

# M-relays, 2, 3 or 4 pole, 6 - 12 A

## Datasheet



### Application

Our general purpose relays are applied mainly in industrial and power automation systems, in signaling and protection systems and in other control and electric drives systems.

### Description

The basic features of the general purpose relays are:

- Number of contacts: 2, 3 or 4
- Rated contact switching current up to 12 A, depending on relay type
- Versions with coil overvoltage suppression
- Versions with flag indicators and manual relay test pushbuttons with the possibility of latching the normal open contacts close
- Mounting sockets for 35 mm rail (EN 50022)
- Rail sockets equipped with screw terminals or spring terminals

### Features

- Compact plug-in design
- 2, 3 or 4 C/O contacts
- Standard mechanical indicator
- Flat and silver relay pins for excellent connection in socket
- Wide range sockets
- Universal pinning
- Transparent cover
- Cadmium free contacts
- Flash barriers
- LED option

### Benefits

- Proven reliability
- Light weight construction
- Long term availability
- Universal pinning
- Competitive pricing

### Industry compliancy

- EN 60255 Relay design and environmental conditions
- EN 60947 Low voltage switch gear and control gear
- EN 60947-5-1 Electromechanical control circuit devices and switching elements
- IEC 61810 Electromechanical elementary relays
- The relays meet the requirements of the RoHS directive



# M-relays

## Technical specifications



Test button & LED



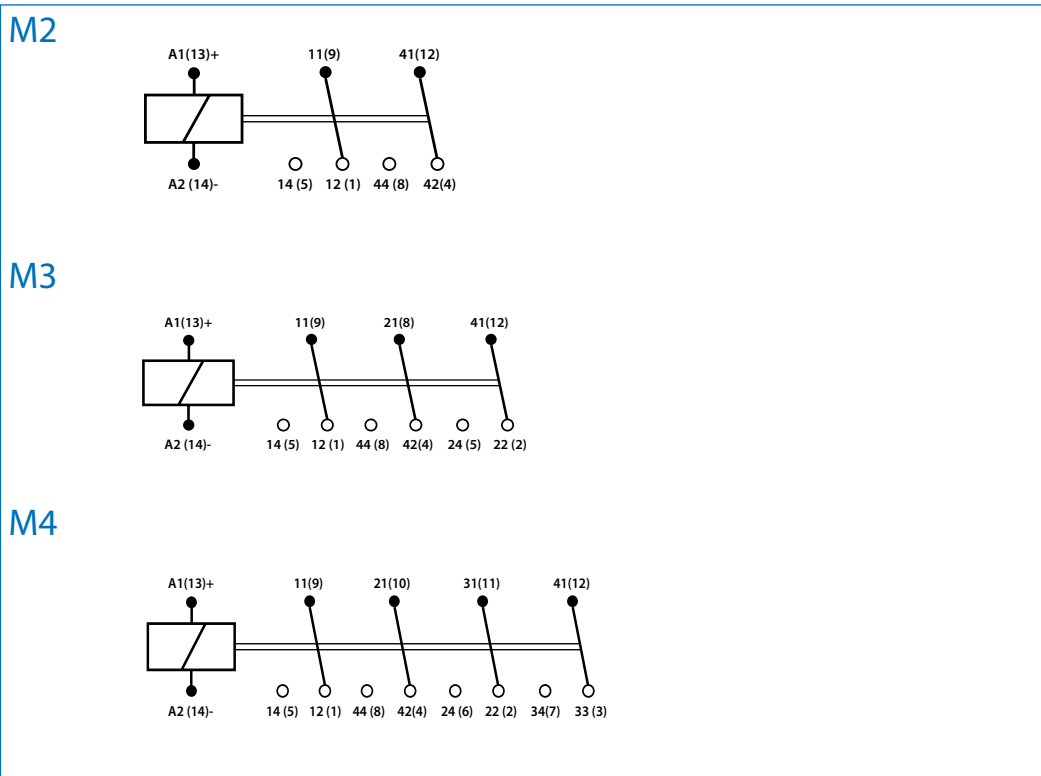
Universal pinning

## Manual test / latching button

The test button can be used in two ways:

1. The plastic tab is broken off. In this situation, when the test button is pushed, the contacts operate, when the test button is released the contacts return to their previous state.
2. The plastic tab remains in tact. In this situation, when the test button is pushed and rotated, the contacts are latched in the operating state, and remain so until the test button is rotated back to its former position.

## Connection diagram



# M-relays

## Technical specifications

### Coil data DC-versions

Operating time at nominal voltage	
Pull-in time	13 ms
Release time	3 ms
Operating voltage range in %	0.8 - 1.1 U <sub>nom</sub>
Nominal power consumption	0.9 W
Min hold-up voltage	0.1 U <sub>nom</sub>

Coil code	Rated voltage U <sub>n</sub> VDC	Coil resistance ±10% at 20 °C Ω	Coil operating range VDC	
			min. (at 20°C)	max. (at 55°C)
D 012	12	110	9.6	13.2
D 024	24	430	19.2	26.4
D 048	48	1750	38.4	52.8
D 110	110	13600	92	126.5
D 125	125	16000	96	132
D 220	220	37000	176	242

*\*other voltages on request*

### Coil data AC-versions

Operating time at nominal voltage	
Pull-in time	10 ms
Release time	8 ms
Operating voltage range in %	0.8 - 1.1 U <sub>nom</sub>
Nominal power consumption	1.6 VA
Min hold-up voltage	0.12 U <sub>nom</sub>

Coil code	Rated voltage U <sub>n</sub> VAC	Coil resistance ±15% at 20 °C Ω	Coil operating range VAC	
			min. (at 20°C)	max. (at 55°C)
A 012	12	39.6	9.6	13.2
A 024	24	158	19.2	26.4
A 048	48	640	38.4	52.8
A 11	110	3610	92	126.5
D 230	230	16100	184	42

*\*other voltages on request*

# M-relays

## Technical specifications

### Contact data

Maximum make current	24 A, 20 A, 12 A
Maximum continuous current	12 A (AC1; IEC 60947)
Maximum switching voltage	250 V, 400 V
Minimum switching voltage/current AgNi	5 V / 5 mA
Material	AgNi
Contact resistance	≤100 mΩ

\* AgNi/Au 0,2µm or 5 µm on request

### Performance characteristics

Electrical life (AC1)	≥ 10 <sup>5</sup>
Mechanical life	≥ 20 x 10 <sup>6</sup> cycles (Unpowered)
Dielectric strength	Between coil contacts 2500 VAC Contact clearance 1500 VAC Pole - pole 2500 VAC
Isolation class	C400
Max. operating frequency	At rated load 360 cycles/hour (AC1) No load 72000 cycles/hour

### Mechanical data

Dimensions (d x w x h)	27.5 x 21.2 x 35.6 mm
Weight	35 g

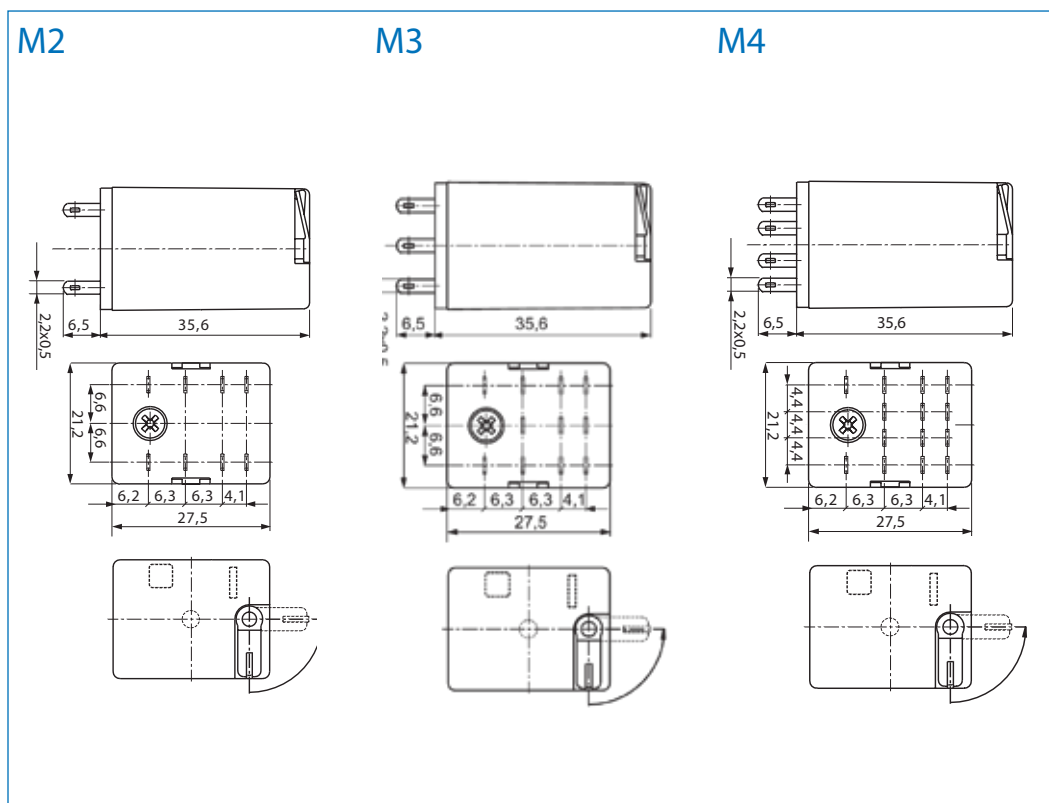
### Environment conditions

Storage temperature	-40 °C...+85 °C
Operating temperature	AC -40 °C...+55 °C DC -40 °C...+70 °C
Shock	10 g
Vibrations	5 g, 10-150 Hz
Environment protection	EN 116000-3 RTI
Degree of protection	EN 60529 IP40

# M-relays

## Technical specifications

### Dimensions



### Options

Code	Description
L	LED

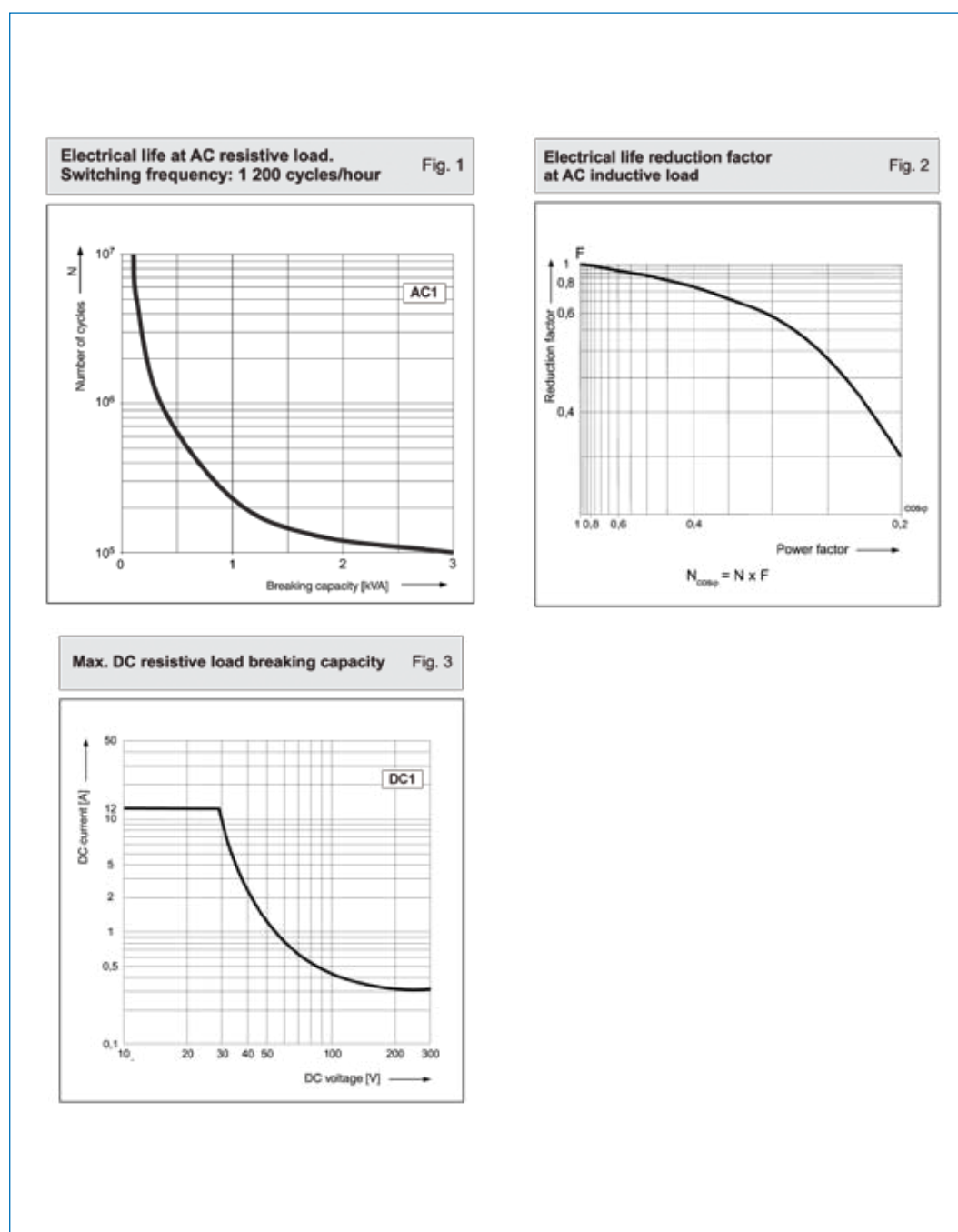
\* Standard coil is 50 Hz, 60 Hz coil on request

# M-relays

## Technical specifications

### Electrical life expectancy - M2

The life expectancy values shown below are based on factory tests. These values could be different in real life applications as environmental conditions, switching frequencies and duty cycles will influence these values.

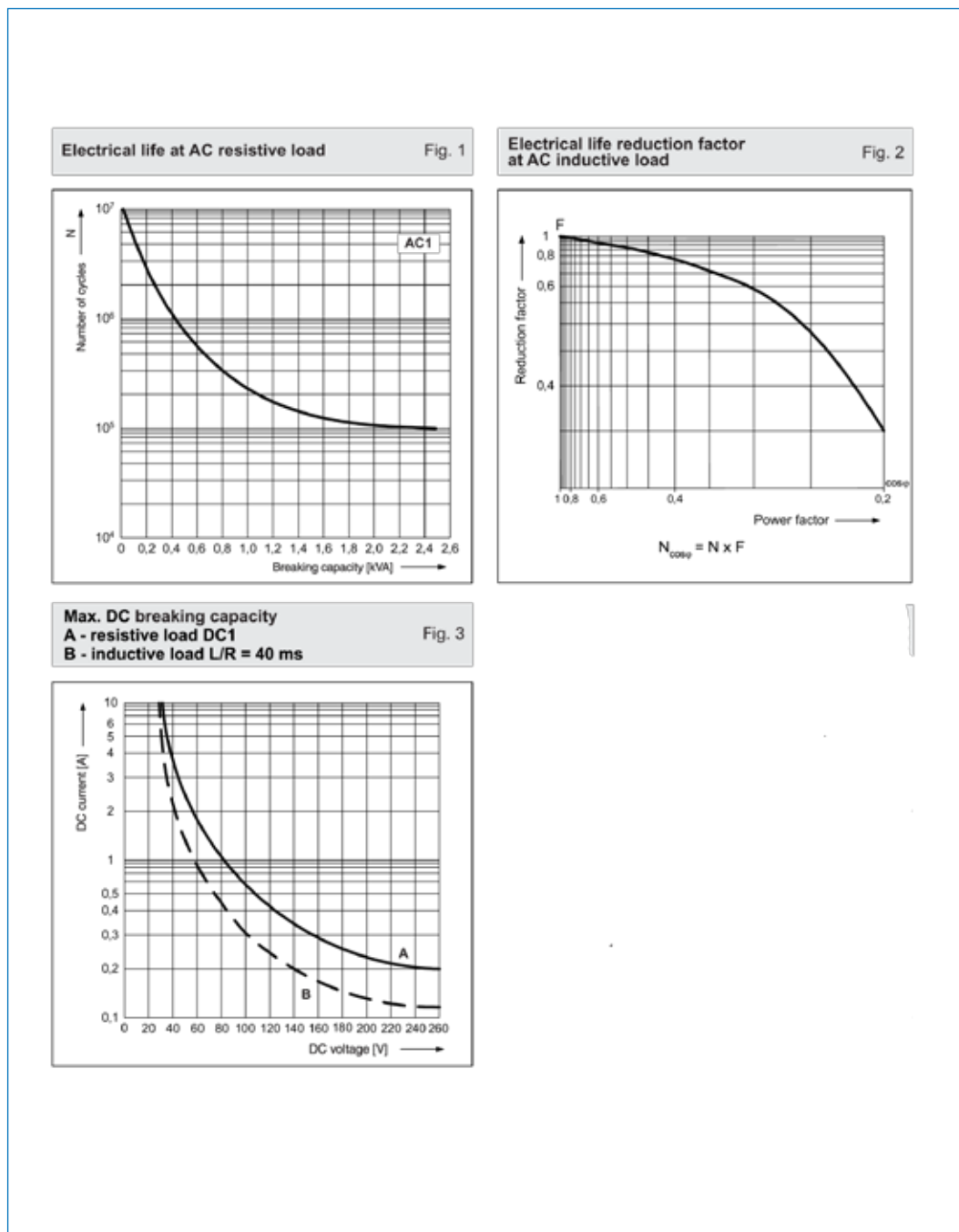


# M-relays

## Technical specifications

### Electrical life expectancy - M3

The life expectancy values shown below are based on factory tests. These values could be different in real life applications as environmental conditions, switching frequencies and duty cycles will influence these values.



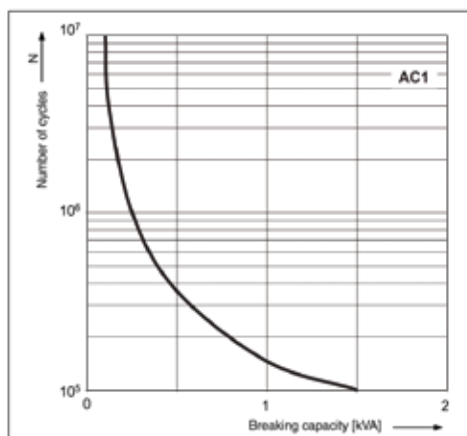
# M-relays

## Technical specifications

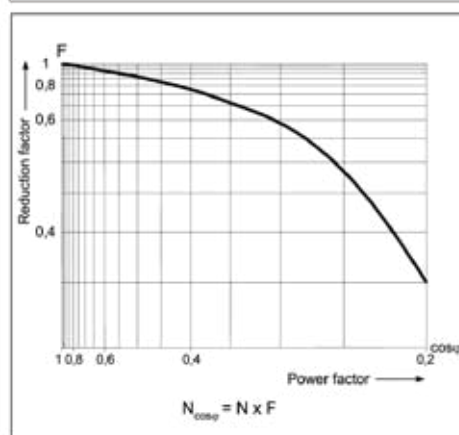
### Electrical life expectancy - M4

The life expectancy values shown below are based on factory tests. These values could be different in real life applications as environmental conditions, switching frequencies and duty cycles will influence these values.

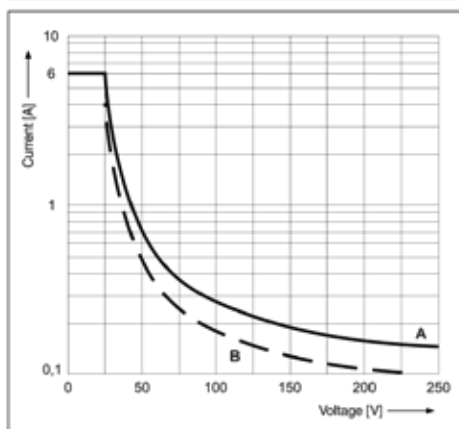
**Electrical life at AC resistive load.**  
Switching frequency: 1 200 cycles/hour **Fig. 1**



**Electrical life reduction factor at AC inductive load** **Fig. 2**



**Max. DC breaking capacity**  
**A - resistive load DC1** **Fig. 3**  
**B - inductive load L/R = 40 ms**



# M-relays

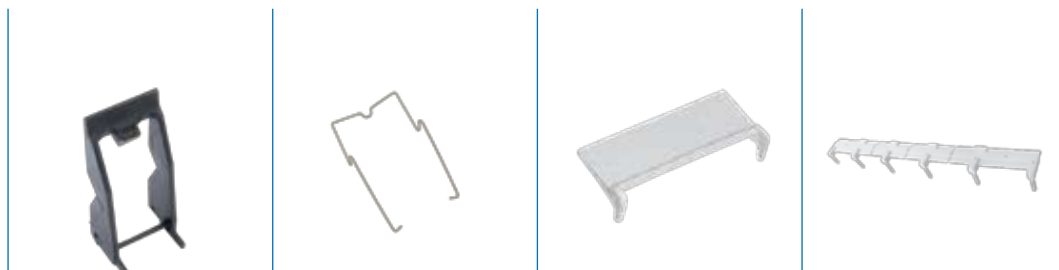
## Sockets



Art. no.	Type	Applicable for	Connection	Weight (g)	Dimensions (mm)
321000520	VM-2R	M2 relays, 35 mm rail or wall	Screw terminals	61	76.3 x 27 x 43
321000510	VM-3R	M3 relays, 35 mm rail or wall	Screw terminals	61	76.3 x 27 x 43
321000519	VM-4R	M4 relays, 35 mm rail or wall	Screw terminals	61	76.3 x 27 x 43
321000521	VM-2L	M2 relays, 35 mm rail or wall	Screw terminals	71	75 x 27 x 61
321000511	VM-3L	M3 relays, 35 mm rail or wall	Screw terminals	71	75 x 27 x 61
321000512	VM-4L	M4 relays, 35 mm rail or wall	Screw terminals	71	75 x 27 x 61
321000516	VM-4	M2 & M4 relays, 35 mm rail or wall	Screw terminals	55	67 x 30 x 29
321000513	VM-4CC	M2 & M4 relays, 35 mm rail or wall	Screw & clamp terminal	74	97 x 27 x 45
321000514	VM-2PCB	M2 relays	PCB	6	30 x 22 x 11
321000515	VM-4PCB	M4 relays	PCB	6	30 x 22 x 11

# M-relays

## Accessories



MS-35

CM-1

DPM-1

M-connect-5

Art. no.	Type	Applicable for	Weight	Dimensions
321000509	MS-35	Relay retaining clip, plastic	4 g	-
321000503	CM-1	Relay retaining clip, metal		
321000522	DMP-1	Description plate		
321000523	M-connector-5	Interconnection strip		

# M-relays Modules



Art.no.	Type	Schematic	Voltage	Colour
321000507	<b>DM-1</b> Limits overvoltage on DC coils	+A2 -A1	6...230 VDC	
321000524	<b>DM-2</b> Limits overvoltage on DC coils	-A2 +A1	6...230 VDC	
321000525	<b>DLM-3R</b> Limits overvoltage on DC coils	+A2 -A1	6...12 VDC	Red
321000526			24...60 VDC	Red
321000527	<b>DLM-3G</b> Limits overvoltage on DC coils	+A2 -A1	110...230 VDC	Red
321000528			6...12 VDC	Green
321000529	Limits overvoltage on DC coils	+A2 -A1	24...60 VDC	Green
321000530			110...230 VDC	Green
321000531	<b>DLM-4R</b> Limits overvoltage on DC coils	-A2 +A1	6...12 VDC	Red
321000532			24...60 VDC	Red
321000533	<b>DLM-4G</b> Limits overvoltage on DC coils	-A2 +A1	110...230 VDC	Red
321000534			6...12 VDC	Green
321000535	Limits overvoltage on DC coils	-A2 +A1	24...60 VDC	Green
321000536			110...230 VDC	Green
321000537	<b>RCM-5</b> Limits overvoltage on DC coils	A2 A1	6...24 VAC/DC	
321000538			24...60 VAC/DC	
321000539			110...230 VAC/DC	
321000540	<b>LM-6R</b> Limits overvoltage on DC coils	A2 A1	6...12 VDC	Red
321000541			24...60 VDC	Red
321000542	<b>LM-6G</b> Limits overvoltage on DC coils	A2 A1	110...230 VDC	Red
321000543			6...12 VDC	Green
321000544			24...60 VDC	Green
321000545	110...230 VDC	Green	Green	
321000546	<b>LVM-7R</b> Limits overvoltage on DC coils	A2 A1	6...12 VDC	Red
321000547			24...60 VDC	Red
321000548	<b>LVM-7G</b> Limits overvoltage on DC coils	A2 A1	110...230 VDC	Red
321000549			6...12 VDC	Green
321000550	Limits overvoltage on DC coils	A2 A1	24...60 VDC	Green
321000551			110...230 VDC	Green
321000552	<b>VM-8</b> Limits overvoltage on DC coils	A2 A1	24 VAC	
321000553			60 VAC	
321000554			230 VAC	
321000555	<b>RM-9</b> Limits overvoltage on DC coils	A2 A1	110...230 VAC	

# M-relays

## Instructions

### Installation, operation, maintenance

#### Installation

- Install the socket and connect wiring according the identification on the terminals, plug the relay into the socket
- Reverse installation of socket is not possible due to mechanical blocking by pinning
- Do not reverse the polarity of the coilconnection when a diode is used
- Relays can be mounted tight next to each other
- Warning! Never use silicon near by relays!

#### Operation

- Before operate always apply voltage to coil to check correct operation
- Also switching the load a few times is advised
- Long term storage may corrode the silver on the relay pins
- By plugging the relay into the socket, the connector receivers will automatically clean the corrosion on the pins and guarantee a good connection
- Do not use the relay in places with flammable gas as the arc generated from switching could ignite gasses

#### Maintenance

- Correct operation of relay can easily be checked as transparent cover gives good visibility on the moving contacts
- When the relay does not appear to operate correct, please check presence of coil voltage
- Use a multimeter.
- If LED is used coil presence should be indicated, if coil voltage is present but the relay does not work, a short circuit of suppression diode is possible (The coil connection was reversed)
- If relay does not work after inspection, please replace the relay by a similar model

# M-relays

## Ordering codes

### M2-relays

#### M2 relays

M2-D024	24 VDC	321000302
M2-D048	48 VDC	321000303
M2-D110	110 VDC	321000304
M2-D220	220 VDC	321000311
M2-A024	24 VAC, 50/60 Hz	321000306
M2-A048	48 VAC, 50/60 Hz	321000307
M2-A110	110 VAC, 50/60 Hz	321000308
M2-A230	230 VAC, 50/60 Hz	321000309

#### M2-L relays (+LED)

M2-L-D024	24 VDC	321000352
M2-L-D048	48 VDC	321000353
M2-L-D110	110 VDC	321000354
M2-L-D220	220 VDC	321000361
M2-L-A024	24 VAC, 50/60 Hz	321000356
M2-L-A048	48 VAC, 50/60 Hz	321000357
M2-L-A110	110 VAC, 50/60 Hz	321000358
M2-L-A230	230 VAC, 50/60 Hz	321000359

*\* other voltages on request*

# M-relays

## Ordering codes

### M3-relays

#### M3 relays

M3-D024	24 VDC	321001002
M3-D048	48 VDC	321001003
M3-D110	110 VDC	321001004
M3-D220	220 VDC	321001011
M3-A024	24 VAC, 50/60 Hz	321001006
M3-A048	48 VAC, 50/60 Hz	321001007
M3-A110	110 VAC, 50/60 Hz	321001008
M3-A230	230 VAC, 50/60 Hz	321001009

#### M3-L relays (+LED)

M3-L-D024	24 VDC	321001152
M3-L-D048	48 VDC	321001153
M3-L-D110	110 VDC	321001154
M3-L-D220	220 VDC	321001161

*\* other voltages on request*

# M-relays

## Ordering codes

### M4-relays

#### M4 relays

M4-D024	24 VDC	321000402
M4-D048	48 VDC	321000403
M4-D110	110 VDC	321000404
M4-D220	220 VDC	321000411
M4-A024	24 VAC, 50/60 Hz	321000406
M4-A048	48 VAC, 50/60 Hz	321000407
M4-A110	110 VAC, 50/60 Hz	321000408
M4-A230	230 VAC, 50/60 Hz	321000409

#### M4-L relays (+LED)

M4-L-D024	24 VDC	321000452
M4-L-D048	48 VDC	321000453
M4-L-D110	110 VDC	321000454
M4-L-D220	220 VDC	321000461
M4-L-A024	24 VAC, 50/60 Hz	321000456
M4-L-A048	48 VAC, 50/60 Hz	321000457
M4-L-A110	110 VAC, 50/60 Hz	321000458
M4-L-A230	230 VAC, 50/60 Hz	321000459

*\* other voltages on request*



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