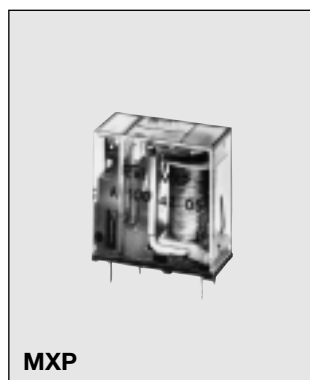


Miniature Relays Series M

Type MX

Monostable



- 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:

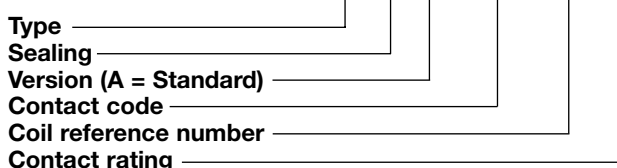
P: Standard, suitable for soldering and manual washing.

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 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		Operating range		Must release VDC
		Ω	± %	Min. VDC	Max. VDC	
40	1.5	11	10	1.12	3.50	≥ 5% of rated voltage
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	
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	

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

Coil reference number	Rated voltage VDC	Winding Resistance		Operating range		Must release VDC
		Ω	± %	Min. VDC	Max. VDC	
40	2.0	11	10	1.53	3.50	≥ 5% of rated voltage
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	
48	18.5	860	15	13.90	30.80	
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

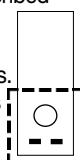
Rating	5 A	10 A
Material (standard version) ²⁾	Ag CdO	
Current (for AC)		
Rated current	5 A	10 A
Max. switching current	6 A	12 A
Overload current (4 sec ON 40 sec Off cycle time)	8 A	15 A
Min. switching current (standard contacts):	100 mA at 24VDC	
Voltage		
Rated voltage	250 VAC	
Max. switching voltage (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, as prescribed 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 from 70° 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 storage	-40 °C to +70 °C -40 °C to +80 °C
Shock resistance	10 G, 11 ms
Inside protection according to IEC 144	IP 67 sealed 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

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.

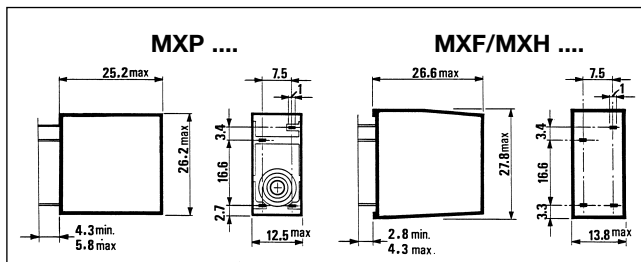
t °C	t °F	K1	K2
0	32	0.92	1.15
10	50	0.96	1.12
20	68	1.00	1.09
30	86	1.04	1.05
40	104	1.08	1.00
50	122	1.12	0.94
60	140	1.16	0.88
70	158	1.20	0.81

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

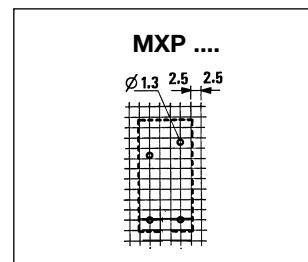
$$V_{\min t} = K1 \cdot V_{\min 20}$$

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

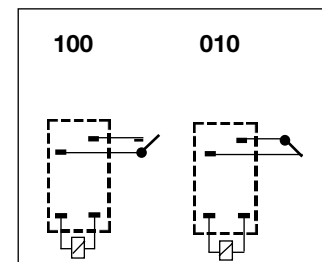
Dimensions



Pin View

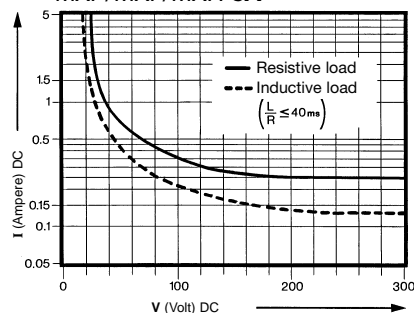


Wiring Diagrams

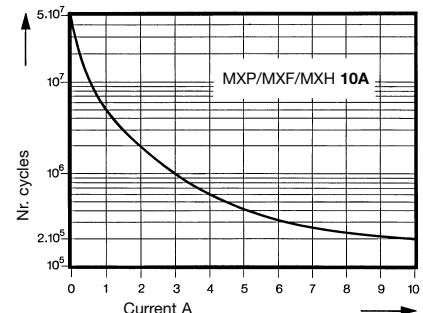
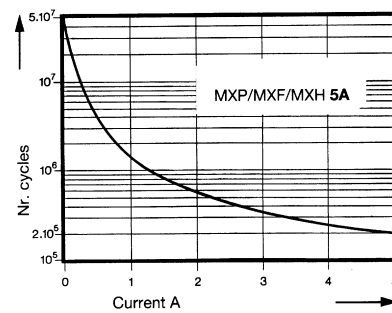


Diagrams

1 Max. switching power DC
With nominal electrical life 2×10^5 cycles
MXP/MXF/MXH 5A

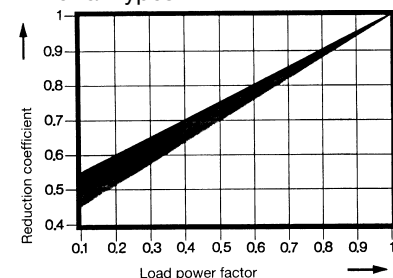


2 Expected switching cycles/switching current at 250 VAC
For resistive loads and repetition rates for 1000 cycles/h



Diagram

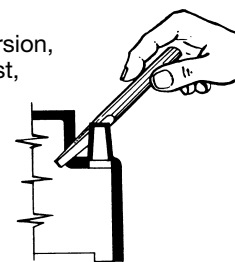
3 Reduction of expected life against load power factor cos
For all types



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 automatic process or soldering and for either total immersion washing or pressure spraying. If maximum utilization is made of full switching capacity, it is recommended that the relay is opened after the washing process, at the point provided for this purpose.



Approvals



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