

# OptiMat E Automatic molded case circuit breakers



OptiMat E automatic molded case circuit breakers are reliable and easy-to-use protective devices for low-voltage distribution systems, carrying current in a normal operating period and current interruptions at short circuits conditions, overloads and they also provide up to 30 switchings from open to closed position a day. Breakers with the acceptance from Russian Maritime Register of Shipping (RS) (RS further) and the acceptance from Russian River Register (RRR) are designed to protect ship electronic equipment and port infrastructure.

## Designation

OptiMat E 100 L 100 UHL3



1	Product range	OptiMat		
2	Configuration	E - automatic molded case circuit breakers		
3	Current rating $I_n$ , A	100	250	
4	Limiting breaking capacity, kA, κA	L - 10 <sup>1)</sup> N - 20 <sup>2)</sup>	L - 18 N - 25 H - 40	
5	Rated current of thermal-magnetic trip unit, A	16, 20, 25, 32, 40, 50, 63, 80, 100	125, 160, 200, 250	
6	Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150	UHL3 (international CT3) - QCD (quality control department) acceptance	UHL3-REG (international CT3) - RRR acceptance	OM4-REG (international UM4) - RS acceptance

<sup>1)</sup> Breakers for rated current: 16, 20 A – 6 κA; 25 A – 8 κA.

<sup>2)</sup> Breakers for rated current: 16...25 A – not available; 32 A – 15 κA.

Basic OptiMat E configuration includes:

- interphase barriers (2 pieces);
- attaching screws kit.

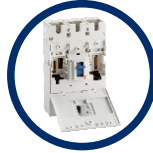
## Batch effectiveness

The optimum protection from short circuit conditions and overloads is highly effective with only two machines. Optimal level of maximum switching capacity, 10 to 40 kA, is used on most facilities.



The educational service for consumers increases the effective use of KEAZ Optima equipment. Tech support considering design and exploitation is provided.

The optimum set of auxiliary accessories expands functional use and facilitates exploitation of the electrical device.



The location in the central part of Russia and domestic manufacture allows to fulfill equipment delivery as soon as possible.

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



OptiMat E automatic breakers can be used within the temperature rate -60 ...+40 C.

The use of modern materials: silver-containing contacts decrease transition resistance, increase resistance towards boiling and have high wear resistance. Plastic do not sustain combustion, has high insulation properties and arc resistance.



It's possible to install the breaker in any position, with the supply lead either from above or from under, without damaging technical characteristics of the breaker.

## Reference (series)

Appearance	Rated current I <sub>n</sub> , A	Nomenclature (general purpose industrial design)	References	Nomenclature (RS acceptance design)	References	Nomenclature (RRR acceptance design)	References	Weight, kg	Accessories
									DIN rail equipment
	16...100	OptiMat E100L016-UHL3	100000	OptiMat E100L016-OM4-REG	233686	OptiMat E100L016-UHL3-REG	242799	0,8	<p>OptiMat E100 UHL3 ref. 100013 OM4-REG ref 233699 UHL3-REG ref. 242821</p>
		OptiMat E100L020-UHL3	100001	OptiMat E100L020-OM4-REG	233687	OptiMat E100L020-UHL3-REG	242800		
		OptiMat E100L025-UHL3	100002	OptiMat E100L025-OM4-REG	233688	OptiMat E100L025-UHL3-REG	242801		
		OptiMat E100L032-UHL3	100003	OptiMat E100L032-OM4-REG	233689	OptiMat E100L032-UHL3-REG	242802		
		OptiMat E100L040-UHL3	100004	OptiMat E100L040-OM4-REG	233690	OptiMat E100L040-UHL3-REG	242803		
		OptiMat E100L050-UHL3	100005	OptiMat E100L050-OM4-REG	233691	OptiMat E100L050-UHL3-REG	242804		
		OptiMat E100L063-UHL3	100006	OptiMat E100L063-OM4-REG	233692	OptiMat E100L063-UHL3-REG	242805		
		OptiMat E100L080-UHL3	100007	OptiMat E100L080-OM4-REG	233693	OptiMat E100L080-UHL3-REG	242806		
		OptiMat E100L100-UHL3	100008	OptiMat E100L100-OM4-REG	233694	OptiMat E100L100-UHL3-REG	242807		
		OptiMat E100N032-UHL3	224958	OptiMat E100N032-OM4-REG	236175	OptiMat E100N032-UHL3-REG	242898		
		OptiMat E100N040-UHL3	224959	OptiMat E100N040-OM4-REG	236176	OptiMat E100N040-UHL3-REG	242808		
		OptiMat E100N050-UHL3	224960	OptiMat E100N050-OM4-REG	236177	OptiMat E100N050-UHL3-REG	242809		
		OptiMat E100N063-UHL3	224961	OptiMat E100N063-OM4-REG	236178	OptiMat E100N063-UHL3-REG	242810		
		OptiMat E100N080-UHL3	224962	OptiMat E100N080-OM4-REG	236179	OptiMat E100N080-UHL3-REG	242811		
		OptiMat E100N100-UHL3	224963	OptiMat E100N100-YX/J3-REG	242812	OptiMat E100N100-UHL3-REG	242812		
	125...250	OptiMat E250L125-UHL3	100009	OptiMat E250L125-OM4-REG	233695	OptiMat E250L125-UHL3-REG	242813	1,2	<p>OptiMat E250 UHL3 apt. 100014 OM4-REG apt. 233700 UHL3-REG apt. 242822</p>
		OptiMat E250L160-UHL3	100010	OptiMat E250L160-OM4-REG	233696	OptiMat E250L160-UHL3-REG	242814		
		OptiMat E250L200-UHL3	100011	OptiMat E250L200-OM4-REG	233697	OptiMat E250L200-UHL3-REG	242815		
		OptiMat E250L250-UHL3	100012	OptiMat E250L250-OM4-REG	233698	OptiMat E250L250-UHL3-REG	242816		
		OptiMat E250N125-UHL3	230652	OptiMat E250N125-OM4-REG	236190	OptiMat E250N125-UHL3-REG	242817		
		OptiMat E250N160-UHL3	230653	OptiMat E250N160-OM4-REG	236191	OptiMat E250N160-UHL3-REG	242818		
		OptiMat E250N200-UHL3	230654	OptiMat E250N200-OM4-REG	236192	OptiMat E250N200-UHL3-REG	242819		
		OptiMat E250N250-UHL3	230655	OptiMat E250N250-OM4-REG	236193	OptiMat E250N250-UHL3-REG	242820		
		OptiMat E250H125-UHL3	230656	OptiMat E250H125-OM4-REG	236194	OptiMat E250H125-UHL3-REG	242899		
		OptiMat E250H160-UHL3	230657	OptiMat E250H160-OM4-REG	236195	OptiMat E250H160-UHL3-REG	242900		
		OptiMat E250H200-UHL3	230658	OptiMat E250H200-OM4-REG	236196	OptiMat E250H200-UHL3-REG	242901		
		OptiMat E250H250-UHL3	230659	OptiMat E250H250-UHL3-REG	236197	OptiMat E250H250-OM4-REG	242902		

	Clamp kit	Interphase barriers	Auxiliary contact	Terminal cover	Shunt trip	Minimum current tripping device	Position locking device (closed)	Rotary extended handle
	<p>OptiMat E100 16..50A-UHL3-3pcs. ref. 100015 OM4-REG ref. 233701 UHL3-REG ref. 242823</p>							
	<p>OptiMat E100 63..100A-UHL3-3pcs. ref. 100016 OM4-REG ref. 233702 UHL3-REG ref. 242824</p>		<p>Left OptiMat E UHL3 ref. 100018 OM4-REG ref. 233704 UHL3-REG ref. 242826</p>	<p>OptiMat E100 UHL3-2 pcs. ref. 100022 OM4-REG-2 pcs. ref. 233708 UHL3-REG-2 pcs. ref. 242830</p>	<p>OptiMat E 12AC/DC-UHL3 ref. 100031 OM4-REG ref. 233712 UHL3-REG ref. 242834</p> <p>OptiMat E 24AC/DC-UHL3 ref. 100032 OM4-REG ref. 233714 UHL3-REG ref. 242836</p>	<p>OptiMat E 12AC/DC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p> <p>OptiMat E 24AC/DC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>		<p>OptiMat E100 UHL3 ref. 100037 OM4-REG ref. 236204 UHL3-REG ref. 242909</p>
		<p>OptiMat E UHL3-2 pcs. ref. 100024 OM4-REG-2 pcs. ref. 233710 UHL3-REG-2 pcs. ref. 242832</p>	<p>Right OptiMat E UHL3 ref. 100019 OM4-REG ref. 233705 UHL3-REG ref. 242827</p>		<p>OptiMat E 48AC/DC-UHL3 ref. 100033 OM4-REG ref. 233716 UHL3-REG ref. 242838</p>	<p>OptiMat E 48AC/DC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>	<p>OptiMat E UHL3 ref. 100041 OM4-REG ref. 233717 UHL3-REG ref. 242839</p>	
	<p>OptiMat E250 UHL3-3 pcs. ref. 100017 OM4-REG ref. 233703 UHL3-REG ref. 242825</p>		<p>Signalling OptiMat E UHL3 ref. 100020 OM4-REG ref. 233706 UHL3-REG ref. 242828</p>		<p>OptiMat E 110AC-UHL3 ref. 100034 OM4-REG ref. 233711 UHL3-REG ref. 242833</p>	<p>OptiMat E 110AC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>		
			<p>Combined OptiMat E UHL3 ref. 100021 OM4-REG ref. 233707 UHL3-REG ref. 242829</p>	<p>OptiMat E 230AC-UHL3 ref. 100035 OM4-REG ref. 233713 YXJ3-REG ref. 242835</p>	<p>OptiMat E 230AC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>	<p>OptiMat E 230AC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>		
				<p>OptiMat E250 UHL3-2 pcs. ref. 100023 OM4-REG-2 pcs. ref. 233709 UHL3-REG-2 pcs. ref. 242831</p>	<p>OptiMat E 400AC-UHL3 ref. 100036 OM4-REG ref. 233715 UHL3-REG ref. 242837</p>	<p>OptiMat E 400AC-UHL3 to develop OM4-REG to develop UHL3-REG to develop</p>		<p>OptiMat E250 UHL3 ref. 100039 OM4-REG ref. 236205 UHL3-REG ref. 242910</p>

## Technical specification

Range of automatic breakers		OptiMat E100		OptiMat E250		
<b>Main characteristics</b>						
Rated operational voltage, Ue V		690				
Rated insulation voltage Ui, V		690				
Rated impulse withstand voltage Uimp, kV		6				
Application category		A				
Suitability for isolation		available				
Number of poles		3				
<b>Control</b>						
Manual	control lever	+		+		
	standart of rotary extended handle	+		+		
<b>Design</b>						
Fixed with front connection		+		+		
<b>Rated and ultimate parameters of breaker main circuit</b>						
Rated current In, A		16, 25, 32, 40, 50, 63, 80, 100			125, 160, 200, 250	
Rated frequency, Hz		50/60				
Levels of breaking capacity		L	N	L	N	H
Rated limiting breaking capacity Icu, kA	Ue 400 V	10 <sup>1)</sup>	20 <sup>2)</sup>	18	25	40
	Ue 690 V	5	5	7,5	10	12
Rated service capacity Ics, % of Icu		50				
Short-circuit making capacity Icm, kA	Ue 400 V	17	40	36	52,5	84
	Ue 690 V	8,5	8,5	13	17	24
General wear resistance, cycles		10000			8000	
Electric wear resistance, cycles		1500			1000	
<b>Protection, indication measurement devices</b>						
Short circuit protection	magnetic tripping value, A	fixed <sup>3)</sup>			10 In	
Overload protection	thermal release value	In				
<b>Control and indication complementary attachments</b>						
Auxiliary contacts	left auxiliary contact	+				
	right auxiliary contact	+				
	indication auxiliary contact	+				
	combined auxiliary contact (auxiliary contact+ indication auxiliary contact)	+				
Voltage release	shunt trip	+				
	undervoltage release	+				
Accessories	DIN rail equipment	+				
	interphase barriers	as a set\can be ordered separately				
	auxiliary terminal shield	+				
	position locking device 'disconnected'	+				
	set of single-connector clasps	+				
<b>Installation and connection</b>						
Connection of copper and aluminium wires and cables with section, mm	In ≤ 50 A	2,5 - 10				
	In ≥ 63 A	10 - 35				
	125 ≤ In ≤ 250 A				35 - 120	
Rigid conductor section connection, mm	In ≤ 50 A	2,5 - 16				
	In ≥ 63 A	10 - 50				
	125 ≤ In ≤ 250 A				35 - 150	
<b>Overall dimensions and weight</b>						
Overall dimentions W*H*D, mm		75x130x60			105x165x60	
Weight, kg		0,8			1,2	

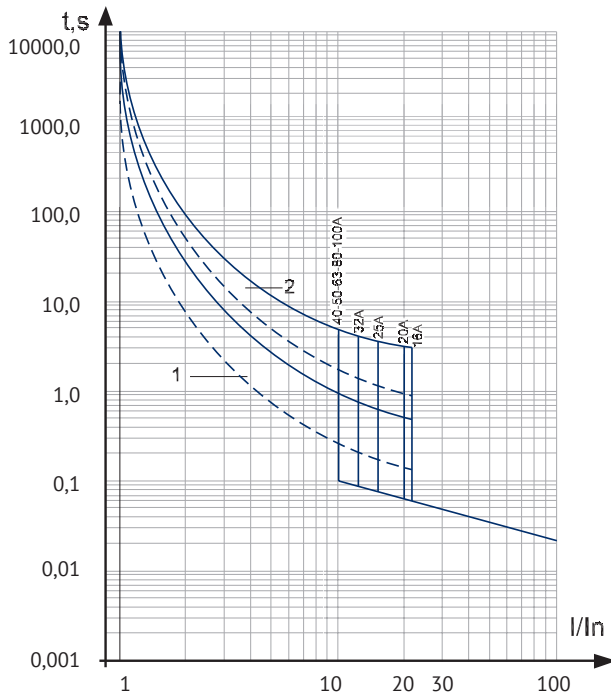
<sup>1)</sup> For breakers with rated current: 16, 20 A – 6 kA; 25 A – 8 kA.

<sup>2)</sup> For breakers with rated current: 16...25 A – is absent; 32 A – 15 kA.

<sup>3)</sup> For breakers with rated current: 16 A – 350; 20...32 A - 400; 40...100 A - 10 In.

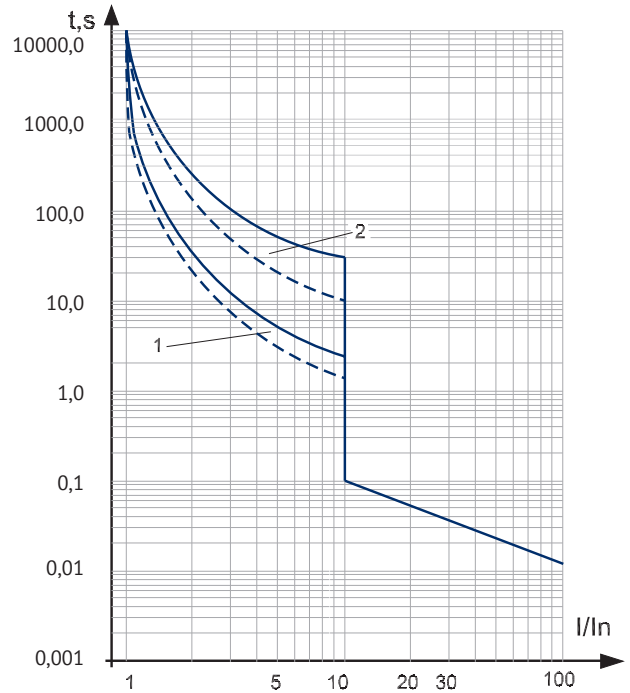
## Current and time characteristics

### OptiMat E100



- 1- working zone of an overcurrent thermal release, from a hot state
- 2- working zone of an overcurrent thermal release, from a cold state

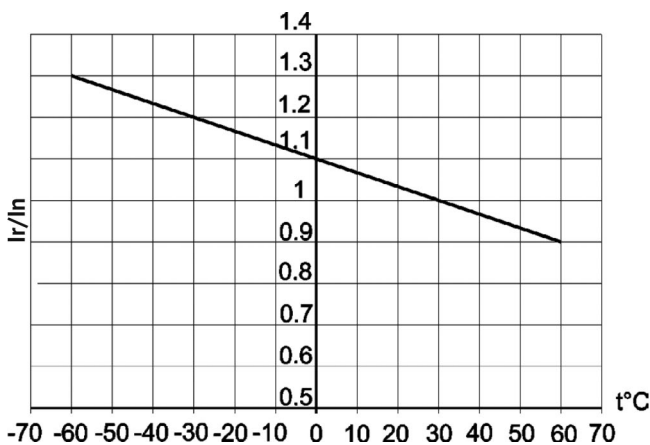
### OptiMat E250



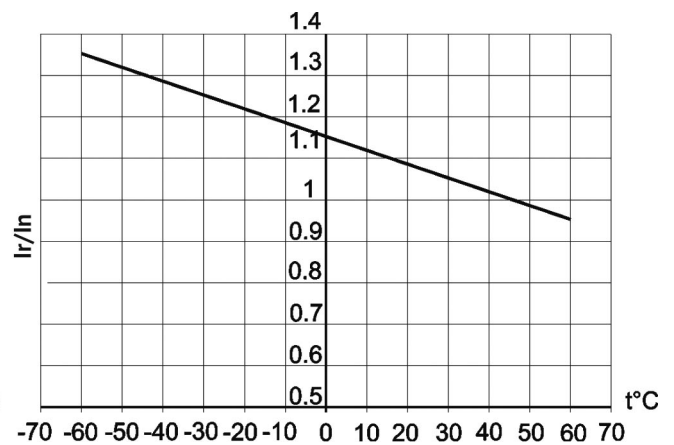
- 1- working zone of an overcurrent thermal release, from a hot state
- 2- working zone of an overcurrent thermal release, from a cold state

## Rated operating current in accordance with ambient temperature

OptiMat E automatic breakers are equipped with an irregular thermal-magnetic trip unit. At the external temperature of +30 C (+45 C for breakers with RS acceptance) the apparatus have  $I=I_n$ . The tripping time is defined by a time-current characteristic of the breaker. The dependence of the rated operating current for OptiMat E from the ambient temperature is below.

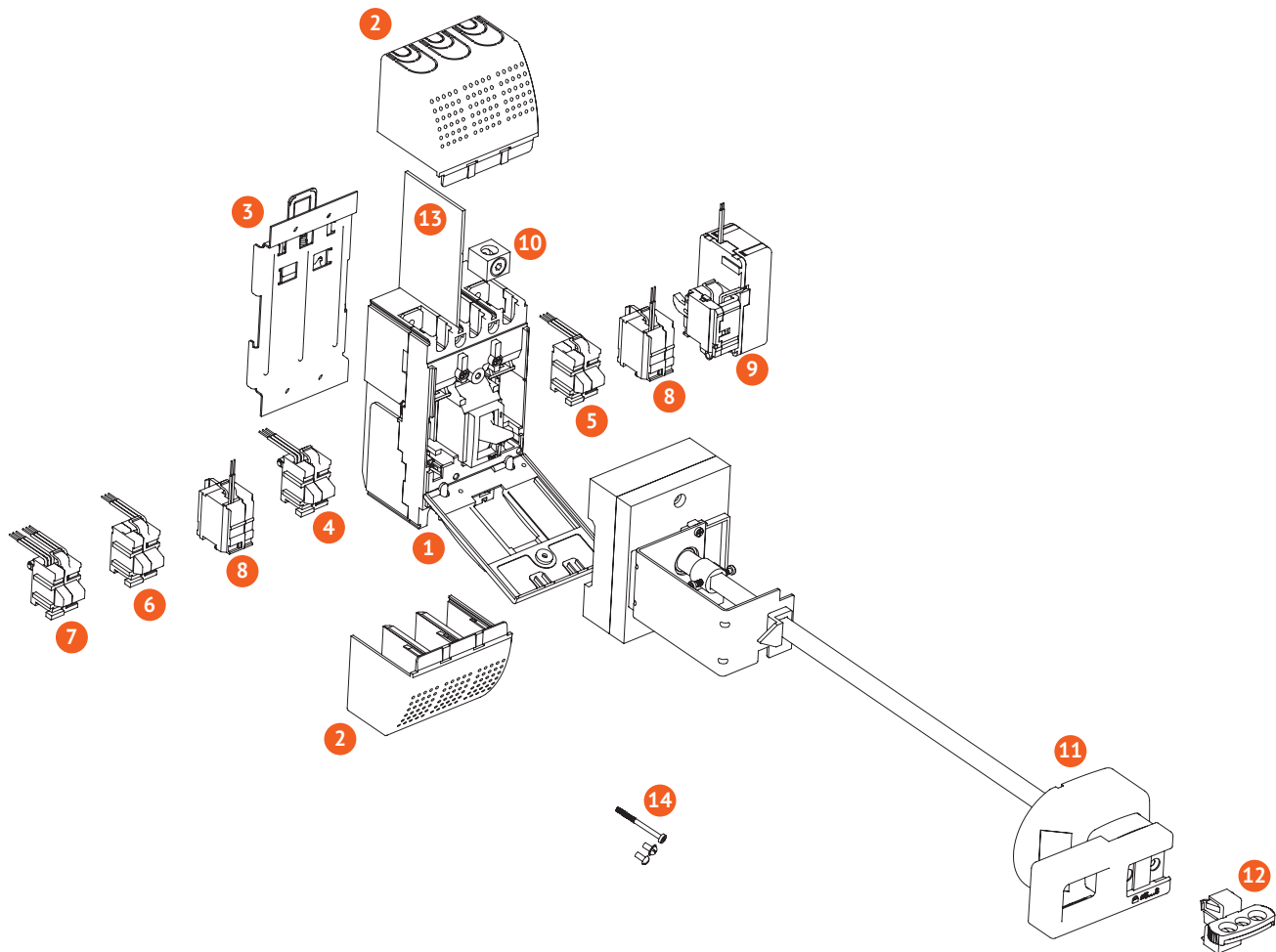


For the breakers of a general purpose industrial design and breakers with RRR acceptance.



For the breakers with RRR acceptance.

## Configuration



1. Automatic breaker
2. Terminal cover
3. DIN rail equipment
4. Auxiliary contact (left)
5. Auxiliary contact (right)
6. Indication auxiliary contact
7. Combined indication contact with alarm signal function (auxiliary contact+indication auxiliary contact)
8. Shunt trip
9. Minimum current tripping device
10. I/O wiring terminal block kit
11. Rotary handle ( extended)
12. Locking device for "off" position
13. Interpole barriers \*
14. Attaching screw kit\*

\* Standard equipment set



## Accessories and auxiliaries

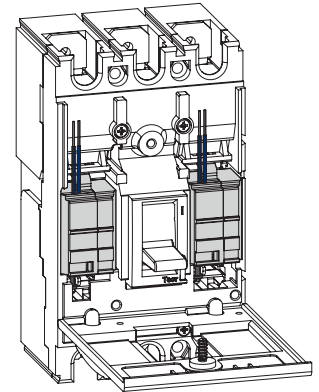
### OptiMat E Shunt trip

The shunt trip is designed to open the breaker remotely and is unified for OptiMat E100 and OptiMat E250 breakers.

It is installed under the front panel of the breaker in its own cell.

The shunt trip opens the breaker in any working conditions at the voltage within 70-110%  $U_e$  range.

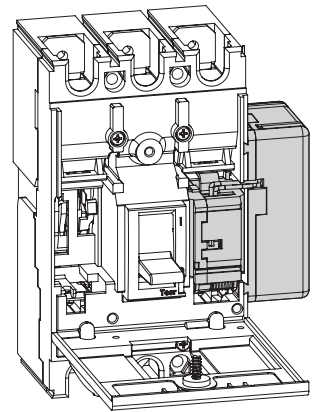
<b>Operating voltage <math>U_e</math>, V</b>	12AC/DC	24AC/DC	48AC/DC	110AC	230AC	400AC	
<b>Operating voltage range</b>	(0,7-1,1) $U_e$						
<b>Consumed power, VA</b>	200			400			
<b>Working mode</b>	short time (pulsed)						
<b>Opening time, ms</b>	35						
<b>Reference</b>	<b>general purpose industrial version</b>	100031	100032	100033	100034	100035	100036
	<b>RRR acceptance</b>	242834	242836	242838	242833	242835	242837
	<b>RS acceptance</b>	233712	233714	233716	233711	233713	233715



### OptiMat E Minimum current tripping unit

Is designed to switch off the automatic breaker at a decreasing phase-to-phase neutral and phase-to-phase voltage at its input. It also prevents tripping when the voltage in the circuit is under a derived minimal level. Is unified for OptiMat E100 and OptiMat E250 breakers. Install under the front panel of the breaker in its own cell. The accessory is installed on the outer right face in a "dovetail" slot. Only one attached tripping unit is acceptable.

<b>Operating voltage <math>U_e</math>, V</b>	12AC/DC	24AC/DC	48AC/DC	110AC	230AC	400AC
<b>Applied voltage range</b>	(0,85-1,1) $U_e$					
<b>Holding voltage range</b>	(0,7-1,1) $U_e$					
<b>Tripping voltage</b>	(0,35-0,7) $U_e$					
<b>Consumed power, V·A</b>	<4					
<b>Reference</b>	<b>general purpose industrial version</b>	to be develop				
	<b>RRR acceptance</b>	to be develop				
	<b>RS acceptance</b>	to be develop				



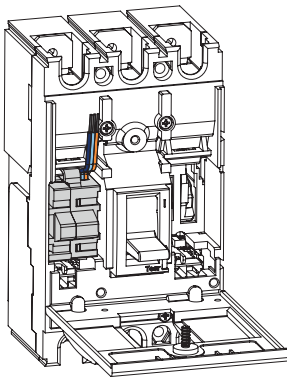
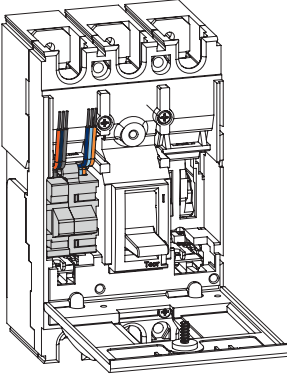
### Auxiliary contacts

Designed to transfer indications about servicing of the breaker. Used for indication, electric lockup, protection system organisation and etc. Unified for breakers OptiMat E100 and OptiMat E250.

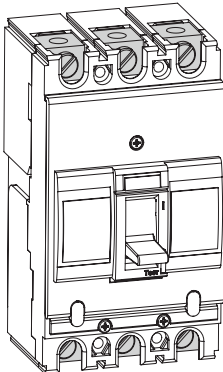
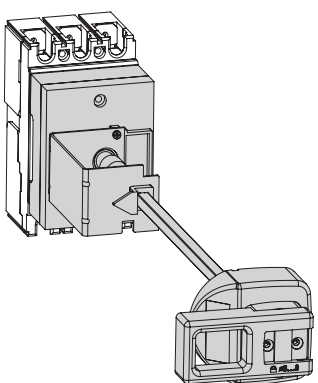
It is installed under the front panel of the breaker in its own cell.

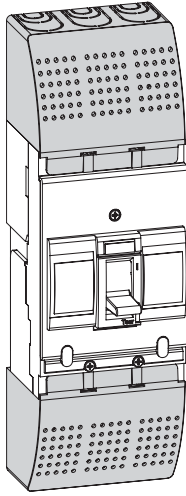
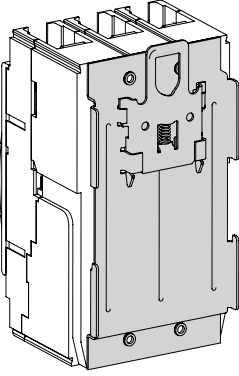
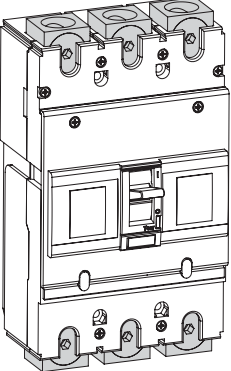
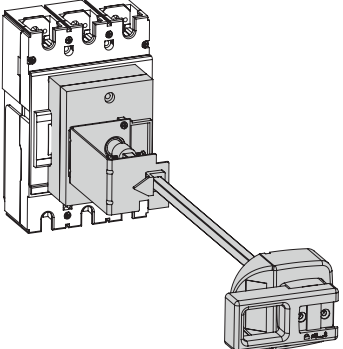
	Title	Rated operating current ( $I_r$ ) at the supply voltage, A						Reference		
		(125-250) AC, 50 Hz	30 DC	50 DC	75 DC	125 DC	220 DC	general purpose industrial version	RRR acceptance	RS acceptance
	Left auxiliary contact OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	1000018	242826	233704
	Right auxiliary contact OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	1000019	242827	233705

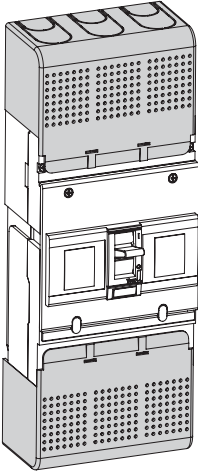
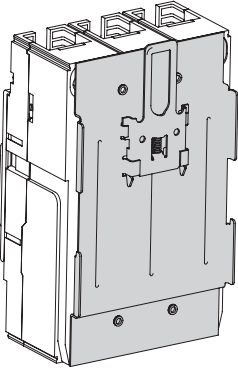
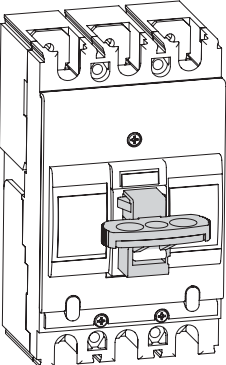
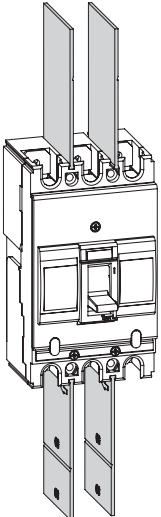


	Title	Rated operating current (I <sub>r</sub> ) at the supply voltage, A						Reference		
		(125-250) AC, 50 Hz	30 DC	50 DC	75 DC	125 DC	220 DC	general purpose industrial version	RRR acceptance	RS acceptance
	Auxiliary indication contact OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	100020	242828	233706
	Combined indicating signal OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	100021	242829	233707

### ■ Auxiliaries for a quick safe mounting and exploitation

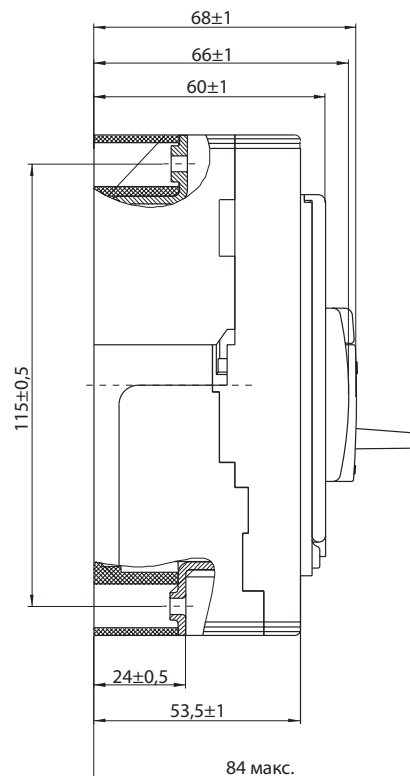
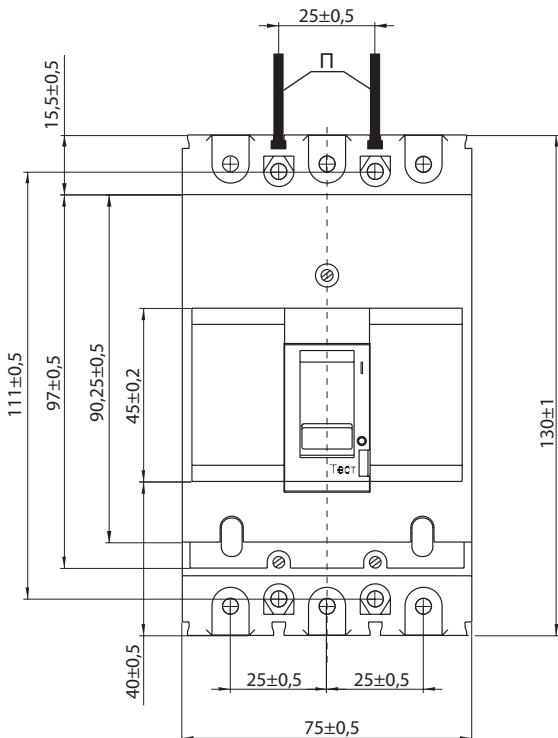
For OptiMat E100	Title	Reference		
		general purpose industrial version	RRR acceptance	RS acceptance
	Clamp kit OptiMat E100-16..50A-UHL3 - 3 pcs.	100015	242823	233701
	Clamp kit OptiMat E100-63..100A-UHL3 - 3 pcs.	100016	242824	233702
	Rotary extended handle OptiMat E100-UHL3	100037	242909	236204

	<p>Terminal shield OptiMat E100-UHL3 - 2 pcs.</p>	<p>100022</p>	<p>242830</p>	<p>233708</p>
	<p>Adapter for a DIN-rail equipment E100-UHL3</p>	<p>100013</p>	<p>242821</p>	<p>233699</p>
<p><b>For OptiMat E250</b></p>				
	<p>Clamp kit OptiMat E250-UHL3 - 3 pcs.</p>	<p>100017</p>	<p>242825</p>	<p>233703</p>
	<p>Rotary extended handle OptiMat E250-UHL3</p>	<p>100039</p>	<p>242910</p>	<p>236205</p>

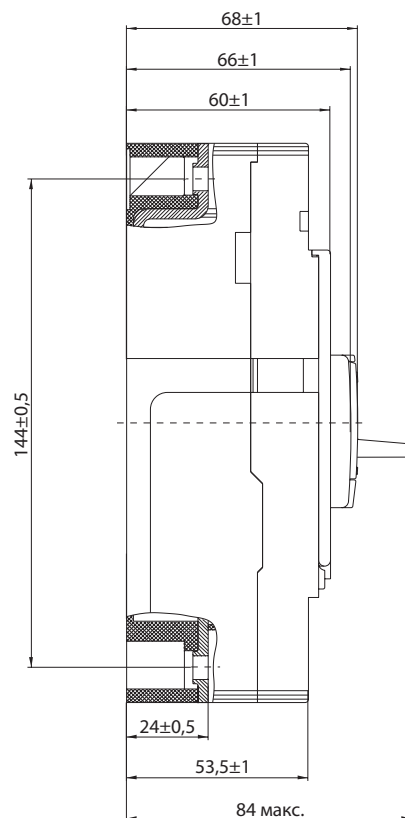
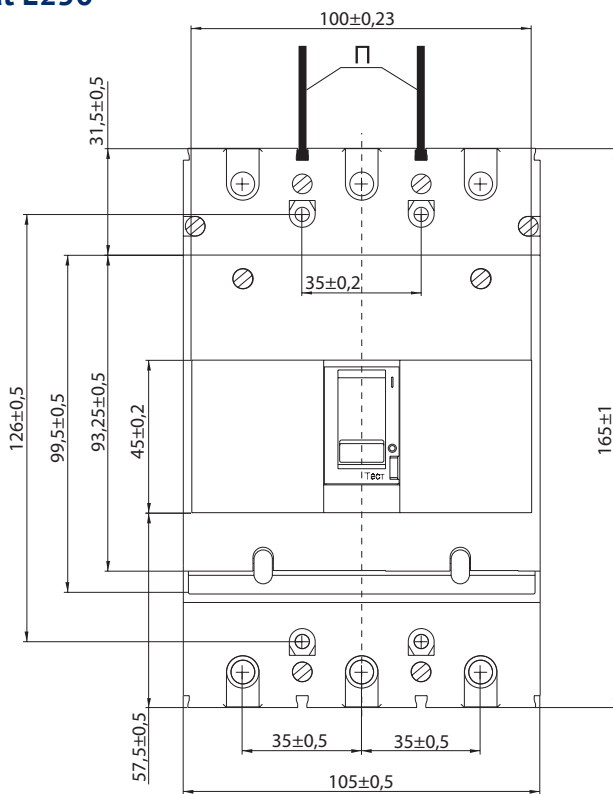
	<p>Terminal shield OptiMat E250-UHL3 - 2 pcs.</p>	<p>100023</p>	<p>242831</p>	<p>233709</p>
	<p>Adapter for a DIN rail equipment OptiMat E250-UHL3</p>	<p>100014</p>	<p>242822</p>	<p>233700</p>
<b>General</b>				
	<p>Position lockup device (off) OptiMat E-UHL3</p>	<p>100041</p>	<p>242839</p>	<p>233717</p>
	<p>Interphase barriers OptiMat E-UHL3 - 2 pcs.</p>	<p>100024</p>	<p>242832</p>	<p>233710</p>

## Overall dimensions (mm)

### OptiMat E100



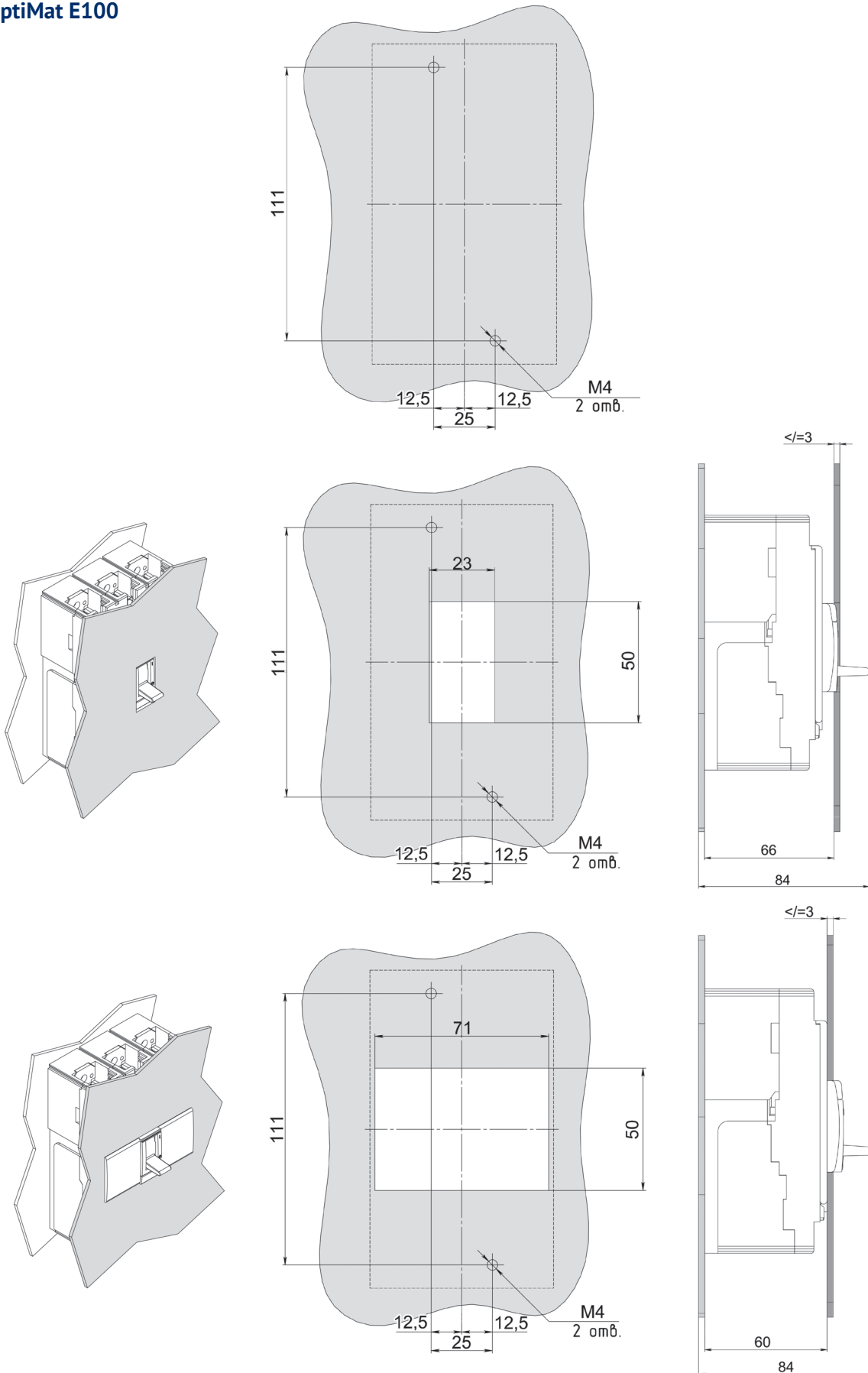
### OptiMat E250



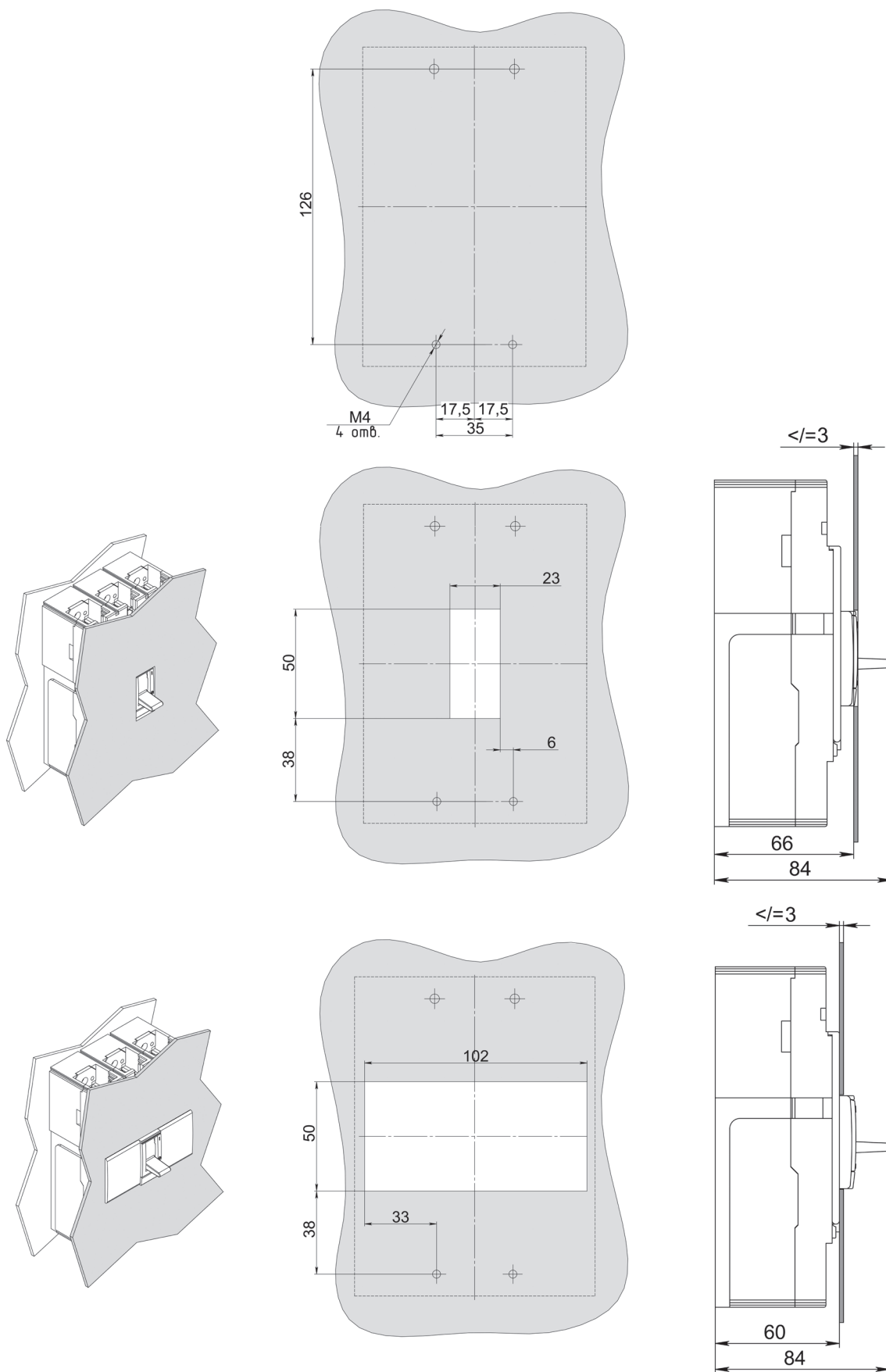
Π - interphase barrier

## Models for marking and box drilling

### OptiMat E100

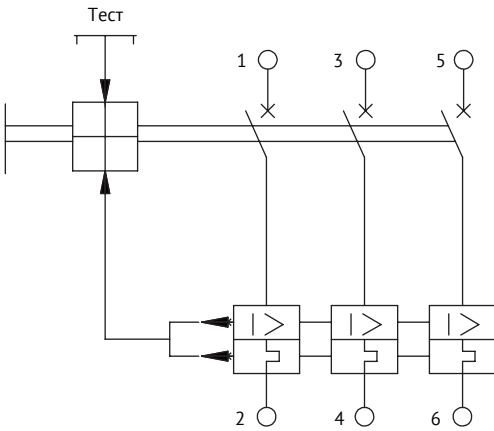


OptiMat E250

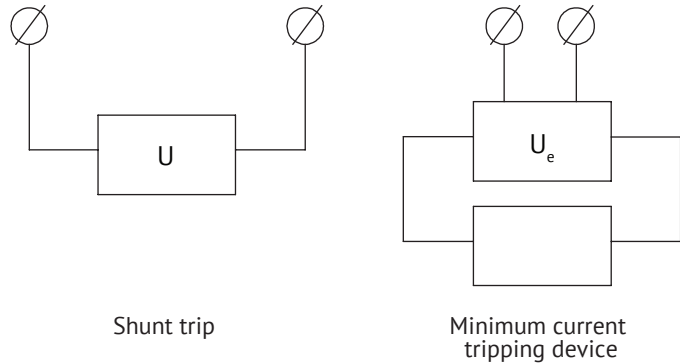


## Wiring diagrams

Breaker without auxiliary units and parts



Auxiliary units and parts



## Auxiliary contacts

### Auxiliary contacts

14 (yellow)

12 (red)

11 (black)

### Indication auxiliary contacts

54 (white)

52 (green)

51 (brown)

### Combined indication signals

14 (yellow)

12 (red)

11 (black)

54 (white)

52 (green)

51 (brown)

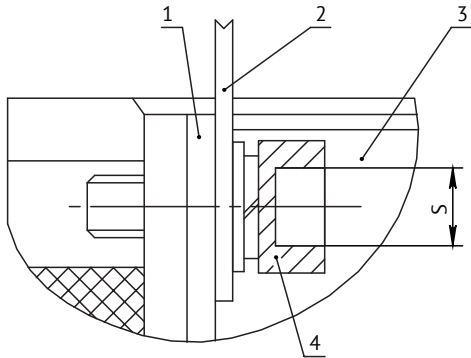
The position of the auxiliary signal contacts and the combined signal contacts is shown for the switch in the "off" position after automatic tripping.

Contact	"Tripped" position	Position "automatic shutdown"	Position "Manual shutdown"
14-11 yellow-black	closed	open	open
12-11 red-black	open	closed	closed
54-51 white-brown	closed	open	closed
52-51 green-brown	open	closed	open

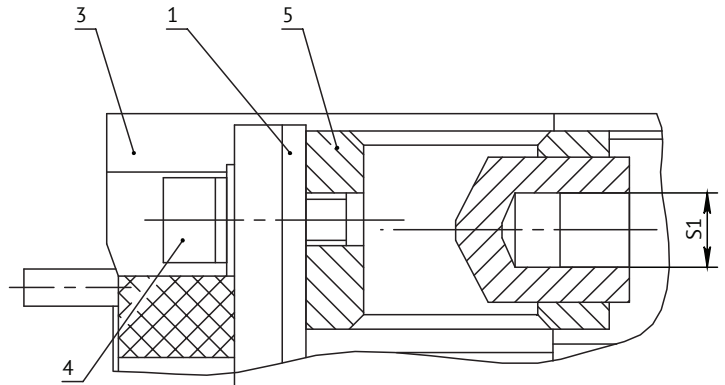


## Ways to attach main circuit conductors of the breaker. Form and size of attaching busbars

Busbar connection or a cable core connection with wiring terminal connector



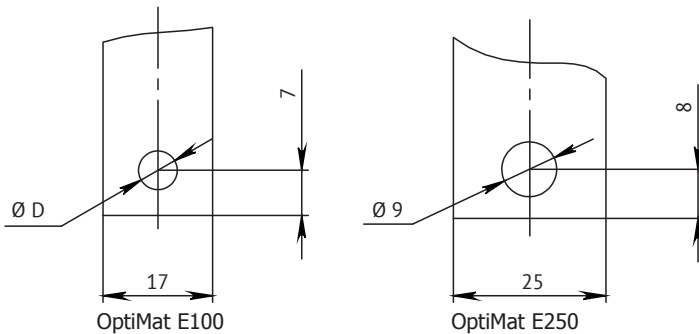
Cable connection without wiring terminal connector



Range of products	Rated current	S	S1
OptiMat E100	In = 16...50 A	4	slot
	In = 63...100 A	6	slot
OptiMat E250	In = 100...250 A	6	5

1. Terminal of the breaker
2. Busbar (or wiring terminal connector)
3. Breaker
4. Screwed connection
5. Single connector

The form and size of a clamped busbar of a maximum transverse section of the breaker



	ØD, mm
In ≤ 50 A	5,5
In ≥ 63 A	8,5

Minimal clearance from OptiMat e100 and E250 breakers to the metal parts of the switchgear

