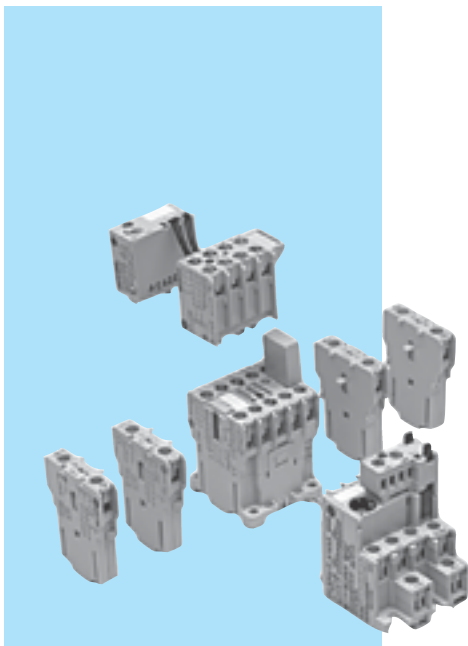




Three and four pole minicontactors 6, 9 and 12A (AC3) 20A (AC1)

- Control circuit: Alternating current up to 600V
Direct current up to 440V
- Terminal numbering in accordance with EN 50012
- Fixing by clipping onto 35 mm DIN rail (EN 50022-35) or by screws
- Screws and fast-on terminals protected against accidental contact in accordance with VDE 0106 T.100 and VBG4
- Versions: Ring terminal and printed circuit terminals
- Facility to mount instant and timed auxiliary contact blocks and voltage suppressor block
- Degree of protection IP20 (EN 60529).
- Maximum number of auxiliary contacts to be added: 6

Standards

IEC/EN 60947-1	BS 4794
IEC/EN 60947-4-1	NFC 63-110
IEC/EN 60947-5-1	CSA C22.2/14
EN 50003	VDE 0660
EN 50005	SEV 10254
EN 50012	JIS C8325
UL 508	JEM 1038
NEMA ICS-1	CENELEC HD 419

General data

	MC0...	MC1...	MC2...
Maximum number of poles	4	4	4
Rated thermal current (I _{th}) $\theta \leq 60^{\circ}\text{C}$ ⁽¹⁾	(A) 20	20	20
Rated operational current I _e ⁽²⁾ (3x440V, 50/60Hz, AC3)	(A) 6	9	12
Rated insulation current U _i	(V) 750	750	750
Rated operational current U _e	(V) 690	690	690

Approvals



Order codes ● pg. C.3
 Auxiliary contact blocks ● pg. C.6
 Accessories ● pg. C.8
 Technical data ● pg. C.23
 Terminal numbering ● pg. C.29
 Dimensions ● pg. C.50

Standard voltages

To complete the catalogue number, replace the symbol ♦ by the code corresponding to the voltage and frequency of the control circuit (other voltages on request)

Alternating current (V). Bifrequency coil

♦	10	1	2	9	3	4	5	6	7	8	12	13
AC	12	24	42	48	110	120	220	230	240	440	380	400
50/60Hz					115							

Operating voltages limits with bifrequency coils:

With 60Hz = 0.85 to 1.1 x U_s

With 50Hz = 0.8 to 1.1 x U_s in continuous service (ED=100%) with a maximum ambient temperature of 40°C

Alternating current (V).

♦	A	E	G	K	M	N	S	U	W	Y
AC			48	115		220	260	380	415	500
50Hz				127		240		400	440	
AC	6	32	60		208	240		440	480	600
60Hz					220	277				

Direct current (V)

♦	A	B	C	D	E	F	G	H	I	J	K	L	N	17	R	S	16
DC	6	12	32	24	36	42	48	60	72	110	120	125	220	230	240	250	440

Direct current (V) - Wide voltage range

♦	WD	WE	WG	WI	WJ	WN
DC	24	33	48	72	110	220

Three pole minicontactors



Max.operat.current Non-inductive loads	Motors <440V, 3 ~ 50/60Hz AC3 ⁽³⁾ A	Admissible power AC3					Aux. contacts		Control circuit: Alternating current		Control circuit: Direct current		
		1-phase		3-phase					Cat. no. ⁽¹⁾	Pack	Cat. no. ⁽¹⁾	Pack	
		115V	220V	220V	380V	500V							
AC1 ⁽²⁾ A	A	kW HP	kW HP	kW HP	kW HP	kW HP	.4	.2	Ref. no. see bottom		Ref. no. see bottom		
Terminal: screw													
20	6	0.37 0,5	0.75 1	1.5 2	2.2 3	3 4	1	0	MC0A310AT ♦	20	MC0C310AT ♦	10	
							0	1	MC0A301AT ♦	20	MC0C301AT ♦	10	
20	9	0.56 0.75	1.12 1.5	2.2 3	4 5.5	4 5.5	1	0	MC1A310AT ♦	20	MC1C310AT ♦	10	
							0	1	MC1A301AT ♦	20	MC1C301AT ♦	10	
20	12	0.75 1	2 2.6	3 4	5.5 7.3	5.5 7.3	1	0	MC2A310AT ♦	20	MC2C310AT ♦	10	
							0	1	MC2A301AT ♦	20	MC2C301AT ♦	10	
Terminal: ring terminal													
20	6	0.37 0.5	0.75 1	1.5 2	2.2 3	3 4	1	0	MC0A310AR ♦	20	MC0C310AR ♦	10	
							0	1	MC0A301AR ♦	20	MC0C301AR ♦	10	
20	9	0.56 0.75	1.12 1.5	2.2 3	4 5.5	4 5.5	1	0	MC1A310AR ♦	20	MC1C310AR ♦	10	
							0	1	MC1A301AR ♦	20	MC1C301AR ♦	10	
20	12	0.75 1	2 2.6	3 4	5.5 7.3	5.5 7.3	1	0	MC2A310AR ♦	20	MC2C310AR ♦	10	
							0	1	MC2A301AR ♦	20	MC2C301AR ♦	10	
Terminal: faston 2x2.8 insulated (5)													
16 ⁽⁴⁾	6	0.37 0.5	0.75 1	1.5 2	2.2 3	3 4	1	0	MC0A310AF ♦	20	MC0C310AF ♦	10	
							0	1	MC0A301AF ♦	20	MC0C301AF ♦	10	
16 ⁽⁴⁾	9	0.56 0.75	1.12 1.5	2.2 3	4 5.5	4 5.5	1	0	MC1A310AF ♦	20	MC1C310AF ♦	10	
							0	1	MC1A301AF ♦	20	MC1C301AF ♦	10	
Terminal: printed circuit													
20	6	0.37 0.5	0.75 1	1.5 2	2.2 3	3 4	1	0	MC0A310AI ♦	20	MC0C310AI ♦	10	
							0	1	MC0A301AI ♦	20	MC0C301AI ♦	10	
20	9	0.56 0.75	1.12 1.5	2.2 3	4 5.5	4 5.5	1	0	MC1A310AI ♦	20	MC1C310AI ♦	10	
							0	1	MC1A301AI ♦	20	MC1C301AI ♦	10	
20	12	0.75 1	2 2.6	3 4	5.5 7.3	5.5 7.3	1	0	MC2A310AI ♦	20	MC2C310AI ♦	10	
							0	1	MC2A301AI ♦	20	MC2C301AI ♦	10	
Spare coil									MB0A ♦	10	MB0C ♦	10	

- (1) To complete the catalogue number, replace the symbol ♦ by the code corresponding to the voltage and frequency of the control circuit (other voltages on request) (see C.2)
- (2) Electrical endurance AC-1: MC0... 0.2 × 10⁶ operations
MC1... 0.3 × 10⁶ operations
MC2... 0.35 × 10⁶ operations
- (3) Electrical endurance AC-3: MC0... (6A) = 1.2 × 10⁶ operations
MC1... (9A) = 0.85 × 10⁶ operations
MC2... (12A) = 0.6 × 10⁶ operations
- (4) Terminal with wire 1.5 mm²: I_e = 16A
with wire 1 mm²: I_e = 10A
Insulated terminal type B 2.8 × 0.8 and wire 1 mm² I_e = 8A in accordance with DIN 46247.
- (5) Fast-on 1 × 6.3 terminals on request (replace letter F by H in the catalogue number)

For reference numbers,
see chapter X, pg. X.4



Three pole interface contactors

	Max. oper. current		Admissible power AC3						Aux. contacts		Voltage 24V D.C. coil 1.2W ⁽¹⁾			Voltage 24V D.C. coil 2W ⁽²⁾		
	Non-inductive load	Motors <440V, 3 ~ 50/60Hz AC3 ⁽³⁾	1-phase		3-phase				.3 .4	.1 .2	Cat. no. ⁽¹⁾	Ref. no.	Pack	Cat. no. ⁽¹⁾	Ref. no.	Pack
	AC1 A	A	115V	220V	220V	380V	500V	230V								
			kW	kW	kW	kW	kW									
	Terminal: screw															
	20	6	0.37	0.75	1.5	2.2	3		1 0	0 1	MC0I310ATD MC0I301ATD	100570 100571	10 10	MC0K310ATD MC0K301ATD	100574 100575	10 10
	20	9	0.56	1.12	2.2	4	4		1 0	0 1	MC1I310ATD MC1I301ATD	100572 100573	10 10	MC1K310ATD MC1K301ATD	100576 100577	10 10
	20	12	0.75	2	3	5.5	5.5		1 0	0 1	MC2I310ATD MC2I301ATD	100559 100538	10 10	MC2K310ATD MC2K301ATD	103590 103591	10 10
	Spare coil															
											MB0ID	100470	10	MB0KD	100471	10

- (1) No possibility of adding instantaneous auxiliary contact blocks.
 (2) Facility to mount an instantaneous auxiliary contact block of two contacts or two instantaneous auxiliary contact blocks of one contact.
 (3) Electrical endurance AC-3:
 MC0... (6A) = 1.2×10^6 operations.
 MC1... (9A) = 0.85×10^6 operations.
 MC2... (12A) = 0.6×10^6 operations.

Four poles minicontactors



Max.oper.current		Admissible power AC3					Poles		Control circuit: Alternating current		Control circuit: Direct current	
Non-inductive load	Motors <440V, 3 ~ 50/60Hz AC3 ⁽³⁾ A	1-phase		3-phase					Cat. no. ⁽¹⁾	Pack	Cat. no. ⁽¹⁾	Pack
		115V	220V	220V	380V	500V						
AC1 ⁽²⁾ A	A	kW HP	kW HP	kW HP	kW HP	kW HP			Ref. no. see bottom		Ref. no. see bottom	
Screw terminal												
20	6	AC1					4	0	MC0A400AT ♦	20	MC0C400AT ♦	10
		1.8	3.5	6.1	10.5	13.8	2	2	MC0AB00AT ♦	20	MC0CB00AT ♦	10
		-	-	-	-	-	0	4	MC0AA00AT ♦	20		
		AC3										
		0.37	0.75	1.5	2.2	3						
		0.5	1	2	3	4						
20	9	AC1					4	0	MC1A400AT ♦	20	MC1C400AT ♦	10
		2.3	4.4	7.5	13	17	2	2	MC1AB00AT ♦	20	MC1CB00AT ♦	10
		-	-	-	-	-	0	4	MC1AA00AT ♦	20		
		AC3										
		0.56	1.12	2.2	4	4						
		0.75	1.5	3	5.5	5.5						
20	12	AC1					4	0	MC2A400AT ♦	20	MC2C400AT ♦	10
		2.3	4.4	7.5	13	17	2	2	MC2AB00AT ♦	20	MC2CB00AT ♦	10
		-	-	-	-	-						
		AC3										
		0.75	2	3	5.5	5.5						
		1	2.6	4	7.3	7.3						
Terminal: faston 2x2.8 insulated (5)												
20	6	AC1					4	0	MC0A400AF ♦	20	MC0C400AF ♦	10
		1.8	3.5	6.1	10.5	13.8	2	2	MC0AB00AF ♦	20	MC0CB00AF ♦	10
		-	-	-	-	-	0	4	MC0AA00AF ♦	20		
		AC3										
		0.37	0.75	1.5	2.2	3						
		0.5	1	2	3	4						
16 ⁽⁴⁾	9	AC1					4	0	MC1A400AF ♦	20	MC1C400AF ♦	10
		2.3	4.4	7.5	13	17	2	2	MC1AB00AF ♦	20	MC1CB00AF ♦	10
		-	-	-	-	-	0	4	MC1AA00AF ♦	20		
		AC3										
		0.56	1.12	2.2	4	4						
		0.75	1.5	3	5.5	5.5						
Terminal: printed circuit												
20	6	AC1					4	0	MC0A400AI ♦	20	MC0C400AI ♦	10
		1.8	3.5	6.1	10.5	13.8	2	2	MC0AB00AI ♦	20	MC0CB00AI ♦	10
		-	-	-	-	-	0	4	MC0AA00AI ♦	20		
		AC3										
		0.37	0.75	1.5	2.2	3						
		0.5	1	2	3	4						
20	9	AC1					4	0	MC1A400AI ♦	20	MC1C400AI ♦	10
		2.3	4.4	7.5	13	17	2	2	MC1AB00AI ♦	20	MC1CB00AI ♦	10
		-	-	-	-	-	0	4	MC1AA00AI ♦	20		
		AC3										
		0.56	1.12	2.2	4	4						
		0.75	1.5	3	5.5	5.5						
Spare coil									MB0A ♦	10	MB0C ♦	10

(1) To complete the catalogue number, replace the symbol ♦ by the code corresponding to the voltage and frequency of the control circuit (see C.2)

(2) Electrical endurance AC-1: MC0... 0.2 × 10⁶ operations
MC1... 0.3 × 10⁶ operations
MC2... 0.35 × 10⁶ operations

(3) Electrical endurance AC-3: MC0... (6A) = 1.2 × 10⁶ operations
MC1... (9A) = 0.85 × 10⁶ operations
MC2... (12A) = 0.6 × 10⁶ operations

(4) Terminal with wire 1.5 mm²: I_e = 16A
with wire 1 mm²: I_e = 10A
Insulated terminal type B 2.8 × 0.8 and wire of 1 mm² I_e = 8A in accordance with DIN 46247.

(5) Faston 1 × 6.3 terminals on request, (replace letter F by H in the catalogue number).

For reference numbers, see chapter X, pg. X.4



Instantaneous auxiliary contact blocks**Front mounting**

Number contacts	Combinations with basic contactor 10E	Contacts in acc. with EN 50012	Contacts in acc. with EN 50005	Aux. contacts		Cat. no.	Ref. no.	Pack
• Two or four additional contacts, to cover combinations of 3 or 5 contacts without increasing the surface are of the basic contactor								
Screw terminal								
2	21E	11		1	1	MACN211AT	100999	10
2	12E	02		0	2	MACN202AT	100998	10
2			20	2	0	MARN220AT	100994	10
2			11	1	1	MARN211AT	100993	10
2			02	0	2	MARN202AT	100992	10
4	41E	31		3	1	MACN431AT	100997	10
4	32E	22		2	2	MACN422AT	100996	10
4	23E	13		1	3	MACN413AT	100995	10
4			40	4	0	MARN440AT	100991	10
4			31	3	1	MARN431AT	100990	10
4			22	2	2	MARN422AT	100989	10
4			13	1	3	MARN413AT	100988	10
4			04	0	4	MARN404AT	100987	10
Ring terminal								
2	21E	11		1	1	MACN211AR	103557	10
2	12E	02		0	2	MACN202AR	103558	10
2			20	2	0	MARN220AR	103349	10
2			11	1	1	MARN211AR	103350	10
2			02	0	2	MARN202AR	103351	10
4	41E	31		3	1	MACN431AR	103559	10
4	32E	22		2	2	MACN422AR	103560	10
4	23E	13		1	3	MACN413AR	103561	10
4			40	4	0	MARN440AR	103352	10
4			31	3	1	MARN431AR	103353	10
4			22	2	2	MARN422AR	103354	10
4			13	1	3	MARN413AR	103355	10
4			04	0	4	MARN404AR	103300	10

Instantaneous auxiliary contact blocks

Lateral mounting



Number contacts	Combinations with basic contactor 10E	Contacts in acc. with EN 50012	Contacts in acc. with EN 50005	Aux. contacts		Cat. no.	Ref. no.	Pack
• One or two additional blocks, to cover combinations of 1 or 2 contacts without increasing the height of the basic unit contactor								
Screw terminal								
1	20	10		1	0	MACL110AT	100560	10
1	11E	01		0	1	MACL101AT	100561	10
Ring terminal								
1	20	10		1	0	MACL110AR	103555	10
1	11E	01		0	1	MACL101AR	103556	10
Terminal: faston 2x2.8 insulated (1)								
1	20	10		1	0	MACL110AF	100562	10
1	11E	01		0	1	MACL101AF	100563	10
Terminal: printed circuit								
1	20	10		1	0	MACL110AI	100564	10
1	11E	01		0	1	MACL101AI	100565	10

- One or two additional blocks, when up to 6 or 7 contacts are needed (combination possible with frontal blocks)
- One or two additional blocks on both sides, to cover up to five contacts (combination possible only with lateral blocks)

Screw terminal								
1			10	1	0	MARL110ATS	100519	10
1			01	0	1	MARL101ATS	100520	10
Ring terminal								
1			10	1	0	MARL110ARS	103299	10
1			01	0	1	MARL101ARS	103298	10
Terminal: faston 2x2.8 insulated (1)								
1			10	1	0	MARL110AFS	100521	10
1			01	0	1	MARL101AFS	100522	10
Terminal: printed circuit								
1			10	1	0	MARL110AIS	100523	10
1			01	0	1	MARL101AIS	100524	10

- (1) Terminal with wire 1 mm²: I_e = 10A
 Insulated terminal type B 2.8 x 0.8 with wire 1 mm²: I_e = 8A, in accordance with DIN 46247

Accessories

	For use with:	Time	Function	Ue	Cat. no.	Ref. no.	Pack
 Electronic timer block	Lateral or front fixing to the contactor						
	MCR..MC_ ...	0.5 - 60 seg.	delay ON	24... 250V AC/DC	MREBC10AC2	100541	10
	MCR..MC_ ...	0.2 - 24 seg.	delay ON	24...250V AC/DC	MREBC20AC2	100542	10
 DIN rail adaptor for electronic timer block	For fixing onto EN 50022-35						
	MREBC...				MVB0R	100543	10
	For use with:	Type	Control	Ue	Cat. no.	Ref. no.	Pack
 Voltage suppressor block	Connection and (plug-in) fixing on to the connector						
	MCRA,MC_ ...	R/C	AC	12...60V 50/60Hz	MP0AAE1	100544	10
	MCRA,MC_ ...	R/C	AC	72...250V 50/60Hz	MP0AAE2	100545	10
	MCRC,MC_ ...	Diode	DC	6...250V DC	MP0CAE3	100546	10
	MCRC,MC_ ...	Varistor	AC/DC	24-48V	MP0DAE4	100536	10
	For use with:	Phases	Terminal capacity	Ue	Cat. no.	Ref. no.	Pack
 Pole paralleling links	To connect two, three or four phases in parallel						
	MC_ ...	2, 3, 4 (parallel)	Ø4.5mm - 16mm ²		MVPOC	100600	10
	For use with:				Cat. no.	Ref. no.	Pack
 Mechanical interlock	Mechanical interlock and pole jumpers						
	MCR, MC_ ...				MMHO	100547	10
	For use with:				Cat. no.	Ref. no.	Pack
Identification	MCR, MC_ ...	Labels (10 sheets of 260 labels)			EAT 260	100548	1
	MCR, MC_ ...	Labelling plate base. Plug-in labelling plate bases (50 pieces in one pack)			SPR	100549	1

Multipack. Series M and Series CL

To reduce the amount of waste packaging material and to save time during installation, we offer the opportunity to order contactors in a multipack without the individual packaging.

	Product	Type	Standard pack	Multipack (1)
	Minicontactors	MC0A...MC2A	20	40
	Contactors	CL00A...CL25A...	20	40
		CL03...CL45...	10	20

(1) The quantity ordered must be a multiple of the quantity in each multipack (with the same frame/size and coil voltage)

How to order

To order a multipack, add the suffix **MP** to the standard catalogue number

Example			Standard pack	Multipack
			MC0A310ATN	MC0A310ATN MP (40 pieces)
			CL03A400MJ	CL03A400MJ MP (20 pieces)



Technical data

General

		MC0...	MC1...	MC2...
Rated thermal current $I_{th} \theta \leq 60^{\circ(1)}$	(A)	20	20	20
Rated operational current $I_e^{(2)}$	(A)	6	9	12
(3 x 440V, 50/60Hz, AC-3)				
Maximum number of poles		4	4	4
Rated insulation current U_i	(V)	750	750	750
Rated operational current U_e	(V)	690	690	690

(1) Insulated terminal type B 2.8 x 0.8 with wire 1 mm²:

$I_e = 8A$, design DIN 46 247

(2) Max.operational current AC3, 3 -phases $\leq 440V$, according to IEC 947-4-1

Conformity to standards

IEC/EN 60947-1	CSA C22.2/14	SEV 10254
IEC/EN 60947-4-1	CENELEC HD 419	JIS C8325
IEC/EN 60947-5-1	VDE 0660	JEM 1038
EN 50003	NFC 63110	NEMA ICS-1
EN 50005	BS 4794	UL 508
EN 50012		

Approvals

cULus	NEMKO	SEMKO
SETI	DEMKO	RINA
IMQ		
Lloyd's Register	Bureau Veritas	CE

Ambient conditions

Storage temperature	-55°C to +80°C	
Operation temperature	-40°C to +60°C	
Altitude	up to 3000m	Nominal values
	from 3000 up to 4000m	90% I_e 80% U_e
	from 4000 up to 5000m	80% I_e 75% U_e

Climatic resistance

Continuous tests 40 / 125 / 56		
Cold (72h)	Temperature	-40°C
	Relative humidity	< 50%
Dry heat (96h)	Temperature	+125°C
	Relative humidity	< 50%
Humid heat (56h)	Temperature	+40°C
	Relative humidity	95%
Cyclic tests		
First half-cycle (12h)	Low temperature	+25°C
	Relative humidity	93%
Second half-cycle (12h)	Low temperature	+55°C
	Relative humidity	95%
Number of consecutive cycles	6	

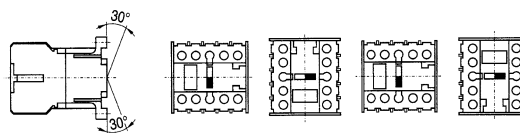
Shock resistance (IEC 68-2-27)

Continuously closed (at 0.8Us)	
Admissible acceleration	25 g
Impulse duration	11 ms
Continuously opened (no voltage)	
Admissible acceleration	20 g
Impulse duration	11 ms

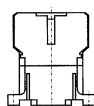
Vibration resistance (IEC 68-2-6)

Continuously closed (at 0.8Us)	
Admissible acceleration	15 g
Sweep between	10 - 200 Hz
Continuously opened (no voltage)	
Admissible acceleration	5g (AC) - 35g (DC)
Sweep between	10 - 200 Hz

Mounting positions



With the same pick-up and drop-out voltage
With the same rated power



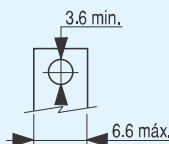
-7% of connection voltage
+4% of disconnection voltage
With the same rated power



7% of connection voltage
+4% of disconnection voltage
With the same rated power

Terminal capacity

Terminal with M3.5 screw (with pozidrive head and safety flange)		Tightening torque
Solid wire		0.8 Nm - 7 Lb/in
Flexible wire without terminal		0.75 to 2 x 2 w.
Flexible wire without terminal with cap		0.75 to 2.5 x 1 w.
Ring terminal		0.8 Nm - 7 Lb/in
Faston terminal 2.8 - 2 insulated terminals		1 x 2 w.
Terminal for printed circuit (Ø of PCB hole)		1.8 mm
Ring terminal cap		7.8 mm
Fork terminal cap		6.5 mm



Control circuit

		MC_A...	MC_C...	MC_I...	MC_K...	MC_C...W
Rated insulation voltage (Ui)	(V)	750	750	750	750	750
Standard voltages (Us)						
50Hz(V)		24 ... 690	-	-	-	-
60Hz(V)		6 ... 600	-	-	-	-
DC	(V)	-	6 ... 440	24	24	12 ... 440
Operating voltages limits						
Operating ⁽¹⁾	xUs	0.8 ... 1.1	0.8 ... 1.1	0.8 ... 1.25	0.7 ... 1.25	0.7 ... 1.3
Drop-out	xUs	0.35 ... 0.55	0.15 ... 0.4	0.15 ... 0.3	0.15 ... 0.35	0.15 ... 0.3
Operating voltages limits with coil 50/60 Hz						
Operating	xUs	0.8 ... 1.1	-	-	-	-
Drop-out	xUs	0.35 ... 0.55	-	-	-	-
Consumption						
50 or 60Hz - monofrequency coil						
Pick-up	(VA)	26	-	-	-	-
Seal	(VA)	4	-	-	-	-
50/60Hz - bifrequency coil						
Pick-up	(VA)	32	-	-	-	-
Seal	(VA)	6	-	-	-	-
DC	(W)	-	3	1.2	2	4
Power factor						
Magnetic circuit open	(cos φ)	0.8	-	-	-	-
Magnetic circuit closed	(cos φ)	0.35	-	-	-	-
Power dissipation	(W)	1.4	3	1.2	2	4
Opening and closing times						
Values between ± %Us	%	+10 ... -20	+10 ... -20	+25 ... -30	+25 ... -30	+30 ... -30
Time on energisation NO	(ms)	6 ... 13	22 ... 36	30 ... 70	20 ... 50	17 ... 28
Time on de-energisation NC	(ms)	8 ... 16	9 ... 12	9 ... 16	9 ... 16	9 ... 12
Time on energisation NC	(ms)	5 ... 11	18 ... 27	20 ... 45	18 ... 35	12 ... 25
Time on de-energisation NO	(ms)	6 ... 13	5 ... 7	5 ... 9	5 ... 9	5 ... 7
Values at Us						
Time on excitation NO	(ms)	7 ... 12	24 ... 27	25 ... 45	25 ... 40	11 ... 23
Time on desexcitation NC	(ms)	8 ... 16	9 ... 11	9 ... 16	9 ... 16	9 ... 11
Time on excitation NC	(ms)	6 ... 10	20 ... 26	25 ... 35	20 ... 30	15 ... 21
Time on desexcitation NO	(ms)	6 ... 13	5 ... 8	5 ... 9	5 ... 8	5 ... 8
Maximum time without voltage	(ms)	3	3	3	3	3
Mechanical endurance						
Monofrequency coil	10 ⁶ ops.	>15	-	-	-	-
Bifrequency coil	10 ⁶ ops.	>10	-	-	-	-
DC	10 ⁶ ops.	-	10	10	10	10
Maximum rate						
No load						
Monofrequency coil	ops./h	9000	-	-	-	-
Bifrequency coil	ops./h	3600	-	-	-	-
DC	ops./h	-	9000	9000	9000	9000
AC1 and AC3 (at rated power)	ops./h	1200	1200	1200	1200	1200
AC4 (at rated power)	ops./h	300	300	300	300	300

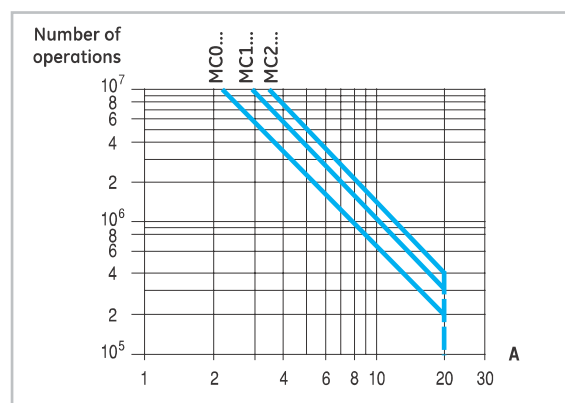
Main circuit (poles)

		MC 0...	MC1...	MC2...
Rated insulation voltage (Ui)	(V)	750	750	750
(acc. IEC 947-4)				
Rated thermal current (I _{th})	(A)	20	20	20
$\theta \leq 60^\circ$ [1]				
Frequency limits	(Hz)	0...400	0...400	0...400
Making capacity (r.m.s.) $U_e \leq 690V$ 50/60Hz	(A)	160	160	160
Breaking capacity (r.m.s.) $U_e \leq 440V$	(A)	106	106	106
$U_e = 500V$	(A)	90	90	90
$U_e = 690V$	(A)	80	80	90
Short-time current				
0.3 sec.	(A)	470	470	470
1 sec.	(A)	250	250	250
5 sec.	(A)	125	125	125
10 sec.	(A)	95	95	95
30 sec.	(A)	70	70	70
1 min.	(A)	50	50	50
3 min.	(A)	40	40	40
Recovery time	min.	10	10	10
Protec. against short-circuits (IEC 947-4). w/o TOR				
Coordination type "1" gL/gG	(A)	32	32	32
Coordination type "2" gL/gG	(A)	16	20	20
w/o welding contacts gL/gG	(A)	12	16	16
Circuit breaker rating (curve G CEE 19.1)		16	20	20
Impedance per pole	(m Ω)	1.5	1.5	1.5
Power dissipation per pole				
AC1	(W)	0.6	0.6	0.6
AC3	(W)	0.06	0.128	0.228
Insulation resistance				
Between adjacent poles	(m Ω)	> 10	> 10	> 10
Between pole and earth	(m Ω)	> 10	> 10	> 10
Between input and output	(m Ω)	> 10	> 10	> 10
Guaranteed no overlap between NO and NC contacts				
Space	(mm)	1	1	1
Time	(ms)	> 2	> 2	> 2

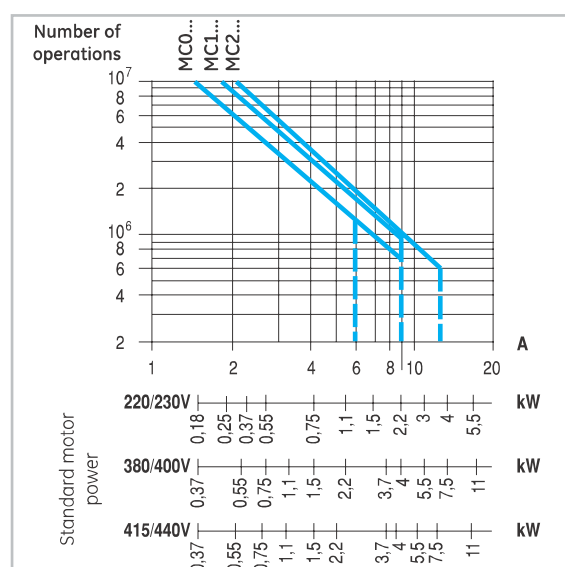
(1) Insulated terminal type B 2.8 x 0.8 with wire 1 mm² I_e = 8A acc. to DIN 46247

Electrical endurance

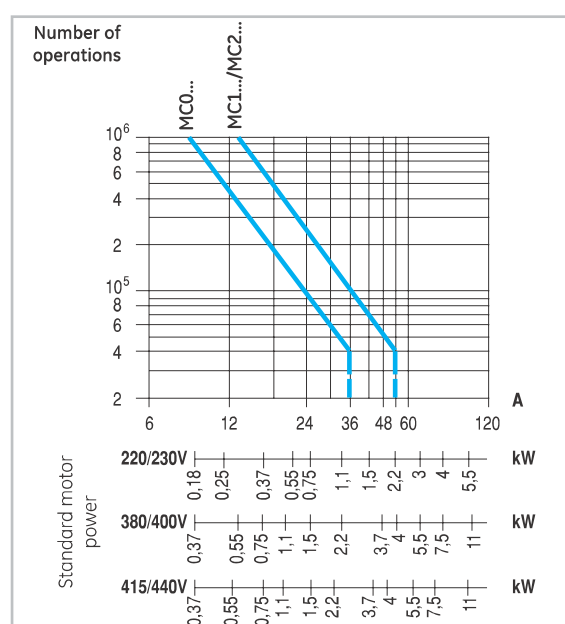
Category AC1



Category AC3



Category AC4



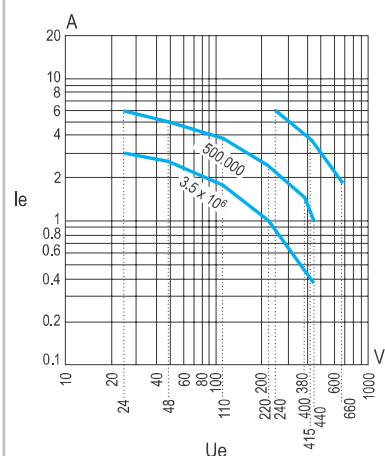
Internal auxiliary contacts

	MC0 / MC1 / MC2
Rated insulation voltage (Ui) IEC 60947-5 (V)	750
Rated thermal current (Ith) $\theta \leq 60^\circ\text{C}$ (A)	16
Making capacity according with IEC 60947-5-1	
$U_e \leq 690$ 50-60 Hz (A)	160
$U_e \leq 440\text{V DC}$ (A)	160
Breaking capacity (r.m.s.) IEC 60947-5-1	
AC-15	
$U_e \leq 440\text{V} / 50-60$ Hz (A)	106
DC-13	
$U_e \leq 110\text{V DC}$ (A)	3
$U_e = 220\text{V DC}$ (A)	1.2
$U_e = 48\text{V DC}$ (A)	10
Minimum operational power (operational safety.)	5mA, 17V
Short-circuit protection (max.class gl fuse) w/o welding	(A)
Insulation resistance	
Between adjacent contacts (m Ω)	> 10
Between contacts and earth (m Ω)	> 10
Between input and output (m Ω)	> 10
Guaranteed no overlap between NO and NC contacts	
Space (mm)	0.5
Minimal time (ms)	> 2
Impedance (m Ω)	2.3
Terminal capacity	Same as main circuit

(1) Insulated terminal type B 2.8 x 0.8 with wire 1 mm² I_e = 8A acc. with DIN 46247

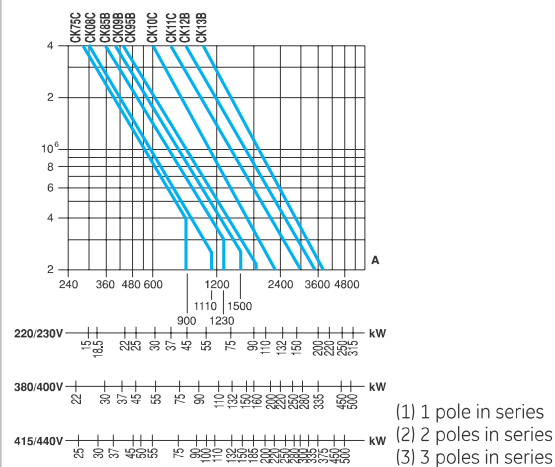
Tripping characteristics (AC)

AC Operation AC-15
Electrical endurance

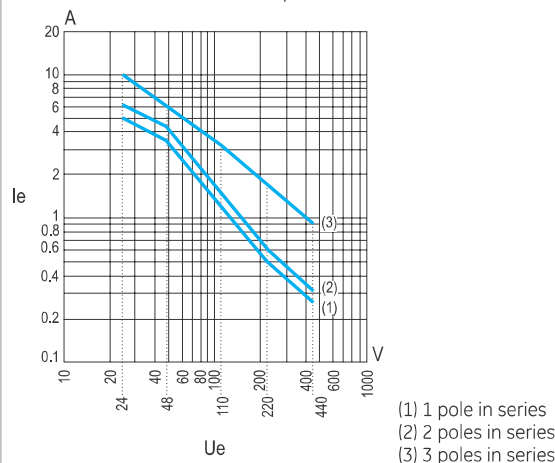


Tripping characteristics (DC)

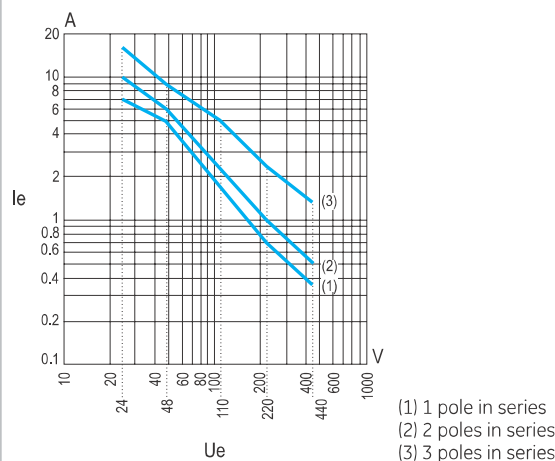
DC Inductive circuit. DC-13 L/R ≤ 100 ms
Electrical endurance 10^6 ops.



DC Inductive circuit. DC-13 L/R ≤ 15 ms
Electrical endurance 10^6 ops.



DC Inductive circuit. DC-13 L/R ≤ 1 ms
Electrical endurance 10^6 ops.



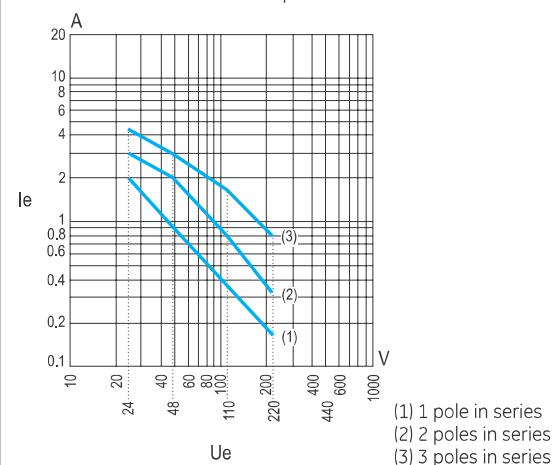
Instantaneous auxiliary contact blocks

MACN..., MACL...		
Rated insulation voltage (Ui) acc. IEC 60947-1	(V)	750
Rated thermal current (Ith) $\theta \leq 60^\circ\text{C}$ ⁽¹⁾	(A)	10
Making capacity (r.m.s.) according with IEC/EN 60947-5-1		
AC-15	Ue $\leq$ 220V 50/60 Hz	(A) 73
	Ue = 380V 50/60 Hz	(A) 38
	Ue = 690V 50/60 Hz	(A) 22
DC-13	Ue $\leq$ 100V DC	(A) 2.6
L/R=100ms	Ue = 220V DC	(A) 1
	Ue = 440V DC	(A) 0.6
Breaking capacity (r.m.s.) acc. IEC/EN 60947-5-1		
AC-15	Ue $\leq$ 220V 50/60 Hz	(A) 73
	Ue = 380V 50/60 Hz	(A) 38
	Ue = 690V 50/60 Hz	(A) 22
DC-13	Ue $\leq$ 100V DC	(A) 2
L/R=100ms	Ue = 220V DC	(A) 0,8
	Ue = 440V DC	(A) 0.4
Rated voltage and rated current Ue-Ie		
AC-15	according to IEC 60947	120V - 6A 230V - 6A 400V - 4A 500V - 1A 600V - 1A
	according to UL, CSA	A600
DC-13	according to IEC 60947	24V - 4A 48V - 2A 110V - 0.7A 220V - 0.3A 440V - 0.1A
	according to UL, CSA	Q600
Minimum operational power (operational safety)	(A)	5 mA, 17V
Short-circuit protection (max. class gl fuse) w/o welding	(A)	10
Insulation resistance		
	Between adjacent contacts (m Ω)	> 10
	Between contacts an earth (m Ω)	> 10
	Between input and output (m Ω)	> 10
Guaranteed no overlap between NO and NC contacts		
	Space (mm)	0,5
	Minimal time (ms)	> 2
Impedance	(m Ω)	2.4
Terminal capacity		Same as main circuit

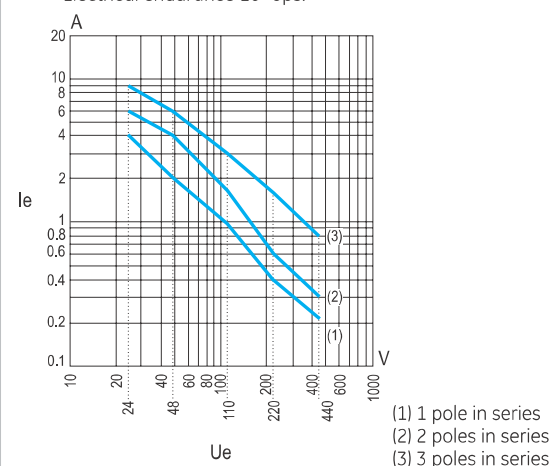
(1) Insulated terminal type B 2.8 x 0.8 with wire 1 mm² Ie = 8A acc. with DIN 46247

Tripping characteristics (DC)

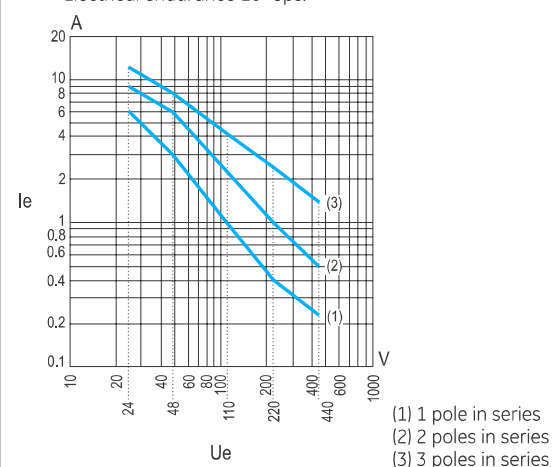
DC Inductive circuit. DC-13 L/R $\leq$ 100 ms
Electrical endurance 10⁶ ops.



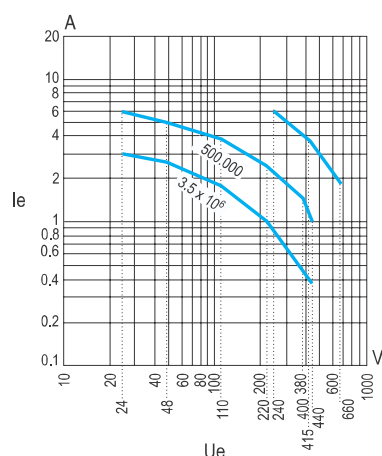
DC Inductive circuit. DC-13 L/R $\leq$ 15 ms
Electrical endurance 10⁶ ops.



DC Inductive circuit. DC-13 L/R $\leq$ 1 ms
Electrical endurance 10⁶ ops.

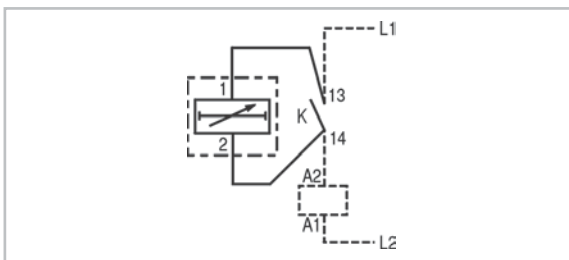
**Tripping characteristics (AC)**

AC Operation AC-15
Electrical endurance



Electronic timer block

	MREBC...
Rated insulation voltage (Ui)	(V) 750
Rated thermal current (Ith) $\theta \leq 60^{\circ}\text{C}$ ⁽¹⁾	(V) 0.55
Supply voltage (AC and DC)	(V) 24 to 250
Operating limits	0.80 to 1.1 Us (0.85 to 1.1 Us to 12V)
Voltage drop	(V) < 3
Maximum load current at :	
20°C	(A) 0.9
40°C	(A) 0.72
60°C	(A) 0.55
Minimum load for safe operation	(A) > 10
Maximum current	(A) 10A per 40 ms
Leakage current at 220V	(mA) < 5
Operational current	
AC-15	(A) 0.7
DC-13	(A) 0.9
Timing range (delay ON)	(s) 0.5 to 60 (± 6 s)
Rearrangement time	(ms) < 100
Repeatability (accuracy) (%)	± 1
Ambient temperature	
storage	(°C) -55 to +80
operation	(°C) -5 to +60
Degree of protection	IP20
Mounting positions	Any
Terminals : 2 free cables	1 mm ² (AWG 17) 250 mm



Contact sequence

	Main contact (NO)	Main contact (NC)	Auxiliary contact (NO)	Auxiliary contact (NC)
Three-pole minicontactor				
MC...310...	0 2 3.5		0 2.3 3.5	
MC...301...	0 2 3.5			0 1.2 3.5
Four-pole minicontactor				
MC...400...	0 2 3.5			
MC...B00...	0 2 3.5	0 1.2 3.5		
MC...A00...		0 1.2 3.5		
Auxiliary contact block				
MAC...			0 2.1 3.5	0 1 3.5
MAR...			0 2.1 3.5	0 1 3.5

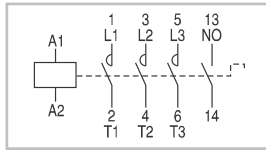
Terminal numbering in accordance with EN 50012

Final structure of the contactor		Auxiliary contactors		Possible basic contactors + Auxiliary contact blocks to be added		
		Combination				
		Description	NO	NC		
Without auxiliary contact blocks						
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 21NC 22	01E	0	1	MC_A301A...	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14	10E	1	0	MC_A310A...	
Auxiliary contact blocks front mounted with two or four contacts						
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22	11E	1	1	MC_A310A... + MACN211A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32	21E	2	1	MC_A310A... + MACN211A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32	12E	1	2	MC_A310A... + MACN202A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 33NO 34 43NO 44	31E	3	1	MC_A310A... + MACN431A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 33NO 34 43NO 44 53NO 54	41E	4	1	MC_A310A... + MACN431A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32 43NO 44	22E	2	2	MC_A310A... + MACN422A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32 43NO 44 53NO 54	32E	3	2	MC_A310A... + MACN422A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32 41NC 42	13E	1	3	MC_A310A... + MACN413A	
	A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 31NC 32 41NC 42 53NO 54	23E	2	3	MC_A310A... + MACN413A	
	Auxiliary contact blocks lateral mounted with one contact					
		A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22	11E	1	1	MC_A310A... + MACL101A
		A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 33NO 34	21E	2	1	MC_A310A... + MACL101A + MACL110A
A1 A2 1L1 2T1 3L2 4T2 5L3 6T3 13NO 14 21NC 22 33NO 34		12E	1	2	MC_A310A... + MACL101A + MACL101A	

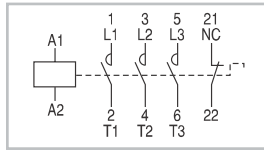
Terminal numbering

Basic three-pole contactors. (EN 50012)

MC __ 310A _

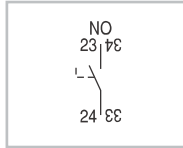


MC __ 301A _

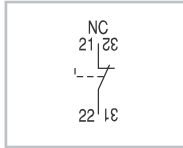


Instantaneous auxiliary contact blocks. (EN 50012)

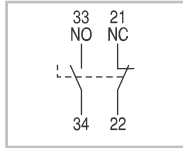
MACL110A _



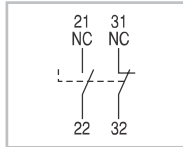
MACL101A _



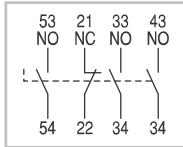
MACN211A _



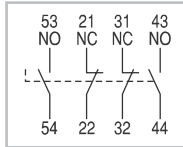
MACN202A _



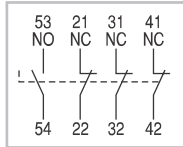
MACN431A _



MACN422A _

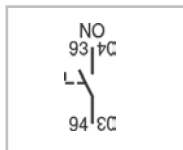


MACN413A _

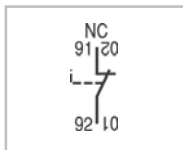


Instantaneous auxiliary contact blocks. (EN 50005)

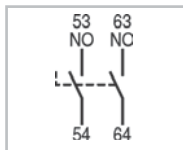
MARL110A _S



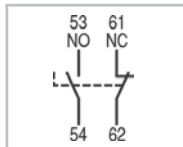
MARL101A _S



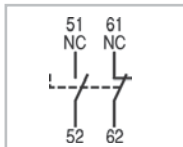
MARN220A _



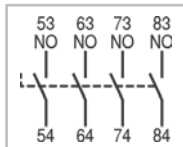
MARN211A _



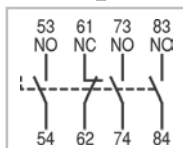
MARN202A _



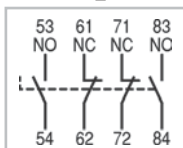
MARN440A _



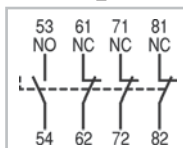
MARN431A _



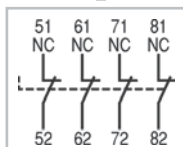
MARN422A _



MARN413A _

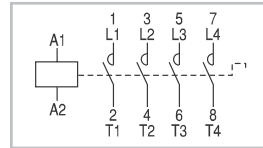


MARN404A _

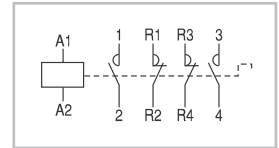


Base four-pole contactors. (EN 50005)

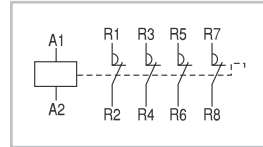
MC __ 400A _



MC __ B00A _

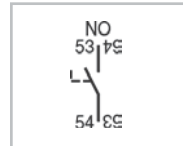


MC __ A00A _

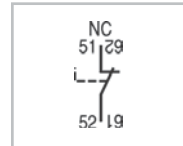


Instantaneous auxiliary contact blocks. (EN 50005)

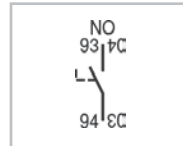
MARL110A _



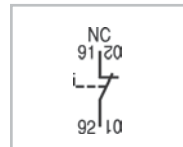
MARL101A _



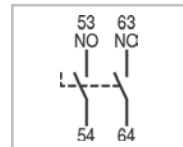
MARL110A _S



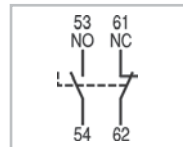
MARL101A _S



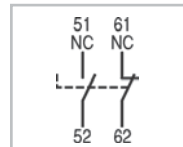
MARN220A _



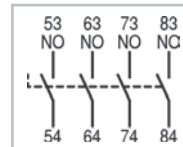
MARN211A _



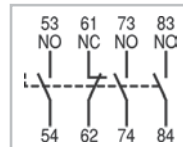
MARN202A _



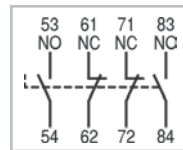
MARN440A _



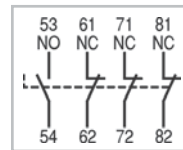
MARN431A _



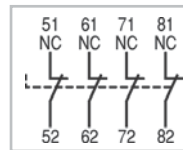
MARN422A _



MARN413A _

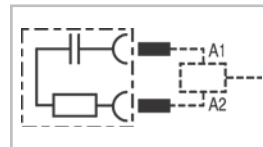


MARN404A _

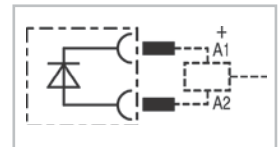


Voltage suppressor block

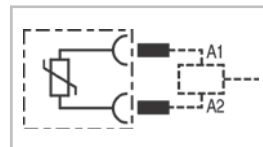
MPOAAE _



MPOCAE3



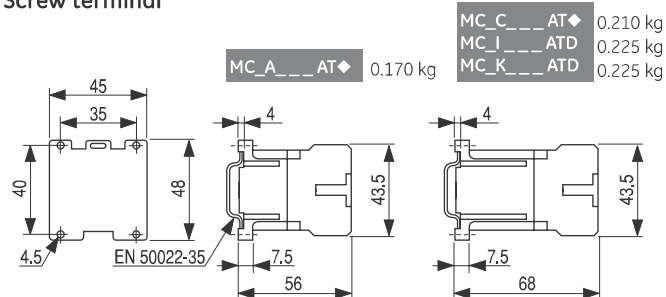
MPOCAE4



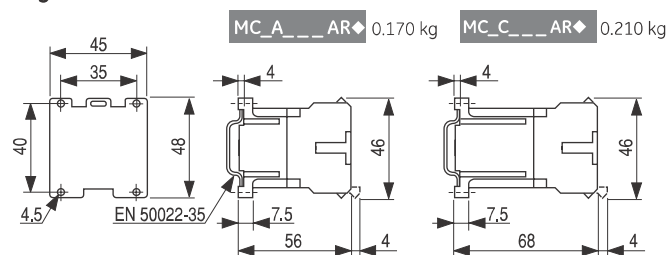
Dimensional drawings

Three and four pole minicontactors

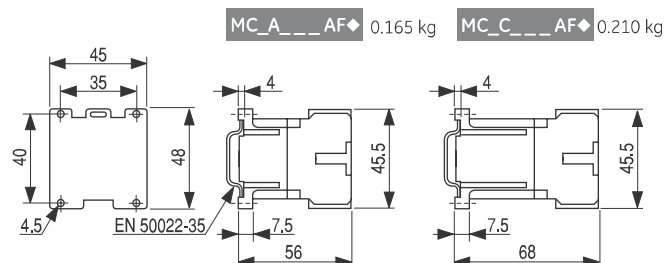
Screw terminal



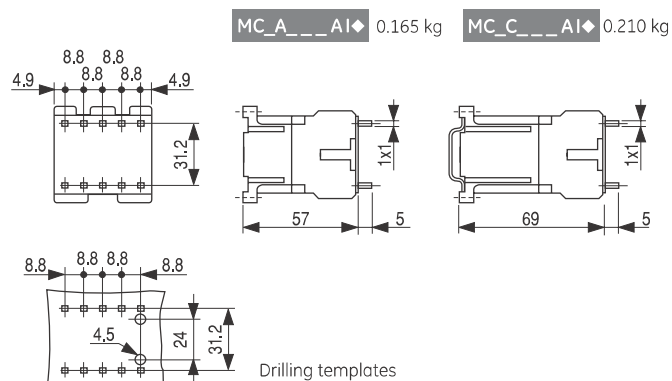
Ring terminal



Terminal: faston 2x2,8 insulated



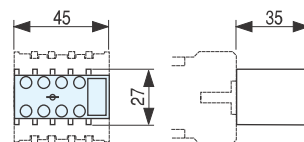
Terminal: printed circuit



Auxiliary contact block. Lateral mounting

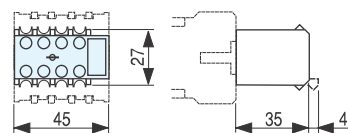
Screw terminal

MACN2__AT - MARN2__AT 0.025 kg
MACN4__AT - MARN4__AT 0.040 kg



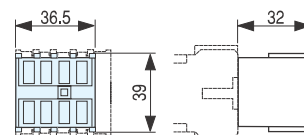
Ring terminal

MACN2__AR - MARN2__AR 0.025 kg
MACN4__AR - MARN4__AR 0.040 kg



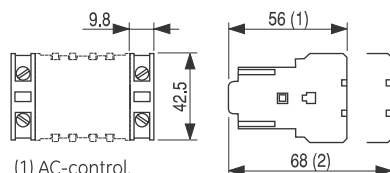
Terminal: faston 2x2.8 insulated

MACF4__AF 0.035 kg
MARF4__AF 0.035 kg



Auxiliary contact blocks. Lateral mounting**Screw terminal**

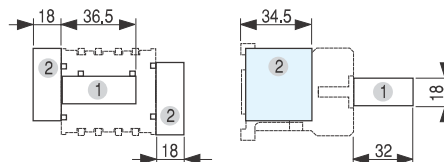
MACL___AT 0.013 kg
MARL___ATS 0.013 kg



(1) AC-control.
(2) DC-control.

Electronic timer block

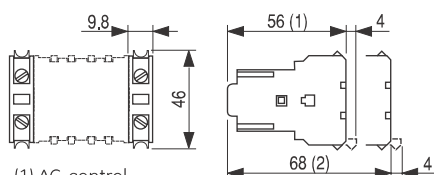
MREBC_0AC2 0.040 kg



(1) Frontal mounting
(2) Lateral mounting

Ring terminal

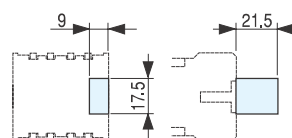
MACL___AR 0.013 kg
MARL___ARS 0.013 kg



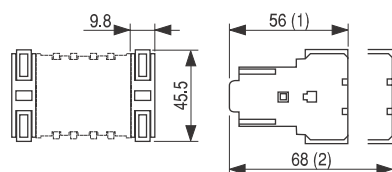
(1) AC-control.
(2) DC-control.

Voltage suppressor block

MP0A_AE 0.010 kg
MPOC_AE3 0.010 kg

**Terminal: faston 2x2.8 insulated**

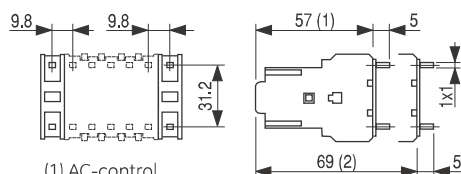
MACL___AF 0.009 kg
MARL___AFS 0.009 kg



(1) AC-control.
(2) DC-control.

Terminal: printed circuit

MACL___AI 0.009 kg
MARL___AIS 0.009 kg



(1) AC-control.
(2) DC-control.

A

B

C

D

E

F

G

H

I

X