

Modular contactor for installation into distribution boards

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1								
Type			R20	R25 (2p)	R25 (4p)	R40	R63	RH11
Main Contacts								
Rated insulation voltage U_i	V AC		440 ²⁾	440 ²⁾	440 ²⁾	440 ²⁾	440 ²⁾	440 ²⁾
Rated operation voltage U_e	V AC		250	440	440	440	440	440
Frequency of operations with AC1, AC3	1/h		300	300	300	600	600	600
Mechanical life	$S \times 10^6$		1	1	1	1	1	1
Utilization category AC1								
Rated operational current $I_e (=I_m)$	open at 60°C	A	20	25	25	40	60	-
Contact life	$S \times 10^6$		0,1	0,1	0,1	0,1	0,1	-
Minimum switch voltage	V/mA		24/100	24/100	24/100	24/100	24/100	17/5
Short time current	10s-current	A	72	72	72	216	240	-
Power loss per pole at $I_e/AC1$		W	2	3	2	3	7	0,5
Utilization category AC3								
Switching of three-phase motors								
Rated operational current I_e		A	-	-	9	27	30	-
Rated operational power of three-phase motors 50-60Hz	220V	kW	-	-	2,2	7,5	8	-
	230-240V	kW	1,1 ⁴⁾		2,5	8	8,5	-
	380-415V	kW	-	-	4	12,5	15	-
Contact life AC 3	$S \times 10^6$		-	-	0,15	0,15	0,15	-
Power consumption of coils								
AC operated	inrush sealed	VA	7-9	7-9	14-18	33-45	33-45	-
		VA	2,2-4,2	2,2-4,2	4,4-8,4	7	7	-
		W	0,8-1,6	0,8-1,6	1,6-3,2	2,6	2,6	-
Operation range of coils in multiples of control voltage U_s	(-40...+40°C)		0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	-
Short-circuit protection								
Coordination-type "1" according to IEC 947-4-1 max. fuse size	gG/gL	A	35	35	35	63	80	-
Cable cross-sections								
Main connector	solid or stranded	mm ²	1,5-10	1,5-10	1,5-10	2,5-25	2,5-25	0,5-2,5 ³⁾
		mm ²	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-2,5 ³⁾
	flexible with multicore cable end	mm ²	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-1,5
Clamps per pole			1	1	1	1	1	2
Magnetic coil	solid or stranded	mm ²	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	-
		mm ²	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	-
	flexible with multicore cable end	mm ²	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	-
Clamps per pole			1	1	1	1	1	-
Auxiliary Contacts								
Rated insulation voltage $U_i^{1)}$	V AC		-	-	-	-	-	440 ²⁾
Thermal rated current I_{th}	40°C	[A]	-	-	-	-	-	10
Ambient temperature	60°C	[A]	-	-	-	-	-	6
Utilization category AC 15								
Rated operational current I_e	220-240V	[A]	-	-	-	-	-	3
	380-415V	[A]	-	-	-	-	-	2
	440V	[A]	-	-	-	-	-	1,6
Utilization category DC13								
Rated operational current I_e per pole	24-60V	[A]	-	-	-	-	-	2
	110V	[A]	-	-	-	-	-	0,4
	220V	[A]	-	-	-	-	-	0,1
Short circuit protection								
short-circuit current 1kA, contact welding not accepted max. fuse size	gG/gL	[A]	-	-	-	-	-	10
Switching time at control voltage $U_s \pm 10\%$								
	make time	ms	7-16	7-16	9-15	11-15	11-15	-
	release time		6-12	6-12	4-8	6-13	6-13	-
	arc duration		10-15	10-15	10-15	10-15	10-15	-

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U_{imp} 8kV.
 2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} 4kV.
 3) Maximum cable cross-section with prepared conductor.
 4) ACSb motor 2-pole 230 V 1,1 kW.

Switching of Lamps

Lamp Type	Power [W]	Current [A]	Capacitors μ F	Max. lamps per pole at 230V 50Hz			
				R20	R25	R40	R63
Incandescent lamps	60	0,27	-	22	28	58	85
	100	0,45	-	13	17	35	51
	200	0,91	-	7	8	17	25
	300	1,36	-	4	5	11	16
	500	2,27	-	3	3	7	10
	1000	4,5	-	1	1	3	5
Fluorescent lamps, uncompensated or serial compensated	11	0,16	-	60	75	210	310
	18	0,37	2,7	25	30	90	140
	24	0,35	2,5	25	30	90	140
	36	0,43	3,4	20	25	70	140
	58	0,67	5,3	14	17	45	70
	65	0,67	5,3	13	16	40	65
	85	0,8	-	11	14	35	60
Fluorescent lamps, dual-connection	11	0,07	-	2x100	2x110	2x220	2x250
	18	0,11	-	2x50	2x55	2x130	2x200
	24	0,14	-	2x40	2x44	2x110	2x160
	36	0,22	-	2x30	2x33	2x70	2x100
	58	0,35	-	2x20	2x22	2x45	2x70
	65	0,35	-	2x15	2x16	2x40	2x60
	85	0,47	-	2x10	2x11	2x30	2x40
Fluorescent lamps, parallel compensated	11	0,16	2,0	30	30	100	140
	18	0,37	2,0	20	20	70	90
	24	0,35	3,0	15	15	55	75
	36	0,43	4,5	10	10	38	51
	58	0,67	7,0	6	6	25	30
	65	0,67	7,0	5	5	24	28
	85	0,8	8,0	4	4	18	23
Fluorescent lamps, with serial electronic	18	0,09	-	40	40	100	150
	36	0,16	-	20	20	50	75
	58	0,25	-	15	15	30	55
	2x18	0,17	-	2x20	2x20	2x50	2x60
	2x36	0,32	-	2x10	2x10	2x25	2x30
	2x58	0,49	-	2x7	2x7	2x15	2x20
Transformers for metal halid low voltage lamps	20		-	40	52	110	174
	50		-	20	24	50	80
	75		-	13	16	35	54
	100		-	10	12	27	43
	150		-	7	9	19	29
	200		-	5	5	14	23
	300		-	3	4	9	14
Mercury-vapour lamps (high pressure lamps), uncompensated e. g. HQL, HPL	50	0,61	-	16	18	38	55
	80	0,8	-	12	14	28	40
	125	1,15	-	8	9	20	28
	250	2,15	-	4	5	11	15
	400	3,25	-	3	4	7	10
	700	5,4	-	1	2	4	6
	1000	7,5	-	1	1	3	4
Mercury-vapour lamps (high pressure lamps), compensated e. g. HQL, HPL	50	0,28	7	7	7	32	46
	80	0,41	8	5	5	25	35
	125	0,65	10	3	3	16	22
	250	1,22	18	2	2	8	12
	400	1,95	25	1	1	5	7
	700	3,45	45	1	1	3	4
	1000	4,8	60	-	-	2	3

Switching of Lamps							
Lamp Type	Power [W]	Current [A]	Capacitors μF	Max. lamps per pole at 230V 50Hz			
				R20	R25	R40	R63
Metal halide lamps uncompensated e. g. HQI, HPI, CDM 400 V per pole	35	0,53	-	22	24	45	65
	70	1	-	12	14	24	35
	150	1,8	-	6	8	13	18
	250	3	-	4	5	8	12
	400	3,5	-	3	4	6	10
	1000	9,5	-	1	1	2	4
	2000	16,5	-	-	-	1	2
	3500	18	-	-	-	-	1
Metal halide lamps compensated e. g. HQI, HPI 400 V per pole	35	0,25	6	8	8	38	50
	70	0,45	12	4	4	20	28
	150	0,75	20	2	2	12	17
	250	1,5	33	1	1	7	10
	400	2,1	35	1	1	5	7
	1000	5,8	95	-	-	2	3
	2000	11,5	148	-	-	1	1
	3500	11,6	100	-	-	-	1
Metal halide lamps with serial electronic (e.g. PCI) 50-125 x I _{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
Sodium-vapour lamps (low pressure lamps), uncompensated	35	1,5	-	7	9	22	30
	55	1,5	-	7	9	22	30
	90	2,4	-	4	6	13	19
	135	3,5	-	3	4	10	13
	150	3,3	-	3	4	10	13
	180	3,3	-	3	4	10	13
	200	3,3	-	3	4	10	13
Sodium-vapour lamps (low pressure lamps), compensated	35	0,31	20	3	3	12	16
	55	0,42	20	2	2	8	14
	90	0,63	30	1	1	5	9
	135	0,94	45	1	1	3	6
	150	1	40	1	1	3	6
	180	1,16	40	1	1	2	5
	200	1,32	25	-	-	2	4
Sodium-vapour lamps (high pressure lamps), uncompensated	150	1,8	-	5	6	11	22
	250	3	-	4	5	7	13
	330	3,7	-	3	4	6	10
	400	4,7	-	2	2	5	8
	1000	10,3	-	1	1	2	4
Sodium-vapour lamps (high pressure lamps), compensated	150	0,83	20	2	2	7	14
	250	1,5	33	1	1	4	8
	330	2	40	1	1	3	6
	400	2,4	48	1	1	2	5
	1000	6,3	106	-	-	1	2
Sodium-vapour lamps (high pressure lamps) with serial electronic (e.g. PCI) 50-125 x I _{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
LED Lamps	max. inrush current of contactor [A]			195	233	424	565

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Type				RD20	RD25	RD40	RD63			
General	Standards			IEC/EN 61095, IEC/EN 60947-4-1, IEC/EN 60947-5-1						
	Module width			1	2	3				
	Mechanical endurance			3 x 106		3 x 106				
	Ambient temperature			-5 ... +55						
	Storage temperature			-30 ... +80						
	No. of contactors (side-by-side)			≤ 40 °C		max. 3				
				40 - 55 °C		max. 2				
	Contact reliability			17 V; ≥ 50 mA						
	Min. distance of open contacts			mm 3,6						
	Power dissipation per pole			1,7	2,2	4	8			
	Overload current withstand capability			72	68	176	240			
	Max. back-up fuse for short-circuit protection gL			lv A 20 25 63 80						
	Coordination type 2									
	Max. operating frequency			DC-1		300				
				AC-1/AC-3/AC-5b/AC-6b		600				
AC-15				1200						
no load				3000						
Weight			0,13	0,24	0,42					
Main circuit	Rated insulation voltage			Ui V 230		440				
	Rated impulse withstand voltage			Uimp kV 4						
	Thermal current			Ith A 20		25 40 63				
	Rated operational voltage			Ue V 230		400				
	Rated frequency			f Hz 50/60						
	Rated operational current AC-1/AC-7a			le A 20		25 40 63				
	Operational power AC-1/AC-7a			single-phase 230 V		4	5,4	8,7	13,3	
				three-phase 230 V		Pe kW -		9	16	24
				three-phase 400 V		-		16	26	40
	Electrical endurance AC-1/AC-7a			op. c. 200.000		100.000				
	Rated operational current AC-3/AC-7b			le A 9		8,5 22 30				
	Operational power AC-3/AC-7b			single-phase motor 230 V		1.3 -> NO ¹⁾	1.3 ²⁾	3.7 ²⁾	5 ²⁾	
				three-phase motor 230 V		Pe kW -		2,2	5,5	8,5
				three-phase motor 400 V		-		4	11	15
	Electrical endurance AC-3/AC-7b			op. c. 300.000		500.000 150.000				
Switching of capacitors AC-6b 230 V			C μF 30		36 220 330					
Electrical endurance AC-6b			op. c. 100.000							

1) Make contacts are marked NO

2) Data for single-phase power are valid for versions -22, -20 and -02

LED lamps, Power supplies for LEDs

RD20, RD20-R, R20-R	RD25, RD25-R, R25-R	RD40	RD63
max. 2,4 A per pole	max. 3,8 A per pole	max. 11 A per pole	max. 18 A per pole

Technical data

Type					RD20	RD25	RD63	RD63
Main circuit	Rated operational current	DC-1						
	1 pole	Ue = 24 V DC			20	25	40	63
		Ue = 110 V DC			6	6	4	4
		Ue = 220 V DC			0,6	0,6	1,2	1,2
	2 poles connected in series	Ue = 24 V DC			20	25	40	63
		Ue = 110 V DC			10	10	10	10
		Ue = 220 V DC			6	6	8	8
	3 poles connected in series	Ue = 24 V DC			-	25	40	63
		Ue = 110 V DC			-	20	30	35
		Ue = 220 V DC			-	15	20	30
	4 poles connected in series	Ue = 24 V DC			-	25	40	63
		Ue = 110 V DC			-	20	40	63
		Ue = 220 V DC			-	15	40	63
	Electrical endurance	DC-1			op. c. 100.000			
Terminal capacity	rigid	S	mm ²	1 ... 10		1.5 ... 25		
	flexible			1 ... 6		1.5 ... 16		
Screw				M3.5		M5		
Screw Head				PZ1		PZ2		
Tightening torque				1,2		3,5		
Auxiliary circuit	Rated operational voltage	Ue	V	230	400	400	400	
	Rated insulation voltage	Ui	V	230	440	440	440	
	Rated impulse withstand voltage	Uimp	kV	4				
	Thermal current	Ith	A	20	25	40	63	
	AC-15							
	Rated operational current	single-phase	230 V	le	A	6		
		single-phase	400 V			-	4	
Electrical endurance	AC-15			300.000	500.000	150.000		
Range of control voltage				Uc	% 85 ... 110			
Control voltages				Uc	V 12 ... 230			
Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5				kV 2				
Coil consumption	switch-on			VA/W	2.1/2.1	2.6/2.6 ³⁾	5/5	5/5
	operation				2.1/2.1	2.6/2.6 ³⁾	5/5	5/5
Make/break delays	make			ms	15 – 45	15 – 45	15 – 20	15 – 20
	break				20 – 50	20 – 70	35 – 45	35 – 45
Terminal capacity	rigid	S	mm ²	1 ... 2.5		1 ... 2.5		
	flexible			1 ... 2.5		1 ... 2.5		
Screw				M 3.5		M3		
Screw head				PZ1				
Tightening torque				Nm 0,6				

3) Coil consumption for version -04 is 3.8 VA/3.8 W

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

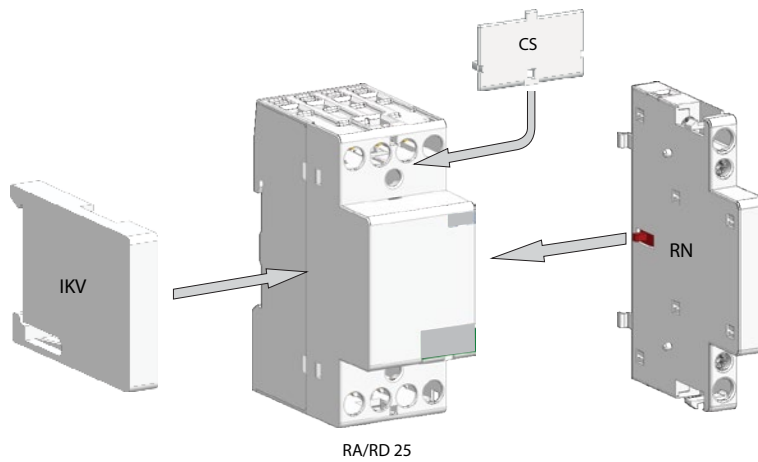
Type			R 20-R	RD 20-R	R 25-R	R D25-R	
General	Standards		IEC/EN 61095, IEC/EN 60947-4-1, IEC/EN 60947-5-1				
	Module width		1		2		
	Mechanical endurance		op. c. 3 x 106				
	Ambient temperature		°C -5 ... +55				
	Storage temperature		°C -30 ... +80				
	No. of contactors (side-by-side)		≤ 40 °C	max. 3	max. 3	no limit	max. 3
			40 - 55 °C	max. 2	max. 2		max. 2
	Contact reliability		17 V; ≥ 50 mA				
	Min. distance of open contacts		mm 3,6				
	Power dissipation per pole		W 1,7 1,7 2,2 2,2				
	Overload current withstand capability		A 72 72 68 68				
	Max. back-up fuse for short-circuit protection gL		Iv A 20 20 25 25				
	Coordination type 2						
	Max. operating frequency		DC-1	op. c./h 300			
			AC-1/AC-3/AC-5b/AC-6b	600			
			AC-15	1200			
			no load	3000			
	Weight		kg 0,13 0,13 0,24 0,24				
	Rated insulation voltage		Ui V 230 440				
	Rated impulse withstand voltage		Uimp kV 4				
Thermal current		Ith A 20 20 25 25					
Rated operational voltage		Ue V 230 230 400 400					
Rated frequency		f Hz 50/60					
Rated operational current		AC-1/AC-7a Ie A 20 20 25 25					
Operational power AC-1/AC-7a		single-phase 230 V	Pe kW 4 4 5,4 5,4				
		three-phase 230 V	- - 9 9				
		three-phase 400 V	- - 16 16				
Electrical endurance		AC-1/AC-7a op. c. 200.000					
Electrical endurance		AC-3/AC-7b op. c. 300.000 500.000 150.000					
Switching of capacitors							
		AC-6b 230 V	C μF 30 30 36 36				
Electrical endurance		AC-6b op. c. 100.000					
Rated operational current		AC-1/AC-7a Ie A 9 9 8,5 8,5					
Operational power AC-3/AC-7b		single-phase motor 230 V	1.3 only for NO ¹⁾ 1.3 only for NO ¹⁾ 1.3 ²⁾ 1.3 ²⁾				
		three-phase motor 230 V	Pe kW - - 2,2 2,2				
		three-phase motor 400 V	- - 4 4				
Electrical endurance		AC-3/AC-7b op. c. 300.000 500.000					
Switching of capacitors							
		AC-6b 230 V	C μF 30 30 36 36				
Electrical endurance		AC-6b op. c. 100.000					

1) Make contacts are marked NO

2) Data for single-phase power are valid for versions -22, -20 and -02

Technical data

Type		R 20-R	RD 20-R	R 25-R	RD 25-R				
Main circuit	Rated operational current	DC-1							
	1 pole	Ue = 24 V DC		20	20	25	25		
		Ue = 110 V DC		le				A	6
		Ue = 220 V DC						0,6	
	2 poles connected in series	Ue = 24 V DC		20		25			
		Ue = 110 V DC		le				A	10
		Ue = 220 V DC						6	
	3 poles connected in series	Ue = 24 V DC		-	-	25	25		
		Ue = 110 V DC		le				A	20
		Ue = 220 V DC						15	
	4 poles connected in series	Ue = 24 V DC		-	-	25	25		
		Ue = 110 V DC		le				A	20
		Ue = 220 V DC						15	
	Electrical endurance	DC-1			op. c.		100.000		
Terminal capacity	rigid	S		mm ²		1 ... 10			
	flexible					1 ... 6			
Screw						M3.5			
Screw Head						PZ1			
Tightening torque						Nm	1,2		
Auxiliary circuit	Rated operational voltage	Ue		V	230	230	400	400	
	Rated insulation voltage	Ui		V	230	230	440	440	
	Rated impulse withstand voltage	Uimp		kV	4				
	Thermal current	Ith		A	20	20	25	25	
	AC-15	single-phase							
	Rated operational current	230 V		le		A		6	
		single-phase							
	AC-15	400 V				-	-	4	4
Electrical endurance				op. c.		300.000	500.000		
Control circuit	Range of control voltage	Uc		%	85 ... 110				
	Control voltages	Uc		V	12 ... 230				
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5			kV	2				
	Coil consumption	switch-on (handle in A)		VA/W		12/10	2.1/2.1	33/25	2.6/2.6
		switch-on (handle in B)				6/3.8	2.1/2.1	10/5	2.6/2.6
		operation				2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6
	Make/break delays	make		ms		15 – 25	15 – 45	10 – 30	15 – 45
		break				10 – 30	20 – 50	10 – 30	20 – 70
	Terminal capacity	rigid	S		mm ²		1 ... 2.5		
		flexible					1 ... 2.5		
Screw						M3			
Screw head						PZ1			
Tightening torque						Nm	0,6		



Technical data

Type				RN		
Standards				IEC/EN 60947-5-1		
Module width				1/2		
Rated insulation voltage U_i		U_i	V	500		
Rated impulse withstand voltage U_{imp}		U_{imp}	kV	4		
Thermal current		I_{th}	A	6		
Rated operational voltage		U_e	V	230		
				400		
Rated operational current						
	AC-15	$U_e = 230V$	I_e	A	6	
		$U_e = 400V$			4	
Electrical endurance				op. c.	50.000	
Mechanical endurance				op. c.	3×10^6	
Min. distance of open contacts				mm	4	
Contact reliability					12 V; ≥ 5 mA	
Power loss per pole				W	0,3	
Weight				kg	0,035	
Max. back-up fuse for short-circuit protection gL						
Coordination type 2				I_v	A	6
Terminal capacity	rigid	S	mm ²		1...2.5	
	flexible				1...2.5	
Screw					M3	
Screw head					PZ1	
Tightening torque				Nm	0,6	

Technical data

Type	Power (W)	Current (A)	C (μF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Incandescent lamps (tungsten filament)	60	0,26	—	33	33	65	85
	100	0,44	—	20	20	40	50
	200	0,87	—	10	10	20	25
	500	2,17	—	3	3	8	10
	1000	4,35	—	1	1	4	5
Fluorescent lamps. uncorrected or series correction	18	0,37	2,7	22	24	90	140
	24	0,35	2,5	22	24	90	140
	36	0,43	3,4	17	20	65	95
	58	0,67	5,3	14	17	45	70
Fluorescent lamps. lead-lag circuit	2 x 18	0,11	—	2 x 30	2 x 40	2 x 100	2 x 150
	2 x 24	0,14	—	2 x 24	2 x 31	2 x 78	2 x 118
	2 x 36	0,22	—	2 x 17	2 x 24	2 x 65	2 x 95
	2 x 58	0,35	—	2 x 10	2 x 14	2 x 40	2 x 60
Fluorescent lamps. parallel correction	18	0,12	4,5	7	8	48	73
	24	0,15	4,5	7	8	48	73
	36	0,00	4,5	7	8	48	73
	58	0,32	7	4	5	31	47
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	—	25	35	100	140
	36	0,16	—	15	20	52	75
	58	0,25	—	14	19	50	72
	2 x 18	0,17	—	2 x 12	2 x 17	2 x 50	2 x 70
	2 x 36	0,32	—	2 x 7	2 x 10	2 x 26	2 x 38
	2 x 58	0,49	—	2 x 7	2 x 9	2 x 25	2 x 36
High-pressure mercury-vapour lamps. uncorrected	50	0,61	—	14	18	38	55
	80	0,01	—	10	13	29	42
	125	1,15	—	7	9	20	29
	250	2,15	—	4	5	10	15
	400	3,25	—	2	3	7	10
	700	0,05	—	1	2	4	6
	1000	0,08	—	1	1	3	4
High-pressure mercury- vapour lamps, parallel correction	50	0,28	7	4	5	31	47
	80	0,41	8	4	5	27	41
	125	0,65	10	3	4	22	33
	250	1,22	18	1	2	12	18
	400	1,95	25	1	1	9	13
	700	3,45	45	—	—	5	7
Halogen metal-vapour lamps. uncorrected	1000	0,05	60	—	—	4	5
	35	0,53	—	18	22	43	60
	70	0,01	—	10	12	23	32
	150	0,02	—	5	7	12	18
	250	0,03	—	3	4	7	10
	400	0,04	—	3	3	6	9
	1000	0,10	—	1	1	2	3
Halogen metal-vapour lamps, parallel correction	2000	16,5	—	—	—	1	1
	35	0,25	6	5	6	36	50
	70	0,45	12	2	3	18	25
	150	0,75	20	1	1	11	15
	250	0,02	33	—	1	6	9
	400	0,03	35	—	1	6	8
Halogen metal-vapour lamps, parallel correction	1000	0,06	95	—	—	2	3
	2000	0,12	148	—	—	1	2

Type	Power (W)	Current (A)	C (μF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x l n lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Transformers for halogen metal-vapour lamps	20	–	–	40	52	110	174
	50	–	–	20	24	50	80
	75	–	–	13	16	35	54
	100	–	–	10	12	27	43
	150	–	–	7	9	19	29
	200	–	–	5	6	14	23
	300	–	–	3	4	9	14
High-pressure sodium-vapour lamps. uncorrected	150	002	–	5	6	17	22
	250	003	–	3	4	10	13
	400	005	–	2	2	6	8
	1000	10,3	–	–	1	3	3
High-pressure sodium-vapour lamps. parallel correction	150	0,83	20	1	1	11	16
	250	002	33	–	1	6	10
	400	002	48	–	–	4	6
	1000	006	106	–	–	2	3
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x l n lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Low-pressure sodium-vapour lamps. uncorrected	18	0,35	–	22	27	71	90
	35	002	–	7	9	23	30
	55	002	–	7	9	23	30
	90	002	–	4	5	14	19
	135	004	–	3	4	10	13
	180	003	–	3	4	10	13
Low-pressure sodium-vapour lamps. parallel correction	18	0,35	5	6	7	44	66
	35	0,31	20	1	1	11	16
	55	0,42	20	1	1	11	16
	90	0,63	26	1	1	8	12
	135	0,94	45	–	–	5	8
	180	1,16	40	–	–	4	7

Technical data

Type	Power (W)	Current (A)	C (μF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	30	80	110
	40	0,21		12	15	40	60
	55	0,28		8	12	30	45
	14	0,08	HE	30	40	105	150
	21	0,11		22	30	80	115
	28	0,14		18	22	60	90
	35	0,18		14	18	48	70
	24	0,12	HO	20	26	70	100
	39	0,20		12	16	42	62
	49	0,24		10	14	35	52
	54	0,27		9	13	32	47
	80	0,39		6	8	22	32
	2 x 22	0,23	2 x FC	2 x 11	2 x 15	2 x 40	2 x 55
	2 x 40	0,42		2 x 6	2 x 7	2 x 20	2 x 30
	2 x 55	0,55		2 x 4	2 x 6	2 x 15	2 x 22
	2 x 14	0,15	2 x HE	2 x 15	2 x 20	2 x 52	2 x 75
	2 x 21	0,22		2 x 11	2 x 15	2 x 40	2 x 57
	2 x 28	0,28		2 x 9	2 x 11	2 x 20	2 x 45
	2 x 35	0,36		2 x 7	2 x 9	2 x 24	2 x 35
	2 x 24	0,24	2 x HO	2 x 10	2 x 13	2 x 35	2 x 50
	2 x 39	0,39		2 x 6	2 x 8	2 x 21	2 x 31
	2 x 49	0,48		2 x 5	2 x 7	2 x 17	2 x 26
	2 x 54	0,54		2 x 4	2 x 6	2 x 16	2 x 23
2 x 80	0,74	2 x 3		2 x 4	2 x 11	2 x 16	

Type	Power (W)	Current (A)	C (μF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Incandescent lamp (tungsten filament)	60	0,26	—	33	33	33	33
	100	0,44	—	20	20	20	20
	200	0,87	—	10	10	10	10
	500	2,17	—	3	3	3	3
	1000	4,35	—	1	1	1	1
Fluorescent lamps uncorrected or series correction	18	0,37	2,7	22	22	24	24
	24	0,35	2,5	22	22	24	24
	36	0,43	3,4	17	17	20	20
	58	0,67	5,3	14	14	17	17
Fluorescent lamps lead-lag circuit	2 x 18	0,11	—	2 x 30	2 x 30	2 x 40	2 x 40
	2 x 24	0,14	—	2 x 24	2 x 24	2 x 31	2 x 31
	2 x 36	0,22	—	2 x 17	2 x 17	2 x 24	2 x 24
	2 x 58	0,35	—	2 x 10	2 x 10	2 x 14	2 x 14
Fluorescent lamps parallel correction	18	0,12	4,5	7	7	8	8
	24	0,15	4,5	7	7	8	8
	36	0,00	4,5	7	7	8	8
	58	0,32	7	4	4	5	5

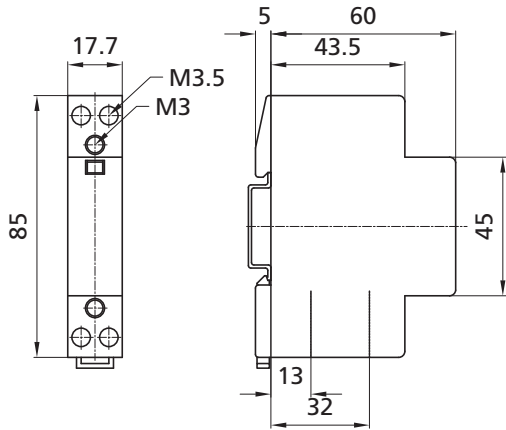
Type	Power (W)	Current (A)	C (μF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	—	25	25	35	35
	36	0,16	—	15	15	20	20
	58	0,25	—	14	14	19	19
	2 x 18	0,17	—	2 x 12	2 x 12	2 x 17	2 x 17
	2 x 36	0,32	—	2 x 7	2 x 7	2 x 10	2 x 10
	2 x 58	0,49	—	2 x 7	2 x 7	2 x 9	2 x 9
High-pressure mercury-vapour lamps uncorrected	50	0,61	—	14	14	18	18
	80	0,01	—	10	10	13	13
	125	1,15	—	7	7	9	9
	250	2,15	—	4	4	5	5
	400	3,25	—	2	2	3	3
	700	0,05	—	1	1	2	2
High-pressure mercury-vapour lamps, parallel correction	1000	0,08	—	1	1	1	1
	50	0,28	7	4	4	5	5
	80	0,41	8	4	4	5	5
	125	0,65	10	3	3	4	4
	250	1,22	18	1	1	2	2
	400	1,95	25	1	1	1	1
Halogen metal-vapour lamps uncorrected	700	3,45	45	—	—	—	—
	1000	0,05	60	—	—	—	—
	35	0,53	—	18	18	22	22
	70	0,01	—	10	10	12	12
	150	0,02	—	5	5	7	7
	250	0,03	—	3	3	4	4
Halogen metal-vapour lamps, parallel correction	1000	0,10	—	1	1	1	1
	2000	16,5	—	—	—	—	—
	35	0,25	6	5	5	6	6
	70	0,45	12	2	2	3	3
	150	0,75	20	1	1	1	1
	250	0,02	33	—	—	1	1
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	400	0,03	35	—	—	1	1
	1000	0,06	95	—	—	—	—
	2000	11,5	148	—	—	—	—
	20	0,00	integrated	9	9	9	9
Transformers for halogen metal-vapour lamps	35	0,00	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	0,01	integrated	4	4	4	4
	20	—	—	40	40	52	52
	50	—	—	20	20	24	24
	75	—	—	13	13	16	16
	100	—	—	10	10	12	12
High-pressure sodium-vapour lamps, uncorrected	150	—	—	7	7	9	9
	200	—	—	5	5	6	6
	300	—	—	3	3	4	4
	150	0,02	—	5	5	6	6
High-pressure sodium-vapour lamps, uncorrected	250	0,03	—	3	3	4	4
	400	0,05	—	2	2	2	2
	1000	10,3	—	—	—	1	1

Technical data

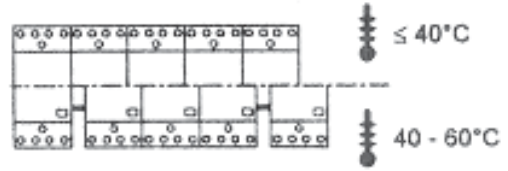
Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
High-pressure sodium-vapour lamps, parallel correction	150	0,83	20	1	1	1	1
	250	002	33	—	—	1	1
	400	002	48	—	—	—	—
	1000	006	106	—	—	—	—
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x ln lamp for 0.6 ms	20	000	integrated	9	9	9	9
	35	000	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	001	integrated	4	4	4	4
Low-pressure sodium-vapour lamps, uncorrected	18	0,35	—	22	22	27	27
	35	002	—	7	7	9	9
	55	002	—	7	7	9	9
	90	002	—	4	4	5	5
	135	004	—	3	3	4	4
	180	003	—	3	3	4	4
Low-pressure sodium-vapour lamps, parallel correction	18	0,35	5	6	6	7	7
	35	0,31	20	1	1	1	1
	55	0,42	20	1	1	1	1
	90	0,63	26	1	1	1	1
	135	0,94	45	—	—	—	—
	180	1,16	40	—	—	—	—
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	22	30	30
	40	0,21		12	12	15	15
	55	0,28		8	8	12	12
	14	0,08	HE	30	30	40	40
	21	0,11		22	22	30	30
	28	0,14		18	18	22	22
	35	0,18		14	14	18	18
	24	0,12	HO	20	20	26	26
	39	000		12	12	16	16
	49	0,24		10	10	14	14
	54	0,27		9	9	13	13
	80	0,39		6	6	8	8
	2 x 22	0,23	2 x FC	2 x 11	2 x 11	2 x 15	2 x 15
	2 x 40	0,42		2 x 6	2 x 6	2 x 7	2 x 7
	2 x 55	0,55		2 x 4	2 x 4	2 x 6	2 x 6
	2 x 14	0,15	2 x HE	2 x 15	2 x 15	2 x 20	2 x 20
	2 x 21	0,22		2 x 11	2 x 11	2 x 15	2 x 15
	2 x 28	0,28		2 x 9	2 x 9	2 x 11	2 x 11
	2 x 35	0,36		2 x 7	2 x 7	2 x 9	2 x 9
	2 x 24	0,24		2 x 10	2 x 10	2 x 13	2 x 13
2 x 39	0,39	2 x HO	2 x 6	2 x 6	2 x 8	2 x 8	
2 x 49	0,48		2 x 5	2 x 5	2 x 7	2 x 7	
2 x 54	0,54		2 x 4	2 x 4	2 x 6	2 x 6	
2 x 80	0,74		2 x 3	2 x 3	2 x 4	2 x 4	

Dimensions

R20
165,150

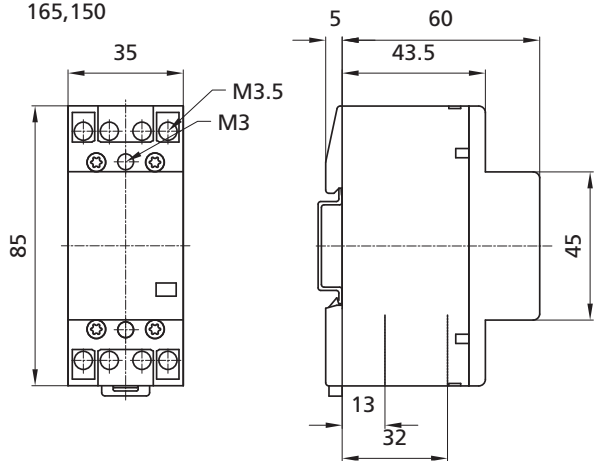


Distance piece

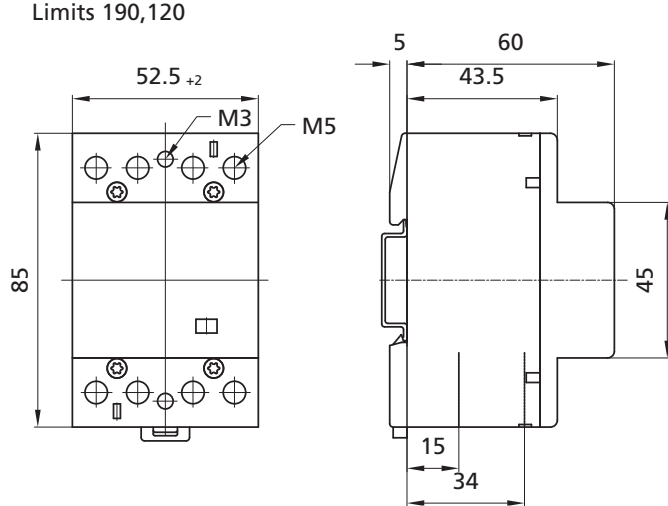


Distance piece is used where ambient temperature is higher than 40°C. Piece width is 1/2 module (8,8 mm)

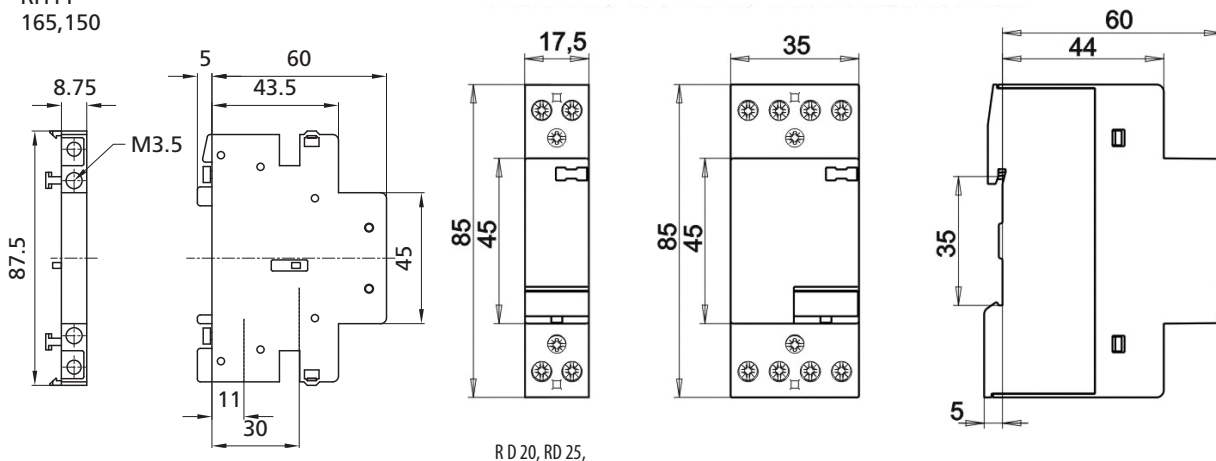
R25
165,150



R40,R63
Limits 190,120

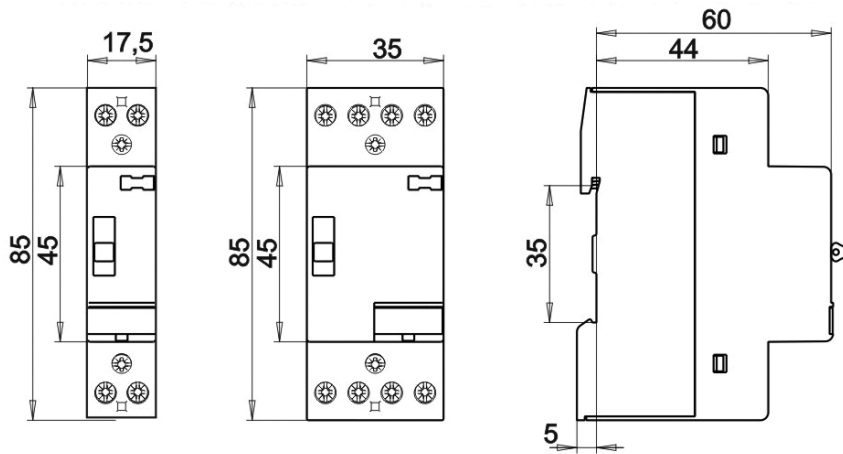
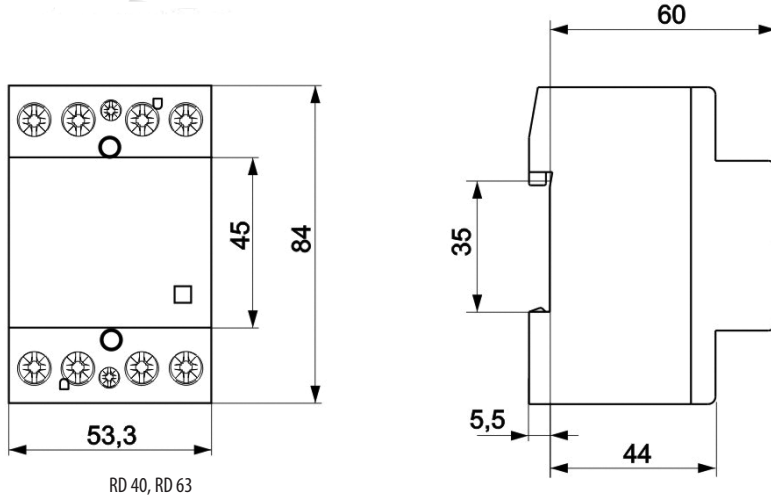


RH11
165,150

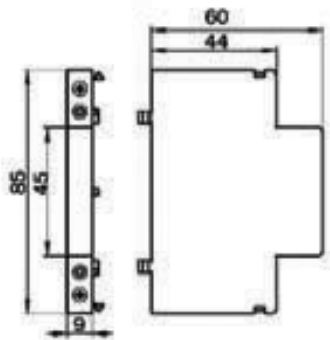


R D 20, R D 25,

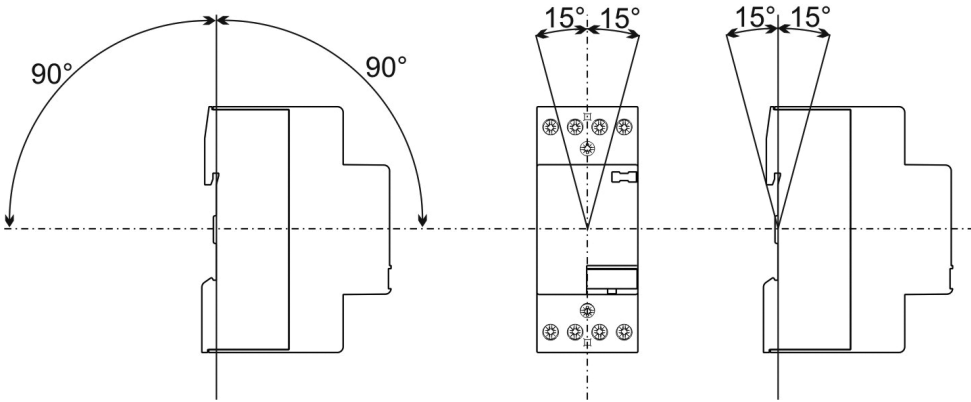
Technical data



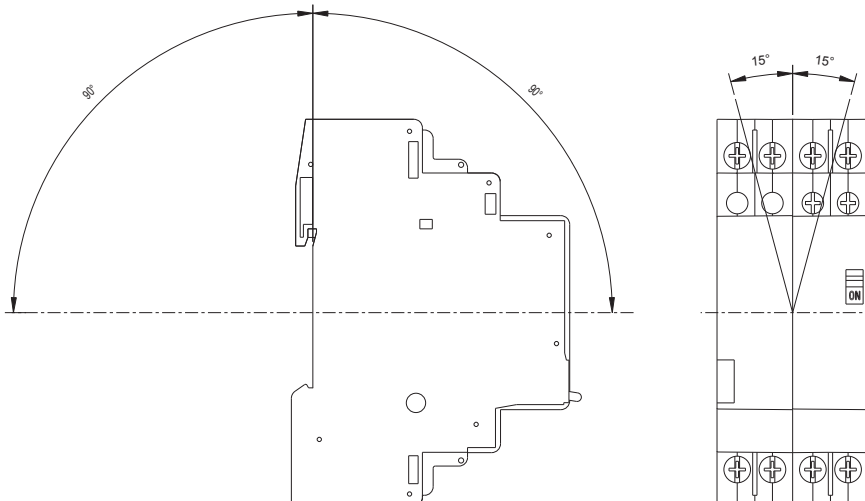
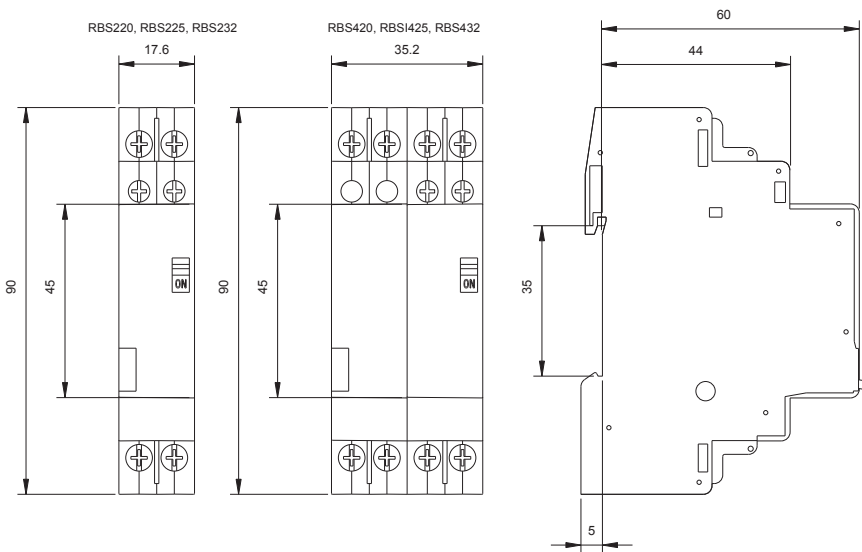
RN auxiliary switch



Mounting position



Bistable Switch RBS




Technical data

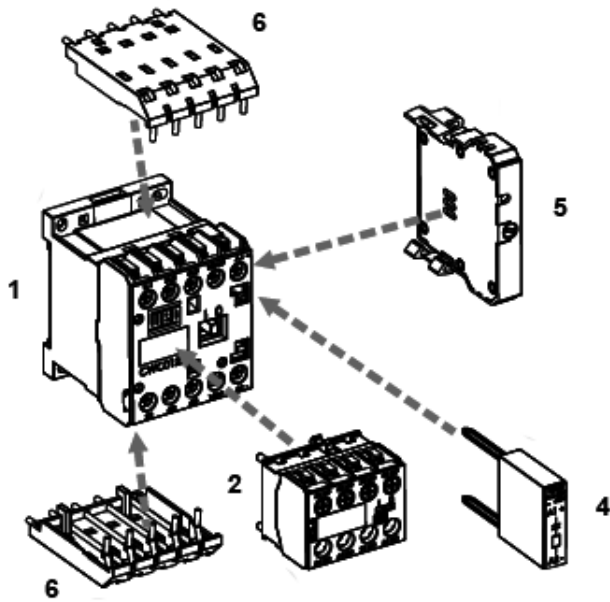
Technical data									
Type		RBS220	RBS225	RBS232	RBS420	RBS425	BI432		
Standards		IEC/EN 60669-2-2							
Manual control		✓							
Control with impulse voltage		✓							
Indication		With actuator							
Protection degree accordance to IEC/EN 60529		IP 20							
Module width		1			2				
Ambient temperature	°C	-25...+55							
Storage temperature	°C	-30...+80							
Max. resistance to humidity		95 % RH at +55 °C							
Min. contact reliability		10 V / 100 mA							
Max. shock resistance accordance to IEC/EN 60068-2-27	g	15							
Max. vibration resistance accordance to IEC/EN 60068-2-6	g	3							
Min. distance of open contacts	mm	>3							
Distance between contacts and coil	mm	>6							
Mechanical endurance	cycles	106							
Max. back-up fuse for short-circuit protection (gL)	A	20	25	32	20	25	32		
Power dissipation per pole	W	1,5	2	3	1,5	2	3		
Rated control voltages	Uc	V AC: 24, 230, other on request							
Rated frequency of control voltage	fc	Hz 50 / 60							
Range of control voltage	Uc	% 90...110							
Coil consumption – inrush		VA/W 18 / 13							
Coil consumption – hold		VA/W 9 / 4							
Min. impulse duration at Uc	ms	50							
Min. impulse duration at 0,85 Uc	ms	100							
Min. duration between two impulses	ms	150							
Max. number of impulses per minute		15		7,5		15		7,5	
Max. impulse duration at Uc		1 hour							
Rated impulse voltage	Uimp	kV 4							
Thermal current	Ith	20	25	32	20	25	32		
Rated insulation voltage	Ui	V 440							
Rated operational voltage	Ue	V 440							
Rated frequency	fe	Hz 50 / 60							
Rated operational current for $\cos\varphi = 0,6$ acc. to IEC/EN 60669-2-2	Ie	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V		
Rated operational current for AC-1 acc. to IEC/EN 60947-4-1	Ie	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V		
Rated operational current for AC-7a acc. to IEC/EN 61095 – Slightly inductive loads in household appliances and similar applications	Ie	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V		
Rated operational current for AC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	Ie	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V	A 20 / 440 V	A 25 / 440 V	A 32 / 440 V		
Rated operational current for AC-22 acc. to IEC/EN 60947-3		20 / 230 V	25 / 230 V	32 / 230 V	20 / 230 V	25 / 230 V	32 / 230 V		
Switching of mixed resistive and inductive loads, including moderate overloads	Ie	A 16 / 440 V	A 20 / 440 V	A 25 / 440 V	A 16 / 440 V	A 20 / 440 V	A 25 / 440 V		
Rated operational current for AC-23 acc. to IEC/EN 60947-3	Ie	A	A	A	A	A	A		
Switching of motor loads or other highly inductive loads		16 / 230 V / 1-phase	20 / 230 V / 1-phase	25 / 230 V / 1-phase	16 / 230 V / 3-phase	20 / 230 V / 3-phase	25 / 230 V / 3-phase		
					16 / 400 V / 3-phase	20 / 400 V / 3-phase	25 / 400 V / 3-phase		

Technical data								
Type			RBS220	RBS225	RBS232	RBS420	RBS425	BI432
Rated operational current for AC-3 acc. to IEC/EN 60947-4-1 Squirrel-cage motors: starting, switching off motors during running	le	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-7b acc. to IEC/EN 61095 Motor-loads for household applications	le	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-6a acc. to IEC/EN 60947-4-1 Switching of transformers having inrush current peaks of not more than 30 times peak of rated current	le	A	3 / 230 V	3,6 / 230 V	4,5 / 230 V	3 / 230 V	3,6 / 230 V	4,5 / 230 V
			1,5 / 400 V	1,8 / 400 V	2,2 / 400 V	1,5 / 400 V	1,8 / 400 V	2,2 / 400 V
Rated operational current for AC-6b acc. to IEC/EN 60947-4-1 – Switching of capacitor banks	C	µF	100 µF / 230 V					
Rated operational current for DC-1 acc. to IEC/EN 60947-4-1 – Non-inductive or slightly inductive loads, resistance furnances	le	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole
Rated operational current for DC-3 acc. to IEC/EN 60947-4-1 – Shunt-motors: starting, plugging, inching	le	A	10 / 24 V / 1 pole	15 / 24 V / 1 pole	25 / 24 V / 1 pole	10 / 24 V / 1 pole	15 / 24 V / 1 pole	25 / 24 V / 1 pole
Rated operational current for DC-5 acc. to IEC/EN 60947-4-1 – Series-motors: starting, plugging, inching	le	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
Rated operational current for DC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	le	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole
Rated operational current for DC-22 acc. to IEC/EN 60947-3 – Switching of mixed resistive and inductive loads, including moderate overloads	le	A	16 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole
Rated operational current for DC-23 acc. to IEC/EN 60947-3 – Switching of highly inductive loads (e.g. series motors)	le	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
Rated operational current for AC-5a acc. to IEC/EN 60947-4-1 – Switching of electric discharge lamp controls	le	A	16 / 230 V					
Rated operational current for AC-5b acc. to IEC/EN 60947-4-1 – Switching of incandescent lamps	le	A	10 / 230 V					
Rated operational current for fluorescent lamps acc. to IEC/EN 60669-2-2	le	A	16 / 230 V					
Fluorescent / energy saving / compact lamps with electronic control gear	le	A	2 / 230 V					
Electrical endurance for all utilization categories		cycles	105					
Terminal capacity for main circuit	S	mm ²	1...10 rigid / flexible					
Screw for main circuit			M4					
Screw-head for main circuit			(±) PZ2					
Tightening torque for main circuit		Nm	1,2					
Terminal capacity for control circuit	S	mm ²	1...4 rigid / flexible					
Screw for control circuit			M3					
Screw-head for control circuit			(±) PZ1					
Tightening torque for control circuit		Nm	0,6					

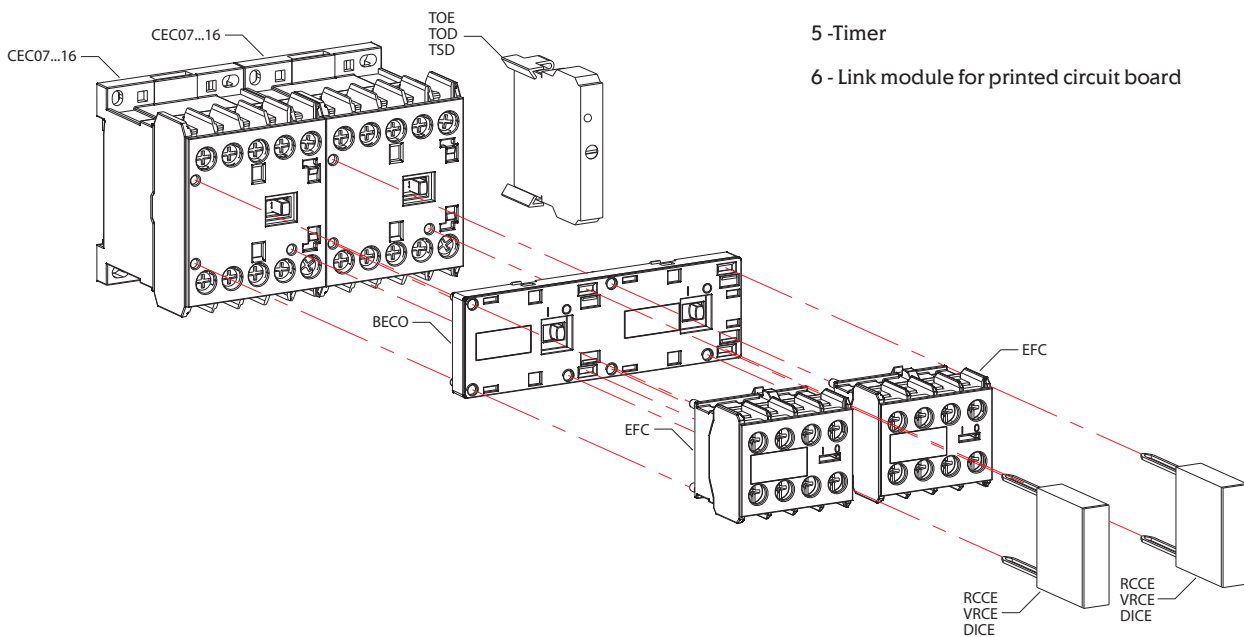
Miniature contactors CE and CEC

Technical data								
Type		CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Standards		IEC/EN 60 947, DIN VDE 0660, UL, CSA						
Rated insulation voltage U_i according to IEC/EN 60947, DIN VDE 0660	V	415 V			690 V			415 V
Rated impulse withstand voltage U_{imp}					4 kV			
Rated operational frequency					25 - 400 Hz			
Degree of protection								
Main circuits					IP20			
Control circuits and auxiliary contacts					IP20			
Ambient temperature								
Operating temperature					-25 ... +55°C			
Storage temperature					-55 ... +80°C			
Altitude								
Normal values					< 3000 m			
90% I_e /80% U_e					3000 ... 4000 m			
80% I_e /75% U_e					4000 ... 5000 m			
Overvoltage category / Pollution degree								
Climatic proofing					III/3			
Number of main poles		3		3			4	4
Rated operational voltage U_e		400-415 V			690 V			400-415 V
Conv. thermal current I_{th} at < 55°C								
rated operational current I_e /AC-1		16 A	18 A	20 A	22 A	22 A	10 A	16 A
AC3 Utilization category								
Rated operational power								
230 V	kW	1,5	1,5	2,2	3	4	-	-
400/415 V	kW	3	3	4	5,5	7,5	-	-
440 V	kW	-	3,7	4,5	5,5	7,5	-	-
500 V	kW	-	3,7	4,5	5,5	7,5	-	-
690 V	kW	-	3,7	5,5	7,5	7,5	-	-
AC4 Utilization category								
Rated operational current I_e AC-4 ($U_e \leq 440V$)			2,8	3,5	4,5	5		
Short circuit rating, max. fuse gG (A)		16	20	20	25	25	6	6
Max. electrical operating frequency								
AC-1	Ops/h	50			300		-	-
AC-3	Ops/h	300			600		-	-
AC-4	Ops/h	250			300		-	-
no load	Ops/h	2000			2500		2500	2500
Mechanical life span	Ops x 10 ⁶				10			
Electrical life span	Ops x 10 ⁶	0,8	1,4	1,3	1,2	1,1	1	1
Maximum number of auxiliary contacts		-			5		-	-
Rated operational current I_e								
AC-15	220-230 V	A	-	-	-	-	10	6
	380-400 V	A	-	-	-	-	6	4
	415 V	A	-	-	-	-	5	-
	500 V	A	-	-	-	-	4	-
	690 V	A					2	
DC-13	24 V	A	-	-	-	-	6,0	2,5
	48 V	A	-	-	-	-	4,0	1,5
	110 V	A	-	-	-	-	2	0,7
	220 V	A	-	-	-	-	0,7	0,35
Auxiliary contacts reliability								
Terminal capacity	mm ²				1 x / 2 x (0,5...2,5)		U_e min=17 V, I_e min=5 mA	U_e min=24 V, I_e min=30 mA
Tightening torque	Nm	0,8			1...1,5			0,8

Technical data				CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Type										
Terminal capacity				1 x / 2 x (0,5...2,5)						
mm ²										
										
Tightening torque				Nm	0,8		1...1,5			0,8
Control circuit										
Power consumption of the coil	AC	Closing	VA	20			30			20
		Cosp					0,8			
	Closed	VA	3,3...5,5			2...3				3,3...5,5
		Cosp	0,2			0,27				0,2
	DC	W	-			2,6...3,7				-
Switching time	Closing/opening (AC)		ms	9...30 / 5...25			8...20 / 6...13			9...30 / 5...25
	Closing/opening (DC)		ms	-			35...45 / 7...12			-
	Coils rated voltage		V	12-660 VAC			12-660 VAC / 12-440 VDC			12-660 VAC
	Coil operational limits						0,85...1,1			



- 1 - Mini contactor
- 2 - Auxiliary frontal contacts block
- 3 - Mechanical interlock block
- 4 - Surge suppressor blocks
- 5 - Timer
- 6 - Link module for printed circuit board



Technical data

Auxiliary contact block			
Standards		IEC 60947-5-1, IEC 60947-4-1	
Rated Insulation voltage U_i	IEC, VDE 0660		1000
Rated operational voltage U_e	IEC, VDE 0660	(V)	690
Conv. thermal current I_{th}		A	10
Rated operational current (I_e)			
AC-15 (IEC 60947-5-1)	$U_e \leq 240V$	(A)	10
	380-400V	(A)	6
	415-440V	(A)	6
	500V	(A)	4
	660-690V	(A)	-
UL, CSA 1)			A600
DC-13 (IEC 60947-5-1)	24V	(A)	1,5
	60V	(A)	0,5
	110V	(A)	0,4
	220-240V	(A)	0,4
UL, CSA 1)			Q600
Short circuit protection max. fuse gL/gG		(A)	10
Control circuit reliability		(V / mA)	17 / 5
Electrical life span		c. op.	1.000.000
Mechanical life span		c. op.	10.000.000
Nr. of conductors and cross section	Stranded without end sleeve	mm ²	2x (0,5...2,5)
Tightening torque		Nm	0,8...1,5

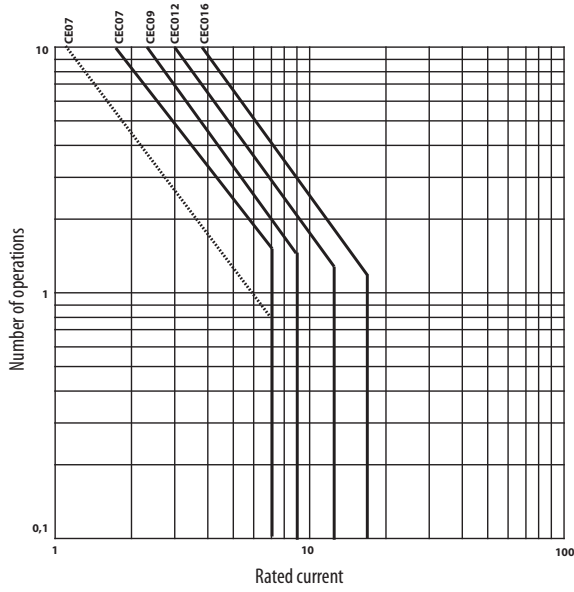
Electronic timer blocks TOE, TOD, TSD

Inputs	Rated insulation voltage (U_i)	V	300	
	Supply voltage (U_e)	1 - 2 terminals	V	24...240 V AC/DC 50/60 Hz (TOE)
				24...60 V AC/DC 50/60 Hz (TOD)
				100...60 V AC/DC 50/60 Hz (TOD)
				220-240 V AC 50/60 Hz (TSD)
				110-130 V AC (TSD)
	Command (U_c) (only TOD)	2 - B1 terminals	V	24...60 V AC/DC 50/60 Hz (TOD) 100...240 V AC/DC 50/60 Hz (TOD)
Voltage limits			0,85 - 1,1 x U_e -> AC 0,8 - 1,25 x U_e -> DC	
Consumption		mA	≤ 5	
Time adjustment	Min. time for Reset	ms	100	
	Min. command time (only TOD)	ms	50	
	Setting accuracy (% of the full scale value)	%	+/-5	
	Repeat accuracy	%	+/-1	
	Changeover time Y - Δ	ms	50	

Diagrams

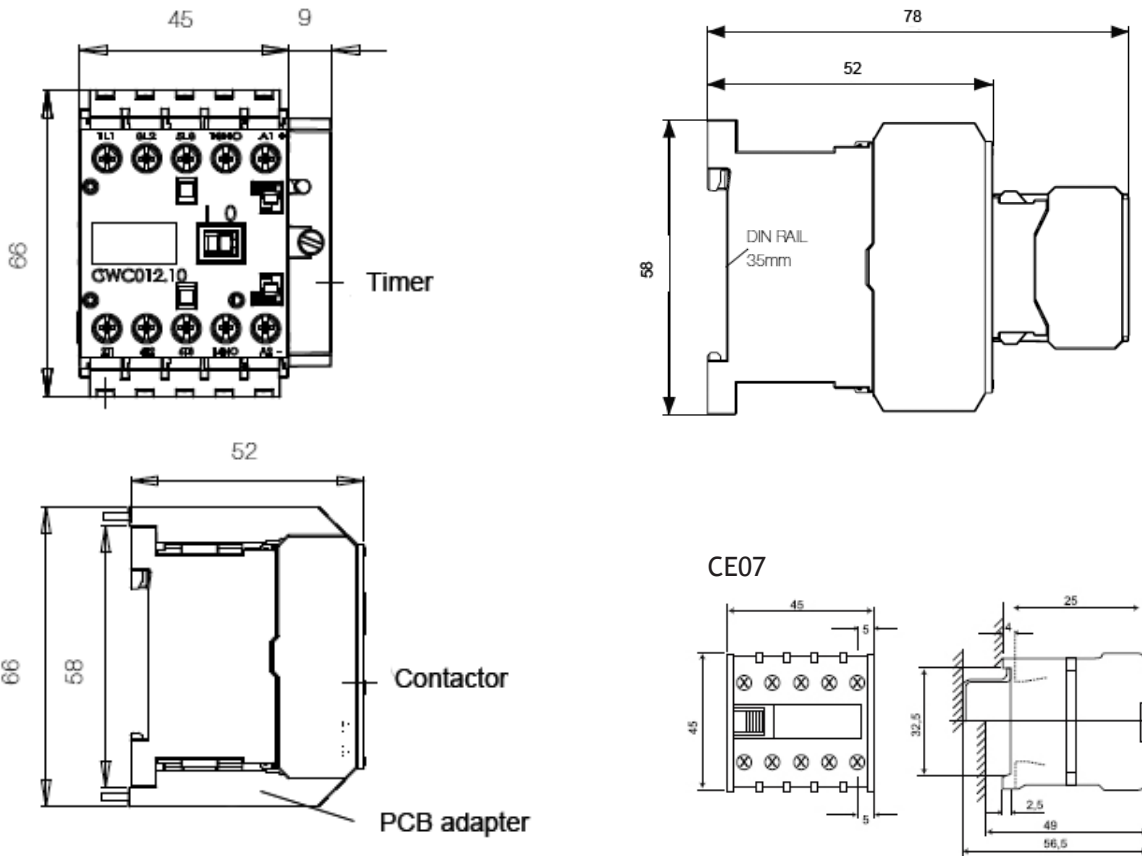
Function	ON Delay TOE		OFF Delay TOD		Star - delta TSD	
Functional diagram						
LED on						
LED off						
Schemes	Terminals		Terminals		Terminals	
	1		(+)1		1	
	2		B1		2	
			(-)2		D	
		B2		Y		

Diagram

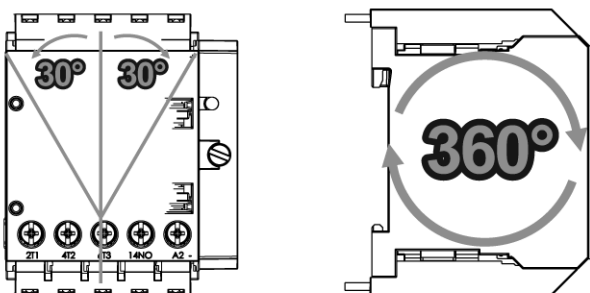


Dimensions

CEC - Dimensions with PCB adapter



Mounting



Motor contactor CES

CES contactors

Contact endurance of the main contacts

The characteristic curves show the contact endurance of contactors when switching resistive and inductive three-phases loads (AC-1/AC-3) depending on the breaking current and the rated operational voltage. It is assumed that the control devices operate randomly, i.e. not in synchronism with the phase angle of the supply system.

The rated operational current I_e for AC-4 duty (breaking 6 times the rated operational current) is selected for a contact endurance of approximately 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e / AC-4 can be increased.

If mixed operation is involved, i.e. normal switching (breaking of rated operational current in AC-3 duty) with intermitted inching (breaking multiples of the rated operational current in AC-4 duty) the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left(\frac{A}{B} - 1 \right)}$$

Legend to the equation:

X Contact endurance for mixed operation in operating cycles

A Contact endurance for normal operation ($I_a = I_e$) in operating cycles

B Contact endurance for inching ($I_a =$ multiple of I_e) in operating cycles

C Percentage of inching operations in total operations

Short-circuit protection of CES 6 to CES 105 contactors without overload relay

Fuses, utilization category gG

or miniature circuit-breaker with C-characteristics

Technical data								
Contactor	Type	CES 6	CES 9	CES 12	CES 18	CES 25	CES 32	
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1" ¹⁾	A	32	32	32	32	63	63
	Type of coordination "2" ¹⁾	A	20	20	25	25	40	40
- weld-free ²⁾	$I_k \geq 100 \times I_e$	A	10	10	10	10	16	16
With miniature circuit breaker	C-characteristic	A	16	16	25	25	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size	0 ... 1						
	Type	CES 6 ... CES 32						
With fuses	A	16						
	A	6, if overload relay auxiliary contacts are in the contactor coil circuit						
with miniature circuit-breaker	A	10						
with C-characteristics	A	3, if overload relay auxiliary contacts are in the contactor coil circuit						
Contactor	Type	CES 40	CES 45	CES 65	CES 75	CES 85	CES 105	
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1" ¹⁾	A	80	80	160	160	250	250
	Type of coordination "2" ¹⁾	A	63	63	100	100	125	160
- weld-free ²⁾	$I_k \geq 100 \times I_e$	A	25	25	63	80	125	125
With miniature circuit breaker	C-characteristic	A	--	--	--	--	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size	0 ... 4						
	Type	CES 40 ... CES 105						
With fuses	A	16						
	A	6, if overload relay auxiliary contacts are in the contactor coil circuit						
with miniature circuit-breaker	A	10						
with C-characteristics	A	3, if overload relay auxiliary contacts are in the contactor coil circuit						

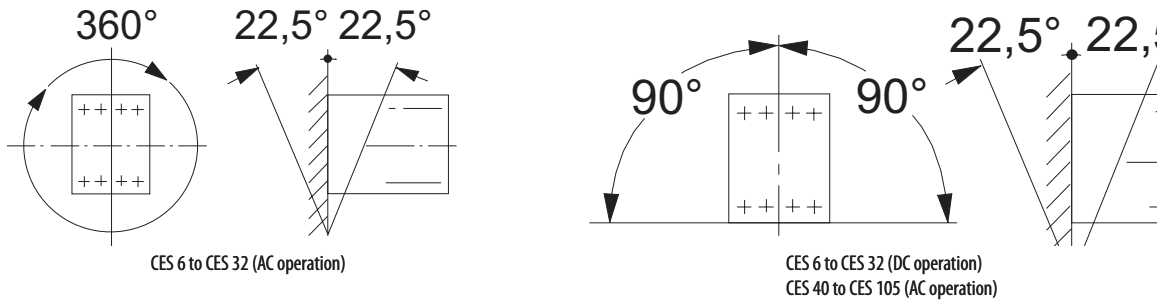
¹⁾ In accordance with IEC 60947-4-1:

Type of coordination "1": Destruction of contactor and overload relay is admissible. Contactor and/or overload relay must be replaced if necessary.

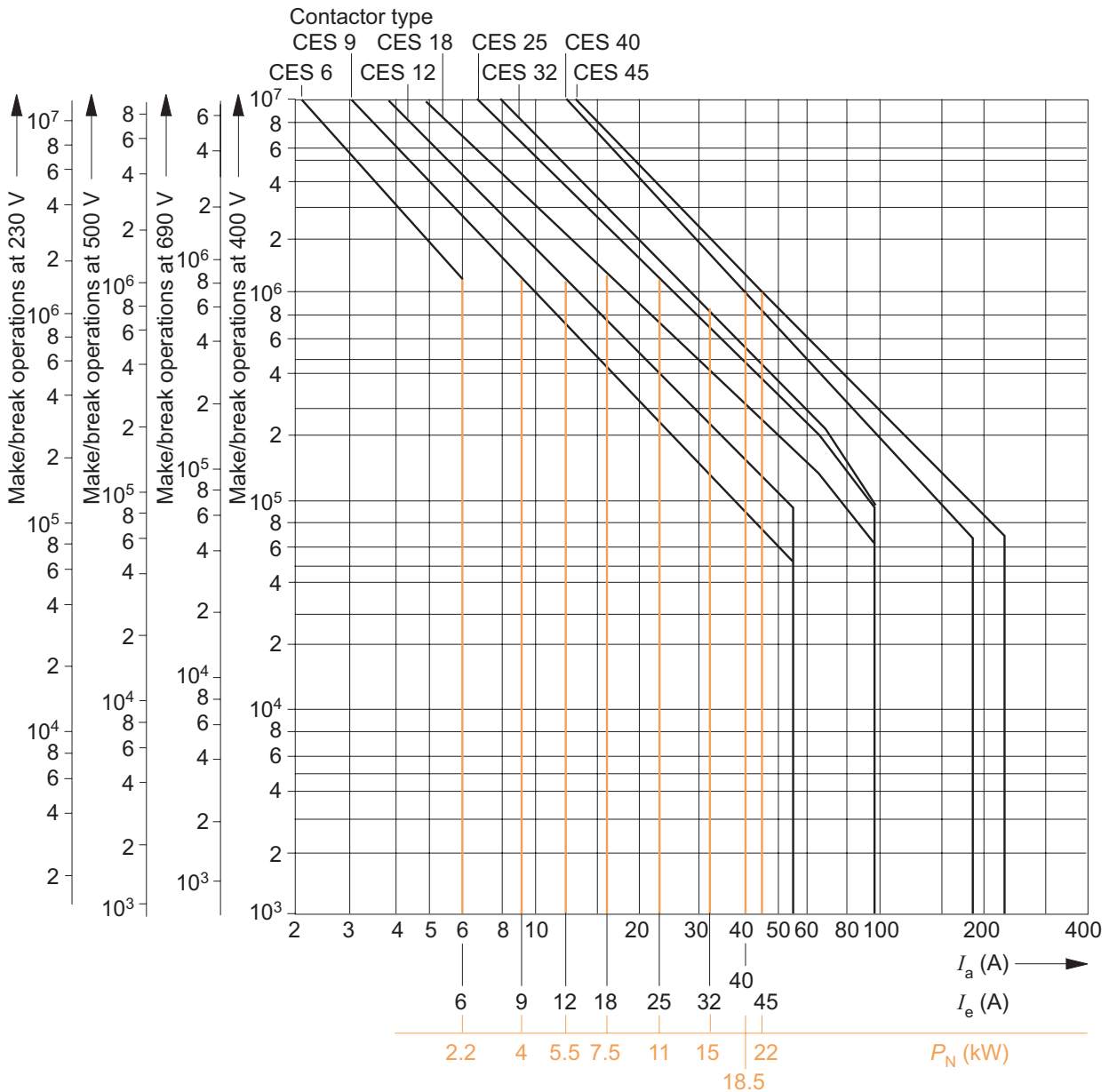
Type of coordination "2": No damage can be tolerated on the overload relay, but contact welding on the contactor is permitted if the contacts can easily be separated.

²⁾ Test conditions according to IEC 60947-4-1.

Mounting position



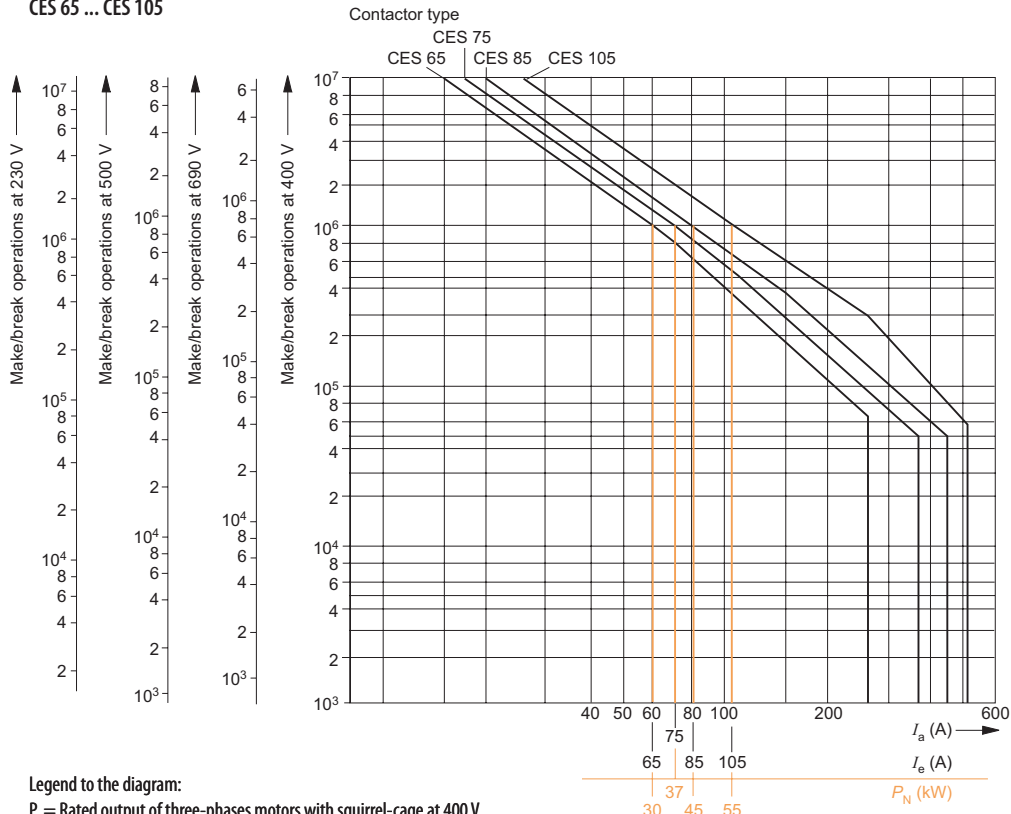
CES 6 ... CES 45



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

CES contactors

CES 65 ... CES 105



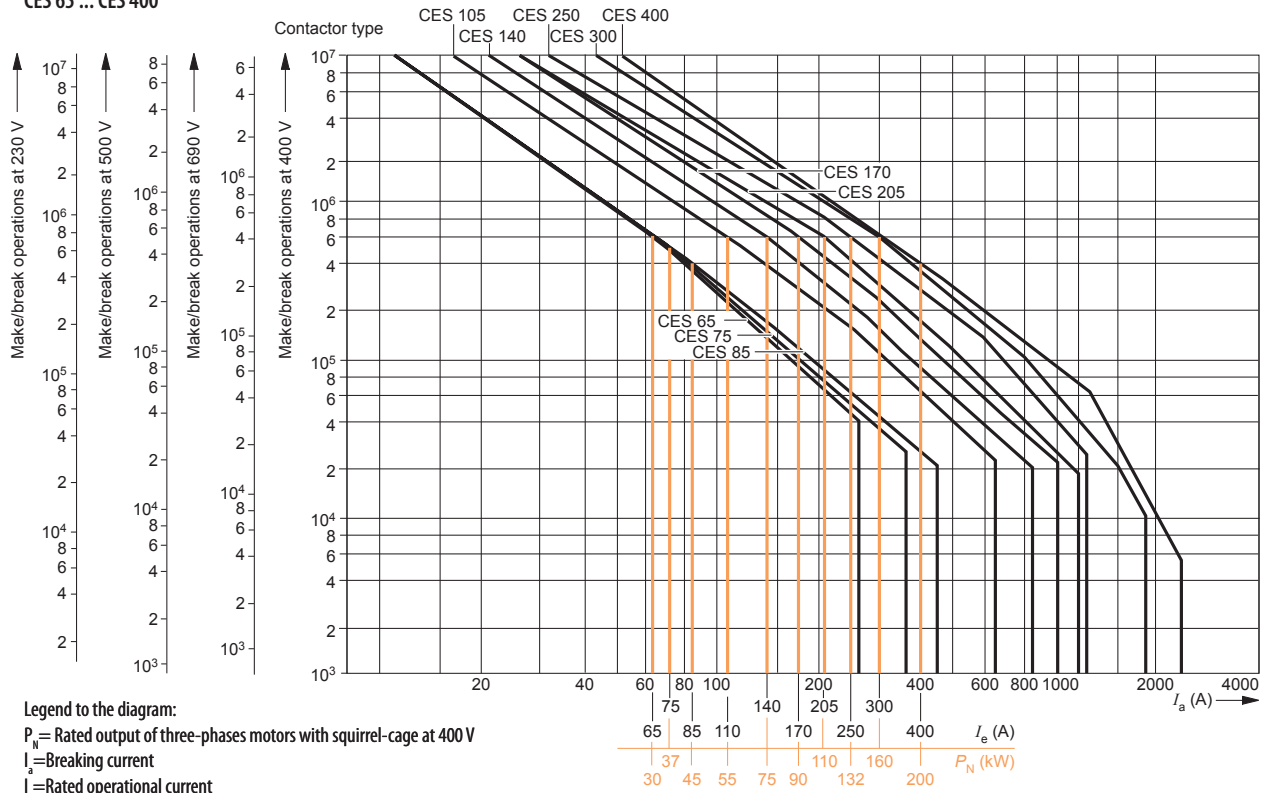
Legend to the diagram:

P_N = Rated output of three-phases motors with squirrel-cage at 400 V

I_a = Breaking current

I_e = Rated operational current

CES 65 ... CES 400



Legend to the diagram:

P_N = Rated output of three-phases motors with squirrel-cage at 400 V

I_a = Breaking current

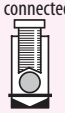
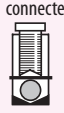

I_e = Rated operational current

Technical data							
Contactor	Type		CES 6 ... CES 18		CES 25, CES 32		
General data							
Mechanical endurance	Basic units	Operating cycles	15 million				
	Auxiliary contact blocks		10 million				
Rated insulation voltage U_i (pollution degree 3)	V		690				
Rated impulse withstand voltage U_{imp}	kV		8				
Protective separation ¹⁾ between coil and main contacts	V		≤ 500		≤ 690		
Permissible ambient temperature ²⁾	°C		-25 to +55 in operation, -50 to +80 when stored				
Degree of protection	acc. to IEC 60947-1		IP 20				
Power consumption of the coils			(with cold coil) and $1.0 \times U_i$				
AC operation		Hz	50/60				
	closing	VA	77/71				
	cos φ		0.81/0.75				
	closed	VA	11/9				
	cos φ		0.28/0.27				
DC operation	closing = closed	W	6.2				
Permissible residual current of the electronics (at 0-Signal)			≤ $8 \text{ mA} \times \frac{220\text{V}}{U_i}$ AC operation		≤ $1.25 \text{ mA} \times \frac{220\text{V}}{U_i}$ DC operation		
Coil voltage tolerance			0.8 ... 1.1 x U_i				
Operating times at 0.8 to 1.1 x U_i			Break time = opening time + arcing time (Values are applicable with the coil in cold state and at operating temperature)				
AC operation	closing time	ms	8 ... 35		10 ... 35		
	opening time	ms	4 ... 18		5 ... 20		
DC operation	closing time	ms	20 ... 170		35 ... 180		
	opening time	ms	10 ... 25		10 ... 25		
Arcing time		ms	10		10		
Operating times at $1.0 \times U_i$							
AC operation	closing time	ms	10 ... 25		10 ... 25		
	opening time	ms	5 ... 18		5 ... 20		
DC operation	closing time	ms	30 ... 70		40 ... 80		
	opening time	ms	12 ... 20		10 ... 20		
Shock resistance	Rectangular pulse	AC	g/ms	7.7/5 & 4.4/10		5.5/5 & 3.2/10	
		DC	g/ms	9.3/5 & 5.4/10		5.8/5 & 3.4/10	
	Sine pulse	AC	g/ms	12/5 & 6.8/10		8.7/5 & 5.1/10	
		DC	g/ms	14.7/5 & 8.5/10		9/5 & 5.3/10	
Conductor cross-sections (screw connection; 1 or 2 conductor connection possible)	Main conductor:						
	solid	mm ²	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4		2 x (2.5 ... 6)		
	finely stranded with end sleeve	mm ²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)		2 x (0.5 ... 1); 2 x (1.5 ... 4)		
	Pin-end connector (DIN 46 231)	mm ²	1 x (1 ... 2.5)		1 x (1 ... 6)		
	solid or stranded	AWG	2 x (18 ... 12)		2 x (14 ... 10)		
	Terminal screw		M3.5		M4		
	Auxiliary conductor:						
	solid	mm ²	2 x (0.5 ... 1); 2 x (1 ... 2.5)		2 x (0.5 ... 1); 2 x (1 ... 2.4)		
	finely stranded with end sleeve	mm ²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)		2 x (0.5 ... 1); 2 x (0.75 ... 2.5)		
	Pin-end connector (DIN 46 231)	mm ²	2 x (1 ... 1.5)		2 x (1 ... 1.5)		
solid or stranded	AWG	2 x (18 ... 12)		2 x (18 ... 12)			
Specified tightening torque of the terminal screws	Main conductor:		0.8 ... 1.4 Nm (7 ... 12 lb.in)		1 ... 1.5 Nm (8.8 ... 13 lb.in)		
	Auxiliary conductor		0.8 ... 1.4 Nm (7 ... 12 lb.in)		0.8 ... 1.4 Nm (7 ... 12 lb.in)		
Operating frequency z in operating cycles per hour (o.c./h)			Operation:		Operation:		
Contactors without overload relay	No-load operating frequency	1/h	AC	DC	AC	DC	
	Rated duty at AC-1	1/h	10000	1500	5000	1500	
	at AC-2 and AC-3	1/h	1500	1500	1500	1500	
	at AC-4	1/h	1000	1000	750	750	
Contactor with overload relay (mean value)		1/h	15		15		

¹⁾ Acc. to IEC 60947-1, Annex N.




²⁾ When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage is $1.1 \times U_i$, the ambient temperature $\geq 45^\circ\text{C}$ and the load factor of all relays is 100 %.

Technical data

Technical data							
Contactor		Type	CES 40		CES 45		
General data							
Mechanical endurance	Basic units	Operating cycles	10 million				
	Auxiliary contact blocks		10 million				
Rated insulation voltage U_i (pollution degree 3)		V	690				
Rated impulse withstand voltage U_{imp}		kV	8				
Protective separation ¹⁾ between coil and main contacts		V	≤ 415				
Permissible ambient temperature		°C	-25 to +55 in operation, -50 to +80 when stored				
Degree of protection	acc. to IEC 60947-1		IP 00				
Power consumption of the coils			(with cold coil) and $1.0 \times U_s$				
AC operation		Hz	50/60				
	closing	VA	121/117				
	p.f.		0.79/0.72				
	closed	VA	16.5/13				
	p.f.		0.27/0.28				
Coil voltage tolerance			0.8 ... 1.1 x U_s				
Operating times at 0.8 to 1.1 x U_s Break time = opening time + arcing time							
AC operation ²⁾	closing time	ms	13 ... 57				
	opening time	ms	5 ... 10				
Arcing time		ms	10				
Operating times at 1.0 x U_s							
AC operation ²⁾	closing time	ms	13 ... 32				
	opening time	ms	5 ... 10				
Shock resistance	Rectangular pulse	AC	g/ms	5.7/5 & 3.3/10			
		DC	g/ms	5.7/5 & 3.3/10			
	Sine pulse	AC	g/ms	9/5 & 5.2/10			
		DC	g/ms	9/5 & 5.2/10			
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	Main conductor:		Front terminal connected	Back terminal connected	Both terminal connected		
					Front terminal	Back terminal	
							
	solid	mm ²	1 ... 16	1 ... 16	1 ... 16	1 ... 16	
	finely stranded without end sleeve	mm ²	2.5 ... 16	1.5 ... 16	2.5 ... 10	1.5 ... 16	
	finely stranded with end sleeve	mm ²	1 ... 16	1 ... 16	1 ... 10	1 ... 16	
	standed	mm ²	2.5 ... 25	1.5 ... 25	2.5 ... 10	1.5 ... 25	
	Pin-end connector (DIN 46 231)	mm ²	1 ... 6	1 ... 6	1 ... 6	1 ... 6	
	solid or stranded	AWG	14 ... 3	16 ... 3	14 ... 6	16 ... 3	
	Terminal screw			M5	M5	M5	M5
	Auxiliary conductor:						
	solid	mm ²	2 x (0.5 ... 1); 2 x (1 ... 2.5)				
	finely stranded with end sleeve	mm ²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)				
	Pin-end connector (DIN 46 231)	mm ²	2 x (1 ... 1.5)				
	solid or stranded	AWG	2 x (18 ... 12)				
Specified tightening torque of the terminal screws	Main conductor:		2.5 ... 3.0 Nm (22 ... 26.5 lb.in)				
	Auxiliary conductor		0.8 ... 1.4 Nm (7 ... 12 lb.in)				
Operating frequency z in operating cycles per hour (o.c./h)			Operation:		Operation:		
			AC	DC	AC	DC	
Contactors without overload relay	No-load operating frequency	1/h	5000	on request	5000	on request	
	Rated duty at AC-1	1/h	1200	1200	1200	1200	
	at AC-2	1/h	600	600	600	600	
	at AC-3	1/h	600	600	600	600	
	at AC-4	1/h	250	250	200	600	
Contactor with overload relay (mean value)		1/h	15		15		

¹⁾ Acc. to IEC 60947-4-1, Annex N.

²⁾ The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data								
Contactor	Type		CES 65	CES 75	CES 85	CES 105		
General data								
Mechanical endurance		Operating cycles	10 million (AC operation)					
Rated insulation voltage U_i (pollution degree 3)		V	1000					
Rated impulse withstand voltage U_{imp}		kV	8					
Protective separation ¹⁾ between coil and main contacts		V	≤ 500		≤ 690			
Permissible ambient temperature		°C	-25 to +55 in operation, -50 to +80 when stored					
Degree of protection		acc. to IEC 60947-1	IP 00/oper type, operating mechanism IP40					
Power consumption of the coils			(with cold coil) and $1.0 \times U_s$					
AC operation		Hz	50/60					
closing		VA	225/192		398/345			
p.f.			0.6/0.54		0.5/0.4			
closed		VA	24/16		46/29			
p.f.			0.29/0.29		0.23/0.24			
Coil voltage tolerance			0.8 ... $1.1 \times U_s$					
Operating times at 0.8 to $1.1 \times U_s$ Break time = opening time + arcing time								
AC operation ²⁾		closing time	ms		15 ... 40			
		opening time	ms		5 ... 25			
Arcing time		ms	10 ... 15					
Operating times at $1.0 \times U_s$								
AC operation ²⁾		closing time	ms		17 ... 30			
		opening time	ms		5 ... 25			
Shock resistance		Rectangular pulse	AC	g/ms		11.2/5 & 6/10		
			DC	g/ms		10.7/5 & 6.2/10 (14.5 & 7.7/10) ¹⁾		
		Sine pulse	AC	g/ms		17.6/5 & 10.3/10		
			DC	g/ms		16.8/5 & 9.7/10 (22/5 & 12/10) ¹⁾		
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)		Main conductor: - with box terminal		Front terminal connected	Back terminal connected	Both terminal connected		
						Front terminal		Back terminal
		solid		mm ²	6 ... 16	1 ... 16	1 ... 16	1 ... 16
		finely stranded without end sleeve		mm ²	10 ... 35	1.5 ... 16	1.5 ... 16	1.5 ... 16
		finely stranded with end sleeve		mm ²	6 ... 35	1 ... 16	1 ... 16	1 ... 16
		standed		mm ²	16 ... 50	1.5 ... 25	1.5 ... 25	1.5 ... 25
		solid or stranded		mm ²	10 ... 1/0	16 ... 3	16 ... 3	16 ... 3
		Terminal screw			M6			
		Tightening torque - without box terminal			4 ... 6 Nm (36 ... 52 lb. in)			
		finely stranded with cable lug		mm ²	10 ... 35 ²⁾			
		standed with cable lug		mm ²	10 ... 50 ²⁾			
		solid or stranded		AWG	7 ... 1/0			
		Terminal bar (max. width)		mm	12			
		Terminal screw			M6 x 20			
		Tightening torque			4 ... 6 Nm (36 ... 52 lb. in)			
		Auxiliary conductor:						
solid		mm ²	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4					
finely stranded with end sleeve		mm ²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)					
Pin-end connector (DIN 46 231)		mm ²	2 x (1 ... 1.5)					
solid or stranded		AWG	2 x (18 ... 12)					
Tightening torque		mm ²	0.8 ... 1.4 Nm (7 ... 12 lb. in)					

¹⁾ In accordance with IEC 60947-1, Annex N.

²⁾ The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data

Technical data									
Contactors		Type	CES 140	CES 170	CES 205	CES 250	CES 300	CES 400	
Rated power AC-3, 400V		KW	75	90	110	132	160	200	
Rated operational current I_e	40° C AC-1	A	160	210	220	300	320	500	
at 400V,	AC-3	A	140	170	205	250	300	400	
at 400V,	AC-4	A	68	75	96	110	125	150	
Conventional thermal current Ith	400V, +40° C	A	160	210	220	300	300	400	
Ambient Temperature	Operation	° C	-25 ... +55						
	Storage	° C	-25 ... +70						
Humidity			+40°C no more than 50%, +25°C no more than 90%						
Altitude without derating		M	≤2000						
Mechanical Life	AC - Operation	mil. cycles	3 times of AC-3 endurance						
Electrical Life	at 400V, Ie / AC-3	mil. cycles	0,6	0,6	0,6	0,6	0,6	0,4	
Max. Operating Frequency without overload relay	at AC-3	cycles/hr.	1200	600	600	600	600	600	
	at AC-4	cycles/hr.							
Rated insulation voltage U_i		V	1000	1000	1000	1000	1000	1000	
Rated impulse withstand voltage U_{imp}		kV	8	8	8	8	8	8	
Power consumption of the coils	AC operation	Closing	VA	550	910	910	1430	1430	2450
		Cosφ		0,45	0,38	0,38	0,34	0,34	0,21
		Closed	VA	39	58	58	84	84	115
		Cosφ		0,24	0,26	0,26	0,24	0,24	0,33
Coil type			AC 50/60Hz 24V, 110V, 220V, 380V						
Operating range of coil	at Us AC	x Us	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	Main conductor:								
	finely stranded with cable lug	mm ²	35 ... 95			50 ... 240			
	stranded with cable lug	mm ²	50 ... 120			70 ... 240			
	solid or stranded	AWG	1/0 ... 250 MCM			2/0 ... 500 MCM			
	Terminal bar (max. with)	mm	20 x 3			25 x 3			
	Terminal screw		M8 x 25			M10 x 30			
Tightening torque	Nm	10 ... 14			14 ... 24				
Degrees of Protection			IP00						
Short circuit protection without overload relay	Coordination type 2	A	225	315	315	355	450	460	
Auxiliary switch block pre-mounted in side		1NO+1NC	√	√	√	√	√	√	
		2NO+2NC	√	√	√	√	√	√	
		4NO+4NC	√	√	√	√	√	√	
Auxiliary switch block in addition - Top mounted		NO/NC	x						
Auxiliary switch block	Rated insulation voltage U_i	V	690						
	Rated impulse withstand voltage U_{imp}	kV	6						
	Rated current capacity		AC-15: 360VA; DC-13 33W						
	Conventional thermal current Ith	A	10						
Dimensions (AC - Operation) H / B; Width	mm	≤120 mm	≤ 135mm		≤ 145mm		≤ 160mm		
Mounting		Screw mounted, Vertical +/- 22.5°C							
Main circuit Terminal screw type		Busbar - Hex head							
Certificates & Standards		CE, RoHS							

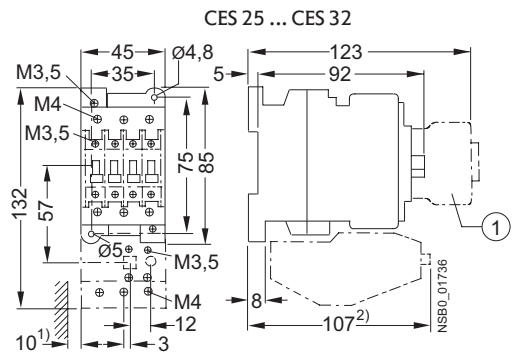
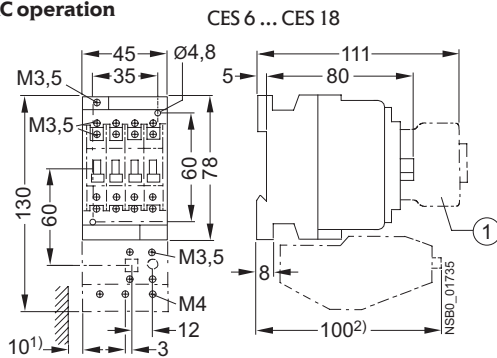
Technical data										
Contactor	Type			CES 6	CES 9	CES 12	CES 18	CES 25	CES 32	
Load ratings of the contactors with AC										
Thermal load	10 s current ¹⁾			A	90	90	96	96	176	176
Power loss per conducting path	at I _e /AC-3			W	0.6	0.6	1.1	1.1	1.6	1.6
AC-1 duty, switching resistive load²⁾										
Rated operational currents I _e	at 40 °C to	690 V	A	25	25	25	25	38	38	
	at 55 °C to	690 V	A	20	20	20	20	32	32	
Minimum conductor cross-section at I _e load	at 40 °C		mm ²	4	4	4	4	10	10	
	at 55 °C		mm ²	4	4	4	4	10	10	
AC-2 and AC-3 duty										
Rated operational currents I _e	up to	400 V	A	6	9	12	18	25	32	
		500 V	A	6	9	12	16	17	32	
		690 V	A	6	6.6	8.8	12.2	12.2	27	
Max. rating of slipping or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	1.5	2.4	3.3	4	5.5	8.5	
		400 V	kW	2.2	4	5.5	7.5	11	15	
		500 V	kW	3	5.5	7.5	9	11	21	
		690 V	kW	4	5.5	7.5	11	11	23	
AC-4 duty (contact endurance approx. 200.000 operating cycles I_a = 6 x I_e)										
Rated operational currents I _e	up to	400 V	A	3.1	3.3	4.3	7.7	8.5	15.6	
		690 V	A	3.1	3.3	4.3	7.7	8.5	15.6	
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	0.8	0.85	1.15	2	2.2	4.3	
Max. permitted rated operational current I _e /AC-4 = [^] I _e /AC-3 up to 500 V with endurance and operating frequency		400 V	kW	1.15	1.4	1.9	3.5	4	7.5	
		690 V	kW	1.9	2.4	3.3	6	6.6	13	
Contactor										
Load ratings of the contactors with AC										
Thermal load	10 s current ¹⁾			A	400	400	360	500	800	800
Power loss per conducting path	at I _e /AC-3			W	2.0	2.5	3.5	6	7.5	10
AC-1 duty, switching resistive load²⁾										
Rated operational currents I _e	at 40 °C to	690 V	A	65	65	90	100	105	105	
	at 55 °C to	690 V	A	55	55	80	90	100	105	
Minimum conductor cross-section at I _e load	at 40 °C		mm ²	16	16	35	35	50	50	
	at 55 °C		mm ²	16	16	25	35	35	35	
AC-2 and AC-3 duty										
Rated operational currents I _e	up to	400 V	A	40	45	65	75	85	105	
		500 V	A	32	38	40	63	75	85	
		690 V	A	27	27	40	63	75	75	
		1000 V	A	--	--	6	6	30	30	
Max. rating of slipping or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	11	15	18.5	22	26	37	
		400 V	kW	18.5	22	30	37	45	55	
		500 V	kW	21	25	30	41	50	59	
		690 V	kW	23	23	39	56	67	67	
		1000 V	A	--	--	--	--	39	39	
AC-4 duty (contact endurance approx. 200.000 operating cycles I_a = 6 x I_e)										
Rated operational currents I _e	up to	400 V	A	18.5	24	28	34	42	54	
		690 V	A	18.5	24	28	34	42	54	
		1000 V	A	--	--	--	23	23	34	
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	5.2	7.3	8.5	10.3	12	16.3	
Max. permitted rated operational current I _e /AC-4 = [^] I _e /AC-3 up to 500 V with endurance and operating frequency		400 V	kW	9	12.6	14.7	17.9	22	28.4	
		690 V	kW	15.5	20.8	24.3	29.5	38	49	
		1000 V	kW	--	--	--	30	30	45	
Contactor										
Load ratings of the contactors with AC										
Thermal load	10 s current ¹⁾			A	1140	1360	1640	2500	2500	3400
Power loss per conducting path	at I _e /AC-3			W	14	14	20	16	23	40
AC-1 duty, switching resistive load²⁾										
Rated operational currents I _e	at 40 °C to	690 V	A	170	230	240	325	325	425	
	at 55 °C to	690 V	A	160	210	220	300	300	400	
Minimum conductor cross-section at I _e load	at 40 °C		mm ²	70	120	120	185	185	2x150	
	at 55 °C		mm ²	70	95	120	185	185	240	
AC-2 and AC-3 duty										
Rated operational currents I _e	up to	500 V	A	140	170	205	250	300	400	
		690 V	A	110	170	170	250	250	400	
		1000 V	A	42	68	68	95	95	180	
Max. rating of slipping or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	45	56	66	82	96	131	
		400 V	kW	75	95	115	142	168	232	
		500 V	kW	98	118	145	178	210	289	
		690 V	kW	105	163	163	245	245	397	
		1000 V	A	65	90	90	132	132	250	
AC-4 duty (contact endurance approx. 200.000 operating cycles I_a = 6 x I_e)										
Rated operational currents I _e	up to	690 V	A	68	75	96	110	125	150	
		1000 V	A	34	42	42	57	57	80	
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	21	23	30	35	40	49	
Max. permitted rated operational current I _e /AC-4 = [^] I _e /AC-3 up to 500 V with endurance and operating frequency		400 V	kW	36	40	52	61	69	85	
		690 V	kW	63	69	90	105	119	147	
		1000 V	kW	45	55	55	75	75	110	

¹⁾ Acc. to IEC 60947-4-1.

²⁾ Industrial furnaces and electric heaters with resistance heating for example (higher current during heating-up allowed for).

Dimensional drawings

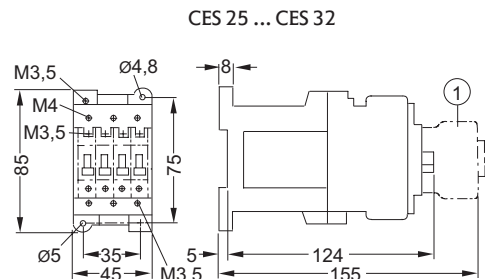
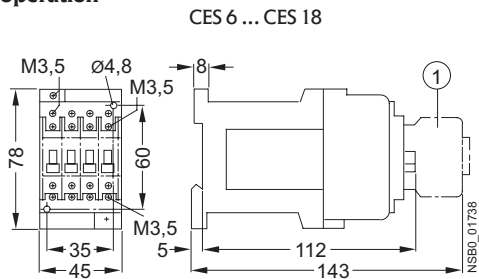
AC operation



- ① Auxiliary switch block
- 1) Minimum clearance from the earthed parts.
- 2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less than 2.5 mm.

- ① Auxiliary switch block
- 1) Minimum clearance from the earthed parts.
- 2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less than 2.5 mm.

DC operation

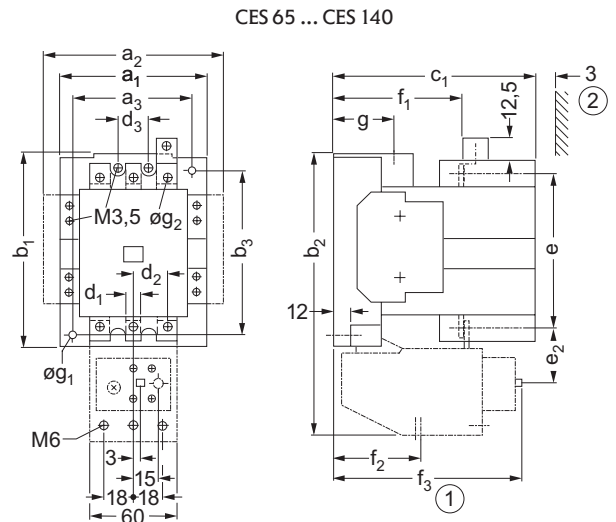
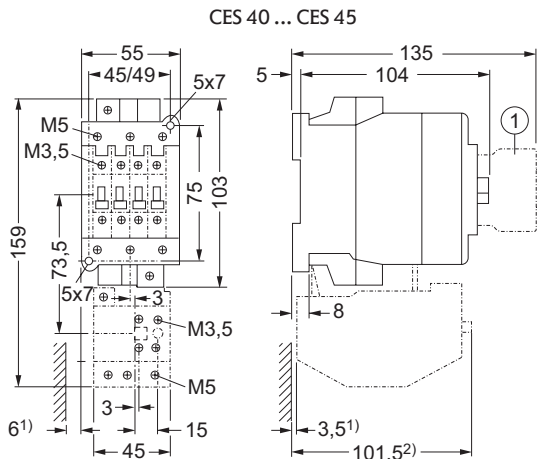


- ① Auxiliary switch block

- ① Auxiliary switch block

• Clearance when mounted in rows:

When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage $1.1 \times U_s$, the ambient temperature $\geq 45^\circ\text{C}$ and the load factor of all relays is 100 %.

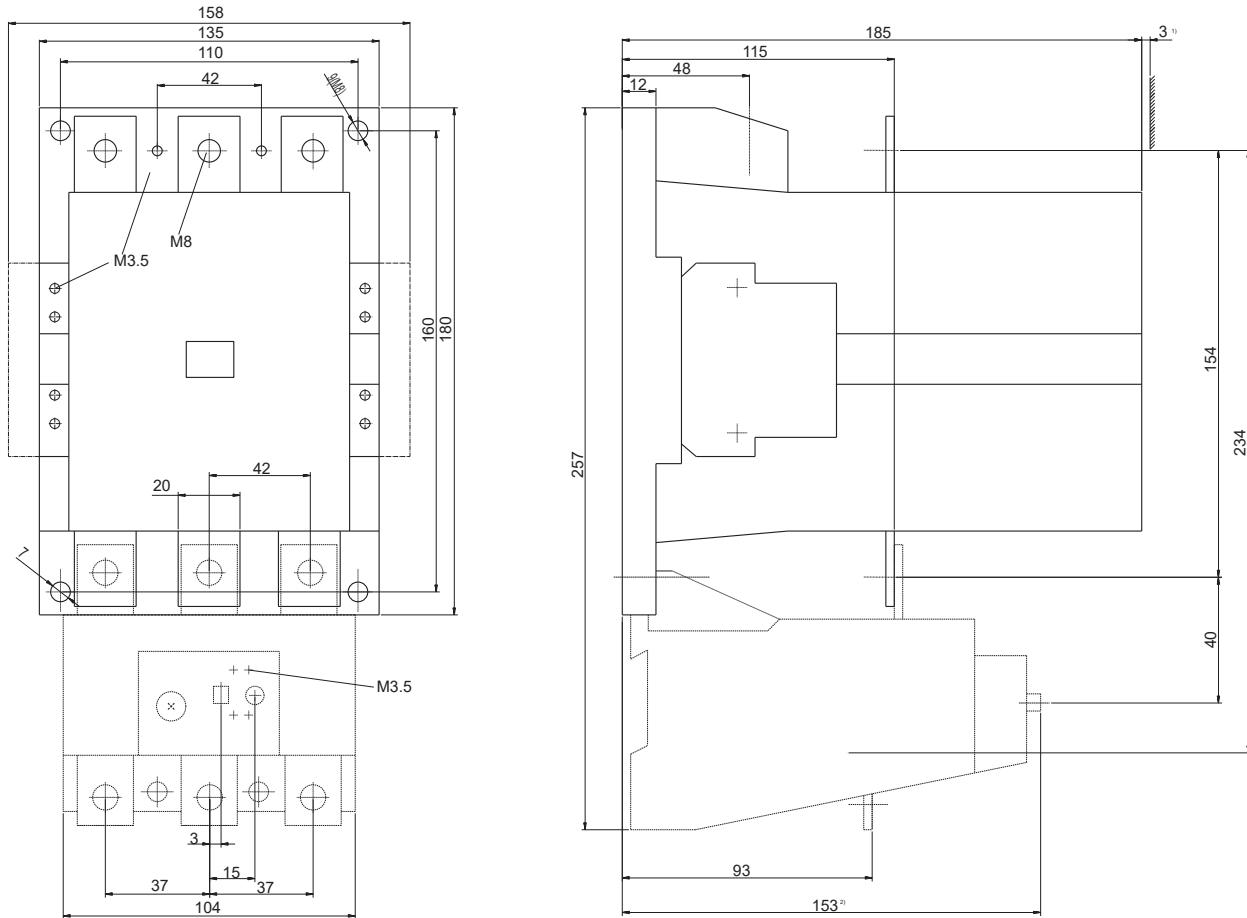


- ① Auxiliary switch block
- 1) Minimum clearance from the earthed parts.
- 2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less than 2.5 mm.

- ① Dimension for the square OFF-button (stroke 3 mm) Dimension for the round RESET-button (stroke 2.5 mm) less than 2.5 mm.
- ② Minimum clearance from insulated components 3 mm Minimum clearance from earthed components 10 mm

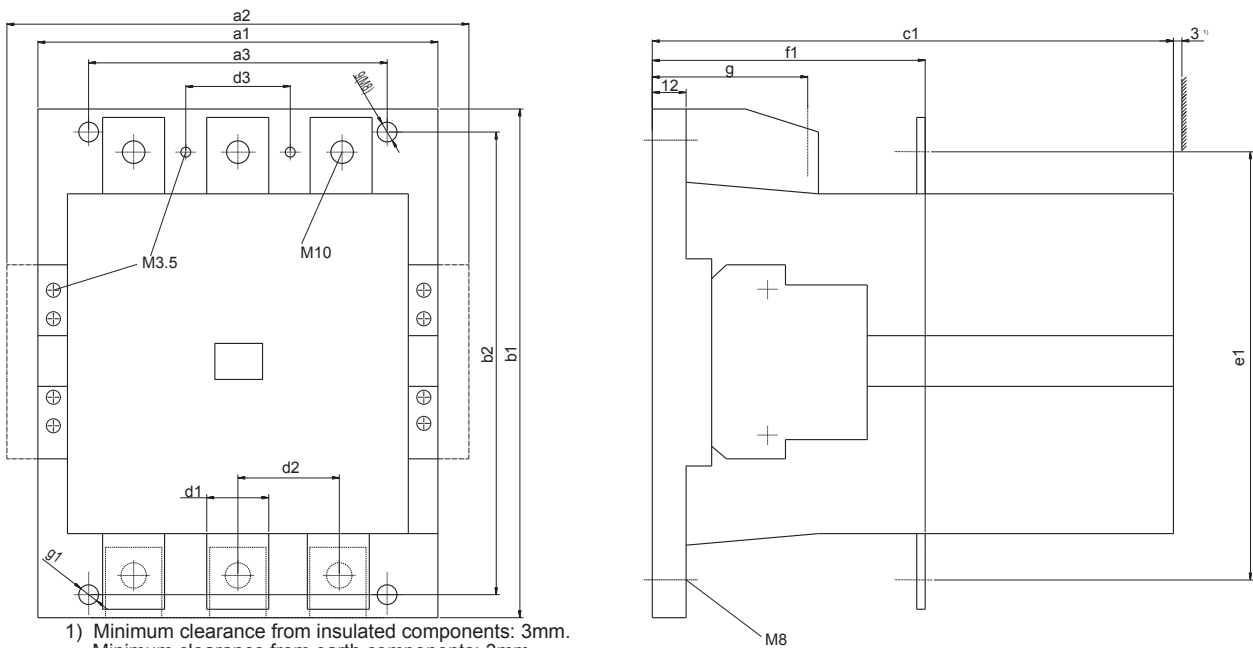
	a1	a2	a3	b1	b2	b3	c1	d1	d2	d3	e	e2	f1	f2	f3	g1	g2
CES 65	90	113	70	117	175	100	123	8	26.5	25	94	80	63	122	28	4.8	6.1 (M6)
CES 75																	
CES 85	100	123	80	133	194	110	140	8	26.5	25	107	89	63	122	39	5.5	6.1 (M6)
CES 105	100	123	80	133	194	110	140	10.5	26.5	25	116	89	63	122	39	5.5	6.1 (M6)
CES 140	120	143	100	150	232	130	150	20	42	37	139	40.5	93	80	146	6.3	9 (M)

CES 170 ... CES 205



- 1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
- 2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

CES 250 ... CES 400



- 1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
- 2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

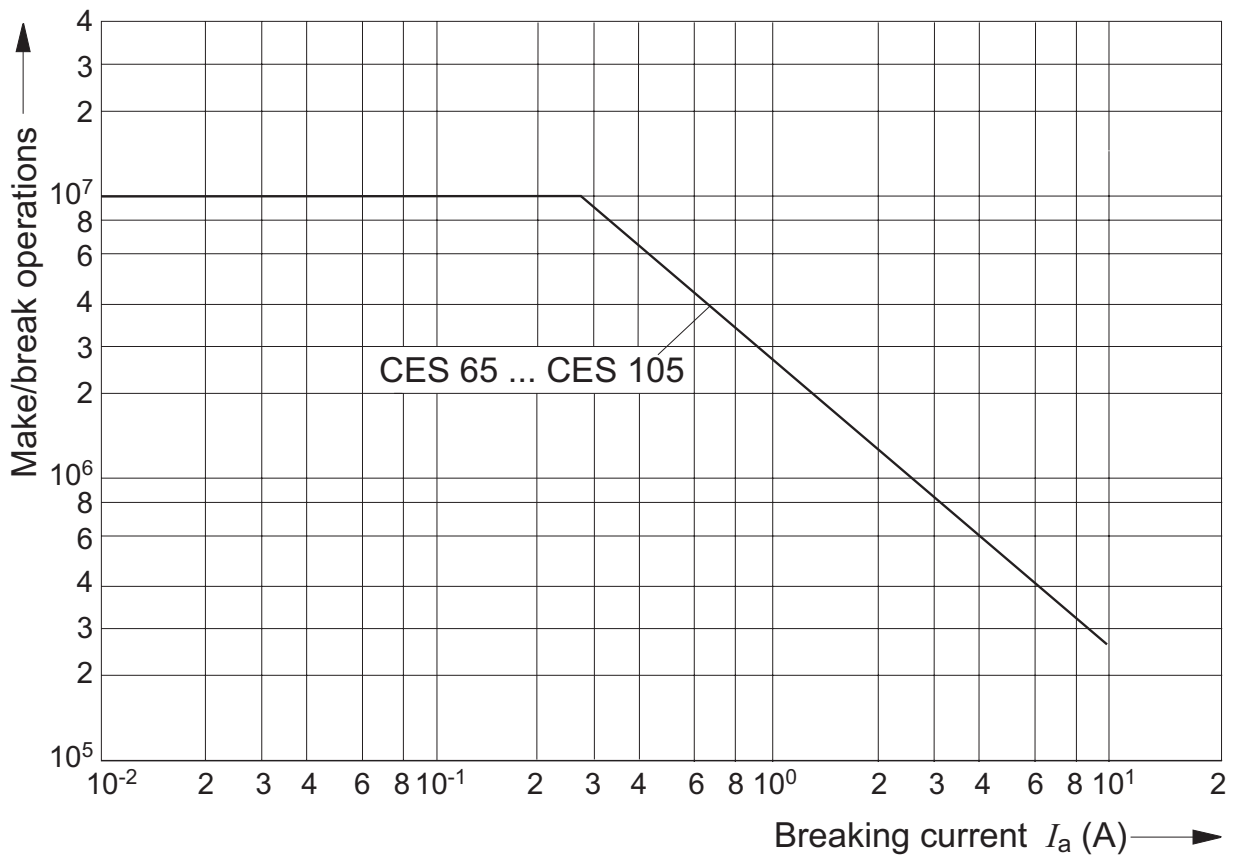
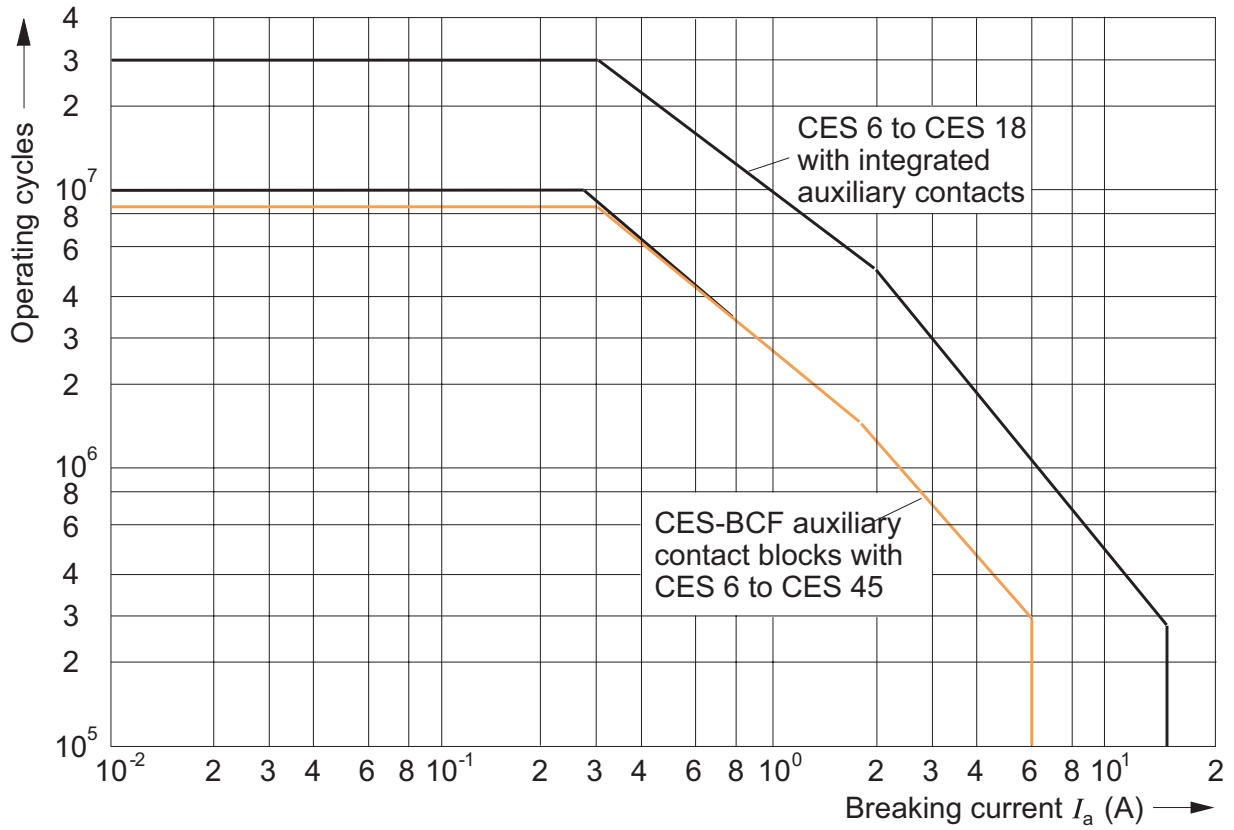
	a1	a2	a3	b1	b2	c1	d1	d2	d3	(c1) ¹	e1	f1	g	g1
CES 250 - CES 300	145	168	120	200	180	198	25	48	48	198	168	132	58	9
CES 400	160	183	130	200	180	222	25	48	48	222	178	150	65	9

Auxiliary contacts for CES contactors Technical Data						
Type		CES 6 ... CES 32 ¹⁾	CES 6 ... CES 18 ²⁾	CES 40, CES 45 ¹⁾	CES 65 ... CES 400	
Rated insulation voltage U_i (pollution degree 3)	V	690	690	690	1000	
Conventional free-air thermal current I_{th} = rated operational current I_e	A	10	10	10	10	
AC duty Rated operational current I_e / AC-15/AC-14 at rated operational voltage U_e	24 V	A	6	10	10	10
	110 V	A	6	10	10	10
	125 V	A	6	10	10	10
	220 V	A	6	10	6	6
	230 V	A	5,6	9,6	5,6	5,6
	380 V	A	4	6	4	4
	400 V	A	3,8	5,5	3,6	3,6
	500 V	A	2,5	4	2,5	2,5
	660 V	A	2	2	2,5	2,5
	690 V	A	1,8	1,8	2,3	2,3
DC duty Rated operational current I_e/DC-12 at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	10	10	--	--
	110 V	A	5,5	2,1	--	--
	125 V	A	--	--	--	--
	220 V	A	1,2	0,8	--	--
	440 V	A	0,28	0,6	--	--
	600 V	A	0,14	0,6	--	--
Rated operational current I_e/DC-13 at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	4,6	5	--	--
	110 V	A	0,8	0,9	--	--
	125 V	A	--	--	--	--
	220 V	A	0,3	0,45	--	--
	440 V	A	0,11	0,25	--	--
	600 V	A	0,08	0,2	--	--

¹⁾ Mountable auxiliary contact blocks.

²⁾ Integrated auxiliary contacts.

Contact endurance of the auxiliary contacts



Thermal overload relays, CLASS 10A

According to IEC 60947-4-1

Type		CES-RT0	CES-RT1	CES-RT2	CES-RT3
General data					
Trip class		CLASS 10A ($2s < t_{\lambda} \leq 10s$ at $7.2 \times I_{\lambda}$ from cold state)			
Phase failure sensitivity by differential phase shift		✓	✓	✓	✓
Changeover to automatic reset		✓	✓	✓	✓
RESET button with trip-free feature		✓	✓	✓	✓
Temperature compensation		✓	✓	✓	✓
Switch position indicator		✓	✓	✓	✓
Test button actuates the NO and NC contacts		✓	✓	✓	✓
Terminal for contactor coil		✓	✓	✓	✗ ¹⁾
Permissible ambient temperature	°C	-25 ... +55			
Degree of protection acc. to IEC 60947-1		IP00/open or IP20			
Shock resistance	g/ms	8/10			
Main circuit					
Rated insulation voltage U_i (Pollution degree 3)	AC/DC V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Type of current, frequency range		DC; AC ≤ 400 Hz			
Conductor cross-sections					
Terminal screw		M4	M5	M4	M5
solid or stranded	mm ²	2.5 ... 6	1.5 ... 25	1.5 ... 25	2.5 ... 35
finely stranded with end sleeve	mm ²	1.5 ... 4	1 ... 16	1 ... 16	1.5 ... 25
Flat bars	mm	--	--	--	--
Tightening torque	Nm	1 ... 1.5	2.5 ... 3	2.5 ... 3	2.5 ... 3
	lb.in	9 ... 13	22 ... 26.5	22 ... 26.5	22 ... 26.5
Power loss per conduction path (max.)					
at lowest value	W (VA)	0.9	1.2	1.2	2.6
at highest value of the setting range	W (VA)	2.25	3	3	4
Auxiliary circuit					
Auxiliary contacts		1 NO + 1 NC			
Conductor cross-sections					
Terminal screw		M3.5			
solid or stranded	mm ²	2 x (0.5 ... 1)/2 x (1 ... 2.5)			
finely stranded with end sleeve	mm ²	2 x (0.5 ... 1)/2 x (0.75 ... 2.5)			
Tightening torque	Nm	0.8 ... 1.4			
	lb.in	7 ... 12			
Rated insulation voltage U_i (pollution degree 3)		Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)	Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)
	V	400	690	400	690
Rated impulse withstand voltage U_{imp}	kV	6			
Switching capacity					
AC-15:					
Rated operational voltage U_e	V	24; 60; 125; 230; 400; 500; 690;			
Rated operational current I_e	A	2; 1.5; 1.25; 1.15; 1.1; 1; 0.8			
Conventional thermal current I_{th}	A	6			
Short-circuit protection		Fuses, utilization category gG 6A or miniature circuit-breaker with C-characteristics 3A			

Main circuit		CES-RT4								
Current setting [Suggested]		A	90-120	110-135	120-150	135-160	150-180	170-205	160-250	250-400
Tripping class		Class	10A							
Protection functions	Tripping due to overload		✓							
	Tripping due to phase unbalance		✓							
	Tripping due to phase failure		✓							
	Phase failure sensitivity by differential phase shift		✓ (according to IEC60947-4-1)							
	Temperature compensation		✓							
Functions	Test button		✓							
	Reset button		Manual and Automatic RESET							
	Switch position indicator		✓							
	Terminal A2 for contactor coil connection		✗							
Functions	Operation	°C	-25 ... +55							
	Storage/transport	°C	-25 ... +70							
	Temperature compensation	°C	≤ 70							
Altitude without derating		m	≤2000							
Rated insulation voltage Ui (pollution degree 3)		V	1000							
Rated impulse withstand voltage Uimp		kV	6							
Type of current, frequency range			DC, AC ≤ 400Hz							
Degree of protection			IP00							
Touch protection			Finger-safe (with accessories)							
Resistance to extreme climates - air humidity		%	< 90%, 25° C; < 50%, 40° C							
Mounting			stand-alone mounting (the terminal busbar should fit contactor terminal)							
Terminals	Main current terminals		Busbar - Hex head							
	Auxiliary contact terminal		Remain as existing							
Max. wire diameter size	Single wire	mm ²	50 ... 120						≤200 A: 185, >200 :240	
	Stranded wire	mm ²								
	finely stranded with end sleeve	mm ²	25 ... 95						----	
	Terminal size	[mm x mm]	20 x 3						20 x 3 / 2 x 30 x 5	
Auxiliary circuit										
Number of NO contacts			1	1	1	1	1	1	1	1
Number of NC contacts			1	1	1	1	1	1	1	1
Rated insulation voltage Ui (pollution degree 3)		V	≥400							
Rated impulse withstand voltage Uimp		kV	6							
Conventional thermal current Ith		A	6							
Rated operational current Ie AC-15		A	Ue=220V, Ie=1.15A; Ue=380V, Ie=1.1A							
Dimensions H / B / T ; Width		mm	≤ 104mm		≤ 104mm		≤ 150mm			
Certificates & Standards			CE, RoHS							

Thermal overload relays, CLASS 10A

Short circuit protection with fuses for motor feeders with short-circuit currents up to 50 kA at 690V, 50/60 Hz¹⁾
 Permissible short-circuit fuses for motor starters consisting of overload relay and contactor, contactor assembly

Technical data according to IEC 60947-4-1					
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination ²⁾		Type of coordination ²⁾	Type of coordination ²⁾	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT0					
0.1 ... 0.16	35	0.5 slow ³⁾	--	25	--
0.16 ... 0.25	35	1 ³⁾	--	25	
0.25 ... 0.4	35	1.6 ³⁾	--	25	
0.4 ... 0.63	35	2	--	25	2
0.63 ... 1	35	4	--	25	4
1 ... 1.6	35	6	--	25	6
1.6 ... 2.5	35	6	--	25	10
2.5 ... 4	35	10	--	25	10
4 ... 6.3	35	16	--	25	16
6.3 ... 10	35	25	--	25	20
8 ... 12.5	35	25	--	25	20
12.5 ... 18	35	25	--	25	25
CES-RT1					
6.3 ... 10	63	25		63	25
10 ... 16	63	35	20	63	35
16 ... 25	63	50	40	63	50
25 ... 32	63	50	50	63	50
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination ²⁾		Type of coordination ²⁾	Type of coordination ²⁾	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT2					
16 ... 25	80	50		100	10
25 ... 36	80	80		100	10
36 ... 45	80	80	--	100	16
CES-RT3					
40 ... 57	160	125	63	160	100
57 ... 70	160	125	63	160	100
70 ... 88	250	160	100	160	125
88 ... 105	250	200	125	160	200
CES-RT4					
90 ... 120	315	224	125	315	224
110 ... 135	315	224	160	315	224
120 ... 150	315	224	160	315	224
135 ... 160	355	224	160	355	224
150 ... 180	355	224	200	355	224
160 ... 250	500	400	250	500	400
250 ... 400	800	500	400	800	500

¹⁾ Voltage tolerance +5 %.

²⁾ Coordination of short-circuit equipment according to IEC 60947-4-1:

Type of coordination "1":

The contactor or starter must not endanger persons or the installation in the event of a short-circuit.

They do not need to be suitable for further operation without repair and the renewal of parts.

Type of coordination "2":

The contactor or starter must not endanger persons or the installation and must be suitable for further use.

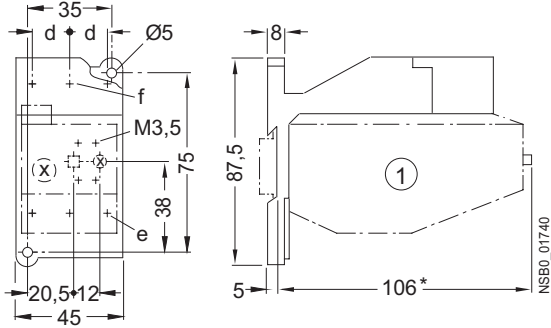
There is a danger of contact welding.

³⁾ D-fuse links $U_N = 500\text{ V}$

Thermal overload relays, CLASS 10A

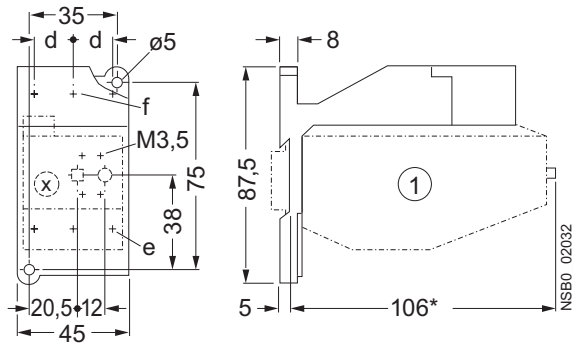
Dimensional drawings

CES-RT0, CES-RT1, with stand-alone adapter



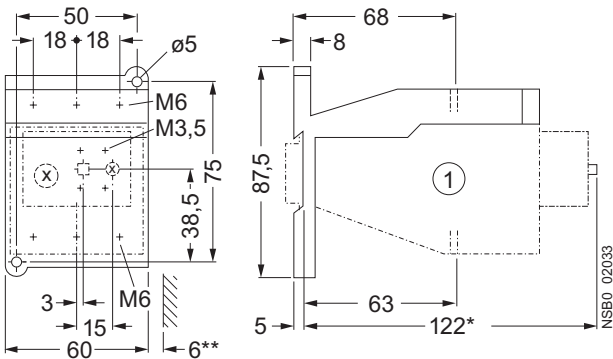
	d	e	f
CES-RT0 & CES-AD-RT0	10	M4	M3.5
CES-RT1 & CES-AD-RT1	14.3	M5	M4

CES-RT2 with CES-AD-RT2 stand-alone adapter

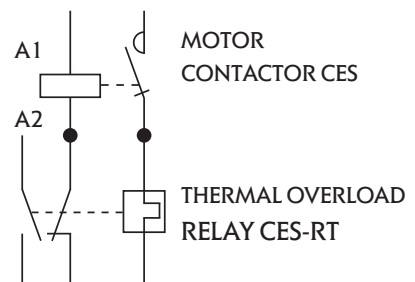


	d	e	f
CES-RT2 & CES-AD-RT2	18.5	M5	M5

CES-RT3 with CES-AD-RT3 stand-alone adapter

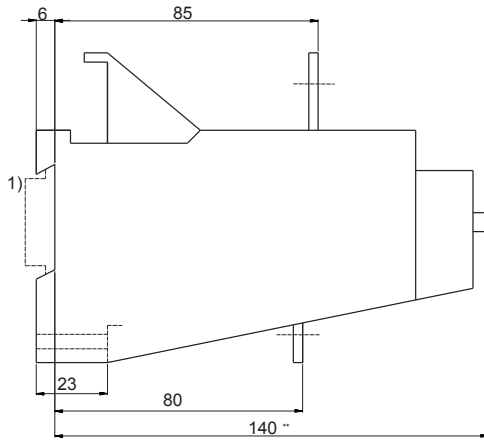
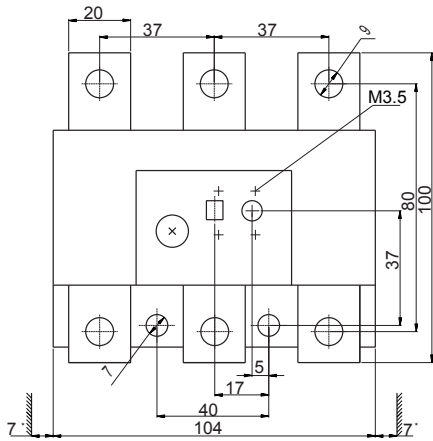


APPLICATION NOTE:



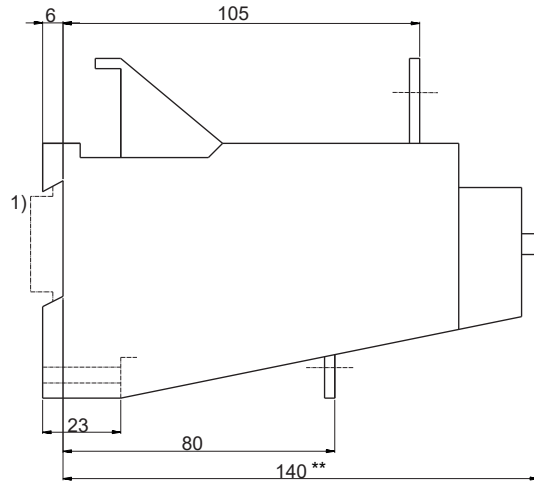
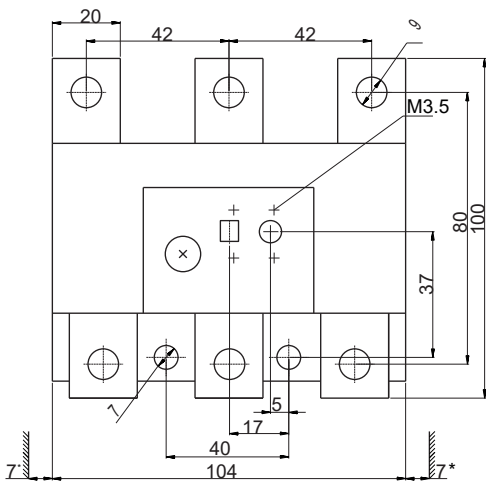
Technical data

CES-RT4 120, 135, 150



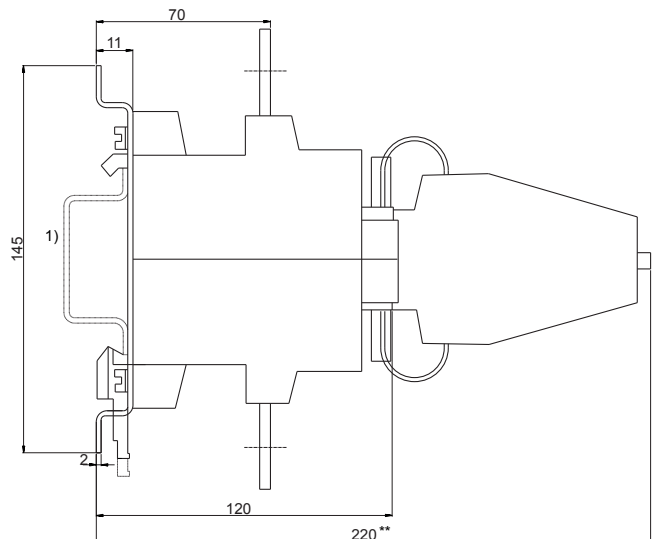
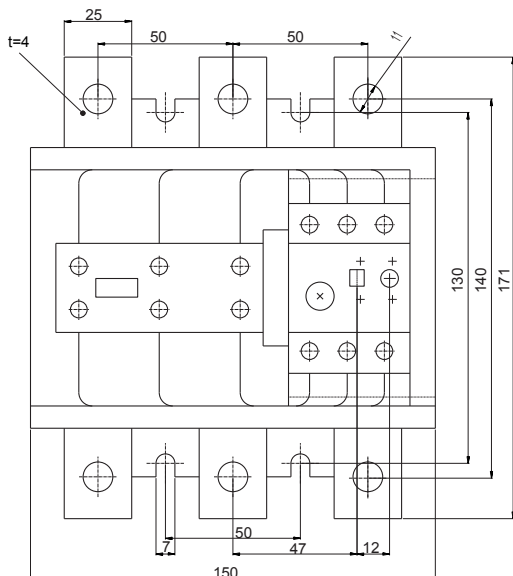
- * Dimension for the ground engaging component
- ** Dimension for the square OFF-button (stroke 3mm)
Dimension for the round RESET-button (Stroke 2.5mm) less 2.5mm
- 1) For 35mm standard (DIN) mounting rail

CES-RT4 160, 180



- * Dimension for the ground engaging component
- ** Dimension for the square OFF-button (stroke 3mm)
Dimension for the round RESET-button (Stroke 2.5mm) less 2.5mm
- 1) For 35mm standard (DIN) mounting rail

CES-RT4 250, 400



- ** Dimension for the square OFF-button (stroke 3mm)
Dimension for the round RESET-button (Stroke 2.5mm) less 2.5mm
- 1) For 75mm standard (DIN) mounting rail

Motor contactor CEM

Contactors CEM up to 132 kW Technical Data

type	CEM 9	CEM 12	CEM 18	CEM 25	CEM 32	CEM 40	CEM 50	CEM 65	CEM 80	CEM 95	CEM 105	CEM 112E	CEM 150E	CEM 180E	CEM 250E	CEM 300E		
Standards	IEC/EN 60 947, DIN VDE 0660																	
Rated insulation voltage U_i (V) to IEC/EN 60 947, DIN VDE 0660	1000 V																	
Rated impulse withstand voltage U_{imp}	6 kV						8 kV											
Rated operational frequency	25 - 400 Hz																	
Degree of protection	Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)																	
Main circuits	IP20			IP10						IP00								
Control circuits and auxiliary contacts	IP20																	
Ambient temperature	-25 ... +55 °C																	
Operating temperature																		
Storage temperature	-55 ... +80 °C																	
Altitude																		
Normal values	≤ 3000 m																	
90 % I_e /80 % U_e	3000 ... 4000 m																	
80 % I_e /75 % U_e	4000 ... 5000 m																	
Overvoltage category/Pollution degree	III/3																	
Climatic proofing	IEC 68-2																	
Main circuits																		
Number of poles	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Rated operation voltage U_e	690 V						1000V											
Conv. thermal current I_{th} at ≤ 55°C																		
Rated operational current I_e /AC-1	25 A	25 A	32 A	45 A	60 A	60 A	90 A	110 A	110 A	140 A	140 A	180 A	225 A	225 A	350A	410A		
AC-3 Duty																		
Rated operational power																		
230 V kW	2,2	3	4	6,5	9	11	15	18,5	22	25	30	30	45	55	75	90		
400 V kW	4	5,5	7,5	11	15	18,5	22	30	37	45	55	55	75	90	132	160		
415-440 V kW	4,5	5,5	9	12,5	15	22	30	37	45	55	55	90	110	150	185			
500 V kW	5,5	7,5	10	15	18,5	25	30	40	45	55	65	75	90	110	160	200		
690 V kW	5,5	7,5	10	15	18,5	30	33	45	45	55	65	80	80	132	200	200		
Short circuit rating max. fuse gG (A)	25	35	35	50	63	80	100	125	125	160	200	224	250	250	400	500		
max. electrical operating frequency																		
AC-1 Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600		
AC-3 Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600	600	600		
AC-4 Ops/h	360	360	360	360	360	360	200	200	200	200	200	150	150	150	150	150		
no load Ops/h	9000	9000	9000	9000	9000	9000	5000	5000	5000	5000	5000	4000	4000	4000	4000	4000		
Mechanical life span Ops x 10 ⁶	10																	
Electrical life span Ops x 10 ⁶	1,6	1,8		1,2				1,1						1,0				
Control circuit																		
Rated insulation voltage U_i (V)	1000 V																	
Nominal voltages U_s 50 Hz (V)	24 - 690 V																	
Nominal voltages U_s 60 Hz (V)	24 - 690 V																	
Nominal voltages U_s DC (V)	12 - 440 V																	
Pick-up and drop-out values																		
Pick-up x U_s (V)	0,8 - 1,1			0,8 - 1,1			0,8 - 1,1						0,8 - 1,1					
Drop-out x U_s (V)	0,35 - 0,55			0,4 - 0,6			0,4 - 0,6						0,3 - 0,5					
Power consumption of the coil 50/60 Hz																		
Pick-up (VA)	70			98			255						213		214		229	
(cos φ)	0,85			0,69			0,32						0,71		0,68		0,73	
Sealing (VA)	4...7,2			6,6...12,3			13,1...19,1						14,8		14,5		14,1	
(cos φ)	0,28			0,34			0,54						0,26		0,27		0,26	
Power consumption of the coil, DC coils																		
Pick-up (W)	3,8...7,5			240			340						166		154		171	
Sealing (W)	3,8...7,5			6			6,5						2,4		2,4		2,5	
Power dissipations																		
PD per pole @ 1, AC-3 (W)	0,2	0,3	0,8	1	1,3	1,5	2,1	3,6	5,5	6,9	8,4	6,2	11,1	13,8	17,9	25,7		
PD of coils, AC coils (W)	2,0	2,0	2,0	2,0	4,2	4,2	10,3	10,3	10,3	10,3	10,3	3,9	3,9	3,9	3,7	3,7		
PD of coils, DC coils (W)	7,5	7,5	7,5	7,5	6	6	6,5	6,5	6,5	6,5	6,5	2,4	2,4	2,4	2,5	2,5		

Technical data

Contactors CEM up to 132 kW Technical Data

Type	CEM 9 to CEM 18	CEM25	CEM32 and CEM40	CEM50 and CEM80	CEM95 and CEM105	CEM112E and CEM 150E	CEM180E	CEM250E and CEM300E
Main terminal capacity (mm²)								
Solid, stranded and finely stranded without end sleeve		2x (1...2,5) 2x (2,5...6) 2x (0,25...2,5)	2x (1...2,5) 2x (2,5... 10) 2x (1...2,5)					
Finely stranded with end sleeve		2x (2,5...6) 2x (13...16)	2x (2,5...10) 2x (13...17)					
One conductor on top								
Stranded				0,75...16	1...35	1,5...50		
Stranded with end sleeve				0,75...16	1...35	1,5...50		
Stranded without end sleeve				1...16	1,5...35	2,5...50		
Finely stranded				1...16	1,5...35	2,5...50		
One conductor on bottom								
Solid				1...16	2,5...35	4...35		
Stranded with end sleeve				1... 16	2,5...35	4...35		
Stranded without end sleeve				1,5...16	6...35	6...35		
Finely stranded				1,5...16	6...35	6...35		
Two conductors on top								
Solid				0,75...16	1...35	1,5...50		
Stranded with end sleeve				0,75...16	1...35	1,5...50		
Stranded without end sleeve				1...16	1,5...35	2,5...50		
Finely stranded				1...16	1,5...35	2,5...50		
Two conductors on bottom								
Solid				1...16	2,5...35	4...35		
Stranded with end sleeve				1...16	2,5...35	4...35		
Stranded without end sleeve				1,5...16	6...35	6...35		
Finely stranded				1,5...16	6...35	6...35		
Solid and stranded with end sleeve Bar						2 x (25...70) 2 x (15x3)	2 x (50...120) 2 x (20x3)	2 x (50...150) 2 x (30x5)
Tightening torque (N.m)		1...1,9	1,6...3	2,5...4	4...6	5...6,5	10	13

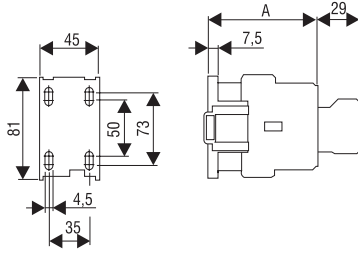
Auxiliary contacts

Type		CEM9	CEM12	CEM18	BCXMF...	BCXMLE ...
Rated insulation voltage Ui						
acc. IEC/EN 60 947	(V)		1000			1000
Rated operational voltage Ue						
	(V)		690			690
Conv. thermal current Ith						
	(A)		20			10
Rated operational current Ie						
AC-15	220 - 240 V	(A)	10			6
	380 - 400 V	(A)	6			4
	415 V	(A)	5			3,5
	500 V	(A)	4			2,5
DC-13	24 V	(A)	6			6
	48 V	(A)	4			4
	110 V	(A)	2			2
	220 V	(A)	0,7			0,7
Making capacity Im						
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)	250			90
DC-13/DC-11	Ue ≤ 220 V DC	(A)	250			90
Breaking capacity Ic						
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)	250			60
DC-13/DC-11	Ue ≤ 220 V DC	(A)	2			0,95
Short circuit protection						
max. fuse gG	(A)		16			10
Control circuit reliability						
			Ie min = 5 mA, Ue min = 17 V			
Electrical life span	Ops		10 ⁶			
Mechanical life span	Ops		15 x 10 ⁶			
Impedance /pole	mR		2,5			

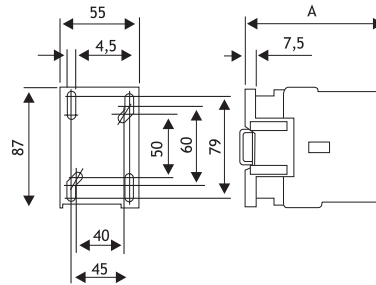
Dimensions

ETICON

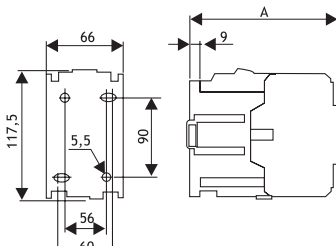
	AC	DC
CAEM4	A=85	A=115
CEM9	A=85	A=115
CEM12	A=85	A=115
CEM18	A=85	A=115
CEM25	A=87	A=117



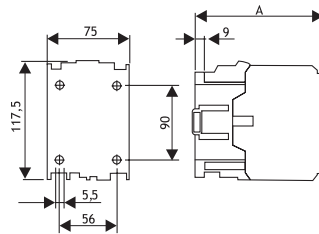
	AC	DC
CEM32	A=98	A=134
CEM40	A=98	A=134



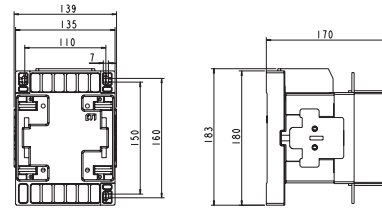
	AC	DC
CEM50	A=116	A=144
CEM65	A=116	A=144
CEM80	A=116	A=144



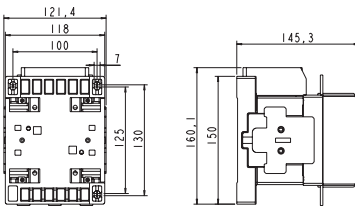
	AC	DC
CEM95	A=126	A=154
CEM105	A=126	A=154



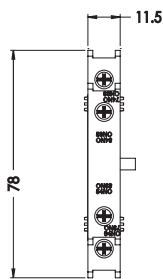
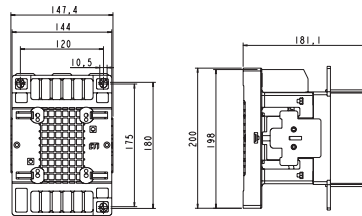
CEM180(E)



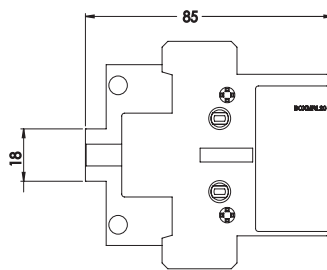
CEM112(E)
CEM150E



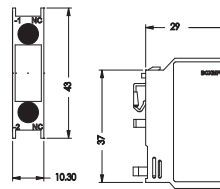
CEM250(E)
CEM300(E)



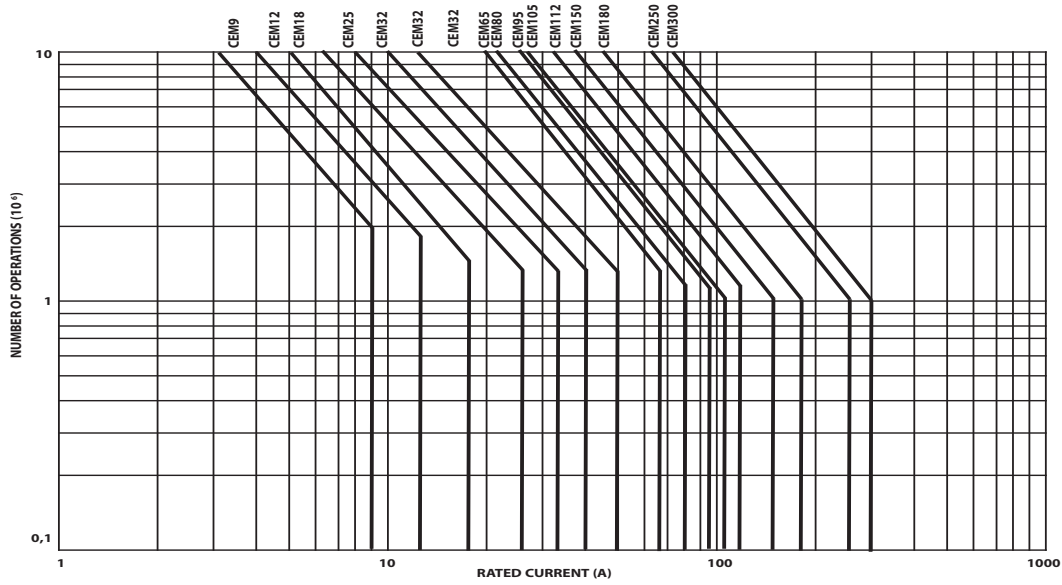
BCXMF



BCXMLE

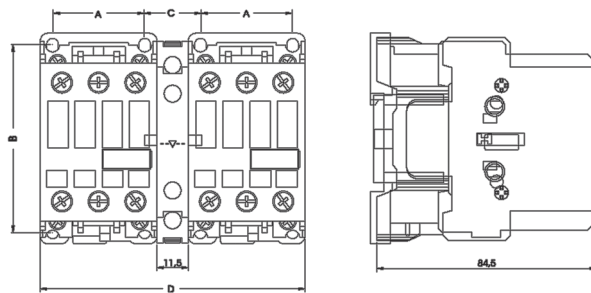


Diagram



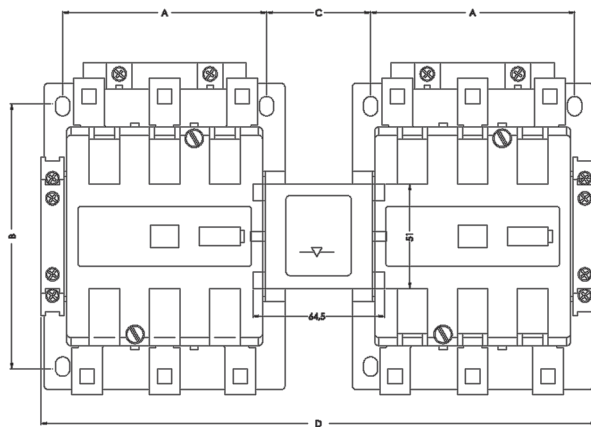
Dimensions

BLIME9-105



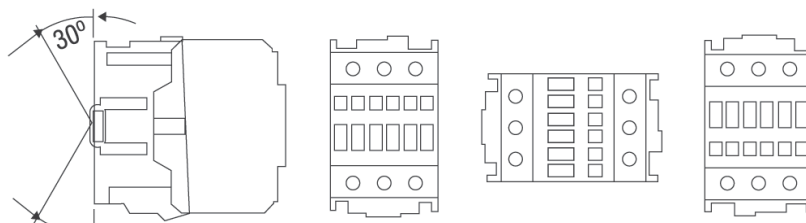
Contactors	A	B	C	D
CEM9...25	35	72,5	22	102
CEM32...40	45	79	22	122
CEM50...80	57	90	22	144
CEM95...105	57	90	29	162

BLIME 112-300E



Contactors	A	B	C	D
CEM112...150	100	130	51	272,5
CEM180	110	160	58,5	303,5
CEM250...300	120	180	57	325,4

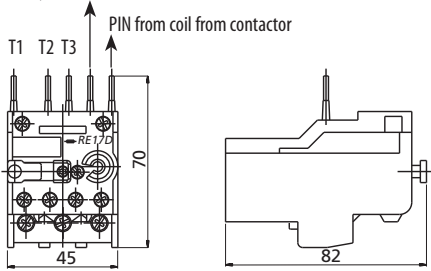
Mounting position



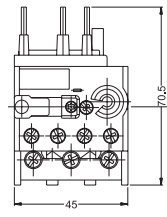
Overload relay

- phase-failure sensitivity to IEC/EN 60947-4-1, DIN VDE 0660T.102
- tripping class 10 according to standard 60947-4-1
- temperature compensation
- auxiliary contact 1NO/1NC
- hand/auto/reset

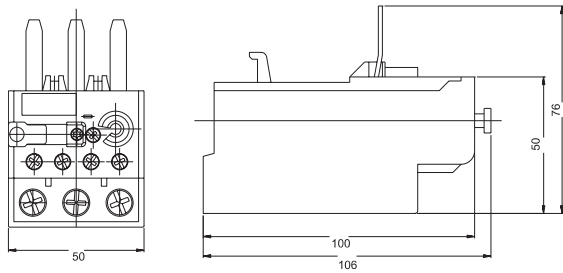
PIN from auxiliary contactor



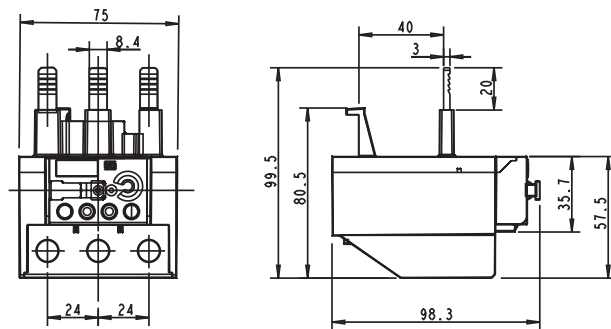
RE17D



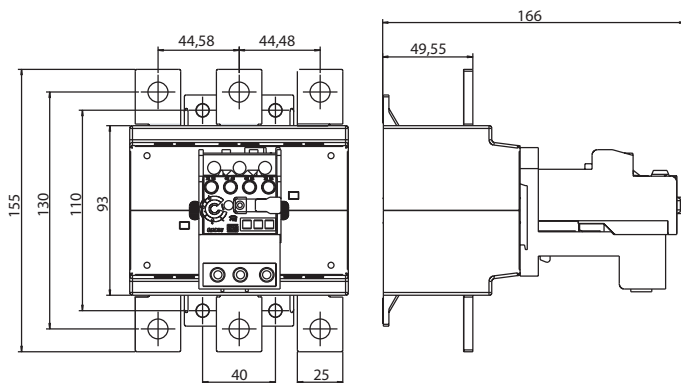
RE27D



RE67D



RE117.1D

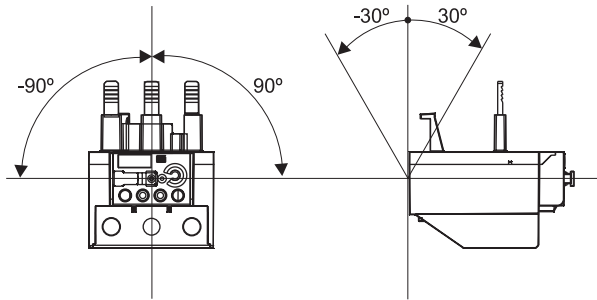


RE317D

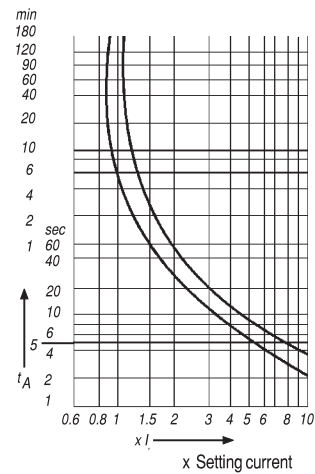
overload relay current setting	recommended fuse gG (A)
0,28-0,4	2
0,4-0,63	2
0,56-0,8	2
0,8-1,2	4
1,2-1,8	6
1,8-2,8	6
2,8-4	10
4-6,3	16
5,6-8	20
7-10	25
8-12,5	25
10-15	35
11-17	35
15-23	50
22-32	63
25-40	80
32-50	100
40-57	100
50-63	100
57-70	125
63-80	125
75-97	200
90-112	250
100-150	315
140-215	355
200-310	500

Technical data

Mounting position for RE17D to RE117D



RE...D Tripping characteristic



These tripping characteristics show mean values of the tolerance range at 20°C ambient temperature starting from cold. They show the tripping times in relation to the response current. At operational temperature, the tripping time of the overload relay drops to approximately 25 % of the shown.

Overload relay		RE17D	RE27D	RE67D	RE117D	RE317D
Type						
General technical data						
Standards		IEC/EN 60 947, DIN VDE 0660			IEC/EN 60 947, DIN VDE 0660	
Current setting	(A)	0,28 - 17	0,28 - 32	25 - 80	75 - 112	100 - 310
Tripping Class acc. o IEC 60947-4-1		10				
Temperature compensation		continuous				
Rated insulation voltage Ui						
acc. IEC/EN 60 947/DIN VDE 0660	(V)	690				
Rated impulse withstand voltage U _{imp}	(kV)	6				
Rated operational frequency	(Hz)	0 - 400				
Degree of protection		IP 20				
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)		finger and back-of-hand proof				
Ambient temperature		-25 ... +60				
Operating temperature	°C	-25 ... +60				
Storage temperature	°C	-40 ... +70				
Power dissipation per pole	(W)	≤3	≤3	≤5,5	≤5,5	≤15
Aux. Contacts impedance (pole)	mR	2,5				
Terminal capacity						
solid	mm ²	2x 1,5 ... 6		1x 6 ...35	1x 25 ... 35	-
flexible without cable	mm ²	2x 1,5 ... 6		1x 6 ...35	1x 25 ... 35	-
flexible with cable lug	mm ²	2x 1,5 ... 6		1x 6 ...35	1x 25 ... 35	-
stranded	mm ²	2x 1,5 ... 10		1x 6 ...35	1x 25 ... 35	-
bar	mm	-		-	-	20 x 4
Tightening torque	Nm	1,4 ... 2,3		4 ... 6	4 ... 6	14 ... 26
Rated insulation voltage Ui						
acc. IEC/EN 60 947/DIN VDE 0660	(V)	690				
Rated operational current						
AC-15	120 V Ie	(A)	3			
	240 V Ie	(A)	2			
	415 V Ie	(A)	1,5			
	500 V Ie	(A)	0,5			
DC-13	24 VDC Ie	(A)	1			
	60 VDC Ie	(A)	0,5			
	110 VDC Ie	(A)	0,25			
	220 VDC Ie	(A)	0,1			

**Minimum fuse size for the protection of three-phase motors.
The maximum size is governed by the requirements of the associated switchgear or overload relay.**

Motor rating			230 V			400 V			500 V			690 V		
[kW]	cosφ	η(%)	Rated motor current [A]	Fuse		Rated motor current [A]	Fuse		Rated motor current [A]	Fuse		Rated motor current [A]	Fuse	
				Starting direct [A]	Y/Δ [A]		Starting direct [A]	Y/Δ [A]		Starting direct [A]	Y/Δ [A]		Starting direct [A]	Y/Δ [A]
0,06	0,7	58	0,37	2	-	0,21	2	-	0,17	2	-	0,12	2	-
0,09	0,7	60	0,54	2	-	0,31	2	-	0,25	2	-	0,18	2	-
0,12	0,7	60	0,72	4	2	0,41	2	-	0,3	2	-	0,24	2	-
0,18	0,7	62	1,04	4	2	0,6	2	-	0,48	2	-	0,35	2	-
0,25	0,7	62	1,4	4	2	0,8	4	2	0,7	2	-	0,5	2	-
0,37	0,72	66	2	6	4	1,1	4	2	0,9	2	2	0,7	2	-
0,55	0,75	69	2,7	10	4	1,5	4	2	1,2	4	2	0,9	4	2
0,75	0,79	71	3,2	10	4	1,9	6	4	1,5	4	2	1,1	4	2
1,1	0,81	74	4,6	10	6	2,6	6	4	2,1	6	4	1,5	4	2
1,5	0,81	74	6,3	16	10	3,6	6	4	2,9	6	4	2,1	6	4
2,2	0,81	78	8,7	20	10	5	10	6	4	10	4	2,9	10	4
3	0,82	80	11,5	25	16	6,6	16	10	5,3	16	6	3,8	10	4
4	0,82	83	14,8	32	16	8,5	20	10	6,8	16	10	4,9	16	6
5,5	0,82	86	19,6	32	25	11,3	25	16	9	20	16	6,5	16	10
7,5	0,82	87	26,4	50	32	15,2	32	16	21,1	25	16	8,8	20	10
11	0,84	87	38	80	40	21,7	40	25	17,4	32	20	12,6	25	16
15	0,84	88	51	100	63	29,3	63	32	23,4	50	25	17	32	20
18,5	0,84	88	63	125	80	36	63	40	28,9	50	32	20,9	32	25
22	0,84	92	71	125	80	41	80	50	33	63	32	23,8	50	25
30	0,85	92	96	200	100	55	100	63	44	80	50	32	63	32
37	0,86	92	117	200	125	68	125	80	54	100	63	39	80	50
45	0,86	93	141	250	160	81	160	100	65	125	80	47	80	63
55	0,86	93	173	250	200	99	200	125	79	160	80	58	100	63
75	0,86	94	233	315	250	134	200	160	107	200	125	78	160	100
90	0,86	94	279	400	315	161	250	200	129	200	160	93	160	100
110	0,86	94	342	500	400	196	315	200	157	250	160	114	200	125
132	0,87	95	401	630	500	231	400	250	184	250	200	134	250	160
160	0,87	95	486	630	630	279	400	315	224	315	250	162	250	200
200	0,87	95	607	800	630	349	500	400	279	400	315	202	315	250
250	0,87	90	-	-	-	437	630	500	349	500	400	253	400	315
315	0,87	96	-	-	-	544	800	630	436	630	500	316	500	400
400	0,88	96	-	-	-	683	1000	800	547	800	630	396	630	400
450	0,88	96	-	-	-	769	100	800	615	800	630	446	630	630
500	0,88	97	-	-	-	-	-	-	-	-	-	491	630	630
560	0,88	97	-	-	-	-	-	-	-	-	-	550	800	630
630	0,88	97	-	-	-	-	-	-	-	-	-	618	800	630

The rated motor currents apply to normal, internal-ventilated and enclosed fan-cooled three-phase motors at 1500 rpm.

D.O.L. Starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 seconds.

Y/D-starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 seconds.

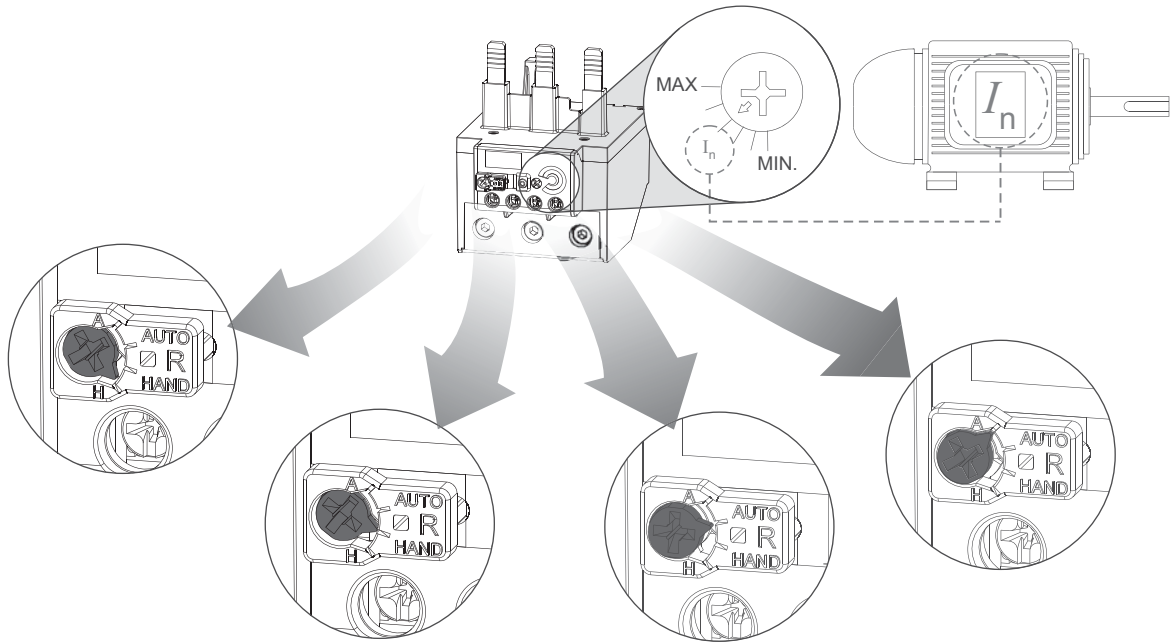
Set the overload relay in the phase lead to 0,58 x rated motor current.

















Rated fuse currents for Y/D-starting also apply to three-phase motors with slip-ring rotors.

Use a larger fuse if the rated current or starting current is higher and/or if the starting time is longer.

The table applies to "slow" or "gL" fuse (VDE 0636)

By NH fuse with aM characteristics, select fuse size to match rated current.



				
				
97-98 NO	 - Device must be reset manually after overload by pushing the button. Relay must cool down before reset.	 - Device must be reset manually after overload by pushing the button. Relay must cool down before reset.	 AUTOMATIC RESET AND TEST - Automatic reset of thermal protection, after cool down. - Test circuit is available.	 AUTOMATIC RESET - Automatic reset of thermal protection, after cool down. - Testing not available in this mode.
95-96 NC	 - Testing not available in this mode.	 - Test function available in this mode.		

Motor protective circuit breaker MSP

Technical data		according to IEC 60947-1; IEC 60947-2; IEC 60947-4-1							
Type		MSP0				MSP1			
General data									
Number of poles		3				3			
Max. rated current I_n									
• motor protection	A	25				52			
Permissible ambient temperature									
• at full rated current	°C	-20 ... +55							
• in storage	°C	-50 ... +80							
Rated operational voltage U_e	V	690							
Rated frequency	Hz	50/60							
Rated insulation voltage U_i	V	750							
Rated impulse withstand voltage U_{imp}	kV	6							
Utilization category									
• to IEC 60947-2 (motor starter protectors)		A							
• to IEC 60947-4-1 (motor starters)		AC-3							
Mechanical endurance									
• up to 25 A	Operating cycles	100000				100000			
• 25 A upwards		--				30000			
Number of operating cycles/h (on load)	1/h	25				25			
Degree of protection with open terminals/with conductors connected		IP00/IP20							
Temperatures compensation to IEC 60947-4-1		✓							
Phase failure sensitivity to IEC 60947-4-1		✓							
Power loss P_v per breaker									
I_n	A	0,6	4	6	25	2,4	6	25	63
P_v	W	5	6	7	9	8	7	14	23

Auxiliary contacts				
Utilization category		AC-15		
Rated operational voltage U_e	ACV	230	400	500
Rated operational current I_e	A	3	1.5	1
Utilization category		DC-13		
Rated operational voltage U_e DC L/R200 ms	DCV	24	60	220
Rated operational current I_e	A	2.3	0.7	0.3

Type		MSP0			MSP1		
Cross-section for main conductors							
Solid or stranded	mm ²	2 x (1 ... 6)			1 x 1.5 ... 2 x 16 or 1 x 25 + 1 x 10		
Finely stranded with end sleeve	mm ²	2 x (1 ... 4)			1 x 1.5 ... 2 x 10 or 1 x 16 + 1 x 10		
Cross-sections for auxiliary and control connecting leads							
Solid or stranded	mm ²	1 x 0.5 ... 2 x 2.5			--		
Finely stranded with end sleeve	mm ²	1 x 0.5 ... 2 x 1.5			--		

Rated short-circuit breaking capacity

The table shows the rated ultimate short-circuit breaking capacity

I_{cu} and the rated service short-circuit breaking capacity I_{cs} for the MSP motor starter protectors with respect to rated current I_n and rated operational voltage U_e .

Infeed is permitted at top or bottom without reduction of rated data. In the short-circuit proof areas, I_{cu} is at least 100 kA. A backup fuse is therefore not necessary.

In the other areas, when the short-circuit current at the installation point exceeds the rated short-circuit breaking capacity given in the table for the motor starter protectors, the motor starter protector must be protected by a backup fuse. See the following table for the maximum rated current for the backup

fuse. With a backup fuse according to the table, the maximum short-circuit current is permitted to equal the rated breaking capacity of the backup fuse.

Technical data

Motor Starter Protectors	Rated current I_n	Up to AC 240 V			Up to AC 415 V			Up to AC 440 V			Up to AC 500 V			Up to AC 690 V		
		I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MSP0	≤ 1 A	Short-circuit proof up to 100 kA, backup fuse is not necessary														
	1.6 A	fuse is not necessary														
	2.4 A															
	3.2 & 4 A															
	5 & 6 A															
	8 & 10 A															
	13 & 16 A															
	20 & 25 A	10 (50)	10 (50)	100	6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
MSP1	≤ 2.4 A	Short-circuit proof up to 100 kA, backup fuse is not necessary														
	4 A															
	6 A															
	10 A															
	16 A															
	25 A															
	32 & 52 A															

Relation between short-circuit breaking capacity I , related power factor and minimum short-circuit making capacity to IEC 60947-2.		
Short-circuit breaking capacity	Power factor $\cos \phi$	Short-circuit making capacity
$I \leq 3000$	0.9	1.42 x I
$3000 < I \leq 4500$	0.8	1.47 x I
$4500 < I \leq 6000$	0.7	1.5 x I
$6000 < I \leq 10000$	0.5	1.7 x I
$10000 < I \leq 20000$	0.3	2.0 x I
$20000 < I \leq 50000$	0.25	2.1 x I
$50000 < I$	0.2	2.2 x I

Curves

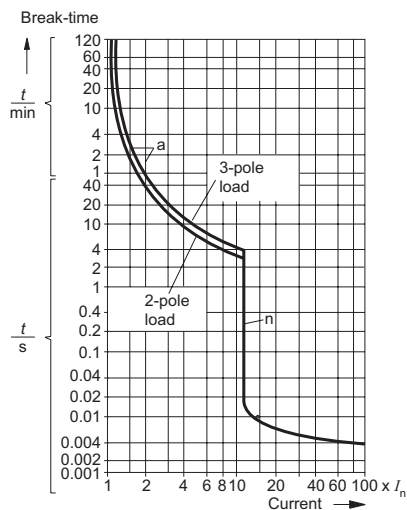
Characteristic curves

The characteristic curves are obtained in the cold state and 3-pole loading.

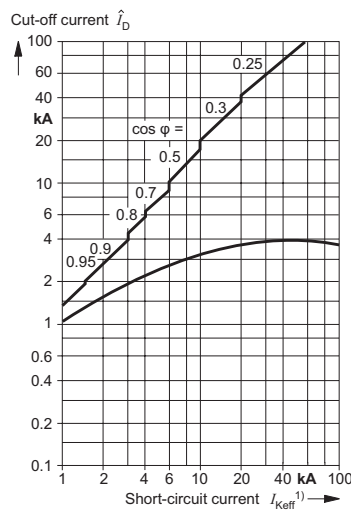
At operating temperature, the tripping time of the thermal releases drops by about 25 %. With 3-pole loading, the deviation in tripping time for 3 times the current and upwards is ± 20 %.

Characteristic curves for MSP0

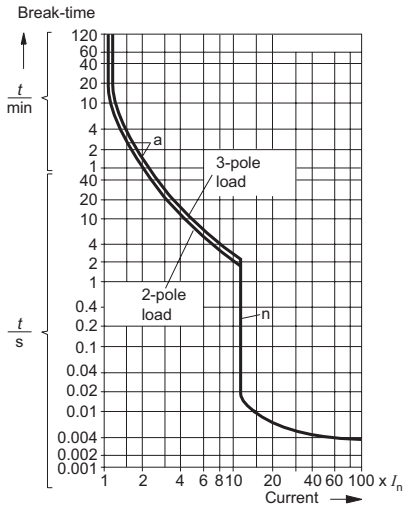
The characteristic curves shown here apply for a MSP0-6 motor starter protector with a rated current of 6 A, a current setting range of 4 to 6 A and a tripping current for the instantaneous overcurrent release of 72 A, at a rated voltage of AC 50 Hz, 400 V.



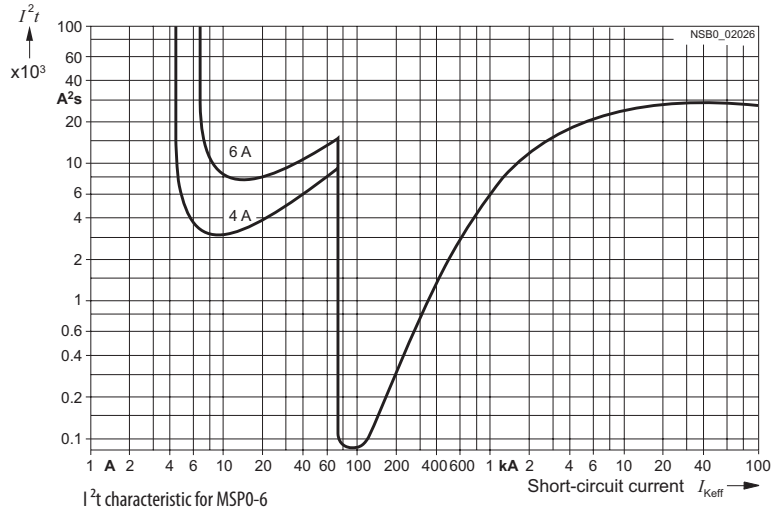
Schematic representation of the time/current characteristic for MSP0



Current limiting characteristic for MSP0-6



Schematic representation of the time/current characteristic for MSP1



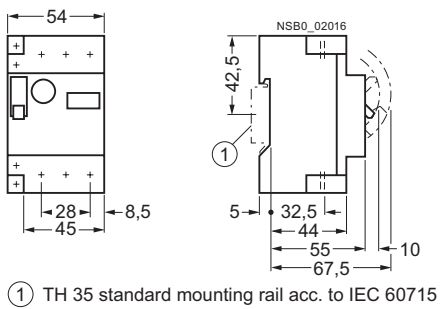
$I^2 t$ characteristic for MSP0-6

Characteristic curves for MSP1

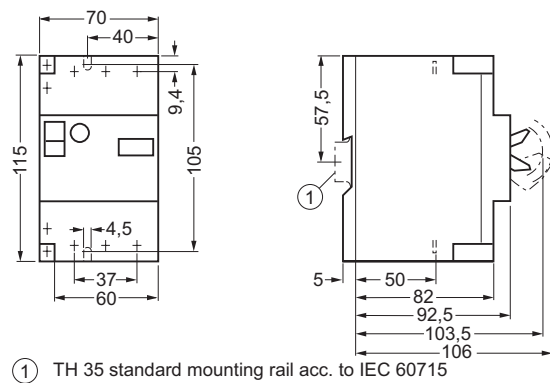
The characteristic curves shown here apply for a motor starter protector with a rated current of 25 A and a tripping current for the instantaneous overcurrent release of 300 A, at a rated voltage of AC 50 Hz, 400 V.

Dimensions

MSP0



MSP1

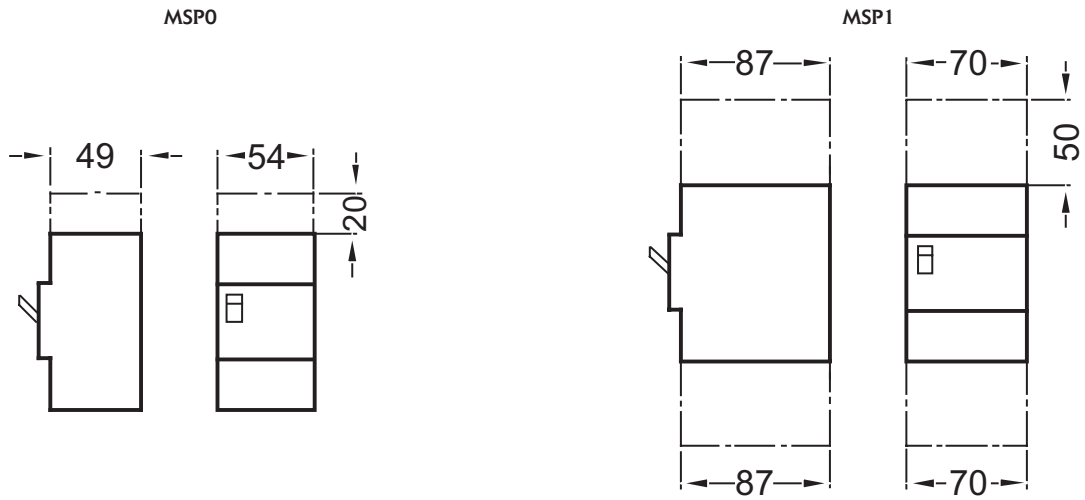


Technical data

Space required above arc chutes

Minimum clearance with rated voltage to adjacent parts as well as non-insulated live parts.

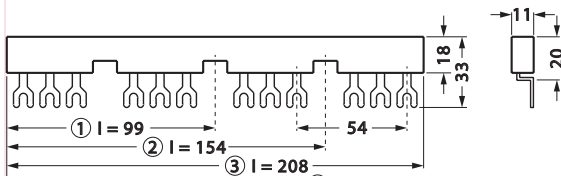
The spacing of minimum 1 cm with MSP0 and minimum 2 cm with MSP1 between large-surface covers and arc openings should be observed.



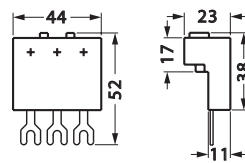
Uninsulated conductors must be insulated within the space required above arc chutes.

Permissible mounting position

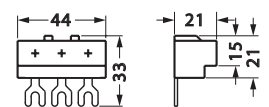
MSP0, MSP1 motor starter protectors permissible mounting position due to the position of the operating parts



three-phase busbar
 ① For 2 devices: MSP-122
 ② For 3 devices: MSP-123
 ③ For 4 devices: MSP-124



MSP-TA2
 three-phase feed-in terminal,
 type I



MSP-TA1
 three-phase feed-in terminal,
 type II

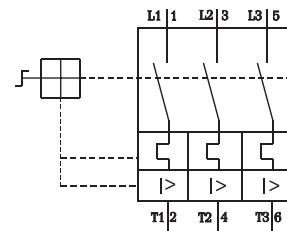
Motor protective circuit breaker MPE25

General technical data				
Standards		IEC/EN 60 947		
Climatic proffing		damp heat, constant to IEC 60 068-2-3 damp heat, cyclical to IEC 60 068-2-30		
Ambient temperature	Storage	°C	-50 ... +80	
	Open	°C	-20 ... +70	
	Enclosed	°C	-20 ... +35	
Mounting position		any position		
Degree of protection		IP20		
Protection against direct contact		IP20		
Shock resistance to IEC 60 068-2-27		g	15	
Altitude		m	2000	
Conductor cross-section for main circuit	solid	mm ²	1 x (1,5 ... 6) / 2 x (1,5 ... 6)	
	stranded	mm ²	2 x (1,5 ... 6) / 2 x (1,5 ... 6)	
Tightening torque	main circuits	Nm	2,0 ... 2,5	
	control circuits	Nm	1,0 ... 1,25	
Main contacts				
Rated impulse withstand voltage Uimp		kV	6	
Overvoltage categ./pollution degree		III/3		
Rated operational voltage Ue		V	690	
Rated operational current Ie		A	25 or setting current of overload release	
Rated frequency		Hz	50/60	
Current heat losses, 3-pole at oper. T	W		5 (MPE25-0,1 - MPE25-0,63)	
	W		6 (MPE25-1 - MPE25-6,3)	
	W		7 (MPE25-10)	
	W		8 (MPE25-16 - MPE25-25)	
	W		10 (MPE25-32)	
Life span, mechanical = electrical		Ops.	100.000	
Maximum operating frequency		Ops./h	15	
Releases				
Temperature compensation		°C	-20 ... +60	
Adjustable overload releases		x Iu	0,6 - 1	
Fixed short circuit releases		x Iu	12	
Phase failure sensitivity		IEC/EN 60 947-4-1		
Auxiliary contacts				
Rated impulse withstand voltage		kV	6	
Overvoltage category/pollution degree		III/3		
Rated operational voltage		V	690 (250 -> ACBFE...)	
Rated operational current				
AC-15	24V	I _e	A	6 (2 -> ACBFE)
	230V	I _e	A	4 (0,5 -> ACBFE)
	380V-415V	I _e	A	3 (∅ -> ACBFE)
	440V-500V	I _e	A	2 (∅ -> ACBFE)
DC-13	24V	I _e	A	2 (1 -> ACBFE)
	60V	I _e	A	0.5 (0,15 -> ACBFE)
	110V	I _e	A	0.5 (∅ -> ACBFE)
	220V	I _e	A	0.25 (∅ -> ACBFE)
Control circuit reliability at Ue		U _{min} = 17V, I _{min} = 5mA		
Fault probability		< 1 fault in 1 million operations		
Short-circuit rating without welding		Fuse gG	A	10
Conductors cross-section for auxiliary and control circuits		solid or stranded	mm ²	1 x (0,5 ... 2,5) / 2 x (0,5 ... 2,5)

Technical data

Max. operational power

type	max. operational power (kW) AC 3				operational inst. current I _u (A)	setting overl. release I _r (A)	short-circuit release I _{rm} (A)
	400V 415V	440V	500V	690V			
MPE25-0,16	-	-	-	0.06	0.16	0,1-0,16	1.9
MPE25-0,25	0.06	0.06	0.06	0.12	0.25	0,16-0,25	3
MPE25-0,40	0.09	0.12	0.12	0.18	0.4	0,25-0,4	4,8
MPE25-0,63	0.12	0.18	0.25	0.25	0.63	0,4-0,63	7,5
MPE25-1,0	0.25	0.25	0.37	0.55	1	0,63-1,0	12
MPE25-1,6	0.55	0.55	0.75	1.1	1.6	1,0-1,6	19
MPE25-2,5	0.75	1.1	1.1	1.5	2.5	1,6-2,5	30
MPE25-4,0	1.5	1.5	2.2	3	4	2,5-4,0	48
MPE25-6,3	2.2	3	3	4	6.3	4,0-6,3	75
MPE25-10	4	4	4	7.5	10	6,3-10	120
MPE25-16	7.5	9	9	12.5	16	10-16	190
MPE25-20	9	11	12.5	15	20	16-20	240
MPE25-25	12.5	12.5	15	22	25	20-25	300
MPE25-32	15	15	18.5	30	32	25-32	384



Technical data

Tripping devices

Rated operational voltage	U _e	V	200-415V
Conductor cross-section for main circuit	solid or stranded	mm ²	1 x (0,5 to 2,5) / 2 x (0,5 to 2,5)

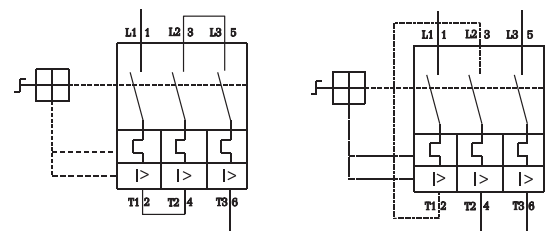
Shunt Releases

Operating range	x U _s	0,7 - 1,1
Power consumption	Pull	VA 10
	Sealing	VA 4.5

Undervoltage Releases

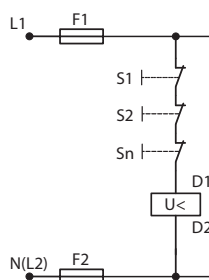
Pick-up voltage	x U _s	0,85 - 1,1
Drop-out voltage	x U _s	0,7 - 0,35

MPE25 wired 1- or 2-pole

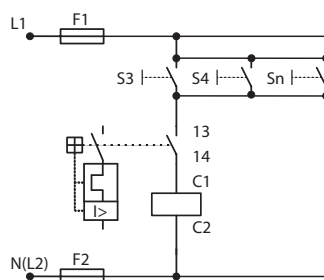


Typical circuits

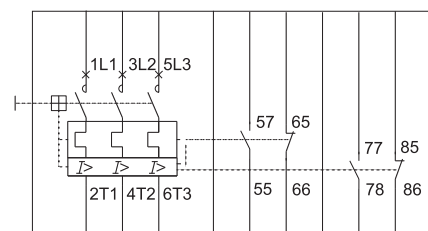
Undervoltage release
URMPE



Shunt release
SRMPE



Trip Signalling Block
TSBE

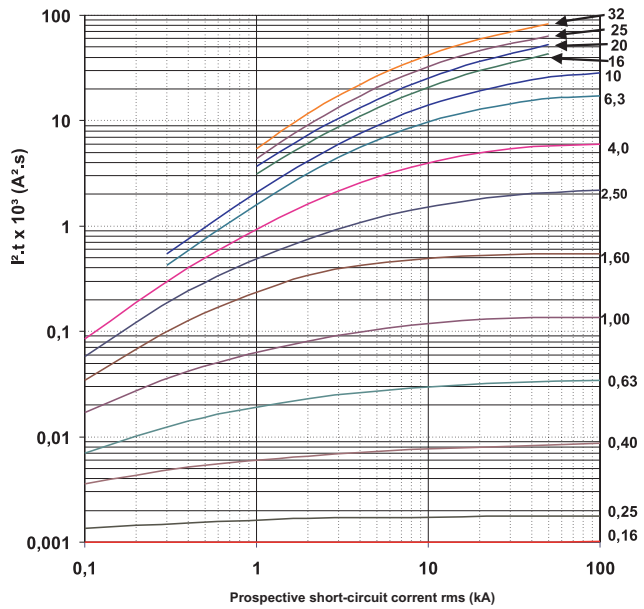
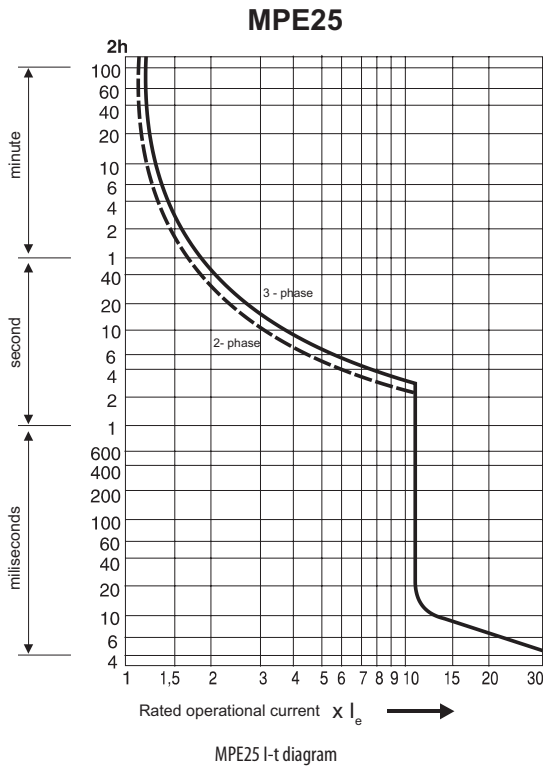


Altitude - Factor of Correction

Altitude (above the sea level) - h	Rated operational voltage U _e	Factor of correction I _u
h < 2000m	690V	1 x I _n
2000m < h < 3000m	550V	0,96 x I _n
3000m < h < 4000m	480V	0,93 x I _n
4000m < h < 5000m	420V	0,90 x I _n

Curves

The tripping characteristics show the tripping time of the circuit-breakers in relation to the current. They show mean values of the tolerance ranges at an ambient temperature of 20 °C, starting from cold. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all three phases of the MPE25 should be loaded.



Breaking capacity of motor protective circuit breakers MPE25

I_{cc} = Prospective short-circuit current

I_{cu} = Rated ultimate short-circuit breaking capacity

I_{cs} = Rated service short-circuit breaking capacity

I _u A	230V			400V			690V		
	I _{cu} kA	I _{cs} kA	max. fuse gG A	I _{cu} kA	I _{cs} kA	max. fuse gG A	I _{cu} kA	I _{cs} kA	max. fuse gG A
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	25 ⁽¹⁾
4	100	100	-	100	100	-	6	3	32 ⁽¹⁾
6.3	100	100	-	100	100	-	6	3	50 ⁽¹⁾
10	100	100	-	100	100	-	6	3	50 ⁽¹⁾
16	100	100	-	50	25	100 ⁽¹⁾	4	3	63 ⁽¹⁾
20	100	100	-	50	25	125 ⁽¹⁾	4	3	63 ⁽¹⁾
25	100	100	-	50	25	125 ⁽¹⁾	4	3	63 ⁽¹⁾
32	100	100	-	50	25	125 ⁽¹⁾	4	3	63 ⁽¹⁾

Note: (1) Fuse required if the prospective short-circuit current exceeds the rated ultimate short circuit breaking capacity (I_{cc} > I_{cu})

The MPE 25 switching of direct current

The MPE circuit breakers for alternating current are able to switch direct current. However, you are obliged to observe the maximum permissible DC voltage per conducting path. In case of higher voltages, series connection of 2 or 3 conducting parts is required. The response characteristics of the overload releases remain unchanged. The response thresholds of the short-circuit releases are increased with direct current by approximately 35%.

The following table shows suggestions for switching direct current:

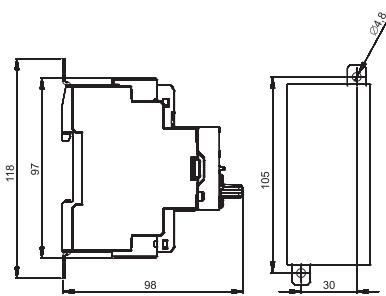
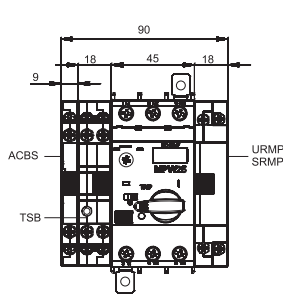
Recommended Connection	Highest Permissible Direct Voltage	Explanation
	150V DC	2-poles switching Ungrounded system If ground fault can be excluded, or if every ground is immediately corrected (via ground-fault monitoring), the maximum permissible DC voltage can be multiplied by 3
	300V DC	2-poles switching Grounded system The grounded pole should be assigned to the individual conducting path so that in the event of a ground fault there are always 2 conducting paths in series
	450V DC	1-pole switching Grounded system 3 conducting paths in series. The grounded pole should be assigned to the unswitched conducting path.

DC short-circuit breaking capacity (time constant $\leq 5\text{ms}$)

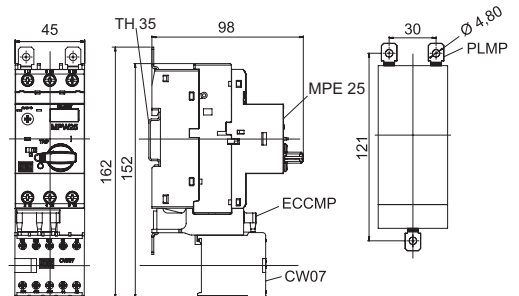
- 1 conducting path DC 150V 10kA
- 2 conducting paths in series DC 350V 10kA
- 3 conducting paths in series DC 350V 10kA

Dimensions

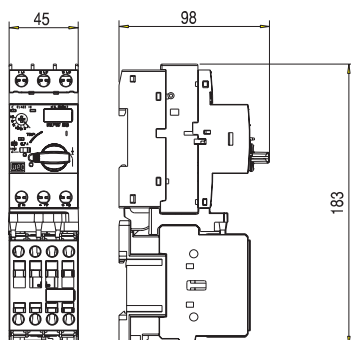
MPE25 + Accessories



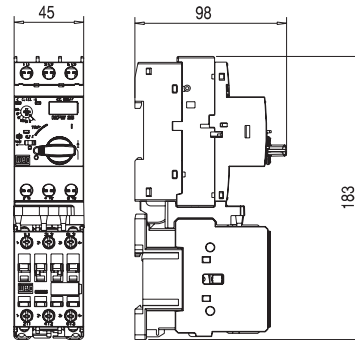
MPE25 + CE07



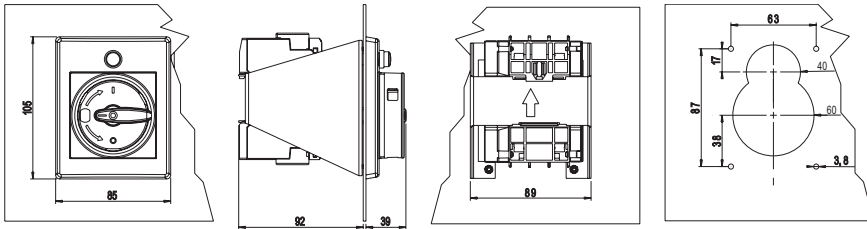
MPE25 + CEM9...CEM18



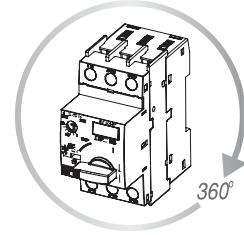
MPE25 + CEM25



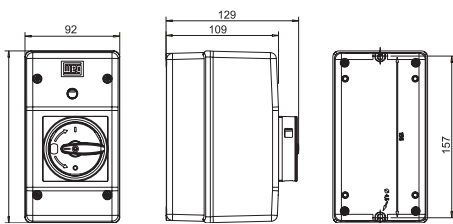
Frontal plate FMEE5E



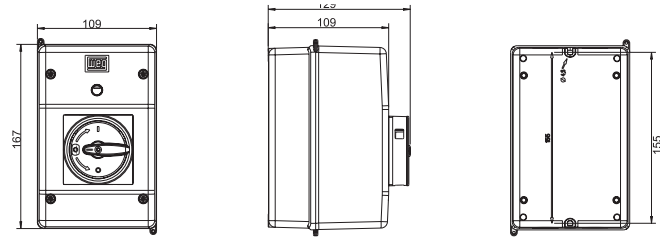
Mounting position



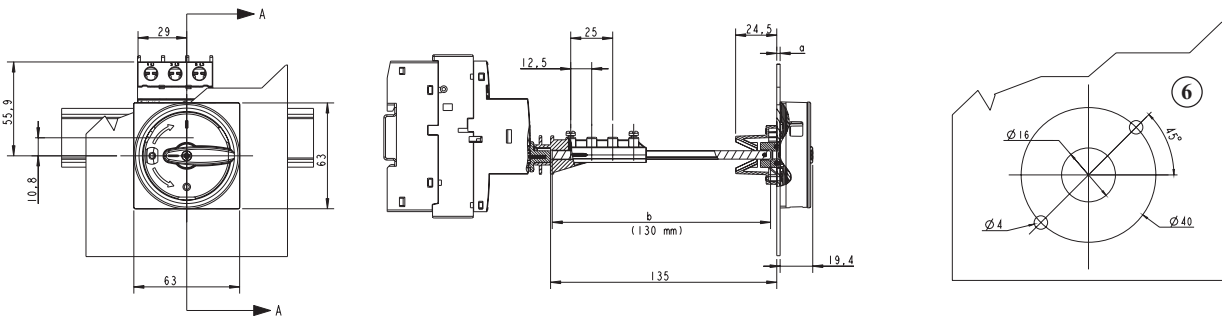
Insulated Enclosure - MPEE55



Insulated Enclosure - MLPEE55



Door coupling rotary handle RMMPE



Motor protective circuit breaker MS25

Technical data - General		
Standards		IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204
Climatic class		constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
Degree of protection		IP20, after terminals covering IP20
Ambient temperature	°C	-25 ... +60
Storage temperature	°C	-25 ... +70
Temperature range of thermal compensation for overload release	°C	-5 ... +40
Mechanical and electrical endurance		100,000
Shock resistance acc. to IEC 68-2-27	g	20
Vibration resistance acc. to IEC 68-2-6		5 g - f = 5 ... 150 Hz
Overvoltage category / pollution degree		III / 3
Rated insulation voltage U_i	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Weight	kg	0.252

Technical data - Main circuit			
Designation of connection terminals			1 - L1; 3 - L2; 5 - L3; 2 - T1; 4 - T2; 6 - T3
Terminal capacity	rigid	S (mm ²)	0.75 ... 6
	flexible		0.75 ... 4
Screw			with self-lifting clamp, protected against falling out
Screw head			PZ2
Tightening torque		Nm	1,8
Max. operational voltage	U_e	V	690
Setting range		A	0.1 - 0.16 (MS25); 0.16 - 0.25 (MS25); 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 10 - 16; 16 - 20; 20 - 25
No. of poles			3
Operating current of thermal overload release	I		$1.05 I_r < I \leq 1.20 I_r$
Sensitivity to phase failure			✓
Operating current of magnetic overload release	I		$11 I_n < I \leq 13 I_n \pm 20\%$
Power dissipation on pole at load with I_n	P	W	2 - 2.5
Utilization category	IEC/EN 60947-4-1		AC-3
	IEC/EN 60947-2		A
Trip class acc. to IEC/EN 60947-4-1			10A

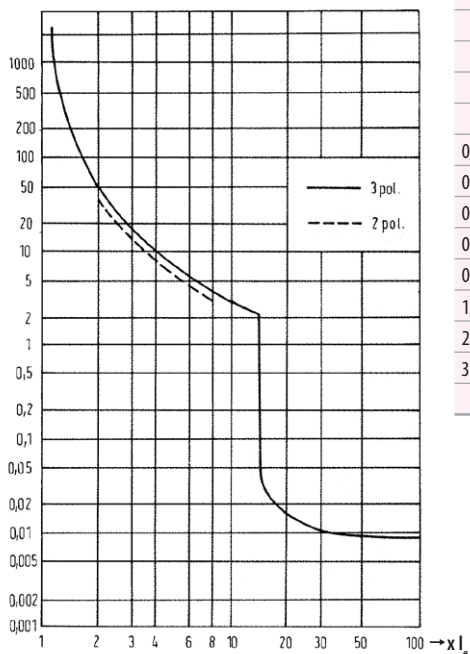
MS25 motor protection switches, rated ultimate short-circuit breaking capacity Icu and max. back-up fuses if prospective short-circuit current Icp exceeds Icu:

Type	Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity Icu (kA)				Max. back-up fuse, if Icp > Icu (gL) (A)						
		230 V	400 V	500 V	690 V	230 V	400 V	500 V	690 V			
MS 25 - 0,16	2	50	50	50	50	No back-up fuse required						
MS 25 - 0,25	3	50	50	50	50							
MS 25 - 0,4	5	50	50	50	50							
MS 25 - 0,63	8	50	50	50	50							
MS 25 - 1	12	50	50	50	50							
MS 25 - 1,6	20	50	50	50	50							
MS 25 - 2,5	33	50	50	3	2,5						25	20
MS 25 - 4	44	50	50	3	2,5						35	25
MS 25 - 6,3	75	50	50	3	2,5						50	35
MS 25 - 10	120	50	6	3	2,5						80	50
MS 25 - 16	160	6	4	2,5	2	80	80	63	35			
MS 25 - 20	230	6	4	2,5	2	80	80	63	50			
MS 25 - 25	270	6	4	2,5	2	80	80	63	50			

Switch selection for motor protection

Single-phase	Standard motor power					Setting range		
	3-phase							
	220 V	230 V	240 V	380 V	400 V		440 V	500 V
				kW		A		
				0,02		0,06	0,1 ... 0,16	
				0,06	0,06	0,06	0,16 ... 0,25	
	0,06	0,09	0,12	0,12	0,12	0,18	0,25 ... 0,4	
	0,09	0,12	0,18	0,18	0,25	0,25	0,4 ... 0,63	
0,06 ... 0,09	0,09 ... 0,12	0,18 ... 0,25	0,25	0,37	0,37	0,37 ... 0,55	0,61 ... 1	
0,12	0,18 ... 0,25	0,37 ... 0,55	0,37 ... 0,55	0,55 ... 0,8	0,75 ... 1,1	0,75 ... 1,1	1 ... 1,6	
0,18 ... 0,25	0,37	0,75 ... 1,1	0,75 ... 1,1	1,1	1,5	1,5	1,6 ... 2,5	
0,37	0,55 ... 0,8	1,1 ... 1,5	1,5	1,5 ... 2,2	2,2 ... 3	2,2 ... 3	2,5 ... 4	
0,55 ... 0,75	1,1 ... 1,5	2,2 ... 2,5	2,2 ... 3	3	4	4	4 ... 6,3	
1,1 ... 1,5	1,5 ... 2,5	3 ... 4	4 ... 5	4 ... 5,5	5,5 ... 7,5	5,5 ... 7,5	6,3 ... 10	
2,2	3 ... 4	5 ... 7,5	5,5 ... 9	7,5 ... 9	11	11	10 ... 16	
3	5,5	9	11	11 ... 12,5	15	15	16 ... 20	
	5,5 ... 7,5	11 ... 12,5	12,5	15	18,5	18,5	20 ... 25	

Tripping characteristic



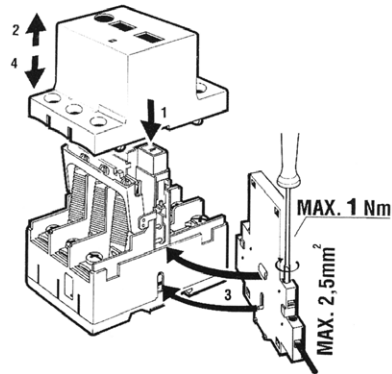
MST25 motor protection switches and max. back-up fuses for short-circuit protection:

Type	Max. back-up fuse Ue < 400 V gL (A)
MST 25 - 0,4	1
MST 25 - 0,63	2
MST 25 - 1	2
MST 25 - 1,6	4
MST 25 - 2,5	6
MST 25 - 4	16
MST 25 - 6,3	20
MST 25 - 10	25
MST 25 - 16	35
MST 25 - 20	50
MST 25 - 25	50

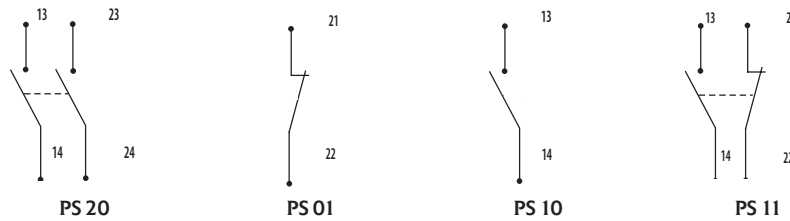
Accessories

Auxiliary switch for lateral mounting PS		
Rated insulation voltage U_i	V	500V
Thermal current I_{th}	A	6 A
Rated operational current at AC-15 230V/400V/500V I_e	A	3,5 A / 2 A / 1,5 A
Terminal capacity	mm ²	0,75 - 2,5 mm ²
Tightening torque	Nm	1

PS mounting

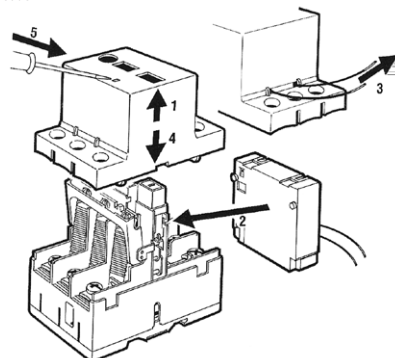


PS designation of contacts



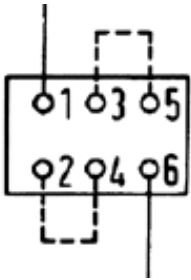
Under-voltage release U Shunt release A		
Control voltages U_c	V	220 - 240
Rated frequency f	Hz	50 - 60

Mounting of UV and shunt release

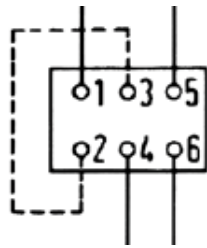


Connection diagram

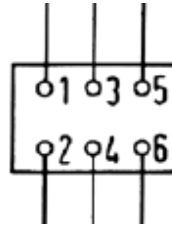
1-p



2-p



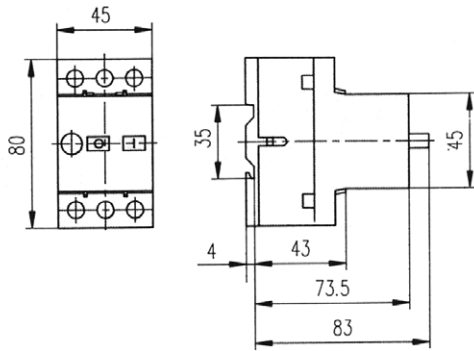
3-p



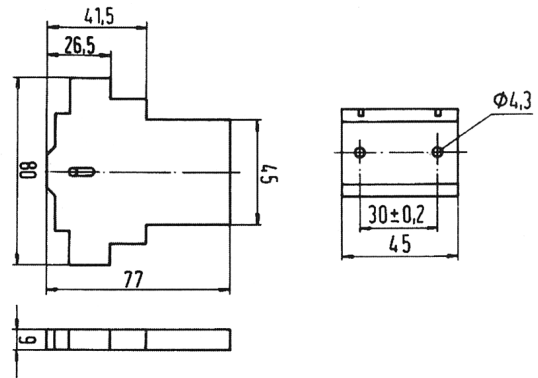
ETICON

Dimensions

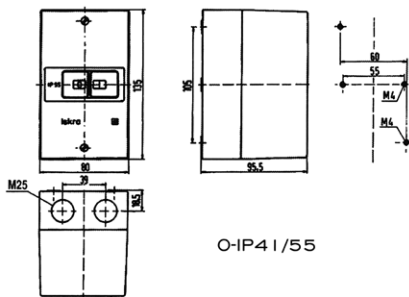
MS25, MST25



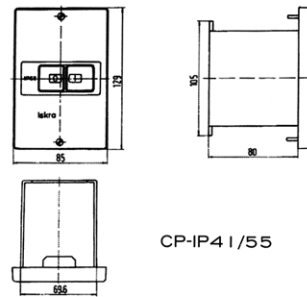
Auxiliary switch PS



Insulated Enclosure O,
Front plate CP



O-IP41/55



CP-IP41/55

O-IP41/55

CP-IP41/55