

OptiMat A Automatic air circuit breakers



OptiMat A automatic air circuit breakers are designed for carrying current in a normal mode, protection and infrequent operation of electrical circuits with rated current 630 to 4000 A. Due to their construction they handle huge capacities easily. The devices are provided with numerous types of protection, which allow to provide selectivity requirements in a protected circuit. Various locking equipment is designed to prevent unqualified actions and protect employees and maintenance staff.

Designation

OptiMat A 2500 N-D-MR8-B-ПД2-МР-ИШ-У3

1	Product range	OptiMat								
2	Configuration	A - automatic air circuit breakers								
3	Rated current In, A	630, 800, 1000, 1250, 1600, 2000, 2500, 3200, 4000								
4	Limiting breaking capacity, kA	N - 85 (to In 2000 A) N - 100 (In 2500 - 4000 A)								
5	Installation method design	F - fixed				D - retractable				
6	Type of a trip system (electronic microprocessor-based release)	MR7 - protection LSIG				MR8 - protection LSIG, electric current measurement, liquid crystal display				
7	Type of wiring	B - rear horizontal or vertical ¹⁾			C - combined		F - frontal			
8	Type of a motor drive	ПД1 - alternating and direct current 110 V				ПД2 - alternating and direct current 230 V				
9	Design	KC - basic configuration ²⁾	MP - basic configuration, minimum current tripping device		3 - basic configuration, built-in key		HP - basic configuration, second shunt trip		КГ - ready signal contact of the breaker for a contact closure	
10	Auxiliary goods	ПК - indication of the breaker position in the chassis				ИШ - safety shutters				
11	Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150	U3								

¹⁾ For breakers 2000 A of fixed and retractable modifications only rear vertical, frontal and combined busbar clamping are available. For breakers 4000A of fixed and retractable modifications only rear vertical busbar clamping is available.

²⁾ Basic configuration includes:
 - shunt trip 230 W AC/DC;
 - actuating coil 230 W AC/DC;
 - auxiliary contacts (6a+6b);
 - cycles counter;
 - interphase barriers.

The references mentioned in the chart can be changed. If you can't find the required references on the site, contact the KEAZ technical support.

Batch effectiveness

The conducting elements are made from pure electrotechnical copper which allows to reach high current conductivity, economy and also long-lived exploitation.



Availability of different lockings (locking of the breaker position in the chassis, locking preventing closing, safety shutters) to provide safety of the the employees and the maintenance personnel.

Use of special alloys on the base of silver to make the contact group, ensured to reach high wear resistance and provide more than 10000 cycles of electrical communication.



Data capability under Modbus protocol to use the system of dispatching control.

Modular construction provides simple and quick mounting.



Warranty 5 years. Each unit undergoes multi-stage quality control from assembling to the finished goods warehouse..

Ways of delivery and mounting of the main terminals



Frontal clamping



Rear horizontal busbar clamping




Rear vertical busbar clamping



Rear vertical and horizontal busbar clamping

* For breakers 2000 A of fixed and retractable modifications only rear vertical, frontal and combined busbar clamping are available. For breakers 4000 A of fixed and retractable modifications only rear vertical busbar clamping is available.

Selection guide

Type	OptiMat A 1 dimension							OptiMat A 2 dimension			
Physical appearance											
Standards	GOST 50030.2										
Number of poles	3, 4										
Electrotechnical characteristics											
Rated current In, A		630	800	1000	1250	1600	2000	2500	3200	4000	
Rated frequency, Hz		50, 60									
Application category		B									
Type of current		AC									
Rated operating voltage Ue, V		690									
Auxiliary (free) contacts		63+6p									
Manual	Control buttons	yes									
Electrical	Motor drive	yes/no									
Limiting switching capacity of the alternating current Icu, kA		85					100				
Trip unit type		no trip units/electrical									
Trip unit model		MR7/ MR8									
Assembly characteristics											
Fixed design	Rear connection	vertical pin type	yes								
		horizontal pin type	yes				no	yes		no	
	Front connection	yes								no	
	Combined connection		yes							no	
Retractable design	Rear connection	vertical pin type	yes								
		horizontal pin type	yes				no	yes		no	
	Front connection	yes								no	
	Combined connection		yes							no	
Performance characteristics											
Degree of protection (IP)		IP20									
Climatic modification and placement category		U3									
Application category according to the selectivity		non-selective/selective									
Additional features											
Indication of the breaker position in the chassis		yes/no									
Minimum-current tripping device ¹⁾		yes/no									
Second shunt trip unit ¹⁾		yes/no									
Ready indication contact for a contact closure		yes/no									
Indoor key-locking		yes/no									
Protective shutters		yes/no									

¹⁾ Minimum circuit tripping device and the second shunt trip are mutually exclusive positions.

Technical specifications

Range of automatic breakers				OptiMat A 1 dimension					OptiMat A 2 dimension			
General characteristics												
Rated operational voltage Ue, V				690								
Rated insulation voltage Ui, V				1000								
Rated sustainable pulsed voltage Uimp, kV				12								
Application category				B								
Suitability for isolation				available								
Number of poles				3, 4								
Control												
Manual		control buttons	+									
Electrical		motor drive	+									
Design			630	800	1000	1250	1600	2000	2500	3200	4000	
Fixed	Rear	vertical	+	+	+	+	+	+	+	+	+	
		horizontal	+	+	+	+	+	-	+	+	-	
	Frontal		+	+	+	+	+	+	+	+	-	
Combined			+	+	+	+	+	+	+	+	-	
Retractable	Rear	vertical	+	+	+	+	+	+	+	+	+	
		horizontal	+	+	+	+	+	-	+	+	-	
	Frontal		+	+	+	+	+	+	+	+	-	
Combined			+	+	+	+	+	+	+	+	-	
Main circuit rated and limiting parameters of the circuit breaker												
Rated current In, A			630	800	1000	1250	1600	2000	2500	3200	4000	
Rated frequency, Hz			50, 60									
Levels of a breaking capacity			N									
Rated ultimate breaking capacity		Ue 400 V	85					100				
		Ue 690 V	65					85				
Rated operating capacity Ics, % Icu			100									
Rated ultimate making capacity		Ue 400 V	143					220				
		Ue 690 V	187					220				
Overall wear resistance, cycles		with maintenance	50000									
		without maintenance	30000									
Electrical wear resistance, cycles		with maintenance	20000									
		without maintenance	10000									
Response time		opening time, ms	40									
		closing time, ms	80									
Devices of protection, indication and measurements												
Trip system			MR7/MR8									
Overload protection			+/-									
Short-circuit protection		with time-delay	+/-									
		non delay	+/-									
Ground fault protection			+/-									
Alternating current indication			-/+									
Device status indication			+/-									
Additional devices ¹⁾ (control and signalling system)												
Auxiliary contacts			6a+6b (as a set)									
Position indication of the breaker in the chassis			+/-									
Shunt trip			as a set ²⁾									
Actuating coil			as a set ³⁾									
Minimum current tripping device ⁴⁾			+/-									
Second shunt trip ⁴⁾			+/-									
Ready signal contact of the breaker for a contact closure			+/-									
Additional devices ¹⁾ (lockings, protection, indication)												
Indoor key-locking			+/-									
Safety shutters			+/-									
Mechanic interlocking for 2 or 3 OptiMat A ⁵⁾			+/-									
Interphase barriers			as a set									
Mechanic loop counter			as a set									
Overall dimensions and weight												
Overall dimen- tions W*H*D, mm	Fixed with frontal connection		3P	361x462x332					421x482x332		-	
	Retractable with frontal connection			353x499x431					413x512x433		-	
	Fixed with rear connection			361x310x335					421x310x335		421x335x391	
	Retractable with rear connection			353x432x435					413x432x435		413x432x492	
Weight, kg	Fixed with frontal connection		3P	52	52	52	54	54	55	65	76	-
	Retractable with frontal connection			75	75	75	78	78	79	92	107	-
	Fixed with rear connection			41	41	41	43	43	45	48	59	65
	Retractable with rear connection			65	65	65	68	68	70	75	90	98

¹⁾ Detailed description of accessories on page 194.



²⁾ The basic configuration includes OptiMat A-230AC/DC-UHL3 shunt trip.

³⁾ The basic configuration includes OptiMat A-230AC/DC-UHL3 actuating coil.

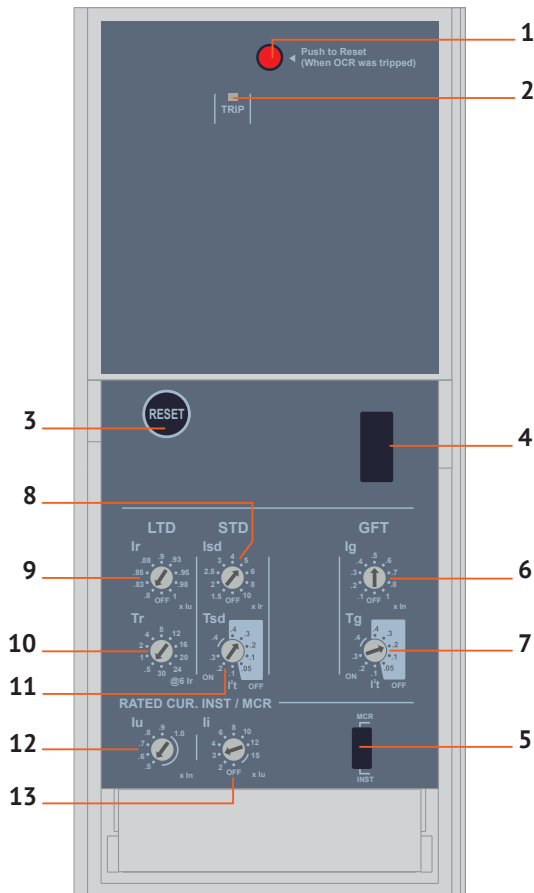
⁴⁾ The minimum current tripping device and the second shunt trip are mutually exclusive positions.

⁵⁾ The mechanical interlocking must be installed only on a retractable breaker modification.

Microprocessor trip system

Types of microprocessor trip systems		
	MR7	MR8
Physical appearance		
Current protection	1) from L overload 2) action-delayed from short circuits 3) non delay from a short circuit	
Measurement	absent	current
Power supply	external power supply (110 AC/DC, 220 AC/DC B DC 24-48 B), supply from current sensors	
Light-emitting activation indicators	overload warning	overload warning; overload; short circuit; single phase ground fault
Control buttons	reset	reset, menu, right, enter, self-test operation
Registration of protective trippings	absent	10 last notes (reason, current, phase, time)
Communication protocol	absent	Modbus/RS-485

Type MR7 basic



All necessary types of protection

AN OVERCHARGE PROTECTION:

- with a long-time delay.

SHORT CIRCUIT PROTECTION:

- instant with an independent time delay;
- additional functions of protection I_{2t} on/off (for protection with a short-time delay).

GROUND FAULT PROTECTION:

- an additional function of protection I_{2t} on/off.

Power from the control circuit of the breaker.

Meets the standard IEC60947-2.

1 Return button after an emergency actuation

2 Tripping indication:

RTI-overload. The light diode flickers when the current reaches 1,13 I_R

3 Reset button

4 Test connector

5 Choice of the protection characteristic I_{2t} (set by the manufacturer)

6 The I_g switch sets make current at a single phase ground fault in multiples of rated current (from 0,1 to 1,0 I_n)

7 T_g switch sets the independent or inverse time delay at a single-phase ground fault (from 0,05 to 0,4 s)

8 I_{sd} switch sets the make current in a short-circuit zone in multiples of the operating current (from 1,5 to 10 I_R)

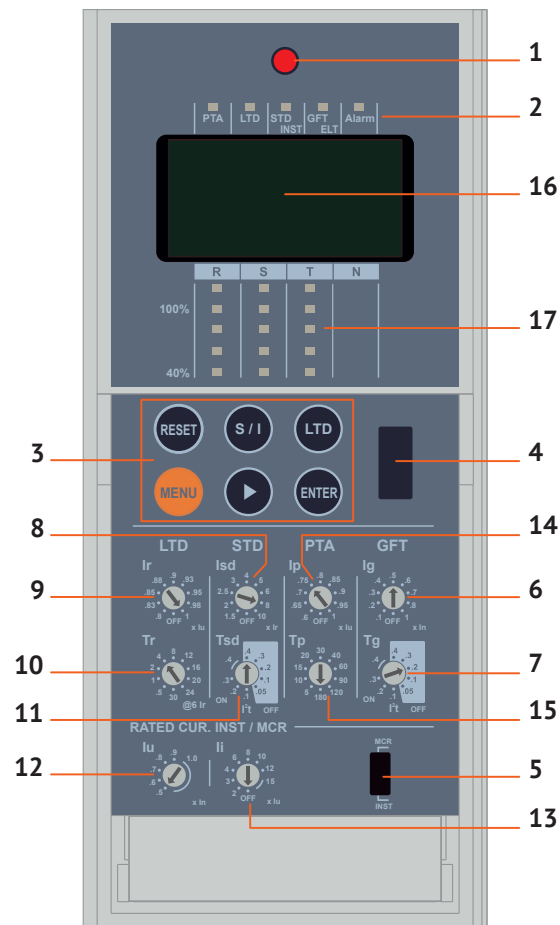
9, 12 I_r and I_u switches set the operating current of the breaker in multiples of the rated current from 0,4 to 1,0 I_n (I_R = I_r*I_u)

10 T_r switch sets time delay in an overload zone (from 0,5 to 30 s at the current load 6 I_R)

11 The T_{sd} switch sets short-time delay in a short-circuit zone (from 0,05 to 0,4 s)

13 The I_i switch sets the current of an instant activation in a short circuit zone in multiples of rated current (from 2 to 15 I_n).

Type MR 8 basic



All necessary types of protection

OVERLOAD PROTECTION:

- with a long-time delay.

SHORT CIRCUIT PROTECTION:

- instant with an independent time delay;
- additional functions of protection I2t on/off (for protection with a short-time delay).

GROUND FAULT PROTECTION:

- an additional function of protection I2t on/off.

OVERLOAD ALARM.

REGISTRATION OF PROTECTIVE TRIPPINGS:

the ability to record 10 last events (the reason of tripping, the value of current, the phase and the time of tripping).

THE FUNCTION OF PARAMETERS SETTING.

DATA TRANSFER INTERFACE:

Modbus/RS485. The measurement accuracy $\pm 1\%$.

Power from the control circuit of the breaker.

Meets the standard IEC60947-2.

1 A return button after an emergency actuation

2 Indication of activation:

PTA - a fault indication during overloads

LTD - actuation from overloads

STD/INST - actuation from a short-circuit

GFT/ELT - actuation from a ground short-circuit

Alarm - actuation of the microprocessor trip unit

3 Navigation button for the menu and self-testing

4 Connector to plug in a testing device

5 Choice of a safety feature I2t (set by the manufacturer)

6 Ig switch sets the make current at a single phase ground fault in multiples of the rated current (from 1 to 1,0 In)

7 Tg switch sets the independent or inverse time delay at a single-phase ground fault (from 0,05 to 0,4 s)

8 Isd switch sets the make current in a short-circuit zone in multiples of the operating current (from 1,5 to 10 IR)

9, 12 Ir and Iu switches set the operating current of the breaker in multiples of the rated current from 0,4 to 1,0 In ($IR = IR \cdot Iu$)

10 Tr switch sets the time delay in an overload zone (from 0,5 to 30 s at 6 IR current load)

11 Tsd switch sets the short time delay in a short-circuit zone (from 0,05 to 0,4 s)

13 Ii switch sets the current of an instant activation in a short circuit zone in multiples of the rated current (from 2 to 15 In)

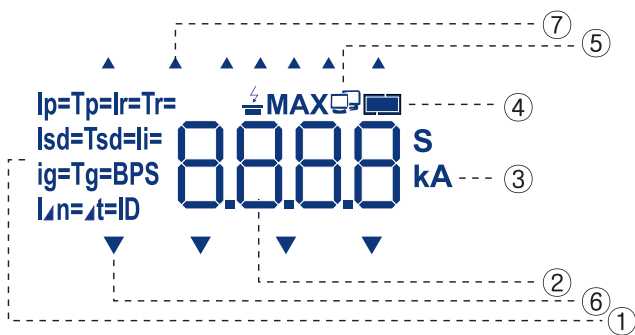
14 The Ip switch sets the make current of an overload alarm in multiples of Iu current

15 The Tp switch sets the turn-on alarm time from the moment of its emergence

16 Liquid crystal display

17 Light emitting indication scales of three phase currents

Liquid crystal display



1. It shows current and time settings. It renders values of the settings and events.
2. Display of numbers and symbols. It shows current, time and simple symbols.
3. Display of measurement units, values of time and current.
4. Accumulator charge control. 3,6-V battery is installed in the trip system (lithium). A battery state Indication. Flashing with the frequency of 0,5 s means that the battery is discharged, replacement is required.
5. The indication of connection, shows the connection speed, the settings of the address and the screen.
6. It displays the measured current, the phase and the level of load.
7. It displays the information about faults and commutations.

It is shown within 1 s after energizing the trip system, then it goes back to the measurement screen.

Image	Button	Description
		<ol style="list-style-type: none"> 1. The current in R\S\T\N phases is shown on the screen with 3 second intervals. 2. The current of every phase is shown on the display. (▶) The type of moving is from left to right. 3. The light emitting bar diagram shows the load of every phase on 40 ~ 110%.
	▶	<ol style="list-style-type: none"> 1. Push the button (▶) to pass to the next step. <ul style="list-style-type: none"> • The measurement screen: transition to current indications of the next phase. • The settings: review the description of the next setting. • The review of time: year, month → day, hour → minute, second. 2. After pushing during 3 ~ 4 seconds the current of the reviewed phase can be changed on the measurement screen. (Keep pushing for a short time then release).
	MENU	Use to check the values of options, review the journal of accidents/events, the settings of time and communication.
	S/I	<ol style="list-style-type: none"> 1. Use to protect with a short-time tripping delay/instantaneous protection, self-testing with short-time delay. 2. The switching off priority without time delay. 3. Instant switching off, when time delay is not set for the protection with short-time tripping delay/instantaneous protection.
	LTD	<ol style="list-style-type: none"> 1. Use for protection with a long tripping delay, self-testing. 2. Is not available if the long tripping delay is not set.
	ENTER	<ol style="list-style-type: none"> 1. Use to review descriptions of the events/malfunctions and date/time changes. 2. After transition to the description it's necessary to check and change the use of MENU button, push ENTER to go to the next step.
	RESET	<ol style="list-style-type: none"> 1. Reset to the original position, delete messages about events, accidents. 2. The combination of elements shown on the liquid crystal display and the tripping information from light diodes, will be on during 0,5 sec. 3. If the opening information with supply from the backup battery is displayed, the light diode indication will be switched off.

		Screen indications	Button	Description
LTD	current	$I_r = 2000 \text{ A}$	M ►	1. Push the menu button (M), while in the "Measurements" menu, once to get to the "Settings" menu. 2. The protection current value with a long-time delay is shown on the first screen. Push the tabs button to review other settings. 3. The top part of the screen: shows " $I_r =$ ".
	time	$T_r = 4.00 \text{ s}$	M ►x1 once	1. Push the tabs button once in the setting menu to check the time setting for protection with a long tripping delay. 2. The top part of the screen: shows " $T_r =$ ".
STD	current	$I_{sd} = 16.00 \text{ kA}$	M ►x2 times	1. Push the tabs button 2 times in the setting menu to check the protection current value with a short tripping delay 2. The top part of the screen: shows " $I_{sd} =$ ".
	time	$T_{sd} = 0.400 \text{ s}$	M ►x3 times	1. Push the tabs button 3 times in the setting menu to check the protection time values with a short tripping delay. If the reverse operate delay I^2t was chosen then displayed value will be more then the set one for 1 V in the last position. E. g. I^2t set delay is 0.400 s.: is displayed as 0,401 s. 2. The top part of the screen: shows " $T_{sd} =$ ".
INST	current	$I_i = 24.00 \text{ kA}$	M ►x4 times	1. Push the tabs button 4 times in the setting menu e to check the instant protection current value. 2. The top part of the screen: shows " $I_i =$ ".
PTA	current	$I_p = 1800 \text{ A}$	M ►x5 times	1. Push the tabs button 5 times in the setting to check the current setting for an overload warning (PTA). 2. The top part of the screen: shows " $I_p =$ ".
	time	$T_p = 20 \text{ s}$	M ►x6 times	1. Push the tabs button 6 times in the settings menu to check the time value for an overload warning (PTA). 2. The top part of the screen: shows " $T_p =$ ".
GFT	current	$I_g = 800 \text{ A}$	M ►x7 times	1. Push the tabs button 7 times in the setting menu to check the current value for the protection from a ground fault. 2. The top part of the screen: shows " $I_g =$ ".
	time	$T_g = 0.400 \text{ s}$	M ►x8 times	1. Push the tabs button 8 times in the setting menu to check time values for the protection from a ground fault. If a reverse tripping delay I^2t was chosen then the displayed value will be more then the set one for 1 V in the last position. E. g. I^2t set delay is 0.400 s.: is displayed as 0,401 s. 2. The top part of the screen: shows " $T_g =$ ".

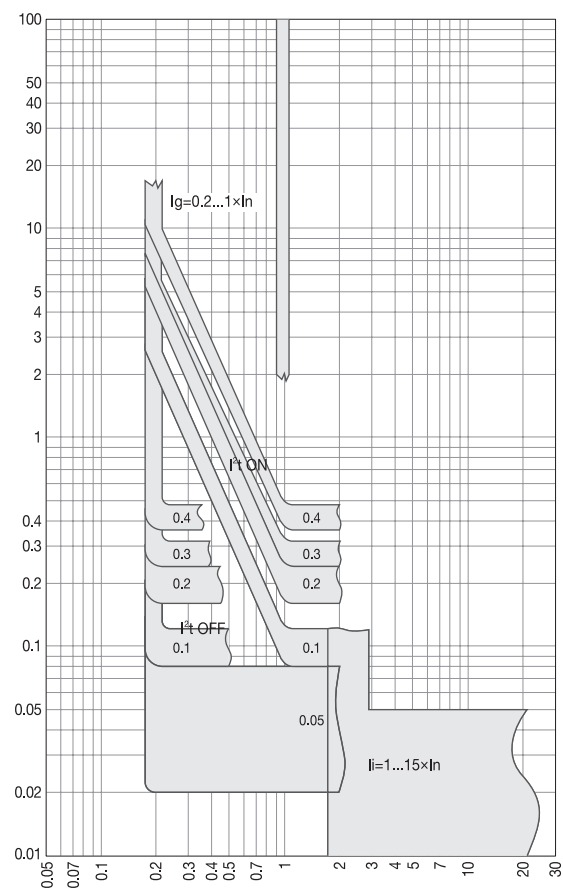
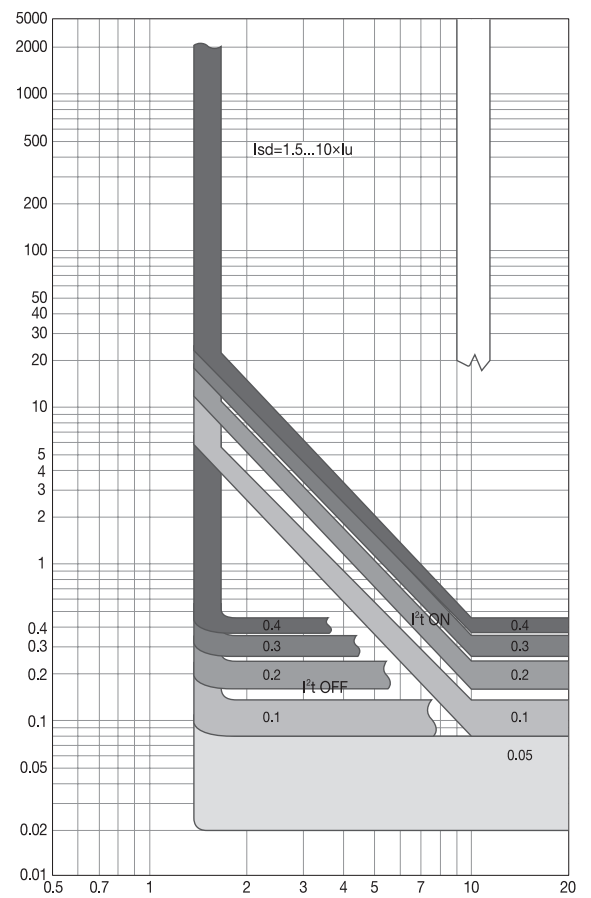
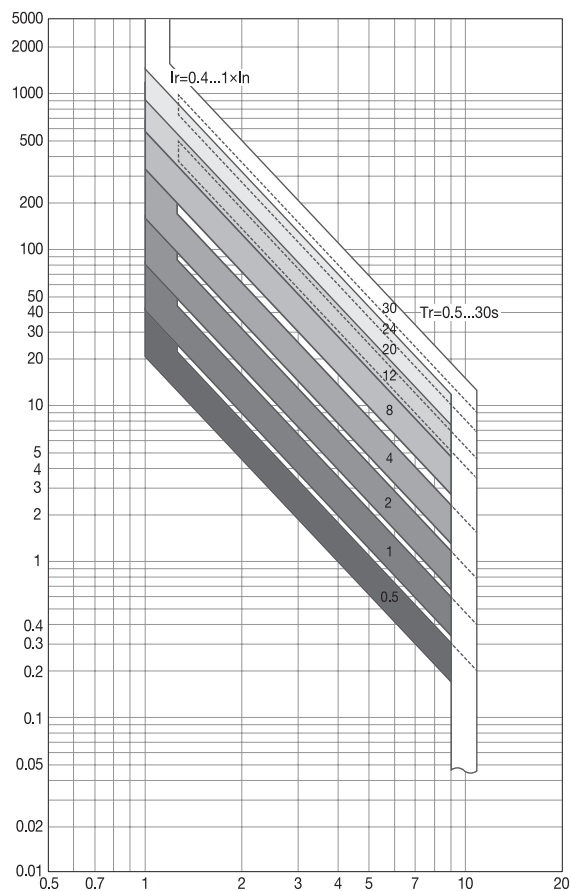
Protection settings for microprocessor trip units

Title of the parameter	Value of the parameter	Accuracy
Operating current value (IR) in multiples of the rated current of the breaker (IR/I_r) $IR=I_r \times I_u$	$I_r = 0,8; 0,83; 0,85; 0,88; 0,9; 0,93; 0,95; 0,98; 1,0$ $I_u = 0,5; 0,6; 0,7; 0,8; 0,9; 1$	1,05IR-1,2IR
Time values of tripping at 6 IR, s (T_r) current	0,5; 1; 2; 4; 8; 12; 16; 20; 24; 30	+15%
Operative current values in a short-circuit zone Isd in multiples of the operating current (I_{sd}/IR)	1,5; 2; 2,5; 3; 4; 5; 6; 8; 10	+15%
Tripping time values in a short-circuit zone, s (T_{sd})	0,05; 0,1; 0,2; 0,3; 0,4 (I^2t off) 0,1; 0,2; 0,3; 0,4 (I^2t on)	+0,03
Instant tripping current value (I_i), A (T_i not more than 0,05 s)	2; 4; 6; 8; 10; 12; 15	+15%
Overload alarm current value (I_p/I_u)	0,6; 0,65; 0,7; 0,75; 0,8; 0,85; 0,9; 0,95; 1,0	+15%
Time of the alarm activation value (T_p), s	5; 10; 15; 20; 30; 40; 60; 90; 120; 180	+15%
Make current with a single phase ground fault in multiples of (I_g/I_n) rated current (I_g/I_n)	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1	+20%
Time with single phase ground fault (T_g), s	0,05; 0,1; 0,2; 0,3; 0,4 (I^2t off) 0,1; 0,2; 0,3; 0,4 (I^2t on)	+0,03

Information transferred with the microprocessor trip system MR8

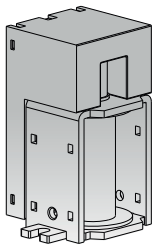
Supported protocol		Modbus RTU
Physical level		RS485
Ultimate speed of a data transferring		19200 bps
Maximum number of devices in parallel work		100
Settings information		
Ir	Make current of the breaker (set Ir and Iu switch in multiples of the rated current from 0,4In to 1,0In (IR= Ir*Iu))	
Tr	Protective characteristics depending on the operating time in an overload zone (from 0,5 to 30 s with 6IR current loading)	
Isd	Operating current in a short circuit zone (from 1,5IR to 10IR)	
Tsd	Short time delay in a short-circuit zone (from 0,05 to 0,4 s)	
Ii	Current of instant tripping in a short circuit zone in multiples of the rated current (from 2In to 15In)	
Ip	Current of the alarm activation in multiples of Iu current	
Tp	Time of the tan overload alarm activation from the moment it was set off	
Ig	Operative current due to a one phase ground fault in multiples of the nominal current (from 0,1In to 1,0In)	
Tg	Short-time delay due to a one-phase ground fault (from 0,05 to 0,4 s)	
Information about trippings of the breaker		
The current in phases during tripping		
Operative current at a one-phase ground fault		
Year, month, date, time (minutes and seconds) of the tripping		
Reason of tripping and phases with maximum current values at the tripping		
Maximum current in one of the phases at trippings		
Changed parameters		
Measured phase current values		

Time-current characteristics of the breaker



Mounting accessories

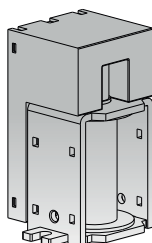
Shunt trip



The shunt trip is designed to open the automatic breaker remotely. It makes the automatic breaker open in any working conditions when the connection voltage stays within 0,75 Ue to 1,1 Ue. It is unified for OptiMat A breakers of all types. Install under the front panel of automatic breaker in its own cell. OptiMat A-230AC/DC-UHL3 shunt trip is a part of the basic configuration.

Title	Shunt trip OptiMat A-230AC/DC-UHL3	Shunt trip OptiMat A-110AC/DC-UHL3
Reference	217987	217986
Operating voltage, V	230 AC/DC	110 AC/DC
Range of operating voltage	(0,75-1,1) Ue	(0,75-1,1) Ue
Consumed power, VA	200	200
Working mode	short time (pulsed)	short time (pulsed)
Opening time, ms	40	40

Actuating coil

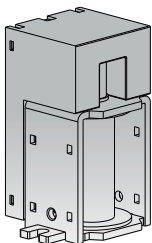


The actuating coil is designed to trip the breaker remotely. It is unified for switches OptiMat A of all types. Install under the front panel of the automatic breaker in its own cell. OptiMat A-230AC/DC-UHL3 actuating coil is a part of the basic configuration.

Title	Actuating coil OptiMat A-230AC/DC-UHL3	Actuating coil OptiMat A-110AC/DC-UHL3
Reference	217989	217988
Operating voltage, V	230 AC/DC	110 AC/DC
Range of operating voltage	(0,75-1,1) Ue	(0,75-1,1) Ue
Consumed power, VA	200	200
Working mode	short time (pulsed)	short time (pulsed)
Actuation time, ms	not more than 50	not more than 50

Minimum current tripping device

OptiMat A2500N-D-MR8-B-ПД2-**MP**-3-ИШ-ПК-У3

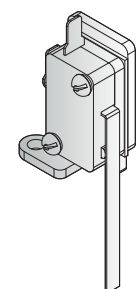


The minimum current tripping device is designed to open the automatic breaker if voltage is below enforceable standard. If the supply voltage is absent, it is impossible to close it automatically or manually. Minimum current tripping device causes openings of the automatic breaker at any working conditions when the supplying voltage decreases within 0,4 to 0,6 Ue. It's possible to close the breaker if you increase the supply from 0,75 to 1,1 Ue. It is unified for OptiMat A breakers of all types. Install under the front panel of the automatic breaker in its own cell.

Title	Trip unit of minimal voltage OptiMat A-230AC/DC-UHL3
Reference	217994
Operating voltage, V	230 AC
Range of operating voltage	(0,75-1,1) Ue
Consumed power, VA	200
Working mode	short time (pulsed)
Opening time, ms	not more than 50

Ready indication contact for a contact closure

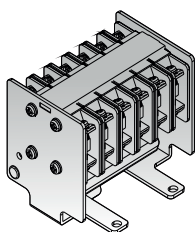
OptiMat A2500N-D-MR8-B-ПД2-**КГ**-3-ИШ-ПК-У3



The ready indication contact for a contact closure is designed to inform about the state of a spring (wind/unwind) which closes the automatic breaker. Install under the front panel of the automatic breaker in its own cell.

Title	Ready signal contact of the breaker for a contact closure OptiMat A630-4000-UHL3	
	Voltage, V	Resistive load, A
Alternating current, VA	250	8
	125	16
Direct current, V	250	0,3
	125	0,6

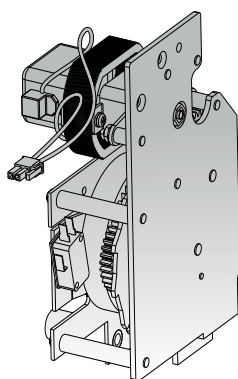
Auxiliary contacts



The auxiliary contacts are designed to indicate the breaker's state. They are unified for OptiMat A breakers of all types. Installation under the front panel of the automatic breaker in its own cell. Are included in the standard (basic) design.

Title	Inductive load	
Alternating current	250 V	5 A
Direct current	30 V	3 A
Number of used contacts	6a+6b	

Motor drive

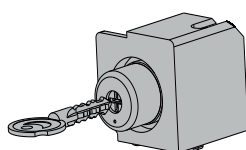


OptiMat A2500N-D-MR8-B-ПД2-МР-3-ИШ-ПК-У3

The motor drive is designed to actuate closing of the spring in the automatic breakers. In case there is no supply the spring actuation is made manually. It is unified for OptiMat A breakers of all types. Installation under the front panel of the automatic breaker in its own cell.

Title	Motor drive OptiMat A630-4000AC-UHL3
Reference	235993
Operating voltage, V	230 AC/DC
Maximum consumption current, A	0,5
Engine speed, loops/min	16000-19000
Maximum starting current	5In
Recharging time, s	not more than 5
Electric strength of insulation	2 kV within 1 min
Range of operating temperatures, °C	-25...+60
Operating frequency	not more than 2 times a minute
Mechanical wear resistance	20000 cycles

Startup key-lock

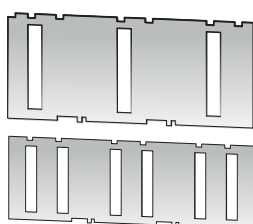


OptiMat A2500N-D-MR8-B-ПД2-МР-3-ИШ-ПК-У3

The built-in key lock is designed to block the startup (blocks the breaker in an opened condition). To unblock the breaker without the corresponding key is impossible. It is unified for OptiMat A breakers of all types. Installation under the front panel of the automatic breaker in its own cell.

Title	Built-in key lock OptiMat A
Reference	217999
Number of keys in a set, pcs	1

Safety shutters

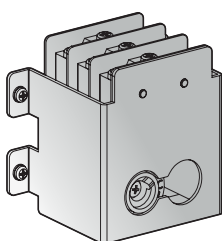


OptiMat A2500N-D-MR8-B-ПД2-МР-3-ИШ-ПК-У3

The safety shutters are designed to avoid access to the plug-in contact when the automatic breaker is in pumped-out or test position (protection level IP20) install in the chassis of the breaker.

Overall dimensions of the breaker	Title	Reference
I dimension to 2000 A	Safety shutters OptiMat A630-2000-UHL3	242118
II dimension to 4000 A	Safety shutters OptiMat A2500-4000-UHL3	242119

Breaker position indication in the chassis

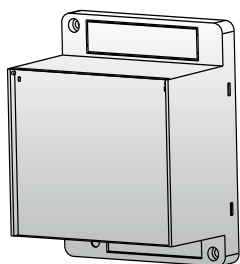


OptiMat A2500N-D-MR8-B-ПД2-МР-3-ИШ-ПК-У3

Position indication shows the state of the breaker: PUMPED-IN/TEST/PUMPED-OUT. Install on the chassis on the left or on the right from the breaker.

Title	Breaker position indication in the chassis OptiMat A-UHL3		
Reference	267249		
	Voltage, V	Resistive load	Inductive load
Alternating current, VA	250	5	2,5
	125	10	10
Direct current, W	250	3	1,5
	125	10	10

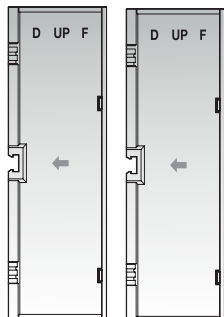
Time delay controller of minimum current tripping device



Controller is designed to prevent the activation of the minimum current tripping device in case of short-term failures and decreases of voltage of a power supply. To plug in as a part of the breaker minimum current tripping device of voltage is required. Install in DIN-rail or on a side wall of the breaker.

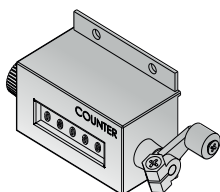
Title	Delay activation controller of voltage minimal trip unit OptiMat A-UHL3
Reference	236607
Delay time, s	0,5; 1,0; 1,5; 3

Set of interphase barriers



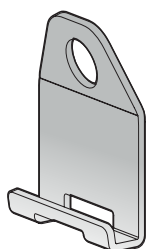
Interphase barriers are designed to prevent interphase short-circuit. Devices are unified for breakers OptiMat A of all types. Install in corresponding slots between main pins of the breaker. Part of a basic configuration.

Mechanical loop counter



Mechanical loop counter is designed to designate the amount of closed/open loops. Unified for switches OptiMat A of all types. Install under front panel of the automatic breaker in its own cell. Part of a basic configuration.

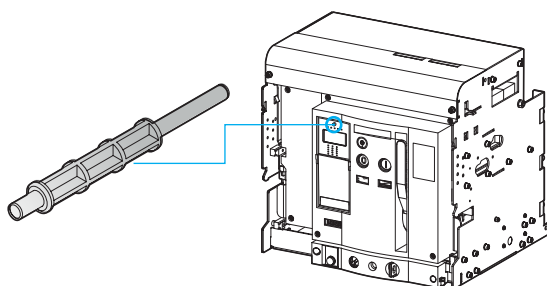
Lifting clamps



Lifting clamps are designed to facilitate lifting and moving of the automatic breaker. Unified for switches OptiMat A of all types.

Title	Lifting clamps OptiMat A-UHL3 (2pcs.)
Reference	240745

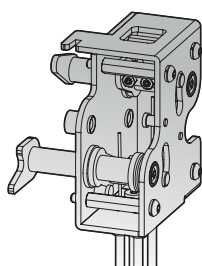
Reset mechanism of the microprocessor trip system



Module in the bottom of a microprocessor trip unit is equipped with the button of manual reset in the original position after its activation from microprocessor trip system.

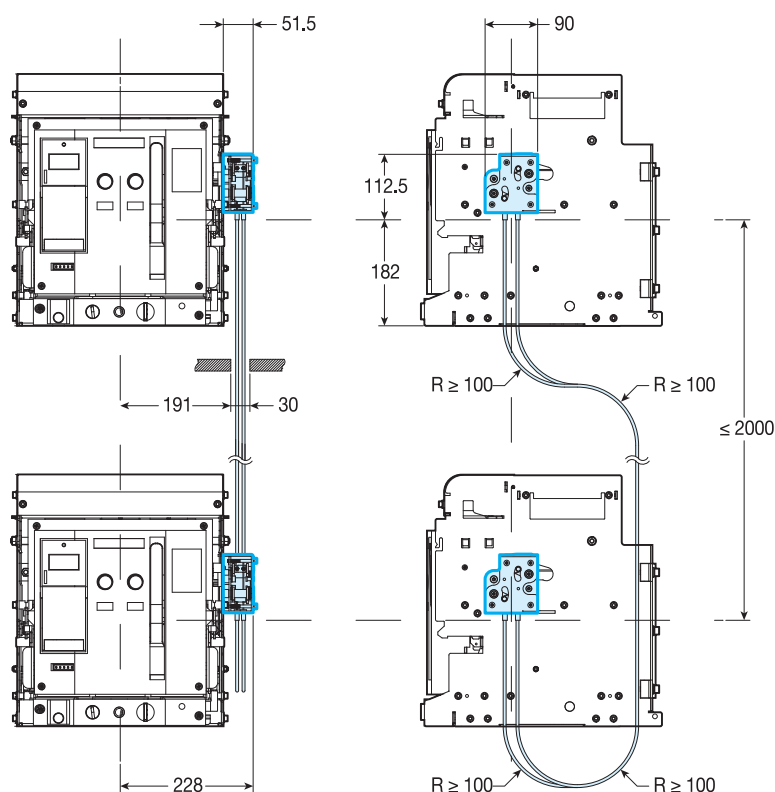
The button protrudes after the activation of the automatic breaker. To switch on the automatic breaker push the button. Unified for switches OptiMat A of all types. Install under front panel of automatic switch in its own cell. Part of the basic configuration.

Mechanical interlocking

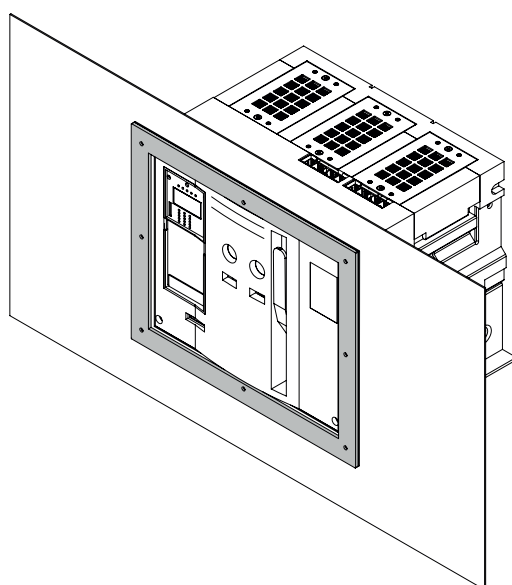


Interlocking mechanism is designed to interlock switching on/off operations of 2 or 3 automatic breakers.

Title	Reference
Set of mechanic locking for 2 OptiMat A630-4000-UHL3	242120
Set of mechanic locking for 3 OptiMat A630-4000-UHL3	248580



Front panel frame

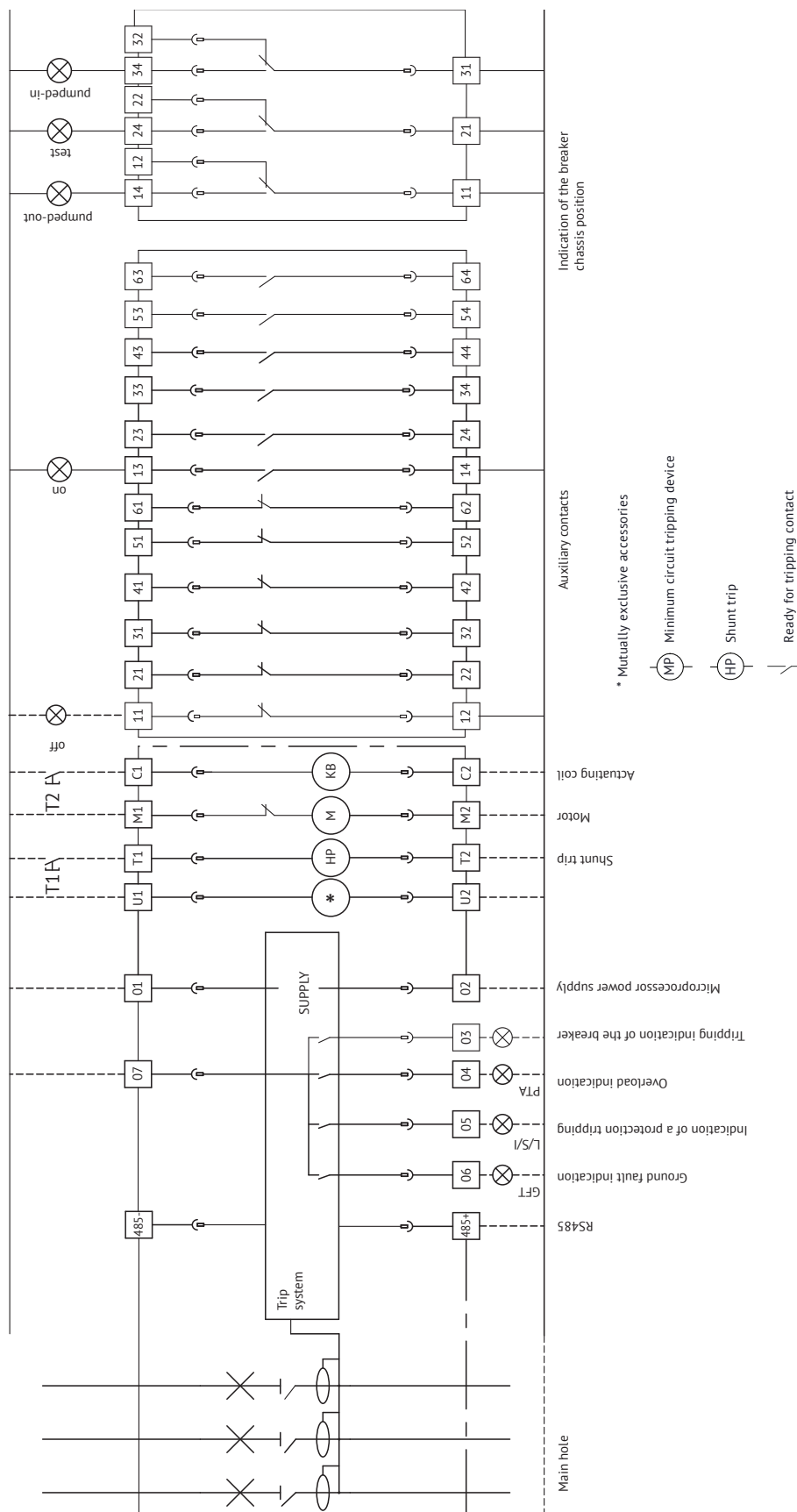


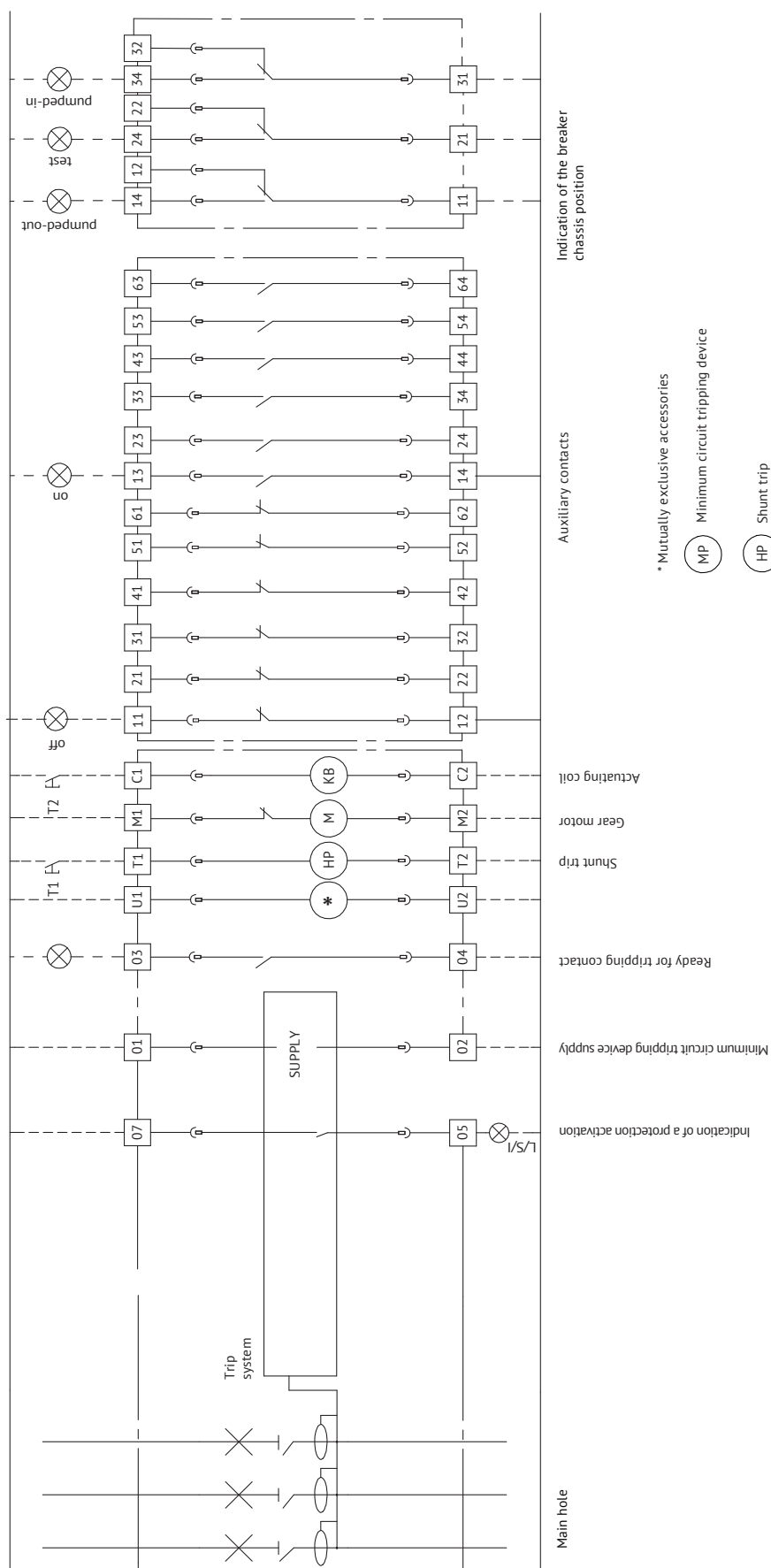
Front panel frame is designed to prevent from touching sharp output. Besides it protects protruding frontal part of the breaker. Install on the frontal panel of an electricity distribution plant.

Title	Reference
Frontal panel frame for fixed OptiMat A 630-2000A-UHL3	246228
Frontal panel frame for fixed OptiMat A 2500-4000A-UHL3	246232
Frontal panel frame for retractable OptiMat A 630-2000A-UHL3	246233
Frontal panel frame for retractable OptiMat A 2500-4000A-UHL3	249399

Wiring diagrams OptiMat A

wiring diagram of the breaker with semiconductor trip unit MR8

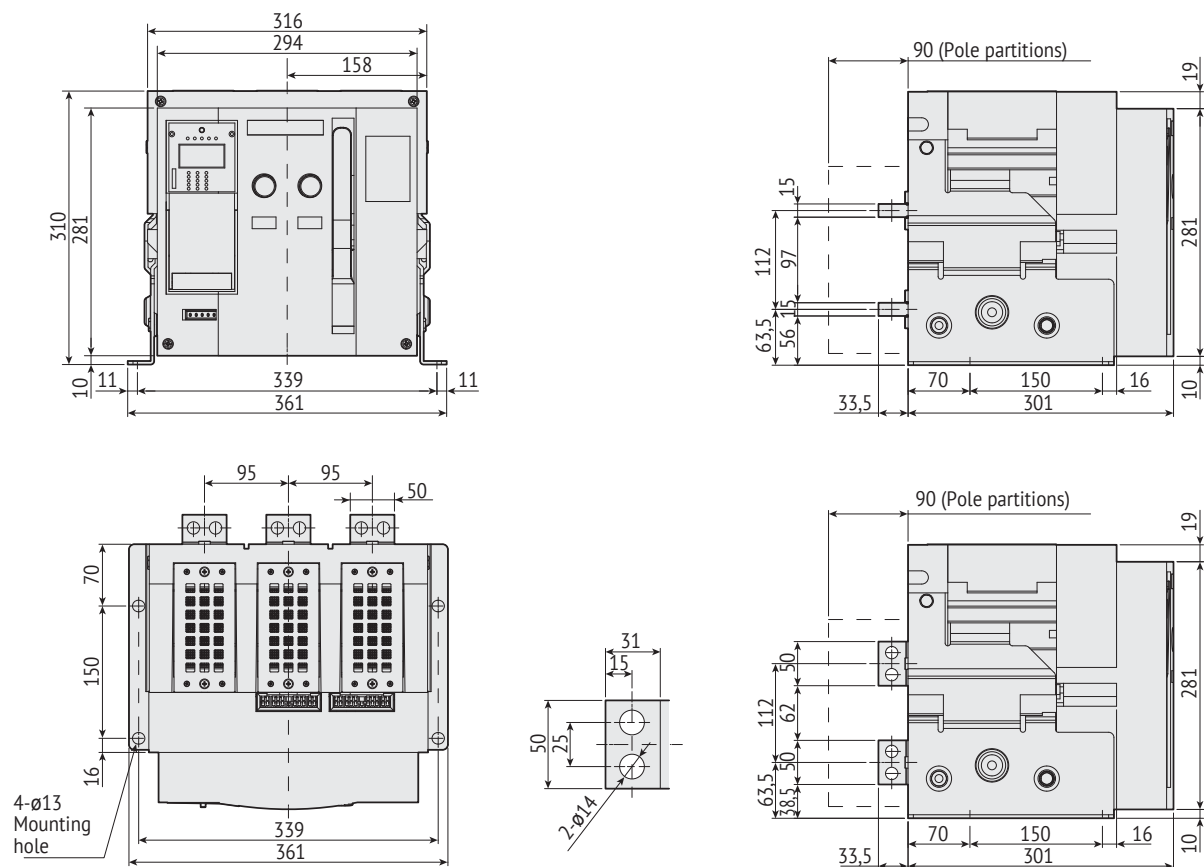


Wiring diagram of the breaker with semiconductor trip unit MR7


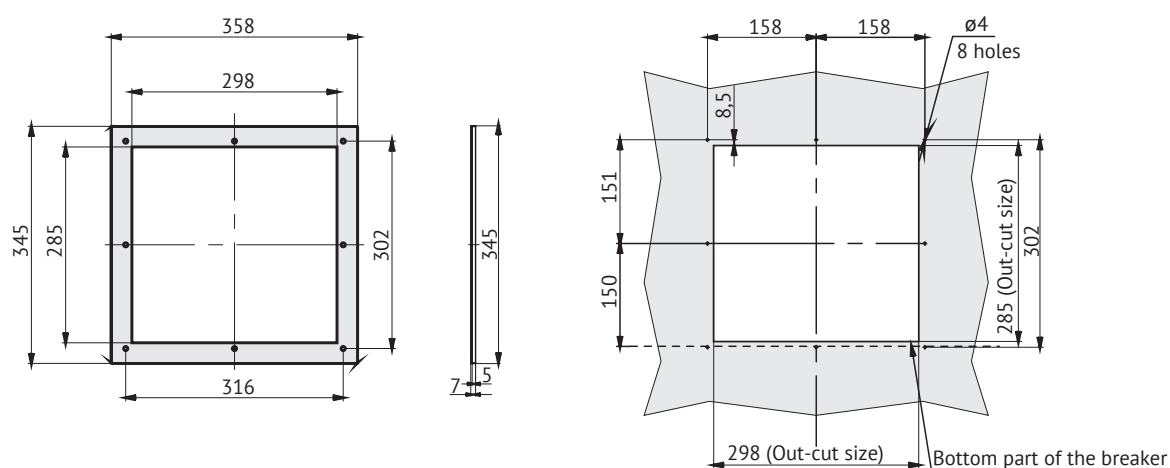
Dash line connections are done by the user.

Overall, installation and clamping dimensions (mm)

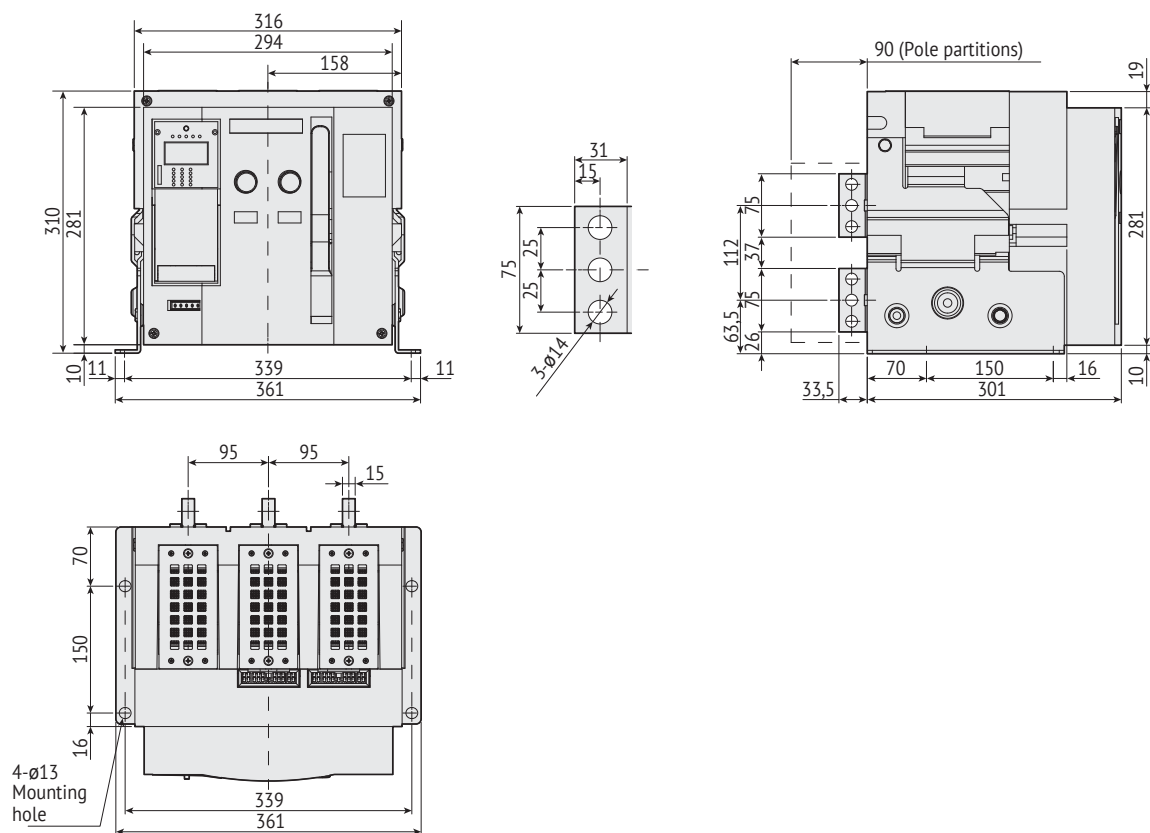
Automatic breakers OptiMat A630, OptiMat A800, OptiMat A1000, OptiMat A1250, OptiMat A1600 of fixed modification with rear busbar clamping



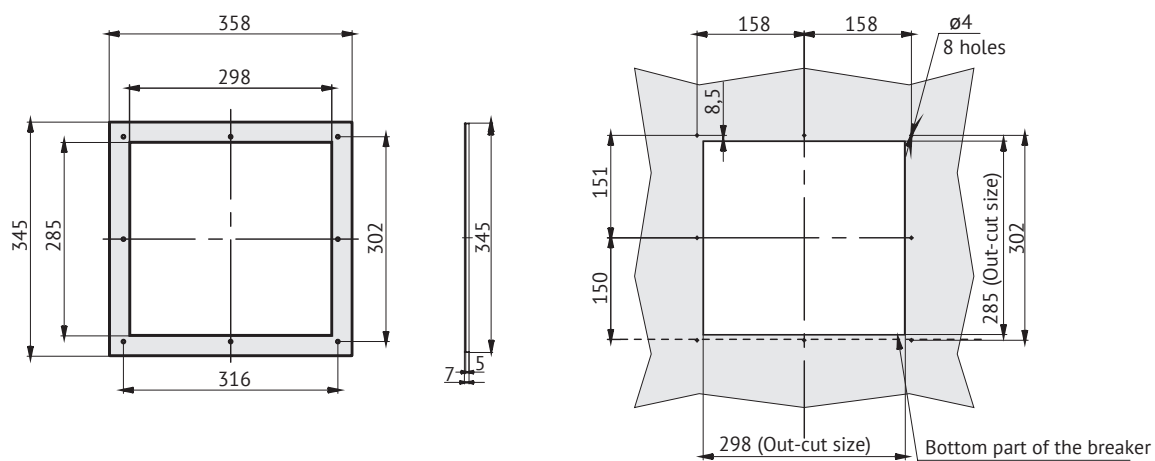
Face panel frame



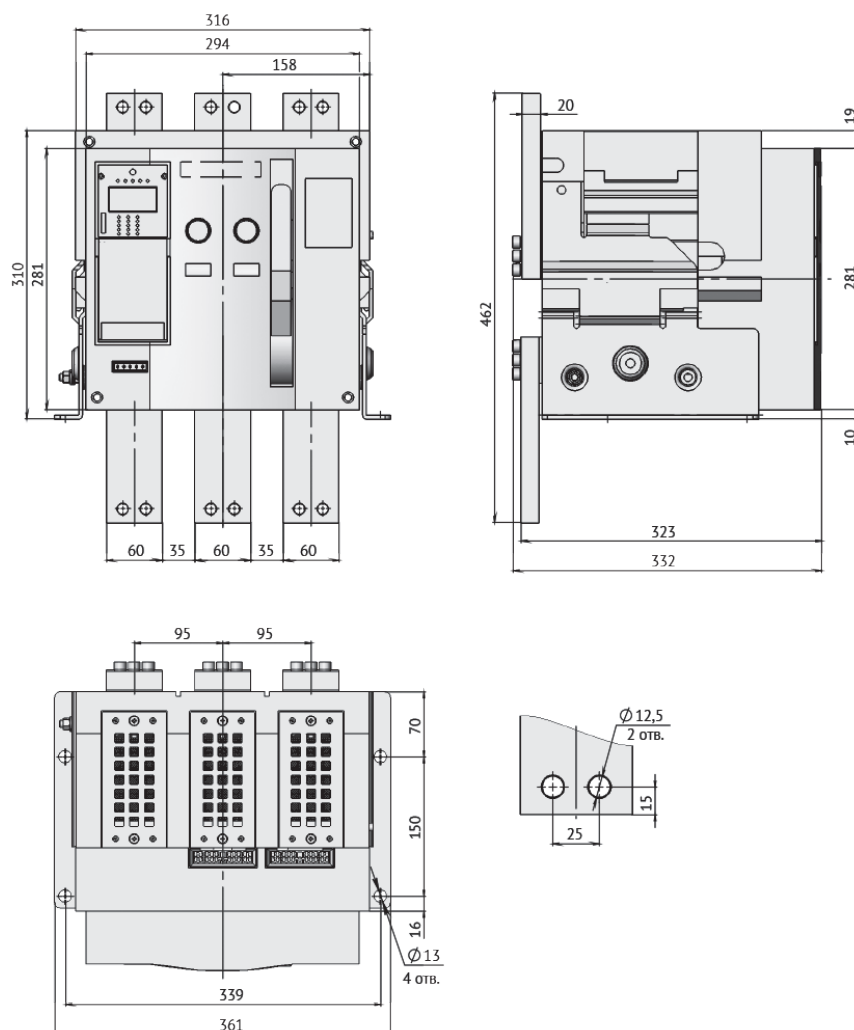
Automatic breakers OptiMat A2000 of fixed modification with rear busbar clamping



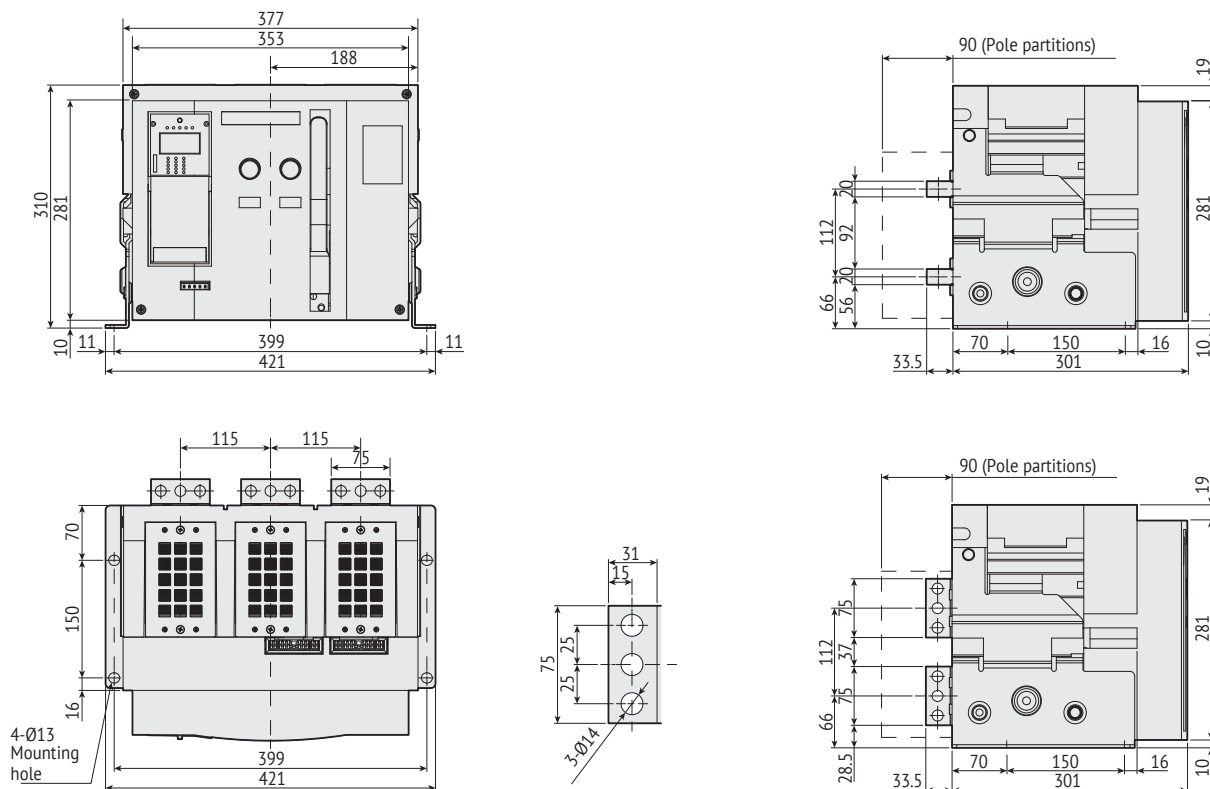
Face panel frame



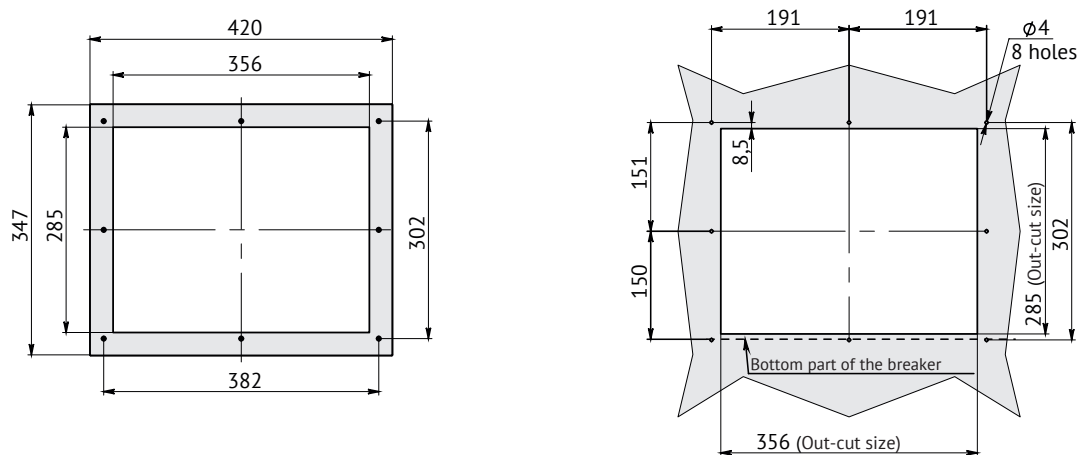
Automatic breakers OptiMat A630, OptiMat A800, OptiMat A1000, OptiMat A1250, OptiMat A1600, OptiMat A2000 of fixed modification with frontal busbar clamping



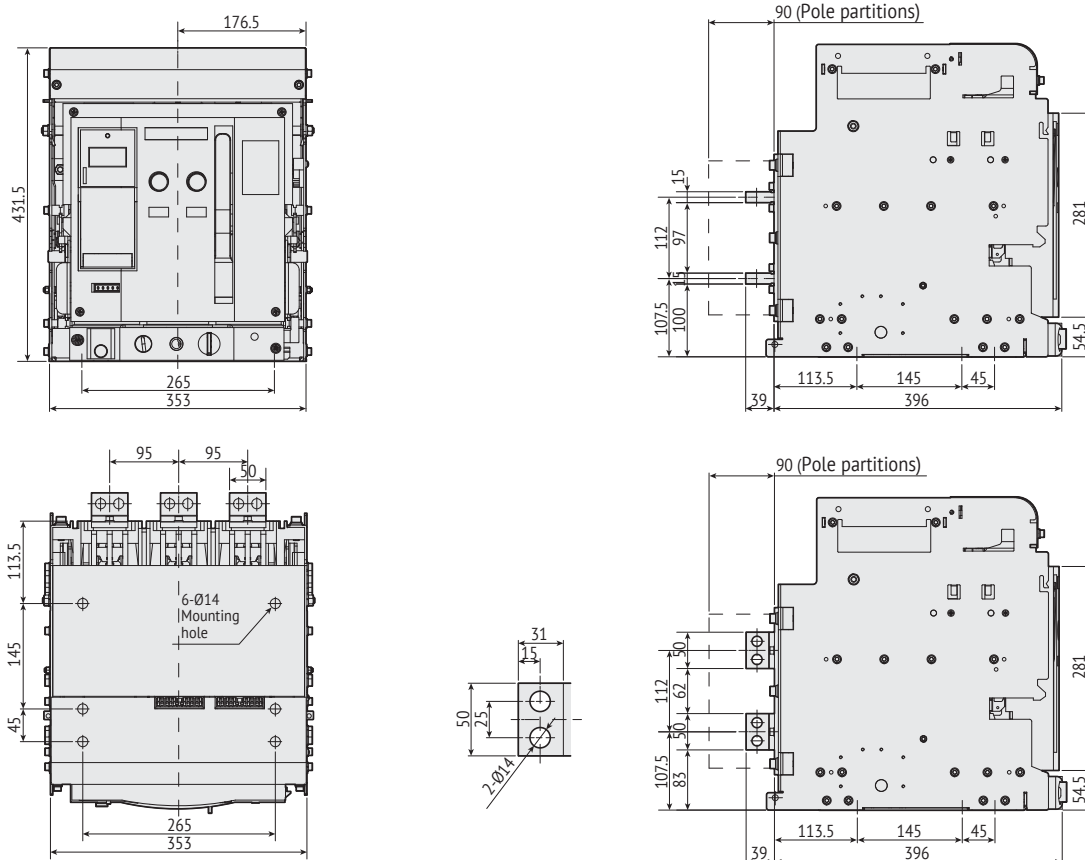
Automatic breakers OptiMat A 2500, OptiMat A3200 of fixed modification with rear busbar clamping



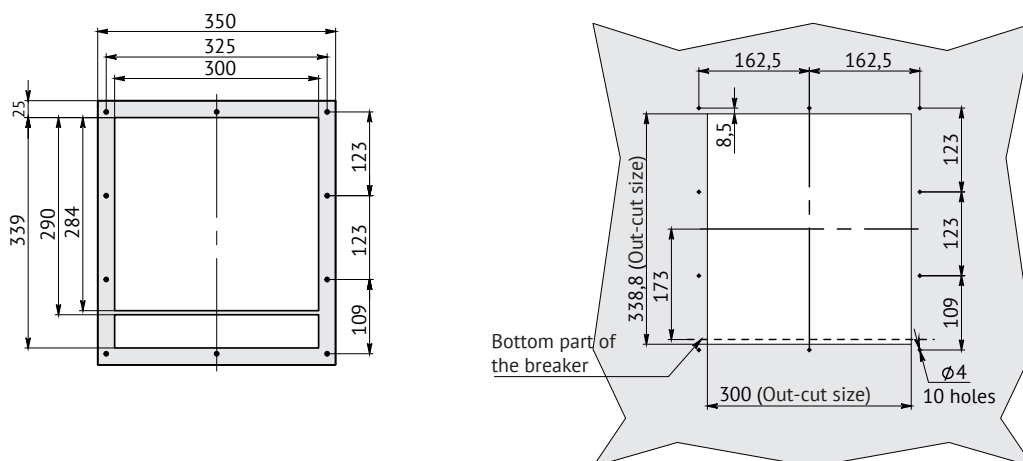
Face panel frame



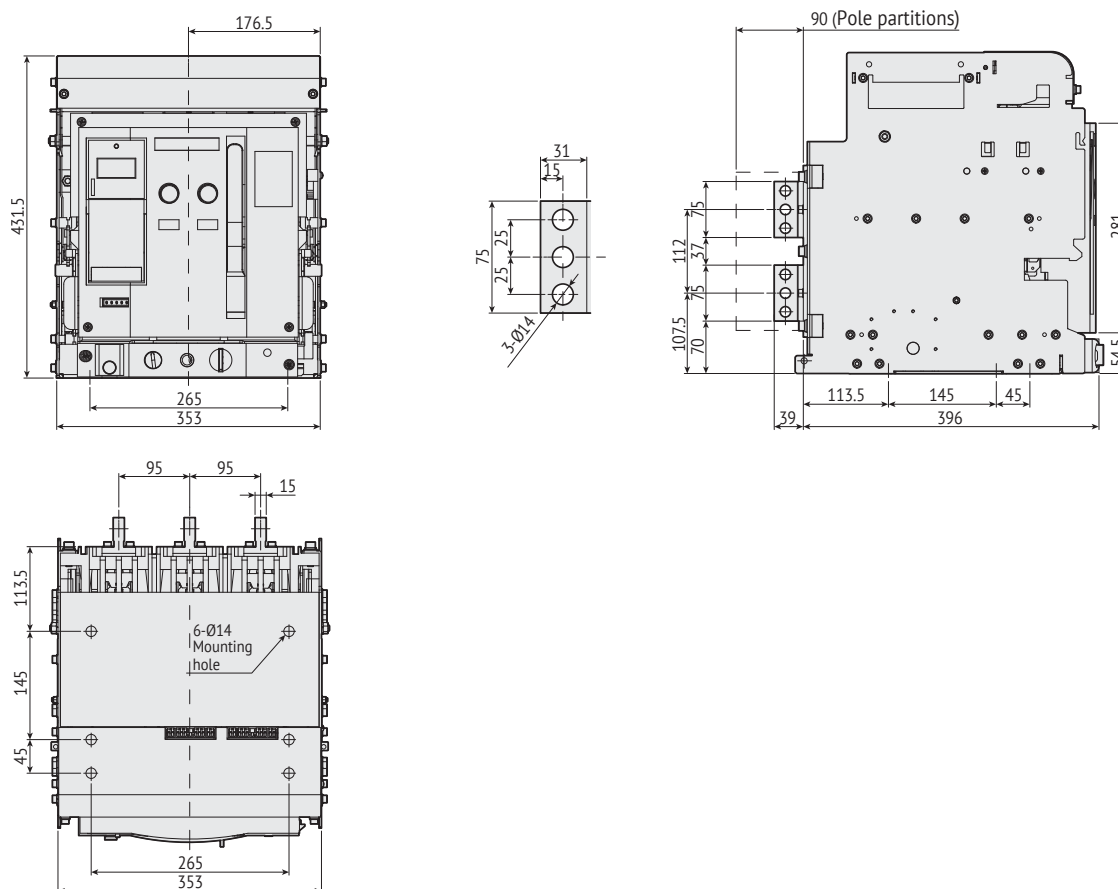
Automatic breakers OptiMat A630, OptiMat A800, OptiMat A1000, OptiMat A1250, OptiMat A1600 of a retractable modification with rear busbar clamping



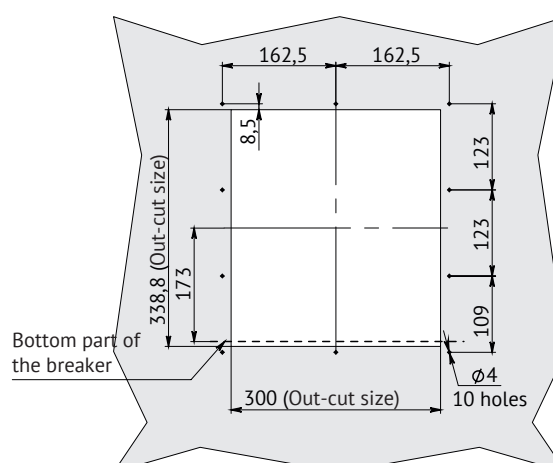
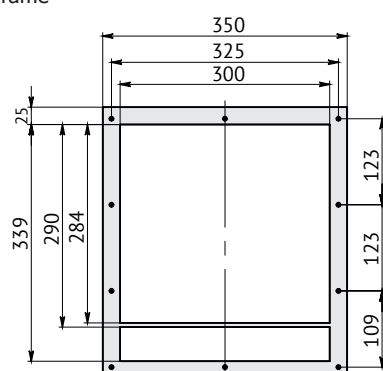
Face panel frame



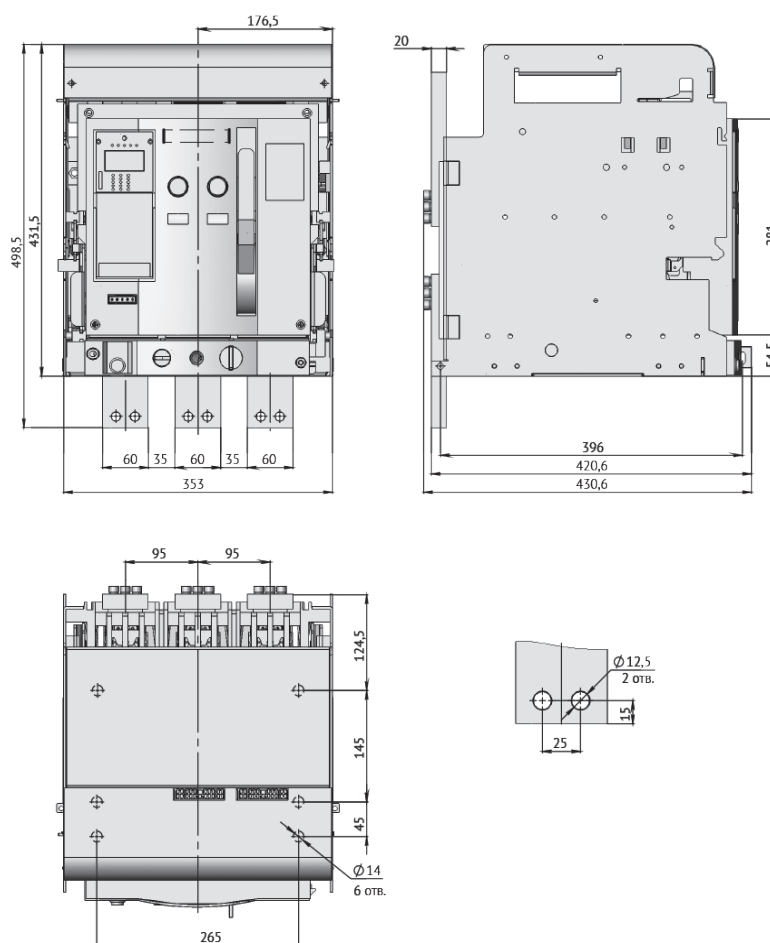
Automatic breakers OptiMat A2000 of a retractable modification with rear busbar clamping



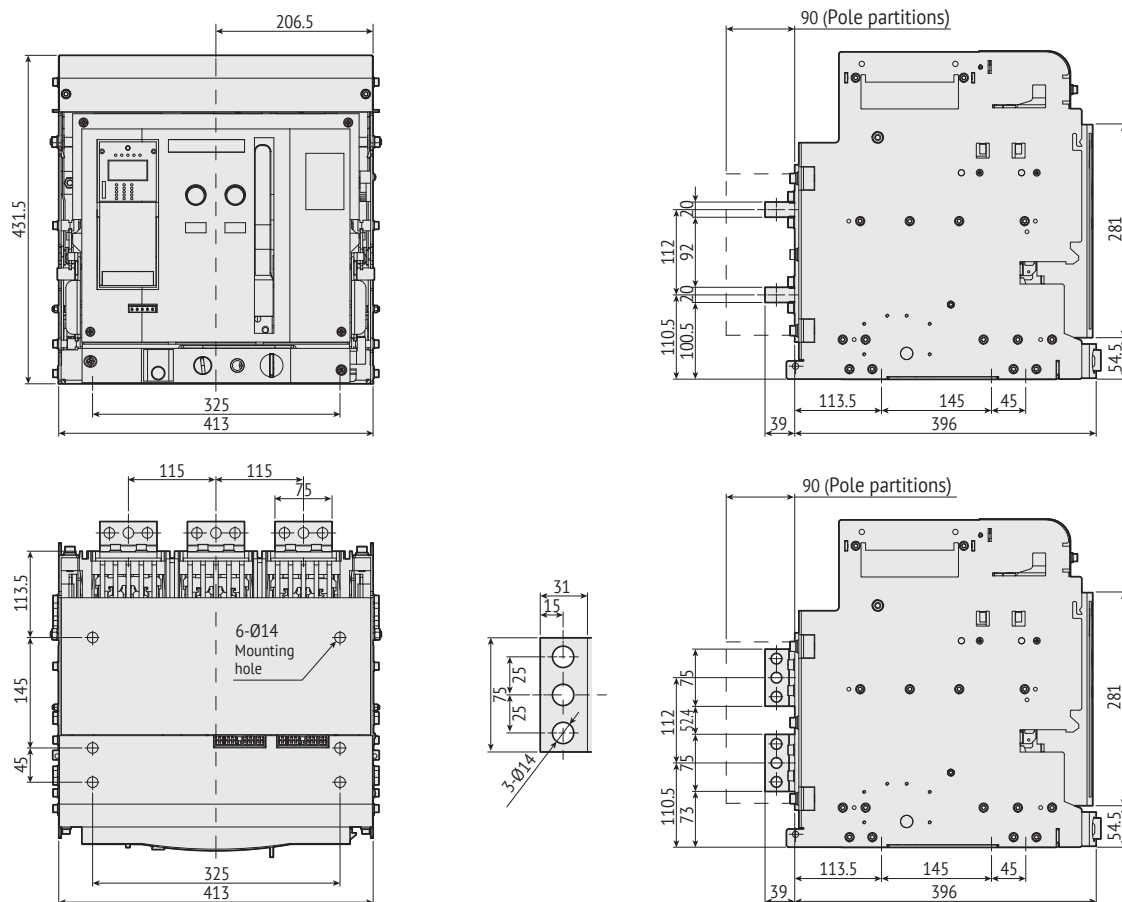
Face panel frame



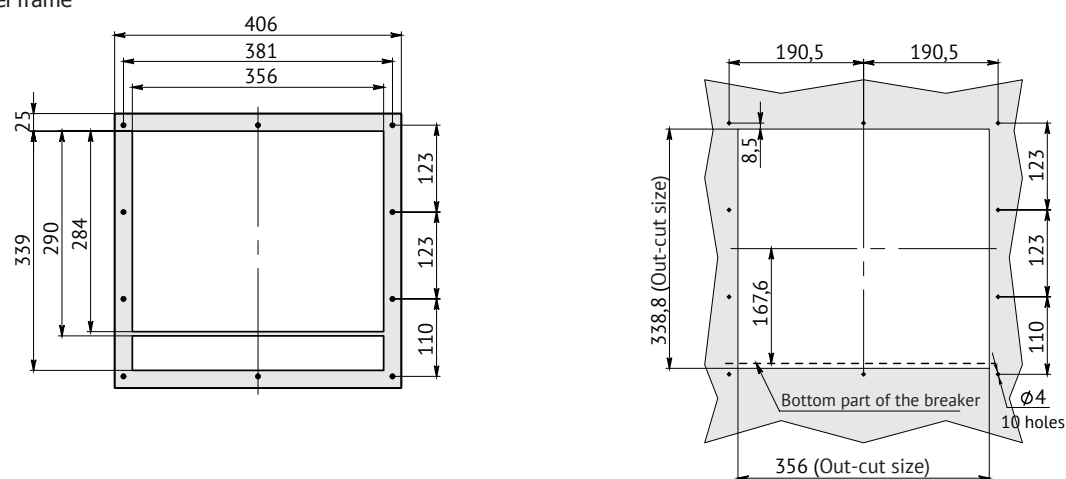
Automatic breakers OptiMat A630, OptiMat A800, OptiMat A1000, OptiMat A1250, OptiMat A1600, OptiMat A2000 of a retractable modification with frontal busbar clamping



Automatic breakers OptiMat A2500, OptiMat A3200 of a retractable design with rear busbar clamping



Face panel frame

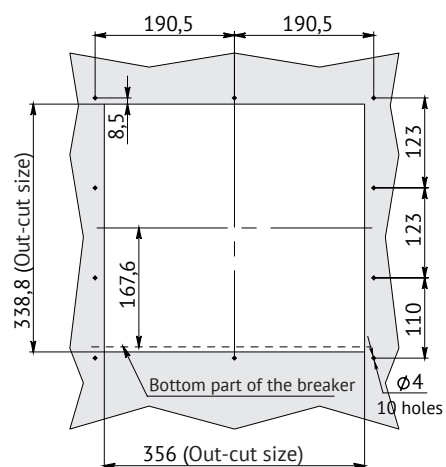


[illegible]

Technical drawing of a rectangular plate with dimensions and tolerances. The drawing shows a top view of the plate with a central rectangular area and a surrounding border. The dimensions are as follows:

- Overall width: 406
- Overall height: 339
- Inner width: 381
- Inner height: 290
- Width of the inner rectangle: 356
- Width of the border: 25
- Height of the border: 123
- Height of the bottom border: 110

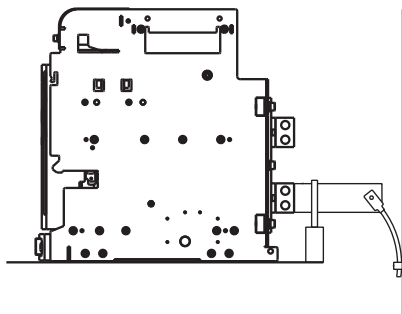
The drawing includes dimension lines and arrows indicating the measurement of each dimension. The central area is shaded gray, and the border is white.



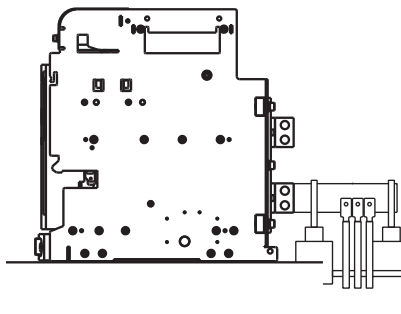
Power cables connection

Cables mass and their mechanical pressure on automatic breaker terminals must be considered when connect power cables:

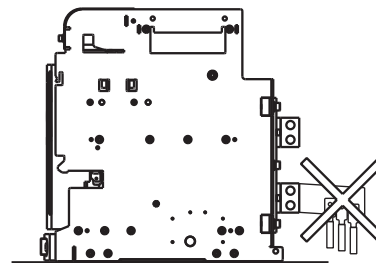
- Extended terminals must have isolated support and the cable must be attached on a solid ground (pic 1).
- When you connect several cables fasten them together and fix on the frame of a fixed structure (pic 2).



Pic. 1



Pic. 2



Pic. 3

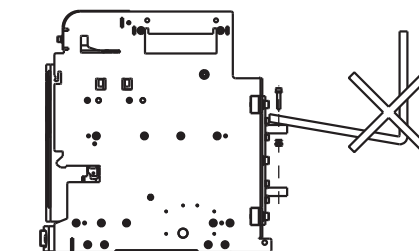
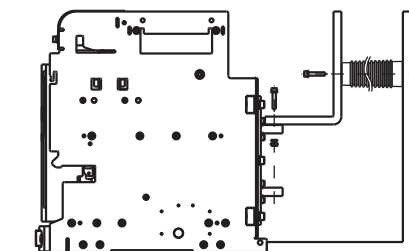
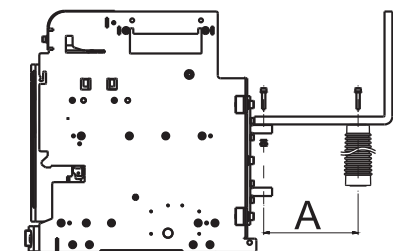
Clamping of busbars

To mount the busbars put mounting holes to coincide with automatic breakers terminal holes and not to make breaking pressure when bolt down.

Fix busbars with base insulators to prevent them from deflection and increased mechanic input.

To ensure busbar tolerance to electrodynamic current impact distance A mustn't be over:

For calculated current s\c, kA	Distance A, mm
30	350
50	300
65	250
80-100	150



Definition of busbar sizes

Size modification	Rated current, A	Copper busbar crossing, mm	Aluminum busbar crossing, mm	Screw M12-6gx88.016	Make-up torque, N m	
					Spring washer GOST 6402	Disk spring washer
Up to 2000 A	630	2x40x5	2x50x8	65	37,5	50
	800	2x50x5	2x50x10	65		
	1000	2x60x5	2x60x10	65		
	1250	2x80x5	2x60x10	65		
	1600	2x100x5	4x50x10	65		
	2000	3x100x5	4x60x10	65		
Up to 4000 A	2500	4x100x5	5x80x10	75		
	3200	2x100x10	-	75		
	4000	3x125x10	-	120		
		4x100x10	-	120		

Recommendation for distribution device mounting

Minimum clearance between automatic air breaker and metal parts are in the table.

Design	A	B
fixed	70	150
retractable	70	0

