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2 Protection and Switching Power Equipment

Power circuit breakers

Molded case circuit breakers VA88

VA88 circuit breakers are intended for conducting current in normal mode and switching it off at short circuits, overload, inadmissible bucking as well as operational actuation and tripping of electric circuit parts. They are designed for use in electric units having the operative voltage limited to 400 V per rated current from 12,5 to 1600 A.
Correspond to the requirements of EN 60947-1, EN 60947-2

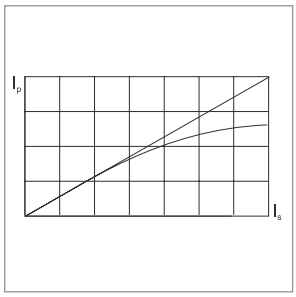
This circuit breaker was awarded silver medal of the 16th International Exhibition “Electro-2007” in nomination “Best electrical equipment”.

Advantages

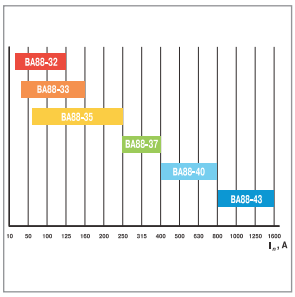
- Easy independent installation of auxiliary devices:
  - signal contact;
  - auxiliary contact;
  - undervoltage trip;
  - shunt trip;
  - rotary handle;
  - motor control;
  - plug-in panel;
  - pull-out panel.

- Standard set of each circuit breaker consists of connecting busbars or cable lugs, phase separators, a set of screws and nuts for its mounting onto an installation panel.
- With the help of special buckles VA88-32 and VA88-33 units can be installed onto a DIN-rail.
- Weight and dimensions of these circuit breakers are by 10-20% less than that suggested by other home manufacturers. This fact provides for mounting smaller boxes and panels. Besides, small dimensions make it possible to change old circuit breakers to VA88.

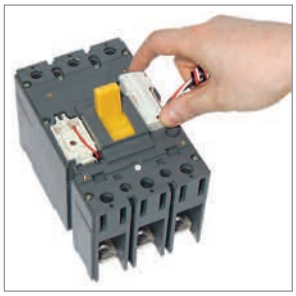
Design Features



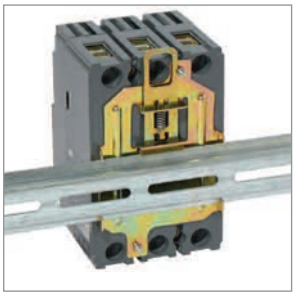
Current limit, in other words – actual short circuit current, is lower than the rated one. This is realized at the expense of boosted contacts separation speed. Dynamic effect of magnetic field and the arc extinguishing chamber structure provide for extinguishing the arc within the shortest possible time.



Full range of thermal releases gives opportunity to ensure selectiveness based on the multi-level protection system.



VA88 construction provide for independent installation of auxiliary devices.



With the help of a special RCS buckle VA88-32, VA88-33 circuit breakers can be installed onto a DIN-rail.

Plastic details of the body are made of glass-nylon composite ensuring yield strength at short circuits.

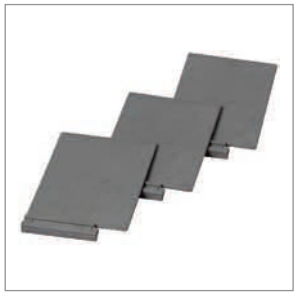
VA88 can be mounted in any position without affecting their rated characteristics. They can be powered from the upper or lower clamps without violating their operation.

Double insulation provides for full separation of power and auxiliary circuits. The body of each auxiliary device is placed to a separate bay that totally excludes any contacts with conducting parts and ensures servicing and testing safety.

High values of ultimate short-circuit breaking capacity extend up to 50 kA.

Configuration

Connecting busbars



Phase separators

Set of screws for panel mounting

Set for connecting external conductors

Selection Guide




Circuit breaker type	VA88-32		VA88-33		VA88-35	VA88-35 with MR211 trip unit
Maximum rated current (base size) Inm, A	125		160		250	250
Maximum rated current (base size) Inm, A Overcurrent release	Thermal & electromagnetic		Thermal & electromagnetic		Thermal & electromagnetic	Electronic
Electromagnetic 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)
Number of poles	500	10·I_n	500	10·I_n	10·I_n	Adjustable: 250×(1,5÷12)
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 Devices						
Rotary handle type	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 buckle type	RCS-1 buckle		RCS-2 buckle			
Signal auxiliary contact type	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 type	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 type	RN-125/160 (RN-32/33)		RN-125/160 (RN-32/33)		RN-250/400 (RN-35/37)	RN-250/400 (RN-35/37)
Undervoltage trip type	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 type	EP-32/33		EP-32/33		EP-35/37	EP-35/37
Mounting panel type (for front plug-in)	PM1/P-32		PM1/P-33		PM1/P-35	–
Mounting panel type (for rear plug-in)	PM1/R-32		PM1/R-33		PM1/R-35	–
Mounting panel type (for front pull-out)	–		–		PM2/P-35	–
Mounting panel type (for rear pull-out)	–		–		PM2/R-35	–

				
VA88-37	VA88-37 with MR211 trip unit	VA88-40	VA88-40 with MR211 trip unit	VA88-43 with MR211 trip unit
400	400	800	800	1600
Thermal & electromagnetic	Electronic	Thermal & electromagnetic	Electronic	Electronic
250, 315, 400	400·(0,4÷1)	400, 500, 630, 800	800·(0,4÷1)	1000·(0,4÷1), 1250·(0,4÷1), 1600·(0,4÷1)
10·I_n	adjustable (1,5÷12)·I_n	10·I_n	adjustable (1,5÷12)·I_n	adjustable (1,5÷12)·I_n
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 (AK-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 (AK-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	–	–	–
PM1/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/R-40	PM2/R-40	PM2/R-43

VA88 Range

	Name	Rated current, A	Number of poles	Ultimate short-circuit breaking capacity I_{cu}	Package amount, pcs		Product ID
					individual	multiple	
	VA88-32 3P 12,5 A 25 kA	12,5	3	25	1	20	SVA10-3-0012
	VA88-32 3P 16 A 25 kA	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 25 A 35 kA	32	3	35	1	16	SVA20-3-0032
	VA88-33 3P 32 A 35 kA	40	3	35	1	16	SVA20-3-0040
	VA88-33 3P 40 A 35 kA	50	3	35	1	16	SVA20-3-0050
	VA88-33 3P 50 A 35 kA	63	3	35	1	16	SVA20-3-0063
	VA88-33 3P 63 A 35 kA	80	3	35	1	16	SVA20-3-0080
	VA88-33 3P 80 A 35 kA	100	3	35	1	16	SVA20-3-0100
	VA88-33 3P 100 A 35 kA	125	3	35	1	16	SVA20-3-0125
	VA88-33 3P 125 A 35 kA	160	3	35	1	16	SVA20-3-0160
	VA88-35 3P 63 A 35 kA	63	3	35	1	6	SVA30-3-0063
	VA88-35 3P 80 A 35 kA	80	3	35	1	6	SVA30-3-0080
	VA88-35 3P 100 A 35 kA	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 MR 211 electronic trip unit	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 MR 211 electronic trip unit	400	3	35	1	4	SVA41-3-0400

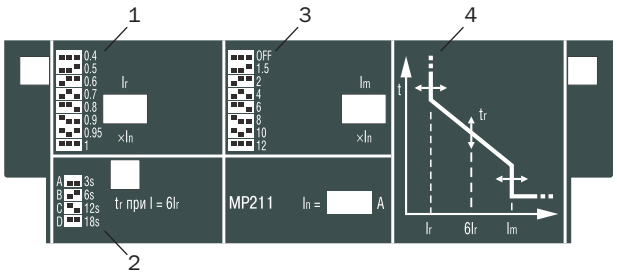
	Name	Rated current, A	Number of poles	Ultimate short-circuit breaking capacity I_{cu}	Package amount, pcs		Product ID
					individual	multiple	
	VA88-40 3P 400 A 35 kA	400	3	35	1	2	SVA50-3-0400
	VA88-40 3P 500 A 35 kA	500	3	35	1	2	SVA50-3-0500
	VA88-40 3P 630 A 35 kA	630	3	35	1	2	SVA50-3-0630
	VA88-40 3P 800 A 35 kA	800	3	35	1	2	SVA50-3-0800
	VA88-40 3P 800 A 35 kA with MR 211 electronic trip unit	800	3	35	1	2	SVA51-3-0800
	VA88-43 3P 1000 A 50 kA with MR 211 electronic trip unit	1000	3	50	1	1	SVA61-3-1000
	VA88-43 3P 1250 A 50 kA with MR 211 electronic trip unit	1250	3	50	1	1	SVA61-3-1250
	VA88-43 3P 1600 A 50 kA with MR 211 electronic trip unit	1600	3	50	1	1	SVA61-3-1600

VA88 delivery package

Name	VA88-32		VA88-33		VA88-35	VA88-35 with an electr. trip unit	VA88-37	VA88-37 with an electr. trip unit	VA88-40	VA88-40 with an electr. trip unit	VA88-43 with an electr. trip unit
	10÷50	63÷125	32÷50	63÷160							
MCCB VA88	+		+		+	+	+	+	+	+	+
Packing box	+		+		+	+	+	+	+	+	+
Certificate	+		+		+	+	+	+	+	+	+
Adapter lug	–	+	–	+	–	–	+	+	+	+	+
Cable lug	+	–	+	–	–	+	–	–	–	–	–
Phase separators	+		+		+	+	+	+	+	+	+
Set for connecting external conductors	–		–		+	+	+	+	+	+	+
Set of screws for panel mounting	+		+		+	+	+	+	+	+	+

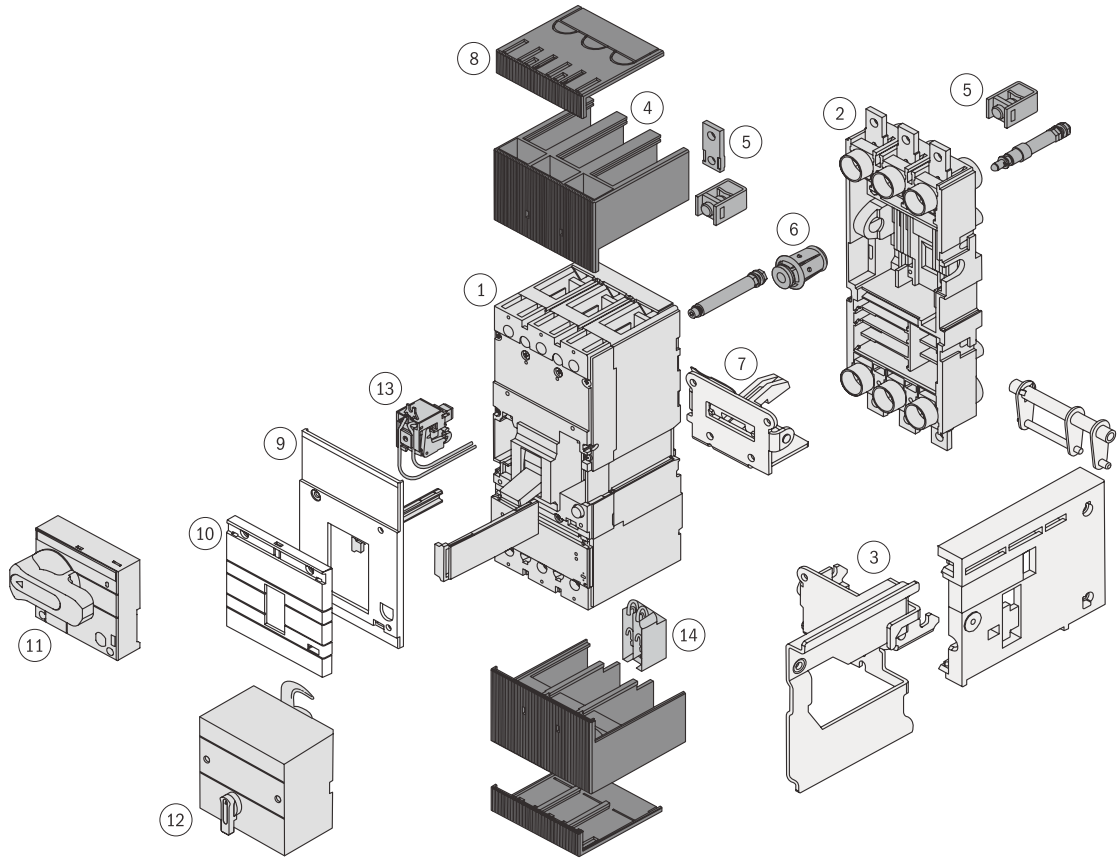
Molded case circuit breaker VA88 with MR211 electronic trip unit

VA88 circuit breakers with MR211 electronic trip unit ensure overload and short-current protection with the help of an electronic overcurrent release. This allows securing high reliability, actuation accuracy and independence from the ambient conditions. Electronic trip unit does not require a separate power source and guarantees correct protection operation at load currents not less than 15% from the rated value even if the voltage is present only in one phase. Protection block includes three current transformers, an electronic module and a trip electromagnet influencing directly on the breaker's mechanism. Current transformers installed inside the trip unit casing ensure supplying power to the electronic circuit and working out signals necessary for performing protection functions.
Protection characteristics (actuation settings) are chosen by the consumer directly on the front panel by adjusting DIP switches in accordance with the indicated mnemonic diagram. More detailed information concerning the settings adjustment is stated in "VA88 molded case circuit breaker" technical catalog.
Owing to the wide range of settings adjustment, MR211 electronic trip unit can be used in any distribution networks requiring reliability and actuation accuracy.



1 - overload protection setting switch
2 – overload protection trigger line switch
3 – short current protection setting switch
4 – time-current characteristic adjustment diagram

Auxiliary devices for VA88 MCCB



1 - Power circuit breaker
2 - Mounting panel (base) for plug-in/pull-out) option
3 - Side panels for pull-out option
4 – Phase separators
5 – Connecting busbars
6 – Plug-in contacts
7 – Blocking unit
8 – Terminal cover
9 – Casing cover
10 – Detachable casing cover
11 - Rotary handle drive
12 – Motor control
13 - Shunt trip/undervoltage trip
14 – Auxiliary/signal contacts

EP motor controls

EP motor controls are designed for remote actuation and switching off VA88 MCCB. Motor controls are fixed electrical devices of general purpose and are intended for complementing the circuit breakers installed in the main distribution panels, lead-in and distribution units, switchboards etc. Circuit breakers with a motor control can be used for completing AVR devices.

Technical Features

Feature	EP32/33	EP35/37	EP40	EP43
Rated operating voltage U_e, V	230	230	230	230
Operating 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, VA	2000	510	660	660
Rated power consumption, VA	–	360	180	180
Switch-on time, max., s.	0,1	0,1	0,1	0,1
Switch-off time, max., s.	0,1	0,1	1,1	1,1
Durability, not less than, power cycles	8000	15 000	1500	1500
Weight, max., kg	0,84	1,6	3,65	3,65

Range

	Name	MCCB type	Package amount, pcs.	Product ID
	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

Plug-in and pull-out mounting panels

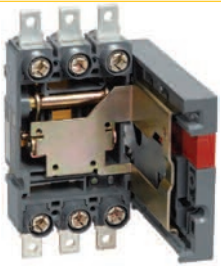
Panels are intended for completing VA88 MCCB installed into the main distribution panels, lead-in and distribution units, switchboards etc. They provide for operative changeover of circuit breakers and ensure creating a visual clearance during the preventive maintenance.

Mounting panels are designed for transforming VA88 MCCB of fixed type into plug-in (PM1) and pull-out (PM2) type devices.

Technical Features

Feature	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 PM2/R-37	PM2/P-40 PM2/R-40	PM2/P-43 PM2/R-43
Rated operating voltage U_e, V				400				
Operating 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, power 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	Package amount, pcs.	Product ID
PM1 front plug-in mounting panel	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
PM1 rear plug-in mounting panel	PM1/P-32	VA88-32	12	SVA10D-PM1-R
	PM1/P-33	VA88-33	12	SVA20D-PM1-R
	PM1/P-35	VA88-35	12	SVA30D-PM1-R
	PM1/P-37	VA88-37	4	SVA40D-PM1-R
PM2 front pull-out mounting panel	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
PM2 rear pull-out mounting panel	PM2/P-35	VA88-35	8	SVA30D-PM2-R
	PM2/P-37	VA88-37	2	SVA40D-PM2-R
PM2 vertical bus pull-out mounting panel	PM2/P-40	VA88-40	2	SVA50D-PM2-V
	PM2/P-43	VA88-43	1	SVA60D-PM2-V

Signal auxiliary contact (AK), auxiliary contact (DK) and coincident contacts (AD/DK)

Signal auxiliary contact AK is intended for giving out a signal when a circuit breaker actuates from:
– overcurrent (overload or short circuit);
– shunt trip;
– undervoltage trip;
– “TEST” button.
When the main contacts return to “switch on” position, the signal turns off.

DK auxiliary contact is designed for giving out a signal about the CB power contacts status (switched on/off).

Coincident AK/DK contacts (auxiliary and signal contacts in one casing) are intended for obtaining information on the status of VA88 MCCB contacts and giving out a signal in case of its actuation from overcurrent, shunt trip or undervoltage release

Technical Features

Contact type	Rated thermal current, A	Rated operating current at supply voltage, A		
		230 V, 50 Hz	400 V, 50 Hz	220 V, DC
AK-125/160, DK-125/160, AK/DK-125/160	4	3	–	0,14
AK-250/400, DK-250/400, AK/DK-250/400	8	6	3,5	0,2
AK-800/1600, DK-800/1600, AK/DK-800/1600	8	6	3,5	0,2

Range

	Name	MCCB type	Package amount, pcs. multiple	Package amount, pcs. transport	Product ID
	AK-125/160 (AK-32/33)	VA88-32, VA88-33	20	480	SVA10D-AK-1
	DK-125/160 (DK-32/33)	VA88-32, VA88-33	20	480	SVA10D-DK-1
	AK/DK-125/160 (AK/DK-32/33)	VA88-32, VA88-33	12	240	SVA10D-AK-DK-1
	AK-250/400 (AK-35/37)	VA88-35, VA88-37	10	240	SVA30D-AK-1
	DK-250/400 (DK-35/37)	VA88-35, VA88-37	10	240	SVA30D-DK-1
	AK/DK-250/400 (AK/DK-35/37)	VA88-35, VA88-37	10	240	SVA30D-AK-DK-1
	AK-800/1600 (AK-40/43)	VA88-40, VA88-43	5	120	SVA50D-AK-1
	DK-800/1600 (DK-40/43)	VA88-40, VA88-43	5	120	SVA50D-DK-1
	AK/DK-800/1600 (AK/DK-40/43)	VA88-40, VA88-43	5	120	SVA50D-AK-DK-1

RN shunt trip

RN shunt trip is used for remote shutting down of MCCB.

Technical Features

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

Range

	Name	MCCB type	Package amount, pcs. multiple	transport	Product ID
	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

RM undervoltage trip

RM undervoltage trip provokes MCCB shutting down when phase or line voltage at the input is lowered up to 70% from the rated value. It also helps to prevent MCCB actuation is the circuit voltage is less than 85% from the rated values.

Technical Features

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

Range

	Name	MCCB type	Package amount, pcs. multiple	transport	Product ID
	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

PRP rotary handle

Rotary handle is designed for converting rotary movements into progressive motion for MCCB control. The rotary handle is fixed on the distribution unit door for operating the MCCB through it or is installed directly on the breaker.

Range

Name	MCCB type	Package amount, pcs. multiple	transport	Product ID
PRP-1 125A (PRP-32)	VA88-32	–	48	SVA10D-PRP-1-1
PRP-1 160A (PRP-33)	VA88-33	–	48	SVA20D-PRP-1-1
PRP-1 250A (PRP-35)	VA88-35	–	16	SVA30D-PRP-1-1
PRP-1 400A (PRP-37)	VA88-37	–	16	SVA40D-PRP-1-1
PRP-1 800A (PRP-40)	VA88-40	–	12	SVA50D-PRP-1-1

DIN-rail mounting brackets

Range

Name	MCCB type	Package amount, pcs. multiple	transport	Product ID
RCS-1	VA88-32	–	270	SVA10D-S35-3
RCS-2	VA88-33		270	SVA20D-S35-3

Lugs

Range

Name	MCCB type	Package amount, pcs. multiple	transport	Product ID
Lugs	VA88-32	6	400	SVA10D-N-3
Lugs	VA88-33	6	400	SVA20D-N-3

Technical Features

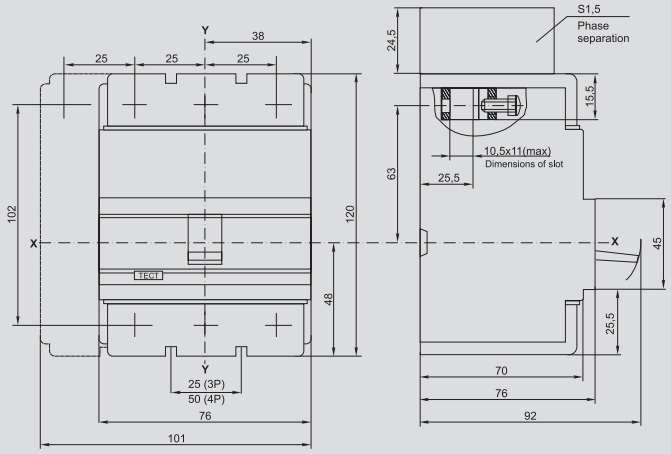
Name		VA88-32	VA88-33	VA88-35	VA88-35*	VA88-37	VA88-37*	VA88-40	VA88-40*	VA88-43**
Peak rated current (base value), I_{nm}, A		125	160	250	250	400	400	800	800	1600
Rated current (thermal trip setting), I_n, A		12.5, 16, 25, 32, 40 / 50, 63, 80, 100, 125	16, 25, 32, 40 / 50, 63, 100, 125, 160	63, 80, 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 trip setting I_m , A		500 / 10 I_n	500 / 10 I_n	10 I_n	Adjust. (1,5÷12) I_n	10 I_n	Adjust. (1,5÷12) I_n	10 I_n	Adjust. (1,5÷12) I_n	Adjust. (1,5÷12) I_n
Overcurrent trip		thermal & electro-magnetic	thermal & electro-magnetic	thermal & electro-magnetic	electronic	thermal & electro-magnetic	electronic	thermal & 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, power cycles		8500	7000	7000	7000	4000	4000	4000	4000	2500
Electrical durability, not less than, power cycles		2500	2000	2000	2000	2000	2000	2000	2000	1500
Type	plug-in	•	•	•		•	•			
	pull-out			•		•	•	•	•	•
External conductor connection	front	•	•	•		•	•	•	•	•
	rear	•	•	•		•	•	•	•	•
Control type	motor	•	•	•	•	•	•	•	•	•
	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
Operating temperature range, °C		–40÷+60	–40÷+60	–40÷+60	–25÷+60	–40÷+60	–25÷+60	–40÷+60	–25÷+60	–25÷+60
Weight max., kg		0,92	1,2	4,1	4,1	5,1	5,1	9,6	9,6	17,2
Service life, not less than, years		15	15	15	15	15	15	15	15	15

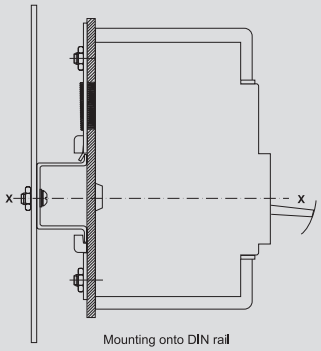
* Shipped with MR211 electronic trip unit.

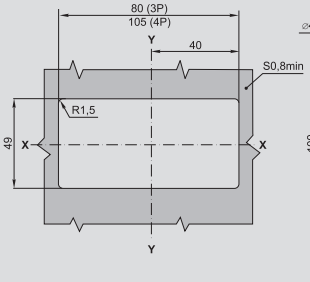
** Depending on set, shipped with MR110 and MR211 electronic trip units.

Overall and Installation Dimensions

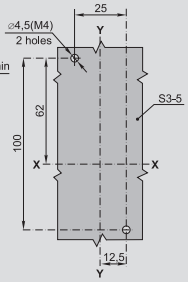
VA88-32



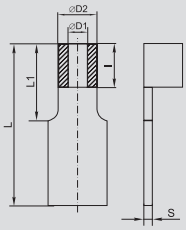




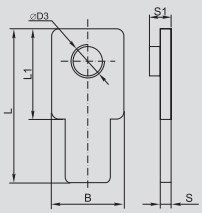
Marking template for door



Marking template for panel



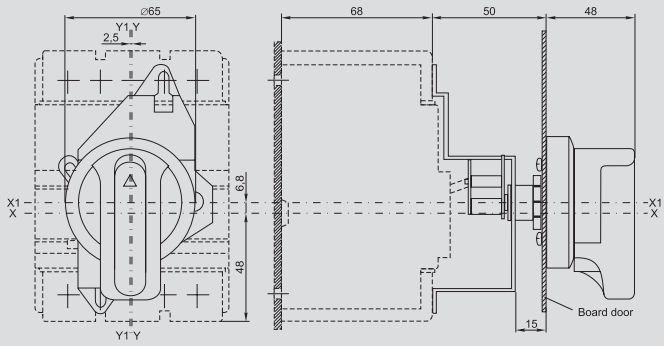
Adapter tip for VA-88-32, from 12,5 A to 100 A

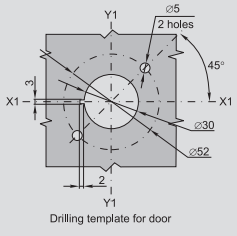


Adapter tip for VA-88-32, from 125 A

Rated current I_n, 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 with PRP-32

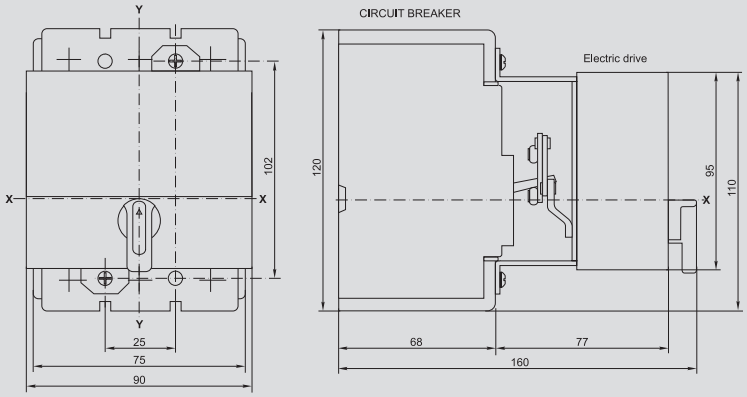




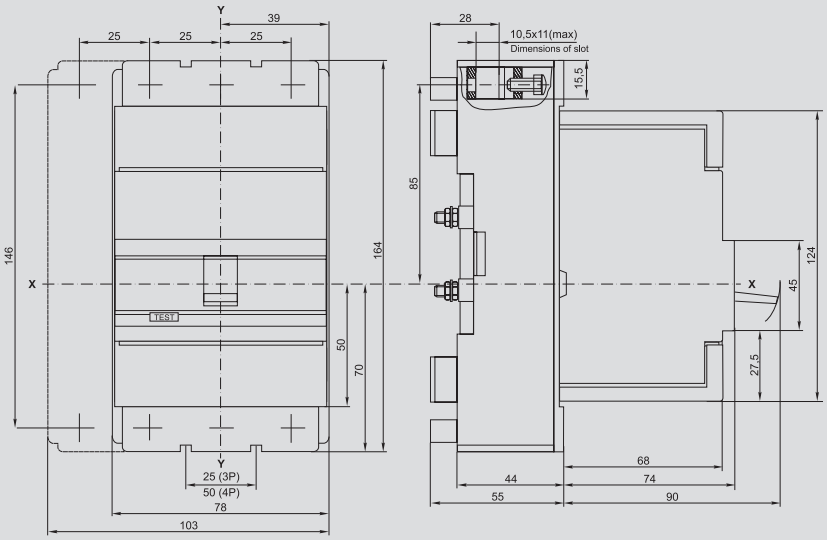
Drilling template for door

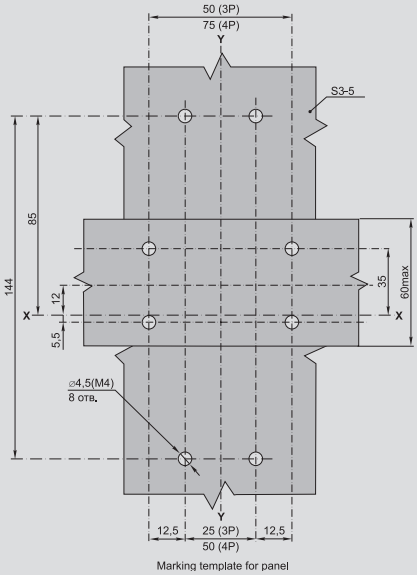
96

VA88-32 with motor control EP-32/33



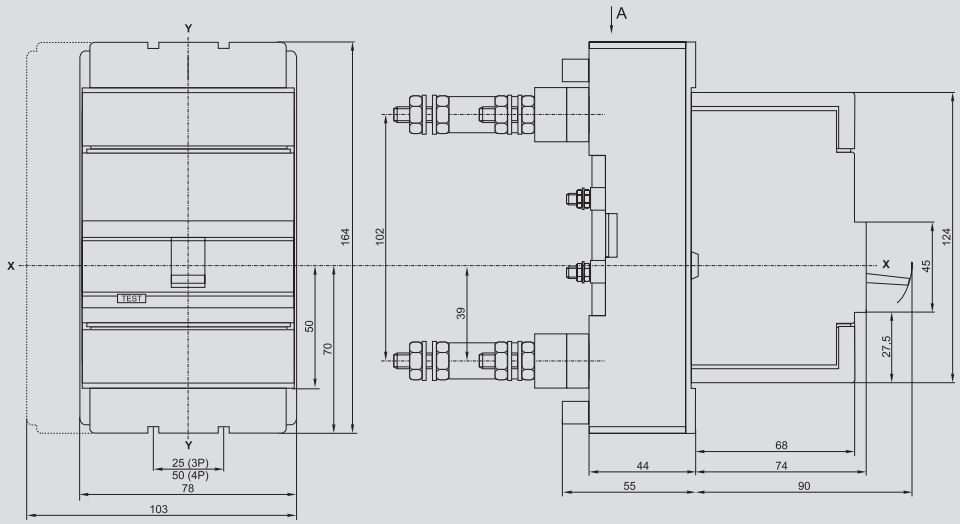
VA88-32 with front plug-in panels PM1/P-32

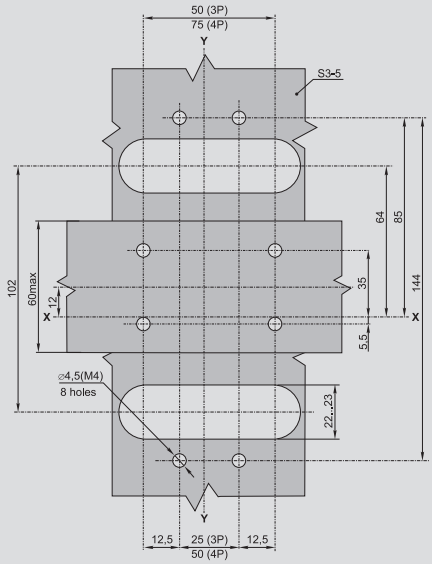




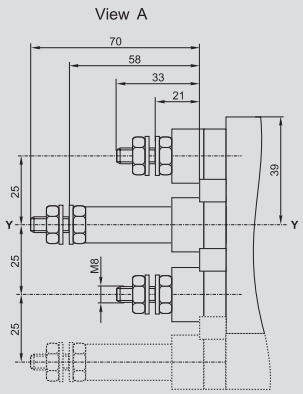
Marking template for panel

VA88-32 with rear plug-in panels PM1/R-32

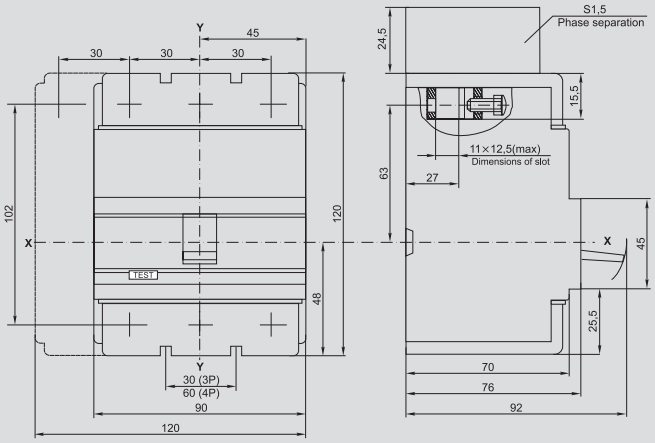


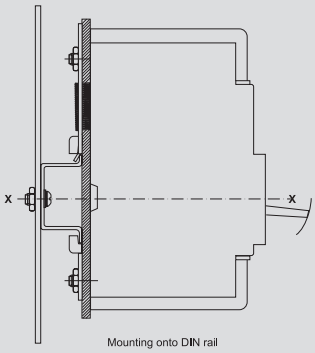


Marking template for panel

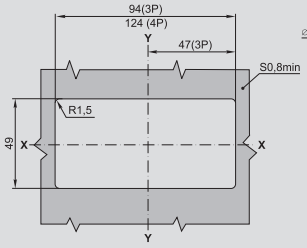


VA88-33

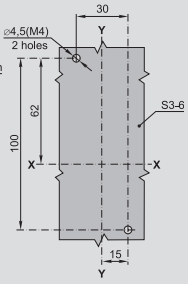




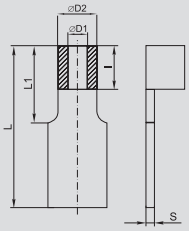
Mounting onto DIN rail



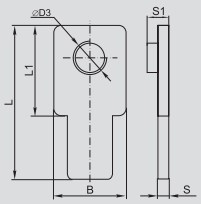
Marking template for door



Marking template for panel



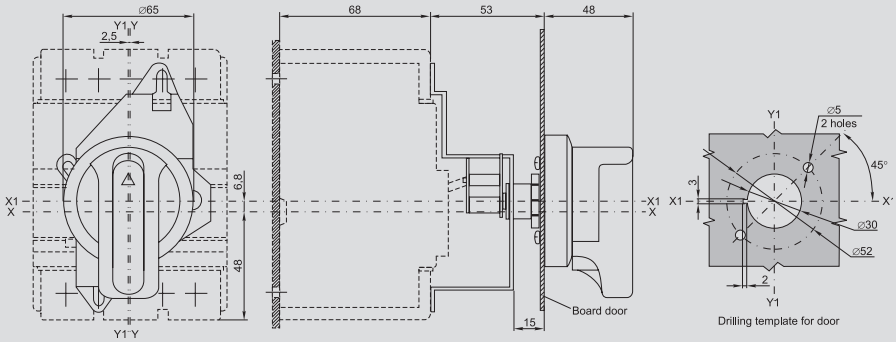
Adapter tip for VA-88-33, from 16 A to 100 A



Adapter tip for VA-88-33, from 160 A

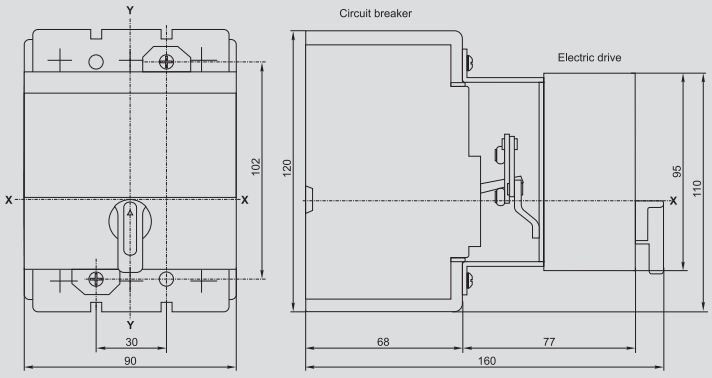
Rated current I_n, A	Dimensions, mm								
	B	⌀D1	⌀D2	⌀D3	l	L	L1	S	S1
16		3	5		6	26	12	1	
25		3	5		6	26	12	1	
32		4	6		8	26	12	1	
40		6	10		10	30	15	2	
50		6	10		10	30	15	2	
63		6	10		10	30	15	2	
80		6	10		10	30	15	2	
100		8	12		11	30	15	2	
125	16			M8		35	20	2,4	4,5
160	18			M8		35	20	2,4	4,5

VA88-33 with PRP-33

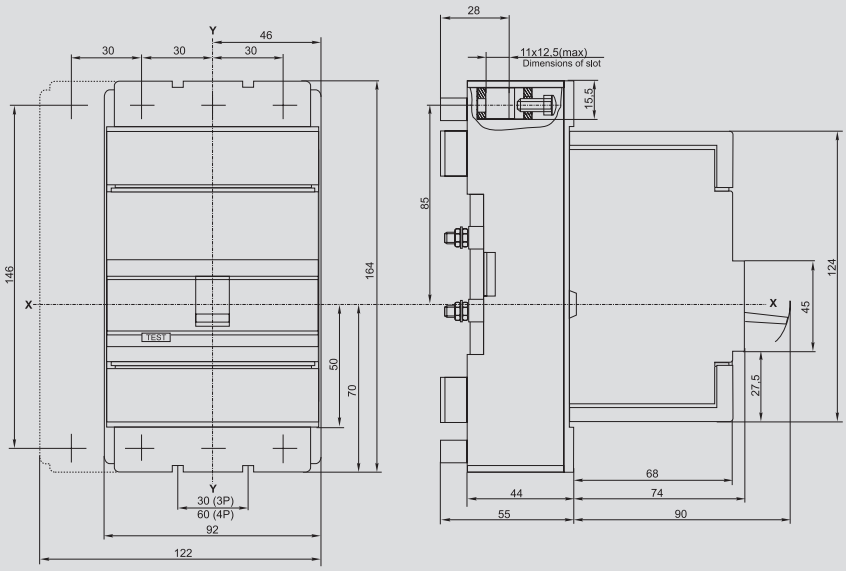


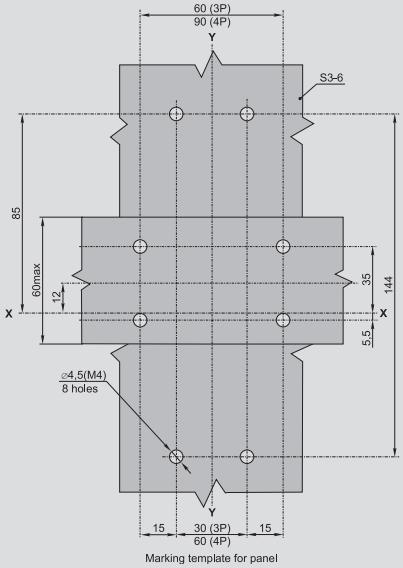
Drilling template for door

VA88-33 with motor control EP-32/33



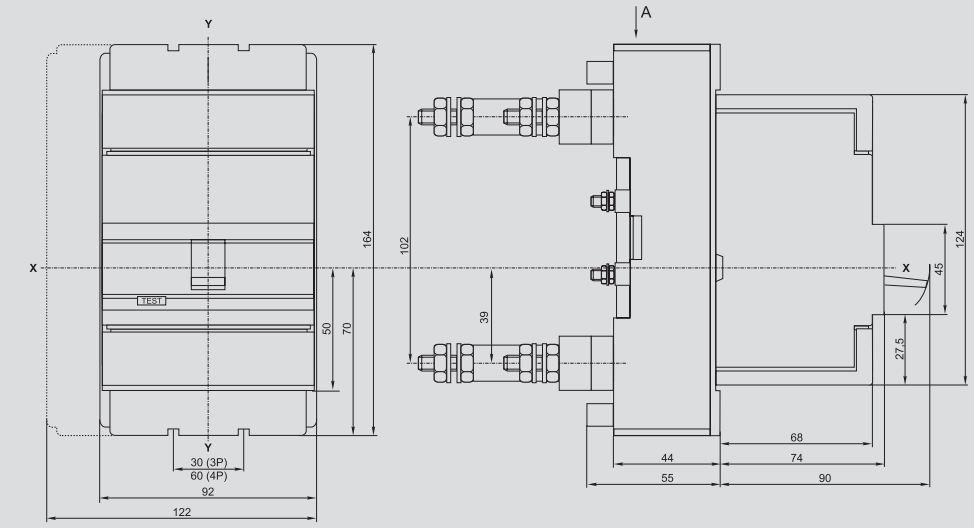
VA88-33 with front plug-in panels PM1/P-33

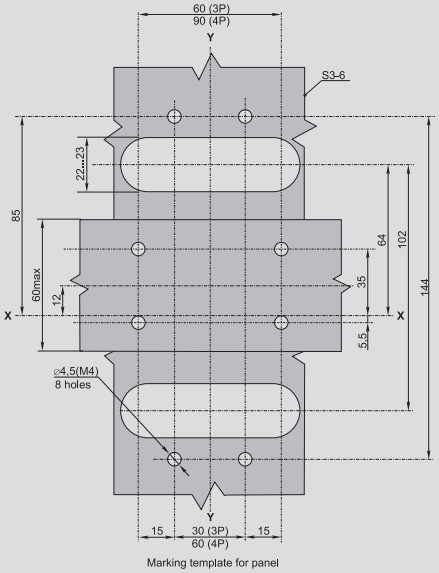




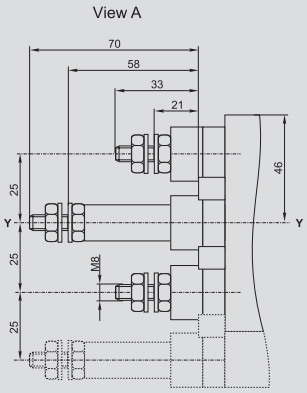
Marking template for panel

VA88-33 with rear plug-in panels PM1/R-33

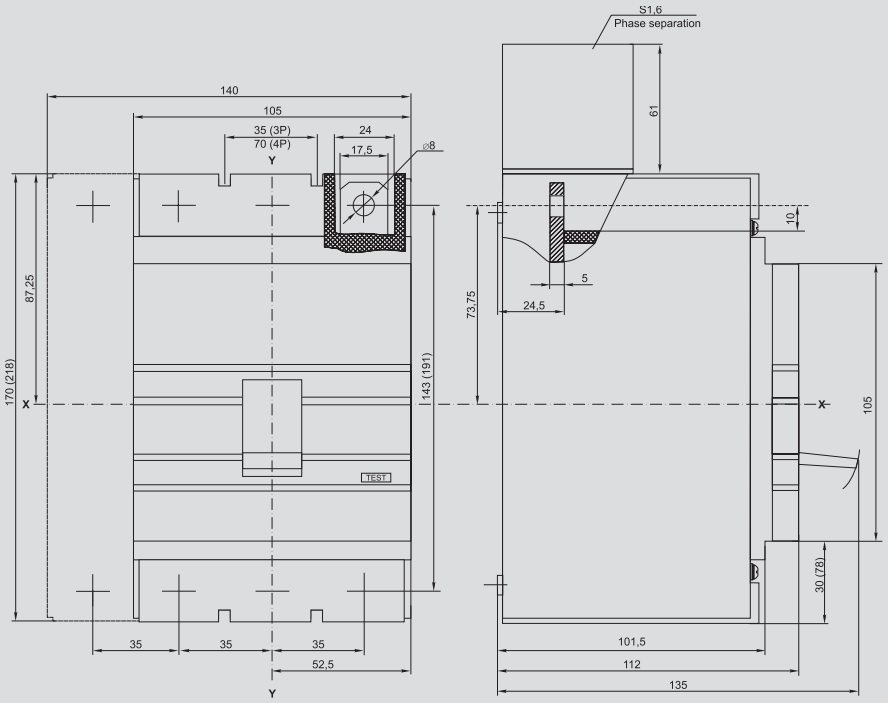


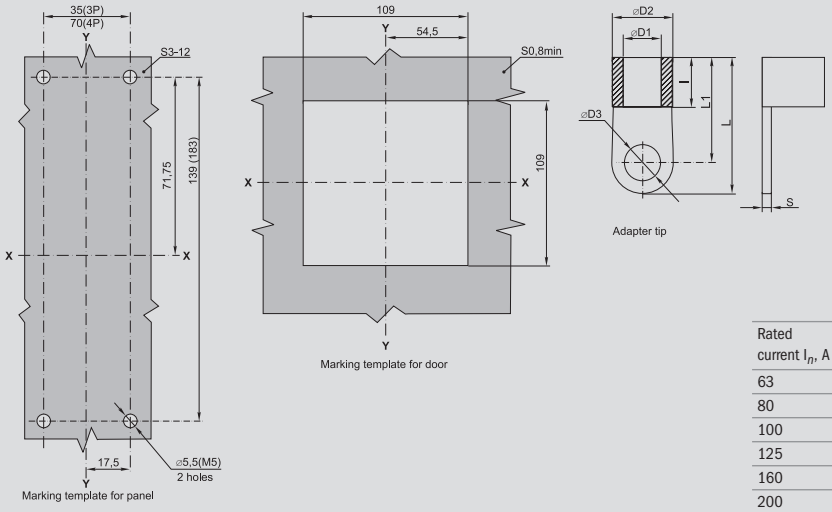


Marking template for panel



VA88-35

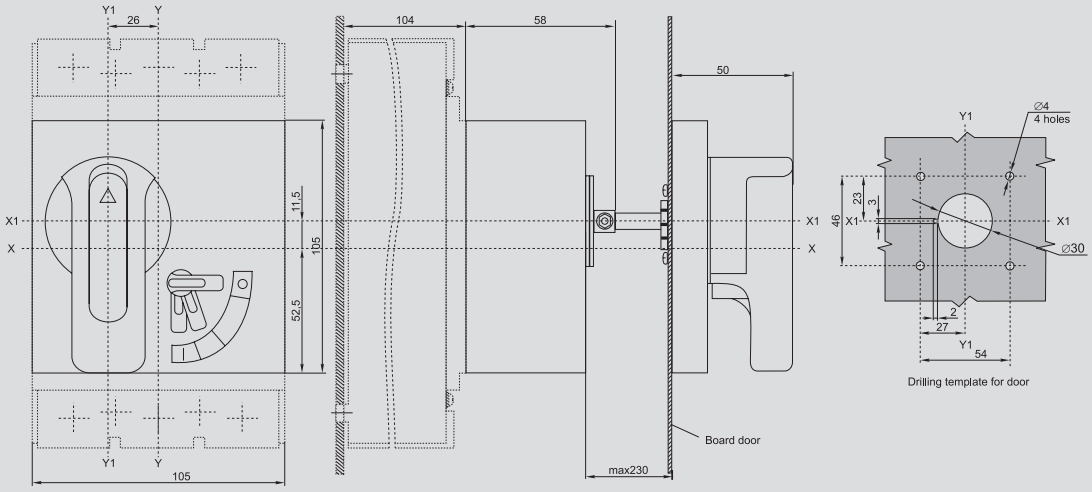




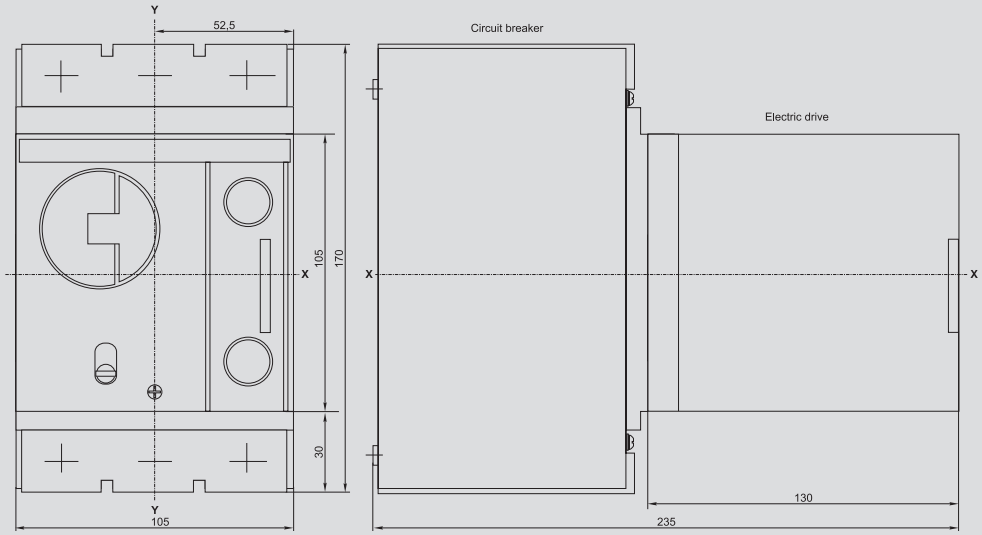
Dimensions in brackets are stated for electronic release type units.

Rated current I_n, 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

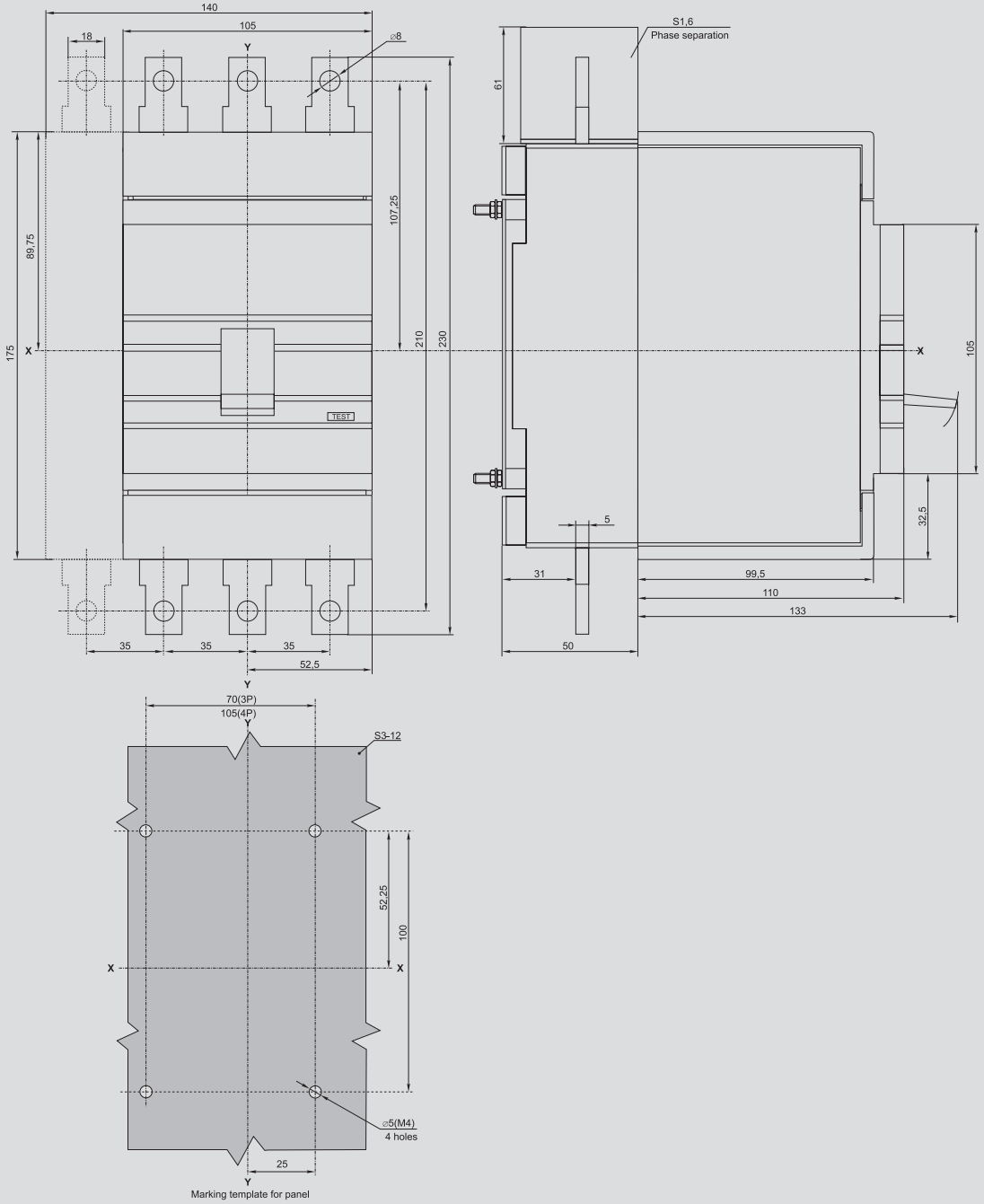
VA88-35 with PRP-35



VA88-33 with motor control EP-35/37

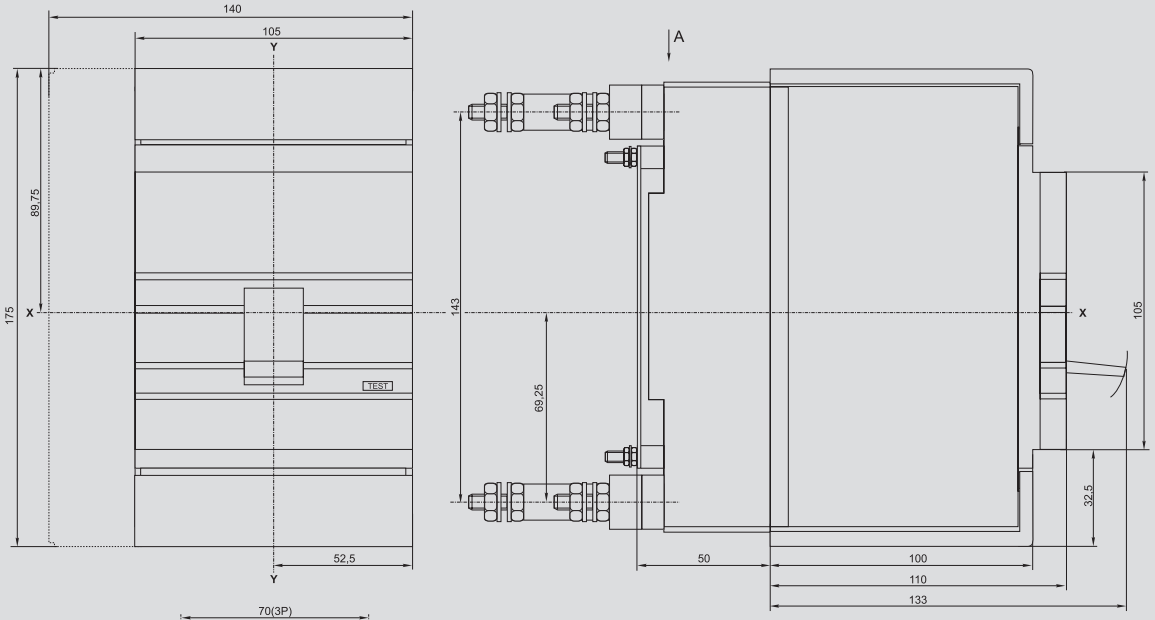


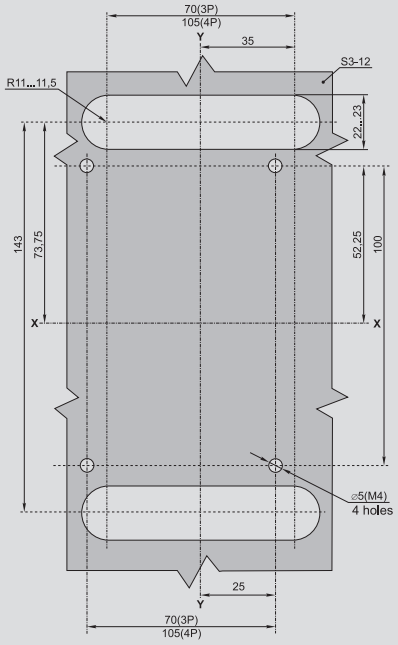
VA88-35 with front plug-in panels PM1/P-33



Marking template for panel

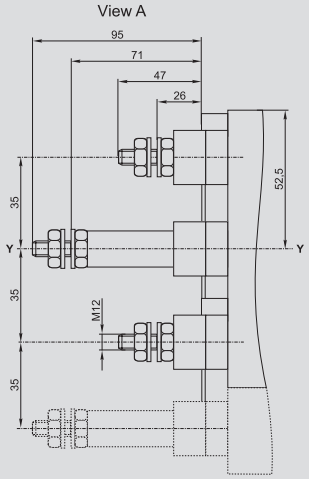
VA88-35 with rear plug-in panels PM1/R-35



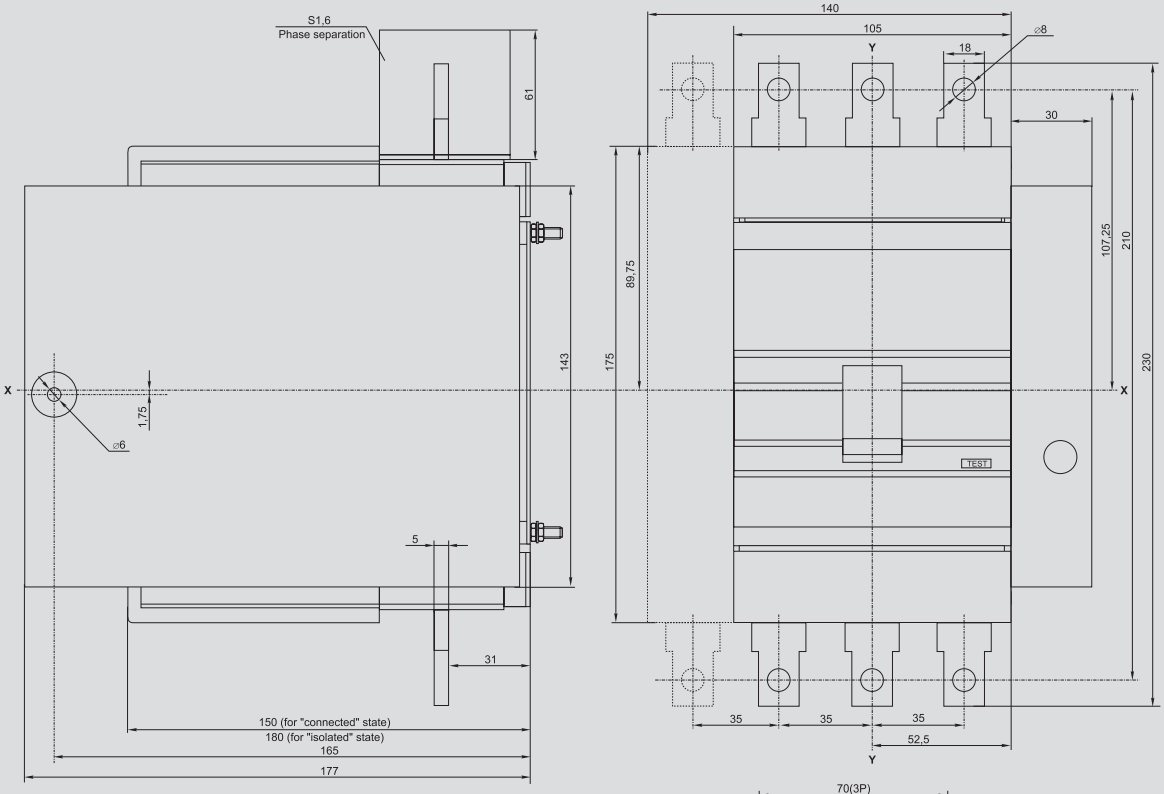


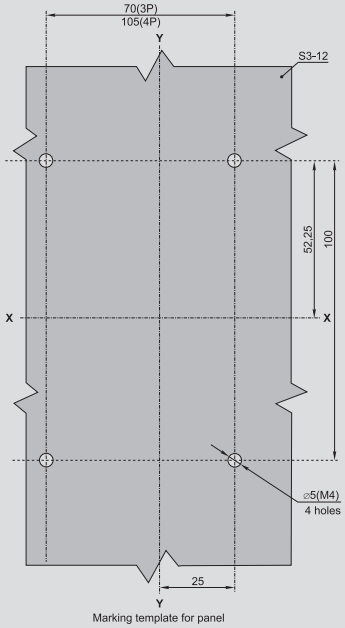
Marking template for panel

View A



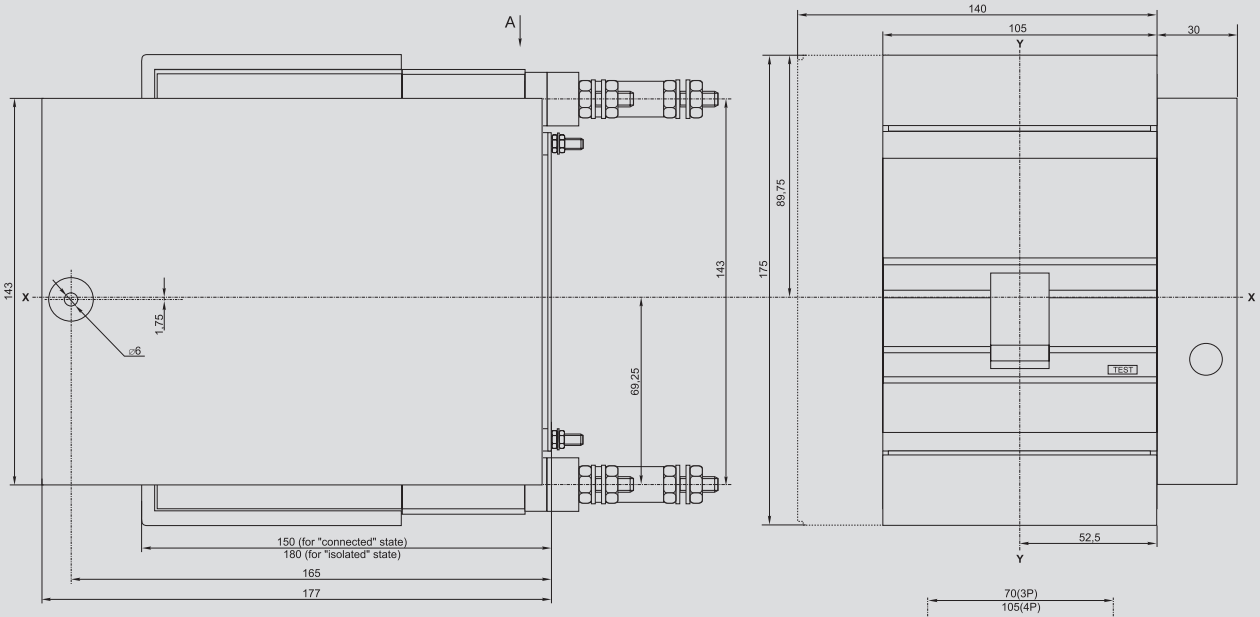
VA88-35 with front pull-out panels PM2/P-35

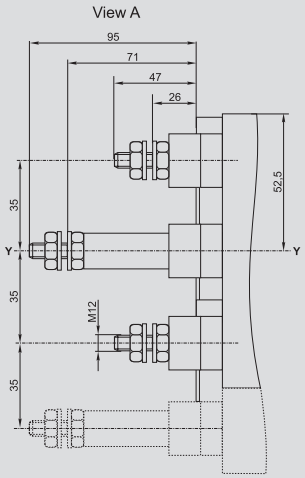


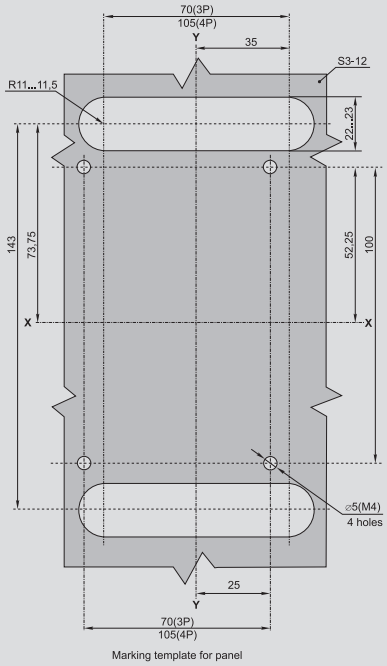


Marking template for panel

VA88-35 with rear pull-out panels PM2/P-35

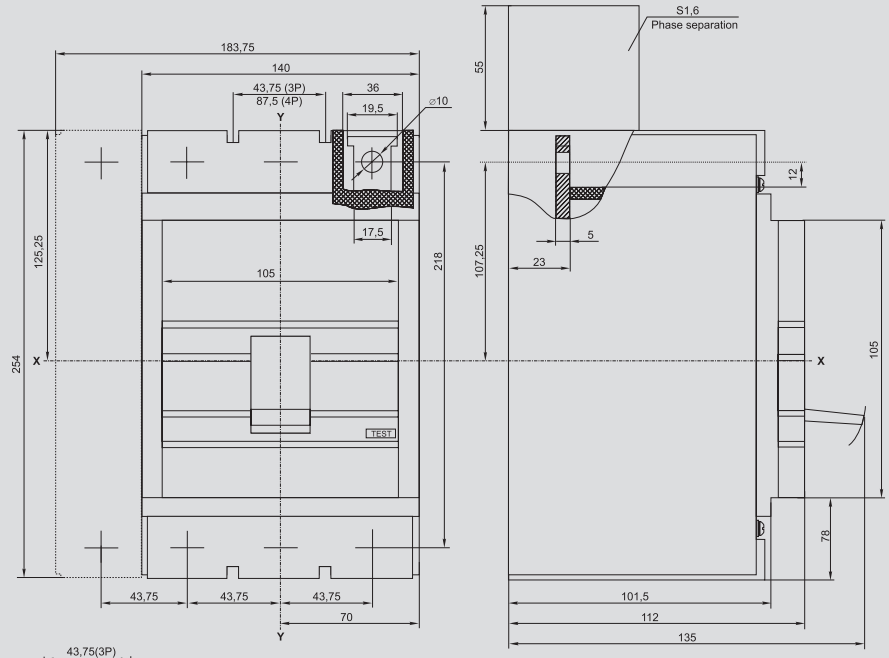


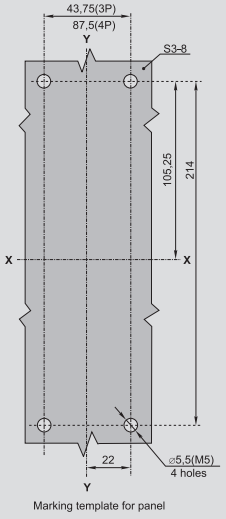




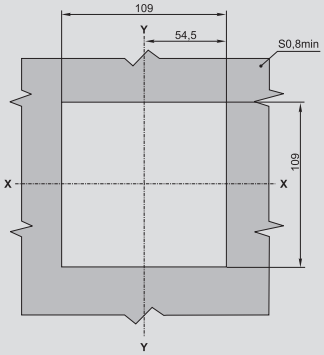
Marking template for panel

VA88-37

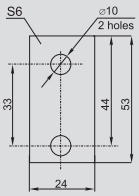




Marking template for panel

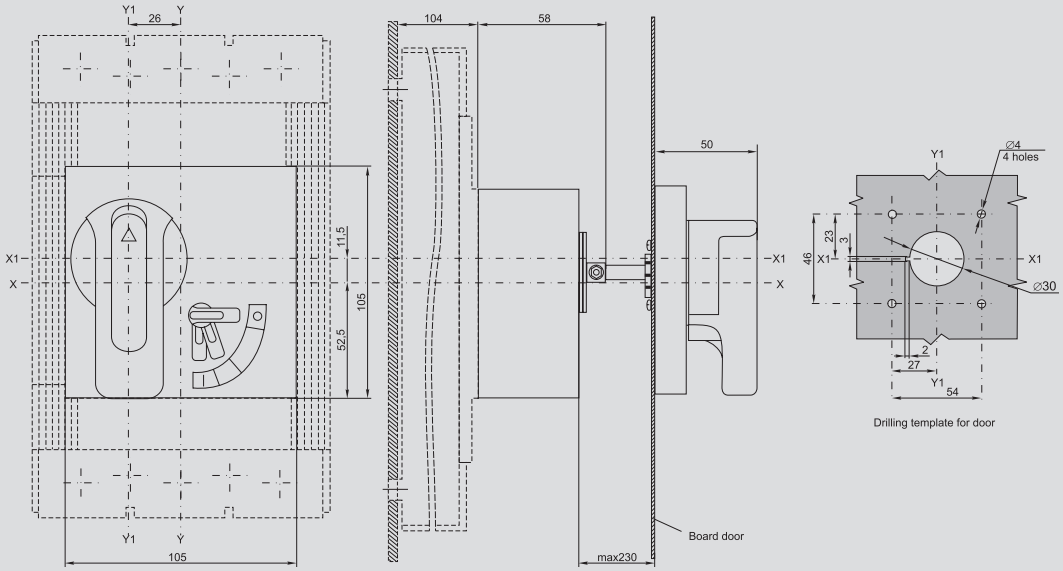


Marking template for door

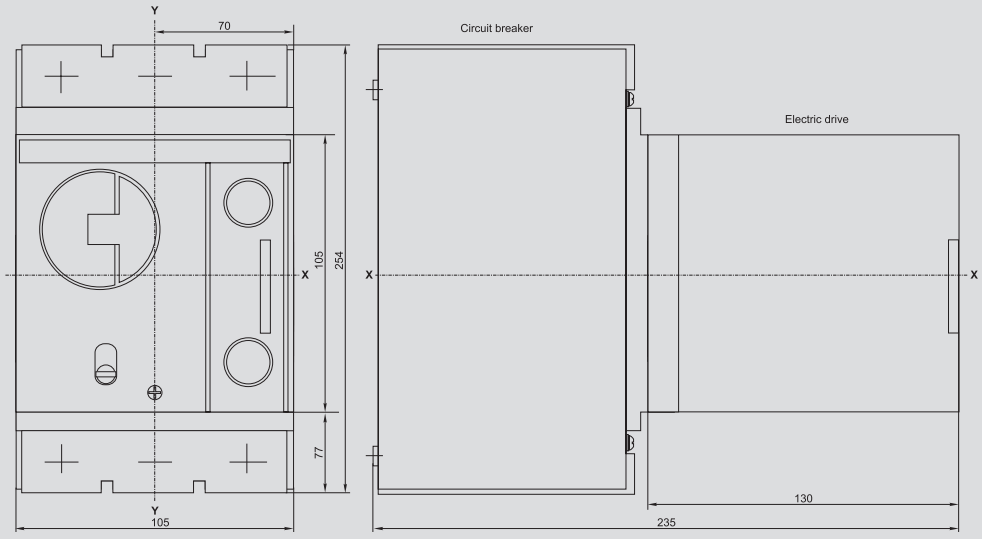


Adapter tip

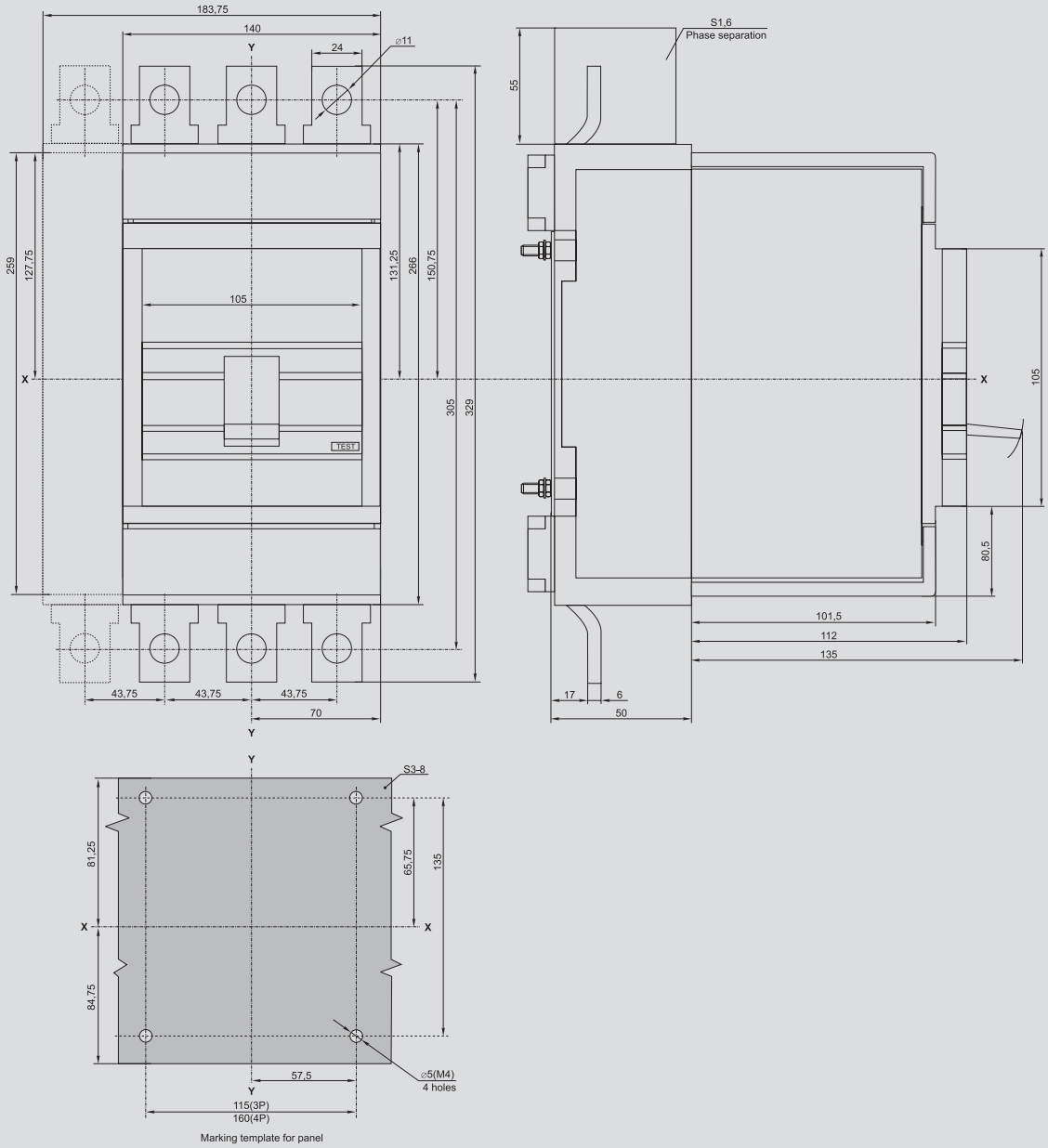
VA88-37 with rotary handle PRP-37



VA88-37 with motor control EP-35/37

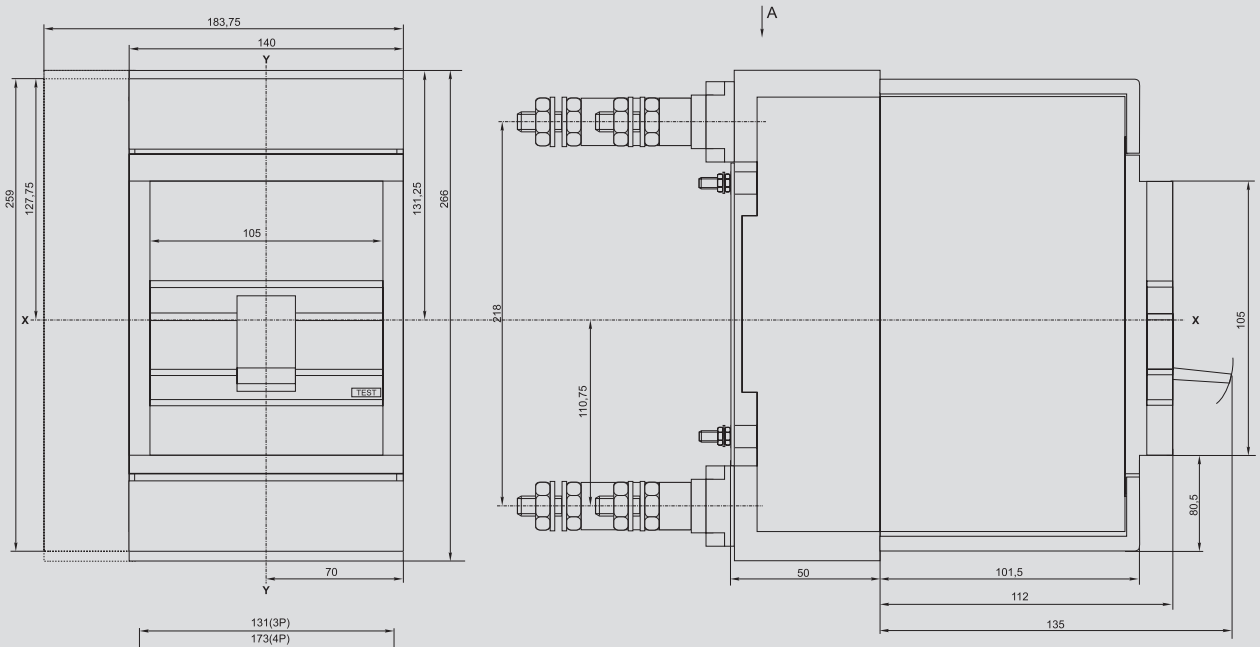


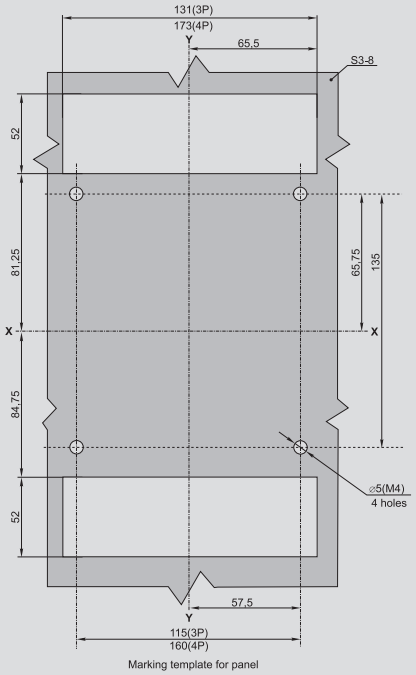
VA88-37 with front plug-in panels PM1/P-37



Marking template for panel

VA88-37 with rear plug-in panels PM1/R-37





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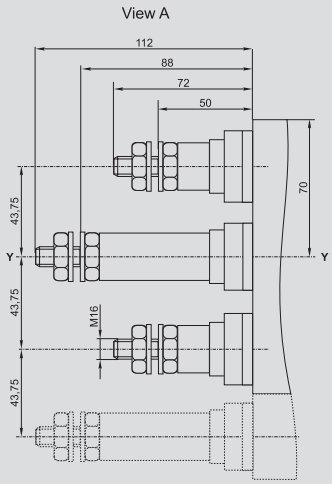
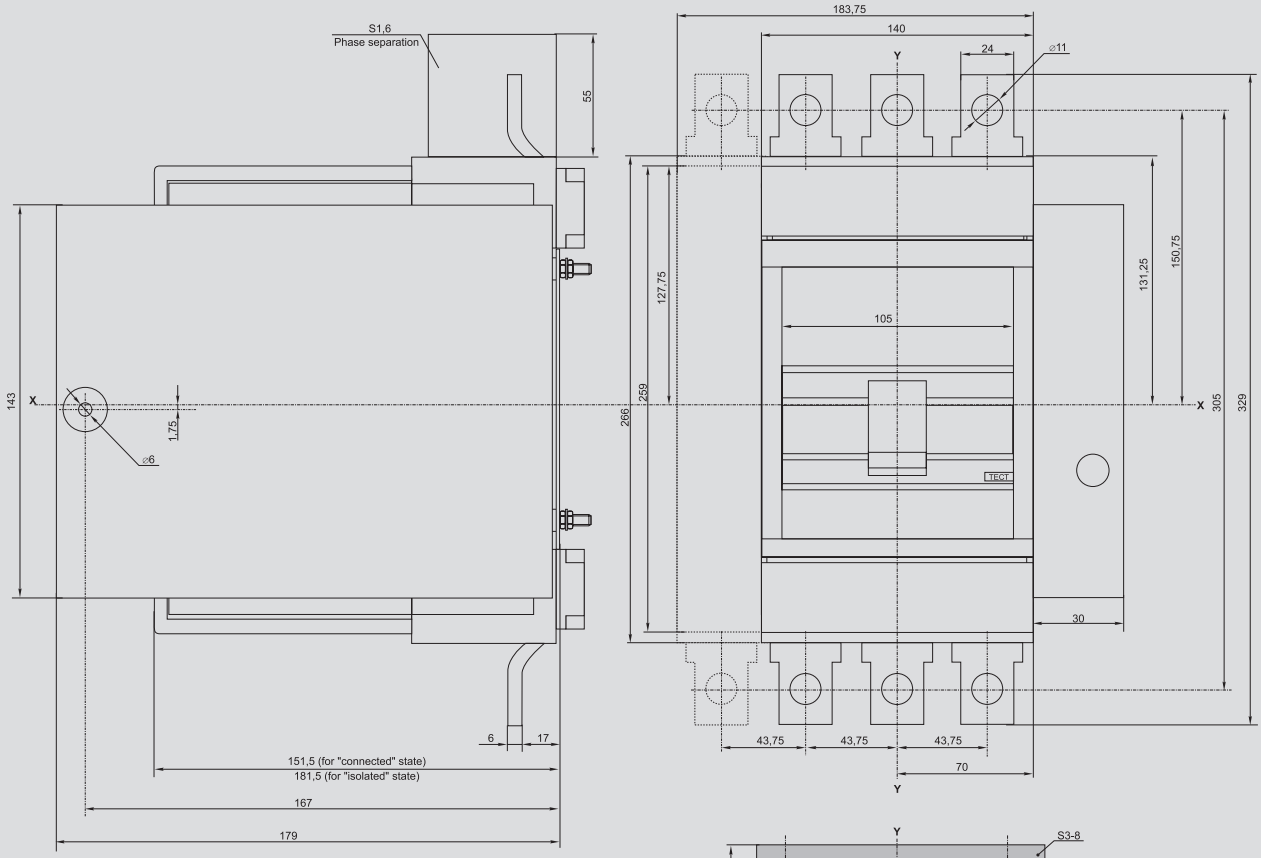
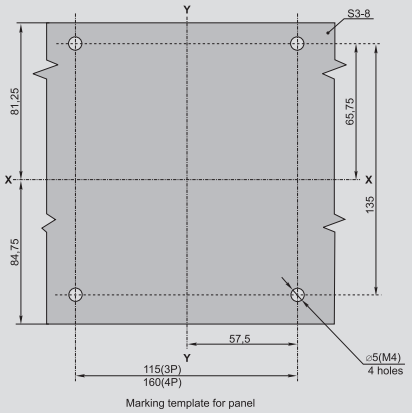


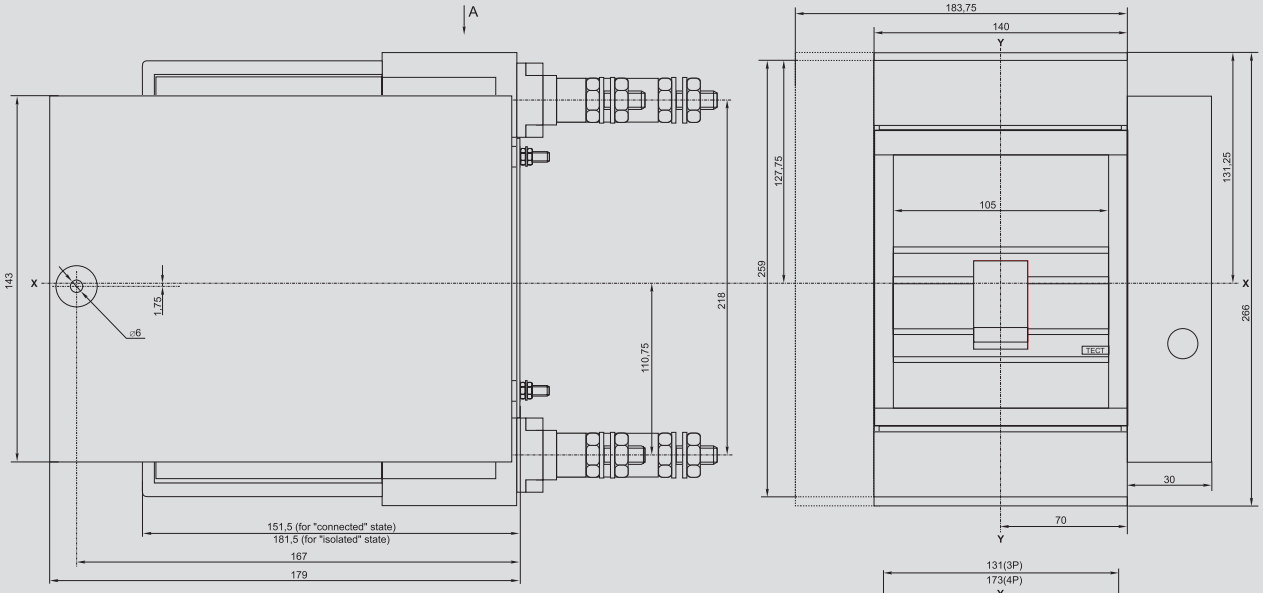
VA88-37 with front pull-out panels PM2/P-37

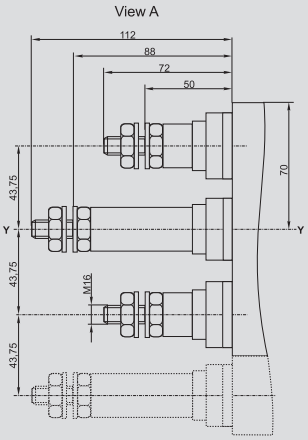


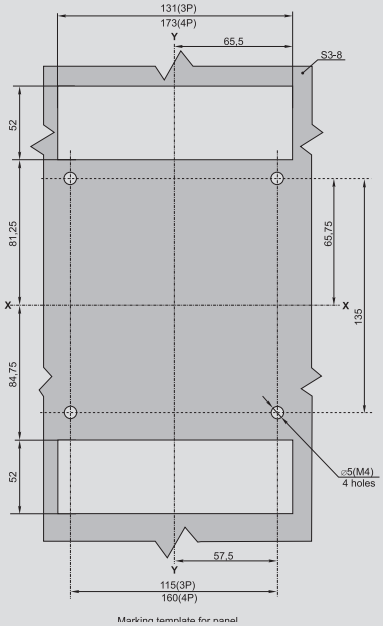


Marking template for panel

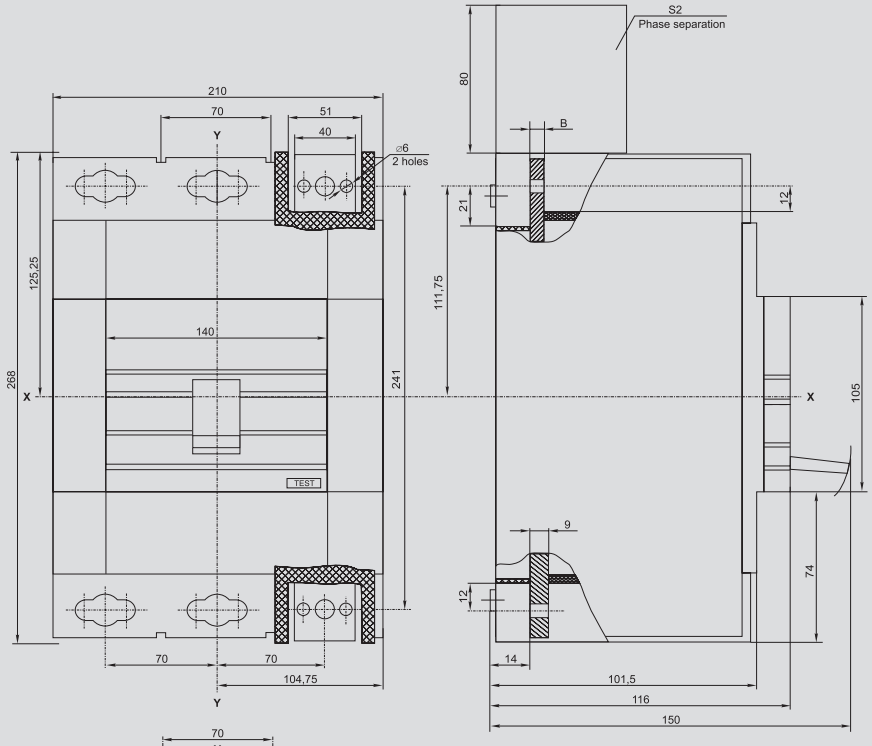
VA88-37 with rear pull-out panels PM2/P-37

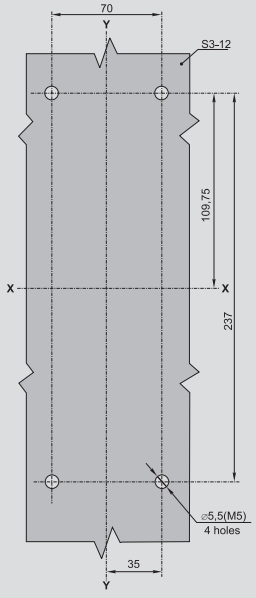




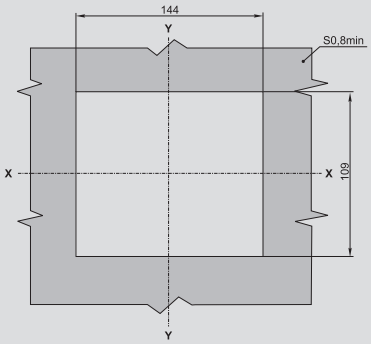


VA88-40

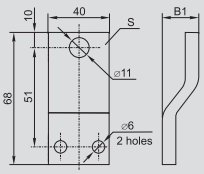




Marking template for panel



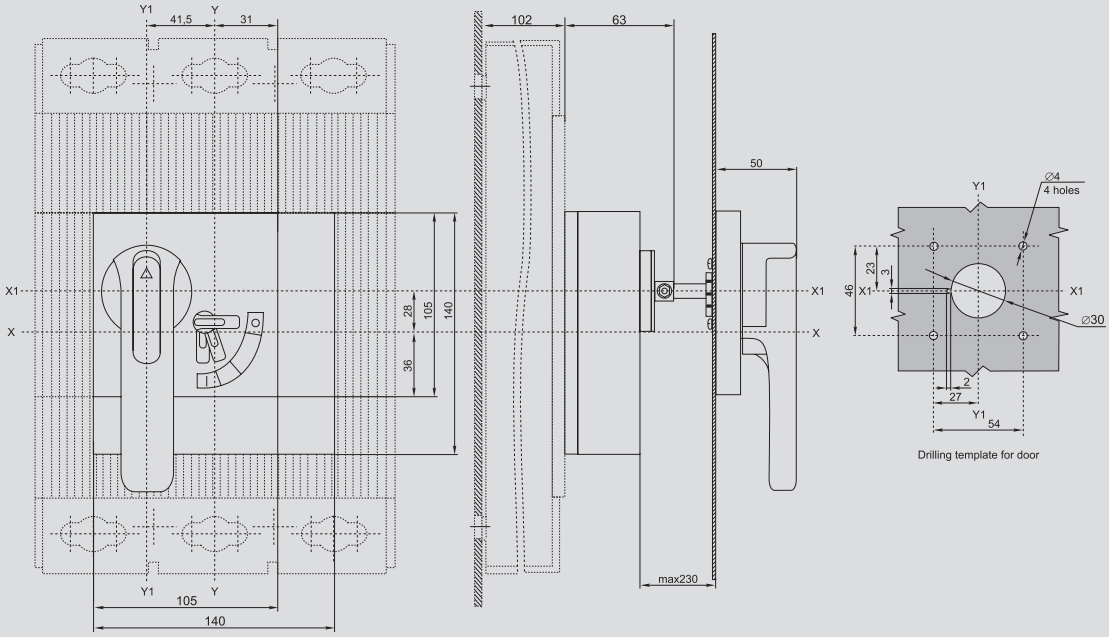
Marking template for door



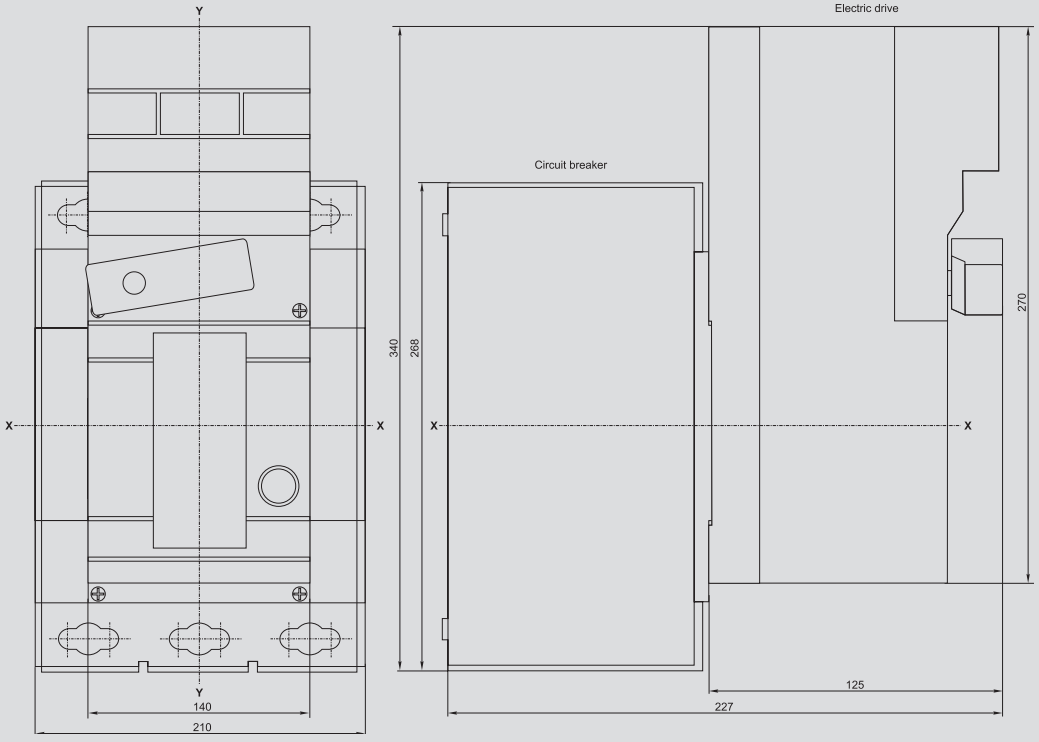
Adapter tip

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

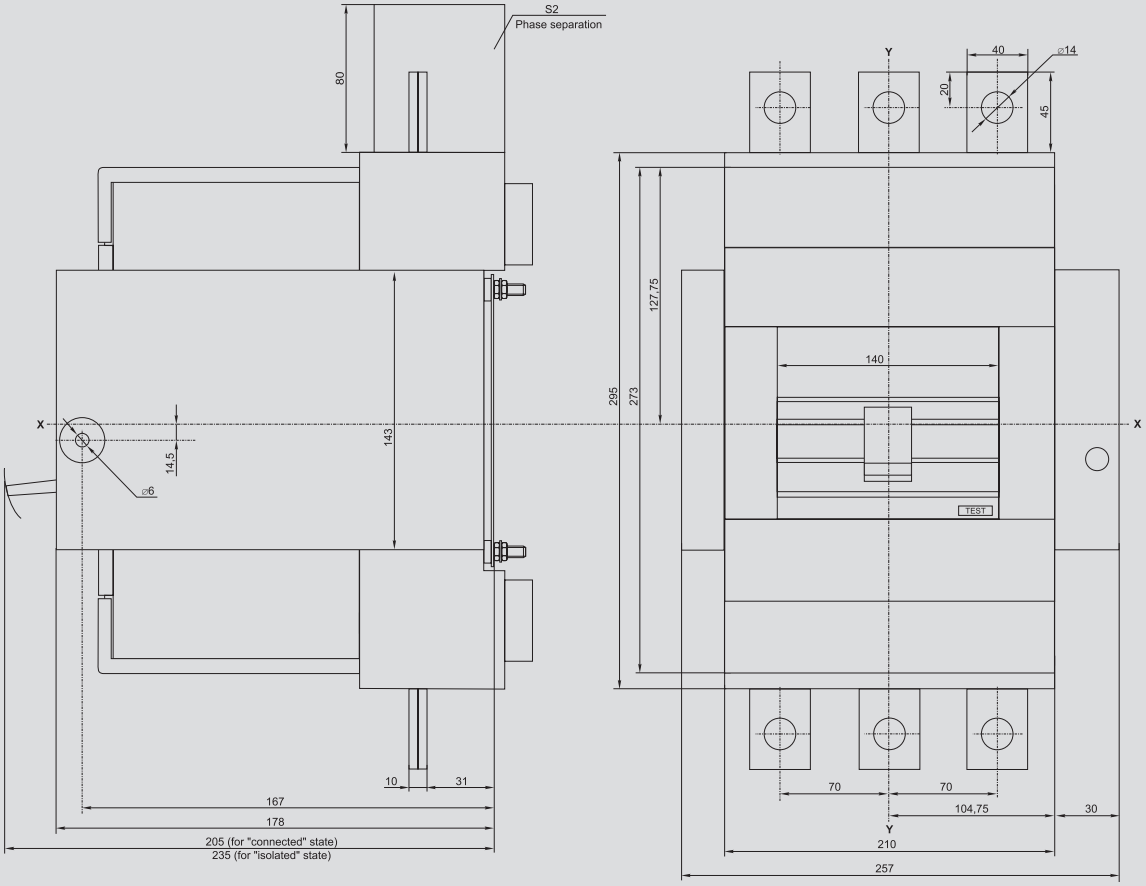
VA88-40 with rotary handle PRP-40

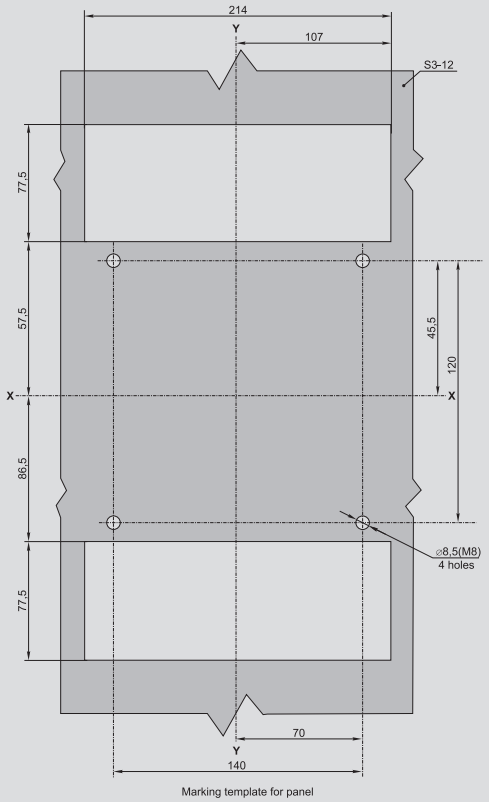


VA88-40 with motor control EP-40

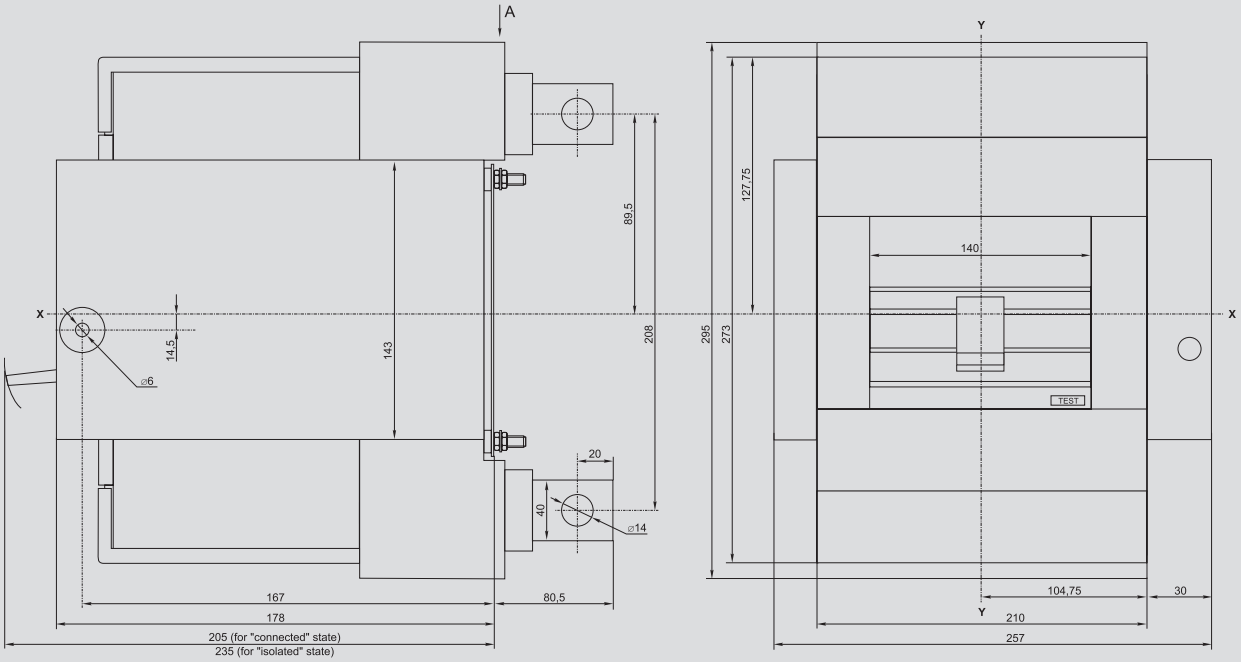


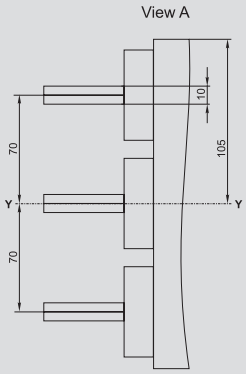
VA88-40 with front pull-out panels PM2/P-40

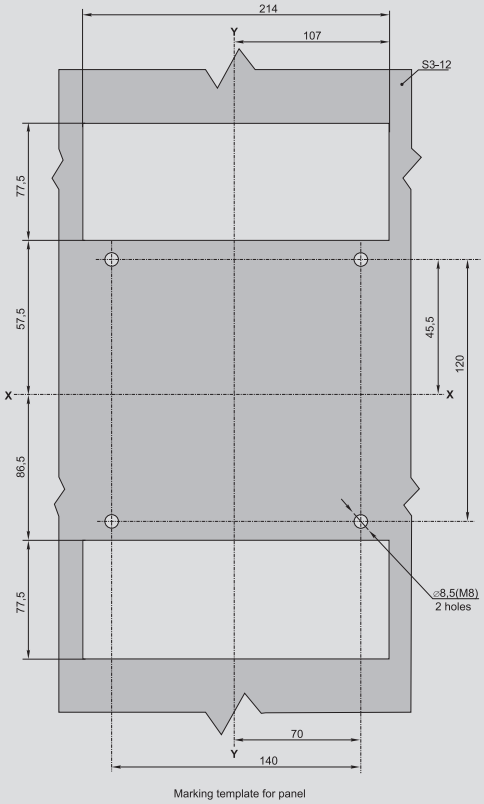




VA88-40 with rear pull-out panels PM2/V-40 (vertical bus connection)

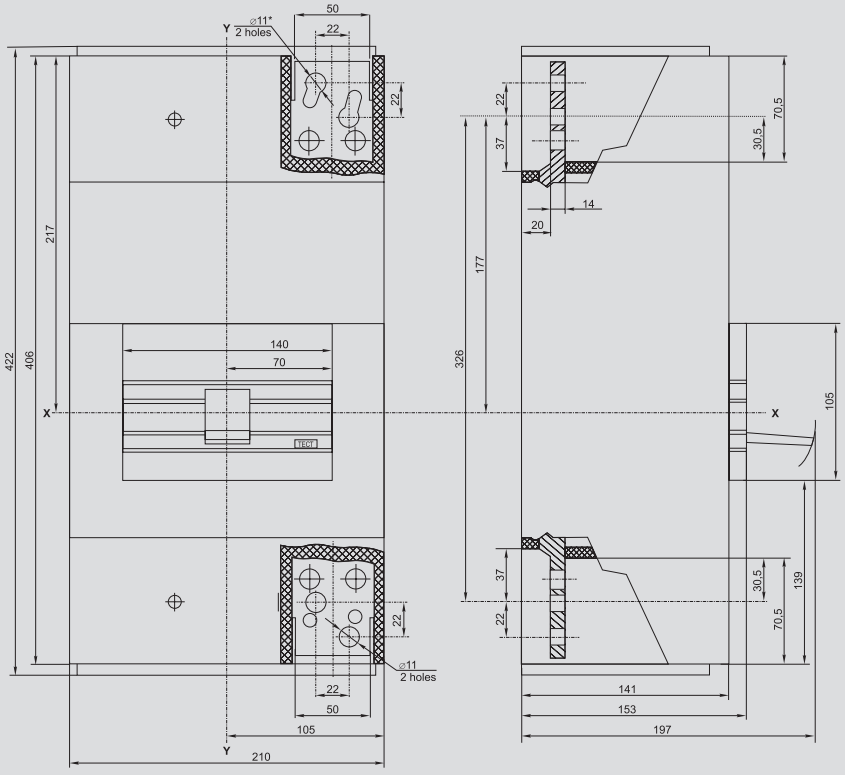




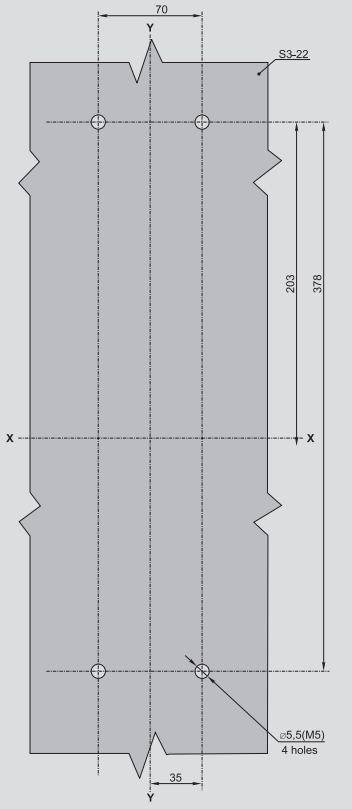


Marking template for panel

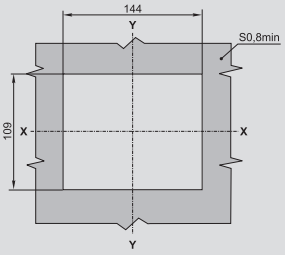
VA88-43



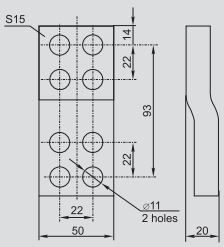
*The holes are designed for fixing of the adapter tip.



Marking template for panel

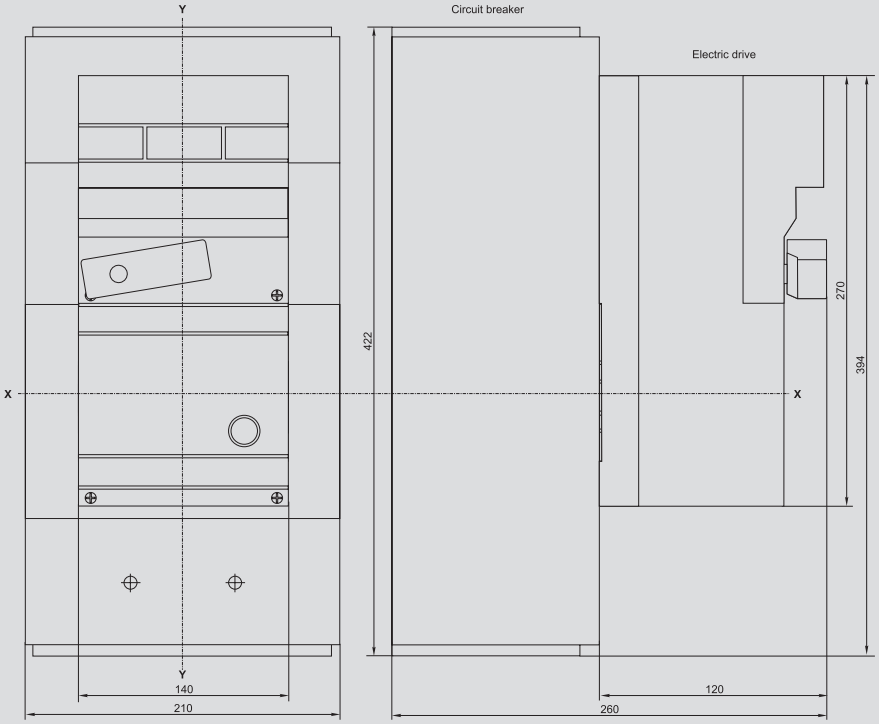


Marking template for door

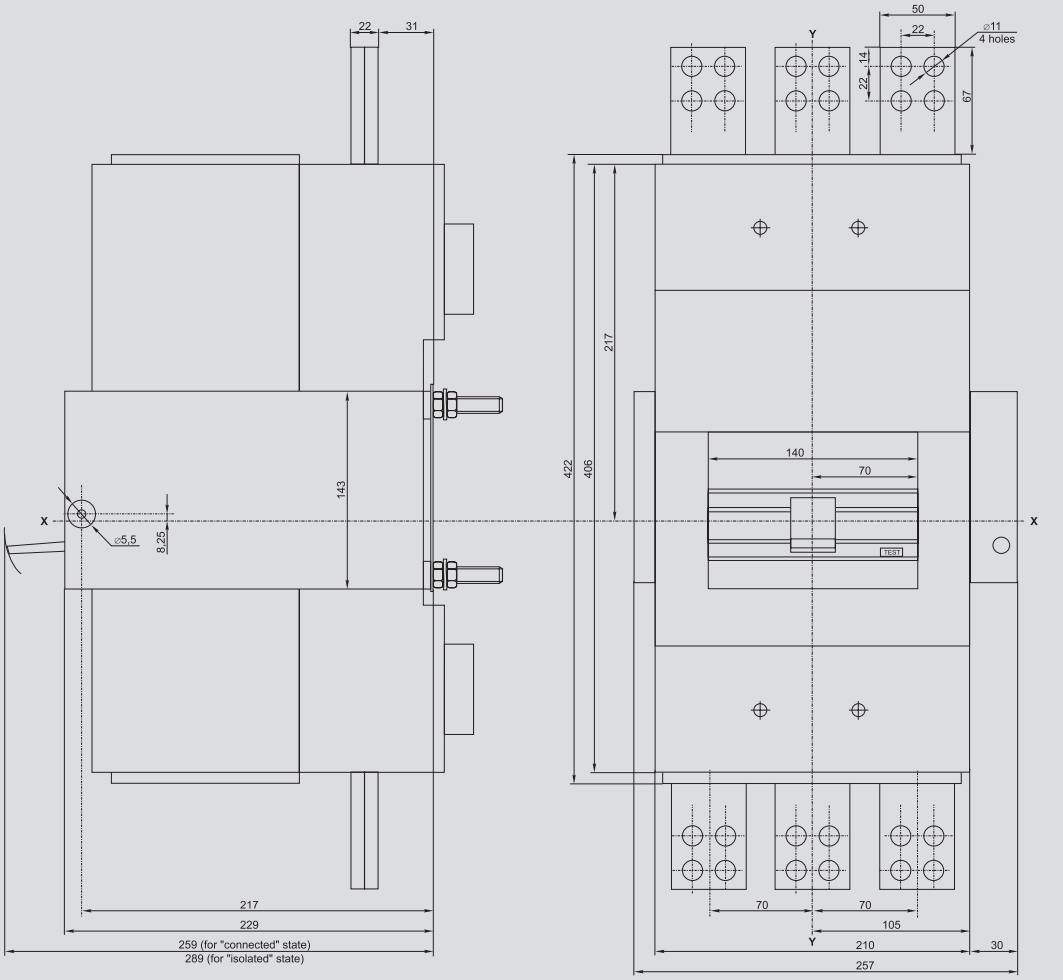


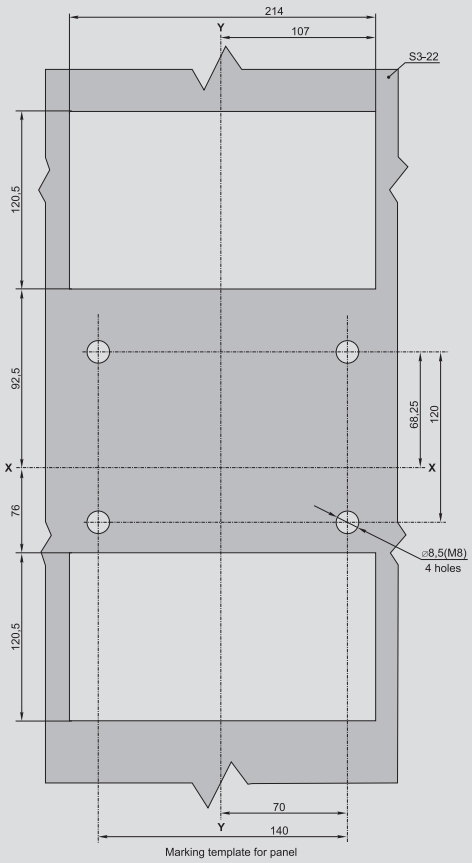
Adapter tip

VA88-43 with motor control EP-43

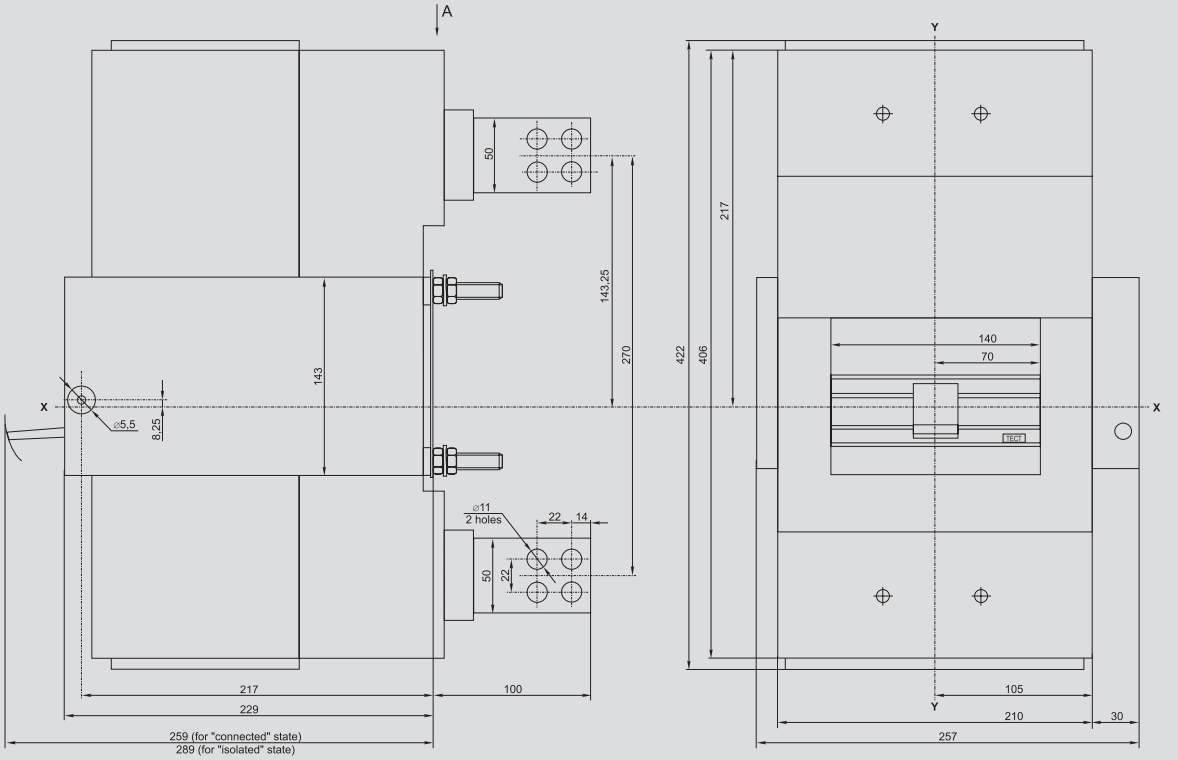


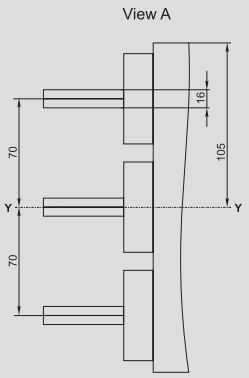
VA88-43 with front pull-out panels PM2/P-43

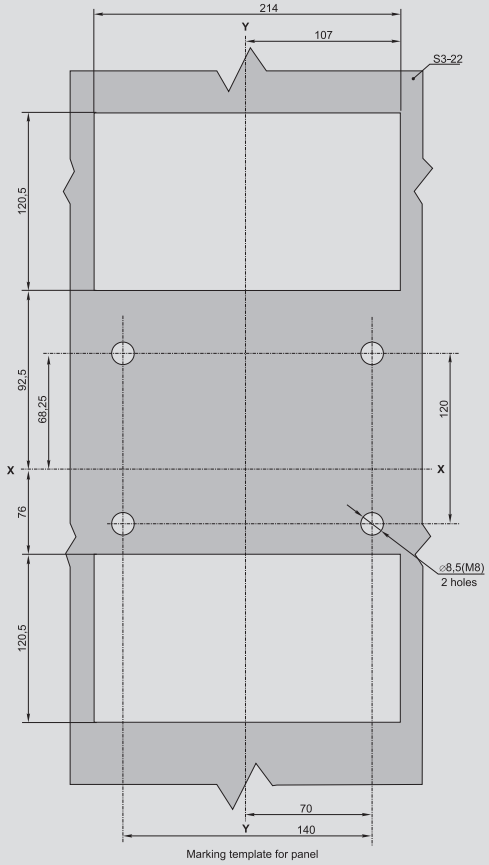




VA88-43 with rear pull-out panels PM2/V-43 (vertical bus connection)







Marking template for panel

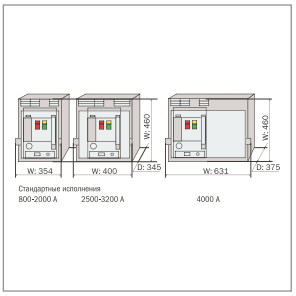
Air circuit breakers VA07

VA07 circuit breakers are installed into transformer substations, switch and control gears and main distribution boards as lead-in, sectional and distribution units for connecting and protecting drives, generators, transformers, buses and cables at industrial and residential construction sites, electric supply of high technology manufactures, banks and utilities. They are intended for exploitation in electric units with rated operating voltage limited to 690 V per rated current from 800 to 4000 A. These ACB correspond to the requirements of IEC 60947-2.

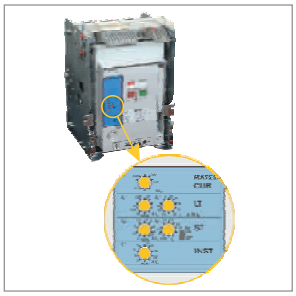
Advantages

- High rated breaking capacity ratings – up to 100 kA.
- Equal ratings of service and ultimate short-circuit breaking capacity: Ics=Icu.
- Expanded standard configuration.
- Maximum saved space inside the distribution board.
- Equal bay in the panel door independently from the ACB dimensions.
- Heightened number of power cycles – up to 30 000 cycles.
- Possibility to change main contacts.
- Fast arc extinguishing owing to Double Break system.
- Small dissipated power value.
- Expanded range of selectivity.
- Raised exploitation safety.
- Special type option for use in tropical and cold climate conditions as well as corrosive environments.

Design Features

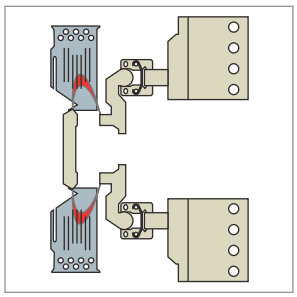


All unit types with rated current limited to 3200 A have equal depth (345 mm) and height (460 mm). Panel door bay dimensions are equal for any VA07ACB that facilitate its mounting inside the distribution board.

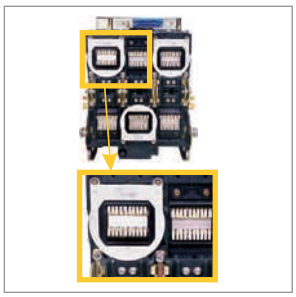


Using an electronic release ensuring performing the following functions:

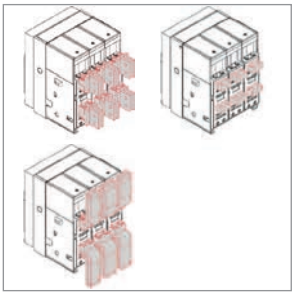
- protection from long-term overload;
- short circuit protection;
- adjustable instantaneous trip function.



“Double Break” system guarantees fast short circuit arc-breaking at the expense of dividing it in two with the help of making breaks in two point of every pole. As a result, it provides for lowering the contacts’ wear resistance and erosion.



Using two transformers on each pole. The first transformer is linear. It is responsible for current signal control. It ensures high accuracy class within the whole short-circuit currents range. The second transformer is intended for the electronic trip input.



Basic shipment configurations predetermine that main contacts type for units per current up to 3200 A is horizontal, up to 4000 – vertical. Front and combined connection are optional.

Main contacts can be easily changed to new ones. It provides for extending the ACB service life. Changing each contacts takes no longer than 15 minutes.

Configuration

Shunt trip unit

Undervoltage trip unit

Starting coil

Motor control

Power cycle counter

Auxiliary contact block

Selection Guide

Trip unit type	Overcurrent trip unit 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} at U_e = 690 V, kA	50	50	50	50	65	65	75
Rated short-circuit making capacity I_{cm} at U_e = 690 V, kA	105	105	105	105	146	146	165
ACB type	VA07-208	VA07-212	VA07-216	VA07-220	VA07-325	VA07-332	VA07-440

Standard configuration

Type	fixed*, draw-out*	draw-out
Spring charging method	manual, motor control	
Protection device	electronic trip unit	
Terminal type	horizontal/vertical**/front** contacts	vertical
Switch on/off devices	shunt trip/undervoltage release*, starting coil, release coil	
Control system elements	control circuit contact block, auxiliary contact block (4 switching contacts)	
Construction protective elements	protective cover of control contact block, main contacts shutters***, protective cover of control block circuit	
Operation indicator	power cycle counter	
Maintenance accessories	standard draw-out handle***, transport plates, door flange IP31	
Accompanying documents	factory test report, operation manual	

* Depending on the product ID.
** Installed against order.
*** Only for draw-out type.

Range

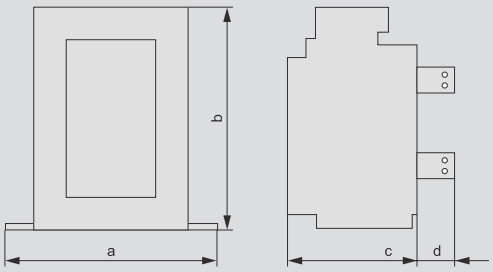
Name	Rated current, A	Number of poles	Ultimate short-circuit breaking capacity I_{cu}	Transport package amount, pcs	Product ID
Draw-out CB VA07-208 with undervoltage trip 3P 800 A 65 kA IEK	800	3	50	1	SAB230-0800-U11H-P11
Draw-out CB VA07-208 with shunt trip 3P 800 A 65 kA IEK	800	3	50	1	SAB230-0800-S11H-P11
Fixed CB VA07-208 with undervoltage trip 3P 800 A 65 kA IEK	800	3	50	1	SAB231-0800-U11H-P11
Fixed CB VA07-208 with shunt trip 3P 800 A 65 kA IEK	800	3	50	1	SAB231-0800-S11H-P11
Draw-out CB VA07-212 with undervoltage trip 3P 1250 A 65 kA IEK	1250	3	50	1	SAB230-1250-U11H-P11
Draw-out CB VA07-212 with shunt trip 3P 1250 A 65 kA IEK	1250	3	50	1	SAB230-1250-S11H-P11
Fixed ACB VA07-212 with undervoltage trip 3P 1250 A 65 kA IEK	1250	3	50	1	SAB231-1250-U11H-P11
Fixed ACB VA07-212 with shunt trip 3P 1250 A 65 kA IEK	1250	3	50	1	SAB231-1250-S11H-P11
Draw-out ACB VA07-216 with undervoltage trip 3P 1600 A 65 kA IEK	1600	3	50	1	SAB230-1600-U11H-P11
Draw-out ACB VA07-216 with shunt trip 3P 1600 A 65 kA IEK	1600	3	50	1	SAB230-1600-S11H-P11
Fixed ACB VA07-216 with undervoltage trip 3P 1600 A 65 kA IEK	1600	3	50	1	SAB231-1600-U11H-P11
Fixed ACB VA07-216 with shunt trip 3P 1600 A 65 kA IEK	1600	3	50	1	SAB231-1600-S11H-P11
Draw-out ACB VA07-220 with undervoltage trip 3P 2000 A 65 kA IEK	2000	3	50	1	SAB230-2000-U11H-P11
Draw-out ACB VA07-220 with shunt trip 3P 2000 A 65 kA IEK	2000	3	50	1	SAB230-2000-S11H-P11
Fixed ACB VA07-220 with undervoltage trip 3P 2000 A 65 kA IEK	2000	3	50	1	SAB231-2000-U11H-P11
Fixed ACB VA07-220 with shunt trip 3P 2000 A 65 kA IEK	2000	3	50	1	SAB231-2000-S11H-P11
Draw-out ACB VA07-325 with undervoltage trip 3P 2500 A 85 kA IEK	2500	3	65	1	SAB330-2500-U11H-P11
Draw-out ACB VA07-325 with shunt trip 3P 800 A 85 kA IEK	2500	3	65	1	SAB330-2500-S11H-P11
Fixed ACB VA07-325 with undervoltage trip 3P 2500 A 85 kA IEK	2500	3	65	1	SAB331-2500-U11H-P11
Fixed ACB VA07-325 with shunt trip 3P 2500 A 85 kA IEK	2500	3	65	1	SAB331-2500-S11H-P11
Draw-out ACB VA07-332 with undervoltage trip 3P 3200 A 85 kA IEK	3200	3	65	1	SAB330-3200-U11H-P11
Draw-out ACB VA07-332 with shunt trip 3P 3200 A 85 kA IEK	3200	3	65	1	SAB330-3200-S11H-P11
Fixed ACB VA07-332 with undervoltage trip 3P 3200 A 85 kA IEK	3200	3	65	1	SAB331-3200-U11H-P11
Fixed ACB VA07-332 with shunt trip 3P 3200 A 85 kA IEK	3200	3	65	1	SAB331-3200-S11H-P11
Draw-out ACB VA07-440 with undervoltage trip 3P 4000 A 100 kA IEK	4000	3	75	1	SAB430-4000-U11V-P11
Draw-out ACB VA07-440 with shunt trip 3P 4000 A 100 kA IEK	4000	3	75	1	SAB430-4000-S11V-P11

Technical Features

Feature			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
Rated electronic trip unit current, 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 insulation voltage U_i, V			1000	1000	1000	1000	1000	1000	1000
Operating voltage (50/60 Hz) U_e, V			690	690	690	690	690	690	690
Main circuit contacts DC internal resistance per pole (mΩ/pole)			0,033	0,033	0,028	0,024	0,014	0,014	0,014
Power consumption, VA (for 3-pole ACB)			200	350	350	490	600	780	1060
Ultimate 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 wear resistance, power cycles	with maintenance		30 000	30 000	30 000	25 000	20 000	20 000	15 000
	no maintenance		15 000	15 000	15 000	12 000	10 000	10 000	8000
Electrical wear resistance, power cycles	no 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 max, kg			73	73	76	79	105	105	139

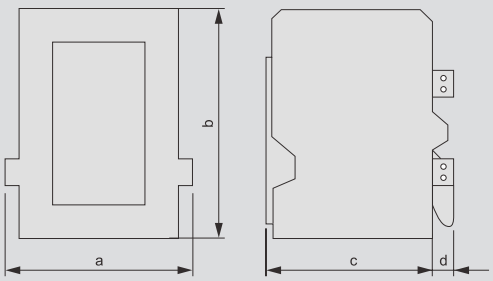
Overall Dimensions

Fixed type



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	–

Draw-out type



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

Fuse links
PPNI fuse links

PPNI Gg type links are designed for protecting industrial electric units and cable lines from overloads and short circuit. They are manufactured per rated current from 2 to 630 A.
PPNI fuse links are used for single and three-phase networks having voltage limited to 660 V (50 Hz).
Application area: lead-in and distribution devices; distribution panels and boards; transformer substation equipment; low-voltage boards; control boxes and boards.
Correspond to the requirements EN 60269-1.

Awarded silver medal of the 15th International Exhibition “Electro-2006” in nomination “Best electrical equipment” for high exploitation characteristics and engineering solution ensuring power loss enhancement.

Advantages

- Power losses lowered by 30% as compared to PN-2 fuses due to the updated modern construction, manufacturing technology and quality of applied materials.
- High resistivity of receptacle (insulator) base to mechanical stress owing to the use of reinforced thermosetting plastic.
- Lowered by 10-20% overall dimensions as compared to PN-2 fuses.
- Wide range of PPNI fuse links including fusible elements with rated current from 2 to 630 A. 82 units in total in 6 sizes.
- Overload protection due to the current-limiting function providing for lowering prospective current short circuit current by several times.
- Wide range of operating temperatures: from –45 to +60 °C. It allows applying PPNI in various climate zones.
- High breaking capacity: at 660 V – 50 kA, at 500 V – 120 kA.

Low power losses

Using quality contemporary materials and new construction decisions contributes to lowering power losses in PPNI fuse links as compared to PN-2 fuses.

Data indicated in the table reflect the cost effectiveness of PPNI as compared to PN-2.

Power losses of PPNI and PN-2 fuse links at 380/400 V

Rated current I_n, A	Power losses P, not less than, W		Power savings when using 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

Energy saving

Efficiency of this new development becomes more visible if we consider not a separate fuse link but an assembled distribution panel. From knowledge that the average cost of electric energy in Russia for people and industries is equal to 3 RUR/kW, we can calculate the cost-effectiveness not only in kW but also in RUR.

If an electrical distribution panel with the outgoing lines per 250 A is assembled basing on new PPNI fuse links, the cost-effectiveness will make up 2602 kW or 7806 RUR annually.

Annual energy saving when using PPNI instead of PN-2 through the example of SHRS boards and VRU distribution panels

Rated current of outgoing lines, A	Energy saving			
	SHRS* (8 outgoing lines)		VRU** (9 outgoing lines)	
	kWh	RUR	kWh	RUR
100	1472	4416	1656	4968
250	2313	6939	2602	7806

* E.g. SHRS-1-24UZ.
** E.g. VRU-1-45-02.

Selection Guide

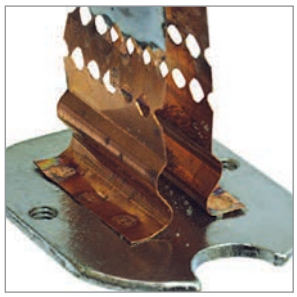





Fuse size	Size 00C	Size 00	Size 0	Size 1	Size 2	Size 3
Fuse element rated current I_n, A						
2	•	•	•			
4	•	•	•			
6	•	•	•			
8	•	•	•			
10	•	•	•			
12	•	•	•			
16	•	•	•			
20	•	•	•			
25	•	•	•			
32	•	•	•			
40	•	•	•	•	•	
50	•	•	•	•	•	
63	•	•	•	•	•	
80	•	•	•	•	•	
100	•	•	•	•	•	•
125	•	•	•	•	•	•
160	•	•	•	•	•	•
200				•	•	•
250				•	•	•
315					•	•
355					•	•
400					•	•
500						•
630						•
Fuse element type	PPNI-33, size 00C	PPNI-33, size 00	PPNI-33, size 0	PPNI-35, size 1	PPNI-37, size 2	PPNI-39, size 3
Fuse receptacle type	DP-33, size 00	DP-33, size 00	DP-33, size 0	DP-35, size 1	DP-37, size 1	DP-39, size 1
Fuse element removal handle			RS-1			

Design Features

Fuse link contacts are made of galvanized (tin-bismuth alloy) electrical copper preventing their oxidation in the process of exploitation.



Fuse element is made of phosphorous bronze (orichalcum with addition of phosphor) and securely fixed by means of spot welding with fuse terminals.

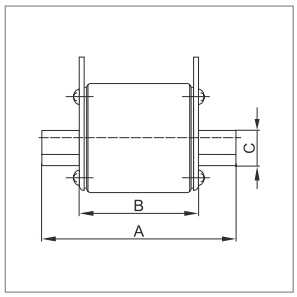
Receptacle base (insulator) is made of reinforced thermosetting plastic resistant to corrosion, mechanical impact, differential temperature and impact blows arising at short circuits up to 120 kA.

There is a special indicator introduced into the fuse element construction executed in the form of a retractable rod providing for visual determining the tripped fuses.

Fuse element contacts are executed in the form of a knife (sharpened) that provides for facilitating their installation in the receptacles.

PPNI fuse links have their breaking capacity lying within the whole gG range allowing ensuring protection of electric installations from short circuits and overloads.

All dimensions of PPNI fuse elements are easy to install or dismount using a universal RS-1 removal handle. The handle's insulation sustains voltage up to 1000 V.



Construction, technical features, overall and installation dimensions of PPNI fuse elements and receptacles correspond to contemporary GOST and IEC standards allowing superseding comparable devices both of local and foreign manufacture.

In order to ensure easy and efficient arc extinguishing, the body of a fuse element is filled with highly chemically purified quartz sand.

Fuse Elements

Range

	Name	Rated current, A	Package amount, pcs		Product ID
			individual	multiple	
	PPNI-33, size 00C, 2 A	2	3	120	DPP11-002
	PPNI-33, size 00C, 4 A	4	3	120	DPP11-004
	PPNI-33, size 00C, 6 A	6	3	120	DPP11-006
	PPNI-33, size 00C, 8 A	8	3	120	DPP11-008
	PPNI-33, size 00C, 10 A	10	3	120	DPP11-010
	PPNI-33, size 00C, 12 A	12	3	120	DPP11-012
	PPNI-33, size 00C, 16 A	16	3	120	DPP11-016
	PPNI-33, size 00C, 20 A	20	3	120	DPP11-020
	PPNI-33, size 00C, 25 A	25	3	120	DPP11-025
	PPNI-33, size 00C, 32 A	32	3	120	DPP11-032
	PPNI-33, size 00C, 40 A	40	3	120	DPP11-040
	PPNI-33, size 00C, 50 A	50	3	120	DPP11-050
	PPNI-33, size 00C, 63 A	63	3	120	DPP11-063
	PPNI-33, size 00C, 80 A	80	3	120	DPP11-080
	PPNI-33, size 00C, 100 A	100	3	120	DPP11-100
	PPNI-33, size 00C, 125 A	125	3	120	DPP11-125
	PPNI-33, size 00C, 160 A	160	3	120	DPP11-160
	PPNI-33, size 00, 2 A	2	3	90	DPP10-002
	PPNI-33, size 00, 4 A	4	3	90	DPP10-004
	PPNI-33, size 00, 6 A	6	3	90	DPP10-006
	PPNI-33, size 00, 8 A	8	3	90	DPP10-008
	PPNI-33, size 00, 10 A	10	3	90	DPP10-010
	PPNI-33, size 00, 12 A	12	3	90	DPP10-012
	PPNI-33, size 00, 16 A	16	3	90	DPP10-016
	PPNI-33, size 00, 20 A	20	3	90	DPP10-020
	PPNI-33, size 00, 25 A	25	3	90	DPP10-025
	PPNI-33, size 00, 32 A	32	3	90	DPP10-032
	PPNI-33, size 00, 40 A	40	3	90	DPP10-040
	PPNI-33, size 00, 50 A	50	3	90	DPP10-050
	PPNI-33, size 00, 63 A	63	3	90	DPP10-063
	PPNI-33, size 00, 80 A	80	3	90	DPP10-080
	PPNI-33, size 00, 100 A	100	3	90	DPP10-100
	PPNI-33, size 00, 125 A	125	3	90	DPP10-125
	PPNI-33, size 00, 160 A	160	3	90	DPP10-160

Name	Rated current, A	Package amount, pcs individual	multiple	Product ID
PPNI-33, size 0, 2 A	2	3	72	DPP20-002
PPNI-33, size 0, 4 A	4	3	72	DPP20-004
PPNI-33, size 0, 6 A	6	3	72	DPP20-006
PPNI-33, size 0, 8 A	8	3	72	DPP20-008
PPNI-33, size 0, 10 A	10	3	72	DPP20-010
PPNI-33, size 0, 12 A	12	3	72	DPP20-012
PPNI-33, size 0, 16 A	16	3	72	DPP20-016
PPNI-33, size 0, 20 A	20	3	72	DPP20-020
PPNI-33, size 0, 25 A	25	3	72	DPP20-025
PPNI-33, size 0, 32 A	32	3	72	DPP20-032
PPNI-33, size 0, 40 A	40	3	72	DPP20-040
PPNI-33, size 0, 50 A	50	3	72	DPP20-050
PPNI-33, size 0, 63 A	63	3	72	DPP20-063
PPNI-33, size 0, 80 A	80	3	72	DPP20-080
PPNI-33, size 0, 100 A	100	3	72	DPP20-100
PPNI-33, size 0, 125 A	125	3	72	DPP20-125
PPNI-33, size 0, 160 A	160	3	72	DPP20-160

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

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

Name	Rated current, A	Package amount, pcs individual	multiple	Product ID
PPNI-39, size 3, 100 A	100	1	24	DPP50-100
PPNI-39, size 3, 125 A	125	1	24	DPP50-125
PPNI-39, size 3, 160 A	160	1	24	DPP50-160
PPNI-39, size 3, 200 A	200	1	24	DPP50-200
PPNI-39, size 3, 250 A	250	1	24	DPP50-250
PPNI-39, size 3, 315 A	315	1	24	DPP50-315
PPNI-39, size 3, 355 A	355	1	24	DPP50-355
PPNI-39, size 3, 400 A	400	1	24	DPP50-400
PPNI-39, size 3, 500 A	500	1	24	DPP50-500
PPNI-39, size 3, 630 A	630	1	24	DPP50-630

Fuse-holders

Range

Name	Rated current, A	Package amount, pcs individual	multiple	Product ID
DP-33, size 00	160	3	72	DPP10D-DP-160
DP-33, size 0	160	3	54	DPP20D-DP-160
DP-35, size 1	250	1	28	DPP30D-DP-250
DP-37, size 2	400	1	18	DPP40D-DP-400
DP-39, size 3	630	1	14	DPP50D-DP-630

Replacement Handles

RS-1 removal handle are universal tools intended for fixing onto the receptacles and dismounting PPNI type fuse links. Besides, RS-1 handles can be used for fuse links of other brands designed in accordance with GOST R 50339, IEC 60269.

Name	Rated current, A	Package amount, pcs individual	multiple	Product ID
RS-1	100	1	56	DPP00D-RS1

Technical Features

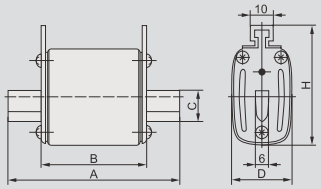
Rated current, A	2÷630
Sizes	00C, 00, 0, 1, 2, 3
Rated voltage, V≈	400, 500, 660
Rated frequency, Hz	50
Classification group	gG*
Rated short-circuit breaking capacity	50 kA at 660 V, 120 kA at 500 V
Operating temperature, °C	–45÷+60
Protection degree	IP00
Operating position	vertical or horizontal
Operation indicator (indicator)	retractable rod (firing pin)
Contact material	Copper with tin-bismuth plating

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

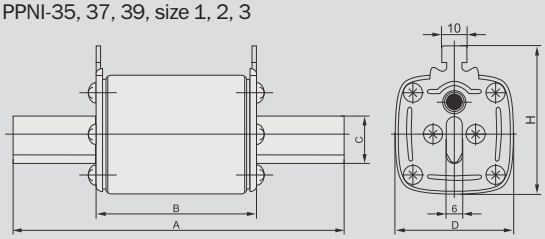
Overall and Installation Dimensions

Fuse Elements

PPNI-33, size 00C, 00, 0

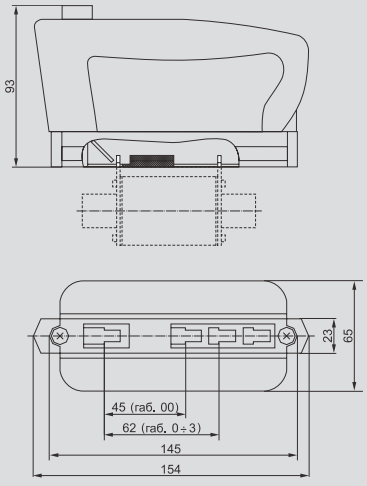


PPNI-35, 37, 39, size 1, 2, 3



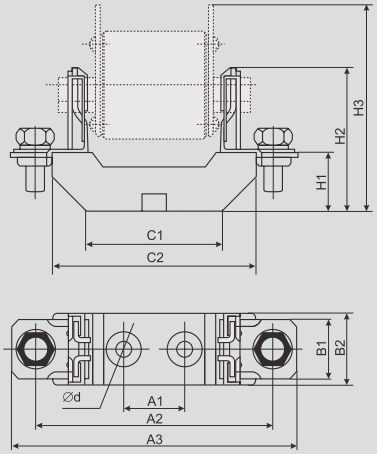
Dimension	PPNI size, mm					Weight, g
	A	B	C	D	H	
00C	78	49	15	21	48	123
00	78	49	15	29	56	175
0	125	68	15	29	56	252
1	135	68	20	48	60	455
2	150	68	25	58	70	650
3	150	68	32	67	80	880

Removal Handle

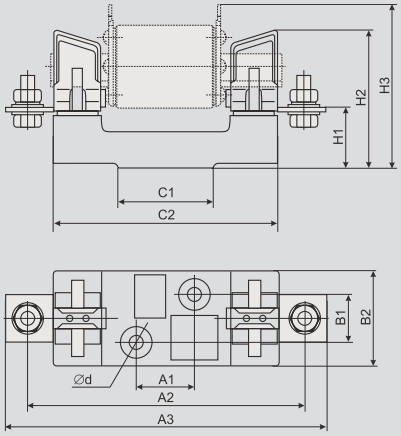


Fuse Receptacles

DP-33, size 00, 0



DP-35, 37, 39, size 1, 2, 3



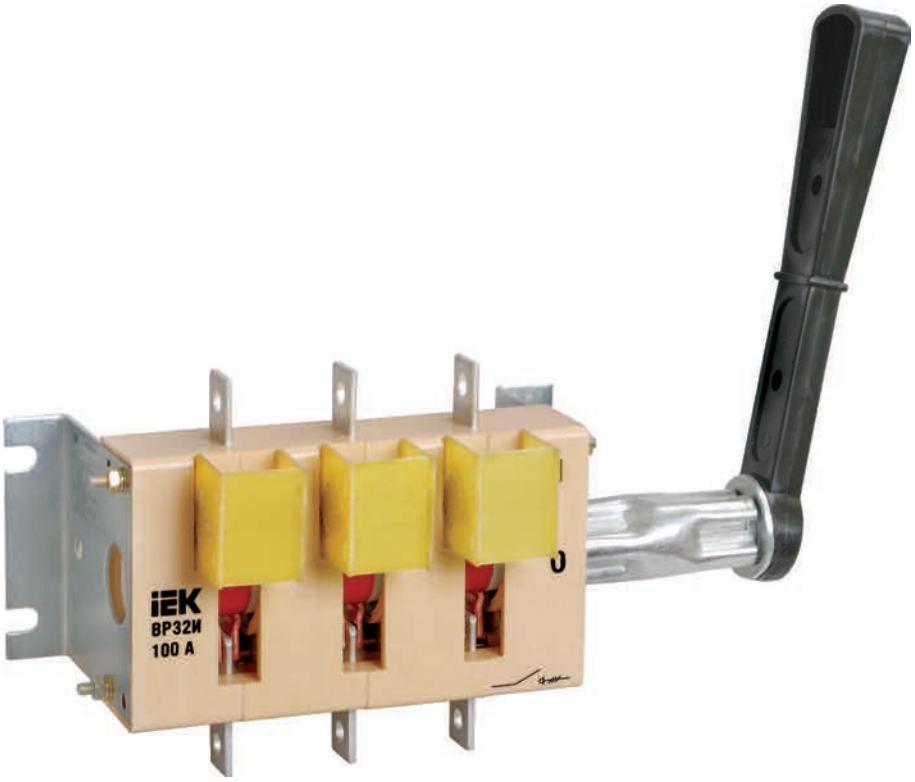
Dimen-sion	DP dimension, mm											Weight, g
	H1	H2	H3	A1	A2	A3	B1	B2	C1	C2	ød	
00	25	60	85	25	100	120	–	30	58	87	7.5	193
0	37	72	91	25	150	170	–	30	68	130	7.5	295
1	38	84	100	25	175	200	30	58	60	142	10.5	550
2	38	100	105	25	200	225	30	60	60	160	10.5	770
3	40	105	118	25	210	250	30	60	60	160	10.5	965

Switch-disconnectors

VR32I switch disconnectors

VR32I switch disconnectors are intended for non-automated commutation of AC circuits with rated voltage up to 690 V (50 Hz).
They are used for installation in low-voltage complete devices such as lead-in distribution units of residential, public and industrial buildings, distribution boards and panels, control panels and boxes, etc.

VR32I switch disconnectors meet the requirements EN 60947-3.



Advantages

- Convenient mounting and exploitation.
- Low power losses at the expense of using contemporary materials.
- Double visible circuit breaking, dismountable handle, color indication of “on” position provide for boosting the safety of electric installations servicing by technical personnel.
- Possibility to connect copper and aluminum current conducting wires as well as cooper and aluminum buses.
- Warranty – 3 years.

Recommendations

- As a basis for building a low-voltage switch unit using VR32I switch disconnectors, IEK Company recommends their own-produced SCHMP metal cases, SCHO panels, lead-in distribution cases, KSRM and SHRS covers.
- When assembling a low-voltage switch unit, it is recommended to use PPNI fuse links or VA88 molded case circuit breakers.

Design Features

Double visible circuit breaking ensures the safety of electric installations servicing by technical personnel.

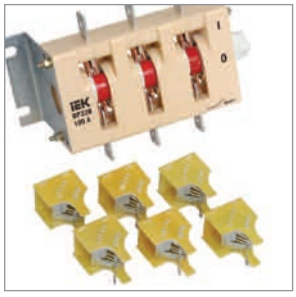
Additional color indication of “on” position signals on the necessary protective precautions.

VR32I body is made of self-extinguishing mechanically strong plastic.

Dismountable handle provides for boosting safety at the expense of electric unit exploitation.

Terminal leads made of high-quality electric copper with applied protective coating allow connecting copper and aluminum current conducting wires supplied with cable lugs as well as copper and aluminum buses.

Marking is applied on the body using a die stamping method ensuring long-term preserving of information about the device.

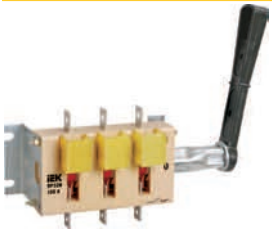


Arch extinguishing chambers, wide contact clearance, double circuit breaking ensure efficient electric arch extinguishing at loads commutations that contributes to lowering the contacts’ wear resistance.

Selection Guide

Type	VR32I-31	VR32I-35	VR32I-37	VR32I-39
Number of poles	3	3	3	3
No. of lines	1 or 2	1 or 2	1 or 2	1 or 2
Conventional free air thermal current I_{th}, A	100	250	400	630
Rated operating voltage, V	690	690	690	690
Arc suppression chambers	Depending on version			
Type of manual drive handle	Depending on version (dismountable and fixed side handles)			
Position of connection plane of leads external terminals	perpendicular to installation plane			

Range

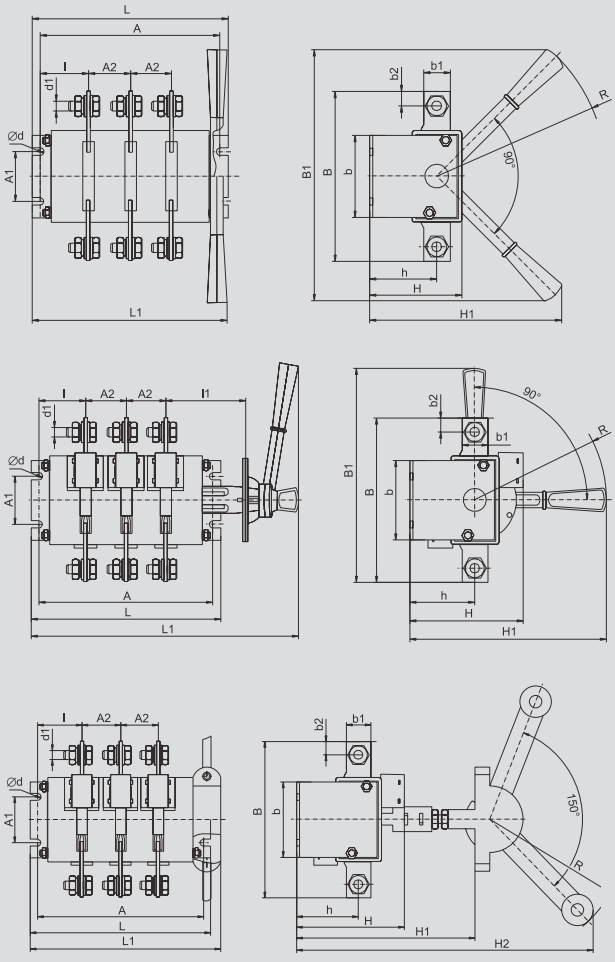
	Name	Number of poles	Conventional free air thermal current I_{th}, A	Transport package amount, pcs	Product ID
	Switch-disconnector VR32I-31A30220 100 A	3	100	18	SRK01-100-100
	Switch-disconnector VR32I-35A30220 250 A	3	250	12	SRK01-100-250
	Switch-disconnector VR32I-37A30220 400 A	3	400	8	SRK01-100-400
	Switch-disconnector VR32I-39A30220 630 A	3	630	4	SRK01-100-630
	Switch-disconnector VR32I-31B31250 100 A	3	100	18	SRK01-111-100
	Switch-disconnector VR32I-31B31250 250 A	3	250	12	SRK21-111-250
	Switch-disconnector VR32I-31B31250 400 A	3	400	8	SRK31-111-400
	Switch-disconnector VR32I-39B31250 630 A	3	630	4	SRK41-111-630
	Switch-disconnector VR32I-31A70220 100 A	3	100	12	SRK01-200-100
	Switch-disconnector VR32I-35A70220 250 A	3	250	8	SRK01-200-250
	Switch-disconnector VR32I-37A70220 400 A	3	400	6	SRK01-200-400
	Switch-disconnector VR32I-39A70220 630 A	3	630	2	SRK01-200-630
	Switch-disconnector VR32I-31B71250 100 A	3	100	12	SRK01-211-100
	Switch-disconnector VR32I-31B71250 250 A	3	250	8	SRK21-211-250
	Switch-disconnector VR32I-31B71250 400 A	3	400	6	SRK31-211-400
	Switch-disconnector VR32I-39B71250 630 A	3	630	2	SRK41-211-630

Technical Features

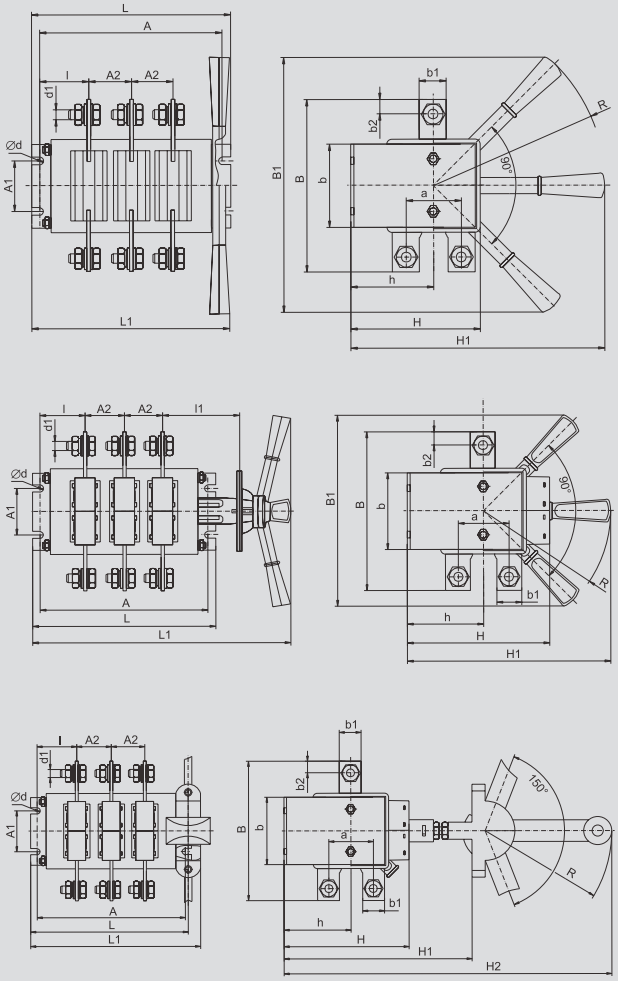
Feature		VR32I-31	VR32I-35	VR32I-37	VR32I-39
Conventional free air thermal current I_{th}, A		100	250	400	630
Conventional thermal sheath current I_{the}, A		80	200	315	500
Rated operation current I_e at U_e= 400 V depending on the application category, A	AC-20V	100	250	400	630
	AC-21V	100	250	400	630
	AC-22V	80	125	200	400
	AC-23V	50	80	–	120
Rated operation current I_e at U_e= 690 V depending on the application category, A	AC-21V	100	250	400	630
	AC-22V	80	125	200	250
	AC-23V	20	40	–	63
Thermal losses, W/pole		3	15	35	60
Rated short-time withstand current (1 sec) Icw, A		5000	8000	11000	16000
Rated insulation voltage U_i, V		690	690	690	690
Rated impulse withstand voltage U_{imp}, kV		8,0	8,0	8,0	8,0
Degree of protection acc. to GOST 14254		IP00, IP32 from drive side when installed in LV packaged switchgear			
Range of operating temperatures, °C		from minus 60 to plus 45			
Electrical wear resistance at U_e=400 V depending on the application category, power cycles	AC-20V	4000	2500	2500	1600
	AC-21V	4000	2000	2000	1000
	AC-22V	3200	1600	1600	1000
	AC-23V	4000	3200	–	1000
Electrical wear resistance at U_e=660 V depending on the application category, power cycles	AC-21V	300	200	200	200
	AC-22V	300	200	200	200
	AC-23V	300	300	–	300
Mechanical wear resistance, power cycles		25 000	25 000	16 000	16 000
Installation altitude above sea level, max, m		2000	2000	2000	2000
Conductor sizes suitable for connection, mm^2		10…50	70…150	120…3×120	150…4x120
Service life from the moment of putting into operation, not less than, years		10	10	10	10

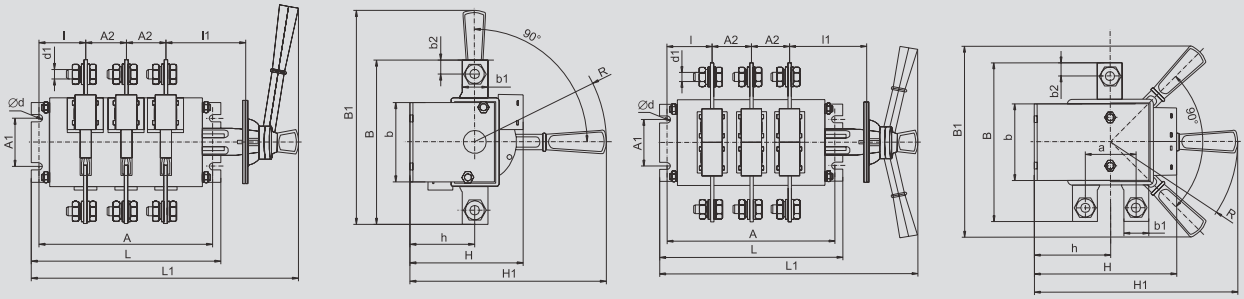
Overall Dimensions

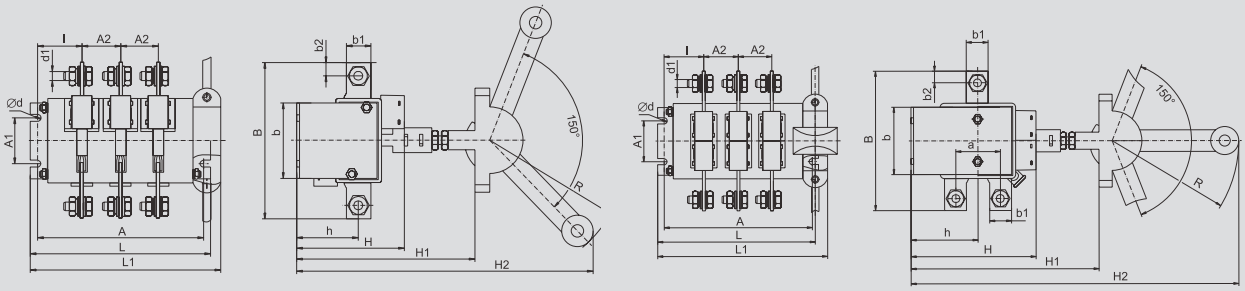
VR32I



VR32 1250







Type	A	A1	A2	B	B1	L1	L	b	b1	b2	H	H1	H2	l	l1	h	a	d	d1	R	Weight, kg
VR32I-31A30220	160,5	50	37,5	117	240	176	174,5	75	15	7,5	72,5	175	–	42,75	–	55	–	7	M6	160	0,80
VR32I-31B31250					218,5	274					100	215			80					160	1,20
VR32I-31A31240					231	202					95	250	332		–					177	1,46
VR32I-31A70220	145,5	50	37,5	120	240	168	157,5	65	15	7,5	107,5	231,5	–	35,25	–	71,5	38	7	M6	160	1,07
VR32I-31B71250						262,5					127,5				78,25					160	1,47
VR32I-31A71240					–	193,5						250	250		–					177	1,82
VR32I-35A30220	172	50	44	164	240	190	186	82,5	25	12,5	79	180	–	42,1	–	58	–	7	M10	160	1,39
VR32I-35B31250					242	282					102	218	–		80					160	1,72
VR32I-35A31240					249	214						250	332		–					177	2,07
VR32I-35A70220	160	50	44	162	240	183	172	80,5	25	12,5	123,5	238,5	–	36,1	–	78,5	58	7	M10	160	2,07
VR32I-35B71250						279					150		–		80					160	2,58
VR32I-35A71240					–	208						250	449		–					177	2,90
VR32I-37A30220	200	50	50	178	240	215	212	99,5	26	13	94,5	191	–	49,1	–	70,5	–	7	M10	160	2,09
VR32I-37B31250					249	303					122	230,5	–		80					160	2,48
VR32I-37A31240					244	240						250	332		–					177	2,80
VR32I-37A70220	200	50	50	164	240	215	212	89,5	26	13	149	259,6	–	49,1	–	99,5	62	7	M10	160	2,95
VR32I-37B71250						305					175				80					160	3,57
VR32I-37A71240					–	240						250	449		–					177	3,91
VR32I-39A30220	236	100	65	220	313	250,5	252	119	35	17,5	110,5	240	–	52,7	–	83,5	–	9	M12	210	3,62
VR32I-39B31250					320	339					149	294			83					210	4,27
VR32I-39A31240					313	280						350	452		–					237	4,95
VR32I-39A70220	236	50	65	208	313	250,5	252	105,5	35	17,5	180,5	330,5	–	52,7	–	120,5	72	9	M12	210	5,30
VR32I-39B71250						336,5					220				83					210	6,32
VR32I-39A71240					–	280						350	621		–					237	7,06

PVR devices

Fuse/switch/disconnectors are designed for non-automatic switching and overcurrent protection of AC circuits of rated voltage up to 690 V and rated frequency 50 Hz.
They are used in LV packaged switchgears like input switchgears in residential, public and industrial buildings, distribution panels, control panels and boxes, power boxes, etc.
Correspond to the requirements EN 60947-3, 60947-5-1.

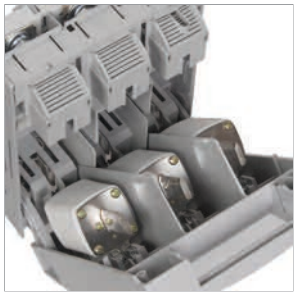
Advantages

- Compact and robust design.
- Flame-inhibiting enclosure.
- On-load switching is possible due to built-in arc suppression chambers.
- Copper and aluminum conductors can be connected.
- Optional contact is possible to monitor the cover position.
- Removable cover for easy fuse installation.
- 5-year warranty.

Recommendations

- IEK Group recommends to use such our products as ShchMP metal enclosures, ShchO panels, VRU, KSRM and ShchRS enclosures as a base for building the packaged LV switchgear with PVR devices.
- PPNI fuse melt inserts as overcurrent protection elements

Design features

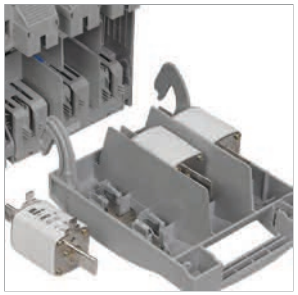


Double visible circuit gap improves personnel safety during maintenance of an electric installation.

Body of PVR device is made from robust self-extinguishing ABS plastic.

Additional contact monitors position of the removable cover.

Built-in arc suppression chambers enable circuit switching under load conditions.



Removable cover ensures personnel safety during replacement of melt inserts.

The contact leads made of high-quality electrical copper with protective coating allow for connection of copper and aluminum conductors.

Transparent window in the removable cover enables visual checks of melt insert status.

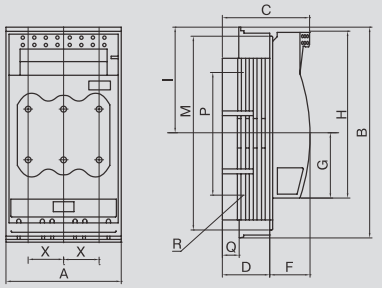
Range

	Description	Number of poles	Conditional thermal current in open air I_{th}, A	Qty in transport packing, pcs.	Product ID
	Fuse/switch/disconnector 160A IEK	3	160	8	SRP-10-3-160
	Fuse/switch/disconnector 250A IEK	3	250	6	SRP-20-3-250
	Fuse/switch/disconnector 400A IEK	3	400	4	SRP-30-3-400
	Fuse/switch/disconnector 630A IEK	3	630	4	SRP-40-3-630
	Additional contact for IEK PVR devices	–	–	–	DK-SRP

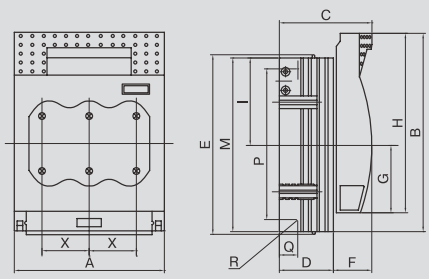
Technical characteristics

Device type	PVR 160 A	PVR 250 A	PVR 400 A	PVR 630 A
Number of poles	3			
Mains rated frequency, Hz	50			
Maximum operating voltage Ue, V	690			
Rated insulation voltage Ui, V, not lower	800			
Maximum permissible short-circuit current, kA	50			
Rated thermal current in open air Ith, A	160	250	400	630
Maximum power dissipation, W per pole	12	23	34	48
Usage category	AC-23 B (400 V), AC-23 B (500 V, 125 A), AC-22 B (690 V), AC-21 B (690 V)	AC-23 B (400 V), AC-22 B (690 V), AC-21 B (690 V)	AC-23 B (400 V), AC-22 B (690 V), AC-21 B (690 V)	AC-23 B (400 V), AC-22 B (690 V), AC-21 B (690 V)
Melt insert type (size)	PPNI-33 (size 00, 00C)	PPNI-33 (size 0), PPNI-35 (size 1)	PPNI-37 (size 2)	PPNI-39 (size 3)
Degree of protection according to GOST 14254 (IEC 529)	IP30			
Mode of operation	continuous			
Working position	vertical, can be turned to the right or left by 90°			
Mechanical wear resistance, ON-OFF cycles, at least	2000			
Weight, kg, not more	0,5	1,8	3,5	4,9
Lifetime, years, at least	10			
Warranty operation period	5 years since date of purchase			

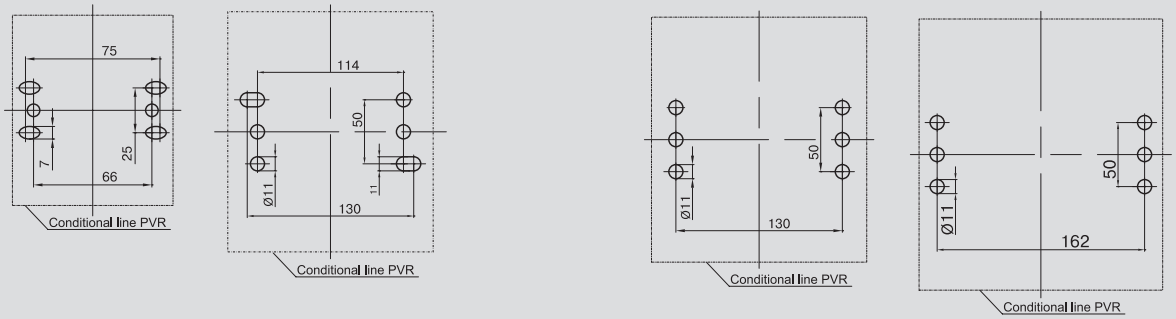
Overall and installation dimensions



PVR 160 A PVR 250 A



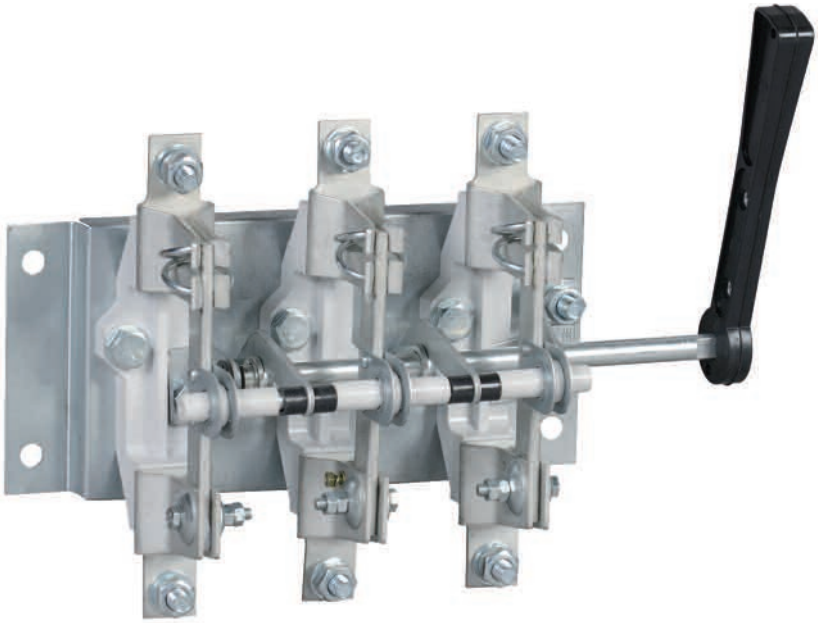
PVR 400 A PVR 630 A



Type	Dimensions, mm													
	A	B	C	D	E	F	G	H	I	M	P	Q	R	X
PVR 160 A	106	200	82,5	45	–	37	60	155	100	181	115	17	M8	33
PVR 250 A	184	243	111,5	66	220	45,5	84	220	107	214,5	185	21,5	M10	57
PVR 400 A	210	288	128	80	–	48	92	249	124	255	210	25	M10	65
PVR 630 A	256	300	142,5	94,5	–	48	98,5	259	127,5	267	210	30	M12	81

Disconnectors of RE-19 series

The disconnectors of RE-19 series are designed for conducting the rated current and not frequent non-automatic switching of circuits without load of rated voltage up to 1000 VAC and frequency 50, 60 Hz. RE-19 IEK® can be used in switchgears with rated currents from 250 to 1600 A.



Advantages

- Convenient installation and operation.
- Low power losses due to use of modern materials.
- Visible circuit gap, wide range of handles.
- Copper and aluminum conductors can be connected.
- 5-year warranty.

Design features

The contact leads made of high-quality electrical copper with protective coating allow for connection of copper and aluminum conductors terminated with cable lugs, as well as copper and aluminum buses.

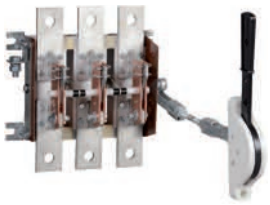
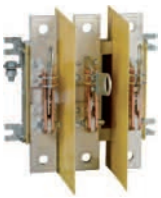
Wide range of control handles.

Knife-type contact system ensures the visible circuit gap.

Complete set of hardware for installation and connection of conductors.

The base is made from robust and flame-inhibiting materials.

Range

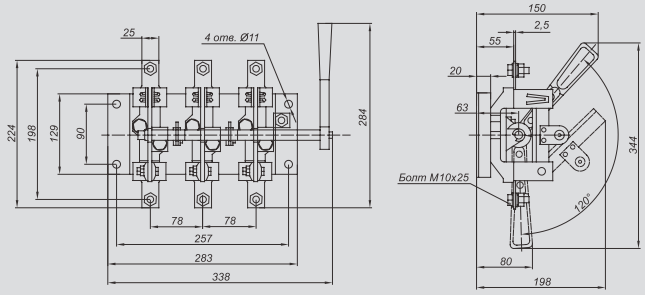
	Description	No. of poles	Conditional thermal current in open air I_{th}, A	Qty in transport packing, pcs.	Product ID
	Disconnector RE19-35-31120 250 A	3	250	4	PE-31120-0250
	Disconnector RE19-37-31120 400 A	3	400	4	PE-31120-0400
	Disconnector RE19-35-31140 250 A	3	250	4	PE-31140-0250
	Disconnector RE19-37-31140 400 A	3	400	4	PE-31140-0400
	Disconnector RE19-39-31120 630 A	3	630	1	PE-31120-0630
	Disconnector RE19-41-31120 1000 A	3	1000	1	PE-31120-1000
	Disconnector RE19-43-31120 1600 A	3	1600	1	PE-31120-1600
	Disconnector RE19-39-31140 630 A	3	630	1	PE-31140-0630
	Disconnector RE19-41-31140 1000 A	3	1000	1	PE-31140-1000
	Disconnector RE19-43-31140 1600 A	3	1600	1	PE-31140-1600
	Disconnector RE19-39-31160 630 A	3	630	1	PE-31160-0630
	Disconnector RE19-41-31160 1000 A	3	1000	1	PE-31160-1000
	Disconnector RE19-43-31160 1600 A	3	1600	1	PE-31160-1600

Technical characteristics

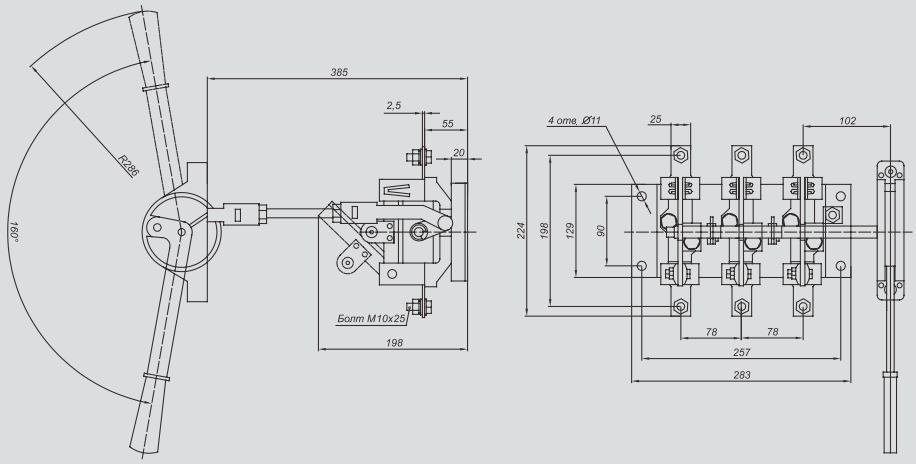
Parameter		PE19-35	PE19-37	PE19-39	PE19-41	PE19-43
Rated operating voltage Ue, V	AC-20 B	660		1000		
	DC-20 B	440				
Rated insulation voltage Ui		660		1000		
Rated operating current Ie, A		250	400	630	1000	1600
Rated short-time short-circuit withstand current Icw, kA		8	17	17	18	20
Rated conditional short-circuit current Icc, A		14	26	32	100	100
Force applied to drive handle, not more, N (kgf)		176,4 (18,0)	264,6 (27,0)	313,6 (32,0)	343 (35,0)	
Mechanical wear resistance, ON-OFF cycles		10000	10000	6300	6300	6300
Degree of protection acc. to GOST 14254		IP00	IP00	IP00	IP00	IP00

Overall and installation dimensions

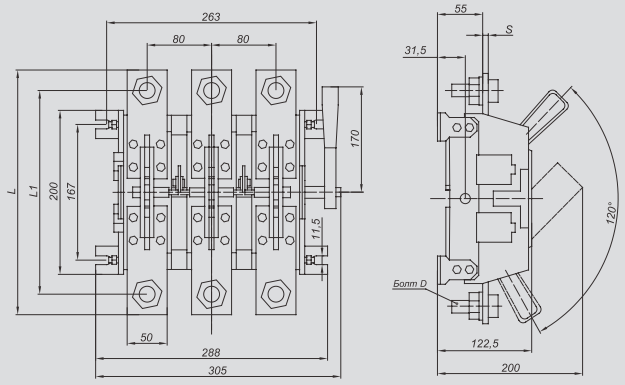
RE19-35-31120 and RE19-37-31120 with side handle



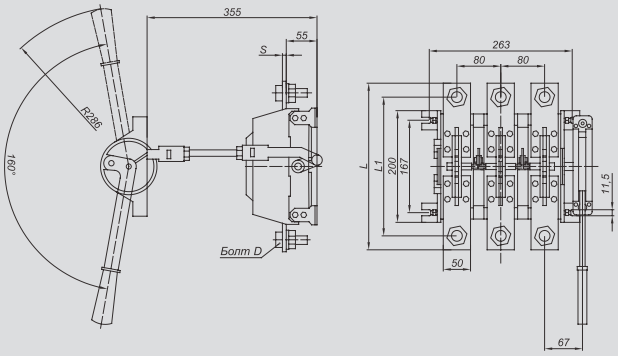
RE19-35-31140 and RE19-37-31140 with frontal shifted handle



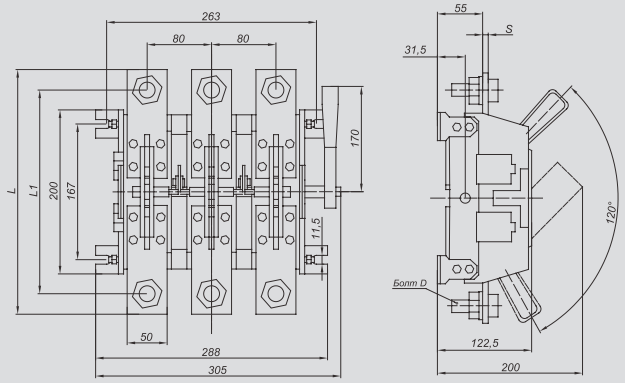
RE19-39-31120, RE19-41-31120 and RE19-43-31120 with side handle



RE19-39-31140, RE19-41-31140 and RE19-43-31140 with frontal shifted handle

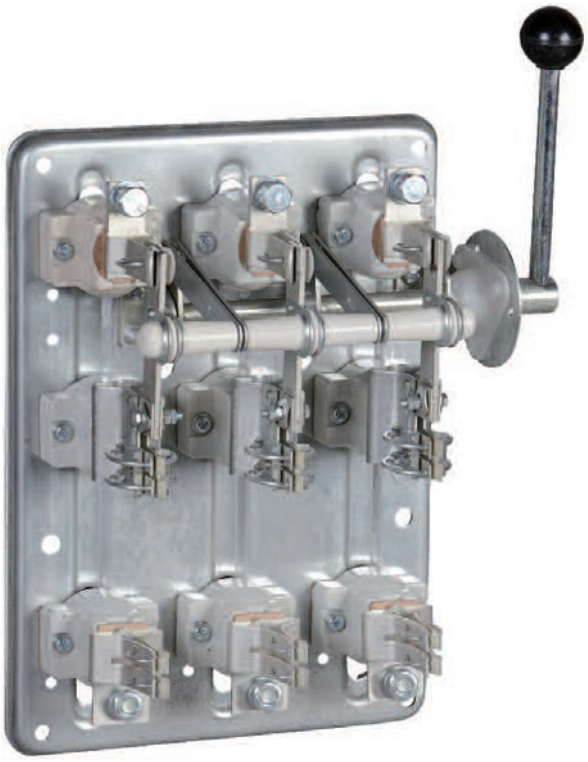


RE19-39-31160, RE19-41-31160 and RE19-43-31160 with lever for handling of rod at each pole



Fuse disconnectors of RP series

The fuse disconnectors of RP series IEK® are designed for conducting the rated current and switching of circuits without load, with rated currents up to 400 A and rated voltage up to 400 VAC in switchgears.
They are used in packaged LV switchgears like input switchgears in residential, public and industrial buildings, distribution panels, control panels and boxes, etc.



Advantages

- Convenient installation and operation.
- Low power losses due to use of high-quality materials.
- Visible circuit gap.
- Wide range of control handles.
- Copper and aluminum conductors can be connected.
- 5-year warranty.

Range

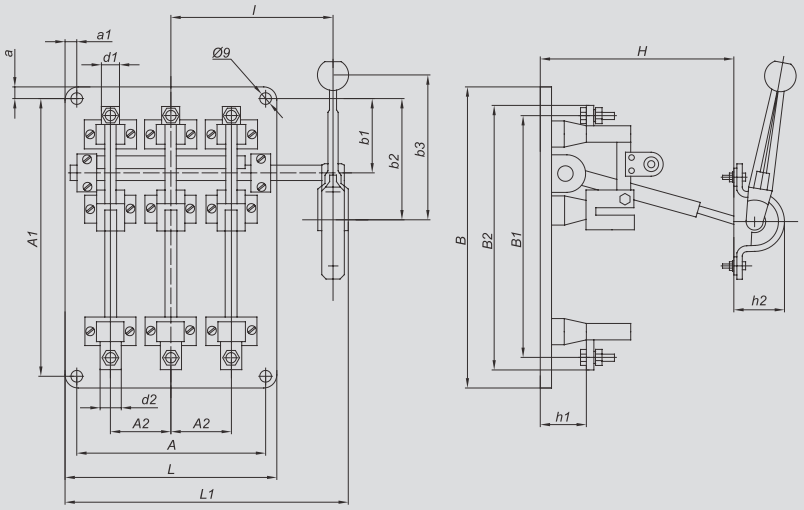
	Description	No. of poles	Conditional thermal current in open air I_{th}, A	Qty in transport packing, pcs.	Product ID
	Disconnector RPB-1 100A P IEK	3	100	2	RP-1-1-100
	Disconnector RPB-2 250A P IEK	3	250	2	RP-2-1-250
	Disconnector RPB-4 400A P IEK	3	400	2	RP-4-1-400
	Disconnector RPS-1 100A P IEK	3	100	2	RP-1-2-100
	Disconnector RPS-2 250A P IEK	3	250	2	RP-2-2-250
	Disconnector RPS-4 400A P IEK	3	400	2	RP-4-2-400

Technical characteristics

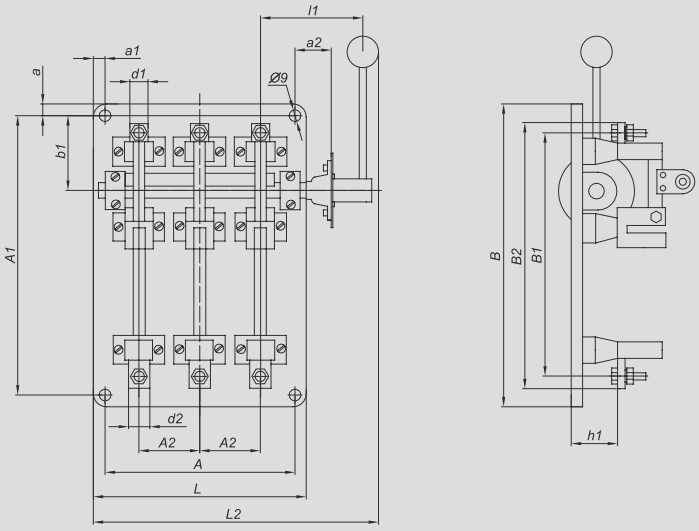
Parameter	RPS-1/P(L) RPB-1/P(L)	RPS-2/P(L) RPB-2/P(L)	RPS-4/P(L) RPB-4/P(L)	RPS-6/P(L) RPB-6/P(L)
Rated operating voltage U_e, V	400	400	400	400
Rated insulation voltage (U_i), V	660	660	660	660
Rated operating current I_e, AC-20 B, A	100	250	400	630
Rated switching capacity at voltage U=1,05·U_e; I=1,5; cosφ=0,95, ON-OFF cycles	10	10	10	10
Rated conditional short-circuit current (I_{cc}), кА	20	20	30	32
Melt insert type (size)	PPNI-33 (size 0)	PPNI-35 (size 1)	PPNI-37 (size 2)	PPNI-39 (size 3)
Weight, kg	5,7	5,6	6,8	10,5
Mechanical wear resistance, ON-OFF cycles	2500			
Degree of protection acc. to GOST 14254	IP00			

Overall dimensions

RPS



RPB




трансформатор
тока

3 Metering, Control & Measuring Devices, Power Supply Equipment

TTI current transformers

TTI current transformers are intended for:
- Applying in electric power metering circuits for calculations with consumers;
- Applying in commercial electric power metering circuits;
- Transmitting metering information signals to measuring, protection and control devices.

These transformers correspond to the requirements IEC 60044-1.

TTI current transformers were awarded silver medal of the International Contest “Best Electric Equipment 2005” sponsored by the Ministry of Industry and Energy of the Russian Federation, Gosstandart RF, ANO Soyuzexpertiza, for their high quality ratings.

TTI current transformers are introduced into the State register of measuring equipment under No. 28139-07. Establishment certificate of measuring equipment CN.C.34.083.A No. 28362.

Advantages

- Copser tinned bus used in TTI-A transformers gives opportunity of connecting both copper and aluminum conductors.
- Each transformer set includes a cover shielding the secondary terminals ensuring exploitation safety.
- Inspection occurrence is established by means of a verification mark impression on the TTI casing and in the passport.
- Weight and dimensions are by 10-20% smaller than that of comparable transformers of other domestic manufacturers.
- Average service life – 25 years.

Design Features

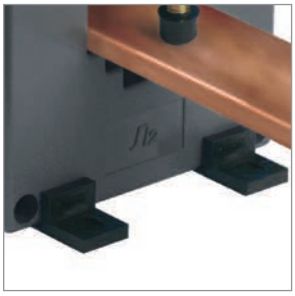
Transformer body is not dismountable. It is sealed with a sticker making it impossible to access to the secondary winding.

Universal TTI current transformer window provides for installing cables and buses of various sizes and configurations as the primary winding.

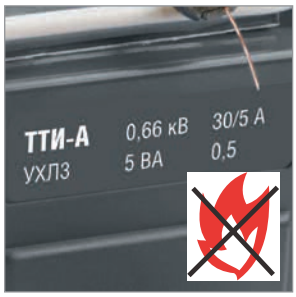
Cover shielding the terminals can be sealed. It is especially essential in electric power metering circuits because it allows excluding a non-authorized access to the secondary terminals.

TTI-30÷TTI-125 are completed with a bracket for adjusting a bus in the transformer's window.

Integrated copper tinned bus used in TTI-A transformers gives opportunity of connecting both copper and aluminum conductors. TTI-A transformers are completed with screws and nuts for conductor fixation.



Delivery package includes special supports for adjusting panel equipment onto the mounting panel.



Transformer body is made of self-extinguishing plastic ensuring fire and electric safety.

Selection Guide

Bus	Integrated bus	No integrated 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							•
Accuracy class	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S	0,5	0,5	0,5	0,5
Rated secondary load	5; 10	5; 10	5; 10	10; 15	15	15	15
Max. bus size, mm	–	31 (dim. 1) 35 (dim. 2)	41,5	60	85,5	100	130
Max. 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, VA	Rated primary transformer current, A	Package amount, pcs		Product ID
				individual	multiple	
	ТТІ-А 5/5А 5 VA 0,5	5	5	1	36	ITT10-2-05-0005
	ТТІ-А 10/5А 5 VA 0,5	5	10	1	36	ITT10-2-05-0010
	ТТІ-А 15/5А 5 VA 0,5	5	15	1	36	ITT10-2-05-0015
	ТТІ-А 20/5А 5 VA 0,5	5	20	1	36	ITT10-2-05-0020
	ТТІ-А 25/5А 5 VA 0,5	5	25	1	36	ITT10-2-05-0025
	ТТИ-А 30/5 А 5 ВА 0,5	5	30	1	36	ITT10-2-05-0030
	ТТІ-А 40/5А 5 VA 0,5	5	40	1	36	ITT10-2-05-0040
	ТТІ-А 50/5А 5 VA 0,5	5	50	1	36	ITT10-2-05-0050
	ТТІ-А 60/5А 5 VA 0,5	5	60	1	36	ITT10-2-05-0060
	ТТІ-А 75/5А 5 VA 0,5	5	75	1	36	ITT10-2-05-0075
	ТТІ-А 80/5А 5 VA 0,5	5	80	1	36	ITT10-2-05-0080
	ТТІ-А 100/5А 5 VA 0,5	5	100	1	36	ITT10-2-05-0100
	ТТІ-А 120/5А 5 VA 0,5	5	120	1	36	ITT10-2-05-0120
	ТТІ-А 125/5А 5 VA 0,5	5	125	1	36	ITT10-2-05-0125
	ТТІ-А 150/5А 5 VA 0,5	5	150	1	36	ITT10-2-05-0150
	ТТІ-А 200/5А 5 VA 0,5	5	200	1	36	ITT10-2-05-0200
	ТТІ-А 250/5А 5 VA 0,5	5	250	1	36	ITT10-2-05-0250
	ТТІ-А 300/5А 5 VA 0,5	5	300	1	36	ITT10-2-05-0300
	ТТІ-А 400/5А 5 VA 0,5	5	400	1	36	ITT10-2-05-0400
	ТТІ-А 500/5А 5 VA 0,5	5	500	1	36	ITT10-2-05-0500
	ТТІ-А 600/5А 5 VA 0,5	5	600	1	36	ITT10-2-05-0600
	ТТІ-А 800/5А 5 VA 0,5	5	800	1	36	ITT10-2-05-0800
	ТТІ-А 1000/5А 5 VA 0,5	5	1000	1	36	ITT10-2-05-1000
	ТТІ-А 100/5А 10 VA 0,5	10	100	1	36	ITT10-2-10-0100
	ТТІ-А 120/5А 10 VA 0,5	10	120	1	36	ITT10-2-10-0120
	ТТІ-А 125/5А 10 VA 0,5	10	125	1	36	ITT10-2-10-0125
	ТТІ-А 150/5А 10 VA 0,5	10	150	1	36	ITT10-2-10-0150
	ТТІ-А 200/5А 10 VA 0,5	10	200	1	36	ITT10-2-10-0200
	ТТІ-А 250/5А 10 VA 0,5	10	250	1	36	ITT10-2-10-0250
	ТТІ-А 300/5А 10 VA 0,5	10	300	1	36	ITT10-2-10-0300
	ТТІ-А 400/5А 10 VA 0,5	10	400	1	36	ITT10-2-10-0400
	ТТІ-А 500/5А 10 VA 0,5	10	500	1	36	ITT10-2-10-0500
	ТТІ-А 600/5А 10 VA 0,5	10	600	1	36	ITT10-2-10-0600
	ТТІ-А 800/5А 10 VA 0,5	10	800	1	36	ITT10-2-10-0800
	ТТІ-А 1000/5А 10 VA 0,5	10	1000	1	36	ITT10-2-10-1000

Range

Transformer type	Name	Rated secondary load, VA	Rated primary current, A	Package amount, pcs		Product ID
				individual	multiple	
	TTI-30 150/5A 5 VA 0,5	5	150	1	40	ITT20-2-05-0150
	TTI-30 200/5A 5 VA 0,5	5	200	1	40	ITT20-2-05-0200
	TTI-30 250/5A 5 VA 0,5	5	250	1	40	ITT20-2-05-0250
	TTI-30 300/5A 5 VA 0,5	5	300	1	40	ITT20-2-05-0300
	TTI-30 200/5A 10 VA 0,5	10	200	1	40	ITT20-2-10-0200
	TTI-30 250/5A 10 VA 0,5	10	250	1	40	ITT20-2-10-0250
	TTI-30 300/5A 10 VA 0,5	10	300	1	40	ITT20-2-10-0300
	TTI-40 300/5A 5 VA 0,5	5	300	1	40	ITT30-2-05-0300
	TTI-40 400/5A 5 VA 0,5	5	400	1	40	ITT30-2-05-0400
	TTI-40 500/5A 5 VA 0,5	5	500	1	40	ITT30-2-05-0500
	TTI-40 600/5A 5 VA 0,5	5	600	1	40	ITT30-2-05-0600
	TTI-40 300/5A 10 VA 0,5	10	300	1	40	ITT30-2-10-0300
	TTI-40 400/5A 10 VA 0,5	10	400	1	40	ITT30-2-10-0400
	TTI-40 500/5A 10 VA 0,5	10	500	1	40	ITT30-2-10-0500
	TTI-40 600/5A 10 VA 0,5	10	600	1	40	ITT30-2-10-0600
	TTI-60 600/5A 10 VA 0,5	10	600	1	32	ITT40-2-10-0600
	TTI-60 750/5A 10 VA 0,5	10	750	1	32	ITT40-2-10-0750
	TTI-60 800/5A 10 VA 0,5	10	800	1	32	ITT40-2-10-0800
	TTI-60 1000/5A 10 VA 0,5	10	1000	1	32	ITT40-2-10-1000
	TTI-60 600/5A 15 VA 0,5	15	600	1	32	ITT40-2-15-0600
	TTI-60 750/5A 15 VA 0,5	15	750	1	32	ITT40-2-15-0750
	TTI-60 800/5A 15 VA 0,5	15	800	1	32	ITT40-2-15-0800
	TTI-60 1000/5A 15 VA 0,5	15	1000	1	32	ITT40-2-15-1000
	TTI-85 750/5A 15 VA 0,5	15	750	1	12	ITT50-2-15-0750
	TTI-85 800/5A 15 VA 0,5	15	800	1	12	ITT50-2-15-0800
	TTI-85 1000/5A 15 VA 0,5	15	1000	1	12	ITT50-2-15-1000
	TTI-85 1200/5A 15 VA 0,5	15	1200	1	12	ITT50-2-15-1200
	TTI-85 1500/5A 15 VA 0,5	15	1500	1	12	ITT50-2-15-1500
	TTI-100 1000/5A 10 VA 0,5	15	1000	1	16	ITT60-2-15-1000
	TTI-100 1200/5A 10 VA 0,5	15	1200	1	16	ITT60-2-15-1200
	TTI-100 1250/5A 10 VA 0,5	15	1250	1	16	ITT60-2-15-1250
	TTI-100 1500/5A 10 VA 0,5	15	1500	1	16	ITT60-2-15-1500
	TTI-100 1600/5A 15 VA 0,5	15	1600	1	16	ITT60-2-15-1600
	TTI-100 2000/5A 15 VA 0,5	15	2000	1	16	ITT60-2-15-2000
	TTI-100 2500/5A 15 VA 0,5	15	2500	1	16	ITT60-2-15-2500
	TTI-100 3000/5A 15 VA 0,5	15	3000	1	16	ITT60-2-15-3000
	TTI-125 1500/5A 10 VA 0,5	15	1500	1	10	ITT70-2-15-1500
	TTI-125 2000/5A 10 VA 0,5	15	2000	1	10	ITT70-2-15-2000
	TTI-125 2500/5A 10 VA 0,5	15	2500	1	10	ITT70-2-15-2500
	TTI-125 3000/5A 10 VA 0,5	15	3000	1	10	ITT70-2-15-3000
	TTI-125 4000/5A 15 VA 0,5	15	4000	1	10	ITT70-2-15-4000
	TTI-125 5000/5A 15 VA 0,5	15	5000	1	10	ITT70-2-15-5000

Range

Transformer type	Name	Rated secondary load, VA	Rated primary current, A	Package amount, pcs		Product ID
				individual	multiple	
	TTI-A 5/5A 5 VA 0,5S	5	5	1	36	ITT10-3-05-0005
	TTI-A 10/5A 5 VA 0,5S	5	10	1	36	ITT10-3-05-0010
	TTI-A 15/5A 5 VA 0,5S	5	15	1	36	ITT10-3-05-0015
	TTI-A 20/5A 5 VA 0,5S	5	20	1	36	ITT10-3-05-0020
	TTI-A 25/5A 5 VA 0,5S	5	25	1	36	ITT10-3-05-0025
	TTI-A 30/5A 5 VA 0,5S	5	30	1	36	ITT10-3-05-0030
	TTI-A 40/5A 5 VA 0,5S	5	40	1	36	ITT10-3-05-0040
	TTI-A 50/5A 5 VA 0,5S	5	50	1	36	ITT10-3-05-0050
	TTI-A 60/5A 5 VA 0,5S	5	60	1	36	ITT10-3-05-0060
	TTI-A 75/5A 5 VA 0,5S	5	75	1	36	ITT10-3-05-0075
	TTI-A 80/5A 5 VA 0,5S	5	80	1	36	ITT10-3-05-0080
	TTI-A 100/5A 5 VA 0,5S	5	100	1	36	ITT10-3-05-0100
	TTI-A 120/5A 5 VA 0,5S	5	120	1	36	ITT10-3-05-0120
	TTI-A 125/5A 5 VA 0,5S	5	125	1	36	ITT10-3-05-0125
	TTI-A 150/5A 5 VA 0,5S	5	150	1	36	ITT10-3-05-0150
	TTI-A 200/5A 5 VA 0,5S	5	200	1	36	ITT10-3-05-0200
	TTI-A 250/5A 5 VA 0,5S	5	250	1	36	ITT10-3-05-0250
	TTI-30 200/5A 5 VA 0,5S	5	200	1	40	ITT20-3-05-0200
	TTI-30 250/5A 5 VA 0,5S	5	250	1	40	ITT20-3-05-0250
	TTI-30 300/5A 5 VA 0,5S	5	300	1	40	ITT20-3-05-0300
	TTI-40 400/5A 5 VA 0,5S	5	400	1	40	ITT30-3-05-0400
	TTI-40 500/5A 5 VA 0,5S	5	500	1	40	ITT30-3-05-0500
	TTI-40 600/5A 5 VA 0,5S	5	600	1	40	ITT30-3-05-0600

Technical Features

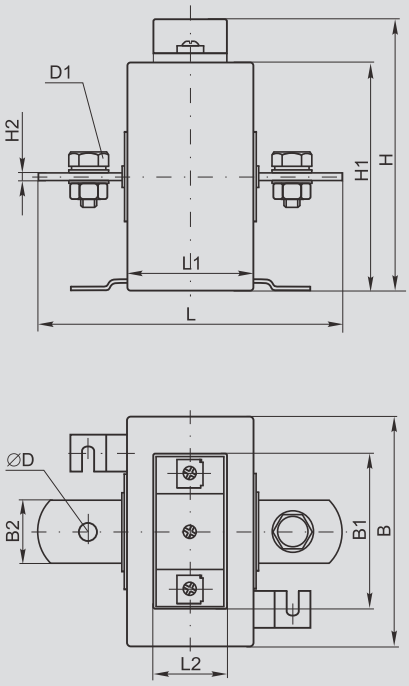
Feature	Transformer modifications						
	TTI-A	TTI-30	TTI-40	TTI-60	TTI-85	TTI-100	TTI-125
Rated voltage U_n, kV				0,66			
Max. operating voltage, kV				0,72			
Rated frequency f_n, Hz				50			
Rated primary current I_{1n}, A	5; 10; 15; 20; 25; 30; 40; 50; 60; 75; 80; 100; 120; 125; 150; 200; 250; 300; 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
Rated secondary operating current I_{2nom}, A	5	5	5	5	5	5	5
Rated secondary load S_{2n}, with power factor cosφ=0,8 V • A	5; 10	5; 10	5; 10	10; 15	15	15	15
Accuracy class				0,5; 0,5S			
Rated transformer ratio n_n determined using a formula				$n_n=I_{1n}/I_{2n}$			
Secondary coil security factor K_{Bn}				5			
Test one-minute voltage of 50 Hz, kV				3			
Max. weight, 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 winding max. error limits

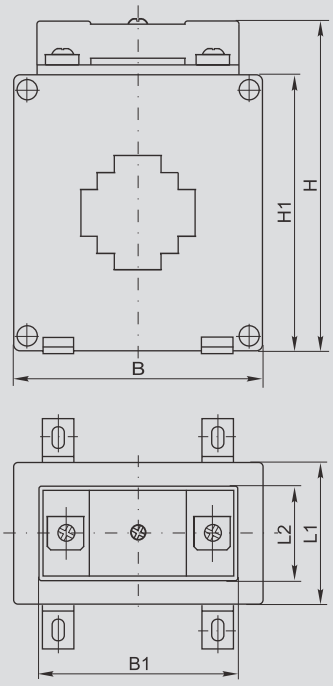
Accuracy class	Primary current, % of rated value	Max. error limit current, %	angular, min		Load limit, % of rated value
0,5S	1	± 1,5	± 90’	± 2,7 grad	
	5	± 0,75	± 45’	± 1,35 grad	25÷100
	20	± 0,5	± 30’	± 0,9 grad	
	100–120	± 0,5	± 30’	± 0,9 grad	
0,5	5	± 1,5	± 90’	± 2,7 grad	
	20	± 0,75	± 45’	± 1,35 grad	25÷100
	100–120	± 0,5	± 30’	± 0,9 grad	

Overall and Installation Dimensions

TTI-A



TTI-30..125

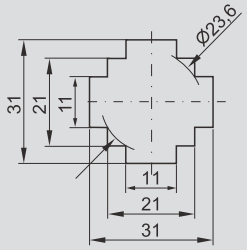


Type	Size, mm										
	B	B1	B2	H	H1	H2	L	L1	L2	D	D1
TTI-A from 5/5A to 300/5A	87	62	25	103	87	3	120	48	34	8	M8 × 16
TTI-A from 400/5A to 500/5A	87	62	26	103	87	6	118	48	34	13	M12 × 27
TTI-A from 600/5A to 1000/5A	87	62	26	103	87	12	118	48	34	13	M12 × 36
TTI-30 dim. 1*	75	62	–	98	82	–	–	42	34	–	–
TTI-30 dim. 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	–	–

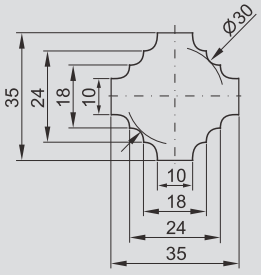
* TTI-30 200/5A 5VA, TTI-30 250/5A 5VA, TTI-30 300/5A 5VA, TTI-30 300/5A 10VA current transformers.
** TTI-30 150/5A 5 VA, TTI-30 200/5A 10VA, TTI-30 250/5A 10VA current transformers.

Bus and Cable Holes Dimensions

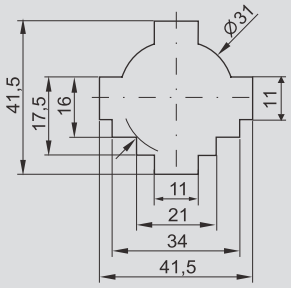
TTI-30 dim. 1



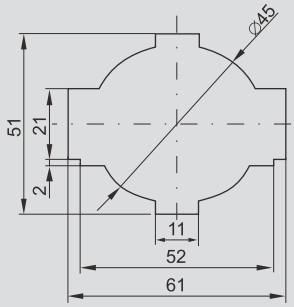
TTI-30 dim. 2



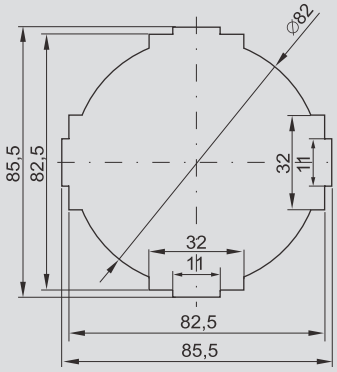
TTI-40



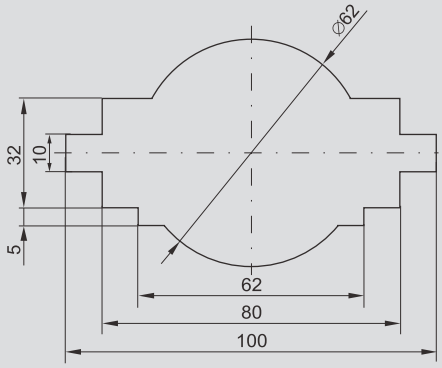
TTI-60



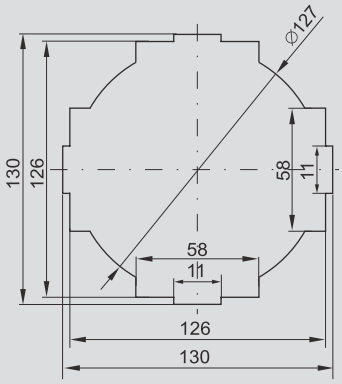
TTI-85



TTI-100

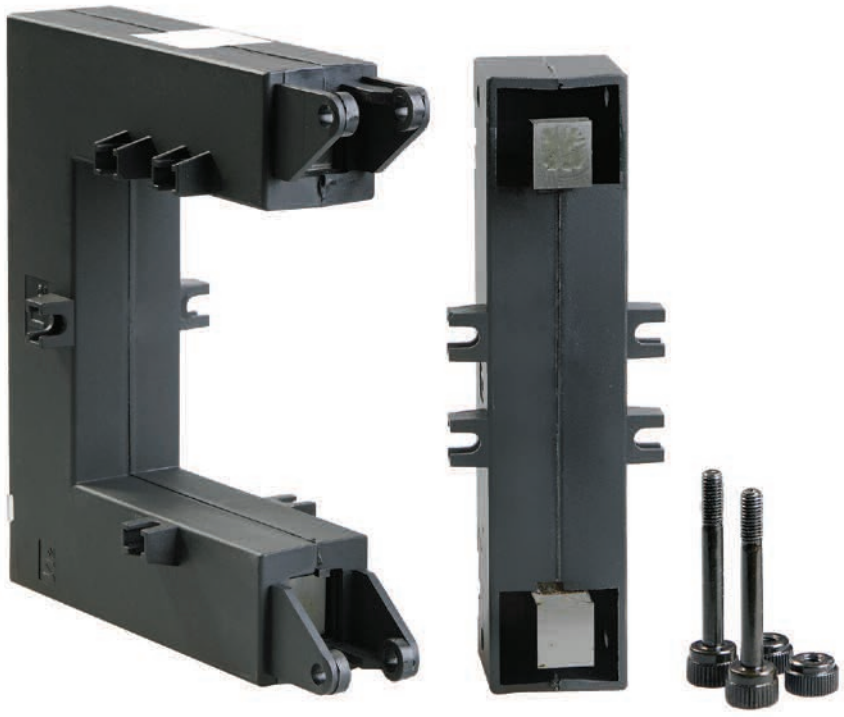


TTI-125



TRP current transformers

IEK TRP dismountable current transformers are intended for:
– Applying in electric power metering circuits for calculations with consumers;
– Applying in commercial electric power metering circuits;
– Transmitting metering information signals to measuring, protection and control devices.



TTI current transformers are introduced into the State register of measuring equipment under No. 38847-08. Establishment certificate of measuring equipment CN.C.34010.A No. 32979.

Advantages

- TRP casing is made of self-extinguishing plastic.
- Each transformer set includes a cover shielding the secondary terminals.
- Warranty period – 5 years.
- TRP transformers are completed with screws and nuts for conductors' fixation.

Design Features

Transformer body and core are dismountable. They are connected with the help of machine screws.

Current transformer sides corresponding to the primary winding's in and out are indicated as L1 and L2; secondary winding outs are indicated as I1 and I2.

Transformer casing is made of self-extinguishing plastic ensuring fire and electrical safety.

Secondary winding terminals are covered with a transparent shield ensuring exploitation safety. Besides, the shield can be sealed. It is especially important in the electric power metering circuits allowing excluding unauthorized access to the secondary winding terminals.

Selection Guide

Rated current, A					
250		•	•		
300	•	•	•		
400	•	•	•		
500		•	•	•	
600		•	•	•	
750		•	•	•	
800		•	•	•	
1000		•	•	•	•
1200				•	•
1250				•	•
1500				•	•
2000					•
2500					•
3000					•
4000					•
5000					•
Accuracy class	0.5	0.5	0.5	0.5	0.5
Rated secondary load, VA	1,5-2,5	1,0-5,0	1,0-5,0	2,5-8,0	10,0-20,0
Transformer type	**TRP-23**	**TRP-58**	**TRP-88**	**TRP-812**	**TRP-816**

Range

Transformer type	Name	Rated secondary load, VA	Rated primary transformer current, A	Multiple package amount, pcs	Product ID
	TRP-23 current transformer 300/5 1,5VA, acc. class 0.5	1,5	300	20	ITT23-2-D015-0300
	TRP-23 current transformer 400/5 2,5VA, acc. class 0.5	2,5	400	20	ITT23-2-D025-0400
	TRP-58 current transformer 250/5 1VA, acc. class 0.5	1	250	10	ITT58-2-D015-0250
	TRP-58 current transformer 300/5 1,5VA, acc. class 0.5	1,5	300	10	ITT58-2-D015-0300
	TRP-58 current transformer 500/5 1,5VA, acc. class 0.5	1,5	400	10	ITT58-2-D015-0400
	TRP-58 current transformer 500/5 2,5VA, acc. class 0.5	2,5	500	10	ITT58-2-D025-0500
	TRP-58 current transformer 600/5 2,5VA, acc. class 0.5	2,5	600	10	ITT58-2-D025-0600
	TRP-88 current transformer 1000/5 5VA, acc. class 0.5	5	1000	10	ITT88-2-D050-1000
	TRP-88 current transformer 400/5 1,5VA, acc. class 0.5	1,5	400	10	ITT88-2-D015-0400
	TRP-88 current transformer 500/5 1,5VA, acc. class 0.5	1,5	500	10	ITT88-2-D015-0500
	TRP-88 current transformer 600/5 2,5VA, acc. class 0.5	2,5	600	10	ITT88-2-D025-0600
	TRP-88 current transformer 800/5 2,5VA, acc. class 0.5	2,5	800	10	ITT88-2-D025-0800
	TRP-812 current transformer 1000/5 5VA, acc. class 0.5	5	1000	10	ITT812-2-D050-1000
	TRP-812 current transformer 1200/5 6VA, acc. class 0.5	6	1200	10	ITT812-2-D060-1200
	TRP-812 current transformer 1250/5 7,5VA, acc. class 0.5	7,5	1250	10	ITT812-2-D075-1250
	TRP-812 current transformer 1500/5 7,5VA, acc. class 0.5	7,5	1500	10	ITT812-2-D075-1500
	TRP-816 current transformer 1000/5 10VA, acc. class 0.5	10	1000	5	ITT816-2-D100-1000
	TRP-816 current transformer 1500/5 15VA, acc. class 0.5	15	1500	5	ITT816-2-D150-1500
	TRP-816 current transformer 2000/5 15VA, acc. class 0.5	15	2000	5	ITT816-2-D150-2000
	TRP-816 current transformer 2500/5 15VA, acc. class 0.5	15	2500	5	ITT816-2-D150-2500
	TRP-816 current transformer 3000/5 20VA, acc. class 0.5	20	3000	5	ITT816-2-D200-3000

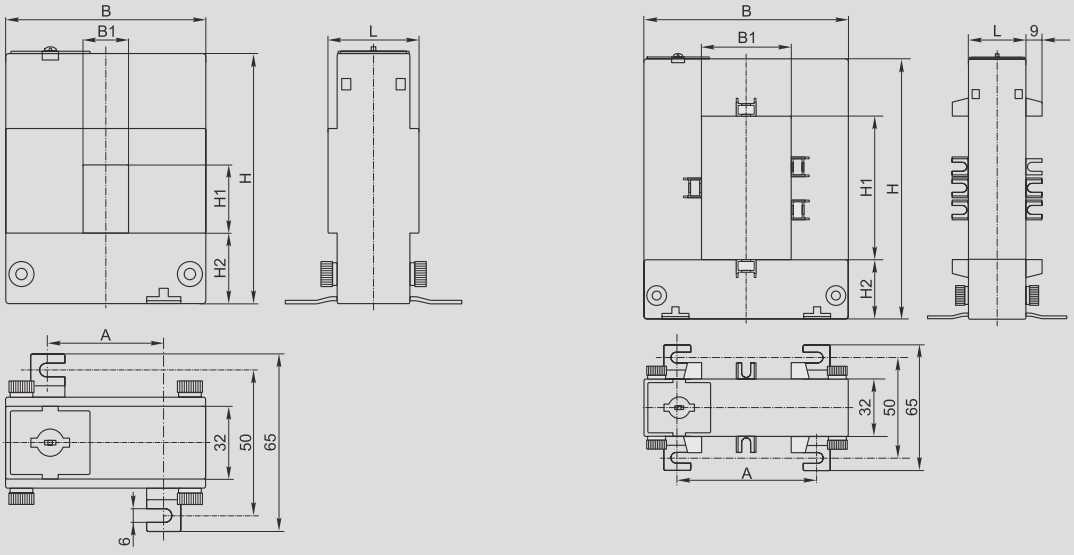
Technical Features

Feature	Transformer modifications				
	TRP-23	TRP-58	TRP-88	TRP-812	TRP-816
Rated voltage U_n, kV			0,66		
Max. operating voltage, kV			0,72		
Rated frequency f_n, Hz			50		
Rated primary current I_{1n}, A	300, 400	250, 300, 400, 500, 600	400, 500, 600, 800, 1000	1000, 1200, 1250, 1500	1500, 2000, 2500, 3000
Rated secondary operating current I_{2n}, A			5		
Rated secondary load S_{2nom}, with power factor cos φ=0,8 V • A			1,5-2,5		
Accuracy class			0,5		
Secondary coil security factor K_{Bn}			5		
Test one-minute voltage of 50 Hz, kV			3		
Max. weight, kg	0,75	0,9	1,05	1,25	4,3

Secondary coil max. error limits

Accuracy class	Primary current, % of rated value	Max. error limit current, %	angular, min		Load limit, % of rated value
0,5	5	± 1,5	± 90’	± 2,7 grad	
	20	± 0,75	± 45’	± 1,35 grad	25÷100
	100–120	± 0,5	± 30’	± 0,9 grad	

Overall Dimensions



Type	Size, mm						
	A, mm	B, mm	B1, mm	H, mm	H1, mm	H2, mm	L, mm
TRP-23	51	89	20	111	30	32	40
TRP-58	78	114	50	145	80	33	32
TRP-88	108	144	80	145	80	33	32
TRP-812	108	145	80	185	120	33	32
TRP-816	120	184	80	245	160	38	52

TOP-0.66 and TShP-0.66 current transformers

The TOP-0.66 and TShP-0.66 current transformers are designed for:
– use in electric energy metering circuits for accounts with the customers;
– use in electric energy revenue metering circuits;
– output of a signal for measurement instruments or protection and control devices.

Advantages

- The cores of all TOP-0.66 and TShP-0.66 transformers are made from special steel of transformer grade with increased content of silicon that enables extending of recalibration interval.
- The copper tinned bus of TOP-0.66 transformer allows for connection of copper and aluminum conductors.
- The enclosures of all TOP-0.66 and TShP-0.66 transformers are made from self-extinguishing plastic
- The recalibration interval is 12 years.
- Each transformer is completed with a cover for secondary terminals, fixtures for panel installation and bus fixing, color labels for phase indication.
- Small weight and size allow for considerable saving of place in a cabinet.

Selection guide

Rated current, A	W/o integrated bus	With integrated bus				
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						•
Accuracy class of transformer	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S	0,5; 0,5S
Rated burden	5	5	5	10	15	15
Maximum size of bus, mm	–	31	41,5	60	86	100
Maximum diameter of cable, mm	–	23,6	31	50	82	62
Type of transformer	**TOP-0.66**	**TShP-0.66 size 30**	**TShP-0.66 size 40**	**TShP-0.66 size 60**	**TShP-0.66 size 85**	**TShP-0.66 size 100**

Range

Type of transformer	Description	Rated burden, VA	Transformer rated primary current, A	Accuracy class	Qty in group packing, pcs.	Product ID
Support-type transformers in plastic enclosures						
	Current transformer TOP-0.66 5/5A 5 VA class 0.5 IEK	5	5	0,5	36	ITP10-2-05-0005
	Current transformer TOP-0.66 10/5A 5 VA class 0.5 IEK	5	10	0,5	36	ITP10-2-05-0010
	Current transformer TOP-0.66 15/5A 5 VA class 0.5 IEK	5	15	0,5	36	ITP10-2-05-0015
	Current transformer TOP-0.66 20/5A 5 VA class 0.5 IEK	5	20	0,5	36	ITP10-2-05-0020
	Current transformer TOP-0.66 25/5A 5 VA class 0.5 IEK	5	25	0,5	36	ITP10-2-05-0025
	Current transformer TOP-0.66 30/5A 5 VA class 0.5 IEK	5	30	0,5	36	ITP10-2-05-0030
	Current transformer TOP-0.66 40/5A 5 VA class 0.5 IEK	5	40	0,5	36	ITP10-2-05-0040
	Current transformer TOP-0.66 50/5A 5 VA class 0.5 IEK	5	50	0,5	36	ITP10-2-05-0050
	Current transformer TOP-0.66 60/5A 5 VA class 0.5 IEK	5	60	0,5	36	ITP10-2-05-0060
	Current transformer TOP-0.66 75/5A 5 VA class 0.5 IEK	5	75	0,5	36	ITP10-2-05-0075
	Current transformer TOP-0.66 80/5A 5 VA class 0.5 IEK	5	80	0,5	36	ITP10-2-05-0080
	Current transformer TOP-0.66 100/5A 5 VA class 0.5 IEK	5	100	0,5	36	ITP10-2-05-0100
	Current transformer TOP-0.66 120/5A 5 VA class 0.5 IEK	5	120	0,5	36	ITP10-2-05-0120
	Current transformer TOP-0.66 125/5A 5 VA class 0.5 IEK	5	125	0,5	36	ITP10-2-05-0125
	Current transformer TOP-0.66 150/5A 5 VA class 0.5 IEK	5	150	0,5	36	ITP10-2-05-0150
	Current transformer TOP-0.66 200/5A 5 VA class 0.5 IEK	5	200	0,5	36	ITP10-2-05-0200
	Current transformer TOP-0.66 5/5A 5 VA class 0.5S IEK	5	5	0,5S	36	ITP10-3-05-0005
	Current transformer TOP-0.66 10/5A 5 VA class 0.5S IEK	5	10	0,5S	36	ITP10-3-05-0010
	Current transformer TOP-0.66 15/5A 5 VA class 0.5S IEK	5	15	0,5S	36	ITP10-3-05-0015
	Current transformer TOP-0.66 20/5A 5 VA class 0.5S IEK	5	20	0,5S	36	ITP10-3-05-0020
	Current transformer TOP-0.66 25/5A 5 VA class 0.5S IEK	5	25	0,5S	36	ITP10-3-05-0025
	Current transformer TOP-0.66 30/5A 5 VA class 0.5S IEK	5	30	0,5S	36	ITP10-3-05-0030
	Current transformer TOP-0.66 40/5A 5 VA class 0.5S IEK	5	40	0,5S	36	ITP10-3-05-0040
	Current transformer TOP-0.66 50/5A 5 VA class 0.5S IEK	5	50	0,5S	36	ITP10-3-05-0050
	Current transformer TOP-0.66 60/5A 5 VA class 0.5S IEK	5	60	0,5S	36	ITP10-3-05-0060
	Current transformer TOP-0.66 75/5A 5 VA class 0.5S IEK	5	75	0,5S	36	ITP10-3-05-0075
	Current transformer TOP-0.66 80/5A 5 VA class 0.5S IEK	5	80	0,5S	36	ITP10-3-05-0080
	Current transformer TOP-0.66 100/5A 5 VA class 0.5S IEK	5	100	0,5S	36	ITP10-3-05-0100
	Current transformer TOP-0.66 120/5A 5 VA class 0.5S IEK	5	120	0,5S	36	ITP10-3-05-0120
	Current transformer TOP-0.66 125/5A 5 VA class 0.5S IEK	5	125	0,5S	36	ITP10-3-05-0125
	Current transformer TOP-0.66 150/5A 5 VA class 0.5S IEK	5	150	0,5S	36	ITP10-3-05-0150

Type of transformer	Description	Rated burden, VA	Transformer rated primary current, A	Accuracy class	Qty in group packing, pcs.	Product ID
Bus-type transformers in plastic enclosures						
	Current transformer TShP-0.66 200/5A 5 VA class 0.5S size 30 IEK	5	200	0,5S	40	ITB20-3-05-0200
	Current transformer TShP-0.66 250/5A 5 VA class 0.5S size 30 IEK	5	250	0,5S	40	ITB20-3-05-0250
	Current transformer TShP-0.66 300/5A 5 VA class 0.5S size 30 IEK	5	300	0,5S	40	ITB20-3-05-0300
	Current transformer TShP-0.66 400/5A 5 VA class 0.5 size 40 IEK	5	400	0,5	40	ITB30-2-05-0400
	Current transformer TShP-0.66 500/5A 5 VA class 0.5 size 40 IEK	5	500	0,5	40	ITB30-2-05-0500
	Current transformer TShP-0.66 600/5A 5 VA class 0.5 size 40 IEK	5	600	0,5	40	ITB30-2-05-0600
	Current transformer TShP-0.66 400/5A 5 VA class 0.5S size 40 IEK	5	400	0,5S	40	ITB30-3-05-0400
	Current transformer TShP-0.66 500/5A 5 VA class 0.5S size 40 IEK	5	500	0,5S	40	ITB30-3-05-0500
	Current transformer TShP-0.66 600/5A 5 VA class 0.5S size 40 IEK	5	600	0,5S	40	ITB30-3-05-0600
	Current transformer TShP-0.66 750/5A 10 VA class 0.5 size 60 IEK	10	750	0,5	32	ITB40-2-10-0750
	Current transformer TShP-0.66 800/5A 10 VA class 0.5 size 60 IEK	10	800	0,5	32	ITB40-2-10-0800
	Current transformer TShP-0.66 1000/5A 10 VA class 0.5 size 60 IEK	10	1000	0,5	32	ITB40-2-10-1000
	Current transformer TShP-0.66 750/5A 10 VA class 0.5S size 60 IEK	10	750	0,5S	32	ITB40-3-10-0750
	Current transformer TShP-0.66 800/5A 10 VA class 0.5S size 60 IEK	10	800	0,5S	32	ITB40-3-10-0800
	Current transformer TShP-0.66 1000/5A 15 VA class 0.5S size 60 IEK	15	1000	0,5S	32	ITB40-3-15-1000
	Current transformer TShP-0.66 1200/5A 15 VA class 0.5 size 85 IEK	15	1200	0,5	12	ITB50-2-15-1200
	Current transformer TShP-0.66 1500/5A 15 VA class 0.5 size 85 IEK	15	1500	0,5	12	ITB50-2-15-1500
	Current transformer TShP-0.66 1200/5A 15 VA class 0.5S size 85 IEK	15	1200	0,5S	12	ITB50-3-15-1200
	Current transformer TShP-0.66 2000/5A 15 VA class 0.5 size 100 IEK	15	2000	0,5	16	ITB60-2-15-2000
	Current transformer TShP-0.66 1500/5A 15 VA class 0.5S size 100 IEK	15	1500	0,5S	16	ITB60-3-15-1500
	Current transformer TShP-0.66 2000/5A 15 VA class 0.5S size 100 IEK	15	2000	0,5S	16	ITB60-3-15-2000

Technical characteristics

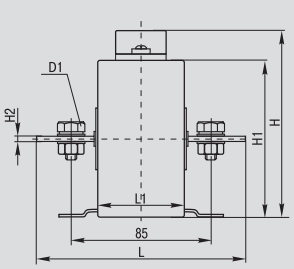
Parameter	TOP-0.66	TShP-0.66 size 30	TShP-0.66 size 40	TShP-0.66 size 60	TShP-0.66 size 85	TShP-0.66 size 100
Rated voltage, U_{nom}, kV			0,66			
Maximum operating voltage, kV			0,72			
Mains rated frequency, f_{nom}, Hz			50			
Transformer rated primary current, I_{1nom}, A	5; 10; 15; 20; 25; 30; 40; 50; 60; 75; 80; 100; 120; 125; 150; 200	150; 200; 250; 300	400; 500; 600	750; 800; 1000	1200	1500; 2000
Rated secondary operating current , I_{2nom}, A	5	5	5	5	5	5
Rated burden, S_{2nom}, with cos φ=0,8, V·A	5	5	5; 10	10	15	15
Accuracy class			0,5; 0,5S			
Rated transformation ratio n_{nom}, from the formula			$n_{nom}= I_{1nom}/I_{2nom}$			
Rated safety factor of secondary winding, S_{Fnom}			5			
1-minute test voltage at 50 Hz, V			3			
Weight, kg, not more	0,6	0,6	0,38	0,6	1,02	1,10; 1,16

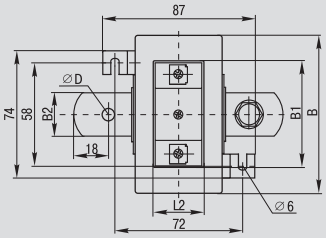
Permissible limits of errors in secondary windings for measurement and accounting

Accuracy class	Primary current, % of rated value	Permissible limit of error			Limit load, % of rated value	
		Current, %	Angular, min			
0,5S	1	± 1,5	± 90'	± 2,7 deg	25÷100	25÷100
	5	± 0,75	± 45'	± 1,35 deg		
	20	± 0,5	± 30'	± 0,9 deg		
	100–120	± 0,5	± 30'	± 0,9 deg		
0,5	5	± 1,5	± 90'	± 2,7 deg	25÷100	25÷100
	20	± 0,75	± 45'	± 1,35 deg		
	100–120	± 0,5	± 30'	± 0,9 deg		

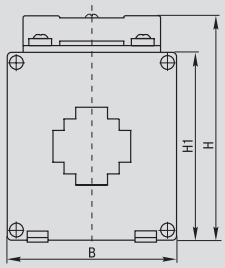
Overall dimensions

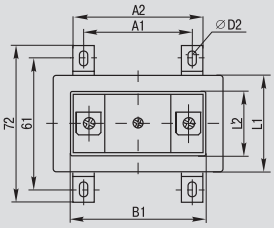
TOP





TShP

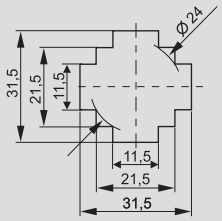




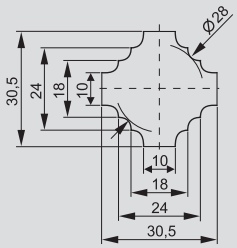
Version	Overall and installation dimensions, mm													
	A1	A2	B	B1	B2	H	H1	H2	L	L1	L2	D	D1	D2
TOP-0.66, from 5/5A to 300/5A	–	–	87	62	25	103	87	3	120	48	34	8	M8×16	–
TOP-0.66 400/5A, 500/5A	–	–	87	62	26	103	87	6	118	48	34	13	M12×27	–
TOP-0.66, from 600/5A to 1000/5A	–	–	87	62	26	103	87	12	118	48	34	13	M12×36	–
TShP-0.66 size 30	46	58	75	62	–	98	82	–	–	42	34	–	–	4,5
TShP-0.66 size 30(T)	46	58	84	62	–	103	86	–	–	48	34	–	–	4,5
TShP-0.66 size 40	46	58	75	62	–	98	82	–	–	42	34	–	–	4,5
TShP-0.66 size 60	41	54	101	62	–	127	111	–	–	42	34	–	–	4,5
TShP-0.66 size 85	72	84	128	62	–	157	145	–	–	42	34	–	–	6
TShP-0.66 size 100	81	93	144	62	–	154	138	–	–	42	34	–	–	4,5
TShP-0.66 size 125	130	142	191	62	–	220	205	–	–	42	34	–	–	6

Dimensions of openings for buses and cables

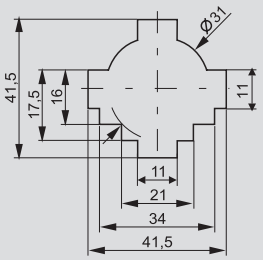
TShP size 30



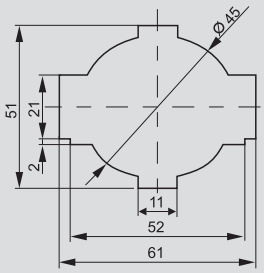
TShP size 30(T)



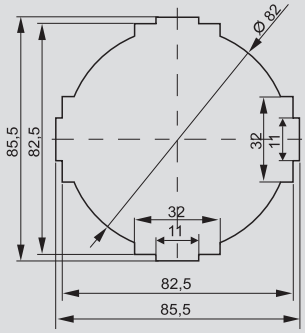
TShP size 40



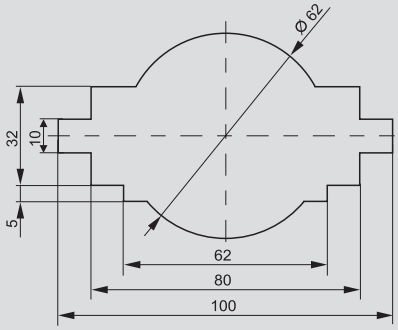
TShP size 60



TShP size 85



TShP size 100



Electric energy meters of STAR series

STAR 1 directly connected electric energy meters are intended for metering of active electric energy in single-phase AC networks of voltage 230 V and frequency 50 Hz.
STAR 3 electric energy meters, directly connected and connected via the current transformer, are intended for metering of active electric energy in AC networks of voltage 3Ч230/400 V and frequency 50 Hz.

Advantages

- The STAR meters in single-phase and three-phase versions are manufactured with four types of enclosure, for mounting on the DIN-rail and electric installation panel.
- Wide range of operating ambient temperatures, from -40°C to +70°C.
- The recalibration interval is 16 years.

Design features

Upper cover has two diagonally located sealable fixing points (for seals of state calibration authority and manufacturer).

Can be mounted on electric installation panel and DIN-rail.

The terminal cover has central fixing point with grooves for seal of electric power supplier.

Transparent upper and terminal covers allow for visual checks of correct connection.

The meter can be placed inside the standard Euro box.

The meters with electromechanical counting mechanism have a reverse stop to prevent reading step-down if current direction is reversed.

Meter versions Sh2 (with two shunts) have additional LED indicator on the faceplate that warns about imbalance of currents in neutral and phase conductors, thus allowing for preventing from unaccounted electric energy consumption without use of N conductor in the mains.

Designation structure

STAR 10X/1 XX-X(XX) X XX

- Type of current sensor:
  Sh (or w/o letter) – shunt
  Sh2 – two shunts
- Type of counting device:
  E – electronic (LCD);
  M – electromechanical
- Base and (maximum) current, A:
  5(60); 10(100)
- Enclosure size
- Installation type
  R – on TN35-7,5 rail GOST R IEC 60715;
  C – on vertical surface
- Accuracy class
- Enclosure model
- Meter name

STAR 30X/1 XX-X(XX) X X

- Type of connection:
  T – via current transformer;
  w/o letter – direct connection
- Type of counting device:
  E – electronic (LCD);
  M – electromechanical
- Base and (maximum) current, A:
  5(60); 10(100).
- Enclosure size
- Installation type
  R – on TN35-7,5 rail GOST R IEC 60715;
  C – on vertical surface
- Accuracy class
- Enclosure model
- Meter name

Range

	Description	Base current, A	Maximum current, A	Accuracy class	Qty in group packing, pcs.	Product ID
Single-phase STAR 101 meters for DIN-rail						
	Electric energy meter 1-phase STAR 101/1 R1-5(60)M Sh2	5	60	1	20	CCE 1R1-1-01-2
	Electric energy meter 1-phase STAR 101/1 R1-5(60)M	5	60	1	20	CCE 1R1-1-01-1
	Electric energy meter 1-phase STAR 101/1 R1-5(60)E	5	60	1	20	CCE 1R1-1-02-1
	Electric energy meter 1-phase STAR 101/1 R1-5(60)E Sh2	5	60	1	20	CCE 1R1-1-02-2
Three-phase STAR 301 meters for DIN-rail						
	Electric energy meter 3-phase STAR 301/1 R2-5(60)M	5	60	1	12	CCE 3R1-1-01-1
	Electric energy meter 3-phase STAR 301/1 R2-10(100)M	10	100	1	12	CCE 3R1-2-01-1
	Electric energy meter 3-phase STAR 301/1 R2-5(60)E	5	60	1	12	CCE 3R1-1-02-1
	Electric energy meter 3-phase STAR 301/1 R2-10(100)E	10	100	1	12	CCE 3R1-2-02-1
Single-phase STAR 102 meters for mounting panel						
	Electric energy meter 1-phase STAR 102/1 C3-5(60)M	5	60	1	24	CCE 1C1-1-01-1
	Electric energy meter 1-phase STAR 102/1 C3-10(100)M	10	100	1	24	CCE 1C1-2-01-1
	Electric energy meter 1-phase STAR 102/1 C3-5(60)E	5	60	1	24	CCE 1C1-1-02-1
	Electric energy meter 1-phase STAR 102/1 C3-10(100)E	10	100	1	24	CCE 1C1-2-02-1
Three-phase STAR 302 meters for mounting panel						
	Electric energy meter 3-phase STAR 302/1 C4-5(60)M	5	60	1	4	CCE 3C1-1-01-1
	Electric energy meter 3-phase STAR 302/1 C4-10(100)M	10	100	1	4	CCE 3C1-2-01-1
	Electric energy meter 3-phase STAR 302/1 C4-5(7,5)M T	5	7,5	1	4	CCE 3C1-3-01-3
	Electric energy meter 3-phase STAR 302/1 C4-5(60)E	5	60	1	4	CCE 3C1-1-02-1
	Electric energy meter 3-phase STAR 302/1 C4-10(100)E	10	100	1	4	CCE 3C1-2-02-1
	Electric energy meter 3-phase STAR 302/1 C4-5(7,5)E T	5	7,5	1	4	CCE 3C1-3-02-3

Technical characteristics

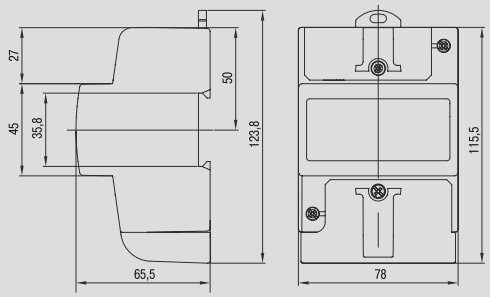
Parameter	Value
Accuracy class	1
No. of tariffs	1
No. of phases	1 or 3
Rated voltage, V	230±10% or 3x230/400±10%
Rated frequency, Hz	50
Time required to start normal work after applying of rated voltage, s, not more	5
Full power consumption in current circuits, VA	0,1
Full power consumption in voltage circuits, VA (W)	9 (0,8)
Meter constant, imp/kWh	400/1600
Time period for which information is stored in memory without power supply, years, at least	10
Relative air humidity	95% at 25 °C
Atmospheric pressure, kPa	85 to 105

Variable parameters

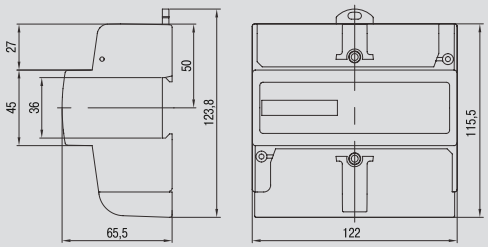
Version of STAR meter	Base current, A	Maximum current, A	Start current, mA	Meter constant, imp/kWh	Counting device	Weight, kg, not more
101/1 R1-5(60)M	5	60	10	–	electromechanical	0,5
101/1 R1-5(60)M Ш2						
101/1 R1-5(60)Э					electronic	
101/1 R1-5(60)Э Ш2						
102/1 C3-5(60)M					electromechanical	0,7
102/1 C3-10(100)M	10	100	20			
102/1 C3-5(60)Э	5	60	10		electronic	
102/1 C3-10(100)Э	10	100	20			
301/1 R2-5(60)M	5	60	20	1600	electromechanical	0,7
301/1 R2-10(100)M	10	100		400		
301/1 R2-5(60)Э	5	60		1600	electronic	
301/1 R2-10(100)Э	10	100		400		
302/1 C4-5(60)M	5	60		1600	electromechanical	1,3
302/1 C4-10(100)M	10	100		400		1,4
302/1 C4-5(7,5)M T	5	7,5	5	6400		1,5
302/1 C4-5(60)Э	5	60	20	1600	electronic	1,8
302/1 C4-10(100)Э	10	100	20	400		1,8
302/1 C4-5(7,5)Э T	5	7,5	5	6400		1,9

Overall dimensions

STAR 101



STAR 301



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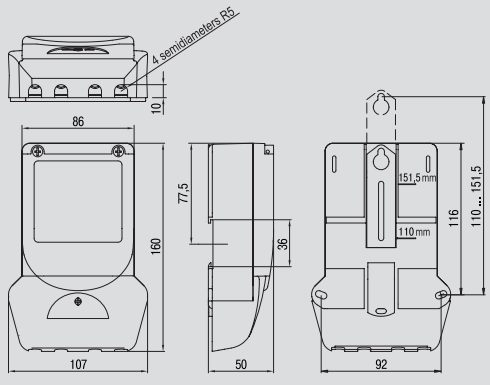

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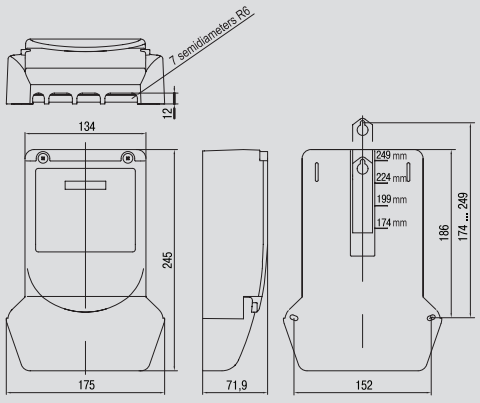


E47 electric measuring devices

These devices are applied in low-voltage complete devices are used in distribution electric circuits of residential, commercial and industrial objects.
E47 A-meters are analog electromagnetic devices designed for measuring current in AC networks.
E47 V-meters are analog electromagnetic devices designed for measuring voltage in AC networks.

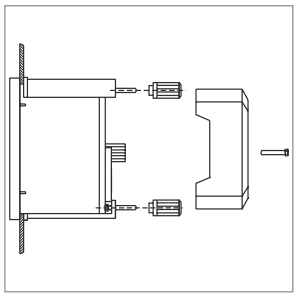
Electric measuring devices of E47 series correspond to the requirements of IEC 61010-1, IEC 61326.

E47 electric measuring devices are introduced into the State register of measuring equipment under No. 39231-08. Establishment certificate of measuring equipment CN.C.34.010A No. 33523.

Advantages

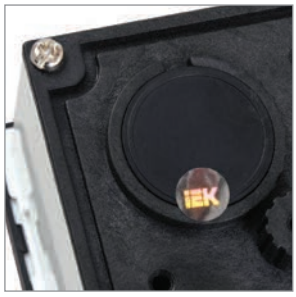
- All TTI current transformers take the primary check in accordance with the Order No 1081 of 30 November, 2009 of the Ministry of Industry and Trade of Russia.
- Wide scale range: A-meters – up to 3000 A, V-meters – up to 600 V.
- Accuracy class – 1.5.
- All A-meter and V-meter modifications are supplied in two dimensions: 72x72 and 96x96 mm.
- Board panel installation.
- Electrical safety.
- Inspection period – 2 years.

Design Features



Assembly parts: nuts, machine screws, plastic holders for installing onto the board panel included in the delivery set ensure easy mounting without applying additional tools.

Transparent protective cover shielding on external connecting terminals ensures electrical safety.



Body sealing prevents unauthorized access to the device's mechanism.

Devices are supplied with a mechanic tool adjusting the needle's zero position.

A-meters for measuring currents exceeding 50 A are connected to the measured circuit using a current transformer with the rated secondary operating current of 5 A.

Body is made of self-extinguishing plastic.

Metal shield protects the electromagnetic system from external magnetic fields.

Operating Principle

A-meters and V-meters are devices with an electromagnetic system. They consist of a round coil with movable and rigid cores inside. When current flows through the coil windings, it creates an electromagnetic field magnetizing both cores making the similar core poles repel and axis with a needle spin. For protection from the negative influence of external magnetic fields, the coil and both cores are covered with a metal shield.

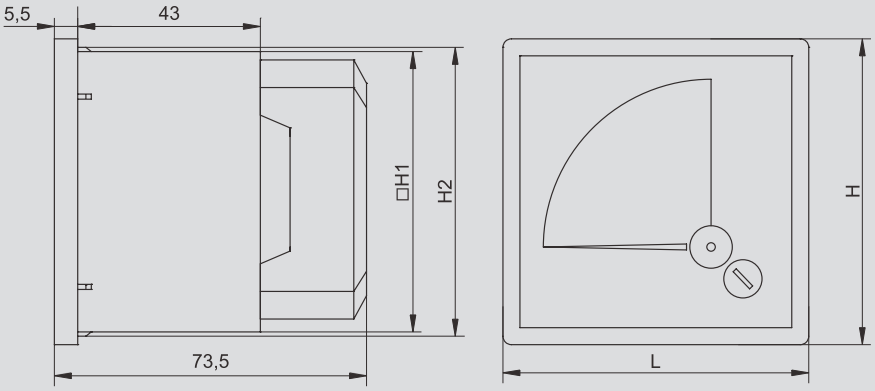
Range

	Type	Actuation method	Accuracy class	Rated operating voltage, V	Front panel size, mm	Multiple package amount, pcs	Product ID
A-meters							
	A-meter E47 10 A 72×72 mm	Direct	1,5	400	72×72	100	IPA10-6-0010-E
	A-meter E47 50 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0050-E
	A-meter E47 100/5 A 72×72 mm	Through the current transformer with secondary current of 5 A	1,5	400	72×72	100	IPA10-6-0100-E
	A-meter E47 150/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0150-E
	A-meter E47 200/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0200-E
	A-meter E47 300/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0300-E
	A-meter E47 400/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0400-E
	A-meter E47 600/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-0600-E
	A-meter E47 1000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-1000-E
	A-meter E47 1500/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-1500-E
	A-meter E47 2000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-2000-E
	A-meter E47 3000/5 A 72×72 mm		1,5	400	72×72	100	IPA10-6-3000-E
	A-meter E47 10 A 96×96 mm	Direct	1,5	400	96×96	60	IPA20-6-0010-E
	A-meter E47 50 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0050-E
	A-meter E47 100/5 A 96×96 mm	Through the current transformer with secondary current of 5 A	1,5	400	96×96	60	IPA20-6-0100-E
	A-meter E47 150/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0150-E
	A-meter E47 200/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0200-E
	A-meter E47 300/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0300-E
	A-meter E47 400/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0400-E
	A-meter E47 600/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-0600-E
	A-meter E47 1000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-1000-E
	A-meter E47 1500/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-1500-E
	A-meter E47 2000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-2000-E
	A-meter E47 3000/5 A 96×96 mm		1,5	400	96×96	60	IPA20-6-3000-E
Voltmeters							
	V-meter E47 100 V 72×72 mm	Direct	1,5	600	72×72	100	IPV10-6-0100-E
	V-meter E47 300 V 72×72 mm		1,5	600	72×72	100	IPV10-6-0300-E
	V-meter E47 500 V 72×72 mm		1,5	600	72×72	100	IPV10-6-0500-E
	V-meter E47 600 V 72×72 mm		1,5	600	72×72	100	IPV10-6-0600-E
	V-meter E47 100 V 96×96 mm		1,5	600	96×96	60	IPV20-6-0100-E
	V-meter E47 300 V 96×96 mm		1,5	600	96×96	60	IPV20-6-0300-E
	V-meter E47 500 V 96×96 mm		1,5	600	96×96	60	IPV20-6-0500-E
	V-meter E47 600 V 96×96 mm		1,5	600	96×96	60	IPV20-6-0600-E

Technical Features

Feature	E47 A-meters	E47 V-meters
System	electromagnetic	electromagnetic
Data input	analog	analog
Scale range	0÷3000 A	0÷600 B
Installation method	onto the board panel	onto the board panel
Actuation method	≤ 50 A – direct, ≥ 100 A – through the current transformer with secondary current of 5A	direct
Accuracy class	1,5	1,5
Main error limit, %	±1,5	±1,5
Max. rated operating voltage	400 V	600 V
Possible long-term overloading (limited to 2 hours)	120% from the max. scale range	120% from the max. scale range
MTTF, not less than, hours	65 000	65 000
Average service life, not less than, years	8	8
Ambient temperature, °C	20±5	20±5
Measurable value frequency, Hz	45÷65	45÷65
Mounting plane position	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



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

SNI voltage stabilizer

SNI1 (single-phase) and SNI3 (three-phase) voltage stabilizers of IEK® brand are intended for maintaining stable single/three-phase supply voltage of residential and industrial loads of 220 V/3 x 220 V, 50 Hz at power fluctuations within wide range of value and period of time.

They are applied for stabilizing voltage when working with highly-sensitive equipment in industrial sites, medical institutions, telecommunication companies, low-rise building as well as housing and public utility sector. SNI voltage regulators provide for extending the service life of alarm systems, computer equipment etc.
Correspond to standards EN 55014-1, EN 55014-2, EN 60335-1, EN 61000-3-2.

These devices were awarded gold medal of the International Exhibition “Elektro-2009” in nomination “Best Electrical Equipment” for their high quality, reliability and exploitation ratings as well as efficient engineering solutions.

Advantages

- Stepless adjustment of output voltage.
- Improved accuracy of output voltage stabilizing: 220±3%.
- Modern schematic solutions.
- Six protection levels: against overload, short-circuit, overheating, hazardous overvoltage, hazardous undervoltage, surge voltages.
- High efficiency.
- No distortions in sinusoidal shape of output voltage curve.
- Good resistance against short-term overloads.
- Extra wide range of products: 0.5 to 150 kVA.
- Extended manufacturer's warranty period: 3 years from purchase date.
- Broad national network of service centers for IEK® voltage stabilizers.

Electromechanical voltage stabilizers of SHIFT series

The voltage stabilizer of SHIFT series perfectly suits to the task of steady power supply even under conditions of constantly lowered mains voltage, maintaining the voltage level with high accuracy (220 V ± 3%).

Power, kVA	Maximum input current, A	Type of circuit breaker	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
3,5	16	Circuit breaker C16 A 2P	16×25×37	13,2	IVS12-1-03500
5,5	25	Circuit breaker C25 A 2P	18×37×39	16,6	IVS12-1-05500
8	36	Circuit breaker C40 A 2P	18×37×39	20,55	IVS12-1-08000
10	45	Circuit breaker C50 A 2P	20×30×43	25,7	IVS12-1-10000

Electromechanical voltage stabilizers of SNI series

Electromechanical voltage stabilizers of SNI series are represented in the products' stock by widest range of power (0.5 to 150 kVA), where models list includes the stabilizers for different types of mains: single-phase (SNI1 series) and three-phase (SNI3 series).

SNI electromechanical voltage stabilizers have high energy efficiency performances, increased stabilization precision and good resistance against overloads. The advantages mentioned above are highly appreciated primarily by commercial customers.

	Power, kVA	Maximum input current, A	Fuse link/Circuit breaker,type	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
Single-phase, SNI1						
	0,5	2,25	Fuse link, In 5A	19,3×16,5×13	4,5	IVS10-1-00500
	1	4,5	Fuse link, I_n 7A	22,5×26×20	6,5	IVS10-1-01000
	1,5	6,75	Fuse link, I_n 8A	22,5×20×26	7,5	IVS10-1-01500
	2	9	Circuit breaker VA47-29 C10 2P	22,5×29×21,5	10	IVS10-1-02000
	3	13,5	Circuit breaker VA47-29 C16 2P	22,5×31×25	12,5	IVS10-1-03000
	5	22,5	Circuit breaker VA47-29 C20 2P	22×31,7×28,3	18	IVS10-1-05000
	7	32	Circuit breaker VA47-29 C32 2P	27,3×31,1×44	26	IVS10-1-07000
	10	45	Circuit breaker VA47-29 D50 2P	27,3×31,1×44	27	IVS10-1-10000
	15	67	Circuit breaker VA47-29 D63 2P	33×38,5×65	60	IVS10-1-15000
	20	80	Circuit breaker VA47-100 D100 2P	57,5×48×84	75	IVS10-1-20000
	30	125	Circuit breaker VA88-32 In 125A 3P	65×55×110	160	IVS10-1-30000
Three-phase, SNI3						
	3 (3×1)	3×4,5	Circuit breaker VA47-29 C8 3P	31,5×45,5×17,5	18	IVS10-3-03000
	6 (3×2)	3×9	Circuit breaker VA47-29 C10 3P	27,5×37,3×67	33,5	IVS10-3-06000
	7,5 (3×2,5)	3×10	Circuit breaker VA47-29 C10 3P	32×35,5×76,8	43,5	IVS10-3-07500
	15 (3×5)	3×22,5	Circuit breaker VA47-29 C20 3P	43,8×39×79,3	78	IVS10-3-15000
	20 (3×6,6)	3×32	Circuit breaker VA47-29 C32 3P	51×44×85	102	IVS10-3-20000
	30 (3×10)	3×45	Circuit breaker VA47-29 D50 3P	51×44×97,5	111	IVS10-3-30000
	45 (3×15)	3×68	Circuit breaker VA88-32 80A 3P	79×58,5×128	200	IVS10-3-45000
	60 (3×20)	3×90	Circuit breaker VA88-32 100A	79×58,5×139	220	IVS10-3-60000
	90 (3×30)	3 x150	Circuit breaker VA88-33 160A	54x109x70,5	270	IVS10-3-90000
	100 (3×33)	3x167	Circuit breaker VA88-33 160A	85x152x64	420	IVS10-3-100000
	150 (3×50)	3x250	Circuit breaker VA88-35 250A	100x170x720	550	IVS10-3-150000

Technical Features

Feature		SHIFT	SNI1	SNI3			
Rated output power P_n at input voltage of 200 V, kVA		3,5; 5,5; 8; 10	0,5; 1; 1,5; 2; 3; 5; 7; 10; 15; 20; 30	3; 6; 7,5; 15; 20; 30; 45; 60; 90		100; 150	
Operating input voltage range U_{in}, V		120÷250	160÷250	– phase: – line:	160÷250 280÷430	– – line:	 304÷456
Max. input voltage range, V		–	135÷275	– phase: – line:	135÷275 235÷475	– – line:	 256÷511
Output voltage U_{out}, V		220	220	– phase: – line:	220 380	– phase: – line:	220 380
Output voltage maintenance accuracy in operating input voltage range, %		± 3	± 3	± 3		± 3	
Tripping voltage from increased output voltage U_{max}, V		243±4	246	246 (for each phase voltage)		246 (for each phase voltage)	
Tripping voltage from decreased output voltage, U_{min}, V		188±4	184	184 (for each phase voltage)		184 (for each phase voltage)	
Thermal protection at increase of transformer temperature, °C		120±5	105	105		105	
Output voltage delay	standard	5 s	5 s	5 s		5 s	
	long	255 s	5 min	no		yes	
Bypass function		yes	no	no		yes	
Efficiency, %		≥ 90	≥ 90	≥ 90		≥ 90	
Response time, s		< 1 (for voltage range of ±10%)					
Ambient temperature range, °C		0÷+ 40	–5÷+ 40	–5÷+ 40		–5÷+ 40	
Degree of protection		IP20	IP20	IP20		IP20	
Climatic version and location category according to GOST 15150		UHL4	UHL4	UHL4		UHL4	

Delivery Package

SNI1
– stabilizer – 1 pcs.
– operation manual. Passport – 1 pcs.
– warranty card – 1 pcs.
– spare fuses (for models 0,5; 1; 1,5 kVA) – 2 pcs.
– spare autotransformer brush – 1 pcs.
– packaging – 1 pcs.

SNI3
– stabilizer – 1 pcs.
– operation manual. Passport – 1 pcs.
– warranty card – 1 pcs.
– spare autotransformer brushes – 1 pcs.
– packaging – 1 pcs.

SHIFT
– voltage stabilizer: 1 pc.
– operation manual, data sheet: 1 pc.
– warranty card: 1 pc.
– set of brackets for wall mounting: 1 pc.
– packing box: 1 pc.

SNR electronic voltage stabilizers

SNR electronic voltage stabilizers are intended for maintaining stable supply voltage of residential and industrial loads of 220 V/3 x 220 V, 50 Hz at power fluctuations within wide range of value and period of time.
Electronic voltage regulators are applied for stabilizing voltage when working with domestic and industrial equipment, commercial units, communication devices as well as complex supply systems of cottages, flats and offices. Single-phase electronic voltage regulators SNR1 correspond to the requirements of EN 55014-1, EN 55014-2, EN 60335-1, EN 61000-3-2.

These devices were awarded silver medal of the International Exhibition “Elektro-2011” in nomination “Best Electrical Equipment” for their high quality, reliability and exploitation ratings as well as efficient engineering solutions.

Advantages

- Strict correspondence of the rated power due to using high-power transformers and power electronic switches.
- Six protection degrees: from overload short circuit, overheating, dangerous overvoltage, dangerous undervoltage, surge overvoltages.
- High efficiency ≥ 95%.
- Wide input voltage range: 140÷270 V.
- High response speed – less than 20 ms.
- Preserving operating condition at short-term overloads up to 120%.
- No disturbing of the sinusoidal waveform.
- Contemporary design.
- Warranty period for stabilizers maintenance is 3 years since date of purchase (1 year for SIMPLE series).
- Expanded network of service centers throughout the country.

Relay voltage stabilizers of HOME series

Unique patented schematic solution and microprocessor-based control of new generation allow the voltage stabilizers of HOME series to ensure high-quality power supply for any home appliances. Good manufacturability along with affordable price ensure the highest demand on the market for the HOME stabilizers.

Power, kVA	Maximum input current, A	Type of fuse / circuit breaker	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
0,5	2,25	Fuse In 6 A	14×24×18	2,6	IVS20-1-00500
1	4,5	Fuse In 6 A	14×24×18	3,3	IVS20-1-01000
1,5	6,75	Fuse In 8 A	14×24×18	3,5	IVS20-1-01500
2	9	Circuit breaker 10 A 1P	16×29×20	5,7	IVS20-1-02000
3	13,5	Circuit breaker 16 A 2P	22×33×24	10,6	IVS20-1-03000
5	22,5	Circuit breaker 25 A 2P	21×36×27	15,4	IVS20-1-05000
8	36	Circuit breaker 40 A 2P	21×36×27	17,9	IVS20-1-08000
10	45	Circuit breaker 50 A 2P	22×39×30	24,2	IVS20-1-10000
12	54	Circuit breaker 63 A 2P	22×38×30	27,2	IVS20-1-12000

Relay voltage stabilizers of EXTENSIVE series

The voltage stabilizers of EXTENSIVE series are designed for the most extreme conditions of power supply mains.

They provide reliable protection for the electric equipment at big fluctuations of mains voltage from the normal level and are capable to suppress voltage surges quickly

Portable

Power, kVA	Maximum input current, A	Type of circuit breaker	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
5	22,5	Circuit breaker 25 A 2P	26×37×28	15,7	IVS23-1-05000
10	45	Circuit breaker 50 A 2P	29×43×35	24,2	IVS23-1-10000

Wall-mounted

3	13,5	Circuit breaker 16 A 2P	25×16×37	8,7	IVS28-1-03000
5	22,5	Circuit breaker 25 A 2P	37×18×39	14	IVS28-1-05000
8	36	Circuit breaker 40 A 2P	37×20×39	15,5	IVS28-1-08000
10	45	Circuit breaker 50 A 2P	30×20×43	20,5	IVS28-1-10000
12	54	Circuit breaker 63 A 2P	30×20×43	23,5	IVS28-1-12000

Relay voltage stabilizers of ECOLINE series

While being simple device, the ECOLINE voltage stabilizer is efficient and reliable in operation.
Due to utilized economical solutions, it offers cost efficiency not only at purchase but also during maintenance thereafter.
The operational reliability is proved by extended manufacturer's warranty period, which is 3 years from purchase date.

	Power, kVA	Maximum input current, A	Type of circuit breaker	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
Portable	5	18	Circuit breaker C25 2P	22×32×24	10,4	IVS26-1-05000
	10	36	Circuit breaker C50 2P	22×39×24	17,7	IVS26-1-10000
Wall-mounted	5	18	Circuit breaker C25 2P	25×37×15	11,2	IVS27-1-05000
	10	36	Circuit breaker C50 2P	28×40×18	21,7	IVS27-1-10000

Relay voltage stabilizers of SIMPLE series

Relay voltage stabilizers of SIMPLE series are designed to protect TV sets, home cinemas, computers, etc. as well as low-power household electronic devices from voltage fluctuations. The SIMPLE stabilizers are featured by compactness, simple design and convenient usage.

	Power, kVA	Maximum input current, A	Fuse	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
	0,35	1,2	Fuse In 6 A	27×15×8	1,5	IVS25-1-00350
	0,75	2,3	Fuse In 6 A	27×15×8	1,9	IVS25-1-00750
	1	3,4	Fuse In 8 A	27×15×8	2	IVS25-1-01000
	1,5	4,1	Fuse In 10 A	27×15×8	2,1	IVS25-1-01500

Relay voltage stabilizers of BOILER series

Electronic controls of gas heating equipment requires a stabilized supply voltage.
The innovative voltage stabilizer of BOILER series was designed as a result of thorough investigation of power supply parameters for gas boilers. Now, gas heating systems have reliable protection against failures!

	Power, kVA	Maximum input current, A	Fuse	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
	0,5	2,3	Fuse In 6 A	20×16×24	2,6	IVS24-1-00500

Technical characteristics

Parameter	HOME	ECOLINE	SIMPLE	EXTENSIVE	BOILER
Output power at input voltage 220 V, kVA	0,5; 1; 1,5; 2; 3; 5; 8; 10; 12	5; 10	0,35; 0,75; 1; 1,5	3; 5; 8; 10; 12	0,5
Operating input voltage range, V	140÷270	125÷270	125÷270	90÷280	110÷270
Output voltage, V	220	220	220	220	220
Precision of maintaining output voltage over operating input voltage range, %	8	8	8	8	6
Voltage level for tripping of protection against output overvoltage, V	243±4	246±4	246±4	243±4	243±4
Voltage level for tripping of protection against output undervoltage, V	188±4	184±4	184±4	188±4	188±4
Temperature level for tripping of thermal protection when transformer temperature rises, єС	120	110	85	120	120
Time delay for output voltage supply, s short	5	5	5	5	5
long (when "Delay Uout" button is pressed)	255	255	255	255	255
Efficiency, %	≥95	≥95	≥95	≥95	≥95
Bypass function	yes	yes	yes	yes	no
Response time, ms	≤20	≤20	≤20	≤20	≤20
Insulation strength, V	1500	1500	1500	1500	1500
Insulation resistance, Mohm	≥2	≥2	≥2	≥2	≥2
Range of operating temperatures, °С	0÷+40	0÷+40	0÷+40	0÷+40	0÷+40
Degree of protection	IP20	IP20	IP20	IP20	IP20

Delivery Package

– voltage stabilizer: 1 pc.
– operation manual, data sheet: 1 pc.
– warranty card: 1 pc.
– spare fuses (for models up to 2 kVA): 2 pcs.
– set of brackets for wall mounting (for wall-mounted models): 1 pc.
– packing box: 1 pc.

Voltage stabilizers of triac type

Triac voltage stabilizers are classified as type of autotransformer stabilizers with electronic control that ensure adjustment of output voltage with maximum speed of response for change and high precision of its maintaining. The adjustment is ensured by switching between the line autotransformer winding leads made by triacs that are controlled by the stabilizer electronic control module.
The triac voltage stabilizers are intended for maintaining stable voltage that supplies household and industrial loads when mains voltage fluctuates over wide limits of value and time.

Advantages

- The most up-to-date principle of switching based on use of powerful contactless electronic switches, triacs.
- No mechanical contact between switching parts and no wear of the stabilizer, thus ensuring high operational reliability and long lifetime.
- Perfectly noiseless work (can be used in living premises).
- Extra quick response to changes of input voltage: response speed 20 ms.
- Improved accuracy of stabilizing: 4% over range 140–250 V.
- High efficiency: >95%.
- Extended output voltage range: 90–270 V.
- No distortions of the output signal sinusoidal shape (switching between the autotransformer winding leads takes place at transition through "zero").
- Six protection levels: against overload, short-circuit, overheating, hazardous overvoltage, hazardous undervoltage, surge voltages.
- No distortions of sinusoidal shape.
- Warranty period for the stabilizer maintenance is 3 years since date of purchase.
- Broad national network of service centers for IEK® voltage stabilizers.

Triac voltage stabilizers of PRIME series

PRIME is the most advanced technologically series of voltage stabilizers designed by IEK®. Innovative schematic solution based on triacs ensures noiseless work of the voltage stabilizer and unsurpassed parameters of electric energy quality. Due to absence of mechanical wear in the PRIME voltage stabilizers, the manufacturer guarantees high operational reliability and long lifetime.

	Power, kVA	Maximum input current, A	Type of circuit breaker	Overall dimensions, cm (W×D×H)	Weight, kg	Product ID
Portable 	0,5	16	Fuse I_n 6 A and circuit breaker 3A 1P	24×14×18	3,4	IVS31-1-00500
	1	25	Fuse I_n 6 A and circuit breaker 6 A 1P	24×14×18	4,1	IVS31-1-01000
	1,5	36	Fuse I_n 8 A and circuit breaker 8 A 1P	29×16×20	4,8	IVS31-1-01500
	2	45	Fuse I_n 10 A and circuit breaker 10 A 1P	29×16×20	6,5	IVS31-1-02000
	3	13,5	Circuit breaker C16 A 3P	33×22×24	11,6	IVS31-1-03000
	5	22,5	Circuit breaker C25 A 3P	33×22×24	15	IVS31-1-05000
	8	36	Circuit breaker C40 A 3P	39×22×24	17,6	IVS31-1-08000
	10	45	Circuit breaker C50 A 3P	39×22×24	24	IVS31-1-10000
Wall-mounted 	5	22,5	Circuit breaker 25 A 3P	18×37×39	16,5	IVS32-1-05000
	10	45	Circuit breaker 50 A 3P	20×30×43	22	IVS32-1-10000

Technical characteristics

Parameter		Value
Output power at input voltage 220 V, kVA		0,5; 1; 1,5; 2; 3; 5; 8; 10
Operating input voltage range, V		90÷270
Output voltage, V		220
Precision of maintaining output voltage over input voltage range 140–250 V, %		4
Precision of maintaining output voltage over input voltage range 90–140 V and 250–270 V, %		7
Voltage level for tripping of protection against output overvoltage $U_{макс}$, V		243±4
Voltage level for tripping of protection against output undervoltage $U_{мин}$, V		188±4
Temperature level for tripping of thermal protection when transformer temperature rises , °C		120±5
Bypass function		yes
Time delay for output voltage supply, s	short	5±2
	long (when "Delay Uout" button is pressed)	255±2
Efficiency, %		≥97
Response time, ms		<50
Insulation strength, V		1500
Insulation resistance, Mohm		≥2
Range of operating temperatures, °C		0÷+40
Degree of protection		IP20