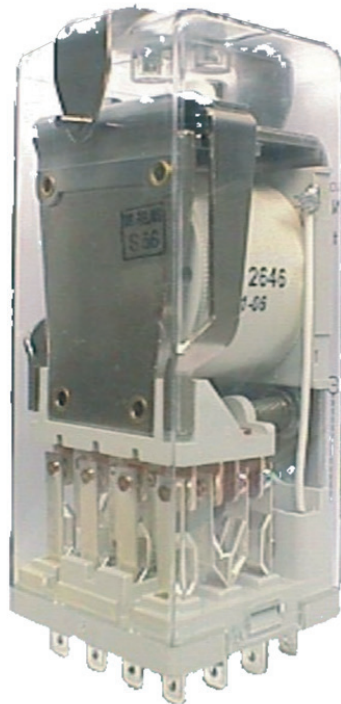


BM 400 relay - Mixed load, 4 contacts

Datasheet



Description

The BM 400 relay has 3 silver double make / double break C/O contacts (form Z) and one gold bifurcated C/O contact

The plug-in design offers secure locking feature for maximum ease of maintenance (no wires need to be disconnected or other hardware removed for relay inspection or replacement).

The resistance to impact and vibration is conform to standards in force for Railway Transported Equipment. Positive mechanical keying of relay to socket is built into relay and socket during manufacture and terminal identifications are clearly marked on identification plate that is permanently attached to the relay.

The BM 400 relays is pluggable in the following sockets: EA 102 B, EA 102 BF, EA 103 BF, EA 104 B, EA 104 BF, EA 105 BF, EA 112 BF.

Application

The BM 400 relay is designed for both power levels and low level signals are being switched for general purpose heavy duty applications such as lighting, pumps and fans, as standard weld no transfer design for safety critical applications such as door control, emergency brake failure, interlocking traction and breaking with a gold bifurcated contact for dry circuit signal information.

Features

- Instantaneous relay
- Plug-in design with secure locking feature for maximum ease of maintenance
- 3 double make / double break C/O silver contacts (form Z)
- 1 gold bifurcated C/O contact
- Contact life (mechanical) of 100 million cycles
- -40 °C...+80 °C operating temperature
- Contacts cross pollution barrier
- Weld no transfer function for silver contacts

Benefits

- Proven reliable in heavy duty application
- 3 silver contacts power contact and 1 gold bifurcated dry circuit contact
- Long life cycle
- Easy to maintain and replace
- Low life cycle cost
- No maintenance

Railway compliancy

- NF F 62-002 Rolling stock - Instantaneous relays contacts and sockets
- NF F16-101/102 Fire behaviour - Railway rolling stock

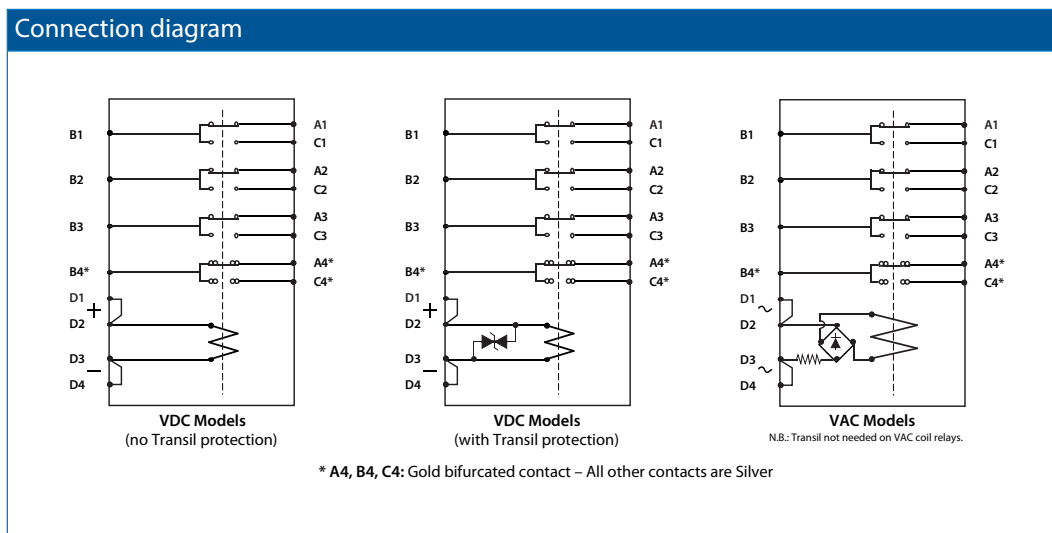
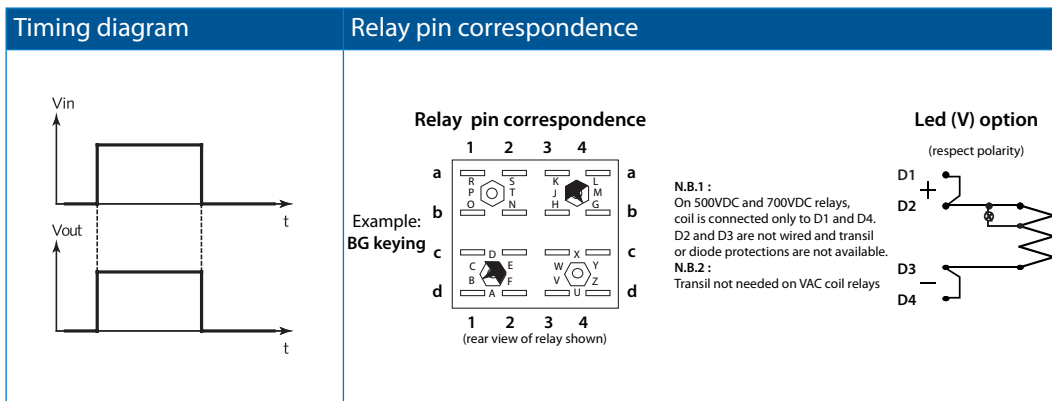


BM 400 relay

Technical specifications



Functional and connection diagrams



BM 400 relay

Technical specifications

Coil data - DC versions

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	R coil (Ω) ⁽¹⁾	L/R (ms) ⁽²⁾
MEZ	12	8 / 16	3.5	6.25	1.25	40	40
AGZ	24	16 / 33	3.5	13.5	2.5	170	40
FLZ	36	25 / 45	3.5	21	3.5	390	40
DGZ	48	33 / 60	3.5	28.5	4.5	625	40
BGZ	72	48 / 90	3.5	40.5	6.5	1600	40
USB	96	65 / 120	3.8	50	9	2400	40
EGZ	115	77 / 144	3.5	60	11.5	4000	40
FGZ	550	440 / 660	4	300	50	75500	40
UTB	700	450 / 900	4.2	380	60	115000	40

(1) Coil resistance tol.: $\pm 8\%$ at 20 °C

(2) Valid for closed relay.

Coil data - AC versions

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	R coil (Ω) ⁽¹⁾	L/R (ms) ⁽²⁾
EMZ	127	88 / 143	4	71.5	12	4000	40
CGZ	220	176 / 242	3	129	21	14350	40

(1) Coil resistance tol.: $\pm 8\%$ at 20 °C

(2) Valid for closed relay.

Contact data - silver contacts

Nominal current	12 A resistive		
Nominal breaking capacity and life	3 A at 72 VDC		L/R : 0 ms Electrical life: 5 x 10 ⁶ op.
	1 A at 72 VDC		L/R: 30 ms Electrical life: 2.5 x 10 ⁶ op.
	3 A at 220 VAC 50 Hz		cos ϕ =1 Electrical life: 2.5 x 10 ⁶ op.
	Lamp filament circuit: 200 W at 72 VDC		Electrical life: 5 x 10 ⁵ op.
Contact closure time	Pick-up time N/O < 55 ms		Drop-out* time N/C < 25 ms
Contact opening time	Pick-up time N/C < 50 ms		Drop-out* time N/O < 15 ms
Minimum contact continuity	20 mA at 24 VDC		
Number of contacts	3 double make / double break contacts (form Z)		
Contact material	Hard silver overlay laminated to copper		
Contact resistance	initial	10 m Ω max at 5 A	
	end of life	40 m Ω max at 5 A	



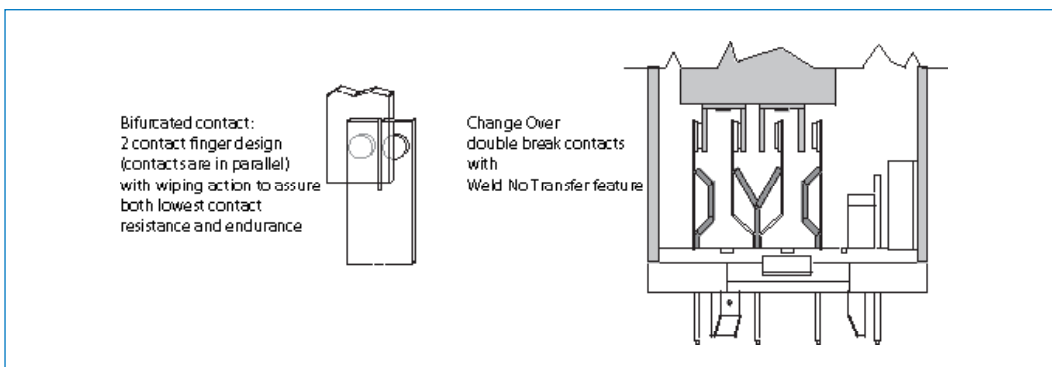
BM 400 relay

Technical specifications

Contact data - Gold bifurcated contact

Number of contacts	1 C/O double break contact	
Contact design	Stationary contacts	Bifurcated 2 contact finger design
	Moveable contacts	Solid blade
Contact resistance	$\leq 20 \text{ m}\Omega$ at 5 A (carry only)	
Maximum contact ratings	Operating	20 mA maximum at 72 VDC
	Carry only (no make and break)	5 A maximum at 5 VDC
Minimum current ratings	1 mA at 5 VDC	
Electrical life	2×10^6 operations	
Contact material	Stationary contacts	Solid gold alloy
	Moveable contacts	Gold over hard silver overlay laminated to copper

Contact design



Electrical characteristics

Dielectric strength	2000 VAC, 1 min between contacts
	2600 VAC, 1 min between contacts, coil and frame
Insulation resistance	$\geq 1000 \text{ M}\Omega$ at 500 VDC



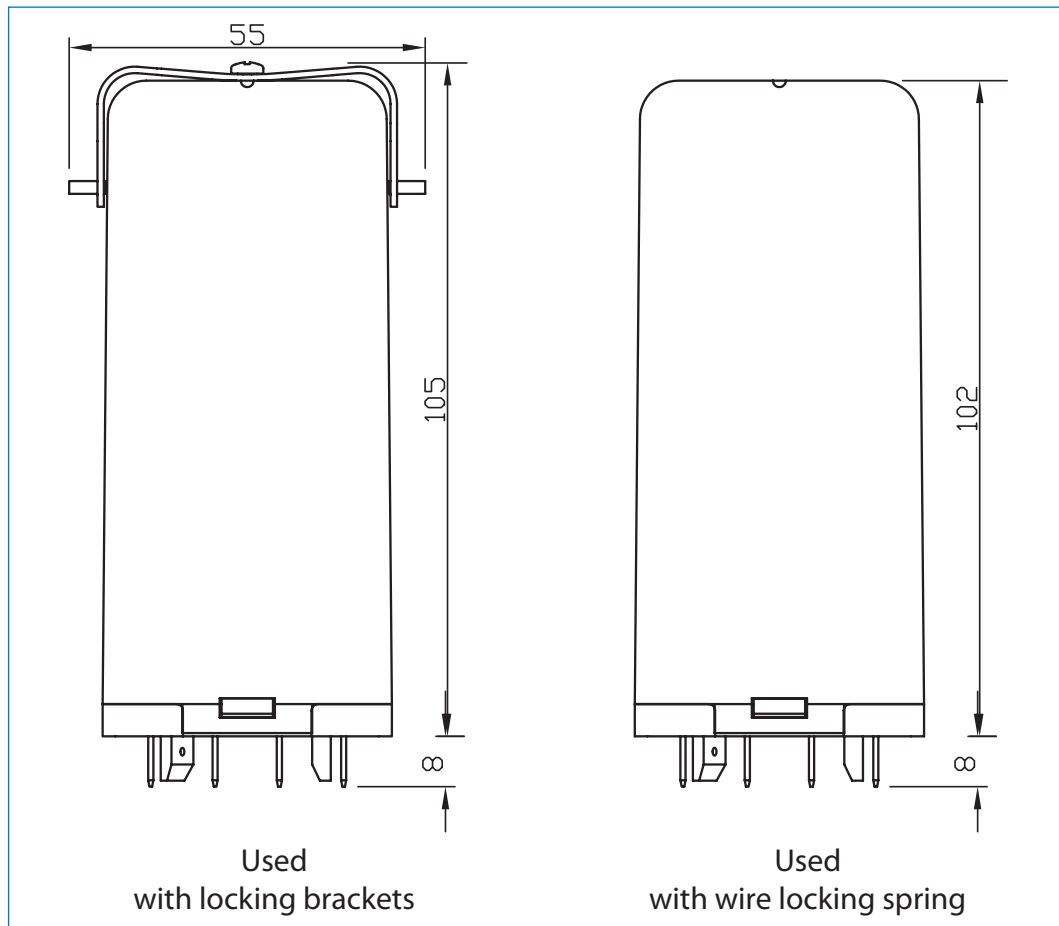
BM 400 relay

Technical specifications

Mechanical & environmental characteristics

Vibration	NF F 62-002 The tests are conducted in the X, Y, Z planes at frequency between 10 & 150 cycles (sinusoidal) at 2 g
Shock	NF F 62-002 Tests are applied in both directions in the X, Y & Z planes. Then successive shocks are administered consisting of the positive component of sinusoidal with a value of 30 g, 18 ms Other vibration and shock tests can be performed on request.
Mechanical life	> 100 x 10 ⁶ operations
Weight	450 g
Temperature	-40 °C...+80 °C
Humidity	93% RH, 40° C for 4 days
Salt mist	5% NaCl, 35° C for 4 days
Protection	IP40 (relay on socket)
Fire & smoke	Materials: Polycarbonate (cover) / polyester melamine (base) Note: These materials have been tested for fire propagation and smoke emission according standards NF F 16-101, NF F 16-102.

Dimensions (mm)



BM 400 relay

Technical specifications

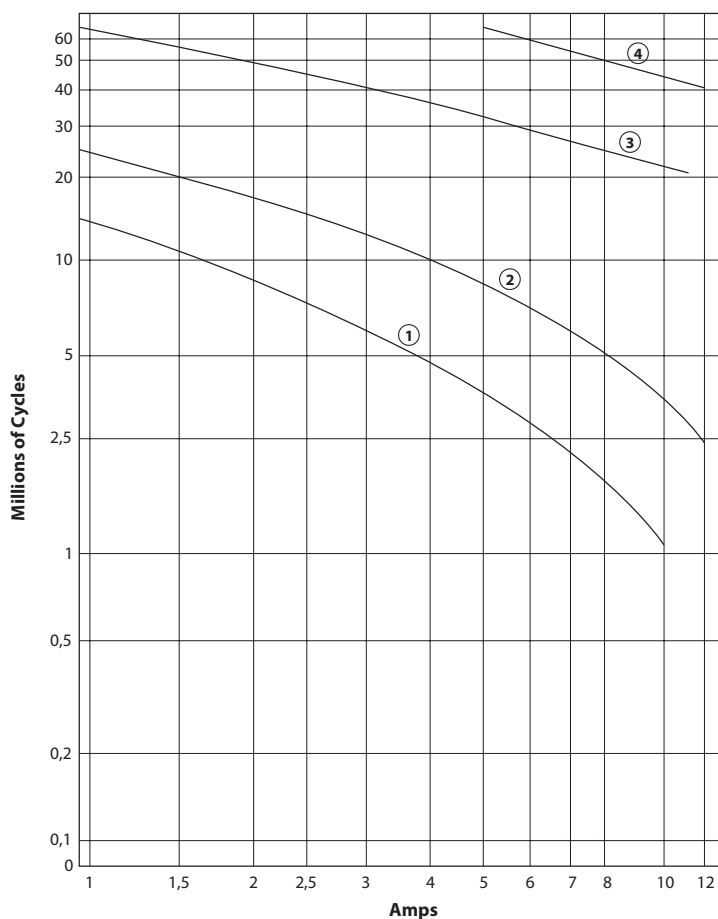
Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.

Rate of contacts opening and closing = 1200 operations per hour.

Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24



(for silver contacts)



BM 400 relay

Technical specifications

Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.

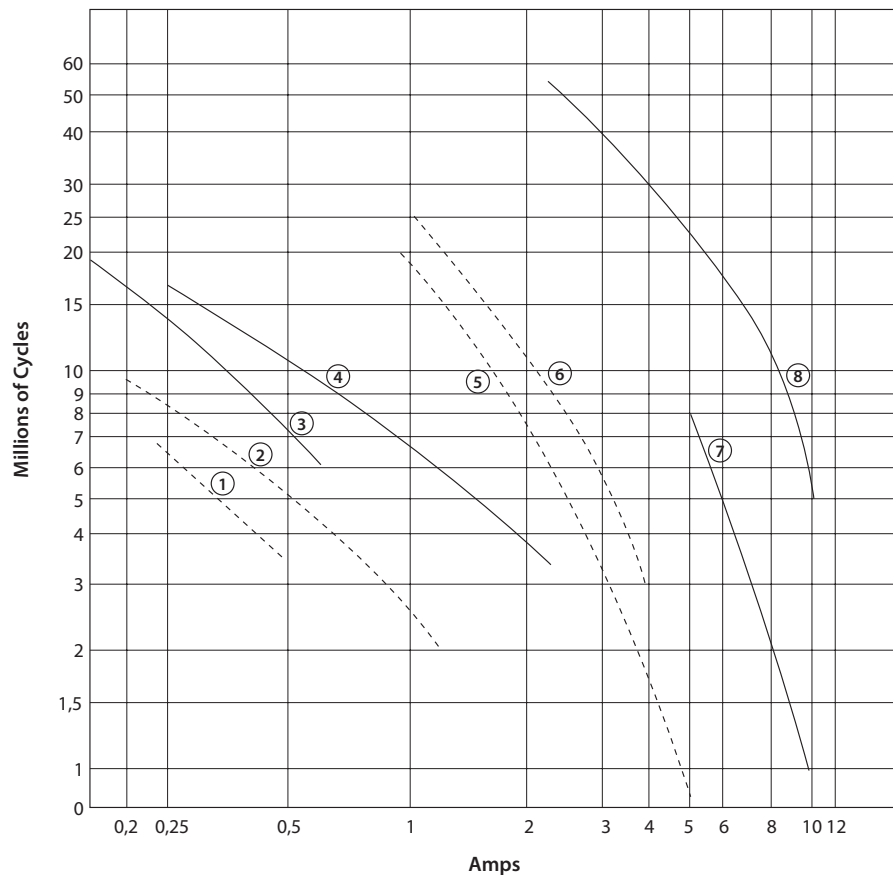
Rate of contacts opening and closing = 1200 operations per hour.

Curves shown for inductive load -

- L/R= 20 ms continuous current
- - - - L/R= 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24



(for silver contacts)



BM 400 relay

Technical specifications

Dynamic relay selection curve No 3

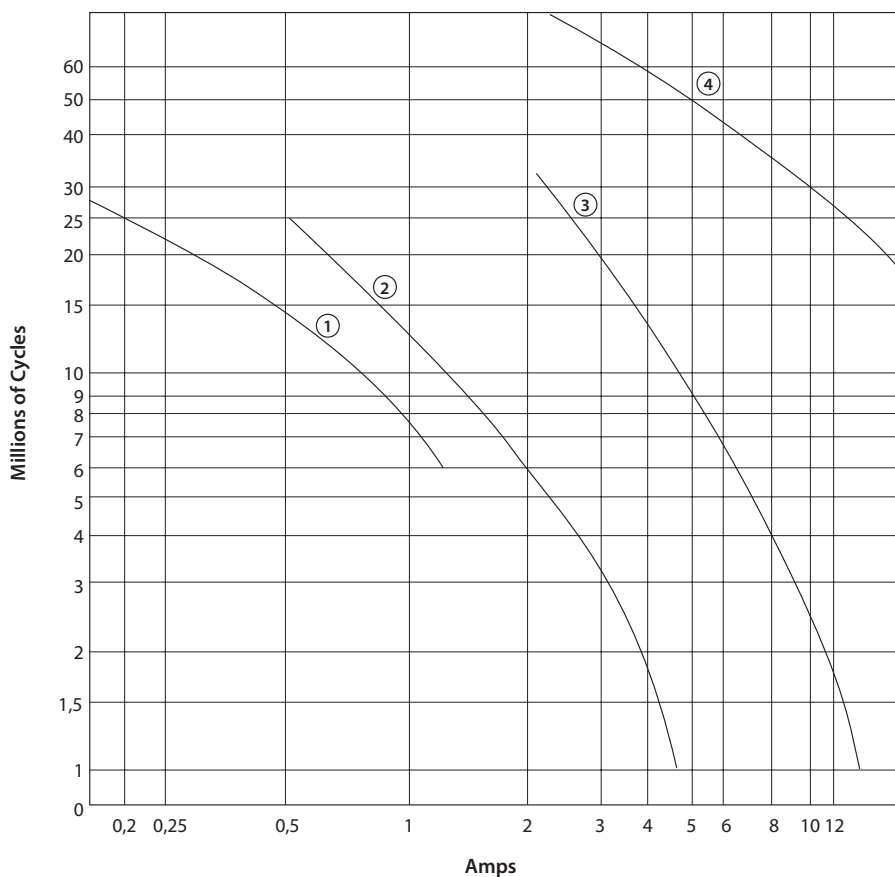
DC Current breaking capacity versus life expectancy in millions of cycles.

Rate of contacts opening and closing = 1200 operations per hour.

Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24



(for silver contacts)



BM 400 relay

Technical specifications

Dynamic relay selection curve No 4

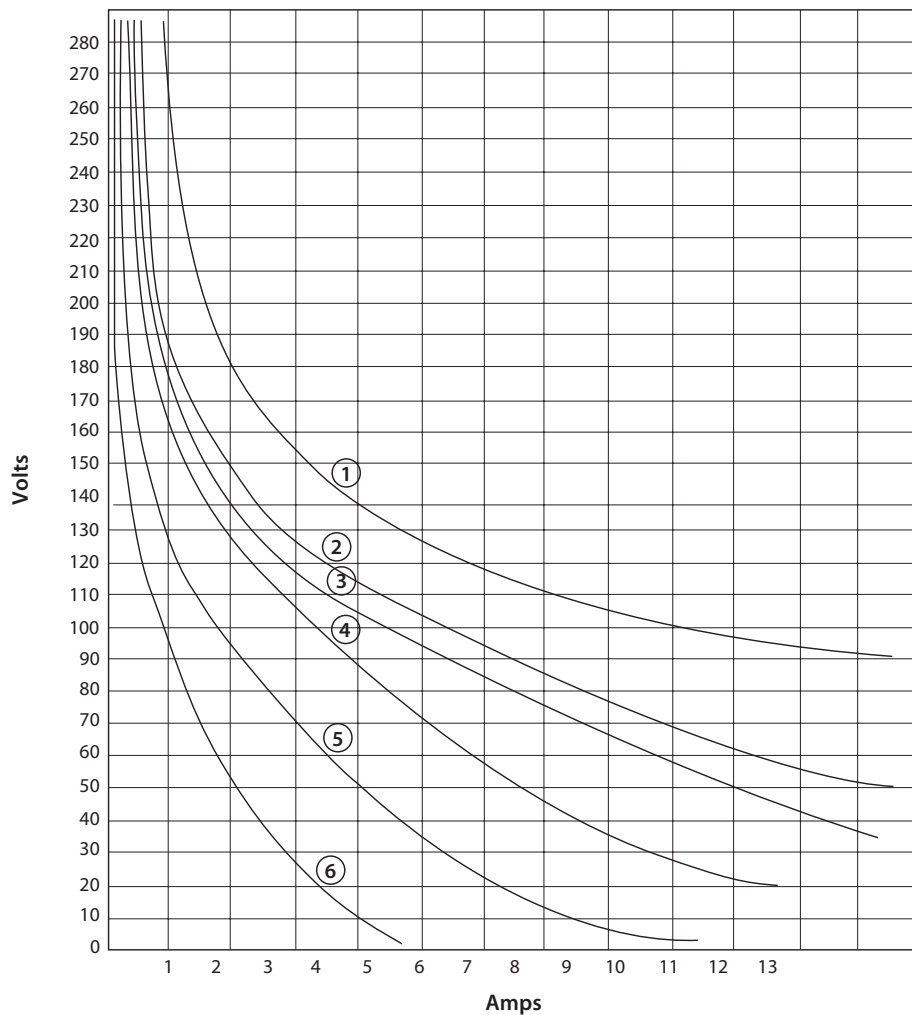
Maximum contact breaking capacity versus voltage for a given L/R.

Rate of contacts opening and closing = 600 operations per hour.

Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Life expectancy: 2 Millions of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms



(for silver contacts)



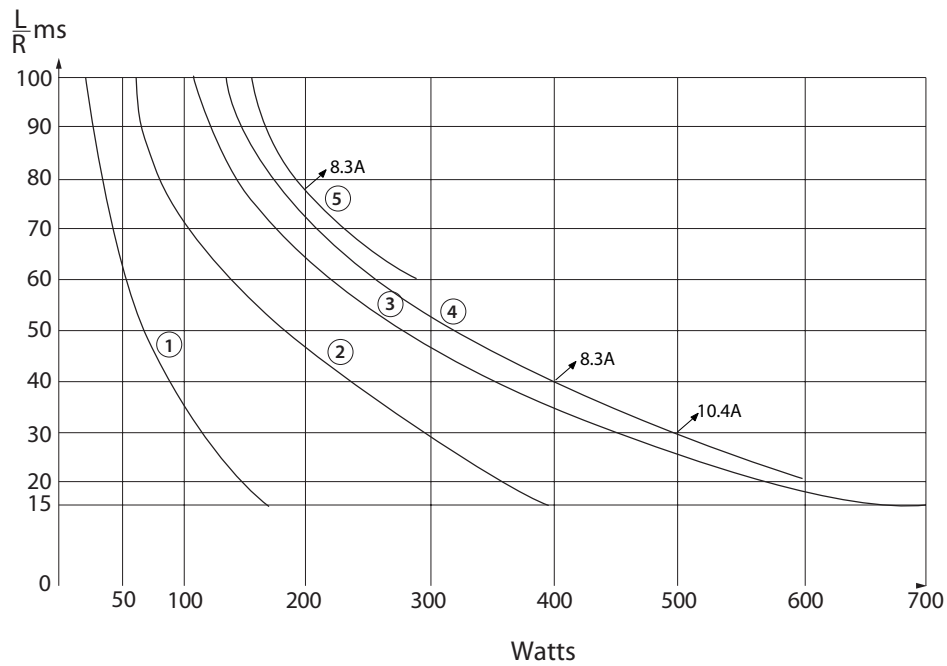
BM 400 relay

Technical specifications

Dynamic relay selection curve No 5

Maximum power interruption versus load time constant (L/R) for a given voltage.
Curves shown for resistive loads. $I = P/V$.

Curve	1	2	3	4	5
VDC	220	125	72	48	24



(for silver contacts)



BM 400 relay

Technical specifications

Dynamic relay selection curve No 6

AC Current breaking capacity versus life expectancy in millions of cycles.

Rate of contacts opening and closing = 1200 operations per hour.

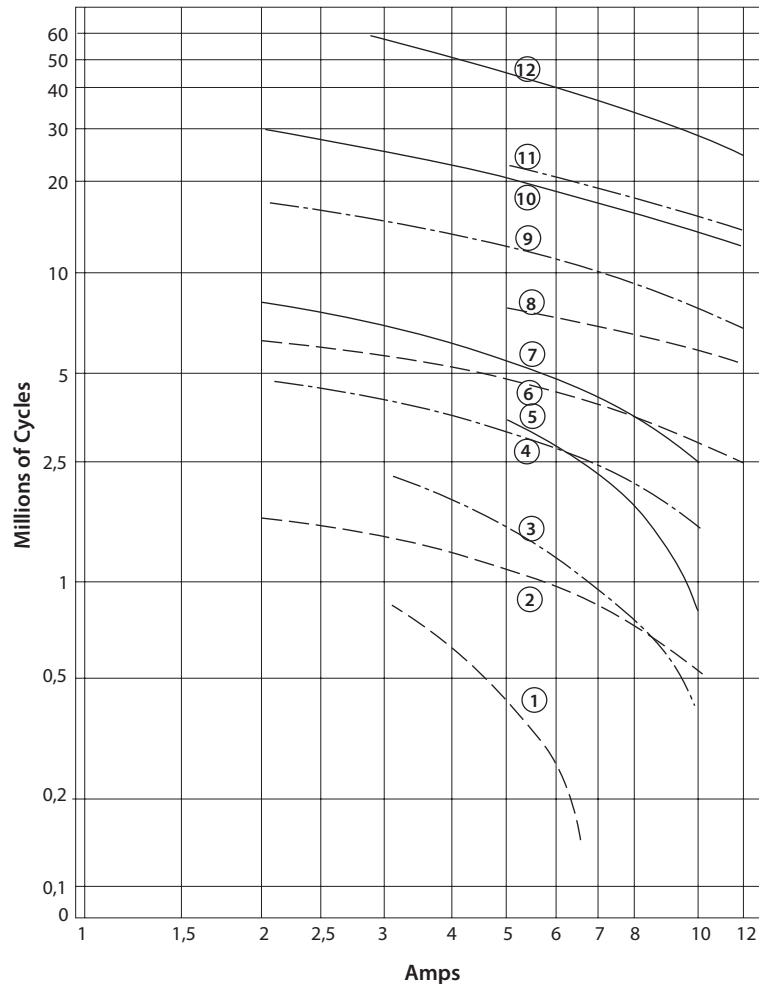
Values shown for inductive loads -

——— Cos ϕ = 0.7

- - - - Cos ϕ = 0.5

- - - - Cos ϕ = 0.3

Curves	1,3 &5	2,4 &7	6,9 &10	8,11 &12
VAC	220	125	48	24

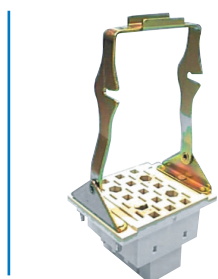


(for silver contacts)

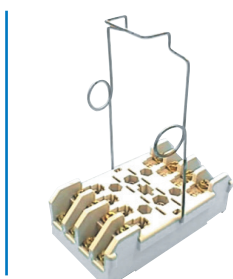


BM 400 relay

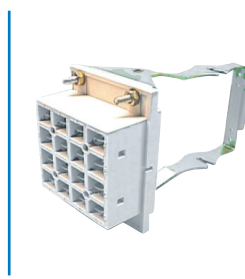
Mounting possibilities / sockets



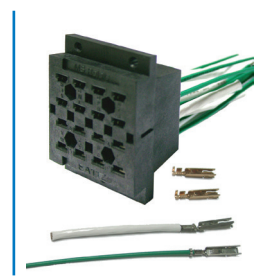
EA 102 B



EA 103 BF



EA 104 B



EA 112 BF

Panel/flush mounting

EA 102 B	Locking bracket (905843), rear connection, double Faston 5 mm
EA 102 BF	Wire locking spring (926853), rear connection, single Faston 5 mm
EA 104 B	Locking bracket (905843), rear connection, single Faston 5 x 0.8 mm
EA 104 BF	Wire locking spring (926853), rear connection, single Faston 5 x 0.8 mm
EA 112 BF	Wire locking spring (926853), rear connection, crimp contact

Surface/wall mounting

EA 103 BF*	Wire locking spring (926853), front connection, M3 screw 6.5 mm ring terminals (2,5 mm ²)
EA 105 BF*	Wire locking spring (926853), front connection, single Faston 5 mm

* Mounting possibility on 35 mm rail EN 50022 by adding suffix D to the part number (see socket datasheet)

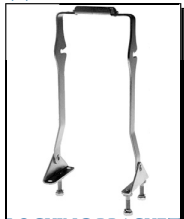
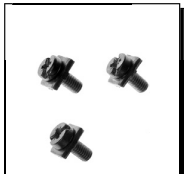
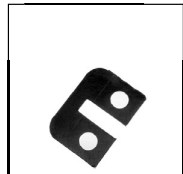
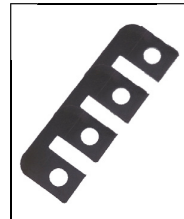
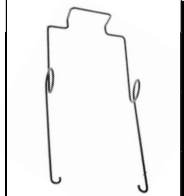
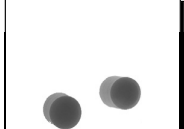


Note: Keying of relay to socket can be specified by adding the keying letters in the part number. See all details in the related socket datasheet.



BM 400 relay

Spare parts

Spare parts - order part numbers

<p>(1)</p>  <p>LOCKING BRACKET 905846</p>	<p>(1)</p>  <p>SCREW FOR BRACKET C927210</p>	<p>(1)</p>  <p>METAL STRAP (2) P928060</p>	<p>(1)</p>  <p>METAL STRAP (4) P928061</p>
<p>(1)</p>  <p>WIRE LOCKING SPRING 431906654</p>	<p>(1)</p>  <p>ROUND PLASTIC PLUGS 414928005</p>	<p>(2)</p>  <p>HEX. PLASTIC KEYS 414905678</p>	<p>(3)</p>  <p>LOCK PINS ASSY 2 SCREWS 906364 212903020</p>

(1) Parts only for socket
 (2) Parts for relay and socket
 (3) Parts only for relay



BM 400 relay

Instructions

Installation

Install socket and connect wiring correctly according identification to terminals. Plug relay into socket. Reverse installation into socket not possible due to mechanical blocking by snap-lock.

Don't reverse polarity of coil connection. Relays can be mounted (tightly) next to each other. and in any attitude

Warning! Never use silicon near by relays

Operation

Before operating always apply voltage to coil to check correct operation.

Long term storage may corrode the silver on the relay pins. Just by plugging the relay into the socket, the female bifurcated 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 doesn't seem 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 doesn't work, a short circuit of suppression diode is possible (The coil connection was reversed). If relay doesn't work after inspection, please replace relay unit by a similar model. Send defective relay back to manufacturer. Normal wear and tear excluded.



BM 400 relay

Ordering scheme

Configuration:



This example represents a **BM 400 24 AGZ S V F**

Description: BM 400 series relay, Unom: 24 VDC, Keying AGZ, transil coil protection, LED indicator, relay cover for wire locking spring

1. Relay model

BM 400

2 & 3. Nominal voltage and keying

MEZ	12 VDC
AGZ	24 VDC
FLZ	36 VDC
DGZ	48 VDC
BGZ	72 VDC
USB	96 VDC
EGZ	115 VDC
FGZ	550 VDC
UTB	700 VDC
EMZ	127 VAC
CGZ	220 VAC

4. Coil overvoltage protection

–	No coil protection
P	Avalanche diode coil protection
S	Transil coil protection (only with 400 type)

Note: no protection for AC coil versions

5. LED coil voltage indicator

–	No LED
V	LED voltage indicator

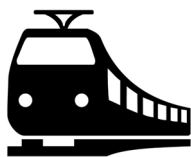
6. Relay cover type

–	Relay cover with lock pins
F	Relay cover for wire locking spring





DS-BM 400 relay-V2.1 July 2016



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