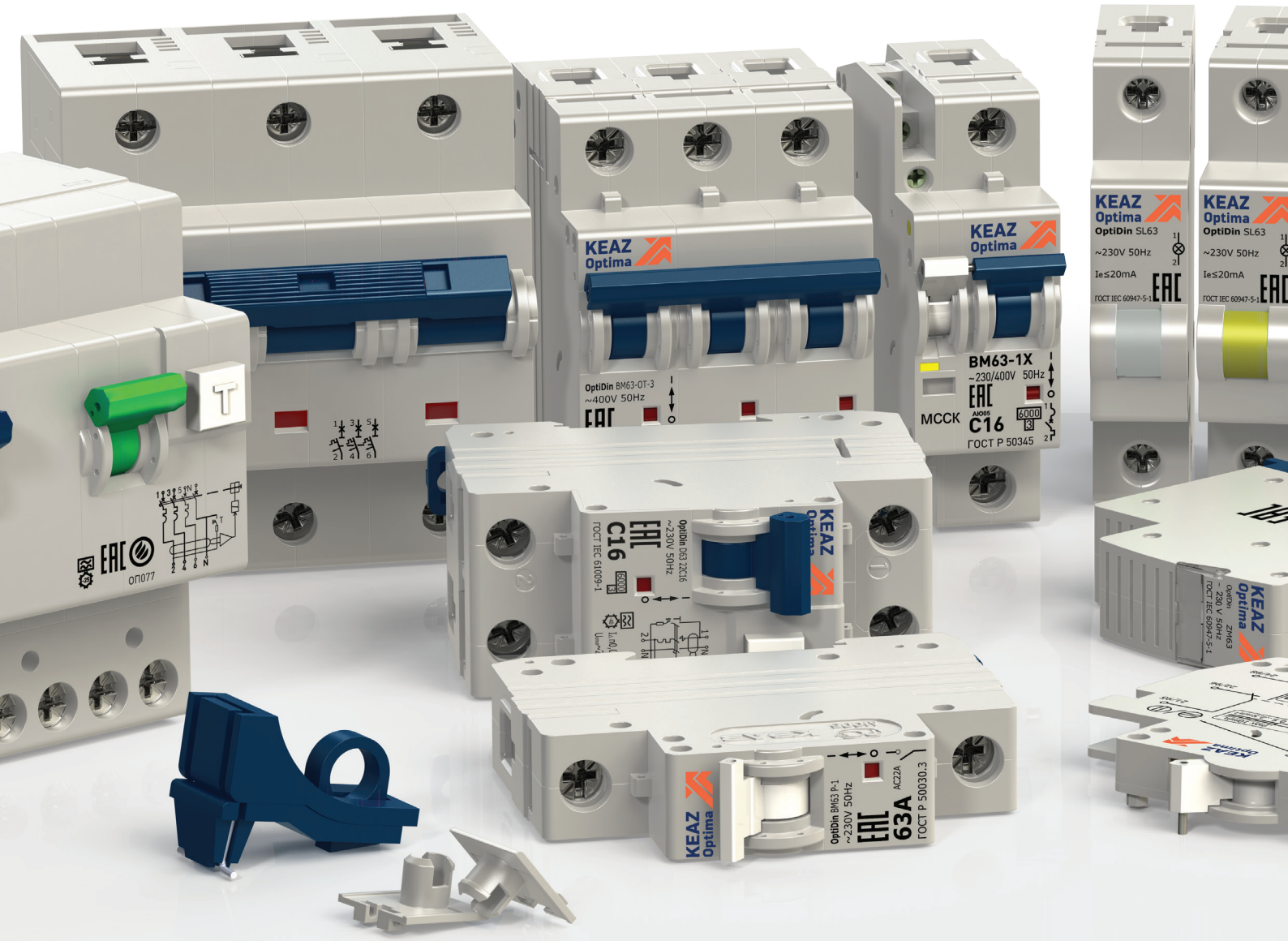
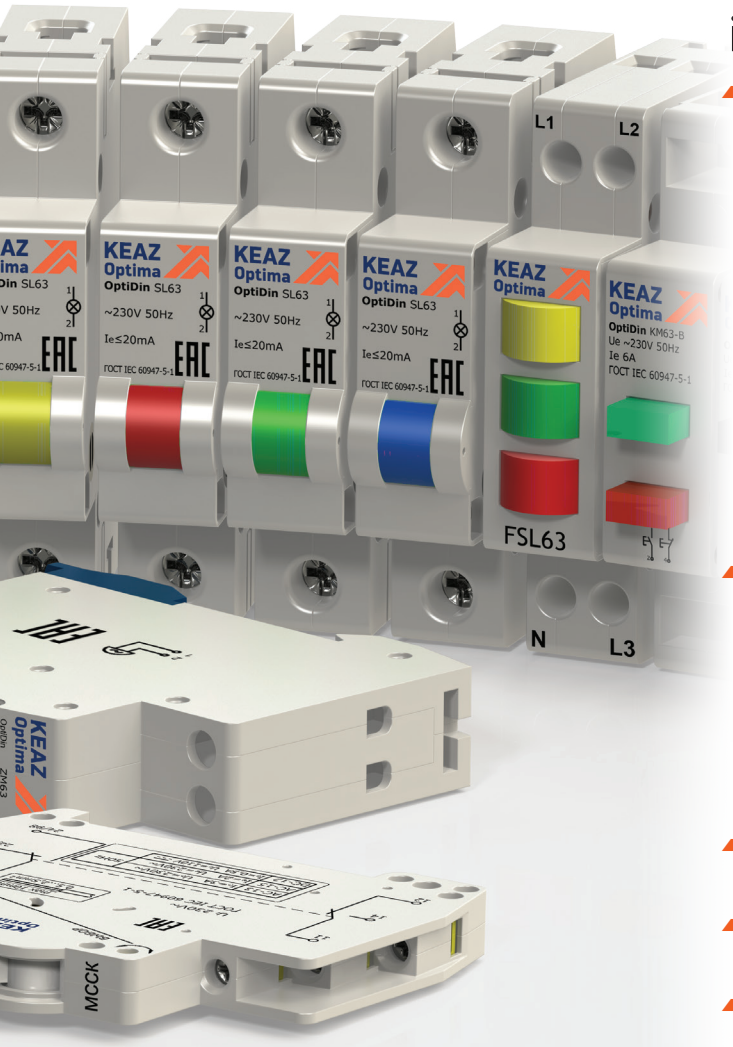
OptiDin are devices with DIN-rail installation type, providing a wide range of different functions



On the basis of OptiDin modular circuit breakers and accessories manufactured by KEAZ, it is possible to implement a solution suitable both for the protection of equipment in residential and public buildings, as well as in complex process units in production.

A wide range of OptiDin residual current circuit breakers will help you choose the right solution to protect people from electric shock and property from fire.

The range of modular contactors and relays OptiDin will allow to realize various schemes of automation of technological processes, and OptiDin surge protection devices will provide protection against lightning and switching surges, as well as protect expensive equipment from electric shock.



OptiDin devices with DIN-rail installation type

- Modular circuit breakers 12
  - OptiDin BM63 Modular automatic circuit breakers for alternating current up to 63 A 14
  - OptiDin BM63-OT Modular current limiters for alternating current up to 63 A 19
  - OptiDin BM63 DC Modular circuit breakers for direct current up to 50 A 21
  - OptiDin BM125 Modular automatic circuit breakers for alternating current up to 125 A 23
  - OptiDin BM63P Modular load break switches for currents up to 63 A 25
  - Accessories for OptiDin modular circuit breakers 27
- Devices for residual current protection 31
  - OptiDin DM63 Residual current circuit breakers up to 100 A 34
  - OptiDin D63 Automatic residual current circuit breakers up to 40 A 36
  - OptiDin VD63 Automatic residual current circuit breakers up to 63 A 38
- Surge protection devices 41
- Modular contactors 58
- Modular command and signal feeders 68
- Modular control and protection relays 78

Devices on the OptiDin DIN-rail allow to implement any possible solution in all energy-saving systems.

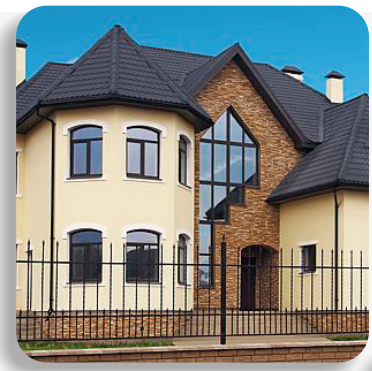
OptiDin BM63
Modular automatic circuit breakers for alternating current up to 63 A

OptiDin BM125
Modular automatic circuit breakers for alternating current up to 125 A

OptiDin DM63
Residual current circuit breakers (protection tripping devices) up to 100 A

OptiDin D63
Automatic residual current circuit breakers up to 40 A

The basic range of modular circuit breakers for currents up to 125A of OptiDin BM63 and OptiDin BM125 series is used together with the RCBO with overcurrent protection of the OptiDin D63 series or the protection tripping devices of the OptiDin DM63 series. The specified devices provide protection of human lives and equipment against overload and short-circuit currents, enabling the construction of safe power supply systems for apartment buildings and cottages.



OptiDin MK63
Modular contactors

Electromechanical modular contactors of the OptiDin MK63 series are used to control loads of small capacities that require frequent switching - lighting, ventilation, heating, air conditioning, pumps, etc.

OptiDin
Modular control and protection relays

The monitoring and control relays of the OptiDin series are designed to protect refrigerating, compressor, and air conditioning equipment of enterprises from unallowable voltage fluctuations, as well as monitoring and control of physical variables: voltage, current, power, temperature, time, etc.

OptiDin VD63
Differential current circuit breakers up to 63 A

OptiDin DM63
Residual current circuit breakers up to 100 A

OptiDin VD63 and OptiDin DM63 residual current switches protect human life and health from AC leakage through the use of universal protective characteristics of type "A". Automatic residual current switches OptiDin VD63 enable the construction of cascade protection of circuits in commercial buildings and hotels due to the availability of selective design of RCBO type "S" in the range . The electromechanical design of the OptiDin DM63 protection tripping device will provide reliable protection in emergency situations when a zero conductor breaks and ensures safe operation at any fluctuations and even power failure, both in an apartment building and at industrial enterprises.

OptiDin BM63
Modular automatic circuit breakers for alternating current up to 63 A special configuration

The only available special series of automatic circuit breakers of the OptiDin BM63 series in Russia with configuration characteristics of Z, L, K allows to protect high-tech equipment at industrial enterprises.

Modular automatic switches of direct current up to 50 A of the OptiDin BM63 DC series are used in automation and control systems of industrial processes, on transport, at solar power stations and wind power stations.

OptiDin BM63 DC
Modular circuit breakers for direct current up to 50 A

A new design of accessories has been developed that allows a shunt release and modules of auxiliary contacts to be connected to the OptiDin BM63 modular switches in various combinations.
This expands the functionality and the scope of automatic switches with accessories from residential and commercial construction to responsible solutions in manufacturing and oil and gas industry.

OptiDin BM63
Module of auxiliary and signal contacts

OptiDin BM63
Shunt release device

Surge protection devices of the OptiDin OM series protect human life and high-precision electronic equipment from impulse overvoltages caused by direct lightning strokes, lightning discharge pickups and switching of various process equipment. The specified devices are widely used in protection of cottages, industrial enterprises, especially to protect the base stations of cellular operators and data processing centers.

OptiDin OM
Surge protection device

Command and signal feeders consist of OptiDin KM63 modular buttons, OptiDin FSL63/SL63 modular indicators, OptiDin ZM63 modular ringers.

OptiDin KM63
Buttons modular

OptiDin FSL63
Visual phase indicator

The devices allow to organize operating control of contactors (magnetic starters), various control relays and other technological equipment in the line of devices for DIN-rail mounting.

OptiDin SL63
Indicator lamp

OptiDin ZM63
Ringers modular

The OptiDin BM series circuit breakers are also available in a special configuration for using in nuclear power plants, on marine and river vessels.

OptiDin Modular circuit breakers

Modular circuit breakers are designed to protect electrical installations from overloads and short circuits, as well as for infrequent switching and disconnection of circuits manually.

Modular circuit breakers by KEAZ for direct and alternating currents are meant as devices of a wide scope of application: from use in solutions for construction, industrial facilities, construction of elite houses, shopping centers, cottages to installations in power systems of nuclear power plants, thermal power plants, ships and submarines of the Ministry of Defense of Russian Federation.

A wide range of accessories makes the use of KEAZ modular automatic devices convenient for any solution.

Designation

OptiDin BM63 - 1 N B 63 - 10 - H5 - DC - UHL3 - REG

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)

1	**Product range**	OptiDin					
2	**Configuration**	BM63, BM125					
3	**Number of poles**	1P	1P+N	2P	3P	3P+N	4P
4	**Pole without a trip unit**	N					
5	**Protection type**	B	C	D	Z	L	K
6	**Current rating, A**	1, 2, 3, 4, 5, 6, 8, 10, 13, 16, 20, 25, 32, 40, 50, 63					
7	**Breaking capacity, кА***	10000					
8	**Shunt release built in an unprotected pole****	H1		H2		H5	
9	**Used for designation of DC circuit breakers*****	DC					
10	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3), OM4 (international UM4)					
11	**Acceptance of maritime and river register**	REG					

* Specified for BM63 circuit breakers with the breaking capacity other than 6000 A
** Indicated if a shunt trip is available
*** Indicated for DC breakers

References, listed in the chapter tables, can be changed. In case the references you need are not found on the site, please contact the technical support of KEAZ.

Selection Guide

Modular circuit breakers						
Type		BM63		BM63-OT	BM63 DC	BM125
Physical appearance						
Standard of compliance		GOST P 50345	GOST P 50030.2	GOST P 50345	GOST IEC 60898-2	GOST P 50030.2
Number of poles		1P, 1P+N, 2P, 3P, 3P+N, 4P		1P, 3P	1P, 2P	1P, 1P+N, 2P, 3P, 3P+N, 4P
Auxiliary units for remote trip and signaling		available	available	available	available	
Electrical properties						
Protection type		B, C, D	Z, L, K	D	B, C, K, L, Z	C, D
Rated current In, A		1 - 63		6-63	1-50	80, 100, 125
Rated operating voltage Ue, B	AC 50 Hz	230/400		230/400	230/400	230/400
Maximum operating voltage Ue, B (max)	AC 50 Hz	400		400	400	400
Minumum operating voltage Ue, B (min)	AC 50 Hz	12		12	12	12
Rated insulation voltage Ui, V (AC current)		230/400		230/400	230/400	400
Rated impulse voltage Uimp, kV		4		4	4	4
Breaking current						
AC	Un					
Rated short-circuit breaking capacity Icn, A	230/400 V	6000, 10000		6000	6000	15000*, 20000**
DC	Un					
Rated short-circuit breaking capacity A	up to 110 V (2P)	1500				
Other specifications						
Visual display of emergency trip		available		available	available	available
Protection class rating		IP20		IP20	IP20	IP20
For more information see pp.		14		19	21	23
Accessories see pp.		27-30		-	27-30	-

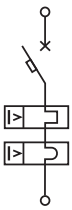
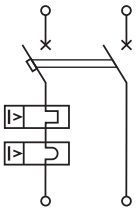
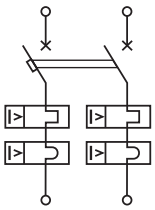
* For a C rating of 125 A and D per 100 A
** For a C rating of 80 and 100 A and D on 100 A

OptiDin BM63 Modular automatic circuit breakers for alternating current up to 63 A

Automatic switches OptiDin BM63 are designed to protect electrical circuits from overload and short-circuit currents, conducting current in a normal mode and operational make - break of the specified circuits.

Switches comply with the requirements of GOST P 50345 (AC household) and GOST IEC 60898-2 (direct current), GOST P 50030.2 (for industrial use), TP TC 004/2011 and are manufactured according to ТУ3421-040-05758109-2009.

References (Series)

OptiDin BM63 automatic circuit breaker (Icn=6000 A)																		
Number of poles	1						1+N						2					
Wiring diagrams																		
Rated current In, A	Protection type						Protection type						Protection type					
	B	C	D	Z	L	K	B	C	D	Z	L	K	B	C	D	Z	L	K
1	257917	260504	260520	260568	260552	260536	260664	260680	260696	260744	260728	260712	260584	260600	260616	260760	260648	260632
2	260491	260507	260523	260571	260555	260539	260667	260683	260699	260747	260731	260715	260587	260603	260619	260763	260651	260635
3	260493	260509	260525	260573	260557	260541	260669	260685	260701	260749	260733	260717	260589	260605	260621	260765	260653	260637
4	260495	260511	260527	260575	260559	260543	260671	260687	260703	260751	260735	260719	260591	260607	260623	260767	260655	260639
5	260497	260513	260529	260577	260561	260545	260673	260689	260705	260753	260737	260721	260593	260609	260625	260769	260657	260641
6	260499	260515	260531	260579	260563	260547	260675	260691	260707	260755	260739	260723	260595	260611	260627	260771	260659	260643
8	260500	260516	260532	260580	260564	260548	260676	260692	260708	260756	260740	260724	260596	260612	260628	260772	260660	260644
10	260487	260501	260517	260565	260549	260533	260661	260677	260693	260741	260725	260709	260581	260597	260613	260757	260645	260629
13	260488	260502	260518	260566	260550	260534	260662	260678	260694	260742	260726	260710	260582	260598	260614	260758	260646	260630
16	257918	260503	260519	260567	260551	260535	260663	260679	260695	260743	260727	260711	260583	260599	260615	260759	260647	260631
20	260489	260505	260521	260569	260553	260537	260665	260681	260697	260745	260729	260713	260585	260601	260617	260761	260649	260633
25	257919	260506	260522	260570	260554	260538	260666	260682	260698	260746	260730	260714	260586	260602	260618	260762	260650	260634
32	260492	260508	260524	260572	260556	260540	260668	260684	260700	260748	260732	260716	260588	260604	260620	260764	260652	260636
40	260494	260510	260526	260574	260558	260542	260670	260686	260702	260750	260734	260718	260590	260606	260622	260766	260654	260638
50	260496	260512	260528	260576	260560	260544	260672	260688	260704	260752	260736	260720	260592	260608	260624	260768	260656	260640
63	260498	260514	260530	260578	260562	260546	260674	260690	260706	260754	260738	260722	260594	260610	260626	260770	260658	260642
Accessories	pp. 27-30																	

ATTENTION! The references have been changed.

Batch effectiveness

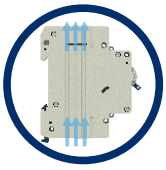
Silver-bearing solders on the movable contact to improve wear resistance and reduce the value of the transition resistance.

The accessories are fastened to the latch on the left side of the switch, ensuring fast and reliable connection with high accuracy in one click.

13 plates in the arc extinguish chamber effectively extinguish the arc and provide a safe shutdown in an emergency situation.

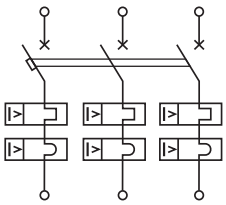
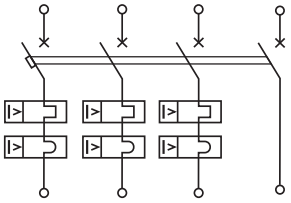
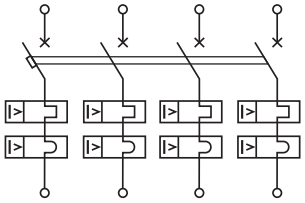
The ability to seal the handle to prevent unauthorized switching on/off.

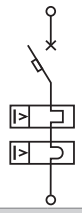
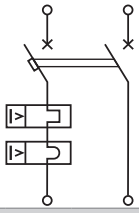
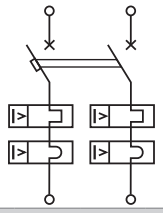
Better cooling due to the availability of profile recesses on the case.

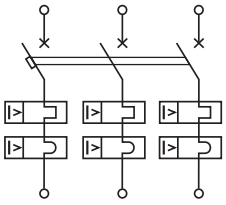
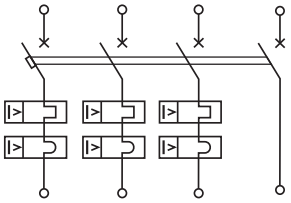
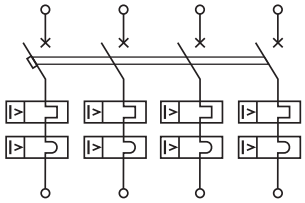


Special design of the clamps ensures: maximum hard and larger in area contact to prevent heating and reflow of the conductors.

OptiDin BM63 automatic circuit breaker (Icn=6000 A)

	3						3+N						4					
																		
	Protection type						Protection type						Protection type					
	B	C	D	Z	L	K	B	C	D	Z	L	K	B	C	D	Z	L	K
	260776	260792	260808	260856	260840	260824	260952	260968	260984	261032	261016	261000	260872	260888	260904	261048	260936	260920
	260779	260795	260811	260859	260843	260827	260955	260971	260987	261035	261019	261003	260875	260891	260907	261051	260939	260923
	260781	260797	260813	260861	260845	260829	260957	260973	260989	261037	261021	261005	260877	260893	260909	261053	260941	260925
	260783	260799	260815	260863	260847	260831	260959	260975	260991	261039	261023	261007	260879	260895	260911	261055	260943	260927
	260785	260801	260817	260865	260849	260833	260961	260977	260993	261041	261025	261009	260881	260897	260913	261057	260945	260929
	260787	260803	260819	260867	260851	260835	260963	260979	260995	261043	261027	261011	260883	260899	260915	261059	260947	260931
	260788	260804	260820	260868	260852	260836	260964	260980	260996	261044	261028	261012	260884	260900	260916	261060	260948	260932
	260773	260789	260805	260853	260837	260821	260949	260965	260981	261029	261013	260997	260869	260885	260901	261045	260933	260917
	260774	260790	260806	260854	260838	260822	260950	260966	260982	261030	261014	260998	260870	260886	260902	261046	260934	260918
	260775	260791	260807	260855	260839	260823	260951	260967	260983	261031	261015	260999	260871	260887	260903	261047	260935	260919
	260777	260793	260809	260857	260841	260825	260953	260969	260985	261033	261017	261001	260873	260889	260905	261049	260937	260921
	260778	260794	260810	260858	260842	260826	260954	260970	260986	261034	261018	261002	260874	260890	260906	261050	260938	260922
	260780	260796	260812	260860	260844	260828	260956	260972	260988	261036	261020	261004	260876	260892	260908	261052	260940	260924
	260782	260798	260814	260862	260846	260830	260958	260974	260990	261038	261022	261006	260878	260894	260910	261054	260942	260926
	260784	260800	260816	260864	260848	260832	260960	260976	260992	261040	261024	261008	260880	260896	260912	261056	260944	260928
	260786	260802	260818	260866	260850	260834	260962	260978	260994	261042	261026	261010	260882	260898	260914	261058	260946	260930

OptiDin BM63 automatic circuit breaker (Icn=10000 A)																		
Number of poles	1						1+N						2					
Wiring diagrams																		
Rated current In, A	Protection type						Protection type						Protection type					
	B	C	D	Z	L	K	B	C	D	Z	L	K	B	C	D	Z	L	K
1	260227	249245	249204	262538	260189	262554	262661	262677	249159	260217	262720	262736	262569	260230	262598	262614	262630	262645
2	262509	249271	262525	262539	260190	262555	262662	262678	262690	262705	262721	262737	262570	262585	262599	262615	262631	262646
3	262510	249273	262526	262540	260191	262556	262663	262679	262691	262706	262722	262738	262571	262586	262600	262616	262632	262647
4	262511	249274	262527	262541	260192	262557	262664	262680	262692	262707	262723	262739	262572	262587	262601	262617	262633	262648
5	262512	249250	262528	262542	260193	262558	262665	262681	262693	262708	262724	262740	262573	262588	262602	262618	262634	262649
6	262513	249252	262529	262543	260194	262559	262666	262682	262694	262709	262725	262741	262574	262589	262603	262619	262635	262650
8	262514	249253	262530	262544	260195	262560	262667	262683	262695	262710	262726	262742	262575	262590	262604	262620	262636	262651
10	262515	249249	262531	262545	260196	262561	262668	262684	262696	262711	262727	262743	262576	262591	262605	262621	262637	262652
13	262516	249254	262532	262546	260197	262562	262669	262685	262697	262712	262728	262744	262577	262592	262606	262622	262638	262653
16	260228	249256	249205	262547	260198	262563	262670	249174	262698	262713	262729	262745	262578	261342	262607	262623	262639	262654
20	262517	262521	262533	262548	260199	262564	262671	262686	262699	262714	262730	262746	262579	262593	262608	262624	262640	262655
25	260229	249258	262534	262549	260200	262565	262672	262687	262700	262715	262731	262747	262580	262594	262609	262625	262641	262656
32	265625	249261	262535	262550	260201	262566	262673	249178	-	262716	262732	-	262581	262595	262610	262626	262642	262657
40	262518	262522	-	262551	260202	-	262674	262688	-	262717	262733	-	262582	262596	-	262627	262643	-
50	262519	262523	-	262552	260203	-	262675	262689	-	262718	262734	-	262583	262597	-	262628	262644	-
63	262520	262524	-	262553	260204	-	262676	260237	-	262719	262735	-	262584	260222	-	262629	260207	-
Accessories	pp. 27-30																	

OptiDin BM63 automatic circuit breaker (Icn=10000 A)																		
Number of poles	3						3+N						4					
Wiring diagrams																		
Rated current In, A	Protection type						Protection type						Protection type					
	B	C	D	Z	L	K	B	C	D	Z	L	K	B	C	D	Z	L	K
1	262752	262768	249203	262786	262801	260211	262922	262938	260231	262964	262980	260214	262830	262846	262861	262877	262892	262907
2	262753	262769	262772	262787	262802	262817	262923	262939	262950	262965	262981	262995	262831	262847	262862	262878	262893	262908
3	262754	262770	262773	262788	262803	262818	262924	262940	262951	262966	262982	262996	262832	262848	262863	262879	262894	262909
4	262755	249288	262774	262789	262804	262819	262925	262941	262952	262967	262983	262997	262833	262849	262864	262880	262895	262910
5	262756	249247	262775	260220	262805	260210	262926	262942	262953	262968	262984	262998	262834	262850	262865	262881	262896	262911
6	262757	249248	262776	262790	262806	262820	262927	262943	262954	262969	262985	262999	262835	262851	262866	262882	262897	262912
8	262758	249246	262777	262791	262807	262821	262928	262944	262955	262970	262986	263000	262836	262852	262867	262883	262898	262913
10	262759	249251	262778	262792	262808	262822	262929	262945	262956	262971	262987	263001	262837	262853	262868	262884	262899	262914
13	262760	249255	262779	262793	262809	262823	262930	262946	262957	262972	262988	263002	262838	262854	262869	262885	262900	262915
16	262761	249257	262780	262794	262810	262824	262931	249160	262958	262973	262989	260213	262839	262855	262870	262886	262901	262916
20	262762	262771	262781	262795	262811	262825	262932	262947	262959	262974	262990	263003	262840	262856	262871	262887	262902	262917
25	262763	249206	262782	262796	262812	262826	262933	253910	262960	262975	262991	263004	262841	262857	262872	262888	262903	262918
32	262764	249207	262783	262797	262813	262827	262934	253911	-	262976	262992	-	262842	262858	262873	262889	262904	262919
40	262765	249192	-	262798	262814	-	262935	262948	-	262977	262993	-	262843	262859	-	262890	262905	-
50	262766	249164	-	262799	262815	-	262936	262949	-	262978	262994	-	262844	262860	-	262891	262906	-
63	262767	249163	-	262800	262816	-	262937	260221	-	262979	260208	-	262845	260224	-	260218	260216	-

Technical specifications

Main characteristics		
In compliance with the requirements of GOST P 50345, GOST P 50003.2		
Insulation voltage Ui, V		400
Degree of pollution		3
Rated impulse voltage Uimp, V		400
Control temperature, ° C		+30
Protection type	B	from 3In to 5In
	C	from 5In to 10In
	D	from 10In to 20In
	Z	from 3,2In to 4,8In
	L	from 6,4In to 9,6In
	K	from 9,6In to 14,4In
Application category		A
Current-limiting class		3
Additional characteristics		
Degree of protection in compliance with the requirements of GOST 14254		IP20
Silver bearing, g/pole		0,0595
Wear resistance of switches B, C, D, switching cycles	commutation	4000
	mechanical	6000
Wear resistance of switches Z, L, K, switching cycles	commutation	1500
	mechanical	8500
Overvoltage category		IV
Operating temperature range, ° C		from -60 to +40
Storage temperature range, ° C		from -65 to +50
Weight, g		
Number of poles	1P	125
	1P+N	260
	2P	225
	3P	390
	3P+N	530
	4P	490

Matching references (series) of accessories for OptiDin BM63

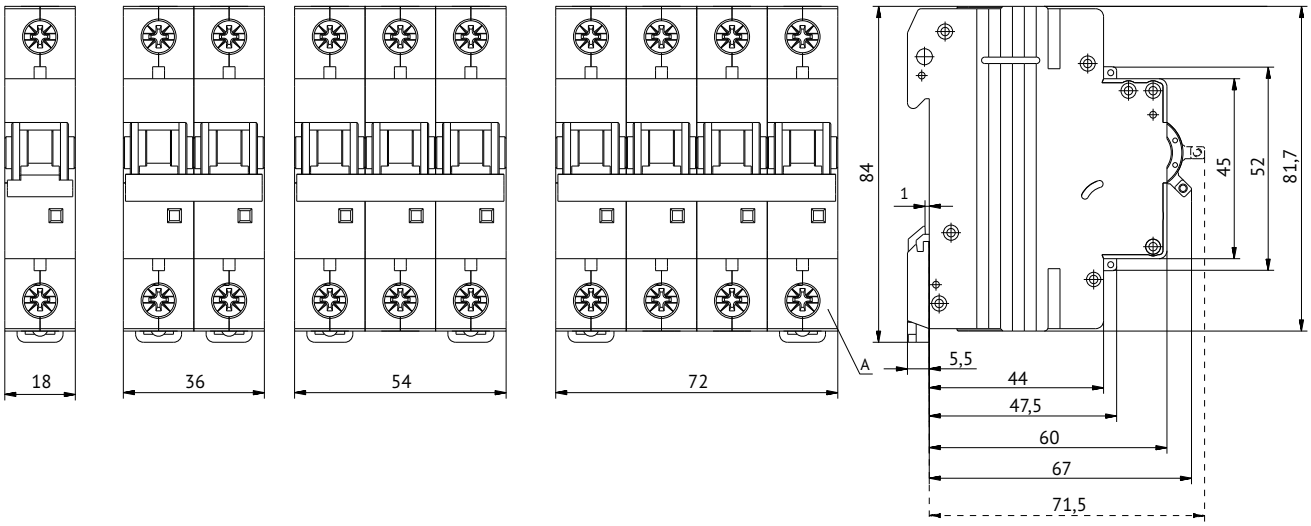
NEW accessories for modular snap-in switches		Accessories for modular circuit breakers	
Reference	Title	Reference	Title
249158	OptiDin BM63-MCCK 2	103899	Module of free and signal contacts OptiDin BM63-UHL3 (TC3)
249189	OptiDin BM63-MCK 1		No analogue available
249197	OptiDin BM63-MCK 2		No analogue available
249184	OptiDin BM63-HP230	103900	Shunt release device in a separate module OptiDin BM63-H3-230AC-UHL3 (TC3)
		114934	Shunt release device in a separate module OptiDin BM63-H4-400AC-UHL3 (TC3)
		143295	Shunt release device in a separate module OptiDin BM63-H6-110AC-UHL3 (TC3)
249177	OptiDin BM63-HP24	228607	Shunt release device a separate module OptiDin BM63-H7-12AC-UHL3 (TC3)

ATTENTION!!! Snap-in accessories are only attached to the updated line of OptiDin BM63 modular circuit breakers (pages 14-16, 21).

Wiring

Rated current In, A	Tightening torque, N/m	Without preparation of the conductor current carrying wire, mm²			With preparation of the conductor current carrying wire, mm²		
		Flexible copper (multiple core)	Inflexible copper (multiple and single core, hard)	Aluminium (multiple and single core)	Flexible copper (multiple core)	Flexible aluminium	Inflexible aluminium (hard)
1-63	2	1,5 - 10	1,5 - 16	2,5 - 10	25	16	25

Overall dimensions (mm)

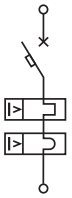
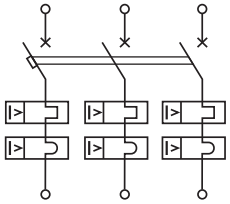


OptiDin BM63-OT Modular current limiters up to 63 A

The OptiDin BM63-OT type current limiters are designed for use in electrical circuits with the voltage of up to 400 V AC frequency of 50 Hz, their protection during overloads and short circuits, limiting power drain off the installed maximum power while operating electrotechnical devices in day-to-day life and in production, conducting current in normal mode and operative make-break (up to 30 times a day) of the specified circuits.

Limiters meet the requirements of GOST P 50345, TP TC 004/2011 and are manufactured in compliance with ТУ3421-040-05758109-2009.

References (series)

OptiDin BM63-OT		
Rated voltage Un, V	230	400
Number of poles	1P	3P
Wiring diagrams		
Rated current In, A	Protection type	Protection type
	D	D
6	219947	219958
10	219949	219960
16	219951	219962
20	219952	219963
25	219953	219964
32	219954	219965
40	219955	219966
50	219956	219967
63	219957	219968

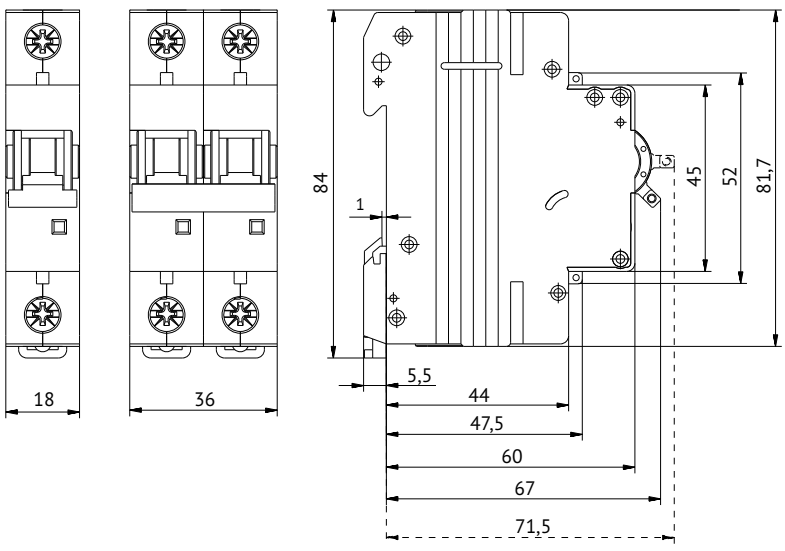
Technical specifications

Main characteristics		
In compliance with the requirements of GOST P 50345, GOST P 5003.2		
Rated short-circuit breaking capacity Icn, A		6000
Insulation voltage Ui, V		400
Degree of pollution		3
Rated impulse voltage Uimp, V		400
Control temperature, ° C		+30
Protection type	D	from 10In to 20In
Application category		A
Current-limiting class		3
Additional characteristics		
Degree of protection in compliance with the requirements of GOST 14254		IP20
Silver bearing, g/pole		0,0595
Wear resistance of switches, switching cycles	commutation	10000
	mechanical	20000
Overvoltage category		IV
Operating temperature range, ° C		from -60 to +40
Storage temperature range, ° C		from -65 to +50
Weight, g		
Number of poles	1P	125
	3P	375

Wiring

Rated current In, A	Tightening torque, Н/м	Without preparation of the conductor current carrying wire, mm²			With preparation of the conductor current carrying wire, mm²		
		Flexible copper (multiple core)	Inflexible copper (multiple and single core, hard)	Aluminium (multiple and single core)	Flexible copper (multiple core)	Flexible aluminium	Inflexible aluminium (hard)
1-63	2	1,5 - 10	1,5 - 16	2,5 - 10	25	16	25

Overall dimensions (mm)

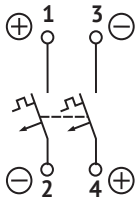


OptiDin BM63 DC Modular automatic switches on DC current up to 50 A

Automatic switches OptiDin BM63 DC are designed to protect electrical circuits of direct current from overload and short-circuit currents, conducting current in normal mode and operational make-break of the specified circuits.

Switches comply with the requirements of GOST IEC 60898-2 (direct current), TP TC 004/2011 and are manufactured according to TУ3421-040-05758109-2009D.

References (series)

OptiDin BM63 DC										
Rated voltage Un, V	220					440				
Number of poles	1P					2P				
Wiring diagrams										
Rated current In, A	Protection type					Protection type				
	B	C	Z	L	K	B	C	Z	L	K
1	261145	261160	261205	261190	261175	261220	261235	261280	261265	261250
2	261148	261163	261208	261193	261178	261223	261238	261283	261268	261253
3	261150	261165	261210	261195	261180	261225	261240	261285	261270	261255
4	261152	261167	261212	261197	261182	261227	261242	261287	261272	261257
5	261154	261169	261214	261199	261184	261229	261244	261289	261274	261259
6	261155	261170	261215	261200	261185	261230	261245	261290	261275	261260
8	261156	261171	261216	261201	261186	261231	261246	261291	261276	261261
10	261142	261157	261202	261187	261172	261217	261232	261277	261262	261247
13	261143	261158	261203	261188	261173	261218	261233	261278	261263	261248
16	261144	261159	261204	261189	261174	261219	261234	261279	261264	261249
20	261146	261161	261206	261191	261176	261221	261236	261281	261266	261251
25	261147	261162	261207	261192	261177	261222	261237	261282	261267	261252
32	261149	261164	261209	261194	261179	261224	261239	261284	261269	261254
40	261151	261166	261211	261196	261181	261226	261241	261286	261271	261256
50	261153	261168	261213	261198	261183	261228	261243	261288	261273	261258
Accessories see pp.	27-30									

ATTENTION! The references have been changed.

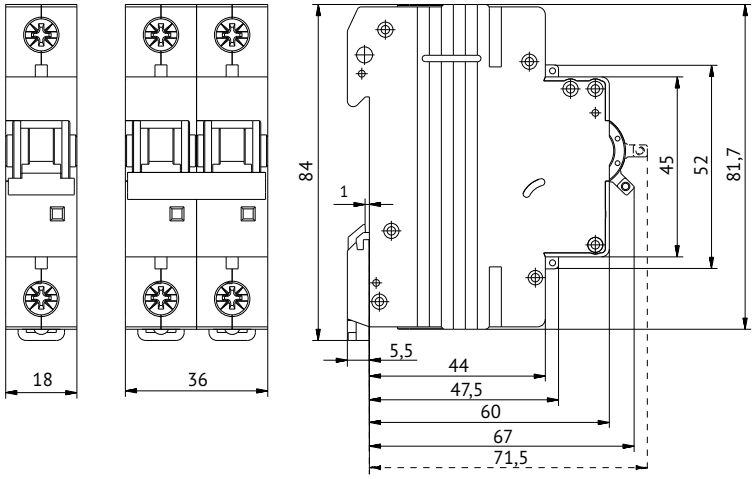
Technical specifications

Main characteristics		
In compliance with the requirements of GOST IEC 60898-2		
Insulation voltage Ui, V		400
Degree of pollution		3
Rated impulse voltage Uimp, V		400
Control temperature, ° C		+30 °C
Protection type	B	from 4In to 7In
	C	from 7In to 15In
	Z	from 3,2In to 8In
	L	from 6,4In to 15In
	K	from 9,6In to 30In
Application category		A
Current-limiting class		3
Additional characteristics		
Degree of protection in compliance with GOST 14254		IP20
Silver bearing, g/pole		0,0595
Wear resistance of switches B, C, switching cycles	commutation	1000
	mechanical	9000
Wear resistance of switches Z, L, K, switching cycles	commutation	1000
	mechanical	9000
Overvoltage category		IV
Operating temperature range, ° C		from -60 to +40
Storage temperature range, ° C		from -65 to +50
Weight, g		
Number of poles	1P	125
	2P	250

Wiring

Rated current In, A	Tightening torque, Н/м	Without preparation of the conductor current carrying wire, mm²			With preparation of the conductor current carrying wire, mm²		
		Flexible copper (multiple core)	Inflexible copper (multiple and single core, hard)	Aluminium (multiple and single core)	Flexible copper (multiple core)	Flexible aluminium	Inflexible aluminium (hard)
1-50	2	1,5 - 10	1,5 - 16	2,5 - 10	25	16	25

Overall dimensions (mm)

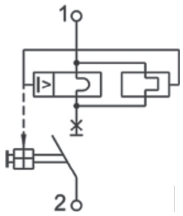
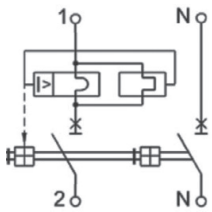
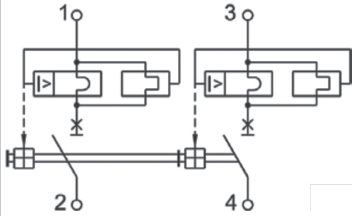


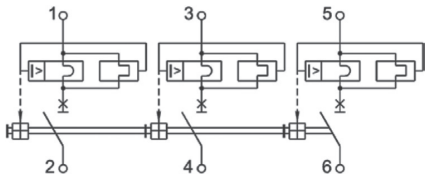
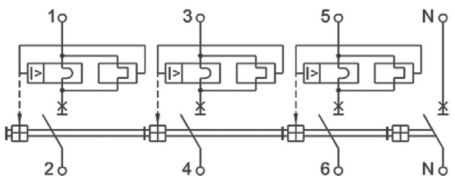
OptiDin BM125 Modular automatic circuit breakers for alternating current up to 125 A

Automatic switches OptiDin BM125 are designed to protect electrical circuits from overload and short-circuit currents, conducting current in a normal mode and operational make-break of the specified circuits.

Switches comply with the requirements of GOST P 50030.2 (for industrial use), TP TC 004/2011 and are manufactured according to TY3421-040-05758109-2009.

References (series)

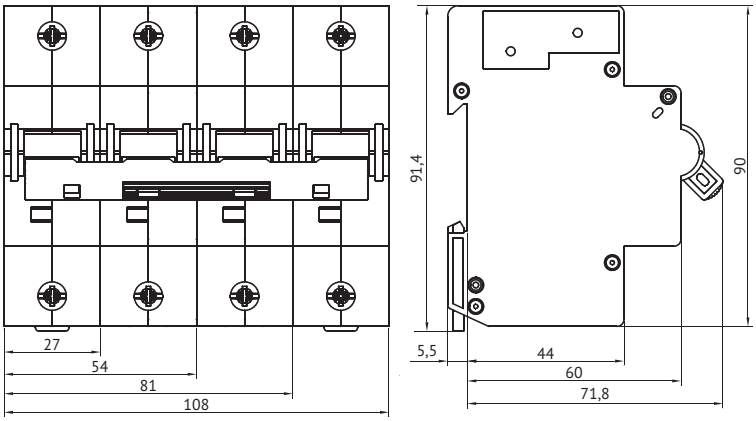
OptiDin BM125 automatic circuit breaker						
Number of poles	1P		1P+N		2P	
Wiring diagrams						
Rated current, In	Protection type					
	C	D	C	D	C	D
80	138534	138596	138540	138600	138537	138597
100	138535	138596	138541	138601	138538	138599
125	138536		138542		138539	

OptiDin BM125 automatic circuit breaker				
Number of poles	3P		3P+N	
Wiring diagrams				
Rated current, In	Protection type			
	C	D	C	D
80	138543	138602	138547	138604
100	138545	138603	138593	138605
125	138546		138594	

Technical specifications

Main characteristics		
In compliance with the requirements of GOST P 50030.2		
Insulation voltage Ui, V		400
Degree of pollution		3
Rated impulse voltage Uimp, V		400
Control temperature, ° C		+30
Protection type	C	from 5In to 10In
	D	from 10In to 20In
Application category		A
Current-limiting class		3
Additional characteristics		
Degree of protection in compliance with GOST 14254		IP20
Silver bearing per one pole, not more than, g		0,66
Wear resistance of switches C, D for In=80, 100 A, switching cycles	commutation	1500
	mechanical	8500
Wear resistance of switches C, D for In=125 A, switching cycles	commutation	1000
	mechanical	7000
Overvoltage category		IV
Operating temperature range, ° C		from -60 to +40
Storage temperature range, ° C		from -65 to +50
Weight, g		
Number of poles	1P	250
	2P	490
	3P	750
	4P	1000

Overall dimensions (mm)



Wiring

Rated current, A	Tightening torque, Н/м	Conductor cross section, mm²
80-125	3,5	2,5 - 50

OptiDin BM63P Modular load break switches on currents up to 63 A

Automatic switches OptiDin BM63P are designed for use in electrical circuits with voltage of up to 400 V AC frequency of 50 Hz and conducting current in a normal mode.

Switches of OptiDin BM63P type comply with the requirements of GOST P 50030.3, TP TC 004/2011 and are manufactured according to TY 3424-011-05758109 -2009.

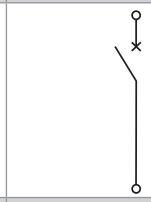
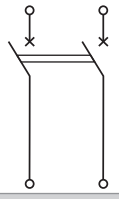
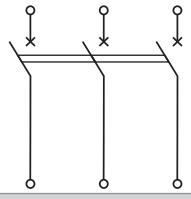
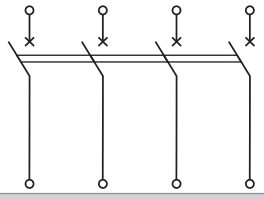
Designation

OptiDin BM63P - 1 - 40 - UHL3

1 2 3 4 5

1	**Product range**	OptiDin			
2	**Configuration**	BM63P			
3	**Number of poles**	1P	2P	3P	4P
4	**Current rating, A**	40		63	
5	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3)			

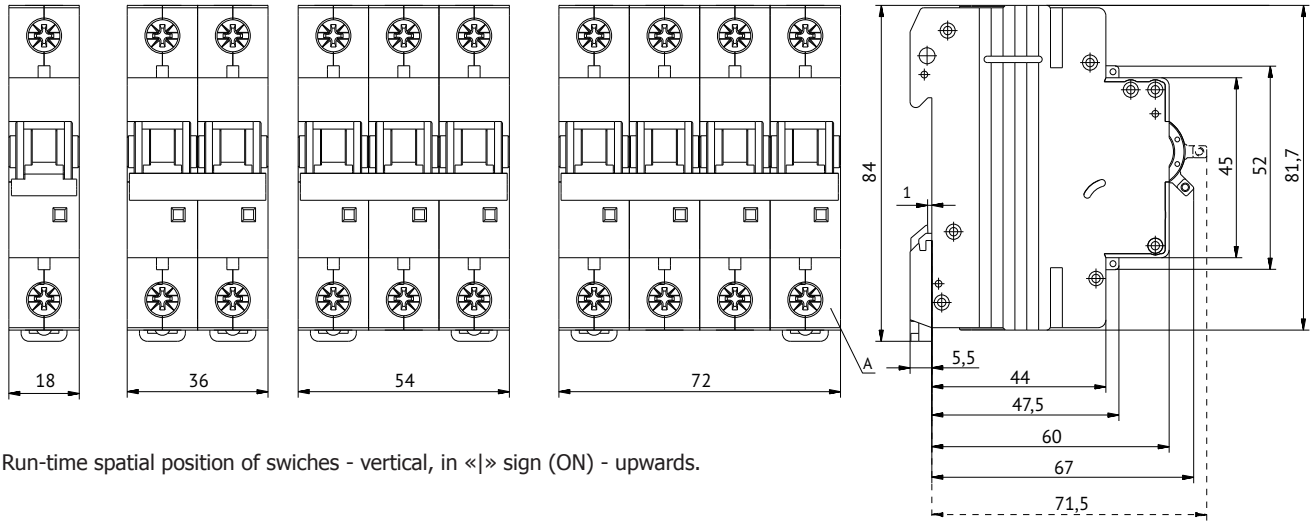
References (series)

OptiDin BM63P modular load break switch				
Number of poles	1P	2P	3P	4P
Wiring diagrams				
Rated current, In				
40	103891	103893	103894	103897
63	103892	103894	103896	103898

Technical specifications

Main characteristics		
Rated voltage in the AC circuit at 50 Hz, V		230/400
Minimum operating voltage, V		24
Additional characteristics		
Cross-section of the wire connected to the terminal clamps, mm²		1,5-25
Degree of protection of the circuit breaker		IP20
Silver bearing, g		0,0595
Wear resistance, not less, cycles	commutation	1500
	mechanical	8500
Operating temperature range, °C		from -60 to +45
Weight, g		
Number of poles	1P	120
	2P	240
	3P	360
	4P	480

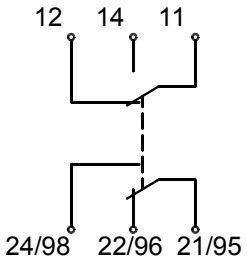
Overall dimensions (mm)



Run-time spatial position of swiches - vertical, in «|» sign (ON) - upwards.

Accessories for OptiDin modular circuit breakers

OptiDin BM63-MCCK 2 Module of auxiliary (free) and signal contacts



Function

1. Informs about the disconnection of the circuit breaker induced by a thermal or electromagnetic release;
2. Informs about the status of the main contacts of the circuit-breaker ("on", "off").

Technical specifications

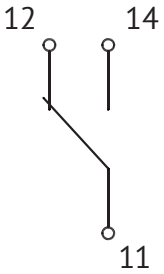
Rated operating current according to the application category, Ie	A	AC-13	3
		AC-15	2
Rated operational voltage in the alternating current circuit of frequency 50Hz, Ue	V		230
Rated operating current in accordance with the application category, Ie	A	DC-12	0,5
Rated operational voltage in the DC circuit, Ue	V		110
Number of contacts	pcs		2P (two switching)
Rated insulation voltage, Ui	V		230
Rated impulse withstand voltage, Uimp	V		2500
Rated conditional short-circuit current	A		1000
Switching wear resistance, not less than	cycles B-O		4000
Other characteristics			
Cross-section of connecting conductors	mm^2		0,5-2,5
Reference			249158

Application

Auxiliary (free) contacts can be used in automation systems to signal the position of the main contacts of the circuit breaker - "closed" or "open" when switching on (off) manually, or after an automatic release caused by overloading or short circuit.

Signal contacts can be used in automation systems for signaling when the circuit-breaker trips only after automatic release due to overloading or short circuit.

Module of auxiliary contacts OptiDin BM63-MCK 1

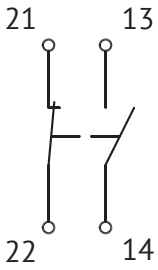


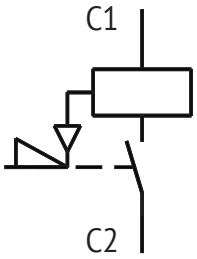
Technical specifications

Rated operating current according to the application category, Ie	A	AC-13	3
		AC-15	2
Rated operational voltage in the alternating current circuit of frequency 50Hz, Ue	V		230
Rated operating current in accordance with the application category, Ie	A	DC-12	0,5
Rated operational voltage in the DC circuit, Ue	V		110
Number of contacts	pcs		1P (one switching)
Rated insulation voltage, Ui	V		230
Rated impulse withstand voltage, Uimp	V		2500
Rated conditional short-circuit current	A		1000
Switching wear resistance, not less than	cycles B-O		4000
Other characteristics			
Cross-section of connecting conductors	mm^2		0,5-2,5
Reference			249189

Application

The module of auxiliary contacts with one switching contact element is used for signaling about the position of the main contacts of the switch.

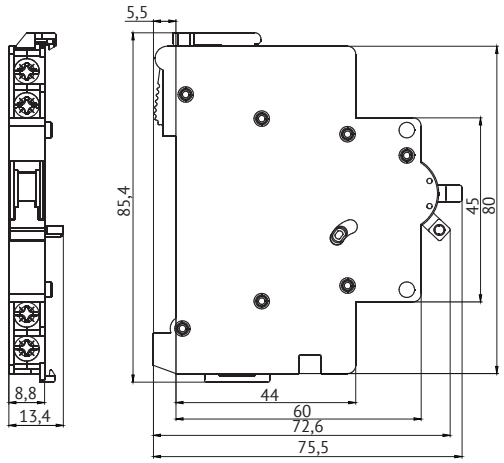
OptiDin BM63-MCK 2 Module of auxiliary contacts			
			
Technical specifications			
Rated operating current according to the application category, Ie	A	AC-13	3
		AC-15	2
Rated operational voltage in the alternating current circuit of frequency 50Hz, Ue	V		230
Rated operating current in accordance with the application category, Ie	A	DC-12	0,5
Rated operational voltage in the DC circuit, Ue	V		110
Number of contacts	pcs		1P+13 (one NC contact, one NO contact)
Rated insulation voltage, Ui	V		230
Rated impulse withstand voltage, Uimp	V		2500
Rated conditional short-circuit current	A		1000
Switching wear resistance, not less than	cycles B-O		4000
Other characteristics			
Cross-section of connecting conductors	$мм^2$		0,5-2,5
Reference			249197
Application			
The module of auxiliary contacts with one NO contact element and one NC contact element allows to connect two independent signaling circuits, which expands the functionality of technological processes automation.			

Shunt release device			
Configuration		OptiDin BM63-HP230	OptiDin BM63-HP24
			
Function			
It is intended for remote disconnection of the switch when the voltage is applied to the winding of the shunt release device and is presented as an electro-magnet with a multi-turn coil.			
Technical specifications			
Range of operation			
alternating voltage, Uc	V	110...400	12...110
constant voltage, Uc	V	110...220	12...60
Tripping time of the switch under the influence of the shunt release device, not more than	sec.	0,04	
Durability of circuit breakers when disconnected by a shunt release device, not less than	cycles B-O	1500	
Other characteristics			
Reference		249184	249177

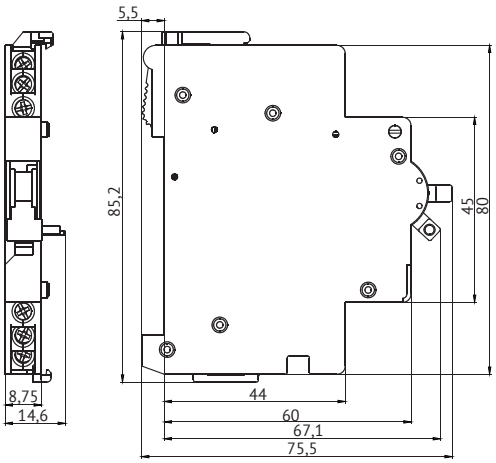
ATTENTION!!! Snap-in accessories are only attached to the updated line of OptiDin BM63 modular circuit breakers (pages 14-16, 21).

Overall dimensions of accessories (mm)

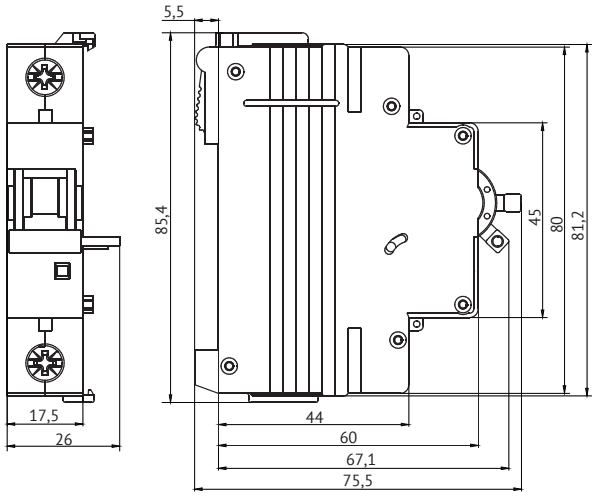
Modue of auxiliary contacts
OptiDin BM63-MCK 1
OptiDin BM63-MCK 2



Module of auxiliary and signal contacts
OptiDin BM63-MCCK 2

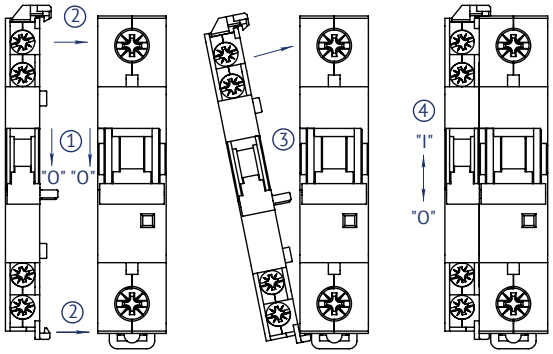


Module with a shunt release device
OptiDin BM63-HP230
OptiDin BM63-HP24



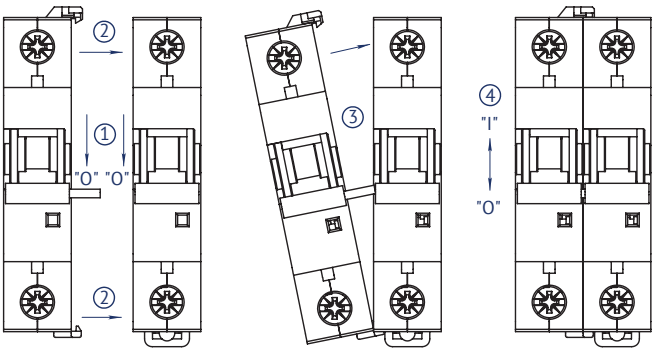
Wiring

Connection of modules with auxiliary contacts to the circuit breaker or to the module with a shunt release



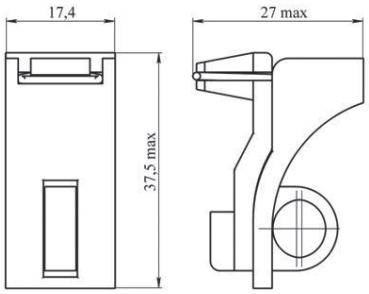
See the installation and operating instructions for the OptiDin BM63 ГЖИК.641266.008ИМ automatic circuit breaker. Appendix B

Connection of a shunt release in a separate module to the switch is carried out in the following sequence



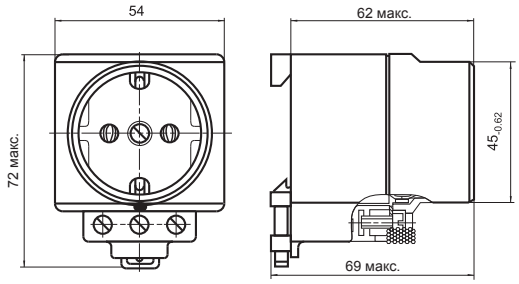
See the installation and operation instructions for the OptiDin BM63 ГЖИК.641266.008ІИМ automatic circuit breaker.
Appendix B

A mechanical lockout device for the OptiDin handle



Function	
The device is designed to secure the lock of the circuit breaker handle against unauthorized and accidental access, ensuring safety of the personnel.	
Other characteristics	
Diameter of the padlock shackle not more, mm	8
Reference	113541

OptiDin PA10 Moduar socket



Function	
Sockets are intended for connection of electric equipment fitted with three-wire plugs, which provide grounding of equipment metal cases.	
Technical specifications	
Rated voltage, V	230
Frequency, Hz	50
Rated current, A	16
Other characteristics	
Service life, years	10
Operating temperature range, °C	from -25 to +40
Environment	UHL in compliance with GOST 15150 (international TC)
Weight, g	120
Reference	111493

Differential protection device

Differential protection devices are switching devices, the primary function of which is protection of a human from electric shock at an accidental
inadvertent contact with current-carrying parts of electrical installations in case of electrical equipment malfunction; prevention of fires after leakage current flows
and earth faults.

In the range of KEAZ today there is a wide choice of automatic switches controlled by differential current with built-in overcurrent protection (RCBT) and switches controlled by differential current without built-in overcurrent protection (RCD) for various rated currents and differential current settings; for RCBOs are presented selective designs with time delay.

OptiDin D63 and OptiDin VD63 meet the requirements of GOST IEC 61009-1, TP TC 004/2011, TP TC 020/2011 and are manufactured according to TУ3422-046-05758109-2008; OptiDin DM63 complies with the requirements of GOST IEC 61008-1, TP TC 004/2011.

Designation

OptiDin VD63 - 2 2 C 16 - A - UHL4

1 2 3 4 5 6 7 8

1	**Product range**	OptiDin				
2	**RCBO configuration**	DM63	D63		VD63	
3	**Number of poles**	2, 4	2		4	
4	**Value of rated breaking differential current, A**	0,1; 0,3; 0,5; 0,03	1 - 0,01	2 - 0,03	3 - 0,1	4 - 0,3
5	**Operation characteristic of electromagnetic release**	-	C			
6	**Rated current, A**	25, 40, 63, 80, 100	6, 10, 16, 20, 25, 32, 40, 50, 63			
7	**Performance value in terms of residual current**	A, AC	A		AC	
8	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL4 (international TC4)				

Selection Guide

		RCCB without overcurrent protection	
Type		**OptiDin DM63**	
Appearance			
Standard of compliance		GOST IEC 61008-1	
Number of poles		2P, 4P	
Electrical properties			
Protection type		-	
Rated current In, A		25, 40, 63, 80[1], 100[1]	
Rated residual breaking current In, A		0,03; 0,1; 0,3; 0,5[2]	
Rated residual non-tripping current, A		0,5In	
Rated operating voltage Ue, V	AC 50 Hz	230	
Type of protective characteristic (according to the operating conditions in the presence of a direct current component)		A, AC	
Rated maximum breaking capacity Icn, A		-	
Rated maximum switching and breaking capacity for residual current Icn, A		-	
Nominal conditional short-circuit current Inc, A		6000	
Nominal conditional residual short-circuit current Inc, A		6000	
Time of switching-off at double value of rated residual breaking current, no more, s		-	
Other features			
Selective design			
Trip indication		available	
Circuit breaker protection degree		IP20	

1 RCDs for rated currents of 80 and 100 A have variable overall dimensions from 25, 40, 63 A.
2 Only for RCDs with 80 and 100 A.
3 Nominal tripping residual current for selective design.

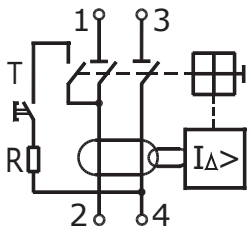
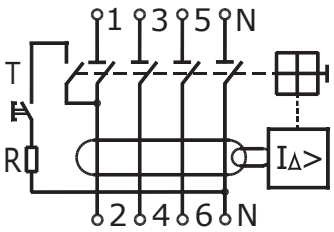
RCBO with overcurrent protection			
	OptiDin D63	**OptiDin VD63**	
			
	GOST IEC 61009-1	GOST IEC 61009-1	
	1P+N	1P+N	3P+N
	C	C	
	6, 10, 16, 20, 25, 32, 40	10, 16, 20, 25, 32, 40, 50, 63	
	0,01; 0,03; 0,1; 0,3	0,01; 0,03; 0,1[3]; 0,3[3]	
	0,5In	0,5In	
	230	230	400
	A	A	
	6000	6000	
	1500	3000	
	-	0,04	0,2
	-	available	available
	available	available	available
	IP20	IP20	

OptiDin DM63 Residual current circuit breakers up to 100 A

OptiDin DM63 protective shutdown device is designed for use in 50 Hz AC electric networks with a dead earthed neutral of rated voltage not exceeding 400 V and rated current up to 100 A to protect people from electric shock in the event of malfunctions of electrical equipment or by deliberate contact with exposed conductive parts of electrical installations, as well as to prevent inflaming and fires resulting from leakage currents and earth faults and operational make break of the specified chains.

OptiDin DM63 is presented as an electromechanical device that does not have its own power consumption, maintains its efficiency at any fluctuations and even voltage unavailability in the network. Complies with the requirements of GOST IEC 61008-1-2012, TP TC 004/2011.

References (Series)

Number of poles		2P					4P				
Wiring diagrams											
Performance type	Rated residual breaking current	25	40	63	80	100	25	40	63	80	100
AC	0,03	254166	254176	254186	-	-	254201	254211	254221	-	-
AC	0,1	254167	254177	254187	-	-	254202	254212	254222	-	-
AC	0,3	254168	254178	254188	-	-	254203	254213	254223	-	-
A	0,03	254266	254276	254286	254291	-	254301	254311	254321	254326	254331
A	0,1	254267	254277	254287	254292	254297	254302	254312	254322	254327	254332
A	0,3	254268	254278	254288	254293	254298	254303	254313	254323	254328	254333
A	0,5	-	-	-	254294	254299	-	-	-	254329	254334

Wiring

Rated current In, A	Tightening torque, N/m	Without preparation of the conductor current carrying wire, mm²		With preparation of the conductor current carrying wire, mm²	
		Copper conductors	Aluminium conductors	Copper conductors	Aluminium conductors
25-100	2	1,5-35	2,5-35	35	35

Batch effectiveness

Viable opportunity of organizing protection against all types of leakage currents - alternating, direct, intermittent current, due to the availability of AC and A type designs.

Secure working capacity from -25 to + 40 ° C.

Use of factory sealing guarantees mechanical integrity of the circuit breaker.

Availability of connecting conductors with a cross-section up to 35 mm².

The electromechanical circuit of the RCD provides reliable protection and stands guard over the life of a person and property from fire even in emergency situations when a zero conductor breaks off.

Safety shutter - prevents false connection of conductors to the RCD and guarantees safe installation.

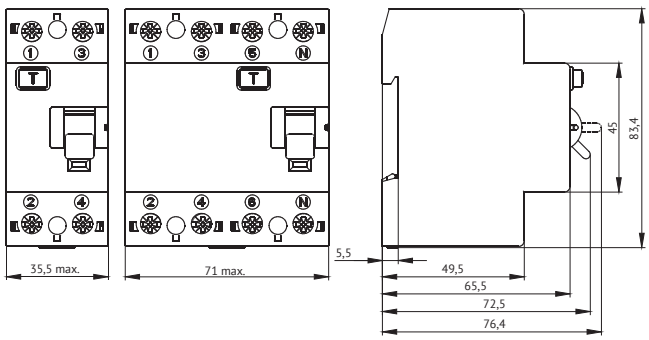
Indication of the contacts position.

Technical specifications

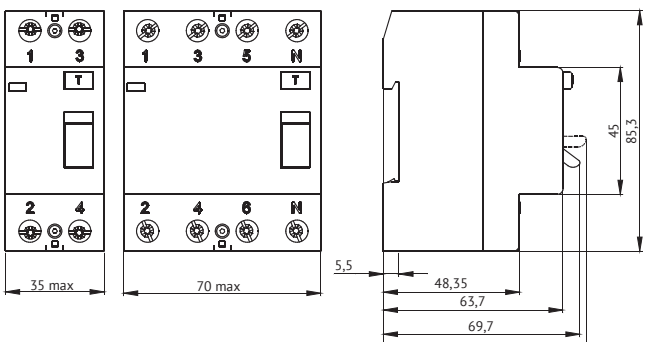
Main characteristics		
Operating voltage, V		230/400
Type of operating characteristic (according to the operating conditions if the direct current component is avaliable)		AC, A
Nominal conditional short-circuit current		6000
Additional characteristics		
Degree of protection		IP20
Wear resistance	Commutation	2000
	Mechanical	5000
Operating temperature range, °C		from -25 to +40
Weight, g		
Number of poles	2	210
	4	360

Overall dimensions (mm)

25-63 A



80-100 A



OptiDin D63 Automatic residual current circuit breakers up to 40 A

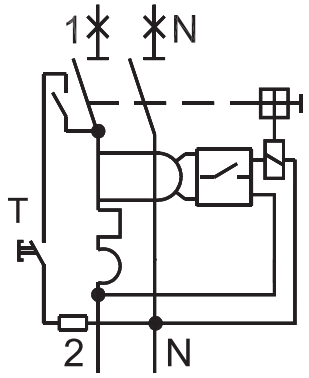
Standard of compliance: GOST P 51327.1 (IEC 61009-1)

Two-pole automatic switches OptiDin D63, controlled by residual current with built-in protection against overcurrents (hereinafter RCBOs), are installed in single-phase AC networks with frequency of 50 Hz with dead-earthed neutral of rated voltage not exceeding 230 V and rated currents up to 40 A. They are designed to protect people from electric shock in case of malfunctions of electrical equipment or in case of unintentional contact with open conductive parts of electrical installations, to prevent inflammation and fires arising from the leakage currents and earth faults, as well as to protect against overload and short circuit.

Bipolar circuit-breakers of the electronic type with one pole protected from overcurrent belong to the class of devices that functionally depend on the supply voltage (they do not automatically break in case of voltage failure) and are intended for the stationary plant with fixed wiring.

RCBOs comply with the requirements of GOST IEC 61009-1, TP TC 004/2011, TP TC 020/2011 and are manufactured according to TУ3422-046-05758109-2008.

References (series)

OptiDin D63 Automatic residual current circuit breaker							
Number of poles	1P+N						
Wiring diagrams							
Rated residual current In, A	Rated current In, A						
	6	10	16	20	25	32	40
0,01	103498	103499	103500	103501	103502	103503	103504
0,03	103505	103506	103507	103508	103509	103510	103511
0,1	103522	103523	103512	103513	103514	103515	103516
0,3	103524	103525	103517	103518	103519	103520	103521

Batch effectiveness

Indication of the position of the contacts.

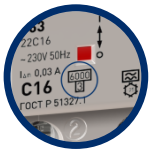
Implements three types of protection.

Increased noise immunity allows to avoid false actuation of the device.

Possibility of installation in locations with high humidity and sharp temperature changes owing to the lacquered electronic board.

Saves space in the dashboard - 36 mm. Residual current automatic circuit breaker - does not require additional automatic switch.

Possibility of connecting conductors with cross-section up to 25 mm².



Can be installed as an input device owing to the high value of maximum switching capacity - 6 kA.

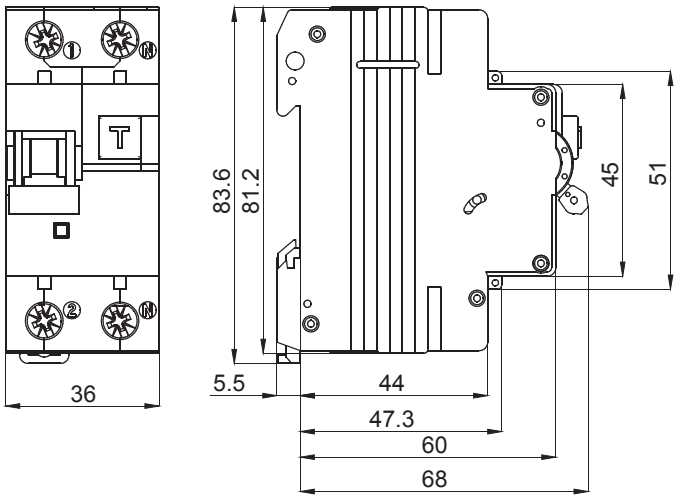
Wiring

Rated current In, A	Tightening torque, N/m	Without preparation of the conductor current carrying wire, mm²			With preparation of the conductor current carrying wire, mm²		
		Flexible copper (multiple core)	Inflexible copper (multiple and single core, hard)	Aluminium (multiple and single core)	Flexible copper (multiple core)	Flexible aluminium	Inflexible aluminium (hard)
6-40	2	1,5 - 10	1,5 - 16	2,5 - 10	25	16	25

Technical specifications

Main characteristics		
Insulation voltage, V		400
Application category		A
Current-limiting class		3
Additional characteristics		
Degree of protection		IP20
Wear resistance	commutation	2000
	mechanical	6000
Operating temperature range, ° C		from -40 to +40
Storage temperature range, ° C		from -45 to +55
Weight, g		
Number of poles	1P+N	190

Overall dimensions (mm)

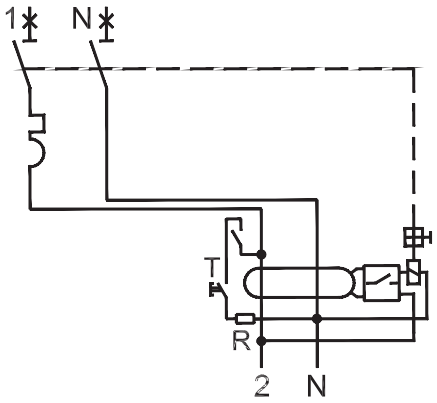


OptiDin VD63 Automatic residual current circuit breakers up to 63 A

Automatic switches of OptiDin VD63 type, controlled by risidual current with built-in protection against overcurrents (hereinafter referred to as automatic residual current circuit breakers - RCBO) are installed in 50 Hz alternating current electric circuits with dead-earthed neutral of rated voltage not exceeding 400 V and rated currents up to 63 A and designed to protect people from electric shock in case of malfunctions of electrical equipment or in case of unintentional contact with open conductive parts of electrical installations, to prevent inflammation and fires arising from the flow of leakage currents and earth fault, and to protect against overload and short circuit. RCBOs belong to a class of devices that functionally depend on the mains voltage (they do not automatically open in case of voltage failure). Bipolar RCBOs are designed for stationary installation with fixed wiring in normal and severe operating conditions in compliance with the requirements of GOST P IEC 335-1 in single-phase, four-pole and three-phase.

RCBOs comply with the requirements of GOST IEC 61009-1, TP TC 004/2011, TP TC 020/2011 and are manufactured according to ТУ3422-046-05758109-2008.

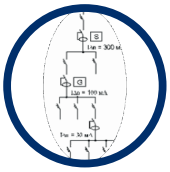
References (series)

OptiDin VD63 Automatic residual current circuit breaker								
Number of poles	1P+N							
Wiring diagrams								
Rated residual current In, A	Rated current In, A							
	10	16	20	25	32	40	50	63
0,01	103448	103449	103450	103451	-	-	-	-
0,03	103452	103453	103454	103455	103456	103457	103458	103459
0,1	103460	103461	103462	103463	103495	103496	103464	103465
0,3	-	-	-	103466	103467	103468	103469	103470

Batch effectiveness

Implements three types of protection.

Actuation cause indication - leakage current/short circuit or overload.



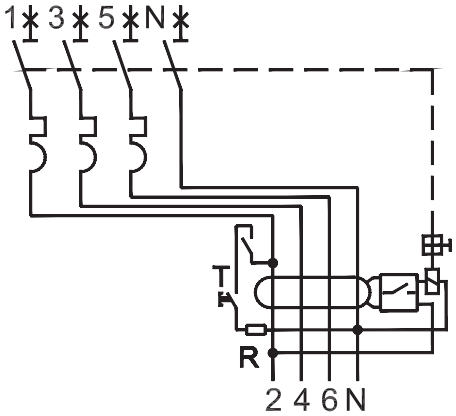
Possibility of constructing cascade protection of circuits due to the avalibility of selective RCBT type "S" in the line.

Increased noise immunity allows to avoid false actuation of the device.

Possibility of connecting conductors with cross-section up to 25 mm^2.

Protection against switching of a circuit in case of life-threatening leakage current.

Possibility of installation as an input device due to the high value of maximum switching capacity - 6 kA.

	3P+N								
									
	Rated current In, A								
	6	10	16	20	25	32	40	50	63
	-	103471	103472	103473	103474	-	-	-	-
	228261	103475	103476	103477	103478	103479	103480	103481	103482
		103483	103484	103485	103486	103487	103488	103489	103490
	-	145736	-	-	103491	103492	103493	103497	103494

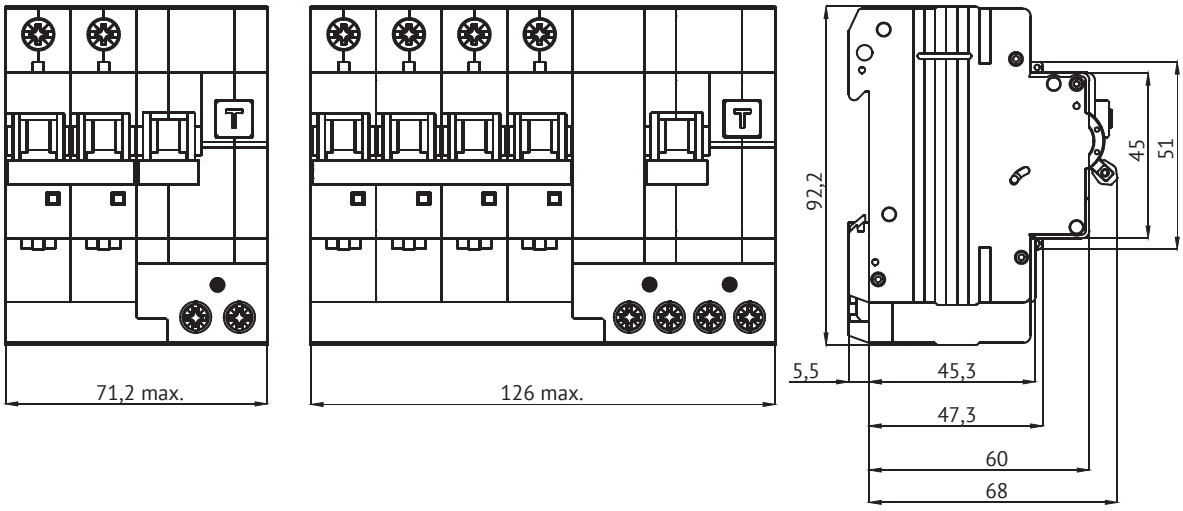
Technical specifications

Main characteristics			
Insulation voltage, V		400	
Application category		A	
Current-limiting class		3	
Additional characteristics			
Degree of protection		IP20	
Wear resistance	commutation	4000	
	mechanical	6000	
Operating temperature range, ° C		from -25 to +40	
Storage temperature range, ° C		from -45 to +55	
Weight, g			
Number of poles		1P+N	0,39
		3P+N	0,72

Wiring

Rated current In, A	Tightening torque, N/m	Without preparation of the conductor current carrying wire, mm²			With preparation of the conductor current carrying wire, mm²		
		Flexible copper (multiple core)	Inflexible copper (multiple and single core, hard)	Aluminium (multiple and single core)	Flexible copper (multiple core)	Flexible aluminium	Inflexible aluminium (hard)
6-40	2	1,5 - 10 мм²	1,5 - 16 мм²	2,5 - 10 мм²	25 мм²	16 мм²	25 мм²

Overall dimensions (mm)



Surge protection devices

Surge protection devices OptiDin OM (impulse surge arresters) are designed to protect against switching and lightning impulse overvoltages.

SPDs OptiDin OM are installed in entrance points of power input in the main switchboard, in supplementary switchboards and directly on electrical machines, devices and equipment.

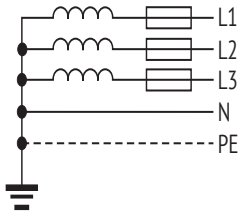
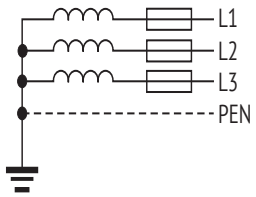
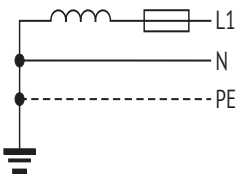
Designation

OptiDin OM u - I - 1 + N U - 280 / 25 / X R S

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)

1	**Product range**	OptiDin						
2	**Configuration**	OM						
3	**Monobloc configuration**	u						
4	**SPD type**	I			II			
5	**Number of poles or the neutral pole of a monobloc configuration (letter N)**	1P	1P+N	2P	3P	3P+N	4P	N
6	**Availability of a pole for a neutral conductor**	N						
7	**Monobloc type of a pole configuration fitting a neutral conductor**	U						
8	**Maximum operating voltage (phase), V**	260			280			
9	**Value of impulse current (for class I SPD) or the maximum discharge current (for class II SPD), kA**	12,5	25	30	40	50	100	
10	**Availability of the function to interrupt residual current**	X						
11	**Availability of pins for remote signaling**	R						
12	**Availability of a wear condition indicator**	S						

Selection Guide

Current type	Earth system type		Number of poles	Title	Reference	Protected conductors	
Alternating current, three-phase power supply	TN-S/TT		3P+N	OptiDin OM-I-3+Nu-280/12,5	114275	L1, L2, L3, N, PE	
			3P+N	OptiDin OM-I-3+Nu-280/12,5/R	114277		
			4P	OptiDin OM-I-4-280/12,5	114243		
			4P	OptiDin OM-I-4-280/12,5/R	114247		
			4P	OptiDin OM-I-4-280/12,5/RS	114263		
			4P	OptiDin OM-I-4-280/12,5/S	114260		
			3P+N	OptiDin OM-II-3+N-280/40	114311		
			3P+N	OptiDin OM-II-3+N-280/40/R	114313		
			4P	OptiDin OM-II-4-280/40	114297		
			4P	OptiDin OM-II-4-280/40/R	114301		
			4P	OptiDin OM-II-4-280/40/RS	114309		
			4P	OptiDin OM-II-4-280/40/S	114307		
			4P	OptiDin OM-II-4-280/40/X	114303		
			4P	OptiDin OM-II-4-280/40/XR	114305		
	TN-C		3P	OptiDin OM-I-3-280/12,5	114242	L1, L2, L3, PEN	
			3P	OptiDin OM-I-3-280/12,5/R	114246		
			3P	OptiDin OM-I-3-280/12,5/RS	114262		
			3P	OptiDin OM-I-3-280/12,5/S	114258		
			3P	OptiDin OM-II-3-280/40	114296		
			3P	OptiDin OM-II-3-280/40/R	114300		
			3P	OptiDin OM-II-3-280/40/RS	114308		
			3P	OptiDin OM-II-3-280/40/S	114306		
			3P	OptiDin OM-II-3-280/40/X	114302		
			3P	OptiDin OM-II-3-280/40/XR	114304		
Alternating current, single-phase supply	TN-S/TT		1P+N	OptiDin OM-I-1+N-280/12,5	114251	L1, L2, L3, N, PE	
			1P+N	OptiDin OM-I-1+N-280/12,5/R	114252		
			1P+N	OptiDin OM-I-1+Nu-280/12,5	114278		
			1P+N	OptiDin OM-I-1+Nu-280/12,5/R	114279		
			2P	OptiDin OM-I-2-280/12,5	114209		
			2P	OptiDin OM-I-2-280/12,5/R	114245		
			2P	OptiDin OM-I-2-280/12,5/RS	114274		
			2P	OptiDin OM-I-2-280/12,5/S	114272		
			1P+N	OptiDin OM-II-1+N-280/40	114310		
			1P+N	OptiDin OM-II-1+N-280/40/R	114312		
			2P	OptiDin OM-II-2-280/40	114295		
			2P	OptiDin OM-II-2-280/40/R	114299		
			2P	OptiDin OM-II-2-280/40/RS	114440		
			2P	OptiDin OM-II-2-280/40/S	114414		
			2P	OptiDin OM-II-2-280/40/X	114320		
			2P	OptiDin OM-II-2-280/40/XR	114412		

	SPD classification							
	SPD class test		Design of the SPD			Overvoltage protection method		
	Class I+II+III	Class II+III	Design with removable module	Output for remote signaling	Wear condition indicator	Switching voltage GDT	Limiting voltage MOV	Combined type MOV + GDT
	+		+			+	+	
	+		+	+		+	+	
	+		+				+	
	+		+	+			+	
	+		+	+	+		+	
	+		+		+		+	
		+	+			+	+	
		+	+	+		+	+	
		+	+				+	
		+	+	+			+	
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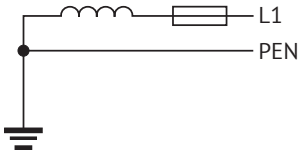
Current type	Earth system type		Number of poles	Title	Reference	Protected conductors	
Alternating current, single-phase supply	TN-C		1P	OptiDin OMu-I-1-280/12,5/X	114283	L1, PEN	
			1P	OptiDin OMu-I-1-280/12,5/XR	114284		
			1P	OptiDin OMu-I-1-280/25/X	114288		
			1P	OptiDin OMu-I-1-280/25/XR	114291		
			1P	OptiDin OMu-I-1-280/30/X	114292		
			1P	OptiDin OMu-I-N-260/100	114286		
			1P	OptiDin OMu-I-N-260/50	114281		
			1P	OptiDin OM-I-1-280/12,5	114201		
			1P	OptiDin OM-I-1-280/12,5/R	114244		
			1P	OptiDin OM-I-1-280/12,5/RS	114273		
			1P	OptiDin OM-I-1-280/12,5/S	114271		
			1P	OptiDin OM-I-N-260/12,5	114269		
			1P	OptiDin OM-II-1-130/40	149961		
			1P	OptiDin OM-II-1-280/40	114294		
			1P	OptiDin OM-II-1-280/40/R	114298		
			1P	OptiDin OM-II-1-280/40/RS	114439		
			1P	OptiDin OM-II-1-280/40/S	114413		
			1P	OptiDin OM-II-1-280/40/X	114318		
			1P	OptiDin OM-II-1-280/40/XR	114411		
			1P	OptiDin OM-II-1-385/40	227679		
			1P	OptiDin OM-II-1-550/40	147311		
			1P	OptiDin OM-II-1-750/30	147312		
			1P	OptiDin OM-II-N-260/40	114315		

	SPD classification								
	SPD class test		Design of the SPD				Overvoltage protection method		
	Class I+II+III	Class II+III	Monobloc design	Design with removable module	Output for remote signaling	Wear condition indicator	Switching voltage GDT	Limiting voltage MOV	Combined type MOV + GDT
	+		+						+
	+		+		+				+
	+		+						+
	+		+		+				+
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		+		+			+		

OptiDin OM(u)-I Surge protection devices of I + II + III classes

The OptiDin OMu-I surge protection devices are designed to protect electrical networks and devices from the effects of an overvoltage wave caused by a close, direct or indirect lightning strike. They are designed in the form of a monoblock with a serial connection of a varistor and an arrester, so that a complete separation of L-> N, N -> PE is provided, without residual currents.

The surge protection devices by OptiDin OM-I are designed for the potential equalization in the event of a direct lightning strike. They are installed on the input side of external conductors in the main switchboard and contain removable plug-in varistors.

The surge protection devices OptiDin OM (u) -I are available with or without remote signaling. Mounting on a 35 mm DIN rail.

SPD comply with the requirements of GOST P 51992.

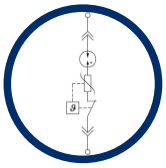
Batch effectiveness

Information input about the protection status and the need of devices replacement due to the availability of a wear degree indicator of the varistor module at operation.

Improved surge diverting properties in monoblock designs.

Safety when replacing plug-in modules due to the possibility of installing the module in any position.

There is a place for additional information input.



Designs with residual current interruption function exclude leakage currents. Due to this property the SPD can be installed upstream the electricity meter.

Marked on outputs allow to exclude wrong connection of conductors at installation.

Availability of an additional contact for remote signaling about the status of the device makes it possible to remotely control the degree of wear of the device.

Technical specifications

Main characteristics		
Operating frequency, Hz		50/60
Operating voltage, V		230/400
Status indication in models	Green	fully functional
	Yellow*	partially worn, replacement recommended
	Red	out of order, immediate replacement is required
Switching alarm contact		M3/0,25 N/m, 0,2 ... 1,5 mm^2, max. 250 B~/1 A
Additional characteristics		
Operating temperature range, ° C		from - 40 to +70
Degree of protection		IP20
Mounting on profile DIN rail, mm		35 x 7,5
Compliance with regulations	GOST P 51992 / IEC 61643-1	Class I + class II + class III
	STN EN 61643-11/A11	Type 1 [T1] + type 2 [T2] + type 3 [T3]
	VDE 0675-06	Class B + class C + class D
Weight, g		
OptiDin OM-I-1		190
OptiDin OM-I-1+N		278
OptiDin OM-I-1+Nu		300
OptiDin OM-I-2		340
OptiDin OM-I-3		490
OptiDin OM-I-3+Nu		550
OptiDin OM-I-4		640
OptiDin OM-I-N		128
OptiDin OMu-I-1-280/12,5		240
OptiDin OMu-I-1-280/25		450
OptiDin OMu-I-1-280/30		450
OptiDin OMu-I-N-260/50		150
OptiDin OMu-I-N-260/100		260

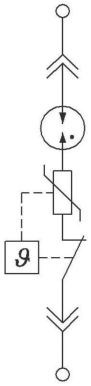
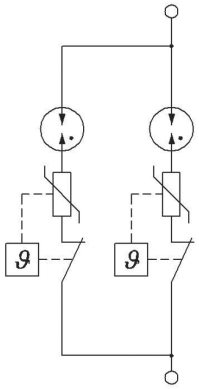
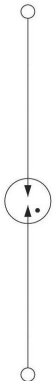
* For models with wear status indicator

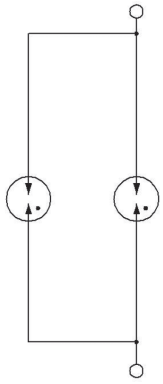
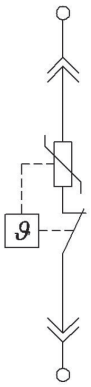
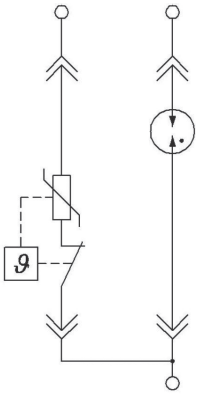
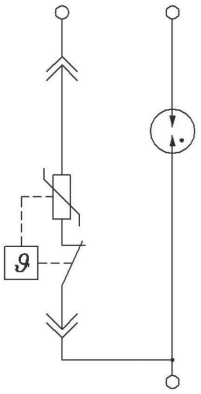
Wiring

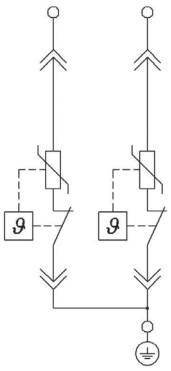
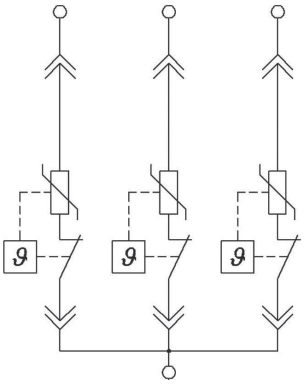
Min./max. tightening torque, N/m	2-3
Cross section of the connecting conductor, mm^2: - wire - cable	 4-35 4-35

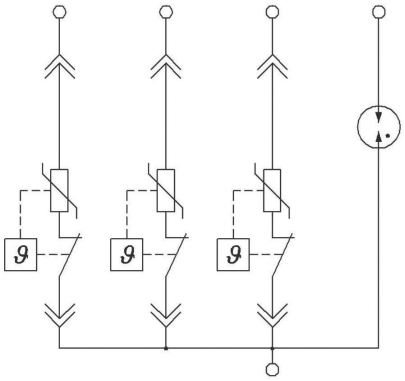
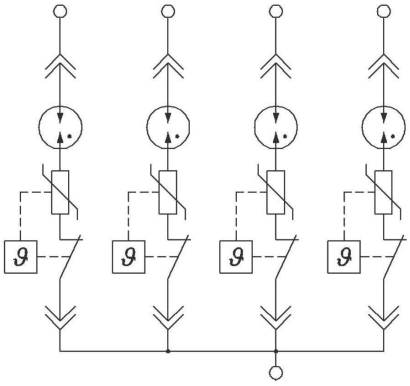
Plug-in modules	
OptiDin OM-I-0-280/12,5	261378
OptiDin OM-I-0-280/12,5/S	261379
OptiDin OM-I-0N-280/12,5	261380

References (series)

OptiDin OM(u)-I						
Appearance						
Number of poles		1P			N	
Wiring diagrams						
Rated voltage of alternating current Un, V		230	230	230	230	
Maximum continuous operating voltage Uc, V		280	280	280	280	
Surge current Iimp (10/350), kA		12,5	25	30	50	
Maximum discharge current Imax (8/20), kA		50	60	60	80	
Rated discharge current In (8/20), kA		30	40	40	50	
Ultimate pressure level Up, kV		≤1,5	≤1,5	≤1,5	≤1,5	
Response time tA, ns		<100	<100	<100	<100	
Open circuit voltage [T3] UOC, kV		6	6	6		
Prospective short-circuit current of the power supply Ip, kAef		25	25	25		
Rating of the protective fuse gL/gG, A		≤160	≤250	≤315		
Temporary overvoltage UTOV, V AC		335	335	335		
Residual current IPE, μA		<1	<1	<1	<1	
Follow current If, A					100	
References						
General design					114281	
	With a remote alarm contact					
With a wear indicator						
	With a remote alarm contact					
With residual current interrupt function		114283	114288	114292		
	With a remote alarm contact	114284	114291			

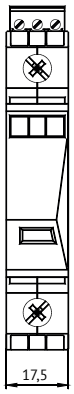
					
	N	1P	N	1P+N	
					
	230	230	230	230	230
	260	280	260	280/260 N/PE	280/260 N/PE
	100	12.5	12.5	12.5	12.5/50 N/PE
	100	50	40	50/40 N/PE	50/80 N/PE
	100	30	20	30/20 N/PE	30/50 N/PE
	≤1,5	≤1,3	≤1,5	≤1,3/≤1,5 N/PE	≤1,3/≤1,5 N/PE
	<100	<25		<25/<100 N/PE	<25/<100 N/PE
	6	20	6	20/6 N/PE	20/10 N/PE
		25		25 L/N	25 L/N
		≤160		≤160 L/N	≤160 L/N
		335		335 L/N	335 L/N
	<1		<1	<1 N/PE	<1 N/PE
	100		100	100 N/PE	100 N/PE
	114286	114201	114269	114251	114278
		114244		114252	114279
		114271			
		114273			

OptiDin OM(u)-I				
Appearance				
Number of poles		2P	3P	
Wiring diagrams				
Rated voltage of alternating current Un, V		230	230	
Maximum continuous operating voltage Uc, V		280	280	
Surge current Iimp (10/350), kA		12,5	12,5	
Maximum discharge current Imax (8/20), kA		50	50	
Rated discharge current In (8/20), kA		30	30	
Ultimate pressure level Up, kV		≤1,3	≤1,3	
Response time tA, ns		<25	<25	
Open circuit voltage [T3] UOC, kV		20	20	
Prospective short-circuit current of the power supply Ip, kAef		25 L/N	25 L/N	
Rating of the protective fuse gL/gG, A		≤160 L/N	≤160 L/N	
Temporary overvoltage UTOV, V AC		335 L/N	335 L/N	
Residual current IPE, μA				
Follow current If, A				
References				
General design		114209	114242	
	With a remote alarm contact	114245	114246	
With wear indicator		114272	114258	
	With a remote alarm contact	114274	114262	

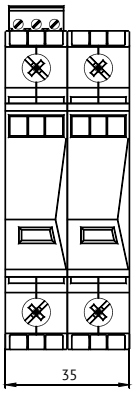
		
	3P+N	4P
		
	230	230
	280	280
	12,5	12,5
	50/80 N/PE	50
	30/50 N/PE	30
	≤1,3/≤1,5 N/PE	≤1,3
	<25/<100 N/PE	<25
	20/10 N/PE	20
	25 L/N	25
	≤160 L/N	≤160
	335 L/N	335
	<1 N/PE	
	100 N/PE	
	114275	114243
	114277	114247
		114260
		114263

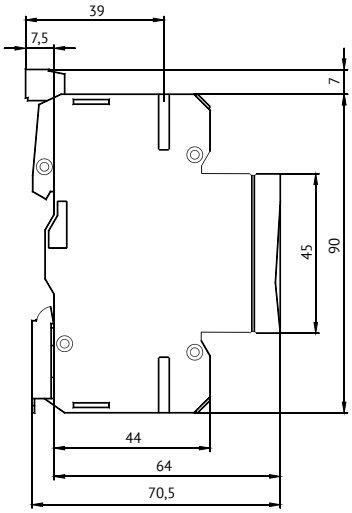
Overall dimensions (mm)

OptiDin OMu-I-1-280/12,5
OptiDin OMu-I-1-260/50



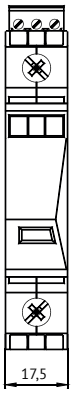
OptiDin OMu-I-1-280/25
OptiDin OMu-I-1-280/30
OptiDin OMu-I-N-260/100



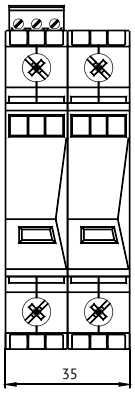


OptiDin OM-I

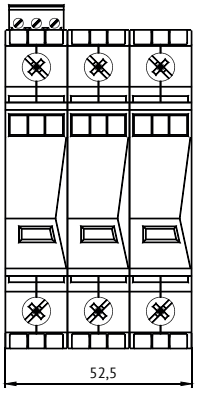
1P
N



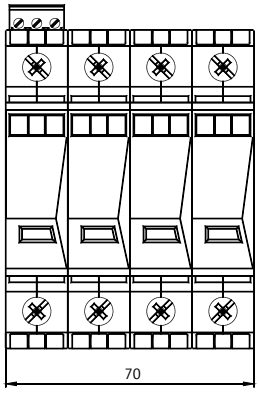
2P
1P+N

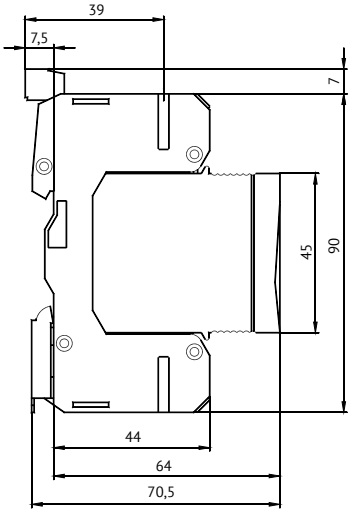


3P



4P
3P+N





OptiDin OM-II Surge protection devices of II + III classes

Class II surge protection devices are designed for protection against category III overvoltages, for which a maximum overvoltage of 4 kV is established by coordinating insulation for 230/400 V networks.

These SPDs serve to drain the energy of the overvoltage pulses in the distribution network of the object. They are installed, mainly, in secondary switchboards.

OptiDin OM-II surge protection devices are designed to drain the energy of overvoltage pulses in power supply systems of buildings. They, as a rule, are installed in secondary switchboards and contain a built-in connected varistor. OptiDIn OM-II surge protection devices are available with or without remote signaling. The installation is carried out on a 35 mm DIN rail.

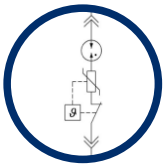
SPDs meet the requirements of GOST P 51992.

Batch effectiveness

Information input about the protection status and the need of replacement of the devices due to the availability of a wear degree indicator of the varistor module at operation.

Safety when replacing plug-in modules due to the possibility of installing the module in any position.

There is a place for additional information input.

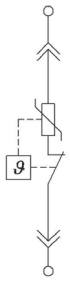
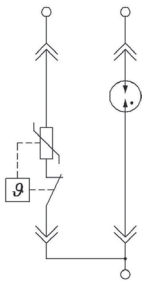


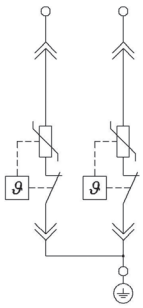
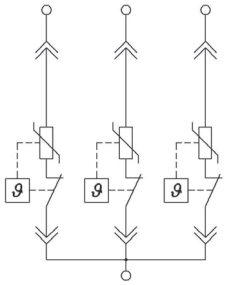
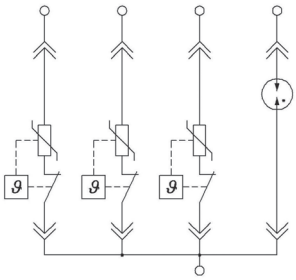
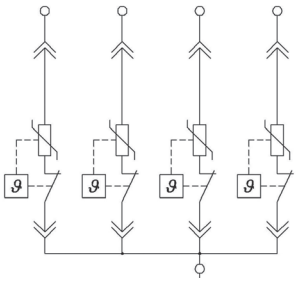
Designs with residual current interruption function exclude leakage currents.

Marked on outputs allow to exclude wrong connection of conductors at installation.

Availability of an additional contact for remote signaling about the status of the device makes it possible to remotely control the degree of wear of the device.

References (series)

OptiDin OM-II								
Appearance								
Number of poles		1P				N	1P+N	
Wiring diagrams								
Rated voltage of alternating current Un, V		230	120	385	470	230	230	
Maximum continuous operating voltage Uc, V		280	130	385	550	260	280/260 N/PE	
Maximum discharge current Imax (8/20), kA		40				40	40	
Rated discharge current In (8/20), kA		20				20	20	
Ultimate pressure level Up, kV		≤1,45	≤0,85	≤1,8	≤2,65	≤1,45	≤1,45	
Response time tA, ns		<25				<150	<25/<150 N/PE	
Open circuit voltage [T3] UOC, kV		6				6	6	
Prospective short-circuit current of the power supply Ip, kAef		25					25 L/N	
Rating of the protective fuse gL/gG, A		≤125					≤125	
Temporary overvoltage UTOV, V AC		335	175	560	685		335 L/N	
Residual current IPE, μA						<1	<1 N/PE	
Follow current If, A						100	100 N/PE	
References								
General design		114294	149961	227679	147311	114315	114310	
	With a remote alarm contact	114298					114312	
With wear indicator		114413						
	With a remote alarm contact	114439						
With residual current interrupt function		114318						
	With a remote alarm contact	114411						

				
	2P	3P	3P+N	4P
				
	230	230	230	230
	280	280	280	280
	40	40	40	40
	20	20	20	20
	≤1,45	≤1,45	≤1,45	≤1,45
	<25	<25	<25/<150 N/PE	<25
	6	6	6	6
	25 L/N	25 L/N	25 L/N	25
	≤125 L/N	≤125 L/N	≤125 L/N	≤125
	335 L/N	335 L/N	335 L/N	335
			<1 N/PE	
			100 N/PE	
	114295	114296	114311	114297
	114299	114300	114313	114301
	114414	114306		114307
	114440	114308		114309
	114320	114302		114303
	114412	114304		114305

Plug-in modules

Title	References
OptiDin OM-II-0-280/40	261381
OptiDin OM-II-0-280/40/S	261382
OptiDin OM-II-0-280/40/X	261383
OptiDin OM-II-0N-260/40	261384

Technical specifications

Main characteristics		
Operating frequency, Hz		50/60
Operating voltage, V		230/400
Status indication in models	Green	fully functional
	Yellow*	partially worn, replacement recommended
	Red	out of order, immediate replacement is required
Switching alarm contact		M3/0,25 N/m, 0,2 ... 1,5 mm², max. 250 B~/1 A
Additional characteristics		
Operating temperature range, ° C		from - 40 to +70
Degree of protection		IP20
Mounting on profile DIN rail, mm		35 x 7,5
Compliance with regulations	GOST P 51992 / IEC 61643-1	Class I + class II + class III
	STN EN 61643-11/A11	Type 1 [T1] + type 2 [T2] + type 3 [T3]
	VDE 0675-06	Class B + class C + class D
Weight, g		
OptiDin OM-II-1		145
OptiDin OM-II-1+N		233
OptiDin OM-II-2		255
OptiDin OM-II-3		355
OptiDin OM-II-3+N		443
OptiDin OM-II-4		460
OptiDin OM-II-N		128

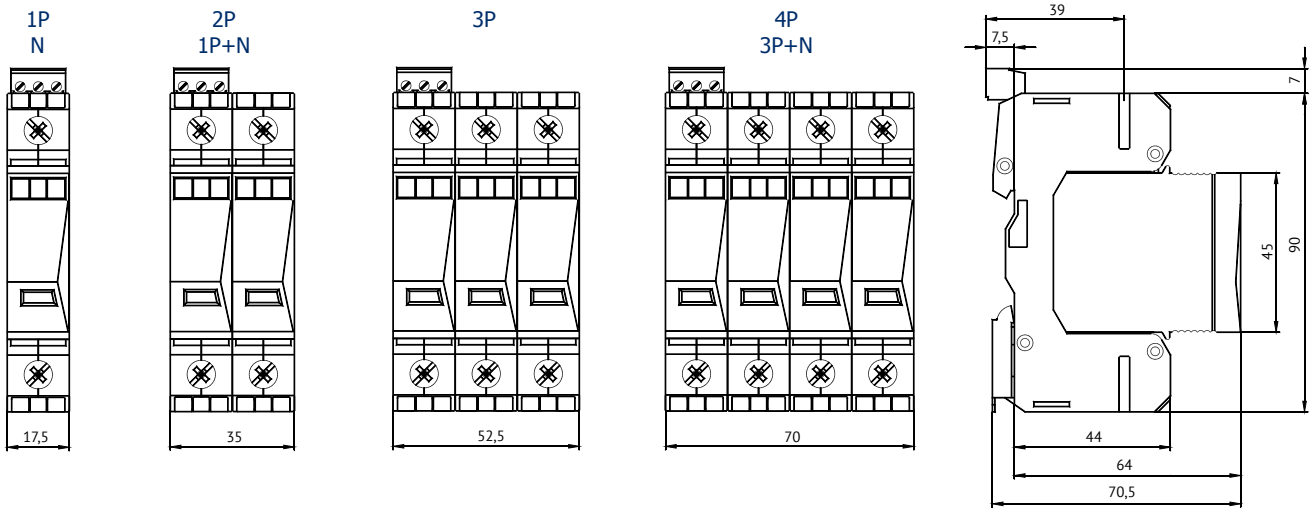
* For models with wear status indicator

Wiring

Min./max. tightening torque, N/m	2-3
Cross section of the connecting conductor, mm²: - wire - cable	 4-35 4-35

Overall dimensions (mm)

OptiDin OM-I



Modular contactors

Electromechanical modular contactors KEAZ are applied in automation and control systems for a variety of technological processes, including air conditioning, ventilation, heating and lighting systems.

Designation

OptiDin MK63 - 25 4 0 - 230 AC

1 2 3 4 5 6 7

1	Product range	OptiDin				
2	Configuration	MK63				
3	Rated operating current of the contactor, A	20, 25, 40, 63				
4	Number of normally open (NO) contacts	0	1	2	3	4
5	Number of normally closed (NC) contacts	0	1	2	3	4
6	Voltage of the control coil circuit, V	24		230		
7	Type of coil current	AC		AC/DC		

OptiDin MK63 Modular contactors for currents up to 63 A

OptiDin MK63 modular contactors are designed for frequent switching of loads with a rated current up to 63 A - electric boilers, direct heating convectors, heat accumulators. The devices are applied for automation and control of a variety of technological processes, including air conditioning, ventilation, lighting.

The OptiDin MK63 provides visual indication of the status of contacts. The main circuit voltage is 230V and 400V AC at 50Hz. The supply voltage of the control coils is 24 and 230 V (AC and DC).

Modular contactors are installed in the distribution cabinets of residential and office premises, hotels, hospitals, shopping centers, industrial buildings and public places.

OptiDin MK63 is applied for remote switching and automatic monitoring of equipment, such as:
- single-phase and three-phase electric motors;
- a variety of pumps;
- air conditioning;
- electric heaters;
- lighting equipment.

The contactors comply with the requirements of GOST P 50030.4.1

Batch effectiveness

It is possible to implement contactors equipped with a varistor for overvoltage protection, as well as a rectifier, which allows the contactor to be controlled either by direct or alternating current.

AC/DC

There is an additional place for marking on each contactor.

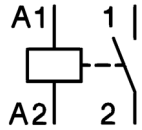
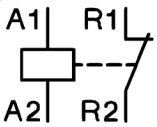
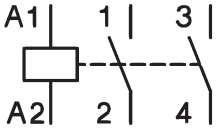
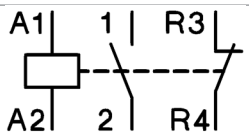
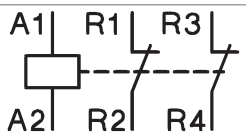
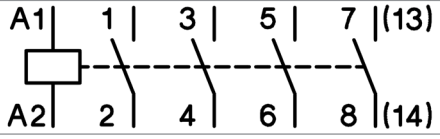
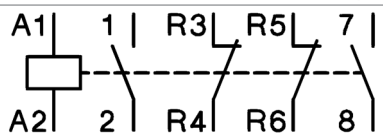
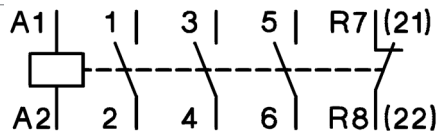
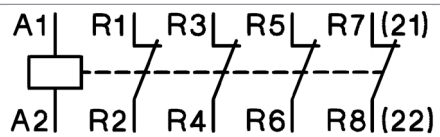
The design of the contactors implies installation on a 35 mm DIN rail.

Dummy module prevents contactors from overheating when immediately adjacent directly one to another.

IP20

All contactors are IP20 protection type.

References (series)

			Rated current In, A	
Wiring diagram	Main circuit contacts type	Control coil voltage , V	Type of coil current	
	1NO	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	1NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	2NO	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	1NO+1NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	2NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	4NO	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	2NO+2NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	3NO+1NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	
	4NC	24	AC	
			AC/DC	
		230	AC	
			AC/DC	

	OptiDin MK63-20	OptiDin MK63-25	OptiDin MK63-40	OptiDin MK63-63
	20	25	40	63
	236841	236850		
	236814	236823		
	236840	236849		
	236813	236822		
	236843	236852		
	236816	236825		
	236842	236851		
	236815	236824		
	236844	236778		
	233825	236779		
	114090	236853		
	236817	236826		
	236846	236778		
	236819	236828		
	236845	236855		
	236818	236827		
	236848	236857		
	236821	236830		
	236847	236856		
	236820	236829		
		236880	236780	236782
		236138	236781	236783
		114095	114128	114136
		236868	236892	236899
		236882	236907	236909
		236139	236896	142270
		114118	114130	114137
		236869	236895	236902
		236881	236906	236908
		150912	236894	236901
		114120	114131	114138
			236893	236900
		236883		236910
		236871	236898	236905
		114124	114135	114139
		236870	236897	236904

Technical specifications

Type		OptiDin MK63-20		OptiDin MK63-25		OptiDin MK63-40		OptiDin MK63-63	
Main characteristics									
Module width		1		2		3			
Mechanical durability, cycle		3000000							
Ambient temperature, ° C		-5 ... +55							
Storage temperature, ° C		-30 ... +80							
Number of contactors (immediately adjacent without setting OptiDin P730 dummy module)	≤ 40 °C	up to 3							
	40 - 55 °C	up to 2							
Stable contact		17 В; ≥ 50 мА							
Minimum open contact clearance, mm		3,6							
Power loss per pole, W		1,7		2,2		4		8	
Resistance to overcurrent, A		72		68		176		240	
Maximum fuse current (gL) Iv, A		20		25		63		80	
Maximum commutation frequency, cycle/h	DC-1	300							
	AC-1/AC-3/AC-5b/AC-6b	600 600							
	AC-15	1200 1200							
	load free	3000 3000							
Control circuit									
Coil voltage range Uc, %		85...110							
Voltage type		AC	AC/DC	AC	AC/DC	AC	AC/DC	AC	AC/DC
Available coil voltages Uc, V		24, 230							
Rated frequency, Hz		50/60 *1)							
Testing discharge voltage, μs, kV		2							
Coil consumption, VA / W	Switching	12/10	2,1/2,1	33/25	2,6/2,6 *2)	5/5		5/5	
	Hold	2,8/1,2	2,1/2,1	5,5/1,6	2,6/2,6 *2)	5/5 5/5		5/5 5/5	
On/off delay, ms	Switching	15-25	15-45	10-30		15-20		15-20	
	Disconnection	10-30	20-50	10-60		35-45		35-45	
Power contacts									
Rated insulation voltage Ui, V		30		440		440			
Withstand impulse voltage Uimp, kV		4							
Thermal current Ith, A		20		25		40		63	
Rated operating voltage Ue, V		230		400		400 400			
Rated frequency f, Hz		50/60							
Rated operating current Ie, A	AC-1/AC-7a	20		25		40		63	
Rated load power Pe, kW	AC-1/AC-7a single-phase, 230 V	4		5,4		8,7		13,3	
	AC-1/AC-7a three-phase, 400 V			16		26		40	
Electrical wear resistance, cycle	AC-1/AC-7a	200000				100000			
Rated operating current Ie, A	AC-3/AC-7b	NO: 9 NC: 6		8,5		22		30	
Rated load power Pe, kW	AC-3/AC-7b single-phase, 230 V	NO: 1,3 NC: 0,75		1,3 *3)		3,7 *3)		5 *3)	
	AC-3/AC-7b three-phase, 400 V			4		11		15	
Electrical contact wear resistance, cycle	AC-3/AC-7b	300000		500000		150000			
Switching capacitors C, μF	AC-6b at 230 V	30		36		220		330	
Electrical wear resistance of contacts	AC-6b	100000				100000			
DC-1 (L/R ≤ 1 ms) DC current breaking capacity, A									
1 pole	Ue = 24 V DC	20		25		40		63	
	Ue = 48 V DC	15		20		24		26	
	Ue = 60 V DC	10		15		18		20	
	Ue = 110 V DC	6		6		4		4	
	Ue = 220 V DC	0,6		0,6		1,2		1,2	

Type		OptiDin MK63-20	OptiDin MK63-25	OptiDin MK63-40	OptiDin MK63-63
2 pole serial attached	Ue = 24 V DC	20	25	40	63
	Ue = 48 V DC	18	25	38	42
	Ue = 60 V DC	15	20	32	34
	Ue = 110 V DC	10	10	10	10
	Ue = 220 V DC	6	6	8	8
3 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	63
	Ue = 60 V DC		25	40	63
	Ue = 110 V DC		20	30	35
	Ue = 220 V DC		15	20	30
4 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	63
	Ue = 60 V DC		25	40	63
	Ue = 110 V DC		20	40	63
	Ue = 220 V DC		15	40	63
Electrical wear resistance, cycle	DC-1	100000		100000	
DC-3 (L/R ≤ 2 ms) DC current breaking capacity, A					
1 pole	Ue = 24 V DC	10	15	22	25
	Ue = 48 V DC	5	8	10	11
	Ue = 60 V DC	2	4	5	5
	Ue = 110 V DC	1	1,3	1,5	1,5
	Ue = 220 V DC	0,1	0,2	0,3	0,3
2 pole serial attached	Ue = 24 V DC	20	25	40	45
	Ue = 48 V DC	10	16	20	22
	Ue = 60 V DC	8	12	16	18
	Ue = 110 V DC	4	5,5	5	5
	Ue = 220 V DC	0,4	0,6	1	1
3 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	45
	Ue = 60 V DC		25	32	35
	Ue = 110 V DC		15	15	18
	Ue = 220 V DC		3	4	5
4 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	63
	Ue = 60 V DC		25	40	63
	Ue = 110 V DC		20	40	63
	Ue = 220 V DC		8	10	10
Electrical wear resistance, cycle	DC-3	100000		100000	
DC-5 (L/R ≤ 7,5 ms) DC current breaking capacity, A					
1 pole	Ue = 24 V DC	10	15	20	25
	Ue = 48 V DC	4	5	8	10
	Ue = 60 V DC	1	3	4	5
	Ue = 110 V DC	0,3	0,5	1	1
	Ue = 220 V DC	0,06	0,1	0,2	0,2
2 pole serial attached	Ue = 24 V DC	20	25	40	45
	Ue = 48 V DC	8	15	18	20
	Ue = 60 V DC	6	10	14	15
	Ue = 110 V DC	2	4	5	5
	Ue = 220 V DC	0,2	0,4	0,8	0,8
3 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	44
	Ue = 60 V DC		20	28	30
	Ue = 110 V DC		12	12	15
	Ue = 220 V DC		2	3	4
4 pole serial attached	Ue = 24 V DC		25	40	63
	Ue = 48 V DC		25	40	63
	Ue = 60 V DC		25	40	63
	Ue = 110 V DC		15	35	45
	Ue = 220 V DC		5	8	10

Type		OptiDin MK63-20	OptiDin MK63-25	OptiDin MK63-40	OptiDin MK63-63
Electrical wear resistance, cycle	DC-5	100000		100000	
Auxiliary contacts unit OptiDin MK63-RH					
Rated operating voltage Ue, V		230	400	400	
Rated insulation voltage Ui, V		230	440	440	
Impulse withstand voltage Uimp, kV		4			
Thermal current Ith, A		20	25	40	63
Rated operating current Ie, A	AC-15 single-phase, 230 V	6			
	AC-15 three-phase, 400 V		4	4	
Electrical wear resistance, cycle	AC-15	300000	500000	150000	
Weight, g					
OptiDin MK63-20				135	
OptiDin MK63-25				275	
OptiDin MK63-40				430	
OptiDin MK63-63				430	
OptiDin MK63-RH				30	
OptiDin MK63-P730				13	

*1) AC / DC can be controlled by alternating voltage with a frequency of 40 to 400 Hz
*2) Coil consumption for main contacts type -04 is 3,8 VA/3,8 W
*3) Data for single-phase power correspond to main contacts of type -22, -20 and -02

Additional devices for quick and safe installation

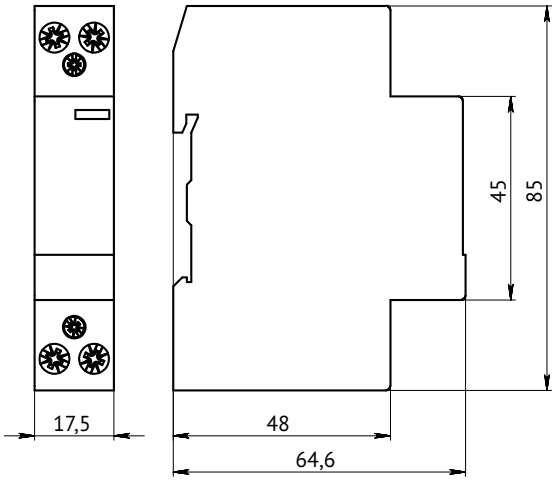
Appearance	Title	Reference
	Auxiliary contact unit OptiDin MK63-RH11	114158
	dummy module OptiDin MK63-P730	114177

Wiring

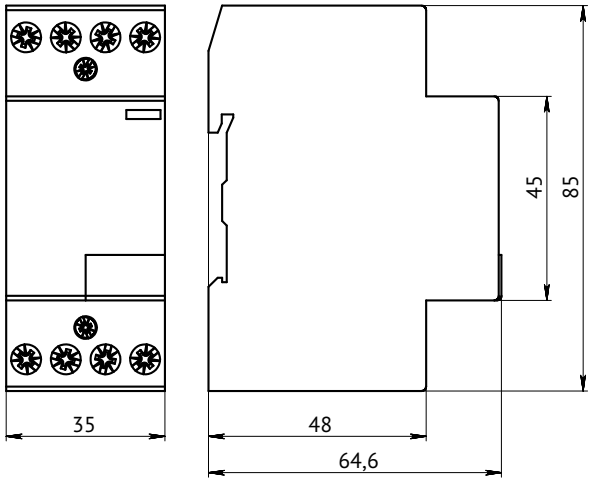
Device type	Conductor cross-section connected to the main circuit, mm²		Conductor cross-section connected to the control circuit, mm²	
	Single-core	Multicore	Single-core	Multicore
OptiDin MK63-20	1-10	1-6	1-2,5	1-2,5
OptiDin MK63-25	1-10	1-6	1-2,5	1-2,5
OptiDin MK63-40	1,5-20	1,5-16	1-2,5	1-2,5
OptiDin MK63-63	1,5-20	1,5-16	1-2,5	1-2,5
OptiDin MK63-RH	0,5-2,5	0,5-2,5	-	-

Overall dimensions (mm)

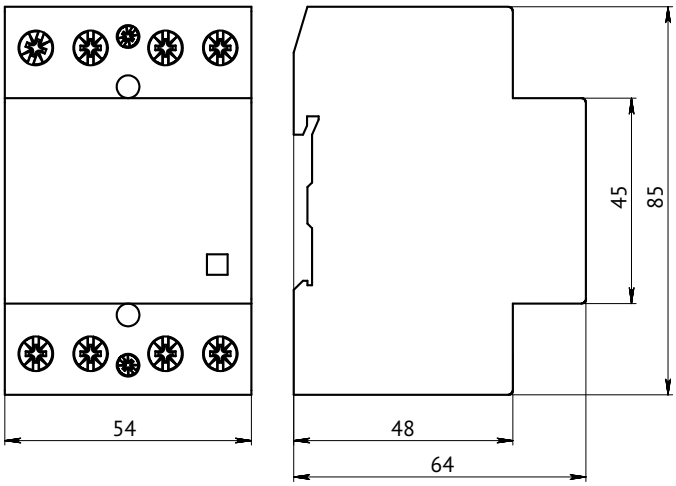
OptiDin MK63-20



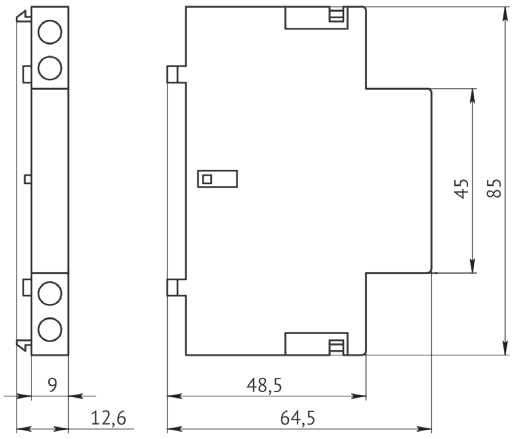
OptiDin MK63-25



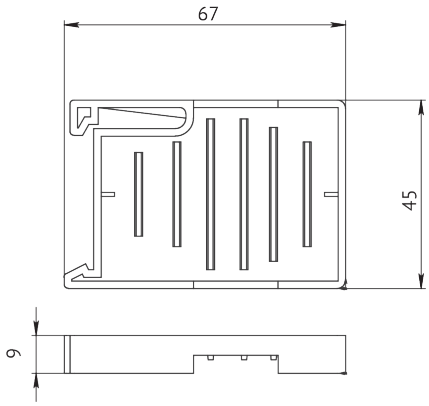
OptiDin MK63-40
OptiDin MK63-63



OptiDin MK63-RH



OptiDin MK63-P730



The table for choosing optimal modification of the OptiDin MK63 contactors for switching of various illumination sources

Lamp Type	Power, W	Current, A	Compensating capacitor, uF	The maximum number of lamps per pole at 230 V, 50 Hz			
				OptiDin MK63- 20	OptiDin MK63- 25	OptiDin MK63- 40	OptiDin MK63- 63
Vacuum and halogen incandescent lamps	15	0,07	-	130	130	260	330
	25	0,11	-	80	80	160	200
	40	0,18	-	50	50	100	125
	60	0,26	-	33	66	65	85
	75	0,33	-	26	26	53	66
	100	0,44	-	20	20	40	50
	150	0,65	-	13	13	26	33
	200	0,87	-	10	10	20	25
	300	1,30	-	6	6	13	16
	500	2,17	-	3	3	8	10
	1000	4,35	-	1	1	4	5
Compact fluorescent lamps, serial connection	10	0,19	1,4	50	60	105	165
	13	0,18	1,4	50	60	105	165
	18	0,23	1,7	40	50	85	135
	26	0,33	2,5	30	35	60	95
	18	0,38	2,7	25	30	50	80
	24	0,35	2,7	25	30	50	80
	36	0,44	3,4	20	25	45	70
Compact fluorescent lamps, parallel connection	5	0,18	2,2	13	16	100	150
	7	0,18	2,1	14	17	104	157
	9	0,17	2,0	15	18	110	165
	10	0,19	2,2	13	16	100	150
	11	0,16	1,7	17	21	125	194
	13	0,18	1,8	16	20	120	183
	18	0,23	2,3	13	15	95	143
	26	0,33	3,3	9	11	66	100
	18	0,38	4,2	7	8	52	78
	24	0,35	3,6	8	10	61	91
	36	0,44	4,4	6	8	50	75
Compact fluorescent lamps with electronic starting-regulating equipment (electronic control gear (ECG))	5	0,05	-	45	63	180	250
	7	0,05	-	45	63	180	250
	9	0,07	-	32	45	128	180
	10	0,07	-	32	45	128	180
	11	0,07	-	32	45	128	180
	13	0,07	-	32	45	128	180
	18	0,22	-	10	14	40	57
	24	0,22	-	10	14	40	57
	26	0,22	-	10	14	40	57
	32	0,22	-	10	14	40	57
	36	0,22	-	10	14	40	57
	40	0,22	-	10	14	40	57
	42	0,22	-	10	14	40	57
	55	0,28	-	8	11	32	45
	57	0,28	-	8	11	32	45
	70	0,35	-	6	9	25	36
	80	0,41	-	5	8	22	30
	120	0,58	-	4	5	15	22
	2x9	0,11	-	2x16	2x22	2x90	2x125
	2x10	0,11	-	2x16	2x22	2x90	2x125
	2x11	0,11	-	2x16	2x22	2x90	2x125
	2x13	0,11	-	2x16	2x22	2x90	2x125
	2x18	0,30	-	2x5	2x7	2x20	2x28
	2x24	0,31	-	2x5	2x7	2x20	2x28
	2x26	0,31	-	2x5	2x7	2x20	2x28
	2x32	0,31	-	2x5	2x7	2x20	2x28
	2x36	0,31	-	2x5	2x7	2x20	2x28
	2x40	0,40	-	2x4	2x6	2x18	2x26
	2x42	0,40	-	2x4	2x6	2x18	2x26
	2x55	0,55	-	2x3	2x5	2x16	2x22
	2x57	0,55	-	2x3	2x5	2x16	2x22
Fluorescent lamps - without correction or with consequent correction	11	0,16	1,3	55	70	125	200
	18	0,37	2,7	22	24	90	140
	24	0,35	2,5	22	24	90	140
	36	0,34	3,4	17	20	65	95
	58	0,67	5,3	14	17	45	70
	65	0,67	5,3	14	17	35	50
	85	0,80	5,3	12	15	25	40

Lamp Type	Power, W	Current, A	Compensating capacitor, uF	The maximum number of lamps per pole at 230 V, 50 Hz			
				OptiDin MK63- 20	OptiDin MK63- 25	OptiDin MK63- 40	OptiDin MK63- 63
Fluorescent lamps - stabilizing circuit	2x11	0,07	-	2x50	2x60	2x140	2x200
	2x18	0,11	-	2x30	2x40	2x100	2x150
	2x24	0,14	-	2x24	3x31	2x78	2x118
	2x36	0,22	-	2x17	2x24	2x65	2x95
	2x58	0,35	-	2x10	2x14	2x40	2x60
	2x65	0,35	-	2x9	2x13	2x30	2x45
	2x85	0,47	-	2x6	2x10	2x20	2x30
Fluorescent lamps - parallel correction	11	0,16	3,5	9	10	62	94
	18	0,37	4,5	7	8	48	73
	24	0,35	4,5	7	8	48	73
	36	0,34	4,5	7	8	48	73
	58	0,67	7,0	4	5	31	47
	65	0,67	7,0	4	5	31	47
	85	0,80	8,0	3	4	27	41
Fluorescent lamps with electronic starting-regulating equipment (electronic control gear (ECG))	18	0,09	-	25	35	100	140
	36	0,16	-	15	20	52	75
	58	0,25	-	14	19	50	72
	2x18	0,17	-	2x12	2x17	2x50	2x70
	2x36	0,32	-	2x7	2x10	2x26	2x38
	2x58	0,49	-	2x7	2x9	2x25	2x36
Mercury lamps of high pressure without correction	50	0,61	-	14	18	38	55
	80	0,80	-	10	13	29	42
	125	1,15	-	7	9	20	29
	250	2,15	-	4	5	10	15
	400	3,25	-	2	3	7	10
	700	5,40	-	1	2	4	6
	1000	7,50	-	1	1	3	4
Mercury lamps of high pressure - parallel correction	50	0,25	7	4	5	31	47
	80	0,41	8	4	5	27	41
	125	0,65	10	3	4	22	33
	250	1,22	18	1	2	12	18
	400	1,95	25	1	1	9	13
	700	3,45	45	-	-	5	7
	1000	4,80	60	-	-	4	5
Metal halide lamps - without correction	50	0,35	-	18	22	43	60
	80	1,00	-	10	12	23	32
	125	1,80	-	5	7	12	18
	250	3,00	-	3	4	7	10
	400	3,50	-	3	3	6	9
	700	9,50	-	1	1	2	3
	1000	16,50	-	-	-	1	1
Metal halide lamps - parallel correction	35	0,25	6	5	6	36	50
	70	0,45	12	2	3	18	25
	150	0,75	20	1	1	11	15
	250	1,50	33	-	1	6	9
	400	2,50	35	-	1	6	8
	1000	5,80	95	-	-	2	3
	2000	11,50	148	-	-	1	2
High-pressure sodium lamps - without correction	150	1,80	-	5	6	17	22
	250	3,00	-	3	4	10	13
	400	4,70	-	2	2	6	8
	1000	10,30	-	-	1	3	3
High-pressure sodium lamps - with correction	150	0,83	20	1	1	11	16
	250	1,50	33	-	1	6	10
	400	2,40	48	-	-	4	6
	1000	6,30	106	-	-	2	3
Low-pressure sodium lamps - without correction	18	0,35	-	22	27	71	90
	35	1,50	-	7	9	23	30
	55	1,50	-	7	9	23	30
	90	2,40	-	4	5	14	19
	135	3,50	-	3	4	10	13
	180	3,50	-	3	4	10	13
Low-pressure sodium lamps - parallel correction	18	0,35	5	6	7	44	66
	35	0,31	20	1	1	11	16
	55	0,42	20	1	1	11	16
	90	0,63	26	1	1	8	12
	135	0,94	45	-	-	4	7
	180	1,16	40	-	-	5	8
Transformers for low-pressure halogene incandescent lamps	20	-	-	40	52	110	174
	50	-	-	20	24	50	80
	75	-	-	13	16	35	54
	100	-	-	10	12	27	43
	150	-	-	7	9	19	29
	200	-	-	5	6	14	23
	300	-	-	3	4	9	14

Modular command and signal feeders

OptiDin SL63 and FSL63 Modular indicators

Signal lamps are intended for light indication of the operating status of electrical equipment in electrical circuits with a voltage of up to 230 V AC at a frequency of 50 Hz.

The light indicators of the phases are intended for the light indication of the supply voltage in each phase.

Signal lamps and phase light indicators comply with the requirements of GOST P 50030.5.1 (appendix J), TP TC 004/2011 and are manufactured according to TY3428-070-05758109-2012.

Designation

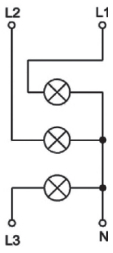
OptiDin SL63 - R 230 AC - UHL3
1 2 3 4 5 6

1	**Products range**	OptiDin				
2	**Configuration of the lamp**	SL63				
3	**Color specification code**	R - red	Y - yellow	G - green	B - blue	W - white
4	**Rated operational voltage, V**	230	110	48	24	
5	**Current type**	AC	AC/DC			
6	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3)				

OptiDin FSL63 - 230 - UHL3
1 2 3 4

1	**Products range**	OptiDin			
2	**Type of phase light indicator**	FSL63			
3	**Rated operating voltage, V**	230	110	48	24
4	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3)			

References (series)

Type		Signal lamps OptiDin SL63					Phase light indicator OptiDin FSL63
Appearance							
Wiring diagrams							
Color		Red	Yellow	Green	Blue	White	
Rated operating voltage in the alternating current circuit of frequency 50 UV, Ue, V	Current type						
24	AC/DC	138609	138613	138617	138621	138625	
48	AC/DC	138608	138612	138616	138620	138624	
110	AC	138607	138611	138615	138619	138623	
230	AC	138606	138610	138614	138618	138622	138626

Technical specifications

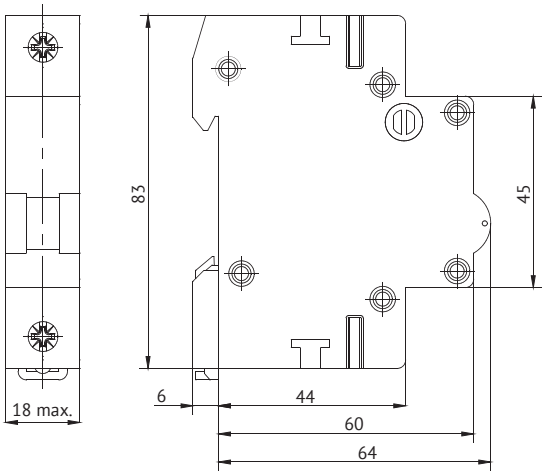
	OptiDin SL63	OptiDin FSL63
Main characteristics		
Insulation voltage Ui, V	230	400
Degree of pollution	3	
Nominal operating current of the information index, at 230 V, not more than, A	0,02	
Consumed rated electric power (power consumption), no more, VA	5	15
Operating mode	Prolonged	
Additional characteristics		
Degree of protection in compliance with the requirements of GOST14254	IP20	
Environment in compliance with the requirements of GOST 15150	UHL3 (TC3)	
Operating temperature range, ° C	from -60 to +40	
Storage temperature range, ° C	from -45 to +50	
Weight, g		
OptiDin SL63	68	
OptiDin FSL63	100	

Wiring

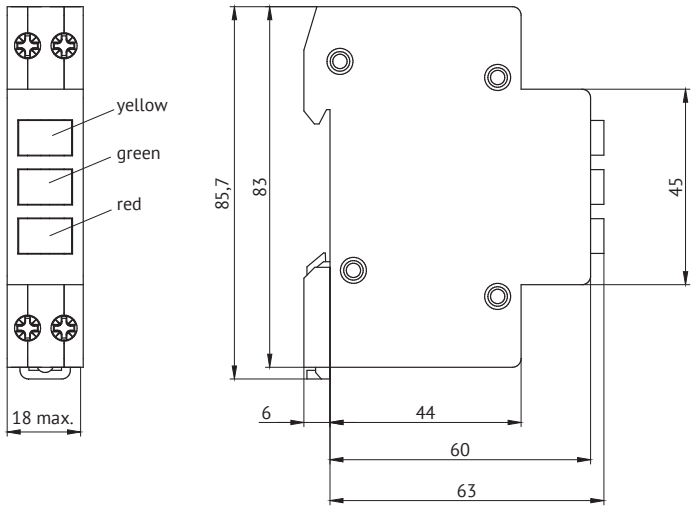
Tightening torque, N/m	Signal lamps			Tightening torque, N/m	Phase light indicator		
	Conductor cross-section, mm²				Conductor cross-section, mm²		
	Copper flexible (multicore)	Copper hard (multicore and single-core)	Aluminum (multicore and single-core)		Copper flexible (multicore)	Aluminum flexible	Aluminum inflexible (hard)
1,5	1,5 - 6			0,5	1,5 - 25		

Overall dimensions (mm)

OptiDin SL63



OptiDin FSL63



OptiDin KM63 Modular Buttons

The control buttons OptiDin KM63 are designed for operational control of contactors (magnetic starters), various automation relays and other technological equipment in electrical circuits of alternating current with the voltage up to 230 V.

The specified buttons meet the requirements of GOST P 50030.5.1, TP TC 004/2011 and are manufactured in compliance with ТУ3428-071-05758109-2012.

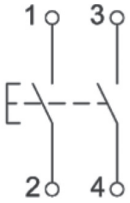
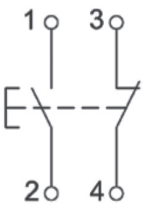
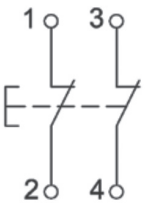
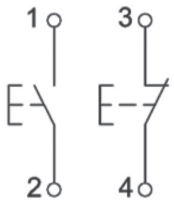
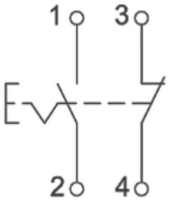
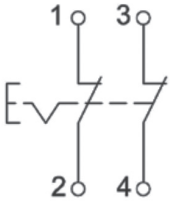
Designation

OptiDin KM63 - C - 11 - UHL3

1 2 3 4 5

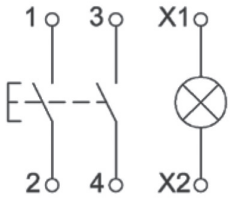
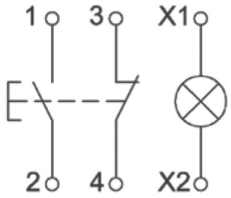
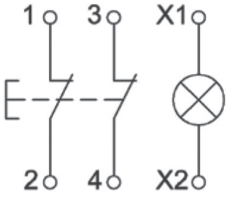
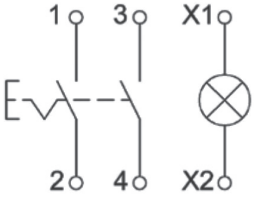
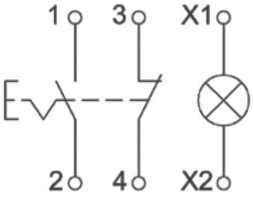
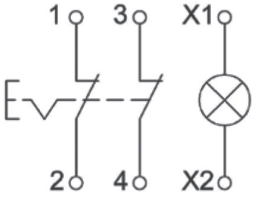
1	**Products range**	OptiDin				
2	**Configuration**	KM63				
3	**Type of control mechanism construction and functions of the contact element**	A	B	C	AF	CF
4	**Order and numerical designation of a number of NO and NC contacts**	10	01	11	20	02
5	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3)				

Reference (series)

	Button modular			Modular button with two independent controls	
Appearance					
Wiring diagrams					
Without fixing the control unit in the lower position	138899	138998	138800	138904	
Wiring diagrams					
With the control unit in the lower position	138902	138901	138903		

Technical specifications

Main characteristics		OptiDin KM63
Rated operating voltage, alternating current 50 Hz, Ue, V		230
Rated operating current Ie, A		6
Insulation voltage Ui, V		230
Additional characteristics		
Degree of protection according to GOST 14254		IP20
Durability, cycles	commutation	100 000
	mechanical	250 000
Overcurrent protection: automatic switch of type OptiDin BM63 with type B, on rated current, A		8
Conditional short-circuit current, A		1000
Power consumed by one normally closed contact, not more than, W		3
Conditional thermal current in the open air Ith, A		16
Conditional heat sheath current, Ithe, A		6
Environment execution in accordance with GOST 15150		UHL3 (TC3)
Operating temperature range, ° C		from -60 to +40
Storage temperature range, ° C		from -45 to +50
Weight, g		68

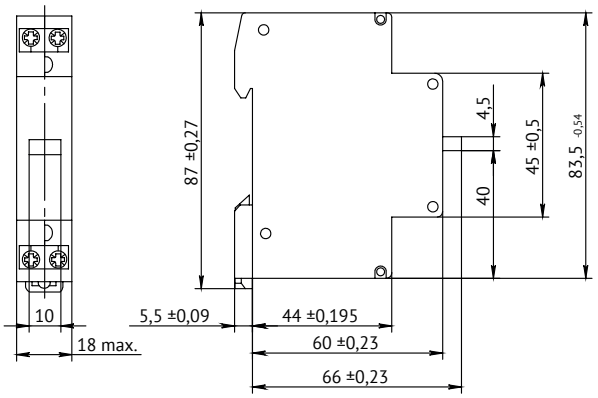
	Button modular with a built-in green indicator light		
			
			
	138906	138905	138907
			
	138909	138908	138910

Wiring

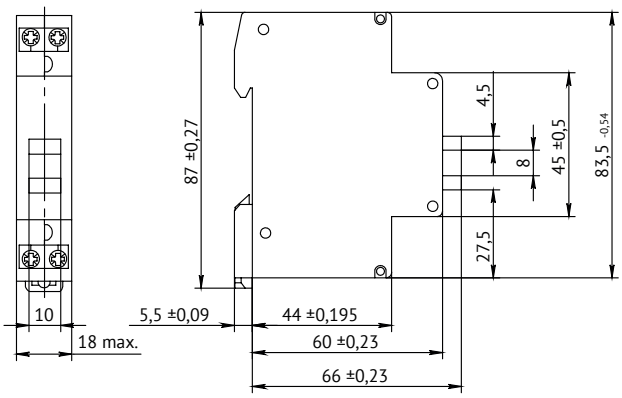
Tightening torque, N/m	Terminal pin clamps			Tightening torque, N/m	Terminals of light indicator outputs		
	Conductor cross-section, mm²				Conductor cross-section, mm²		
	Copper flexible (multicore)	Copper inflexible (multicore and single-core)	Aluminum (multicore and single-core)		Copper flexible (multicore)	Aluminum inflexible (hard)	Aluminum flexible
0,8	1,5 - 6			0,4	0,5 - 4		

Overall dimensions (mm)

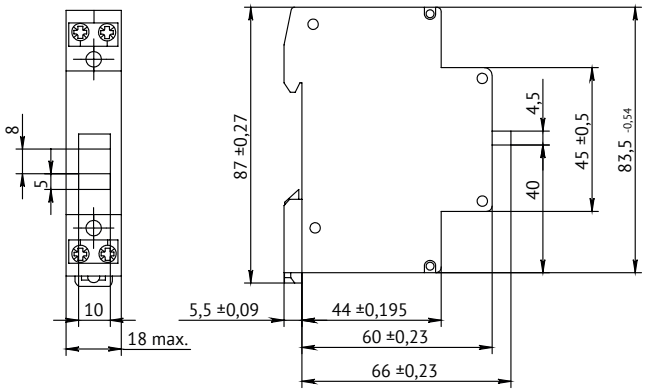
OptiDin KM63-A(AF)



OptiDin KM63-B



OptiDin KM63-C(CF)



OptiDin ZM63 Modular ringers

The electrical modular ringers are designed for use in AC networks with voltages up to 230 V and serve to signal the occurrence of emergency situations (FAULTS) in electrical circuits.

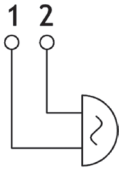
The specified ringers meet the requirements of GOST P 7220-87, GOST P 50030.5.1, TP TC 004/2011.

Designation

OptiDin ZM63 - 230 AC - UHL3
1 2 3 4 5

1	**Products range**	OptiDin		
2	**Configuration of the phase indicator**	ZM63		
3	**Rated operational voltage, V**	230	24	12
4	**Current type**	AC		
5	**Symbol of environment and environmental class of location in compliance with the requirements of GOST 15150**	UHL3 (international TC3)		

References (series)

Type	Ringers modular OptiDin ZM63
Schematic circuit diagram	
Rated operating voltage, alternating current 50 Hz, Ue, V	
12	138630
24	138629
230	138627

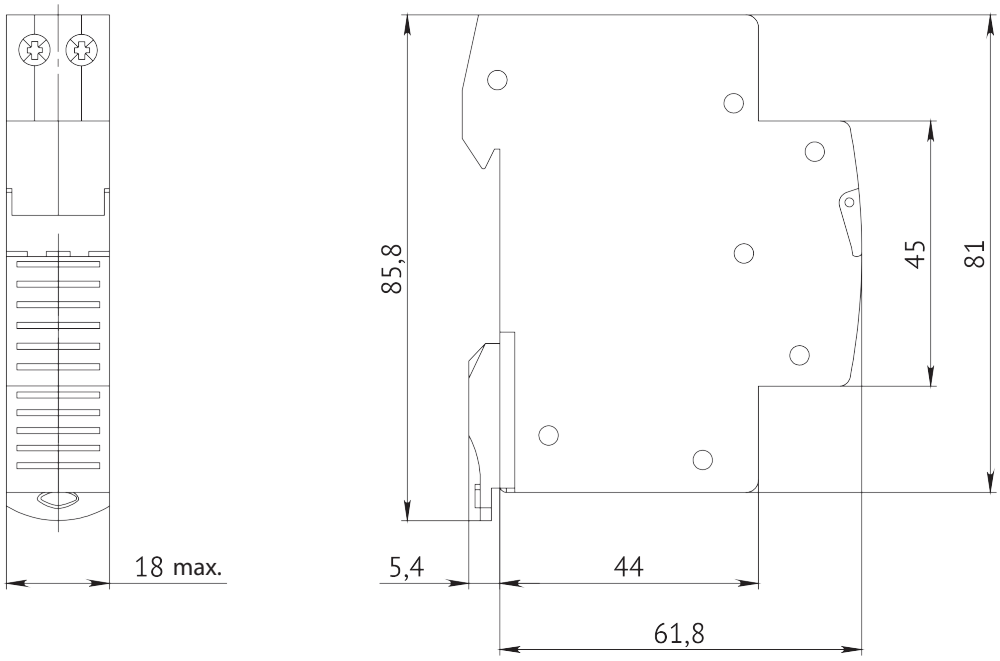
Technical specifications

Parameter title	OptiDin ZM63
Number of poles	single-pole
Rated operating voltage, V	12, 24, 110, 230
Sound volume, not more than, dB	90
Rated operational current Ie, at voltage 230 V, not more, A	0,03
Rated frequency, Hz	50
Degree of protection according to GOST 14254	IP20
Cross-section of the wire connected to the terminal clamps, mm^2	1,5 ÷ 6
Average service life, years	10
Environment and placement category in compliance with the requirements of GOST 15150	UHL3 (TC3)
Operation mode	intermittent
Rated impulse withstand voltage, V	230
Weight, g	100

Wiring

Tightening torque, N/m	Conductor cross-section, mm²	
	Copper flexible (multicore and single-core)	Aluminum (multicore and single-core)
1,5	1,5 - 6	

Overall dimensions (mm)



Modular control and protection relays

Selection guide

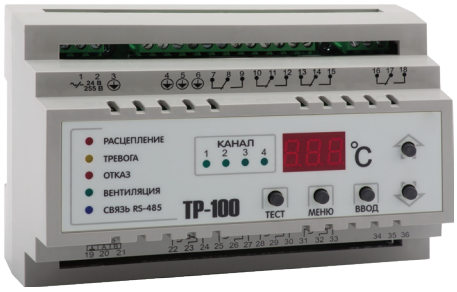
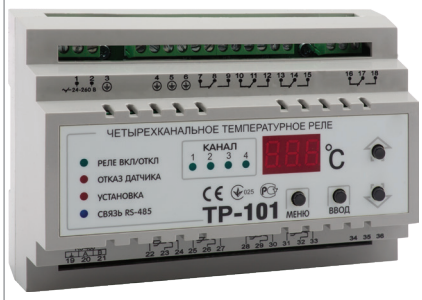
Application	Single-phase voltage monitoring relays				
Physical appearance					
Title	Voltage relay OptiDin PH-111M	Voltage relay OptiDin PH-113	Voltage relay OptiDin PH-116	Voltage relay OptiDin PH-117	
Main functions	• Voltage relay; • Minimum voltage relay; • Maximum voltage relay; • Power on-delay relay.	• Voltage relay; • Minimum voltage relay; • Maximum voltage relay; • Power on-delay relay.	• Voltage relay; • Minimum voltage relay; • Maximum voltage relay; • Power on-delay relay.	• Voltage relay; • Minimum voltage relay; • Maximum voltage relay; • Power on-delay relay.	
	114056	114058	114023	114053	

	Three-phase voltage and phase control relays			Phase selector relays
				
	Voltage and phase control relay OptiDin РНПП-301	Voltage and phase control relay OptiDin РНПП-302	Voltage and phase control relay OptiDin РНПП-311М	Phase selector relay OptiDin ПЭФ-301
	• Monitoring the overrun of actual voltage value beyond the permissible threshold (RMS voltage contingency); • Control of impaired phase sequence and sticking of phases; • Monitoring the failure of full-phase and balance of network voltage.	• Monitoring the overrun of the actual voltage value beyond the permissible threshold (RMS voltage contingency); • Control of impaired phase sequence and sticking of phases; • Monitoring the failure of full-phase and symmetric network voltage; • Monitoring of the main parameters of the electrical network and their deviation, load disconnection.	• Monitoring the overrun of the actual voltage value beyond the permissible limits of threshold (RMS voltage contingency); • Control of impaired phase sequence and sticking of phases; • Monitoring the failure of full-phase and balance network voltage; • Monitoring the main parameters of the electrical network and in the event of supply deviation tripping of the load.	• Supply of industrial and household single-phase load 220 V/50 Hz from three-phase four-wire network 3x380 + N.
	114063	114064	114060	114066

Application	Multifunctional time relays	Timers with voltage and light control relays		Power limit relays and current relays	
Physical appearance					
Title	Time relays OptiDin РЭВ-201М	Relay universal OptiDin РН-16ТМ	Relay universal OptiDin РЭВ-302	Current relay OptiDin PMT-101	
Main functions	• Power on-delay relay.; • Pulse relay; • Relay periodic (cyclic); • Control relay.	• Voltage relay; • Light relay; • Real time relay.	The microprocessor programmable device is designed to enable / disable one or two loads in a pre-installed user-specific time points, taking into account the network voltage and illumination of the external photosensor.	• Digital ammeter; • Current consumption limiting relay; • Load priority selection relay.	
	114067	114072	114073	114074	

	Power limit relays and current relays		Universal motor protection units
			
	Power relay OptiDin OM-110	Power relay OptiDin OM-310	Motor protection relay OptiDin УБЗ-301
	• Digital wattmeter (active or full power meter); • Power limit relay.	• Consumer protection in the event of substandard electrical network parameters; • Full load disconnection if the power consumption exceeds the main threshold for a user-specified time; • Partial load shutdown when the additional power consumption exceeds the power set by the user; • Measurement and indication of parameters of a three-phase electrical network (effective values of phase and linear voltages of forward, reverse and zero sequences, active values of phase currents, active, reactive and apparent power consumption, cosφ); • Emergency fault notification; • Remote connection and disconnection of the load via RS-232 / RS485 interface or external switch.	• Simple and accurate setting of the rated EM current; • Setting the operating current of the EM; • Actuation on overload with a dependent time delay; • The possibility of shifting the current characteristic both along the current axis and along the time axis; • Threshold setting for the minimum / maximum voltage, skew of line voltages and phase currents, as well as the time of automatic reactivation at customer's own discretion; • Indication of the type of alarm, availability of voltage supply, current range.
	114075	114076	139505, 139506, 139507

Application	Universal motor protection units		
Physical appearance			
Title	Motor protection relay OptiDin УБЗ-302	Motor protection relay OptiDin УБЗ-302-1	
Main functions	Has a full set of protections implemented in the OptiDin УБЗ-301. In addition, it provides protection against delayed starting and blocking of the rotor, controls overheating of the motor windings by means of temperature sensors.	• Protection at low-quality mains voltage (unacceptable voltage surges, phase failure and skew, impaired phase sequence and sticking of phases; • Protection during mechanical overloads (symmetrical overload on phase / line currents); • Protection against exceeding the threshold of the negative sequence current (current skew); • Protection with a delayed start-up of the engine or block of the rotor; • Protection at an unacceptably low level of insulation between the stator and the motor housing (check before switching on); • Protection during earth faults of the stator winding during operation - protection by leakage currents to earth; • Protection against thermal overload of the engine; • A set of certain protection parameters is determined by the user by programming the device. For each type of protection, it is possible to prohibit or permit automatic reclosing (AR) of the load.	
	129855	129856	

	Temperature controllers		
			
	OptiDin TP-100 Temperature relay	OptiDin TP-101 Temperature relay	OptiDin TP-102 Temperature relay
	• Protection of motors and generators; • Protection of three-phase dry transformers with additional control of the temperature of the core or the environment.	• Temperature measurement on four independent channels using standard sensors; • Temperature control according to the proportional-integral-differential (PID) law, with the output key element (relay); • Two-position temperature control; • Display of the current measured temperature value on the built-in LED digital indicator; • Transfer to the PC of the measured temperature values of the monitored sensors using the standard Modbus RTU protocol; • Detection of open or closed lines of connected sensors; • Digital filtering and correction of the measured temperature; • Programming with buttons on the front panel and PC; • Save settings when the power is turned off; • Protect settings from unauthorized changes.	• Maintenance of temperature in four thermal zones in compliance with a cyclic scheme; • Blocking control of uncontrolled zones; • Displays the current monitored zone and its monitoring time on the built-in LED digital indicator; • Transmission of data to the PC on the controlled zones using the standard Modbus RTU protocol; • Programming with buttons on the front panel or PC; • Save settings when the power is turned off; • Protect settings from unauthorized changes.
	114077	114078	114079

Single-phase voltage monitoring relays

Single-phase voltage control relays are designed to protect single-phase loads from unacceptable fluctuations in the mains voltage. They have a wide range of adjustments, including adjustment of the on-delay for protection of refrigerating, compressor and air conditioning equipment. In all voltage relays, the return ratio (hysteresis) is about 5 V. The operating range is 30-150% of the rated voltage. In the event of deep undervoltages, as well as at sudden spikes in voltage, an accelerated tripping of the relay is automatically introduced.

The voltage control relays provide automatic load switching after recovery of the voltage parameters with a certain time delay. They are light in weight and small in size. Can be used as independent switching devices, and for controlling other devices, for example contactors modular OptiDin MK63.

Voltage relay OptiDin PH-111M

The OptiDin PH-111M relay is designed to disconnect the household and industrial single-phase load of 220 V, 50 Hz with unacceptable voltage fluctuations in the network and then automatically turn it on after restoring the network parameters.

Depending on the power consumption, the load can be connected directly to the relay terminals, or via a contactor/magnetic starter.

The relay can work in four independent modes, as:
- voltage relay;
- minimum voltage relay;
- maximum voltage relay;
- power on delay relay.

A load status indicator (on/off) and a three-digit seven-segment indicator are displayed on the front panel of the device, which, depending on the status of the device, indicates:
- current effective value of voltage;
- the exact value of the parameter being set;
- time remaining until the load is restarted;
- emergency load disconnection (flashing of the current voltage value).

The knobs of potentiometers located on the front panel allow the user to set:
- response threshold for the maximum allowable voltage value;
- response threshold for the minimum allowable voltage value;
- load startup time delay after the recovery of the network parameters.

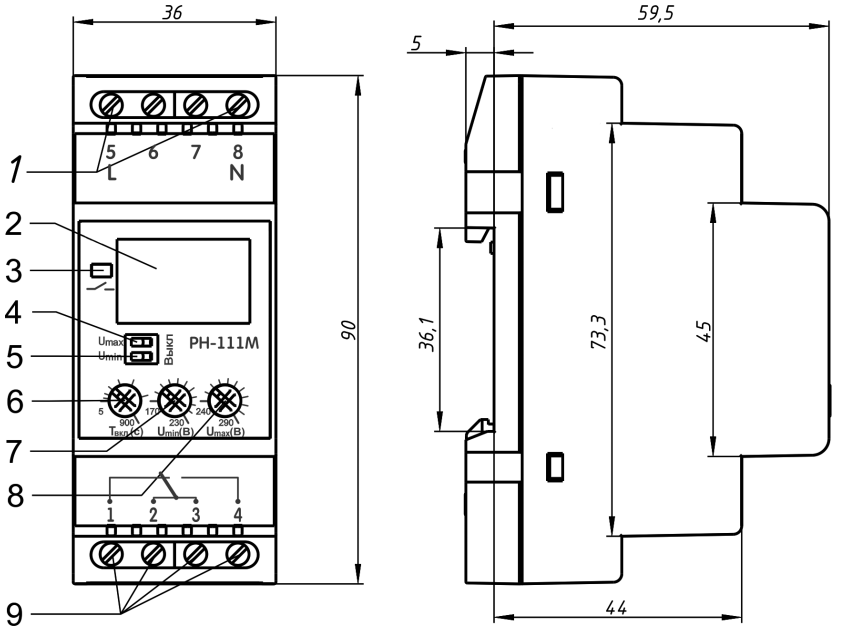
Technical specifications

Rated voltage Un, V		220/230
Network frequency, Hz		47-65
Adjustment range:	- tripping by Umin, V - tripping by Umax, V - time of automatic reclosing, sec.	170-230 240-290 5-900
Fixed actuation time according to Umax, s		1
Fixed tripping delay according to Umin, s		12
Fixed response time at the voltage reduction by more than 60 V from the Umin setting, s		0,2
Fixed response time at the voltage buildup above 30 V from the Umax setting, s		0,12
Maximum switching current (active load), A, not less than		16
Accuracy of the voltage response threshold determination , V		3
Minimum voltage providing survival, V		100
Maximum voltage providing survival, V		420
Hysteresis (voltage return ratio), V, not less than		4-5
Operating temperature range, °C		from -35 to +55
Storage temperature range, °C		from -45 to +70
Total current consumption from the network, mA		up to 15
Commutation life of output contacts:	- under the load of 16 A, times, not less than - under load 5 A, times, not less than	100 thsd. 1 mln.
Overall dimensions, (two modules of type S), mm		36x92x64,5
Weight, kg, no more than		0,1
Environment		UHL3.1 (international TC3.1)

Characteristics of output contacts 1-3 (4)-6

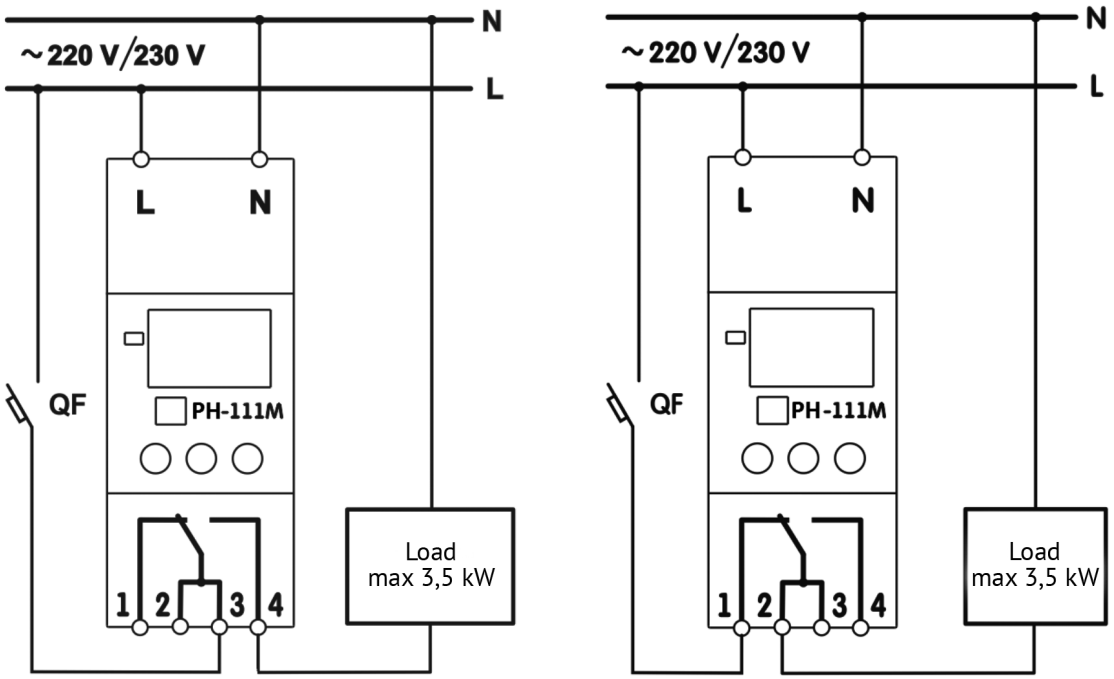
Cos φ	Maximum current at U ~ 250 V, A	Maximum power at a normally closed contact, VA	Maximum switching power, VA	Maximum continuous additional voltage for AC/DC, V	Maximum current at Uост= 30 V, A
0,4	5	5000	4000	380/150	5
1	16	5000	4000	380/150	5

Overall dimensions (mm)



1 - Input contacts for power supply connection;
2 – Three-digit indicator;
3 – Load-on indicator (output relay);
4 – Overvoltage control switch (Umax);
5 – Undervoltage control switch (Umin);
6 – Handle for setting the AR time (Ton(sec));
7 – Handle for setting undervoltage threshold (Umin (V));
8 – Handle for setting overvoltage threshold (Umax (V));
9 – Output contacts for load connection.

Relay wiring diagram



Voltage relay OptiDin PH-113

The OptiDin PH-113 voltage relay is designed to disconnect the household and industrial single-phase load of 220 V, 50 Hz with unacceptable fluctuations in the voltage of the network and then automatically turn it on after the recovery of the network parameters. The load is connected to the network either directly through the relay contacts, or via a magnetic starter. Depending on the power consumption, the load can be connected either directly to the relay outputs, or via a contactor/magnetic starter.

The relay can work in four independent modes, as:
- voltage relay;
- minimum voltage relay;
- maximum voltage relay;
- power on delay relay.

The load status indicator (on/off) and a three-digit seven-segment indicator are introduced on the front panel of the device, which, depending on the status of the device, indicates:
- current effective voltage value;
- the exact value of the parameter being set;
- time remaining until the load is restarted;
- emergency load disconnection (flashing of the current voltage value).

The knobs of potentiometers located on the front panel allow the user to set:
- response threshold for the maximum allowable voltage value;
- response threshold for the minimum allowable voltage value;
- load startup time delay after the recovery of the network parameters.

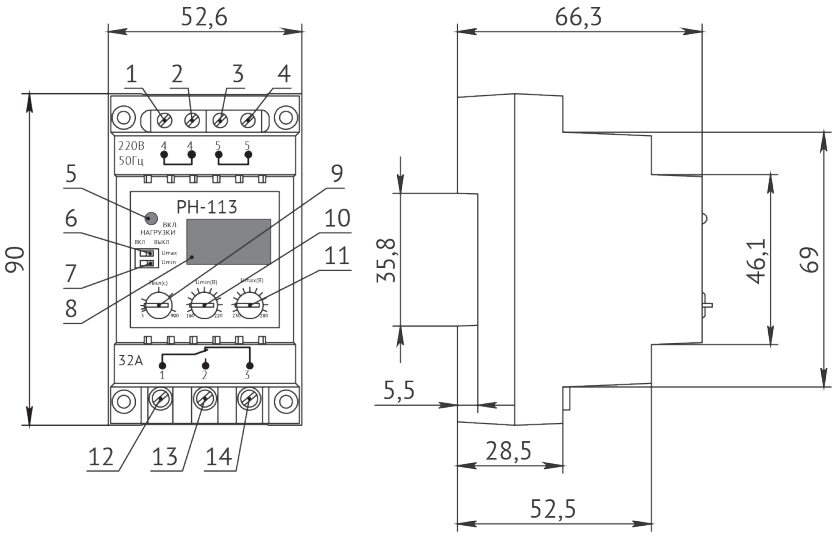
Technical specifications

Rated voltage Un, V		230
Network frequency, Hz		48-52
Adjustment range:	- tripping by Umin, V - tripping by Umax, V - automatic reclosing time, s	160-220 230-280 5-900
Fixed response time by Umax, s		1
Fixed tripping delay according to Umin, s		12
Fixed response time at the voltage reduction by more than 60 V from the Umin setting, s		0,2
Fixed response time at the voltage buildup above 30 V from the Umax setting, s		0,12
Maximum switching current (active load), A, not less than		32
Accuracy of the voltage response threshold determination , V		3
Minimum voltage providing survival, V		100
Maximum voltage providing survival, V		420
Hysteresis (voltage return ratio), V, not less than		4-5
Operating temperature range, °C		from -35 to +55
Storage temperature range, °C		from -45 to +70
Total current consumption from the network, mA		up to 15
Commutation life of output contacts:	- under a load of 16 A, times, not less than - under a load of 5 A, times, not less than	100 thsd. 1 mln.
Overall dimensions, (two modules of type S), mm		52,6x90x66,3
Weight, kg, no more than		0,150
Environment		UHL3.1 (international TC3.1)

Characteristics of output contacts 1-3 (4)-6

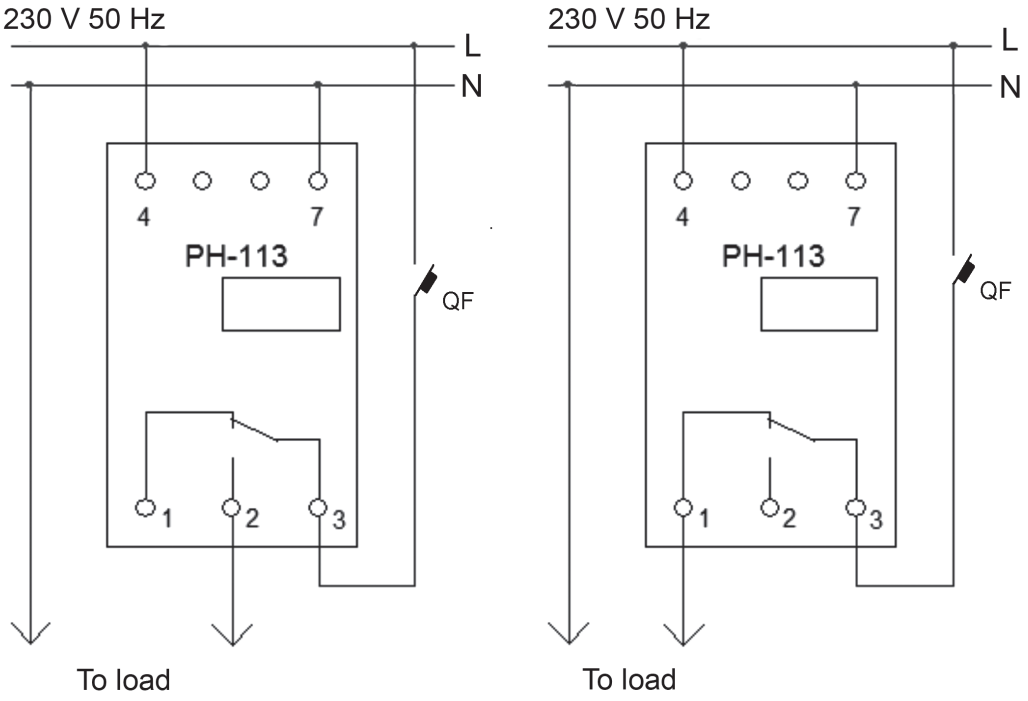
Cos φ	Max. current at U ~ 250 V, A	Maximum switching power, VA	Maximum continuous additional voltage for AC/DC, V	The maximum current at Uпост = 30 V, A
1	32	7200	250/110	30

Overall dimensions (mm)



1, 4 - Input contacts
2, 3 - Dead contacts
5-7 - Output contacts
8 - Load "ON" Indicator
9 - Maximum voltage control switch (Umax)
10 - Undervoltage control switch (Umin)
11 - Tricharged segment indicator
12 - Adjustment of the reclosure time (ACR)
13 - Adjustment of the threshold relay tripping by the the minimum voltage (Umin)
14 - Adjustment of the threshold relay tripping by the maximum voltage (Umax)

Relay wiring diagram



Voltage relay OptiDin PH-116

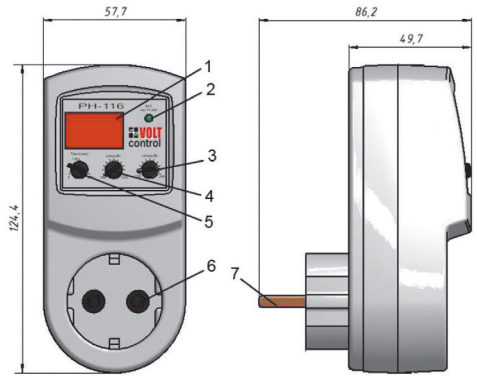
The OptiDin PH-116 voltage relay is designed to disconnect residential and industrial single-phase load of 220 V, 50 Hz with the power up to 3.5 kW (up to 16 A) at unacceptable circuit voltage fluctuations with automatic reclose (hereinafter referred to as AR) after recovery of the mains parameters.

OptiDin PH-116 indicates the actual value of the input voltage, faults condition and the output relay status.

Technical specifications

Rated voltage of frequency 50 Hz Un, V		220
Network frequency, Hz		47-65
Adjustment range:	- tripping by Umin, V - tripping by Umax, V - automatic reclose time, s	160-210 230-280 5-900
Fixed actuation time according to Umax, s		1
Fixed tripping delay according to Umin, s		7
Fixed time of voltage reduction below 145 V, s, not more than		0,12
Fixed tripping time at voltage build up to over 30 V from the setpoint by Umax or when voltage is more than 285 V, s, no more than		0,12
Fixed actuation time for a pulse voltage build up of more than 290 V for a duration pulse more than 1,5 ms, s, not more than		0,02
Maximum switching current (active load), A, not less than		16
Accuracy of the response threshold determination by U, V		up to 3
Maximum voltage providing survival, V		400
Operating temperature range, °C		from -20 to +45
Storage temperature range, °C		from -45 to +65
Power consumption at rated voltage, not more than, W		5
Commutation life of output contacts:	- under the load of 16 A, times, not less than - under the load of 5 A, times, not less than	100 thsd. 1 mln.
Overall dimensions, (two modules of type S), mm		124,4x57,7x86,2
Weight, kg, no more than		0,160
Environment		UHL3.1 (international TC3.1)
Minimum voltage providing survival (effective value), V		120

Overall dimensions (mm)



1- tricharged seven-segment indicator
2- load switch indicator
3- maximum voltage adjustment
4- minimum voltage adjustment
5- AR time adjustment
6- output contacts
7- input contacts

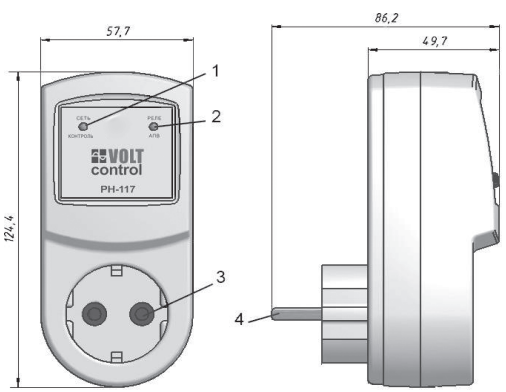
Voltage relay OptiDin PH-117

OptiDin PH-117 voltage relay is designed to disconnect the residential and industrial single-phase load of 220 V, 50 Hz with the power of up to 3.5 kW (up to 16 A) at unacceptable voltage fluctuations in the mains with automatic reclose (hereinafter AR) after recovery of the mains parameters.
OptiDin PH-117 indicates the compliance of the mains voltage with the current standards, faults condition and the output relay status.

Technical specifications

Rated voltage Un, V		220
Network frequency, Hz		47-65
Protection operating time at a voltage value above 260 V, s		1
Protection operating time at a voltage value above 285 V, s		0,03
Fixed tripping time with a pulse voltage build up of more than 295 V at a pulse duration of more than 1.5 ms, s		0,015
Tripping time at a voltage below 165 V, s		7
Tripping time at a voltage below 145 V, s		0,12
Maximum switching current (active load), A		16
Accuracy of threshold determination for U, V		up to 3
Maximum voltage providing survival, V		420
Hysteresis (voltage return ratio), V, not less than		4
Automatic reclose time (AR), s		5
Operating temperature range, ° C		from -25 to +45
Storage temperature, ° C		from -45 to +60
Total current consumption, mA		up to 15
Commutation life of output contacts:	- under the load of 16 A, times, not less than - under the load of 5 A, times, not less than	100 thsd. 1 mln.
Overall dimensions, mm, not more than		124,4x57,7x86,2
Weight, kg, no more than		0,16
Environment		UHL3.1 (international TC3.1)

Overall dimensions (mm)



1 - Indicator CIRCUIT / CONTROL
• lights up continuously if the mains voltage is within the range of 165-260 V;
• flashes at high speed if the mains voltage is more than 260 V;
• flashes at a low speed if the mains voltage is less than 165 V.
2 - LOAD / AR indicator
• Lit if the load relay is switched on;
• flashes if the load relay is switched off, the mains voltage is OK, the reclosing time is running;
• Does not light up if the load relay is switched off and the mains voltage is less than or greater than normal.
3 - Output contacts
4 - Input contacts

Three-phase voltage and phase control relays

Three-phase voltage and phase-to-phase voltage control relays of KEAZ are used to protect three-phase consumers from unacceptable voltage fluctuations in the network, phase failure and skew, sticking and phase sequence interruption. The devices can be used as stand-alone switching devices, as well as for controlling other devices, for example, modular OptiDin MK63 contactors. In all voltage relays, the return ratio (hysteresis) is about 5V. The operating range is 30-150% of the rated voltage. At deep undervoltage, as well as in the event of a spike in voltage, a fast-operate tripping of the relay is automatically introduced.

Voltage control relays provide automatic load switching after the recovery of voltage parameters with a certain time delay. They are light in weight and small in size. Three-phase voltage and phase monitoring relays have a special delay in voltage dips, operate at an effective or average value. This allows them to work in problem networks, including switching and impulse disturbances.

Relays are used to protect equipment that has an electric motor load, and are also used in ATS circuits, where it is necessary to carry out constant monitoring of the availability (availability check), quality and full-phase of the mains voltage.

Voltage and phase control relay OptiDin РНПП-301

Voltage relay OptiDin РНПП-301 is designed to protect three-phase consumers from the main types of accidents in the electrical network, such as:
- overrun of actual voltage value beyond the permissible threshold (RMS voltage contingency);
- impaired phase sequence and sticking of phases;
- failure of full-phase and balance of the mains voltage.

The device monitors the main parameters of the electrical network and, if they deviate, disconnects the load.
The relay allows built-in testing of the magnetic starter/contactor.

The LEDs on the front panel of the relay indicate:
- voltage supply in the network;
- load status (ON or OFF);
- type of fault.

Six adjustment potentiometers made on the front panel allow the user to set:
- threshold for the maximum permissible voltage;
- threshold tripping at the minimum permissible voltage value;
- threshold value of phase skew;
- response time of load disconnection in case of emergency voltage drop;
- response time of the load disconnection in the event of other types of network failure;
- load delay on time after recovering network parameters.

The device can operate in phase or line voltage monitoring mode (user selectable).

Technical specifications

Rated voltage Un, V	220/380
Network frequency, Hz	45-55
Adjustment range according to Umin in % Un, s	5-25
Adjustment range according to Umax in % Un, s	5-25
Range of adjustment in phase skew, %	5-20
Adjustment range according to Tmin, s	0-20
Adjustment range by Tcp, s	0-10
Adjustment range by Tвкл, s	0-600
Minimum tripping time at threshold values, s	0,1
Readiness time during the voltage supply to the relay, not more than, s	0,2
Hysteresis (voltage return ratio), not less than, V	5-6
The accuracy of voltage threshold determination, not more than, V	up to 3
Accuracy of phase imbalance, not more than, %	1,5
Voltage range at which the working capacity is ensured, % of nom.	50-150
Consumed power (under load), no more than, VA	3,0
Maximum switching current of output contacts, A	5
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +60

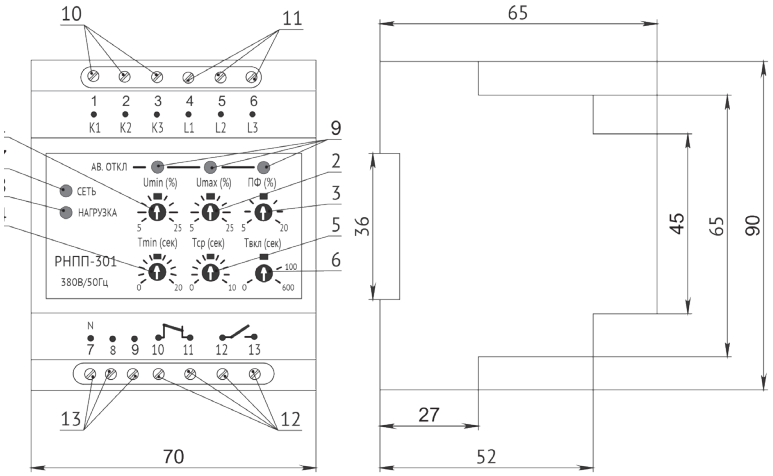
Total current consumption from the network, mA		up to 15
Commutation life of output contacts:	- under the load of 16 A, times, not less than - under the load of 5 A, times, not less than	100 thsd. 1 mln.
Degree of protection:	- the device - the terminal block	IP40 IP20
Overall dimensions, mm		70x90x65
Weight, no more than, kg		0,2
Environment		UHL3.1 (international TC3.1)
Mounting		on a standard DIN rail 35 mm
Mounting position		arbitrary

Characteristics of output contacts 1-3 (4)-6

Cos φ	Max. current at U ~ 250 V, A	Maximum switching power, VA	Maximum continuous additional voltage for AC / DC, V	Maximum current at Uпост = 30 V, A
0,4	3	1200	460	3
1	3	1200	460	3

With the option of monitoring for phase or line voltage.
With additional control switching power contacts of a magnetic starter.

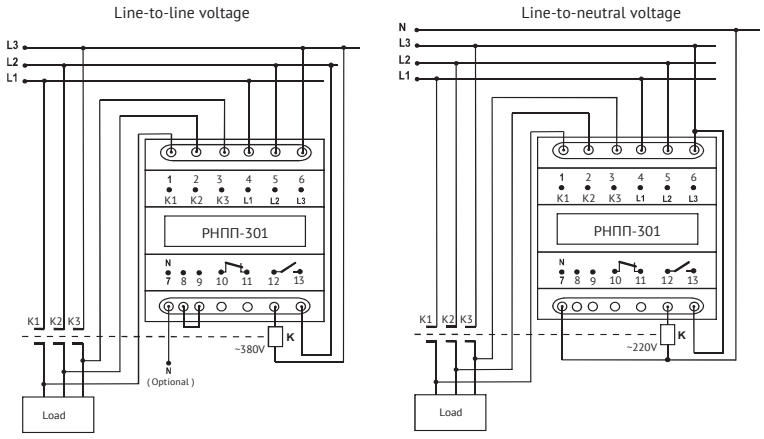
Overall dimensions (mm)



1 - Adjusting knob for Umin
2 - Adjusting knob for Umax
3 - Phase skew value adjustment knob
4 - Time adjustment knob Tmin
5 - Time adjustment knob Tcp
6 - Automatic reclosing time control knob Твкл
7 - Green LED for voltage supply in the network
8 - Green power-up LED
9 - Red LEDs for mains voltage failure/power contacts monitoring
10 - Terminals for monitoring MS power contacts
11 - Input contacts
12 - Output contacts
13 - Mode selection terminals: Line/phase voltage monitoring

Relay connection diagram

The relay is connected in parallel to the load according to the diagram below.
Connection scheme OptiDin РНПП-301 with the choice of control:



Voltage and phase control relay OptiDin РНПП-302

Voltage relay OptiDin РНПП-302 is designed to protect three-phase consumers from the main types of accidents in the electrical network, such as:

- overrun of actual voltage value beyond the permissible threshold (RMS voltage contingency);
- impaired phase sequence and sticking of phases;
- failure of full-phase and balance of the mains voltage;
- the device monitors the main parameters of the electrical network and, if they deviate, disconnects the load.

The availability of a tricharged seven-segment indicator on the front panel of the device allows:

- to constantly indicate the current value of the voltage in the network;
- to indicate the type of failure that occurred;
- to view (visualize) the installation of modes and parameters.

Using the menu, the user can set:

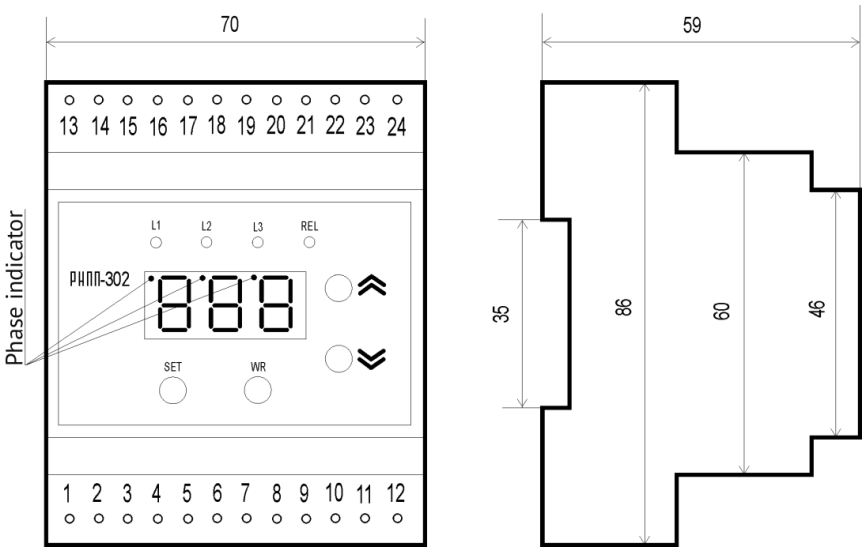
- a mode of indication of voltage values on phases;
- relay response mode to a digital signal of remote shutdown;
- type of relay;
- the method of setting the voltage deviation;
- enable/disable phase skew;
- enable/disable phase sequence control;
- voltage monitoring mode at the starter terminals;
- type of measured voltage;
- threshold for the maximum permissible voltage;
- threshold for the operation of the minimum permissible value of the voltage;
- the threshold of permissible phase skew;
- reclosing time;
- delay time of the undervoltage trip;
- tripping time delay at the maximum voltage;
- operate delay time at phase skew;
- operate delay time at phase loss;
- operate delay time by the alarm signal at the digital input.

The device has an additional alarm relay with normally open led out contacts.

Technical specifications

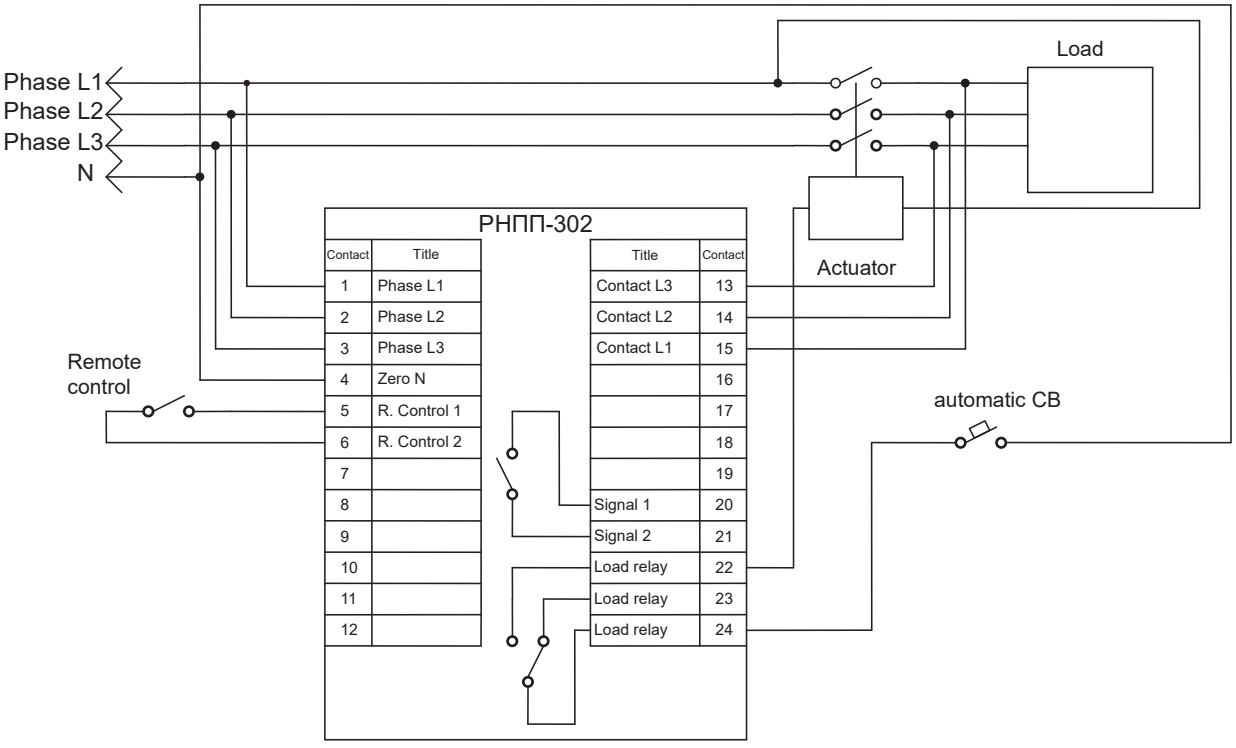
Digital remote relay ON/OFF input	
Double-throw output relay for load starter control	8 A, 250 V at cos φ = 1
Normally open contact of the alarm relay	8 A, 250 V at cos φ = 1
Accuracy of the voltage response threshold determination	not more than 3 V
Rated phase/line voltage	220/380 (230/400 or 240/415) V
Power consumption (under load), not more than, W	5
Network frequency, Hz	45-55
Degree of protection: - the device - the terminal block	IP40 IP20
Environment	UHL3.1 (international TC3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +60
Weight, no more than, kg	0,3
Mounting	on a standard DIN rail 35 mm
Mounting position	arbitrary
Overall dimensions, mm	70x86x59

Overall dimensions (mm)



Red LED L1 - lit when an L1 phase alarm occurs;
Red LED L2 - lit when an L2 phase alarm occurs;
Red LED L3 - lit when a phase L3 alarm occurs;
Green LED;
REL - lit when the output relay is on;
Button SET - included in the mode of parameters change ;
WR button - write a parameter;
Buttons ▲ ▼ - change the parameter.

Wiring sheme of OptiDin РНПП-302 to three-phase network with a dead-grounded neutral



Contact	Title	Title	Contact
1	Phase L1	Contact L3	13
2	Phase L2	Contact L2	14
3	Phase L3	Contact L1	15
4	Zero N		16
5	R. Control 1		17
6	R. Control 2		18
7			19
8		Signal 1	20
9		Signal 2	21
10		Load relay	22
11		Load relay	23
12		Load relay	24

Note. When connecting the relay to the network with isolated neutral zero-N (terminal 4) connection is not required.
automatic CB - automatic circuit breaker for a current of 10 A.

Voltage and phase control relay OptiDin РНПП-311М

Voltage relay OptiDin РНПП-311М is designed to protect three-phase consumers from the main types of failure in the electrical network, such as:
- overrun of actual voltage value beyond the permissible threshold (RMS voltage contingency);
- impaired phase sequence and sticking of phases;
- failure of full-phase and balance of the mains voltage.

The device monitors the main parameters of the electrical network and, if they deviate, disconnects the load.

The LEDs on the front panel of the relay indicate:
- supply of voltage in the network;
- load status (ON or OFF);
- type of failure.

The adjustment potentiometers allow the user to set:
- minimum/maximum allowable voltage threshold (as a percentage of the rated voltage);
- delay of load on time after recovering network parameters;
- time of tripping of load disconnection for all types of the mains failure.

Using the switches on the front panel of the device, the user can select the type of monitored 380/400 V network, and enable or disable monitoring of the following network parameters:
- impaired phase sequence and sticking of phases;
- full-phase and balance of the mains voltage;
- undervoltage;
- building-up.

Corresponding combinations of switch positions allow the OptiDin РНПП-311М to operate in various modes, such as:
- a mode of the full control of the supply voltage;
- minimum/maximum voltage monitoring mode;
- minimum voltage monitoring mode;
- maximum voltage monitoring mode;
- phase control mode;
- control mode for existing impaired phase sequence and sticking of phases;
- phase skew mode and in other modes.

Phase monitoring is maintained at any position of the switches, including when they are in the OFF position.

Technical specifications

Rated line/phase voltage, V		380/220, 400/230
Network frequency, Hz		45-65
Threshold adjustment range Umax / Umin, in% of Uном		± (5-50)
Adjustment range by Tcp, s		0-10
Adjustment range by Tвкл, s		0-600
Fixed tripping delay by Umin, s		12*
The response time at the loss of one of the phases, no more than, s		0,2
Readiness time at the voltage supply to the relay, not more than, s		0,2**
Value of phase skew s, V		30
Voltage hysteresis, V		5-6
Hysteresis in phase skew, V		5-6
Accuracy of the voltage response threshold determination, not more than, V		3
Accuracy of electrical imbalance, not more than, %		2
Voltage providing survival, V:	- on one phase - on three phases	140-450 95-450
Consumed power (under load), no more than, VA		1,2
Maximum switching current of output contacts, A		5
Commutation life of output contacts:	- under load 5A, not less than, times - under load 1A, not less than, times	100 thsd. 1 mln.
Degree of protection:	- the device - the terminal block	IP40 IP20
Environment		UHL3.1 (international TC3.1)
Operating temperature range, ° C		from -35 to +55

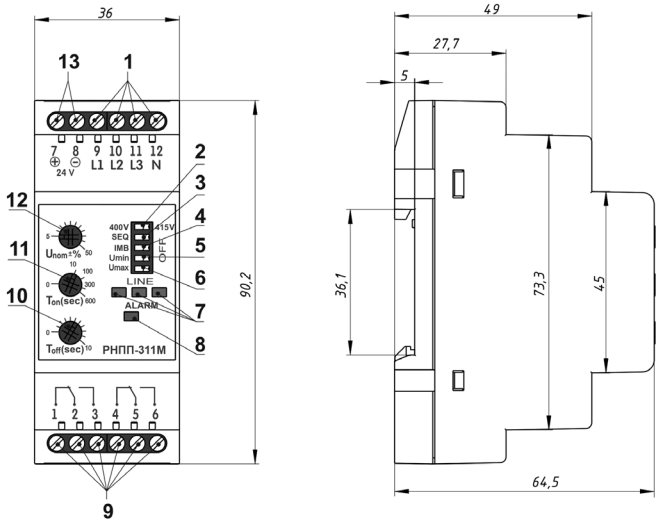
Storage temperature range, ° C	from -45 to +70
Weight, no more, kg	0,2
Overall dimensions, mm	35x92x58
Mounting	on standard 35 mm DIN rail
Amounting position	arbitrary

* If the failure occurred according to Umin, the fixed operation time of the relay will be 12 seconds, provided:
  a. the switches Umax and Umin are in the left position, and the switches of the ЧФ (PS) and ПФ (PI) are in the right position;
  b. switches 5-8 are in the left position.

With any other combination of switches, the relay will operate for a user-defined Tcp time. If during this time (12 s) another failure occurs, for example, according to Umax, the relay will operate at the lowest of the periods: after the time Tcp specified by the user, or after the remaining time from 12 s.

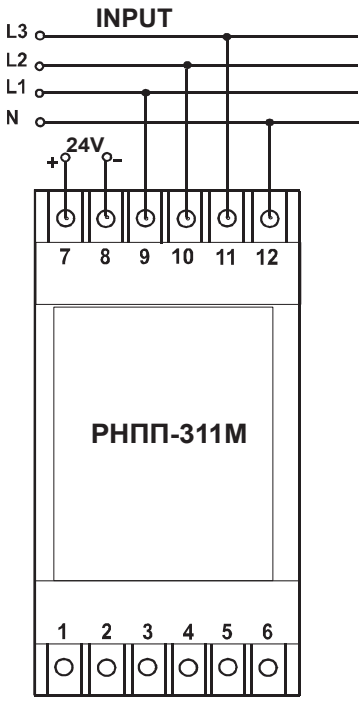
** When operating in the mode of the maximum voltage relay - 0,3 s.

Overall dimensions (mm)



1 – Voltage tripping threshold adjustment (Umax/ Umin);
2 – Automatic reclosing time adjustment (Твкл);
3 – Tripping time adjustment (Tcp);
4 – Switch: type of power circuit 380V/400V;
5 – Switch: phase sequence tripping (PS);
6 – Switch: phase imbalance tripping (PI);
7 – Switch: Minimal voltage tripping (Umin);
8 – Switch: Maximal voltage tripping (Umax);
9 – Green LED indicators of voltage supply on each phase;
10 – Red LED "ALARM OFF" of the failure and switched off relay;
11 – Input terminals 380V/400V;
12 – Input terminals 24V;
13 – Output terminals.

Wiring scheme OptiDin РНПП-311М



INPUT + 24 V	7
INPUT - 24 V	8
INPUT L1	9
INPUT L2	10
INPUT L3	11
INPUT N	12
OUTPUT 1	1
	2
	3
OUTPUT 2	4
	5
	6

Phase selection relay OptiDin ПЭФ-301

OptiDin ПЭФ-301 universal automatic electronic phase switch is designed to supply industrial and household appliance single-phase 220V/50Hz loads from three-phase four-wire mains 3×380+N with the purpose of maintaining uninterrupted power supply of essential single-phase loads and protect them against unallowable voltage variations in the mains.

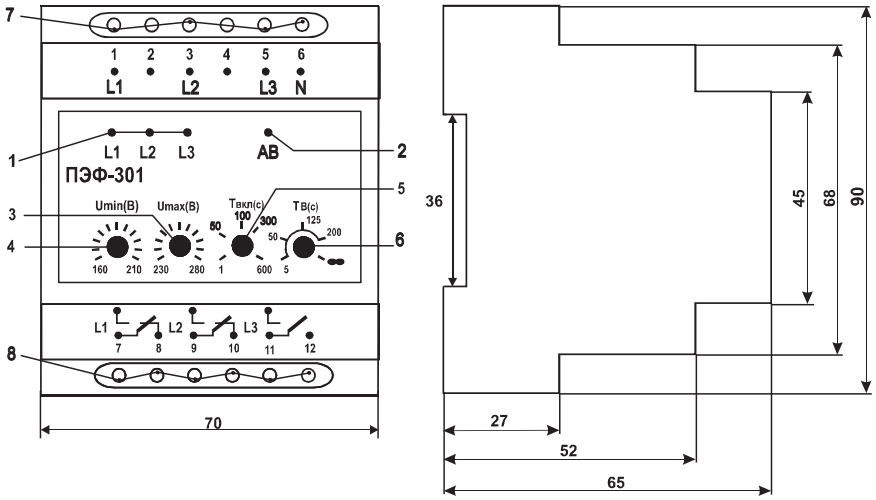
Depending on voltage presence and voltage quality on phases, the ПЭФ-301 will automatically select the optimal phase and promptly switch the single phase load supply of any wattage to this phase:

- at a power of up to 3.5 kW (16 A), the load is supplied directly from OptiDin ПЭФ-301;
- at a power exceeding 3.5 kW (16 A), the phase switch OptiDin ПЭФ-301 controls the magnetic starter coils (MS) of the corresponding power.

Technical specifications

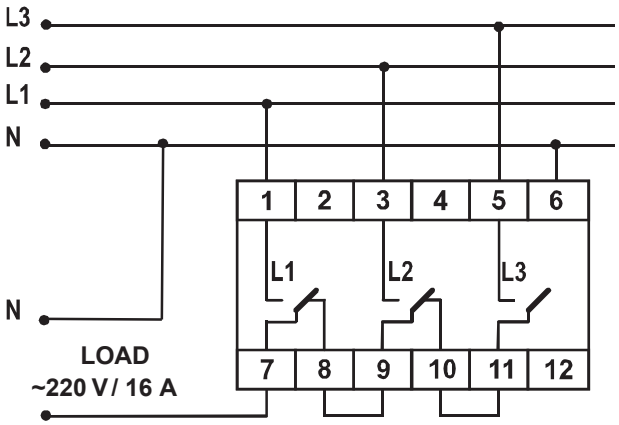
Rated phase-to-phase voltage		220
Network frequency, Hz		45–65
Adjustment range according to Umin, s		160-210
Adjustment range according to Umax, s		230-280
Return to the priority phase, in the range of Тв (5-200), s		available
Return to the priority phase, in the range of Тв (200-∞), s		not available
Adjustment range for reclosing time, Твкл, s		1-600
Fixed switching delay (trip) by Umin, s		12
Switchover time to reserve phases, not more than, s		0,2
Hysteresis (voltage return ratio), not less than, V		5-7
Accuracy of the voltage response threshold determination, V		±3
Maximum switching current (active) of output contacts, not less than, A		16
Operating phase voltage at which the device remains enabled, V		400
Short-time allowable maximum phase voltage providing survival, V		450
Consumed power (under load), no more than, VA		1,0
Commutation life of output contacts:	- under load 16 A, not less than, times - under load 5 A, not less than, times	100 thsd. 1 mln.
Environment		UHL3.1 (international TC3.1)
Degree of protection:	- the device - terminal block	IP40 IP20
Overall dimensions, mm		70x90x65
Weight, no more than, kg		0,2
Storage temperature range, ° C		from -35 to +55
Mounting		on a standard DIN rail 35 mm
Mounting position		arbitrary

Overall dimensions (mm)

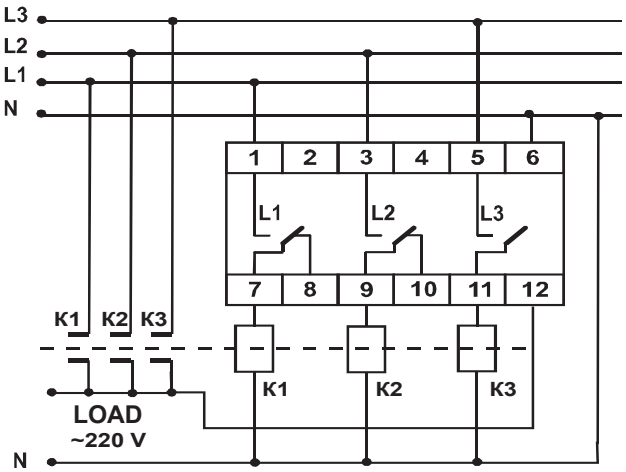


1 - Phase indication LEDs
2 - Alarm LED
3 - Toggle switch for adjusting the maximum voltage threshold
4 - Minimum voltage control toggle switch
5 - Automatic reclosing time control toggle switch Tвкл
6 - Switch delay to reverse phase, Tв
7, 8 - Connection terminals

Connection diagram at a load value of up to 16 A OptiDin ПЭФ-301



Connection diagram at a load value of more than 16 A with the use of magnetic starters or contactors OptiDin ПЭФ-301



OptiDin ПЭФ-301 provides internal blocking from sticking contacts of the output built-in relays, as well as monitoring the status of the power contacts of the MS in the external circuit (blocking from their sticking, terminal 12 is used).

Multifunctional time relays

Electronic two-channel delayed-time relay (switches) are designed for switching AC and DC electrical networks with adjustable time delay.

Time relay OptiDin РЭВ-201М

Two-channel time delay relay with delay on make function of OptiDin РЭВ-201М is designed for switching electric circuits of alternating current 230-240 V / 50 Hz and direct current 24-100 V with adjustable time delay on make from 0 to 36000 s.

The relay contains two channels and can operate according to one of four user-defined operation algorithms:
- tripping delay relay;
- impulse relay;
- periodic relay (cyclic);
- control relay.

The algorithm is set by the position of the switches A.

The corresponding device wiring scheme allows to realize:
- independent operation of channels (the time delay is counted from the moment the power is applied to a specific channel);
- parallel operation of channels (power to both channels is fed simultaneously).

Adjustment of time intervals is made by a pair of potentiometers and a block of limit switches for each channel separately.

On the front panel for each channel is a two-color LED with the following algorithm:
- green glow - voltage supply on the channel;
- red light - the load relay is switched on.

Each channel on the output has one disconnect and one make contact. The relay supply circuit is galvanically isolated from the output circuits.

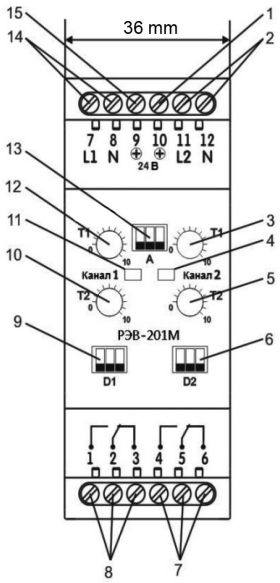
Technical specifications

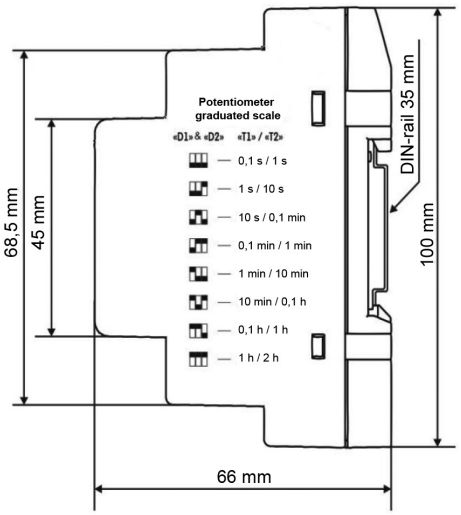
Rated supply voltage, V: - alternating single-phase - direct	 230/240 24 (±10%)
Voltage providing survival, V	150-300
Rated supply voltage constant (contacts +24, N), V	24 ± 10%
Power circuit frequency, Hz	50-60
Readiness time after the power supply, no more than, s	0,25
Accuracy of time retention setpoint, not less than, %	1,5
Accuracy of setting point (scale accuracy), not less than, %	4
Number of operation algorithms	7
Adjustment range, s	0-36000
Time delay adjustment	gradual
Quantity of scale marks of potentiometer knobs	10
Quantity and type of contacts per channel (flip-flops)	1
Environment	U3.1 (international T3.1)
Degree of protection: - the device - the terminal block	 IP40 IP20
Commutation life of output contacts: - under load of 7 A, not less than, times - under load of 1 A, not less than, times	 100 thsd. 1 mln.
Consumed power (under load), no more than, VA	1,0
Weight, no more than, kg	0,15
Overall dimensions, mm	36x100x66
Operating temperature range, ° C	from -30 to +55
Storage temperature range, ° C	from -45 to +70

Characteristics of output contacts

Cos φ	Max. current at U ~ 250 V, A	Maximum switching power, VA	Maximum continuous additional voltage for AC / DC, V	The maximum current at Uпост= 30 V, A
1	7	1250	250	3

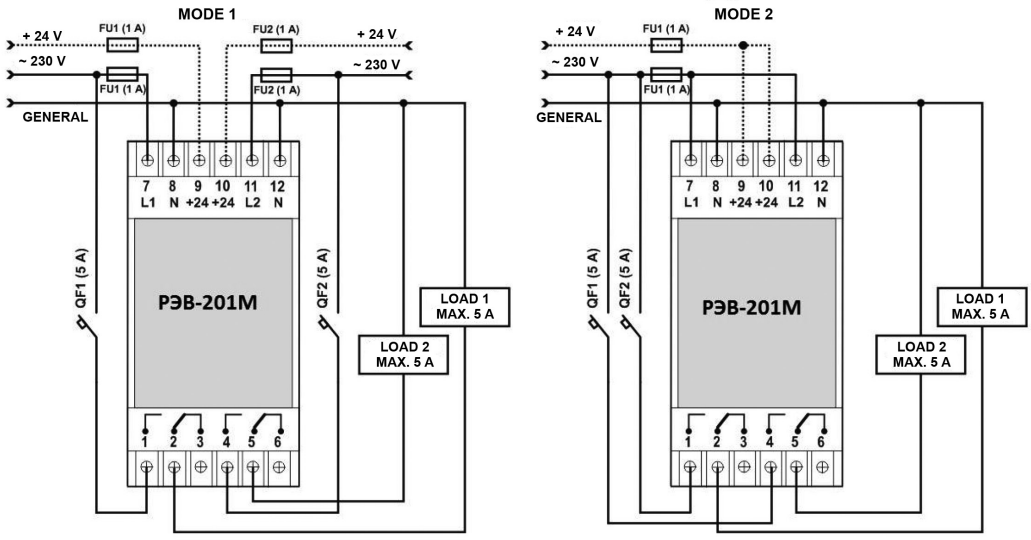
Overall dimensions (mm)





1, 15 – input contacts +24 V of the first and second channels;
2, 14 – input contacts ~ 230/240 V of the first and second channels;
3, 5 – knobs for setting the time tripping thresholds of the second channel (T1, T2);
4, 11 – two-color indicators of the first and second channels - turn green when there is voltage on the channels, turn red when load relays are actuated (Channel 1, Channel 2);
6, 9 – switches of time control ranges of the first and second channels (D1, D2);
7, 8 – output contacts of the load relay of the first and second channels;
10, 12 – knobs for setting the time tripping thresholds of the first channel (T1, T2);
13 – product operation algorithm switch (A).

Relay wiring scheme depending on the operating mode



Timers with voltage monitoring and light control relay

Programmable timers with photo-relays and voltage control are designed for switching on/off the load at the pre-set times of the user, taking into account the mains voltage and the illumination of the external photosensor.

General-purpose relay OptiDin PH-16TM

The general-purpose relay OptiDin PH-16TM combines the following functions:
- voltage relay;
- light relay;
- real-time relay.

Designed for:
- switching on/off the load according to user-defined on / off times;
- load disconnection for unallowable voltage fluctuations in the network with subsequent automatic switching after recovering the network parameters;
- load turn on/off according to the user-defined illumination levels.

The LEDs on the front panel of the device indicate:
- voltage supply in the network;
- load condition (on/off);
- operating mode of the relay.

The photodiode, which controls the level of illumination, is installed on the front panel of the device. It is also possible to connect an external photodiode.

The relay provides operation in the following modes:
- weekly timer;
- voltage relay;
- light relay;
- weekly timer with voltage control;
- light relay with voltage control.

The four-digit seven-segment indicator, depending on the selected mode, indicates:
- current time;
- current value of the voltage in the network;
- level of illumination;
- alternately the current time and the voltage value in the network;
- alternately the level of illumination and the current value of the voltage in the network.

The output contacts of the OptiDin PH-16TM can directly switch loads up to 3,5 kW (16 A). If it is required to switch more load, a magnetic starter must be applied.

The device menu allows you to:
- choose the operating mode;
- select and change the set of parameters;
- clear the current set of parameters;
- view the list of events;
- create a list of events;
- set the current time;
- set the time for switching on and off the load;
- set the day of the week;
- set the threshold for the minimum permissible voltage value;
- set the maximum permissible voltage threshold;
- set the response time of load disconnection at the upper voltage threshold;
- set the response time of load disconnection at the lower voltage threshold;
- set the response time of the load disconnection after restoring the network parameters;
- set the illumination threshold value.

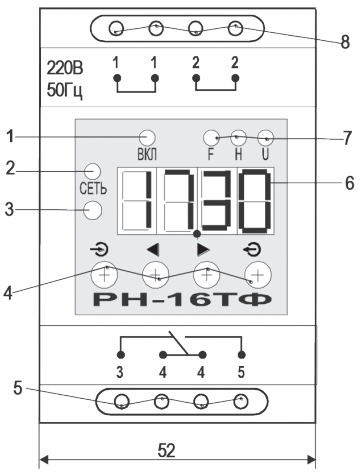
Technical specifications

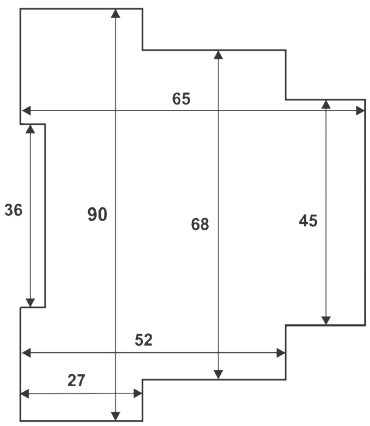
Rated supply voltage, V		220
Lower threshold of supply voltage, starting relay, V		140
Maximum permissible supply voltage, V		320
Voltage response setting range, V:	- lower threshold - upper threshold	150-210 230-320
Accuracy of setting for voltage response threshold, V		1
Setting range of illumination level, lux		0-175
Voltage measurement error ratio, not more than, V		1
Voltage return coefficient (hysteresis), V		±5
Coefficient of return (hysteresis) in terms of illumination, %		12
Adjustable response time of the relay with increasing/decreasing voltage, s		0-9,9
Automatic reclosing time delay, s		0-9,9
Fixed tripping time for illumination, s		12
Accuracy of the time setpoint, not more, min		1
Run error, not more than, hours per day		3
The maximum number of events per day, including: - actuation - trippings - per week		60 30 30 60x7=420
Power reserve (saving of settings at the supply voltage loss, not less than)		1 month
Environment		UHL3.1 (international TC3.1)
Degree of protection:	- the relay - the terminal block	IP40 IP20
Commutation life of output contacts:	- under load 16 A, not less than, times - under load 5 A, not less than, times	100 thsd. 1 mln.
Consumed power (under load), no more than, VA		3,0
Weight, no more than, kg		0,150
Overall dimensions, mm		50x88x65
Operating temperature range, °C		from -10 to +55
Storage temperature range, °C		from -20 to +60

Characteristics of output contacts 1-3 (4)-6

Cos φ	Max. current at U ~ 250 V, A	Maximum capacity at NC contacts, VA	Maximum switching power, VA	Maximum continuous additional voltage for AC / DC, V	The maximum current at Uпост = 30 V, A
0,4	5	3000	2000	380/150	5
1	16				

Overall dimensions (mm)





1 - Green power-up LED
2 - Green/red LED
3 - Photodiode
4 - Menu control buttons:
→ - enter the menu, enter the parameter,
← - write, exit the menu,
◄► - selection
5 - Seven-segment indicator (display)
6 - Green LEDs for indicating the set relay modes
7 - Contacts for connection
8 - Internal battery jumper (set when using relays), remove jumper during storage

General-purpose relay OptiDin OptiDin РЭВ-302

Multifunctional relay OptiDin РЭВ-302 is a microprocessor-based programmable device and is designed for switching on / off the load at the user preset time points, taking into account the mains voltage and illumination of the external light sensor.

Properties of OptiDin РЭВ-302:

- availability of two groups of contacts for switching (two channels) with a rated current of 16 A/250 V;
- power supply from AC 220-240 V / 50 Hz or 24 V DC power supply;
- joint or independent operation of time relays, voltage relays and light relays;
- flexible transfer of contact management between voltage relays, light relays and time relays;
- eight independent control programs and the ability to quickly switch between them for each of the contact groups;
- the ability to manage both groups of contacts from one program;
- calendar with power reserve of up to 10 years in the absence of external power;
- functions of daily, weekly, monthly and yearly time relays;
- independent lists of events for each of the programs;
- accuracy of planned events up to 1 second;
- the ability to compile your list of days off and holidays;
- accomplishment of a special list of events for weekends and holidays;
- total internal memory for 5000 independent events distributed among all programs for a day/week/month/year, depending on the selected mode;
- the ability to cycle the program at a given time range;
- automatic daylight saving time;
- function of a pulse time relay (periodic activation and deactivation of contacts without calendar referencing);
- function of simple contacts activation following the specified time after the power is applied;
- disconnection of the contacts at the minimum and maximum voltage of the network;
- time delay for starting the relay after power-up;
- selected time delays for the voltage relay and the light relay operation performance (for setting the time of the reclose, etc.);
- a remote light sensor;
- LCD graphic display;
- indication of the status of each channel;
- USB input for connection to a personal computer (PC);
- PC software with a convenient graphical interface for editing all relay settings and with the availability to create arrays of events or events bound to sunrises and sunsets;
- Russian-language interface;
- menu management using 5 buttons on the front panel;
- downloading preinstalled control programs via USB with additional software;
- possibility to set a password to enter the settings menu;
- common reset button on the front panel.

Specifications of output contacts

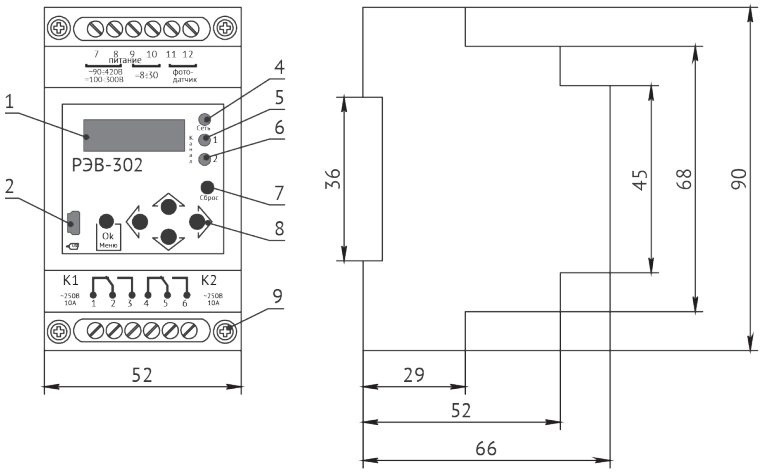
Cos φ	Max. current at U ~ 250 V, A	Max. power, VA	Max. current at Uпост = 24 V, A
1	16	4000	16
0,4	4	1000	
Commutation life of output contacts: - - mechanical life - - electrical life 16 A 250 V AC, times, not less than - - electrical life 16 A 24 V DC, times, not less than - - electrical life 4 A 250 V AC (cos φ=0,4), times, not less thann			10^7 100 thsd. 30 thsd. 100 thsd.
Mounting			Standard DIN rail 35 mm
Mounting layout			arbitrary

Technical specifications

AC mains voltage (terminals 7-8), V	90÷420
DC network (terminals 7-8), V	100÷300
Rated supply voltage, sustained (terminals 9-10), V	8÷30
Mains frequency, Hz	50/60
Internal fuse	available
Maximum number of events	5000
Error of the clock rate, not more, s/days	1
Clock rate reserve when the power supply is cut off, not less than, years	10
Accuracy of setting, s	1
Accuracy of setting for voltage response threshold, V	1
Voltage measurement error, not more than,%	2
Illumination measurement error up to 200 lux, not more, %	10
Error of measurement of illumination from 200 lux, not more, %	20
Minimum contact switching time for the time relay, s	0,015
Minimum contact switching time for the voltage relay, s	0,035
Minimum contact switching time for light relay, s	0,1
Setting range of the lower threshold for voltage operation Umin, V	90÷416, but not higher than; U_{max}-dU_{max}
Setting range of the lower threshold for voltage operation Umax, V	94÷420, but not lower than; U_{min}-dU_{min}
Hysteresis of the lower voltage threshold dUmin, V	3÷9
Hysteresis of the upper voltage threshold dUmax, V	3÷9
Turn-off delay on U_{min}	from 0 s to 19 min. 99 s
Turn-off delay by Umax *	from 0 s to 19 min. 99 s
Load reclosure delay	from 1 s to 19 min. 99 s
Setting range of illumination level, lux	0÷9999
Hysteresis of setting the illumination level, lux	0÷999
Actions delay in the event of the illumination below the threshold	from 0 s to 99 min. 99 s
Actions delay if the illumination is above the threshold	from 0 s to 99 min. 99 s
Total delay after power-up	from 0 s to 99 min. 99 s
Load relay indication	available
Saving the settings in the event of the network and the back supply	available
Data memory, not less than, years	10
Connecting to a computer	USB
Length of the light sensor cable in the set, m	2
Distance between the device and the light sensor is not more than, m	20
The event log	year/month/week/day
Permissible humidity without condensation, %	90
Degree of protection	IP20
Environment	UHL4 (international TC4)
Consumed power (under load), no more than, VA	3,0
Weight, no more than, kg	0,200
Overall dimensions, mm	90x52x66
Operating temperature range, °C	from -20 to +55
Storage temperature range, °C	from -35 to +70
Number of output relays (channels), pcs.	2
Number and type of contacts per channel (double - throw)	IP

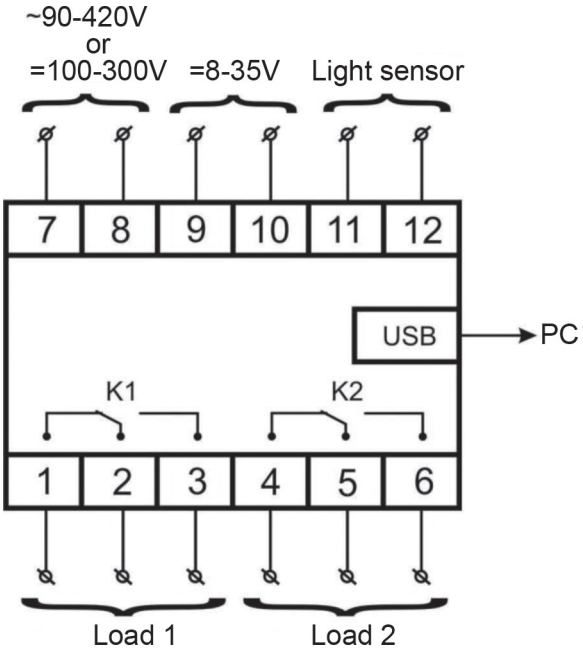
* It is recommended to leave the parameter at the value of "00 min. 00 s" for the fastest shutdown.

Overall dimensions (mm)



1 - LCD indicator
2 - USB connector for PC communication
3 - Connection contacts
4 - Power indicator
5 - Load relay activation indicator, 1st channel
6 - Load relay activation indicator, 2nd channel
7 - Reset buttons
8 - Menu navigation buttons
9 - Mounting screws

OptiDin РЭВ-302 Connecting diagram



Power limit relays and current relays

The overcurrent relay is designed to disconnect the load when the current rises above the set value.
The power limit relay is designed to continuously monitor the active and full power of a single-phase load.

Current relay OptiDin PMT-101

The maximum current relay OptiDin PMT-101 is designed to disconnect the load when the current is increased above the set value in the range from 0 to 100 amperes.

The device can be used as:
- digital ammeter;
- current consumption limiting relay;
- priority of load relay.

The LEDs on the front panel of the relay indicate:
- load condition (on/off);
- exceeding the threshold of the maximum permissible value of the load current.

The three-digit seven-segment indicator, depending on the operating mode, indicates:
- the current value of the current in the load;
- the maximum value of the current since the last reset of the parameter;
- value of the parameter to be set;
- the time remaining before the load is switched on or off;
- availability of a blocking re-activation.

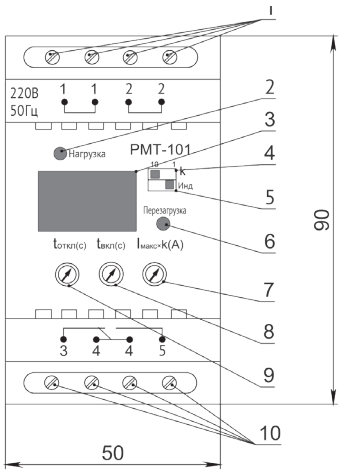
The adjustment potentiometers allow the user to set:
- the threshold of the maximum permissible value of the load current;
- response time of load disconnection when the threshold of the maximum permissible load current is exceeded;
- delay in the time when the load is switched on after the current is reduced to permissible level.

Technical specifications

Rated supply voltage, V	220/230
Voltage providing survival, V *	from 130 to 300
Network frequency, Hz	47-53
Range of current measurement, A	0-100
Accuracy of current measurement, at least	1%
Adjustment range for I_{max}, s	0-10
absolute error of current measurement, not more than, A	± 0,1
Adjustment range by I_{min}, s	0-99,9
absolute error of current measurement, not more than, A	± 1
Adjustment range by $T_{вкл}$, s	0-900
Adjustment range by $T_{откл}$, s	0-300
Readiness time, no more than, s	0,8
Consumed power (under load), no more than, VA	3,0
The maximum switching current of the output contacts at cos φ = 1, A	8
Commutation life of output contacts: - under load 8 A, not less than, times - under load of 1 A, not less than, times	 100 thsd 1 mln
Degree of protection: - the device - the terminal block	 IP40 IP20
Environment	UHL3.1 (international TC3.1)
Operating temperature range, °C	from -25 to +45
Storage temperature range, ° C	from -45 to +70
Weight, no more than, kg	0,2
Overall dimensions, mm (size - 3 standard S-modules on DIN-rail 35 mm), mm	52,6x90x69,1
Mounting	on standard DIN-rail 35 mm
Mounting position	arbitrary

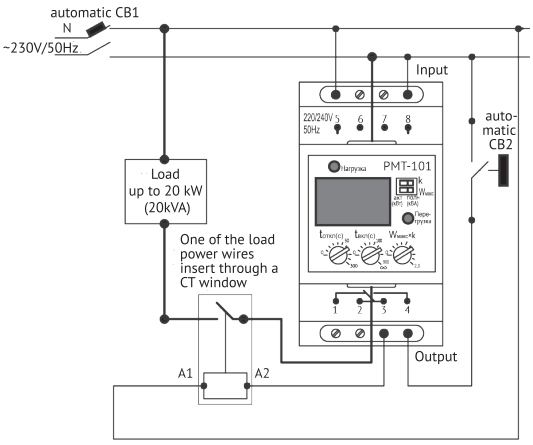
* In the OptiDin PMT-101, the indicator (pos.3) is disconnected when the supply voltage drops below 130 volts and the OptiDin OM-110 is locked when the supply voltage drops below 110 V.

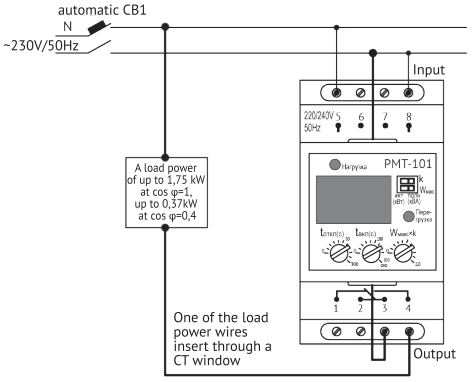
Overall dimensions (mm)



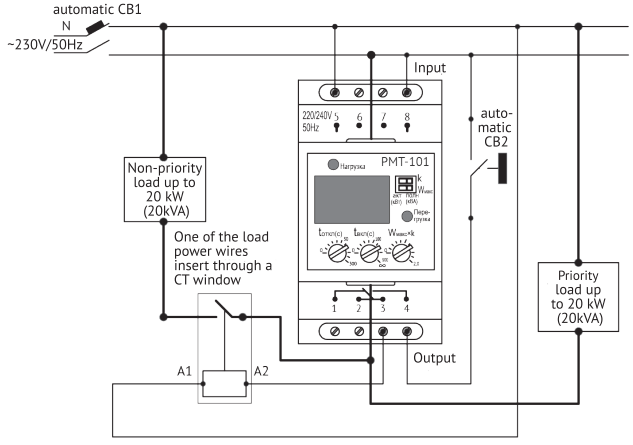
1 - Power supply input OptiDin PMT-101 - ~ 220 V/50 Hz
2 - LED "Load"
3 - Indicator of measured and monitored parameters
4 - Range switch -10/100 A of the regulator "maximum current setting"
5 - "Current current"/"maximum current" indication switch
6 - "Overload" LED
7 - "Maximum current setpoint" regulator - I_{max}
8 - Regulator "setting the load reclosure delay" - $T_{вкл}$
9 - Regulator "load tripping delay setting" - $T_{откл}$
10 - Outputs of the load control relay, max. ~ 250 V, 8

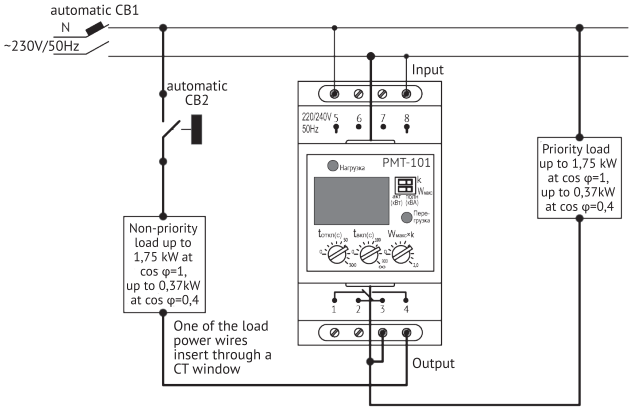
Connecting diagram OptiDin PMT-101





OptiDin PMT-101 Connecting diagram as priority of load relay





L - phase, N - neutral

Note: AB1, as the main circuit-breaker, must be set to the operating current of not more than 8 A at a load power of up to 1,75 kW. With load power up to 20 kW - AB1 it is necessary to set the current to not more than 100 A. AB2 is an automatic switch for a non-priority load, it protects both the load and the PMT-101 directly from a short circuit.

Power relay OptiDin OM-110

The power limit switch OptiDin OM-110 is designed to continuously monitor the active or full power of a single-phase load. Measured power ranges from 0 to 20 kW or from 0 to 20 kVA. The OptiDin OM-110 performs load shutdown in case of exceeding the user-defined maximum permissible load power level (with a specified shutdown time) and then automatical switching on (with a specified on-delay time or with a re-enable lock).

On the front panel of the device, potentiometers and dip-switches are installed, which allow the user to set:

- Maximum permissible power level;
- Relay response time;
- Auto-reclosing delay time (AR).

The power consumption is measured without breaking the electrical circuit with a current sensor built into the device.

OptiDin OM-110 relay can be used as:

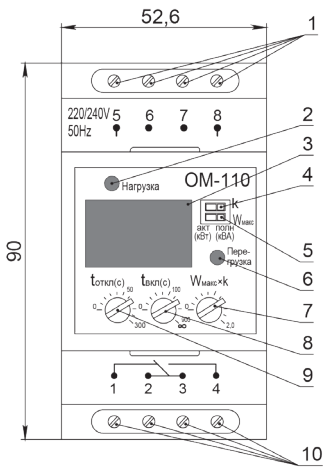
- Digital wattmeter (active or full power meter);
- Power consumption limiting relay;
- The OptiDin OM-110 is powered by voltage measurement circuits.

Technical specifications

Rated supply voltage, V	220/230
Maximum permissible voltage, not more than, V	400
Voltage providing survival, V *	from 130 to 300
Network frequency, Hz	47-53
Range of current measurement, A - actual power P, kW - full power S, kW	 0-20 0-20
Accuracy of current measurement, at least	2,5%
Adjustment range, with k=1, Wmax, kW (kVA)	0-1,75
absolute error of current measurement, not more than, A	± 0,05
Adjustment range, with k=10, Wmin, kW (kVA)	0-20
absolute error of current measurement, not more than, A	± 0,5
Adjustment range by $T_{вкл}$, s	0-900, ∞
Adjustment range by $T_{выкл}$, s	0-300
Readiness time, no more than, s	0,8
Consumed power (under load), no more than, VA	3,0
The maximum switching current of the output contacts at cos φ=1, A	8
Commutation life of output contacts: - under load 5 A, not less than, times - under load of 1 A, not less than, times	 100 thsd 1 mln
Degree of protection: - the device - the terminal block	 IP40 IP20
Environment	UHL3.1 (international TC3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -55 to +60
Weight, no more than, kg	0,2
Overall dimensions, mm (size - 3 standard S-modules on DIN-rail 35 mm), mm	52,6x90x69,1
Mounting	on standard DIN-rail 35 mm
Mounting position	arbitrary

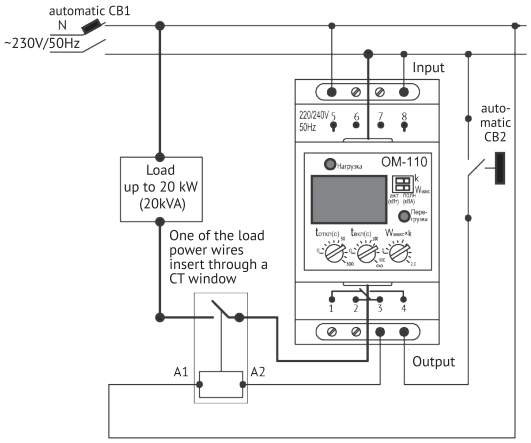
* In the OptiDin PMT-101, the indicator (pos.3) is disconnected when the supply voltage drops below 130 volts and the OptiDin OM-110 is locked when the supply voltage drops below 110 V.

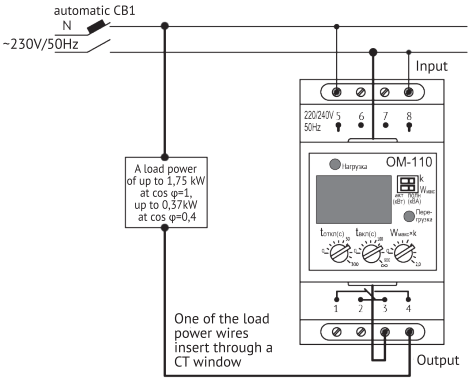
Overall dimensions (mm)



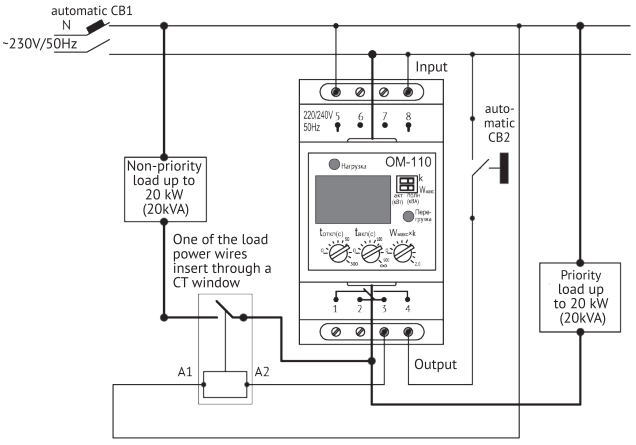
1 - Input terminals (load voltage measurement circuit and power supply OptiDin OM-110)
2 - LED "Load"
3 - Indicator of measured and monitored parameters
4 - The switch for selecting the multiplier value k (1 or 10). The multiplier specifies the throw of a governor "maximum power setting" from 0 to 2 or 0 to 20 kW (kVA)
5 - Power Limit Switch "Active Power Limit"/"Full Power Limit"
6 - "Overload" LED
7 - "Maximum current setpoint" regulator - Wmax
8 - Regulator "setting the load reclosure delay" - $T_{вкл}$
9 - Regulator "load tripping delay setting" - $T_{откл}$
10 - Outputs of the load control relay, max. ~ 250 V, 8 A

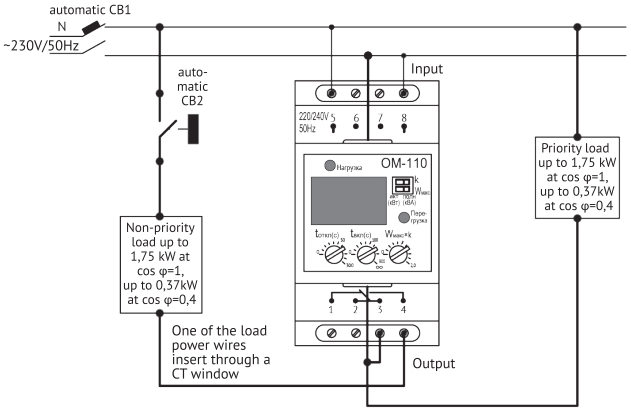
OptiDin OM-110 Connecting diagram





OptiDin OM-110 Connecting diagram as priority of load relay





L - phase, N - neutral

Note: AB1, as the main circuit-breaker, must be set to the operating current of not more than 8 A at a load power of up to 1,75 kW. With load power up to 20 kW - AB1 it is necessary to set the current to not more than 100 A. AB2 is an automatic switch for a non-priority load, it protects both the load and the PMT-101 directly from a short circuit.

Power relay OptiDin OM-310

Intended for:
- consumer protection in case of poor electrical network parameters;
- full load disconnection when the power consumption of the main threshold exceeds the user-defined time;
- partial load disconnection when the additional power consumption exceeds the power set by the user;
- measurement and indication of the parameters of the three-phase electrical network (the active values of phase and linear voltages of the forward, reverse and zero sequences, the active values of the phase currents, the active, reactive and full power, cos φ);
- alerts about emergency situations;
- remote connection and disconnection of the load via RS-232/RS485 interface or external switch.

The device provides operation with a load from 2.5 kW to 30 kW with the use of built-in current transformers and up to 350 kW when applying external current transformers, including electrical networks with an isolated neutral.

OptiDin OM-310 provides the following types of consumer protection:
- at a low-quality mains voltage (unacceptable voltage surges, phase failure, interruption of phase sequence and phase sticking, phase/line electrical imbalance);
- if the specified maximum current is exceeded by any of the load phases;
- for leakage currents to earth.

For each type of protection, it is possible to prohibit and permit the automatic reactivation of the load. Protection of electrical equipment is provided by controlling the coil of the magnetic starter (contactor).

Technical specifications

Rated supply voltage, three-phase, V	380
Network frequency, Hz	48-62
Range of rated load power (when operating from built-in current transformers), kW	3-30
An error in determining the threshold for operation in power, not more, in% of the nominal	5
An error in determining the threshold of operation in the current, in% of the nominal, not more than	2
An error in determining the voltage thresholds, not more than, V	3
Error of phase electrical imbalance, not more than, V	3
Voltage providing survival: - a phase, with power from one phase and connected neutral wire, V not less than - line, with power from three phases, not more than, V	 180 450
Consumed power (under load), no more than, VA	5
Main outputs - load relay - two groups of double-throw contacts - 8 A 250 V at cos φ=1 - functional relay - one group of double-throw contacts - 16 A 250 V at cos φ = 1 (user relay setting)	
Analog inputs - input for a remote switch connection - three analog inputs for standard CTs with 5 A output (type T-0.66 or equivalent) - input for connecting a residual current transformer (the zero-sequence transformer)	
Degree of protection: - the device - the terminal block	IP40 IP20
Environment	U3.1 (international T3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +70
Weight, no more than, kg	0,5
Dimensions	9 modules of S - type
Mounting	on a DIN-rail of 35 mm
Mounting position	arbitrary

Description of output contacts of built-in relays

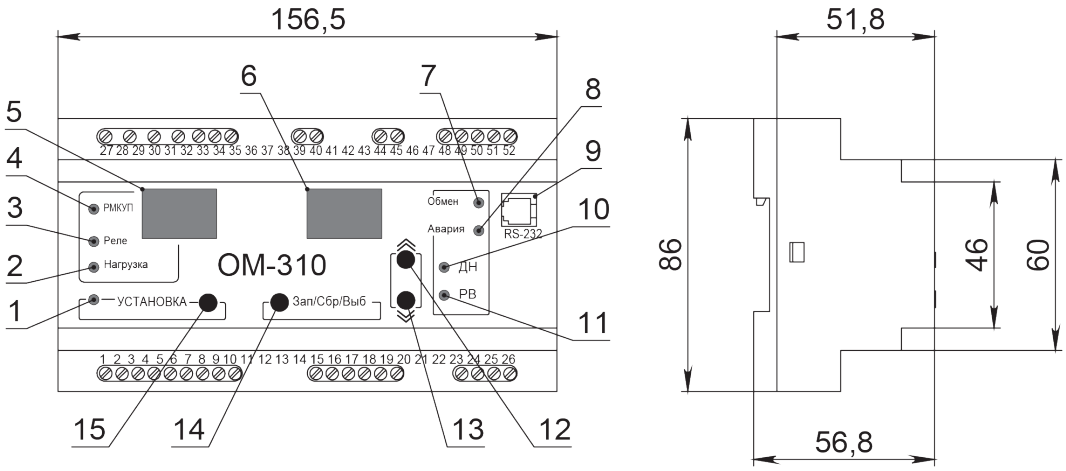
Load relay

cos φ	Maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional voltage for AC/DC, V	Maximum current at Uпост = 30 V, A
0,4	2	200	500	440/125	1,3
1	8	50	2000		

Functional Relay

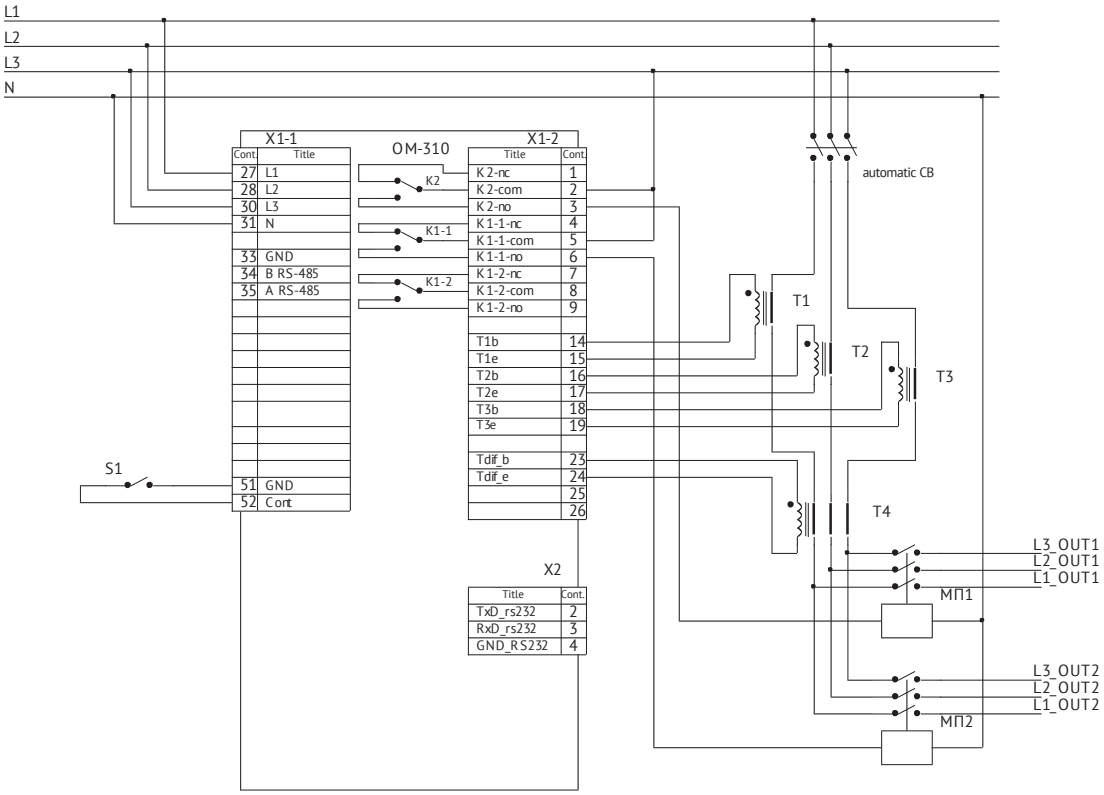
cos φ	Maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional voltage for AC/DC, V	Maximum current at Uпост = 30 V, A
0,4	5	400	1250	440/125	3 A
1	16	50	4000		

Overall dimensions (mm)



1 - Red LED SETUP - lights up when the relay is in the parameter setting mode
2 - Green LED LOAD - lit when the load relay is on
3 - Green RELAY LED - lit when the function relay is on
4 - Green LED of the MMSP- lit when the function relay is on
5 - Thricharged indicator of parameter mnemonics:
- the dot in the low-order digit of the indicator lights when the OptiDin OM-310 is in the setup mode of the equipment adjuster;
- the point in the middle of the indicator light is on when the value of the setting parameter is protected by the setup password;
- the point in the highest digit of the indicator is lit when the setting parameter is not included in the list of the MMSP.
6 - Tricharged indicator of the parameter value
7 - Blue LED EXCHANGE - lit when there is an exchange with a PC
8 - Red LED FAULT
- when the load relay is switched off: it is on when the OptiDin OM-310 is in the state (flashing, if an auto reclosure (AR) is possible after an accident);
- when the load relay is switched on - flashes when the power consumed by the load is greater than the main threshold, but the load relay tripping time is not in operation yet.
9 - mount hole for connecting OptiDin OM-310 to a PC via RS-232
10 - The green LED DN is lit up when the OptiDin OM-310 functional relay is operating in the additional load control mode
11 - The green LED of the PB is lit when the OptiDin OM-310 function relay is operating in the time relay mode and flashes when the OptiDin OM-310 function relay is operating in the mode of signaling the exceeding of the main active power threshold
12 - Button ▲ (in the text UP) - scrolling the displayed parameters in the parameter view mode and scrolling through the menus in the parameter setting mode
13 - Button ▼ (in the text DOWN) - to scroll through the displayed parameters in the parameter view mode and to scroll through the menus in the parameter setting mode
14 - RES / MEM / SEL button - to record parameters in the setup mode, to switch the group of displayed parameters in the playback mode, reset
15 - SETUP button - turns on the parameter setting mode

The connection scheme of the OptiDin OM-310 with external CTs and with ρρΣ=2 (operation of the functional relay in the mode of the additional load relay)



S1 - remote switch
AB - automatic circuit breaker
МП1 - magnetic starter of additional load
МП2 - solenoid starter of the main load
Relay K1 - load relay
Relay K2 - functional relay
T1-T3 - external CTs
T4 - differential current transformer

Universal Motor Protection Units

Universal motor protection units are designed for continuous parameters monitoring of three-phase electrical equipment operation : mains voltage, active phase/line current values, power consumption, power consumption, voltage and current of direct and reverse sequence, insulation resistance to the housing, differential leakage currents to earth currents of zero sequence), temperature operating modes.

OptiDin УБЗ-301 relay of motor protection

The universal motor protection unit OptiDin УБЗ-301 (hereinafter referred to as the unit) is intended for constant monitoring of the mains voltage parameters and the current phase/line current values of three-phase electrical equipment 380 V/ 50 Hz, namely asynchronous electric motors (EM) 5-315 kW, including networks with isolated neutral.

Three modifications of the device are produced according to the current ratings:
OptiDin УБЗ-301 5-50 A reference 139505
OptiDin УБЗ-301 10-100 A reference 139506
OptiDin УБЗ-301 63-630 A reference 139507

The relay performs full and effective motor protection by disconnecting from electrical grid and/or blocking its start-up in the following cases:

- substandard mains voltage (invalid voltage jumps, phase open fault, impaired phase sequence, phase sticking);
- mechanical overloads (symmetrical overload on phase/line currents) - overload protection with dependent time delay;
- unbalanced overloads in phase/line currents related to damages inside the motor - protection against phase misalignments with subsequent inhibition of automatoc reclosure;
- asymmetry of phase currents without overload, associated with insulation failure inside the engine and/or the supply cable;
- failure of the shaft torque on the EM ("dry running" - for pumps) - protection according to the minimum starting and/or operating current;
- if the insulation level on the housing is unacceptably low - check before switching on with start-up inhibition in case of poor insulation;
- closing of the stator winding to the ground during operation - protection by leakage currents to earth.

The unit provides protection of electrical equipment by controlling the coil of the magnetic starter (contactor).

OptiDin УБЗ-301 performs the following functions:

- a simple and accurate setting of the nominal EM current using a standard rated current scale;
- setting the working current of the EM, which is different from the standard values, taking into account the long-term permissible overload;
- overload operation with a dependent time delay. This characteristic is constructed for a conventionally cold engine.
- in the course of work, the differential equation of the thermal balance of EM is solved. Such an approach allows to take into account the previous state of EM and to make the most reliable decision about the presence of the thermal overload. This method allows also to take into account the heating of the EM at start-ups and to limit (at the request of the customer) their number per unit of time.
- the ability to shift the current-time characteristic both along the current axis (pot N 1,2) and along the time axis (pot N 3 - the response time for a double overload);
- setting of the thresholds for the operation of the minimum/maximum voltage, the distortion of the line voltages and phase currents, and the time of automatic restart at the discretion of the customer independently;
- indication of the type of failure, the presence of the mains voltage, the current range to which the unit is configured and the load switching;
- through the transfer unit BO-01 allows to exchange and transfer information via RS-485 protocol (BO-01 is supplied to order).

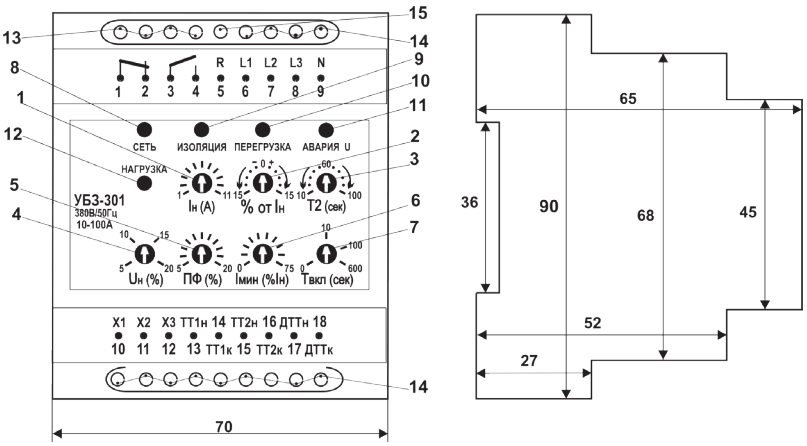
Technical specifications

Rated linear voltage, V	380
Network frequency, Hz	45-55
Range of rated currents, A OptiDin УБЗ-301 5-50 A OptiDin УБЗ-301 10-100 A OptiDin УБЗ-301 63-630 A	 5-50 10-100 63-630
Operating current setting range, in % of the rated value	±15
Time adjustment range in the event of a dual overload, s	10-100
Range of adjustment in phase skew, %	5-20
Adjustment range of the pickup threshold according to Imin, in% of operation (nom.)	0-75
Time adjustment range of automatic reclosure (Твкл), s	0-600
First load make time at Твкл = 0, s	2-3
Time of tripping at current overload	time-current characteristic
Tripping time at voltage failures, s	2
The response time for a current fault, except overload, c	2
Fixed set point for leakage current, A	1,0
Threshold of insulation resistance control, kOhm	500±20
Hysteresis for voltage (phase/line), V	10/17
Hysteresis for heat, % from accumulated during shutdown	33
Accuracy of the current response threshold determination, in % from Iном, not more than	2-3
Accuracy of voltage threshold determination, not more than, V	3
Accuracy of phase skew determination, not more than, %	1,5
Voltage providing survival, % of the rated value	50-150
Consumed power (under load), no more than, VA	3.0
Maximum switching current of output contacts, A	5
Commutation life of output contacts: - under load 5 A, not less than, times - under load 1 A, not less than, times	 100 thsd 1 mln
Degree of protection: - the device - the terminal block	 IP40 IP20
Environment	UHL3.1 (international TC3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +70
Weight, no more than, kg	0,2
Overall dimensions (see below)	4 modules of S - type
Mounting	on a standard DIN-rail 35 mm
Mounting position	arbitrary

Characteristics of output contacts 1-2-3-4

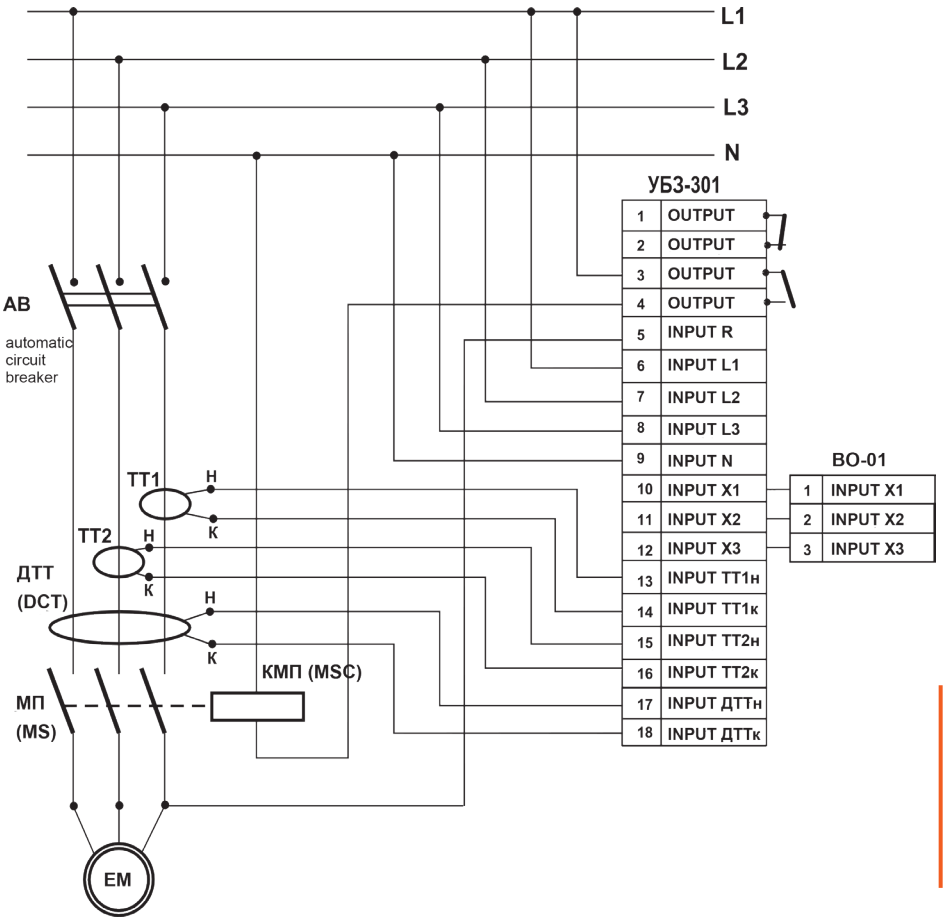
Cos φ	Maximum current at U ~ 250 V, A	Maximum switching power, VA	Maximum continuous additional voltage, V	Maximum current at Uпост = 30 V, A
0,4	3	2000	460	3
1	5			

Overall dimensions (mm)



1 - Rated current setting knob (toggle switch)
2 - Operating current setting knob (±% of Iном)
3 - Time setting knob T2 (tripping time at double overload)
4 - Knob of combined tripping adjustment according to Umin/Umax
5 - Phase skew knob
6 - Minimum current trip setting knob
7 - Automatic reclosing time setting knob
8 - Green LED for voltage supply in the circuit/ indicator of the set rated current
9 - Red LEDs for indication of accidents
10 - Red LEDs for indication of faults
11 - Red LEDs for indication of faults
12 - Green power-up LED
13 - Output terminals
14 - Input terminals (10, 11, 12 - communication with BO-01 exchange unit)
15 - Insulation monitoring terminals

Connection scheme OptiDin УБЗ-301



МП - magnetic starter
КМП - MS coil
ДТТ - differential current sensor (dc transformer)
TT1, TT2 - current sensors
BO-01 - unit for exchange and transmission of information (on request)

Notes:
- If necessary, the "START" and "STOP" buttons can be included in the circuit of the MSC.
- The 220 V MSC connection is shown here. The 380 V MSC power supply circuit is analogous, the supply to the coil is provided from different phases through contacts 2-4.
- In case when BO-01 terminals are not included, terminals 10, 11, 12 remain unused (dead).

Motor protection relay OptiDin УБЗ-302

OptiDin УБЗ-302 is designed for continuous monitoring of three-phase electrical equipment operation parameters (primarily three-phase asynchronous electric motors): mains voltage, active phase/line current, power consumption, voltage and current of direct and reverse sequence, insulation resistance to the housing, differential leakage currents on earth (zero sequence currents), temperature operating modes. The unit is designed for wide application in engineering systems of buildings and structures (heating, ventilation, water supply, air conditioning), process control systems and industrial automation systems, control, record and dispatching.

The unit allows to significantly reduce the probability of failure of three-phase electrical equipment, reduce the cost of operation, optimize power consumption and significantly improve the usability.

It is equipped with a full set of protections implemented in the OptiDin УБЗ-301. In addition, it provides protection against delayed start and blocking of the rotor, as well as overheating of the motor windings by means of temperature sensors.

Availability of the second output control relay allows for an additional operating mode inclusion:
- switching "wye-delta";
- "delayed start" power-on (for example, cascade motor start);
- remote alarm relay.

Technical specifications

Rated supply voltage, three-phase, V	380
Network frequency, Hz	48-62
Range of rated currents (when operating from built-in current transformers), A	5-63
Voltage hysteresis (phase/line), V	10/17
Thermal hysteresis, % from accumulated during shutdown	33
Accuracy of the current response threshold determination, not more than, in % from Iном	2
Accuracy of the voltage threshold determination, not worse than, V	3
Accuracy of phase imbalance by voltage, not worse, %	3
Voltage providing survival: - a phase, with power from one phase and connected neutral wire, V not less than - a line, with power from three phases, not more than, V	 180 450
Analog inputs: - two analog inputs for connecting temperature sensors (types Pt100, Ni100, Ni120) - analog input for connecting a sensor with 0-10 V output - analog input for connecting a sensor with a 4 mA output (0 mA) - 20 mA - three analog inputs for standard CT with 5 A output (type T-0.66 or similar) - input for connecting a differential current transformer (the zero-sequence transformer)	
Main outputs: - load relay - two groups of double-throw contacts for controlling the motor starter - 5 A 250 V at cos φ=1 - functional relay - one group of double-throw contacts - 16 A 250 V at cos φ=1 (relay function is user-defined)	
Temperature sensor resolution, °C	1
Consumed power (under load), no more than, VA	5,0
Degree of protection: - the device - the terminal block	 IP40 IP20
Environment	U3.1 (international T3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +70
Weight, no more than, kg	0,5
Overall dimensions (see below)	9 modules of S - type
Mounting	on a standard DIN-rail 35 mm
Mounting position	arbitrary

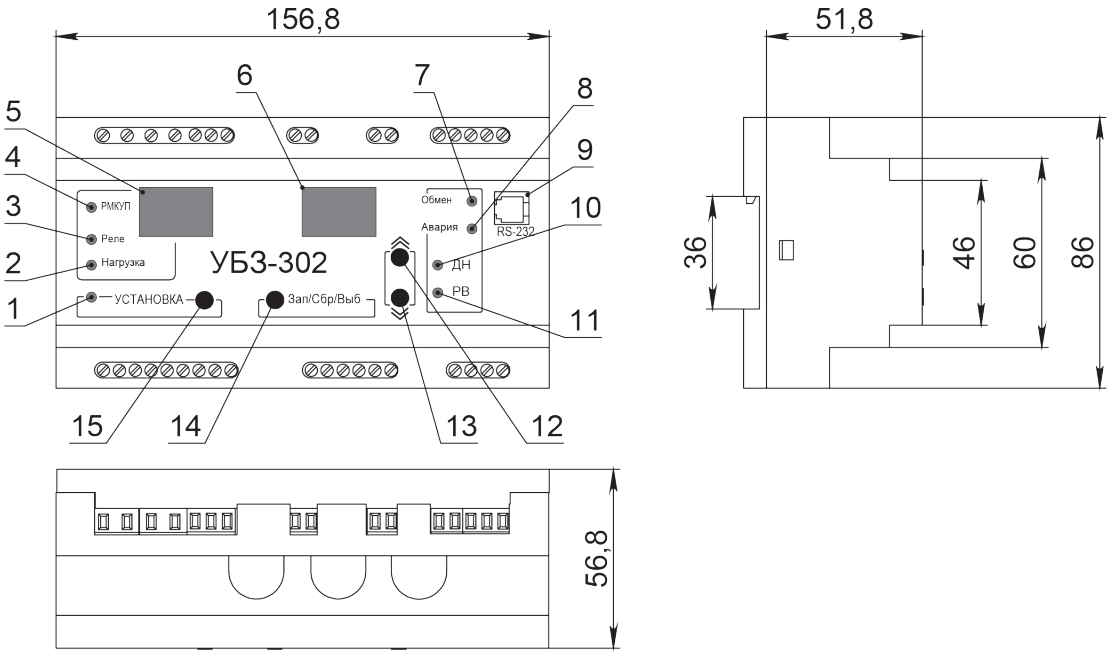
Description of output contacts of built-in relay

Cos φ	The maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional voltage for AC/DC, V	Max. current at Uност = 30 V (number of trips), A
0,4	2	100	1000	460	3 (50000)
1,0	5	100			

Functional relay

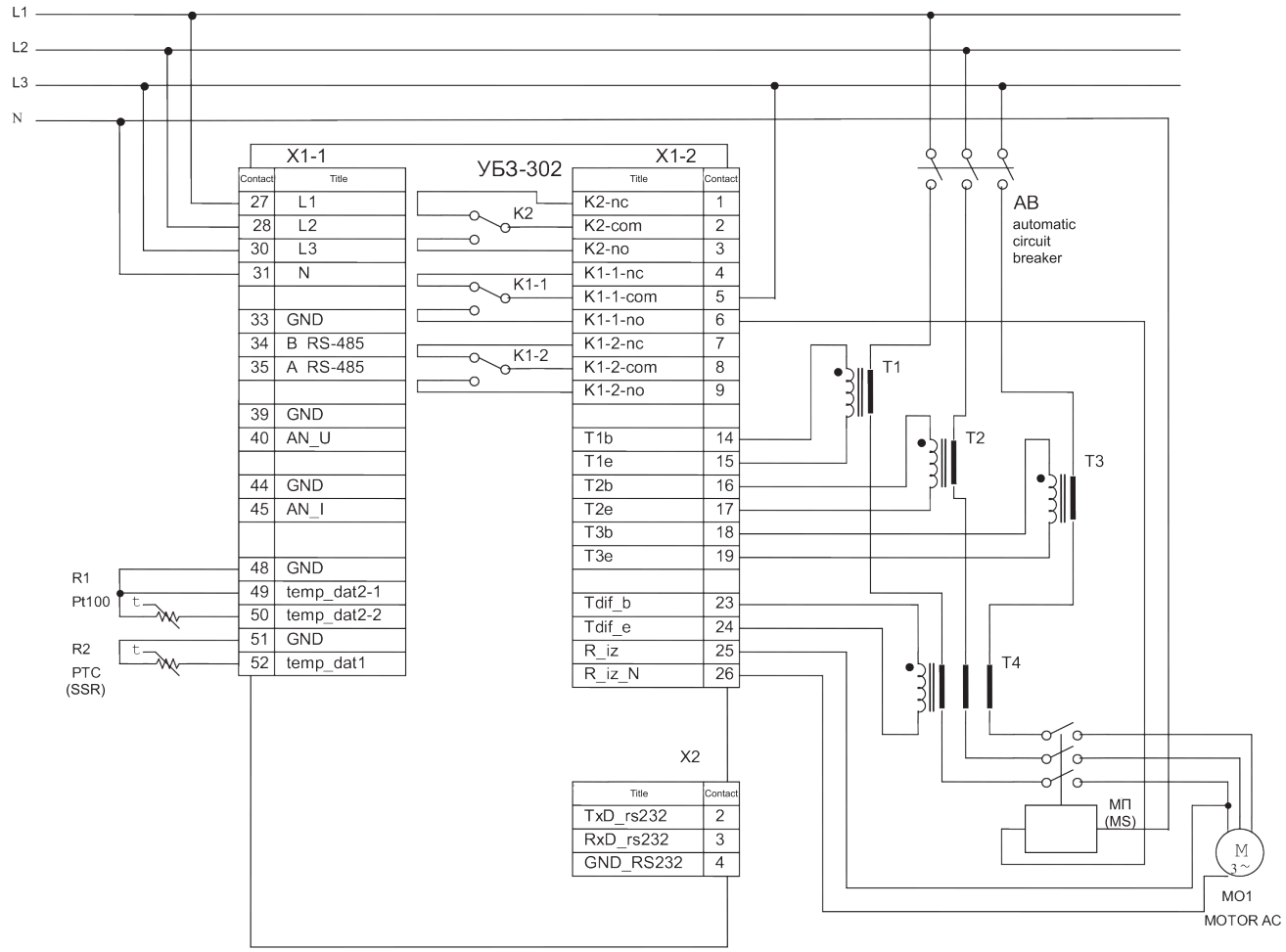
Cos φ	The maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional AC voltage, V	Max. current at Uност = 30 V, A
0,4	5	100	4000	440/300	3
1,0	16	100			

Overall dimensions (mm)



1 - Green LED "SETUP" - glows when the relay is in the parameter setting mode
2 - Green LED "LOAD" - glows when the load relay is on
3 - Green LED "RELAY" - glows when the function relay is on
4 - Green LED "MMSP" - glows when the relay is in the MMSP mode
5 - Three-digit indicator of parameter mnemonics:
- the point in the low-order digit of the indicator is lit when the УБЗ is in the setup mode of the engineer;
- the point in the middle of the indicator light is on when the value of the setting parameter is protected by the setup password;
- the point in the highest digit of the indicator is lit when the setting parameter is not included in the list of the MMSP
6 - Three-charge indicator of the parameter value
7 - Blue LED "EXCHANGE" - glows when data is being transferred from a PC
8 - Red LED "FAULT":
- when the load relay is switched off, it is lit when the УБЗ is in an alarm condition (blinking, if an auto reclosure is allowed after a fault);
- when the load relay is switched on - flashes when the motor is in the overload condition by the maximum current or thermal overload, but the relay trip time has not come yet.
9 - Connection module for OptiDin УБЗ-302 to PC via RS-232
10 - The green "S/D" LED glows when the OptiDin УБЗ-302 functional relay is operating in a star-delta mode.
11 - Green LED "FB" is lit, when the functional relay УБЗ operates in the time relay mode
12 - Button ▲ (in the text "UP") - view the displayed parameters in the parameter view mode and scrolling the menu in the parameter setting mode
13 - Button ▼ (in the text "DOWN") - scrolling the displayed parameters in the mode of viewing the parameters and flip through the menu in the parameter setting mode
14 - "RES/MEM/SEL" button - record parameters in the setup mode, switch the group of displayed parameters in the view mode, reset
15 - "SETUP" button - turns on the setting mode

Connection scheme of the OptiDin УБЗ-302



Relay K1 - load relay
Relay K2 - functional relay

Electric motor protection relay OptiDin УБЗ-302-1

The universal unit for protection of asynchronous electric motors OptiDin УБЗ-302-01 is designed to protect dual-speed (double-coil) motors, constant monitoring of network voltage parameters, operating phase/line current values and checking the value of insulation resistance of electric motors.
OptiDin УБЗ-302-01 provides protection of asynchronous dual-speed (double-coil) motors with a rated current of 5-50 A when using built-in current transformers.

OptiDin УБЗ-302-01 provides protection of electric motors at:
- substandard quality network voltage (unacceptable voltage surges, phase failure and skew, impaired phase sequence and phase sticking);
- mechanical overloads (symmetrical overload on phase / line currents);
- in the event of reverse sequence of the current threshold (current imbalance);
- delayed tripping of the engine or blockage of the rotor;
- the insulation level between the stator and the motor housing is abnormally low (start up check);
- the ground-to-fault of the stator winding during operation occurs - protection by leakage currents to earth;
- thermal overload of the engine.

A set of these or other protection parameters is determined by the user while the device programming. For each type of protection, it is possible to prohibit or allow the automatic reclosing (AR) of the load.

It is equipped with a full set of protections implemented in OptiDin УБЗ-302-01. In addition, it provides protection against delayed start and blocking of the rotor, controls overheating of the motor windings by means of temperature sensors.

Technical specifications

Rated supply voltage, three-phase, V	380
Network frequency, Hz	48-62
Range of rated currents, A	5-50
Voltage hysteresis (phase/line), V	10/17
Thermal hysteresis, % from accumulated during shutdown	33
Accuracy of the current response threshold determination, not more than, in % from the rated value	2
Accuracy of the voltage threshold determination, not worse than, V	3
Accuracy of phase imbalance by voltage, not worse, %	3
Temperature sensor resolution, °C	1
Voltage providing survival (minimum operational voltage): - a phase, with power from one phase and connected neutral wire, V not less than - a line, with power from three phases, not more than, V	 180 450
Digital input for signal to switch to higher speed (dry contact). Analog input to connect differential current transformer (zero sequence transformer). Three analog inputs for external CT connection. There are two analog inputs for connection of temperature sensors (type PT100, Ni100, Ni120)	
Main outputs: - load relay - two groups of double-throw contacts (5A 250 V at cos φ=1) - to control the motor starter	
Consumed power (under load), no more than, VA	5,0
Degree of protection: - the device - the terminal block	 IP40 IP20
Environment	U3.1 (international T3.1)
Operating temperature range, °C	from -35 to +55
Storage temperature range, °C	from -45 to +70
Weight, no more than, kg	0,5
Overall dimensions	9 modules of S-type
Mounting	on a standard DIN-rail 35 mm
Mounting position	arbitrary

Description of output contacts of a built-in relay

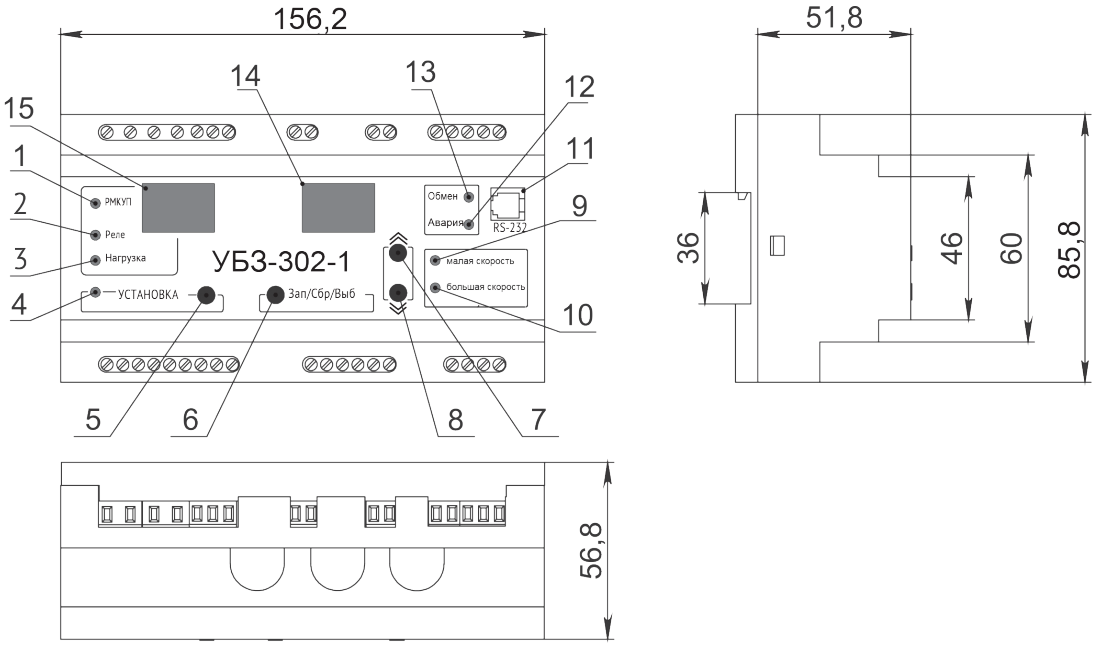
Load relay

Cos φ	Maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional voltage for AC, V	Max. current at Uпост = 30 V (number of trips), A
0,4	2	100	1000	460	3 (50000)
1	5	100			

Signal Relay

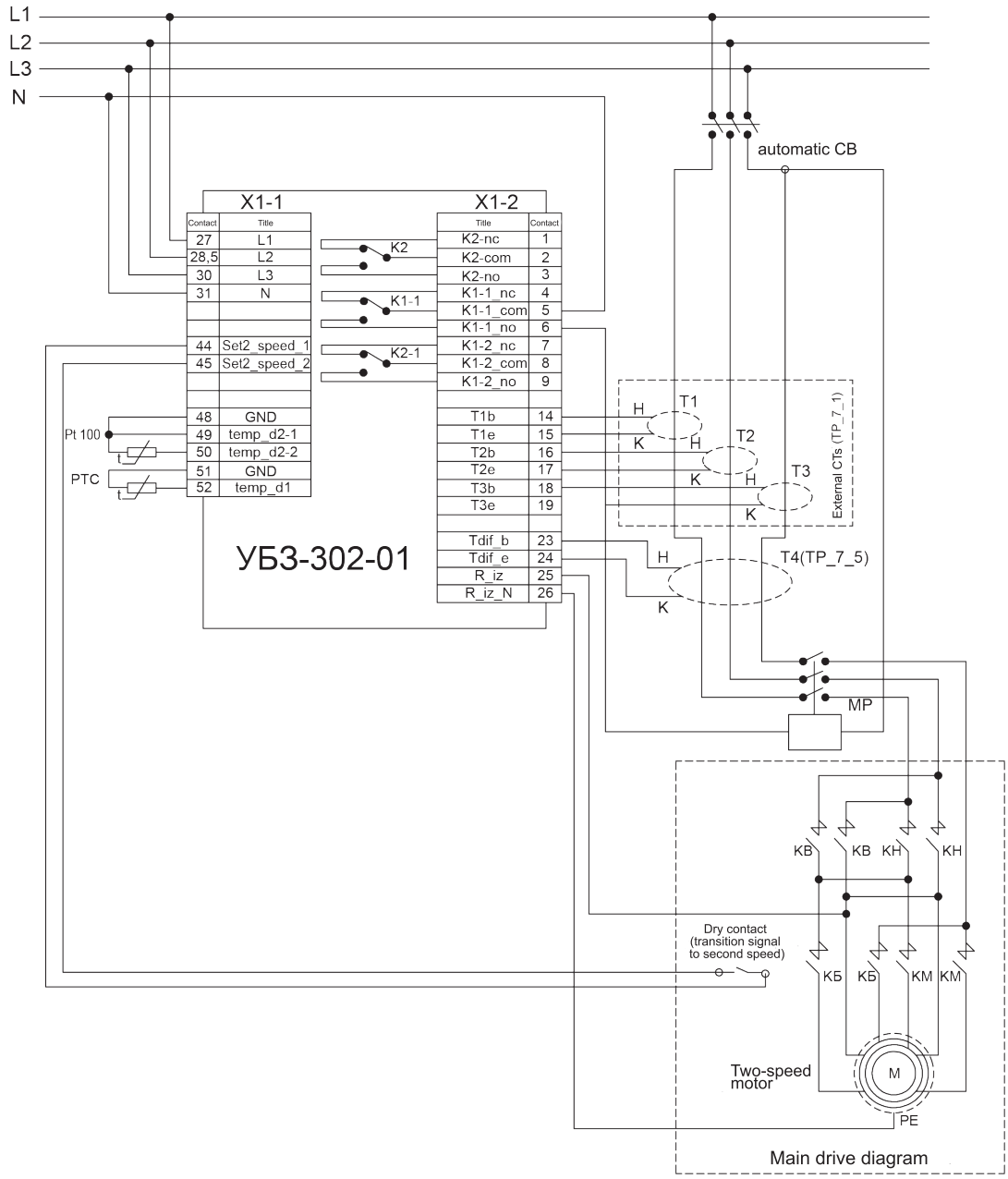
Cos φ	The maximum current at U ~ 250 V, A	Number of trips x 1000	Maximum switching power, VA	Maximum continuous additional voltage for AC, V	Max. current at Uпост = 30 V, A
0,4	5	100	4000	440/300	3
1	16	100			

Overall dimensions (mm)



1 - green LED of the MMSP - glows when the relay is in the MMSP mode;
2 - green LED RELAY - glows when alarm relay is on;
3 - green LED LOAD - glows when the load relay is on;
4 - green LED SETUP - glows when the relay is in the parameter setting mode;
5 - SETUP button - turns on the setting mode;
6 - Res/Mem/Sel – used to record parameters in setup mode; switch between groups of parameters displayed in view mode, reset;
7- button ▲ (in the text UP) - scrolling the displayed parameters in the parameter view mode and scrolling through the menus in the parameter setting mode;
8 - button ▼ (in the text DOWN) - scrolling the displayed parameters in the parameter view mode and scrolling through the menus in the parameter setting mode;
9 - indication of the engine operation at low speed;
10 - indication of the engine operation at high speed;
11 – socket for connecting a computer via RS-232 interface;
12 - red LED FAULT:
• glows when the load relay is switched off, it is on when the УБЗ is in an fault condition (flashes, if an auto reclosure is possible after an accident);
• when the load relay is switched on, it flashes when the motor is in overload condition at the maximum current or thermal overload, but the relay trip time has not been reached yet.
13 – blue LED EXCHANGE, lit when accessing УБЗ via RS-232, RS-485 interface;
14 - three-digit indicator of the parameter value;
15 - three-digit indicator of the parameter mnemonics:
- glows when the УБЗ is in the engineer's mode;
- glows when the value of the setting parameter is protected by the installer password;
- glows when the setting parameter is not included in the list of the MMSP.

Connection scheme of the OptiDin УБЗ-302-1

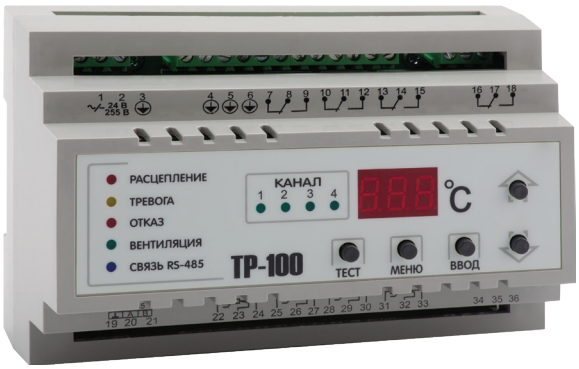


M - motor
PE - protective earth (protective conductor)

Temperature Controllers

Temperature controllers are designed to control freezers, refrigerated counters, monoblocks and other refrigeration commercial and industrial equipment.

Temperature relay OptiDin TP-100



The OptiDin TP-100 is designed to measure and control the temperature of the device via four PT100 sensors connected via a two- or three-wire circuit, followed by a display of temperature on the monitor and in case of alarm signals when any parameters exceed specified limits.

Can be used for protection:
- motors and generators;
- three-phase dry transformers with additional control of the temperature of the core or the environment;
- TP-100 has got universal power, can use any voltage from 24 to 255 V, regardless of polarity.

As temperature sensors OptiDin TP-100 can use the following types:
- PT100 - platinum sensor with a nominal resistance of 100 Ohm, at 0 °C;
- PT1000 - platinum sensor with a nominal resistance of 1000 Ohm, at 0 °C;
- KTY83 - silicon sensor with a nominal resistance of 1000 Ohm, at +25 °C;
- KTY84 - silicon sensor with a nominal resistance of 1000 Ohm, at +100 °C;
- PTC (1, 3, 6 series connection) the cold resistance of the sensor is 20-250 Ohms.

Technical specifications

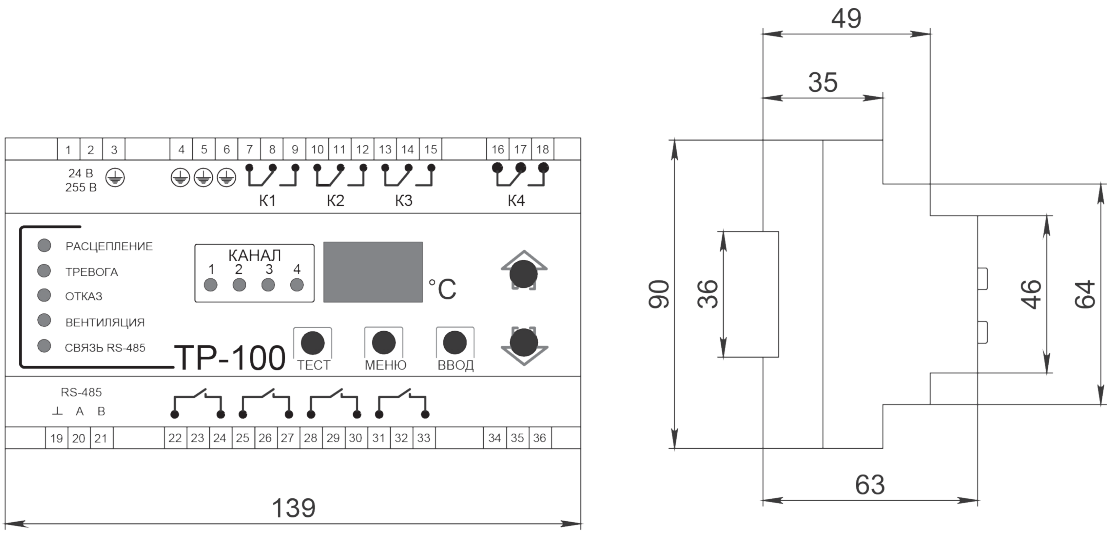
Supply power, V	24-260 AC/DC
Recommended fuse for equipment protection, A	1-2
Thermal transducers type	PT100, PT1000, KTY83, KTY84, PTC
Connectable transducers, pcs.	1-4*
Method of wiring	double-/three-wire
Sensor wire length (depending on the method of hardwire), m	double-wire up to 5 three-wire up to 100
Amount of output relay, pcs.	4
Data-hold time, years, not less then	15
Temperature measurement error, °C	±3
Temperature measurement range, °C	from -40 to +240
Output relay test	available
Indication test	available
RS-485 MODBUS RTU	available
Time measurement, sec	≤2
Degree of protection: - body - terminal block	 IP30 IP20
Environment	UHL3.1 (international TC3.1)
Power input (power load), VA, no more than	4,0
Weight, kg, no more then	0,37
Dimensions, mm	90x139x63
Operation temperature range, °C	from -40 to +50
Storage temperature, °C	from -50 to +60
Mounting	on standard 35 mm DIN-rail
Mounting position	arbitrary

* PTC transducers can be wired in a series connection (1, 3, 6 pcs.)

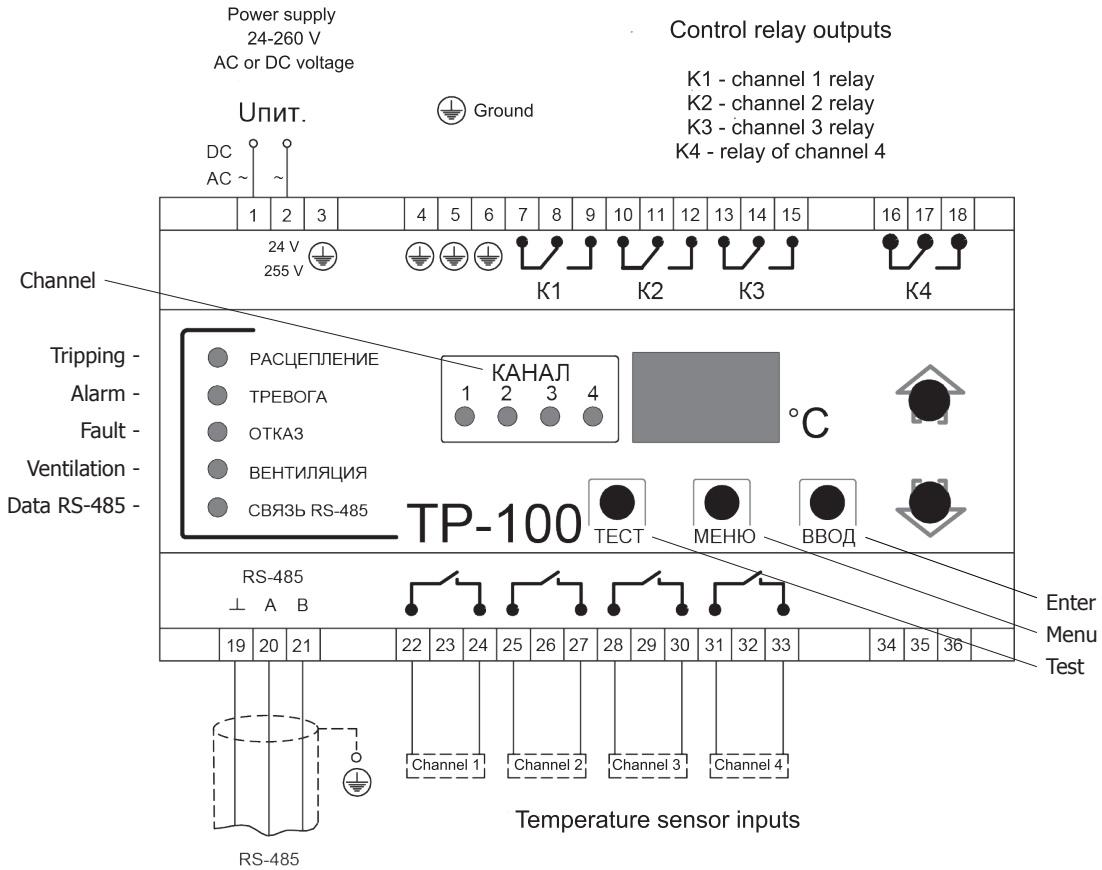
Description of output contacts

Cos φ	The maximum current at U ~ 250 V, A	Maximum capacity, VA	Maximum voltage, ~V	Max. current at Uпост = 24 V, A
1	10	2500	440	3
Commutation life of output contacts: - electrical life 10 A 250 V AC times, not less than - electrical life 10 A 24 V DC times, not less than				 100 thsd 100 thsd

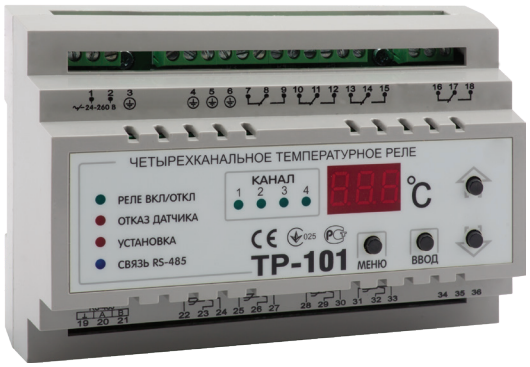
Overall dimensions (mm)



Wiring diagrams of OptiDin TP-100



Temperature relay OptiDin TP-101



The OptiDin TP-101 digital temperature relay is designed to measure and control the temperature of the device using four independent sensors, connected via a two- or three-wire circuit, followed by the temperature data presentation on the display. The device can be used in various industries, public services and agriculture.

The device allows to perform the following functions:
- temperature measurement on four independent channels using standard sensors;
- temperature control according to the proportional-integral-differential (PID) law, with the output key unit (relay), as well as a dual-position temperature control;
- presentation of the current measured temperature value on the built-in LED digital indicator;
- transfer to the computer the measured temperature values of the monitored sensors using the standard Modbus RTU protocol;
- detection of an open or closed line of the connected sensors;
- digital filtering and correction of the measured temperature;
- programming with buttons on the front panel and through the PC;
- save settings when the power is turned off;
- protect settings from unauthorized changes.

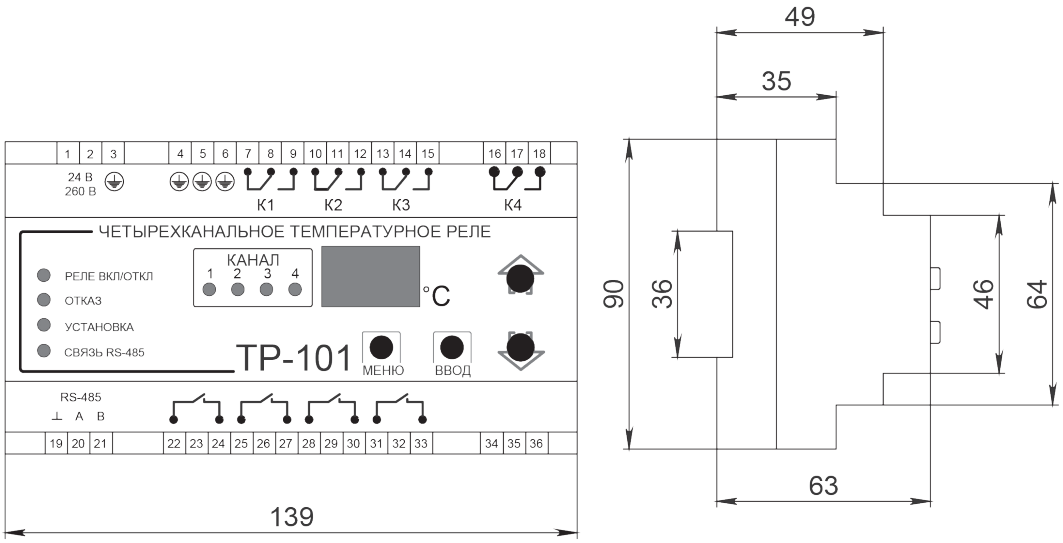
Technical specifications

Supply voltage, V	24-260 AC/DC
Recommended fuse for protection of the device, A	1-2
Type of sensors used to measure temperature	Pt50, Pt100, Pt500, Pt1000, Cu50, Ni100, Ni120, Ni500, Ni1000, PTC1000
Number of connected sensors, pcs.	1-4
Wiring diagram of sensors	2/3 wires
Sensor wire length depending on the wiring scheme, m	dual-wire up to 5 three-wire, up to 100
Number of output relays, pcs.	4
Data retention time, not less than, years	10
Temperature measurement error, not more than, °C	±2
Range of measured temperatures, °C	from -50 to +200
Output relay test	available
RS-485 MODBUS RTU	available
PID control with a key element (relay)	available
Two-position control	available
Channel measurement time, s	≤ 0,6
Degree of protection: - housings - terminal block	 IP30 IP20
Environment	U3.1 (international T3.1)
Consumed power (under load), no more than, VA	4,0
Weight, no more than, kg	0,37
Overall dimensions, mm	90x139x63
Mounting	on a standard DIN-rail 35 mm
Mounting position	arbitrary
Operating temperature range, ° C	from -35 to +55
Storage temperature, °C	from -45 to +60

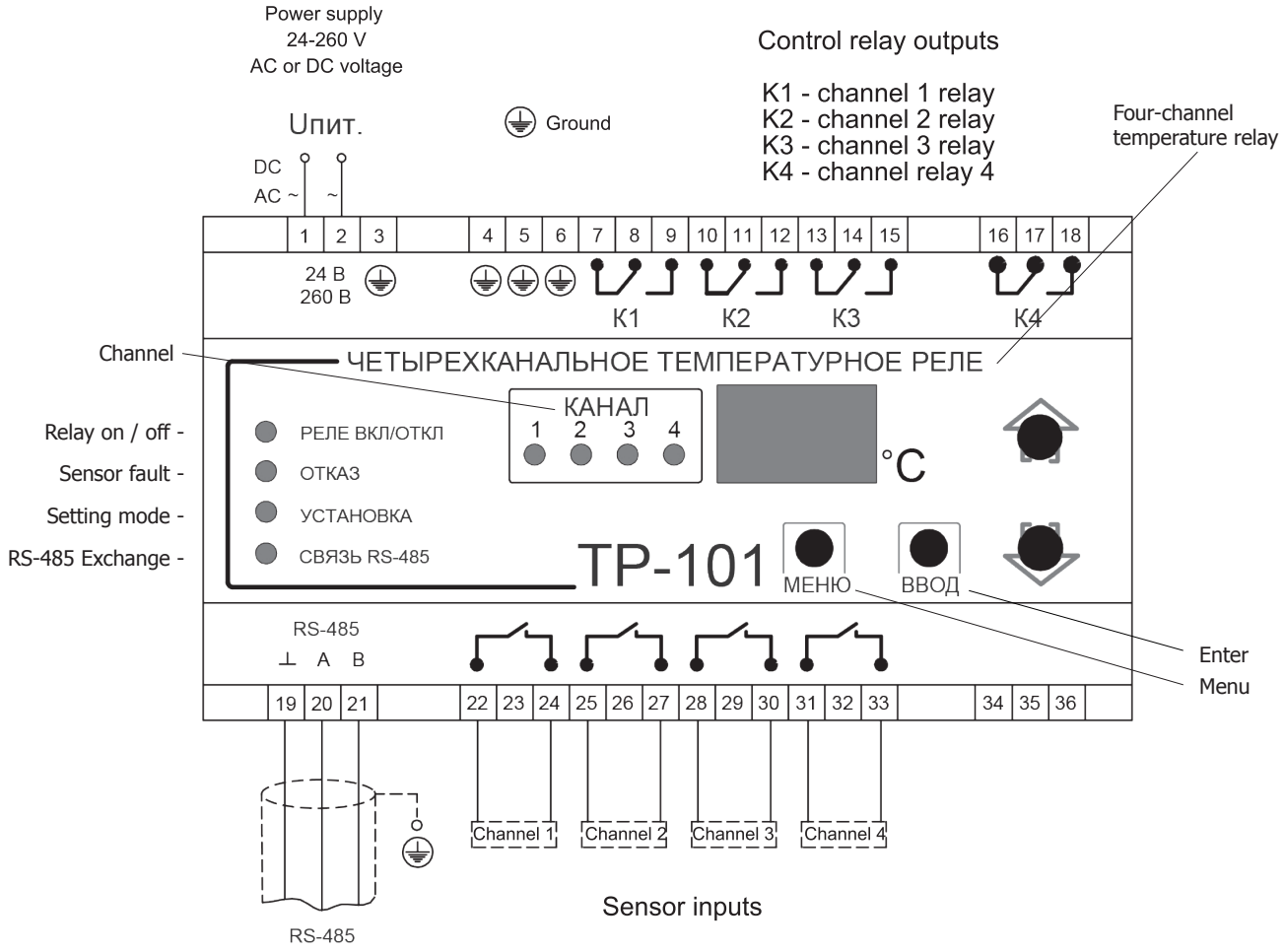
Description of output contacts

Cos φ	The maximum current at U ~ 250 V, A	Maximum capacity, VA	Maximum voltage, ~ V	Max. current at Uпост = 30 V, A
1,0	10	4000	440	3
Commutation life of output contacts: - electrical life 10 A 250 V AC times, not less than - electrical life 10 A 24 V DC times, not less than				 100 thsd 100 thsd

Overall dimensions (mm)



Electrical wiring diagram OptiDin TP-101



Temperature relay OptiDin TP-102

OptiDin TP-102 is designed to maintain the temperature in four zones with the help of thermoregulator contacts (bimetallic sensor). The temperature is maintained in a cyclic mode with an indication of the current control zone.

The device allows you to perform the following functions:

- maintenance of temperature in four thermal zones according to a cyclic scheme;
- blocking control of uncontrolled zones;
- display of the current monitored zone and its control time on the built-in LED digital indicator;
- transfer to the PC of data on the controlled zones using the standard Modbus RTU protocol;
- programming with buttons on the front panel via PC;
- save settings when the power is turned off;
- protection of settings from unauthorized changes.

The OptiDin TP-102 has a universal power supply and can use any voltage from 24 to 260 V, regardless of its polarity.

As sensors OptiDin TP-102 are used as a bimetallic thermoregulator sensor (the logic of operation is set by the user during programming).

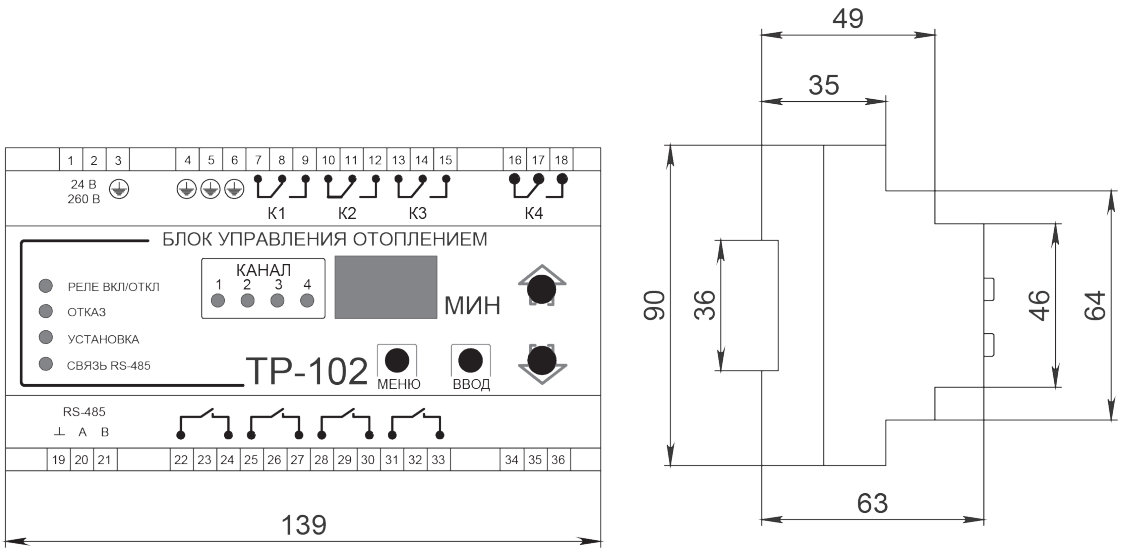
Technical specifications

Supply voltage, V	24-260 AC/DC
Recommended fuse for protection of the device, A	1-2
Number of connected sensors, pcs.	1-4
Number of output relays, pcs.	4
Data retention time, not less than, years	10
RS-485 MODBUS RTU	available
Degree of protection: - body - terminal block	 IP30 IP20
Environment	U3.1 (international T3.1)
Consumed power (under load), no more than, VA	4,0
Weight, no more than, kg	0,37
Overall dimensions, mm	90x139x63
Mounting	on a standard DIN-rail 35 mm
Mounting position	arbitrary
Rated impulse withstand voltage, kV	2,5
Sensor type, "dry contact"	bimetallic sensor
Operating temperature range, ° C	from -35 to +55
Storage temperature, °C	from -45 to +60

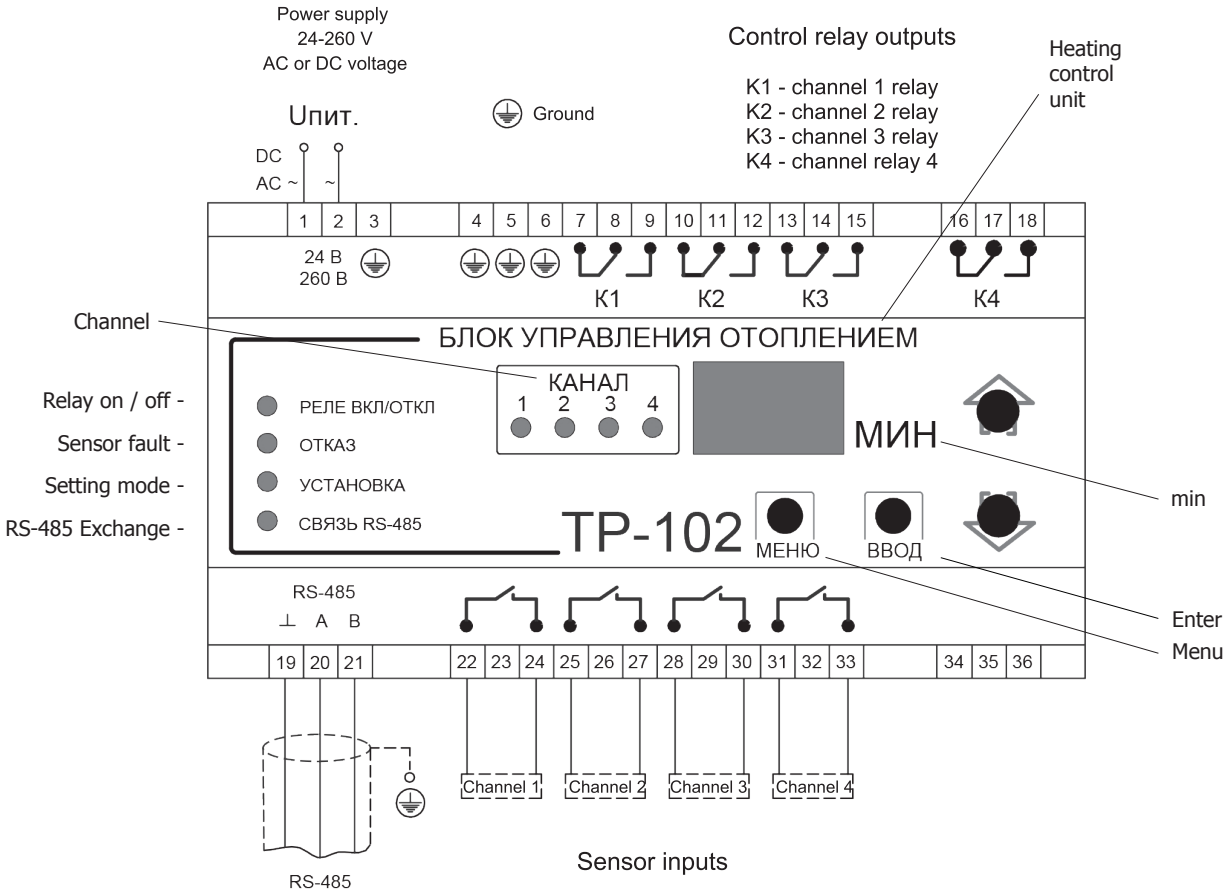
Description of output contacts

Cos φ	The maximum current at U ~ 250 V, A	Maximum capacity, VA	Maximum voltage, ~ V	Max. current at Uпост = 30 V, A
1	10	4000	440	3
Commutation life of output contacts: - electrical life 10 A 250 V AC times, not less than - electrical life 10 A 24 V DC times, not less than				 100 thsd 100 thsd

Overall dimensions (mm)



Heating control unit OptiDin TP-102



Time-current characteristics of switches

Dependence of the rated operating currents of the overcurrent releases of automatic circuit breakers OptiDin BM63, OptiDin BM63 DC from ambient temperature.

Ambient temperature (° C)													
In(A)	-25	-20	-10	0	10	20	**30**	35	40	45	50	55	60
1	1,2	1,2	1,2	1,1	1,09	1,05	**1**	1	0,94	0,94	0,93	0,9	0,89
2	2,4	2,4	2,3	2,2	2,2	2,1	**2**	2	1,9	1,9	1,9	1,8	1,8
3	3,5	3,4	3,3	3,3	3,3	3,2	**3**	2,9	2,8	2,8	2,75	2,7	2,7
4	4,9	4,8	4,7	4,5	4,3	4,2	**4**	3,9	3,9	3,8	3,7	3,6	3,5
5	5,9	5,8	5,7	5,6	5,4	5,2	**5**	4,9	4,8	4,6	4,5	4,3	4,3
6	7,3	7,2	7	6,7	6,54	6,38	**6**	5,82	5,64	5,6	5,6	5,4	5,3
8	9	8,9	8,9	8,8	8,7	8,4	**8**	7,8	7,5	7,4	7,2	7,2	7
10	12	12	12	11	10,9	10,5	**10**	9,6	9,3	9,3	9,2	9	8,9
13	16	16	15	15	14	14	**13**	13	13	12	12	12	12
16	20	19	19	18	17,44	16,8	**16**	15,52	15,04	15	14,8	14	14
20	24	24	23	22	21,8	21	**20**	19,4	18,8	18,5	18,2	18	18
25	31	30	29	28	27,25	26,3	**25**	24,25	23,5	24	23	23	22
32	39	38	37	36	35	33,6	**32**	31	30	30	30	29	28
40	49	48	47	45	43	42	**40**	38,4	36,8	37	36	36	35
50	61	60	58	56	54,5	52,5	**50**	48,5	47	47	46	45	44
63	77	76	73	71	68,7	66,2	**63**	61,1	59,2	60	58	57	56

Control temperature + 30 ° C

Time-current characteristics of automatics of switches OptiDin BM63 in accordance with GOST R 50345

Switches with the type B of protection characteristics

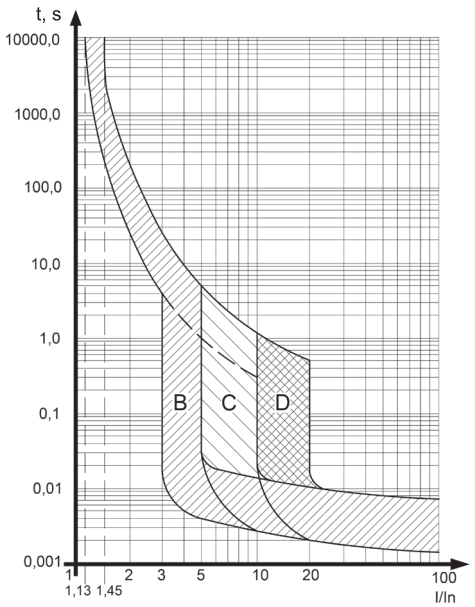
The electromagnetic release operates in the range from 3 to 5 In.
Thermal release does not work for 1 hour at a current of 1,13 In and is activated for 1 hour at a current 1,45 In.

Switches with the type of protective characteristic C

The electromagnetic release operates in the range from 5 to 10 In.
Thermal release does not work for 1 hour at a current of 1,13 In and is activated for 1 hour at a current 1,45 In.

Switches with type of protective characteristic D

The electromagnetic release operates in the range from 10 to 20 In.
Thermal release does not work for 1 hour at a current of 1,13 In and is activated for 1 hour at a current 1,45 In.



Time-current characteristics of automatic switches OptiDin BM63 in accordance with GOST R 50030.2

Switches with Z type protective characteristics

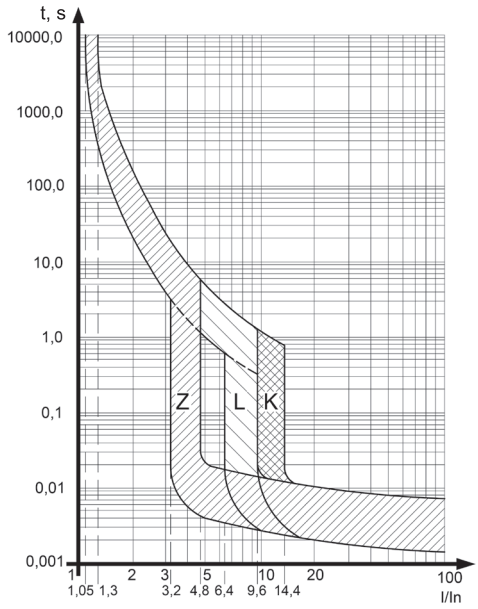
The electromagnetic release operates in the range from 3,2 In to 4,8 In.
Thermal release does not work for 1 hour at a current of 1,05 In and operates for 1 hour at a current 1,3 In.

Switches with the type of protection characteristics L

The electromagnetic release operates in the range from 6,4 In to 9,6 In.
Thermal release does not work for 1 hour at a current of 1,05 In and operates for 1 hour at a current 1,3 In.

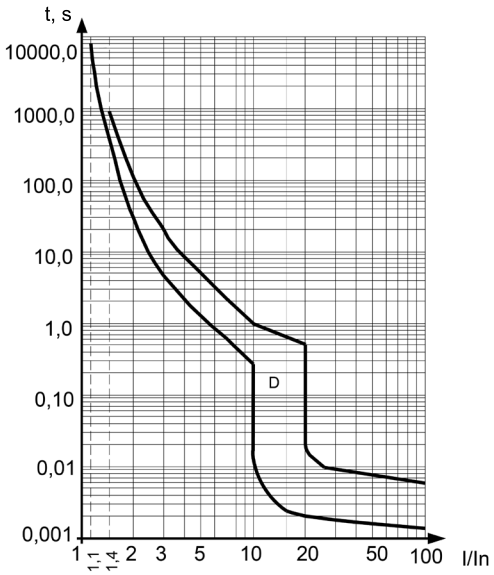
Switches with type of protection characteristics K

The electromagnetic release operates in the range from 9,6 In to 14,4 In.
Thermal release does not work for 1 hour at a current of 1,05 In and operates for 1 hour at a current 1,3 In.



Time-current characteristics of automatic switches OptiDin BM63-OT according to GOST 50345

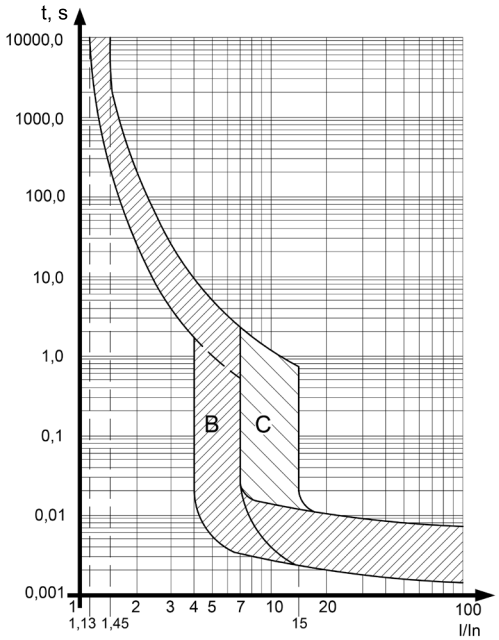
Switches with with D type of protective characteristics
The electromagnetic release trips in the range from 10 to 20 In. The thermal release does not trip for 1 hour at a current of 1,1 In and is activated for 1 hour at a current of 1,4 In. 1,05 In and operates for 1 hour at a current of 1,3 In.



Time-current characteristics of the automatic switch OptiDin BM63 DC according to GOST IEC 60898-2

Switches with the B type of protective characteristics
The electromagnetic release trips in the range from 3 to 5 In. The thermal release does not trip for 1 hour at a current of 1,13 In and is activated for 1 hour at a current of 1,45 In.

Switches with the C type of protective characteristics
The electromagnetic release trips in the range from 5 to 10 In. The thermal release does not trip for 1 hour at a current of 1,13 In and is activated for 1 hour at a current of 1,45 In.

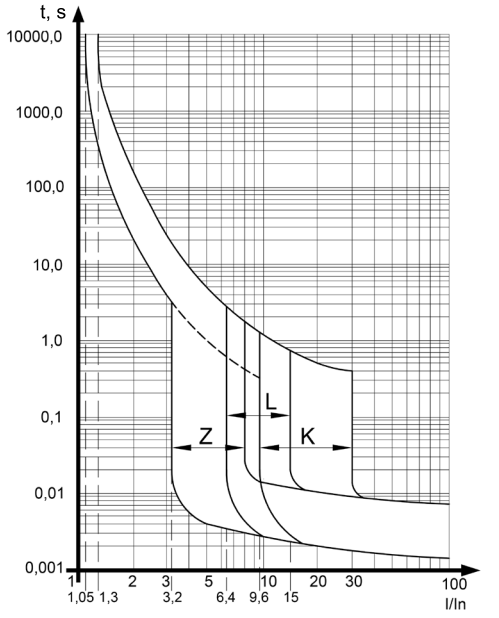


Time-current characteristics of the automatic switch OptiDin BM63 DC according to GOST IEC 60898-2

Switches with Z type of protective characteristics
The electromagnetic release trips in the range from 3,2 to 4,8 In. The thermal release does not trip for 1 hour at a current of 1,05 In and is activated for 1 hour at a current of 1,3 In.

Switches with the L type of protective characteristics
The electromagnetic release trips in the range from 6,4 to 9,6 In. The thermal release does not trip for 1 hour at a current of 1,05 In and is activated for 1 hour at a current of 1,3 In.

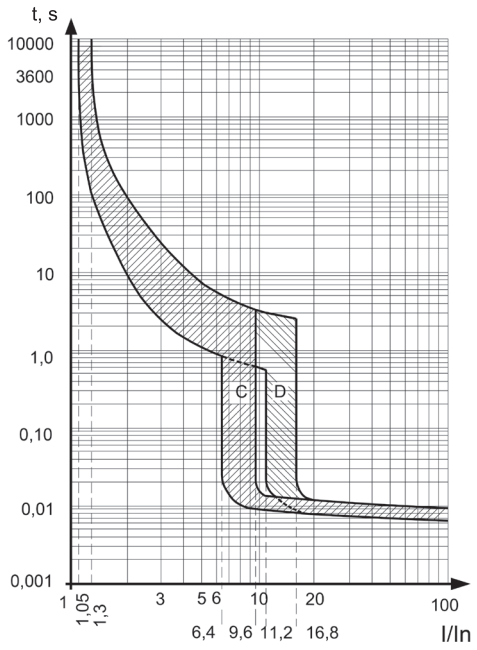
Switches with K type of protective characteristics
The electromagnetic release trips in the range from 9,6 to 14,4 In.
The thermal release does not trip for 1 hour at a current of 1,05 In and is activated for 1 hour at a current of 1,3 In.



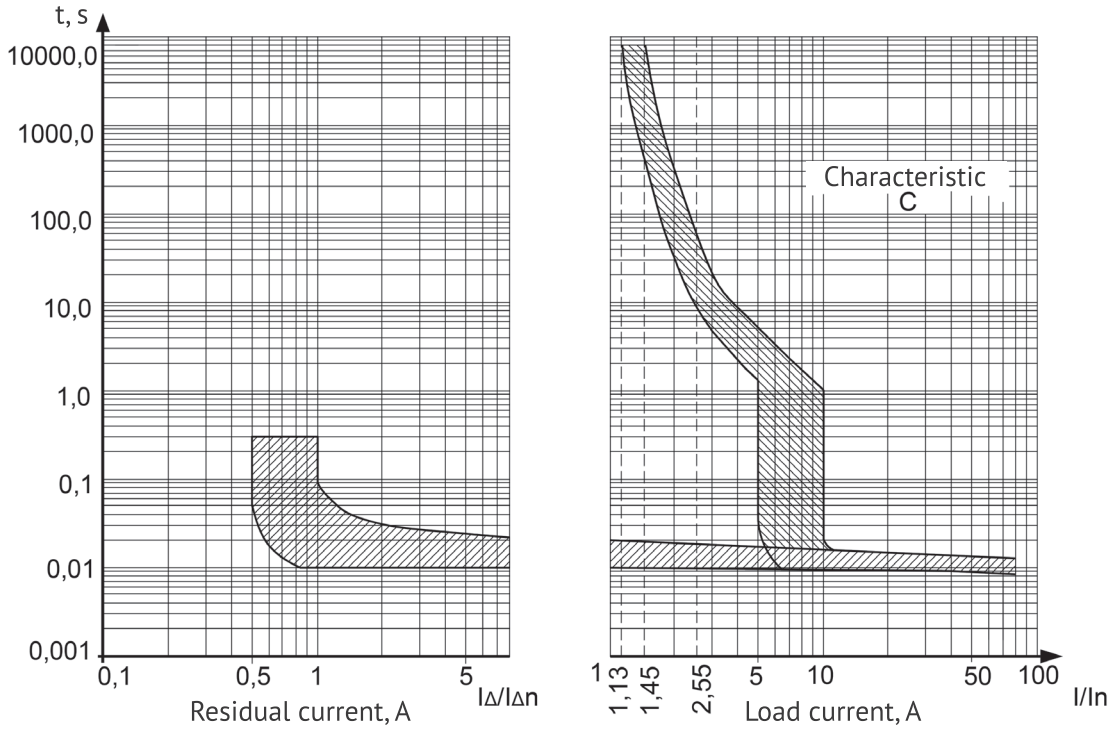
Time-current characteristics of automatic switches OptiDin BM125 in accordance with GOST R 50030.2

Switches with the C type of protective characteristics
The electromagnetic release trips in the range from 5 to 10 In. The thermal release does not trip for 2 hours at a current of 1,05 In and is activated for 2 hours at a current of 1,3 In.

Switches with D type of protective characteristics
The electromagnetic release trips in the range from 10 In to 20 In.
The thermal release does not trip for 2 hours at a current of 1,05 In and is activated for 2 hours at a current of 1,3 In.



Time-current characteristics of automatic RCBOs OptiDin D63 and OptiDin VD63 GOST IEC 61009-1



a) Trip characteristic and time threshold values for residual current tripping.

b) Protection characteristic in the conditions of action of overcurrents at a reference temperature plus 30º + 5ºC, from a cold position, when current is directed through all protected poles of the RCBO.