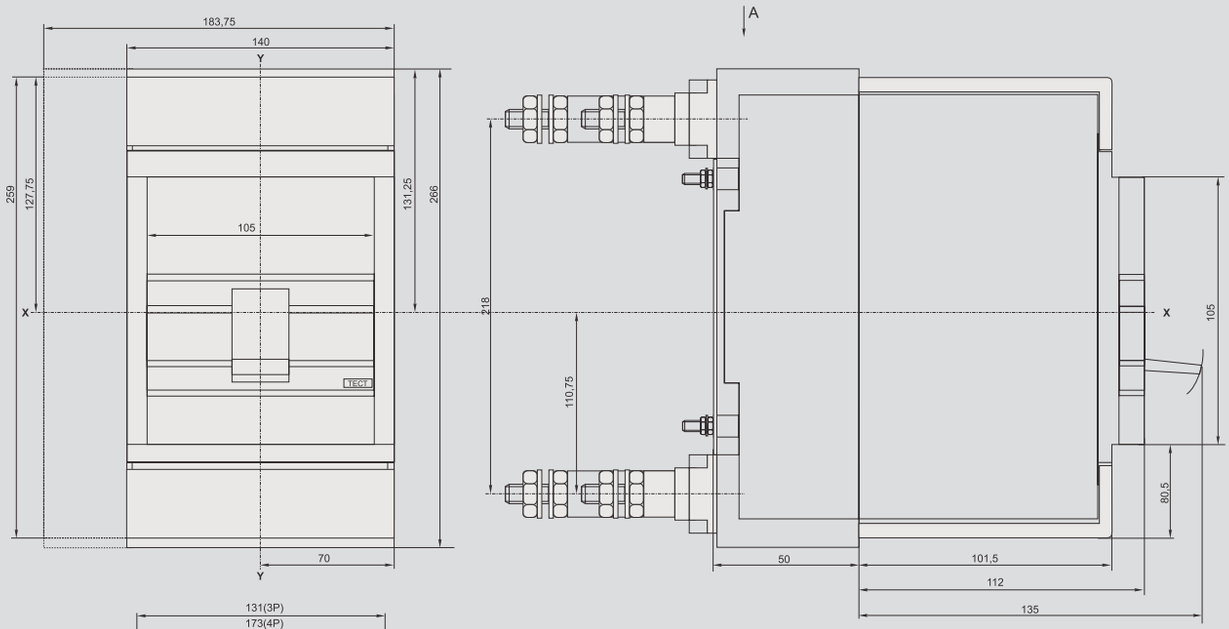
VA88-37 with plug-in front-connected panels PM1/P-37

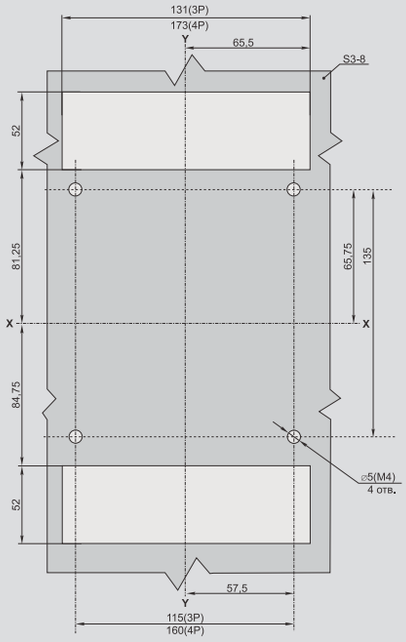




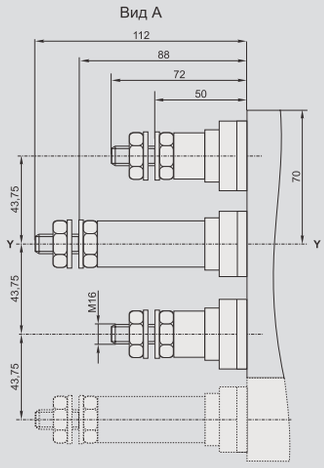
Шаблон для разметки панели

VA88-37 with plug-in back screw-connected panels PM1/R-37

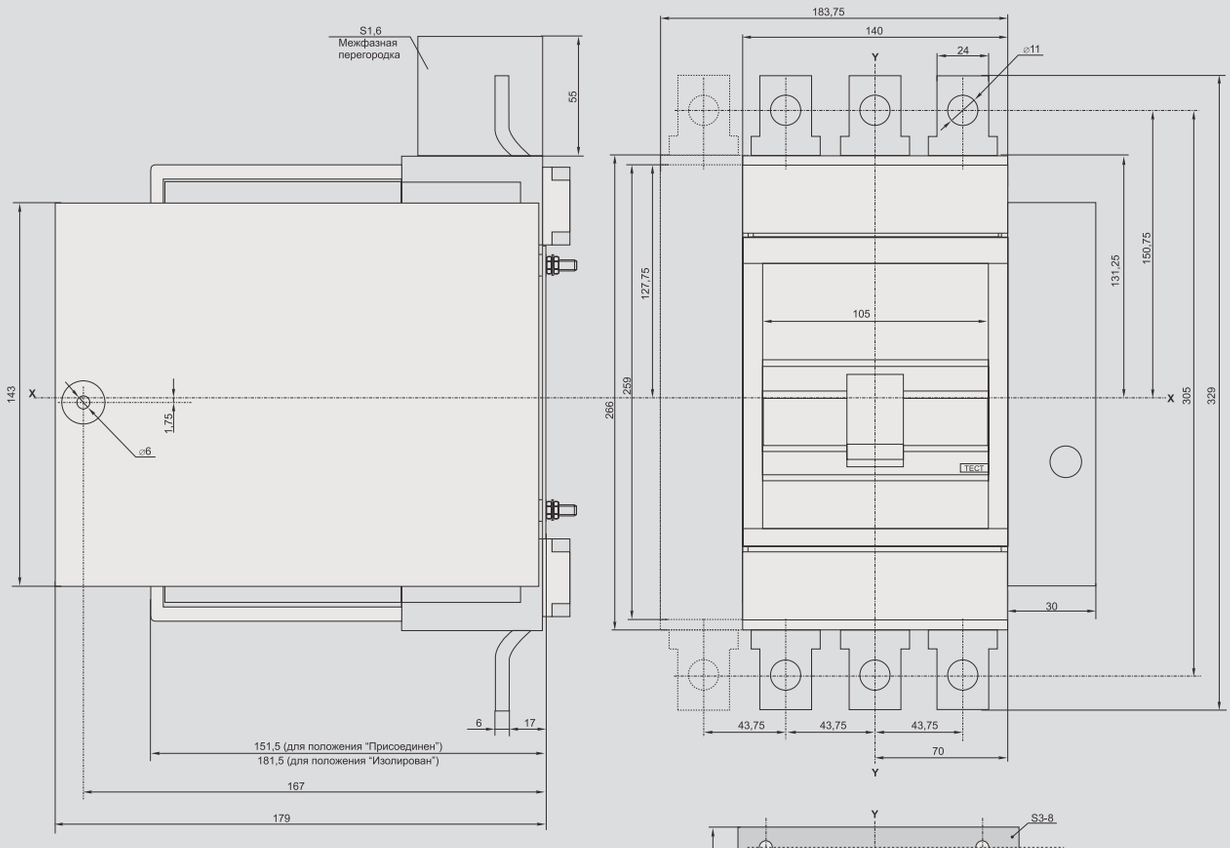


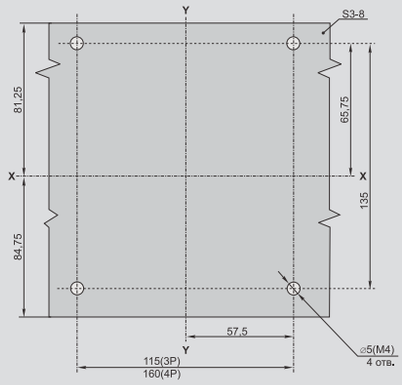


Шаблон для разметки панели



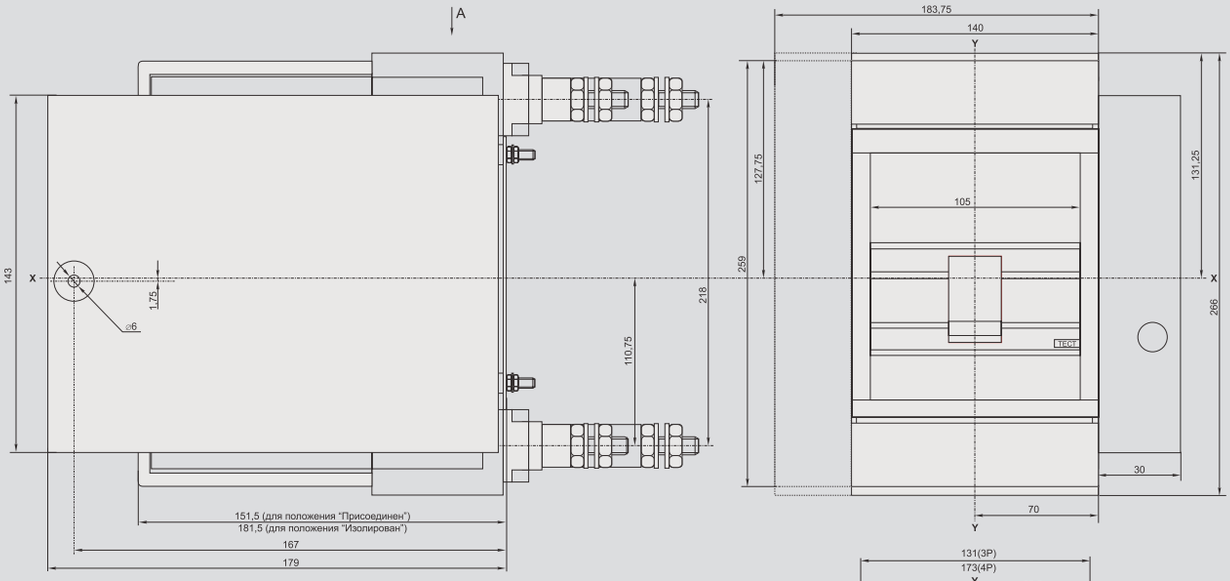
VA88-37 with slide-out front-connected panels PM2/R-37

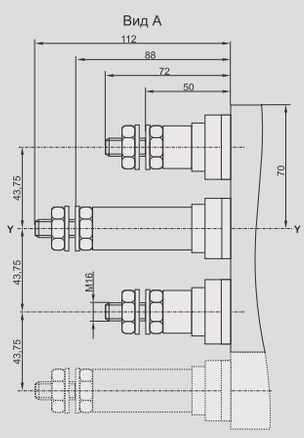


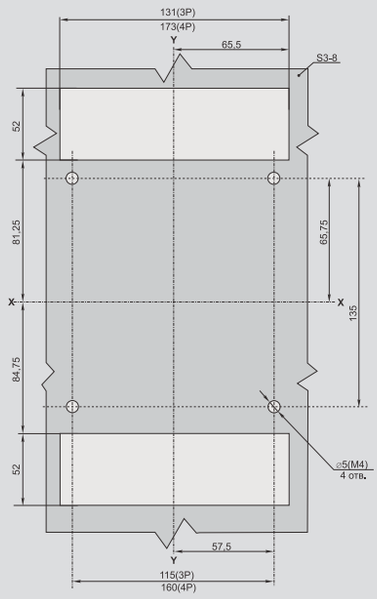


Шаблон для разметки панели

VA88-37 with slide-out back screw connected panels PM2/R-37

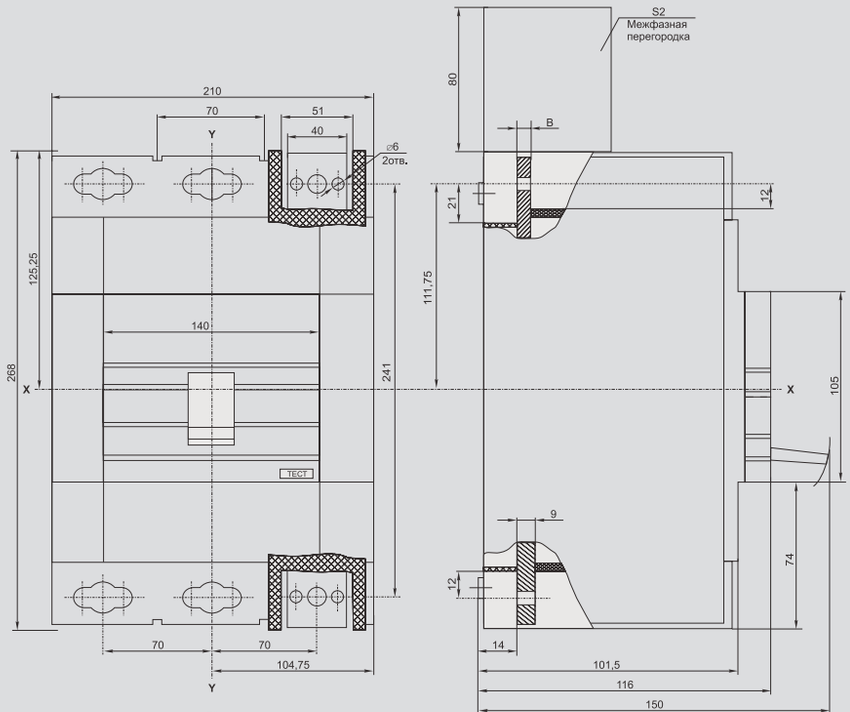


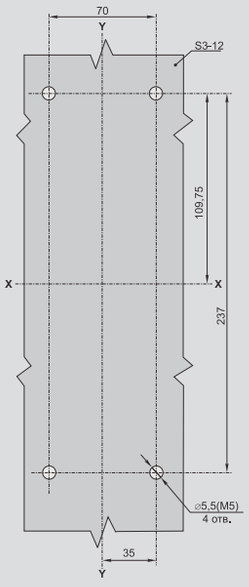




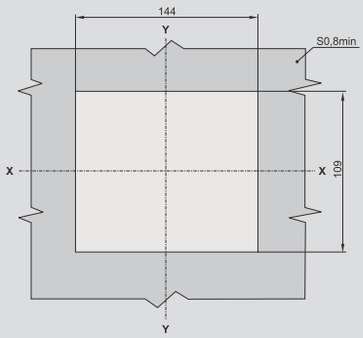
Шаблон для разметки панели

VA88-40

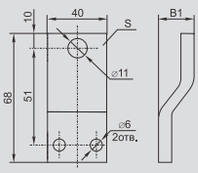




Шаблон для разметки панели



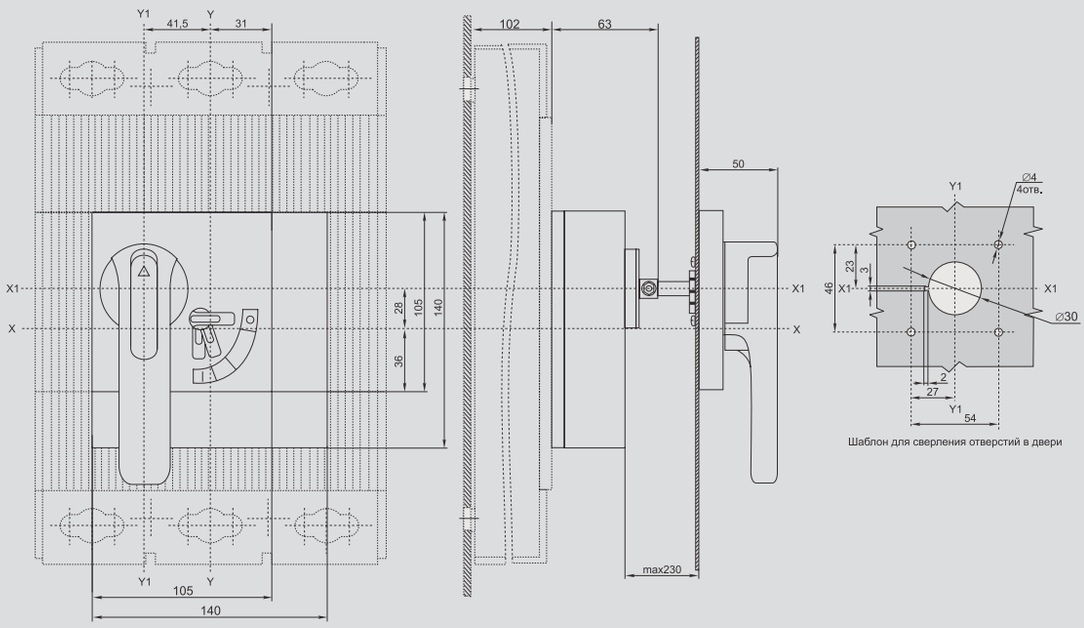
Шаблон для разметки двери



Наконечник-переходник

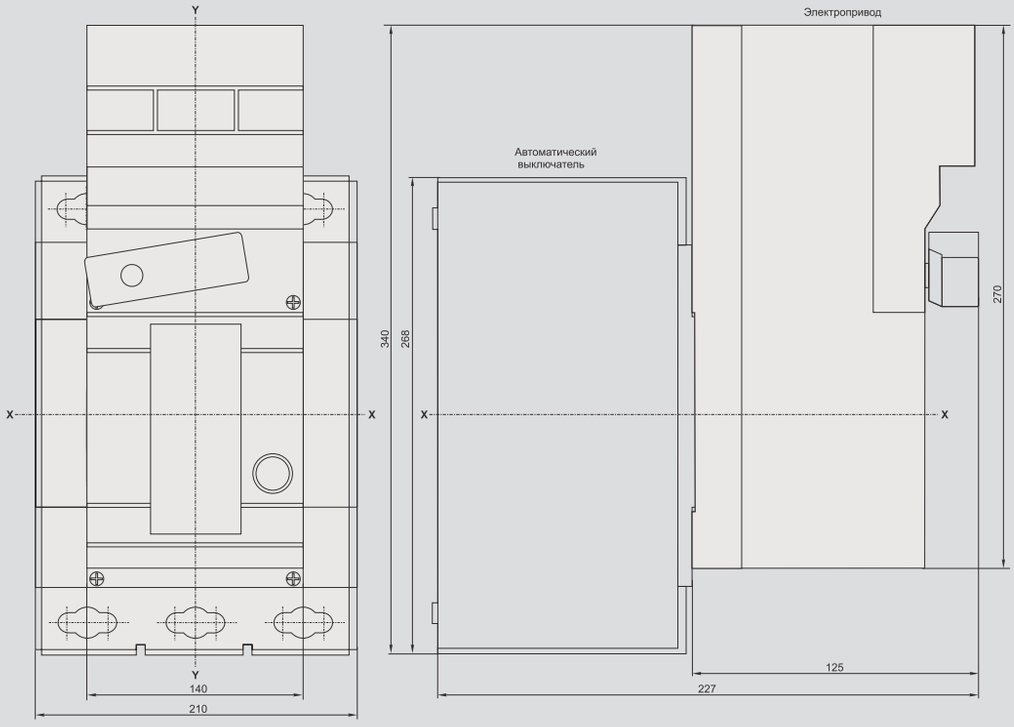
Rated current In, A	Dimensions, mm		
	B	B1	S
400	7	20	7
500	7	20	7
630	8	22	8
800	9	24	9

VA88-40 with manual rotary actuator PRP-40

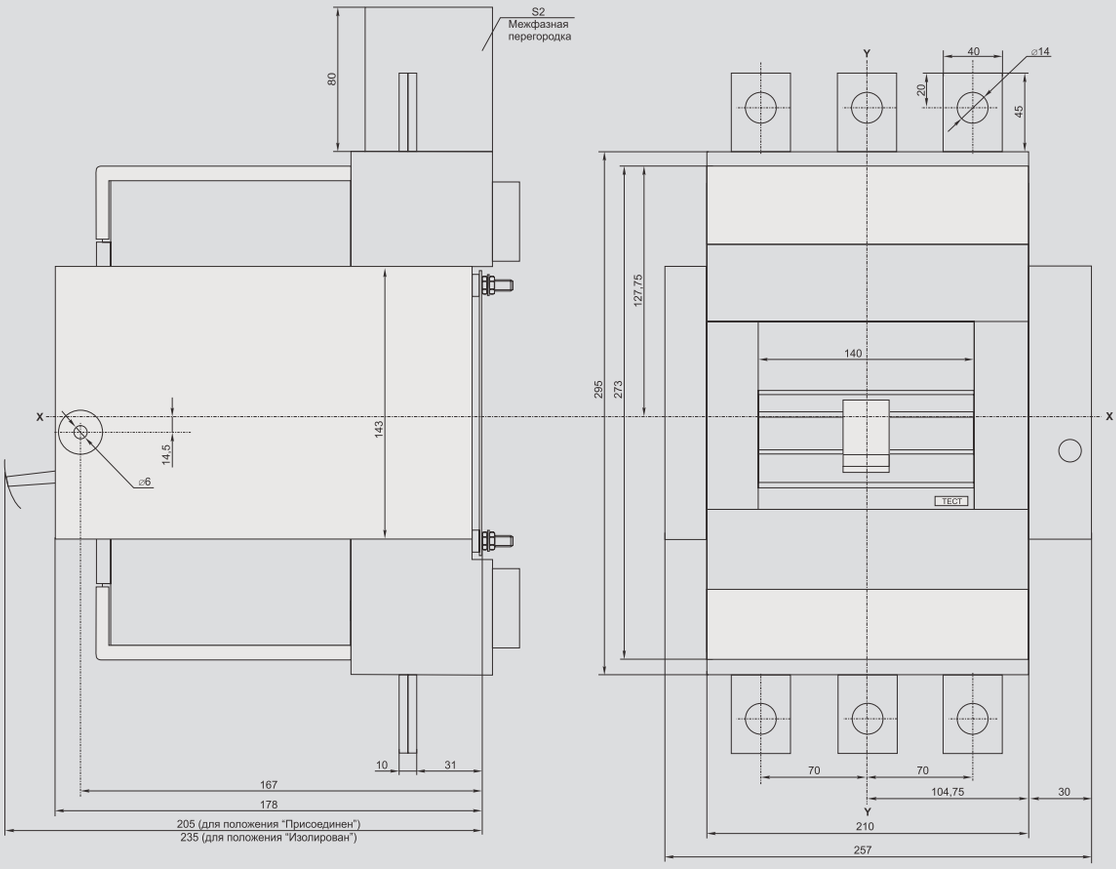


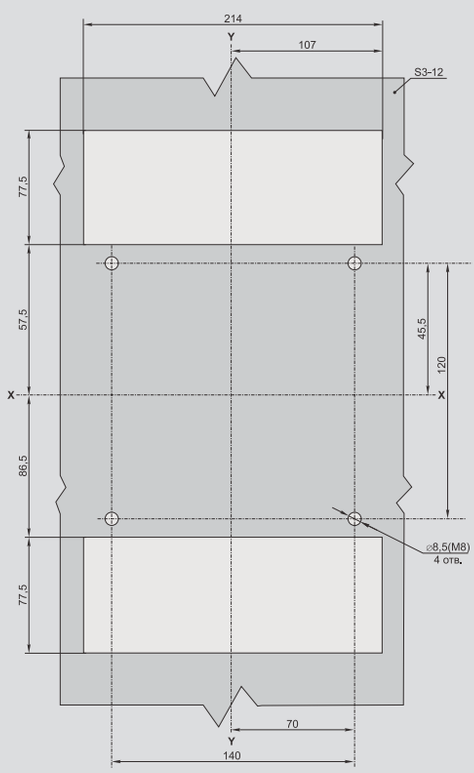
Шаблон для сверления отверстий в двери

VA88-40 with electric drive EP-40



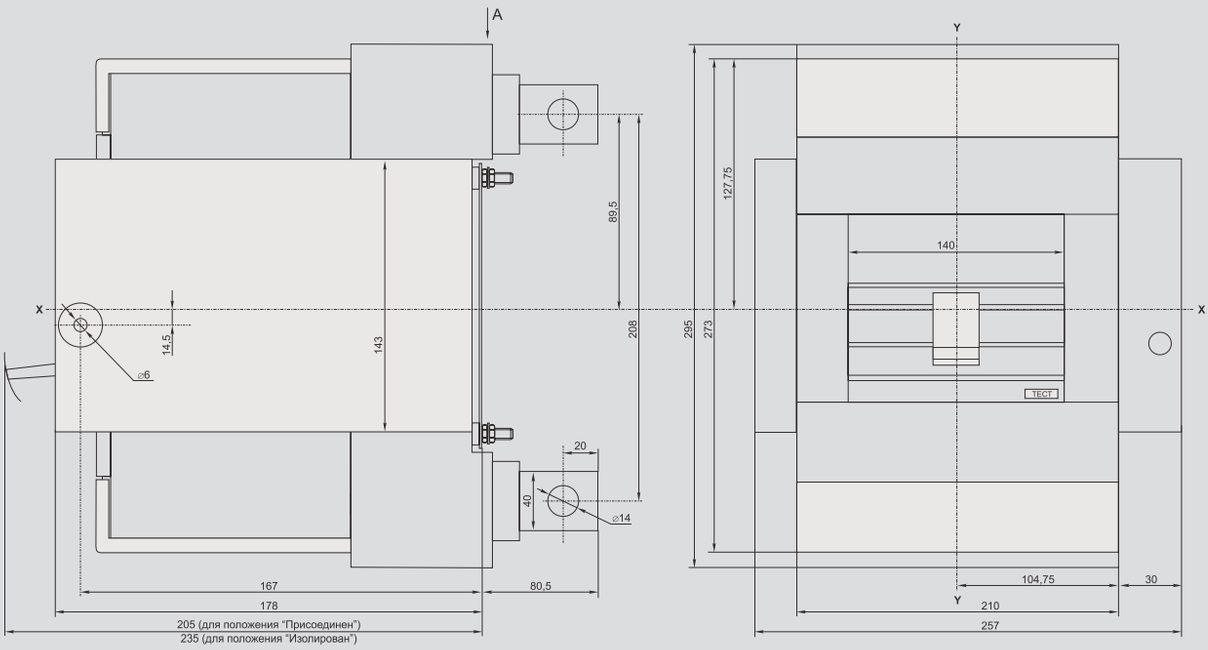
VA88-40 with slide-out front-connected panels PM2/P-40

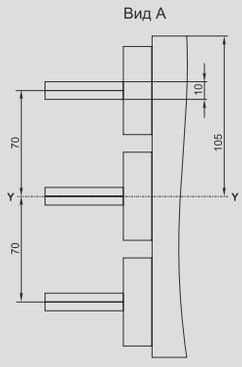


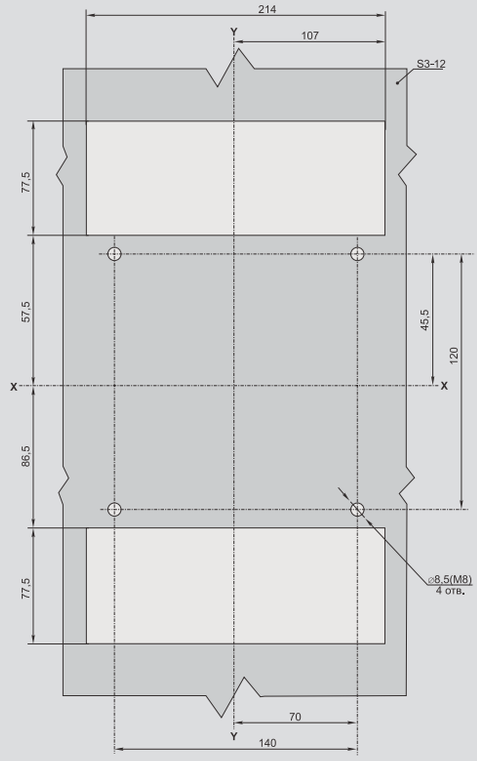


Шаблон для разметки панели

VA88-40 with slide-out panels with back connection to vertical buses PM2/V-40

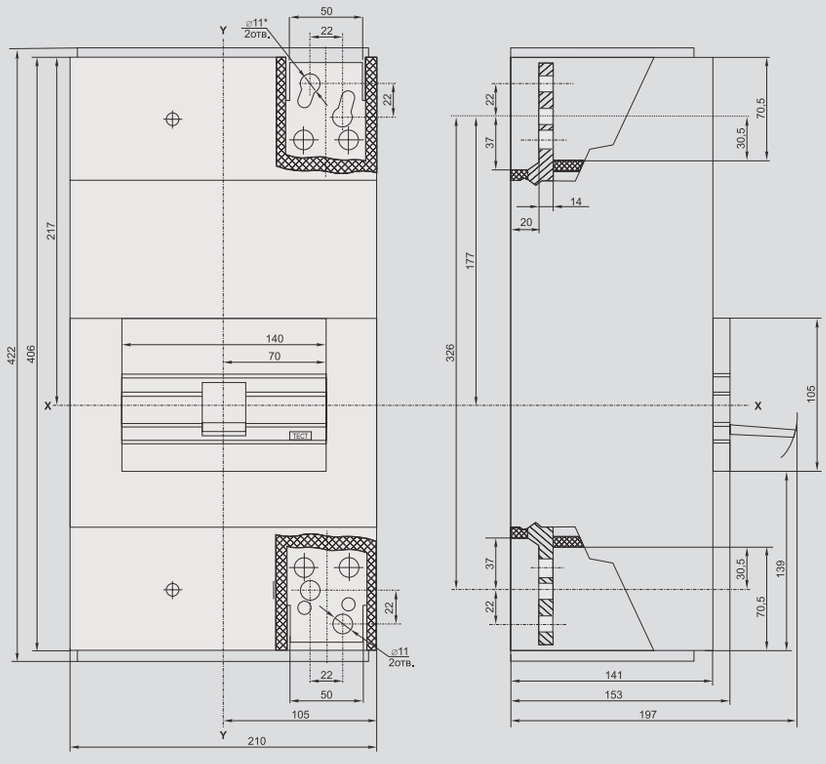




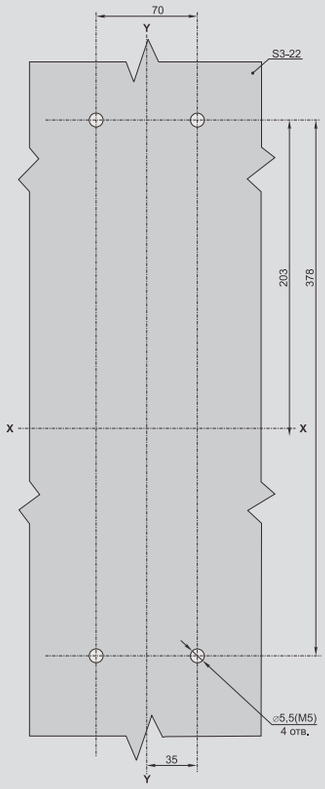


Шаблон для разметки панели

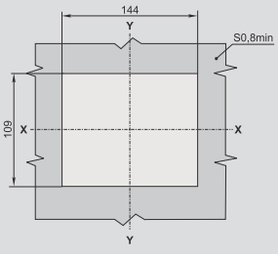
VA88-43



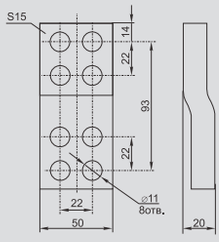
*Отверстия предназначены для крепления наконечника-переходника



Шаблон для разметки панели

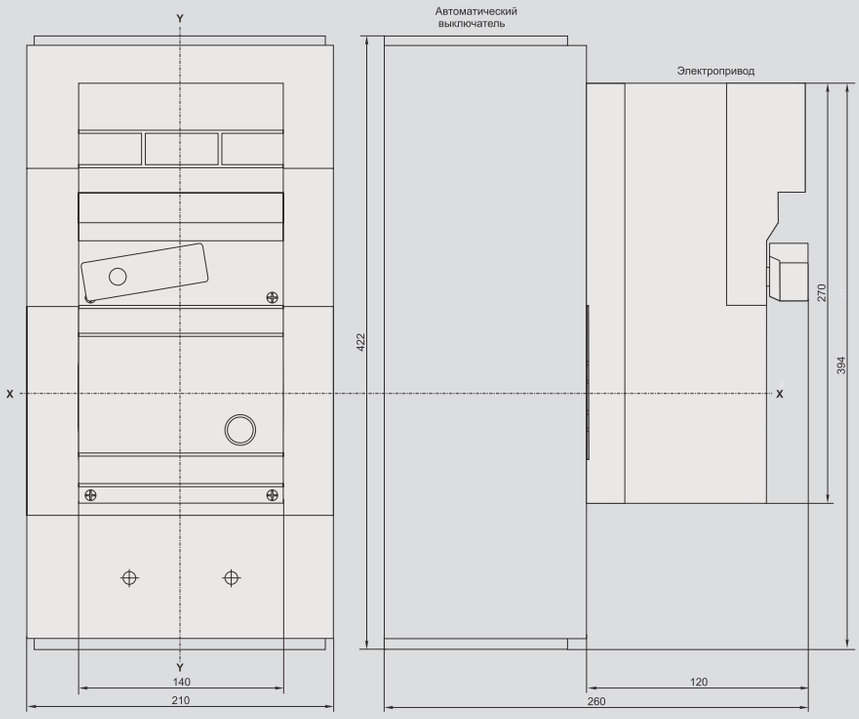


Шаблон для разметки двери

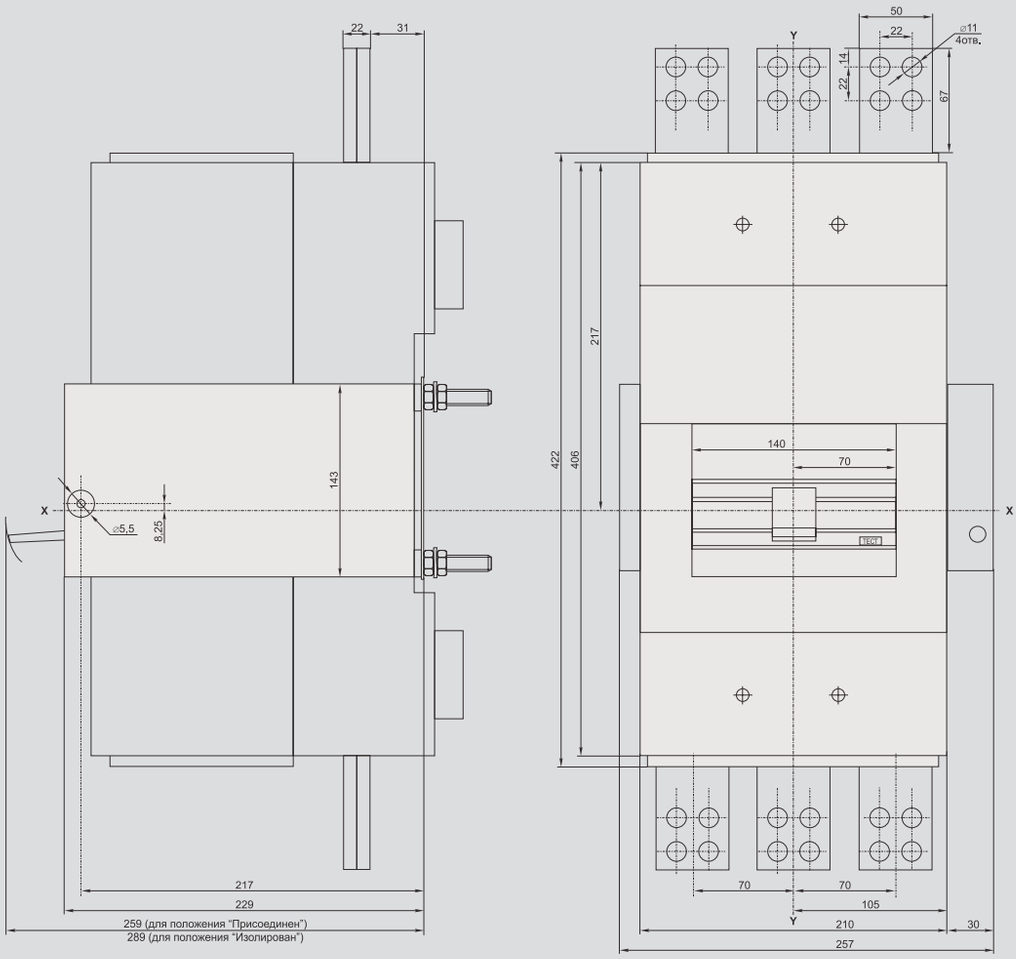


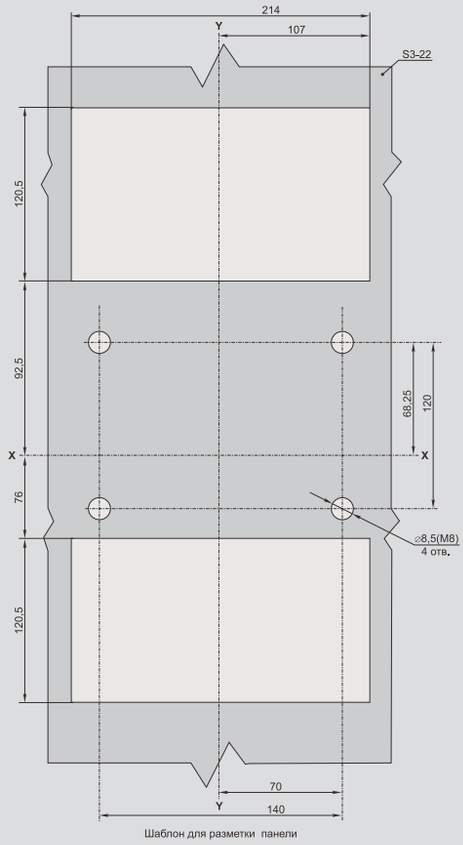
Наконечник-переходник

VA88-43 with electric drive EP-43



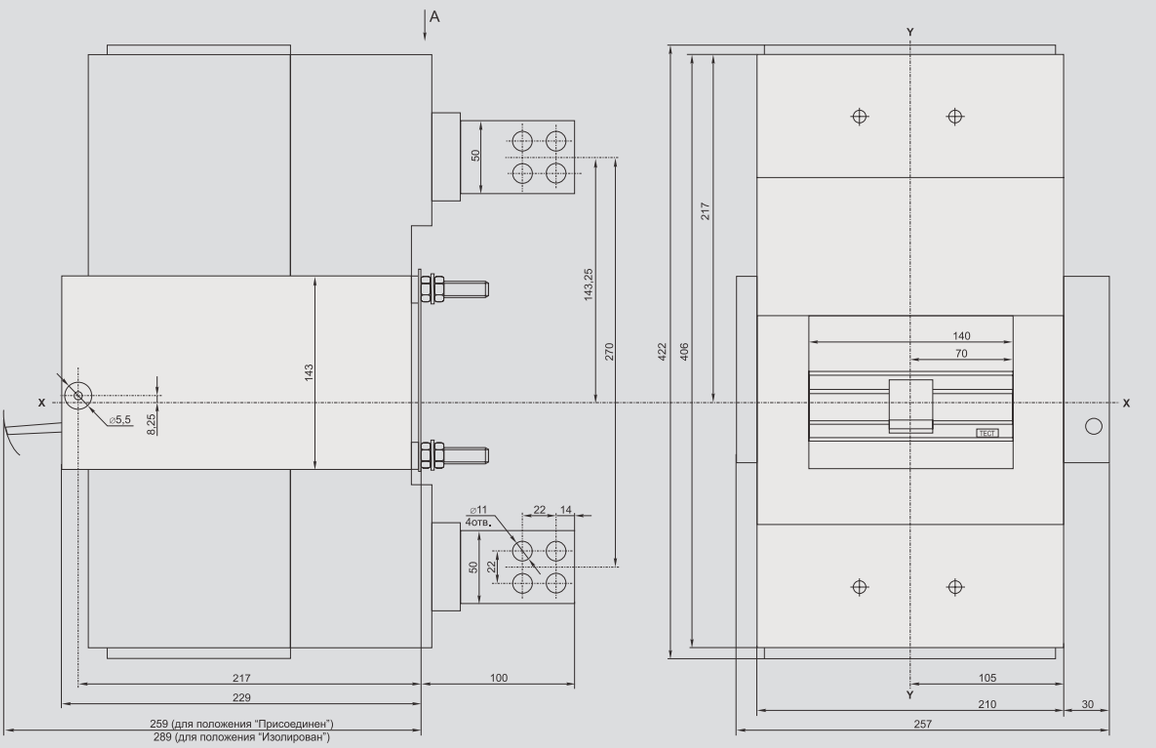
VA88-43 with slide-out front-connected panels PM2/P-43

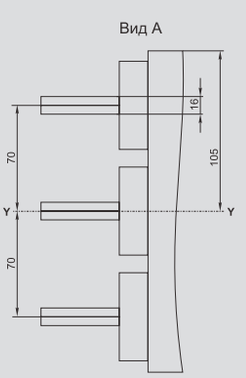


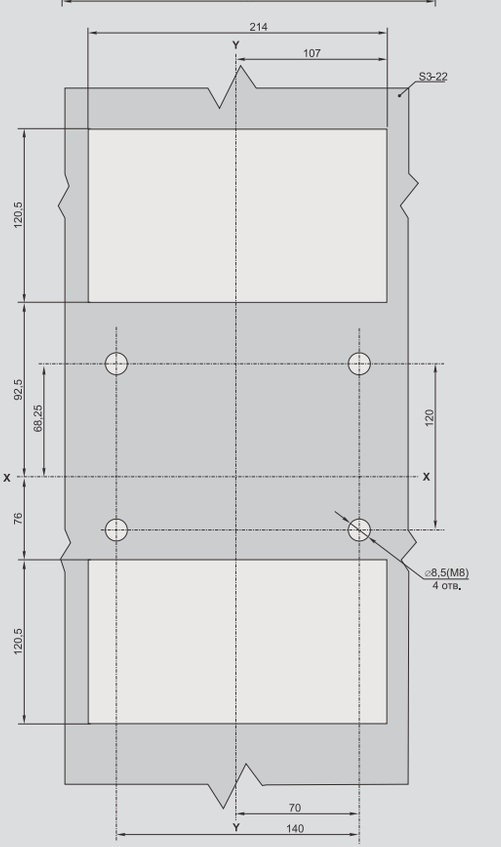


Шаблон для разметки панели

VA88-43 with slide-out panels with back connection to vertical buses PM2/V-43







Шаблон для разметки панели

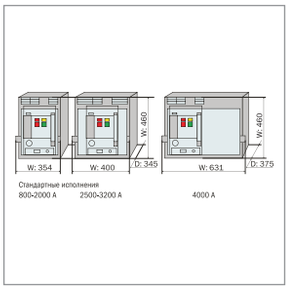
Air Circuit Breakers VA07

Air Circuit Breakers VA07 are installed in TP, KRU, GRSHCH as lead-in, sectional, and distributing apparatuses for switching and protection of engines, generators, transformers, bus-lines, cables on industry and civil engineering facilities, for power supply of high-technology productions, banking institutions, power plants and are designed for operation in electrical installations with Rated voltage up to 690 V and rated current from 800 up to 4000 A.
They comply with requirements of GOST R 50030.1, 500030.2 and manufactured according to technical Performance Specificationss TU 3420-058-18461115-2007.

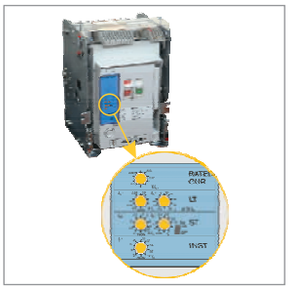
Advantages

- High values of rated interrupting capacities – up to 100 kA.
- Equal rated maximum interrupting capacity and operating interrupting capacity values;
- Expanded standard Performance Specifications;
- Maximal space economy in power distribution board.
- Identical cutout in the board door regardless of breakers overall dimensions;
- Higher number of on/off cycles – up to 30 000 cycles;
- Main contacts replacement option;
- Swift arc extinction due to application of double breaking system Double Break;
- Low dispersion energy.
- Expanded selectivity;
- Advanced operational safety;
- Optional special design for tropical and cold weather and corrosive environment.

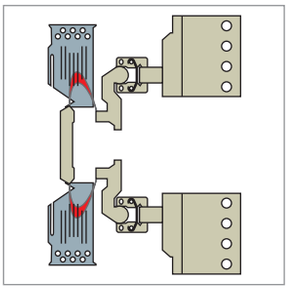
Design features



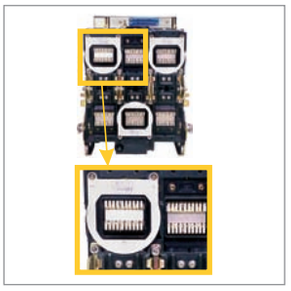
All versions of units with rated current up to 3200 A are 345 mm deep and 460 mm high.
The size of aperture in board panel for frontal panel is identical for all breakers in VA07 series that facilitates installation in the distribution cell.



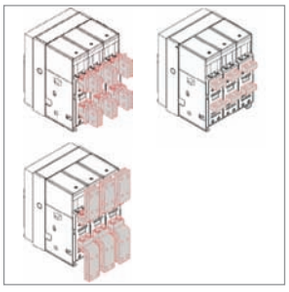
Use of the electronic breaker ensuring the following functions:
- protection against sustained overload;
- short-circuit protection;
- regulated function of instantaneous disconnection.



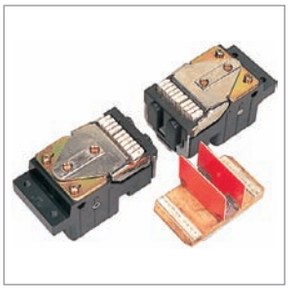
Double break system “Double Break” guarantees rapid breaking of current arc K3 due to separation of the arc using breaking in two points of each pole that results in lower contacts wear and erosion.



Use of two transformers at each pole. The first transformer is a line one controling the current signal. It ensures high precision level in all currents range of short circuit. The second transformer is used for power supply of electronic breaker.



Basic packaging arrangements of supplies presume that design of main contacts for apparatuses for currents up to 3200 A is horizontal, and is vertical for current 4000 A. Frontal and combined connections are possible.



Main contacts can be easily changed with new ones, which allows extending the life cycle of the automatic releaser. Replacement of each contact takes max. 15 minutes.

Packaging arrangement

Shunt trip

Undervoltage trip

Starting coil

On-Off cycle counter

Auxiliary switch assembly

Selection tables

Release type	Overcurrent release with built-in 16-bit microprocessor						
Number of poles	3	3	3	3	3	3	3
Peak rated current, A	800	1250	1600	2000	2500	3200	4000
Service short-circuit breaking capacity I_{cs}, kA (U_e 690 V)	50	50	50	50	65	65	75
Rated short-circuit making capacity (I_{cm}), kA (U_e 690 V)	105	105	105	105	146	146	165
Air Circuit Breaker type	VA07-208	VA07-212	VA07-216	VA07-220	VA07-325	VA07-332	VA07-440

Standard configuration

Type	Fixed*; Draw-Out*	Draw-Out
Spring raising method	manual; electric drive	
Protection device	electronic releaser	
Type of terminal	horizontal ** / vertical ** / front contacts	Vertical
On-Off operation devices	Shunt / Undervoltage trip*, Starting coil, Release coil	
Control system elements	Control system switch assembly / auxiliary switch assembly (4 switching contacts)	
Protection parts	Control circuit terminal cover, Main circuit Shutters***, On-Off terminal cover	
Operation indicator	On-Off cycle counter	
Maintenance accessories	Standard Draw-Out handle***, transportation plates, door flange with a gasket IP31	
Accompanying documents	factory test report, operational manual	

* Depending on product item.
** Optional.
*** Only for Draw-Out type.

Range

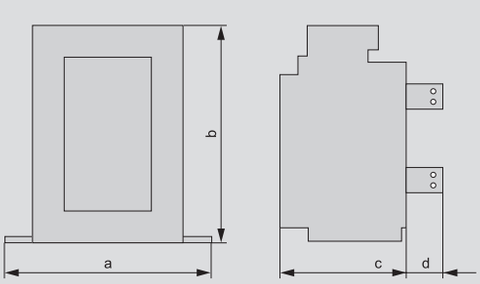
Designation	Rated current, A	Number of poles	Rated maximum ultimate breaking capacity, kA	PCS/PACKAGE	Article
Air Circuit Breaker VA07-208; stationary; pull-out type; w. min. releaser 3R 800 A 65 kA, IEK	800	3	50	1	SAB230-0800-U11H-P11
Air Circuit Breaker VA07-208; stationary; pull-out type; w. independent releaser 3R 800 A 65 kA, IEK	800	3	50	1	SAB230-0800-S11H-P11
Air Circuit Breaker VA07-208; stationary; pull-out type; w. min. releaser 3R 800 A 65 kA, IEK	800	3	50	1	SAB231-0800-U11H-P11
Air Circuit Breaker VA07-208; stationary; pull-out type; w. independent releaser 3R 800 A 65 kA, IEK	800	3	50	1	SAB231-0800-S11H-P11
Air Circuit Breaker VA07-212; stationary; pull-out type; w. min. releaser 3R 1250 A 65 kA, IEK	1250	3	50	1	SAB230-1250-U11H-P11
Air Circuit Breaker VA07-212; stationary; pull-out type; w. independent releaser 3R 1250 A 65 kA, IEK	1250	3	50	1	SAB230-1250-S11H-P11
Air Circuit Breaker VA07-212; stationary; pull-out type; w. min. releaser 3R 1250 A 65 kA, IEK	1250	3	50	1	SAB231-1250-U11H-P11
Air Circuit Breaker VA07-212; stationary; pull-out type; w. independent releaser 3R 1250 A 65 kA, IEK	1250	3	50	1	SAB231-1250-S11H-P11
Air Circuit Breaker VA07-216; stationary; pull-out type; w. min. releaser 3R 1600 A 65 kA, IEK	1600	3	50	1	SAB230-1600-U11H-P11
Air Circuit Breaker VA07-216; stationary; pull-out type; w. independent releaser 3R 1600 A 65 kA, IEK	1600	3	50	1	SAB230-1600-S11H-P11
Air Circuit Breaker VA07-216; stationary; pull-out type; w. min. releaser 3R 1600 A 65 kA, IEK	1600	3	50	1	SAB231-1600-U11H-P11
Air Circuit Breaker VA07-216; stationary; pull-out type; w. independent releaser 3R 1600 A 65 kA, IEK	1600	3	50	1	SAB231-1600-S11H-P11
Air Circuit Breaker VA07-220; stationary; pull-out type; w. min. releaser 3R 2000 A 65 kA, IEK	2000	3	50	1	SAB230-2000-U11H-P11
Air Circuit Breaker VA07-220; stationary; pull-out type; w. independent releaser 3R 2000 A 65 kA, IEK	2000	3	50	1	SAB230-2000-S11H-P11
Air Circuit Breaker VA07-220; stationary; pull-out type; w. min. releaser 3R 2000 A 65 kA, IEK	2000	3	50	1	SAB231-2000-U11H-P11
Air Circuit Breaker VA07-220; stationary; pull-out type; w. independent releaser 3R 2000 A 65 kA, IEK	2000	3	50	1	SAB231-2000-S11H-P11
Air Circuit Breaker VA07-325; stationary; pull-out type; w. min. releaser 3R 2500 A 85 kA, IEK	2500	3	65	1	SAB330-2500-U11H-P11
Air Circuit Breaker VA07-325; stationary; pull-out type; w. independent releaser 3R 2500 A 85 kA, IEK	2500	3	65	1	SAB330-2500-S11H-P11
Air Circuit Breaker VA07-325; stationary; pull-out type; w. min. releaser 3R 2500 A 85 kA, IEK	2500	3	65	1	SAB331-2500-U11H-P11
Air Circuit Breaker VA07-325; stationary; pull-out type; w. independent releaser 3R 2500 A 85 kA, IEK	2500	3	65	1	SAB331-2500-S11H-P11
Air Circuit Breaker VA07-332; stationary; pull-out type; w. min. releaser 3R 3200 A 85 kA, IEK	3200	3	65	1	SAB330-3200-U11H-P11
Air Circuit Breaker VA07-332; stationary; pull-out type; w. independent releaser 3R 3200 A 85 kA, IEK	3200	3	65	1	SAB330-3200-S11H-P11
Air Circuit Breaker VA07-332; stationary; pull-out type; w. min. releaser 3R 3200 A 85 kA, IEK	3200	3	65	1	SAB331-3200-U11H-P11
Air Circuit Breaker VA07-332; stationary; pull-out type; w. independent releaser 3R 3200 A 85 kA, IEK	3200	3	65	1	SAB331-3200-S11H-P11
Air Circuit Breaker VA07-440; stationary; pull-out type; w. min. releaser 3R 4000 A 100 kA, IEK	4000	3	75	1	SAB430-4000-U11V-P11
Air Circuit Breaker VA07-440; stationary; pull-out type; w. independent releaser 3R 4000 A 100 kA, IEK	4000	3	75	1	SAB430-4000-S11V-P11

Technical features

Feature name			VA07-208	VA07-212	VA07-216	VA07-220	VA07-325	VA07-332	VA07-440
Number of poles			3	3	3	3	3	3	3
Peak rated current, I_n, A			800	1250	1600	2000	2500	3200	4000
Номинальный ток электронного расцепителя, A			100≤I_n≤200 200≤I_n≤400 400≤I_n≤800	200≤I_n≤400 400≤I_n≤800 630≤I_n≤1250	200≤I_n≤400 400≤I_n≤800 630≤I_n≤1250 800≤I_n≤1600	200≤I_n≤400 400≤I_n≤800 630≤I_n≤1250 800≤I_n≤1600 1000≤I_n≤2000	1250≤I_n≤2500	1600≤I_n≤3200	2000≤I_n≤4000
Rated current of overcurrent release, A			1000	1000	1000	1000	1000	1000	1000
Rated insulation voltage, Ui, B			690	690	690	690	690	690	690
Rated voltage (50/60Hz) Ue, V			0,033	0,033	0,028	0,024	0,014	0,014	0,014
Main circuit contacts DC internal resistance per pole (mΩ/pole)			200	350	350	490	600	780	1060
Rated short-circuit breaking capacity (I_{cs} = I_{cu}), kA	AC 690 V		50	50	50	50	65	65	75
	AC 440 V		65	65	65	65	85	85	100
Rated short-circuit making capacity, I_{cm}, kA		690 V~	105	105	105	105	146	146	165
		440 V~	143	143	143	143	187	187	220
Rated short-time withstand current (1 sec.), I_{cw}, kA			65	65	65	65	85	85	100
Mechanical durability, B-0	with maintenance		30 000	30 000	30 000	25 000	20 000	20 000	15 000
	without maintenance		15 000	15 000	15 000	12 000	10 000	10 000	8000
Electrical durability, cycles. B-0	without maintenance	AC 440 V	12 000	12 000	12 000	10 000	7000	7000	3000
		AC 690 V	10 000	10 000	10 000	7000	5000	5000	2500
Weight, kg			73	73	76	79	105	105	139

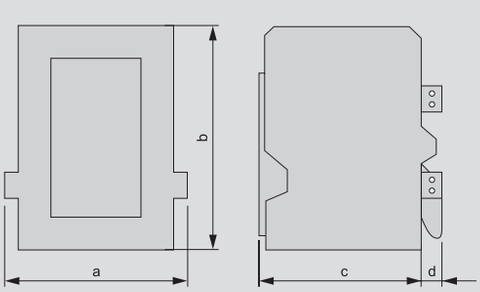
Overall dimensions

Stationary version



Dimensions	VA07-208	VA07-212	VA07-216	VA07-220	VA07-325	VA07-332	VA07-440
a	360	360	360	360	466	466	–
b	460	460	460	460	460	460	–
c	290	290	290	290	290	290	–
d	75	75	75	75	75	75	–

Pull-out version



Dimensions	VA07-208	VA07-212	VA07-216	VA07-220	VA07-325	VA07-332	VA07-440
a	354	354	354	354	460	460	631
b	460	460	460	460	460	460	460
c	345	345	345	345	345	345	375
d	40	40	40	40	40	40	53

Safety Fuse
Safety Fuse PPNI

PPNI series, gG type safety fuses are intended for general application and designated for protection of industrial electrical installations and cable lines from overload and short circuit and are manufactured for rated currents from 2 to 630 A. They are used in single- and three-phase networks with voltage up to 660 V and frequency 50 Hz.
Range of application of PPNI safety fuse includes lead-in distributors (VRU); switchboards and distributing points (SHRS, SHR, PR); equipment of transformer substations (SHCHO); low-voltage cabinets (SHR-NN); control cabinets and control boxes.
These safety fuses comply with GOST R 50339.0, 50339.2 requirements.

The silver medal of 15th International Fair “Electro-2006” in category “Best electrical equipment” is awarded for high operational features and design concept minimizing power losses.

Advantages

- Modern design, production technology and materials quality of PPNI safety fuses minimize the power losses by over 30% comparing with PN-2 safety fuses;
- High mechanical stability of carriers base (isolator) due to design of reinforced thermosetting plastics;
- Overall dimensions of PPNI safety fuses are reduced by 10-20% comparing with PN-2 safety fuses;
- High breaking capacity: –50 кА at 660 V and 120 кА at 500 V.
- Broad Range of PPNI safety fuses includes fuse links with rated currents from 2 to 630 A, altogether with 82 items in 6 dimensions.
- Overload protection due to function of current limiting, which allows reducing prospected short-circuit current several times;
- Broad range of operating temperatures from –45 to +60 ° C allows application of PPNI safety fuses in various climatic zones.

Low power losses

Comparing to the PN-2 safety fuses, power loss in the PPNI safety fuses is reduced due to usage of quality modern materials and new design.

The data sheet represents effectiveness of PPNI comparing with PN-2.

Power losses (PPNI and PN-2 at voltage 380/400 V)

Rated current I_n, A	Power losses max. P, W		Power saving (PPNI ΔP)	
	PPNI	PN-2	W	%
100	9	16	7	44
160	16	28	12	43
250	23	34	11	32
400	34	56	22	39
630	45	85	40	47

Экономия электроэнергии

Once we consider the assembled switch board instead of a single safety device the effectiveness of new development becomes more evident. One can calculate the effectiveness not only in kilowatts, but also in rubles considering the average price of 3 rubles per kW of the electric energy in Russia for population and enterprises.

When the lead-in distributor with outgoing lines for 250 A is assembled on new safety devices PPNI the energy savings will be 2602 kW or 7806 rubles a year.

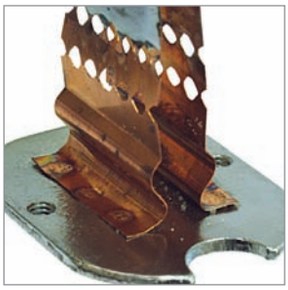
Energy saving if using PPNI safety fuses, comparing with PN-2 (by the example of ShRS Cabinets and VRU Switchgears), per annum

Rated current of outgoing lines, A	Energy saving			
	ShRS*, (8 outgoing lines),		VRU** (8 outgoing lines),	
	kW/h	rubles	kW/h	rubles
100	1472	4416	1656	4968
250	2313	6939	2602	7806

* For example, ShRS-1-24UZ
** For example, VRU-1-45-02.

Design features

Terminals of safety fuse are made of electrical copper with electrodeposit coating of stannum-bismuth alloy that protects them against oxidation during operation.



Safety fuse is made of phosphor bronze (copper-zinc alloy with phosphor additive) and firmly connected by dot-welding with safety fuse terminals.

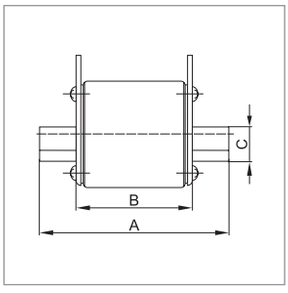
The base of a carrier (isolator) is made of reinforced thermosetting plastics resistant to rust, mechanical effects, temperature differential, and impact blows that occur at short-circuits up to 120 кА.

There is a special indicator in the fuse link in the form of retractable rod which allows visual detection of the activated safety fuse.

Terminals of safety fuse are made knife-shaped (sharpened), that facilitates installing them into carriers.

PPNI safety fuse links have the breaking capacity in all gG range that allows protecting the electrical installations against short-circuits and overloads.

Fuse links PPNI of any dimensions are easy to install or dismantle with a universal free handle RS-1 having isolation that stands voltage up to 1000 V.



Design, Performance Specifications, overall and setting dimensions of PPNI fuse links and holders comply with modern standards MEK and GOST, therefore allow replacing the similar homeland and foreign-made devices.

Case of safety fuse is filled with silica sand of high chemical treatment in order to ensure quick and effective arc distinguishing.

Selection tables






Safety fuse dimension		Dimension 00C	Dimension 00	Dimension 0	Dimension 1	Dimension 2	Dimension 3
Rated current of safety fuse, I_n, A	2	•	•	•			
	4	•	•	•			
	6	•	•	•			
	8	•	•	•			
	10	•	•	•			
	12	•	•	•			
	16	•	•	•			
	20	•	•	•			
	25	•	•	•			
	32	•	•	•			
	40	•	•	•	•	•	
	50	•	•	•	•	•	
	63	•	•	•	•	•	
	80	•	•	•	•	•	
	100	•	•	•	•	•	•
	125	•	•	•	•	•	•
	160	•	•	•	•	•	•
	200				•	•	•
	250				•	•	•
	315					•	•
	355					•	•
	400					•	•
	500						•
	630						•
Type of fuse link		PPNI-33, dimension 00C	PPNI-33, dimension 00	PPNI-33, dimension 0	PPNI-35, dimension 1	PPNI-37, dimension 2	PPNI-39, dimension 3
Type of fuse-holder		DP-33, dimension 00	DP-33, dimension 00	DP-33, dimension 00	DP-35, dimension 1	DP-37, dimension 2	DP-39, dimension 3
Free handle for fuse links		RS-1					

Name Rated current, A

Safety fuse

Range

	Name	Rated current, A	PCS/PACKAGE	PCS/CTN	Article
	PPNI-33, dim. 00C, 2 A	2	3	120	DPP11-002
	PPNI-33, dim. 00C, 4 A	4	3	120	DPP11-004
	PPNI-33, dim. 00C, 6 A	6	3	120	DPP11-006
	PPNI-33, dim. 00C, 8 A	8	3	120	DPP11-008
	PPNI-33, dim. 00C, 10 A	10	3	120	DPP11-010
	PPNI-33, dim. 00C, 12 A	12	3	120	DPP11-012
	PPNI-33, dim. 00C, 16 A	16	3	120	DPP11-016
	PPNI-33, dim. 00C, 20 A	20	3	120	DPP11-020
	PPNI-33, dim. 00C, 25 A	25	3	120	DPP11-025
	PPNI-33, dim. 00C, 32 A	32	3	120	DPP11-032
	PPNI-33, dim. 00C, 40 A	40	3	120	DPP11-040
	PPNI-33, dim. 00C, 50 A	50	3	120	DPP11-050
	PPNI-33, dim. 00C, 63 A	63	3	120	DPP11-063
	PPNI-33, dim. 00C, 80 A	80	3	120	DPP11-080
	PPNI-33, dim. 00C, 100 A	100	3	120	DPP11-100
	PPNI-33, dim. 00C, 125 A	125	3	120	DPP11-125
	PPNI-33, dim. 00, 160 A	160	3	120	DPP11-160
	PPNI-33, dim. 00, 2 A	2	3	90	DPP10-002
	PPNI-33, dim. 00, 4 A	4	3	90	DPP10-004
	PPNI-33, dim. 00, 6 A	6	3	90	DPP10-006
	PPNI-33, dim. 00, 8 A	8	3	90	DPP10-008
	PPNI-33, dim. 00, 10 A	10	3	90	DPP10-010
	PPNI-33, dim. 00, 12 A	12	3	90	DPP10-012
	PPNI-33, dim. 00, 16 A	16	3	90	DPP10-016
	PPNI-33, dim. 00, 20 A	20	3	90	DPP10-020
	PPNI-33, dim. 00, 25 A	25	3	90	DPP10-025
	PPNI-33, dim. 00, 32 A	32	3	90	DPP10-032
	PPNI-33, dim. 00, 40 A	40	3	90	DPP10-040
	PPNI-33, dim. 00, 50 A	50	3	90	DPP10-050
	PPNI-33, dim. 00, 63 A	63	3	90	DPP10-063
	PPNI-33, dim. 00, 80 A	80	3	90	DPP10-080
	PPNI-33, dim. 00, 100 A	100	3	90	DPP10-100
	PPNI-33, dim. 00, 125 A	125	3	90	DPP10-125
	PPNI-33, dim. 00, 160 A	160	3	90	DPP10-160

Name	Rated current, A	PCS/PACKAGE		Article
PPNI-33, dim. 0, 2 A	2	3	72	DPP20-002
PPNI-33, dim. 0, 4 A	4	3	72	DPP20-004
PPNI-33, dim. 0, 6 A	6	3	72	DPP20-006
PPNI-33, dim. 0, 8 A	8	3	72	DPP20-008
PPNI-33, dim. 0, 10 A	10	3	72	DPP20-010
PPNI-33, dim. 0, 12 A	12	3	72	DPP20-012
PPNI-33, dim. 0, 16 A	16	3	72	DPP20-016
PPNI-33, dim. 0, 20 A	20	3	72	DPP20-020
PPNI-33, dim. 0, 25 A	25	3	72	DPP20-025
PPNI-33, dim. 0, 32 A	32	3	72	DPP20-032
PPNI-33, dim. 0, 40 A	40	3	72	DPP20-040
PPNI-33, dim. 0, 50 A	50	3	72	DPP20-050
PPNI-33, dim. 0, 63 A	63	3	72	DPP20-063
PPNI-33, dim. 0, 80 A	80	3	72	DPP20-080
PPNI-33, dim. 0, 100 A	100	3	72	DPP20-100
PPNI-33, dim. 0, 125 A	125	3	72	DPP20-125
PPNI-33, dim. 0, 160 A	160	3	72	DPP20-160

PPNI-35, dim. 1, 40 A	40	3	48	DPP30-040
PPNI-35, dim. 1, 50 A	50	3	48	DPP30-050
PPNI-35, dim. 1, 63 A	63	3	48	DPP30-063
PPNI-35, dim. 1, 80 A	80	3	48	DPP30-080
PPNI-35, dim. 1, 100 A	100	3	48	DPP30-100
PPNI-35, dim. 1, 125 A	125	3	48	DPP30-125
PPNI-35, dim. 1, 160 A	160	3	48	DPP30-160
PPNI-35, dim. 1, 200 A	200	3	48	DPP30-200
PPNI-35, dim. 1, 250 A	250	3	48	DPP30-250

PPNI-37, dim. 2, 40 A	40	1	24	DPP40-040
PPNI-37, dim. 2, 50 A	50	1	24	DPP40-050
PPNI-37, dim. 2, 63 A	63	1	24	DPP40-063
PPNI-37, dim. 2, 80 A	80	1	24	DPP40-080
PPNI-37, dim. 2, 100 A	100	1	24	DPP40-100
PPNI-37, dim. 2, 125 A	125	1	24	DPP40-125
PPNI-37, dim. 2, 160 A	160	1	24	DPP40-160
PPNI-37, dim. 2, 200 A	200	1	24	DPP40-200
PPNI-37, dim. 2, 250 A	250	1	24	DPP40-250
PPNI-37, dim. 2, 315 A	315	1	24	DPP40-315
PPNI-37, dim. 2, 355 A	355	1	24	DPP40-355
PPNI-37, dim. 2, 400 A	400	1	24	DPP40-400

Name	Rated current, A	PCS/PACKAGE	PCS/CTN	Article
PPNI-39, dim. 3, 100 A	100	1	24	DPP50-100
PPNI-39, dim. 3, 125 A	125	1	24	DPP50-125
PPNI-39, dim. 3, 160 A	160	1	24	DPP50-160
PPNI-39, dim. 3, 200 A	200	1	24	DPP50-200
PPNI-39, dim. 3, 250 A	250	1	24	DPP50-250
PPNI-39, dim. 3, 315 A	315	1	24	DPP50-315
PPNI-39, dim. 3, 355 A	355	1	24	DPP50-355
PPNI-39, dim. 3, 400 A	400	1	24	DPP50-400
PPNI-39, dim. 3, 500 A	500	1	24	DPP50-500
PPNI-39, dim. 3, 630 A	630	1	24	DPP50-630

Fuse holders

Range

Name	Rated current, A	PCS/PACKAGE	PCS/CTN	Article
DP-33, dim. 00	160	3	72	DPP10D-DP-160
DP-33, dim. 0	160	3	54	DPP20D-DP-160
DP-35, dim. 1	250	1	28	DPP30D-DP-250
DP-37, dim. 2	400	1	18	DPP40D-DP-400
DP-39, dim. 3	630	1	14	DPP50D-DP-630

Free handles

Free handle RS-1 is all-purpose device intended for installation into holder and disassemble of PPNI fuse link as well as other fuse links designed according to GOST R 50339, IEC 60269.

Name	Rated current, A	PCS/PACKAGE	PCS/CTN	Article
RS-1	100	1	56	DPP00D-RS1

Technical features

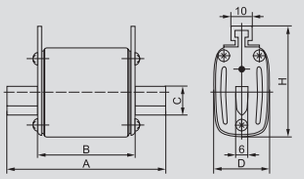
Rated current, A	2÷630
Dimensions	00C, 00, 0, 1, 2, 3
Rated voltage, V ~	400, 500, 660
Rated frequency. Hz	50
Classification group	gG*
Rated short-circuit breaking capacity, kA (50 kA at 660 V)	50 kA at 660 V, 120 kA at 500 V
Range of ambient temperature, °C	–45÷+60
Protection degree	IP00
Working position	vertical or horizontal
Operation indicator (indicator)	retractable rod (firing pin)
Contacts material	Copper with tin-bismuth plating
Standards	GOST R 50339.0-92, GOST R 50339.2-92

*“g” – protection with breaking capacity in the whole range from overload and short circuit
“G” – general purpose fuses.

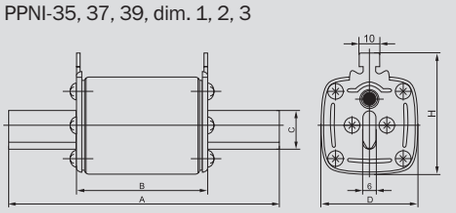
Overall and setting dimensions

Safety fuse link

PPNI-33, dim. 00C, 00, 0



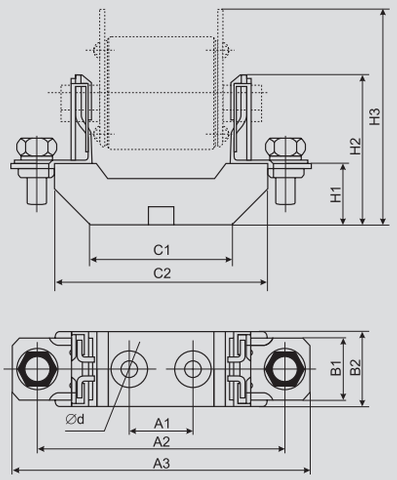
PPNI-35, 37, 39, dim. 1, 2, 3



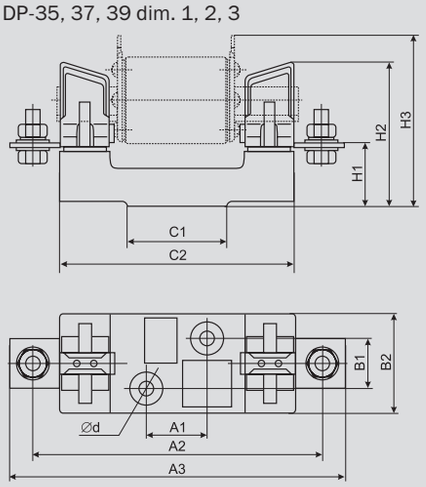
Dimension	Dimensions of PPNI, mm					Weight, g
	A	B	C	D	H	
00C	78	49	15	21	48	123
00	78	49	15	29	56	175
0	125	68	15	29	56	252
1	135	68	20	48	60	455
2	150	68	25	58	70	650
3	150	68	32	67	80	880

Fuse holder

DP-33, dim. 00, 0

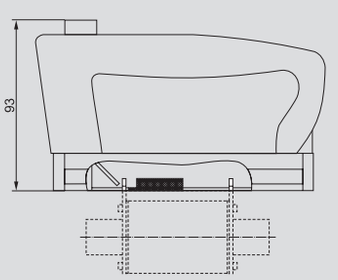


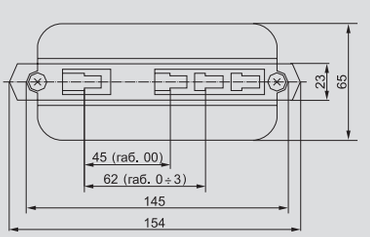
DP-35, 37, 39 dim. 1, 2, 3



Dimen-sion	Dimensions of DP, mm											Weight, g
	H1	H2	H3	A1	A2	A3	B1	B2	C1	C2	∅d	
00	25	60	85	25	100	120	–	30	58	87	7.5	193
0	37	72	91	25	150	170	–	30	68	130	7.5	295
1	38	84	100	25	175	200	30	58	60	142	10.5	550
2	38	100	105	25	200	225	30	60	60	160	10.5	770
3	40	105	118	25	210	250	30	60	60	160	10.5	965

Free handle



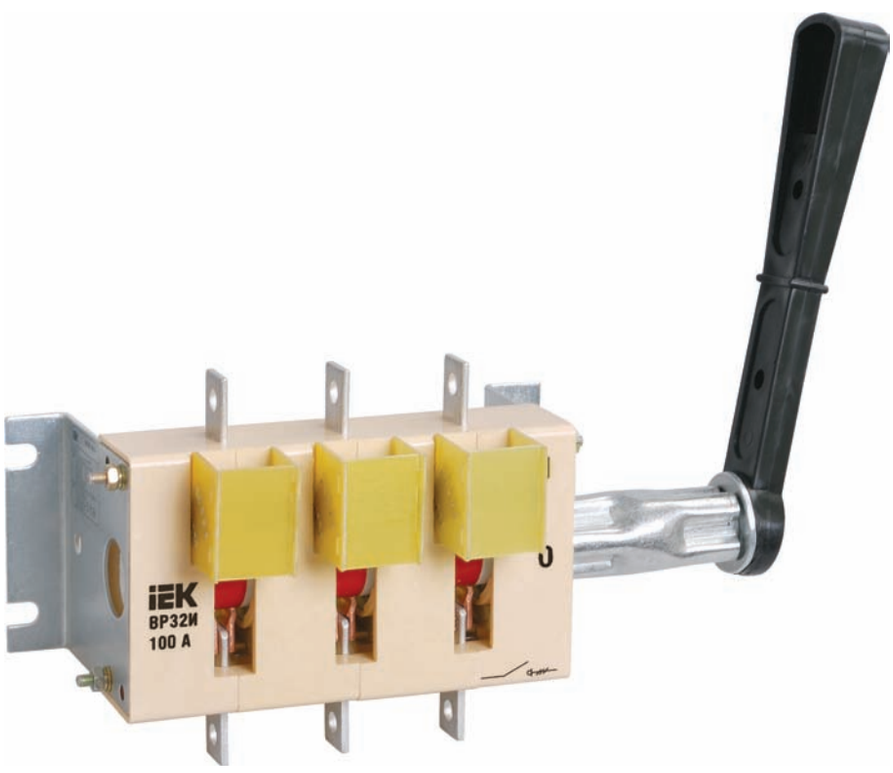


Switch-disconnectors

Switch-disconnectors VR32I

Switch-disconnectors of VR32I series designated for non-automatic commutation of alternating current networks with rated voltage up to 690 V, rated frequency 50 Hz.
These devices are used for installation in low-voltage complex facilities such as lead-in distributor of residential, communal and industrial buildings, distributive boards and control boxes, power boxes, etc.

Switch-disconnectors VR32I comply with GOST R 50030.3 and are manufactured according to Performance Specifications TU 3424-029-18461115-2009.



Advantages

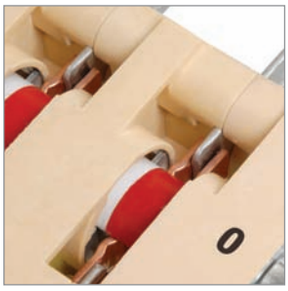
- Convenience of assembly and operation.
- Low power losses due to modern materials applied;
- Double visible circuit break, removable handle, color indication of “Switched on” position allow increasing safety of technical personnel servicing the installation.
- Option of connecting the copper and aluminum electric conductors as well as copper and aluminum bus-lines.
- Warranty period – 3 years

Recommendations

- IEK company recommends own-produced metal cases SHCHMP, SHCHO boards, VRU, KSRM and SHRS cases as base for making the NKU using switch-disconnectors VR32I.

It is recommended to use safety fuses of PPNI series or molded case circuit breakers of VA88 series as protection devices during assembly of NKU.

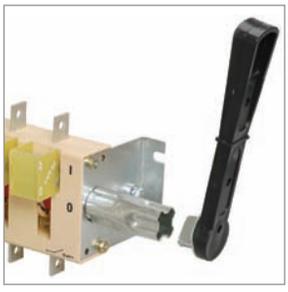
Design features



Double visible circuit break ensures safety of technical personnel servicing the installation.

Additional color indication of “Switched on” position signals of necessary safety measures.

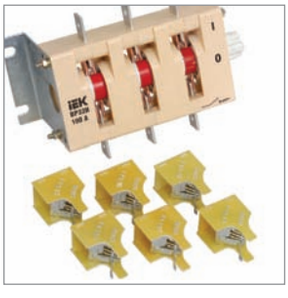
Case of VR32I is made of self-extinguishing mechanically-resistant plastic.



Movable handle ensures higher safety in operation of electrical device.

Contact terminals made of high-quality electric copper with protective coating allow connecting the copper and aluminum electric conductors terminated with cable points as well as copper and aluminum bus-lines.

Case is labeled by tampon printing method ensuring durable retaining of product information.

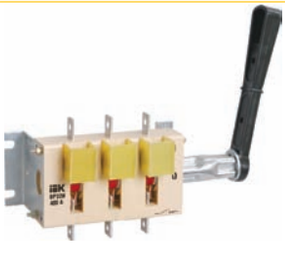


Arc-extinguishing chambers, large opening of contacts and double current break ensure efficient extinguishing the electric arc during commutation of loads that reduces contacts’ wear.

Selection tables

Item	VR32I 100 A	VR32I 250 A	VR32I 400 A
Number of poles	3	3	3
Number of directions	one	one	one
Conventional free air thermal current I_{th}, A 20	100	250	400
Rated voltage, V	690	690	690
Arc extinguish chamber	+	+	+
Drive handle type	removable side off-center		
Location of plane for outside terminals connection	perpendicular to installation plane		
Conductor size suitable for connection, mmI	10…50	70…150	120…3×120

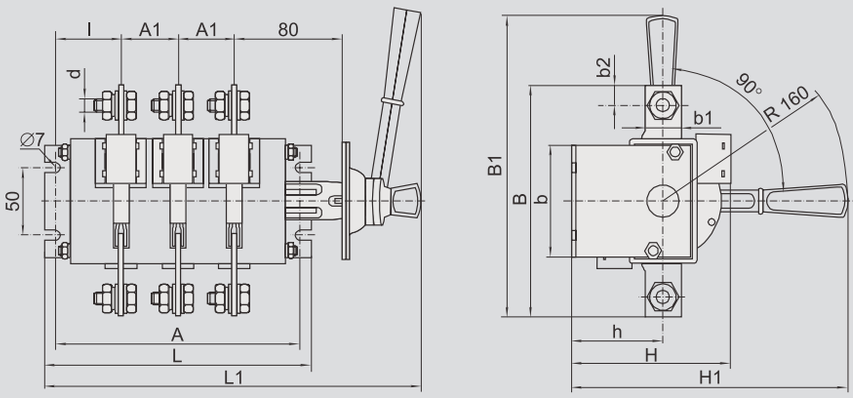
Range

	Item	Number of poles	Conventional free air thermal current Ith, A	PCS/CTN	Article
	VR32I 100 A	3	100	24	SRK01-111-100
	VR32I 250 A	3	250	18	SRK21-111-250
	VR32I 400 A	3	400	12	SRK31-111-400

Technical features

Feature name		VR32I 100 A	VR32I 250 A	VR32I 400 A
Conventional free air thermal current Ith, A		100	250	400
Conventional thermal current enclosed condition I_{the}, A		80	200	315
Rated operation current I_e, (U_e=400 V, application category), A	AC-20V	100	250	400
	AC-21V	100	250	400
	AC-22V	100	250	400
	AC-23V	50	80	–
Rated operation current I_e, (U_e=690 V, application category), A	AC-21V	100	250	400
	AC-22V	80	125	200
	AC-23V	20	40	–
Heat loss, W/pole		3	15	35
Rated insulationvoltage U_i, V		690	690	690
Rated impulse withstand voltage, U_{imp}, kV		8,0	8,0	8,0
Protection degree (GOST 14254)		IP00; IP32 from drive		
Range of ambient temperature, °C		–25 ÷ +40		
Weight, kg		1,2	1,8	2,5
Electrical durability, (U_e=400 V, application category), cycles	AC-20V	4000	2500	2500
	AC-21V	4000	2000	2000
	AC-22V	3200	1600	1600
	AC-23V	4000	3200	–
Electrical durability, (U_e=660 V, application category), cycles	AC-21V	300	200	200
	AC-22V	300	200	200
	AC-23V	300	300	–
Mechanical durability, cycles		25 000	25 000	16 000
Climate type (GOST 15150) - MRC3		boreal climate (BC) 3	boreal climate (BC) 3	boreal climate (BC) 3
Groups of operation conditions (GOST 17516.1)		M4	M4	M4
Installation altitude above sea level, max., m		2000	2000	2000
Conductor size suitable for connection, mm^2		10…50	70…150	120…3×120
Durability, not less than, years		10	10	10

Dimensions



Item	Dimensions, mm													
	A	A2	B	B1	b	b1	b2	L	L1	H	H1	I	h	d
VR32I 100 A	161	38	117	218,5	75	15	8	175	274	100	215	43	55	M6
VR32I 250 A	172	44	164	242	83	25	13	186	282	102	218	42	58	M10
VR32I 400 A	200	50	178	249	100	26	13	212	303	122	231	49	71	M10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тока

3 Metering, control & measurement devices, power supply equipment

TTI Current transformers

TTI Current transformers are designated for the tasks as follows:
- application in energy accounting schemes in settlements with consumers;
- application in commercial energy accounting schemes;
- transmission of measurement data signal to measuring instruments or control and protection devices.

These devices comply with GOST 7746 and are manufactured in accordance with Performance Specifications TU 3414-001-18461115-2006.

TTI current transformers are awarded silver medal for high quality on International competition «Best electrical equipment-2005», organized by Ministry of industry and Energy of the Russian Federation, State Committee of the Russian Federation for Standard and Metrology, and Independent Inspection Services "Soyuzexpertisa".

TTI current transformers have been entered into State register of measuring instruments under No. 28139-07. The certificate of approval of measuring instruments type CN.C.34.083.A №28362 has been issued.

Advantages:

- Copper tinned bus of TTI-A transformers allows connecting the copper as well as aluminum conductors.
- Case of all TTI transformers is made of self-extinguishing plastic.
- Complete set of each transformer includes cover for closing the terminals of secondary coil.

TTI-A transformers also are supplied with screws and nuts for fastening the conductors.
- TTI-30/TTI-125 transformers are supplied with a bracket for fastening the bus in transformers viewport. Weight and dimensions are 10-20% less than those of similar transformers of other inland manufacturers.

Design features

Transformer case is non-separable and sealed with label that makes access to the secondary coil impossible.

Transformer case is made of self-extinguishing plastic that ensures fire- and electrical safety.

Terminals of secondary coil are covered with transparent easy-to-seal cover that ensures operation safety. It is extremely important in energy accounting schemes as excludes non-authorized access to secondary coil terminals.

Multipurpose viewport of TTI current transformer allows installation of cables and buses with various sections and configurations as primary coil.

The in-built tinned copper bus of TTI-A version allows connecting the copper as well as aluminum conductors.

There are two assembly methods as follows:

– on a bus using special spreader which firmly fastens transformer on it;
– on panel using special brackets.

Selection tables

The bus availability	With the in-built bus	Without the in-built bus					
Rated current, A							
5	•						
10	•						
15	•						
20	•						
25	•						
30	•						
40	•						
50	•						
60	•						
75	•						
80	•						
100	•						
120	•						
125	•						
150	•	•					
200	•	•					
250	•	•					
300	•	•	•				
400	•		•				
500	•		•				
600	•		•	•			
750				•	•		
800	•			•	•		
1000	•			•	•	•	
1200					•	•	
1250						•	
1500					•	•	•
1600						•	
2000						•	•
2500						•	•
3000						•	•
4000							•
5000							•
Transformer accuracy class	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S	0,5	0,5	0,5	0,5
Rated burden	5; 10	5; 10	5; 10	10; 15	15	15	15
Maximum bus dimension, mm	–	31 (dim. 1) 35 (dim. 2)	41,5	60	85,5	100	130
Maximum cable diameter, mm	–	23,6 (dim. 1) 30 (dim. 2)	31	45	82	62	127
Transformer type	**TTI-A**	**TTI-30**	**TTI-40**	**TTI-60**	**TTI-85**	**TTI-100**	**TTI-125**

Range

Transformer type	Name	Rated secondary load	Primary rated current, A	PCS/PACKAGE	PCS/CTN	Article
	TTI-A 5/5 A 5 BA 0,5	5	5	1	36	ITT10-2-05-0005
	TTI-A 10/5 A 5 BA 0,5	5	10	1	36	ITT10-2-05-0010
	TTI-A 15/5 A 5 BA 0,5	5	15	1	36	ITT10-2-05-0015
	TTI-A 20/5 A 5 BA 0,5	5	20	1	36	ITT10-2-05-0020
	TTI-A 25/5 A 5 BA 0,5	5	25	1	36	ITT10-2-05-0025
	TTI-A 30/5 A 5 BA 0,5	5	30	1	36	ITT10-2-05-0030
	TTI-A 40/5 A 5 BA 0,5	5	40	1	36	ITT10-2-05-0040
	TTI-A 50/5 A 5 BA 0,5	5	50	1	36	ITT10-2-05-0050
	TTI-A 60/5 A 5 BA 0,5	5	60	1	36	ITT10-2-05-0060
	TTI-A 75/5 A 5 BA 0,5	5	75	1	36	ITT10-2-05-0075
	TTI-A 80/5 A 5 BA 0,5	5	80	1	36	ITT10-2-05-0080
	TTI-A 100/5 A 5 BA 0,5	5	100	1	36	ITT10-2-05-0100
	TTI-A 120/5 A 5 BA 0,5	5	120	1	36	ITT10-2-05-0120
	TTI-A 125/5 A 5 BA 0,5	5	125	1	36	ITT10-2-05-0125
	TTI-A 150/5 A 5 BA 0,5	5	150	1	36	ITT10-2-05-0150
	TTI-A 200/5 A 5 BA 0,5	5	200	1	36	ITT10-2-05-0200
	TTI-A 250/5 A 5 BA 0,5	5	250	1	36	ITT10-2-05-0250
	TTI-A 300/5 A 5 BA 0,5	5	300	1	36	ITT10-2-05-0300
	TTI-A 400/5 A 5 BA 0,5	5	400	1	36	ITT10-2-05-0400
	TTI-A 500/5 A 5 BA 0,5	5	500	1	36	ITT10-2-05-0500
	TTI-A 600/5 A 5 BA 0,5	5	600	1	36	ITT10-2-05-0600
	TTI-A 800/5 A 5 BA 0,5	5	800	1	36	ITT10-2-05-0800
	TTI-A 1000/5 A 5 BA 0,5	5	1000	1	36	ITT10-2-05-1000
	TTI-A 100/5 A 10 BA 0,5	10	100	1	36	ITT10-2-10-0100
	TTI-A 120/5 A 10 BA 0,5	10	120	1	36	ITT10-2-10-0120
	TTI-A 125/5 A 10 BA 0,5	10	125	1	36	ITT10-2-10-0125
	TTI-A 150/5 A 10 BA 0,5	10	150	1	36	ITT10-2-10-0150
	TTI-A 200/5 A 10 BA 0,5	10	200	1	36	ITT10-2-10-0200
	TTI-A 250/5 A 10 BA 0,5	10	250	1	36	ITT10-2-10-0250
	TTI-A 300/5 A 10 BA 0,5	10	300	1	36	ITT10-2-10-0300
	TTI-A 400/5 A 10 BA 0,5	10	400	1	36	ITT10-2-10-0400
	TTI-A 500/5 A 10 BA 0,5	10	500	1	36	ITT10-2-10-0500
	TTI-A 600/5 A 10 BA 0,5	10	600	1	36	ITT10-2-10-0600
	TTI-A 800/5 A 10 BA 0,5	10	800	1	36	ITT10-2-10-0800
	TTI-A 1000/5 A 10 BA 0,5	10	1000	1	36	ITT10-2-10-1000

Range

Transformer type	Name	Rated secondary load	Primary rated current, A	PCS/PACKAGE	PCS/CTN	Article
	TTI-30 150/5 A 5 BA 0,5	5	150	1	40	ITT20-2-05-0150
	TTI-30 200/5 A 5 BA 0,5	5	200	1	40	ITT20-2-05-0200
	TTI-30 250/5 A 5 BA 0,5	5	250	1	40	ITT20-2-05-0250
	TTI-30 300/5 A 5 BA 0,5	5	300	1	40	ITT20-2-05-0300
	TTI-30 200/5 A 10 BA 0,5	10	200	1	40	ITT20-2-10-0200
	TTI-30 250/5 A 10 BA 0,5	10	250	1	40	ITT20-2-10-0250
	TTI-30 300/5 A 10 BA 0,5	10	300	1	40	ITT20-2-10-0300
	TTI-40 300/5 A 5 BA 0,5	5	300	1	40	ITT30-2-05-0300
	TTI-40 400/5 A 5 BA 0,5	5	400	1	40	ITT30-2-05-0400
	TTI-40 500/5 A 5 BA 0,5	5	500	1	40	ITT30-2-05-0500
	TTI-40 600/5 A 5 BA 0,5	5	600	1	40	ITT30-2-05-0600
	TTI-40 300/5 A 10 BA 0,5	10	300	1	40	ITT30-2-10-0300
	TTI-40 400/5 A 10 BA 0,5	10	400	1	40	ITT30-2-10-0400
	TTI-40 500/5 A 10 BA 0,5	10	500	1	40	ITT30-2-10-0500
	TTI-40 600/5 A 10 BA 0,5	10	600	1	40	ITT30-2-10-0600
	TTI-60 600/5 A 10 BA 0,5	10	600	1	32	ITT40-2-10-0600
	TTI-60 750/5 A 10 BA 0,5	10	750	1	32	ITT40-2-10-0750
	TTI-60 800/5 A 10 BA 0,5	10	800	1	32	ITT40-2-10-0800
	TTI-60 1000/5 A 10 BA 0,5	10	1000	1	32	ITT40-2-10-1000
	TTI-60 600/5 A 15 BA 0,5	15	600	1	32	ITT40-2-15-0600
	TTI-60 750/5 A 15 BA 0,5	15	750	1	32	ITT40-2-15-0750
	TTI-60 800/5 A 15 BA 0,5	15	800	1	32	ITT40-2-15-0800
	TTI-60 1000/5 A 15 BA 0,5	15	1000	1	32	ITT40-2-15-1000
	TTI-85 750/5 A 15 BA 0,5	15	750	1	12	ITT50-2-15-0750
	TTI-85 800/5 A 15 BA 0,5	15	800	1	12	ITT50-2-15-0800
	TTI-85 1000/5 A 15 BA 0,5	15	1000	1	12	ITT50-2-15-1000
	TTI-85 1200/5 A 15 BA 0,5	15	1200	1	12	ITT50-2-15-1200
	TTI-85 1500/5 A 15 BA 0,5	15	1500	1	12	ITT50-2-15-1500
	TTI-100 1000/5 A 15 BA 0,5	15	1000	1	16	ITT60-2-15-1000
	TTI-100 1200/5 A 15 BA0,5	15	1200	1	16	ITT60-2-15-1200
	TTI-100 1250/5 A 15 BA 0,5	15	1250	1	16	ITT60-2-15-1250
	TTI-100 1500/5 A 15 BA 0,5	15	1500	1	16	ITT60-2-15-1500
	TTI-100 1600/5 A 15 BA 0,5	15	1600	1	16	ITT60-2-15-1600
	TTI-100 2000/5 A 15 BA 0,5	15	2000	1	16	ITT60-2-15-2000
	TTI-100 2500/5 A 15 BA 0,5	15	2500	1	16	ITT60-2-15-2500
	TTI-100 3000/5 A 15 BA 0,5	15	3000	1	16	ITT60-2-15-3000
	TTI-125 1500/5 A 15 BA 0,5	15	1500	1	10	ITT70-2-15-1500
	TTI-125 2000/5 A 15 BA 0,5	15	2000	1	10	ITT70-2-15-2000
	TTI-125 2500/5 A 15 BA 0,5	15	2500	1	10	ITT70-2-15-2500
	TTI-125 3000/5 A 15 BA 0,5	15	3000	1	10	ITT70-2-15-3000
	TTI-125 4000/5 A 15 BA 0,5	15	4000	1	10	ITT70-2-15-4000
	TTI-125 5000/5 A 15 BA 0,5	15	5000	1	10	ITT70-2-15-5000

Range

Transformer type	Name	Rated secondary load	Primary rated current, A	PCS/PACKAGE	PCS/CTN	Article
	TTI-A 5/5 A 5 BA 0,5S	5	5	1	36	ITT10-3-05-0005
	TTI-A 10/5 A 5 BA 0,5S	5	10	1	36	ITT10-3-05-0010
	TTI-A 15/5 A 5 BA 0,5S	5	15	1	36	ITT10-3-05-0015
	TTI-A 20/5 A 5 BA 0,5S	5	20	1	36	ITT10-3-05-0020
	TTI-A 25/5 A 5 BA 0,5S	5	25	1	36	ITT10-3-05-0025
	TTI-A 30/5 A 5 BA 0,5S	5	30	1	36	ITT10-3-05-0030
	TTI-A 40/5 A 5 BA 0,5S	5	40	1	36	ITT10-3-05-0040
	TTI-A 50/5 A 5 BA 0,5S	5	50	1	36	ITT10-3-05-0050
	TTI-A 60/5 A 5 BA 0,5S	5	60	1	36	ITT10-3-05-0060
	TTI-A 75/5 A 5 BA 0,5S	5	75	1	36	ITT10-3-05-0075
	TTI-A 80/5 A 5 BA 0,5S	5	80	1	36	ITT10-3-05-0080
	TTI-A 100/5 A 5 BA 0,5S	5	100	1	36	ITT10-3-05-0100
	TTI-A 120/5 A 5 BA 0,5S	5	120	1	36	ITT10-3-05-0120
	TTI-A 125/5 A 5 BA 0,5S	5	125	1	36	ITT10-3-05-0125
	TTI-A 150/5 A 5 BA 0,5S	5	150	1	36	ITT10-3-05-0150
	TTI-A 200/5 A 5 BA 0,5S	5	200	1	36	ITT10-3-05-0200
	TTI-A 250/5 A 5 BA 0,5S	5	250	1	36	ITT10-3-05-0250
	TTI-30 200/5 A 5 BA 0,5S	5	200	1	40	ITT20-3-05-0200
	TTI-30 250/5 A 5 BA 0,5S	5	250	1	40	ITT20-3-05-0250
	TTI-30 300/5 A 5 BA 0,5S	5	300	1	40	ITT20-3-05-0300
	TTI-40 400/5 A 5 BA 0,5S	5	400	1	40	ITT30-3-05-0400
	TTI-40 500/5 A 5 BA 0,5S	5	500	1	40	ITT30-3-05-0500
	TTI-40 600/5 A 5 BA 0,5S	5	600	1	40	ITT30-3-05-0600

Technical features

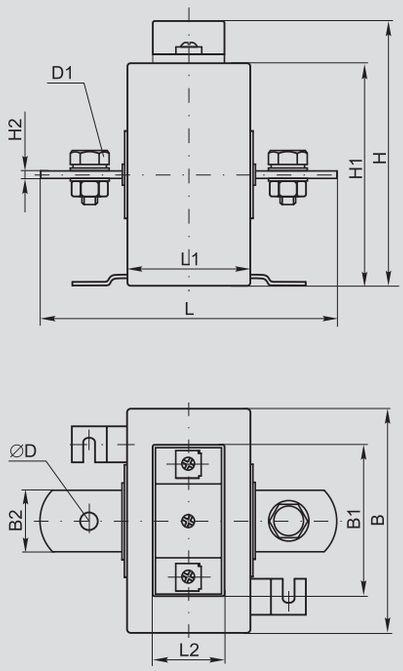
Feature name	Transformer type						
	TTI-A	TTI-30	TTI-40	TTI-60	TTI-85	TTI-100	125
Rated voltage U_{nom}, kV				0,66			
Max. operating voltage, kV				0,72			
Rated frequency, f_{nom}, Hz				50			
Primary rated current I_{1nom}, A	5; 10; 15; 20; 25; 30; 40; 50; 60; 75; 80; 100; 120; 125; 150; 200; 250; 300; 400; 500; 600; 800; 1000	150; 200; 250; 300	300; 400; 500; 600	600; 750; 800; 1000	750; 800; 1000; 1200; 1500	1000; 1200; 1250; 1500; 1600; 2000; 2500; 3000	1500; 2000; 2500; 3000; 4000; 5000
Secondary rated current, I_{2nom}, A	5	5	5	5	5	5	5
Rated secondary load S_{2nom} ($\cos\varphi$ = 0.8), VA	5; 10	5; 10	5; 10	10; 15	15	15	15
Accuracy class				0,5; 0,5S			
Rated transformer ratio, $n=I_p/I_s$				$n=I_p/I_s$			
Secondary coil security factor K				5			
Test voltage 50 Hz/1 min., kV				3			
Weight max., kg	0,6	0,6	0,38	0,6	0,75 0,82 0,89 0,99 1,02	0,80 0,85 0,94 1,10 1,16	1,00 1,15 1,45 1,60 1,90 2,20

Secondary coil Max. error limits

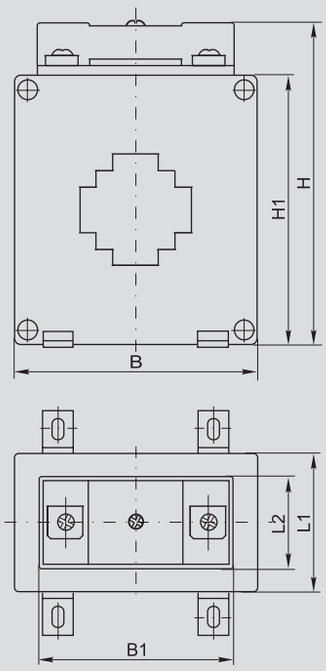
Accuracy Class	Primary current, % of nominal value	Current Max. error limit current error, %	angle error, min		Load limit, in % of nominal value
0,5S	1	± 1,5	± 90’	± 2,7 crad	
	5	± 0,75	± 45’	± 1,35 crad	25÷100
	20	± 0,5	± 30’	± 0,9 crad	
	100–120	± 0,5	± 30’	± 0,9 crad	
0,5	5	± 1,5	± 90’	± 2,7 crad	
	20	± 0,75	± 45’	± 1,35 crad	25÷100
	100–120	± 0,5	± 30’	± 0,9 crad	

Overall and setting dimensions

TTI-A



TTI-30..125

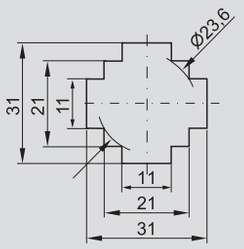


Type	Dimension, mm										
	B	B1	B2	H	H1	H2	L	L1	L2	D	D1
TTI-A от 5/5А до 300/5А	87	62	25	103	87	3	120	48	34	8	M8 × 16
TTI-A от 400/5А, 500/5А	87	62	26	103	87	6	118	48	34	13	M12 × 27
TTI-A от 600/5А до 1000/5А	87	62	26	103	87	12	118	48	34	13	M12 × 36
TTI-30 габ. 1*	75	62	–	98	82	–	–	42	34	–	–
TTI-30 габ. 2 **	84	62	–	102	86	–	–	48	34	–	–
TTI-40	75	62	–	98	82	–	–	42	34	–	–
TTI-60	101	62	–	127	111	–	–	42	34	–	–
TTI-85	128	62	–	157	145	–	–	42	34	–	–
TTI-100	144	62	–	154	138	–	–	42	34	–	–
TTI-125	191	62	–	220	205	–	–	42	34	–	–

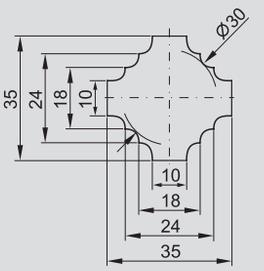
* Current transformers TTI-30 200/5A 5VA, TTI-30 250/5A 5VA, TTI-30 300/5A 5VA
** Current transformers TTI-30 150/5A 5VA, TTI-30 200/5A 10VA, TTI-30 250/5A 10VA, TTI-30 300/5A 10VA

Dimension of apertures for wires and cables

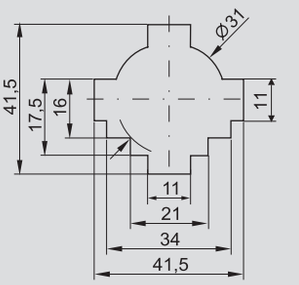
TTI-30 dim. 1



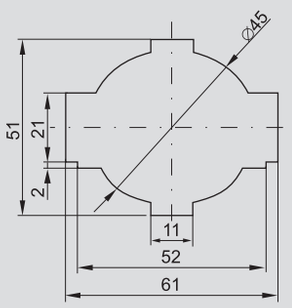
TTI-30 dim. 2



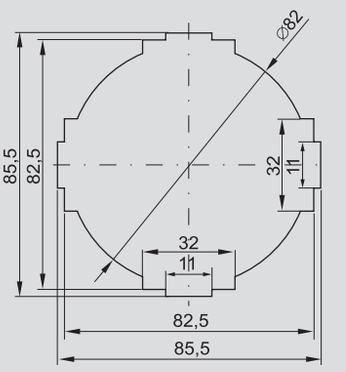
TTI-40



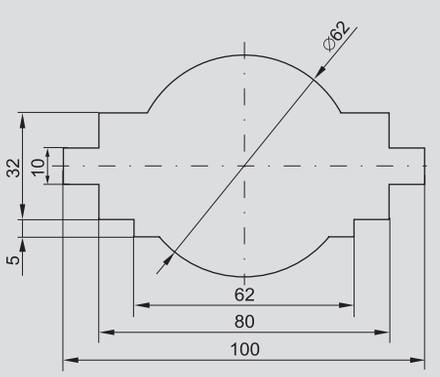
TTI-60



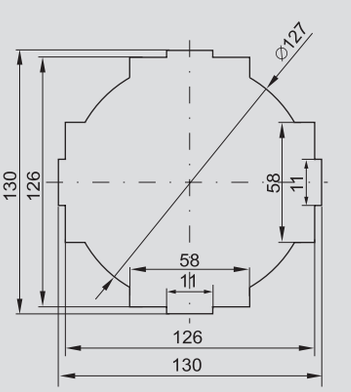
TTI-85



TTI-100



TTI-125



Measurement devices E47 series

These devices are applied in low-voltage complete devices in electrical distribution networks of residential houses, commercial and industrial enterprises.
Ampere-meters E47 are analog electromagnetic electrical measuring instruments, intended for measuring the current strength in alternating current electrical networks.
Voltmeters E47 are analog electromagnetic electrical measuring instruments designated for measuring the voltage in alternating current electrical networks.

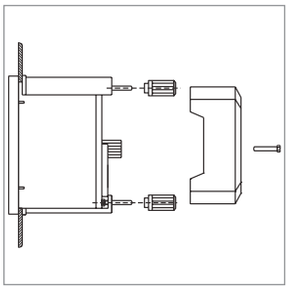
These devices comply with GOST 30012.1, GOST 8711, GOST 22261; GOST R 52319 and are manufactured in accordance with Performance Specifications TU 4223-023-18461115-2008.

The measurement devices E47 series have entered into State Register of measurement devices under No. 39231-08 with receiving the certificate of approval for the type of measurement devices SM.S.34.010 A No. 33523.

Advantages:

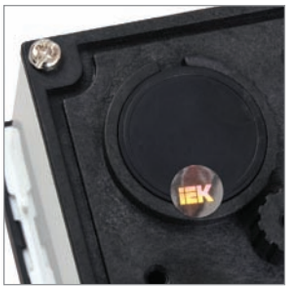
- Devices are entered into State Register of measurement devices of the Russian Federation (certificate of approval for the type of measurement devices).
- All devices undergo initial control according to GOST 8.497.
- Broad range of measurements: amperemeters – up to 3000 A, voltmeters – up to 600 V.
- Convenience of assembly.
- Full compatibility with current transformers TTI of IEK trade mark.
- Case sealing.
- Option of zero mark adjustment.
- Electrical safety.
- Recalibration interval – 2 years.

Design features



Mounting elements: nuts, fastening screws, plastic fasteners for board panel in delivery package of devices ensure convenient assembly without using the additional components.

Protective transparent cover for external connection terminals ensures electrical safety.



Box sealing prevents unauthorized access to the device measuring unit.

Devices are equipped with a mechanical element for zero setting to correct the pointer zero position.

Amperemeters designed for measurement of currents above 50 A are connected to the measured network using current transformer with rated secondary current 5 A.

Device case is made of self-extinguishing plastic.

Operation principle

Amperemeters and voltmeters E47 belong to devices with an electromagnetic system equipped with round coil and movable and immovable cores inside. When current runs through loops of the coil it creates magnetic field magnetizing both cores. As a result, similar poles of cores repulse and movable core turns the pin of the pointer. Coil and cores are covered with metal screen protecting them against harmful effects of external magnetic fields.

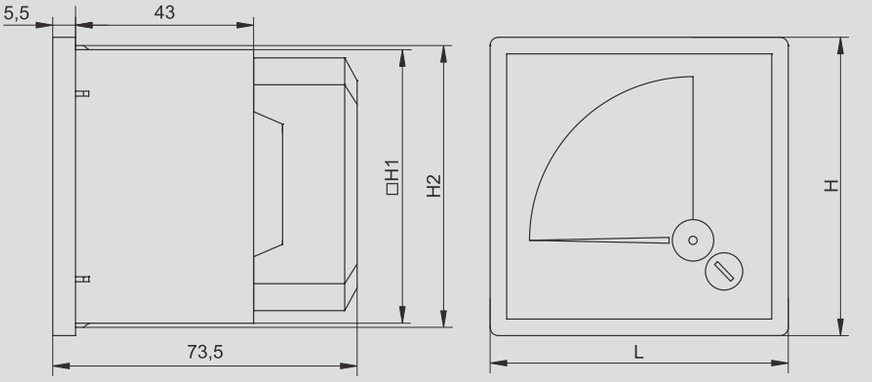
Range

	Item	Insertion	Accuracy class	Rated voltage, V	Dimensions of front board, mm	PCS/CTN	Article
Amperemeters							
	Amperemeter 347 10 A 72×72 mm	direct	1,5	400	72×72	100	IPA10-6-0010-E
	Amperemeter 347 50 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0050-E
	Amperemeter 347 100/5 A 72×72 mm	insertion via CT with (I. = 5 A)	1,5	400	72×72	100	IPA10-6-0100-E
	Amperemeter 347 150/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0150-E
	Amperemeter 347 200/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0200-E
	Amperemeter 347 300/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0300-E
	Amperemeter 347 400/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0400-E
	Amperemeter 347 600/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0600-E
	Amperemeter 347 1000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-1000-E
	Amperemeter 347 1500/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-1500-E
	Amperemeter 347 2000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-2000-E
	Amperemeter 347 3000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-3000-E
	Amperemeter 347 10 A 96×96 mm	direct	1,5	400	96×96	60	IPA20-6-0010-E
	Amperemeter 347 50 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0050-E
	Amperemeter 347 100/5 A 96×96 mm	insertion via CT with (I. = 5 A)	1,5	400	96×96	60	IPA20-6-0100-E
	Amperemeter 347 150/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0150-E
	Amperemeter 347 200/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0200-E
	Amperemeter 347 300/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0300-E
	Amperemeter 347 400/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0400-E
	Amperemeter 347 600/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0600-E
	Amperemeter 347 1000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-1000-E
	Amperemeter 347 1500/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-1500-E
	Amperemeter 347 2000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-2000-E
	Amperemeter 347 3000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-3000-E
Voltmeters							
	Voltmeter 347 100 B 72×72 mm	direct	1,5	600	72×72	100	IPV10-6-0100-E
	Voltmeter 347 300 B 72×72 mm		1,5	600	72×72	100	IPV10-6-0300-E
	Voltmeter 347 500 B 72×72 mm		1,5	600	72×72	100	IPV10-6-0500-E
	Voltmeter 347 600 B 72×72 mm		1,5	600	72×72	100	IPV10-6-0600-E
	Voltmeter 347 100 B 96×96 mm		1,5	600	96×96	60	IPV20-6-0100-E
	Voltmeter 347 300 B 96×96 mm		1,5	600	96×96	60	IPV20-6-0300-E
	Voltmeter 347 500 B 96×96 mm		1,5	600	96×96	60	IPV20-6-0500-E
	Voltmeter 347 600 B 96×96 mm		1,5	600	96×96	60	IPV20-6-0600-E

Technical features

Feature name	Amperemeters E47	Voltmeters E47
System	electromagnetic	electromagnetic
Data output	analogue	analogue
Range of measurement	0÷3000 A	0÷600 B
Installation	on electric service panel	on electric service panel
Insertion	≤ 50 A – direct insertion ≥ 100 A – insertion via CT with (I2=5A)	direct insertion
Accuracy class	1,5	1,5
Max. error limits, %	±1,5	±1,5
Rated voltage max., V	400 B	600 B
Max. long-term overload (max. 2h)	120% of finale value of measurement range	120% of finale value of measurement range
Mean time to failure, not less than, h	65 000	65 000
Durability, not less than, years	8	8
Ambient temperature, °C	20±5	20±5
Frequency, Hz	45÷65	45÷65
Assembly	vertical	vertical
Weight, kg	72×72 mm – 0,164 96×96 mm – 0,238	72×72 mm – 0,164 96×96 mm – 0,238
Overall dimensions, mm	72×72×73,5 96×96×73,5	72×72×73,5 96×96×73,5

Overall dimensions



Front panel dimensions, mm	H, mm	L, mm	H1, mm	H2, mm
72×72	72	72	66	68
96×96	96	96	90	92

Voltage Stabilizers SNI

Voltage Stabilizers SNI1 (single-phase), SNI3 (three-phase) of IEK® trade-mark are intended for maintenance of steady single-phase/three-phase supply voltage of household and industrial consumers 220 V/3x220 V, 50 Hz in case of deviations in network voltage in broad range of values and duratiuon.

These stabilizers are applied to stabilize voltage using highly-sensitive equipment on industrial enterprises, health-care institutions, telecommunication companies, low-height housing construction, and housing and utilities sector that allows extending operation life of lighting, computing, and other equipment.
The comply with GOST R 52161.1, GOST R 51318.14.1, GOST R 51317.3.2, GOST R 51317.3.3 standards and are manufactured in accordance with Performance Specifications TU 3468-001-18461115-2009.

Golden medal of 18th International Fair «Electro-2009» in category «Best electrical equipment» is awarded for high values of quality, reliability, operational features and effective design concepts.

Advantages

- High precision of maintaining the output voltage in rated range of input voltage of 220 V ± 3%.
- Broad range of rated input voltage: 160ч250 V for SNI1; for SNI3: 160ч250 V - phase, 280ч430 V (linear).
- High efficiency coefficient > 90%.
- Availability of four types of protection: from over-currents (overload or short-circuit), against output over- and under-voltage, against overheating of auto-transformer coil.
- The stabilizer does not distort sinusoidal form of output voltage.
- Use of high-quality protective and switching devices of IEK trade mark – automatic circuit breakers of VA47-29, VA47-100 series and KMI contactors.
- Modern circuit design.
- Convenience of assembly, maintenance and transportation of stabilizers due to application of built-in ergonomic handles for compact stabilizers and transporting wheels for large-dimension ones.
- Availability of spare parts – safety fuse links and collector brushes of auto-transformer – in standard Performance Specifications.
- Warranty service period of stabilizers is 1 year from sale date, while warranty period for such spare parts as automatic circuit breakers VA47-29, VA47-100 and KMI contactor is 5 years.

Design features

Indication of all operation modes: actuation of protection, and levels of input and output phase voltages. Helps selecting the proper stabilizer load.

Indication of input and output voltage level for each phase.

Convenience of assembly and maintenance of thermal stabilizer.

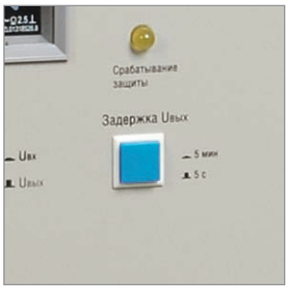
Usage of high-quality protection and commutation devices of IEK® trademark –automatic breakers of VA47-29, and VA 47-100 series and KMI contactors.

Thermal protection ensured by self-returning thermo-bimetallic sensor.

Two-pole automatic breakers of IEK® trademark installed in single-phase voltage stabilizers SNI1 protect phase and zero conductors to improve the level of electrical safety and reliability of stabilizer.

Improved design of brush holder to avoid overheating of connector assembly.

There is a phase retardation protection function in voltage stabilizers SNI3 which switches it off in case of a given emergency situation. It is extremely important for engines' power supply (refrigerators, air conditioners, etc.) characterized by break-downs at phase retardation.



Reaction delay for protection of equipment against voltage surges (refrigerators, air conditioners, etc.).

Availability of spare parts in standard Performance Specifications, including safety fuse links and autotransformers brushes.

Operating principle

Voltage stabilizers SNI belong to electro-mechanical type of stabilizers and ensure smooth precise regulation of output voltage with precise voltage retaining. After switch-on, a stabilizer's controller module analyses values of input and output voltage and sets a command signal to electric motor, which transfers the collector brush along the coil of autotransformer, with simultaneous smooth increase or decrease of output voltage up to rated value of 220 V.

How to choose SNI series voltage stabilizer

When choosing the voltage stabilizer (hereinafter called the "Stabilizer") the customer shall determine the parameters as follows:
а) total power of switched load considering starting currents of devices equipped with electric motors (refrigerators, pumps, air-conditioners, etc.).
In order to determine the total power of switched devices it is necessary to summarize values of full powerof individual devices. The power value is specified in datasheet or operation manual, and sometimes the consumers' power is indicated in the information on the back plate of a device. Though the rated power of a device, i.e. power in stabilized operation mode is usually specified in a datasheet, electric devices equipped with motors usually consume greater power. For example, low-capacity household appliances using electric motors (refrigerators, air-conditioners, etc.) have starting power exceeding the rated ones on the average twofold or threefold, and middle-capacity appliances with electric motors (pumps, machine tools, etc.) exceed this ratio four- or sevenfold. Therefore you must consider this fact in calculations. The starting power value is usually specified in device datasheet; if not, you can calculate it approximately by the following formula:
STARTING POWER = RATED POWER × 4.

In calculation of total power of load it is necessary to consider complete and active power of devices. Full power is specified in VA (volt-ampere) and active power – in W (Watt). Full power in VA and active power in W correlate by coefficient cosϕ specified in datasheet of specific device.

STARTING POWER = RATED POWER / cosϕ.

For such devices as incandescent lamps, irons, electrical ovens the cosϕ coefficient is = 1,0; for some devices such as electrical motors the cosϕ coefficient is = 0,6. In case this cosϕ coefficient is unknown, one can take *cosϕ* = 0,75;
б) minimal possible actual voltage.
Minimal network voltage is measured at the moment of network peak loads. In case the network voltage goes beyond 220 V±22 V (permissible maximum deviation of network voltage) established by GOST13109-97 the application of voltage stabilizer is recommended. Once values of full power of switched load and minimal voltage are obtained you can select the voltage stabilizer.

ATTENTION!

1. Rated power of SNI stabilizer complies with input voltage of 220 V. Once the input voltage decreased the output voltage decreases. Graph for this correlation is given below:

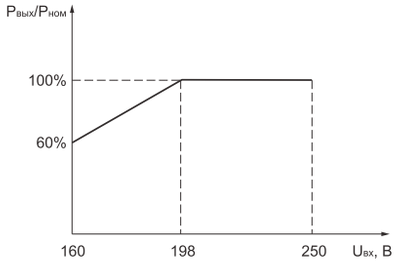


Рисунок 1. Correlation of output power with input voltage where U_{in} – is input voltage, P_{out} – output power, and P_{nom} – rated (nameplate) output capacity.

2. It is necessary to avoid prolonged operation of stabilizer at voltage U_{in} less than 160 V as current overload of stabilizer is possible.

When the current overload occurs the protection will be actuated and stabilizer switched off.

3. It is not permitted to exceed duration of permissible overloads (see Chart 1).

Taking into consideration the above notes we obtain formula as follows:

POWER of voltage stabilizer = TOTAL POWER of switched LOAD × K,

Where *TOTAL POWER* is specified in VA;
K – capacity safety margin that considers decrease of network voltage (see Chart 2).
Selection of a stabilizer in the range of IEK stabilizers is done according to the obtained calculated power value. The power of stabilizer is rounded up from the calculated value.
It is recommended to provide for 20-30% power margin while selecting a stabilizer. It will facilitate its operating mode alongside with extending the operation life of device.

How to select a single-phase stabilizer

For example, a stabilizer is required for cottage house – illumination (300 W, cosϕ = 1,0), refrigerator (rated power 250 W, starting power 625 W, cosϕ = 0,75), TV set (80 W, cosϕ = 1,0), electric stove (2000 W, cosϕ = 1,0). The voltage of network can fall to 170 V.

1. Calculation of total load capacity:
300 W/1+250 W × 2,5/0,75+80 W/1+2000 W/1 = 3213,3 VA
(2,5 – the ratio considering starting power of refrigerator, i.e. 625 W).

2. Consideration of voltage variation in network:
3213,3 VA × 1,3 = 4177,3 VA (1,3 – the ratio considering minimal possible actual voltage of network, i.e. 170 B).

3. Power margin:
4177,3 VA × 1,3 = 5430,5 VA (1,3 – power margin, i.e. 30%).

Thus for switch-on of the above-stated load with full power of 3213,3 VA we require a stabilizer with power 5430,5 VA.
In the range of SNI voltage stabilizers we find a stabilizer with power min. 5430,5 VA: i.e., single-phase SNI1-7 kVA.

Method of selecting a three-phase stabilizer for operation with single-phase loads is similar to that of a single-phase one. Calculation considers the most loaded phase and minimal supply voltage of phases. Then the obtained value is multiplied by 3 (number of phases), and a voltage stabilizer of standard power line is selected according to the data obtained.
The full power demand for three-phase consumers (such as engines, machine tools, etc.) is usually specified in the device datasheet or Performance Specifications nameplate on a devices case. Some three-phase consumers (for example, machine tools) have several operating modes. In this case the stabilizer is selected based on the highest load operating conditions. For engines the stabilizer is selected considering the starting powers which in some cases may exceed the nominal one four- or seven times. In order to ensure optimal operating mode of a stabilizer it is necessary to provide 10% power margin.
In conclusion it should be noted that engagement of skilled technician in calculation and selection of a voltage stabilizer will spare financial recourses and ensure reliable operation of electrical appliances.

Chart 1

Permissible overload, in % of P_{nom}	Permissible overload time, min.
20	60
40	32
60	5

Chart 2

Voltage of network, V	130	150	170	200	220
Power margin ratio	1,7	1,5	1,3	1,1	1,0

Range

	Item	Power, kWA	Maximum input current, A	Operating input voltage range, V		Output voltage U_{out}, V	Overall dimensions (W×D×H), mm	Weight, kg	PCS/ CTN	Article
Single-phase voltage stabilizers SNI1										
	SNI1-0,5 KVA	0,5	2,25	160÷250		220 ± 3%	19,3×16,5×13	4,5	4	IVS10-1-00500
	SNI1-1 KVA	1	4,5				22,5×26×20	6,5	4	IVS10-1-01000
	SNI1-1,5 KVA	1,5	6,75				22,5×20×26	7,5	4	IVS10-1-01500
	SNI1-2 KVA	2	9				22,5×29×21,5	10	1	IVS10-1-02000
	SNI1-3 KVA	3	13,5				22,5×31×25	12,5	1	IVS10-1-03000
	SNI1-5 KVA	5	22,5				22×31,7×28,3	18	1	IVS10-1-05000
	SNI1-7 KVA	7	32				27,3×31,1×44	26	1	IVS10-1-07000
	SNI1-10 KVA	10	45				27,3×31,1×44	27	1	IVS10-1-10000
	SNI1-15 KVA	15	67				33×38,5×65	60	1	IVS10-1-15000
Three-phase voltage stabilizers SNI3										
	SNI3-3 KVA	3×1	3×4,5	Phase 160÷250	Linear 280÷430	220 ± 3%	31,5×45,5×17,5	18	1	IVS10-3-03000
	SNI3-6 KVA	3×2	3×9				27,5×37,3×67	33,5	1	IVS10-3-06000
	SNI3-7,5 KVA	3×2,5	3×10				32×35,5×76,8	43,5	1	IVS10-3-07500
	SNI3-15 KVA	3×5	3×22,5				43,8×39×79,3	78	1	IVS10-3-15000
	SNI3-20 KVA	3×6,6	3×32				51×44×85	102	1	IVS10-3-20000
	SNI3-30 KVA	3×10	3×45				51×44×97,5	111	1	IVS10-3-30000

Technical features

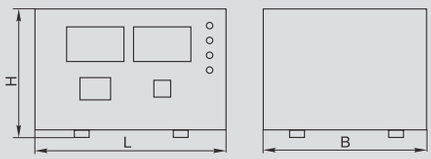
Feature name		SNI1	SNI3
Rated output power Pn (U_{in} = 220 V), KVa		0,5; 1; 1,5; 2; 3; 5; 7; 10; 15	3; 6; 7,5; 15; 20; 30
Operating input voltage range U_{in}, V		160÷250	– phase voltage: 160÷250 – line voltage: 280÷430
Output voltage, U_{out}, V		220	– phase voltage: 220 – line voltage: 380
Output voltage maintenance accuracy in operating input voltage range, %		± 3	± 3
Input voltage range, V		135÷275	– phase voltage: 135÷275 – line voltage: : 235÷475
Tripping voltage from increased output voltage U_{max}, V		246	246 (for each of phase voltages)
Tripping voltage from decreased output voltage, U_{min}, V		184	184 (for each of phase voltages)
Thermal protection at increase of transformer temperature, °C		105	105
Output voltage delay	Standard delay	5 sec	5 sec
	Long delay	5 min	n/d
Output-input ration (efficiency), %		≥ 90	
Response time, ms		< 1 (U_{in} ±10%)	
Range of ambient temperatures, °C		–5÷+ 40	
Climate type and installation category (GOST 15150)		MRC4 (Moderate and rigid climate)	

Supply set

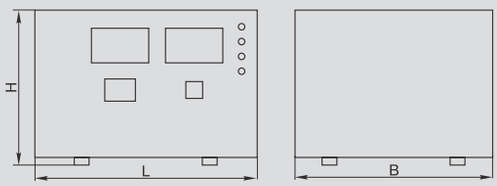
SNI1
- stabilizer – 1 pc.
- operational manual. Datasheet – 1 pc.
- spare fuses (for models 0,5; 1; 1,5 kVa) – 2pc.
- spare autotransformer brush – 1pc.
- packing box – 1 pc.

SNI3
- stabilizer – 1 pc.
- operational manual. Datasheet – 1 pc.
- spare autotransformer brush - 3 pc.
- packing box – 1 pc.

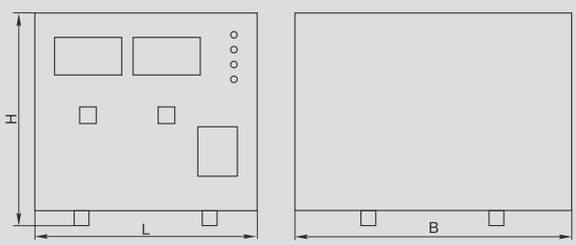
Overall dimensions



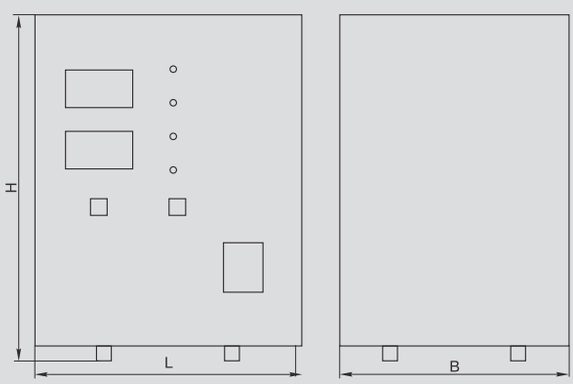
Item	L, mm	H, mm	B, mm
SNI1-0,5 KVA	193	130	165



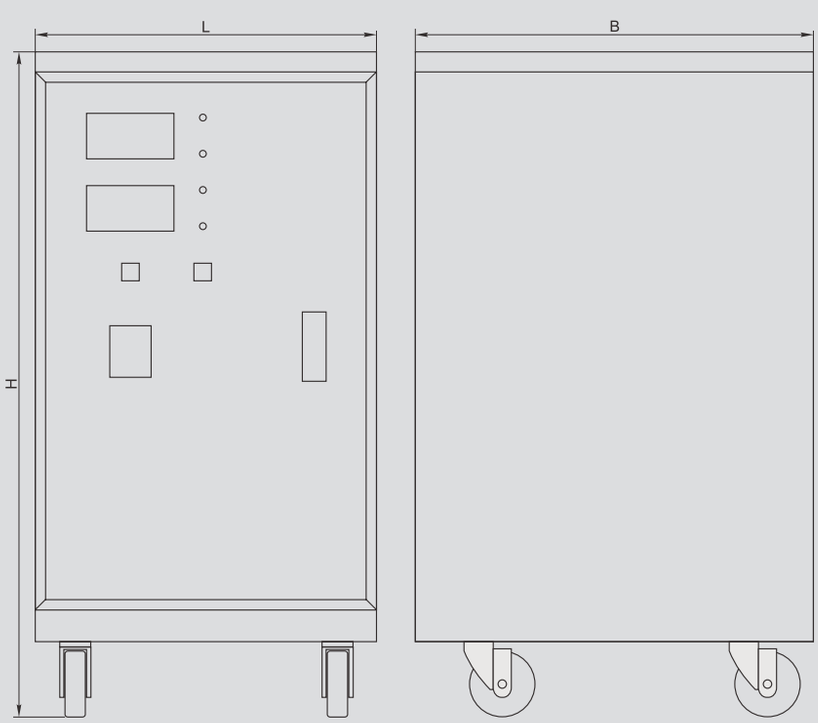
Item	L, mm	H, mm	B, mm
SNI1-1 KVA	225	150	200
SNI1-1,5 KVA	225	150	200



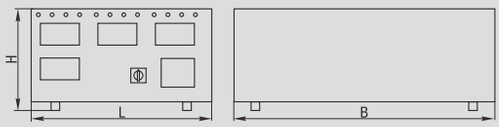
Item	L, mm	H, mm	B, mm
SNI1-2 KVA	225	215	280
SNI1-3 KVA	225	250	295
SNI1-5 KVA	220	283	235



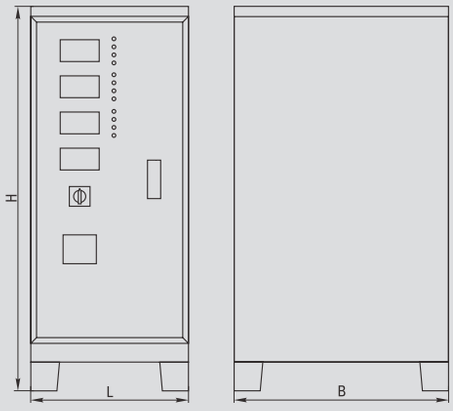
Item	L, mm	H, mm	B, mm
SNI1-7 KVA	273	380	232
SNI1-10 KVA	273	380	232



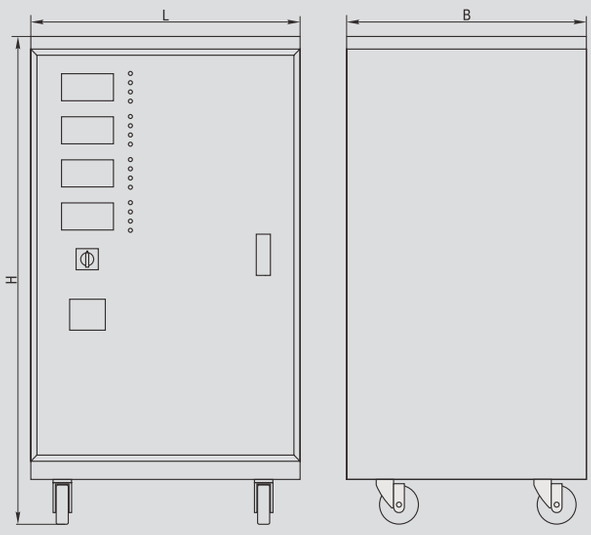
Item	L, mm	H, mm	B, mm
SNI1-15 KVA	330	650	385



Item	L, mm	H, mm	B, mm
SNI3-3 KVA	315	175	455



Item	L, mm	H, mm	B, mm
SNI3-6 KVA	275	670	373
SNI3-7,5 KVA	320	768	355



Item	L, mm	H, mm	B, mm
SNI3-15 KVA	438	793	390
SNI3-20 KVA	510	850	440
SNI3-30 KVA	510	975	440

Electronic voltage stabilizers SNR

НОВИНКА

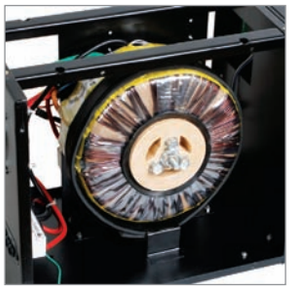
Electronic voltage stabilizers SNR are intended for maintenance of constant load supply voltage for household and industrial purposes in broad range of values and duration.
Electronic voltage stabilizers SNR are applied for stabilizing the power-supply voltage and protection of household and industrial facilities, trade equipment, communication devices as well as complex power supply systems of industrial facilities, cottages, apartments and offices.
Single-phase electronic voltage stabilizers SNP1 comply with GOST R 52161.1-2004, GOST R 51318.14.1-2006 section 4, GOST R 51318.14.2-2006 sections 5, 7, GOST R 51317.3.2-2006 sections 6, 7, GOST R 51317.3.3.-2008 and are manufactured in accordance with Performance Specifications TU 3468-002-18461115-2010.

Advantages

- Precise compliance with rated power due to application of powerful transformers and power electronic switchers.
- Six protection levels: against overloads, short-circuit, overheat, dangerous overvoltage, dangerous undervoltage and surge overvoltage.
- High efficiency coefficient > 95 %.
- Expanded range of input voltage – 140÷270 V.
- High actuation speed – less than 20 ms.
- No of sinusoid distortion.
- Maintaining the operational condition during short-term overloads up to 120%.
- Application of high-quality protection device of IEK® trademark – VA47-29.
- Bypass mode for tracking the stabilization mode (for items higher than 3 kVA).
- Modern design.
- Warranty period of stabilizers is 1 year after sale date.

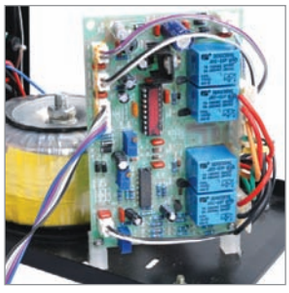
Design features

Multipurpose display indicates operation mode and allows selection of proper load.



Ribbon-type autotransformer coil with copper winding ensures conformity to power rate, secures reliable and noiseless operation.

Thermal protection ensures load switch-off in case of temperature rise of the autotransformer.



Modern circuit design of control unit with microprocessor and seven stages of regulation ensure high quality of output voltage.

Application of high-quality protection devices of IEK® trademark – automatic breakers of VA47-29 series.

Reaction delay for protection of equipment from voltage surges (refrigerators, air conditioners, etc.).

The bypass function is provided for items 3, 5, 8, and 10 kVA after activation of which stabilizers input voltage is transferred to load without stabilization.

Mobile SNR1-0 items 5, 8 and 10 kVA allow using the forced cooling ventilators.

Regulating relays ensure high precision of voltage stabilization.

Metal-plastic case ensures safekeeping of devices and fire safety.

Range

	Name	Power, kVA	Maximum input current, A	Fuse, circuit breaker (type)	Overall dimensions, cm (W×D×H)	Weight, kg	PCS/CTN	Article
SNR stationary electronic voltage stabilizers								
	SNR1-1-0,5 KVA	0,5	2,25	Fuse, I_n 6 A	22×19×11	2,5	6	IVS21-1-00500
	SNR1-1-1 KVA	1	4,5	Fuse, I_n 6 A	22×19×11	3,0	6	IVS21-1-01000
	SNR1-1-1,5 KVA	1,5	6,75	Fuse, I_n 8 A	22×19×11	3,3	6	IVS21-1-01500
SNR portable electronic voltage stabilizers								
	SNR1-0-0,5 KVA	0,5	2,25	Fuse, I_n 6 A	14×24×18	2,6	4	IVS20-1-00500
	SNR1-0-1 KVA	1	4,5	Fuse, I_n 6 A	14×24×18	3,3	4	IVS20-1-01000
	SNR1-0-1,5 KVA	1,5	6,75	Fuse, I_n 8 A	14×24×18	3,5	4	IVS20-1-01500
	SNR1-0-2 KVA	2	9	Circuit breaker, 10 A, 1P	16×29×20	5,7	4	IVS20-1-02000
	SNR1-0-3 KVA	3	13,5	Circuit breaker, 16 A, 2P	22×33×24	10,6	1	IVS20-1-03000
	SNR1-0-5 KVA	5	22,5	Circuit breaker, 25 A, 2P	21×36×27	15,4	1	IVS20-1-05000
	SNR1-0-8 KVA	8	36	Circuit breaker, 40 A, 2P	21×36×27	17,9	1	IVS20-1-08000
	SNR1-0-10 KVA	10	45	Circuit breaker, 50 A, 2P	22×39×30	24,2	1	IVS20-1-10000
SNR wall-type electronic voltage stabilizers								
	SNR1-2-3 KVA	3	13,5	Circuit breaker, 16 A, 2P	25×16×37	8,7	2	IVS22-1-03000
	SNR1-2-5 KVA	5	22,5	Circuit breaker, 25 A, 2P	37×18×39	14	2	IVS22-1-05000
	SNR1-2-8 KVA	8	36	Circuit breaker, 40 A, 2P	37×20×39	15,5	2	IVS22-1-08000
	SNR1-2-10 KVA	10	45	Circuit breaker, 50 A, 2P	30×20×43	20,5	1	IVS22-1-10000

Technical features

Feature name		Value
Rated output power P_n (U_{in} = 220 V), kVA		0,5; 1; 1,5; 2; 3; 5; 8; 10
Operating input voltage range U_{in}, V		140÷270
Output voltage, U_{out}, V		220
Regulation steps		7
Output voltage maintenance accuracy in operating input voltage range, %		8
Tripping voltage from increased output voltage U_{max}, V		243±4
Tripping voltage from decreased output voltage, U_{min}, V		188±4
Thermal protection at increase of transformer temperature, °C		120
Output voltage delay	Short delay	5
	Long delay (button “Delay Uout” is pushed)	255
Output-input ration (efficiency), %		≥95
Response time, ms		≤20
Insulation strength, V		1500
Insulation resistance, MΩ		≥2
Range of ambient temperature, °C		0÷+40
Protection degree		IP20