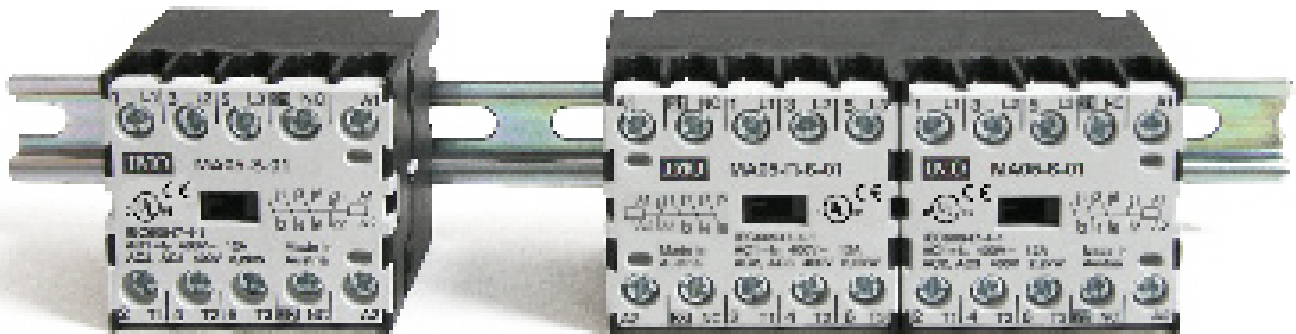


# Micro Contactor MA Series



- Relay-sized contactor, making it the world's smallest
- >3mm contact clearance acc. to IEC 60335-1 for Safety Applications
- Reversing contactor with mechanical interlock
- 3 Pole and 1 Aux. Contact NO or NC
- 5A AC3 @ 400VAC (2.2kW) - 12A AC1 @ 400VAC
- AC coil voltages - TS15 DIN rail mounting
- PCB mounting option
- AC and DC coil voltage



Micro Contactor Relays

Page 2



Micro Contactors

Page 3



Micro Contactors With Solder Pins  
Coil Voltages

Page 4



Micro Reversing Contactor

Page 5



Technical Data

Page 6



Dimensions

Page 10

# Micro Contactor MA Series



## Micro Contactor Relays 4-Pole

AC/DC Operated

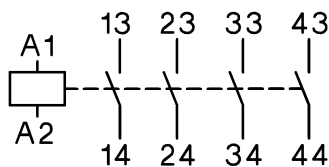
Ratings Therm.	Contacts *2	Distinc. Number	Additional Contact	Type	Coil Voltage *1	Pack pcs.	Weight kg/pc.
<b>AC15</b>	Rated-Current				<b>24</b> 24V 50/60Hz <b>230</b> 220-240V 50/60Hz <b>24DC</b> 24VDC <b>42DC</b> 42VDC		
<b>230V A</b>	400V A $I_{th}$ A	NO NC	acc. to EN50011	Blocks Type	↓		

4-Pole, With Screw Terminals

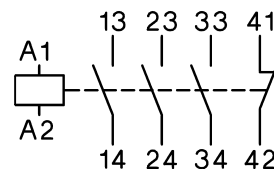


<b>3</b>	1.5	5	4	-	40E	-	MA04-S-40	...	10	0.07
<b>3</b>	1.5	5	3	1	31E	-	MA04-S-31	...	10	0.07
<b>3</b>	1.5	5	2	2	22E	-	MA04-S-22	...	10	0.07

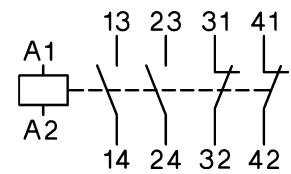
### MA04-S-40



### MA04-S-31



### MA04-S-22





\*1 Other coil voltages - see page 4  
 \*2 Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Positively guided contacts.

# Micro Contactor MA Series



## Micro Contactors

AC/DC Operated

Power Ratings	Rated Current	Aux. Contacts*2 Built-in	Additional	Type	Coil Voltage *1	Pack pcs.	Weight kg/pc.
AC2, AC3	AC1				<b>24</b> 24V 50/60Hz <b>230</b> 220-240V 50/60Hz <b>24DC</b> 24VDC <b>42DC</b> 42VDC		
<b>380V</b> <b>400V</b> <b>415V</b> <b>kW</b>	660V 690V kW	440V A	 NO	 NC	↓		

### 3-Pole, With Screw Terminals

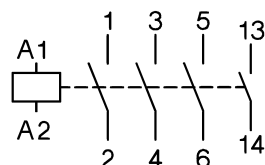
2.2	-	12	1	-	-	MA05-S-10	...	10	0.07
2.2	-	12	-	1	-	MA05-S-01	...	10	0.07

### 4-Pole, With Screw Terminals

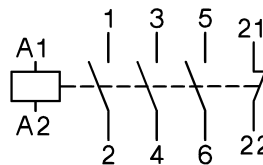
2.2	-	12	-	-	-	MA05-S-0040	...	10	0.07
-----	---	----	---	---	---	-------------	-----	----	------



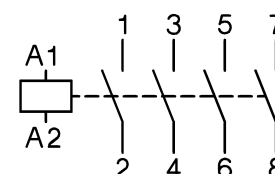
### MA05-S-10



### MA05-S-01

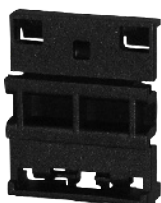


### MA05-S-0040



## Snap-On Adaptor

For Type	Specification	Type	Pack pcs.	Weight kg/pc.
MA	for snap mounting of <b>Snap on Adaptor for MA</b>  accessories on 35mm DIN-Rail acc. DIN EN 50022	MA-P1039	10	0.01



\*1 Other coil voltages - see page 4  
 \*2 Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Positively guided contacts.

# Micro Contactor MA Series



## Micro Contactors

AC/DC Operated

Power Ratings	Rated Current	Aux. Contacts*2		Type	Coil Voltage *1	Pack pcs.	Weight kg/pc.
		Built-in	Additional				
AC2, AC3	AC1				<b>24</b> 24V 50/60Hz <b>230</b> 220-240V 50/60Hz <b>24DC</b> 24VDC <b>42DC</b> 42VDC		
<b>380V</b> <b>400V</b> <b>415V</b> <b>kW</b>	660V 690V kW	440V A	NO	NC	↓		

### 3-Pole, With Solder Pins Ø1.15 For Printed Circuit Applications

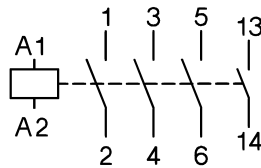
2.2	-	9	1	-	-	MA05-P-10	...	10	0.07
2.2	-	9	-	1	-	MA05-P-01	...	10	0.07

### 4-Pole, With Solder Pins Ø1.15 for Printed Circuit Applications

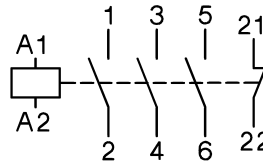
2.2	-	9	-	-	-	MA05-P-0040	...	10	0.07
-----	---	---	---	---	---	-------------	-----	----	------



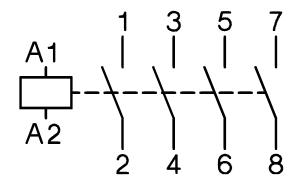
#### MA05-P-10



#### MA05-P-01



#### MA05-P-0040



## Coil Voltages for AC operated contactors

Suffix to contactor type e.g. MA05-S-1024AC	Voltage Marking at the coil for		Rated Control Voltage U <sub>s</sub> range for 50Hz				for 60Hz		
	50Hz	60Hz	min.	max.	min.	max.	min.	max.	max.
12	12	12	11	12	12	12			
<b>24</b>	<b>24</b>	<b>24</b>	<b>22</b>	<b>24</b>	<b>24</b>	<b>24</b>			
42	42	42	38.5	42	42	42			
48	48	48	48	50	48	52			
90	100	100	90	100	100	105			
95	95-100	105-110	95	100	105	110			
100	100	110-115	100	105	110	115			
105	105-110	115-120	105	110	115	120			
110	110-115	120-125	110	115	120	125			
180	200	200	185	200	200	210			

\*1 Other coil voltages - see above  
\*2 Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Positively guided contacts.

Suffix to contactor type e.g. MA05-S-10230AC	Voltage Marking at the coil for		Rated Control Voltage U <sub>s</sub> range for 50Hz				for 60Hz		
	50Hz	60Hz	min.	max.	min.	max.	min.	max.	max.
200	200	200-220	195	205	200	220			
210	205-215	220-230	205	215	220	230			
220	210-220	220-240	210	220	220	240			
<b>230</b>	<b>220-230</b>	<b>230-250</b>	<b>220</b>	<b>230</b>	<b>230</b>	<b>250</b>			
240	230-240		230	240	250	260			

Standard voltages in bold type letters  
Operating range of magnet-coils: 0.85 x U<sub>s</sub> (min value of rated control voltage) up to 1.1 x U<sub>s</sub> (max value of rated control voltage)

Coil not exchangeable

## Coil Voltages for DC operated contactors

Suffix to contactor type e.g. MA05-S-1012DC	Voltage Marking on the coil	Rated Control Voltage U <sub>s</sub> Min.	Rated Control Voltage U <sub>s</sub> Max.
12DC	12	10.2	13.2
24DC	24	20.4	26.4
42DC	42	35.7	46.2

# Micro Contactor MA Series



## Micro Reversing Contactors, Mechanical Interlock

AC/DC Operated

Power Ratings	Rated Current	Aux. Contacts*2		Type	Coil Voltage *1
		Built-in	Additional on the left hand side contactor		
AC2, AC3	AC1				<b>24</b> 24V 50/60Hz <b>230</b> 220-240V 50/60Hz <b>24DC</b> 24VDC <b>42DC</b> 42VDC

380V 400V 415V kW	660V 690V kW	440V A	NO	NC	K1 Type	K2 Type	↓	Pack pcs.	Weight kg/pc.
----------------------------	--------------------	-----------	----	----	------------	------------	---	-----------	---------------

### 3-Pole, With Screw Terminals

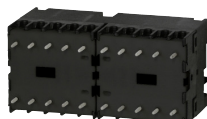


2.2	-	12	-	1	-	-	MA05-R-S-01	...	1	0.14
2.2	-	12	1	-	-	-	MA05-R-S-10	...	1	0.14

### 4-Pole, With Screw Terminals

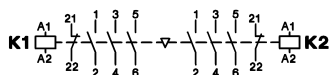
2.2	-	12	-	-	-	-	MA05-R-S-0040	...	1	0.14
-----	---	----	---	---	---	---	---------------	-----	---	------

### 3-Pole, With Solder Pins Ø1.15 For Printed Circuit Applications

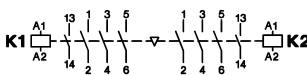


2.2	-	xxx*3	-	1	-	-	MA05-R-P-01	...	1	0.14
2.2	-	xxx*3	1	-	-	-	MA05-R-P-10	...	1	0.14

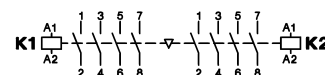
### MA05-R-S-01



### MA05-R-S-10



### MA05-R-S-0040



\*1 Other coil voltages - see page 4  
 \*2 Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Positively guided contacts.  
 \*3 Data available upon request

# Micro Contactor MA Series

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

Main Contacts	Type	MA05-S..
Rated insulation voltage $U_i$	V AC	480*1
Making capacity $I_{eff}$ at $U_e = 440V$ AC	A	65
Breaking capacity $I_{eff}$ $\cos\varphi = 0.65$ 400V AC	A	50
<b>Utilization category AC1</b>		
<b>Switching of resistive load</b>		
Rated operational current $I_e (=I_{th})$ at 40°C, open	<b>A</b>	<b>12</b>
Rated operational power of three-phase resistive loads 50-60Hz, $\cos\varphi = 1$	230V kW	4.7
	240V kW	4.8
	400V kW	8.3
	415V kW	8.6
	480V kW	9.5
Rated operational current $I_e (=I_{th})$ at 60°C, enclosed	A	8
Rated operational power of three-phase resistive loads 50-60Hz, $\cos\varphi = 1$	230V kW	3.1
	240V kW	3.3
	400V kW	5.5
	415V kW	5.7
	480V kW	6.5
Minimum cross-section of conductor at load with $I_e (=I_{th})$	mm <sup>2</sup>	1.5
<b>Utilization category AC2 and AC3</b>		
<b>Switching of three-phase motors</b>		
Rated operational current $I_e$ open and enclosed	220V A	6.2
	230V A	6.2
	240V A	5.6
	<b>380-400V A</b>	<b>5</b>
	415-440V A	5
	480V A	5
Rated operational power of three-phase motors 50-60Hz	220-240V kW	1.5
	<b>380-440V kW</b>	<b>2.2</b>
	480V kW	2.2
<b>Utilization category AC4</b>		
<b>Switching of squirrel cage motors, inching</b>		
Rated operational current $I_e$ open and enclosed	220V A	4.9
	230V A	4.9
	240V A	4.1
	<b>380-400V A</b>	<b>3.5</b>
	415-440V A	3.5
	480V A	3.5
Rated operational power of three-phase motors 50-60Hz	220-240V kW	1.1
	<b>380-440V kW</b>	<b>1.5</b>
	480V kW	1.5

\*1 Suitable at 690V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 4kV$ .  
Data for other conditions on request

# Micro Contactor MA Series

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

Main Contacts		Type	MA05-S..
<b>Utilization category DC1</b>			
<b>Switching of resistive load</b>	1 pole 24V	A	12
Time constant L/R ≤ 1ms	60V	A	12
Rated operational current I <sub>o</sub>	110V	A	-
	220V	A	-
	3 poles in series 24V	A	12
	60V	A	12
	110V	A	12
	220V	A	-
<b>Utilization category DC3 and DC5</b>			
<b>Switching of shunt motors and series motors</b>	1 pole 24V	A	12
Time constant L/R ≤ 15ms	60V	A	-
Rated operational current I <sub>o</sub>	110V	A	-
	220V	A	-
	3 poles in series 24V	A	12
	60V	A	12
	110V	A	12
	220V	A	-
<b>Maximum ambient temperature</b>			
Operation	open	°C	-40 to +60 (+90) <sup>*1</sup>
	enclosed	°C	-40 to +40
with thermal overload relay	open	°C	-25 to +60
	enclosed	°C	-25 to +40
Storage		°C	-50 to +90
<b>Short circuit protection</b>			
for contactors without thermal overload relay			
Coordination-type "1" according to IEC 947-4-1			
Contact welding without hazard of persons max. fuse size	gL (gG)	A	20
Coordination-type "2" according to IEC 947-4-1			
Light contact welding accepted max. fuse size	gL (gG)	A	-
Contact welding not accepted max. fuse size	gL (gG)	A	-
For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size			
<b>Cable cross-sections</b>			
for contactors			
main connector	solid or stranded	mm <sup>2</sup>	0.5-1.5
	flexible	mm <sup>2</sup>	0.5-1.5
	flexible with multicore cable end	mm <sup>2</sup>	0.5-1.5
Cables per clamp			2
	solid or stranded	AWG	20-14
<b>Frequency of operation z</b>			
contactors without thermal overload relay			
	without load	1/h	10000
	AC3 I <sub>o</sub>	1/h	600
	AC4 I <sub>o</sub>	1/h	120
	DC3 I <sub>o</sub>	1/h	600
<b>Mechanical life</b>	AC operated	S x 10 <sup>6</sup>	3
	DC operated	S x 10 <sup>6</sup>	xxx <sup>*2</sup>
<b>Short time current</b>	10s-current	A	50
<b>Power loss per pole</b>	at I <sub>o</sub> /AC3 400V	W	0.2
<b>Resistance to shock according to IEC 68-2-27</b>			
Shock time 20ms sine-wave			
AC operated	NO	g	2.5
	NC	g	2.5

\*1 With reduced control voltage range 0.9 up to 1.0 x U<sub>o</sub> and with reduced rated current I<sub>o</sub>/AC1 according to I<sub>o</sub>/AC3  
 \*2 Data on request

# Micro Contactor MA Series

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

Auxilliary Contacts	Type	MA04-S.. MA05-S..
<b>Rated insulation voltage</b>	$U_i$ VAC	440*1
<b>Thermal rated current <math>I_{th}</math> bis 440V</b>		
Ambient temperature	40°C A	5
	60°C A	3
<b>Power loss per pole</b>	$I_{th}$ W	0.25
<b>Utilization category AC15</b>		
Rated operational current $I_e$	220-240V A	3
	380-415V A	1.5
	440V A	1
<b>Utilization category DC13</b>		
Rated operational current $I_e$	60V A	0.5
		-
		-
<b>Maximum ambient temperature</b>		
Operation	open °C	-40 bis to +60 (+90)*2
	enclosed °C	-40 bis to +40
Storage	°C	-40 bis to +90
<b>Short circuit protection</b> short circuit current 1kA, contact welding not accepted max fuse size	gL (gG) A	10
For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size		
<b>Power consumption of coils</b>		
AC operated	inrush VA	9
	sealed VA	4
	W	1.8
<b>Operation range of coils</b> in multiples of control voltage $U_s$		0.85 - 1.1
<b>Switching time</b> at control voltage $U_s \pm 10\%$ *3*4		
AC operated	make time ms	13 - 18
	release time ms	5 - 10
	arc duration ms	10 - 15
DC operated	make time ms	-
	release time ms	-
	arc duration ms	-
<b>Cable cross-section</b> all connectors	solid mm <sup>2</sup>	05 - 1.5
	flexible mm <sup>2</sup>	0.5 - 1.5
	flexible with multicore cable end mm <sup>2</sup>	0.5 - 1.5
Clamps per pole		2
	solid or stranded AWG	20 - 14

\*1 Suitable at 690V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 4kV$   
Data for other conditions on request

\*2 With reduced control voltage range 0.9 up to 1.0 x  $U_s$  and with reduced thermal rated current  $I_{th}$  to  $I_e/AC15$

\*3 Summary switching time = release time + arc duration

\*4 Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units)

\*5 Data on request



# Micro Contactor MA Series

For North America - Data according UL508

Main Contacts (cULus)	Type	MA05-S.. MA05-R-S..	MA04-S..
Rated operational current "General Use"	A	12	5
Rated operational power of three phase motors at 60Hz (3ph)	110-120V hp	1/2	-
	200-208V hp	1	-
	220-240V hp	1	-
	277V hp	1 1/2	-
Rated operational power of AC motors at 60Hz (1ph)	110-120V hp	1/6	-
	200-208V hp	1/2	-
	220-240V hp	3/4	-
Fuse / Short circuit current	A/kA	30/5	-
Rated voltage	VAC	300	300
Auxilliary contacts (cULus)	heavy pilot duty AC	B300	B300
	Standard pilot duty DC	R300	R300

**Motor Rating**  
**P<sub>n</sub> = AC4**

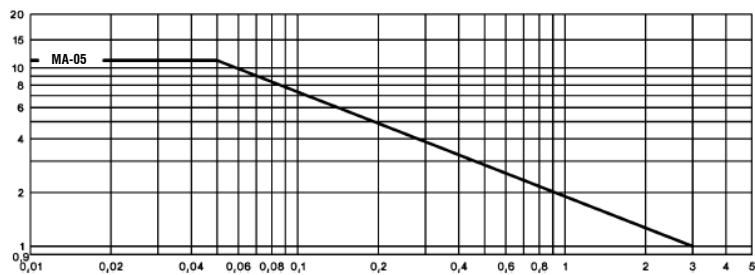
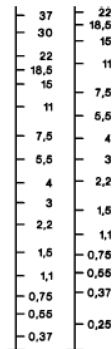
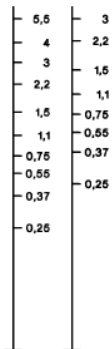
380/ 220/  
400V 230V  
kW kW

**Motor Rating**  
**P<sub>n</sub> = AC3**

380/ 220/  
400V 230V  
kW kW

**Breaking Current**  
**I<sub>a</sub> (= I<sub>e</sub> = AC1)**

A



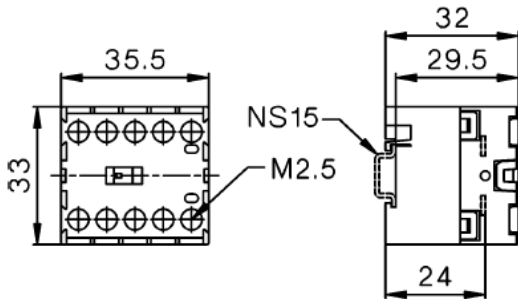
Millions of Operations

# Micro Contactor MA Series

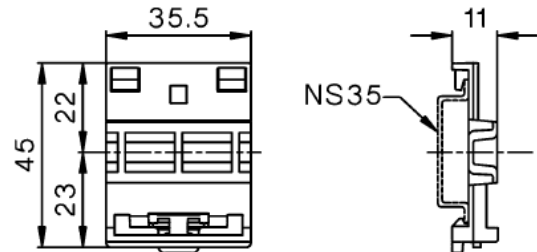
## Dimensions

**AC Operated**  
with screw terminals

**MA04-S..**  
**MA05-S..**

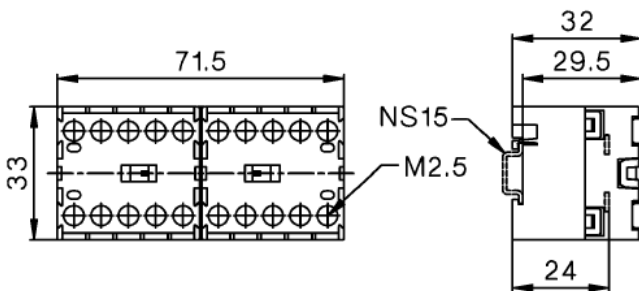


**Snap-On Adaptor MA-P1039**

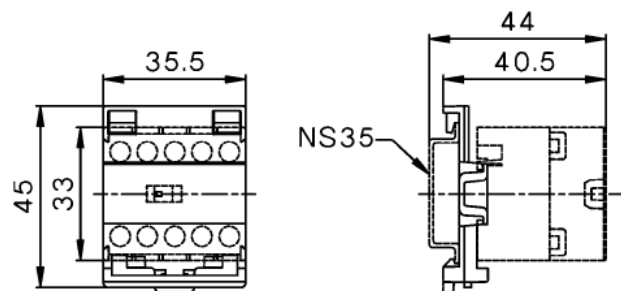


**Reversing Contactors**  
with screw terminals

**MA05-R-S..**

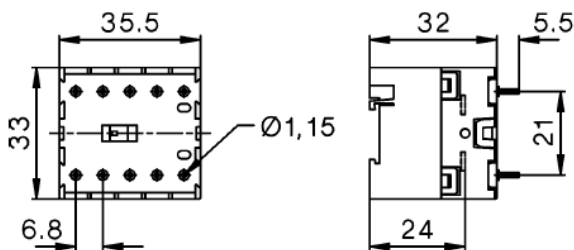


**MA..-S.. with Snap-On Adaptor MA-P1039**



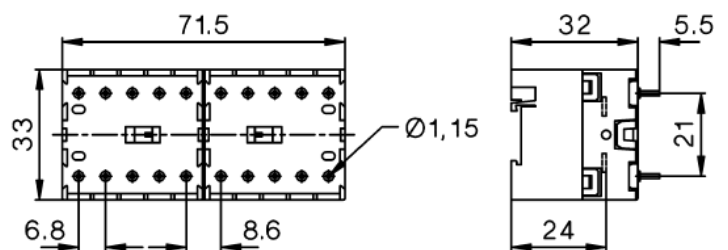
**AC Operated**  
with solder connections

**MA04-P.**  
**MA05-P.**



**Reversing Contactors**  
with solder connections

**MA05-R-S..**



## Mounting positions of contactors

**MA**

