Miniature Relays Series M
Type MX
Monostable

MXP

MXF/MXH

- **Miniature size**
- **PCB mounting**
- **Reinforced insulation 4 kV / 8 mm**
- **Switching capacity 5 to 10 A**
- **DC coils 1.12 to 160 VDC**
- **1 contact normally open or normally closed**
- **General purpose, industrial electronics**
- **Types: Standard, flux-free or sealed**

Product Description

Sealing:
P: Standard, suitable for soldering and manual washing.
F: Flux-free, suitable for automatic soldering and partial immersion or spray washing.
H: Sealed with inert gas according to IP 67, suitable for automatic soldering and/or partial immersion or spray washing.

Ordering Key

MX P A 100 47 10

Type
Sealing
Version (A = Standard)
Contact code
Coil reference number
Contact rating

Type Selection

Contact configuration		Contact rating	Contact code
1 normally open contact	(SPST-NO {1-form A})	5 A 10 A	**100**
1 normally closed contact	(SPST-NC {1-form B})	5 A 10 A	**010**

Coil Characteristics, DC (20°C) 5A version

Coil reference number	Rated voltage VDC	Winding Resistance Ω	Winding Resistance ± %	Operating range Min. VDC	Operating range Max. VDC	Must release VDC
40	1.5	11	10	1.12	3.50	
41	2.5	30	10	1.88	5.75	
42	3.4	55	10	2.57	7.80	
43	4.9	110	10	3.70	11.00	
44	6.0	170	10	4.55	13.70	
45	7.5	280	10	5.75	17.60	
46	9.6	450	10	7.33	22.50	
47	12.5	720	15	9.30	28.60	≥ 5% of rated voltage
48	13.5	860	15	10.30	30.80	
49	15.5	1150	15	11.80	35.70	
50	19.5	1750	15	15.00	44.00	
51	24.5	2700	15	18.60	55.00	
52	31.0	4300	15	23.80	69.30	
53	39.0	6450	15	29.70	84.70	
54	50.0	9900	15	38.30	104.00	
55	57.5	12550	15	43.90	117.00	
56	66.0	16200	15	50.10	136.00	
57	75.5	23500	15	57.70	160.00	

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Coil Characteristics, DC (20°C) 10 A version

Coil reference number	Rated voltage VDC	Winding Resistance Ω	Winding Resistance ± %	Operating range Min. VDC	Operating range Max. VDC	Must release VDC
40	2.0	11	10	1.53	3.50	
41	3.4	30	10	2.55	5.75	
42	4.6	55	10	3.48	7.80	
43	6.6	110	10	5.01	11.00	
44	8.1	170	10	6.17	13.70	
45	10.5	280	10	7.80	17.60	
46	13.0	450	10	9.98	22.50	
47	16.5	720	15	12.60	28.60	≥ 5% of
48	18.5	860	15	13.90	30.80	rated voltage
49	21.0	1150	15	16.00	35.70	
50	26.5	1750	15	20.30	44.00	
51	33.0	2700	15	25.30	55.00	
52	42.0	4300	15	32.30	69.30	
53	52.5	6450	15	40.10	84.70	
54	68.0	9900	15	51.90	104.00	
55	77.5	12550	15	59.40	117.00	
56	88.5	16200	15	67.90	136.00	
57	102.0	23500	15	78.10	160.00	

Contact Characteristics

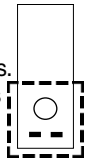
Rating	**5 A**	**10 A**
Material (standard version)[2]	**Ag CdO**	
Current (for AC)		
Rated current	**5 A**	**10 A**
Max. switching current	**6 A**	**12 A**
Overload current (4 sec ON 40 sec Off cycle time)	**8 A**	**15 A**
Min. switching current (standard contacts):	**100 mA at 24VDC**	
Voltage		
Rated voltage	**250 VAC**	
Max. switching voltage (VDE 0435)	**380 VAC**	
Max. switching power with resistive load in AC[3]	**1250 VA**	**2500 VA**
Max. switching power in DC	**see diagram 1**	
Life (see diagram 2)		
Expected life at max. resistive load and repetition		
at 1000 cycles /h	**2 x 10^5 cycles**	
at 500 cycles/h	**2.5 x 10^5**	
Max. electrical repetition rate	**3600 cycles/h**	
Mech. life at 18000 cycles/h	**50 x 10^6 cycles**	

[2] If required, they may be supplied with 0.5µ flash gilded silver contacts for medium/low switching levels, as well as with 3µ gold plated silver contacts also for very low swit. levels around 10 mV + 10 mA

[3] Intended with opened knob for sealed version MXH... .

[4] IGR insulation groups shown in the table are valid only if also PCB tracks are kept at minimum distances from each other and from accessible metal parts of the relays magnetic circuit, asprescribed by VDE norm 0110.Therefore within the marked zone on the printed circuit board, where the relay is in contact with the board (see sketch at side),there must be no conducting strips.

[5] Feeding the relay at the maximum voltage given in the tables "Temperature Influence", the ambient temperature decreases from70° to 40°C.



General Data

Operating time at rated voltage (excl. bounces)	**≤ 10 ms max.**
Release time (excl. bounces)	**≤ 5 ms max.**
Vibration resistance	**2.5 mm p.p. 5 to 45 Hz** **10 G, 45 to 100 Hz**
Ambient temp.[5] operating	**-40 °C to +70 °C**
storage	**-40 °C to +80 °C**
Shock resistance	**10 G, 11 ms**
Inside protection	**IP 67 sealed**
according to IEC 144	**IP 40 not sealed**
Climatic category (IEC 68-1)	**40/070/21**
Weight	**15 to 18 g**
Working class / type of serv.	**C / continuous**

Insulation

Test voltage (1 min.)		
Coil/frame		**750 VAC**
Contacts/coil		**5000 VAC**
Contacts/frame		**5000 VAC**
Insulation group (VDE 0110)[4]		
Contacts/coil	IGR	**C/660**
Contacts/frame	IGR	**C/660**
Open contacts	IGR	**C/250**
Impulse test volt. 1.2µs-50µs		**10 kV**
Air and surface gap between Coil-frame contacts		**> 8 mm**
Insulation resist. at 500 VDC		**10^6 MΩ**

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Temperature Influence

Operating voltages for step excitation. Minimum operating voltage is referred to +20 °C/+68 °F ambient temperature; maximum operating voltage is referred to +40 °C/+104 °F ambient temperature.

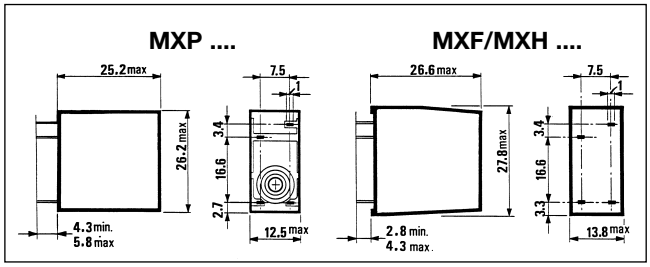
t °C	t °F	K1	K2
0	**32**	0.92	1.15
10	**50**	0.96	1.12
20	**68**	1.00	1.09
30	**86**	1.04	1.05
40	**104**	1.08	1.00
50	**122**	1.12	0.94
60	**140**	1.16	0.88
70	**158**	1.20	0.81

Values of minimum and maximum operating voltage in respect to ambient temperature (t) may be obtained applying the following formulas (only for DC relays):

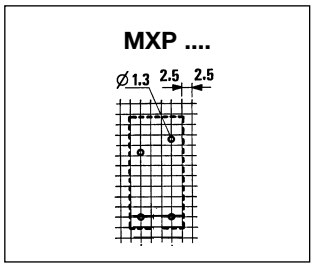
$$V_{min\ t} = K1 \cdot V_{min\ 20}$$

$$V_{max\ t} = K2 \cdot V_{max\ 40}$$

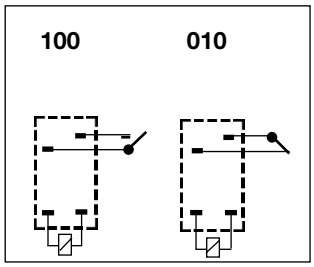
Dimensions



Pin View

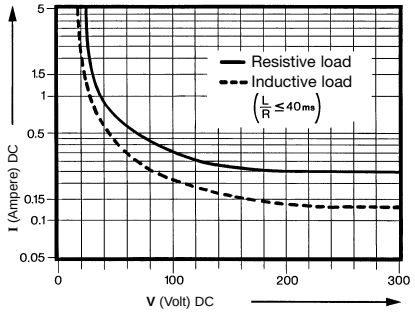


Wiring Diagrams

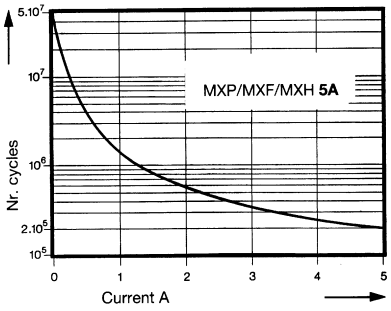


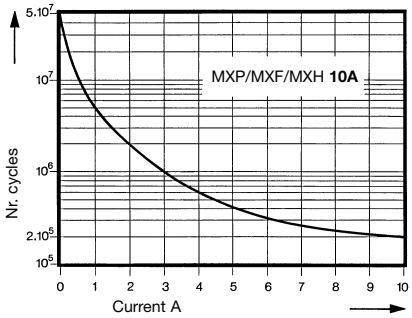
Diagrams

1 Max. switching power DC
With nominal electrical life 2x10^5 cycles
MXP/MXF/MXH **5A**



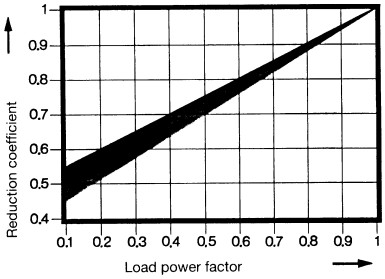
2 Expected switching cycles/switching current at 250 VAC
For resistive loads and repetition rates for 1000 cycles/h





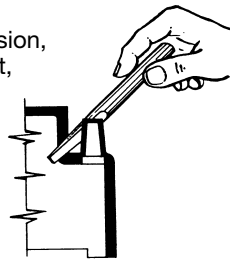
Diagram

3 Reduction of expected life against load power factor cos
For all types



Application Hints

Use of sealed relays
The MXH relay types are in sealed version, IEC 68 part 2-17 (DIN 40046) QC2-test, in inert gas, suitable for au-tomatic process or soldering and for either total immersion washing or pressure spraying. If maximum utilization is made of full switchingcapacity, it is recommended that therelay is opened after the washing process, at the point provided for this purpose.



Approvals

ITALY · U.S.A. · CANADA · GERMANY · SWEDEN · DENMARK · NORWAY · FINLAND

The approvals stated are not generally applicable to all relay versions of a particular type.
For further information please apply for relevant data sheets ref. **3.84.00.10.X**