OptiMat E Molded case circuit breakers for currents from 16 to 250 A

OptiMat E molded case circuit breaker series is represented by reliable and simple protection devices designed for low-voltage distribution systems, for current conduction in normal mode and current interruption in case of short circuits, overloads and up to 30 operative switching on and off of electric circuits per day. Circuit breakers approved by the Russian Maritime Register of Shipping (hereinafter RS) and the Russian River Register (hereinafter RRR) are designed to protect electrical equipment on ships and port infrastructure. Circuit breakers approved by the NPP are designed to protect nuclear power stations.

Designation

OptiMat E 100 L 100 UHL3 AES

1 2 3 4 5 6 7

1	Series	OptiMat			
2	Configuration	E — molded case circuit breakers			
3	Rated current In, A	100		250	
4	Limiting breaking capacity, kA	L — 15[1)] N — 20[2)]		L — 18 N — 25 H — 40	
5	Thermomagnetic release rated current, A	16, 20, 25, 32, 40, 50, 63, 80, 100		125, 160, 200, 250	
6	Designation of climatic and placement category	UHL3 (international TC3)		OM4 (international UM4) for circuit breakers with RS approval	
7	Approval type, delivery terms	REC- RS or RRR approval	AES - for nuclear power plants	RR - for Russian railways	when absent - QCD approval

[1)] Breakers for rated current: 16, 20 A - 6 kA; 25 A - 8 kA.
[2)] Breakers for rated current: 16...25 A - not available; 32 A - 15 kA.

Basic configuration of OptiMat D circuit breakers includes:
- inter-pole partitions (2 pieces);
- attaching screws kit.

Codes indicated in the tables can be amended. If you did not find the necessary codes on the website, please call KEAZ customer service.

Series advantages

Optimal protection from both short circuits and overload with high efficiency using only two dimensions. Optimal level of limiting switching capacity (LSC), 10 to 40 kA, is used on most facilities.

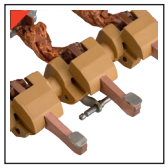
Conducting customer training to improve the efficiency of KEAZ Optima appliances operation. Technical consulting for design and operation.

Optimal range of optional accessories extends the functionality of circuit breakers and facilitates the operation of electrical installations.

The location in the central part of Russia and fully domestic production facilities allow us to fulfill equipment delivery in the shortest possible time.

Each unit undergoes multistage quality control from assembling to the finished goods warehouse. 5 years warranty.

OptiMat E circuit breakers can be operated from -60 to +40 °C.



The use of modern materials: silver-containing contacts reduce transient resistances, increase welding wear resistance and exclude welding susceptibility; non-combustible plastic with improved electrical insulation properties and arc resistance.

It's possible to install the breaker in any spatial position, with power supply from the top and bottom, without compromising technical characteristics of the breaker.

Items

Appearance	Rated current (In), A	Product name (general industrial design)	Code	Product name (RS-approved version)	Code	Product name (RRR-approved version)	Code	Weight, kg
OptiMat E100 	16...100	OptiMat E100L016-UHL3	100000	OptiMat E100L016-OM4-REG	273882	OptiMat E100L016-UHL3-REG	273883	0,8
		OptiMat E100L020-UHL3	100001	OptiMat E100L020-OM4-REG	273884	OptiMat E100L020-UHL3-REG	273885	
		OptiMat E100L025-UHL3	100002	OptiMat E100L025-OM4-REG	273886	OptiMat E100L025-UHL3-REG	273887	
		OptiMat E100L032-UHL3	100003	OptiMat E100L032-OM4-REG	273888	OptiMat E100L032-UHL3-REG	273889	
		OptiMat E100L040-UHL3	100004	OptiMat E100L040-OM4-REG	273890	OptiMat E100L040-UHL3-REG	273891	
		OptiMat E100L050-UHL3	100005	OptiMat E100L050-OM4-REG	273892	OptiMat E100L050-UHL3-REG	273893	
		OptiMat E100L063-UHL3	100006	OptiMat E100L063-OM4-REG	273894	OptiMat E100L063-UHL3-REG	273895	
		OptiMat E100L080-UHL3	100007	OptiMat E100L080-OM4-REG	273896	OptiMat E100L080-UHL3-REG	273897	
		OptiMat E100L100-UHL3	100008	OptiMat E100L100-OM4-REG	273898	OptiMat E100L100-UHL3-REG	273899	
		OptiMat E100N032-UHL3	224958	OptiMat E100N032-OM4-REG	273900	OptiMat E100N032-UHL3-REG	273901	
		OptiMat E100N040-UHL3	224959	OptiMat E100N040-OM4-REG	273902	OptiMat E100N040-UHL3-REG	273903	
		OptiMat E100N050-UHL3	224960	OptiMat E100N050-OM4-REG	273904	OptiMat E100N050-UHL3-REG	273905	
		OptiMat E100N063-UHL3	224961	OptiMat E100N063-OM4-REG	273906	OptiMat E100N063-UHL3-REG	273907	
		OptiMat E100N080-UHL3	224962	OptiMat E100N080-OM4-REG	273908	OptiMat E100N080-UHL3-REG	273909	
		OptiMat E100N100-UHL3	224963	OptiMat E100N100-UHL3-REG	273910	OptiMat E100N100-UHL3-REG	273911	
OptiMat E250 	125...250	OptiMat E250L125-UHL3	100009	OptiMat E250L125-OM4-REG	273913	OptiMat E250L125-UHL3-REG	273914	1,2
		OptiMat E250L160-UHL3	100010	OptiMat E250L160-OM4-REG	273915	OptiMat E250L160-UHL3-REG	273916	
		OptiMat E250L200-UHL3	100011	OptiMat E250L200-OM4-REG	273917	OptiMat E250L200-UHL3-REG	273918	
		OptiMat E250L250-UHL3	100012	OptiMat E250L250-OM4-REG	273919	OptiMat E250L250-UHL3-REG	273920	
		OptiMat E250N125-UHL3	230652	OptiMat E250N125-OM4-REG	273921	OptiMat E250N125-UHL3-REG	273922	
		OptiMat E250N160-UHL3	230653	OptiMat E250N160-OM4-REG	273923	OptiMat E250N160-UHL3-REG	273924	
		OptiMat E250N200-UHL3	230654	OptiMat E250N200-OM4-REG	273925	OptiMat E250N200-UHL3-REG	273926	
		OptiMat E250N250-UHL3	230655	OptiMat E250N250-OM4-REG	273927	OptiMat E250N250-UHL3-REG	273928	
		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	273929	
		OptiMat E250H250-UHL3	230659	OptiMat E250H250-UHL3-REG	236197	OptiMat E250H250-OM4-REG	242902	

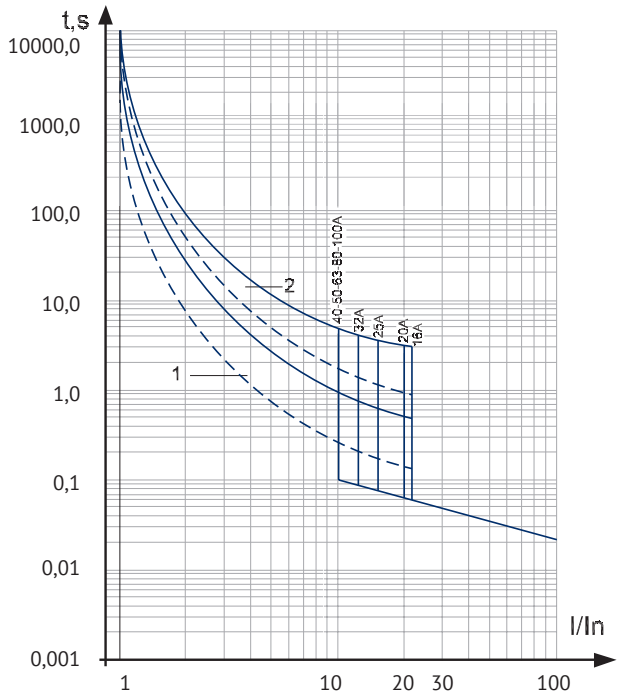
Technical specification

Circuit breaker series		OptiMat E100		OptiMat E250		
Main characteristics						
Rated operating voltage Ue, V		690				
Rated insulation voltage Ui, V		690				
Rated impulse withstand voltage Uimp, kV		6				
Application category		A				
Suitability for disconnection		yes				
Number of poles		3				
Control						
Manual	control lever	+		+		
	standard or rotary remote handle	+		+		
Design option						
Fixed with front connection		+		+		
Rated and limiting parameters of the main circuit of circuit breakers						
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	15 [1]	20 [2]	18	25	40
	Ue 690 V	5	5	7,5	10	12
Rated operating capacity Ics, % from Icu		50				
Rated 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		
Electrical wear resistance, cycles		1500		1000		
Devices for protection, indication and measurement						
Short circuits protection	setpoint of the electromagnetic release, A	fixed [3]		10 In		
Overload protection	thermal release setpoint	In				
Supplementary devices for control and signaling						
Auxiliary contacts	left auxiliary contact	+				
	right auxiliary contact	+				
	alarm auxiliary contact	+				
	combined alarm contact (auxiliary contact + alarm auxiliary contact)	+				
Voltage releases	shunt trip	+				
	undervoltage release	+				
Accessories	din-rail adapted	+				
	inter-pole partitions	as a set\can be ordered separately				
	terminal cover	+				
	position locking device (off)	+				
	one-celled terminal sets	+				
Installation and connection						
Connecting copper and aluminum wires and cables section, mm	In ≤ 50 A	2,5–10				
	In ≥ 63 A	10–35				
	125 ≤ In ≤ 250 A			35–120		
Connecting stiff wires with the following section, mm	In ≤ 50 A	2,5–16				
	In ≥ 63 A	10–50				
	125 ≤ In ≤ 250 A			35–150		
Overall dimensions and weight						
Overall dimensions W×H×D, mm		75x130x60		105x165x60		
Weight, kg		0,8		1,2		

[1] Breakers for rated current: 16, 20 A - 6 kA; 25 A - 8 kA.
[2] Breakers for rated current: 16...25 A - not available; 32 A - 15 kA.
[3] Breakers for rated current: 16 A — 350; 20...32 A — 400; 40...100 A — 10 In.

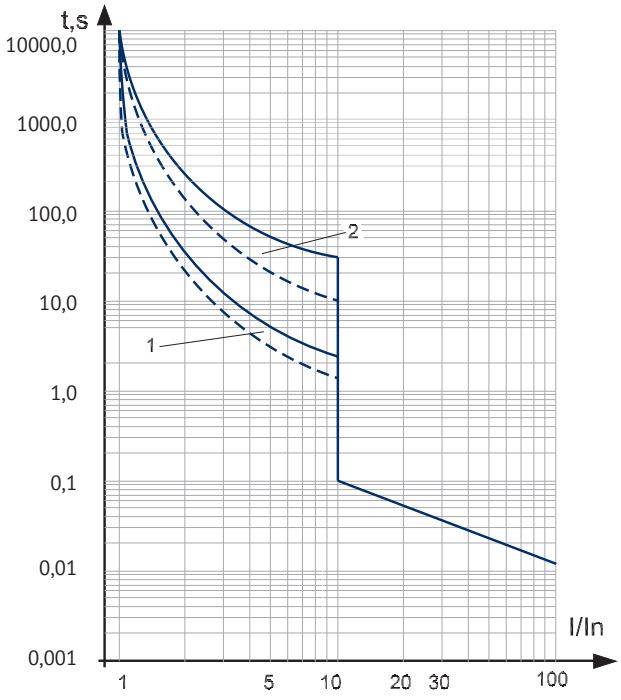
Current and time characteristics

OptiMat E100



1 — working zone of an overcurrent thermal release, measured in hot state
2 — working zone of an overcurrent thermal release, measured in cold state

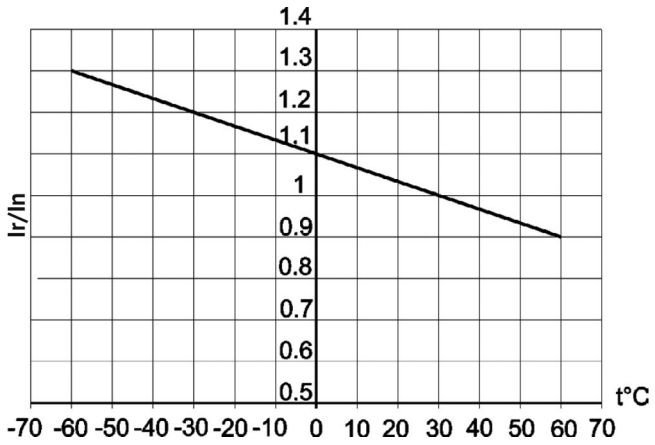
OptiMat E250



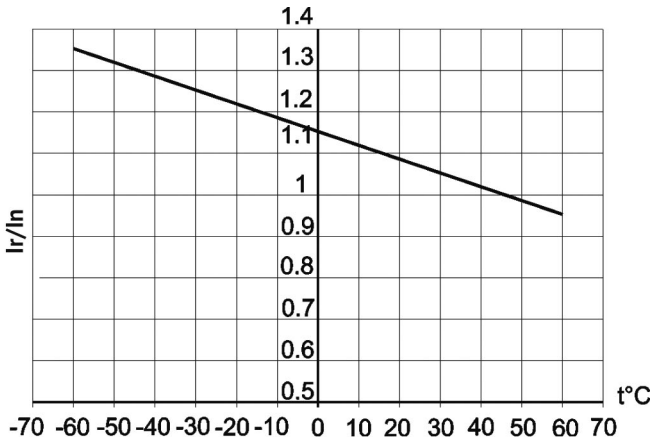
1 — working zone of an overcurrent thermal release, measured in hot state
2 — working zone of an overcurrent thermal release, measured in cold state

Rated operating current in accordance with ambient temperature

OptiMat E circuit breakers are equipped with non-regulated thermomagnetic releases. With external temperature of +30 °C (+45 °C in case of RS-approved (Register of Shipping) breakers), the devices have I = In.
Circuit breaker tripping time is defined by its tripping curve. Dependence of rated operating currents of OptiMat E circuit breakers from the ambient temperature is shown on the picture below.

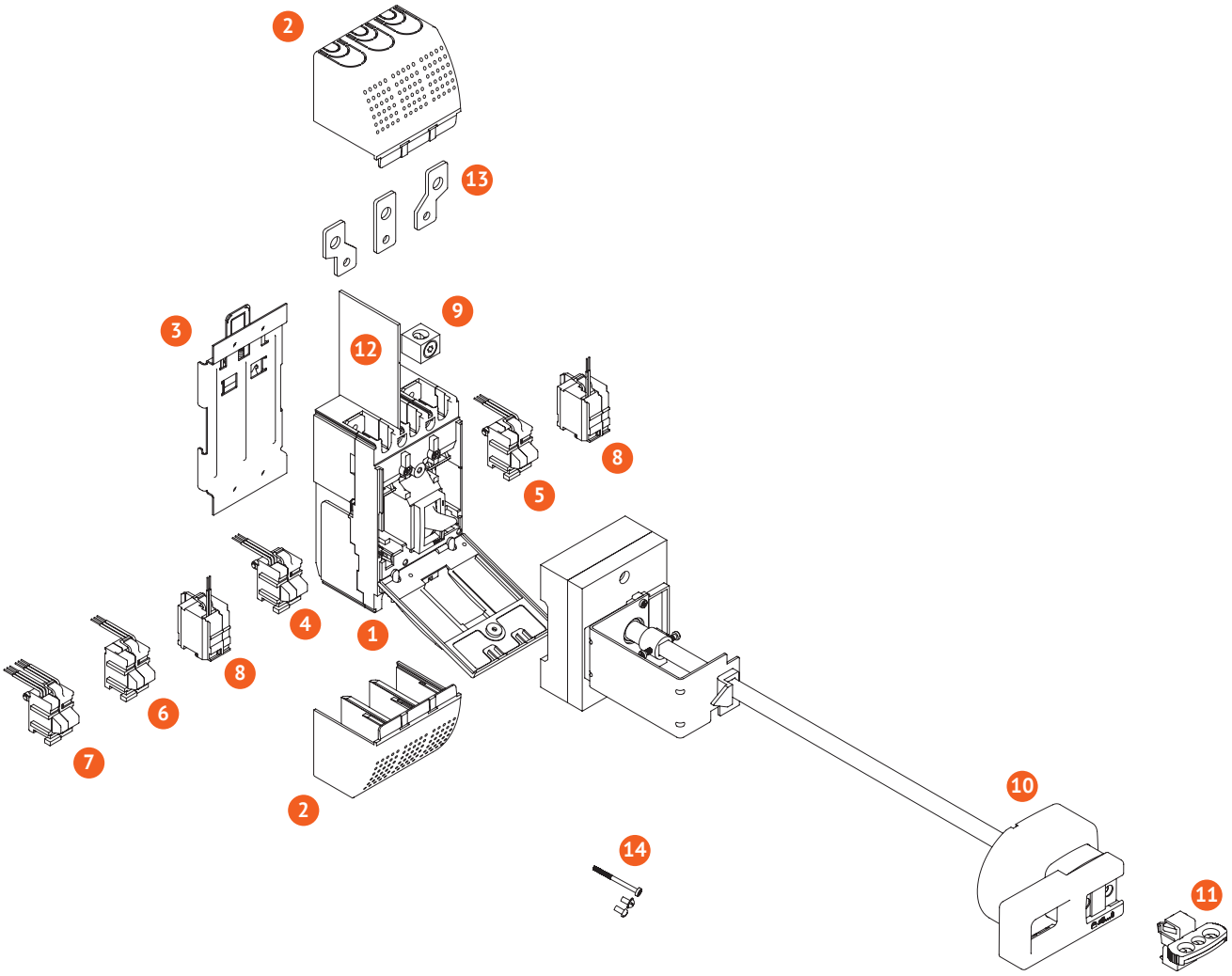


For general purpose circuit breakers with RRR (Russian River Register) approval



For circuit breakers with RS approval

Configuration

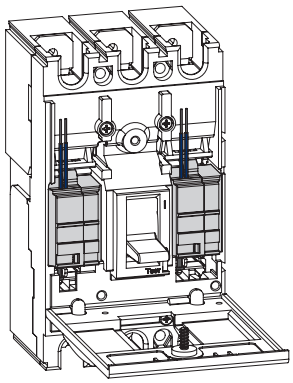


1. Circuit breaker*
2. Terminal covers
3. Din-rail adapter
4. Auxiliary contact (left)
5. Auxiliary contact (right)
6. Alarm auxiliary contact
7. Combined alarm contact with emergency signal (auxiliary contact + alarm auxiliary contact)
8. Shunt trip
9. Terminal sets for external conductors
10. Rotary remote handle
11. Position locking device (off)
12. Inter-pole partitions*
13. Pole extenders
14. Fastening screws set*

* Standard equipment set

Accessories and auxiliary devices

OptiMat E Shunt trip

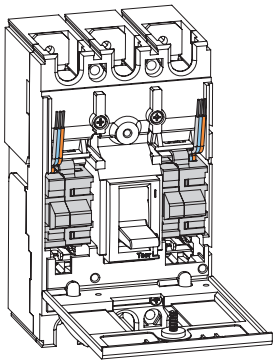
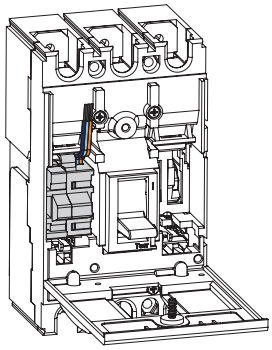
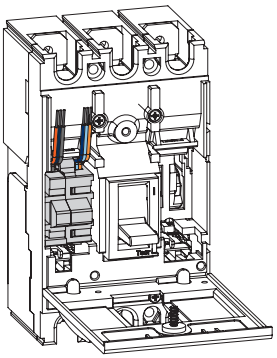


Shunt trip is designed for circuit breaker remote opening. Unified for OptiMat E100 and OptiMat E250 circuit breakers. Installed under the front panel of the circuit breaker in its own cubicle.
Shunt trip causes circuit breaker opening in any operating conditions, when supply voltage remains within the range from 70 to 110 % Ue. It has a built-in contact that removes power from the coil after the shunt trip is triggered.

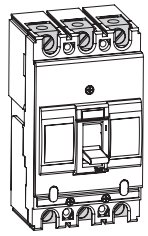
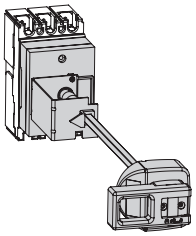
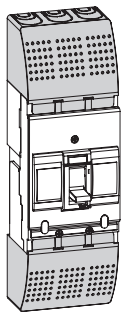
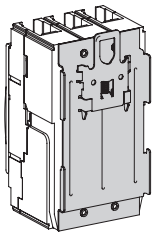
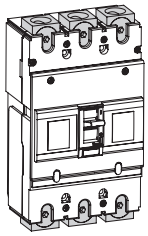
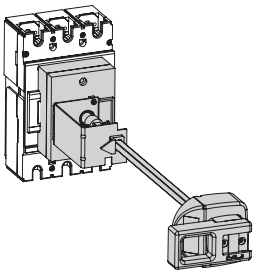
Operating voltage Ue, V		12AC/DC	24AC/DC	48AC/DC	110AC	230AC	400AC
Operating voltage range		(0,7–1,1) Ue					
Power consumption, VA		200		400			
Operating mode		Short-time (pulse)					
Break time, ms		35					
Code	general purpose industrial version	100031	100032	100033	100034	100035	100036
	RRR acceptance	273960	273964	273968	273958	273962	273966
	RS acceptance	273959	273963	273967	273957	273961	273965

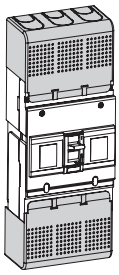
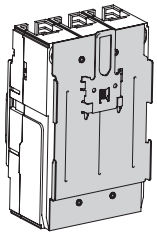
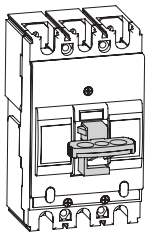
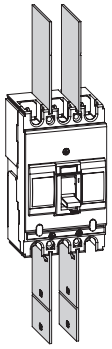
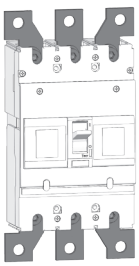
Auxiliary contacts

They are designed to transfer signals about circuit breaker operation and used for sending alarms, conduct electric blocking, ar range relay protection, etc. Unified for OptiMat E100 and OptiMat E250 circuit breakers. They are installed under the circuit breaker's face panel in their own cell.

	Product name	Rated operating current (Ir) at the supply voltage, A						Code		
		(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	273944	273943
	Right auxiliary contact OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	100019	273946	273945
	Alarm auxiliary contact OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	100020	273948	273947
	Combined indicating signal OptiMat E-UHL3	5	5	1	0,75	0,5	0,25	100021	273950	273949

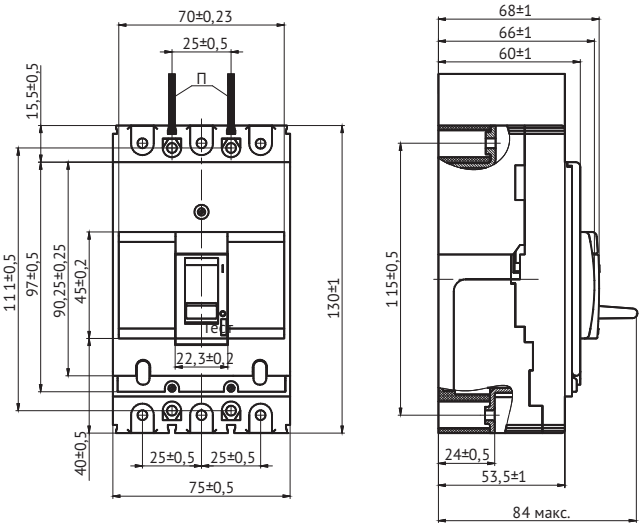
Additional devices for quick and save installation and operation

For OptiMat E100	Product name	Code		
		general purpose industrial version	RRR acceptance	RS acceptance
	Terminal set OptiMat E100-16..50A-UHL3 — 3 pcs.	100015	273938	273937
	Terminal set OptiMat E100-63..100A-UHL3 — 3 pcs.	100016	273940	273939
	Rotary remote handle OptiMat E100-UHL3	100037	242909	236204
	Terminal cover OptiMat E100-UHL3 — 2 pcs.	100022	273952	273951
	Din-rail adapter OptiMat E100-UHL3	100013	273933	273912
For OptiMat E250				
	Terminal set OptiMat E250-UHL3 — 3 pcs.	100017	273942	273941
	Rotary remote handle OptiMat E250-UHL3	100039	242910	236205

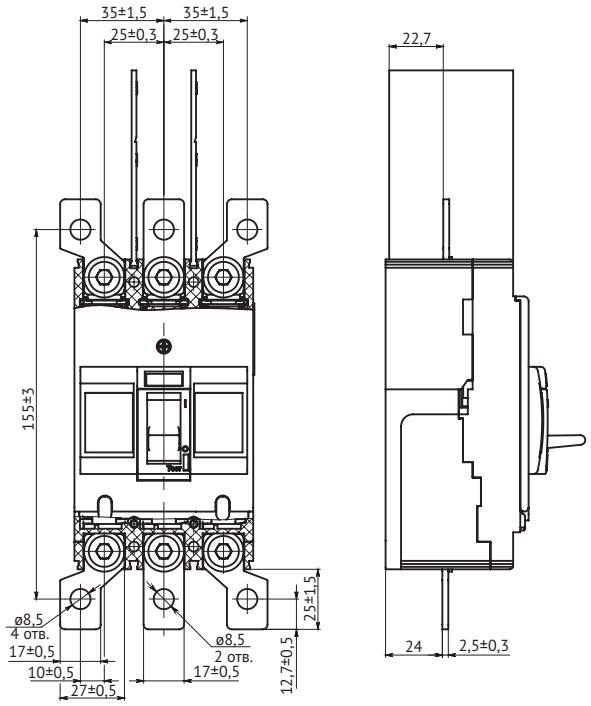
	Product name	Code		
		general purpose industrial version	RRR acceptance	RS acceptance
	Terminal cover OptiMat E250-UHL3 — 2 pcs.	100023	273954	273953
	Din-rail adapter OptiMat E250-UHL3	100014	273936	273935
General				
	Position locking device (off) OptiMat E-UHL3	100041	273970	273969
	Inter-pole partitions OptiMat E-UHL3 — 2 pcs.	100024	273956	273955
	Pole extenders OptiMat E100-16...50-UHL3 — 3 pcs. Pole extenders OptiMat E100-63...100-UHL3 — 3 pcs.	293113 292988		300257 300264
	Pole extenders OptiMat E250-UHL3 — 3 pcs.	272862	272863	272864

Overall dimensions (mm)

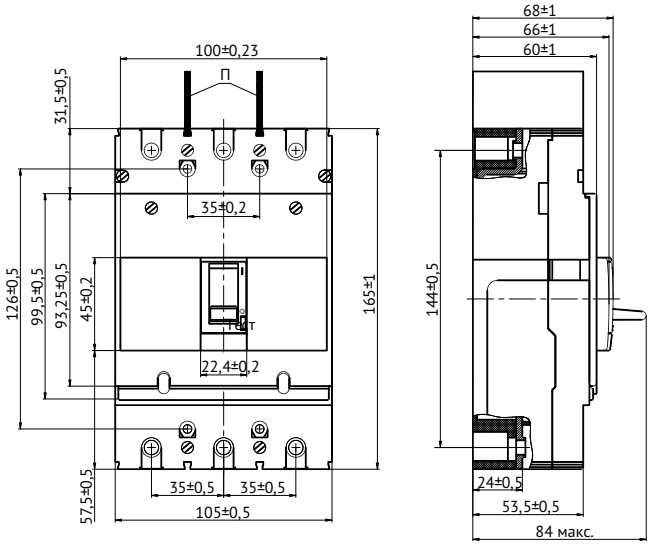
OptiMat E100



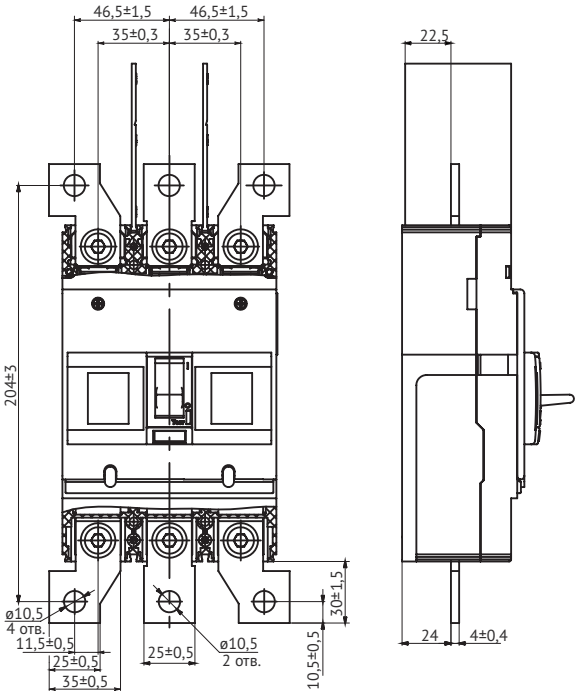
OptiMat E100 with pole extenders



OptiMat E250



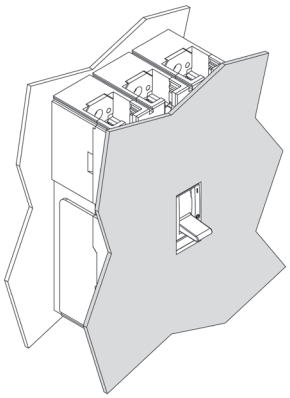
OptiMat E250 with pole extenders

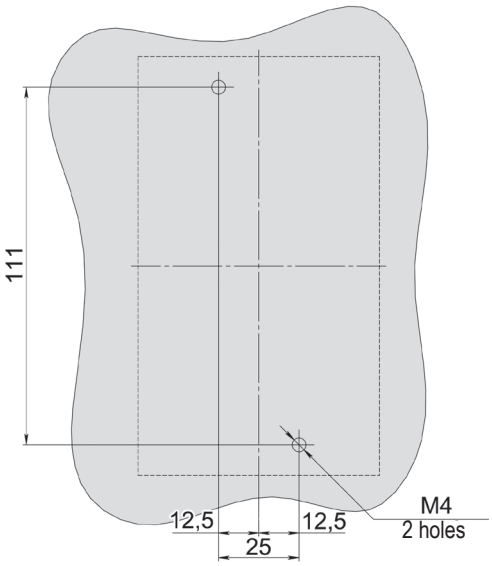


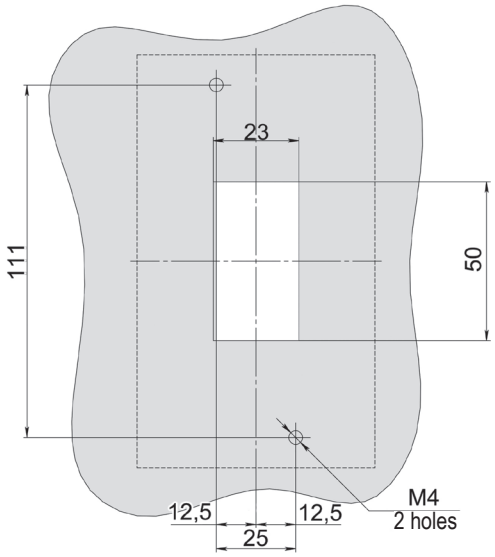
П — inter-pole partitions

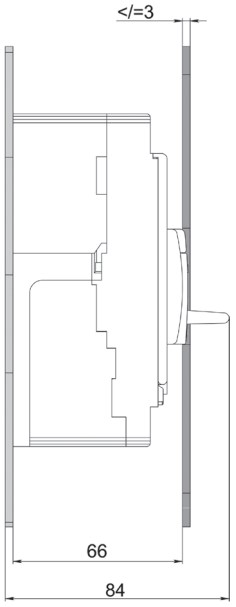
Models for cabinet marking and drilling

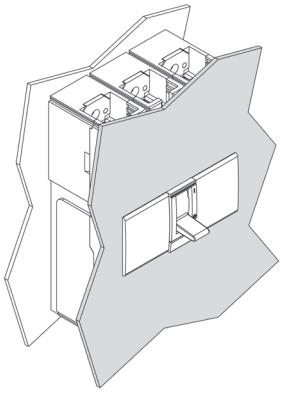
OptiMat E100

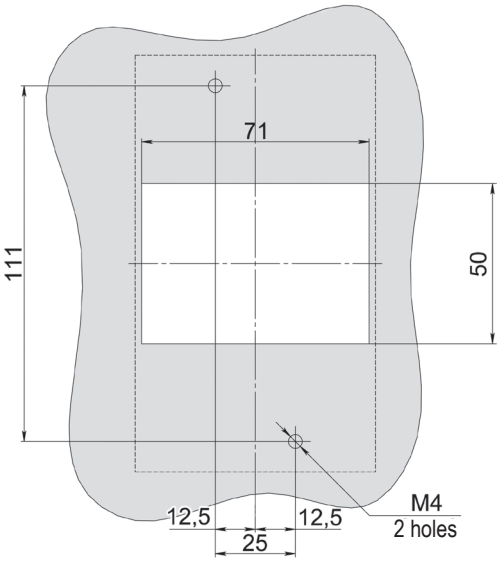


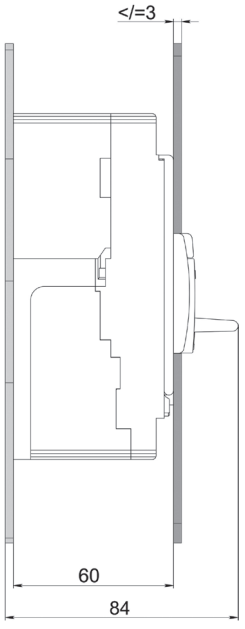




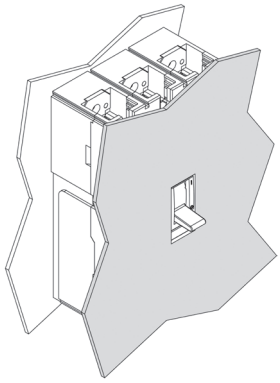


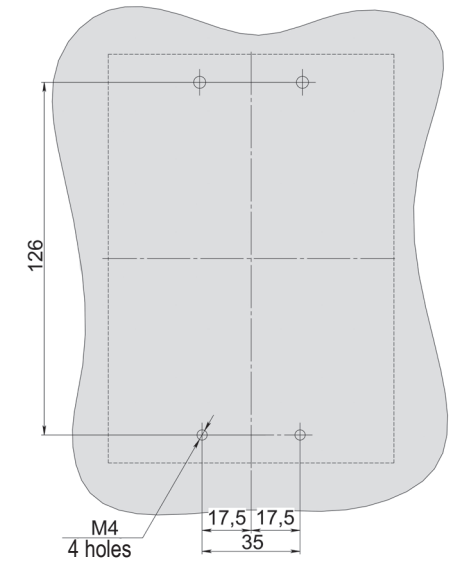


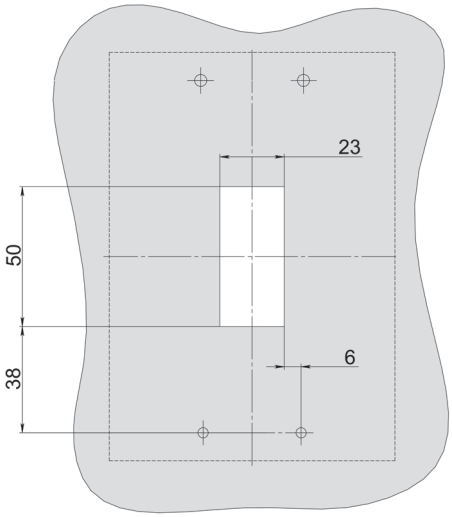


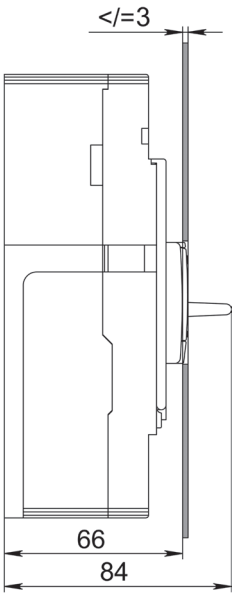


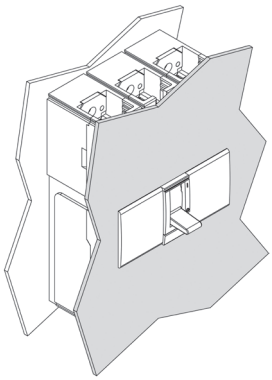
OptiMat E250

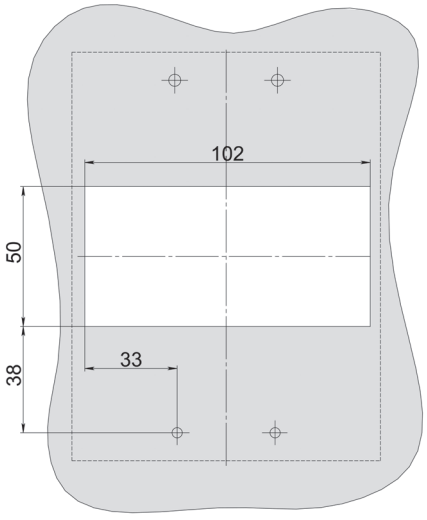


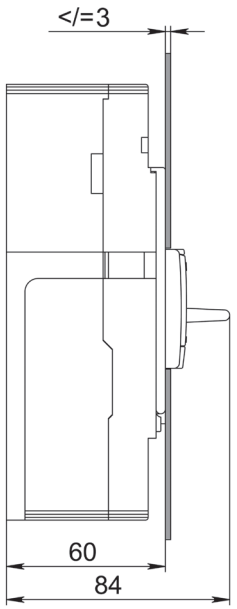




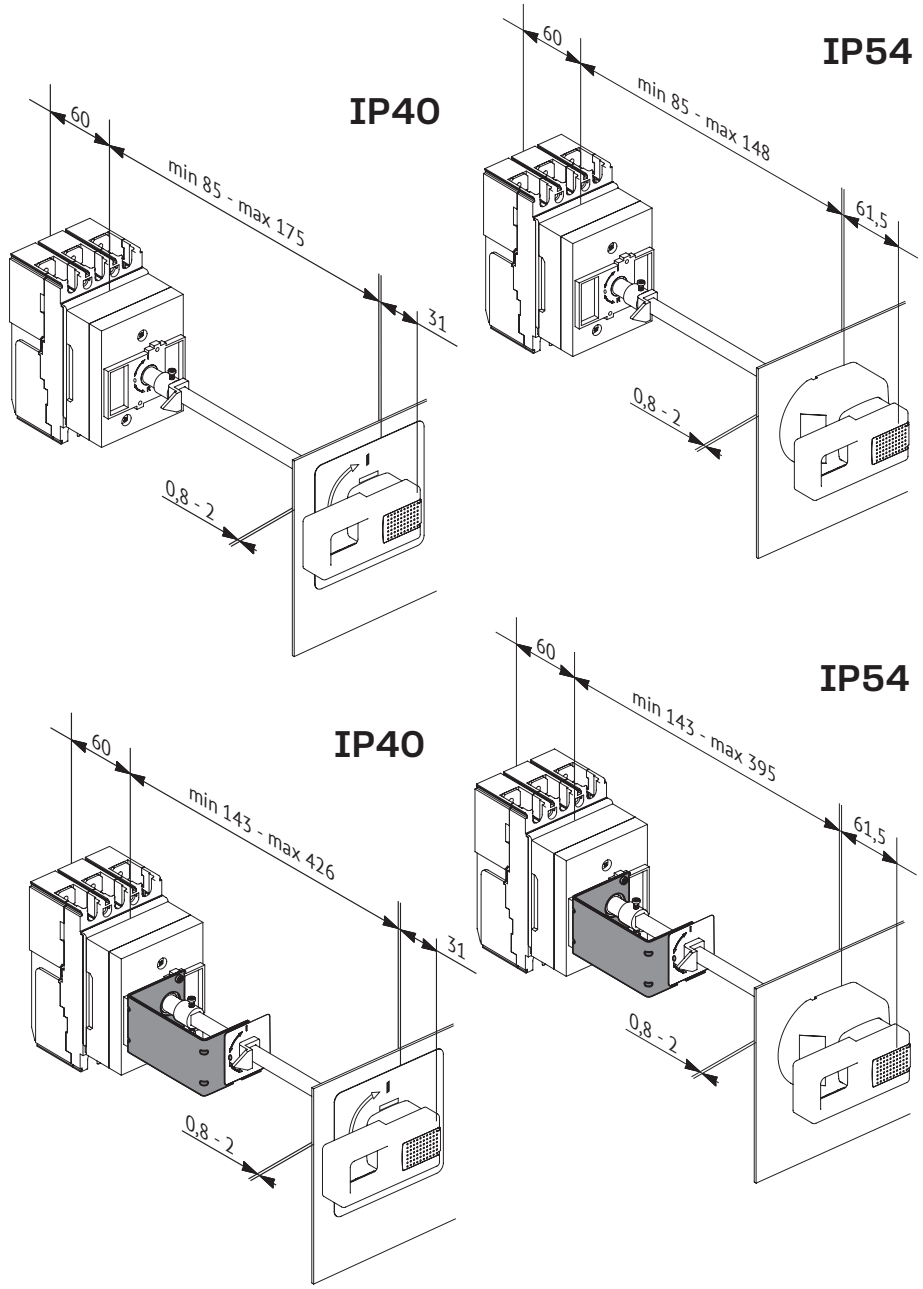






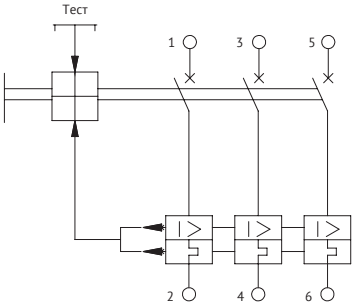


Installation versions of rotary remote handle OptiMat E100 and E250

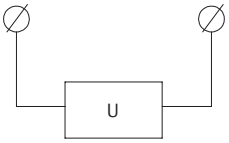


Circuit diagrams

Circuit breaker without supplementary assembly elements



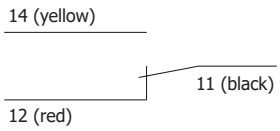
Supplementary assembly elements



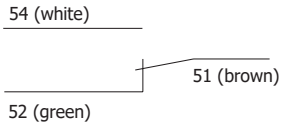
shunt trip

Auxiliary contacts

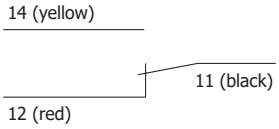
Auxiliary contacts

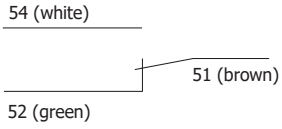


Alarm auxiliary contacts



Alarm combined contacts



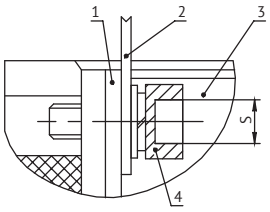


Position of alarm auxiliary contacts and combined alarm contacts are given for circuit breaker in the «off» position after automatic operation.

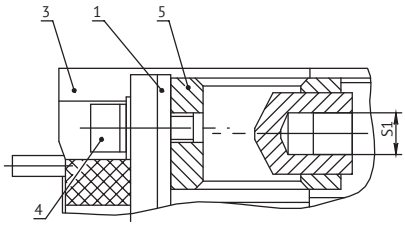
Contact	«Tripped» position	Position «automatic shutdown»	Position «Manual shutdown»
14–11 yellow-black	closed	open	open
12–11 red-black	open	closed	closed
54–51 white-brown	closed	open	closed
52–51 green-brown	open	closed	open

Methods of connection of the external conductors of the main circuit of the circuit breaker. Form and size of the connected busbars

Busbar connection or a cable core connection with wiring terminal connector



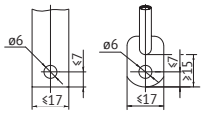
Cable connection without wiring terminal connector



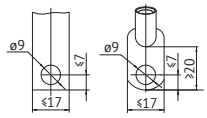
1. Terminal of the breaker
2. Busbar (or wiring terminal connector)
3. Breaker
4. Screwed connection
5. Single connector

Series	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

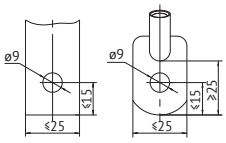
Form and size of the connected switch bus, maximum section



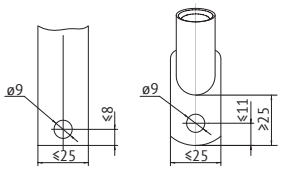
OptiMat E100 16...50A



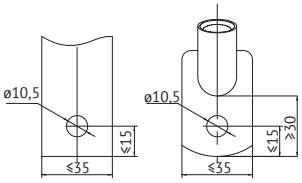
OptiMat E100 63...100A



OptiMat E100 with pole extenders



OptiMat E250



OptiMat E250 with pole extenders

Minimum allowable distance from OptiMat E100 and E250 switches to metal parts of switchgear