

OptiStart - represents start-up equipment that is intended to allow the implementation of both standard and technically complex solutions



On the basis of KEAZ devices of the OptiStart series and relevant accessories, it is possible to implement any solution for the protection of equipment, even in complex process plants in production. The main areas of application: heat and water supply, metallurgy, oil and gas industry, metal mining industry, electric transport and industries with heavy - duty operation of electric motors.

A broad assortment, high reliability, compactability, as well as a wide range of additional accessories provide for flexibility and adaptability while solving the problems of control and protection of electrical equipment. Modular design enables to modify and equip additionally the units with auxiliary contact blocks, releases, electronic timers and other accessories.

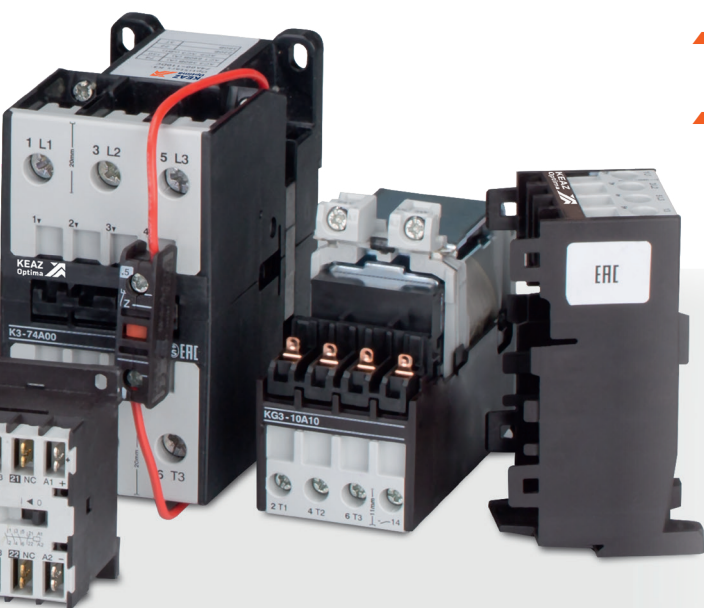
OptiStart product range

- ▣ OptiStart MP Automatic motor protection circuit breakers 326
 - ▣ OptiStart MP-32 Automatic circuit breakers
 - ▣ OptiStart MP-63 Automatic circuit breakers
 - ▣ OptiStart MP-100 Automatic circuit breakers

- ▣ OptiStart K Electromagnetic contactors 348
 - ▣ OptiStart K1 (D) Mini - contactors
 - ▣ OptiStart K1 (F) Mini - contactors with "faston" contacts
 - ▣ OptiStart K1 (L) Mini - contactors for printed circuit boards
 - ▣ OptiStart K1W Mini - contactors reversing
 - ▣ OptiStart K1-07 Relay type mini - contactors
 - ▣ OptiStart K3/OptiStart K(G)3/OptiStart K2 Electromagnetic contactors
 - ▣ OptiStart K3-07 Electromagnetic relay type contactors
 - ▣ OptiStart K3 (K) Contactors for capacitor switching

- ▣ OptiStart B Direct-on-line starters 410

- ▣ OptiStart TU Thermal overload relays 415
 - ▣ OptiStart TU12/16 (K1) Thermal overload relays for mini-contactors
 - ▣ OptiStart TU12/16 (K3) Thermal overload relays for electromagnetic contactors
 - ▣ OptiStart TU3 Thermal overload relays for electromagnetic contactors
 - ▣ OptiStart TU Thermal overload relays for electromagnetic contactors (separate mounting)
 - ▣ OptiStart TUAT Thermal overload relays for electromagnetic contactors (with a slow response characteristic)



The OptiStart product range allows to implement any solution in various power supply systems

Automatic motor protection circuit breakers

OptiStart MP-32T



OptiStart MP-32RH



OptiStart MP-63R



OptiStart MP-100R



Automatic motor protection circuit breakers are applied as components in the control circuits of electric motors. A wide range and a variety of technical specifications allow to select a circuit breaker for protection against thermal overload and/or short-circuit currents with standard or increased maximum switching capacity.



Mini - contactors

OptiStart K1 (D)



OptiStart K1 (F)



OptiStart K1 (L)



Mini - contactors feature compact and powerful devices that perfectly suit for installations where reliability, along with small overall dimensions, is the main requirement. A wide range of standard series and a variety of technical specifications allow customers to select a contactor for any application area, including electronic circuits (for printed circuit boards).



Three-pole electromagnetic contactors

OptiStart K3-10



Three-pole contactors control the operation modes of electrical equipment for residential, commercial buildings and industrial enterprises, as well as control the operating modes of low voltage distribution networks.

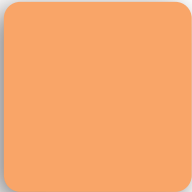
OptiStart K3-1000



OptiStart K3-90



Four-pole electromagnetic contactors



Four-pole contactors meet the special requirements for energy distribution systems. For example, they are applied to switch off distribution systems with an ungrounded neutral, for distribution systems of power supply, for TT distribution systems, where the neutral pole is meant to be always disconnected.

OptiStart K3-10

OptiStart K2-60



Capacitor switching contactors

OptiStart K3 (K)

To reduce the starting current, special capacitor contactors of the two-step start are applied, which prevent the welding of contacts at the time of capacitor commutation in reactive power compensation units.



Thermal overload relays

Thermal overload relays are designed to protect three-phase asynchronous motors with a squirrel-cage rotor from current overloads of unallowable duration, including those occurring in the event of a phase loss.

OptiStart TU12/16

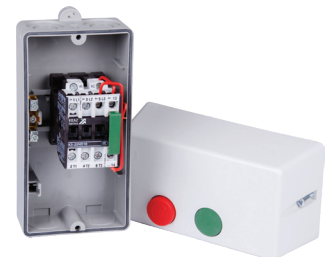
OptiStart TU3/32

OptiStart TU85

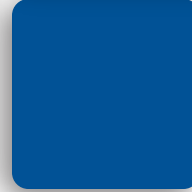


Direct-on-line starters

OptiStart B1T



Electromagnetic starters are intended for use as component units in the control circuits of electric motor drives for a remote start-up by the direct connection to the network and stop of three-phase asynchronous motors with a squirrel-cage rotor, and other current collectors of electrical installations. When equipped with thermal relays, they provide protection against current overloads of unallowable duration, including those that occur in the event of a phase loss. The available high quality plastic case ensures the IP65 degree of protection.



OptiStart MP Automatic motor protection circuit breakers



OptiStart MP automatic motor protection circuit breakers are intended for application as components in control circuits for electric motor drives (mainly in stationary installations). The devices are used for:

- conducting currents in the normal mode;
- protection of asynchronous electric motors with a squirrel-cage rotor, contactors and motor starters from the currents that occur during a short circuit event, overloads of unallowable duration, the loss of a phase;
- remote starting of motors by direct connection to the intermitting network with a frequency of not more than 25 starts per hour in the circuits with a rated voltage of up to 690 V and currents of 100 A.

The OptiStart MP series of automatic circuit breakers is designed with a push - button switch or a rotary type switch, are compact in size, which allows the specified switches to be mounted on a standard DIN - rail and to maintain operating space in the switchboard. The OptiStart MP automatic circuit breakers are available as an option only with an electromagnetic release, as well as in conjunction with a bimetallic thermal release with the inverse time delay. The range includes circuit breakers with standard and increased maximum switching capacity. The state of the automatic circuit breaker is monitored by the data from the signal contact.

Selection table

Type of equipment	32T	32RH	32RHI	63R	63RH	63RHI	100R	100RH	100RHI	
Rated current In, A	32			63			100			
Type of control	Push-button type			Rotary type						
Handle position indication	ON/OFF			ON/OFF/TRIP						
Availability of a thermal release	+		-	+		-	+		-	
Maximum switching capacity, kA	100-15		100-50		100-25		100-50		50	100-75
Temperature compensation, °C	-20 ... +60									

Designation





OptiStart MP - 100 R H I - 75



①	Product range	OptiStart - electric motor control and protection equipment								
②	Identification of equipment	MP - automatic motor protection circuit breaker								
③	Configuration	32			63			100		
④	Type of control	T - push - button type			R - rotary type					
⑤	Making and breaking capacity	without a letter designation - standard					H - increased			
⑥	Availability of a thermal release	without a letter designation - a release is available					I - without a release			
⑦	Rated current In, A	from 0,16 to 100								

The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.

Selection guide

Type of equipment	Appearance	Type of the handle	Rated current I_n , A	Compatible with motors of 3~400V, kW *	Setting range of the thermal release, A	Setting of the electromagnetic release, A	Breaking capacity at 3~400V I_{cu} , kA	Title	Reference	Weight, kg
Automatic motor protection circuit breakers with thermal protection and short-circuit current protection with standard maximum switching capacity										
32T		Push - button type	0,16	-	0,1-0,16	2,1	100	OptiStart MP-32T-0,16	115713	0,32
			0,25	0,06	0,16-0,25	3,3		OptiStart MP-32T-0,25	115714	
			0,4	0,09	0,25-0,4	5,2		OptiStart MP-32T-0,4	115715	
			0,63	1,018	0,4-0,63	8,2		OptiStart MP-32T-0,63	115716	
			1	0,25	0,63-1	13		OptiStart MP-32T-1	115734	
			1,6	0,55	1-1,6	20,8		OptiStart MP-32T-1,6	115735	
			2,5	0,75	1,6-2,5	32,5		OptiStart MP-32T-2,5	115740	
			4	1,5	2,5-4	52		OptiStart MP-32T-4	115742	
			6	2,2	4-6	78		OptiStart MP-32T-6	115744	
			8	3	5-8	104		OptiStart MP-32T-8	115745	
			10	4	6-10	130		OptiStart MP-32T-10	115746	
			13	5,5	9-13	169		OptiStart MP-32T-13	115751	
			17	7,5	11-17	221		OptiStart MP-32T-17	115752	
			22	7,5	14-22	286		OptiStart MP-32T-22	115756	
26	11	18-26	338	OptiStart MP-32T-26	115758					
32	15	22-32	416	OptiStart MP-32T-32	115759					
63R		Rotary type	10	4	6-10	130	100	OptiStart MP-63R-10	251655	1,1
			13	5,5	9-13	169	50	OptiStart MP-63R-13	251656	
			17	7,5	11-17	221	25	OptiStart MP-63R-17	251657	
			22	7,5	14-22	286		OptiStart MP-63R-22	251658	
			26	12,5	18-26	338		OptiStart MP-63R-26	115785	
			32	15	22-32	416		OptiStart MP-63R-32	115787	
			40	18,5	28-40	520		OptiStart MP-63R-40	115790	
			50	22	34-50	650		OptiStart MP-63R-50	115793	
63	30	45-63	819	OptiStart MP-63R-63	115796					
100R		Rotary type	17	7,5	11-17	221	50	OptiStart MP-100R-17	251664	2,2
			22	7,5	14-22	286		OptiStart MP-100R-22	251665	
			26	12,5	18-26	338		OptiStart MP-100R-26	251666	
			32	15	22-32	416		OptiStart MP-100R-32	251667	
			40	18,5	28-40	520		OptiStart MP-100R-40	251668	
			50	22	34-50	650		OptiStart MP-100R-50	251669	
			63	30	45-63	819		OptiStart MP-100R-63	115798	
			75	37	55-75	957		OptiStart MP-100R-75	115799	
			90	45	70-90	1170		OptiStart MP-100R-90	115800	
			100	-	80-100	1300		OptiStart MP-100R-100	116113	
Automatic motor protection circuit breakers with thermal protection and short-circuit current protection with increased maximum switching capacity										
32RH		Rotary type	0,16	-	0,1-0,16	2,1	100	OptiStart MP-32RH-0,16	251674	0,32
			0,25	0,06	0,16-0,25	3,3		OptiStart MP-32RH-0,25	251675	
			0,4	0,09	0,25-0,4	5,2		OptiStart MP-32RH-0,4	251676	
			0,63	1,018	0,4-0,63	8,2		OptiStart MP-32RH-0,63	251677	
			1	0,25	0,63-1	13		OptiStart MP-32RH-1	251678	
			1,6	0,55	1-1,6	20,8		OptiStart MP-32RH-1,6	251679	
			2,5	0,75	1,6-2,5	32,5		OptiStart MP-32RH-2,5	251680	
			4	1,5	2,5-4	52		OptiStart MP-32RH-4	251681	
			6	2,2	4-6	78		OptiStart MP-32RH-6	251682	
			8	3	5-8	104		OptiStart MP-32RH-8	251683	
			10	4	6-10	130		OptiStart MP-32RH-10	251684	
			13	5,5	9-13	169		OptiStart MP-32RH-13	251685	
			17	7,5	11-17	221		OptiStart MP-32RH-17	251686	
			22	7,5	14-22	286		OptiStart MP-32RH-22	251687	
26	11	18-26	338	OptiStart MP-32RH-26	251688					
32	15	22-32	416	OptiStart MP-32RH-32	251689					

* Approximate ratings of standard motors

Type of equipment	Appearance	Type of the handle	Rated current In, A	Compatible with motors of 3~400V, kW *	Setting range of the thermal release, A	Setting of the electromagnetic release, A	Breaking capacity at 3~400V Icu, kA	Title	Reference	Weight, kg	
63RH		Rotary type	10	4	6-10	130	100	OptiStart MP-63RH-10	251690	1,1	
			13	5,5	9-13	169		OptiStart MP-63RH-13	251691		
			17	7,5	11-17	221		OptiStart MP-63RH-17	251692		
			22	7,5	14-22	286		OptiStart MP-63RH-22	251693		
			26	12,5	18-26	338	50	OptiStart MP-63RH-26	251694		
			32	15	22-32	416		OptiStart MP-63RH-32	251695		
			40	18,5	28-40	520		OptiStart MP-63RH-40	251696		
			50	22	34-50	650		OptiStart MP-63RH-50	251697		
63	30	45-63	819	OptiStart MP-63RH-63	251698						
100RH		Rotary type	17	7,5	11-17	221	100	OptiStart MP-100RH-17	251699	2,2	
			22	7,5	14-22	286		OptiStart MP-100RH-22	251700		
			26	12,5	18-26	338		OptiStart MP-100RH-26	251701		
			32	15	22-32	416		OptiStart MP-100RH-32	251702		
			40	18,5	28-40	520		OptiStart MP-100RH-40	251703		
			50	22	34-50	650		OptiStart MP-100RH-50	251704		
			63	30	45-63	819	OptiStart MP-100RH-63	251705			
			75	37	55-75	957	75	OptiStart MP-100RH-75	251706		
			90	45	70-90	1170		OptiStart MP-100RH-90	251707		
			100	-	80-100	1300		OptiStart MP-100RH-100	251708		
			Automatic motor protection circuit breakers with short-circuit current protection with increased maximum switching capacity								
32RHI		Rotary type	0,16	-	-	2,1	100	OptiStart MP-32RHI-0,16	251709	0,32	
			0,25	0,06	-	3,3		OptiStart MP-32RHI-0,25	251710		
			0,4	0,09	-	5,2		OptiStart MP-32RHI-0,4	251711		
			0,63	1,018	-	8,2		OptiStart MP-32RHI-0,63	251712		
			1	0,25	-	13		OptiStart MP-32RHI-1	251713		
			1,6	0,55	-	20,8		OptiStart MP-32RHI-1,6	251714		
			2,5	0,75	-	32,5		OptiStart MP-32RHI-2,5	251715		
			4	1,5	-	52		OptiStart MP-32RHI-4	251716		
			6	2,2	-	78		OptiStart MP-32RHI-6	251717		
			8	3	-	104		OptiStart MP-32RHI-8	251718		
			10	4	-	130		OptiStart MP-32RHI-10	251719		
			13	5,5	-	169		OptiStart MP-32RHI-13	251720		
			17	7,5	-	221		50	OptiStart MP-32RHI-17		251721
			22	7,5	-	286			OptiStart MP-32RHI-22		251722
26	11	-	338	OptiStart MP-32RHI-26	251723						
32	15	-	416	OptiStart MP-32RHI-32	251724						
63RHI		Rotary type	10	4	-	130	100	OptiStart MP-63RHI-10	251725	1,1	
			13	5,5	-	169		OptiStart MP-63RHI-13	251726		
			17	7,5	-	221	50	OptiStart MP-63RHI-17	251727		
			22	7,5	-	286		OptiStart MP-63RHI-22	251728		
			26	12,5	-	338		OptiStart MP-63RHI-26	251729		
			32	15	-	416		OptiStart MP-63RHI-32	251730		
			40	18,5	-	520		OptiStart MP-63RHI-40	251731		
			50	22	-	650		OptiStart MP-63RHI-50	251732		
63	30	-	819	OptiStart MP-63RHI-63	251733						

* Approximate ratings of standard motors

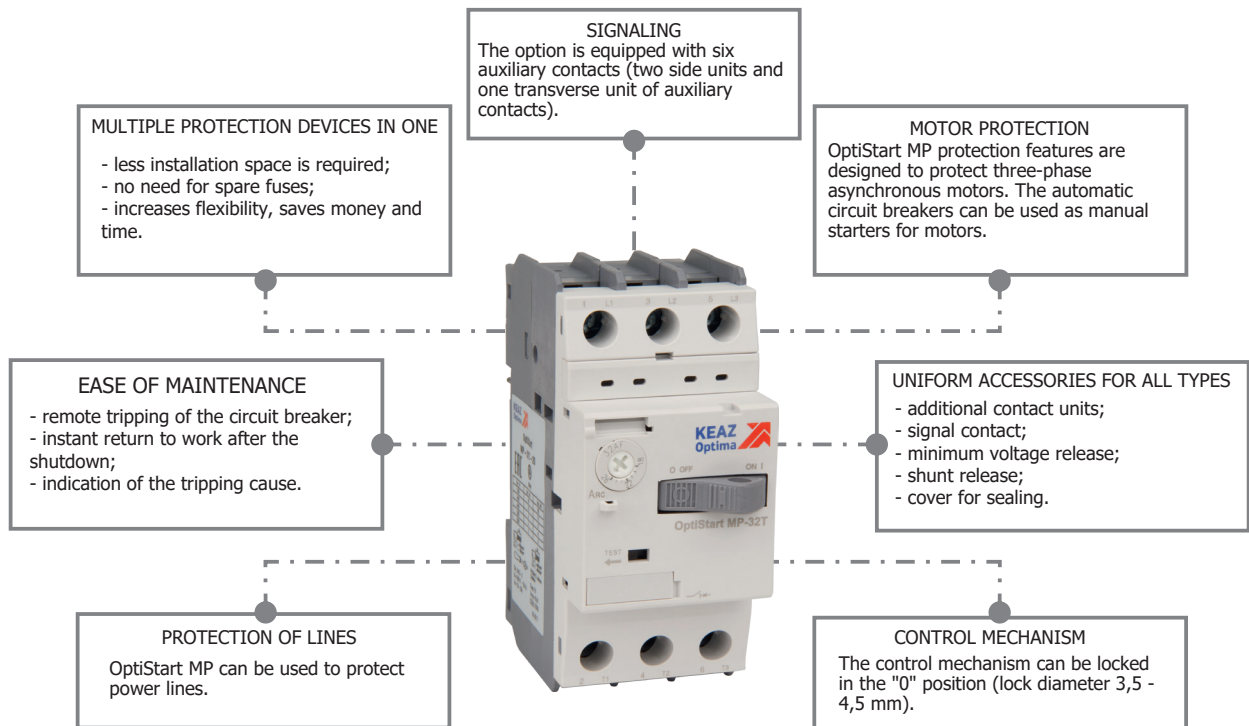
Type of equipment	Appearance	Type of the handle	Rated current In, A	Compatible with motors of 3~400V, kW *	Setting range of the thermal release, A	Setting of the electromagnetic release, A	Breaking capacity at 3~400V Icu, kA	Title	Reference	Weight, kg
100RHI		Rotary type	17	7,5	-	221	100	OptiStart MP-100RHI-17	251734	2,2
			22	7,5	-	286		OptiStart MP-100RHI-22	251735	
			26	12,5	-	338		OptiStart MP-100RHI-26	251736	
			32	15	-	416		OptiStart MP-100RHI-32	251737	
			40	18,5	-	520		OptiStart MP-100RHI-40	251738	
			50	22	-	650		OptiStart MP-100RHI-50	251739	
			63	30	-	819	OptiStart MP-100RHI-63	251740		
			75	37	-	957	OptiStart MP-100RHI-75	251741		
			90	45	-	1170	OptiStart MP-100RHI-90	251742		
			100	-	-	1300	OptiStart MP-100RHI-100	251743		

For more detailed information, see pages 330-334

For accessories, see pages 335-338

* Approximate ratings of standard motors

Batch effectiveness



Technical specifications

The given table shows the maximum breaking capacity I_{cu} and the maximum operating breaking capacity I_{cs} of the OptiStart MP automatic circuit breakers at the corresponding operating voltage.

If the short-circuit current is higher than the maximum breaking capacity of the automatic circuit breaker specified in the table, the backup protection must be installed.

The back-up current of the fuse link performing the backup protection is specified in the table. These fuses break the short-circuit current indicated on the fuse.

Type of equipment	Rated current, A	240 V ²			400 V ² 415 V ³			690 V ²		
		I_{cu} , kA	I_{cs} , kA	Fuse link operating current (gl/gG), A 1	I_{cu} , kA	I_{cs} , kA	Fuse link operating current (gl/gG), A 1	I_{cu} , kA	I_{cs} , kA	Fuse link operating current (gl/gG), A 1
OptiStart MP-32T	0,16	100	100	-	100	100	-	100	100	-
	0,25	100	100	-	100	100	-	100	100	-
	0,4	100	100	-	100	100	-	3	3	20
	0,63	100	100	-	100	100	-	3	3	35
	1	100	100	-	100	100	-	3	3	40
	1,6	100	100	-	100	100	-	3	3	50
	2,5	100	100	-	100	100	-	3	3	63
	4	100	100	-	100	100	-	3	3	63
	6	100	100	-	100	100	-	3	3	63
	8	100	100	-	100	100	-	3	3	63
	10	100	100	-	50	38	80	3	3	63
	13	100	100	-	50	38	80	3	3	63
	17	50	38	-	20	15	100	3	3	63
	22	40	30	125	15	11	100	3	3	63
26	40	30	125	15	11	100	3	3	63	
32	30	22	125	15	11	100	3	3	63	
OptiStart MP-63R	10	100	100	-	100	100	-	4	3	63
	13	100	100	-	50	38	80	4	3	63
	17	100	100	-	25	19	100	4	3	63
	22	50	38	125	25	19	125	4	3	63
	26	50	38	125	25	19	125	4	3	63
	32	50	38	160	25	19	125	4	3	63
	40	50	38	160	25	19	125	4	3	63
50	50	38	160	25	19	160	4	3	63	
63	50	38	200	25	19	160	4	3	63	
OptiStart MP-100R	17	100	100	-	50	38	100	10	8	63
	22	100	100	-	50	38	125	10	8	80
	26	100	100	-	50	38	125	10	8	80
	32	100	100	-	50	38	125	10	8	80
	40	100	100	-	50	38	160	6	5	80
	50	100	100	-	50	38	160	6	5	80
	63	100	100	-	50	38	160	6	5	80
	75	100	100	-	50	38	160	5	4	100
90	100	100	-	50	38	160	5	4	125	
100	100	100	-	50	38	160	5	4	125	
OptiStart MP-32RH/ OptiStart MP-32RHI	0,16	100	100	-	100	100	-	100	100	-
	0,25	100	100	-	100	100	-	100	100	-
	0,4	100	100	-	100	100	-	100	100	-
	0,63	100	100	-	100	100	-	100	100	-
	1	100	100	-	100	100	-	100	100	-
	1,6	100	100	-	100	100	-	100	100	-
	2,5	100	100	-	100	100	-	8	8	35
	4	100	100	-	100	100	-	8	8	40
	6	100	100	-	100	100	-	6	6	50
	8	100	100	-	100	100	-	6	6	63
	10	100	100	-	100	100	-	6	6	63
	13	100	100	-	100	100	-	6	6	63
	17	100	100	-	50	38	100	4	4	63
	22	100	100	-	50	38	125	4	4	63
26	100	100	-	50	38	125	4	4	63	
32	100	100	-	50	38	125	4	4	63	
OptiStart MP-63RH/ OptiStart MP-63RHI	10	100	100	-	100	100	-	6	5	63
	13	100	100	-	100	100	-	6	5	63
	17	100	100	-	50	50	100	5	5	63
	22	100	100	-	50	50	125	5	5	80
	26	100	100	-	50	50	125	5	5	80
	32	100	100	-	50	50	125	5	5	80
	40	100	100	-	50	50	160	5	5	80
50	100	100	-	50	50	160	5	5	80	
63	100	100	-	50	50	160	5	5	80	

Type of equipment	Rated current, A	240 V ²			400 V ²			690 V ²		
		Icu, kA	Ics, kA	Fuse link operating current (gl/gG), A 1	415 V ³		Fuse link operating current (gl/gG), A 1	Icu, kA	Ics, kA	Fuse link operating current (gl/gG), A 1
					Icu, kA	Ics, kA				
OptiStart MP-100RH/ OptiStart MP-100RHI	17	100	100	-	100	100	-	12	9	80
	22	100	100	-	100	50	-	12	9	80
	26	100	100	-	100	50	-	12	9	80
	32	100	100	-	100	50	-	12	9	80
	40	100	100	-	100	50	-	12	9	80
	50	100	100	-	100	50	-	10	8	100
	63	100	100	-	100	50	-	8	6	100
	75	100	100	-	75	50	-	6	6	125
	90	100	100	-	75	50	-	6	6	160
	100	100	100	-	75	50	-	6	6	160

- A fuse is not required

1 A fuse is required if the short-circuit current at the installation site is more than Icu

2 10% overvoltage

3 5% overvoltage

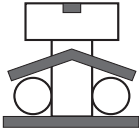


Main circuit

Type of equipment		MP-32	MP-63	MP-100
Number of poles		3		
Maximum rated current In max (is equal to the maximum rated operating current Ie), A		32	63	100
Permissible ambient temperature				
Storage/Transportation, °C		from -50 to +80		
Operation, °C		from -20 to +60		
Rated insulation voltage Ui, B		690 ¹	1000 ²	1000 ²
Rated impulse withstand voltage Uimp, kV		6	8	8
Rated operating voltage Ue, V		690		
Rated frequency, Hz		50/60		
Trip class	in compliance with the requirements of GOST R 50030.4.1	10		
Application category				
GOST R 50030.2	automatic circuit breaker	A		
GOST R 50030.4.1	starter	AC-3		
Power loss Pv of the automatic circuit breaker at the maximum current value of the setting range In W.	In up to 4 A	9,8	-	-
	In from 6 to 26 A	8	-	-
The resistance of the pole is equal to: $R = \frac{P_v}{3 \times I_n^2}, \text{ Ом}$	In 32 A	3,9	-	-
	In from 26 to 63 A	-	12,6	-
	In up to 63 A	-	-	11,9
	In from 75 to 100 A	-	-	15
Shock resistance, g	in compliance with the requirements of GOST R IEC 60068-2-27	25		
Protection degree	in compliance with the requirements of GOST R IEC 60529	IP20		
Shock-hazard protection	in compliance with the requirements of DIN 0106 part 100	Protection from accidental contact		
Temperature compensation, °C	in compliance with the requirements of GOST R 50030.4.1	from -20 to +60		
Wear life, cycles				
Mechanical life		100000	50000	50000
Commutation life		100000	25000	25000
Maximum amount of starts per hour (starting of the motor)		25		

1 Voltage 690 V, for systems with earthed neutral, overvoltage category from I to IV, pollution degree 3: Uimp = 6 kV

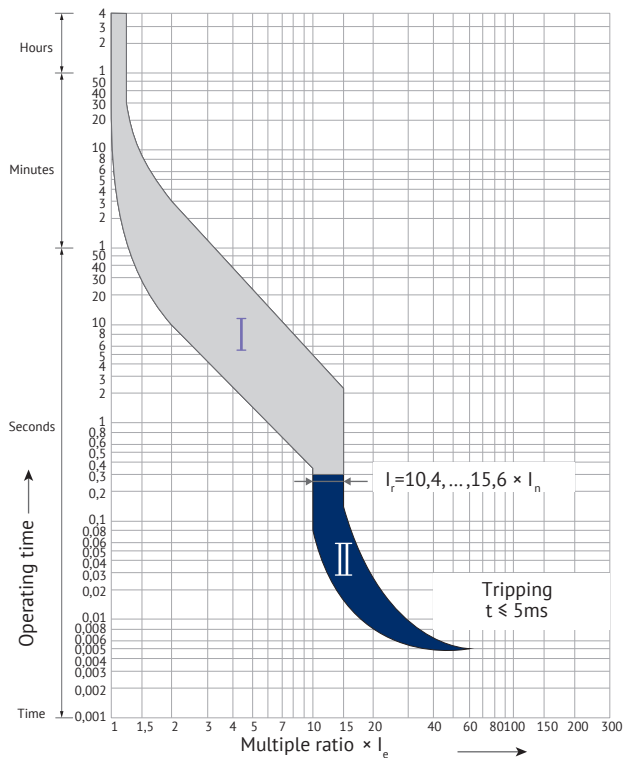
2 Voltage 1000 V, for systems with earthed neutral, overvoltage category from I to IV, pollution degree 3: Uimp = 8 kV

Conductor cross-section for the main circuit

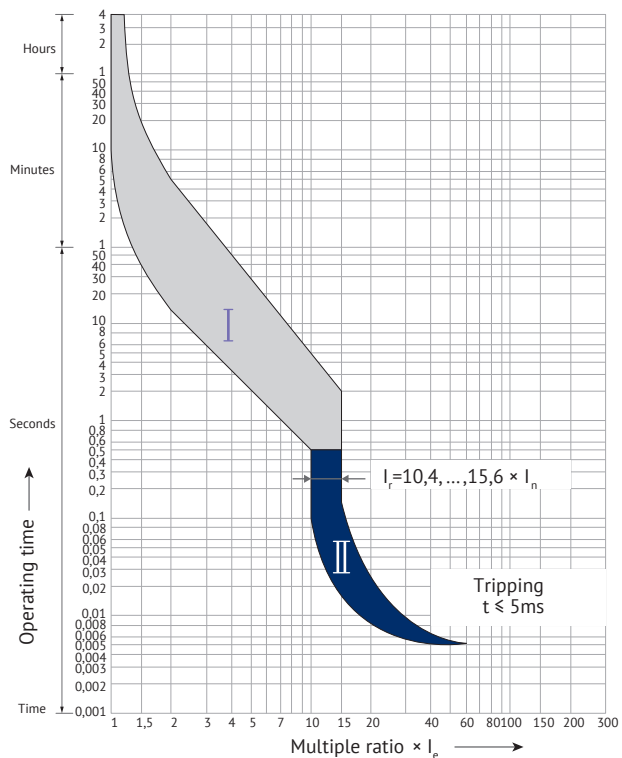
Type of equipment	OptiStart MP-32	OptiStart MP-63	OptiStart MP-100
Type of terminals/screws	 Pz2	 Pz2	 4 mm hexagon drive
Tightening torque, Nm	from 0,8 to 2,5	from 3 to 4,5	from 4 to 6
Cross - section of the conductors			
single-core, mm ²	1 x (from 1 to 10)	1 x (from 0,75 to 35)	1 x (from 2,5 to 70)
single-core, mm ²	2 x (from 1 to 6)	2 x (from 0,75 to 25)	2 x (from 2,5 to 50)
multiple-core, mm ²	1 x (from 1 to 6)	1 x (from 0,75 to 35)	1 x (from 2,5 to 70)
multiple-core, mm ²	2 x (from 1 to 6)	2 x (from 0,75 to 35)	2 x (from 2,5 to 70)
flexible with a multicore end, mm ²	1 x (from 1 to 6)	1 x (from 0,75 to 25)	1 x (from 2,5 to 50)
flexible with a multicore end, mm ²	2 x (from 0,75 to 4)	2 x (from 0,75 to 16)	2 x (from 2,5 to 35)

Time-current characteristics

OptiStart MP-32



OptiStart MP-63, OptiStart MP-100



Zone I - time-current characteristic of tripping of the overcurrent release (thermal release) from a cold state at an ambient temperature of 20°C.

Zone II - time-current characteristic of tripping of the short-circuit current release.

Time-current characteristics are valid for direct and alternating currents with frequency from 0 to 400 Hz.

In the heated state of the circuit-breaker, the tripping time of the overcurrent releases is reduced by 25% of the time of their tripping from the cold state.

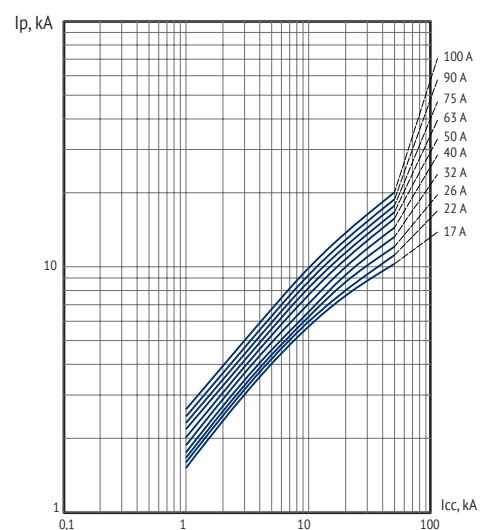
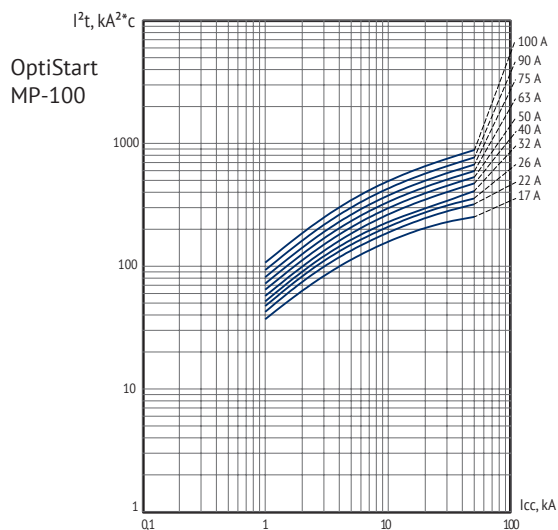
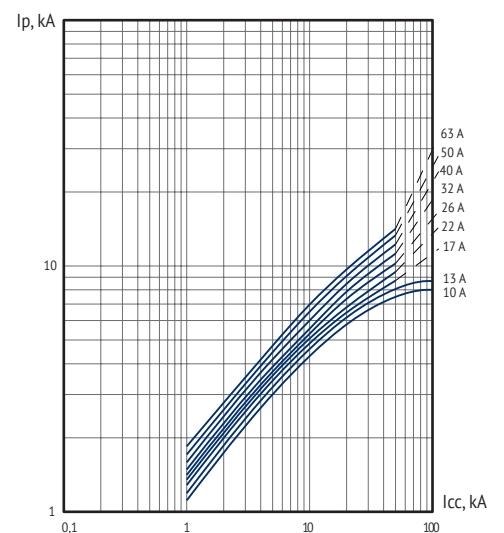
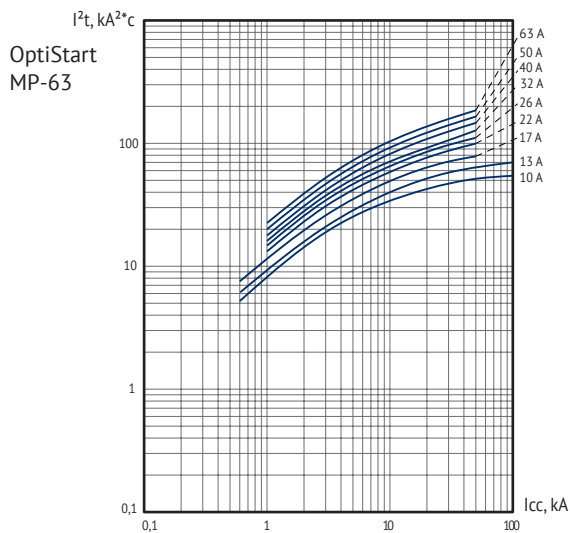
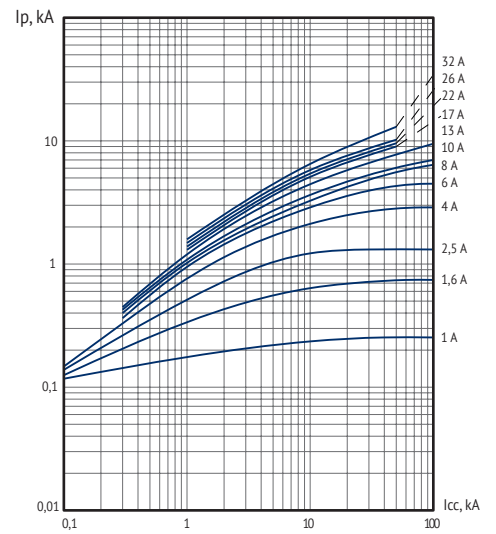
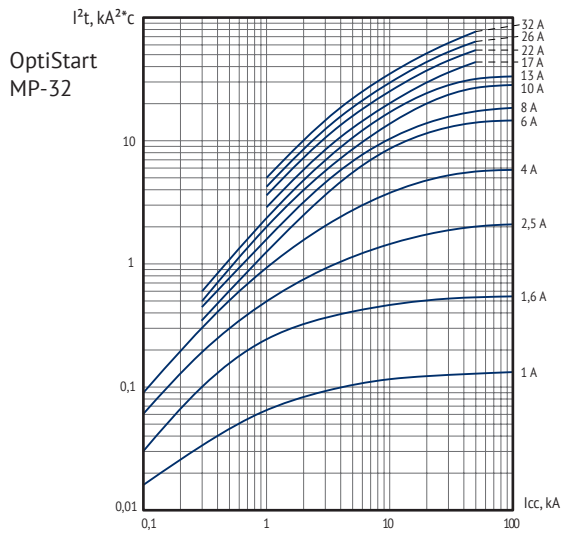
Time-current characteristics are valid for all ranges of the switch settings.

The dependence of the specific let-through energy on the current I_{cc}

I_{cc} [kA] - the design current of a symmetrical short circuit (rms current value)
 I^2t [kA²*c] - is the specific let-through energy

Current limitation

I_{cc} [kA] - the design current of a symmetrical short circuit (rms current value)
 I_p [kA] - maximum peak short-circuit current



Releases

In addition to the overcurrent and short-circuit releases, the circuit breakers can be equipped with a shunt release and a minimum voltage release, which are installed on the right on the circuit breaker.

Adjustment of the overcurrent release is performed by a controller located on the front panel, by setting the current value of the controlled motor. To protect against unauthorized changes to the set current value, a cover is used for sealing.

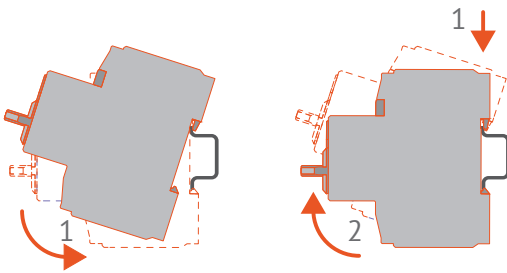
The short-circuit current release has a fixed (not adjustable) setpoint that is equal to $13 \times I_n$ (I_n is the maximum current of a specific setting range).

Operational environment

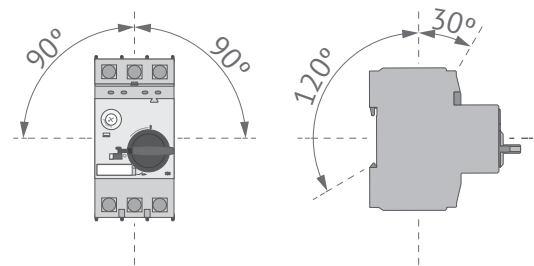
To prevent false tripping, it is recommended to ensure the protection of automatic circuit breakers from direct sunlight, fresh or cold air (e.g. air conditioning systems). In dusty or damp premises, mounting is carried out in proper casing. The power supply can be provided from the upper and the lower positions.

Mounting

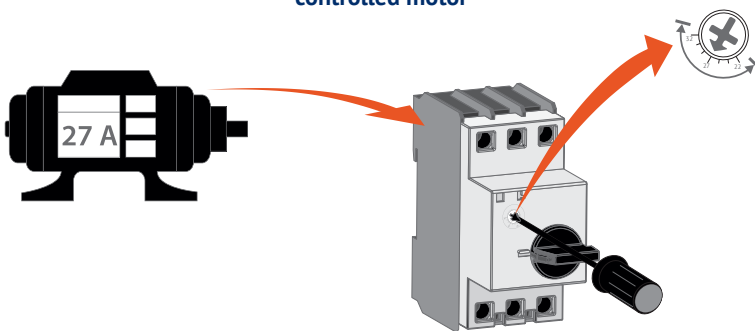
Mounting on the
DIN - rail and dismounting



Operating position



Current setting of the
controlled motor




Connection of the
single - phase motor



Caution: Do not turn the controller outside the setup scale.





Accessories for OptiStart MP automatic motor protection circuit breakers

The accessories are standardized to all the types of OptiStart MP automatic motor protection circuit breakers												
Appearance	Title	Type of the automatic circuit breaker	Contacts		Rated operating current, A			Weight, kg	Reference			
			NO	NC	AC-15		AC-1					
					24V	240V	240V					
Auxiliary contact blocks												
Transverse												
	OptiStart MP-HQ11	MP-32 MP-63 MP-100	1	1	3	2	5	0,02	115674			
	OptiStart MP-HQ20		2	-					2	5	115675	
	OptiStart MP-HQ02		-	2							116822	
Side												
	OptiStart MP-HS11	MP-32 MP-63 MP-100	1	1	6	4	10	0,03	116823			
	OptiStart MP-HS20		2	-					10	116824		
	OptiStart MP-HS02		-	2							116825	
Signal contacts												
Short circuit clearing												
	OptiStart MP-M11	MP-32 MP-63 MP-100	1	1	6	4	10	0,04	116827			
	OptiStart MP-M02		-	2					4	10	0,04	251755
	OptiStart MP-M20		2	-					4	10	0,04	251756
Any type of tripping												
	OptiStart MP-MA11	MP-32	1	1	6	4	10	0,04	116826			
	OptiStart MP-MA02		-	2					4	10	0,04	251751
	OptiStart MP-MA11-63/100	MP-63 MP-100	1	1					4	10	0,04	251752
	OptiStart MP-MA02-63/100		-	2					4	10	0,04	251753
Appearance	Title	Type of the automatic circuit breaker	Characteristic		Weight, kg	Reference						
			At 100% use	When used during 5 seconds								
Undervoltage releases												
	OptiStart MP-U24	MP-32 MP-63 MP-100	24 V 50 Hz, 28 V 60 Hz		0,11	116829						
	OptiStart MP-U110		110-127 V 50 Hz, 120 V 60 Hz			116830						
	OptiStart MP-U230		220-230 V 50 Hz, 240-260 V 60 Hz			116831						
	OptiStart MP-U400		380-400 V 50 Hz, 440-460 V 60 Hz			116833						
Undervoltage releases with auxiliary contacts 2NO												
	OptiStart MP-UX24	MP-32 MP-63 MP-100	24 V 50 Hz, 28 V 60 Hz		0,11	251763						
	OptiStart MP-UX110		110-127 V 50 Hz, 120 V 60 Hz			251764						
	OptiStart MP-UX230		220-230 V 50 Hz, 240-260 V 60 Hz			251765						
	OptiStart MP-UX400		380-400 V 50 Hz, 440-460 V 60 Hz			251767						

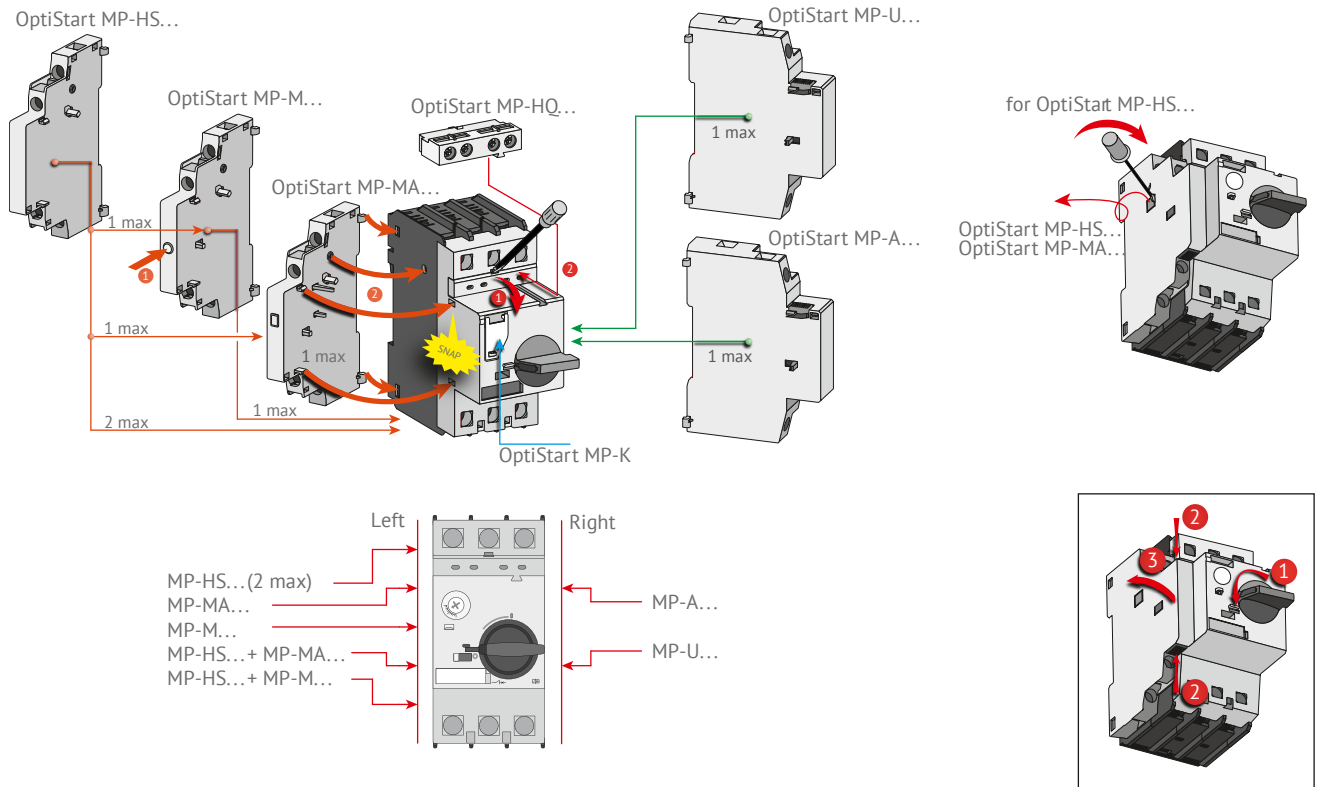
Appearance	Title	Type of the automatic circuit breaker	Characteristic		Weight, kg	Reference
			At 100% use	When used during 5 seconds		
Shunt release						
	OptiStart MP-A24	MP-32 MP-63 MP-100	24 V 50 Hz, 28 V 60 Hz	20-70 V 50/60 Hz DC	0,12	116851
	OptiStart MP-A110		75-127 V 50 Hz, 120 V 60 Hz	75-190 V 50/60 Hz DC		116852
	OptiStart MP-A230		190-230 V 50 Hz, 240-260 V 60 Hz	190-330 V 50/60 Hz DC		116853
	OptiStart MP-A400		300-400 V 50 Hz, 440-460 V 60 Hz	300-500 V 50/60 Hz DC		116855

Appearance	Title	Type of the automatic circuit breaker	Type of equipment	Definition	Degree of protection	Weight, kg	Reference
Rotary mechanism with the door mounting type							
	OptiStart MP-32R-EH1-115	MP-32R	Black-and-grey	Shaft length 115 mm		0,1	116884
	OptiStart MP-32R-EH1-315			Shaft length 315 mm		0,2	116885
	OptiStart MP-63R-EH1-115	MP-63		Shaft length 115 mm		0,1	116886
	OptiStart MP-63R-EH1-315			Shaft length 315 mm		0,2	116887
	OptiStart MP-100R-EH1-115	MP-100		Shaft length 115 mm		0,1	116888
	OptiStart MP-100R-EH1-315			Shaft length 315 mm		0,2	116889
	OptiStart MP-32R-EHN1-115	MP-32R	Yellow-and-red	Shaft length 115 mm		0,1	116890
	OptiStart MP-32R-EHN1-315			Shaft length 315 mm		0,2	116891
	OptiStart MP-63R-EHN1-115	MP-63		Shaft length 115 mm		0,1	116892
	OptiStart MP-63R-EHN1-315			Shaft length 315 mm		0,2	118092
	OptiStart MP-100R-EHN1-115	MP-100		Shaft length 115 mm		0,1	118093
	OptiStart MP-100R-EHN1-315			Shaft length 315 mm		0,2	116893
Casing for the automatic circuit breaker							
	OptiStart MP-32R-PFH4	MP-32R	Black-and-grey	Plastic casing with a rotary mechanism. Lockable with N- and PE- terminals. Allows space for 1 transverse and 1 side auxiliary contacts, and for 1 release.	IP65	0,53	116857
	OptiStart MP-32R-PFHN4		Yellow-and-red				116858
Adapter on the DIN-rail							
	OptiStart MP-32-HU1	MP-32	For contactors K1, K(G)3-10 – K(G)3-40	Mounted on one 35-mm DIN-rail (height 15 mm) or two 35-mm DIN - rails (125 mm distance).		0,1	116908
	OptiStart MP-63-HU1	MP-63	For contactors K(G)3-24 – K(G)3-40, K3-50 – K3-74	Mounted on two 35-mm DIN-rails (125 mm distance) or one 75-mm DIN-rail. Can be mounted on screws.		0,2	116909

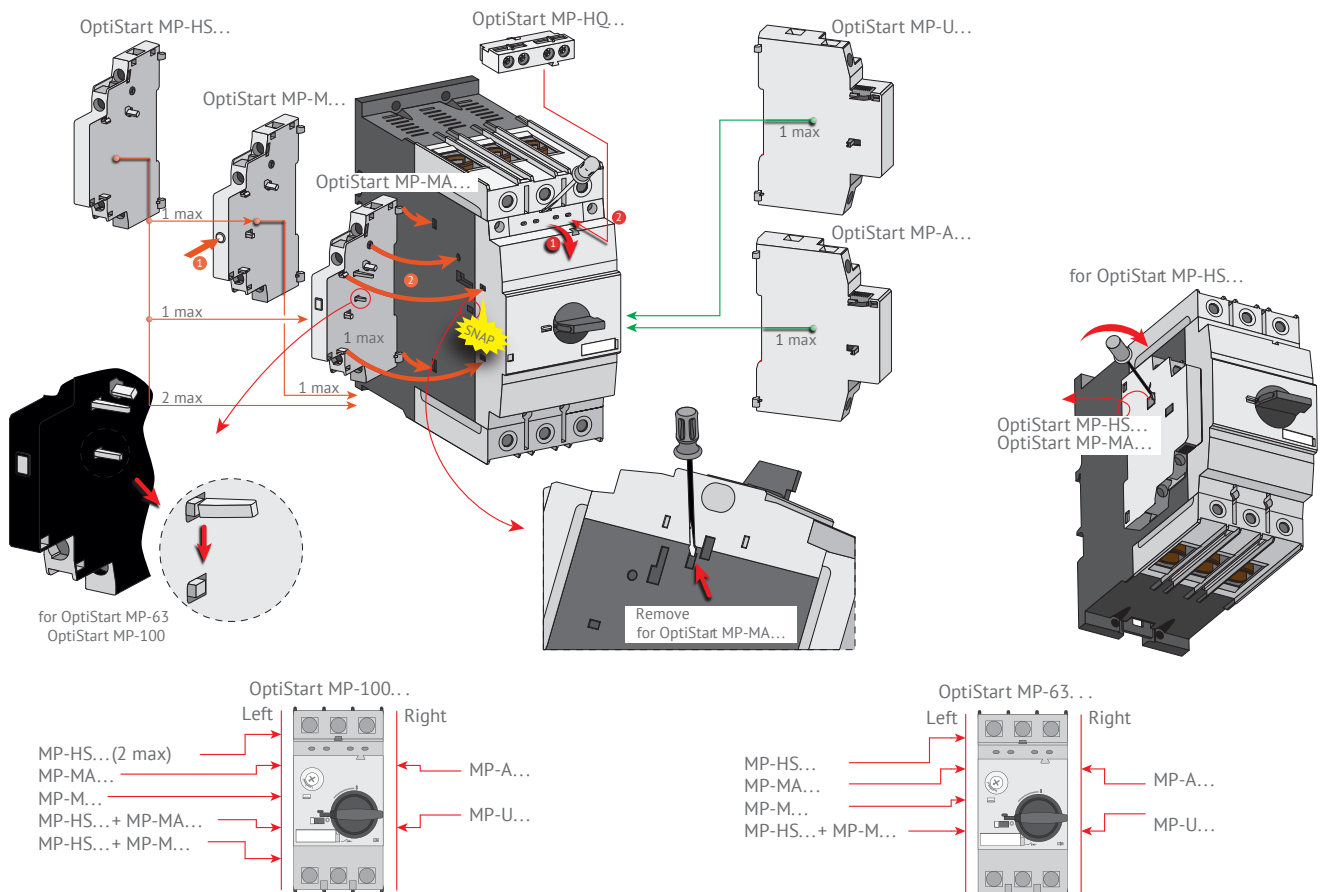
Appearance	Title	Type of the automatic circuit breaker	Type of equipment	Definition	Degree of protection	Weight, kg	Reference	
	OptiStart MP-100-HU1	MP-100	For contactors K3-50 - K3-74	Mounted on two 35-mm DIN-rails (125 mm distance) or one 75-mm DIN-rail. Can be mounted on screws.		0,2	116910	
Busbar adapter								
	OptiStart MP-32-SA60	MP-32	Up to 32 A, 690 V. Width 45 mm. Length 182 mm Busbar width: 12 and 15 mm. Busbar thickness: 5 and 10 mm			0,18	115673	
Connecting module								
	OptiStart MP-32-VK1	MP-32	For contactors K1	Connecting module, for mechanical and electrical connection of the switch and the contactor. Maximum current 32 A		0,015	115672	
	OptiStart MP-32-VK3		For contactors K3-10 - K3-22			0,02	115671	
	OptiStart MP-32-VKG3		For contactors KG3-10 - KG3-22			0,02	115670	
	OptiStart MP-32-VD		For contactors K(G)3-24 - K(G)3-40	Connecting module, for electrical connection of the switch and the contactor. Maximum current 32 A		0,01	115669	
	OptiStart MP-63-VD	MP-63	For contactors K3-24 - K3-74	Connecting module, for electrical connection of the switch and the contactor. Maximum current 63 A		0,02	116911	
	OptiStart MP-63-VDG		For contactors KG3-24 - KG3-40				116912	
	OptiStart MP-100-VD	MP-100	For contactors K3-50 - K3-74	Connecting module, for electrical connection of the switch and the contactor. Maximum current 100 A		0,02	116911	
Three-phase isolated busbar								
	OptiStart MP-32-S2	MP-32	Fork type	Three-phase isolated busbar to supply power to several (2, 3, 4 or 5) MP-32 switches. Rated operating voltage max. 690V. Distance between modules: 45 mm (54 mm on request)		IP10	0,03	116894
	OptiStart MP-32-S3					IP10	0,05	116895
	OptiStart MP-32-S4					IP10	0,07	116896
	OptiStart MP-32-S5					IP10	0,1	116897
	OptiStart MP-63-S2	MP-63	Pin type	Three-phase isolated busbar to supply power to 2 or 3 MP-63R switches. Rated operating voltage max. 690 V. Distance between modules: 45 mm (54 mm on request)		IP10	0,15	116907
	OptiStart MP-63-S3		Pin type					

Appearance	Title	Type of the automatic circuit breaker	Type of equipment	Definition	Degree of protection	Weight, kg	Reference
Terminal block							
	OptiStart MP-32-SE	MP-32	Fork type	Wire cross section: single-core/multiple-core 6-25 mm ² with a lug of 4-16 mm ²	IP10	0,04	116898
Protective cover							
	OptiStart MP-32-SF	MP-32	Protective cover for protection against accidental contact with terminals			0,003	116899
	OptiStart MP-63-SF	MP-63				0,003	251790
Fixing bracket							
	OptiStart MP-32-L	MP-32	A fixing bracket for screw mounting of automatic switches to the mounting surface. 2 pieces are required per one automatic circuit breaker.			0,01	116859
Insulating barrier							
	OptiStart MP-100-E	MP-100	The insulating barrier is meant to increase the clearance between the devices. You need 4 pieces per device (2 on each side of the output).			0,01	116863

Connection of accessories to OptiStart MP-32



Connection of accessories to OptiStart MP-63 and OptiStart MP-100



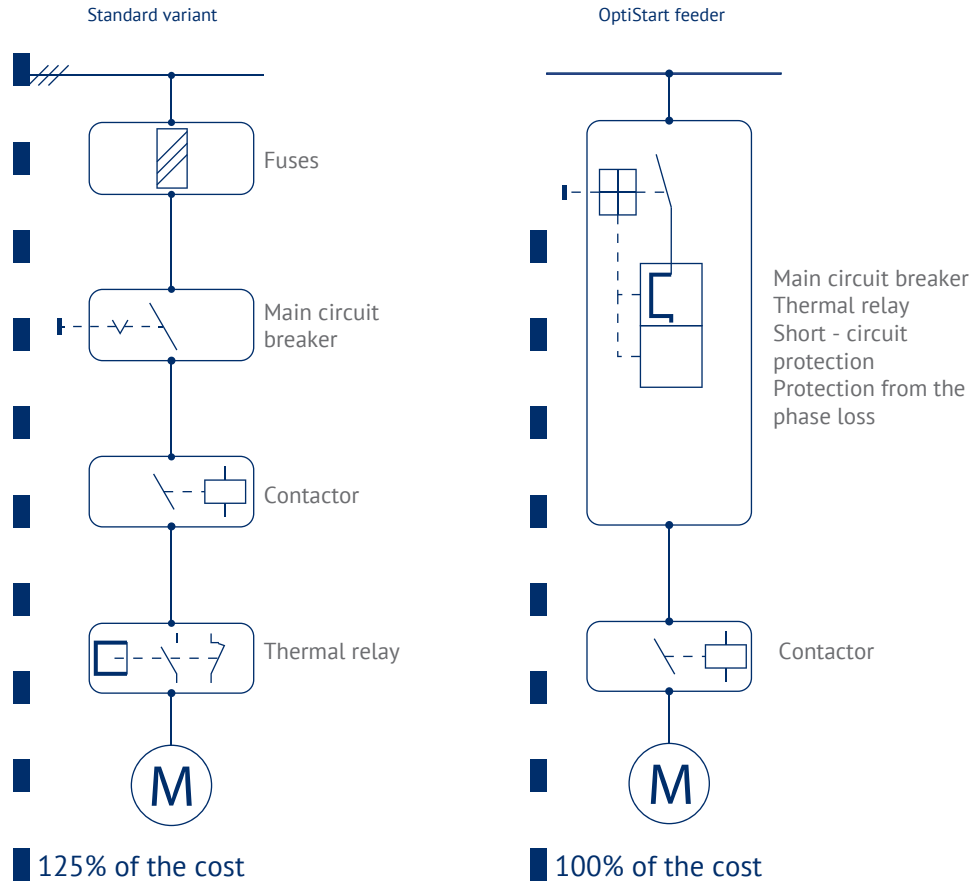
Technical specifications of accessories

Type of accessories	Parameter title	Operating mode	Parameter value	
OptiStart MP-HQ... (transverse auxiliary contact)	Rated operating voltage U _e , V	AC	24	240
	Rated operating current I _e , A	AC-15	3	3
		AC-12	5	5
	Rated operating voltage U _e , V	DC at L/R 200 ms	24	220
	Rated operating current I _e , A	DC-13	1	0,1
OptiStart MP-HS... (auxiliary contact)	Rated operating voltage U _e , V	AC	24	240
	Rated operating current I _e , A	AC-15	6	4
		AC-12	10	
OptiStart MP-M... (signal contact)	Rated operating voltage U _e , V	DC at L/R 200 ms	24	220
	Rated operating current I _e , A	DC-13	2	0,25
OptiStart MP-U... (undervoltage release)	Power consumption, VA/W	starting	8,5/6	
		holding	3/1,2	
	Pickup voltage, V	tripping	$(0,7 - 0,35) \times U_s$	
		starting	$(0,85 - 1,1) \times U_s$	
	OptiStart MP-A... (shunt release)	Power consumption, VA/W	starting	8,5/6
holding			3/1,2	
Pickup voltage, V		starting	$(0,7 - 1,1) \times U_s$	
Short circuit protection for accessories and control circuits	Fuse gL/gG, A	10		
	Modular automatic circuit breaker C-characteristic, A	6		
Type of the terminal		Pz2		
Cross-section of conductors for accessories and control circuits, mm ²	single - core	1 x (from 0,5 to 2,5) 2 x (from 0,5 to 2,5)		
	multiple - core	1 x (from 0,5 to 4) 2 x (from 0,75 to 2,5)		

Feeders without safety fuses

Direct starting and protection of a three-phase asynchronous motor

Reduction of costs



The application of the feeder allows:

- reduce the length of the connected conductors, as well as reduce the number of wires and errors;
- ensure a rigid and reliable connection and installation;
- reduce the dimensions of the low voltage electrical switchboards and reduce the production areas.

Automatic motor protection switch	Connecting module			Electromagnetic contactor	Adapter on a DIN-rail	
	Title	Reference	Connection type		Title	Reference
OptiStart MP-32	OptiStart MP-32-VK1	115672	Mechanical and electrical connection	OptiStart K1	OptiStart MP-32-HU1	116908
	OptiStart MP-32-VK3	115671		OptiStart K3-10...K3-22		
	OptiStart MP-32-VKG3	115670		OptiStart KG3-10...KG3-22		
	OptiStart MP-32-VD	115669	OptiStart K(G)3-24...K(G)3-40			
OptiStart MP-63	OptiStart MP-63-VD	116911	Electrical connection	OptiStart K3-24...K3-74	OptiStart MP-63-HU1	116909
	OptiStart MP-63-VDG	116912		OptiStart KG3-24...KG3-40		
OptiStart MP-100	OptiStart MP-100-VD	116913		OptiStart KG3-50...KG3-74	OptiStart MP-100-HU1	116910

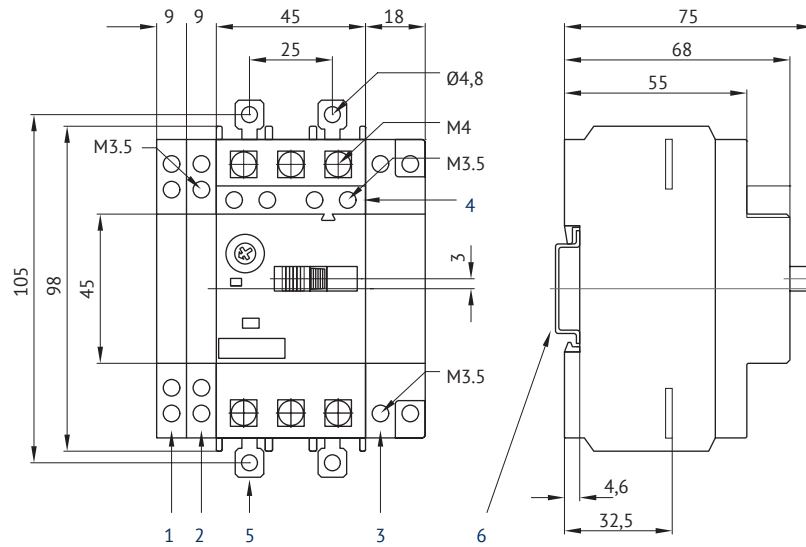
Technical specifications

Electrical layouts

Automatic circuit breaker	OptiStart MP...RHI	OptiStart MP...RH	
Transverse auxiliary contact block	OptiStart MP-HQ11	OptiStart MP-HQ20	OptiStart MP-HQ02
Auxiliary contact block	OptiStart MP-HS11	OptiStart MP-HS20	OptiStart MP-HS02
Signal contact (short-circuit)	OptiStart MP-M11	OptiStart MP-M20	OptiStart MP-M02
Signal contact (any type of tripping)	OptiStart MP-MA11		OptiStart MP-MA02
Undervoltage release	OptiStart MP-U...	OptiStart MP-UX...	
Shunt release	OptiStart MP-A...		

Overall dimensions (mm)

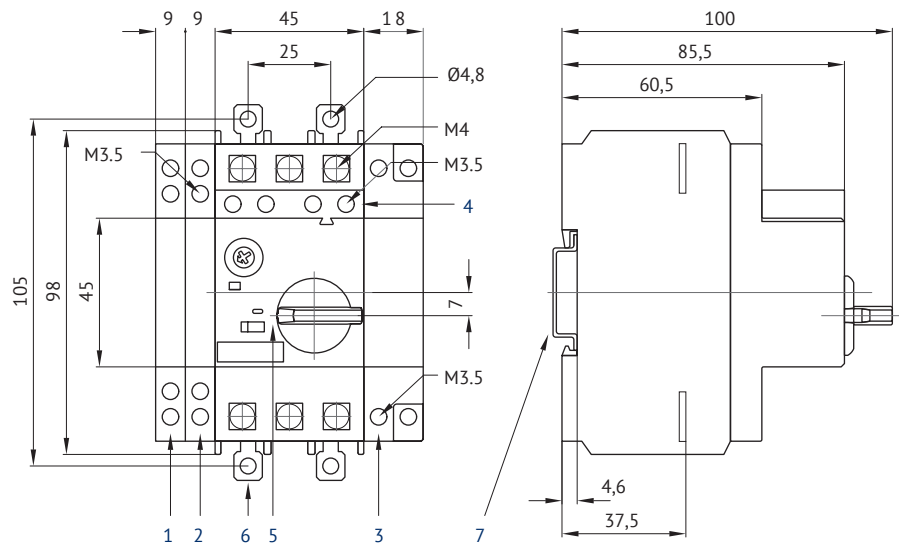
OptiStart MP-32T automatic circuit breaker



Clearance from grounded parts	
At Ue, V	mm
240	20
690	20

- 1 Side auxiliary contact
- 2 Signal contact
- 3 Shunt release or an undervoltage release
- 4 Transverse auxiliary contact
- 5 Fixing brackets for screw mounting
- 6 35-mm DIN-rail

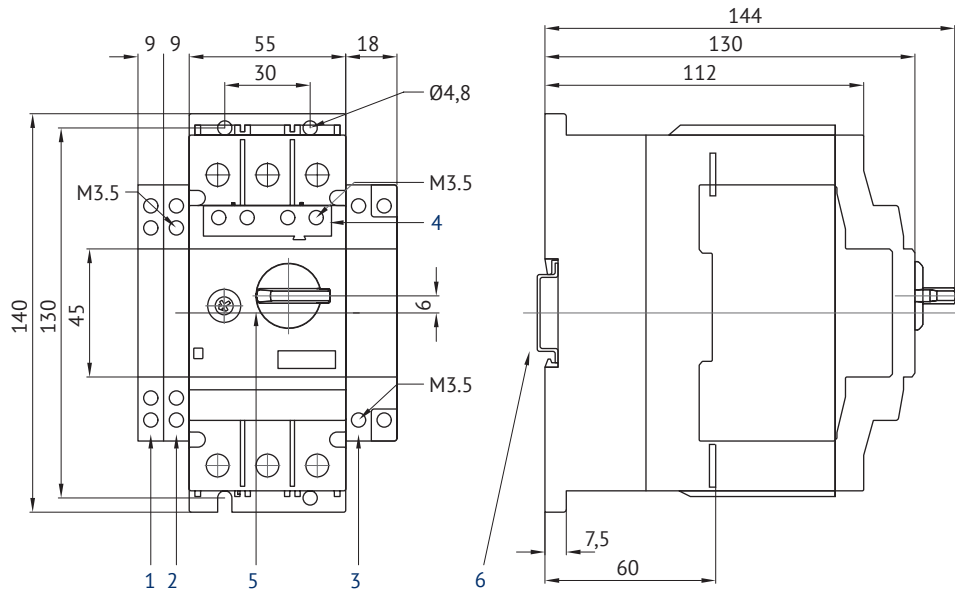
OptiStart MP-32RH automatic circuit breaker



Clearance from grounded parts	
At Ue, V	mm
240	30
690	30

- 1 Side auxiliary contact
- 2 Signal contact
- 3 Shunt release or an undervoltage release
- 4 Transverse auxiliary contact
- 5 The handle lock is in the position "Off" (Ø5 mm)
- 6 Fixing brackets for screw mounting
- 7 35-mm DIN-rail

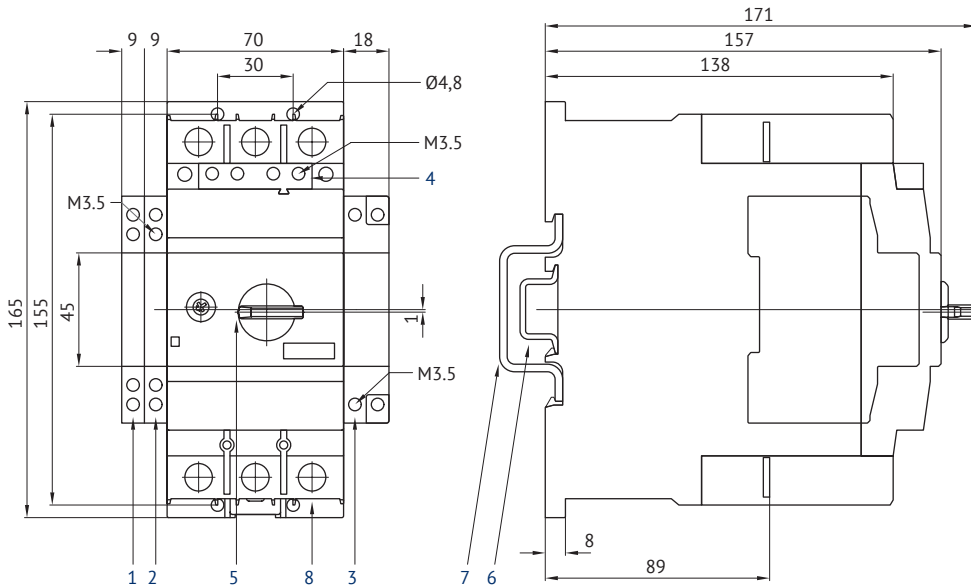
OptiStart MP-63 automatic circuit breaker



Clearance from grounded parts	
At Ue, V	mm
240	50
690	50

- 1 Side auxiliary contact
- 2 Signal contact
- 3 Shunt release or an undervoltage release
- 4 Transverse auxiliary contact
- 5 The handle lock is in the position "Off" (Ø5 mm)
- 6 35-mm DIN-rail

OptiStart MP-100 automatic circuit breaker

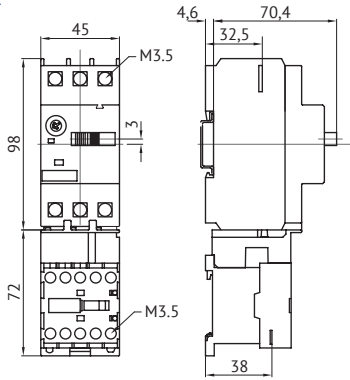


Clearance from grounded parts	
At Ue, V	mm
240	50
690	150

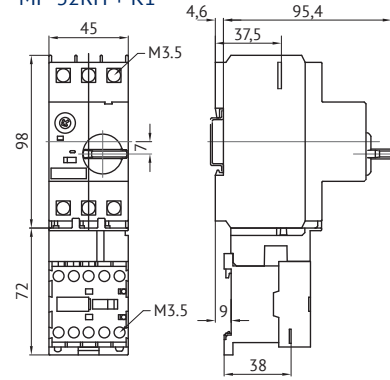
- 1 Side auxiliary contact
- 2 Signal contact
- 3 Shunt release or an undervoltage release
- 4 Transverse auxiliary contact
- 5 The handle lock is in the position "Off" (Ø5 mm)
- 6 35-mm DIN-rail
- 7 70 mm DIN-rail
- 8 4-mm hexagon drive

OptiStart MP-32-VK1 Connecting module

MP-32T + K1-



MP-32RH + K1-



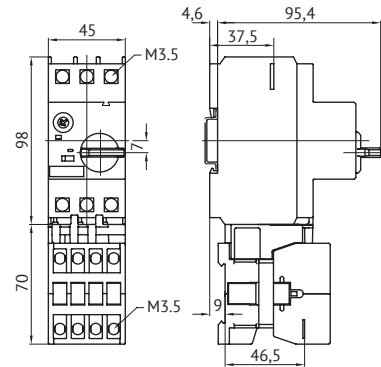
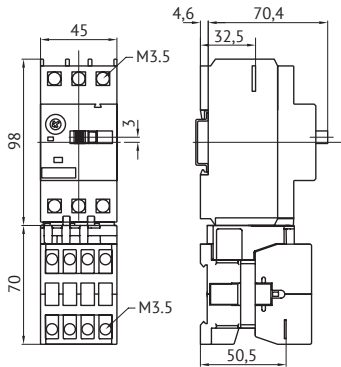
OptiStart MP-32-VK3 Connecting module

MP-32T + K3-10...
MP-32T + K3-18...

MP-32T + K3-14...
MP-32T + K3-22...

MP-32RH + K3 - 10...
MP-32RH + K3 - 18...

MP-32RH + K3 - 14...
MP-32RH + K3 - 22...



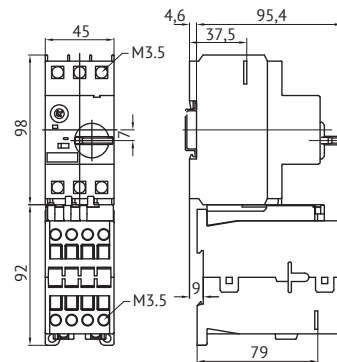
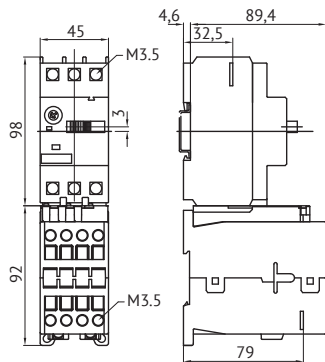
OptiStart MP-32-VKG3 Connecting module

MP-32RH + KG3 - 14...
MP-32RH + KG3 - 22...

MP-32T + KG3-10...
MP-32T + KG3-18...

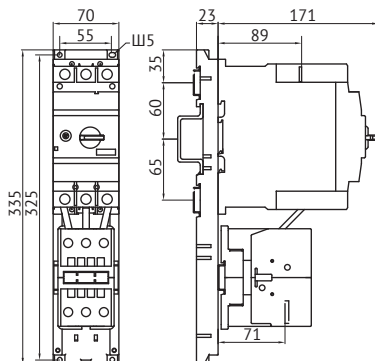
MP-32T + KG3-14...
MP-32T + KG3-22...

MP-32RH + KG3 - 10...
MP-32RH + KG3 - 18...



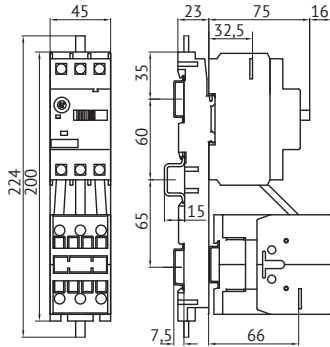
OptiStart MP-100-HU1 adapters for DIN-rail feeder mounting

MP-100 + K3-62 + MP-100VD
MP-100 + K3-74 + MP-100VD

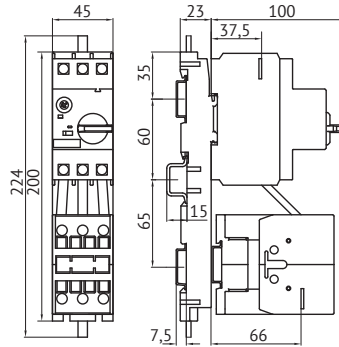


OptiStart MP-32-HU1 adapters for DIN-rail feeder mounting

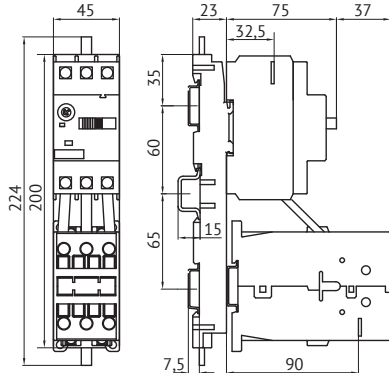
MP-32T + K3-24 + MP-32VD
MP-32T + K3-32 + MP-32VD



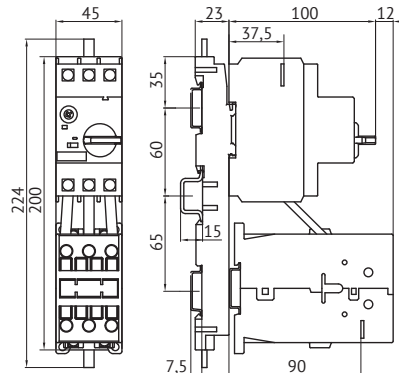
MP-32RH + K3-24 + MP-32VD
MP-32RH + K3-32 + MP-32VD



MP-32T + KG3-24 + MP-32VD
MP-32T + KG3-32 + MP-32VD

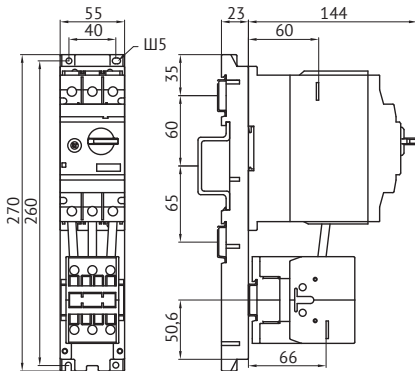


MP-32RH + KG3-24 + MP-32VD
MP-32RH + KG3-24 + MP-32VD

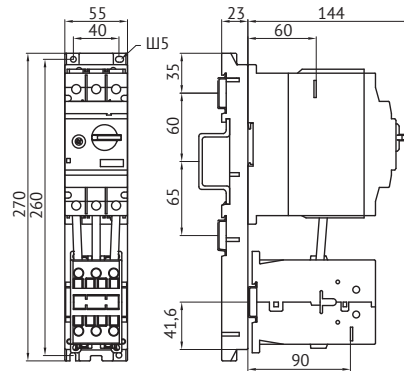


OptiStart MP-63-HU1 adapters for DIN - rail feeder mounting

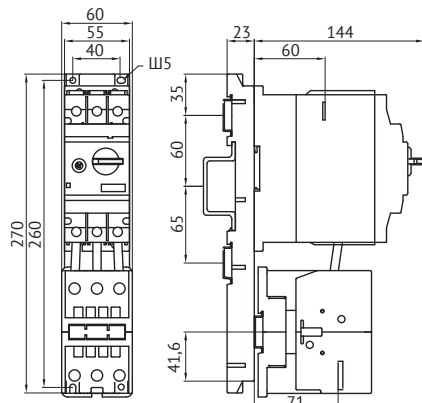
MP-63 + K3-32 + MP-63VD
MP-63 + K3-40 + MP-63VD



MP-63 + KG3-32 + MP-63VDG
MP-63 + KG3-40 + MP-63VDG

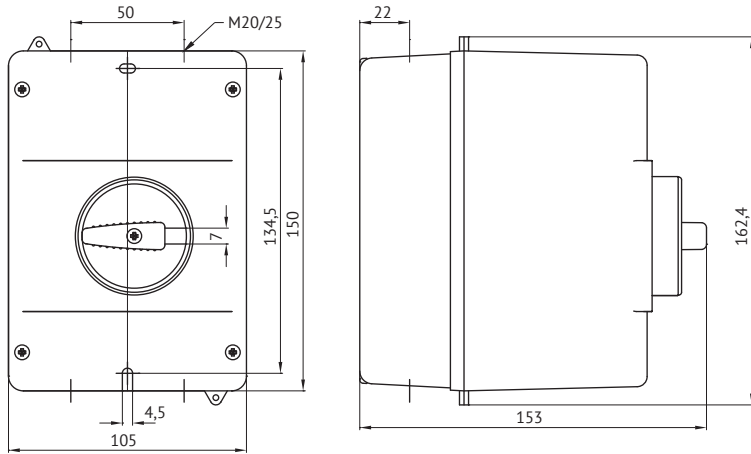


MP-63 + K3-50 + MP-63VD
MP-63 + K3-62 + MP-63VD



Casing

OptiStart MP-32R-PFH4
OptiStart MP-32R-PFHN4

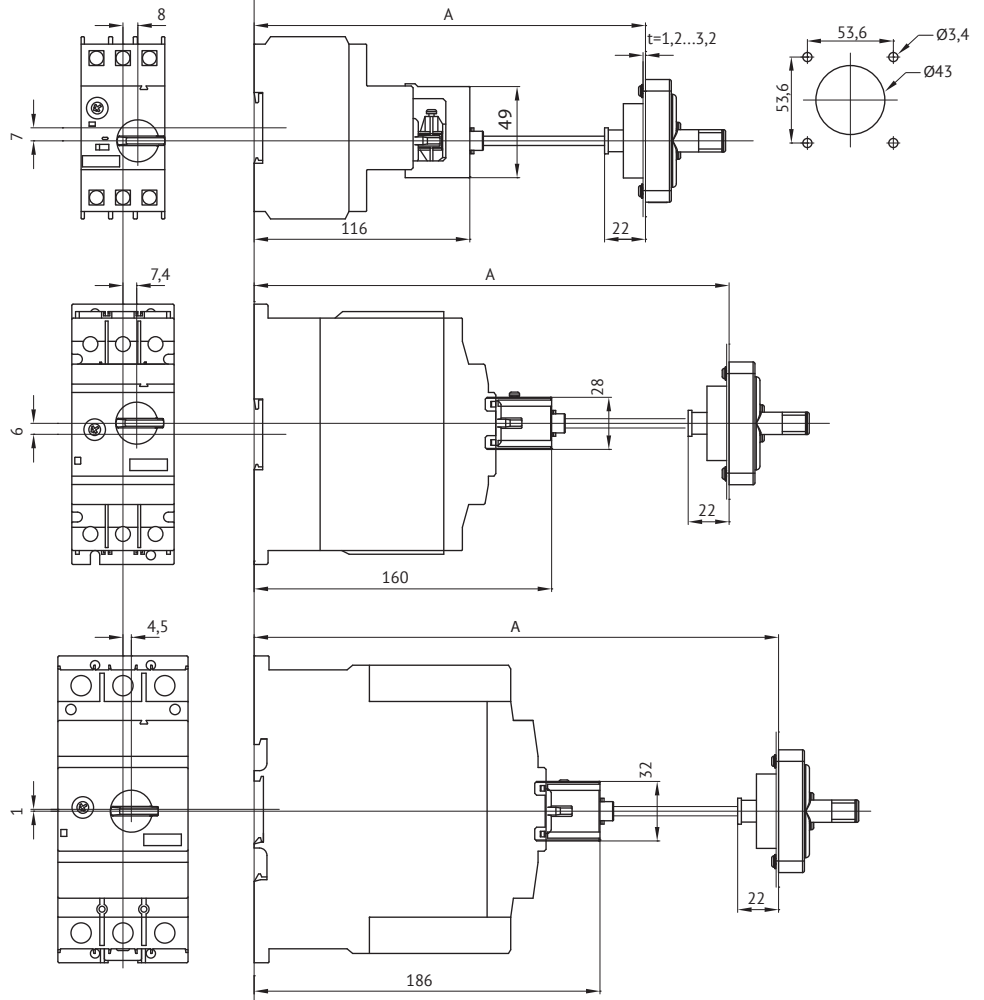


Rotary mechanism with the door mounting type

Type of equipment	A
OptiStart MP-32R-EH1-115	149-210
OptiStart MP-32R-EH1-315	149-210
OptiStart MP-32R-EHN1-115	149-410
OptiStart MP-32R-EHN1-315	149-410

Type of equipment	A
OptiStart MP-63R-EH1-115	194-255
OptiStart MP-63R-EH1-315	194-255
OptiStart MP-63R-EHN1-115	194-455
OptiStart MP-63R-EHN1-315	194-455

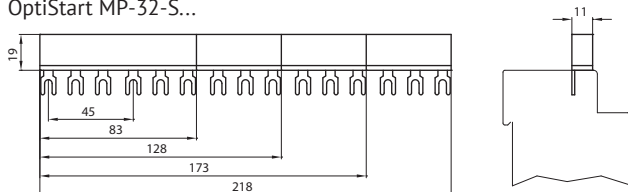
Type of equipment	A
OptiStart MP-100R-EH1-115	220-282
OptiStart MP-100R-EH1-315	220-282
OptiStart MP-100R-EHN1-115	220-482
OptiStart MP-100R-EHN1-315	220-482



Mounting holes

Three-phase isolated busbar

OptiStart MP-32-S...



OptiStart K Electromagnetic contactors

Electromagnetic contactors of the OptiStart K series are distinguished by their wide functionality, modern design and compact dimensions. The new generation of contactors ensures the operation of electric motors with a current from 9 to 1200 A (at AC-3 380 V). The coils feature an extended range of control voltages, both AC and DC. A contactor for any purpose can be found in the OptiStart K series.



Selection table

Range of product	Rated current, A	Control coil voltage type	Number of poles	Configuration	Contact clamp type	Page
Mini-contactors OptiStart K1	9-12 at AC-3 380B	AC, DC, AC/DC	3/4	(non-) reversing	screw type (D) "faston" (F) for printed circuit boards (L)	349
Relay type mini-contactors OptiStart K1-07	3 at AC-15 220B	AC, DC, AC/DC	4	non-reversing	screw type (D)	352
Electromagnetic contactors OptiStart K3	10-1200 at AC-3 380B	AC, DC, AC/DC	3/4	non-reversing	screw type (D) bolt type	363
Electromagnetic contactors OptiStart K3-07	3 at AC-15 220B	AC, DC	4	non-reversing	screw type (D) bolt type	377
Capacitor switching contactors OptiStart K3 (NK)	0-144 at AC-6b	230AC	3	non-reversing	screw type with leading contacts (NK)	393

OptiStart K1 Mini-contactors



The OptiStart K1 series of mini - contactors feature compact devices that perfectly match with installations, where reliability along with small dimensions is the main requirement. A wide configuration range and a variety of technical specifications provide customers with the opportunity to select a contactor for any application area, including electronic circuits (for printed circuit boards). Mini - contactors of the OptiStart K1 series provide for the operation at the current range from 9 to 12 A (at AC-3 380 V). If necessary, auxiliary contact blocks OptiStart HK or OptiStart HKM can be installed.

Designation

OptiStart
K1W-09
D
00
- 40MC
= 24DC
- VS

1
2
3
4
5
6
7
8




1	Product range	OptiStart – electric motor control and protection equipment			
2	Configuration	K1 - mini-contactor	K1W - reversing	K1-07 - relay type	
3	Rated operating current AC-3 380 V, A	9	12	3 (AC-15 220 V)*	
4	Terminal type	D - screw type terminals with washers	F - "faston" terminals	L - terminals for PCB mounting	D - screw type terminals with washers*
5	Auxiliary contacts	1 digit indicates NO		2 digit indicates NC	
6	Number of poles	40 – four-pole design	MC – three-pole design with mechanical locking	40MC - four - pole design with mechanical locking	The absence of a symbol indicates a three-pole design
7	Rated control voltage (V) and type of control circuit current	AC - alternating	=DC - direct, double-wound coil		AC/DC - alternating or direct
8	Options	VS – coil with a built-in suppressor (surge protection device)		VR – energy-saving coil with a built-in suppressor (surge protection device)	

* is applied only to the design of K1-07

The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.




Selection guide

OptiStart K1 Mini - contactors with an AC control coil

Type of equipment		K1							
Appearance									
Coil voltage, V		24, 230, 24VS, 230VS*							
Number of poles		3							
Contact clamp type		screw type				"faston" type		for printed circuit boards (PCBs)	
Rated operating current Ie at AC-3, 380 V, A		9	9	12	12	9	9	9	9
Rated operating current Ie at AC-1, 690 V, A		20	20	20	20	16	16	16	16
Motor power AC-3, 380 V, kW		4	4	5,5	5,5	4	4	4	4
Configuration		non-reversing							
Auxiliary contacts	NO	1	-	1	-	1	-	1	-
	NC	-	1	-	1	-	1	-	1
Weight, kg		0,16							
For more details, see pages		354-360							
For accessories, see page		361							

* VS - contactors with a built-in suppressor

OptiStart K1 Mini - contactors with a DC control coil




Type of equipment		K1							
Appearance									
Coil voltage, V		24, 24VS, 24VR*							
Number of poles		3							
Contact clamp type		screw type				"faston" type		for printed circuit boards (PCBs)	
Rated operating current Ie at AC-3, 380 V, A		9	9	12	12	9	9	9	9
Rated operating current Ie at AC-1, 690 V, A		20	20	20	20	16	16	16	16
Motor power AC-3, 380 V, kW		4	4	5,5	5,5	4	4	4	4
Configuration		non-reversing							
Auxiliary contacts	NO	1	-	1	-	1	-	1	-
	NC	-	1	-	1	-	1	-	1
Weight, kg		0,19							
For more details, see pages		354-360							
For accessories, see page		361							

* VS - contactors with a built-in suppressor, VR - coil 1,5 W, from 19 to 30 V DC, with a built-in suppressor.


K1			K1W												
24, 230, 24VS, 230VS*															
4			3										4		
screw type		for printed circuit boards (PCBs)	screw type				for printed circuit boards (PCBs)		screw type						
9	12	9	9	9	12	12	9	9	9	9	9	12			
20	20	16	20	20	20	20	16	16	16	16	20	20			
4	5,5	4	4	4	5,5	5,5	4	4	4	4	4	5,5			
non-reversing			reversing												
-	-	-	1	-	1	-	1	-	-	-	-	-			
-	-	-	-	1	-	1	-	1	-	-	-	-			
0,16			0,32												

K1			K1W												
24, 24VS, 24VR*															
4			3										4		
screw type		for printed circuit boards (PCBs)	screw type				for printed circuit boards (PCBs)		screw type						
9	12	9	9	9	12	12	9	9	9	9	9	12			
20	20	16	20	20	20	20	16	16	16	16	20	20			
4	5,5	4	4	4	5,5	5,5	4	4	4	4	4	5,5			
non-reversing			reversing												
-	-	-	1	-	1	-	1	-	-	-	-	-			
-	-	-	-	1	-	1	-	1	-	1	-	-			
0,19			0,32												

OptiStart K1 Mini - contactors with an AC/DC control coil

Type of equipment		K1							
Appearance									
Coil voltage, V		24, 230							
Number of poles		3							
Contact clamp type		screw type				"faston" type		for printed circuit boards (PCBs)	
Rated operating current Ie at AC-3, 380 V, A		9	9	12	12	9	9	9	9
Rated operating current Ie at AC-1, 690 V, A		20	20	20	20	16	16	16	16
Motor power AC-3, 380 V, kW		4	4	5,5	5,5	4	4	4	4
Configuration		non-reversing							
Auxiliary contacts	NO	1	-	1	-	1	-	1	-
	NC	-	1	-	1	-	1	-	1
Weight, kg		0,16							
For more details, see pages		354-360							
For accessories, see page		361							

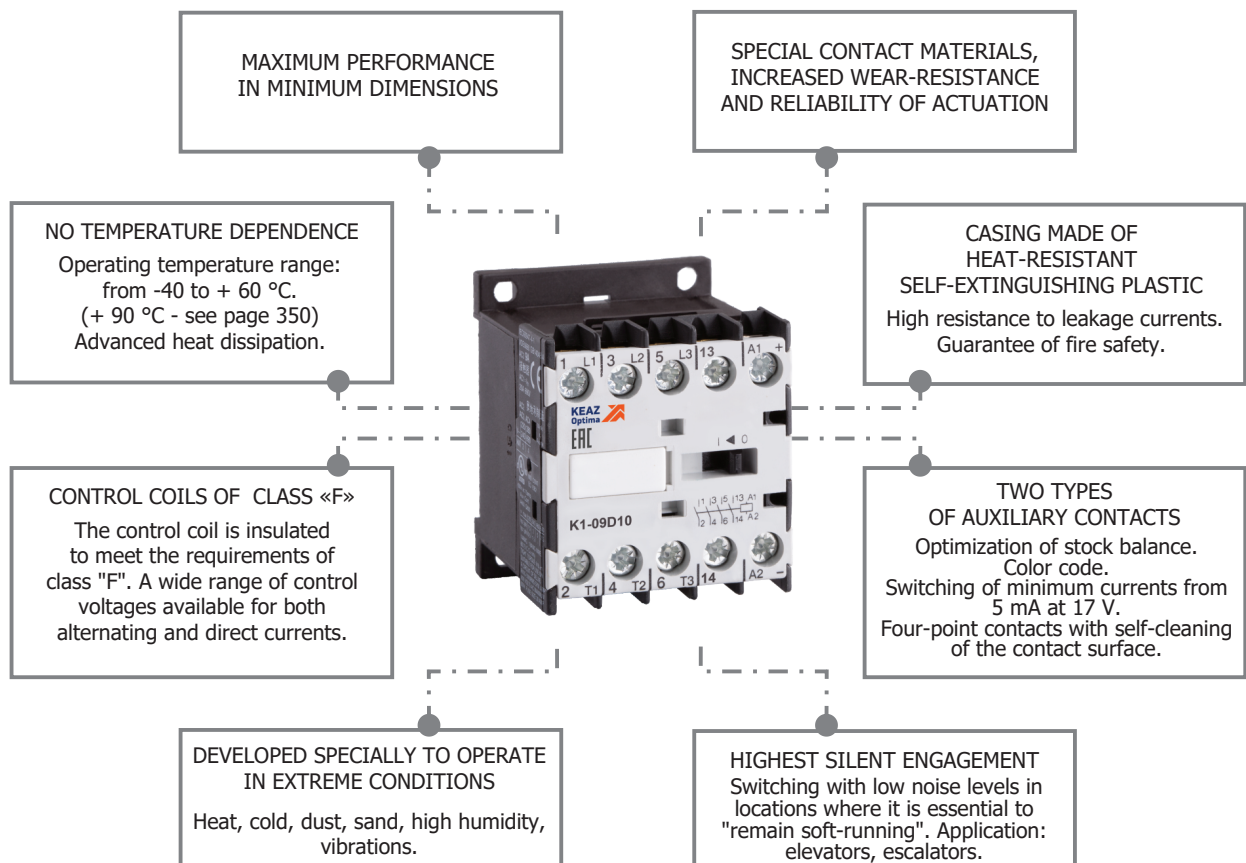
OptiStart K1-07 Relay type contactors

Type of equipment		K1-07		
Appearance				
Coil voltage, V	AC	24, 230, 24VS, 230VS*		
	DC	24, 24VS, 24VR*		
	AC/DC	24, 230		
Number of poles		3		
Contact clamp type		screw type		
Rated operating current Ie at AC-3, 380 V, A		3		
Rated operating current Ie at AC-1, 690 V, A		2		
Motor power AC-3, 380 V, kW		10		
Configuration		non-reversing		
Auxiliary contacts	NO	4	3	2
	NC	-	1	2
Weight, kg	AC	0,16		
	DC	0,20		
	AC/DC	0,16		
For more details, see pages		354-360		
For accessories, see page		361		

* VS - contactors with a built-in suppressor, VR - coil 1,5 W, from 19 to 30 V DC, with a built-in suppressor

K1				K1W									
4				3									
screw type		for printed circuit boards (PCBs)		screw type				for printed circuit boards (PCBs)				screw type	
9	12	9		9	9	12	12	9	9	9	12		
20	20	16		20	20	20	20	16	16	20	20		
4	5,5	4		4	4	5,5	5,5	4	4	4	5,5		
non-reversing				reversing									
-	-	-		1	-	1	-	1	-	-	-		
-	-	-		-	1	-	1	-	1	-	-		
0,16				0,32									

Batch effectiveness



References (series)

OptiStart K1 AC Mini-contactors

Appearance	Rated operating current I _e at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
three-pole non-reversing								
	9	screw type	1	-	OptiStart K1-09D10-	230AC	147785	0,16
	9		1	-		24AC	147786	0,16
	12		OptiStart K1-12D10-	1	-	24AC	148961	0,16
	12			1	-	230AC	148962	0,16
	9	"faston" type	-	1	OptiStart K1-09F01-	230AC	117094	0,16
	9		-	1		230AC-VS	117096	0,16
	9		-	1		24AC	117093	0,16
	9		-	1		24AC-VS	117095	0,16
	9	for printed circuit boards (PCBs)	-	1	OptiStart K1-09L01-	230AC	117102	0,16
	9		-	1		230AC-VS	117104	0,16
	9		-	1		24AC	117101	0,16
	9		-	1		24AC-VS	117103	0,16
	9		1	-		230AC	117098	0,16
	9		1	-		230AC-VS	117100	0,16
	9		1	-		24AC	117097	0,16
	9		1	-		24AC-VS	117099	0,16
three-pole reversing								
	9	screw type	-	1	OptiStart K1W-09D01-MC-	230AC	117126	0,32
	9		-	1		230AC-VS	117128	0,32
	9		-	1		24AC	117125	0,32
	9		-	1		24AC-VS	117127	0,32
	9		1	-	OptiStart K1W-09D10-MC-	230AC	117118	0,32
	9		1	-		230AC-VS	117120	0,32
	9		1	-		24AC	117117	0,32
	9		1	-		24AC-VS	117119	0,32
	12		-	1	OptiStart K1W-12D01-MC-	230AC	117130	0,32
	12		-	1		230AC-VS	117132	0,32
	12		-	1		24AC	117129	0,32
	12		-	1		24AC-VS	117131	0,32
12	1	-	OptiStart K1W-12D10-MC-	230AC	117122	0,32		
12	1	-		230AC-VS	117124	0,32		
12	1	-		24AC	117121	0,32		
12	1	-		24AC-VS	117123	0,32		
	9	for printed circuit boards (PCBs)	-	1	OptiStart K1W-09L01-MC-	230AC	117134	0,32
	9		-	1		230AC-VS	117136	0,32
	9		-	1		24AC	117133	0,32
	9		-	1		24AC-VS	117135	0,32
	9		1	-	OptiStart K1W-09L10-MC-	230AC	117138	0,32
	9		1	-		230AC-VS	117140	0,32
	9		1	-		24AC	117137	0,32
	9		1	-		24AC-VS	117139	0,32
four-pole non-reversing								
	9	screw type	-	-	OptiStart K1-09D00-40-	230AC	117106	0,16
	9		-	-		230AC-VS	117108	0,16
	9		-	-		24AC	117105	0,16
	9		-	-		24AC-VS	117107	0,16
	12		OptiStart K1-12D00-40-	-	-	230AC	115110	0,16
	12			-	-	230AC-VS	117112	0,16
12	24AC	117109	0,16					
12	24AC-VS	117111	0,16					
	9	for printed circuit boards (PCBs)	-	-	OptiStart K1-09L00-40-	230AC	117114	0,16
	9		-	-		230AC-VS	117116	0,16
	9		-	-		24AC	117113	0,16
	9		-	-		24AC-VS	117115	0,16

OptiStart K1 AC Mini-contactors

Appearance	Rated operating current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
four-pole reversing								
	9	screw type	-	-	OptiStart K1W-09D00-40MC-	230AC	117142	0,32
	9		-	-		230AC-VS	117144	0,32
	9		-	-		24AC	117141	0,32
	9		-	-		24AC-VS	117143	0,32
	12		-	-	OptiStart K1W-12D00-40MC-	230AC	117146	0,32
	12		-	-		230AC-VS	117148	0,32
	12		-	-		24AC	117145	0,32
	12		-	-		24AC-VS	117147	0,32

OptiStart K1 DC Mini-contactors

Appearance	Rated operating current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
three-pole non-reversing								
	9	screw type	-	1	OptiStart K1-09D01=	24DC	117347	0,19
	9		-	1		24DC-VR	117354	0,20
	9		-	1		24DC-VS	117348	0,19
	9		1	-	OptiStart K1-09D10=	24DC	117345	0,19
	9		1	-		24DC-VR	117353	0,20
	9		1	-		24DC-VS	117346	0,19
	12		-	1	OptiStart K1-12D01=	24DC	117351	0,19
	12		-	1		24DC-VS	117352	0,19
12	1	-	OptiStart K1-12D10=	24DC		117349	0,19	
	12	1	-	OptiStart K1-12D10=	24DC-VS	117350	0,19	
	9	"faston" type	-	1	OptiStart K1-09F01=	24DC	117357	0,19
9	-		1	24DC-VS		117358	0,19	
9	1		-	OptiStart K1-09F10=	24DC-VS	244483	0,19	
	9	for printed circuit boards (PCBs)	-	1	OptiStart K1-09L01=	24DC	117361	0,19
	9		-	1		24DC-VS	117362	0,19
	9		1	-	OptiStart K1-09L10=	24DC	117359	0,19
	9		1	-		24DC-VS	117360	0,19
three-pole reversing								
	9	screw type	-	1	OptiStart K1W-09D01-MC=	24DC	117371	0,32
	9		-	1		24DC-VS	117372	0,32
	9		1	-	OptiStart K1W-09D10-MC=	24DC	117369	0,32
	9		1	-		24DC-VS	117370	0,32
	12		-	1	OptiStart K1W-12D01-MC=	24DC	117375	0,32
	12		-	1		24DC-VS	117376	0,32
	12		1	-	OptiStart K1W-12D10-MC=	24DC	117373	0,32
	12		1	-		24DC-VS	117374	0,32
	9	for printed circuit boards (PCBs)	-	1	OptiStart K1W-09L01-MC=	24DC	117379	0,32
	9		-	1		24DC-VS	244457	0,32
	9		1	-	OptiStart K1W-09L10-MC=	24DC	117377	0,32
	9		1	-		24DC-VS	117378	0,32
four-pole non-reversing								
	9	screw type	-	-	OptiStart K1-09D00-40=	24DC	117363	0,19
	9		-	-		24DC-VS	117364	0,19
	12		-	-	OptiStart K1-12D00-40=	24DC	117365	0,19
	12		-	-		24DC-VS	117366	0,19

OptiStart K1 DC Mini-contactors

Appearance	Rated operating current I _e at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	9	for printed circuit boards (PCBs)	-	-	OptiStart K1-09L00-40=	24DC	117367	0,19
	9		-	-		24DC-VS	117368	0,19
four-pole reversing								
	9	screw type	-	-	OptiStart K1W-09D00-40MC=	24DC	117381	0,32
	9		-	-		24DC-VS	117382	0,32
	12		OptiStart K1W-12D00-40MC=	-	-	24DC	117383	0,32
	12			-	-	24DC-VS	117384	0,32

OptiStart K1 AC/DC Mini-contactors

Appearance	Rated operating current I _e at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
three-pole non-reversing								
	9	screw type	-	1	OptiStart K1-09D01-	230AC/DC	117569	0,16
	9		-	1		24AC/DC	117568	0,16
	9		OptiStart K1-09D10-	1	-	230AC/DC	117565	0,16
	9			1	-	24AC/DC	117564	0,16
	12		OptiStart K1-12D01-	-	1	230AC/DC	117571	0,16
	12			-	1	24AC/DC	117570	0,16
	12		OptiStart K1-12D10-	1	-	230AC/DC	117567	0,16
	12			1	-	24AC/DC	117566	0,16
	9	"faston" type	-	1	OptiStart K1-09F01-	230AC/DC	117575	0,16
	9		-	1		24AC/DC	117574	0,16
	9		OptiStart K1-09F10-	1	-	230AC/DC	117573	0,16
	9			1	-	24AC/DC	117572	0,16
	9	for printed circuit boards (PCBs)	-	1	OptiStart K1-09L01-	230AC/DC	117579	0,16
	9		-	1		24AC/DC	117578	0,16
	9		OptiStart K1-09L10-	1	-	230AC/DC	117577	0,16
	9			1	-	24AC/DC	117576	0,16
three-pole reversing								
	9	screw type	-	1	OptiStart K1W-09D01-MC-	230AC/DC	117591	0,32
	9		-	1		24AC/DC	117590	0,32
	9		OptiStart K1W-09D10-MC-	1	-	230AC/DC	117587	0,32
	9			1	-	24AC/DC	117586	0,32
	12		OptiStart K1W-12D01-MC-	-	1	230AC/DC	117593	0,32
	12			-	1	24AC/DC	117592	0,32
	12		OptiStart K1W-12D10-MC-	1	-	230AC/DC	117589	0,32
	12			1	-	24AC/DC	117588	0,32
	12	for printed circuit boards (PCBs)	-	1	OptiStart K1W-09L01-MC-	230AC/DC	117595	0,32
	9		-	1		24AC/DC	117594	0,32
	9		OptiStart K1W-09L10-MC-	1	-	230AC/DC	117597	0,32
	9			1	-	24AC/DC	117596	0,32

OptiStart K1 AC/DC Mini-contactors

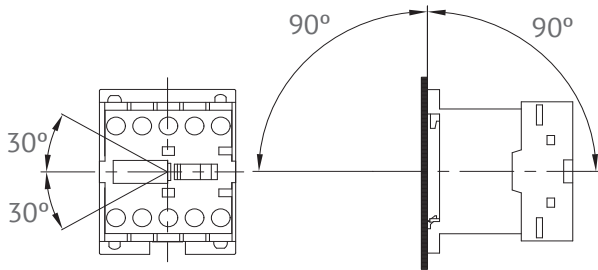
Appearance	Rated operating current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
four-pole non-reversing								
	9	screw type	-	-	OptiStart K1-09D00-40-	230AC/DC	117581	0,16
	9		-	-		24AC/DC	117580	0,16
	12		OptiStart K1-12D00-40-	-	-	230AC/DC	117583	0,16
	12			-	-	24AC/DC	117582	0,16
	9	for printed circuit boards (PCBs)	-	-	OptiStart K1-09L00-40-	230AC/DC	117585	0,16
	9		-	-		24AC/DC	117584	0,16
four-pole reversing								
	9	screw type	-	-	OptiStart K1W-09D00-40MC-	230AC/DC	117599	0,32
	9		-	-		24AC/DC	117598	0,32
	12		OptiStart K1W-12D00-40MC-	-	-	230AC/DC	117601	0,32
	12			-	-	24AC/DC	117600	0,32
OptiStart K1-07 Relay type contactors								
Appearance	Rated operating current Ie at AC-3 380 V, A	Contact clamp type	Main contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
With an AC control coil								
	3	screw type	2	2	OptiStart K1-07D22-	230AC	117158	0,16
	3		2	2		230AC-VS	117160	0,16
	3		2	2		24AC	117157	0,16
	3		2	2		24AC-VS	117159	0,16
	3		3	1	OptiStart K1-07D31-	230AC	117154	0,16
	3		3	1		230AC-VS	117156	0,16
	3		3	1		24AC	117153	0,16
	3		3	1		24AC-VS	117155	0,16
	3		4	-	OptiStart K1-07D40-	230AC	117150	0,16
	3		4	-		230AC-VS	117152	0,16
	3		4	-		24AC	117149	0,16
	3		4	-		24AC-VS	117151	0,16
With a DC control coil								
	3	screw type	2	2	OptiStart K1-07D22-	24DC	117389	0,19
	3		2	2		24DC-VR	117393	0,20
	3		2	2		24DC-VS	117390	0,19
	3		3	1	OptiStart K1-07D31-	24DC	117387	0,19
	3		3	1		24DC-VR	117392	0,20
	3		3	1		24DC-VS	117388	0,19
	3		4	-	OptiStart K1-07D40-	24DC	117385	0,19
	3		4	-		24DC-VR	117391	0,19
	3		4	-		24DC-VS	117386	0,19
	3		4	-				
With an AC/DC control coil								
	3	screw type	2	2	OptiStart K1-07D22-	230AC/DC	117607	0,16
	3		2	2		24AC/DC	117606	0,16
	3		3	1	OptiStart K1-07D31-	230AC/DC	117605	0,16
	3		3	1		24AC/DC	117604	0,16
	3		4	-	OptiStart K1-07D40-	230AC/DC	117603	0,16
	3		4	-		24AC/DC	117602	0,16

Technical specifications



In compliance with the requirements of IEC/EN 60947-1, 60947-2, 60947-4-1

Allowable deviations from the operating position

K1-...



Screw type terminals

Mini-contactor	Screw with a washer	Screwdriver	Tightening torque, Nm
OptiStart K1-...	M3,5 		Pz2 0,8-1,4

Main circuit

Type of equipment	K1-09D...	K1-09F...	K1-09L...	K1-12D...
Rated insulation voltage U_i , AC, V	690	690	690	690
Making capacity I_{ef} , A	690 V AC 165	165	165	165
Breaking capacity I_{eff} , A	400 V AC 100	100	100	100
Application category AC-1 - active load commutation				
Rated current I_e (= I_{th}) at +40°C, A	20	16	16	20
Rated power of the three-phase active load, 50/60 Hz, kW	220 V 7,9	6	6	7,9
	400 V 13,8	11	11	13,8
Application category AC-2 and AC-3 - Start-up, shutdown of three-phase motors				
Rated operating current I_e , A	220 V 12	12	12	15
	400 V 9	9	9	12
	690 V 5	5	5	6,5
Rated power of the three-phase motor, 50/60 Hz, kW	220 V 3	3	3	4
	400 V 4	4	4	5,5
	690 V 4	4	4	5,5
Ambient air temperature, °C				
application	open	from -40 to +60 (+90) ¹		
	closed	from -40 to +40		
with a thermal relay	open	from -25 to +60		
	closed	from -25 to +40		
Storage	from -50 to +90			
Short-circuit protection for contactors without thermal relays, A				
Coordination type 1: welding of contacts, safe for the personnel	gL(gG) 40	40	40	40
Coordination type 2: easy welding of contacts is allowed	gL(gG) 25	25	25	25
Welding of contacts is unallowable	gL(gG) 10	10	10	10
Conductor cross-section for contactors without thermal relays, mm²				
Single-core	0,5 - 2,5	"faston" type	male (pin) connection type ø 1,15	0,5 - 2,5
Multiple-core	0,5 - 2,5	1 x 6,3x0,8		0,5 - 2,5
Flexible with a multicore end	0,5 - 1,5	or		0,5 - 1,5
Number of conductors per clamp	2	2 x 2,8x0,8		2
Frequency of operations, amount per hour				
without load	10000	10000	10000	10000
in the mode of AC-3, I_e	600	600	600	600
Mechanical life, mln. of cycles				
contactors with an AC coil	S x 5	5	5	5
contactors with a DC coil	S x 15	15	15	15
Short-time current (10 sec), A				
	96	96	96	120
Power loss at the pole, W				
	I_e , AC-3 400 V	0,15	0,15	0,15
		0,15	0,15	0,25

¹ Contactors are allowed to be applied at the ambient air temperature of + 90 °C only in the AC-1 application category, with the contactor operate voltage equal to (0,9 - 1,0) U_c , and the rated operating current in the AC-1 application category must correspond to the values given for the AC-3 application category.

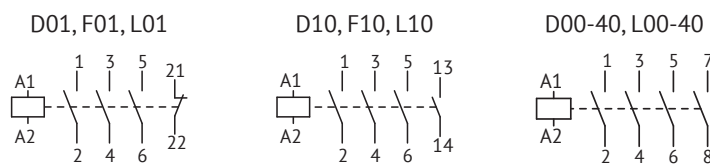
Auxiliary circuit

Type of equipment		K1-07D... K1-09D... K1-12D...	K1-07D...= K1-09D...= K1-12D...=	K1-07D...= 24VR K1-09D...= 24VR	K1-09F... (=)	K1-07L... (=) K1-09L... (=)	HK...
Rated insulation voltage U_i , AC, V		690	690	690	690	690	690
Power loss at the pole, W	at I_{th}	0,5	0,5	0,5	0,5	0,5	0,5
Rated thermal current for 690 V, A							
Ambient air temperature, °C	40 °C	10	10	10	10	10	10
	60 °C	6	6	6	6	6	6
Application category AC-15							
Rated operating current I_e , A	220 V	3	3	3	3	3	3
	400 V	2	2	2	2	2	2
	690 V	1,6	1,6	1,6	1,6	1,6	1,6
Ambient air temperature, °C							
Application	open	from -40 to +60 (+90) ¹					
	closed	from -40 to +40					
Storage		from -40 to +90					
Short circuit protection							
Short-circuit current 1 kA, welding of contacts is unallowable, A	gL(gG)	20	20	20	20	20	20
Power consumed by the coil							
AC, VA	starting	25	-	-	25	25	-
	holding	4-5	-	-	4-5	4-5	-
DC, W	starting	-	2,5	1,5	2,5	2,5	-
	holding	-	2,5	1,5	2,5	2,5	-
Conductor cross-section, mm²							
Single-core		0,5-2,5	0,5-2,5	0,5-2,5	"faston" type	male (pin) connection type $\varnothing 1,15$	0,5-2,5
Multiple-core		0,5-2,5	0,5-2,5	0,5-2,5	1 x 6,3x0,8		0,5-2,5
Flexible with a multicore end		0,5-1,5	0,5-1,5	0,5-1,5	or		0,5-1,5
Number of conductors per clamp		2	2	2	2 x 2,8x0,8		2

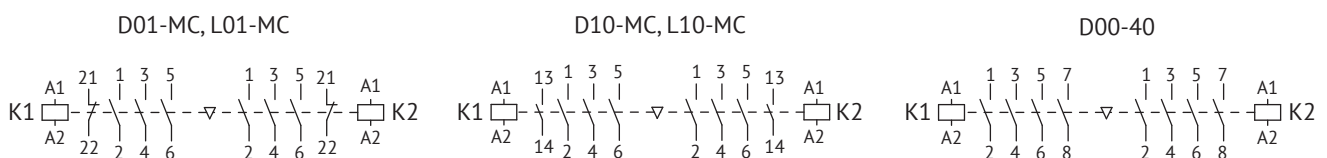
¹ Contactors are allowed to be applied at the ambient air temperature of + 90 °C, with the contactor operate voltage equal to (0,9 - 1,0) U_c , and the rated thermal current I_{th} must correspond to the values given for the AC-15 application category.

Electrical layouts

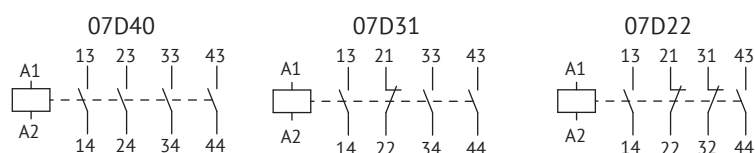
For non-reversing three- and four-pole contactors



For reversing three- and four-pole contactors



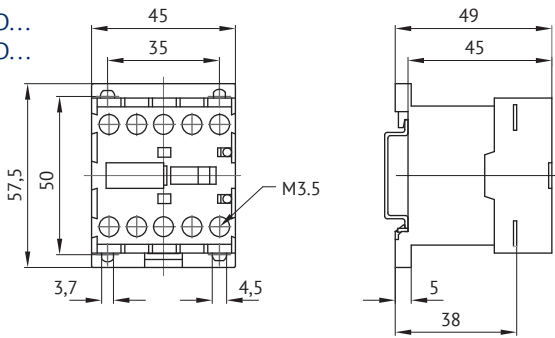
For relay type four-pole contactors



Overall dimensions (mm)

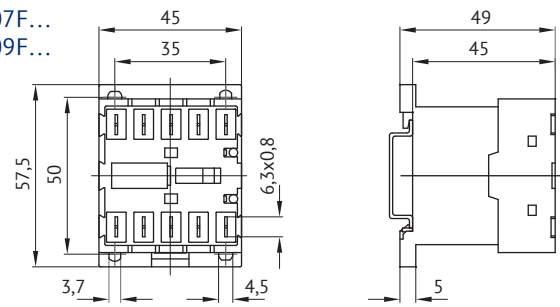
Mini-contactors with screw type contact clamps

K1-07D...
K1-09D...



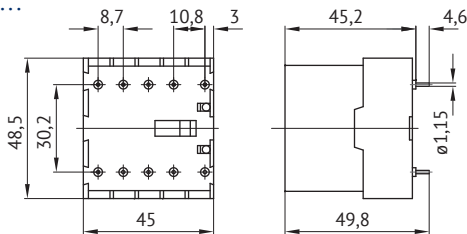
Mini - contactors with "faston" type contact clamps

K1-07F...
K1-09F...



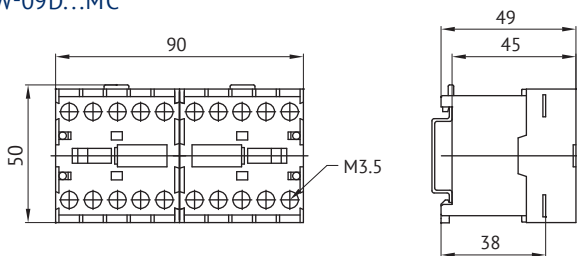
Mini-contactors for printed circuit boards (PCBs)

K1-07L...
K1-09L...



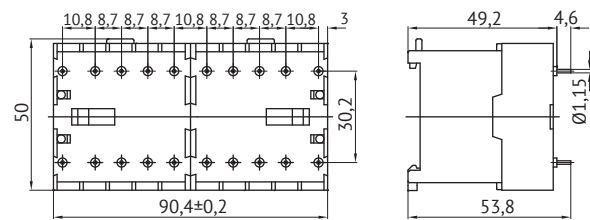
Reversing mini - contactors with screw type contact clamps

K1W-09D...MC







Reversing mini - contactors for printed circuit boards (PCBs)

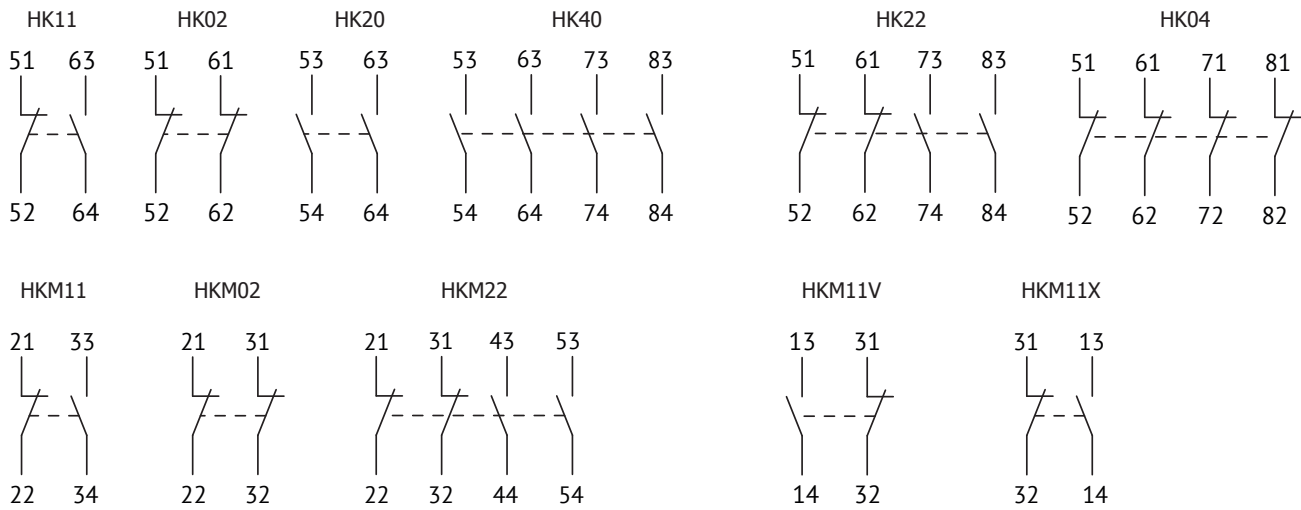
K1W-09L...MC



Accessories

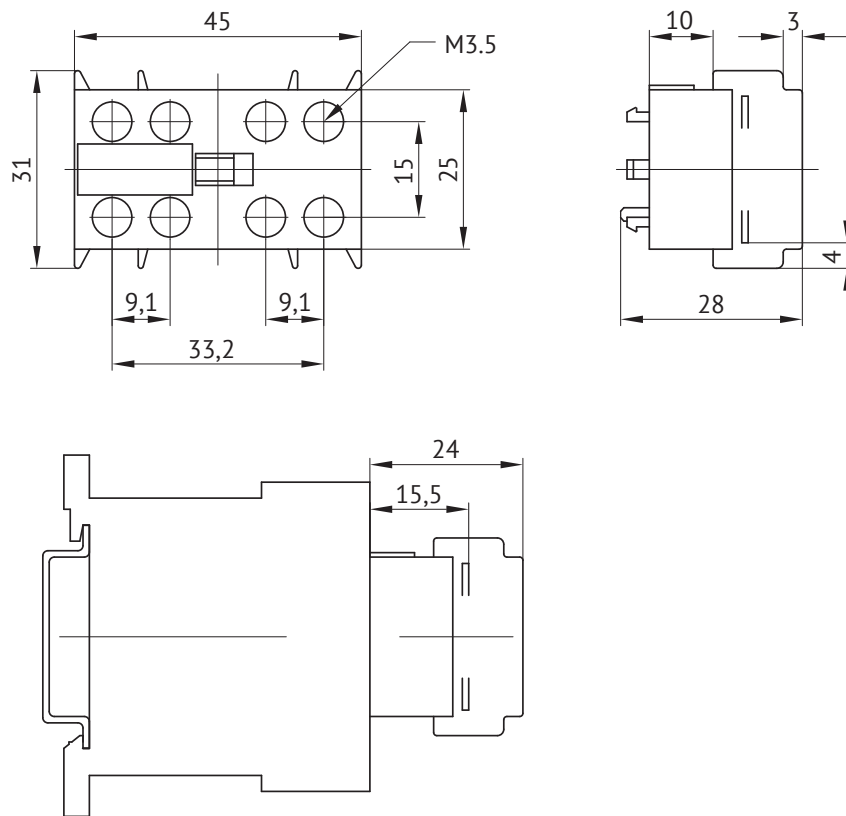
Auxiliary contact blocks								
Appearance	Title	Contacts		Rated operating current, A			Reference	Weight, kg
				AC-15		AC-1		
		NO	NC	220 V	400 V	690 V		
For contactors K1-07								
	OptiStart HK11	1	1	3	2	10	117737	0,04
	OptiStart HK02	-	2	3	2	10	117738	0,04
	OptiStart HK20	2	-	3	2	10	117739	0,04
	OptiStart HK40	4	-	3	2	10	117740	0,04
	OptiStart HK22	2	2	3	2	10	117741	0,04
	OptiStart HK04	-	4	3	2	10	117742	0,04
For contactors K1-09...K1-12								
	OptiStart HKM11	1	1	3	2	10	117743	0,04
	OptiStart HKM02	-	2	3	2	10	117744	0,04
	OptiStart HKM22	2	2	3	2	10	117745	0,04
For contactors K1W-09...K1W-12								
	OptiStart HKM11V	1	1	3	2	10	117746	0,04
	OptiStart HKM11X	1	1	3	2	10	117747	0,04
OptiStart K1W-VB Reverse starter connector								
Appearance	Title	Type of equipment				Reference	Weight, kg	
	OptiStart K1W-VB	for contactors K1W09D...MC; K1W12D...MC				117839	0,01	

Electrical layouts



Overall dimensions

HK...



OptiStart K3 Electromagnetic contactors



OptiStart K series of electromagnetic contactors feature wide functionality, modern design and compact dimensions. The new generation of contactors ensures the operation of electric motors on currents from 10 to 1200 A (at AC-3 380 V).

The product range of KEAZ includes capacitor switching contactors, which are intended for application in power-factor correction units (PFC units) and are used to start any type of capacitors.

Three-pole contactors of the OptiStart K3 series control the operation modes of electrical equipment for residential, commercial buildings and industrial enterprises, as well as managing the operation modes of low voltage distribution networks.

Four-pole contactors of the OptiStart K3 series meet special requirements for energy distribution systems. Specifically, they are used for disconnecting distribution systems with an ungrounded neutral, for power distribution systems, for power distribution systems of TT type, where the neutral pole is meant to be always disconnected.

To implement not only standard, but also technically complex solutions the range of KEAZ offers a wide selection of accessories.

Designation

OptiStart K3 - 10 NA 00 - 40 - 230AC



1	Product range	OptiStart – electric motor control and protection equipment		
2	Configuration	K2	K(G)3	K3-07
3	Rated operating current AC-3 380 V, A	10-1200		4, 12 (AC-15 220 V)*
4	Terminal type	A (NA) - screw type terminals with a clamp shackle		D (ND) - screw type terminals with washers
5	Auxiliary contacts	1 digit indicates NO		2 digit indicates NC
6	Number of poles	40 - four-pole design		The absence of a symbol indicates a three-pole design
7	Rated control voltage, (V) and type of control circuit current	AC - alternating	DC - direct **	=DC - direct, double-wound coil AC/DC - alternating or direct

* is applied only to the design of K3-07

** is applied only to the design of KG3

The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.

Appearance														
Type of equipment	OptiStart K3-	10ND10	10ND01	14ND10	14ND01	18ND10	18ND01	22ND10	22ND01	24A00	32A00	40A00		
Rated operating current Ie, A	AC-3 400 V	10		14		18		22		24	32	40		
	AC-1 690 V	25				32				50	65	80		
Motor power, kW	AC-3 380-400 V	4		5,5		7,5		11		15	18,5			
	AC-3 660-690 V	5,5		7,5		10				18,5				
Auxiliary contacts	NO	1	-	1	-	1	-	1	-	-	-	-		
	NC	-	1	-	1	-	1	-	1	-	-	-		
Conductor cross-section, mm ²	single-core	0,75-6								1,5-25				
	flexible	1-4								2,5-16				
Rated thermal and operating current of the auxiliary contact, A	Ith at +40 °C	10								-				
	at AC-15, 230 V	3								-				
	at AC-15, 400 V	2								-				
Power consumed by the coil, VA	switching	33-45								90-115				
	holding	7-10								9-13				
Mounting	Mounting on a 35-mm DIN-rail and a mounting plate													
Auxiliary contact blocks	front mounting type													
		OptiStart HN10	OptiStart HN01	OptiStart HN10U	OptiStart HN01U									
	NO	1	-	1	-									
	NC	-	1	-	1									
	maximum amount for mounting	4												
	side mounting type	-												
		OptiStart HB11												
Type of the thermal overload relay		OptiStart TU12/16...C					OptiStart TU3/32					OptiStart TU3/42		
Number of the setting ranges	16								4					
Current setting range, A	0,12-30				0,12-32				10-42					
Connection busbars	-													



50A00	62A00	74A00	90A00	115A00	151A00	176A00	210A00	260A00	316A00	450A22	550A22	700A22	860A22	1000A22	1200A22																												
50	62	74	90	115	150	175	210	260	315	450	550	700	860	1000	1200																												
110	120	130	160	200	230	250	350	450	500	600	750	1000	1100	1200	1350																												
22	30	37	45	55	75	90	110	132	160	250	300	400	500	580	680																												
30	37	45	55		90	110	160	210	250	375	475	630	700	850	1000																												
-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2																												
-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2																												
4-50			10-120		2x16-120		busbar 30x6			busbar 30x6	busbar 40x6	busbar 50x8	busbar 50x10																														
10-35			10-95																																								
-			-		-		-			10																																	
-			-		-		-			3																																	
-			-		-		-			2																																	
140-165			280		350		360			800-950		1350-1600		2400																													
13-18					5					9-11		21-25		70																													
Mounting on a 35-mm DIN-rail and a mounting plate			Mounting on a 35-mm and a 75-mm DIN-rail and a mounting plate		Mounting on a mounting plate																																						
OptiStart HA10		OptiStart HA01		OptiStart HKT11			OptiStart HKT22			OptiStart HKF22			OptiStart HKB11																														
1		-		1			2			2			1																														
-		1		1			2			2			1																														
4		7		1			2			-			-																														
OptiStart HB02		OptiStart HKA11																																									
0		1																																									
2		1																																									
2		2																																									
OptiStart TU3/74		OptiStart TU85		OptiStart TU180			OptiStart TU320			OptiStart TU800																																	
5		2		1			2			3																																	
20-74		60-120		120-180			144-320			240-800																																	
				built-in type						OptiStart STU840/550		OptiStart STU840/860																															

Selection guide

OptiStart K3 with an AC control coil

Type of equipment		K3											
Appearance													
Coil voltage, V		24, 36, 48, 110, 127, 230, 400											
Number of poles		3											
Contact clamp type		screw type with a washer					screw type with a clamp shackle						
Rated operating current I _e at AC-3, 380 V, A		10	14	18	22	24	32	40					
Rated operating current I _e at AC-1, 690 V, A		25			32			50	65	80			
Motor power AC-3, 380 V, kW		4	5,5	7,5	11			15	18,5				
Configuration		non-reversing											
Auxiliary contacts		NO	1	-	1	-	1	-	1	-	-	-	-
		NC	-	1	-	1	-	1	-	1	-	-	-
Weight, kg		0,23					0,48						
For more details, see pages		371-392											
For accessories, see pages		397-404											

OptiStart K3 with an AC control coil



Type of equipment		K3											
Appearance													
Coil voltage, V		400					24, 110, 230, 400						
Number of poles		3											
Contact clamp type		bolt type											
Rated operating current I _e at AC-3, 380 V, A		450	550	700	860	1000	1200						
Rated operating current I _e at AC-1, 690 V, A		600	760	1000	1100	1200	1350						
Motor power AC-3, 380 V, kW		250	300	400	500	580	680						
Configuration		non-reversing											
Auxiliary contacts		NO	2	2	2	2	1	1					
		NC	2	2	2	2	2	2					
Weight, kg		13	13,5	26,5	27,6	49	53						
For more details, see pages		371-392											
For accessories, see pages		397-404											

K3										
24, 36, 48, 110, 127, 230, 400						400				
3										
screw type with a clamp shackle						bolt type				
50	62	74	90*	115*	150*	175*	210*	260*	315*	
110	120	130	160	200	230	250	350	450	500	
22	30	37	45	55	75	90	110	132	160	
non-reversing										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
0,85			2,2			4		7,2		



K3				K2					K3						
				24, 110, 230, 400											
4															
screw type with a clamp shackle									bolt type						
10	14	18	22	23	30	37	45	60	115*	150*	175*	210*	260*	315*	
	25		32	45		50	80	100	200	230	250	350	450	500	
4	5,5	7,5	11	11	15	18,5	22	30	55	75	90	110	132	160	
non-reversing															
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0,22			0,65			1,1			4,7			8			

* contactors with a built-in suppressor

OptiStart K3 with a DC control coil

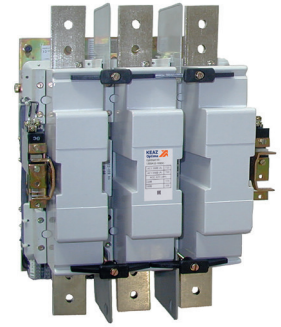
Type of equipment		KG3										
Appearance												
Coil voltage, V		24, 48, 110										
Number of poles		3										
Contact clamp type		screw type with a clamp shackle										
Rated operating current Ie at AC-3, 380 V, A		10*	14*	18*	22*	24*	32*	40*				
Rated operating current Ie at AC-1, 690 V, A		25			32			50	65	80		
Motor power AC-3, 380 V, kW		4	5,5	7,5	11			15	18,5			
Configuration		non-reversing										
Auxiliary contacts		NO	-	1	-	1	-	1	-	-	-	-
		NC	1	-	1	-	1	-	1	-	-	-
Weight, kg		0,53					0,57					
For more details, see pages		371-392										
For accessories, see pages		397-404										

OptiStart K3 with an AC/DC control coil

Type of equipment		K3						
Appearance								
Coil voltage, V		24, 48, 110, 230, 400						
Number of poles		3						
Contact clamp type		screw type with a clamp shackle						
Rated operating current Ie at AC-3, 380 V, A		90*	115*	150*	175*	210*	260*	315*
Rated operating current Ie at AC-1, 690 V, A		160	200	230	250	350	450	500
Motor power AC-3, 380 V, kW		45	55	75	90	110	132	160
Configuration		non-reversing						
Auxiliary contacts		NO	-	-	-	-	-	-
		NC	-	-	-	-	-	-
Weight, kg		2,2	2,3	4			7,2	
For more details, see pages		371-392						
For accessories, see pages		397-404						

* contactors with a built-in suppressor

K3



24, 60, 110, 220

24, 48, 110

3

screw type with a washer

screw type with a clamp shackle

bolt type

10	14	18	22	24	32	40	50	62	74	1000	1200		
25		32		50	65	80	110	120	130	1200	1350		
4	5,5	7,5	11		15	18,5	22	30	37	580	682		
1	-	1	-	1	-	1	-	-	-	1	1		
-	1	-	1	-	1	-	1	-	-	2	2		
0,25				0,55				0,9				49	53

K3





24, 48, 110, 230, 400

3

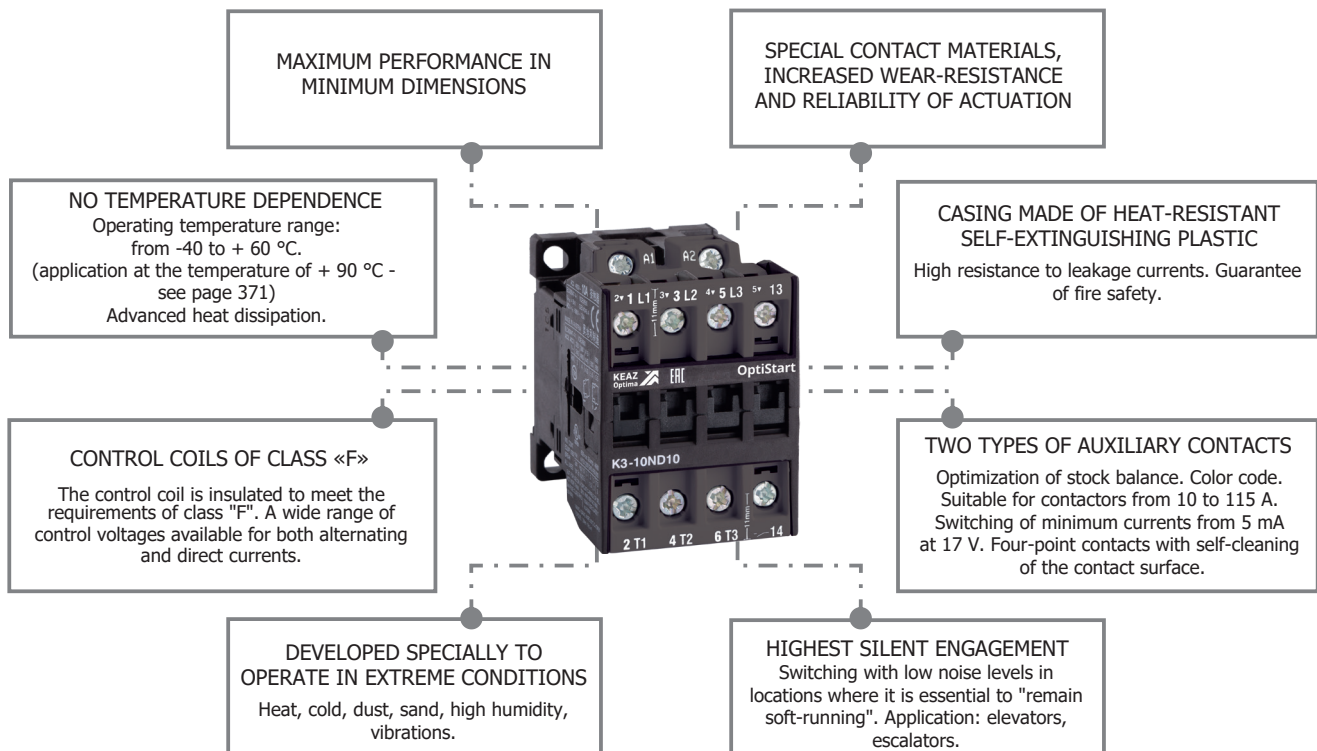
bolt type

450	550	700	860
600	760	1000	1100
250	300	400	500
non-reversing			
2	2	2	2
2	2	2	2
13	13,5	26,5	27,6

Type of equipment		K3-07	KG3-07*										
Appearance													
Coil voltage, V	AC	24, 110, 230, 400	-										
	DC	24, 60, 110, 220	24, 60, 110, 220										
Number of poles		4											
Contact clamp type		screw type with a washer	screw type with a clamp shackle										
Rated operating current I _e at AC-15, 220 V, A		4	12										
Rated operating current I _e at AC-15, 380 V, A		2	4										
Rated thermal current I _{th} , A		10	20										
Configuration		non-reversing											
Main contacts	NO	4	3	2	-	4	3	2	-	4	3	2	-
	NC	-	1	2	4	-	1	2	4	-	1	2	4
Weight, kg	AC	0,22				-							
	DC	0,25				0,53							
For more details, see pages		371-392											
For accessories, see pages		397-404											




* contactors with a built-in suppressor

Batch effectiveness



References (series)





OptiStart K3 contactors with an AC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
three-pole non-reversing								
	10	screw type with a washer	-	1	OptiStart K3-10ND01-	110AC	116922	0,23
	10		-	1		230AC	116923	
	10		-	1		24AC	116921	
	10		-	1		400AC	116924	
	10		1	-	OptiStart K3-10ND10-	110AC	116918	
	10		1	-		230AC	116919	
	10		1	-		24AC	116917	
	10		1	-		400AC	116920	
	14		-	1	OptiStart K3-14ND01-	110AC	116930	
	14		-	1		230AC	116931	
	14		-	1		24AC	116929	
	14		-	1		400AC	116932	
	14		1	-	OptiStart K3-14ND10-	110AC	116926	
	14		1	-		230AC	116927	
	14		1	-		24AC	116925	
	14		1	-		400AC	116928	
	18		-	1	OptiStart K3-18ND01-	110AC	116938	
	18		-	1		230AC	116939	
	18		-	1		24AC	116937	
	18		-	1		400AC	116940	
	18		1	-	OptiStart K3-18ND10-	110AC	116934	
	18		1	-		230AC	116935	
	18		1	-		24AC	116933	
	18		1	-		400AC	116936	
	22		-	1	OptiStart K3-22ND01-	110AC	116946	
	22		-	1		230AC	116947	
	22		-	1		24AC	116945	
	22		-	1		400AC	116948	
22	1	-	OptiStart K3-22ND10-	110AC	116942			
22	1	-		230AC	116943			
22	1	-		24AC	116941			
22	1	-		400AC	116944			
	24	screw type with a clamp shackle	-	-	OptiStart K3-24A00-	110AC	116950	0,48
	24		-	-		230AC	116951	
	24		-	-		24AC	116949	
	24		-	-		400AC	116952	
	32		-	-	OptiStart K3-32A00-	110AC	116954	
	32		-	-		230AC	116955	
	32		-	-		24AC	116953	
	32		-	-		400AC	116956	
	40		-	-	OptiStart K3-40A00-	110AC	116958	
	40		-	-		230AC	116959	
40	-	-	24AC	116957				
40	-	-	400AC	116960				
	50	screw type with a clamp shackle	-	-	OptiStart K3-50A00-	110AC	116962	0,85
	50		-	-		230AC	116963	
	50		-	-		24AC	116961	
	50		-	-		400AC	116964	
	62		-	-	OptiStart K3-62A00-	110AC	116966	
	62		-	-		230AC	116967	
	62		-	-		24AC	116965	
	62		-	-		400AC	116968	
	74		-	-	OptiStart K3-74A00-	110AC	116970	
	74		-	-		230AC	116971	
74	-	-	24AC	116969				
74	-	-	400AC	116972				




OptiStart K3 contactors with an AC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	90	screw type with a clamp shackle	-	-	OptiStart K3-90A00-	400AC	116973	2,2
	115		-	-	OptiStart K3-115A00-	400AC	116974	
	150	screw type with a clamp shackle	-	-	OptiStart K3-151A00-	400AC	116975	4
	175		-	-	OptiStart K3-176A00-	400AC	116976	
	210		-	-	OptiStart K3-210A00-	400AC	116977	7,2
	260		-	-	OptiStart K3-260A00-	400AC	116978	
	315		-	-	OptiStart K3-316A00-	400AC	116979	
	450	bolt type	2	2	OptiStart K3-450A22-	400AC	116980	13
	550		2	2	OptiStart K3-550A22-	400AC	116981	13,5
	700		2	2	OptiStart K3-700A22-	400AC	116982	26,5
	860		2	2	OptiStart K3-860A22-	400AC	116983	27,6
	1000	bolt type	1	2	OptiStart K3-1000A12-	110AC	116985	49
	1000		1	2		230AC	116986	
	1000		1	2		24AC	116984	
	1000		1	2		400AC	116987	
	1200		1	2	OptiStart K3-1200A12-	110AC	116989	53
	1200		1	2		230AC	116990	
	1200		1	2		24AC	116988	
	1200		1	2		400AC	116991	
four-pole								
	10	screw type with a clamp shackle	-	-	OptiStart K3-10NA00-40-	110AC	116993	0,22
	10		-	-		230AC	116994	
	10		-	-		24AC	116992	
	10		-	-		400AC	116995	
	14		-	-	OptiStart K3-14NA00-40-	110AC	116997	
	14		-	-		230AC	116998	
	14		-	-		24AC	116996	
	14		-	-	OptiStart K3-18NA00-40-	400AC	116999	
	18		-	-		110AC	117001	
	18		-	-		230AC	117002	
	18		-	-	OptiStart K3-18NA00-40-	24AC	117000	
	18		-	-		400AC	117003	
	22		-	-		OptiStart K3-22NA00-40-	110AC	
	22		-	-	230AC		117006	
	22		-	-	24AC		117004	
22	-	-	400AC	117007				





OptiStart K3 contactors with an AC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	23	screw type with a clamp shackle	-	-	OptiStart K2-23A00-40-	110AC	117009	0,65
	23		-	-		230AC	117010	
	23		-	-		24AC	117008	
	23		-	-		400AC	117011	
	30		-	-	OptiStart K2-30A00-40-	110AC	117013	
	30		-	-		230AC	117014	
	30		-	-		24AC	117012	
	30		-	-		400AC	117015	
	37		-	-	OptiStart K2-37A00-40-	110AC	117017	
	37		-	-		230AC	117018	
	37		-	-		24AC	117016	
	37		-	-		400AC	117019	
	45	screw type with a clamp shackle	-	-	OptiStart K2-45A00-40-	110AC	117021	1,1
	45		-	-		230AC	117022	
	45		-	-		24AC	117020	
	45		-	-		400AC	117023	
	60		-	-	OptiStart K2-60A00-40-	110AC	117025	
	60		-	-		230AC	117026	
	60		-	-		24AC	117024	
	116	bolt type	-	-	OptiStart K3-116A00-40-	110AC	117029	4,7
	116		-	-		230AC	117030	
	116		-	-		24AC	117028	
	116		-	-		400AC	117031	
	151		-	-	OptiStart K3-151A00-40-	110AC	117033	
	151		-	-		230AC	117034	
	151		-	-		24AC	117032	
	151		-	-		400AC	117035	
	175		-	-	OptiStart K3-176A00-40-	110AC	117037	
	175		-	-		230AC	117038	
	175		-	-		24AC	117036	
	175		-	-		400AC	117039	
	210	bolt type	-	-	OptiStart K3-210A00-40-	110AC	117041	8
	210		-	-		230AC	117042	
	210		-	-		24AC	117040	
	210		-	-		400AC	117043	
	260		-	-	OptiStart K3-260A00-40-	110AC	117045	
	260		-	-		230AC	117046	
	260		-	-		24AC	117044	
	260		-	-		400AC	117047	
	315		-	-	OptiStart K3-316A00-40-	110AC	117049	
	315		-	-		230AC	117050	
	315		-	-		24AC	117048	
	315		-	-		400AC	117051	







OptiStart KG3 contactors with a DC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg	
			NO	NC					
three-pole non-reversing KG3									
	10	screw type with a clamp shackle	-	1	OptiStart KG3-10A01-	110DC	117187	0,53	
	10		-	1		24DC	117185		
	10		-	1		48DC	117186		
	10		1	-	OptiStart KG3-10A10-	110DC	117184		
	10		1	-		24DC	117182		
	10		1	-		48DC	117183		
	14		-	1	OptiStart KG3-14A01-	110DC	117193		
	14		-	1		24DC	117191		
	14		-	1		48DC	117192		
	14		1	-	OptiStart KG3-14A10-	110DC	117190		
	14		1	-		24DC	117188		
	14		1	-		48DC	117189		
	18		-	1	OptiStart KG3-18A01-	110DC	117199		
	18		-	1		24DC	117197		
	18		-	1		48DC	117198		
	18		1	-	OptiStart KG3-18A10-	110DC	117196		
	18		1	-		24DC	117194		
	18		1	-		48DC	117195		
	22		-	1	OptiStart KG3-22A01-	110DC	117205		
	22		-	1		24DC	117203		
22	-	1	48DC	117204					
22	1	-	OptiStart KG3-22A10-	110DC	117202				
22	1	-		24DC	117200				
22	1	-		48DC	117201				
	24	screw type with a clamp shackle	-	-	OptiStart KG3-24A00-	110DC	117208	0,57	
	24		-	-		24DC	117206		
	24		-	-		48DC	117207		
	32		-	-	OptiStart KG3-32A00-	110DC	117211		
	32		-	-		24DC	117209		
	32		-	-		48DC	117210		
	40		-	-	OptiStart KG3-40A00-	110DC	117214		
	40		-	-		24DC	117212		
40	-	-	48DC	117213					
three-pole non-reversing K3									
	10	screw type with a washer	-	1	OptiStart K3-10ND01=	110DC	117236	0,25	
	10		-	1		220DC	117237		
	10		-	1		24DC	117234		
	10		-	1	OptiStart K3-10ND10=	60DC	117235		
	10		1	-		110DC	117232		
	10		1	-		220DC	117233		
	10		1	-	OptiStart K3-10ND10=	24DC	117230		
	10		1	-		60DC	117231		
	14		-	1		110DC	117244		
	14		-	1	OptiStart K3-14ND01=	220DC	117245		
	14		-	1		24DC	117242		
	14		-	1		60DC	117243		
	14		1	-	OptiStart K3-14ND10=	110DC	117240		
	14		1	-		220DC	117241		
	14		1	-		24DC	117238		
	14		1	-	OptiStart K3-14ND10=	60DC	117239		
	18		-	1		OptiStart K3-18ND01=	110DC		117252
	18		-	1			220DC		117253
	18		-	1	24DC		117250		
	18		-	1	60DC	117251			

OptiStart K3 contactors with a DC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	18	screw type with a washer	1	-	OptiStart K3-18ND10=	110DC	117248	0,25
	18		1	-		220DC	117249	
	18		1	-		24DC	117246	
	18		1	-		60DC	117247	
	22		-	1	OptiStart K3-22ND01=	110DC	117260	
	22		-	1		220DC	117261	
	22		-	1		24DC	117258	
	22		-	1	OptiStart K3-22ND10=	60DC	117259	
	22		1	-		110DC	117256	
	22		1	-		220DC	117257	
	22		1	-		24DC	117254	
	22		1	-	60DC	117255		
	24	screw type with a clamp shackle	-	-	OptiStart K3-24A00=	110DC	117264	0,55
	24		-	-		220DC	117265	
	24		-	-		24DC	117262	
	24		-	-		60DC	117263	
	32		-	-	OptiStart K3-32A00=	110DC	117268	
	32		-	-		220DC	117269	
	32		-	-		24DC	117266	
	32		-	-		60DC	117267	
	40		-	-	OptiStart K3-40A00=	110DC	117272	
	40		-	-		220DC	117273	
	40		-	-		24DC	117270	
	40		-	-		60DC	117271	
	50		-	-	OptiStart K3-50A00=	110DC	117217	0,9
	50		-	-		24DC	117215	
	50		-	-		48DC	117216	
	62		-	-	OptiStart K3-62A00=	110DC	117220	
	62		-	-		24DC	117218	
	62		-	-		48DC	117219	
	74		-	-	OptiStart K3-74A00=	110DC	117223	
	74		-	-		24DC	117221	
	74		-	-		48DC	117222	
	1000	bolt type	1	2	OptiStart K3-1000A12=	110DC	117226	49
	1000		1	2		24DC	117224	
	1000		1	2		48DC	117225	
	1200		1	2	OptiStart K3-1200A12=	110DC	117229	53
	1200		1	2		24DC	117227	
	1200		1	2		48DC	117228	

OptiStart K3 contactors with an AC/DC control coil

Appearance	Rated current Ie at AC-3 380 V, A	Contact clamp type	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
three-pole								
	90	screw type with a clamp shackle	-	-	OptiStart K3-90A00-	110AC/DC	117532	2,2
	90		-	-		230AC/DC	117533	
	90		-	-		24AC/DC	117531	
	90		-	-		48AC/DC	117165	
	115		-	-	OptiStart K3-115A00-	110AC/DC	117535	2,3
	115		-	-		230AC/DC	117536	
	115		-	-		24AC/DC	117534	
	151	bolt type	-	-	OptiStart K3-151A00-	110AC/DC	117538	4
	151		-	-		230AC/DC	117539	
	151		-	-		24AC/DC	117537	
	151		-	-	48AC/DC	117167		
	176		-	-	OptiStart K3-176A00-	110AC/DC	117541	7,2
	176		-	-		230AC/DC	117542	
	176		-	-		24AC/DC	117540	
	176		-	-	48AC/DC	117168		
	210		-	-	OptiStart K3-210A00-	110AC/DC	117544	7,2
	210		-	-		230AC/DC	117545	
	210		-	-		24AC/DC	117543	
	210		-	-	48AC/DC	117169		
	260		-	-	OptiStart K3-260A00-	110AC/DC	117547	7,2
	260		-	-		230AC/DC	117548	
	260		-	-		24AC/DC	117546	
	260		-	-	48AC/DC	117170		
316	-	-	OptiStart K3-316A00-	110AC/DC	117550	7,2		
316	-	-		230AC/DC	117551			
316	-	-		24AC/DC	117549			
316	-	-	48AC/DC	117171				
	450	bolt type	2	2	OptiStart K3-450A22-	110AC/DC	117553	13
	450		2	2		230AC/DC	117554	
	450		2	2		24AC/DC	117552	
	450		2	2	48AC/DC	117172		
	550	bolt type	2	2	OptiStart K3-550A22-	110AC/DC	117556	13,5
	550		2	2		230AC/DC	117557	
	550		2	2		24AC/DC	117555	
	550		2	2	48AC/DC	117173		
	700	bolt type	2	2	OptiStart K3-700A22-	110AC/DC	117559	26,5
	700		2	2		230AC/DC	117560	
	700		2	2		24AC/DC	117558	
	700		2	2	48AC/DC	117174		
	860	bolt type	2	2	OptiStart K3-860A22-	110AC/DC	117562	27,6
	860		2	2		230AC/DC	117563	
	860		2	2		24AC/DC	117561	
	860		2	2	48AC/DC	117175		

OptiStart K3-07 relay type contactors

Appearance	Rated current Ie at AC-15 220 V, A	Contact clamp type	Main contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
with an AC control coil								
	4	screw type with a washer	-	4	OptiStart K3-07ND04-	110AC	117081	0,22
	4		-	4		230AC	117082	
	4		-	4		24AC	117080	
	4		-	4	400AC	117083		
	4		2	2	OptiStart K3-07ND22-	110AC	117077	
	4		2	2		230AC	117078	
	4		2	2		24AC	117076	
	4		2	2	400AC	117079		
	4		3	1	OptiStart K3-07ND31-	110AC	117073	
	4		3	1		230AC	117074	
	4		3	1		24AC	117072	
	4		3	1	400AC	117075		
	4		4	-	OptiStart K3-07ND40-	110AC	117069	
	4		4	-		230AC	117070	
	4		4	-		24AC	117068	
4	4	-	400AC	117071				
with a DC control coil								
	4	screw type terminals with a washer	-	4	OptiStart K3-07ND04=	110DC	117343	0,25
	4		-	4		220DC	117344	
	4		-	4		24DC	117341	
	4		-	4	60DC	117342		
	4		2	2	OptiStart K3-07ND22=	110DC	117339	
	4		2	2		220DC	117340	
	4		2	2		24DC	117337	
	4		2	2	60DC	117338		
	4		3	1	OptiStart K3-07ND31=	110DC	117335	
	4		3	1		220DC	117336	
	4		3	1		24DC	117333	
	4		3	1	60DC	117334		
	4		4	-	OptiStart K3-07ND40=	110DC	117331	
	4		4	-		220DC	117332	
	4		4	-		24DC	117329	
4	4	-	60DC	117330				
	4	screw type with a washer	-	4	OptiStart KG3-07D04-	110DC	117304	0,53
	4		-	4		220DC	117305	
	4		-	4		24DC	117302	
	4		-	4	60DC	117303		
	4		2	2	OptiStart KG3-07D22-	110DC	117300	
	4		2	2		220DC	117301	
	4		2	2		24DC	117298	
	4		2	2	60DC	117299		
	4		3	1	OptiStart KG3-07D31-	110DC	117296	
	4		3	1		220DC	117297	
	4		3	1		24DC	117294	
	4		3	1	60DC	117295		
	4		4	-	OptiStart KG3-07D40-	110DC	117292	
	4		4	-		220DC	117293	
	4		4	-		24DC	117290	
	4		4	-	60DC	117291		
	12		-	4	OptiStart KG3-07A04-	110DC	117288	
	12		-	4		220DC	117289	
12	-	4	24DC	117286				
12	-	4	60DC	117287				

OptiStart K3-07 relay type contactors

Appearance	Rated current Ie at AC-15 220 V, A	Contact clamp type	Main contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	12	screw type with a washer	2	2	OptiStart KG3-07A22-	110DC	117284	0,53
	12		2	2		220DC	117285	
	12		2	2		24DC	117282	
	12		2	2		60DC	117283	
	12		3	1	OptiStart KG3-07A31-	110DC	117280	
	12		3	1		220DC	117281	
	12		3	1		24DC	117278	
	12		3	1	OptiStart KG3-07A40-	60DC	117279	
	12		4	-		110DC	117276	
	12		4	-		220DC	117277	
	12		4	-		24DC	117274	
	12		4	-	60DC	117275		

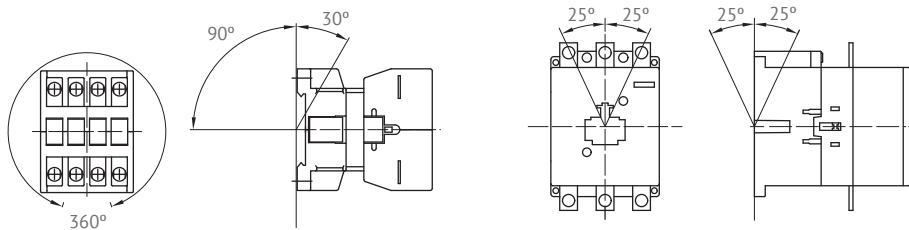
Technical specifications

In compliance with the requirements of IEC/EN 60947-1, 60947-2, 60947-4-1

Allowable deviations from the operating position

K3-07...K3-115

K3-151...K3-1200



Screw type terminals

	Contact clamp type			Screwdriver	Tightening torque, Nm
	Screw with a washer	Screw with a clamp shackle	Bolt with a nut		
Relay type contactors					
K(G)3-07	M3,5	-	-		0,8-1,4
Contactors					
Main terminals					
K(G)3-10... K(G)3-22	M3,5	-	-		0,8-1,4
K(G)3-24...K(G)3-40	-	M5	-		2,5-3
K(G)3-50...K(G)3-74	-	M6	-		3,5-4,5
K(G)3-90...K(G)3-115	-	-	M8		4-6,5
K(G)3-116...K(G)3-176	-	-	M8		17
K(G)3-210...K(G)3-316	-	-	M10		35
K(G)3-450...K(G)3-700	-	-	M12		60
K(G)3-860	-	-	M14		75
K(G)3-1000, K3-1200	-	-	M12		60

Main circuit

Type of equipment		K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Rated insulation voltage U_i , AC, V		690	690	690	690	690	690	690	690	690	690
Making capacity I_{ef} , A	690 V AC	200	200	200	200	400	500	500	700	900	900
Breaking capacity I_{eff} , A	400 V AC	180	180	200	200	380	400	400	600	800	800
Application category AC-1 - active load commutation											
Rated operating current I_e (= I_{th}) at 40°C, A	690 V	25	25	32	32	50	65	80	110	120	130
Rated power of the three-phase active load, 50/60 Hz, kW	220 V	9,5	9,5	12,2	12,2	19	24,7	30,4	41,9	45,7	49,5
	400 V	16,4	16,4	21	21	32,9	42,7	52,6	72,3	78,9	85,5
	690 V	29,8	29,8	38,2	38,2	59,7	77,6	95,5	131,3	143,2	155,2
Application category AC-2 and AC-3 - Start-up, shutdown of three-phase motors											
Rated operating current I_e , A	220 V	12	15	18	22	24	30	40	50	63	74
	400 V	10	14	18	22	24	32	40	50	62	74
	690 V	6,5	8,5	8,5	8,5	17	20	20	31	40	40
Rated power of the three-phase motor, 50/60 Hz, kW	220 V	3	4	5	6	6	8,5	11	12,5	18,5	22
	400 V	4	5,5	7,5	11	11	15	18,5	22	30	37
	690 V	5,5	7,5	10	10	15	18,5	18,5	30	37	45
Ambient air temperature, °C											
Application	open	from -40 to +60 (+90) ¹					from -40 to +60 (+90) ¹				
	closed	from -40 to +40					from -40 to +40				
With a thermal relay	open	from -25 to +60					from -25 to +60				
	closed	from -25 to +40					from -25 to +40				
Storage		from -50 to +90					from -50 to +90				
Short-circuit protection, A											
Coordination type 1: welding of contacts, safe for the personnel	gL(gG)	63	63	63	63	80	80	80	160	160	160
Coordination type 2: easy welding of contacts is allowed	gL(gG)	25	35	35	35	50	50	50	100	125	125
Welding of contacts is unallowable	gL(gG)	16	16	16	16	25	35	35	50	63	63
Conductor cross-section, mm²											
Single-core		0,75-6				1,5-25	1,5-25		4-50		
Multiple-core		1-4				2,5-16	2,5-16		10-35		
Flexible with a multicore end		0,75-4				1,5-16	1,5-16		6-35		
Number of conductors per clamp		2	2	2	1	1	1	1	1	1	1
Frequency of operations, amount per hour											
without load		10000	10000	10000	10000	7000	7000	7000	7000	7000	7000
in the mode of AC-3		600	600	600	600	600	600	600	400	400	400
Mechanical life, mln. of cycles											
Contactors with an AC coil	S x	10	10	10	10	10	10	10	10	10	10
Contactors with a DC coil	S x	50	50	50	50	50	50	50	-	-	-
Contactors with a double-wound DC coil	S x	10	10	10	10	10	10	10	10	10	10
Short-time current, A											
10 sec		96	120	144	176	184	240	296	360	504	592
120 sec		28	35	42	51	53	69	85	104	145	171
Power loss at the pole, W	I_e , at AC-3 400 V	0,21	0,35	0,5	0,75	0,7	1,3	2	2,2	3,9	5,5

¹ Contactors are allowed to be applied at the ambient air temperature of + 90 °C only in the AC-1 application category, with the contactor operate voltage equal to (0,9 - 1,0) U_c , and the rated operating current in the AC-1 application category must correspond to the values given for the AC-2, AC-3 application categories.

Main circuit

Type of equipment		K3-90	K3-115	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
Rated insulation voltage U_i , AC, V		1000	1000	1000	1000	1000	1000	1000	1000	1000	690	690	690	690
Making capacity I_{ef} , A	690 V AC	1100	1200	1500	2000	2100	2600	3200	4500	5500	7000	8600	10000	12000
Breaking capacity I_{eff} , A	400 V AC	950	1100	1200	1500	1600	2100	2600	4500	5500	7000	8000	8000	10000
Application category AC-1 - active load commutation														
Rated operating current I_e (= I_{th}) at 40°C, A	690 V	160	200	230	250	350	450	500	700	760	1000	1100	1200	1350
Rated power of the three-phase active load, 50/60 Hz, kW	220 V	60	76	87	95	133	171	190	266	289	381	419	457	514
	400 V	105	131	151	164	230	296	329	460	500	658	724	789	888
	690 V	191	239	274	298	418	537	597	836	908	1195	1314	1434	1613
Application category AC-2 and AC-3 - Start-up, shutdown of three-phase motors														
Rated operating current I_e , A	220 V	90	115	150	175	210	260	315	450	550	700	860	1000	1200
	400 V	90	115	150	175	210	260	315	450	550	700	860	1000	1200
	690 V	58	58	120	140	150	180	240	400	500	630	700	860	1000
Rated power of the three-phase motor, 50/60 Hz, kW	220 V	25	33	40	50	60	75	90	132	175	225	280	325	390
	400 V	45	55	75	90	110	132	160	250	300	400	500	580	680
	690 V	55	55	110	132	160	210	250	375	500	630	700	850	1000
Ambient air temperature, °C														
Application	open	from -40 to +60 (+90) ¹			from -40 to +55 (+70) ²			from -40 to +55 (+70) ²				from -40 to +55 (+70) ²		
	closed	from -40 to +40			from -25 to +40			from -25 to +40				from -25 to +40		
With a thermal relay	open	from -25 to +60			from -25 to +55			from -25 to +55				from -25 to +55		
	closed	from -25 to +40			from -25 to +40			from -25 to +40				from -25 to +40		
Storage		from -50 to +90			from -55 to +80			from -55 to +80				from -55 to +80		
Short-circuit protection, A														
Coordination type 1: welding of contacts, safe for the personnel	gL(gG)	250	250	250	315	400	450	500	630	630	800	1000	1000	1250
Coordination type 2: easy welding of contacts is allowed	gL(gG)	160	200	200	250	315	400	400	500	560	-	-	-	-
Welding of contacts is unallowable	gL(gG)	100	125	160	200	250	315	-	-	-	-	-	-	-
Conductor cross-section, mm²														
Single-core		0,5-95	10-120	busbar	busbar	busbar	busbar	busbar	busbar	busbar	busbar	busbar	busbar	busbar
Multiple-core		0,5-70	25-95	18x4	18x4	25x6	25x6	25x6	30x5	40x6	50x8	50x8	50x10	50x10
Flexible with a multicore end		0,5-70	10-95	M8	M8	M10	M10	M10	M12	M12	M12	M14	2xM12	2xM12
Number of conductors per clamp		1	1	1	1	1	1	1	1	1	1	1	1	1
Frequency of operations, amount per hour														
without load		3000	3000	1200	1200	1200	1200	1200	1200	1200	1200	1200	300	300
in the mode of AC-3		300	-	-	-	-	-	-	-	-	-	-	-	-
Mechanical life, min. of cycles														
Contactors with an AC coil	S x	5	5	10	10	5	5	5	5	5	5	5	5	5
Contactors with a DC coil	S x	-	-	-	-	-	-	-	-	-	-	-	-	-
Contactors with a double-wound DC coil	S x	5	5	10	10	5	5	5	5	5	5	5	5	5
Short-time current, A														
10 sec		680	880	1200	1400	1800	2200	2600	3600	4400	5600	6900	8000	9600
120 sec		196	254	346	404	520	751	900	1039	1270	1617	1992	2309	2771
Power loss at the pole, W	I_e , at AC-3 400 V	4,8	7,9	9	11	8	11	14,9	26,3	33,3	49	59,2	60	72

¹ Contactors are allowed to be applied at the ambient air temperature of + 90 °C only in the AC-1 application category, with the contactor operate voltage equal to (0,9 - 1,0) U_c , and the rated operating current in the AC-1 application category must correspond to the values given for the AC-3 application category.

² Contactors are allowed to be applied at the ambient air temperature of + 70 °C only in the AC-1 application category, with the contactor operate voltage equal to 1,0 U_c , and the rated operating current in the AC-1 application category must correspond to the values given for the AC-3 application category.

Auxiliary circuit

Type of equipment		K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Rated insulation voltage U_i , AC, V		690	690	690	690	-	-	-	-	-	-
Rated thermal current for 690 V, A											
Ambient air temperature	+40 °C	10 (16) ¹	10 (16) ¹	10 (16) ¹	10 (16) ¹	-	-	-	-	-	-
	+60 °C	6 (12) ¹	6 (12) ¹	6 (12) ¹	6 (12) ¹	-	-	-	-	-	-
Application category AC-15, A											
Rated operating current I_e	220 V	3 (12) ¹	3 (12) ¹	3 (12) ¹	3 (12) ¹	-	-	-	-	-	-
	400 V	2 (4) ¹	2 (4) ¹	2 (4) ¹	2 (4) ¹	-	-	-	-	-	-
	690 V	0,6 (4) ¹	0,6 (4) ¹	0,6 (4) ¹	0,6 (4) ¹	-	-	-	-	-	-
Short circuit protection, A											
Short-circuit current 1 kA, welding of contacts is unallowable	gL(gG)	25	25	25	25	-	-	-	-	-	-
Power consumed by the coil											
AC, VA	starting	33-45	33-45	33-45	33-45	90-115	90-115	90-115	140-165	140-165	140-165
	holding	7-10	7-10	7-10	7-10	9-13	9-13	9-13	13-18	13-18	13-18
DC, W	starting	3	3	3	3	4	4	4	-	-	-
	holding	3	3	3	3	4	4	4	-	-	-
Double winding DC, W	starting	75	75	75	75	140	140	140	200	200	200
	holding	2	2	2	2	2	2	2	6	6	6
Conductor cross-section for auxiliary contacts, mm²											
Single-core		0,75-6	0,75-6	0,75-6	0,75-6	-	-	-	-	-	-
Multiple-core		1-4	1-4	1-4	1-4	-	-	-	-	-	-
Flexible with a multicore end		0,75-4	0,75-4	0,75-4	0,75-4	-	-	-	-	-	-
Conductor cross-section for the coil terminal, mm²											
Single-core		0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5
Multiple-core		0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5
Flexible with a multicore end		0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5
Number of conductors per clamp		2	2	2	2	2	2	2	2	2	2

¹ for contactors KG3

Type of equipment		K3-90	K3-115	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
Rated insulation voltage U_i , AC, V		-	-	-	-	-	-	-	690	690	690	690	690	690
Rated thermal current for 690 V, A														
Ambient air temperature	+40 °C	-	-	-	-	-	-	-	10	10	10	10	10	10
	+60 °C	-	-	-	-	-	-	-	-	-	-	-	-	-
Application category AC-15, A														
Rated operating current I_e	220 V	-	-	-	-	-	-	-	3	3	3	3	3	3
	400 V	-	-	-	-	-	-	-	2	2	2	2	2	2
	690 V	-	-	-	-	-	-	-	1	1	1	1	1	1
Short circuit protection, A														
Short-circuit current 1 kA, welding of contacts is unallowable	gL(gG)	-	-	-	-	-	-	-	10	10	10	10	10	10
Power consumed by the coil														
AC, VA	starting	165-220	165-220	350	350	360	360	360	800-950	800-950	1350-1600	1350-1600	2400	2400
	holding	2,5-5	2,5-5	5	5	5	5	5	9-11	9-11	21-25	21-25	70	70
DC, W	starting	-	-	-	-	-	-	-	-	-	-	-	-	-
	holding	-	-	-	-	-	-	-	-	-	-	-	-	-
Double winding DC, W	starting	250	250	350	350	360	360	360	700-850	700-850	1300-1550	1300-1550	2100	2100
	holding	5	5	5	5	5	5	5	8-10	8-10	18-22	18-22	60	60
Conductor cross-section for auxiliary contacts, mm²														
Single-core		-	-	-	-	-	-	-	-	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5
Multiple-core		-	-	-	-	-	-	-	-	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5
Flexible with a multicore end		-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor cross-section for the coil terminal, mm²														
Single-core		0,75-2,5	0,75-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5
Multiple-core		0,5-2,5	0,5-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5	1-2,5
Flexible with a multicore end		0,5-1,5	0,5-1,5	-	-	-	-	-	-	-	-	-	-	-
Number of conductors per clamp		2	2	2	2	2	2	2	2	2	2	2	2	2

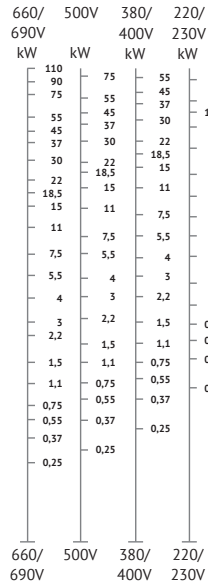
Relay type contactors - main circuit

Type of equipment		K3-07ND	K3-07ND=	KG3-07A	KG3-07D	
Rated insulation voltage U_i , AC, V		690	690	690	690	
Rated thermal current for 690 V						
Ambient air temperature	+40 °C	10	10	20	10	
	+60 °C	6	6	16	6	
Frequency of operations, amount per hour		10000	10000	10000	10000	
Mechanical life, mln. of cycles		S x		10	50	
Application category AC-15, A						
Rated operating current I_e	220 V	4	4	12	4	
	400 V	2	2	4	2	
	690 V	0,6	0,6	1	0,6	
Short-circuit protection, A						
Short-circuit current 1 kA, welding of contacts is unallowable		gL(gG)	20	20	25	20
Power consumed by the coil						
AC, VA	starting	30-45	-	-	-	
	holding	7-10	-	-	-	
DC, W	starting	-	75	3	3	
	holding	-	2	3	3	
Ambient air temperature, °C						
Application	open	from -40 to +60 (+90) ¹				
	closed	from -40 to +40				
Storage		from -40 to +90				
Conductor cross-section for auxiliary contacts, mm²						
Single-core		0,75-6				
Multiple-core		1-4				
Flexible with a multicore end		0,75-4				
Conductor cross-section for the coil terminals, mm²						
Single-core		0,75-2,5				
Multiple-core		0,75-2,5				
Flexible with a multicore end		0,5-1,5				
Number of conductors per clamp		2				

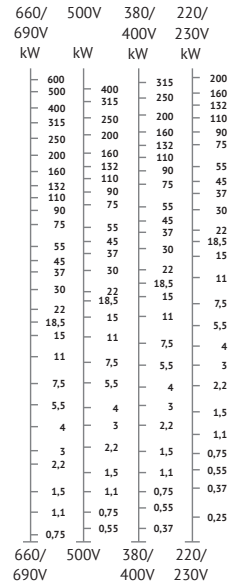
¹ Contactors are allowed to be applied at the ambient air temperature of + 90 °C, with the contactor operate voltage equal to (0,9 - 1,0) U_c , and the rated thermal current I_{th} must correspond to the values given for the AC-15 application category.

Selection of the contactor according to the commutation wear resistance

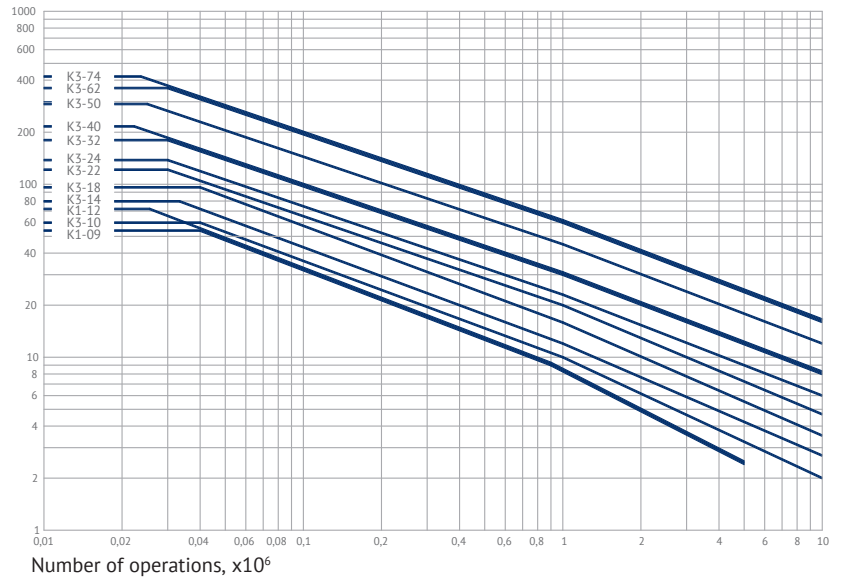
Motor power
Pn, AC-4



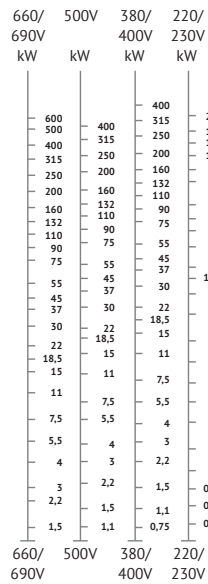
Motor power
Pn, AC-3



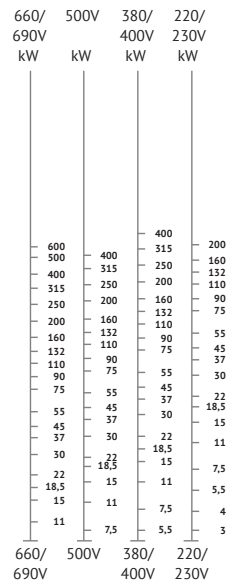
Breaking current, A
A



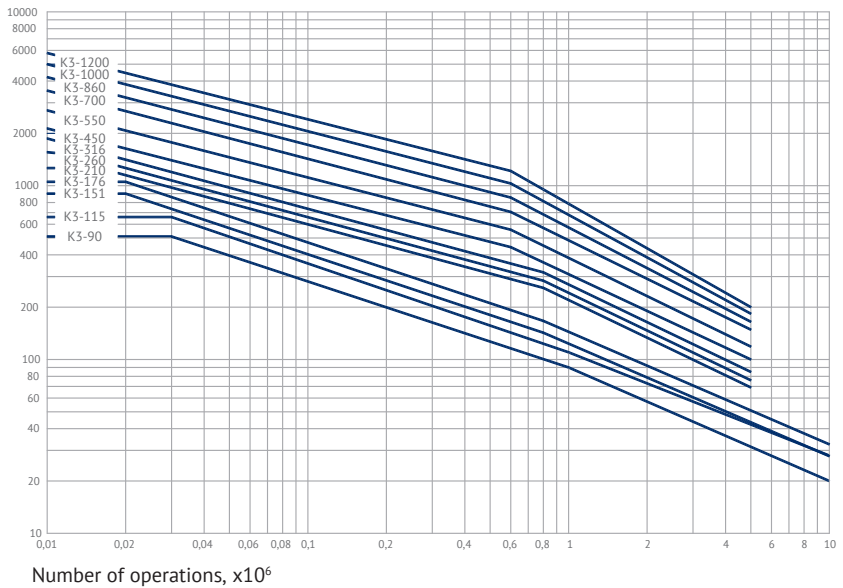
Motor power
Pn, AC-4



Motor power
Pn, AC-3



Breaking current, A
A

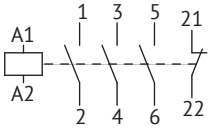


To select a contactor according to the rated operating voltage of the motor, its power and application category, it is necessary:
 For the AC-3 application category, use the scale "Pn, AC-3", while the breaking current is equal to the rated operating current of the motor.
 For the AC-4 application category, use the scale "Pn, AC-4", while the breaking current is equal to 6 x (rated operating current of the motor).
 To select a contactor for the AC-1 application category, use the axis of the "Breaking current, A" graph as the scale.

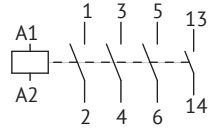
Electrical layouts

For three-pole contactors

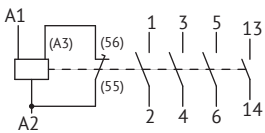
D01



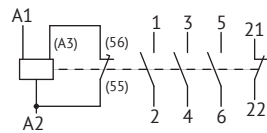
D10



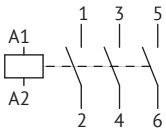
D10=



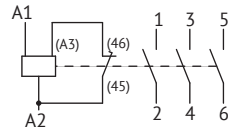
D01=



A00

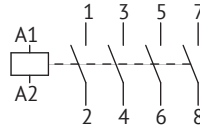


A00=

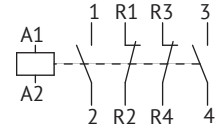


For four-pole contactors

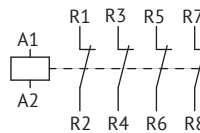
A00-40



A00-22

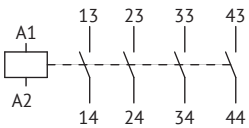


A00-04

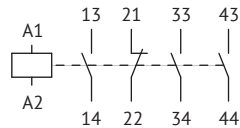


For relay type four-pole contactors

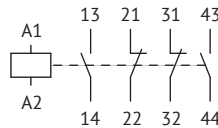
07A40, 07D40



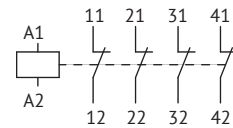
07A31, 07D31



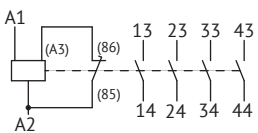
07A22, 07D22



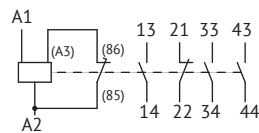
07A04, 07D04



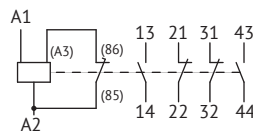
ND40=



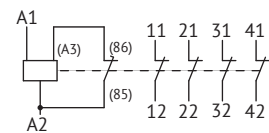
ND31=



ND22=



ND04=

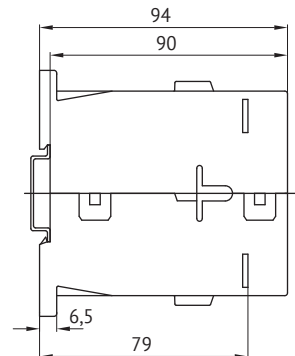
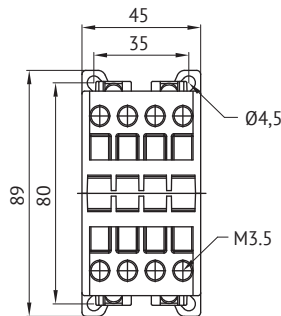
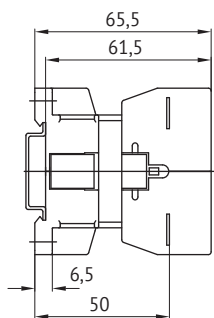
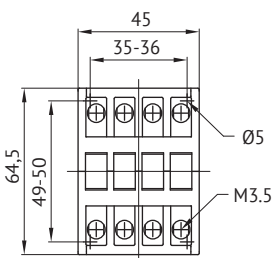


Overall dimensions (mm)

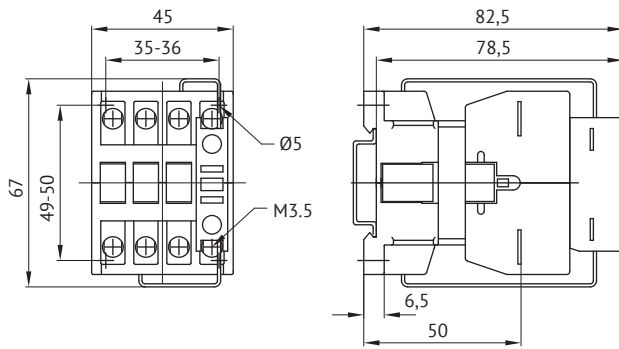
Three-pole contactors

K3-10N... K3-18N...
K3-14N... K3-22N...

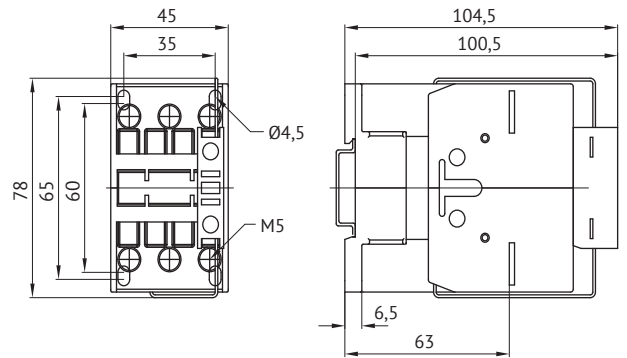
KG3-10... KG3-18...
KG3-14... KG3-22...



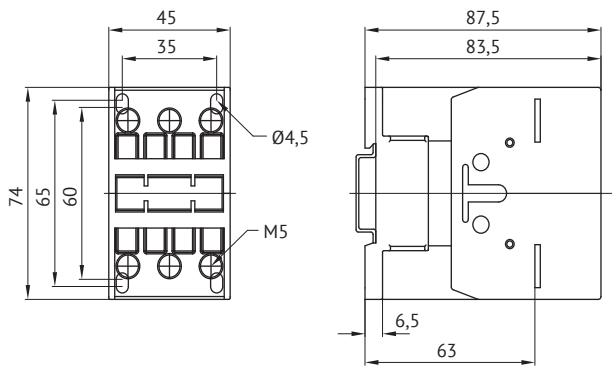
K3-10N...= K3-18N...=
K3-14N...= K3-22N...=



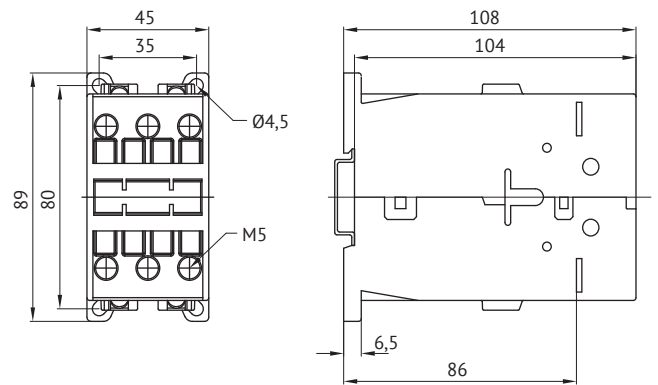
K3-24...= K3-40...=
K3-32...=



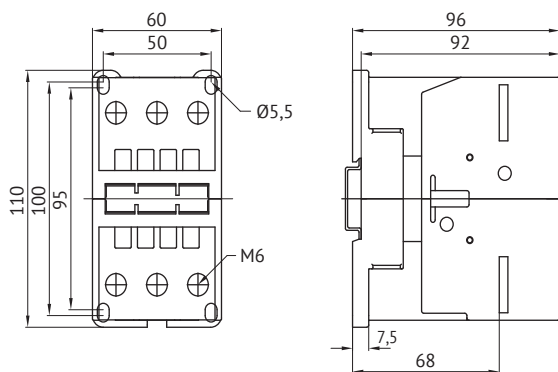
K3-24... K3-40...
K3-32...



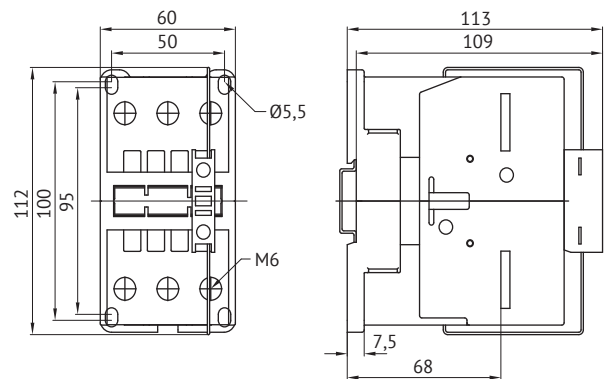
KG3-24... KG3-40...
KG3-32...



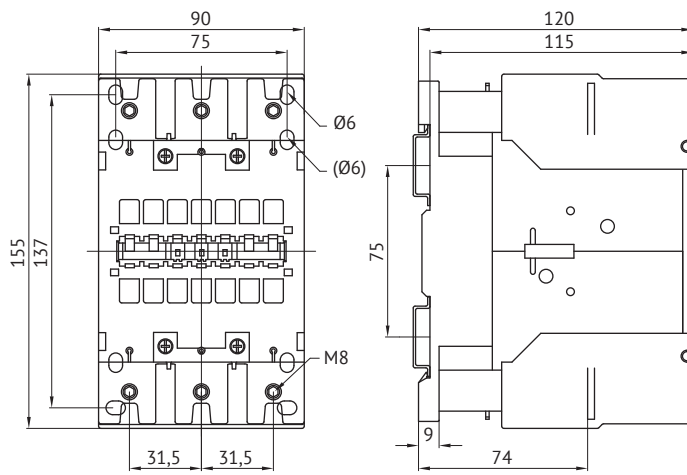
K3-50... K3-74...
K3-62...



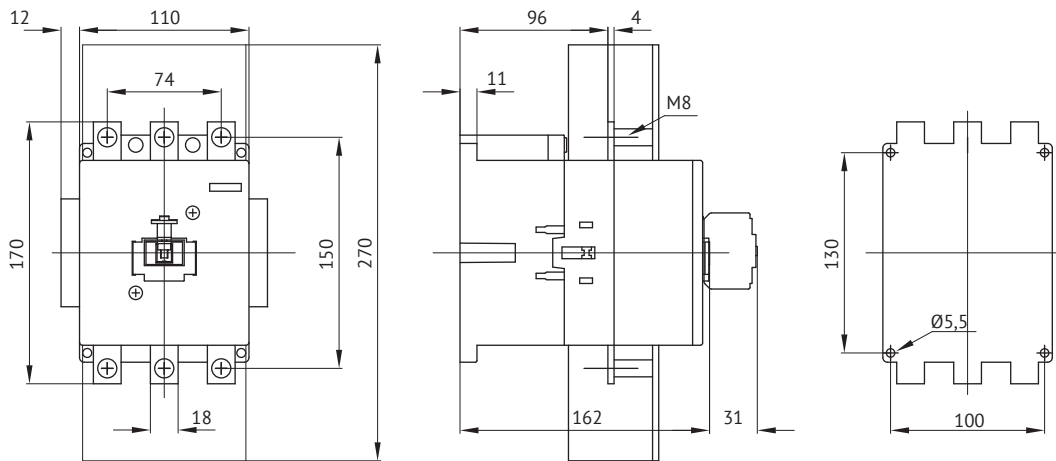
K3-50...= K3-74...=
K3-62...=



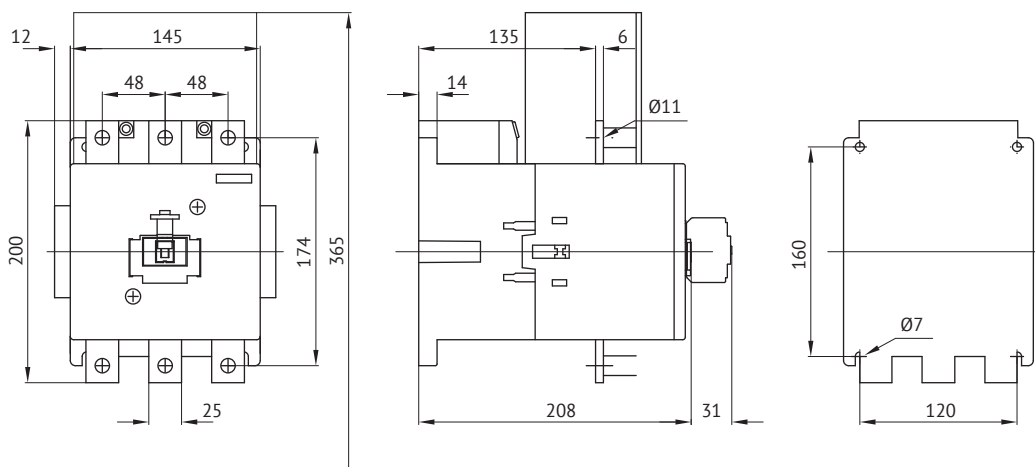
K3-90...
K3-115...



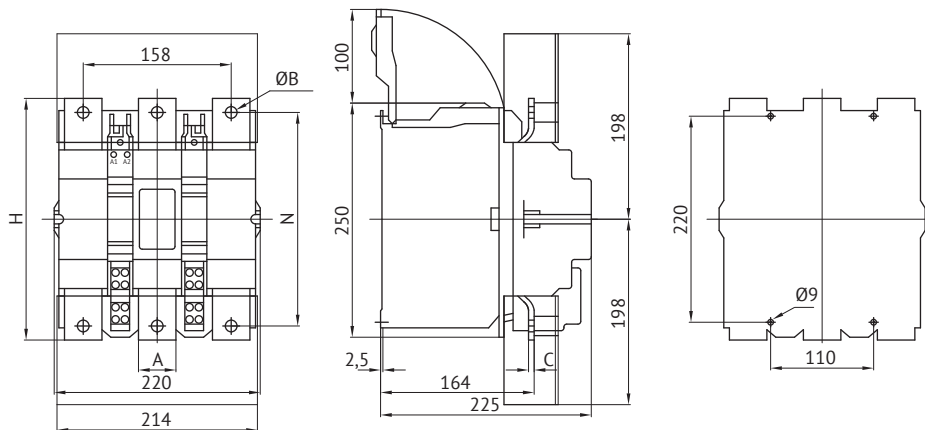
K3-151...
K3-176...



K3-210... K3-316...
K3-260...

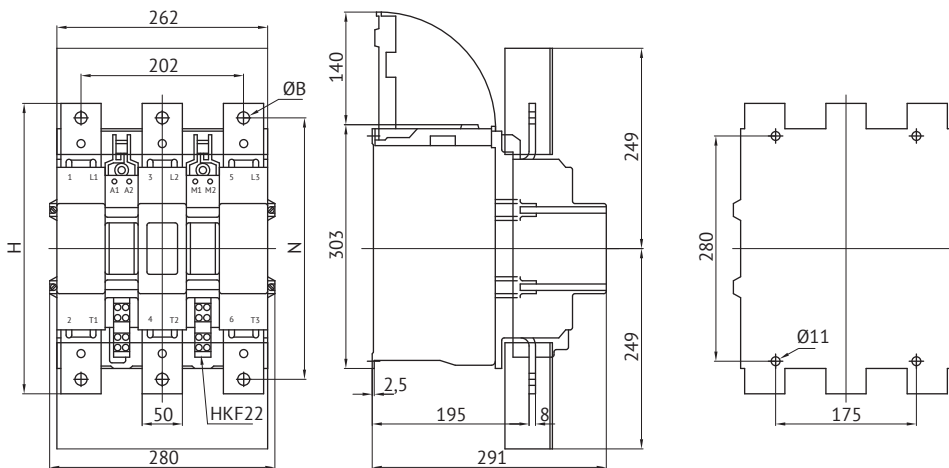


K3-450...
K3-550...



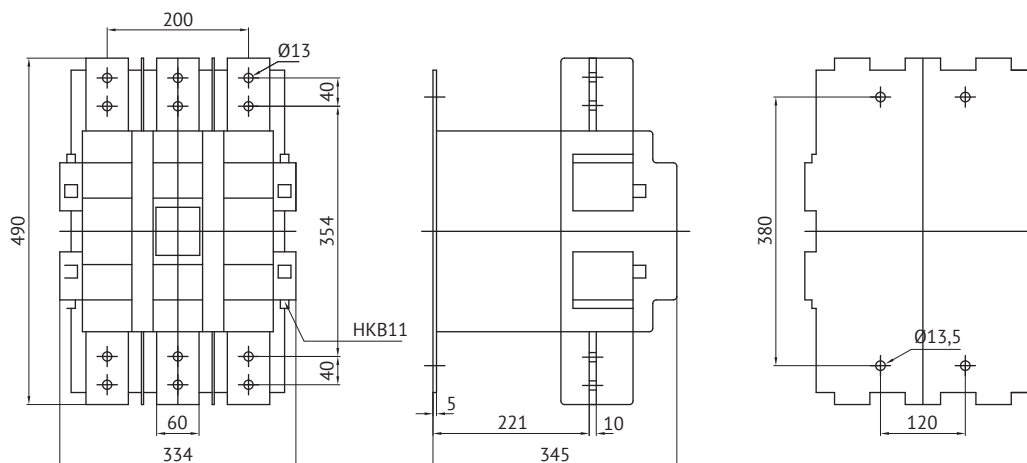
Type	A	B	C	H	N
K3-450	40	10,5	4	233	206
K3-550	40	12,5	6	258	228

K3-700...
K3-860...



Type	B	H	N
K3-700	13	310	277
K3-860	15	361	325

K3-1000...
K3-1200...

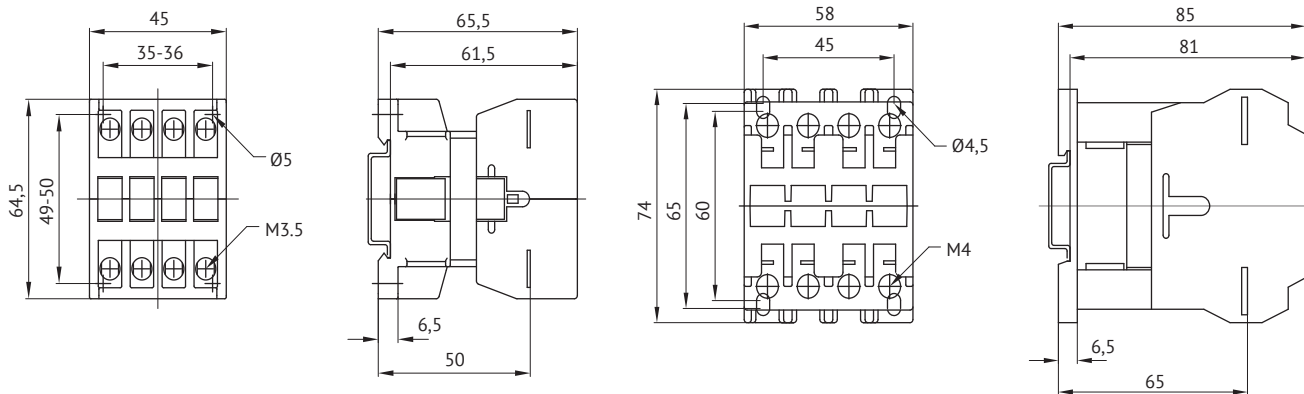


Four-pole contactors

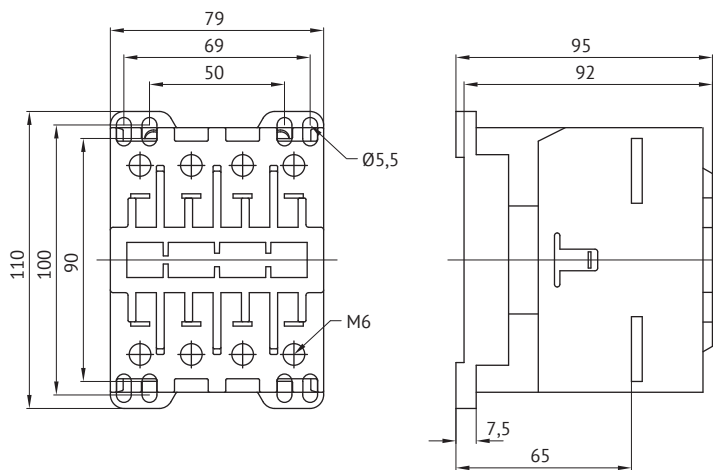
K3-10NA00-40
K3-14NA00-40

K3-18NA00-40
K3-22NA00-40

K2-23A00-40
K2-30A00-40

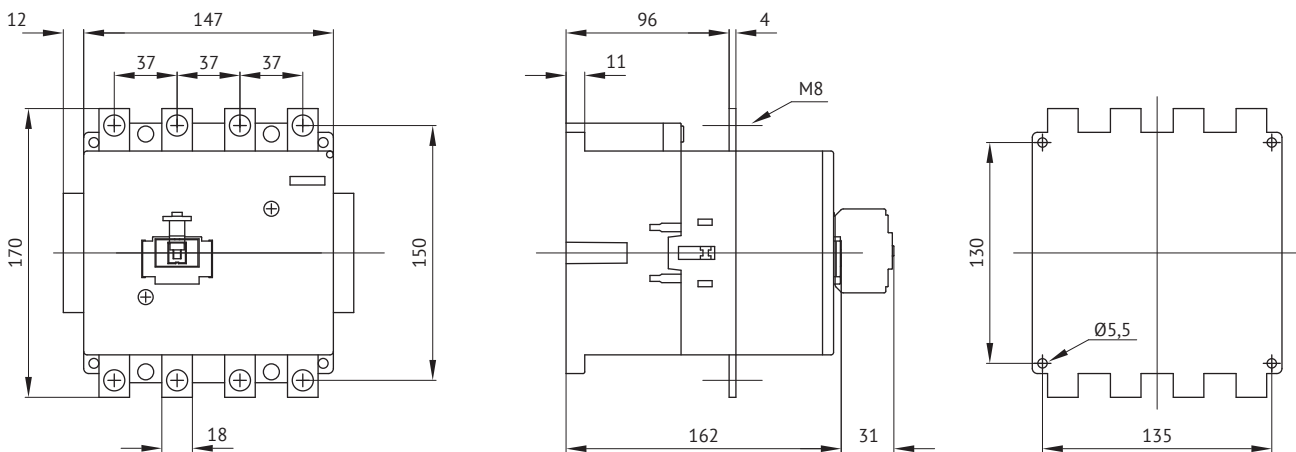


K2-45A00-40
K2-60A00-40

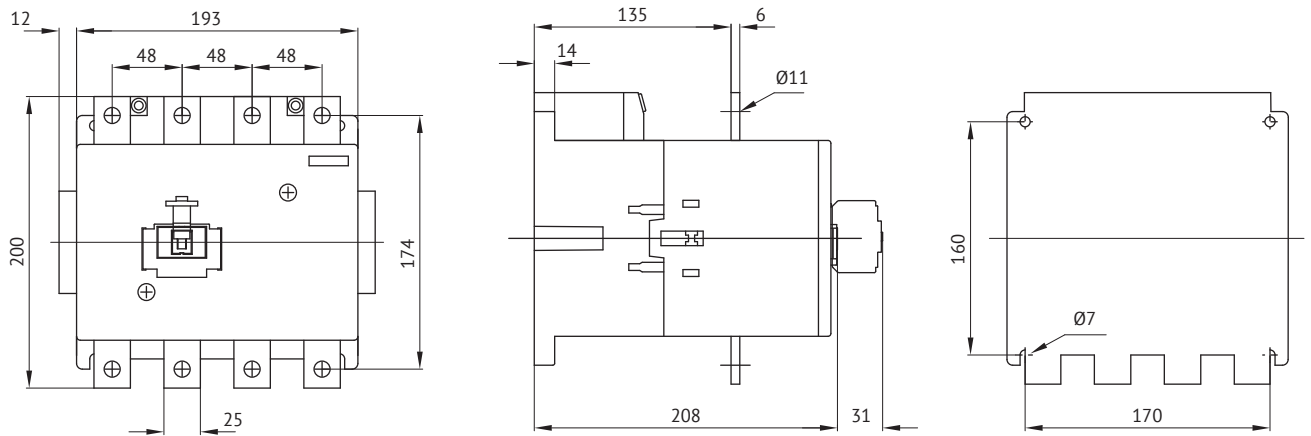


K3-116A00-40
K3-151A00-40

K3-176A00-40

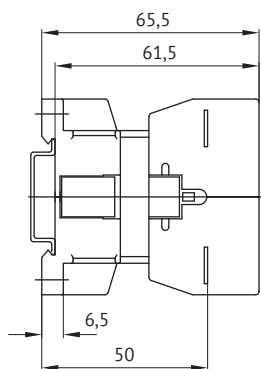
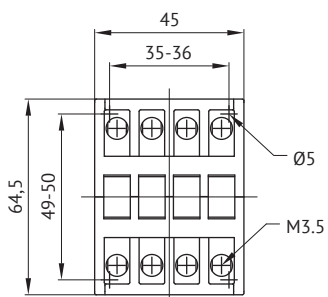


K3-210A00-40 K3-316A00-40
K3-260A00-40

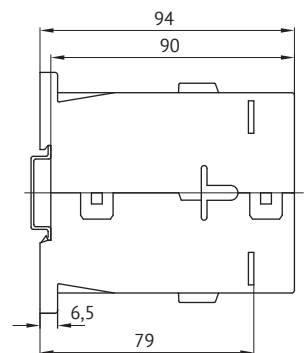
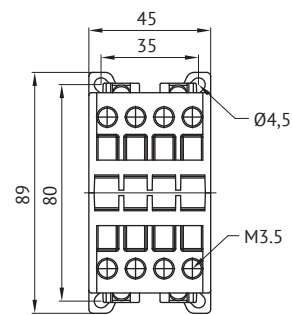


Relay type contactors

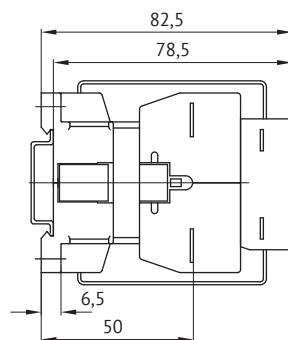
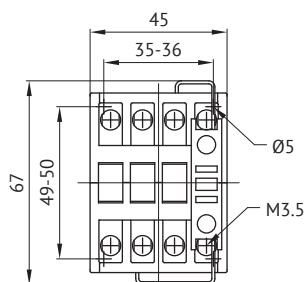
K3-07ND...



KG3-07...



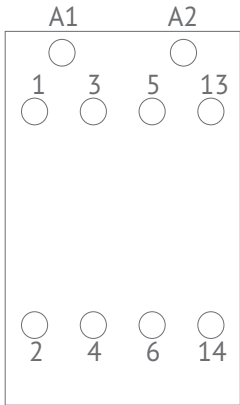
K3-07ND...=



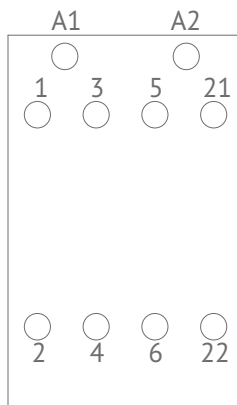
Terminal marking

Contactors

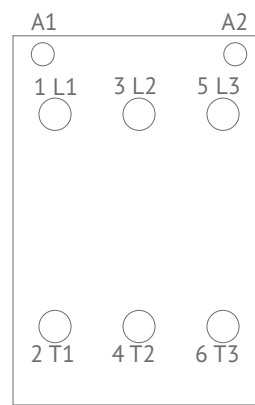
K3-10ND10 K3-18ND10
K3-14ND10 K3-22ND10



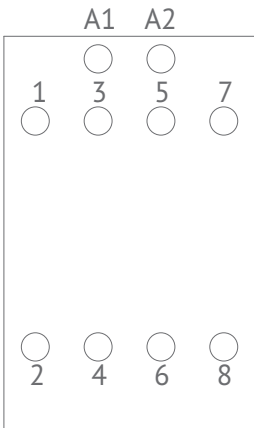
K3-10ND01 K3-18ND01
K3-14ND01 K3-22ND01



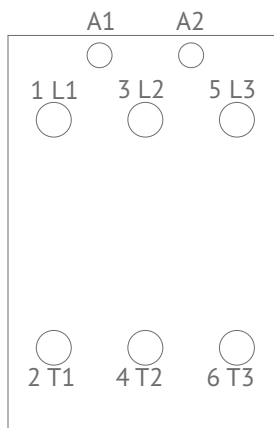
K3-24A00 K3-50A00
K3-32A00 K3-62A00
K3-40A00 K3-74A00



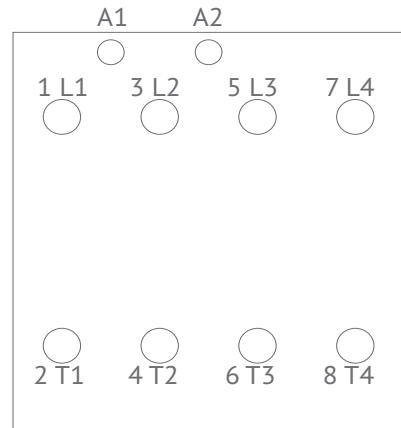
K3-10NA00-40 K2-23A00-40
K3-14NA00-40 K2-30A00-40
K3-18NA00-40 K2-37A00-40
K3-22NA00-40 K2-45A00-40
K2-60A00-40



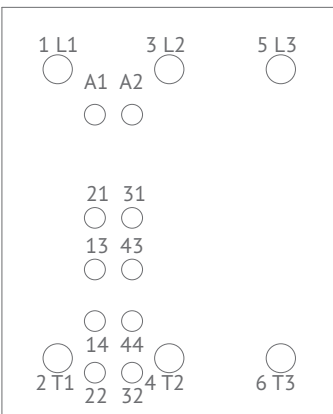
K3-90A00 K3-210A00
K3-115A00 K3-260A00
K3-151A00 K3-316A00
K3-176A00



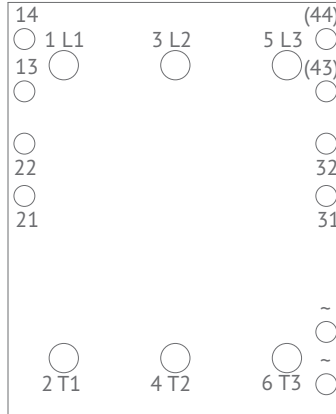
K3-151A00-40 K3-260A00-40
K3-176A00-40 K3-316A00-40
K3-210A00-40



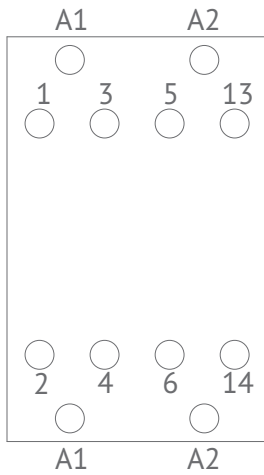
K3-450A22 K3-700A22
K3-550A22 K3-860A22



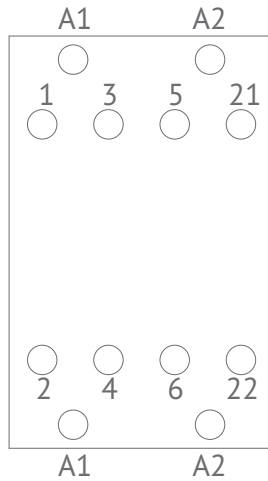
K3-1000A12
K3-1200A12



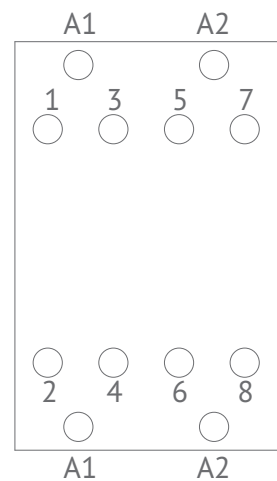
KG3-10A10 KG3-18A10
KG3-14A10 KG3-22A10



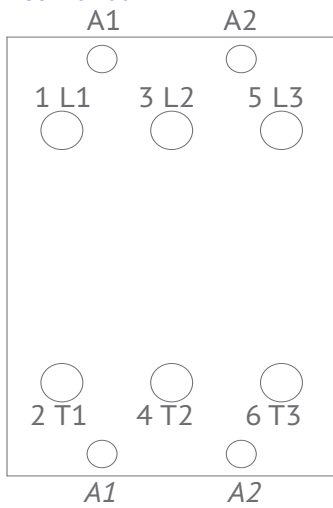
KG3-10A01 KG3-18A01
KG3-14A01 KG3-22A01



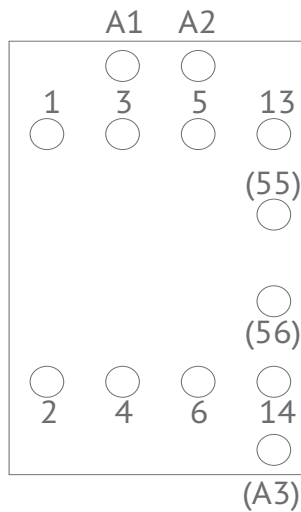
KG3-10A00-40 KG3-18A00-40
KG3-14A00-40 KG3-22A00-40



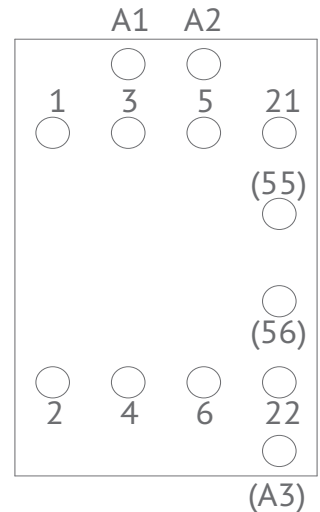
KG3-24A00
KG3-32A00
KG3-40A00



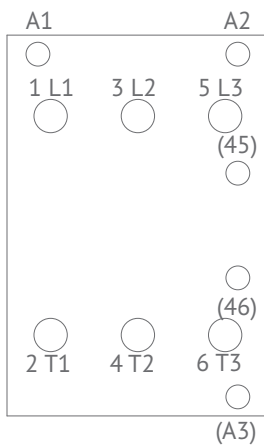
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K3-14ND10= K3-22ND10=



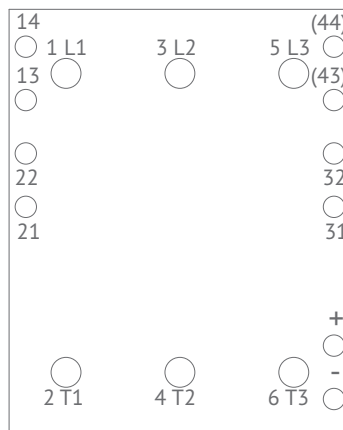
K3-10ND01= K3-18ND01=
K3-14ND01= K3-22ND01=



K3-24A00= K3-50A00=
K3-32A00= K3-62A00=
K3-40A00= K3-74A00=

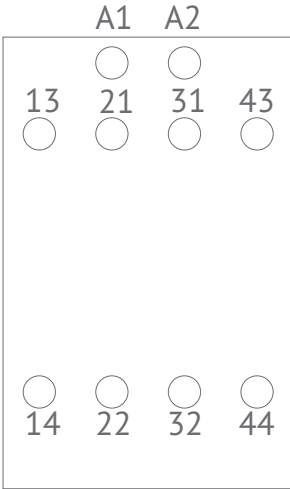


K3-1000A12=
K3-1200A12=

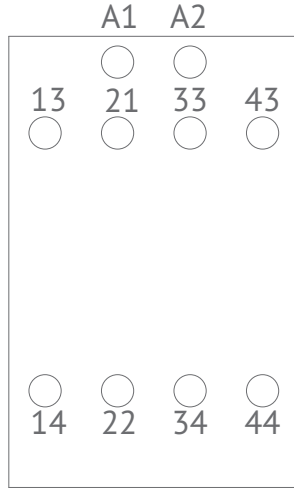


Relay type contactors

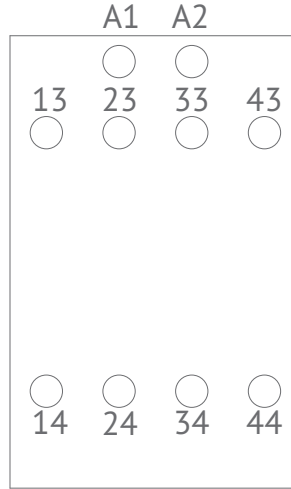
K3-07ND22



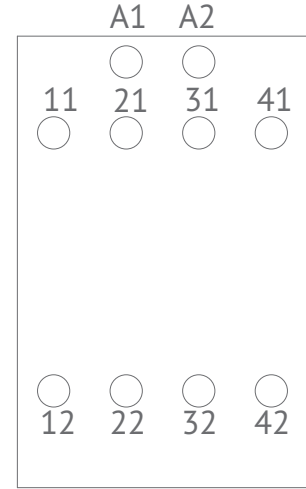
K3-07ND31



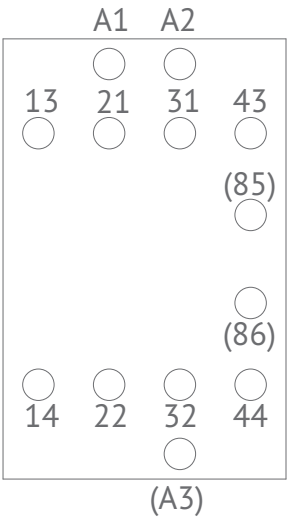
K3-07ND40



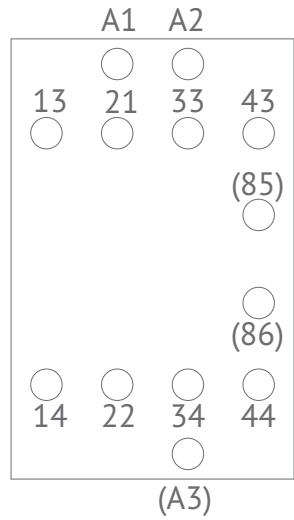
K3-07ND04



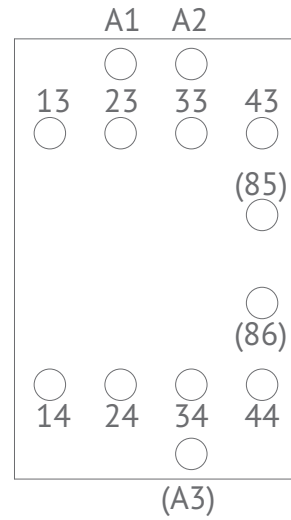
K3-07ND22=



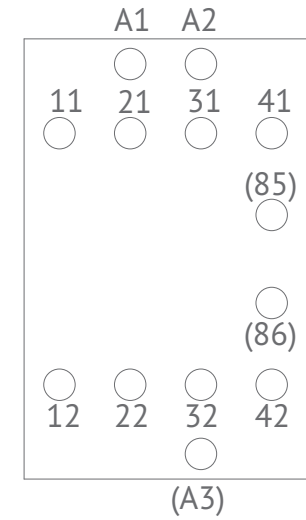
K3-07ND31=



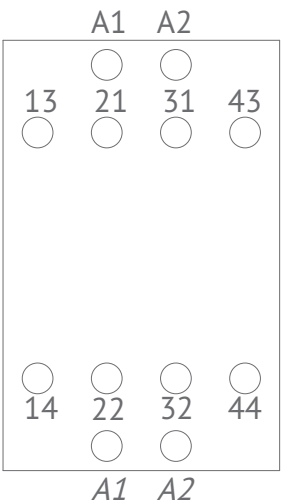
K3-07ND40=



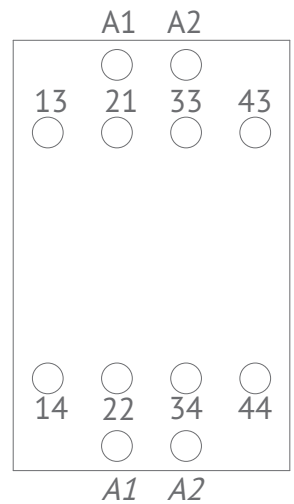
K3-07ND04=



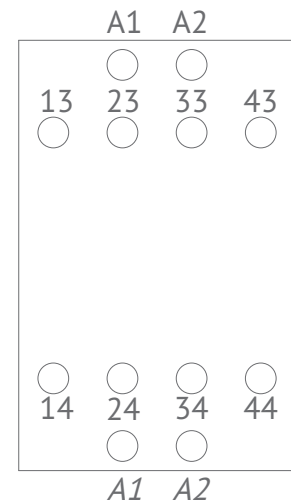
KG3-07A22
KG3-07D22



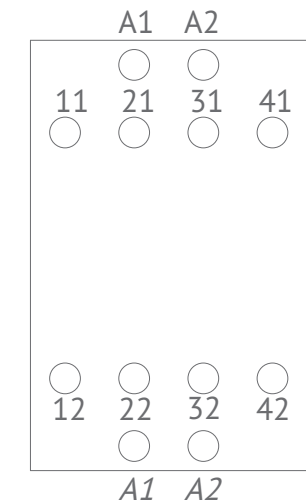
KG3-07A31
KG3-07D31



KG3-07A40
KG3-07D40



KG3-07A04
KG3-07D04



OptiStart K Capacitor switching contactors



Optistart K contactors are designed for switching capacitor banks and are used in reactive power compensation (RPC) units to switch on and off all types of capacitors. Switching can be performed with or without protective chokes. The design provides for leading contacts and damping resistors.

Leading contacts are designed to connect (for a short time 5-10 ms, during the contactor on period) quenching resistors that limit the charge current of the capacitors.

Special design allows to exclude the leading contacts from the common circuit during the disconnection of the contactor, capacitor banks are disconnected by the main contacts.

Designation

OptiStart K3-18 NK 10 - 230AC



①	Product range	OptiStart – electric motor control and protection equipment							
②	Configuration	K3							
③	Rated operating current AC-6b, A	0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144
④	Terminal type	K (NK) - screw type clamps with leading contacts							
⑤	Auxiliary contacts	1 digit indicates NO				2 digit indicates NC			
⑥	Rated control voltage, (V) and type of control circuit current	AC - alternating							

The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.

Selection guide

Type of equipment		K3-...K								
Appearance										
Coil voltage, V		220								
Rated operating current In at AC-6b, A		0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144	
Switching load at Ue 380 V, kVAr		0-12,5	10-20	10-25	20-33,3	20-50	20-75	33-80	33-100	
Switching load at Ue 690 V, kVAr		0-20	17-33	17-41	36-55	36-82	36-120	57-120	57-148	
Fuse current, A gL(gG)		63	80	100	160	200	250			
Auxiliary contacts	NO	1	-	-	-	-	-	-	-	
	NC	-	1	-	-	-	-	-	-	
Weight, kg		0,34	0,62	1,0	2,3					
For more details, see pages		395-396								
For accessories, see pages		397-404								

Batch effectiveness



Theoretical review

Actuation

When the capacitor banks are switched on, the peak charging currents can weld the main contacts of the contactor, as well as damage the capacitors. To exclude this phenomenon, in the construction of contactors for switching capacitor banks are included quenching resistors and leading contacts, which close quenching resistors before closing the main contacts of the contactor, which leads to a decrease in peak charging currents. The quenching resistors are switched on for at least 5 ms and trip after the main contacts of the contactor are closed.

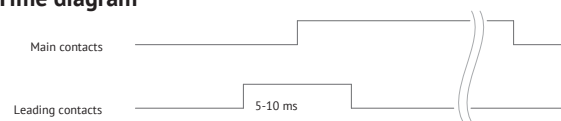
Application

During application, the quenching resistor is not hooked up to the common network and therefore does not heat up.

Disconnection





Important: Leading contacts are not hooked up to the common network at the time of tripping, which means that the peak tripping voltage of the chokes can not cause any damage. Accordingly, the capacitor switching contactors of the OptiStart K series can be applied in installations with any types of capacitors.

Time diagram



During 5-10 ms, when the contactor is switched on, the leading contacts connect the line-dropping resistors, which limit the charging current of the capacitors. As soon as the process of closing the main contacts ends, these resistors are disconnected.

References (series)

Appearance	Rated operating current I_e , at AC-6b, A	Switching load at 380 V AC, kVAr	Auxiliary contacts		Title	Coil voltage, V	Reference	Weight, kg
			NO	NC				
	0-18	0-12,5	-	1	OptiStart K3-18NK01-	230AC	117085	0,34
	0-18	0-12,5	1	-	OptiStart K3-18NK10-	230AC	117084	0,34
	14-28	10-20	-	-	OptiStart K3-24K00-	230AC	117086	0,62
	14-36	10-25	-	-	OptiStart K3-32K00-	230AC	117087	0,62
	20-33,3	20-33,3	-	-	OptiStart K3-50K00-	230AC	117088	1,0
	20-50	20-50	-	-	OptiStart K3-62K00-	230AC	117089	1,0
	20-75	20-75	-	-	OptiStart K3-74K00-	230AC	117090	1,0
	50-115	33-80	-	-	OptiStart K3-90K00-	230AC	117091	2,3
	50-144	33-100	-	-	OptiStart K3-115K00-	230AC	117092	2,3

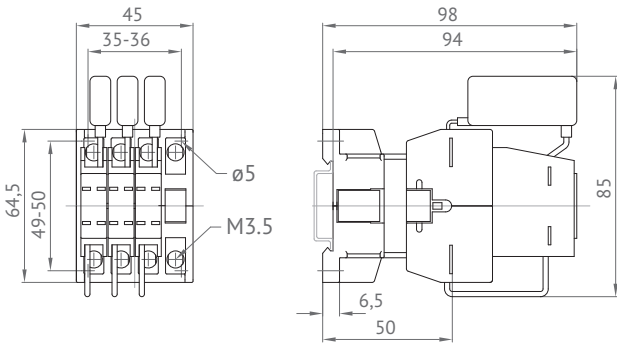
Technical specifications

Main contacts

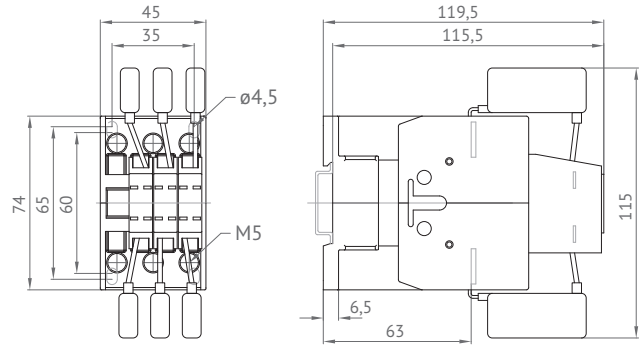
Type of equipment		K3-18NK	K3-24K	K3-32K	K3-50K	K3-62K	K3-74K	K3-90K	K3-115K
Application category AC-6b - switching of capacitor banks (ambient air temperature is not more than + 50°C)									
Rated operating current I_e , A	690 V	0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144
Switching load, at U_e , kVAr	220 V	0-7	5-11	5-14	12-20	12-28	12-33	20-45	20-55
	380 V	0-12,5	10-20	10-25	20-33,3	20-50	20-75	33-80	33-100
	690 V	0-20	17-33	17-41	36-55	36-82	36-120	57-120	57-148
Application category AC-6b - switching of capacitor banks (ambient air temperature is not more than + 60°C)									
Rated operating current I_e , A	690 V	0-18	14-28	14-36	30-48	30-72	30-87	50-108	50-130
Switching load, at U_e , kVAr	220 V	0-7	5-11	5-14	12-20	12-28	12-30	20-40	20-50
	380 V	0-12,5	10-20	10-25	20-33,3	20-50	20-60	33-75	33-90
	690 V	0-20	17-33	17-41	36-55	36-82	36-100	57-120	57-148
Application category AC-1									
Rated thermal current I_{th} , A	at +50°C	32	45	60	100	110	120	155	190
	at +60°C	32	40	55	90	100	110	145	170
Turn-on frequency, amount per hour		120	120	120	120	120	80	80	80
Overload factor (in compliance with the requirements of EN 61921: 30% minimum)									
At +50°C, %		78	60	67	108	53	11	35	32
At +60°C, %		78	43	53	88	39	26	34	31
Fuse gL(gG), A		35-63	50-80	63-100	80-160	125-160	160-20	160-200	160-250

Overall dimensions (mm)

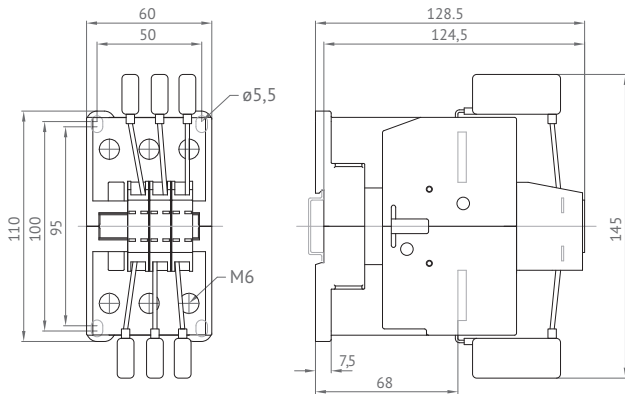
K3-18NK...



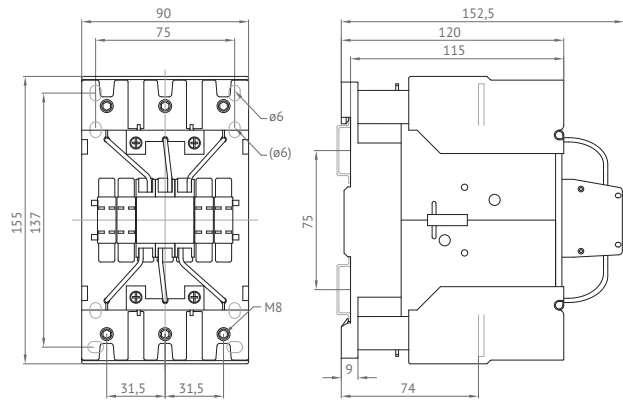
K3-24K...
K3-32K...



K3-50K... K3-74K...
K3-62K...

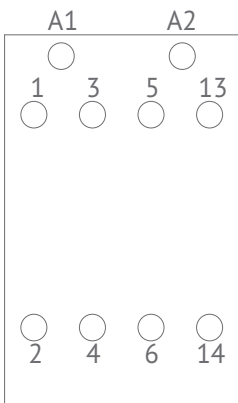


K3-90K...
K3-115K...

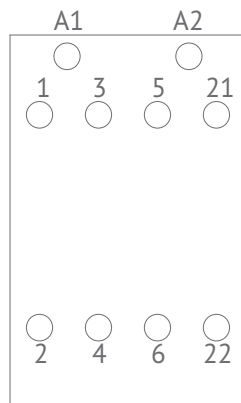


Terminal marking

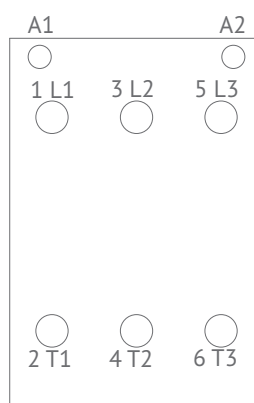
K3-18NK10









K3-18NK01



K3-24K00 K3-62K00
K3-32K00 K3-74K00
K3-50K00




Accessories

Auxiliary contact blocks													
Appearance	Title	Contacts				Rated operating current, A						Reference	Weight, kg
						AC-15			DC-13				
		NO	NC	EM*	LB*	220 V	400 V	690 V	60 V	110 V	220 V		
For contactors K(G)3-07...K3-115													
	OptiStart HN10	1	-	-	-	3	2	0,6	2	0,4	0,1	117748	0,02
	OptiStart HN01	-	1	-	-	3	2	0,6	2	0,4	0,1	117749	
	OptiStart HN10U	-	-	1	-	3	2	0,6	2	0,4	0,1	117750	
	OptiStart HN01U	-	-	-	1	3	2	0,6	2	0,4	0,1	117751	
	OptiStart HA10	1	-	-	-	6	3	1	8	1	0,1	117752	0,02
	OptiStart HA01	-	1	-	-	6	3	1	8	1	0,1	117753	
For contactors K(G)3-07...K3-115 (manual control)													
	OptiStart HTN10	1	-	-	-	3	2	0,6	2	0,4	0,1	117761	0,02
	OptiStart HTN01	-	1	-	-	3	2	0,6	2	0,4	0,1	117762	
For contactors K3-24...K3-115													
	OptiStart HB11	1	1	-	-	3	2	0,6	2	0,4	0,1	117754	0,02
	OptiStart HB02	0	2	-	-	3	2	0,6	2	0,4	0,1	117755	
For contactors K3-116...K3-1200													
	OptiStart HKT11	1	1	-	-	3	2	0,6	-	0,5	0,2	117756	0,04
	OptiStart HKT22	2	2	-	-	3	2	0,6	-	0,5	0,2	117757	0,05
	OptiStart HKA11	1	1	-	-	3	2	0,6	-	0,5	0,2	117758	0,05


* EM - leading contacts
LB - lagging contacts

Appearance	Title	Contacts				Rated operating current, A						Reference	Weight, kg
						AC-15			DC-13				
		NO	NC	EM*	LB*	220 V	400 V	690 V	60 V	110 V	220 V		


For contactors K3-450...K3-860

	OptiStart HKF22	2	2	-	-	3	2	1	-	0,5	0,2	117759	0,12
---	-----------------	---	---	---	---	---	---	---	---	-----	-----	--------	------



For contactors K3-1000...K3-1200

	OptiStart HKB11	1	1	-	-	3	2	0,6	-	0,5	0,2	117760	0,17
---	-----------------	---	---	---	---	---	---	-----	---	-----	-----	--------	------

For contactors K(G)3-07...K3-115

Appearance	Title	Specification	Thermal current I _{th} , A	Reference	Weight, kg
	OptiStart K2-DK	2 clamps, closed together	26	117831	0,02

Indication module

Appearance	For contactors	Definition	Type of equipment	Color	Title	Voltage, V	Reference	Weight, kg
	K(G)3-07...K3-115; K2-...	It is connected in series with the control coil. If the coil is damaged, the indicator goes dark. The voltage drop is 2 V.	Coil current indicator	Green	OptiStart K2-ING	24-660 AC/DC	117856	0,02
				Red	OptiStart K2-INR	24-660 AC/DC	117857	0,02
	K(G)3-07...K3-115; K2-...	It is connected in parallel with the control coil. The indicator lights up when voltage is applied to the coil and does not go out. If the coil is damaged, the indicator goes dark.	Coil voltage indicator	Transparent	OptiStart K2-UN	220-415 AC/DC	117858	0,02
				Red	OptiStart K2-UNR	24-120 AC/DC	117859	0,02

* EM - leading contacts
LB - lagging contacts

Coils for contactors

Control coils of class "F"

- The specified control coil has insulation that meets the requirements of class "F".
- A wide range of control voltages is available for both AC and DC.

Appearance	For contactors	Title	Coil voltage, V	Reference	Weight, kg		
AC coils							
	K2-23...K2-37	OptiStart K23/4.110	110	117684	0,085		
		OptiStart K23/4.230	230	117686			
		OptiStart K23/4.24	24	117682			
		OptiStart K23/4.400	400	117687			
		OptiStart K23/4.42	42	117683			
	K3-24...K3-40	OptiStart K23/41.180	180	117685	0,085		
		OptiStart K24/4.110	110	117678			
		OptiStart K24/4.230	230	117680			
		OptiStart K24/4.24	24	117676			
		OptiStart K24/4.400	400	117681			
	K3-50...K3-74	OptiStart K24/4.42	42	117677	0,11		
		OptiStart K24/41.180	180	117679			
		OptiStart K45/4.110	110	117690			
		OptiStart K45/4.230	230	117692			
		OptiStart K45/4.24	24	117688			
K3-1000...K3-1200	OptiStart K45/4.400	400	117693	3,12			
	OptiStart K45/4.42	42	117689				
	OptiStart K45/41.180	180	117691				
	DC coils						
		K3-24...K3-40	OptiStart K24/47.110		110	117636	0,09
			OptiStart K24/47.220		220	117661	
OptiStart K24/47.24			24	117645			
K3-50...K3-74		OptiStart K45/47.110	110	117624	0,115		
		OptiStart K45/47.220	220	117635			
		OptiStart K45/47.24	24	117630			
K3-1000...K3-1200		OptiStart K3-1200/43.110	110	117618	3,12		
		OptiStart K3-1200/43.220	220	117620			
AC/DC coils							
	K3-90...K3-115	OptiStart K3-115/4.110	110	117621	0,3		
		OptiStart K3-115/4.230	230	117617			
		OptiStart K3-115/4.24	24	117616			
		OptiStart K3-115/4.400	400	117619			
	K3-151...K3-176	OptiStart K3-176/4.110	110	117626	0,68		
		OptiStart K3-176/4.230	230	117622			
		OptiStart K3-176/4.24	24	117643			
		OptiStart K3-176/4.400	400	117627			
	K3-210...K3-316	OptiStart K3-316/4.110	110	117625	1,63		
		OptiStart K3-316/4.230	230	117648			
		OptiStart K3-316/4.24	24	117623			
	K3-450...K3-550	OptiStart K3-316/4.400	400	117650	2,44		
		OptiStart K3-550/4.110	110	117651			
		OptiStart K3-550/4.230	230	117647			
	K3-700...K3-860	OptiStart K3-550/4.24	24	117646	2,44		
OptiStart K3-550/4.400		400	117649				
OptiStart K3-860/4.110		110	117732				
OptiStart K3-860/4.230		230	117733				
K3-700...K3-860	OptiStart K3-860/4.24	24	117731	2,44			
	OptiStart K3-860/4.400	400	117734				

Wiring diagrams of the coil circuit

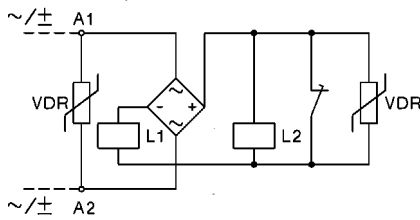
Alternating current (AC)

K3-07...K110..



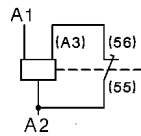
AC/DC coils with double winding

K3-90A00, K3-115A00
K3-151A00, K3-176A00
K3-210A00, K3-316A00

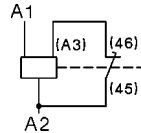


Direct current (DC) with double winding

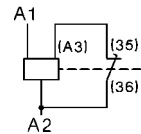
K3-07..=...K3-22..=



K3-24..=...K3-74..=

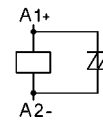


K85..= K110..=



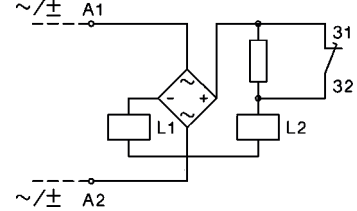
Direct current (DC)

KG3..



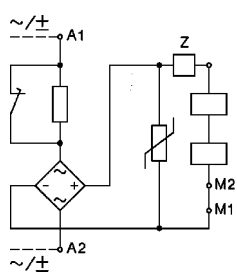
AC / DC contactors with a series resistor

K3-200A21
K3-315A21



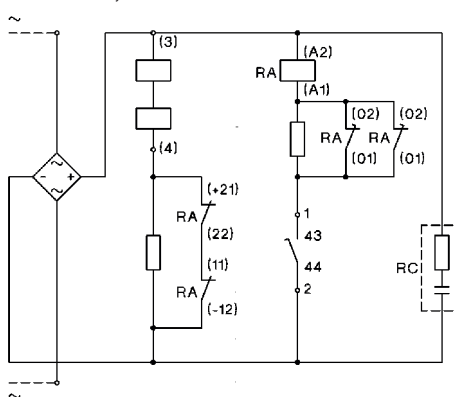
AC / DC contactors with a series resistor

K3-450...K3-860



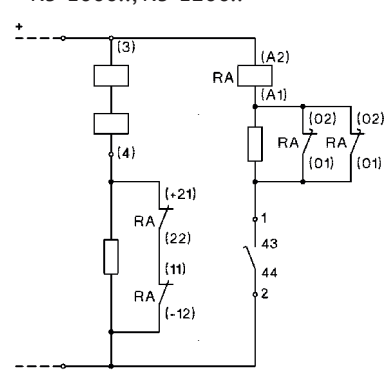
Alternating current (AC) with a DC coil

K3-1000.., K3-1200..



Direct current (DC) with a DC coil

K3-1000.., K3-1200..



Adjustable release time for K3-450 .. - K3-860 ..:
150-200 ms - connection according to the diagram
above (standard).

Contactor K3-1000.., K3-1200..: for the control voltage below
125 V, the normally-closed contacts 21-22 and 11-12
are connected in parallel, for higher voltages the
contacts are connected in series.

- 1 Coils for other control voltages are provided on request
- 2 If the control voltage changes, replace the coil and the power supply unit

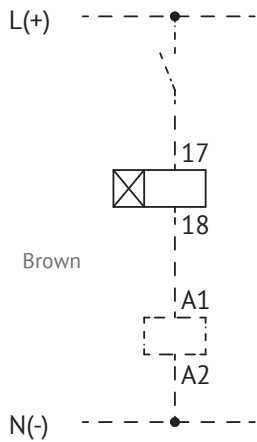
Mechanical locking						
Appearance	Contactor interlocked with a contactor		Mounting type	Title	Reference	Weight, kg
	Type of equipment	Type of equipment				
	K3-07...K3-40	K3-07...K3-40	Horizontal	OptiStart LG10889	117861	0,006
	KG3-07...KG3-22	KG3-07...KG3-22	Horizontal			
	KG3-24...KG3-40	KG3-24...KG3-40	Horizontal			
	K3-24...K3-74	K3-50...K3-74	Horizontal	OptiStart LG10890	117862	0,01
	K3-90...K3-115	K3-90...K3-115	Horizontal	OptiStart LG11478	117863	0,01
	K3-116...K3-316	K3-116...K3-316	Horizontal	OptiStart LG11223H	117865	0,06
	K3-315...K3-550	K3-315...K3-550	Horizontal	OptiStart LG10400H	117866	0,8
	K3-315...K3-550	K3-315...K3-550	Vertical	OptiStart LG10400V	117867	0,8
	K3-450...K3-550	K3-700...K3-860	Horizontal	OptiStart LG10399H	117868	1,6
	K3-450...K3-550	K3-700...K3-860	Vertical	OptiStart LG10399H	117869	0,9
	K3-700...K3-860	K3-700...K3-860	Horizontal	OptiStart LG10402H	117870	1,5
	K3-700...K3-860	K3-700...K3-860	Vertical	OptiStart LG10402V	117871	0,9
	K3-700...K3-860	K3-1000...K3-1200	Horizontal	OptiStart LG10401H	117872	1,9
	K3-700...K3-860	K3-1000...K3-1200	Vertical	OptiStart LG10401V	117873	1,6
	K3-1000...K3-1200	K3-1000...K3-1200	Horizontal	OptiStart LG10403H	117874	1,8
K3-1000...K3-1200	K3-1000...K3-1200	Vertical	OptiStart LG10403V	117875	1,5	
Latch for contactors						
Appearance	For contactors	Definition	Title	Coil voltage, V	Reference	Weight, kg
	K3-07...K3-22	With an auxiliary NC contact, maximum power consumption is 30 VA	OptiStart K2-L22-	24	117844	0,08
				110	117845	
				230	117846	
				400	117847	
	K3-24...K3-40; KG3-10...KG3-40		OptiStart K2-L40-	24	117848	0,08
				110	117849	
				230	117850	
				400	117851	
	K3-50...K3-74		OptiStart K2-L74-	24	117852	0,08
				110	117853	
				230	117854	
				400	117855	

Suppressor							
Appearance	For contactors	Voltage range AC/DC, V	Specification		Title	Reference	Weight, kg
			nF	Ohm			
	RC- module for K3-07...K3-74	12-24	1600	22	OptiStart RC-K3N 24	230877	0,01
		48-127	680	270	OptiStart RC-K3N 110	230878	
		110-230	220	2200	OptiStart RC-K3N 230	230879	
		230-415	120	620	OptiStart RC-K3N 400	230880	
		12-24	1600	22	OptiStart RC-K3NW 24*	230881	
		48-127	680	270	OptiStart RC-K3NW 110*	230882	
		110-230	220	2200	OptiStart RC-K3NW 230*	230883	
		230-415	120	620	OptiStart RC-K3NW 400*	230884	

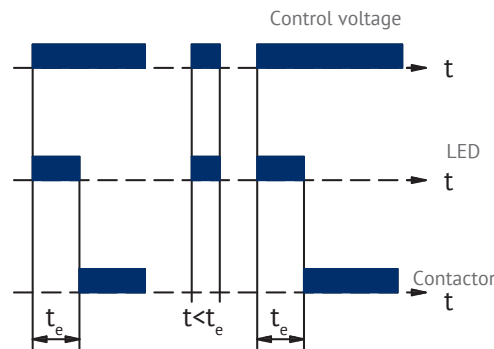
* where W stands for the identification of a suppressor for reversing contactors

Electronic power on timer							
Appearance	Title	Time range, sec.	Operating voltage AC/DC, V	Rated current AC-15, A	For contactors	Reference	Weight, kg
	OptiStart K2-TE30-60	1-30	24-60	0,75	K(G)3-07...; K3-115; K2-...	117770	0,08
	OptiStart K2-TE30-250	1-30	100-250			117771	
	OptiStart K2-TE180-60	10-180	24-60			117772	
	OptiStart K2-TE180-250	10-180	100-250			117773	
	OptiStart K2-TE600-60	30-600	24-60			117774	
	OptiStart K2-TE600-250	30-600	100-250			117775	

Electrical layout



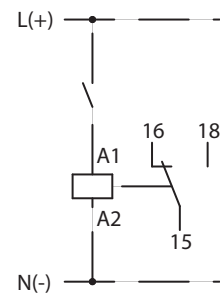
Time diagram



Operating range	0,8-1,1xU _s
Accuracy of the time setting, %	≤1
Recovery time (normal), ms	50
Voltage drop after the response time of the add-on unit t _e (control voltage is 24 V: use contactors with a coil of 20 V)	<3
Max. switching current (peak value), A	25 (<10 ms)
Cyclic duty, %	100
Ambient temperature, °C	-40 - +60
Short circuit protection, A	2


Appearance	Title	Time range, sec.	Rated current AC-1 250 V, A	Reference	Weight, kg
Electronic timer *					
	OptiStart K3-T180-240	0,1-1	5	218930	0,085
		1-10			
		6-60			
		18-180			

Electrical layout



* The universal electronic timer can be used as a replacement for both the electronic on/off timer and the pneumatic timer

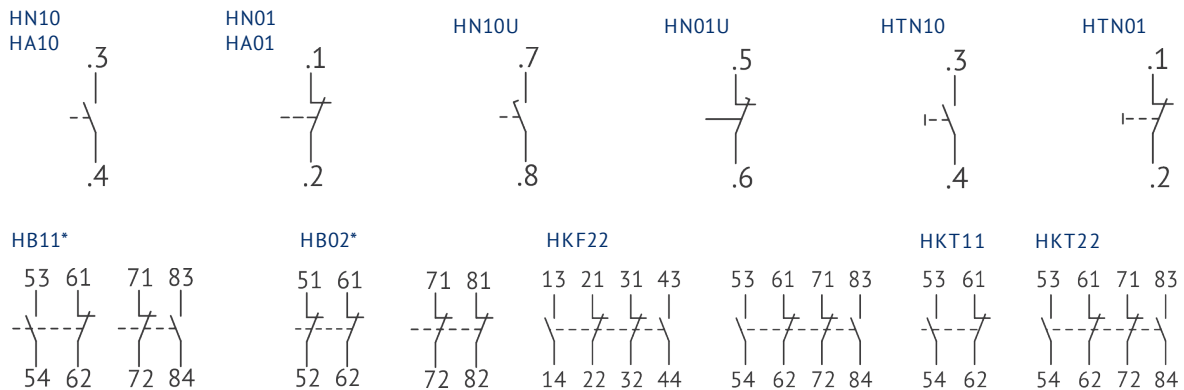
Interface for contactors								
Appearance	For contactors	Definition	Rated current AC-15, A		Title	Coil voltage, V	Reference	Weight, kg
			at 250 AC	at 400 AC				
	K3-07...K3-74; K2-23...K2-60	The amplifier unit for contactor control from a programmable controller	0,75	0,5	OptiStart K2-IM	24 DC	117840	0,03
Fuse holder								
Appearance	For contactors	Definition	Rated current, V		Reference	Weight, kg		
	K(G)3-07...K3-115; K2-	The fuse holder of 5x20 mm (max 6.3 A), fuses are not included in the set.	250 AC		117841	0,02		
Rectifier with a fuse holder								
	K(G)3-07...K3-115; K2-	With a built-in 1A rectifier	250 AC		117842	0,03		
		With a built-in 3A rectifier	250 AC		117843	0,03		
Parallel connector								
Appearance	For contactors	Definition	Cross-section of the conductor on the clamp mm ²			Title	Reference	Weight, kg
			Single-core and multiple-core	Flexible	Flexible with a multicore end			
	K(G)3-10...K(G)3-22	Three poles are in parallel. Permissible current load: 2,5xAC1 - of the contactor rating.	Mounting hole for M5 screw			OptiStart LG9241	117885	0,004
	K2-23...K2-37		4-35	6-25	4-25	OptiStart LG5587	117886	0,022
	K(G)3-10...K(G)3-22	Four poles are in parallel. Permissible current load: 3,2xAC1 - of the contactor rating.	Mounting hole for M5 screw			OptiStart LG7360	117887	0,006
Auxiliary contact								
Appearance	For contactors	Thermal current I _{th} , A	Title		Reference	Weight, kg		
	K3-315, K3-450, K3-550	325	OptiStart NP325		117802	0,7		
	K3-315, K3-450, K3-550	500	OptiStart NP500		117803	1,3		
	K3-450, K3-550	760	OptiStart NP760		117804	1,4		
	K3-700, K3-860	501	OptiStart NP501		117805	1,3		
	K3-700, K3-860	1000	OptiStart NP1000		117806	1,6		
	K3-1000, K3-1200	1000	OptiStart NP1001		117807	1,6		
Terminal cover								
Appearance	For contactors	Specification	Title		Reference	Weight, kg		
	K3-151, K3-176 three-pole	for three clamps	OptiStart LG10404		117877	0,12		
	K3-116...K3-176 four-pole	for four clamps	OptiStart LG104044		117878	0,14		
	K3-210, K3-260, K3-316	for three clamps	OptiStart LG11457		117879	0,14		
	K3-200	for three clamps	OptiStart LG10405		117880	0,18		
	K3-315, K3-450		OptiStart LG10406		117881	0,28		
	K3-550		OptiStart LG10407		117882	0,34		
	K3-700		OptiStart LG10408		117883	0,39		
	K3-860		OptiStart LG10409		117884	0,49		

Appearance	For contactors	Definition	Cross-section of the conductor on the clamp mm ²			Title	Reference	Weight, kg
			Single-core and multiple-core	Flexible	Flexible with a multicore end			
	K(G)3-10...K(G)3-22	Auxiliary clamp, one pole, with touch protection	0,75-10	0,75-6	0,75-6	OptiStart LG9339	117833	0,009
	K3-151...K3-176		-	16-120	16-95	OptiStart LG11224	117834	0,1
	K3-50...K3-74	Auxiliary clamp, one pole, a three-component set	4-35	6-25	4-25	OptiStart LG9030	117835	0,052
	K3-50...K3-74		10-70	16-50	10-35	OptiStart LG9031	117836	0,17
Snap-on adapter								
Appearance	For accessories	Definition			Title	Reference	Weight, kg	
	K2-DK, K2-TE... K2-IM, K2-F, K2-RF..., K2-IN..., K2-UN...	To mount accessories on a 35-mm DIN-rail			OptiStart K2-SM	117860	0,009	

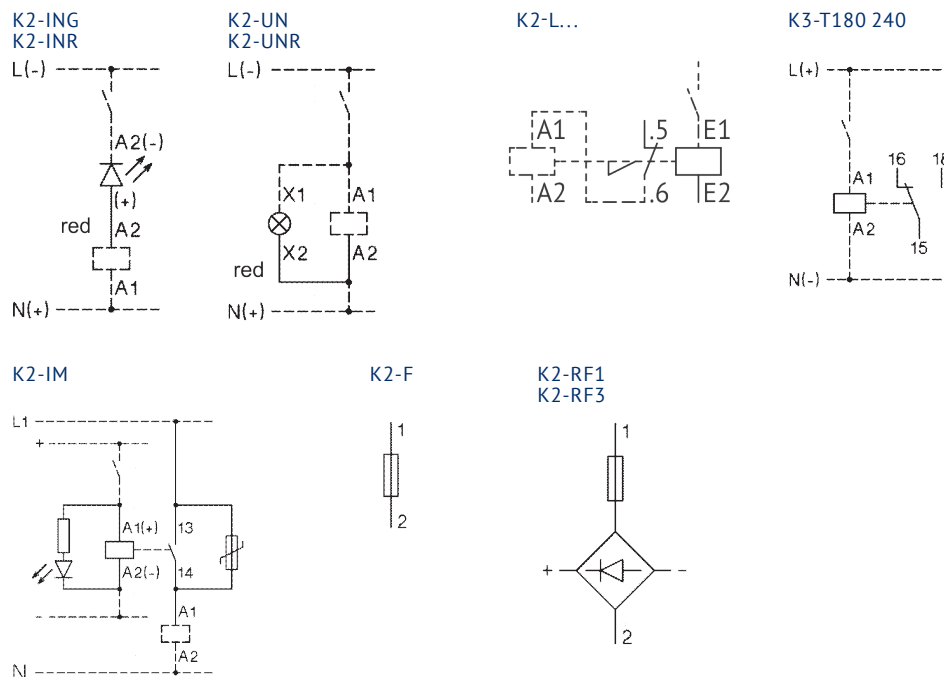
Technical specifications

Type of equipment		HN	HTN	HA	HB	HKT	HKF	K2-TP	K2-L
Rated insulation voltage U_i , AC, V		690	690	690	690	690	690	690	690
Frequency of operations, amount per hour		3000	-	3000	3000	-	-	1200	3000
Mechanical life, mln. of cycles	S x	10	10	10	10	-	-	1	10
Power loss at the pole, W	at $I_e/AC-1$	0,5	0,5	1,5	0,5	-	-	-	-
Rated thermal current I_{th} at 690 V, A									
Ambient air temperature, °C	+40	10	10	25	10	10	16	10	10
	+60	6	6	20	6	-	-	-	-
Application category AC-15, A									
Rated operating current	220 V	3	3	6	3	3	3	4	3
	400 V	2	2	3	2	2	2	3	2
	690 V	0,6	0,6	1	0,6	1	1	2	0,5
Short-circuit protection, A									
Short-circuit current 1 kA, welding of contacts is unallowable	gL(GG)	20	20	25	20	10	10	10	10
Conductor cross-section, mm²									
Single-core		0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	1-2,5	0,75-2,5
Multiple-core		0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5
Flexible with a multicore end		0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,75-2,5	0,5-1,5
Number of conductors per clamp		2	2	2	2	2	2	2	2

Electrical layouts



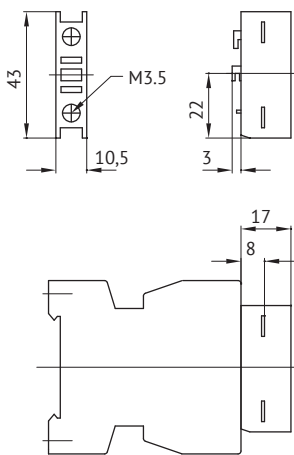
* Marking of contacts is performed during mounting



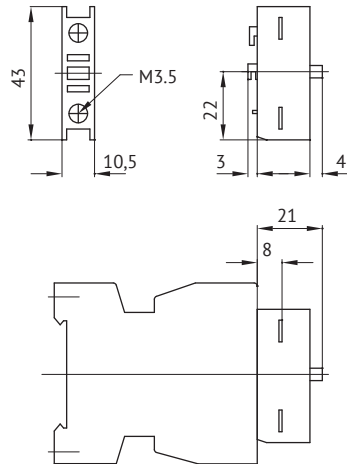
Overall dimensions (mm)

Auxiliary contact blocks

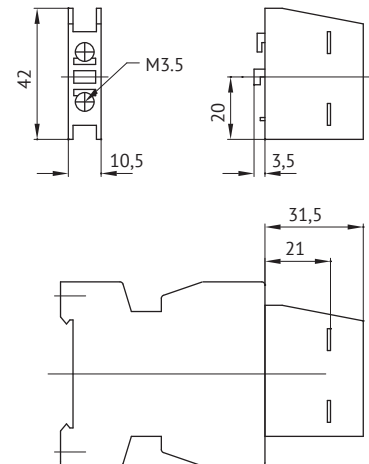
HN10
HN01



HTN10
HTN01

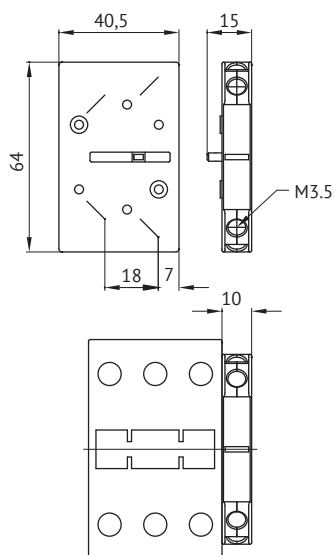


HA10
HA01

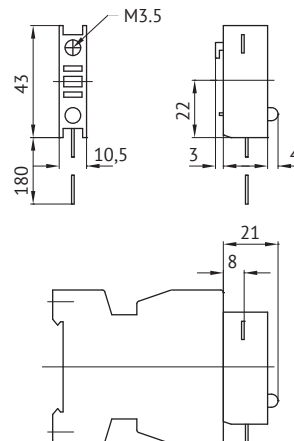


Indication modules

HB11
HB02

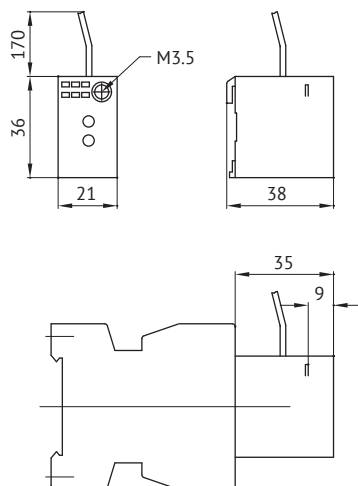


K2-ING, K2-INR
K2-UN, K2-UNR

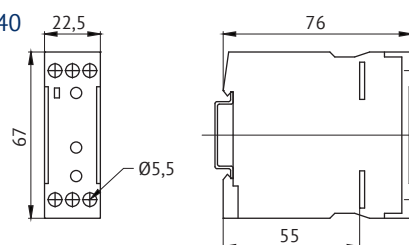


Electronic timers

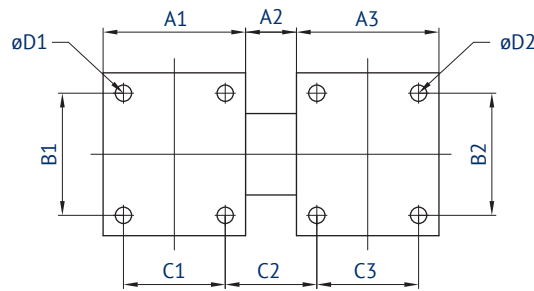
K2-TE...



K3-T180 240

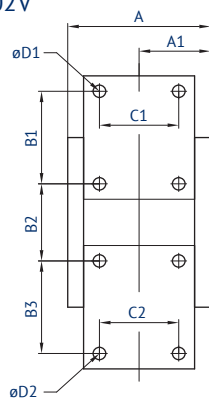


Mechanical locking

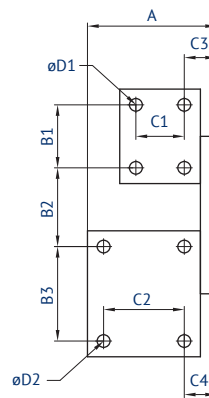


Type of equipment	Contactor 1	Contactor 2	A1	A2	A3	B1	B2	C1	C2	C3	D1	D2
LG10889	K3-07 - K3-40	K3-07 - K3-40	45	7	45	50	50	35	17	35	4,5	4,5
LG10889	KG3-07 - KG3-22	KG3-07 - KG3-22	45	7	45	50	50	35	17	35	4,5	4,5
LG10889	KG3-24 - KG3-40	KG3-22 - KG3-40	45	7	45	50	50	35	17	35	4,5	4,5
LG10890	K3-50 - K3-74	K3-24 - K3-40	60	12	55	100	65	50	22	45	5,5	4,5
LG10890	K3-50 - K3-74	K3-50 - K3-75	60	12	60	100	100	50	22	50	5,5	5,5
LG11478	K3-90 - K3-115	K3-90 - K3-115	90	12	90	100	100	75	27	75	5,5	5,5
LG8511	K65 - K110	K65 - K110	90	12	90	100	100	75	27	75	6	6
LG11223H	K3-151 K3-176	K3-151 K3-176	110	30	110	130	130	100	40	100	6	6
LG11223H	K3-116 K3-151 K3-176	K3-116 K3-151 K3-176	147	30	147	130	130	135	42	135	6	6
LG11223H	K3-210 K3-260 K3-316	K3-210 K3-260 K3-316	145	30	145	160	160	120	55	120	6	6
LG11223H	K3-210 K3-260 K3-316	K3-210 K3-260 K3-316	193	30	193	160	160	170	55	170	6	6
LG10400H	K3-450 K3-550	K3-450 K3-550	220	42	220	220	220	110	152	110	9	9
LG10402H	K3-700 K3-860	K3-700 K3-860	280	32	280	280	280	175	137	175	11	11
LG10403H	K3-1000 K3-1200	K3-1000 K3-1200	334	46	334	380	380	120	260	120	13,5	13,5
LG10399H	K3-450 K3-550	K3-700 K3-860	220	37	280	220	280	110	144,5	175	9	11
LG10401H	K3-700 K3-860	K3-1000 K3-1200	280	73	334	280	380	175	232,5	120	11	13,5

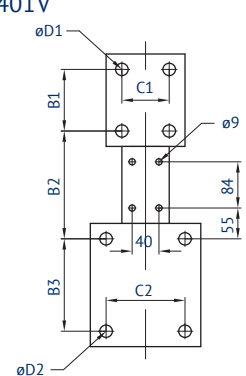
LG10400V
LG10402V



LG10399V



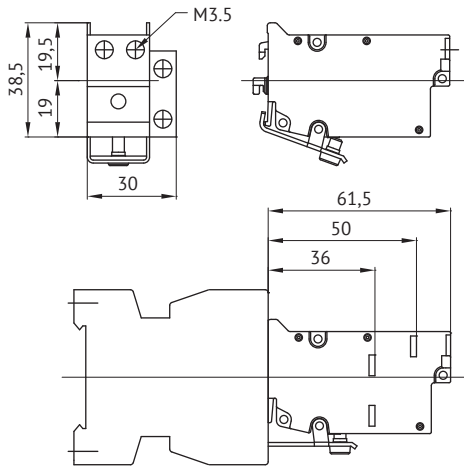
LG10403V
LG10401V



Type of equipment	Contactor 1	Contactor 2	A	A1	B1	B2	B3	C1	C2	C3	C4	D1	D2
LG10400V	K3-315 - K3-550	K3-315 - K3-550	250	134	220	94	220	110	110	-	-	9	9
LG10402V	K3-700 K3-860	K3-700 K3-860	302	162	280	200	280	175	175	-	-	11	11
LG10403V	K3-1000 K3-1200	K3-1000 K3-1200	-	-	380	280	380	120	120	-	-	13,5	13,5
LG10399V	K3-450 K3-550	K3-700 K3-860	302	-	220	150	280	110	175	51	74,5	9	11
LG10401V	K3-700 K3-860	K3-1000 K3-1200	-	-	280	240	380	175	120	-	-	11	13,5

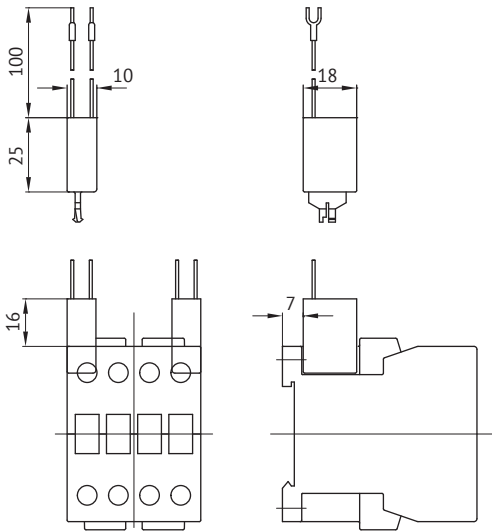
Latches for contactors

K2-L...

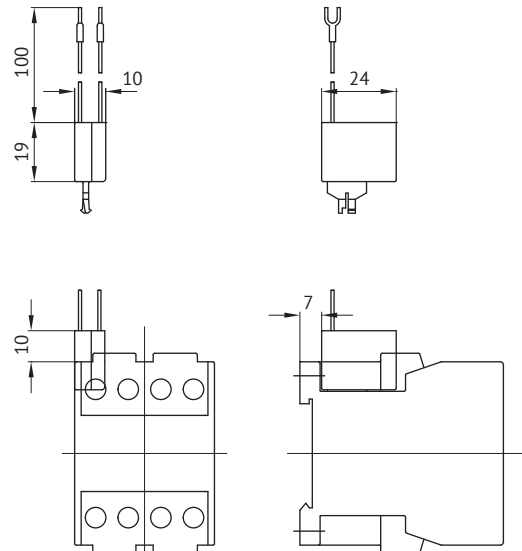


Suppressors

RC-K3NW ..

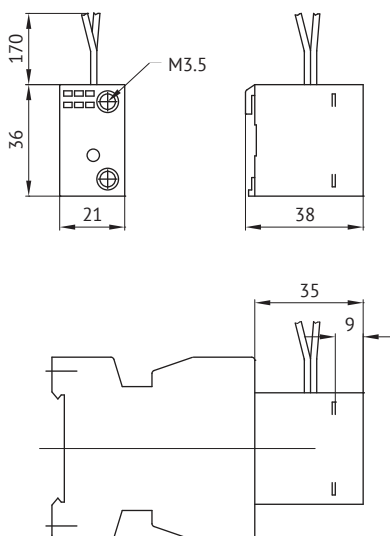


RC-K3N



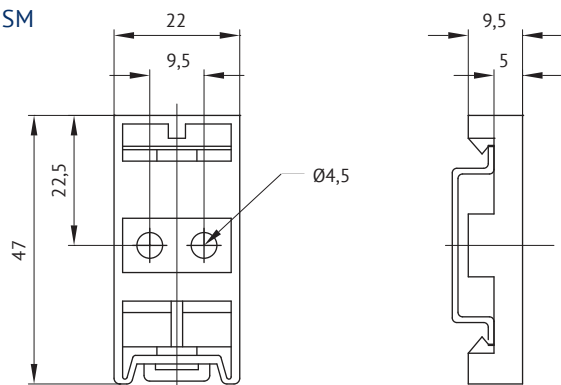
Interface for contactors

K2-IM



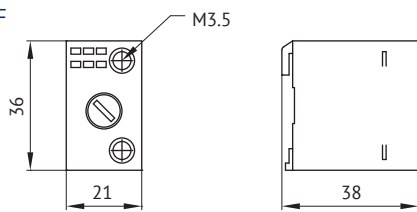
Snap-on adapter

K2-SM

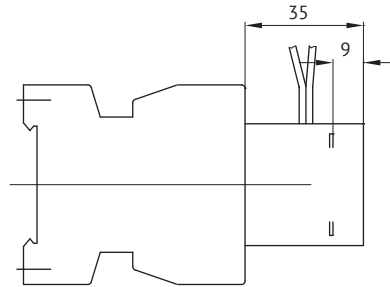
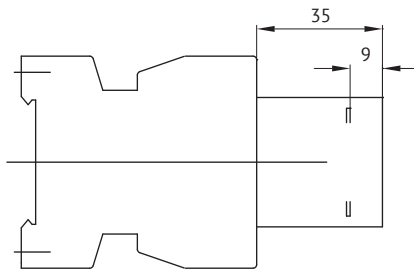
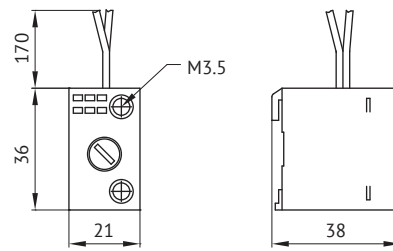


Fuse holders

K2-RF

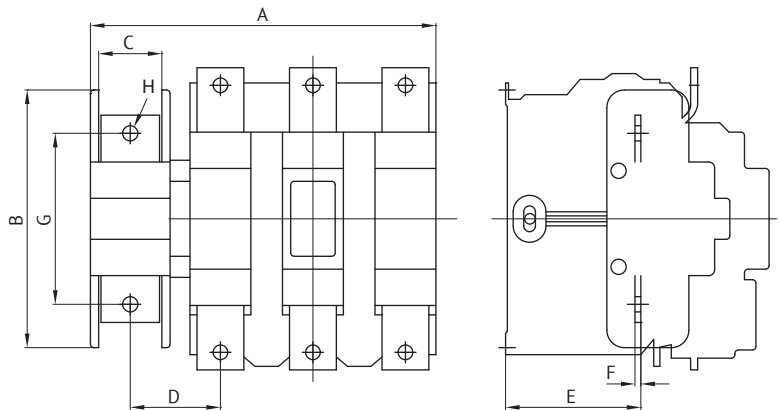


K2-RF1
K2-RF3



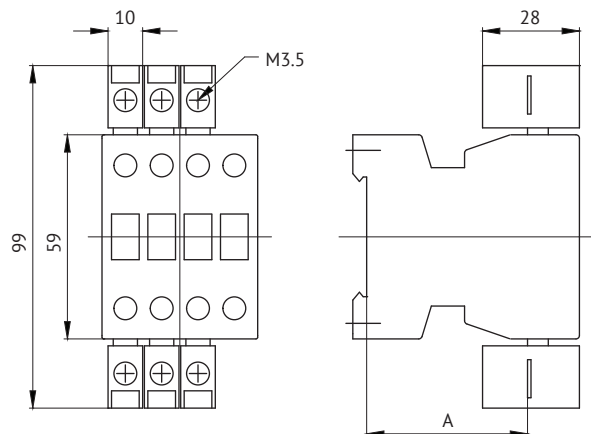
Auxiliary contacts

	A	B	C	D	E	F	G	H
NP175	223	148	26	52	98	5	122	M8
NP350	223	148	26	52	98	5	122	M8
NP325	262	148	26	55	116	5	122	M10
NP500	294	220	53	72	138	5	152	M12
NP760	294	220	53	72	138	5	152	M12
NP501	348	220	53	73	145	5	152	M12
NP1000	348	220	53	73	145	8	152	M12
NP1001	410	220	53	110	157	8	152	M12

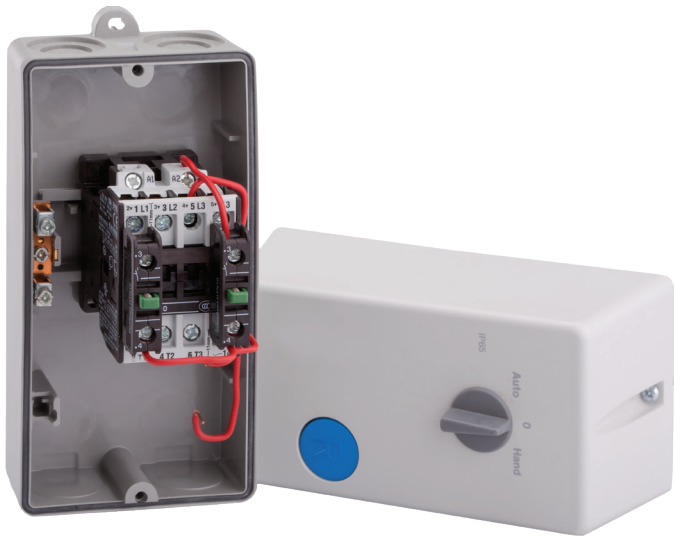


Auxiliary terminals

LG9339N (6 pcs.)
for K3-10N...K3-22N



OptiStart B Direct-on-line starters



The electromagnetic direct-on-line starter in a protective casing with the IP65 protection degree features a complex switching electromagnetic device that is able to allow the remote start-up by direct connection to the network, the shutdown of three-phase asynchronous electric motors with a squirrel-cage rotor. When equipped with thermal relays, they provide for protection against overloads, from the phase loss and skew.

Designation

OptiStart B1 W 18 P - 230 AC



1	Product range	OptiStart – electric motor control and protection equipment		
2	Identification of equipment	B1 - direct-on-line starter		
3	Type of control	T - with the push buttons "Start" and "Stop/Reset"	W - with a selector switch	
4	Rated current In, A	10	18	22
5	Availability of a relay	The relay is required and delivered according to a separate order		
6	Rated control voltage, V	230	400	
7	Type of control circuit current	AC		

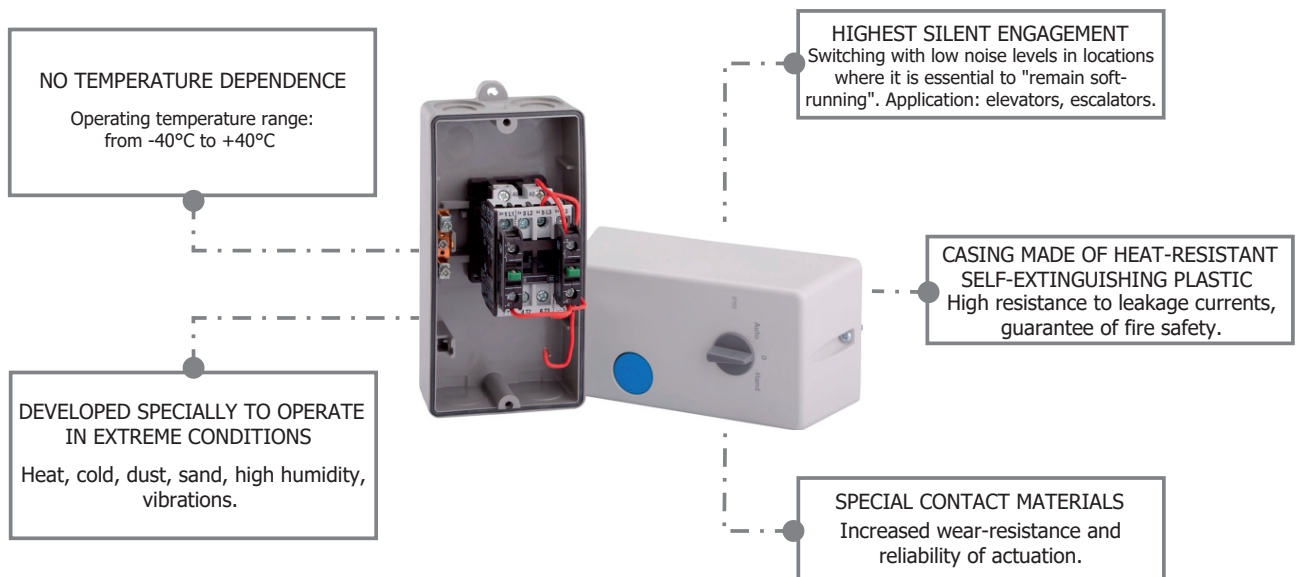
The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.

Selection guide

Type of equipment		B1T/B1W		
Appearance				
Coil voltage, V		230, 400		
Type of control		With the push buttons START-STOP/RESET or with a selector switch		
Number of poles		3		
Connection type		screw type with a washer		
Rated operating current In at AC-3, 380 V, A		10	18	22
Rated operating current In at AC-1, 690 V, A		25	32	32
Motor power AC-3, 380 V, kW		4	7,5	11
Configuration		non-reversing		
Auxiliary contacts	NO	1		
	NC	-		
Mounting location for auxiliary contacts		2		
Degree of protection		IP65		
Cable entry, mm		Ø 20,5		
Weight, kg		0,6		
Compatible with relays		OptiStart TU12/16...C		
For more details, see page		412		
For accessories, see page		413		

These specified direct-on-line starters can be stocked with any thermal overload relays of the OptiStart TU12 /16 ... C type. The relay is required and delivered on a separate order.

Batch effectiveness



References (series)

Appearance	Rated operating current I_n , A at AC-3 380 V	Type of control	Design		Reference	Weight, kg
			Type of equipment	Coil voltage, V		
	10	With the push buttons START and STOP/RESET	OptiStart B1T10-	230AC	115698	0,6
	10			400AC	115693	
	18		OptiStart B1T18-	230AC	115694	
	18			400AC	115700	
	22		OptiStart B1T22-	230AC	115701	
	22			400AC	115707	
	10	With a selector switch	OptiStart B1W10-	230AC	115702	
	10			400AC	115703	
	18		OptiStart B1W18-	230AC	115704	
	18			400AC	115705	
	22		OptiStart B1W22-	230AC	115708	
	22			400AC	117395	

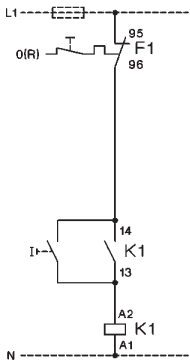
Technical specifications

Connection diagrams in the control circuit

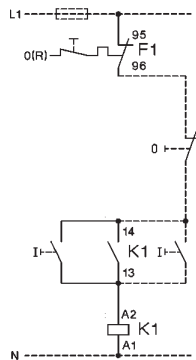
Typical diagrams (for the separate coil power supply, connection of control voltage between L1 and N). Marking of terminals according to the requirements of EN 50012.

Direct-on-line starters with START and STOP / RESET push buttons

B1T10, B1T18, B1T22 with a thermal relay TU12/16...C

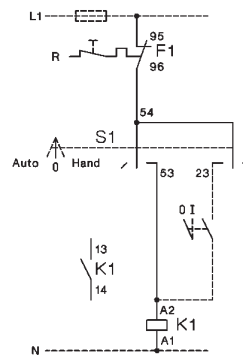


B1T10, B1T18, B1T22 with external push buttons

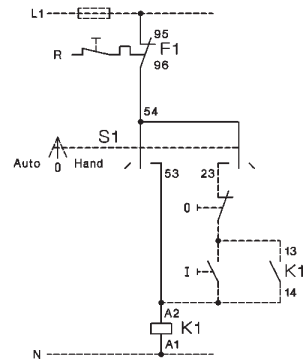


Direct-on-line starters with a selector switch

B1W10, B1W18, B1W22 with external control switch

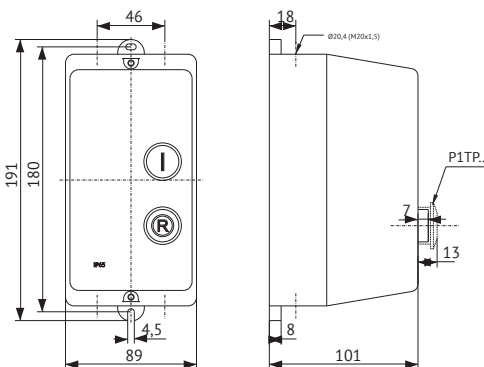


B1W10, B1W18, B1W22 with external push buttons

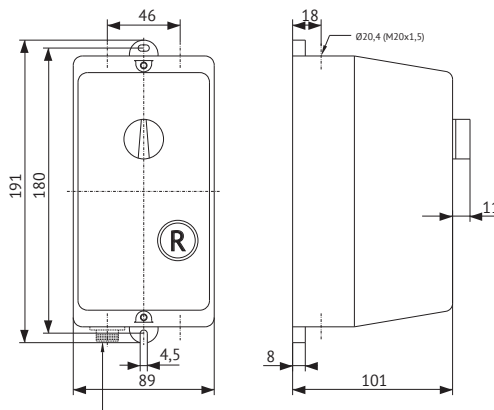


Overall dimensions (mm)

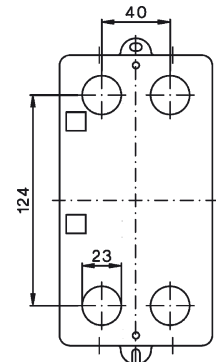
Direct-on-line starters with START-STOP/RESET push buttons
OptiStart B1T



Direct-on-line starters with a selector switch
OptiStart B1W.. OptiStart B1W18T.., B1W18P



Rear cable entry holes
breakthrough plugs 4xø23



Accessories for OptiStart B direct-on-line starters

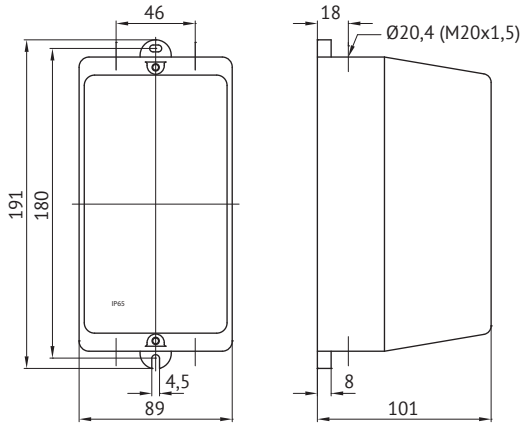
Casing for contactors							
Appearance	Suitable for contactors	Degree of protection	Cable entry, mm	Title	Reference	Weight, kg	
	OptiStart K3-07...K3-22 OptiStart K3-24...K3-40	IP65	2 x Ø20,5	OptiStart B1	117399	0,35	
	OptiStart K3-07...K3-22 + TU12/16...C			OptiStart B1R	117400		
Indication module							
Appearance	Type of equipment	Color	Definition	Voltage, V	Title	Reference	Weight, kg
	Current indicator	Green	It is connected in series with the control coil. If the coil is damaged, the indicator goes dark. The voltage drop is around 2 V.	24-660 AC/DC	OptiStart K2-ING	117856	0,02
		Red		24-660 AC/DC	OptiStart K2-INR	117857	
	Voltage indicator	Transparent	It is connected in parallel with the control coil. The indicator lights up when voltage is applied to the coil and does not go out. If the coil is damaged, the indicator goes dark.	220-415 AC/DC	OptiStart K2-UN	117858	
		Red		24-120 AC/DC	OptiStart K2-UNR	117859	
Lens for indication modules							
Appearance	Type of equipment	Color	Mounting instructions	Title	Reference	Weight, kg	
	Lens-cap	Transparent	ctp. 406	OptiStart LG9743T	117401	0,005	
	Lens-cap	Red		OptiStart LG9743R	117402		
	Lens-cap	Green		OptiStart LG9743GR	117403		
Thermal component							
Appearance	Definition	Power consumption, W	Voltage, V	Title	Reference	Weight, kg	
	It is applied to avoid condensation in rooms with high humidity and sudden temperature jumps.	1,5	380-415	OptiStart C2-HR	117404	0,02	
			220-240	OptiStart C2-HR-230	117405		
Auxiliary terminals							
Appearance	Type of equipment	Conductor cross-section, mm ²			Title	Reference	Weight, kg
		single-core	multiple-core	flexible multiple-core			
	Neutral terminal	2 x 0,75-4	2 x 0,75-2,5	2 x 0,5-2,5	OptiStart LG9744	117406	0,009
	Ground terminal	2,5-16	1,5-10	1,5-10	OptiStart LG9750	117407	0,052
Appearance	Type of equipment	For contactors	Definition	Title	Reference	Weight, kg	
	Initiating (start) contact	OptiStart K3-10...K3-22	It is top-mounted on auxiliary contacts	OptiStart LG9319-C3	117408	0,03	

Technical specifications of accessories

Overall dimensions (mm)

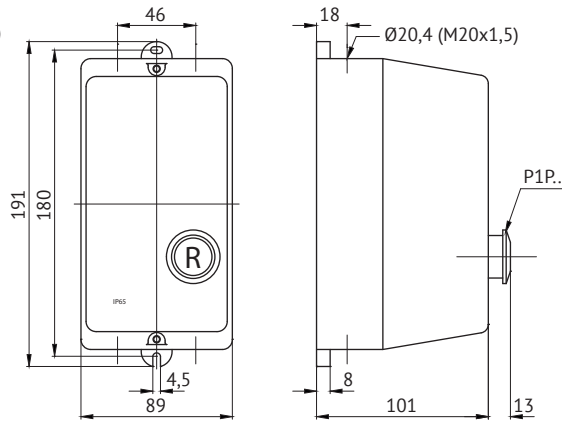
Casing for contactors

OptiStart B1

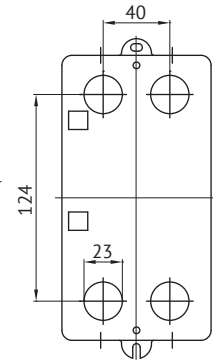


Casing for direct-on-line starters

OptiStart B1R

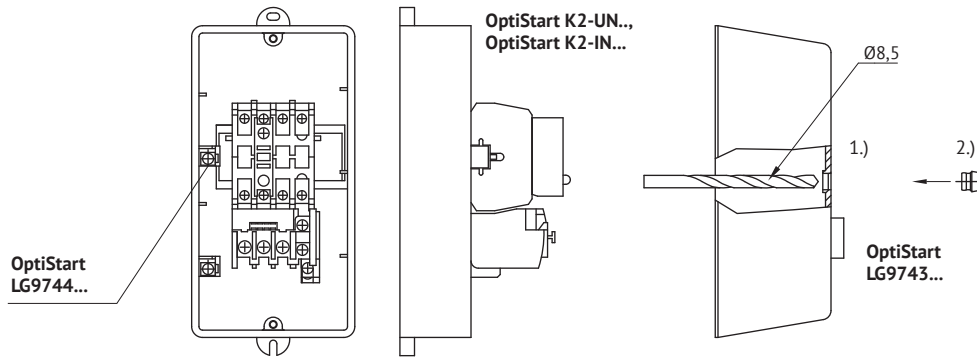


Rear cable entry holes
breakthrough plugs
4xØ23

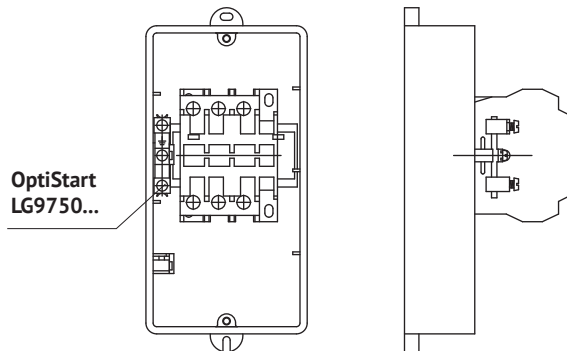


Mounting and connection instructions

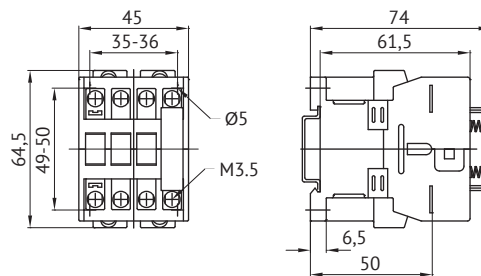
Neutral terminal, indicators and lenses for direct-on-line starters OptiStart B1



Ground terminal for contactors OptiStart K2-23 and
OptiStart K2-30



Auxiliary terminal for contactors OptiStart K3-10ND10...OptiStart
K3-22ND10



OptiStart TU Thermal relays



Thermal relays of the OptiStart TU series are economical electromechanical devices. They are designed primarily to protect three-phase asynchronous motors with a squirrel-cage rotor from current overloads of unallowable duration, including those that occur in the event of a phase loss. In combination with contactors, thermal overload relays form compact solutions for the motor operation.

Selection table

Contactor		Relay	Maximum setpoint current, A	Reset method	Trip class	
OptiStart	K1 (D)	OptiStart TU12/16A...CM	0,12-14	Automatic and manual (hand)	10A	
		OptiStart TU12/16E...CM		Manual		
		OptiStart TU12/16EQ...CM				
	K(G)3-10... K(G)3-22	OptiStart TU12/16E...C	0,12-14	Automatic and manual		
		OptiStart TU12/16EQ...C	0,4-14			
	K(G)3-10... K(G)3-40	OptiStart TU3/32	0,12-32	Automatic and manual		
	K(G)3-24... K(G)3-40	OptiStart TU3/42	10-42			
	K3-50... K3-74	OptiStart TU3/74	20-74			
	K3-90... K3-115	OptiStart TU85	60-120	Manual		20
	K3-151... K3-176	OptiStart TU180	120-180	Automatic and manual		10A
	K3-210... K3-316	OptiStart TU320	144-320			
	K3-315... K3-860	OptiStart TU800	240-800			10
all the types of equipment	OptiStart TUAT	0,8-72	Manual	30		

Designation

OptiStart TU 12/16 E Q - 4 CM



1	Product range	OptiStart – electric motor control and protection equipment			
2	Identification of equipment	TU - thermal overload relays			
3	Configuration	12/16	3/32	3/42	3/74
4	Reset method	E - manual (hand)		A - automatic	
5	Response characteristic	Q - with a quick response characteristic			
6	Maximum setpoint current, A	0,18 - 74			
7	Specified contactors	C - for OptiStart K(G)3-10... K(G)3-22 CM – for OptiStart K1	for OptiStart K(G)3-10...K(G)3-40	for OptiStart K(G)3-24...K(G)3-40	for OptiStart K3-50...K3-74

OptiStart TU 85 - 120



1	Product range	OptiStart – electric motor control and protection equipment						
2	Identification of equipment	TU - thermal overload relays						
3	Configuration	85	180	320	800	AT21	AT22	AT23
						with a slow response characteristic		
4	Maximum setpoint current, A	60-800				0,8-72		

The references listed in the tables of the unit are subject to change. If the references you need are not found on the site, contact the technical support service of KEAZ.

Batch effectiveness

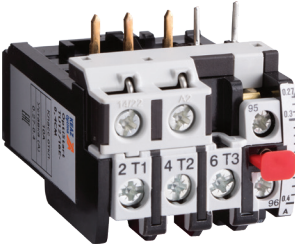
- ▣ Protection for each phase
- ▣ Temperature compensation
- ▣ Tripping and signal contacts







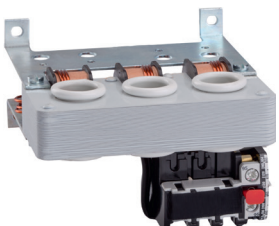
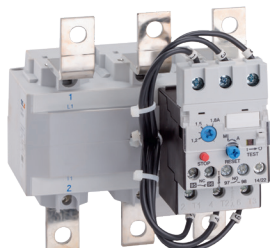

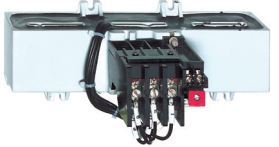
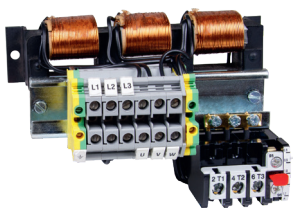
- ▣ Compact dimensions - smaller-sized boards
- ▣ Quick tripping in the event of a phase loss, regardless of the setting range

- ▣ Each device is manually calibrated, which ensures accurate operation
- ▣ Thermobimetal undergoes thermal stabilization to ensure maximum effective performance

Selection guide

Appearance	Type of equipment	Type of reset	Current setting range of the thermal release, A		Title	Reference	Weight, kg
			Direct-on-line start	Y/Δ			
For mini - contactors OptiStart K1							
	TU12/16E	Manual (hand)	0,12-0,18	-	OptiStart TU12/16E-0,18CM	117410	0,1
			0,18-0,27	-	OptiStart TU12/16E-0,27CM	117411	
			0,27-0,4	-	OptiStart TU12/16E-0,4CM	117412	
			0,4-0,6	-	OptiStart TU12/16E-0,6CM	117413	
			0,6-0,9	-	OptiStart TU12/16E-0,9CM	117414	
			0,8-1,2	-	OptiStart TU12/16E-1,2CM	117415	
			1,2-1,8	-	OptiStart TU12/16E-1,8CM	117416	
			1,8-2,7	-	OptiStart TU12/16E-2,7CM	117417	
			2,7-4	-	OptiStart TU12/16E-4CM	117418	
			4-6	7-10,5	OptiStart TU12/16E-6CM	117419	
			6-9	10,5-15,5	OptiStart TU12/16E-9CM	117420	
			8-11	14-19	OptiStart TU12/16E-11CM	117421	
			10-14	18-24	OptiStart TU12/16E-14CM	117422	
	TU12/16A	Automatic and manual	0,12-0,18	-	OptiStart TU12/16A-0,18CM	117439	0,1
			0,18-0,27	-	OptiStart TU12/16A-0,27CM	117440	
			0,27-0,4	-	OptiStart TU12/16A-0,4CM	117441	
			0,4-0,6	-	OptiStart TU12/16A-0,6CM	117442	
			0,6-0,9	-	OptiStart TU12/16A-0,9CM	117443	
			0,8-1,2	-	OptiStart TU12/16A-1,2CM	117444	
			1,2-1,8	-	OptiStart TU12/16A-1,8CM	117445	
			1,8-2,7	-	OptiStart TU12/16A-2,7CM	117446	
			2,7-4	-	OptiStart TU12/16A-4CM	117447	
			4-6	7-10,5	OptiStart TU12/16A-6CM	117448	
			6-9	10,5-15,5	OptiStart TU12/16A-9CM	117449	
			8-11	14-19	OptiStart TU12/16A-11CM	117450	
			10-14	18-24	OptiStart TU12/16A-14CM	117451	
	TU12/16EQ (With a quick response characteristic for EEx motors and immersion pumps)	Manual (hand)	0,4-0,6	-	OptiStart TU12/16EQ-0,6CM	117452	0,1
			0,6-0,9	-	OptiStart TU12/16EQ-0,9CM	117453	
			0,8-1,2	-	OptiStart TU12/16EQ-1,2CM	117454	
			1,2-1,8	-	OptiStart TU12/16EQ-1,8CM	117455	
			1,8-2,7	-	OptiStart TU12/16EQ-2,7CM	117456	
			2,7-4	-	OptiStart TU12/16EQ-4CM	117457	
			4-6	7-10,5	OptiStart TU12/16EQ-6CM	117458	
6-9			10,5-15,5	OptiStart TU12/16EQ-9CM	117459		
8-11	14-19	OptiStart TU12/16EQ-11CM	117460				

Appearance	Type of equipment	Type of reset	Current setting range of the thermal release, A		Title	Reference	Weight, kg
			Direct-on-line start	Y/Δ			
For contactors OptiStart K(G)3-10...K(G)3-22							
	TU12/16E	Manual (hand)	0,12-0,18	-	OptiStart TU12/16E-0,18C	117423	0,1
			0,18-0,27	-	OptiStart TU12/16E-0,27C	117424	
			0,27-0,4	-	OptiStart TU12/16E-0,4C	117425	
			0,4-0,6	-	OptiStart TU12/16E-0,6C	117426	
			0,6-0,9	-	OptiStart TU12/16E-0,9C	117427	
			0,8-1,2	-	OptiStart TU12/16E-1,2C	117428	
			1,2-1,8	-	OptiStart TU12/16E-1,8C	117429	
			1,8-2,7	-	OptiStart TU12/16E-2,7C	117430	
			2,7-4	-	OptiStart TU12/16E-4C	117431	
			4-6	7-10,5	OptiStart TU12/16E-6C	117432	
			6-9	10,5-15,5	OptiStart TU12/16E-9C	117433	
			8-11	14-19	OptiStart TU12/16E-11C	117434	
			10-14	18-24	OptiStart TU12/16E-14C	117435	
			13-18	23-31	OptiStart TU12/16E-18C	117436	
			17-23	30-40	OptiStart TU12/16E-23C	117437	
	22-30	38-52	OptiStart TU12/16E-30C	117438	0,13		
	TU12/16EQ (With a quick response characteristic for EEx motors and immersion pumps)	Manual (hand)	0,4-0,6	-	OptiStart TU12/16EQ-0,6C	117462	0,1
			0,6-0,9	-	OptiStart TU12/16EQ-0,9C	117463	
			0,8-1,2	-	OptiStart TU12/16EQ-1,2C	117464	
			1,2-1,8	-	OptiStart TU12/16EQ-1,8C	117465	
1,8-2,7			-	OptiStart TU12/16EQ-2,7C	117466		
2,7-4			-	OptiStart TU12/16EQ-4C	117467		
4-6			7-10,5	OptiStart TU12/16EQ-6C	117468		
6-9			10,5-15,5	OptiStart TU12/16EQ-9C	117469		
8-11	14-19	OptiStart TU12/16EQ-11C	117470				
10-14	18-24	OptiStart TU12/16EQ-14C	117471				
For contactors OptiStart K3-10...K3-40							
	TU3/32	Automatic and manual	0,12-0,18	-	OptiStart TU3/32-0,18	117472	0,14
			0,18-0,27	-	OptiStart TU3/32-0,27	117473	
			0,27-0,4	-	OptiStart TU3/32-0,4	117474	
			0,4-0,6	-	OptiStart TU3/32-0,6	117475	
			0,6-0,9	-	OptiStart TU3/32-0,9	117476	
			0,8-1,2	-	OptiStart TU3/32-1,2	117477	
			1,2-1,8	-	OptiStart TU3/32-1,8	117478	
			1,8-2,7	-	OptiStart TU3/32-2,7	117479	
			2,7-4	-	OptiStart TU3/32-4	117480	
			4-6	7-10,5	OptiStart TU3/32-6	117481	
			6-9	10,5-15,5	OptiStart TU3/32-9	117482	
			8-11	14-19	OptiStart TU3/32-11	117483	
			10-14	18-24	OptiStart TU3/32-14	117484	
			13-18	23-31	OptiStart TU3/32-18	117485	
			17-24	30-41	OptiStart TU3/32-24	117486	
			23-32	40-55	OptiStart TU3/32-32	117487	

Appearance	Type of equipment	Type of reset	Current setting range of the thermal release, A		Title	Reference	Weight, kg	
			Direct-on-line start	Y/Δ				
For contactors OptiStart K3-24... - K3-40...								
	TU3/42	Automatic and manual	10-14	18-24	OptiStart TU3/42-14	117488	0,3	
			14-20	24-35	OptiStart TU3/42-20	117489		
			20-28	35-48	OptiStart TU3/42-28	117490		
			28-42	48-73	OptiStart TU3/42-42	117491		
For contactors OptiStart K3-50... - K3-74...								
	TU3/74	Automatic and manual	20-28	35-48	OptiStart TU3/74-28	117492	0,4	
			28-42	48-73	OptiStart TU3/74-42	117493		
			40-52	70-90	OptiStart TU3/74-52	117494		
			52-65	90-112	OptiStart TU3/74-65	117495		
			60-74	104-128	OptiStart TU3/74-74	117496		
For contactors OptiStart K3-90... - K3-115...								
	TU85	Manual (hand)	60-90	104-156	OptiStart TU85-90	117497	0,9	
			80-120	140-207	OptiStart TU85-120	117498	0,9	
For contactors OptiStart K3-151... - K3-176...								
	TU180	Automatic and manual	120-180	208-312	OptiStart TU180-180	117499	1,5	
	For contactors OptiStart K3-210... - K3-316...							
	TU320	Automatic and manual	144-216	250-374	OptiStart TU320-216	117500	1,8	
			216-320	374-554	OptiStart TU320-320	117501		
For contactors OptiStart K3-315... - K3-860...								
	TU800	Automatic and manual	240-360	416-623	OptiStart TU800-360	117502	4,1	
			360-540	623-935	OptiStart TU800-540	117503		
			540-800	935-1385	OptiStart TU800-800	117504		
	TUAT	Manual (hand)	For all the types of contactors					1
			0,8-1,2	1,2-2,1	OptiStart TUAT21-1,2	117505		
			1,2-1,8	2,1-3,1	OptiStart TUAT21-1,8	117506		
			1,6-2,4	2,8-4,2	OptiStart TUAT21-2,4	117507		
			2,4-3,7	4,2-6,4	OptiStart TUAT21-3,7	117508		
			3,7-5,7	6,4-9,9	OptiStart TUAT21-5,7	117509		
			5,3-8,2	9,2-14,2	OptiStart TUAT21-8,2	117510		
			8-12	13,9-20,1	OptiStart TUAT21-12	117511		
			12-18	20,1-31,2	OptiStart TUAT21-18	117512		
			16-24	27,7-41,6	OptiStart TUAT22-24	117513		
			24-37	41,6-64	OptiStart TUAT23-37	117514		
			32-49	55,4-85	OptiStart TUAT23-49	117515		
48-72	83-125	OptiStart TUAT23-72	117516					
For more details, see pages				421-430				
For accessories, see page				431				

Technical specifications

Tripping (breaking) time for selecting relays for EEx motors

Setting range, A	The tripping time depends on the setting of the current from the cold state (tolerance $\pm 20\%$ of the tripping time), sec					
	I_A/I_N 3	I_A/I_N 4	I_A/I_N 5	I_A/I_N 6	I_A/I_N 7,2	I_A/I_N 8
With the characteristics of a standard trip						
TU12/16E(A)...						
0,12-0,18	18,5	10,4	7,2	5,5	4,3	3,6
0,18-0,27	16,7	9,8	6,5	5,0	4,1	3,5
0,27-0,4	19,4	12,1	8,2	5,9	4,9	4,2
0,4-0,6	18,7	11,2	8,0	6,0	4,9	4,1
0,6-0,9	19,7	11,6	8,1	6,1	4,9	4,2
0,8-1,2	22,9	13,6	10,0	7,3	6,0	5,2
1,2-1,8	22,2	13,2	9,2	7,6	5,8	5,3
1,8-2,7	23,0	13,7	9,3	7,6	5,7	5,1
2,7-4	24,0	14,4	9,9	7,8	5,9	5,1
4-6	24,7	13,8	9,9	7,3	5,6	4,8
6-9	22,0	13,4	8,0	5,7	4,1	3,5
8-11	17,4	9,2	5,9	4,1	2,9	2,3
10-14	26,4	12,9	7,6	5,2	3,5	2,8
13-18	14,7	7,7	4,8	3,2	2,3	1,7
17-23	16,2	8,4	5,0	3,6	2,4	1,8
22-30	16,8	8,5	5,0	3,6	2,3	1,9
With the characteristics of a fast tripping ¹⁾						
TU12/16EQ...						
0,4-0,6	13,6	8,4	5,9	4,2	3,3	3,0
0,6-0,9	13,8	7,8	5,2	4,1	3,2	2,7
0,8-1,2	13,1	7,5	5,2	3,9	3,1	2,7
1,2-1,8	14,6	8,7	6,0	4,6	3,6	3,2
1,8-2,7	13,5	7,6	5,3	3,9	3,1	2,7
2,7-4	11,0	6,0	4,1	2,6	1,7	1,4
4-6	9,6	5,3	3,3	2,3	1,6	1,3
6-9	10,2	5,4	3,4	2,3	1,6	1,3
8-11	12,0	6,2	3,9	2,5	1,8	1,3
10-14	12,8	6,6	4,0	2,6	1,8	1,4

All the time values of the overload relay TU12/16EQ are less than the minimum values of t_E time for motors with EEx degree of protection in accordance with EN 50019, so that they are suitable for all motors with EEx degree of protection.

An example of selecting a thermal overload relay

Technical data for a motor with the protection degree EEx

$$P_N = 1,5 \text{ kW} \quad I_N = 3,6 \text{ A} \quad I_A/I_N = 5 \quad \text{time } t_e = 8 \text{ s}$$

1) TU12/16E 4 (2,7 - 4 A)

Tripping time at $5 \times I_N = 9,9 \text{ s}$

$$9,9 \text{ s} + 20\% \text{ tolerance} = 11,9 \text{ s} > t_{E \text{ Motor}} = 8 \text{ s}$$

Thermal relay TU12/16E 4 is not suitable.

Setting range, A	The tripping time depends on the setting of the current from the cold state (tolerance $\pm 20\%$ of the tripping time), sec					
	I_A/I_N 3	I_A/I_N 4	I_A/I_N 5	I_A/I_N 6	I_A/I_N 7,2	I_A/I_N 8
With the characteristics of a standard trip						
TU3/32...						
0,12-0,18	16,1	9,6	6,8	5,3	4,2	3,7
0,18-0,27	16,6	9,7	6,7	5,2	4,1	3,6
0,27-0,4	19,4	11,4	7,9	6,1	4,7	4,2
0,4-0,6	18,7	10,9	7,6	5,9	4,6	4
0,6-0,9	19,2	11,2	7,7	5,9	4,6	4,1
0,8-1,2	20,8	12,3	8,5	6,6	5,2	4,6
1,2-1,8	25,5	14,1	9,8	7,6	5,9	5,2
1,8-2,7	26,6	15,6	10,9	8,3	6,5	5,7
2,7-4	22,7	13,6	9,5	7,4	5,8	5,1
4-6	22,2	13,3	9,3	7,1	5,6	4,9
6-9	20,4	11,9	8,2	6,1	4,7	4,0
8-11	20,9	11,8	7,9	5,7	4,3	3,5
10-14	21,3	11,7	7,4	5,1	3,7	3,0
13-18	21,2	12,1	8,0	6,2	4,6	4,1
17-24	20,4	12,0	8,6	6,3	4,5	3,7
23-32	20,2	10,2	6,7	4,7	3,4	2,8
TU3/42...						
10-14	21,8	11,4	7,0	5,0	3,7	2,8
14-20	22,4	11,2	6,7	4,5	3,2	2,4
20-28	21,8	10,8	6,5	4,5	3,3	2,5
28-42	25,2	13,3	8,0	5,5	4,0	3,1
TU3/74...						
20-28	21,8	10,8	6,5	4,5	3,3	2,5
28-42	25,2	13,3	8,0	5,5	4,0	3,1
40-52	18,3	9,2	5,6	3,9	2,8	2,2
52-65	17,8	8,7	5,2	3,4	2,5	1,9
TU85...						
60-90	19,5	13,5	11,0	10,0	9,5	8,5
80-120	18,0	11,0	10,0	9,0	8,5	8,0
TU840...						
260-360	23,3	14,1	10,0	7,6	6,1	5,4
340-480	23,0	13,8	9,6	7,6	6,1	5,4
440-620	20,5	12,4	9,0	7,0	5,5	5,0
560-800	21,0	12,5	9,0	7,0	5,6	5,2

1) Preferably for motors with short time t_e and for immersion pumps.

Fuses

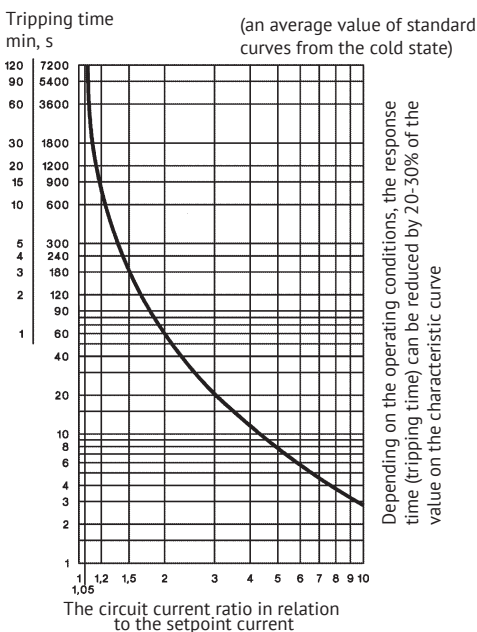
Setting range, A		Maximum fuse rating in accordance with the coordination type, A				Short-circuit current, kA
		«2» ¹		«1» ¹		
Direct-on-line start	YA	fast-acting	slow-blow (time-delay), gL(gG)	slow-blow (time-delay), gL(gG)	aM ²	
TU3/32(TU12/16E)						
0,12-0,18	-	0,5	0,5	25	-	5
0,18-0,27	-	1,0	1,0	25	-	5
0,27-0,4	-	2	2	25	-	5
0,4-0,6	-	2	2	25	-	5
0,6-0,9	-	4	4	25	-	5
0,8-1,2	-	4	4	25	2	5
1,2-1,8	-	6	6	25	2	5
1,8-2,7	-	10	10	25	4	5
2,7-4	-	16	10	25	4	5
4-6	7-10,5	20	16	25	6	5
6-9	10,5-15,5	35	25	35	10	5
8-11	14-19	35	25	35	16	5
10-14	18-24	50	35	63	16	5
13-18	23-31	50	35	63	20	5
17-(23)24	30-(40)41	63	50	63	25	5
(22)23-(30)32	(38)40-(52)55	80	63	80	35	5
TU3/42						
10-14	18-24	50	35	80	16	5
14-20	24-35	63	50	80	25	5
20-28	35-48	80	63	80	35	5
28-42	48-73	100	80	150	50	5
TU3/74						
20-28	35-48	100	80	150	35	5
28-42	48-73	125	100	150	50	5
40-52	70-90	160	100	150	63	5
52-65	90-112	160	125	150	80	10
60-74	104-128	160	125	150	80	10
TU85						
60-90	104-156	To protect the overload relay with the current transformer from a short circuit, a fuse is used according to the contactor type from the assembly set				10
80-120	140-207					10
TU180, TU320, TU800						
all the ranges		To protect the overload relay with the current transformer from a short circuit, a fuse is used according to the contactor type from the assembly set				-

1 Coordination type according to IEC 947-4-1: «2» - easy welding of the contacts is allowed. Overload relay damage is not allowed; «1» - contact welding and damage to the overload relay are acceptable.

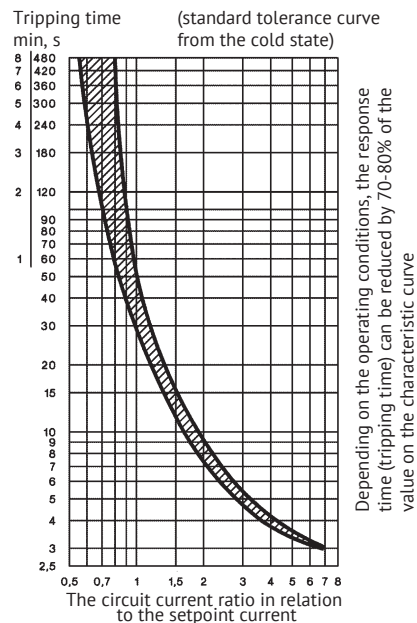
2 Safety fuse

Time-current characteristics of TU12/16E, TU3/32, TU3/42, TU3/74

with a three-phase load



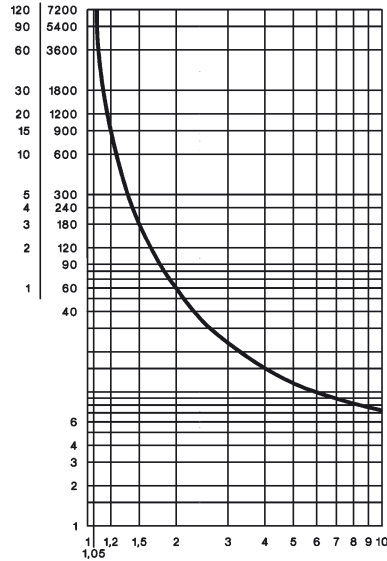
with a double-pole load



Time - current characteristics of TU85, TU180, TU320, TU800

TU85 with a three-phase load

Tripping time (faired curve for the cold state)
min, s

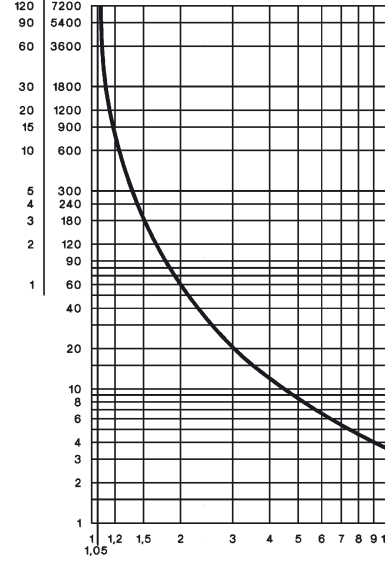


Depending on the operating conditions, the response time (tripping time) can be reduced by 20-30% of the value on the characteristic curve

Actual current to rated current ratio

TU180, TU320 with a three-phase load

Tripping time (faired curve for the cold state)
min, s

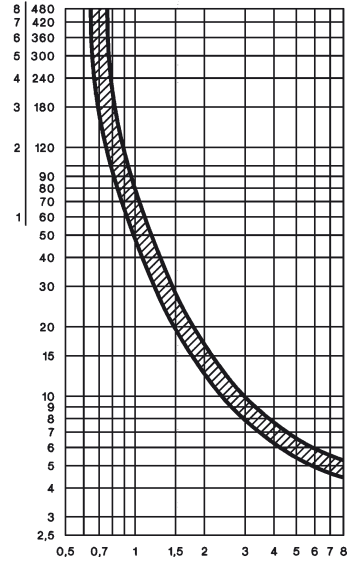


Depending on the operating conditions, the response time (tripping time) can be reduced by 20-30% of the value on the characteristic curve

Actual current to rated current ratio

With a double-pole load

Tripping time (faired curve for the cold state)
min, s

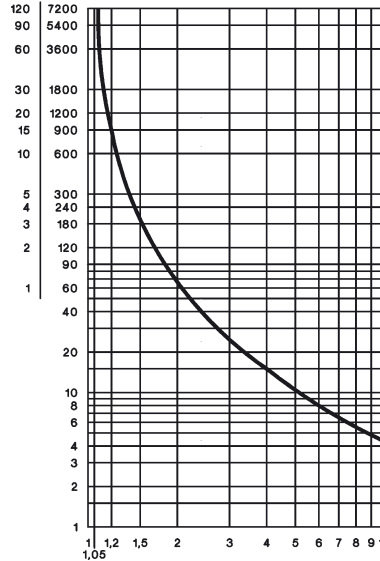


Depending on the operating conditions, the response time (tripping time) can be reduced by 70-80% of the value on the characteristic curve

$K = I_{max}/I_e$ I_{max} = maximum phase current
 I_e = maximum value of the scale

TU800 with a three-phase load

Tripping time (faired curve for the cold state)
min, s



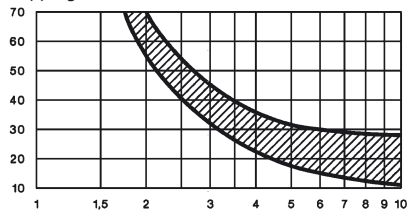
Depending on the operating conditions, the response time (tripping time) can be reduced by 20-30% of the value on the characteristic curve

Actual current to rated current ratio

Time - current characteristics of TUAT21, TUAT22, TUAT23

with a three-phase load

Tripping time, s



(standard tolerance curves from the cold state)

Depending on the operating conditions, the response time (tripping time) can be reduced by 20-30% of the value on the characteristic curve.

Actual current to rated current ratio

Miscellaneous technical specifications

Type of equipment	TU12/16	TU3/32	TU3/42	TU3/74	TU85	TU180	TU320	TU800	TUAT21	TUAT22	TUAT23
Rated insulation voltage, Ui, V	690	690	690	690	750	690	1000	1000	690	690	690
Ambient air temperature											
Application, °C	from -25 to +60				from -25 to +60		from -25 to +55		from -25 to +60		
Storage, °C	from -50 to +70				from -50 to +70		from -40 to +70		from -50 to +70		
Trip class according to IEC 947-4-1	10 A	10 A	10 A	10 A	20	10 A	10 A	10	30	30	30
Conductor cross-section - Main contacts											
single-core, mm ²	0,75-6+0,75-2,5	0,75-6	0,75-10	4-35		busbar	-	busbar	0,5-10	0,5-16	0,5-25
multiple-core, mm ²	0,75-4+0,5-2,5	1-4	0,75-6	6-25					0,5-6	0,5-10	0,5-16
flexible with a multicore end, mm ²	0,5-2,5+0,5-1,5	0,75-4	0,75-6	4-25					0,5-6	0,5-10	0,5-16
Number of wires on the terminal	1+1	2	2	1					1	1	1
Conductor cross-section - Auxiliary contacts											
single-core, mm ²	0,75-2,5				0,75-2,5		1-2,5		0,75-2,5		
multiple-core, mm ²	0,5-2,5				0,5-2,5		1-2,5		0,75-2,5		
flexible with a multicore end, mm ²	0,5-1,5				0,5-1,5		1-2,5		0,5-1,5		
Number of wires on the terminal	2				2		2		2		

Type of equipment	TU12/16A	TU12/16E TU12/16EM	TU12/16EQ	TU3/32	TU3/42 TU3/74	TU85	TU180 TU320	TU800	TUAT21 TUAT22 TUAT23	
Application category AC-15										
Rated operating current I _e , A	220 V	2,5	3	3	2	2,5	3	2	2,5	3
	400 V	1,5	2	2	1	1,5	2	1	1,5	2
	690 V	0,6	0,6	0,6	0,5	0,6	0,6	0,5	0,6	0,6
Short-circuit protection										
Maximum fuse rating, A	gL(gG)	4	6	6	4	6	6	4	6	6

Type of equipment	TU12/16	TU12/16E	TU3/32	TU3/42	TU3/42	TU3/74	TU3/74	TU85
Setting range, A	up to 23	22-30	the whole range	up to 28	28-42	up to 52	52-65	the whole range
Power loss at the current winding (not more than)								
Minimum setting value, W	1,1	1,7	1,1	1,3	1,3	2	2,9	1,1
Maximum setting value, W	2,3	3,7	2,3	2,6	3,3	3,7	4,5	2,5

Temperature compensation

In the event of a high ambient air temperature, the following formula is applied: $(\text{Ambient air temperature} - 20) \times 0,125 = \text{correction in \% of the rated load current of the motor.}$

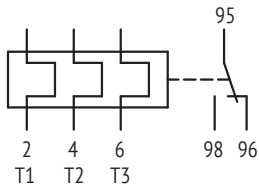
Example: the ambient air temperature is 70 °C, the motor rated load current is 7 A

$$(70-20) \times 0,125 = 6,25\%$$

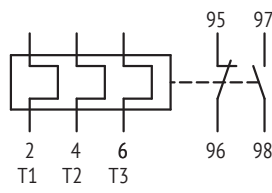
$$\text{The setting value: } 7 \text{ A} + 6,25\% = 7,44 \text{ A}$$

Electrical layouts

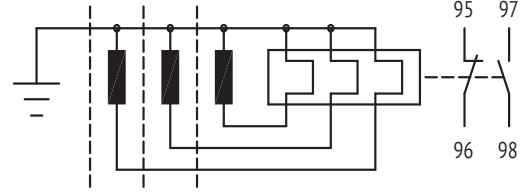
TU12/16A



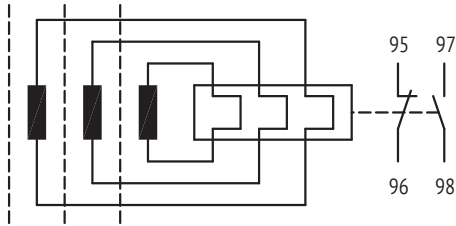
TU12/16E(Q), TU3/...



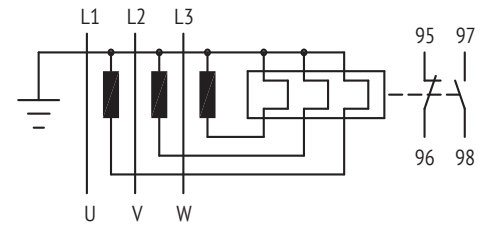
TU85



TU180

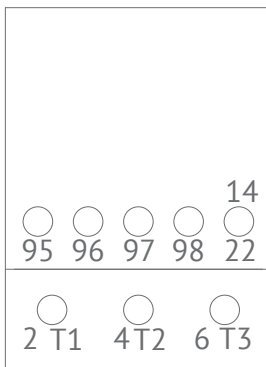


TUAT

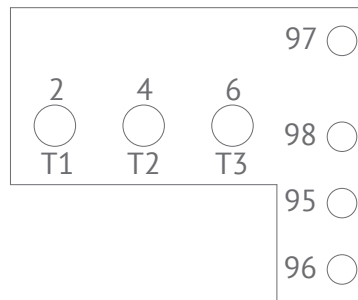


Terminal locations

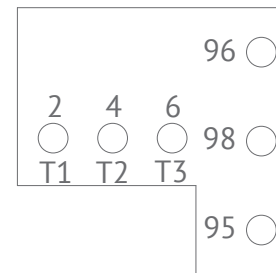
TU3/32



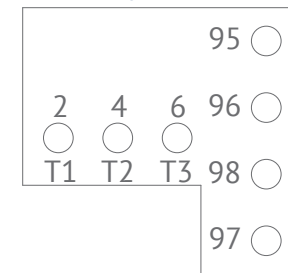
TU3/42, TU3/74



TU12/16A

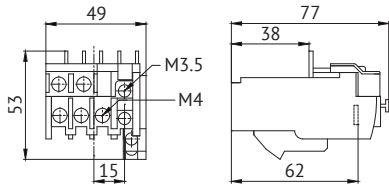


TU12/16E TU12/16EM
TU12/16EQ

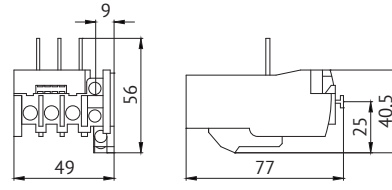


Overall dimensions (mm)

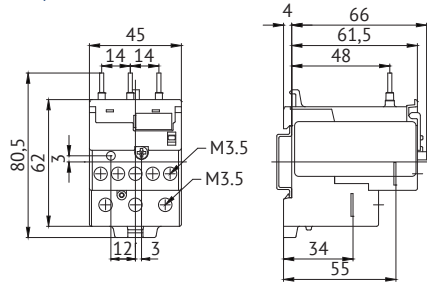
TU12/16 K1



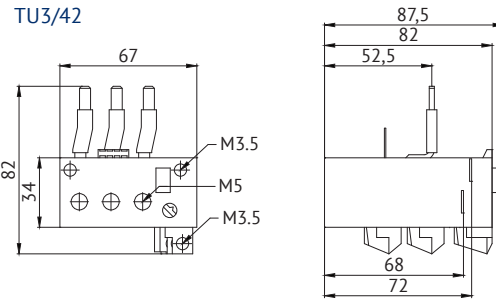
TU12/16 K3



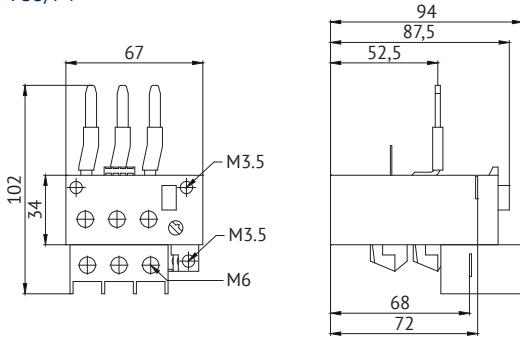
TU3/32



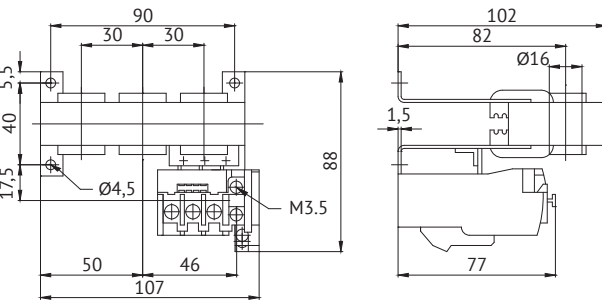
TU3/42



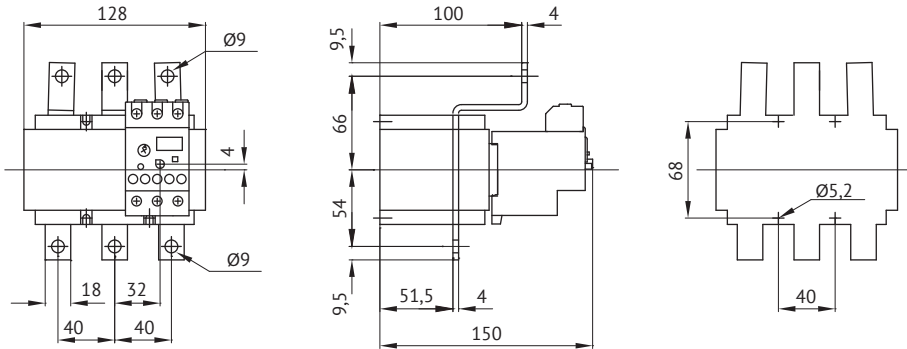
TU3/74



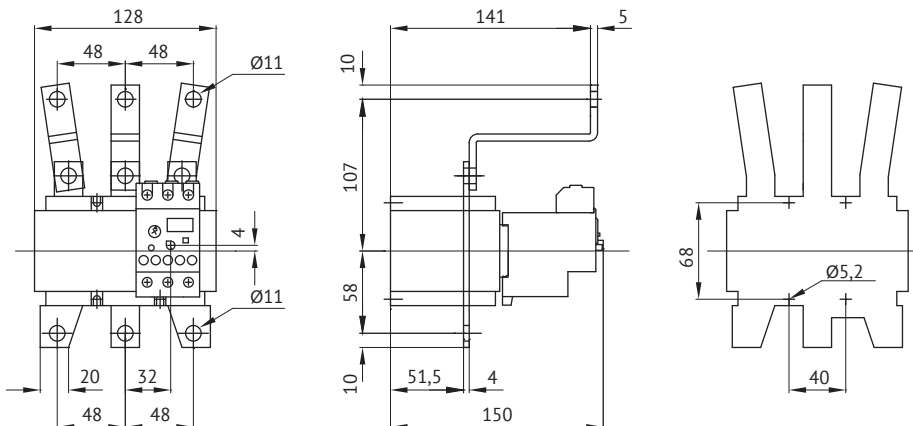
TU85



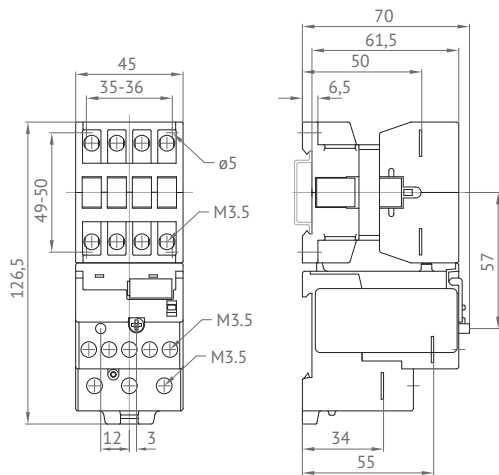
TU180



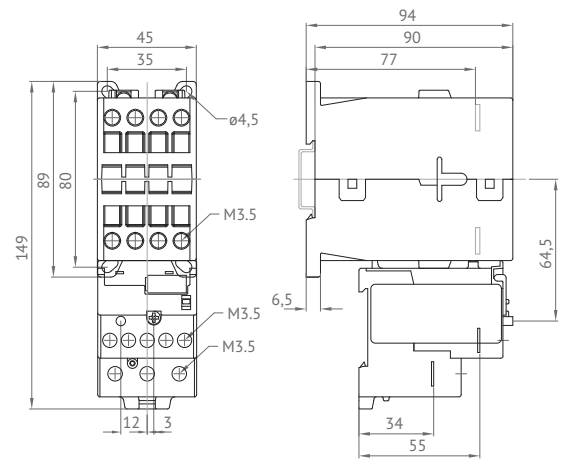
TU320



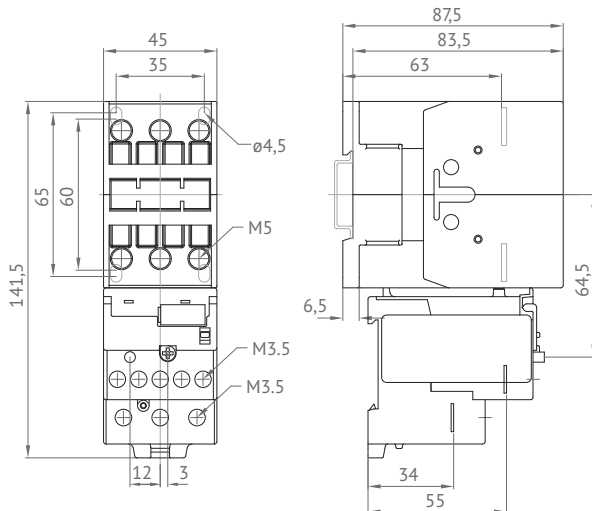
K3-10N + TU3/32 K3-18N + TU3/32
K3-14N + TU3/32 K3-22N + TU3/32



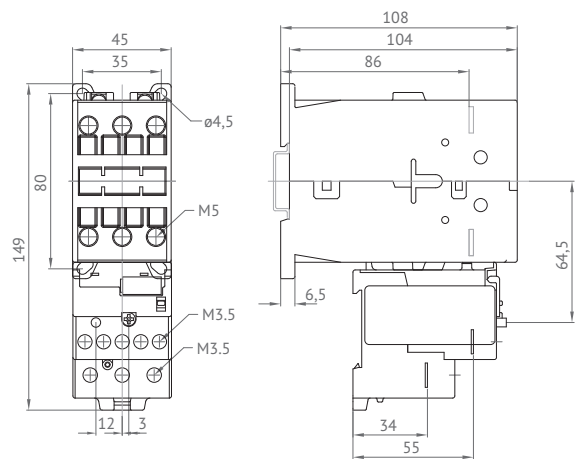
KG3-10N + TU3/32 KG3-18N + TU3/32
KG3-14N + TU3/32 KG3-22N + TU3/32



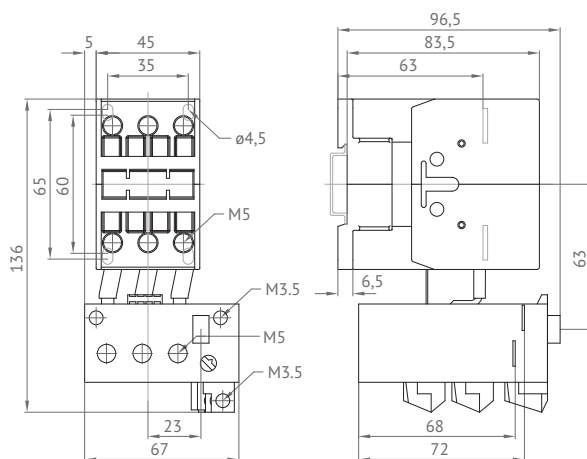
K3-24 + TU3/32 K3-40 + TU3/32
K3-32 + TU3/32



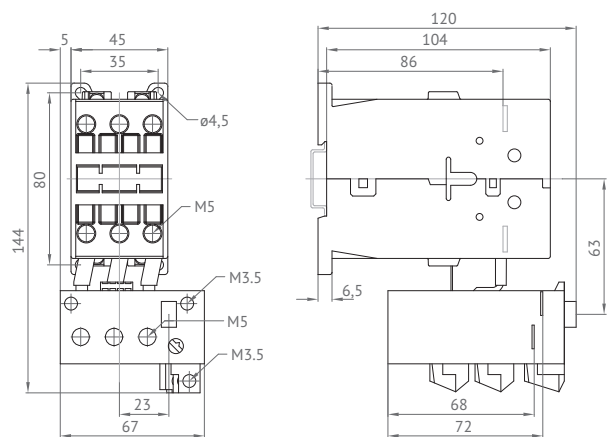
KG3-24 + TU3/32 KG3-40 + TU3/32
KG3-32 + TU3/32



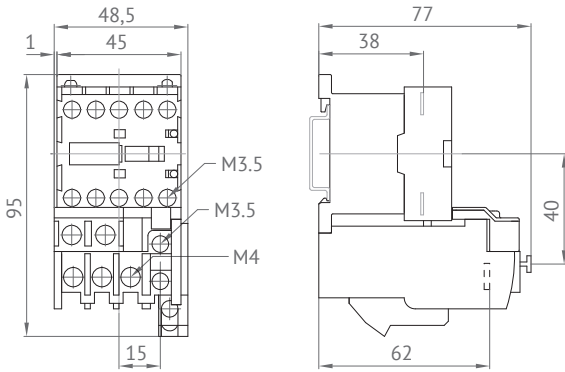
K3-24 + TU3/42 K3-40 + TU3/42
K3-32 + TU3/42



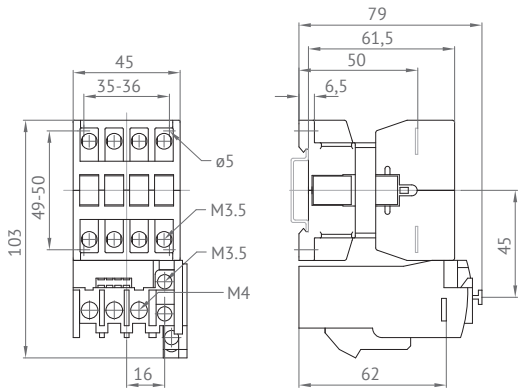
KG3-24 + TU3/42 KG3-40 + TU3/42
KG3-32 + TU3/42



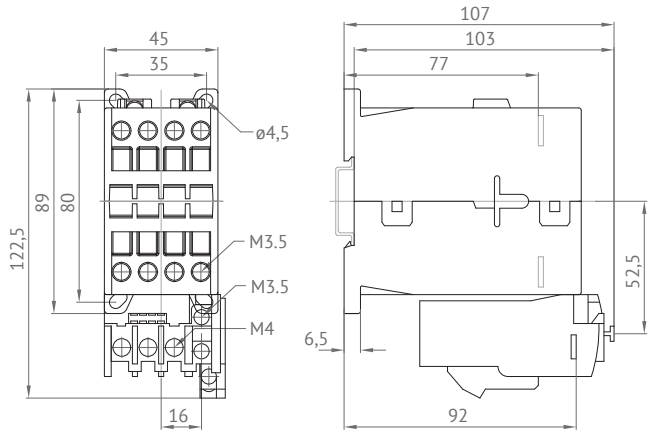
K1-09 + TU12/16...CM
K1-12 + TU12/16...CM



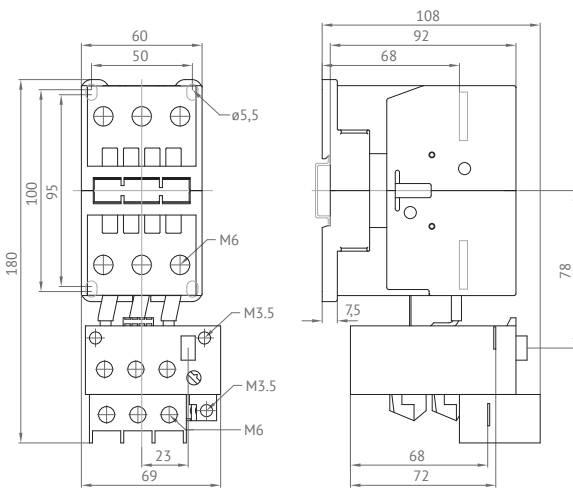
K3-10N + TU12/16...C
K3-14N + TU12/16...C



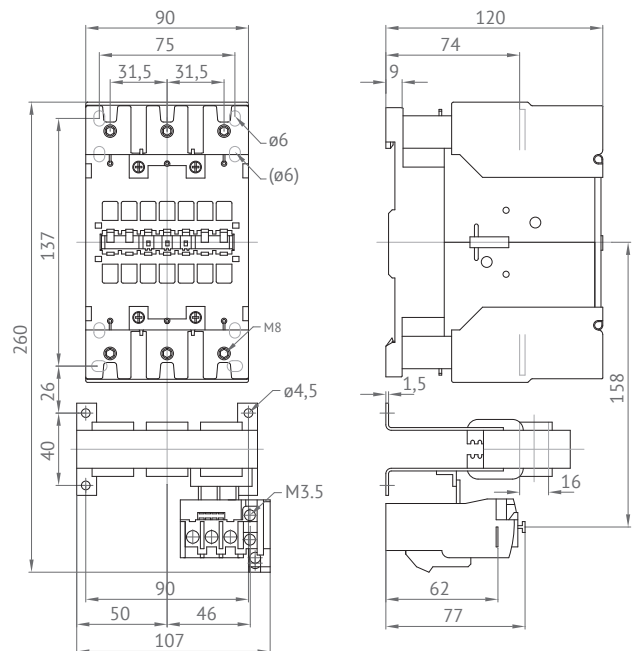
KG3-10 + TU12/16...C
KG3-14 + TU12/16...C



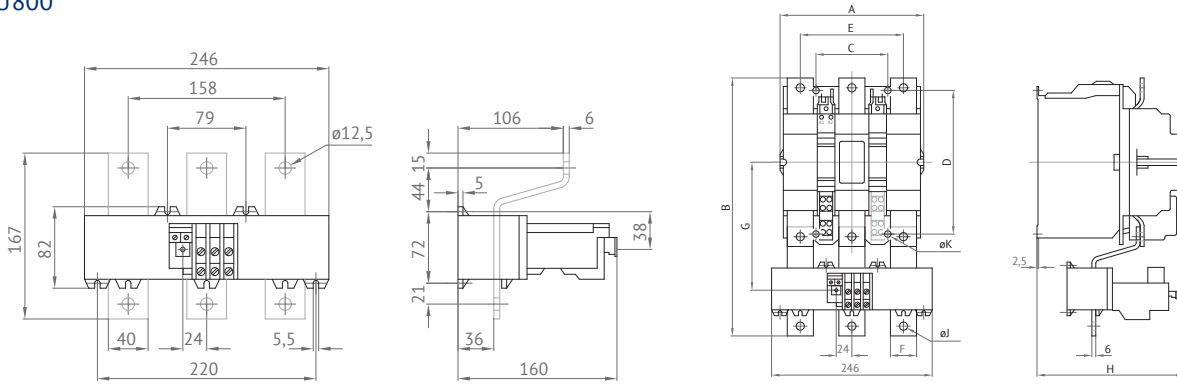
K3-50 + TU3/74
K3-62 + TU3/74



K3-90A + TU85
K3-115A + TU85



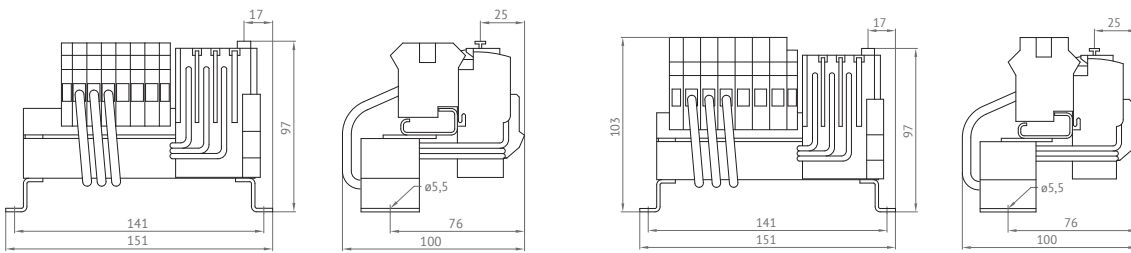
U800



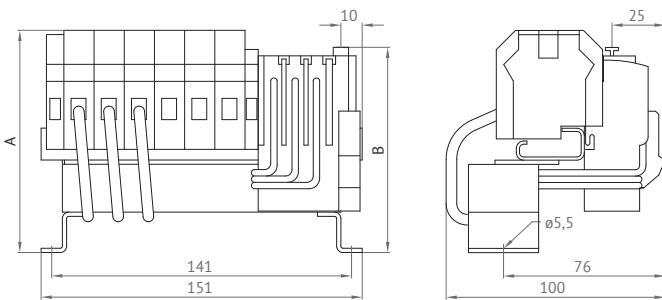
U800 with	A	B	C	D	E	F	G	H	J	K
K3-450	220	372	110	220	158	40	185	225	12,5	9
K3-550	220	395	110	220	158	40	196	225	12,5	9
K3-700	280	487	175	280	202	50	257	291	14,5	11
K3-860	280	540	175	280	202	50	280	291	14,5	11

TUAT21

TUAT22



TUAT23



Type	Setting range	A	B
TUAT23-37	23-37 A	105,5	97,5
TUAT23-49	32-49 A	94	86
TUAT23-72	48-72 A	94	86

Accessories

Appearance	For a thermal relay	Conductor cross-section, mm ²		Title	Reference	Weight, kg
		Single-core or multiple-core	Flexible			
Adapter for separate mounting						
	TU12/16...C	0,75-6	0,75-4	OptiStart TU12SM C3	117519	0,035
	TU3/42 TU3/74	-	-	OptiStart TU3/42G	117520	0,03
Additional contact terminal						
	TU3/32	0,75-6	0,75-4	OptiStart TU3/32SM	117521	0,035
	TU12/16 TU3/32	0,75-10	0,75-6	OptiStart LG9339	117833	0,009
	TU3/42	4-35	6-25	OptiStart LG7559	117522	0,052
Connecting wire						
	TU3/42 TU3/74	150 mm x 10 mm ²		OptiStart LG5830-4	117523	0,06
		250 mm x 10 mm ²		OptiStart LG5830-2	117524	0,1
Busbar						
	TU800	for contactors OptiStart K3-450..., K3-550...		OptiStart STU840/550	117517	1,7
		for contactors OptiStart K3-450..., K3-550...		OptiStart STU840/860	117518	2,1