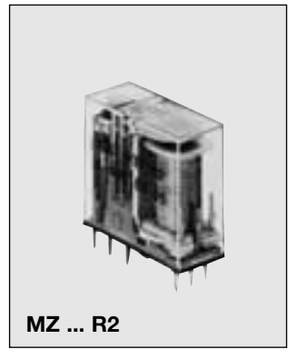
Miniature Relays Series M
Type MZ . -R1/MZ . -R2
Bistable

MZ ... R1



MZ ... R2

- **Miniature size**
- **PCB mounting**
- **Reinforced insulation 4 kV / 8 mm**
- **Switching capacity 5 to 16 A**
- **DC coils 2.34 to 260 VDC**
- **1 normally open contact to 2 change over contacts**
- **General purpose, industrial electronics**
- **Types: Standard, flux-free or sealed**
- **Relay activated even if power to the coil is removed**

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 solde ring and/or partial immersion or spray washing.

Ordering Key

MZ P R1 A 100 47 10

Type
Sealing
R1 = 1 coil ; R2 = 2 coils
Version (A = Standard)[1)]
Contact configuration
Coil reference number
Contact rating

Version MZ..100/001. 5/10
A= 3.5 mm / Ag CdO (standard)
B= 5.0 mm / Ag CdO
C= 3.5 mm / hard gold plated
D= 3.5 mm / flash gilded
S= 3.5 mm / Ag Sn O_2

Version MZ..200/020/002. 5/10 and MZ..100/010/001. /16
A = 5.0 mm / Ag CdO (standard)
C = 5.0 mm / hard gold plated;
D= 5.0 mm / flash gilded
S = 5.0 mm / Ag Sn 02

other contact materials and pin Layout/contact material combinations on request

Type Selection

Contact configuration		Contact rating	Contact code
1 normally open contact	(SPST -NO {1-form A})	5 A 10 A 16 A	**100**
1 change over contact	(SPDT {1-form C})	5 A 10 A 16 A	**001**
2 normally open contacts	(DPST -NO {2-form A})	5 A 10 A	**200**
2 change over contacts	(DPDT {2-form C})	5 A 10 A	**002**

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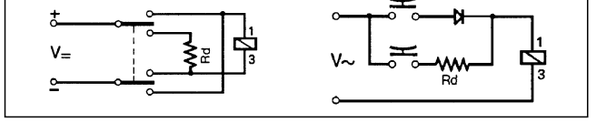
How to use

The use of a special high remanence magnetic circuit lets these relays remain activated even when the power to the coil is removed (bistable action). They cannot operate with permanent supply but only with pulses having a duration between 10 msec and the maximum time stated in the table, according to the type and the ambient temperature. Minimum operating voltages are referred to + 20 °C ambient temperature; values of $V_{min.\ t}$ in respect of ambient temperature (t). The circuit diagrams show the operation with DC or AC supply for relays with one or two windings.

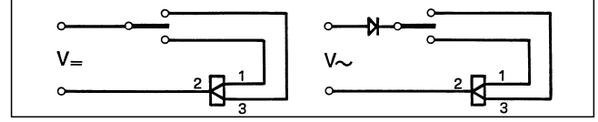
Types		Ambient temperature 20 °C	40 °C	70 °C
MZP/MZF/MZH-R1 100/001	**5 A**	750 s	350 s	100 s
MZP/MZF/MZH-R1 100/001	**10 A**	410 s	230 s	80 s
MZP/MZF/MZH-R1 100/001	**16 A**	410 s	230 s	80 s
MZP/MZF/MZH-R1 200/002	**5/10 A**	350 s	190 s	65 s

Types		Ambient temperature 20 °C	40 °C	70 °C
MZP/MZF/MZH-R2 100/001	**5 A**	400 s	240 s	75 s
MZP/MZF/MZH-R2 100/001	**10 A**	230 s	120 s	40 s
MZP/MZF/MZH-R2 100/001	**16 A**	230 s	120 s	40 s
MZP/MZF/MZH-R2 200/002	**5/10 A**	230 s	120 s	40 s

R1



R2



Warning: use always the RD resistance in series to the deactivation circuit. If RD is not used, the relay will not deactivate properly or will re-activate (Rd is not supplied with the relay)

Coil Characteristics DC/AC MZ.-R1 (20 °C)

Coil ref. no.	Winding resistance Rated value Ω	Tol. ± %	Turns N°	Wire Ø mm	Coil voltage MZ.-R1 100/001 5A Operating voltage VDC/VAC min. to VDC/VAC max.	Rd (1 W) Ω±10%	Coil voltage MZ.-R1 100/001 10/16A Operating voltage VDC/VAC min. to VDC/VAC max.	Rd (1 W) Ω±10%	Coil voltage MZ.-R1 200/002 5/10A Operating voltage VDC/VAC min. to VDC/VAC max.	Rd (1 W) Ω±10%
40	11	10	736	0.180	2.34 ... 4.05	33	2.76 ... 4.70	47	2.93 ... 5.15	47
41	30	10	1180	0.140	3.92 ... 6.75	82	4.62 ... 7.93	120	4.82 ... 8.44	120
42	55	10	1600	0.120	5.37 ... 9.30	150	6.32 ... 10.90	220	6.62 ... 11.50	220
43	110	10	2270	0.100	7.70 ... 13.10	330	9.09 ... 15.50	470	9.39 ... 16.20	470
44	170	10	2820	0.090	9.47 ... 16.30	470	11.10 ... 19.10	680	11.50 ... 20.00	680
45	280	10	3610	0.080	10.90 ... 21.00	820	12.90 ... 24.30	1200	13.40 ... 25.80	1200
46	450	10	4520	0.071	13.90 ... 26.30	1200	16.40 ... 30.90	1800	17.00 ... 32.50	1800
47	720	15	5860	0.063	17.60 ... 33.00	2200	20.80 ... 39.20	2700	21.70 ... 41.00	2700
48	860	15	6380	0.060	19.50 ... 37.00	2700	23.00 ... 43.30	3900	23.80 ... 45.50	3900
49	1150	15	7280	0.056	22.40 ... 42.50	3300	26.50 ... 49.90	4700	27.30 ... 52.00	4700
50	1750	15	8980	0.050	28.30 ... 53.00	5600	33.40 ... 63.00	8200	34.60 ... 66.00	8200
51	2700	15	11130	0.045	35.30 ... 81.60	8200	41.60 ... 78.50	12000	43.00 ... 81.50	12000
52	4300	15	14150	0.040	45.10 ... 85.00	12000	53.10 ... 100.00	18000	53.30 ... 105.00	18000
53	6450	15	17150	0.036	56.10 ... 106.00	18000	66.20 ... 125.00	27000	68.50 ... 132.00	27000
54	9900	15	20800	0.032	72.80 ... 137.00	33000	85.40 ... 161.00	47000	88.90 ... 167.00	47000
55	12550	15	23200	0.030	83.30 ... 157.00	39000	98.00 ... 184.00	56000	104.00 ... 197.00	56000
56	16200	15	26200	0.028	95.20 ... 179.00	47000	114.00 ... 207.00	68000	121.00 ... 222.00	68000
57	23500	15	32000	0.025	110.00 ... 207.00	68000	131.00 ... 242.00	82000	140.00 ... 260.00	82000

Coil Characteristics DC/AC MZ.-R2 (20 °C)

Coil ref. no.	Operating winding 1 - 2 Winding resistance Rated value Ω	Tol. ± %	Turns N°	Wire Ømm	Operating winding 2 - 3 Winding resistance Rated value Ω	Tol. ± %	Turns N°	Wire Ømm	Coil voltage MZ.-R2 100/001 5A Operating voltage VDC/VAC min. to max.	Coil voltage MZ.-R2 100/001 10/16A Operating voltage VDC/VAC min. to max.	Coil voltage MZ.-R2 200/002 5/10A Operating voltage VDC/VAC min. to max.
80	8.0	10	538	0.180	31.5	10	538	0.090	2.34 ... 4.34	2.77 ... 5.00	2.89 ... 5.40
81	13.5	10	721	0.160	68.0	10	721	0.071	3.32 ... 6.22	3.54 ... 7.15	3.70 ... 7.15
82	23.5	10	949	0.140	115.0	15	949	0.063	4.70 ... 8.20	4.70 ... 9.35	4.85 ... 9.35
83	42.5	10	1262	0.120	195.0	15	1262	0.056	6.00 ... 11.00	6.42 ... 12.50	6.70 ... 12.50
84	57.0	10	1470	0.112	280.0	15	1470	0.050	7.55 ... 12.70	7.55 ... 14.50	7.70 ... 14.50
85	89.0	10	1830	0.100	435.0	15	1830	0.045	8.54 ... 15.90	8.54 ... 18.00	8.82 ... 18.00
86	140.0	10	2303	0.090	690.0	15	2303	0.040	10.90 ... 20.00	10.90 ... 22.50	10.90 ... 22.50
87	225.0	10	2955	0.080	1100.0	15	2955	0.036	13.60 ... 25.20	13.60 ... 28.50	14.00 ... 28.50
88	605.0	15	4875	0.063	2620.0	15	4875	0.030	20.30 ... 37.00	21.60 ... 42.50	22.50 ... 45.50

Specifications are subject to change without notice

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Contact Characteristics

Rating	5 A		10 A		16 A
	100 001	200 002	100	200 002	100 001
Material (standard version)[2]	Ag CdO		Ag CdO		Ag CdO
Current (for AC)					
Rated current	5 A		10 A		16 A
Max. switching current	6 A		12 A		20 A
Overload current	8 A	7 A	15 A	14 A	25 A
Min. switc. current (typ. value)	100mA at 24 VDC		100mA at 24 VDC		100mA at 24 VDC
Voltage					
Rated voltage	250 VAC		250 VAC		250 VAC
Max. switching voltage (VDE 0435)	380 VAC		380 VAC		380 VAC
Max. switching power with resistive load in AC[3]	1250 VA		2500 VA		4000 VA
Max. switching power in DC	see diagram 3		see diagram 3		see diagram 3
Life (see diagram 1)					
Expected life at max. resistive load and repetition					
at: 1000 cycles /h	3×10^5	2×10^5	3×10^5	7.5×10^4	10^5 cycles
500 cycles/h	3.5×10^5	2.5×10^5	3.5×10^5	8×10^4	1.5×10^5
Max. electrical repetition rate	3600 cycles/h		3600 cycles/h		3600 cycles/h
Mech. life at 18000 cycles/h	50×10^6 cycles		50×10^6 cycles		50×10^6 cycles

Insulation

Test voltage (1 min.)	
Coil/frame	750 VAC
Contacts/coil	5000 VAC
Contacts/frame	5000 VAC
Open contacts	1000 VAC
Contacts circuits off different polarity	4000 VAC (MZ...200/020/002 5/10A)
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

General Data

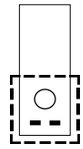
Operating time at rated voltage (excl. bounces)	≤10 ms max.
Release time at rated voltage (excl. bounces)	≤5 ms max.
Vibration resistance	2.5 mm p.p. 5 to 45 Hz 10 G, 45 to 200 Hz
Ambient temp.[5] operating storage	-40 °C to +70 °C -40 °C to +80 °C
Shock resistance	10 G, 11 ms
Inside protection according 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

[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 MZH.. .

[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] Supplying the relay coil at the maximum voltage given in the table "Temperature Influence", the maximum ambient temperature value decreases from70° to 40°C.



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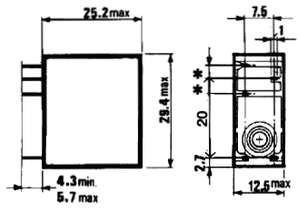
Dimensions

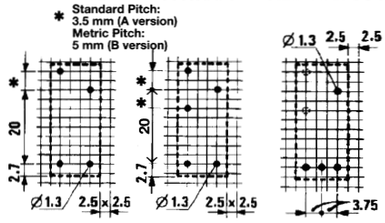
Pin View

Wiring Diagrams

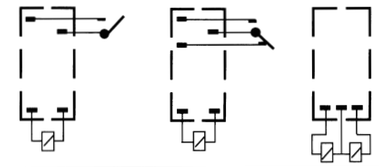
MZP...100/001 5/10A



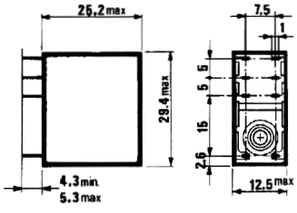
R1..100 R1..001 R2..100/001



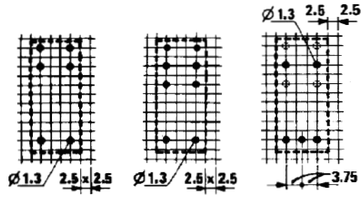
R1..100 R1..001 R2..100/001



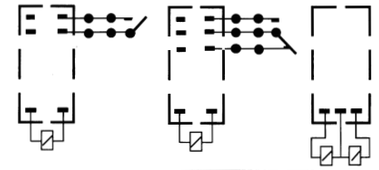
MZP...100/001 16A



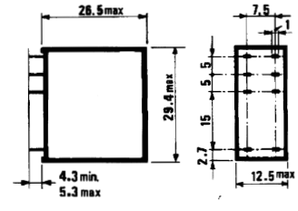
R1..100 R1..001 R2..100/001



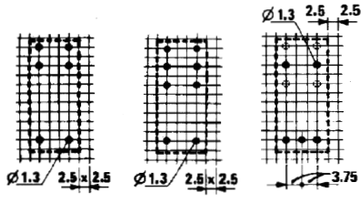
R1..100 R1..001 R2..100/001



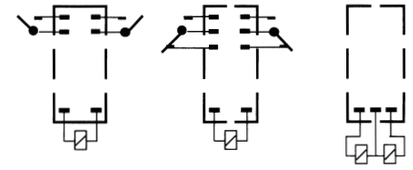
MZP...200/002 5/10A



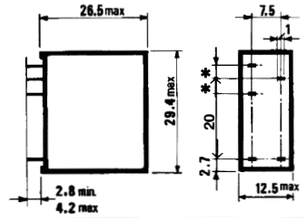
R1..200 R1..002 R2..200/002



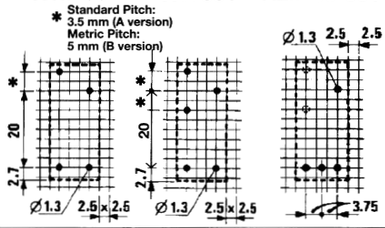
R1..200 R1..002 R2..200/002



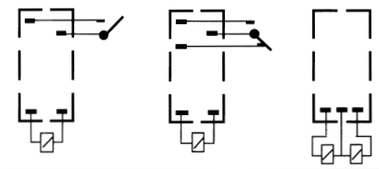
MZF/MZH...100/001 5/10A



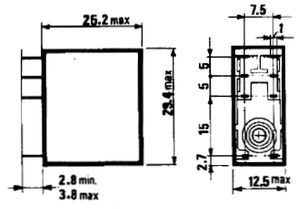
R1..100 R1..001 R2..100/001



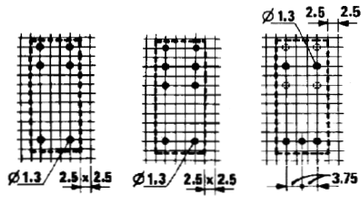
R1..100 R1..001 R2..100/001



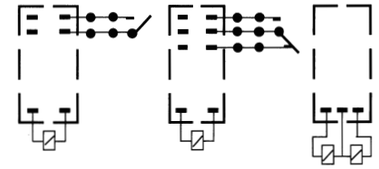
MZF/MZH...100/001 16A



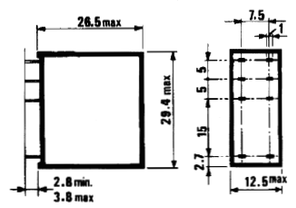
R1..100 R1..001 R2..100/001



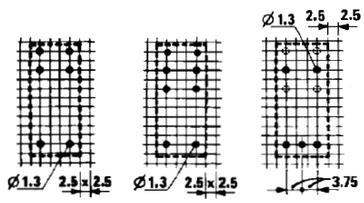
R1..100 R1..001 R2..100/001



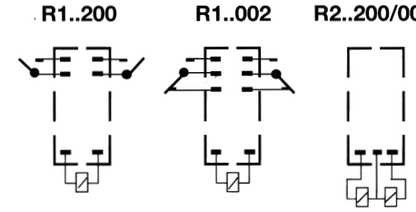
MZF/MZH...200/002 5/10A



R1..200 R1..002 R2..200/002



R1..200 R1..002 R2..200/002



Specifications are subject to change without notice

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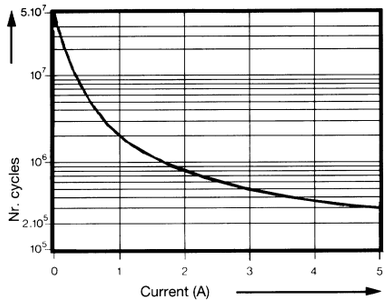
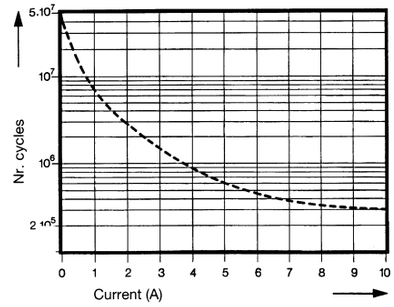
Diagrams

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

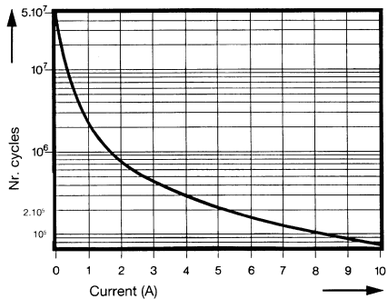
MZP/MZF/MZH-R1/R2 100/001 **5A**



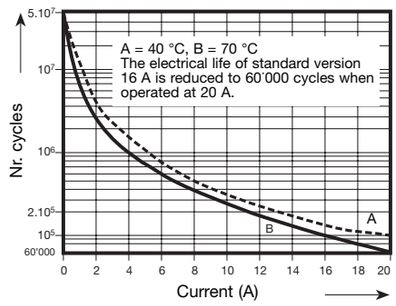
MZP/MZF/MZH-R1/R2 100/001 **10A**



MZP/MZF/MZH-R1/R2 200/002 **10A**

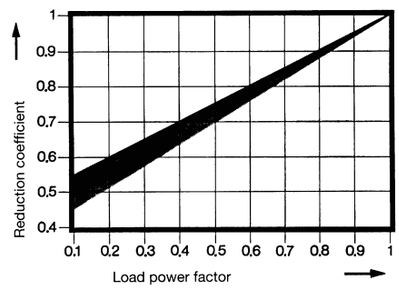


MZP/MZF/MZH-R1/R2 001 /100 **16A**

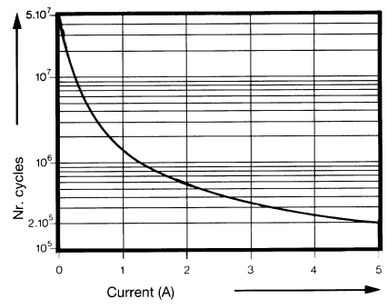


2 Reduction of expected life against load power factor cos φ

For all types



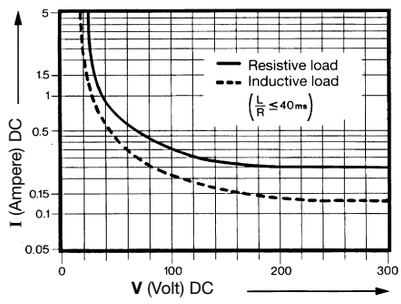
MZP/MZF/MZH-R1/R2 200/002 **5A**



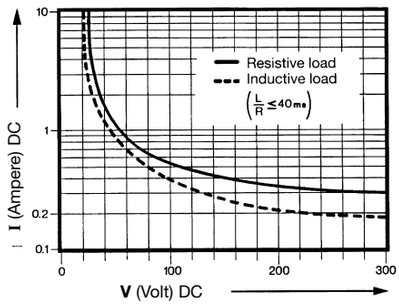
Diagrams

3 Max. switching power DC

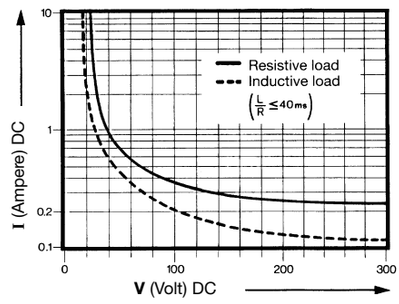
MZP/MZF/MZH-R1/R2 100/001 **5A**
MZP/MZF/MZH-R1/R2 200/002 **5A**



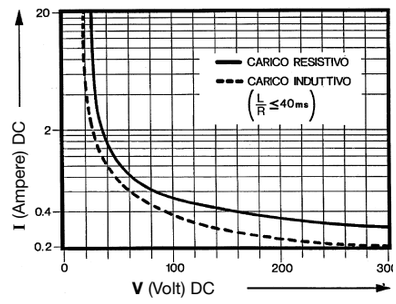
MZP/MZF/MZH-R1/R2 100/001 **10A**



MZP/MZF/MZH-R1/R2 200/002 **10A**



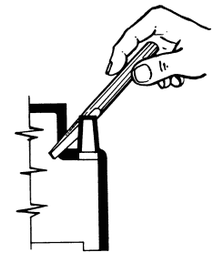
MZP/MZF/MZH-R1/R2 100/001 **16A**



Application Hints

Use of sealed relays

The MZH relay types are in sealed version, IEC 68 Part 2-17 (DIN 40046) QC2-test, suitable for automatic process of soldering and for either total immersion washing or pressure spraying. If maximum utilization is made of full switching capacity, it is recommendend that the relay be opened after the washing process, at the point provided for this purpose.



Product safety

Operations outside the stated ratings shown in this catalogue may result in a possible failure or unsafe operating conditions.