

# OptiMat A Air circuit breakers for currents from 630 to 6300 A



Air circuit breakers of OptiMat A series are assigned for conducting current in a normal mode, protection and infrequent operating of electric circuits with rated current from 630 to 6300 A. Owing to their design, they easily handle high capacities. The devices are equipped with numerous types of protection that allow to provide selectivity requirements in the protected network. Various locking equipment is intended to prevent unqualified actions and protection of the operating and maintenance personnel.

## Designation

OptiMat A-630-S2-3P-85-D-MR8.0-B-C2200-M2-P01-S1-03

	a	b	c	d
1	Range of product			
2	Design			
3	Rated current $I_n$ , A			
4	Dimension (standard size)			
5	Number of the circuit breaker poles			
6	Maximum breaking capacity, kA at $U_n = 400$ V			
7	Version by installation method			
8	Type of a microprocessor-based release			
9	Types of wiring			
10	Type of control coils			
11	Type of a motor drive			
12	Type of protection systems			
13	Type of auxiliary signaling contacts			
14	Type of additional signaling systems			

<sup>1)</sup> Fixed version is available in all dimensions, except S5, S6.

<sup>2)</sup> For fixed and withdrawable 2000A circuit breakers, only a rear vertical, a front and a combined mounting types are available. For 4000 A fixed and withdrawable circuit breaker versions, only a rear vertical busbar connection type is available. For the 5000 and 6300 A circuit breakers, only a rear horizontal busbar connection type is available.

## Batch effectiveness

The presence in the overall design of S2, S4, S5, S6 of twelve (6a + 6b) galvanically isolated contacts allows for the implementation of a large number of signaling circuits.

The block with screw clamps in overall design of S1, S5, S6 allows for quick installation of control circuits, without using additional crimps and soldering connections.

Conductive elements are made of pure electrical copper, which allows to obtain high conductivity, efficiency, as well as durable operation.

The availability of various interlocks (blocking the status of the switch in the chassis, blocking the closing, isolating shutters, etc.) ensure the safety of the maintenance personnel.

Compact dimensions of the circuit breakers of the S1 overall design make it possible to complete standard boards with larger amount of equipment, or, alternatively, use boards of a smaller size.

The possibility of changing the position of the terminals from horizontal to vertical in the overall design of S1, S2, S4 that enables the client to use the switches in the circuits with both vertical application of busbars, as well as horizontal.

Application of special alloys based on silver for creation of a contact group, enabled to achieve high wear resistance and provide for over ten thousand cycles of electrical switching.

Data transfer support via Modbus protocol in the releases MR8.0 and MR8.1 allows for the application of the dispatch system.

Modular design provides simple and quick mounting.

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



## Various delivery and main output mounting options



**Rear horizontal busbar  
S1 connection type**



**Front busbar S2 connection  
type**



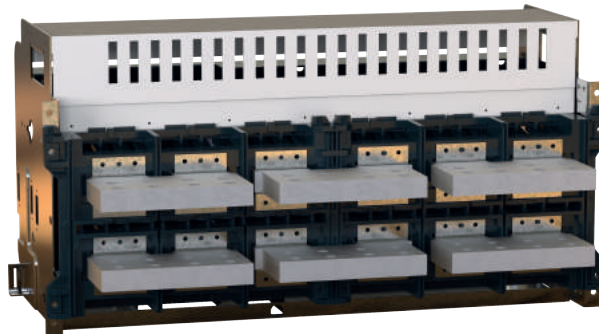
**Rear vertical busbar  
S1 connection type**



**Rear vertical busbar S4  
connection type**



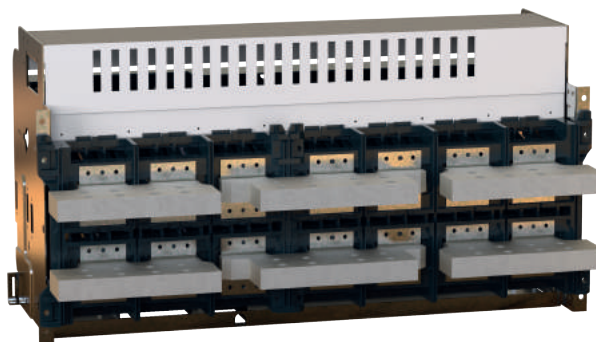
**Rear horizontal busbar  
S4 connection type**



**Rear horizontal busbar  
S5 connection type**







**Rear combined busbar  
S4 connection type**



**Rear horizontal busbar  
S6 connection type**

Note: For detailed delivery options of connection types, see the technical specifications chart.

## Selection guide

Automatic circuit breakers of OptiMat A series																
Type	OptiMat A-S1			OptiMat A-S2			OptiMat A-S4			OptiMat A-S5,S6						
Appearance																
Standards of compliance	GOST 50030.2															
Number of poles	3			3/4						3						
Electrical properties																
Rated current In, A	630	800	1000	1250	1600	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300
Rated frequency, Hz	50						50,60						50			
Application category	B															
Type of current	AC AC															
Rated operational voltage Ue, V							690						400			
Auxiliary (free) contacts	6c									6a+6b						
Manual													Available			
Electrical													Available			
Operation buttons	Available															
Motor drive	Available						Available / Non-available						Available			
Ultimate breaking capacity of AC Icu (kA)	50						65			85			120			
Release type	Electronic						No release / Electronic						Electronic			
Release version	MR5.0						MR7.0 / MR8.0 / MR8.1						MR5.0			
Mounting properties																
Fixed design	Rear connection type	vertical output type				Available						Non-available				
		horizontal output type	Available			Non-available			Available			Non-available				
	Front connection type		Non-available			Available						Non-available				
	Combined		Non-available			Available						Non-available				
Withdrawable design	Rear connection type	vertical output type				Available						Non-available				
		horizontal output type	Available			Non-available			Available			Non-available		Available		
	Front connection type		Non-available			Available						Non-available				
	Combined		Non-available			Available						Non-available				
Performance characteristics																
Degree of protection (IP)	IP20															
Environment and location category	U3 (T3)															
Application category by selectivity	Selective						Non-selective / Selective						Selective			
Extra features																
Indication of the switch position in the chassis	Non-available						Available / Non-available						Non-available			
Undervoltage release <sup>1)</sup>	Non-available						Available / Non-available						Non-available			
Second independent trip device <sup>1)</sup>	Non-available						Available / Non-available						Non-available			
Indication contact of the switch availability to close the main contacts <sup>2)</sup>	Non-available						Available / Non-available						Non-available			
Internal installation lock	Non-available						Available / Non-available						Non-available			
Protective shutters							Available / Non-available						Available			

<sup>1)</sup> Feature mutually exclusive positions in the circuit breakers of the overall design S2, S4 (installed in one cell);

<sup>2)</sup> Feature mutually exclusive position in the circuit breakers of the overall design S2, S4 with a minimum release or second shunt release in the versions of the switch with MR8.0 and MR8.1 (connected to the terminal block into one U1 and U2 connectors).

## Technical specifications

Series of circuit breakers			OptiMat A-S1				
<b>General characteristics</b>							
Rated operational voltage U <sub>e</sub> , V			690				
Rated insulation voltage U <sub>i</sub> , V			690				
Rated impulse withstand voltage U <sub>imp</sub> , kV			8				
Application category			B				
Suitability for isolation			available				
Number of poles			3				
<b>Control</b>							
Manual		Operation buttons	+				
Electrical		Motor drive	+				
Version			630	800	1000	1250	1600
Fixed	Rear	vertical	+	+	+	+	+
		horizontal	+	+	+	+	+
	Combined	-	-	-	-	-	
Withdrawable	Rear	vertical	+	+	+	+	+
		horizontal	+	+	+	+	+
	Combined	-	-	-	-	-	
Rated and limiting parameters of the main circuit of switches							
Rated current I <sub>n</sub> , A			630	800	1000	1250	1600
Rated frequency, Hz			50				
Rated ultimate breaking capacity (I <sub>cu</sub> ), kA	U <sub>e</sub> 400 V		50				
	U <sub>e</sub> 690 V		25				
Rated service capacity (I <sub>cs</sub> ), kA	U <sub>e</sub> 400 V		40				
	U <sub>e</sub> 690 V		20				
Short-time withstand current (I <sub>cw</sub> ) within 1s, kA	U <sub>e</sub> 400 V		40				
	U <sub>e</sub> 690 V		20				
Rated short-circuit making capacity	U <sub>e</sub> 400 V		-				
	U <sub>e</sub> 690 V		-				
General wear resistance, cycles	with maintenance		-				
	without maintenance		15000				
Electrical life, cycles	with maintenance		-				
	without maintenance		5000				
Trip time	Break-time (opening), ms		50±10				
	Make-time (closing), ms		50±10				
<b>Protection, indication and measurement devices</b>							
Microprocessor-based release			MR5.0				
Overload protection			+				
Short-circuit protection	with time-delay		+				
	non-time-delay		+				
Earth fault protection			+				
Changed current indication			+				
Device status indication			-				
<b>Auxiliary devices (control and signaling systems) <sup>1)</sup></b>							
Voltage trip devices			6c				
Voltage trip devices	independent trip device		230V AC / 220 V DC				
	closing coil		230V AC / 220 V DC				
	undervoltage release <sup>2)</sup>		-				
	Secondary independent trip device <sup>2)</sup>		-				
Indication of the switch position in the basket (chassis)			-				
Signaling contact of the switch availability for closing the main contacts			-				
<b>Additional devices (locking, protection, indication systems) <sup>1)</sup></b>							
Internal lock			-				
Protective shutters			-/+				
Insulation (interpole) barriers			+				
Mechanical cycle counter			+				
Mechanical interlocking <sup>3)</sup>			-				
<b>Overall dimensions and weight</b>							
Overall dimensions WxHxD, mm	Fixed with front connection type		3P	-			
	Withdrawable with front connection type		3P	-			
	Fixed with rear (back) connection type		3P	370×340×490			
	Withdrawable with rear (back) connection type		3P	450×360×530			
Weight, kg	Fixed with front connection type		3P	-			
	Withdrawable with front connection type		3P	-			
	Fixed with rear (back) connection type		3P	33			
	Withdrawable with rear (back) connection type		3P	53			

<sup>1)</sup> For a detailed description of accessories, see page 206.

<sup>2)</sup> Are mutually exclusive positions in overall dimensions of S2, S4 versions.

<sup>3)</sup> Mechanical interlock is installed only on withdrawable version of the switch.

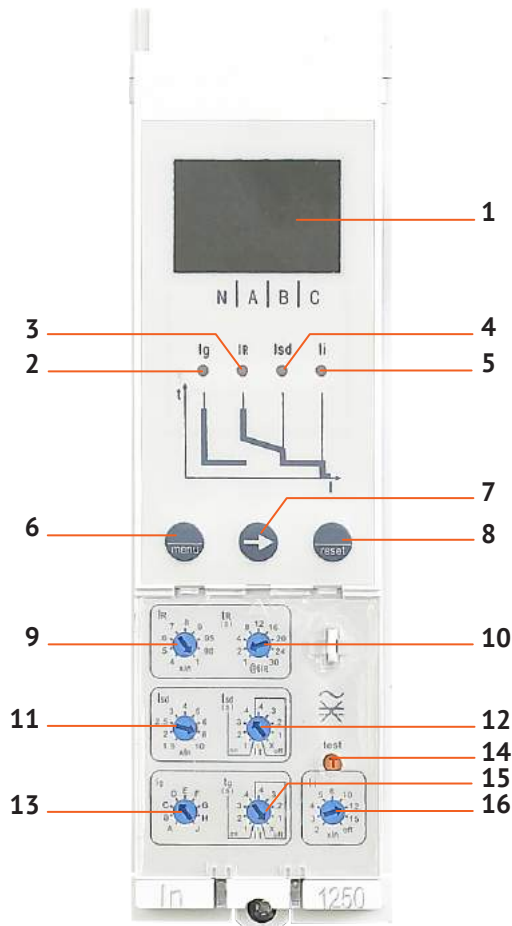
OptiMat A-S2						OptiMat A-S4				OptiMat A-S5, S6	
690						1000				400	
12						B available				12	
3,4										3	
						+					
						+					
630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	
+	+	+	+	+	+	+	+	+	-	-	
+	+	+	+	+	-	+	+	-	-	-	
+	+	+	+	+	+	+	+	-	-	-	
+	+	+	+	+	+	+	+	-	-	-	
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+	+	+	+	+	+	+	+	-	-	-	
+	+	+	+	+	+	+	-	-	-	-	
630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	
50,60										50	
85						100				120	
65						85				-	
85						100				100	
65						85				-	
50						85				100	
-						-				-	
143						220				-	
187						220				-	
50000										-	
30000										5000	
20000										-	
10000										500	
40										50±10	
80										50±10	
MR7.0 / MR8.0 / MR8.1										MR5.0	
+ / +										+	
+ / +										+	
+ / +										+	
+ / +										+	
- / +										+	
+ / +										-	
6a+6b										6a+6b	
230 V AC / 220V DC / 24 V DC										230V AC / 220 V DC	
230 V AC / 220V DC / 24 V DC										230V AC / 220 V DC	
230 V AC / 220V DC										-	
230 V AC / 220V DC / 24 V DC										-	
- / +										-	
- / +										-	
- / +										-	
- / +										- / +	
+										+	
- / +										+	
- / +										-	
361x462x332						421x482x332		-		-	
353x499x431						413x512x433		-		-	
361x310x335						421x310x335		421x335x391		-	
353x432x435						413x432x435		413x432x492		970×600×660	
52	52	52	54	54	55	65	76	-	-	-	
75	75	75	78	78	79	92	107	-	-	-	
41	41	41	43	43	45	48	59	65	-	-	
65	65	65	68	68	70	75	90	98	240	260	

## Microprocessor-based releases

Types of microprocessor-based releases				
	MR5.0	MR7.0	MR8.0	MR8.1
Appearance				
Current protection	1) From overload 2) From short circuit with time delay 3) From short circuit non-time-delay / instantaneous	1) From overload 2) From short circuit with time delay 3) From short circuit non-time-delay / instantaneous		
Measurement	current	no current	current	
Power supply	External power supply: – 230 V AC	Powered by current sensors * installed in the protected network (at least 20% of rated current) External power supply: – AC/DC 110/220V – DC 48V	Powered by current sensors * installed in the protected network (at least 20% of rated current) External power supply is required for data exchange: – AC/DC 110/220V – DC 48V	
LED operation indicators	Alarm signaling indications of the earth fault protection functions / alarm indication of the overload protection functions / alarm indication of the short-circuit protection functions with a short response delay / alarm indication of the short-circuit protection functions.	warning about overload	Overload indication / Indication of overload and short-circuit operation / shutdown indication without time delay / indication of currents in phases	
Control buttons	Reset, menu, rightwards.	Not available	Reset, menu, rightwards, rightwards, input, self-test	Input, reset, leftwards, rightwards, return, self-test
Registration of protective operations	1 last trip (current, time)	Not available	10 last records (reason, current, phase, time)	300 last records (reason, current, phase, time)
Data transfer protocol	Not available	Not available	Modbus / RS-485	

\* Power supply from current sensors is a backup power system. When using power only from current sensors, the release does not provide protection when switched on short-circuit, since it takes 3 seconds to load, and for normal information display and release operation, it is necessary that the current of the power circuits will be at least 20% of the rated current of the circuit breaker. For functional operation, and full protection of electrical networks, according to the stated characteristics, it is recommended to power the release from an external source.

## MR5.0 type



### All required types of protection

**OVERLOAD PROTECTION:**

- with long-time delay.

**PROTECTION AGAINST SHORT CIRCUIT:**

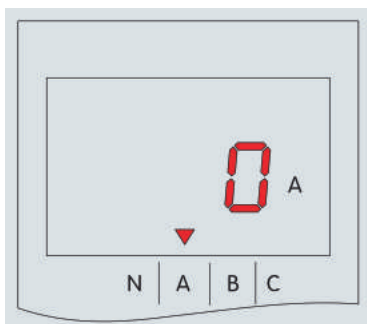
- instantaneous with independent time delay;
- additional protection function I<sub>2t</sub> on / off (for protection with short-time delay).

**PROTECTION AGAINST GROUND SHORT CIRCUIT:**

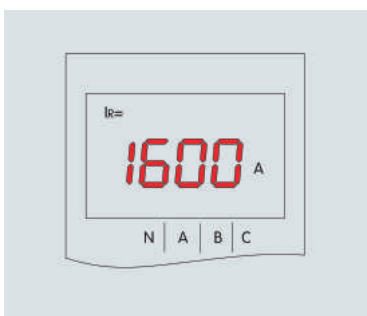
- additional protection function I<sup>2t</sup> on / off

- 1 LED display
- 2 I alarm signaling indicator of earth fault protection functions;
- 3 IR alarm signaling indicator overload protection functions;
- 4 Isd alarm signaling indicator of short-circuit protection functions with short response time;
- 5 Ii indicator of the alarm signaling functions of protection against short circuit;
- 6 "MENU" button to access different submenus;
- 7 "→" button to move through the menu;
- 8 "RESET" parameter setting button;
- 9 "IR" adjustment of the current setting value for overload protection;
- 10 "tR" setting of the overload protection delay;
- 11 "Isd" adjustment of the current setting value for protection against short circuit;
- 12 "tsd" setting for a short delay;
- 13 "Ig" setting of the value of the ground fault current setting;
- 14 "test" testing of instantaneous short circuit protection;
- 15 "tg" setting of the response delay of the earth fault protection;
- 16 "Ii" adjustment of the current setting value for instantaneous short circuit protection.

### MR5.0 Liquid Crystal Display



To move to the request status with parameters, you need to press the "menu" button once, being on the main screen of the release.

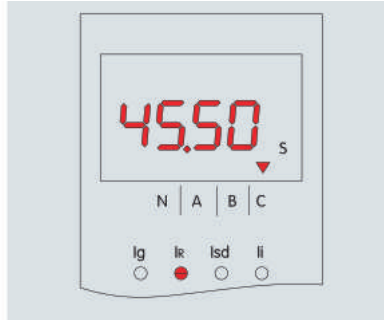


To move to the query which parameter is set for protection against overcurrent, you need to press the "→" button.



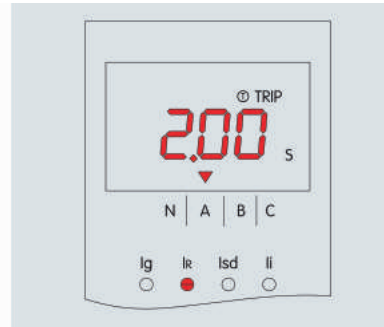
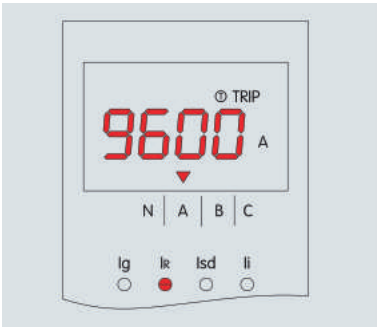


a) operating (trip) current



b) response time

Press the "menu" button twice to move to the response request status (displays information about the last response).



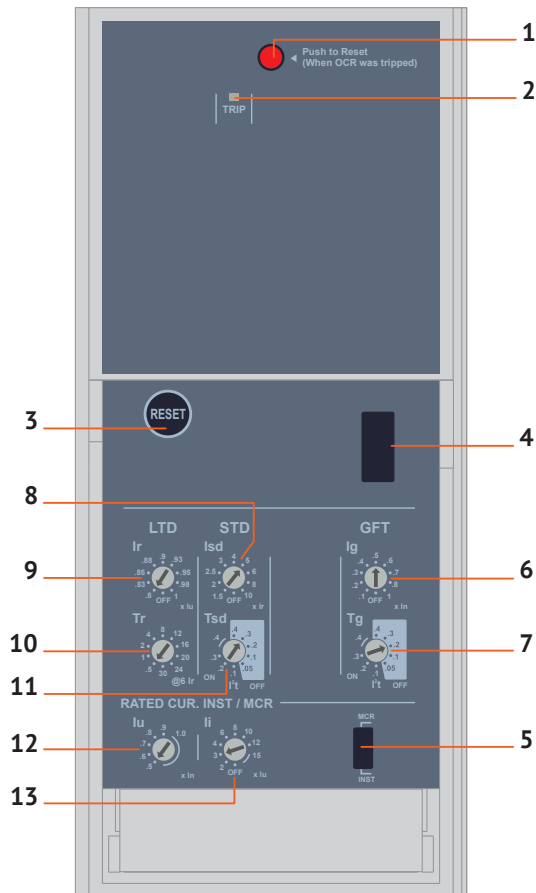
To move to the response simulation status at 6IR, press the "test" button. After actuation, you can see the following data.

To return to the default interface from any status, press the "RESET" button.

### Protection settings for microprocessor-based trip unit MR5.0

Parameter name	Parameter value	Accuracy
Setpoint of operating (service) current (IR) in multiples of the switch rated current	0,4; 0,5; 0,6; 0,7; 0,8; 0,9; 0,95; 0,98; 1	10%
Setpoints by the response time at current $6_{IR}$ , s	1; 2; 4; 8; 12; 16; 20; 24; 30	15%
Setpoints by the response current in the zone of short circuit Isd in multiples of the operating (service) current ( $I_{sd} / I_u$ )	1,5; 2; 2,5; 3; 4; 5; 6; 8; 10	15%
Setpoints by the response time in the zone of short circuit, s	0,1; 0,2; 0,3; 0,4; X (I <sup>2</sup> t off) 0,1; 0,2; 0,3; 0,4 (I <sup>2</sup> t on)	15%
Instantaneous current setpoints (I <sub>1</sub> ), A	2; 3; 4; 6; 8; 10; 12; 15; off	15%
Trip current setpoints at single-phase short circuit to earth in multiples of the rated current (I <sub>g</sub> ), A	A; B; C; D; E; F; G; H; J*	10%
Response time settings at the single-phase short circuit to earth (T <sub>g</sub> ), s	0,1; 0,2; 0,3; 0,4; X (I <sup>2</sup> t off) 0,1; 0,2; 0,3; 0,4 (I <sup>2</sup> t on)	15%

## MR7.0 type



### All required types of protection

#### OVERLOAD PROTECTION:

- with long-time delay.

#### PROTECTION AGAINST SHORT CIRCUIT:

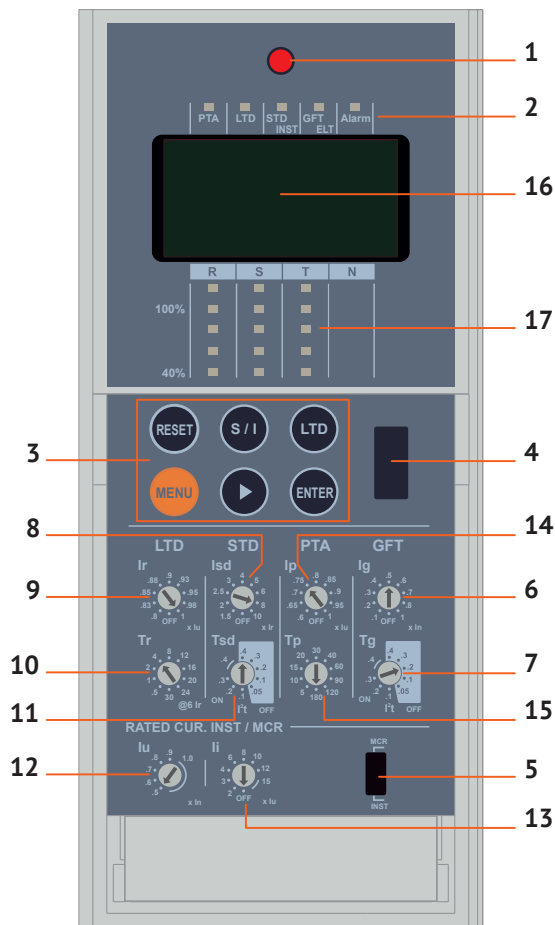
- instantaneous with independent time delay;
- additional protection function  $I^2t$  on / off (for protection with short-time delay).

#### PROTECTION AGAINST GROUND SHORT CIRCUIT:

- additional protection function  $I^2t$  on / off

- 1 Return button after fault tripping
- 2 Indication of tripping:  
PTI – overload. LED flickers when the current reaches the value  $1.13 I_R$
- 3 Reset button
- 4 Testing device jack
- 5 Selection of  $I^2t$  protection characteristic (set by the manufacturer)
- 6 The  $I_g$  switch sets the tripping current at single-phase short circuit to earth in multiples to the rated current (from 0.1 to  $1.0 I_n$ )
- 7  $T_g$  switch sets independent or inverse-time delay in the event of single-phase short circuit to earth (from 0.05 to 0.4 s)
- 8 The  $I_{sd}$  switch is used to set the tripping current in the zone of short circuit in multiples to the operating current (from 1.5 to  $10 I_R$ )
- 9, 12  $I_r$  and  $I_u$  switches set the operating current of the switch in multiples to the rated current from 0.4 to  $1.0 I_n$  ( $I_R = I_r \times I_u$ )
- 10 The  $T_r$  switch is used to set the time delay in the zone of overload (from 0.5 to 30 s with a load of  $6 I_R$ )
- 11 With the  $T_{sd}$  switch, a short-time delay is set in the zone of short circuit (from 0.05 to 0.4 s)
- 13  $I_i$  switch sets the reflex tripping current in the zone of short circuit in multiples to the rated current (from 2 to  $15 I_n$ ).

## MR8.0 type



### All required types of protection

#### OVERLOAD PROTECTION:

- with long-time delay.

#### PROTECTION AGAINST SHORT CIRCUIT:

- instantaneous with independent time delay;
- additional protection function  $I^2t$  on / off (for protection with short-time delay).

#### PROTECTION AGAINST GROUND SHORT CIRCUIT:

- additional protection function  $I^2t$  on / off.

#### OVERLOAD SIGNALING.

#### PROTECTIVE ACTUATION RECORDING:

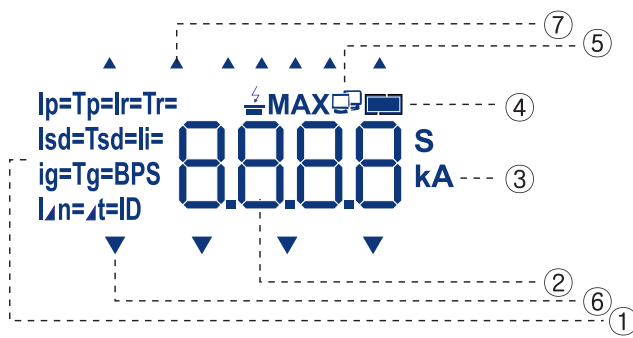
- record of the last 10 events (the cause of actuation, the value of the operating current, a phase and actuation time).

#### DATA EXCHANGE INTERFACE:

Modbus/RS485.

- 1 Return button after fault tripping
- 2 Actuation indication:  
PTA – alarm indication in the event of overload  
LTD – overload protection  
STD / INST – short circuit tripping  
GFT / ELT – tripping by short circuit to ground  
Alarm – microprocessor trip operation
- 3 Button to navigate the menu and self-test operation
- 4 Testing device jack
- 5 Selection of  $I^2t$  protection characteristic (set by the manufacturer)
- 6 The  $I_g$  switch sets the tripping current at single-phase short circuit to earth in multiples to the rated current (from 0.1 to 1.0  $I_n$ )
- 7  $T_g$  switch sets independent or inverse-time delay in the event of single-phase short circuit to earth (from 0.05 to 0.4 s)
- 8 The  $I_{sd}$  switch is used to set the tripping current in the zone of short circuit in multiples to the operating current (from 1.5 to 10  $I_R$ )
- 9, 12  $I_r$  and  $I_u$  switches set the operating current of the switch in multiples to the rated current from 0.4 to 1.0  $I_n$  ( $I_R = I_r \times I_u$ )
- 10 The  $T_r$  switch is used to set the time delay in the zone of overload (from 0.5 to 30 s with a load of 6  $I_R$ )
- 11 With the  $T_{sd}$  switch, a short-time delay is set in the zone of short circuit (from 0.05 to 0.4 s)
- 13  $I_i$  switch sets the reflex tripping current in the zone of short circuit in multiples to the rated current (from 2 to 15  $I_n$ )
- 14 The  $I_p$  switch sets the overload alarm making current in multiples to the  $I_u$  current
- 15 The  $T_p$  switch sets the make time for the overload alarm from the moment when it occurs
- 16 Liquid crystal display
- 17 LED three-phase current indication scales

## MR8.0 Liquid Crystal Display



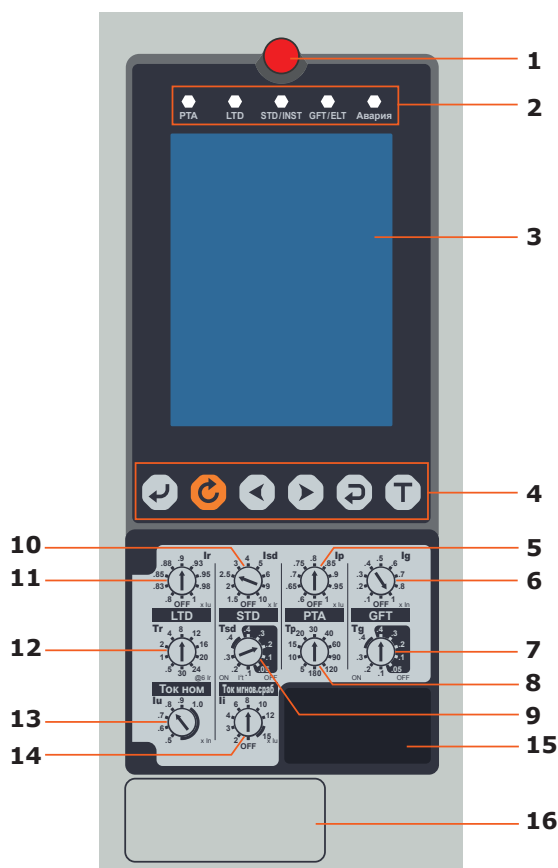
1. Displays current and time settings. Displays setting values and events.
2. Display numbers or symbols. Displays current, time and simple symbols.
3. Displays units, time and current values.
4. Battery charge control. A 3.6V battery is installed in a microprocessor-based release (lithium). Indication of battery status. Flicker with a frequency of 0.5 s means that the battery is low, replacement is necessary.
5. Indication of connection. Displays connection speed, address and screen settings.
6. Displays the measured current, phase and load level.
7. Displays information about alarms and commutations.

It is displayed for 1 s after supplying power to the microprocessor release, and then returns to the measurement screen.

Image	Button	Description
		<ol style="list-style-type: none"> <li>1. On the screen, current in R / S / T / N phases is displayed within 3-second intervals.</li> <li>2. The current of each phase is displayed. (▶) The form moves from left → to right.</li> <li>3. LED bar graph shows the load level of each phase by 40 ~ 110%.</li> </ol>
	▶	<ol style="list-style-type: none"> <li>1. Pressing the button (▶) is used to move to the next step.                             <ul style="list-style-type: none"> <li>• Measurement screen: moving to the next phase current reading.</li> <li>• Adjustment of settings: View the description of the next setting.</li> <li>• Viewing time: year, month → day, hour → minute, seconds.</li> </ul> </li> <li>2. When pressed for about 3 ~ 4 seconds on the measurement screen, the current of the displayed phase can be measured. (Press and hold for a short time, then release).</li> </ol>
	MENU	Used to check parameter values, view the alarm / event log, time and communication parameters.
	S/I	<ol style="list-style-type: none"> <li>1. Used for protection with short-time delay response / instant protection, SELF-TESTING.</li> <li>2. Priority of the shutdown without time delay.</li> <li>3. Instant shutdown in the event when time delay is not set for protection with a short-time delay / instantaneous protection.</li> </ol>
	LTD	<ol style="list-style-type: none"> <li>1. Used for protection with long time delay, SELF TEST.</li> <li>2. Unavailable if long-time delay is not set.</li> </ol>
	ENTER	<ol style="list-style-type: none"> <li>1. Used to view the description of the event / fault and change the date / time.</li> <li>2. After proceeding to the description, you must check or change the use of the MENU button, press the ENTER button to move to the next step.</li> </ol>
	RESET	<ol style="list-style-type: none"> <li>1. Return to the initial state after actuation, resetting event and alarm reports.</li> <li>2. The set of displayed LCD elements and the actuation information shown by the LEDs will be turned on for about 0.5 seconds.</li> <li>3. When displaying disconnection data using power from the backup battery, the LED indication will be turned off.</li> </ol>

		Screen indication	Button	Description
LTD	current	Ir= 2000 A	M ▶	<ol style="list-style-type: none"> <li>Being in the "Measurements" menu, press the Menu (M) button once to move to the "Settings" menu.</li> <li>The first screen displays the current setting for protection with long-time delay, press the tab button to view the values of other settings.</li> <li>Top of the screen: "I<sub>r</sub> =" is displayed.</li> </ol>
	time	Tr= 4.00 S	M ▶x1 times	<ol style="list-style-type: none"> <li>Press the tab button once in the settings preview menu to check the time setting for protection with long-time delay.</li> <li>Top of the screen: "T<sub>r</sub> =" is displayed.</li> </ol>
STD	current	Isd= 16.00 kA	M ▶x2 times	<ol style="list-style-type: none"> <li>Press the tab button 2 times in the settings preview menu to check the current setting for protection with short-time delay.</li> <li>Top of the screen: "Isd =" is displayed.</li> </ol>
	time	Tsd= 0.400 S	M ▶x3 times	<ol style="list-style-type: none"> <li>Press the tab button 3 times in the settings preview menu to check the time setting for protection with short-time delay. If the inverse response delay of I2t was chosen, then the displayed value will be greater than the specified value by 1 in the last digit. Example: With I2t on, the delay set 0.400 s. is displayed as 0.401 s.</li> <li>Top of the screen: "T<sub>sd</sub> =" is displayed.</li> </ol>
INST	current	Ii= 24.00 kA	M ▶x4 times	<ol style="list-style-type: none"> <li>Press the tab button 4 times in the settings preview menu to check the current setting for instantaneous protection.</li> <li>Top of the screen: "I<sub>i</sub> =" is displayed.</li> </ol>
PTA	current	I <sub>p</sub> = 1800 A	M ▶x5 times	<ol style="list-style-type: none"> <li>Press the tab button 5 times in the settings preview menu to check the current setting for overload alarm (PTA).</li> <li>Top of the screen: "I<sub>p</sub> =" is displayed.</li> </ol>
	time	T <sub>p</sub> = 20 S	M ▶x6 times	<ol style="list-style-type: none"> <li>Press the tab button 6 times in the settings preview menu to check the time setting for overload alarm (PTA).</li> <li>Top of the screen: "T<sub>p</sub> =" is displayed.</li> </ol>
GFT	current	I <sub>g</sub> = 800 A	M ▶x7 times	<ol style="list-style-type: none"> <li>Press the tab button 7 times in the settings preview menu to check the current setting for earth fault protection.</li> <li>Top of the screen: "I<sub>g</sub> =" is displayed.</li> </ol>
	time	T <sub>g</sub> = 0.400 S	M ▶x8 times	<ol style="list-style-type: none"> <li>Press the tab button 8 times in the settings preview menu to check the time setting for earth fault protection. If an inverse response delay I2t was selected, then the displayed value will be greater than the specified value by 1 in the last digit. Example: With I2t on, the set delay 0.400 s. is displayed as 0.401 s.</li> <li>Top of the screen: "T<sub>g</sub> =" is displayed.</li> </ol>

## MR8.1 type



### All required types of protection

#### OVERLOAD PROTECTION:

- with long-time delay.

#### PROTECTION AGAINST SHORT CIRCUIT:

- instantaneous with independent time delay;
- additional protection function I2t on / off (for protection with short – time delay).

#### PROTECTION AGAINST GROUND SHORT CIRCUIT:

- additional protection function I2t on / off.

#### OVERLOAD SIGNALING.

#### PROTECTIVE ACTUATION RECORDING:

- record of the last 300 events (the cause of actuation, the value of the operating current, a phase and actuation time).

#### CONTACT PROGRAMMING FUNCTION.







#### RUSSIAN LANGUAGE MENU

#### DATA EXCHANGE INTERFACE:

Modbus RTU/RS485.

- 1 Reset button
- 2 Alarm indications
- 3 LCD display
- 4 Control buttons and adjustment block
- 5 Adjustment of the current setting for overload indication
- 6 Adjustment of the current setting for earth fault
- 7 Adjustment of the time setting for earth fault
- 8 Adjustment of the time setting for overload indication
- 9 Adjustment of the time setting for single phase short circuit
- 10 Adjustment of the current setting for single phase short circuit
- 11 Adjustment of the current setting for overload
- 12 Adjustment of the time setting for overload
- 13 Adjustment of the operating current setting in multiples of nominal
- 14 Adjustment of the instantaneous current setting (no time delay)
- 15 Multifunctional connector
- 16 Battery cell

## LCD – display MR8.1

Button	Designation	Description
	Input, menu selection (ENTER)	- Used to select the menu; - Used to save changed settings.
	Error reset (RESET)	- Used to update the screen; - Used to update the error indication; - When the trip information is displayed using the backup battery, by pressing the RESET button, the main screen can be turned off
	Move left (LEFT)	- Used to navigate the menu or change parameters and select values.
	Move right (RIGHT)	- Used to navigate the menu or change parameters and select values.
	Reset (RESET)	- Used to navigate through the main menu; - Moves to the "Save" screen if there are changes on the settings display.
	Testing (TEST)	- Run the test using the specified test condition;

The microprocessor-based trip unit MR8.1 includes the following main menus:

### - Measurements

In this tab, you can see the current values of current and current readings in each phase.

### - System

In this tab, you can change rated current, rated frequency, system settings, system time, password, language, assignment of digital outputs and self-test settings.

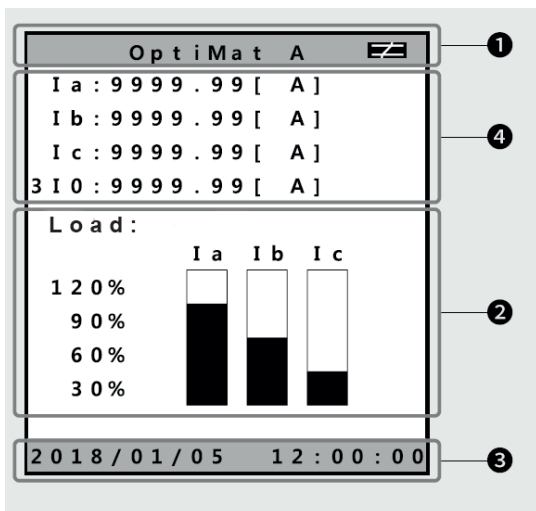
### - Settings

In this tab, you can change the settings.

### - Data log

In this tab, you can see information about the operations and faults.

The main screen displays the following information:



- 1 Display of the status of the internal battery and the menu titles.
- 2 Display of the load indication of each phase.
- 3 Display of the date and time.
- 4 Display of the exact current value in each phase.

## Protection settings for microprocessor-based releases MR7.0, MR8.0, MR8.1

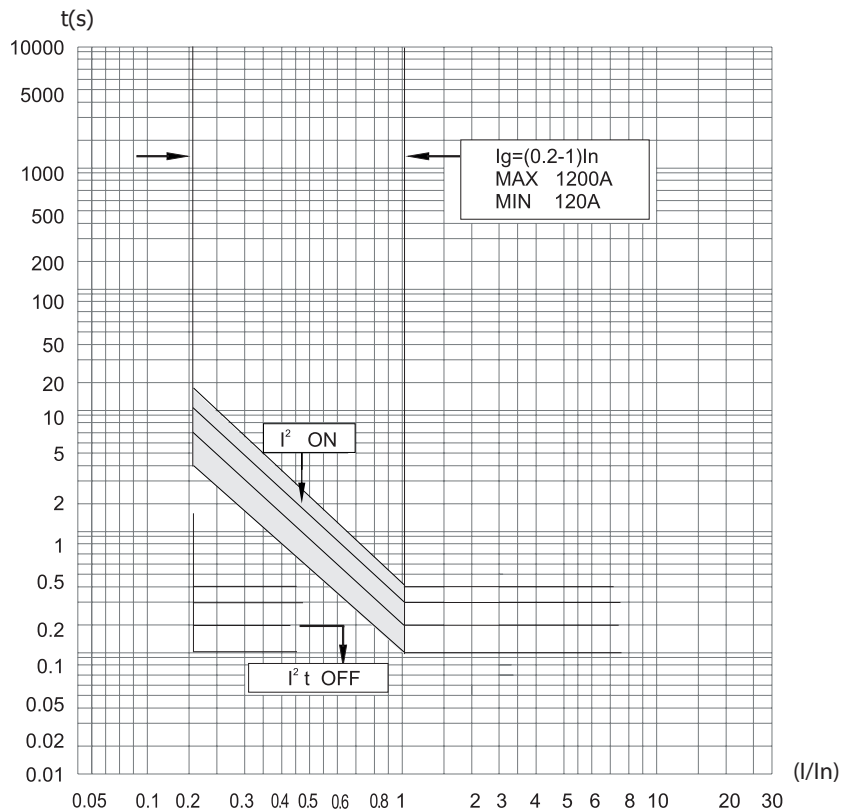
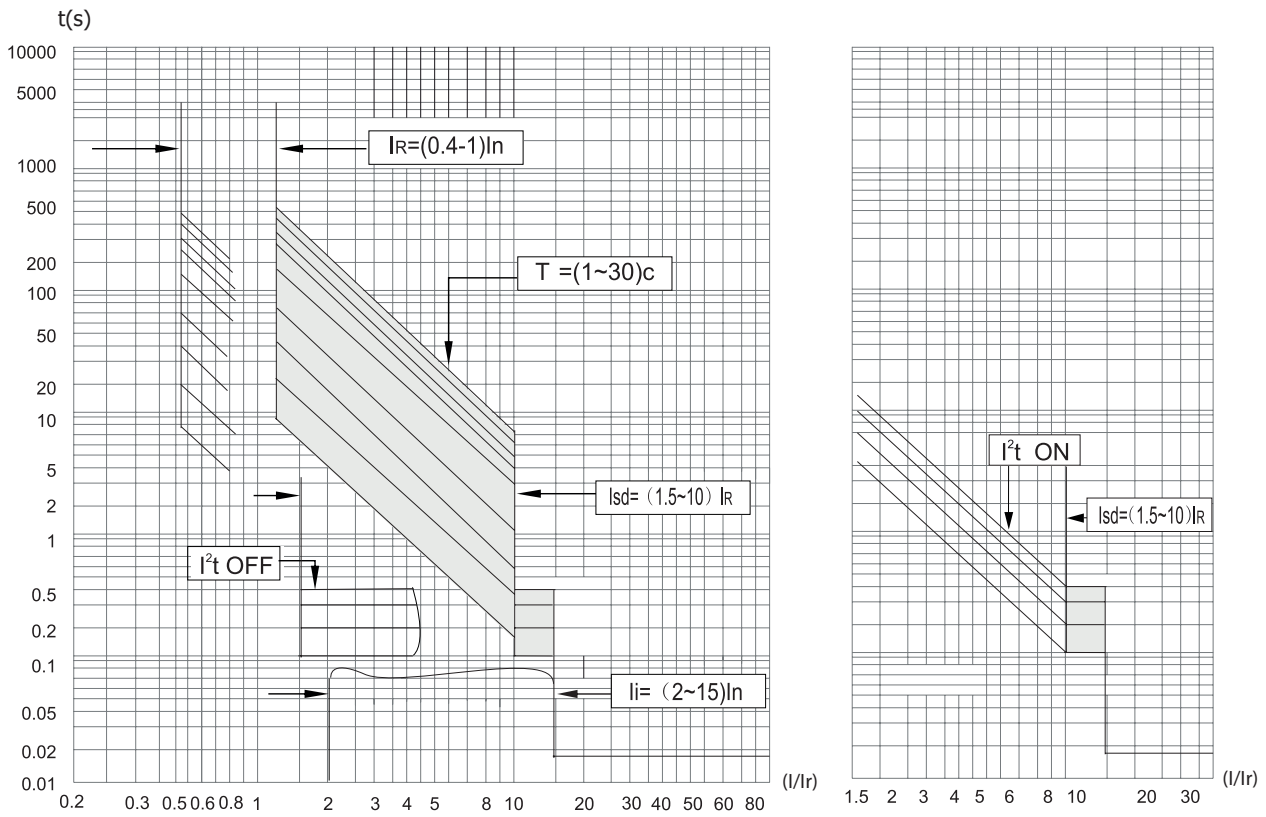
Parameter name	Parameter value	Accuracy
Setpoint of operating current (IR) in multiples of the rated current of the switch ( $IR / I_n$ ) $IR = I_r \times I_u$	$I_r = 0,8; 0,83; 0,85; 0,88; 0,9; 0,93; 0,95; 0,98; 1,0$ $I_u = 0,5; 0,6; 0,7; 0,8; 0,9; 1$	
Settings by the response time at a current of 6 IR, s ( $T_r$ )	0,5; 1; 2; 4; 8; 12; 16; 20; 24; 30	+15%
Settings by the trip current in the zone of short circuit Isd in multiples of the operating current ( $I_{sd} / IR$ )	1,5; 2; 2,5; 3; 4; 5; 6; 8; 10	+15%
Settings by the response time in the zone of short circuit, 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 s
Settings by the instantaneous tripping current ( $I_i$ ), A ( $T_i$ not more than 0.05 s)	2; 4; 6; 8; 10; 12; 15	+15%
Overload alarm current settings ( $I_p / I_u$ )	0,6; 0,65; 0,7; 0,75; 0,8; 0,85; 0,9; 0,95; 1,0	+15%
Settings by the time of the alarm signaling actuation ( $T_p$ ), s	5; 10; 15; 20; 30; 40; 60; 90; 120; 180	+15%
Tripping current settings at single-phase earth fault in multiples to the rated current ( $I_g / I_n$ )	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1	+20%
Settings by the response time at single-phase short circuit to earth ( $T_g$ ), 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 s

## Information transmitted by the microprocessor-based release MR8.0, MR8.1

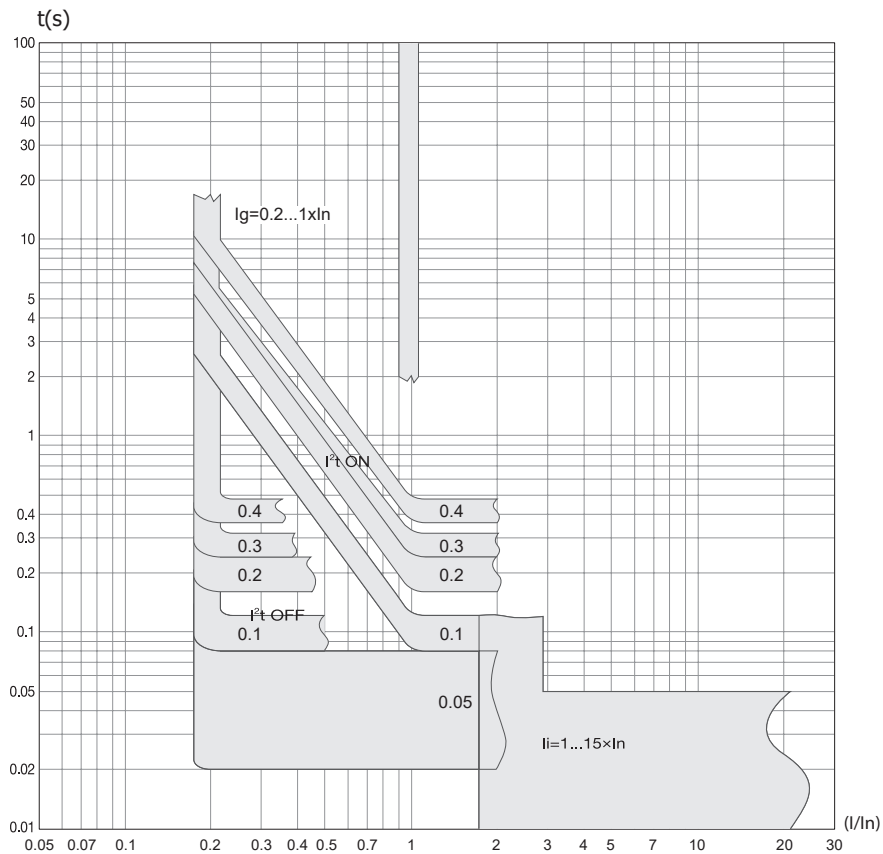
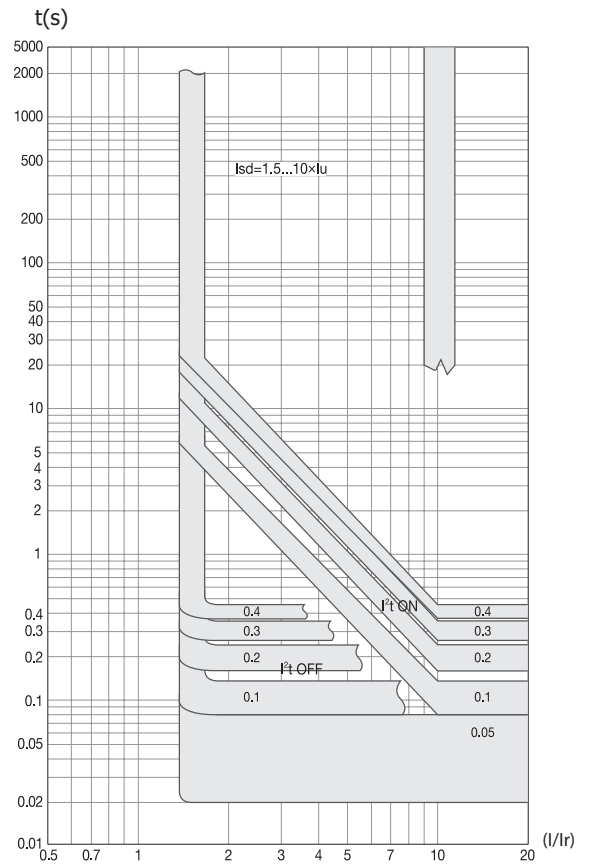
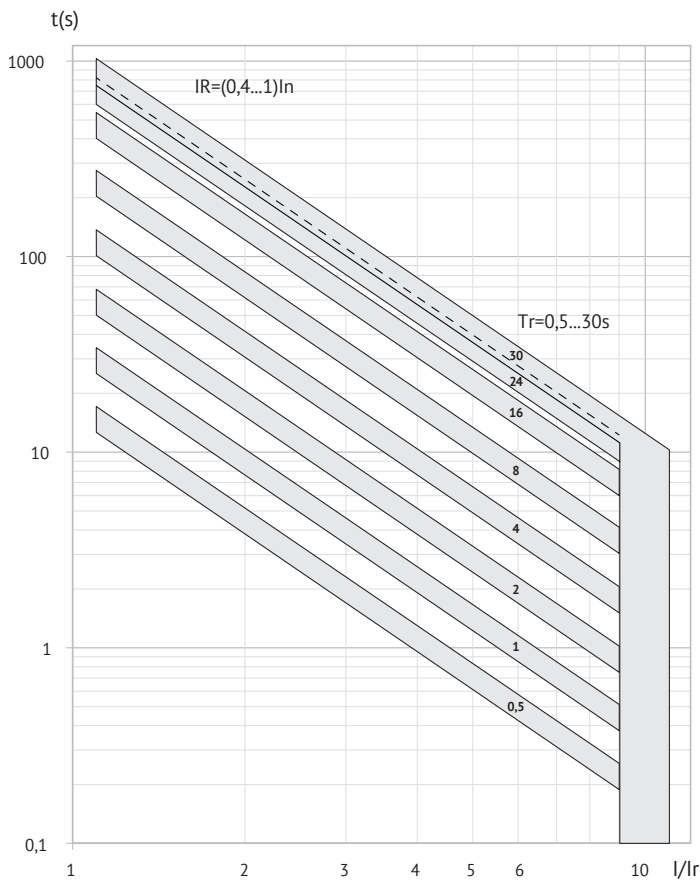
Supported protocol		Modbus RTU
Physical level		RS485
Maximum data transfer rate		19200 bps
Maximum number of devices in parallel operation		100
Settings information		
Ir	Operating current of the switch (set by the switches Ir and Iu in multiples of the rated current from 0.4 In to 1.0In ( $IR = Ir \cdot I_u$ ))	
Tr	Protective characteristic depending on the response time in the overload zone (from 0.5 to 30 s with a load of 6IR)	
Isd	Tripping current in the short circuit zone (from 1.5IR to 10IR)	
Tsd	Short-time delay in the zone of short circuit (from 0.05 to 0.4 s)	
Ii	Instantaneous operating current in the zone of short circuit in multiples of the rated current (from 2In to 15In)	
Ip	Overload alarm switching current in multiples of current Iu	
Tp	Overload alarm actuation time since the moment of its occurrence	
Ig	Tripping current at single-phase short-circuit to earth in multiples of the rated current (from 0.1In to 1.0In)	
Tg	Short-time delay at single-phase short circuit to earth (0.05 to 0.4 s)	
Data on circuit breaker actuation		
Current in phases in the event of the switch actuation		
Tripping current in the event of single-phase short circuit to earth		
Year, month, date, time (minutes and seconds) of the circuit breaker actuation		
Cause of the circuit breaker actuation and the phase with the maximum current value when the circuit breaker trips		
Maximum current in one of the phases when the circuit breaker trips		
Measured parameters		
Measured current value in phases		



# Time – current characteristics of switches with a microprocessor-based release MR5.0



# Time - current characteristics of switches with a microprocessor-based release MR7.0, MR8.0, MR8.1



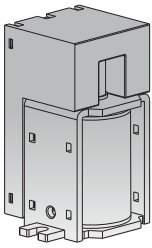
## Mounting accessories OptiMat A of overall designs S2, S4

### Independent trip device

The specified independent trip device is designed to remotely disconnect the circuit breaker. The independent trip device causes the circuit breaker to open in all operating conditions, when the supply voltage remains within the range from 0,75Ue to 1,1Ue. Unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell.

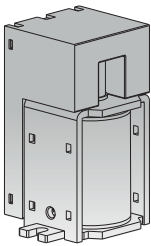
### Secondary independent trip device

The secondary independent trip device is intended for a remote disconnection of the circuit breaker and features a backup system of the shunt release. Technical specifications correspond to the characteristics of the shunt release. Is installed if additional requirements are placed on the system reliability, which include an air circuit breaker. It is a mutually exclusive position with an undervoltage release.



Title	Independent trip device OptiMat A-230AC/DC-UHL3 (TC3)	Independent trip device OptiMat A-110AC/DC-UHL3 (TC3)	Independent trip device OptiMat A-24DC-UHL3 (TC3)
Reference	217987	217986	272026
Operating voltage, V	230 AC/DC	110 AC/DC	24 DC
Range of operating voltages	(0,75-1,1) Ue		
Power consumption, VA, W	200		
Operation mode	Short-time (impulse)		
Break – time, ms	not more than 50		

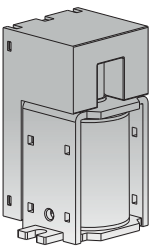
### Closing coil



The closing coil is designed to remotely actuate the circuit breaker. Unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell.

Title	Closing coil OptiMat A-230AC/DC-UHL3 (TC3)	Closing coil OptiMat A-110AC/DC-UHL3 (TC3)	Closing coil OptiMat A-24DC-UHL3 (TC3)
Reference	217989	217988	272020
Operating voltage, V	230 AC/DC	110 AC/DC	24 DC
Range of operating voltages	(0,75-1,1) Ue		
Power consumption, VA, W	200		
Operation mode	Short-time (impulse)		
Break – time, ms	not more than 50		

### Undervoltage release

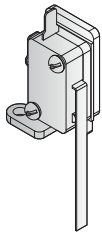


The undervoltage release is designed to disconnect the circuit breaker when the voltage drops below the established norms. If there is no supply voltage at the undervoltage release, automatic or manual closing is impossible. The undervoltage release causes the circuit breaker trip under any operating conditions when the supply voltage decreases within the range from 0,75 to 1,1 Ue. Closing of the circuit breaker becomes possible when applying to the undervoltage release from 0,75 to 1,1 Ue. The device is unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell.

The position is mutually exclusive with the secondary independent trip device.

Title	Undervoltage release OptiMat A-230AC/DC-UHL3 (TC3)
Reference	217994
Operating voltage, V	230 AC/DC
Range of operating voltages	(0,75-1,1) Ue
Power consumption, VA	200
Operation mode	Short-time (impulse)
Break – time, ms	not more than 50

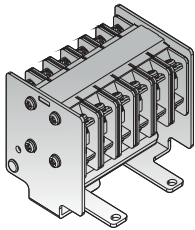
## — Signaling contact of the switch availability for closing the main contacts



Signaling contact of the switch availability for closing the main contacts is intended to inform on the status of the spring (it is wound / not wound), turning on the automatic switch. It is installed under the front panel of the circuit breaker in its own cell.

Signaling contact of the switch availability for closing the main contacts of OptiMat A630-4000-UHL3(TC3)		
Title	Voltage, V	Active load, A
Alternating current, VA	250	8
	125	16
Direct current, W	250	0,3
	125	0,6

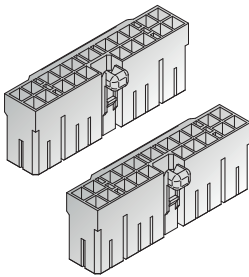
## — Auxiliary contacts



Auxiliary contacts are used to signal the status of the switch. The devices are unified for all types of OptiMat A switches. Installed under the front panel of the circuit breaker in their own cell. Included in standard configuration.

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

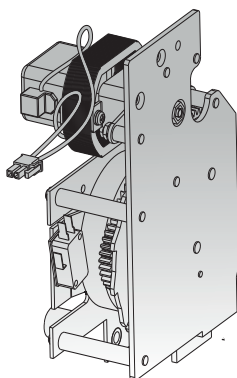
## — Set of connectors for control circuits



A set of connectors for control circuits is designed for electrical connection of the air circuit breaker systems with the main control body. It is mounted to external electrical wiring and is connected to the circuit breaker. Included in standard configuration of the circuit breakers of withdrawable (draw-out) version.

Title		OptiMat A-UHL3 (TC3) set of connectors for control circuits
Reference		234555
Delivery quantity	Plastic terminal block	2
	Female contact	15

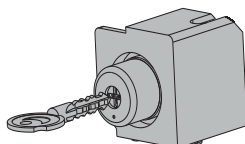
## — Motor drive



The motor drive is designed for arming the closing spring of the circuit breaker. In the event of power supply absence to the motor drive, the arming of the closing spring is performed manually. The device is unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell.

Title	Motor drive OptiMat A630-4000-230AC / DC-UHL3 (TC3)
Reference	235993
Operating voltage, V	230 AC/DC
Maximum current consumption, A	0,5
Motor rotational speed, rpm	16000-19000
Maximum starting current	5In
Arming time, s	not more than 5
Insulation strength	2 kV within 1 min
Operating temperature range, °C	-25...+60
Operating frequency	no more than 2 times / min
Mechanical life	20,000 cycles

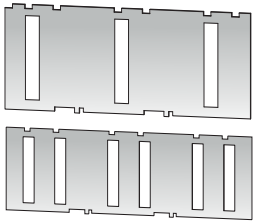
## — Startup lock



The built-in startup lock is designed to lock actuation (locks the circuit breaker in the disconnected state). It is impossible to unlock the switch without the corresponding key. The device is unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell.

Title	OptiMat A built-in lock
Reference	217999
Number of keys in the set, pcs	1

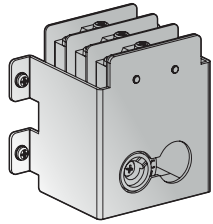
### Insulating shutters



Insulating shutters are designed to prevent access to plug-in contacts when the circuit breaker is in the "draw-out" or "test" position (IP20 protection level). Installed in the chassis (basket) of the circuit breaker.

Dimension of circuit breaker	Title	Reference
Dimension I up to 2000 A	Insulating shutters OptiMat A630-2000-UHL3 (TC3)	242118
Dimension II up to 4000 A	Insulating shutters OptiMat A2500-4000-UHL3 (TC3)	242119

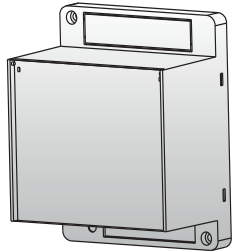
### Indication of the circuit breaker position in the chassis (basket)



The position indication determines the state of the circuit breaker: DRAW-IN / TEST / DRAW-OUT. Installed on the basket (chassis) to the left or right of the CIRCUIT BREAKER.

Title			
Indication of the circuit breaker position in the chassis (basket) OptiMat A-UHL3 (TC3)			
Reference	267249		
	Voltage, V	Active load	Inductive load
Alternating current, VA	250	5	2,5
	125	10	10
Direct current, W	250	3	1,5
	125	10	10

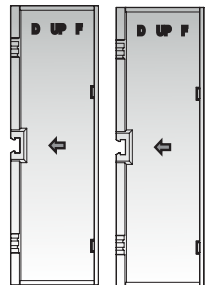
### Response delay controller of the undervoltage release



The controller is designed to prevent tripping of the undervoltage release in case of short-time failures or voltage drops at the power supply. The undervoltage release is required for connection as part of a circuit breaker. Mounted on a DIN rail or on the side of the switch.

Title	
Response delay controller of the undervoltage release OptiMat A-UHL3 (TC3)	
Reference	236607
Delay time, s	0,5; 1,0; 1,5; 3

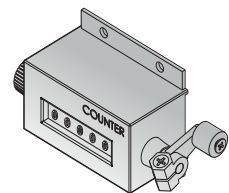
### Interpole barriers



Interpole barriers are designed to prevent the occurrence of interphase short circuit. The devices are unified for all types of OptiMat A circuit breakers. They are installed in the corresponding grooves between the main terminals of the switch. Included in standard configuration.

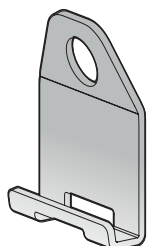
Title	Interpole barriers OptiMat A630-4000-UHL3(TC3)-2 pcs
Reference	269618
Number of barriers in the set	2

### Mechanical cycle counter



The mechanical cycle counter is designed to indicate the number of on / off cycles. Unified for all types of OptiMat A switches. It is installed under the front panel of the circuit breaker in its own cell. Included in standard configuration.

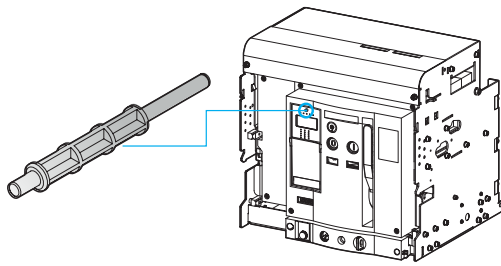
### Lifting lugs



Lifting lugs are designed to facilitate lifting and moving a circuit breaker. Unified for all types of OptiMat A switches.

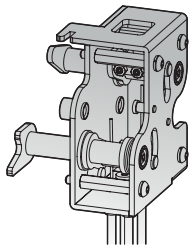
Title	Lifting lugs OptiMat A-UHL3(TC3)-2pcs
Reference	240745

### Retracting mechanism of the microprocessor-based release



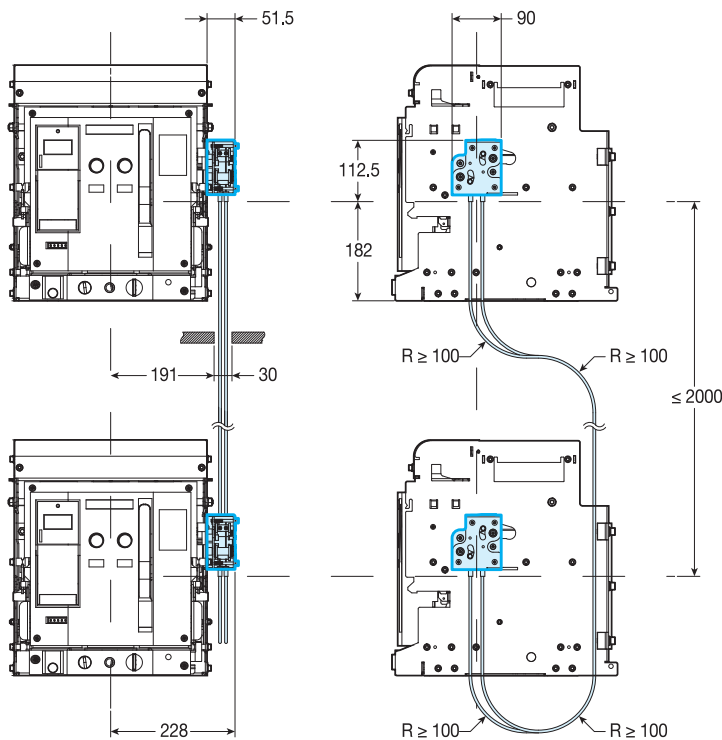
The module in the base of the microprocessor-based release is equipped with a manual retraction (return) button after actuation from the microprocessor trip unit. After the automatic circuit breaker is actuated, the button moves forward. To turn on the circuit breaker, it is necessary to press the button. Unified for OptiMat A switches of all types. It is installed under the front panel of the circuit breaker in its own cell. Included in standard configuration.

### Mechanical interlocking

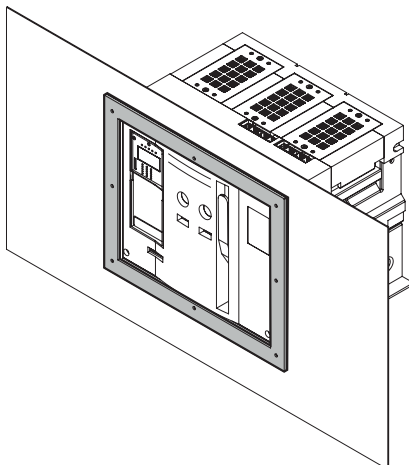


Mechanical interlocking is designed for reciprocal interlocking of the on / off operations of two or three automatic circuit breakers.

Title	Reference
Mechanical interlock kit for 2 OptiMat A630-4000-UHL3 (TC3)	242120
Mechanical interlock kit for 3 OptiMat A630-4000-UHL3 (TC3)	248580



### Front panel frame



The frame of the front panel is designed to protect against contact with the sharp edge of the cutout. In addition, it protects the extending front part of the switch. Is mounted on the front panel of the switchgear.

Title	Reference
Front panel frame of the fixed OptiMat A 630-2000A-UHL3 (TC3)	246228
Front panel frame of the fixed OptiMat A 2500-4000A-UHL3 (TC3)	246232
Front panel frame of the withdrawable OptiMat A 630-2000A-UHL3 (TC3)	246233
Front panel frame of the withdrawable OptiMat A 2500-4000A-UHL3 (TC3)	249399

## Mounting accessories of OptiMat A series of overall dimensions S1, S5, S6

### Closing coil and independent trip device

The closing coil is designed to actuate the switch remotely, and the independent trip device is designed to disconnect the switch remotely. They are designed for operation in AC and DC circuits.

Operating voltage Ue, V	230AC/220DC
Operating voltage range, V	(0,7 ~ 1,1)Ue
Power consumption V / A or W	200
Break-time	50±10 ms

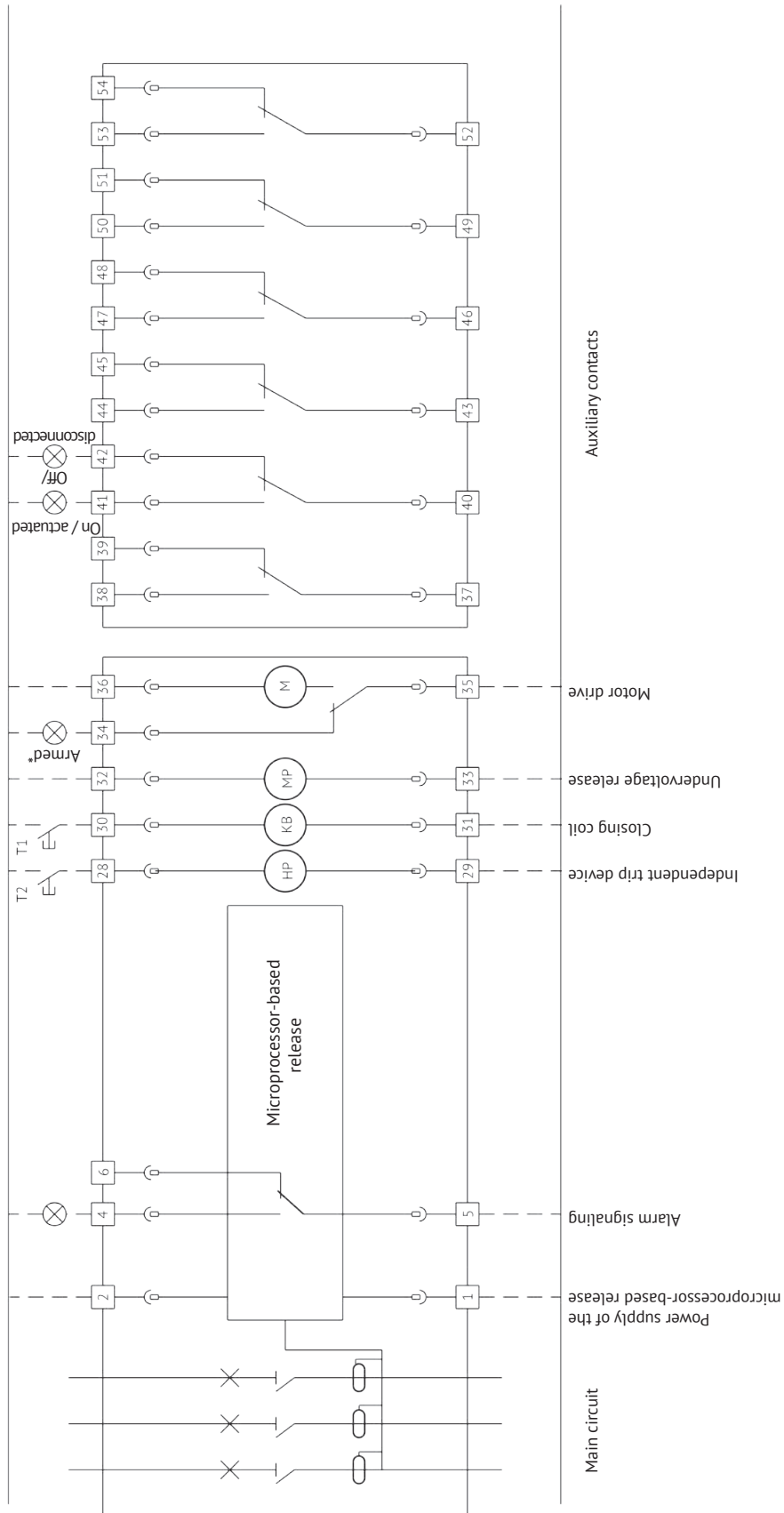
### Motor drive

The motor drive is designed for remote arming of the switch mechanism, pre-compression of the actuating spring, i.e. preparation of the switch to close. The nominal operation mode of the motor drive is short-term. The motor drive is designed for operation in an AC or DC circuit.

Operating voltage Ue, V	230AC/220DC
Operating voltage range, V	(0,85 ~ 1,1)Ue
Power consumption V / A or W	150
Arming (retraction) time, s	<8
Frequency of arming	up to three cycles per minute

# Wiring diagrams of OptiMat A

Wiring diagram of the circuit breaker with a semiconductor release MR5.0 type of S1 overall dimension

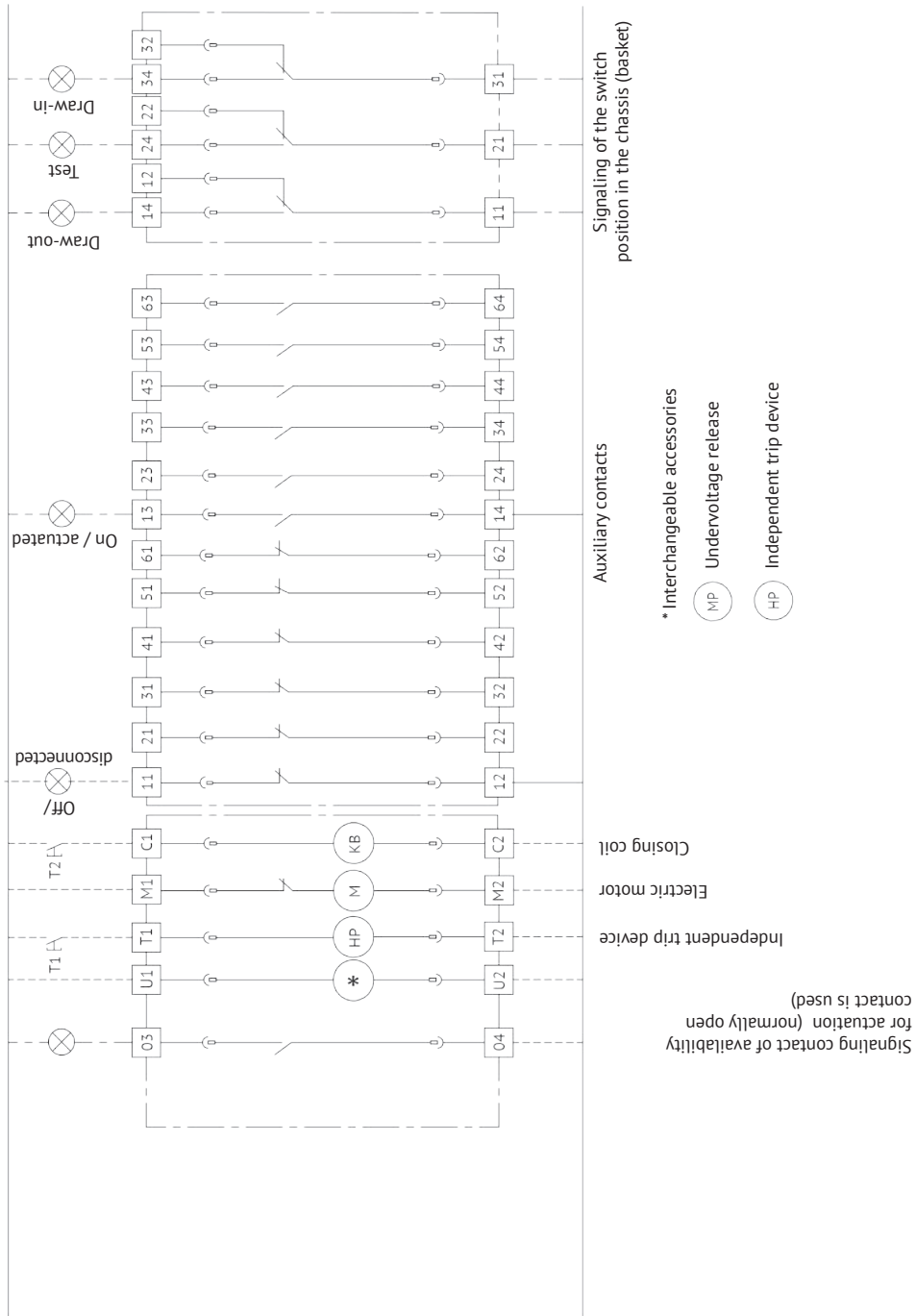


\*Output "34" (armed) is not galvanically isolated with output "36"

Dashed lines indicate connections made by a consumer.

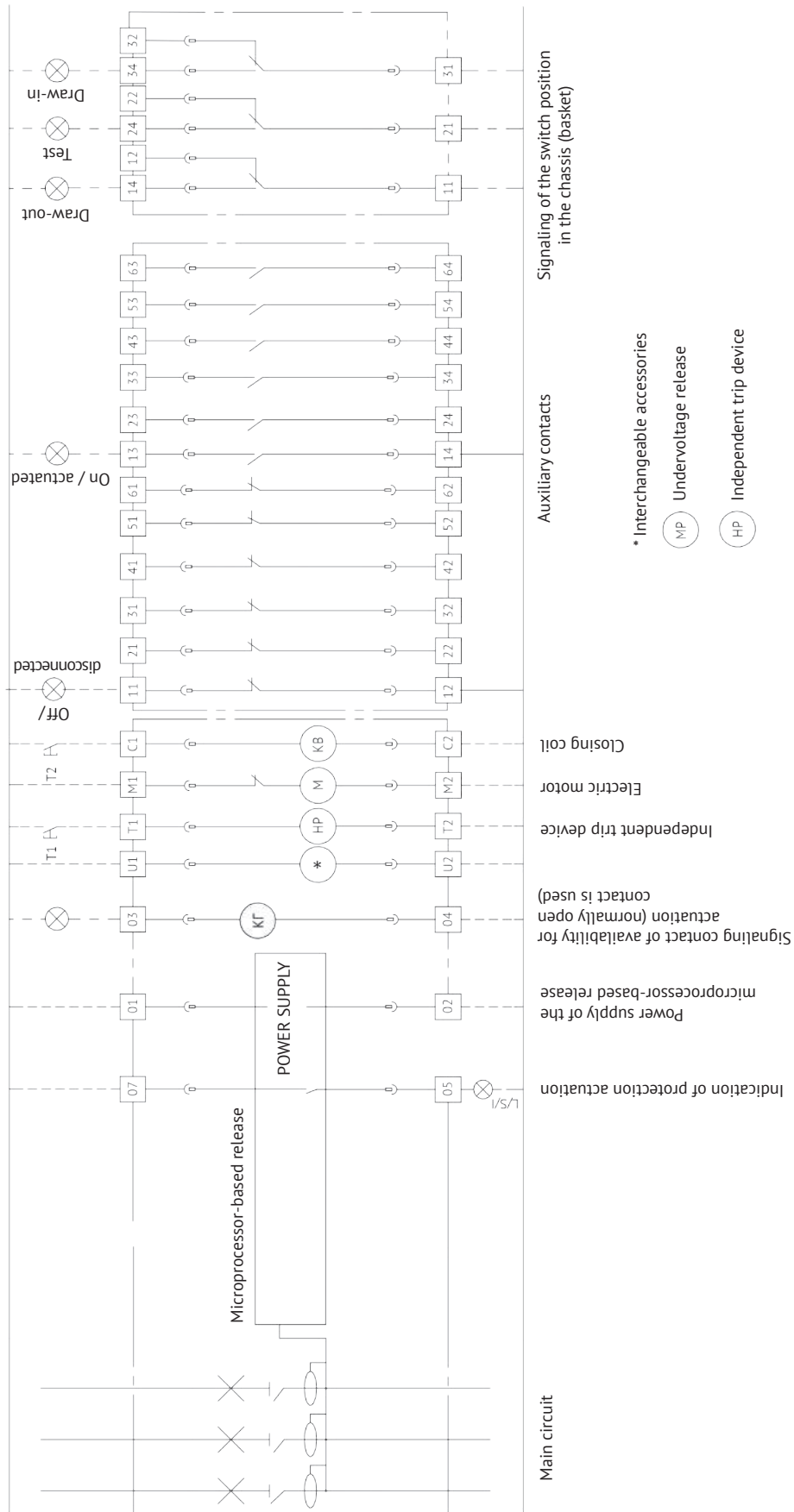


**Wiring diagram of the circuit breaker without a semiconductor release type of S2, S4 overall dimensions**



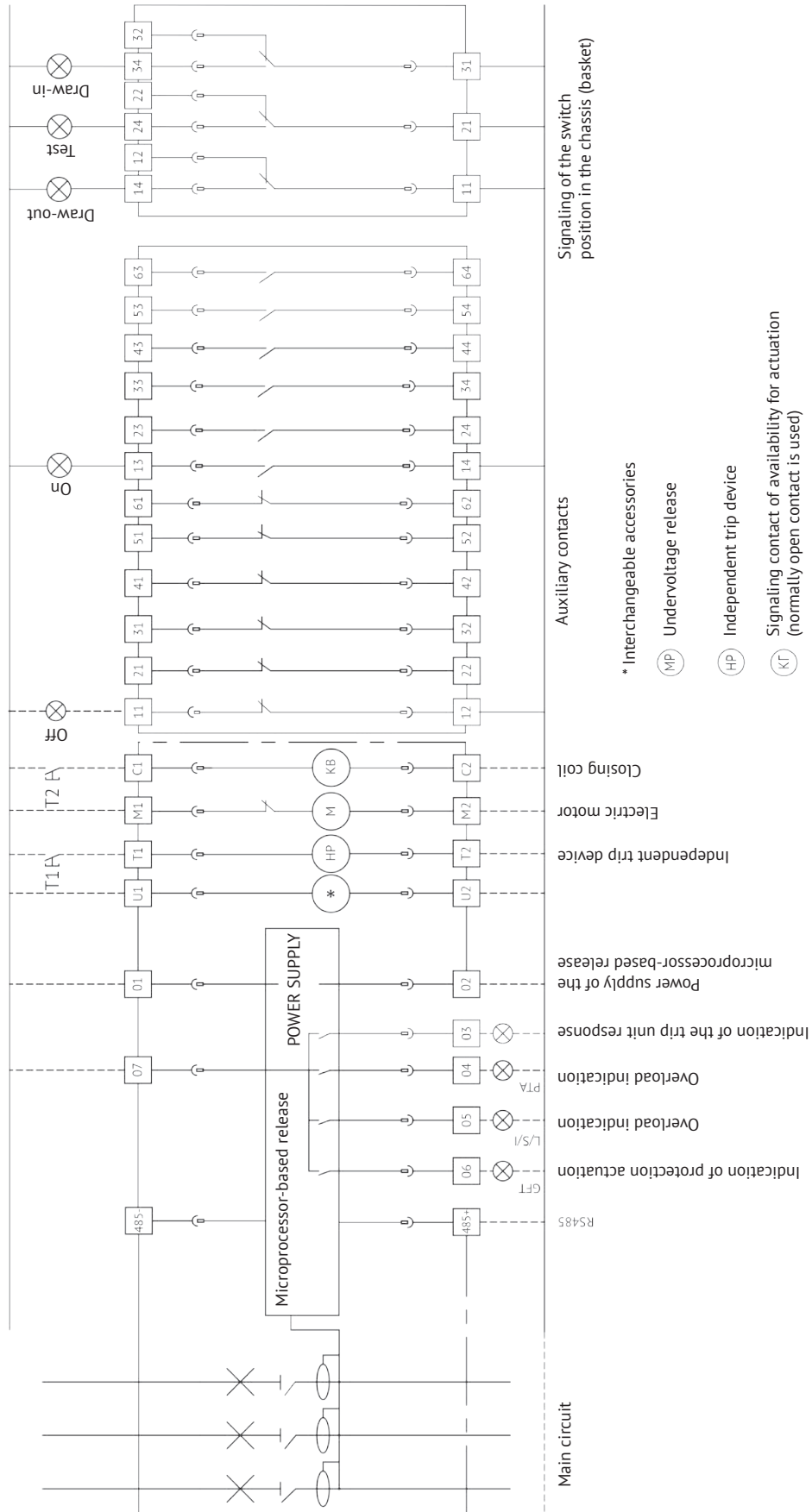
Dashed lines indicate connections made by a consumer.

**Wiring diagram of the circuit breaker with a semiconductor release type MR7.0 of S2, S4 overall dimensions**



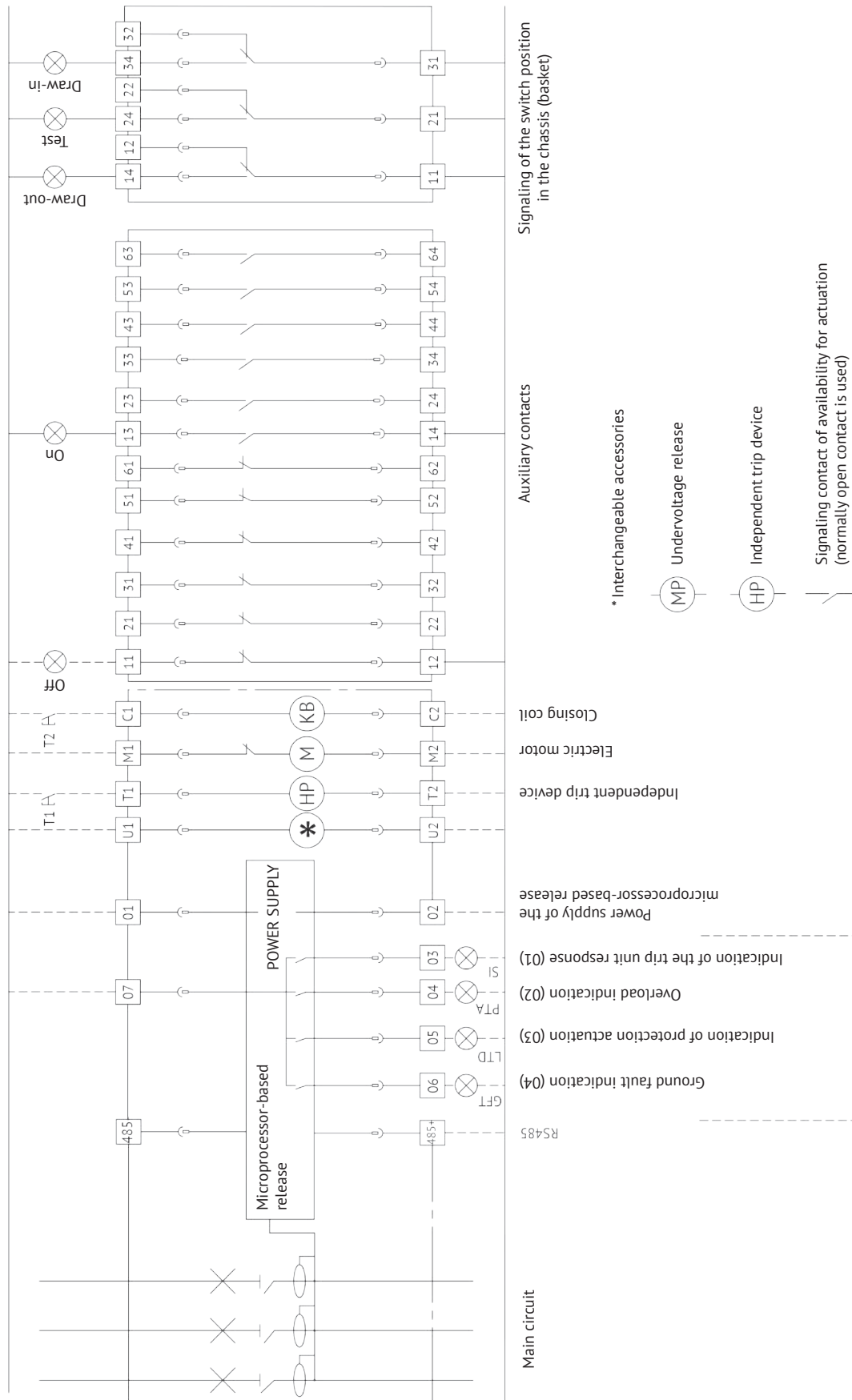
Dashed lines indicate connections made by a consumer.

**Wiring diagram of the circuit breaker with a semiconductor release type MR8.0 of S2, S4 overall dimensions**



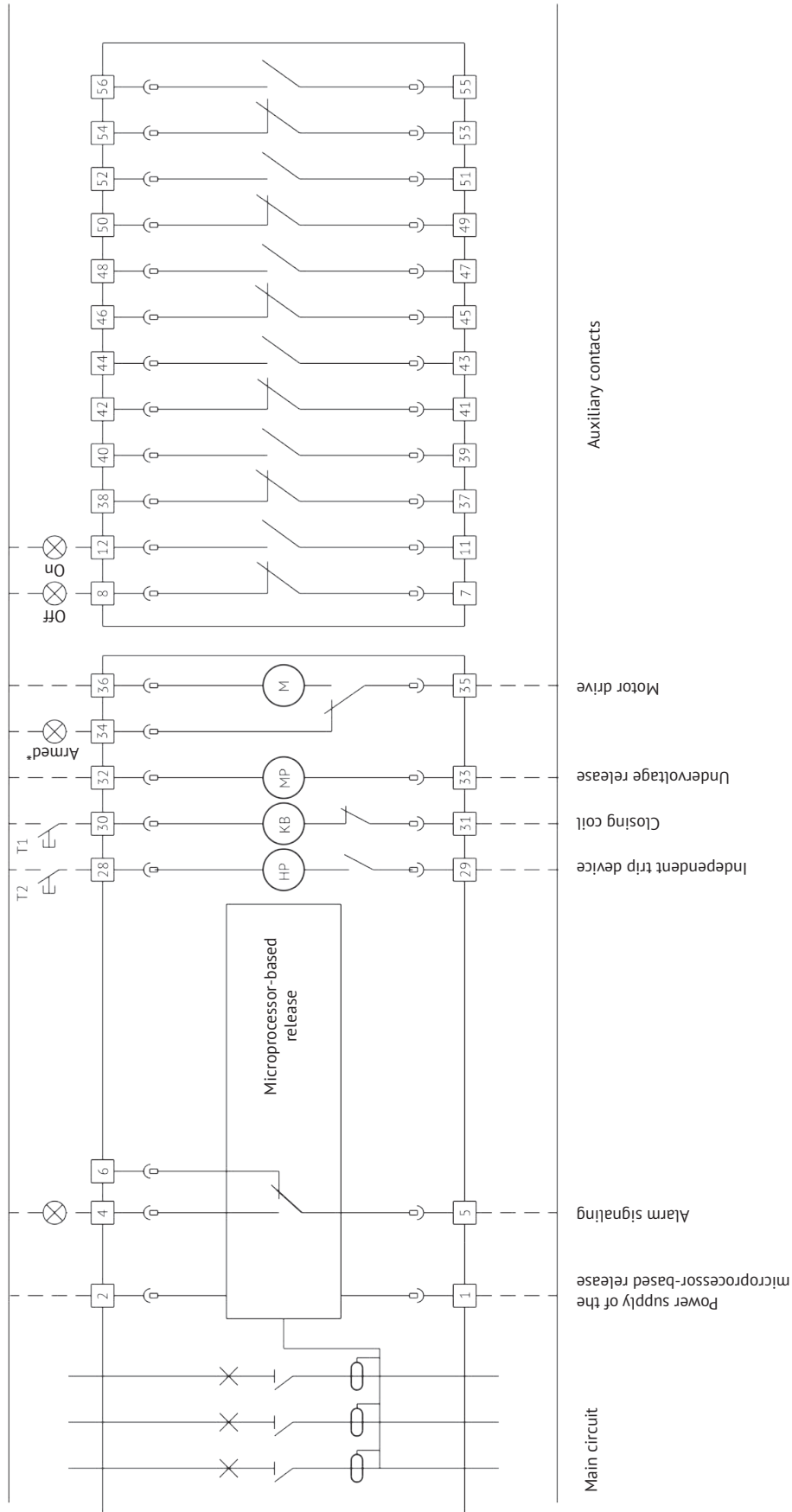
Dashed lines indicate connections made by a consumer.

**Wiring diagram of the circuit breaker with a semiconductor release type MR8.1 of S2, S4 overall dimensions**



Dashed lines indicate connections made by a consumer.

**Wiring diagram of the circuit breaker with a semiconductor release type MR5.0 S5, S6 overall dimensions**



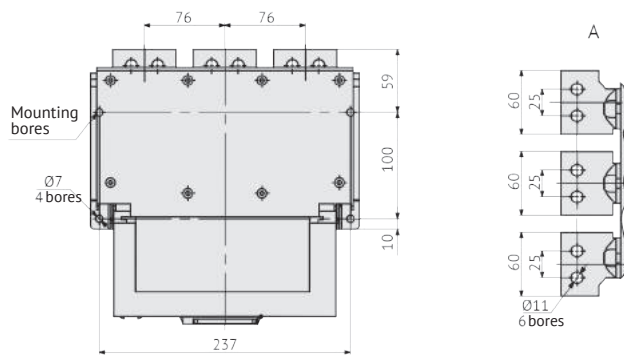
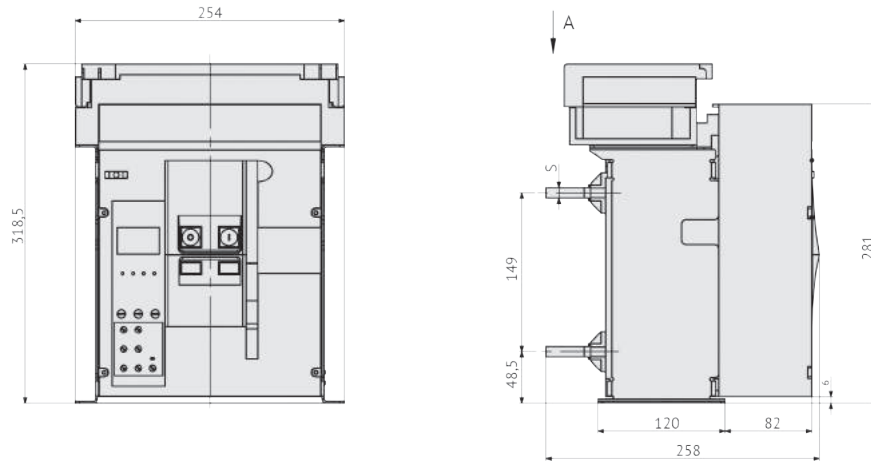
Dashed lines indicate connections made by a consumer.

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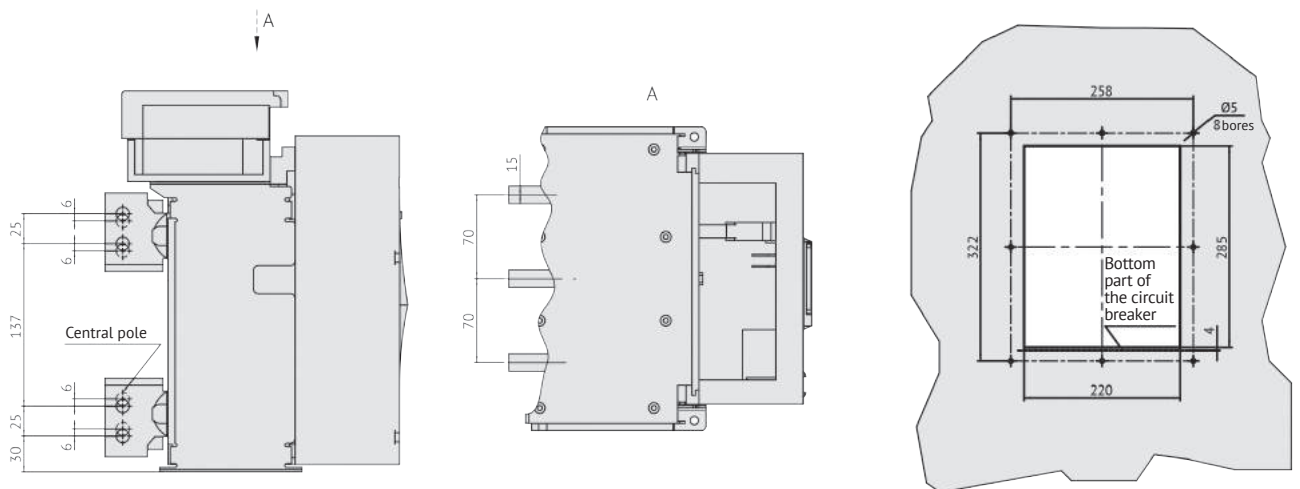
## Overall, mounting and connection dimensions (mm)

### Drawings of S1 dimension fixed circuit breakers

OptiMat A circuit breakers of S1 dimension, fixed version with rear busbar connection option from 630 to 1600 A

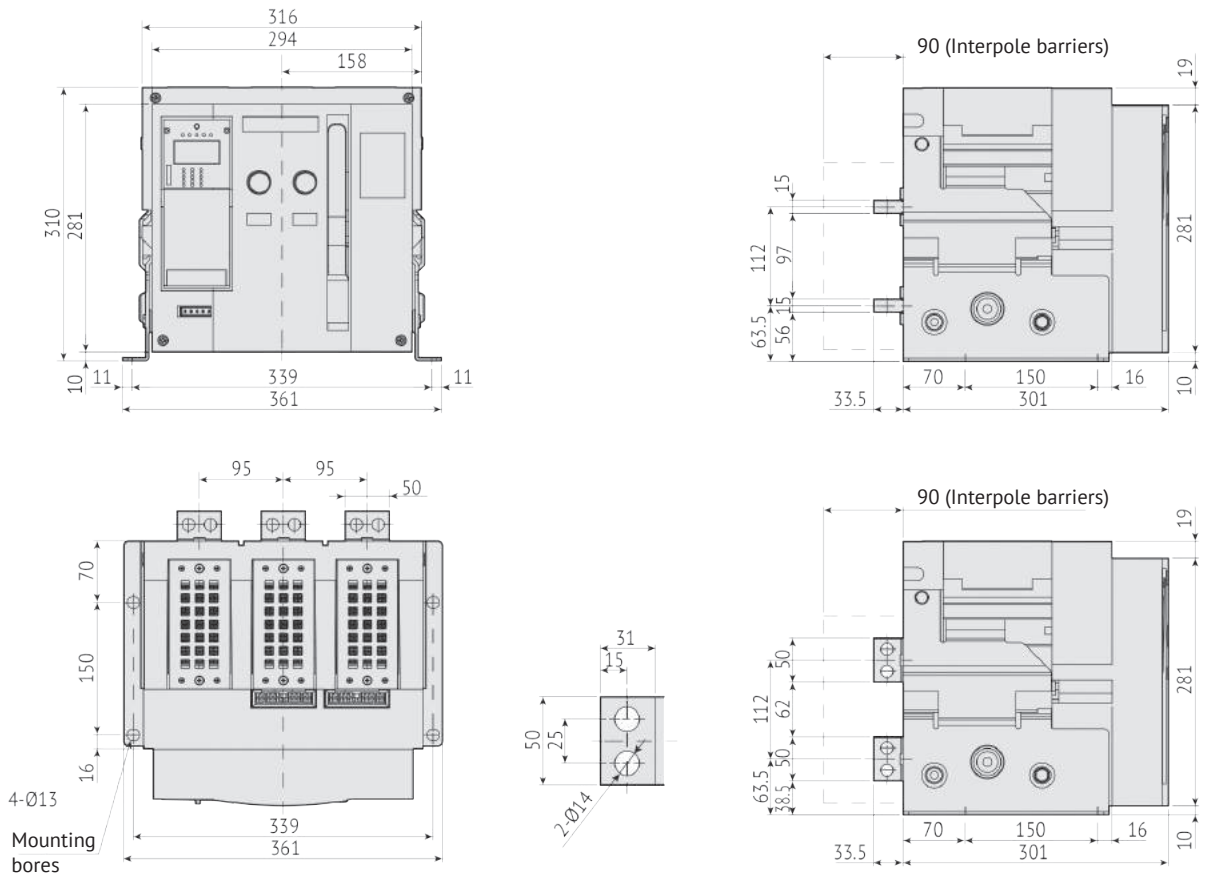


Rated current, A	S, mm
630	5
800	10
1000	
1250	15
1600	

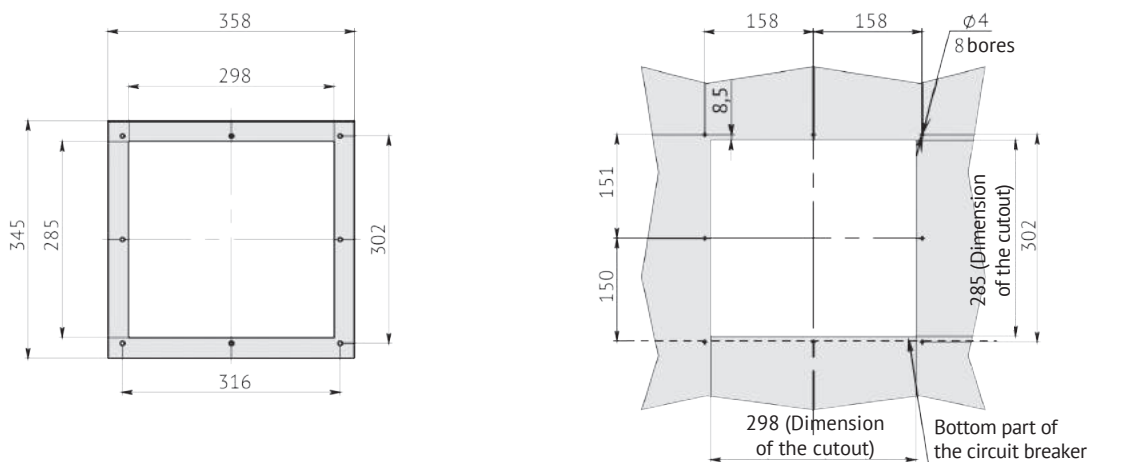


## Drawings of S2 dimension fixed circuit breakers

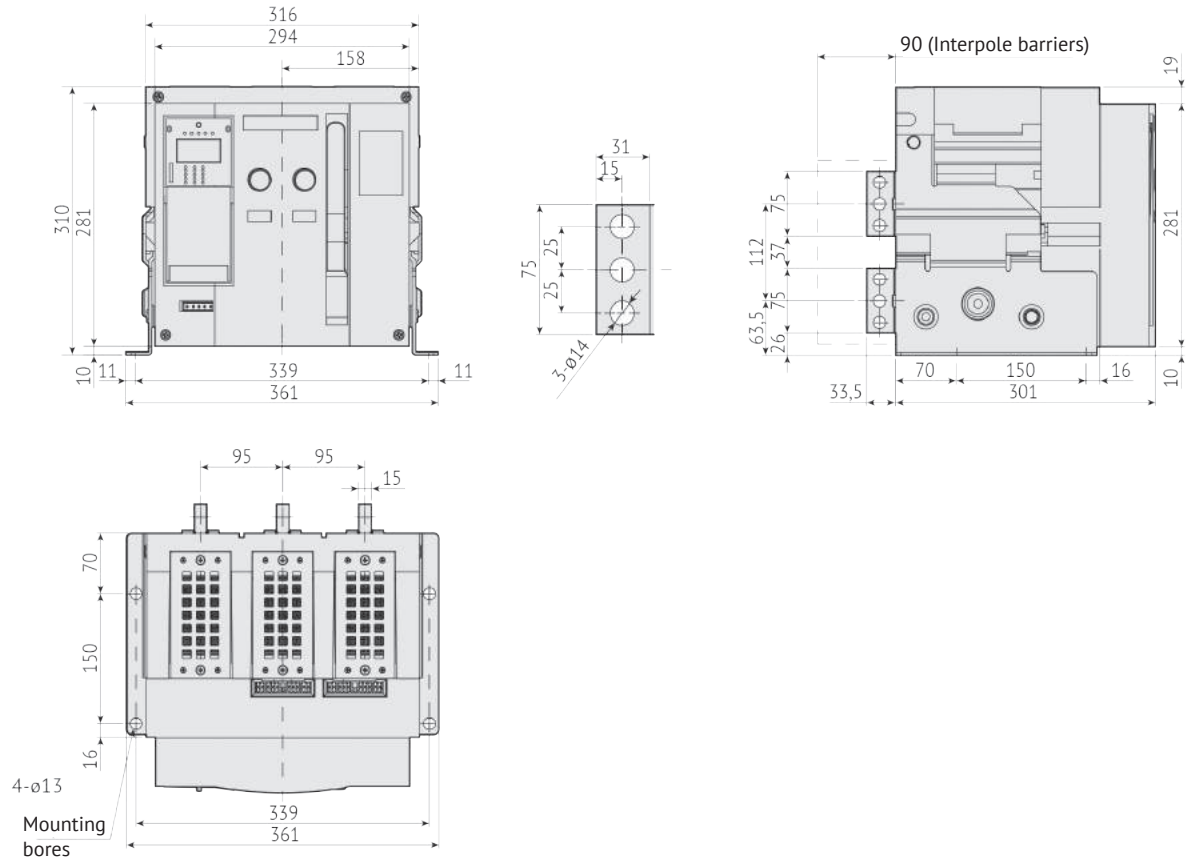
### OptiMat A circuit breakers of S2 dimension, fixed version with rear busbar connection option from 630 to 1600 A



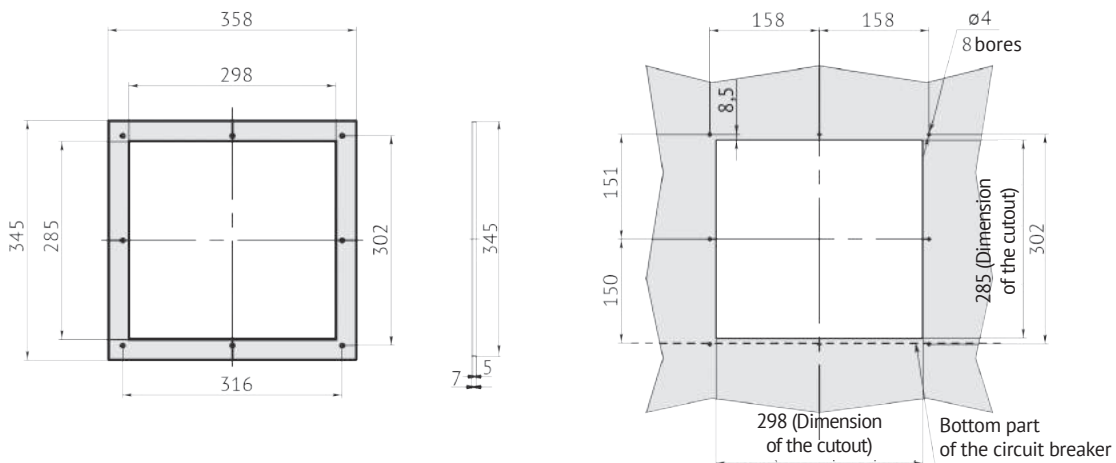
### Front panel frame



**OptiMat A circuit breakers of S2 dimension, fixed version with rear busbar connection option for 2000 A**

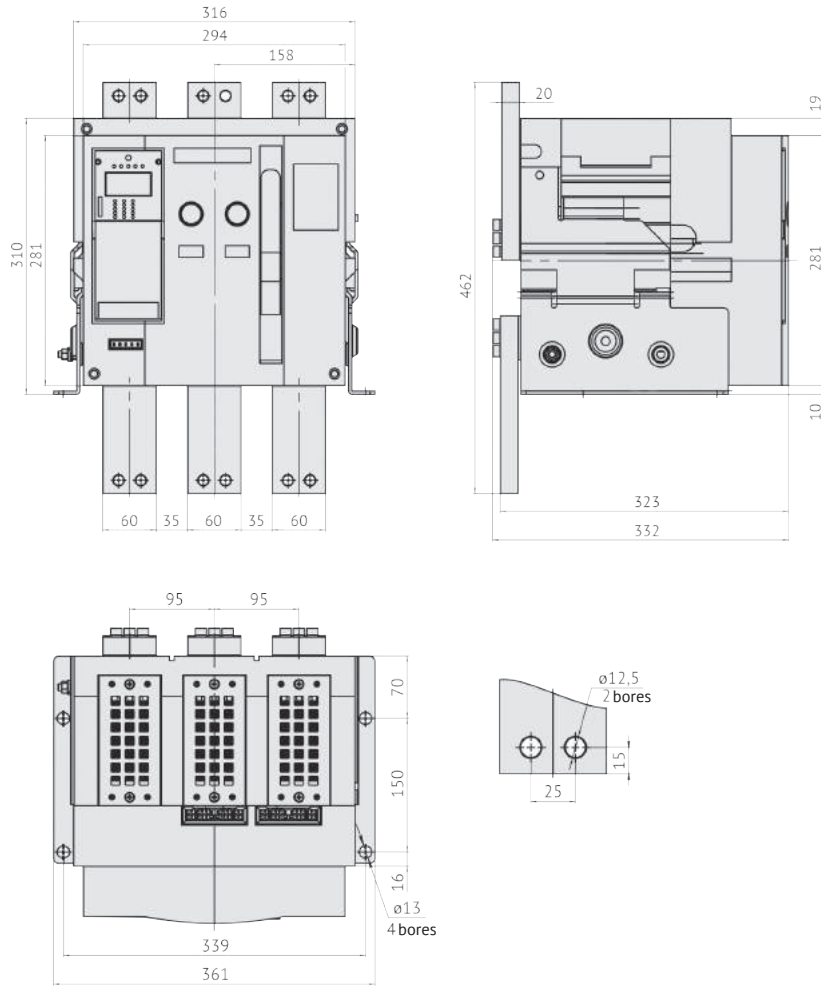


**Front panel frame**

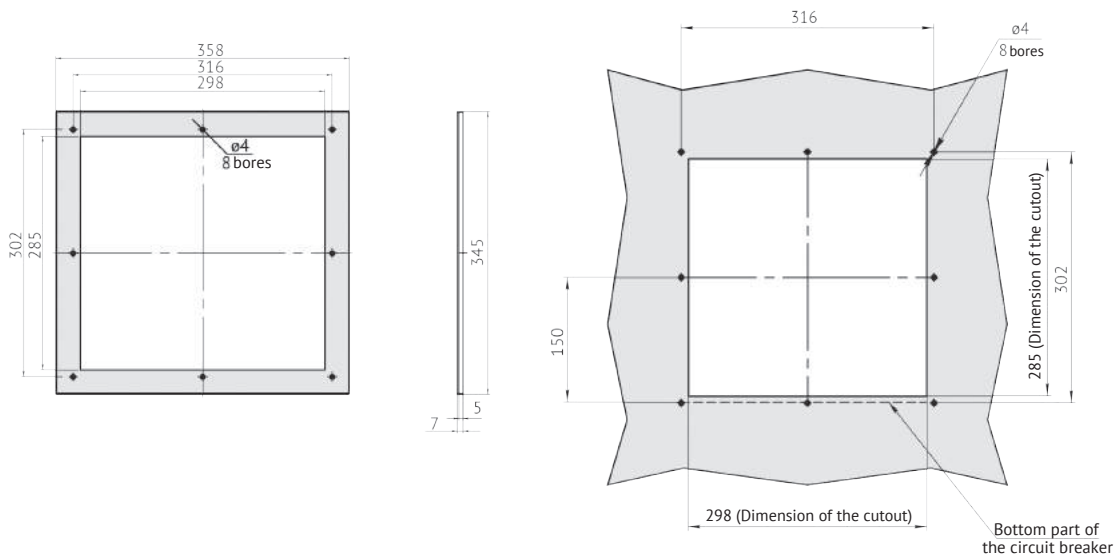




### OptiMat A circuit breakers of S2 dimension, fixed version with front busbar connection option from 630 to 2000 A

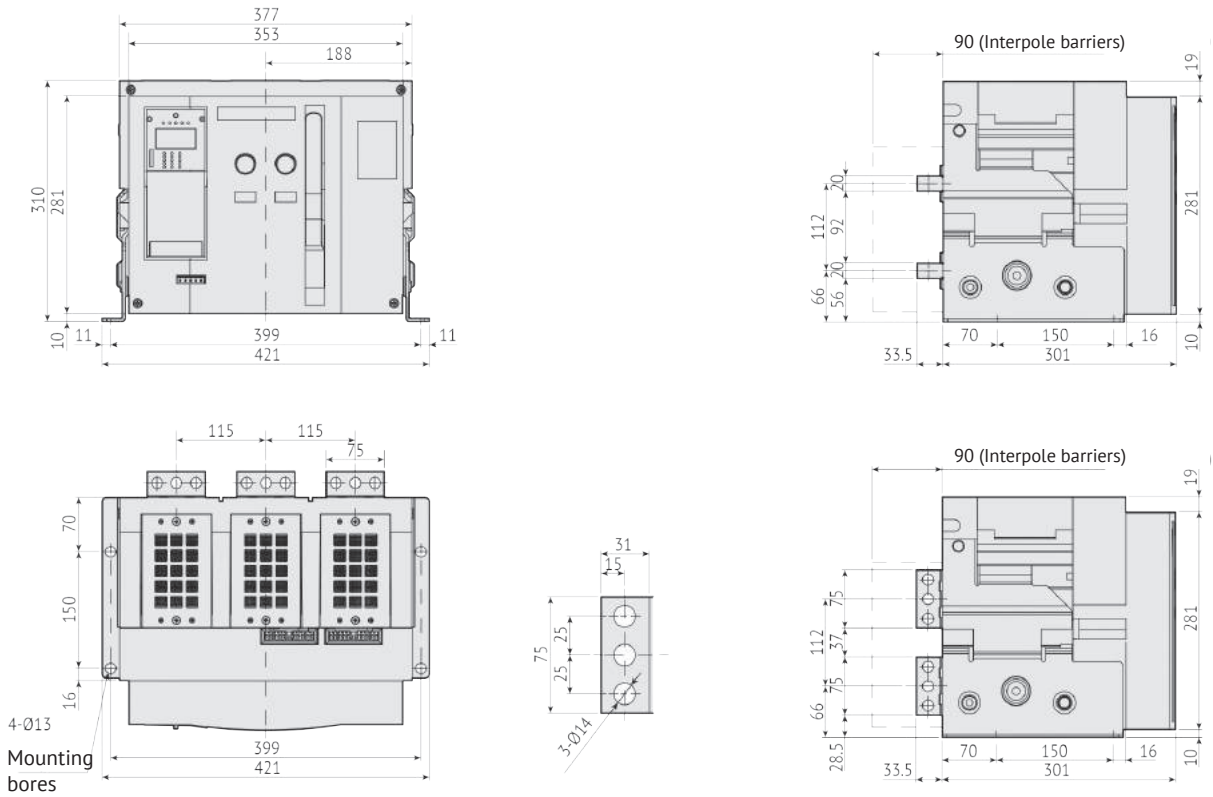


#### Front panel frame

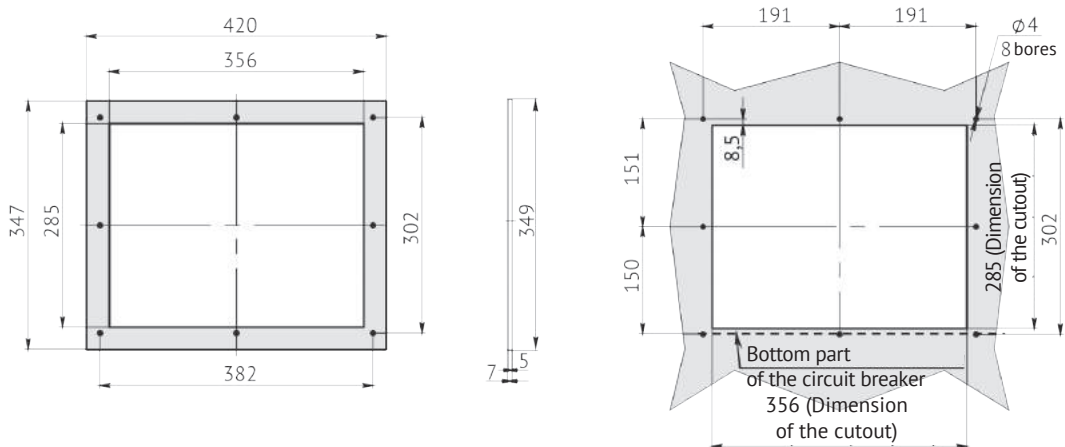


### Drawings of S4 dimension fixed circuit breakers

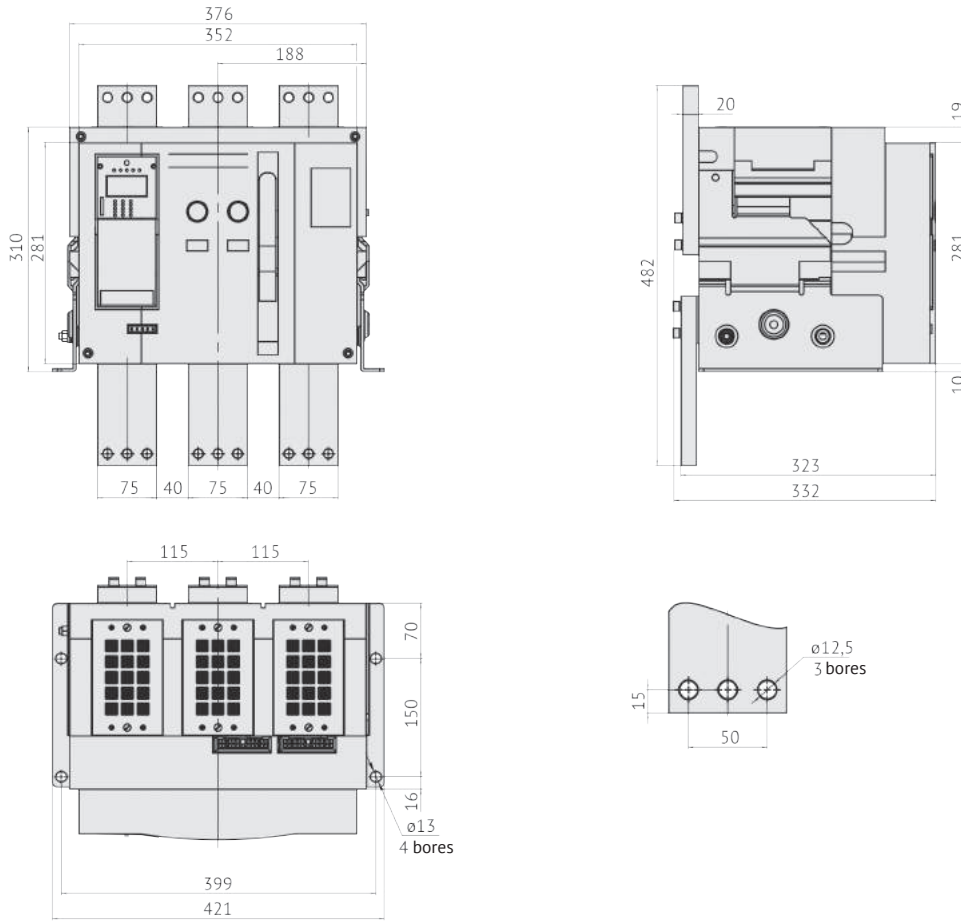
#### OptiMat A circuit breakers of S4 dimension, fixed version with rear busbar connection option from 2500 to 3200 A



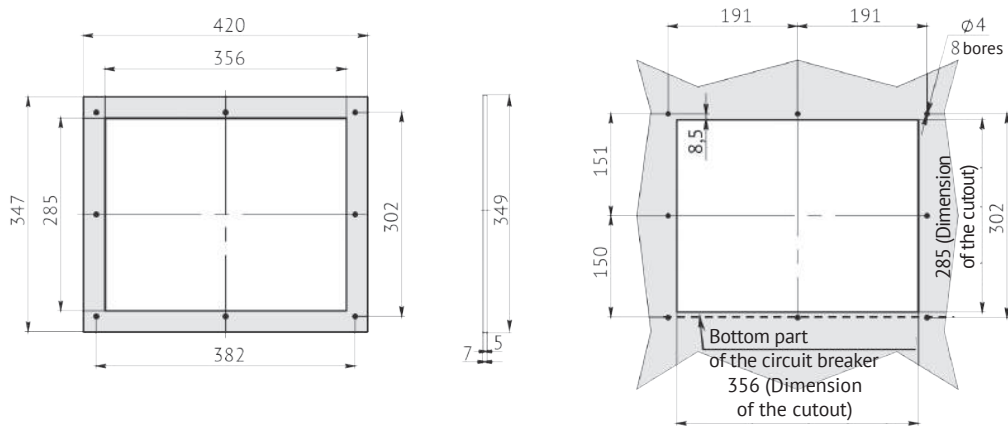
#### Front panel frame



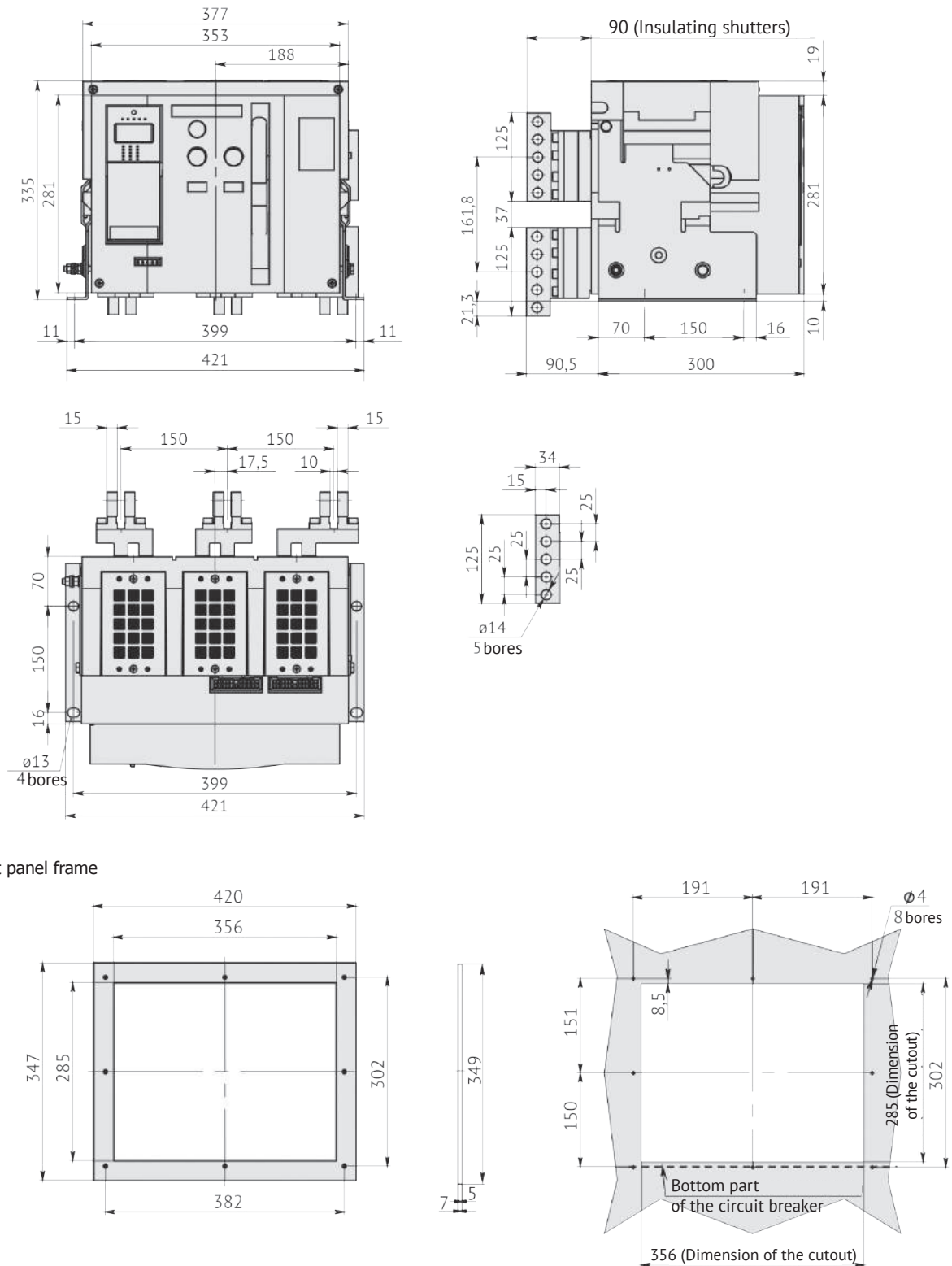
**OptiMat A circuit breakers of S4 dimension, fixed version with front busbar connection option for 2500A**



**Front panel frame**

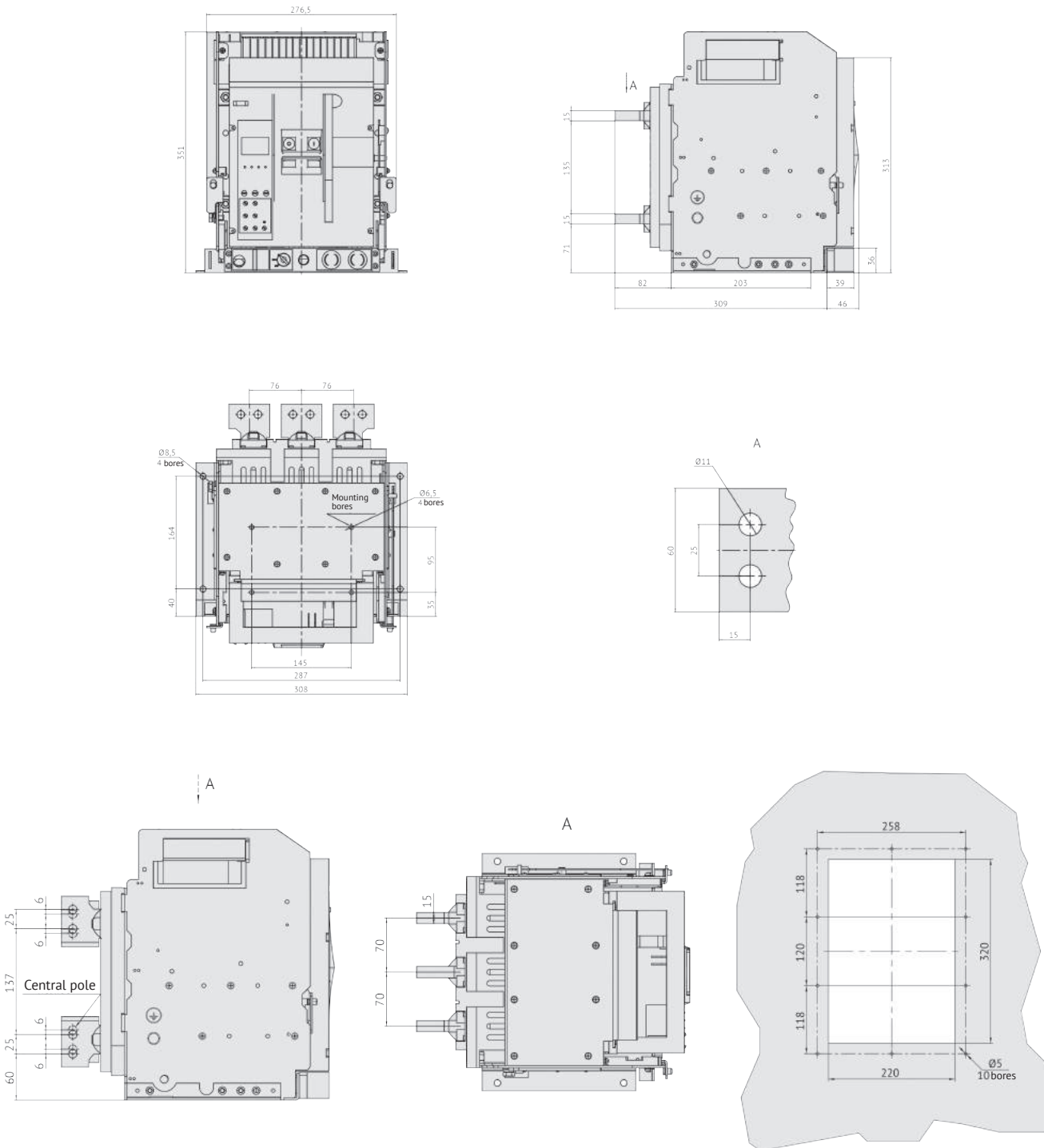


**OptiMat A circuit breakers of S4 dimension, fixed version with rear busbar connection option for 4000A**



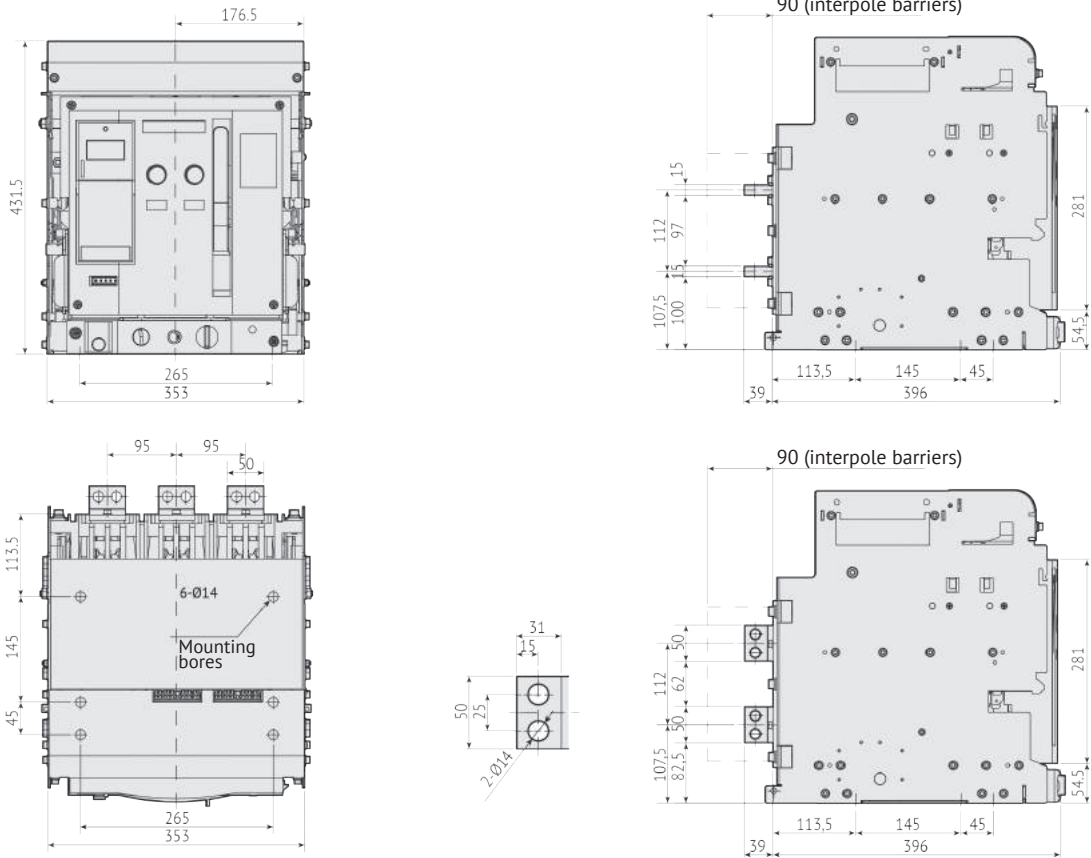
### Drawings of S1 dimension retractable (withdrawable) circuit breakers

#### OptiMat A circuit breakers of S1 dimension, retractable (withdrawable) version with rear busbar connection option from 630 to 1600A

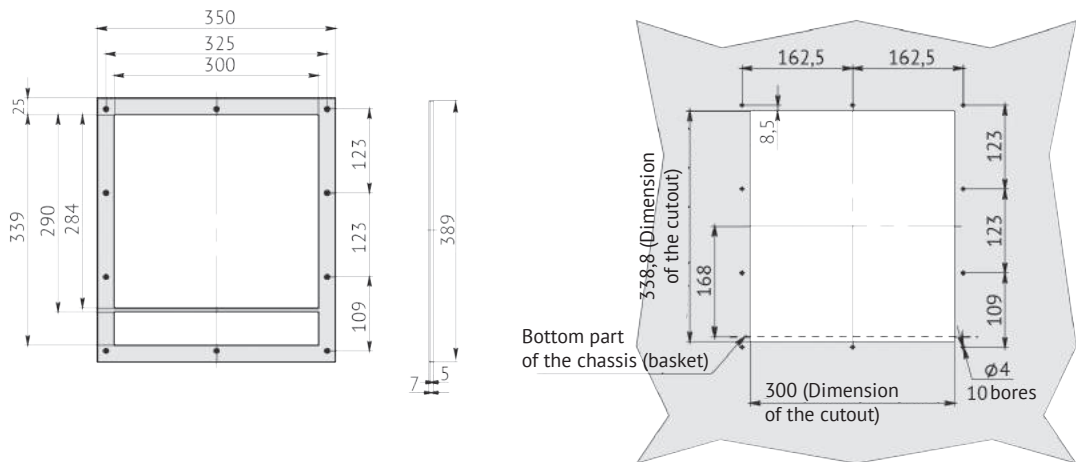


### Drawings of S2 dimension retractable (withdrawable) circuit breakers

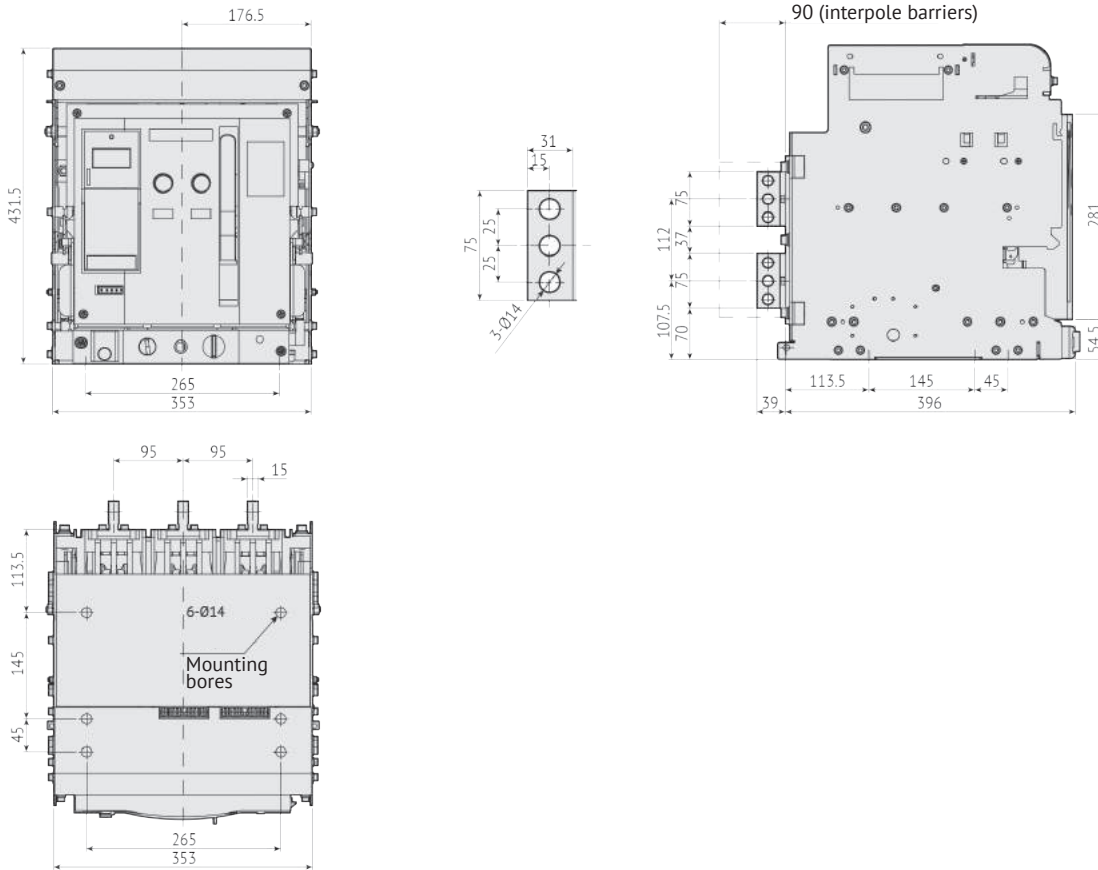
#### OptiMat A circuit breakers of S2 dimension, retractable (withdrawable) version with rear busbar connection option from 630 to 1600A



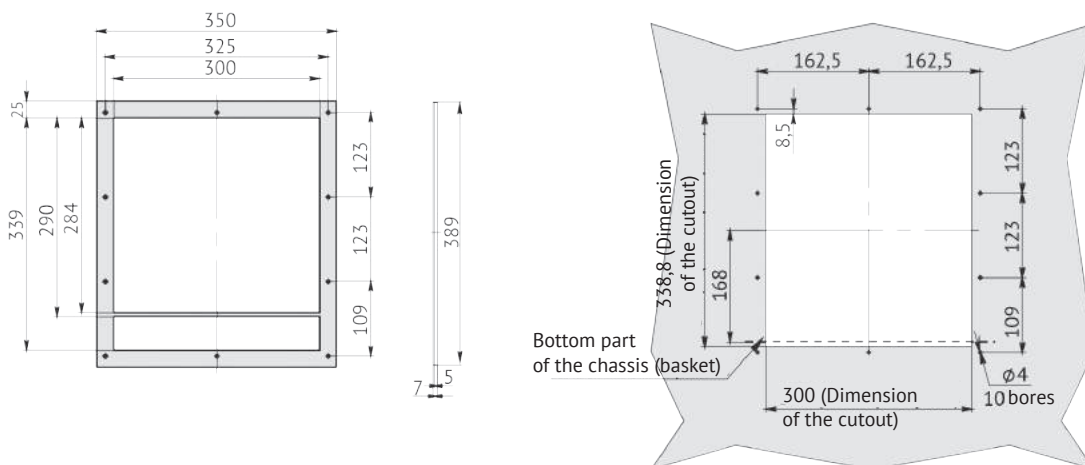
#### Front panel frame



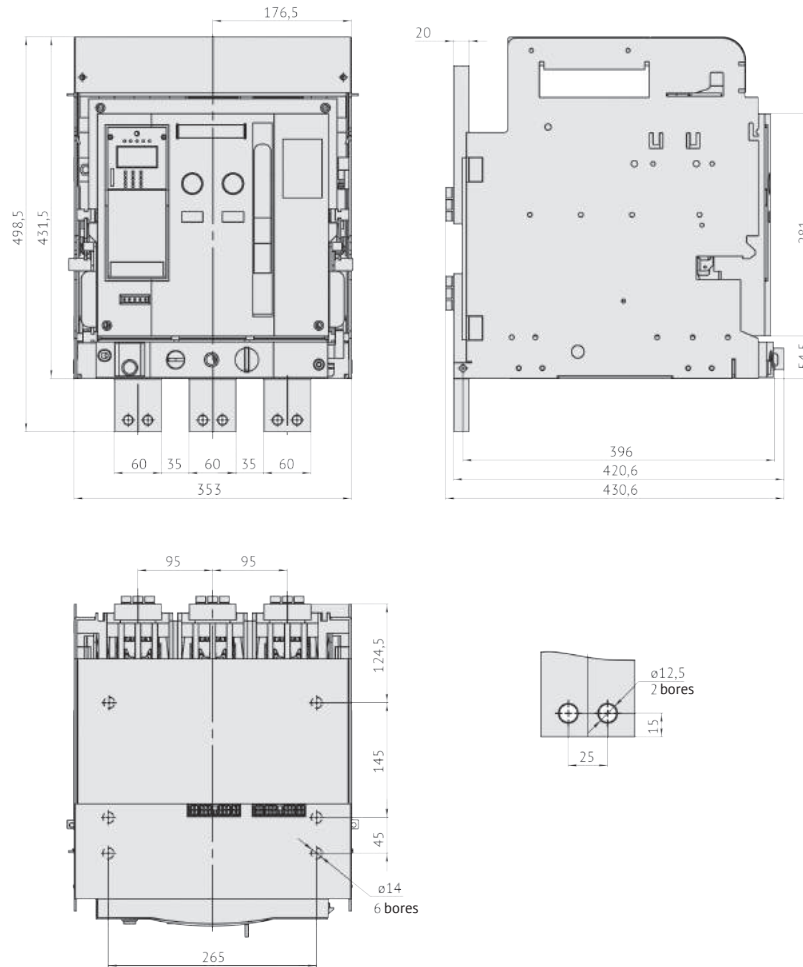
**OptiMat A circuit breakers of S2 dimension, retractable (withdrawable) version with rear busbar connection option for 2000A**



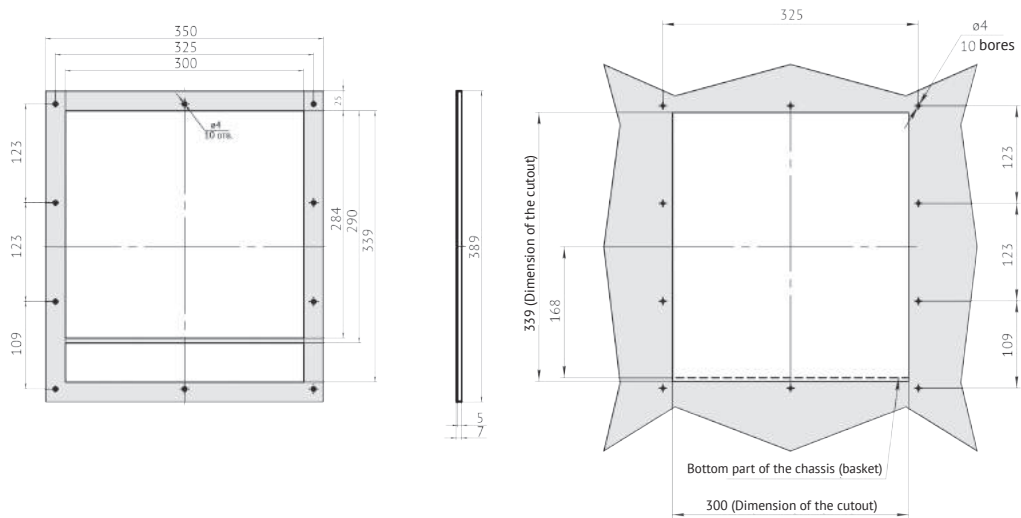
**Front panel frame**



**OptiMat A circuit breakers of S2 dimension, retractable (withdrawable) version with front busbar connection option from 630 to 2000A**



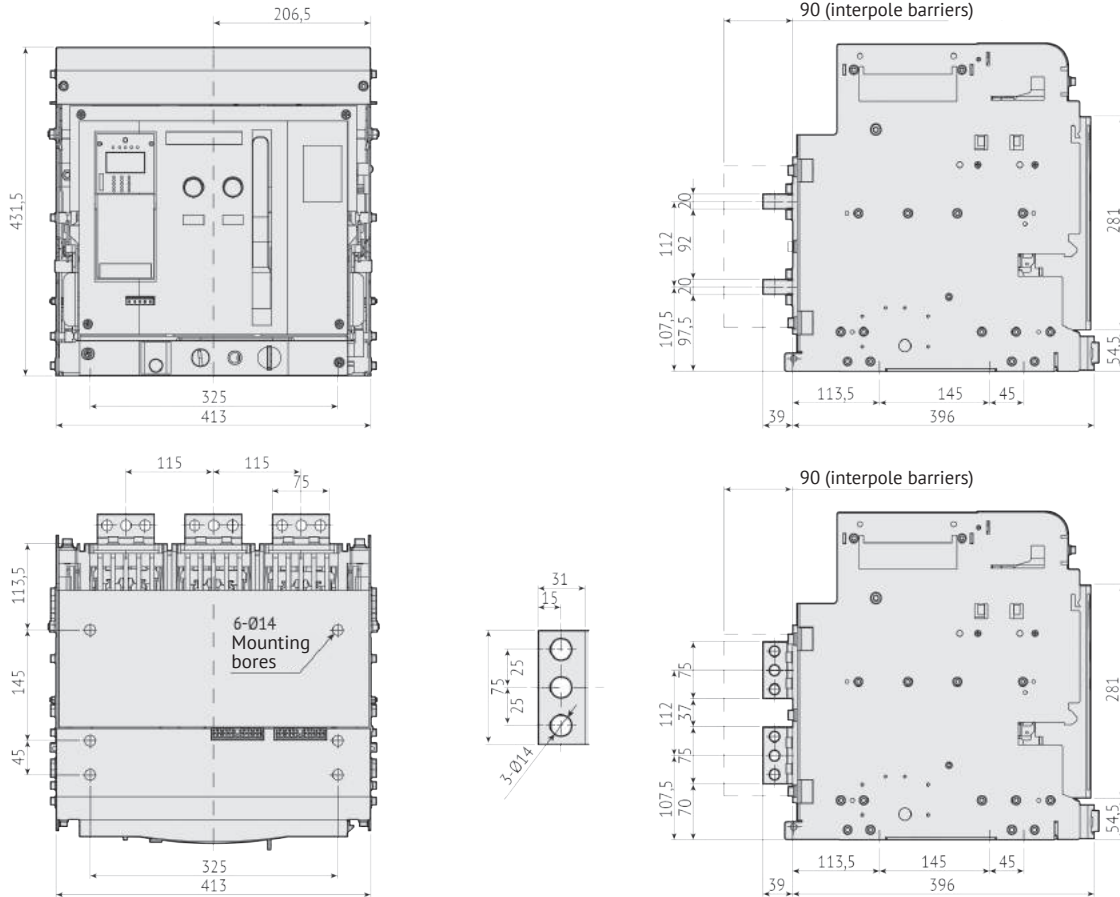
Front panel frame



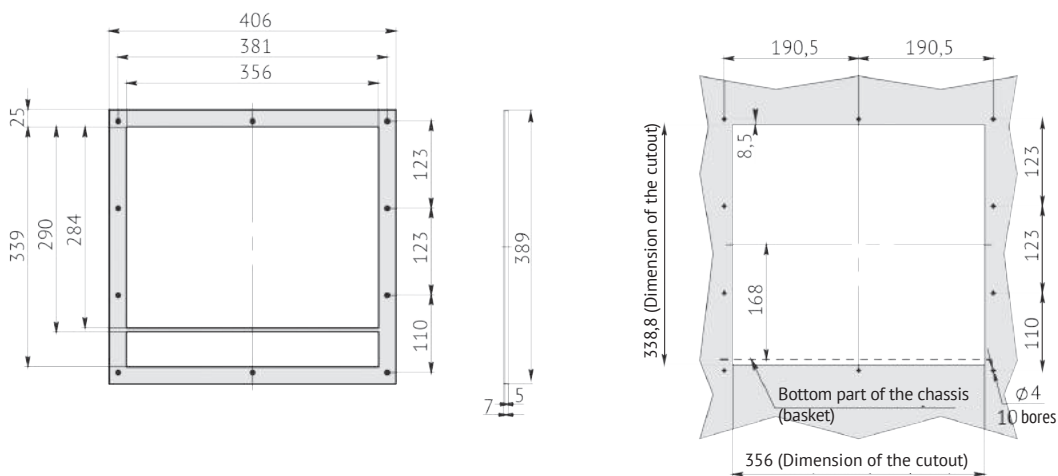


## Drawings of S4 dimension retractable (withdrawable) circuit breakers

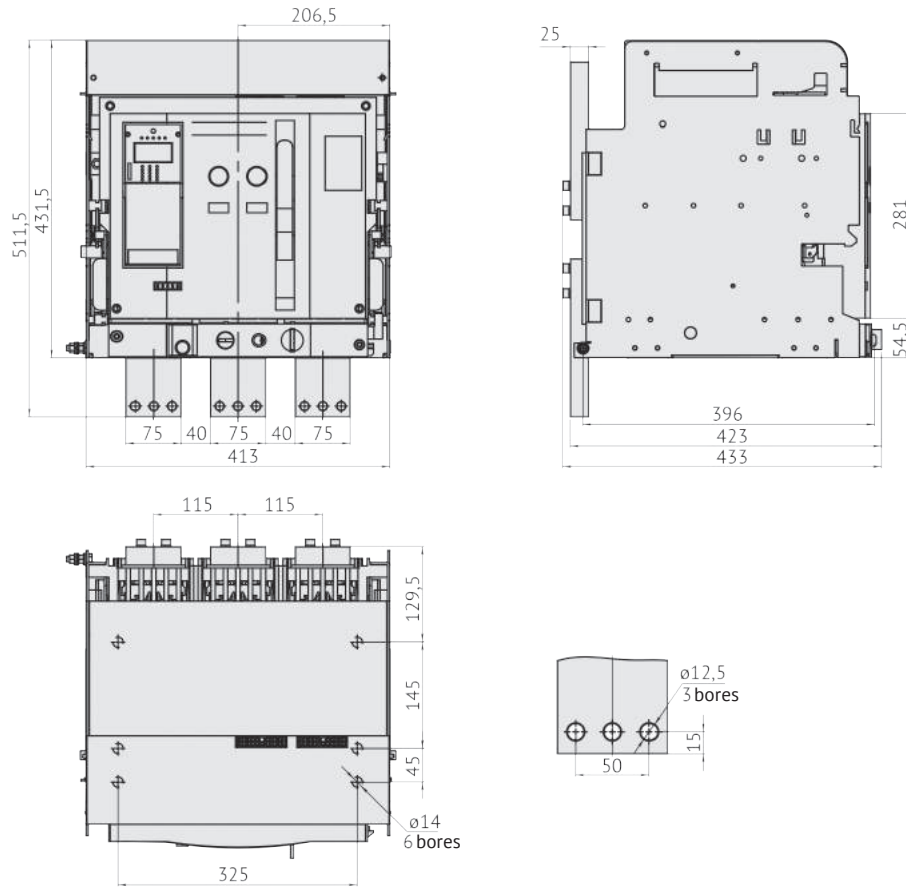
### OptiMat A circuit breakers of S4 dimension, retractable (withdrawable) version with rear busbar connection option from 2500 to 3200A



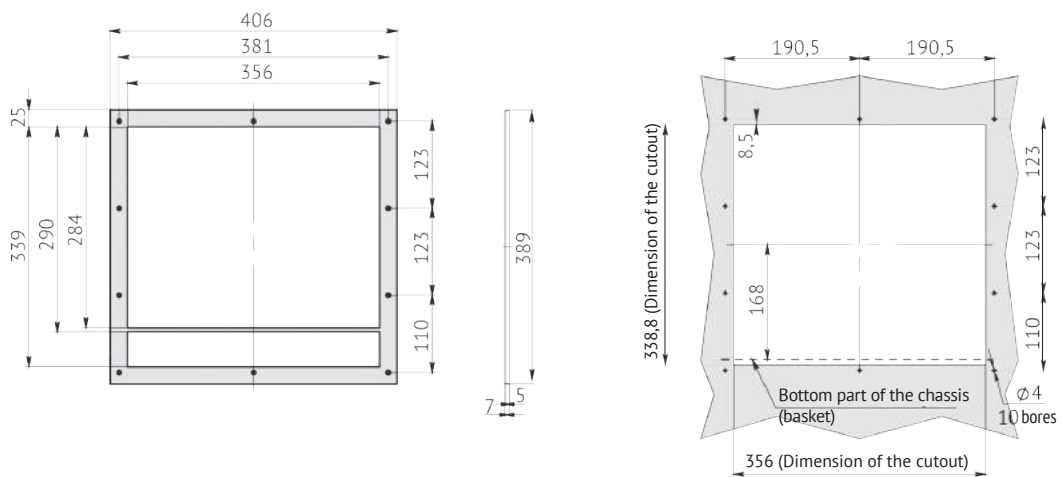
#### Front panel frame



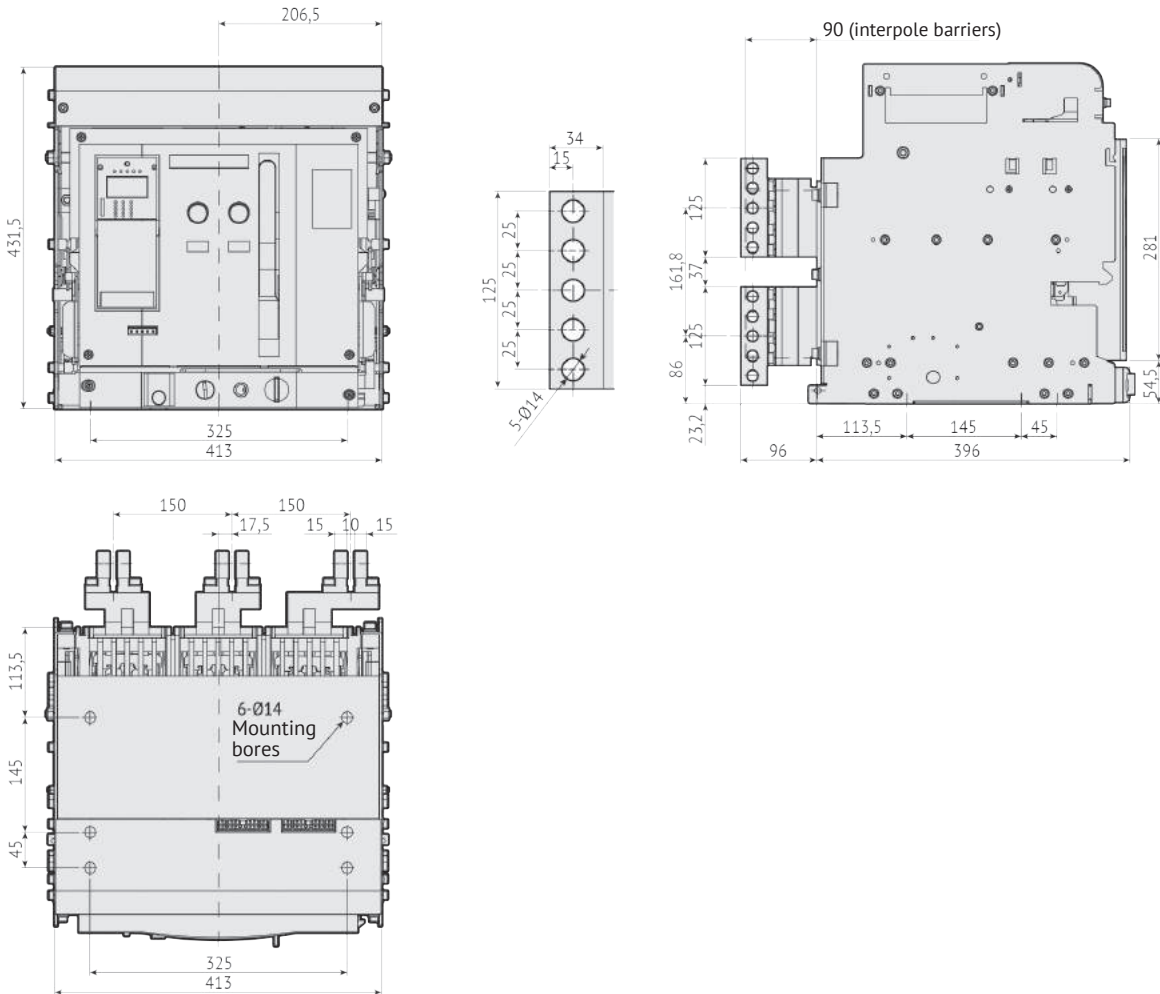
**OptiMat A circuit breakers of S4 dimension, retractable (withdrawable) version with front busbar connection option for 2500A**



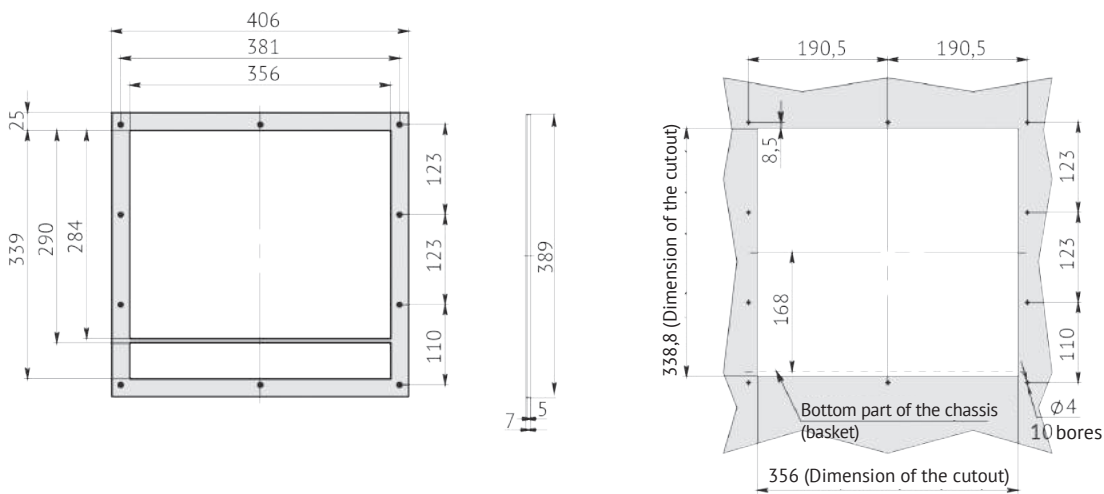
**Front panel frame**



**OptiMat A circuit breakers of S4 dimension, retractable (withdrawable) version with rear busbar connection option for 4000A**

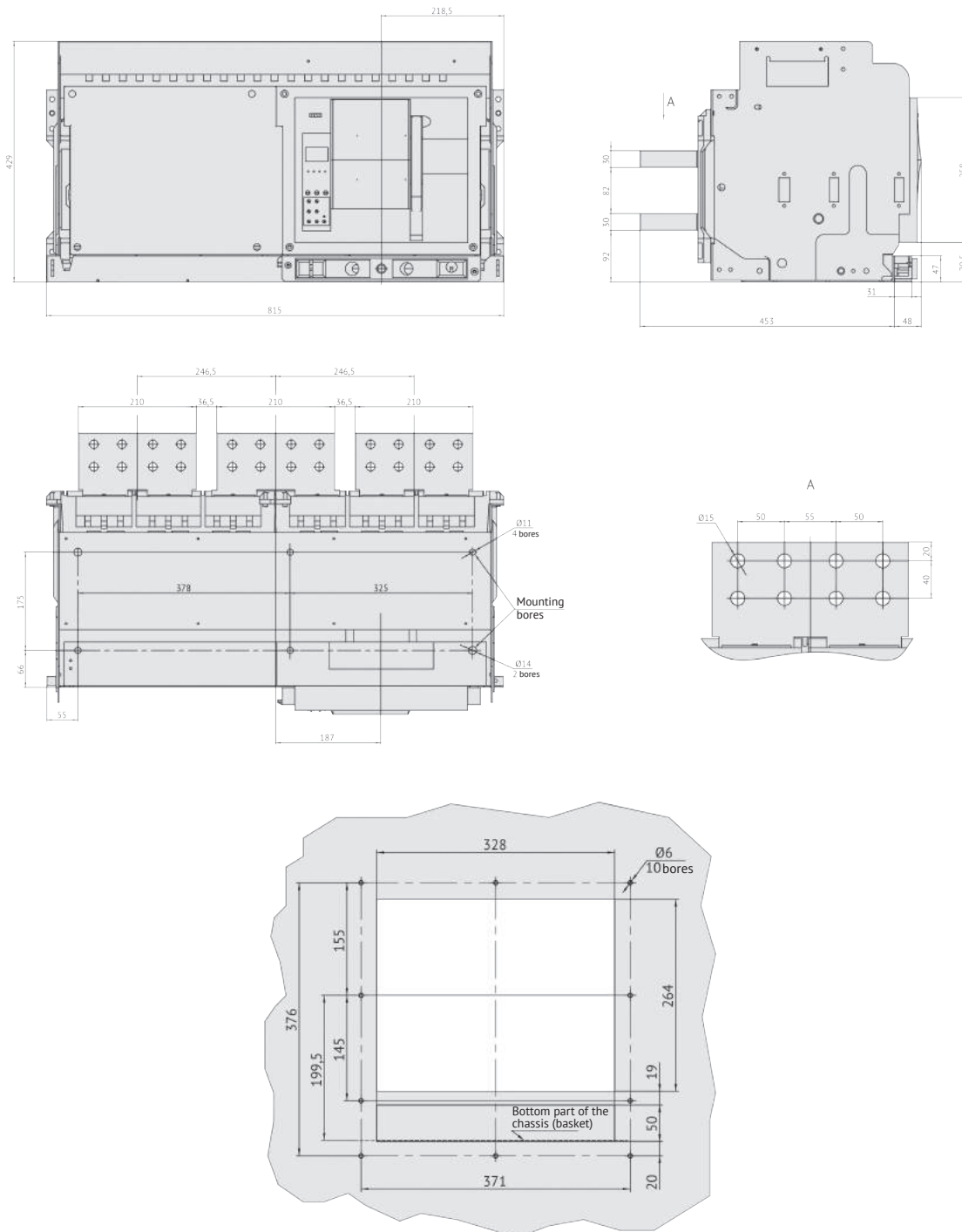


**Front panel frame**



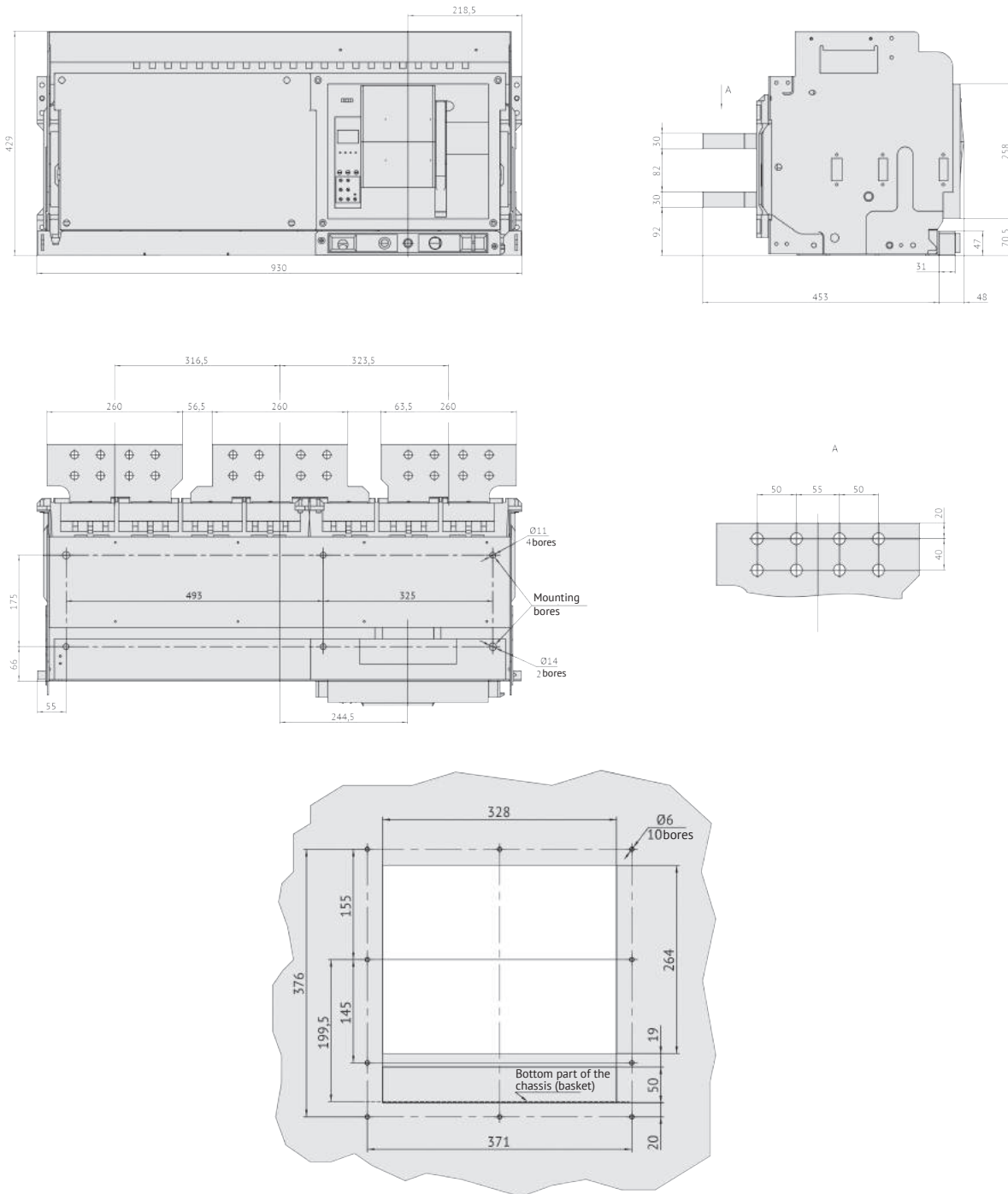
## Drawings of S5 dimension retractable (withdrawable) circuit breakers

### OptiMat A circuit breakers of S5 dimension, retractable (withdrawable) version with rear busbar connection option for 5000A



### Drawings of S6 dimension of retractable (withdrawable) circuit breakers

#### OptiMat A circuit breakers of S6 dimension, retractable (withdrawable) version, with rear busbar connection option for 6300A



## Connecting power cables

When connecting power cables, consider the weight of the cable and its mechanical pressure on the output of the circuit breaker:

- Extended outputs must be insulated, and the cable must be fixed to a solid surface (Fig. 1).
- When connecting several cables, it is necessary to fasten them together and secure on the frame of a fixed structure (Fig. 2).

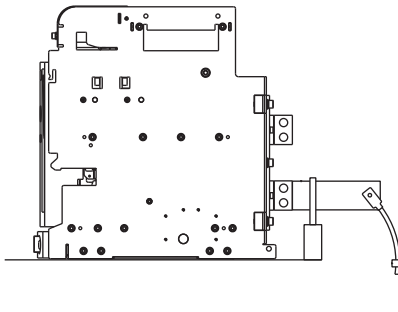


Fig. 1

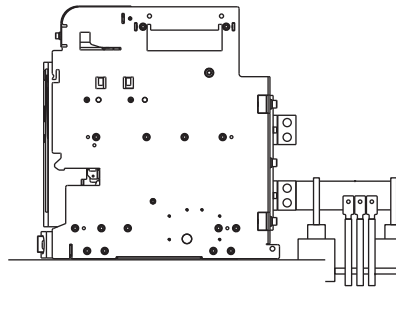


Fig. 2

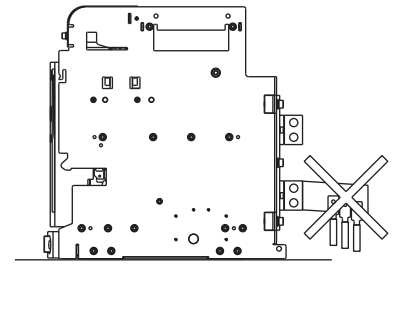


Fig. 3

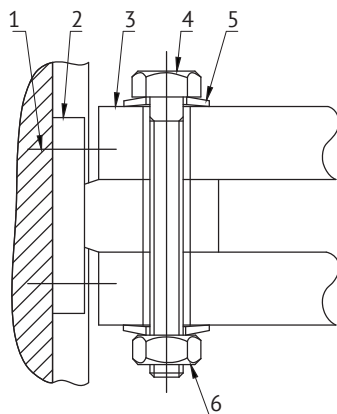
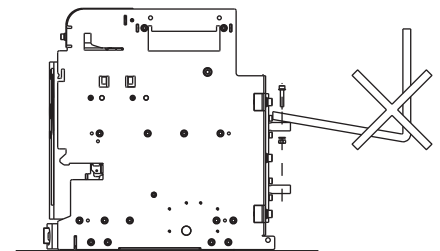
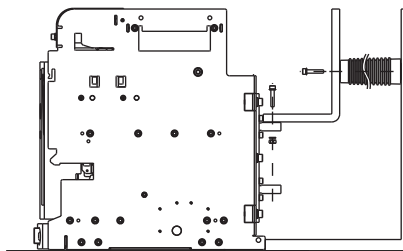
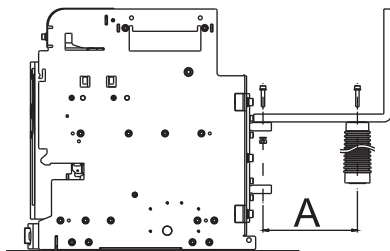
## Busbar connection

When mounting the busbars, the mounting bores should be positioned so that they coincide with the holes on the terminals of the circuit breaker and do not create breaking pressure when bolted.

To prevent deflection of the busbars and increased mechanical stress on the breaker outputs, it is necessary to fix the busbars with supporting insulators.

To ensure the resistance of the busbars to the electrodynamic effects of current, the distance A should be no more than:

For short circuit design current, kA	Distance A, mm
30	350
50	300
65	250
80-100	150



- 1 – fastening screw to the device;
- 2 – switch connector;
- 3 – busbars;
- 4 – bolt;
- 5 – disk washers;
- 6 – nut.

Figure G.5 – Connection of the busbars to the device

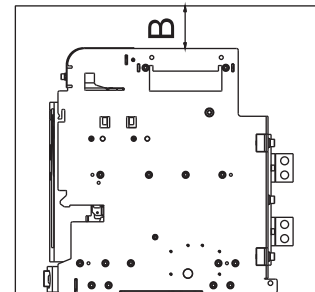
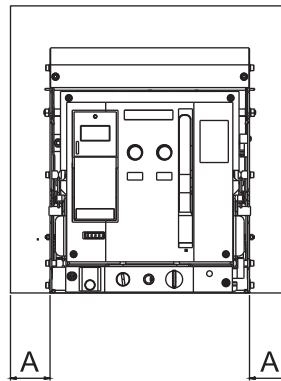
## Busbar sizing

Overall dimension	Rated current, A	Copper busbars		Aluminium busbars		Fasteners	Tightening torque, Nm	
		Number, pcs	Cross section, mm <sup>2</sup>	Number, pcs	Cross section, mm <sup>2</sup>		Spring washer GOST 6402	Disk spring GOST 3057
S1	630	2	5x40	2	8x50	Bolt M10-6gx50.88.016 GOST 7798	37,5	50
	800		5x50		10x50			
	1000		5x60		10x60			
	1250		6x60					
	1600		10x60		4			
S2	630	2	5x40	2	8x50	Bolt M12-6gx65.88.016 GOST 7798		
	800		5x50		10x50			
	1000		5x60		10x60			
	1250		5x80					
	1600				10x50			
	2000	3	5x100	4	10x60			
S4	2500	4	5x100	5	10x80	Bolt M12-6gx75.88.016 GOST 7798		
	3200	2	10x100	-	-			
	4000	3	10x125	-	-	Bolt M12-6gx120.88.016 GOST 7798		
		4	10x100	-	-			
S5	5000	7	10x100	-	-			
S6	6300	8	10x100	-	-			

## Recommendations for switchgear mounting

The table shows the minimum allowable distance between the automatic air circuit breaker and the metal parts of the switchgear.

Switch version	A, mm	B, mm
Fixed	70	150
Withdrawable	70	0

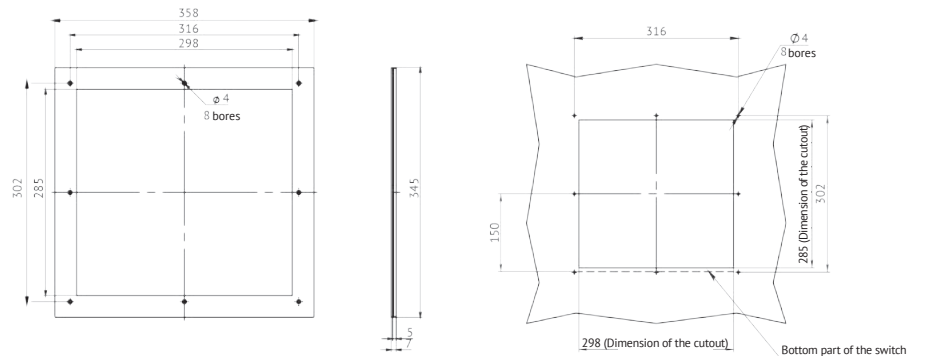


## Mounting of the switch in the panel board with the installation of the frame of the air circuit breaker for switches of S2, S4 overall dimensions

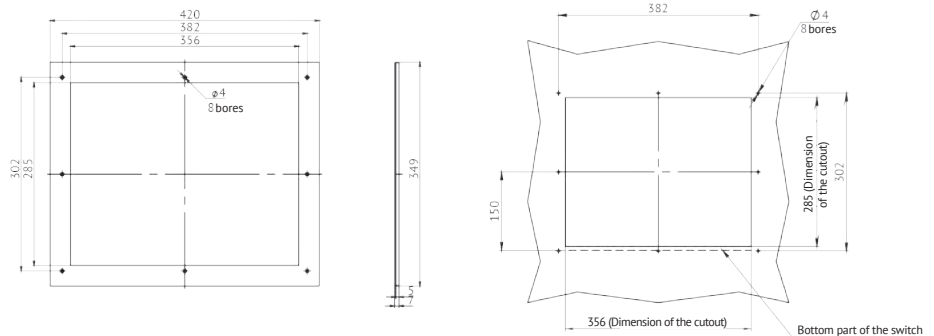
The frame of the air circuit breaker OptiMat A is designed to provide access to the operated units of the circuit breaker and the information displayed in the windows on the state of the mechanisms of the switch when the door of the electrical cabinet is closed. To ensure proper installation and further operation, it is necessary to mount the circuit breaker and its frame according to the instructions given in the figures below.

### Overall and mounting dimensions of the frame of the OptiMat A circuit breaker of a retractable (withdrawable) and fixed versions of S2, S4 dimensions

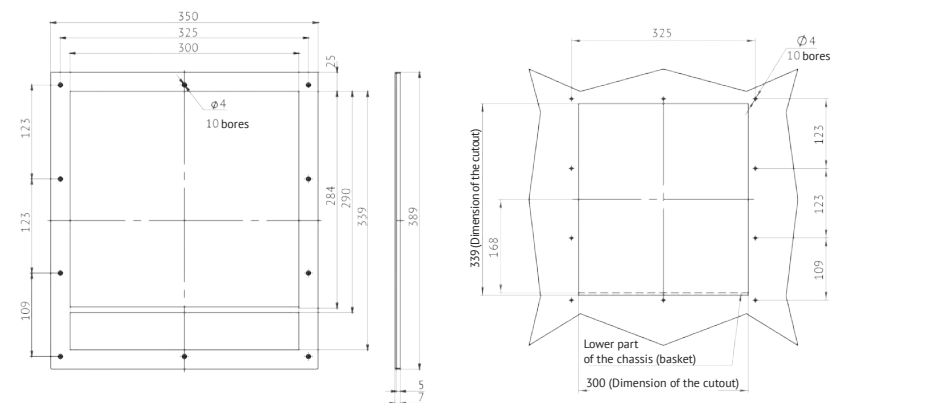
Front panel frame of a fixed OptiMat A of overall size S2 for currents from 630 to 2000 A



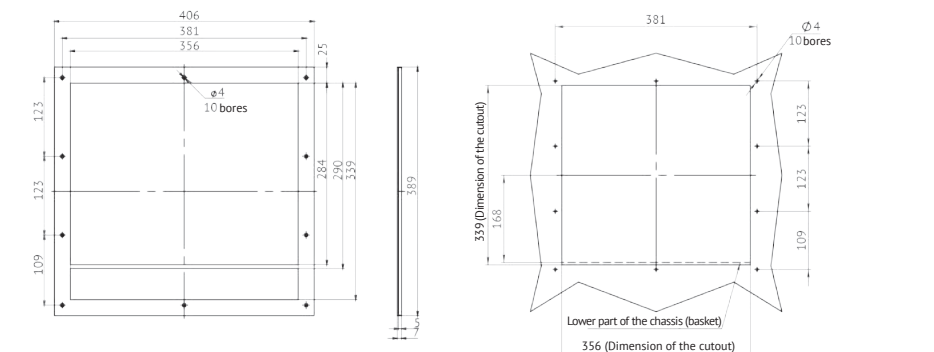
Front panel frame of a fixed OptiMat A of overall size S4 for currents from 2500 to 4000 A



Front panel frame of a retractable OptiMat A of overall size S2 for currents from 630 to 2000 A

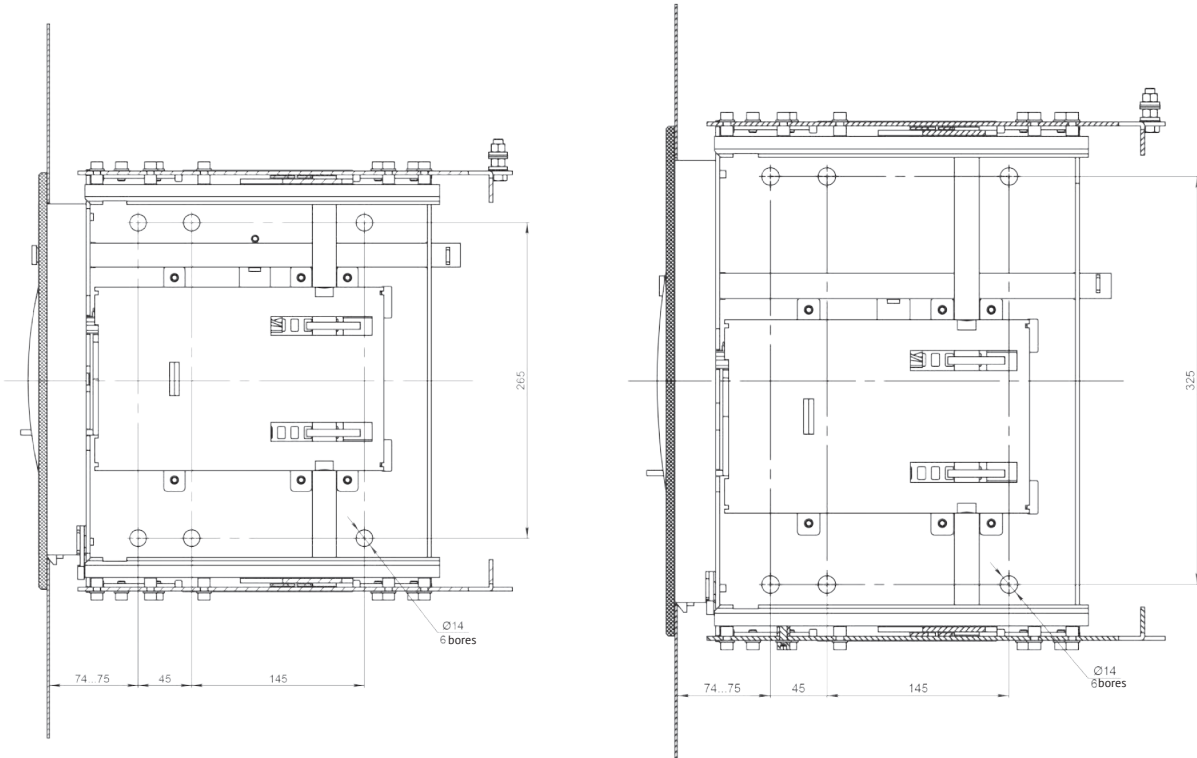


Front panel frame of a retractable OptiMat A of overall size S4 for currents from 2500 to 4000 A





**Installation dimensions of the chassis (basket) of dimensions S2 and S4, relative to the front panel of the cell**

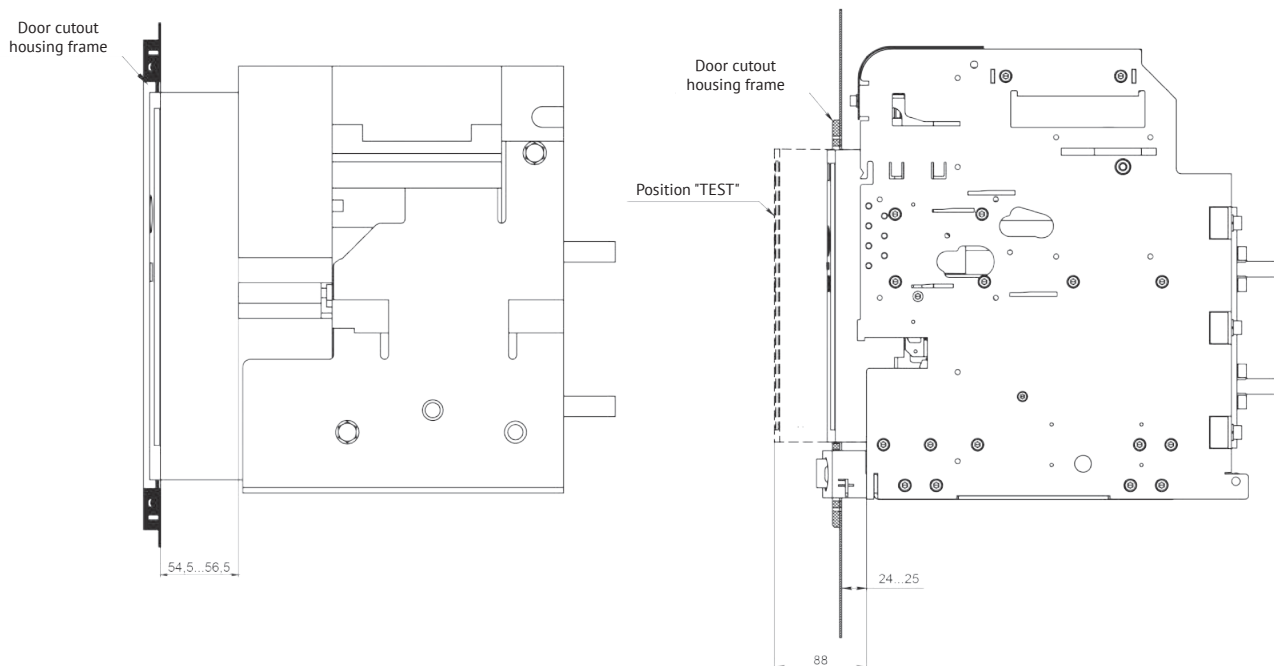


The installed switch and its frame enable to operate the circuit breaker in the "Draw-in" position, as well as to transfer it and operate in the "Test" position.

Moving out the switch to the "Draw-out" position with the cabinet door closed is not provided by the design and is prohibited due to technical reasons.

The following figures are provided with correctly installed automatic circuit breakers, of fixed and withdrawable versions, relative to the front panel of the cell.

**Side view of OptiMat A circuit breaker, fixed and withdrawable versions of S2 and S4 overall dimensions after mounting into a cell with installation of a frame**



A properly mounted switch and its frame enable to open the enclosure doors when the switch is in the position "Draw-in" and "Test".

