Compact Power Relays
MK

CSM_MK_DS_E_2_2

A Wide Variation of Octal Pin Power Relays

- Encased Relays unified to an AC4 rating (100/110 VAC at 50/60Hz and 200/220 VAC at 50/60 Hz).
- Easy to install, wire, and use.
- Highly durable with a life of over 5,000,000 mechanical operations.
- Extensive product lineup: Standard models, encased models, special contact models, bifurcated contact models, double-winding latching models, and more.

⚠ **Refer to the *Common Relay Precautions*.**

Refer to the standards certifications and compliance section of your OMRON website for the latest information on certified models.

Model Number Structure

Configuration (Models certified for safety standards are included. Refer to page 2)

Classification	Structure: Number of poles	Encased models: Relays with Plug-in Terminals
Standard models	**2**	MK2P
	3	MK3P
Bifurcated contacts	**2**	MK2ZP
	3	MK3ZP
Models with built-in mechanical operation indicators	**2**	MK2PA
	3	MK3PA
Models with built-in operation indicator lights	**2**	MK2PN
	3	MK3PN
Special internal connection models	**2**	MK2P-2 and MK2ZP-2
	3	MK3P-2, MK3ZP-2, MK3P-5, and MK3ZP-5
Models with built-in arc barriers	**3**	MK3LP
Models with built-in diodes	**2**	MK2P-DO
	3	MK3P-DO
Models certified for safety standards	**2**	MK2P-US and MK2P2-US
	3	MK3P-US, MK3P2-US, and MK3P5-US

Note: 1. Refer to the *MKK Electromagnetic Latching Relays*.
2. If an AC rated voltage is specified for models with built-in diodes, the diode will act as a varistor.

Ordering Information

When your order, specify the rated voltage.

List of Models

Encased Models and Models with Plug-in Terminals

Number of poles / Classification		2 poles		3 poles	
		Model	Rated voltage (V)	Model	Rated voltage (V)
Standard models		MK2P	6, 12, 24, 50, 100/110, or 200/220 VAC	MK3P	6, 12, 24, 50, 100/110, or 200/220 VAC
			6, 12, 24, 48, or 100 VDC		6, 12, 24, 48, or 100/110 VDC
Bifurcated contacts		MK2ZP	24, 100/110, or 200/220 VAC	MK3ZP	6, 12, 24, 50, 100/110, or 200/220 VAC
			12, 24, 48, or 100 VDC		6, 12, 24, 48, or 100 VDC
Models with built-in diodes		MK2P-DO	6, 12, 24, 48, or 100 VDC	MK3P-DO	12, 24, 48, or 100 VDC
Models with built-in operation indicators		MK2PA	100/110 or 200/220 VAC	MK3PA	24, 100/110, or 200/220 VAC
			24, 48, or 100 VDC		24, 48, or 100 VDC
Models with built-in operation indicators		MK2PN	6, 12, 24, 50, 100/110, or 200/220 VAC	MK3PN	6, 12, 24, 50, 100/110, or 200/220 VAC
			6, 12, 24, 48, or 100 VDC		12, 24, 48, or 100 VDC
Models with built-in arc barriers		---	---	MK3LP	12, 24, 100/110, or 200/220 VAC
					24, 48, or 100 VDC
Special internal connection models	Single-contacts	MK2P-2	6, 24, 50, 100/110, or 200/220 VAC	MK3P-2	6, 24, 50, 100/110, or 200/220 VAC
			6, 12, 24, 48, or 100 VDC		12, 24, 48, or 100 VDC
		---	---	MK3P-5	12, 24, 100/110, or 200/220 VAC
					6, 12, 24, 48, or 100 VDC
	Bifurcated contacts	MK2ZP-2	24, 100/110, or 200/220 VAC	MK3ZP-2	24, 100/110 or 200/220 VAC
			24 or 100 VDC		6, 12, 24, 48, or 100 VDC
		---	---	MK3ZP-5	24, 100/110, or 200/220 VAC
					24 VDC

Models certified for safety standards

Encased Models and Models with Plug-in Terminals

Number of poles / Classification	2 poles		3 poles	
	Model	Rated voltage (V)	Model	Rated voltage (V)
Standard models (Ag contacts)	MK2P-US	100 or 200 VAC	MK3P-US	200 VAC
		24 VDC		
Special internal connection models (Ag contacts)	MK2P2-US	12 VDC	MK3P2-US	200/(220) VAC
				24 VDC
			MK3P5-US	24 or 200/(220) VAC
				24 VDC

Ratings and Specifications

Ratings (Refer to page 3 for models certified for safety standards.)

Operating Coil

MK2(P or P-2), MK3(P, P-2, or P-5), MK2ZP(-2), MK□PA, and MK□P-DO

Item / Rated voltage (V)		Rated current (mA) 50 Hz	Rated current (mA) 60Hz	Coil resistance (Ω)	Coil inductance (H) Armature OFF	Coil inductance (H) Armature ON	Must-operate voltage (V)	Must-release voltage (V)	Maximum voltage (V)	Power consumption (VA, W)
AC	6	404	360	5.3	0.028	0.041	80% max.	30% min.	110%	Approx. 1.9 to Approx. 2.2 (at 60 Hz)
	12	202	180	21.5	0.115	0.165				
	24	98	88	91	0.422	0.678				
	50	43.6	39	420	1.95	3.2				
	✱100/110	22.4/24.7	19/21	1,620	9.0	13.2				Approx. 1.9 to 2.4 (at 60 Hz)
	✱200/220	11.7/12.9	10/11	7,100	33.9	49.6				
DC	6	255		23.5	0.14	0.23		10% min.		Approx. 1.5
	12	126		95	0.56	0.87				
	24	56		430	2.82	4.46				
	48	29.5		1,630	10.99	16.52				
	100	14.7		6,800	41.46	66.34				

MK3ZP(-2 and -5) and MK3LP

Item / Rated voltage (V)		Rated current (mA) 50 Hz	Rated current (mA) 60Hz	Coil resistance (Ω)	Power consumption (VA, W)
AC	6	500	445	3.8	Approx. 2.8 (at 60 Hz)
	12	258	230	16.2	
	24	130	116	62	
	50	63	56	280	
	✻100/110	27.1/29.8	23.1/25.4	1,300	Approx. 2.3 to 2.8 (at 60 Hz)
	✻200/220	13.6/14.9	11.5/12.7	5,900	
DC	6	302		19.9	Approx. 1.9
	12	156		77	
	24	79		303	
	48	39		1,230	
	100	18.9		5,300	

MK□PN

Item / Rated voltage (V)		Rated current (mA) 50 Hz	Rated current (mA) 60Hz	Coil resistance (Ω)	Power consumption (VA, W)
AC	6	420	375	5.3	Approx. 2.2 to 2.7 (at 60 Hz)
	12	220	195	21.5	
	24	110	100	91	
	50	60	53	420	
	✻100/110	22.4/24.7	19/21	1,620	Approx. 1.9 to 2.4 (at 60 Hz)
	✻200/220	11.7/12.9	10/11	7,100	
DC	6	275		23.5	Approx. 1.6 to 2.3 (at 60 Hz)
	12	146		95	
	24	71		430	
	48	48		1,630	
	100	14.7		6,800	Approx. 1.5

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/–20% for the AC rated current and ±15% for the DC coil resistance.
2. The AC coil resistance and coil inductance values are reference values only.
3. Operating characteristics were measured at a coil temperature of 23°C.
4. The maximum allowable voltage is the maximum value of the allowable voltage fluctuation range for the Relay coil operating power supply and was measured at an ambient temperature of 23°C. There is no continuous allowance.

✻ These are for a 4 rating specification.

Contact Ratings

Model	MK2P(-2), MK2PN, MK2PA, and MK2P-DO		MK3P(-2 and -5), MK3PN, MK3PA, and MK3P-DO		MK2ZP(-2) and MK3ZP(-2 and -5)		MK3LP	
Load / Item	Resistive load	Inductive load (cos ϕ = 0.4, L/R = 7 ms)	Resistive load	Inductive load (cos ϕ = 0.4, L/R = 7 ms)	Resistive load	Inductive load (cos ϕ = 0.4, L/R = 7 ms)	Resistive load	Inductive load (cos ϕ = 0.4, L/R = 7 ms)
Contact structure	Single				Bifurcated		Single	
Contact materials	Ag				AgNi		Ag	
Rated load	5 A at 220 VAC 3 A at 24 VDC	2A at 220 VAC 2.5A at 24 VDC	3 A at 220 VAC 2 A at 24 VDC	1.2 A at 220 VAC 1.5 A at 24 VDC	3 A at 220 VAC 2 A at 24 VDC	1.2 A at 220 VAC 1.5 A at 24 VDC	5 A at 220 VAC 3 A at 24 VDC	3 A at 220 VAC 1.8 A at 24 VDC
Rated carry current	5 A		3 A		3 A		5 A	
Maximum contact voltage	250 VAC 250 VDC		250 VAC 250 VDC		250 VAC 250 VDC		250 VAC 250 VDC	
Maximum contact current	5 A	5 A	3 A	3 A	3 A	3 A	5 A	5 A
Maximum switching capacity (reference value)	1,100 VA 72 W	440 VA 60 W	660 VA 48 W	260 VA 35 W	660 VA 48 W	260 VA 35 W	1,100 VA 72 W	660 VA 42 W

Ambient operating temperature	–10 to 40°C (with no icing or condensation)
Ambient operating humidity	5% to 85%

Characteristics

Item		Classification	Bifurcated contacts	Encased models
Contact resistance✻1			25 mΩ max.	50 mΩ max.
Operation time✻2			AC: 20 ms max., DC: 30 ms max.	
Release time✻2			20 ms max., (✻4 40 ms max.)	
Maximum operating frequency		Mechanical	18,000 operations/h	
		Rated load	1,800 operations/h	
Insulation resistance✻3			100 MΩ min.	
Dielectric strength	2 poles	Between coil and contacts	2,000 VAC at 50/60 Hz for 1 min.	
		Between contacts of different polarity		
		Between contacts of the same polarity	1,000 VAC at 50/60 Hz for 1 min.	
	3 poles	Between coil and contacts	1,500 VAC at 50/60 Hz for 1 min.	
		Between contacts of different polarity		
		Between contacts of the same polarity	1,000 VAC at 50/60 Hz for 1 min.	
Vibration resistance		Destruction	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)	
		Malfunction	10 to 55 to 10 Hz, 0.5-mm single amplitude (1-mm double amplitude)	
Shock resistance		Destruction	1,000 m/s^2	
		Malfunction	100 m/s^2	
Endurance		Mechanical	5,000,000 operations min. (operating frequency: 18,000 operations/hr)	
		Electrical✻5	500,000 operations min. (rated load, switching frequency: 1,800 operations/h)	
Failure rate P level (reference value✻6)			100 μA at 1 VDC	10 mA at 1 VDC
Weight			Approx. 85 g	

Note: The above values are initial values.
✻1. Measurement conditions: 1 A at 5 VDC using the voltage drop method
✻2. Measurement conditions: With rated operating power applied, not including contact bounce.
Ambient temperature condition: 23°C
✻3. Measurement conditions: For 500 VDC applied to the same location as for dielectric strength measurement.
✻4. This value is for models with built-in diodes.
✻5. Ambient temperature condition: 23°C
✻6. This value was measured at a switching frequency of 60 operations per minute.

Models certified for safety standards

UL and CSA-certified models are also available. The ratings for these models are not the same as our standard models for Japan.

UL-certified Models (File No. E41515)
CSA-certified Models (File No. LR35535)

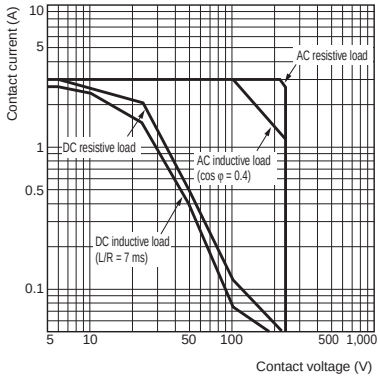
Model	Number of poles	Coil ratings	Contacts	Contact ratings	Number of test operations
MK	2 3	6 to 260 VAC 6 to 130 VDC	Ag	5 A 230 VAC Resistive 5 A 28 VDC Resistive	6,000 operations

Engineering Data

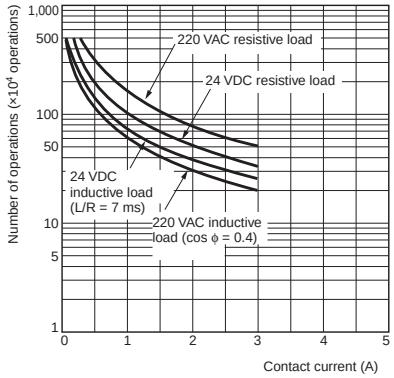
Standard Models, MK□(P)

MK3P

Maximum Switching Capacity

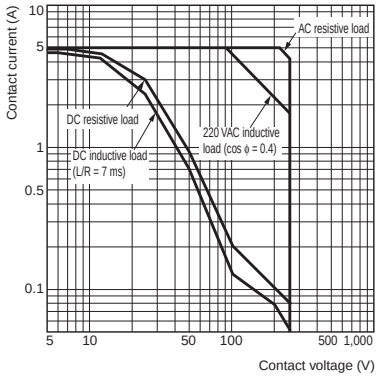


Endurance Curve

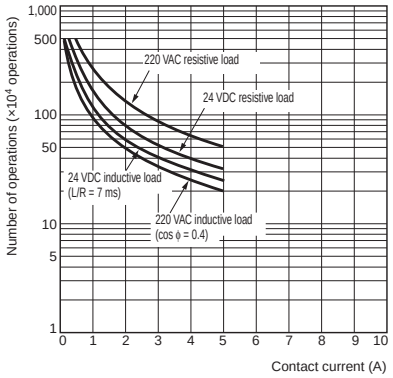


MK2P

Maximum Switching Capacity

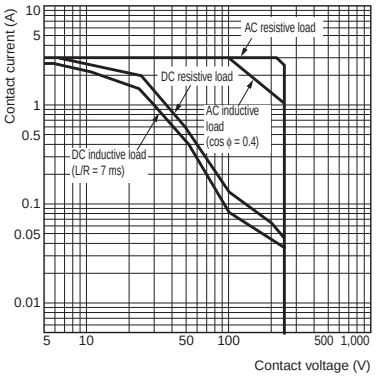


Endurance Curve

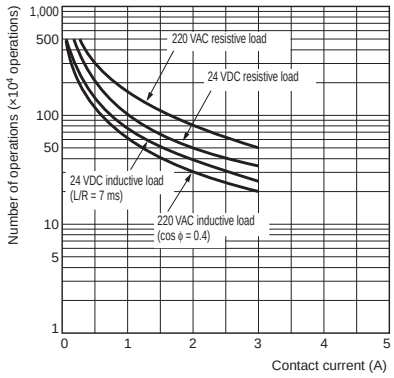


MK2ZP and MK3ZP

Maximum Switching Capacity

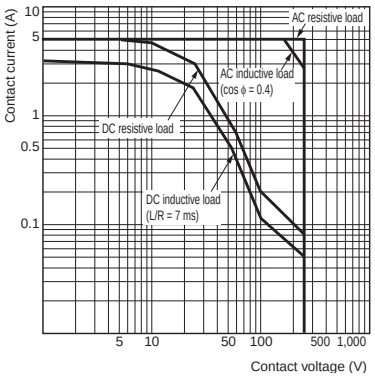


Endurance Curve

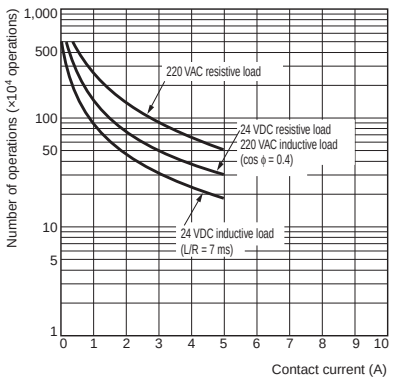


MK3LP

Maximum Switching Capacity

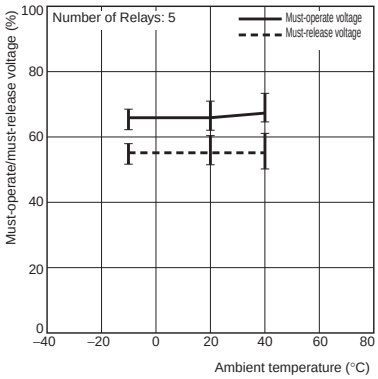


Endurance Curve

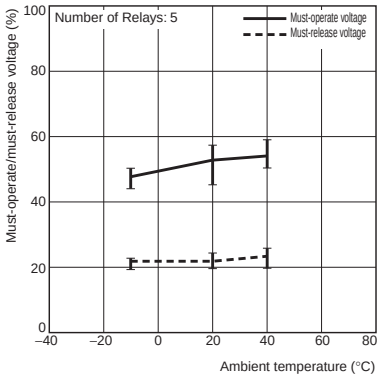


Ambient Temperature vs. Must-operate and Must-release Voltage

MK3P AC (60 Hz)

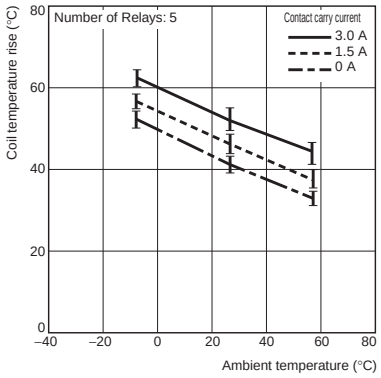


MK3P DC

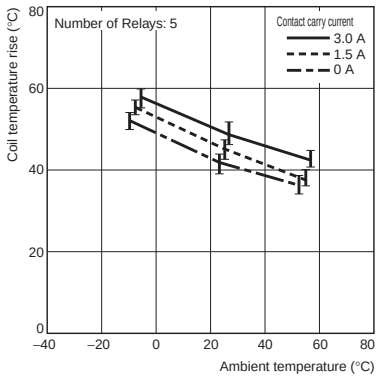


Ambient Temperature vs. Coil Temperature Rise

MK3P AC110V (50 Hz)

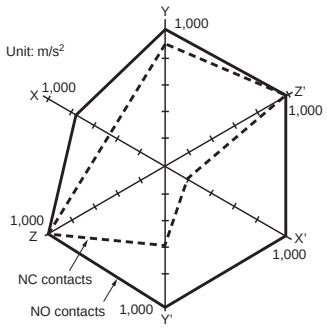


MK3P DC

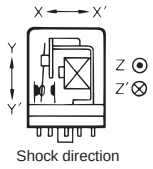


Malfunctioning Shock

MK3P AC



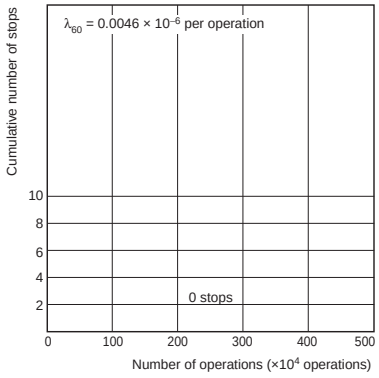
N = 5
Measurement: Shock was applied 3 times each in 6 directions along 3 axes with the Relay energized and not energized to check the shock values that cause the Relay to malfunction.
Criteria: 100 m/s²



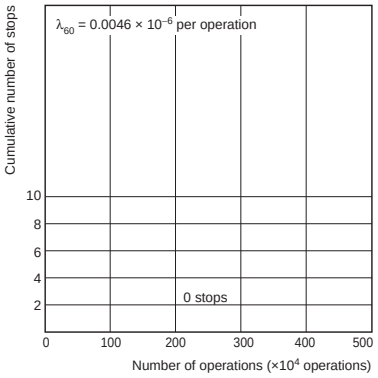
Shock direction

Contact Reliability (JIS C4530 Allen Bradley Circuit)

Encased Models, MK2P and MK3P 100 VAC

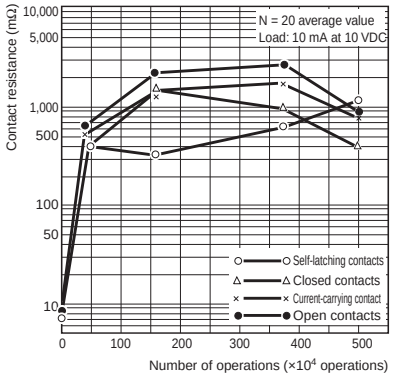


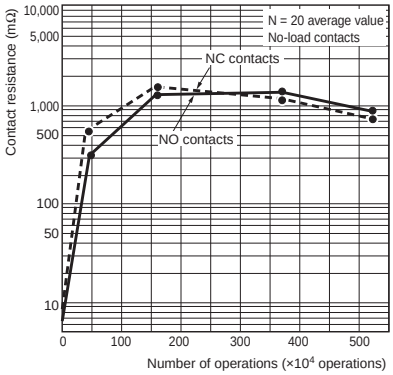
Encased Models, MK2P and MK3P 24 VDC



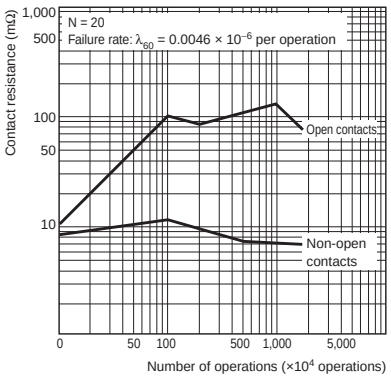
Contact Reliability (Modified Allen Bradley Circuit)

MK3P 24 VDC



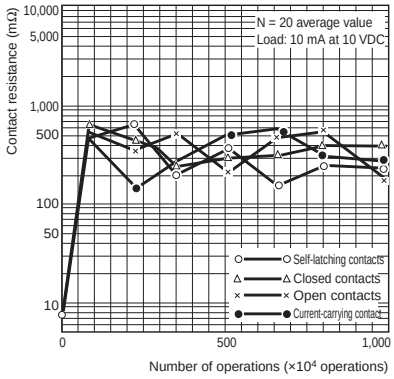


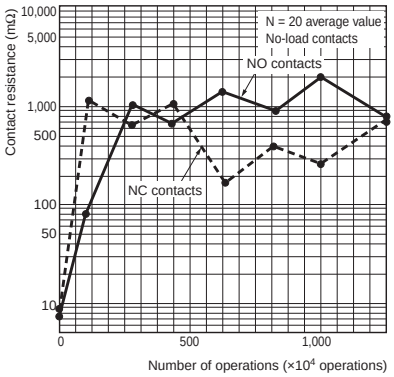
MK3P 100/110 VAC



Contact Reliability (Modified Allen Bradley Circuit)

MK2ZP and MK3ZP





Dimensions

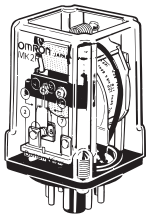
(Unit: mm)

List of Models

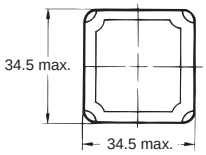
● **Encased models**

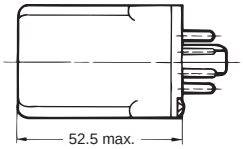
Relays with Plug-in Terminals

MK2(Z)P(-2)
MK2P-DO
MK2PN
MK2PA



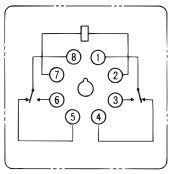
The above figure is for the MK2P.



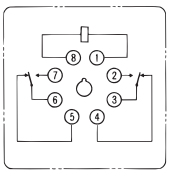


Terminal Arrangement/Internal Connections (Bottom View)

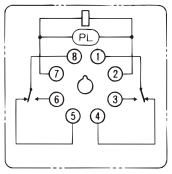
MK2P, MK2ZP, and MK2PA



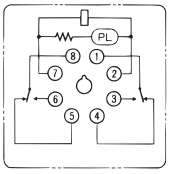
MK2P-2 and MK2ZP-2



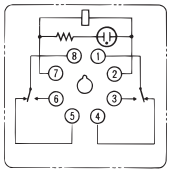
MK2PN*1
6, 12, or 24 VAC
6, 12, or 24 VDC



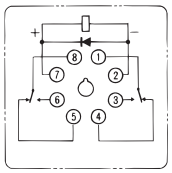
MK2PN*1
50 VAC
48 VDC



MK2PN*2
100/110 or 200/220 VAC
100 VDC

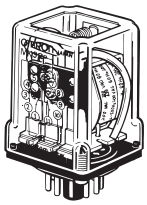


MK2P-DO

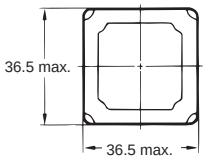


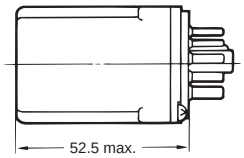
Note: Only the MK2P-DO has coil polarity.
***1.** The operation indicators are pilot indicators.
***2.** The operation indicators are neon indicators.

MK3(Z)P(-2, -5) **MK3P-DO**
MK3PA **MK3PN**
MK3LP

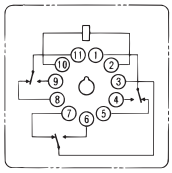


The above figure is for the MK3ZP.

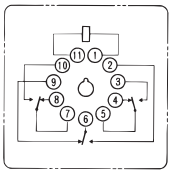




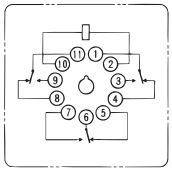
MK3(Z)P and MK3PA
MK3LP



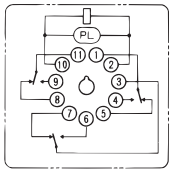
MK3P-2
MK3ZP-2



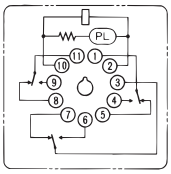
MK3P-5
MK3ZP-5



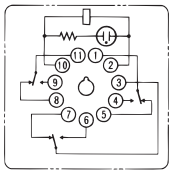
MK3PN*1
6, 12, or 24 VAC
6, 12, or 24 VDC



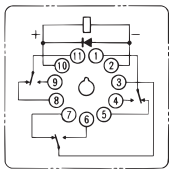
MK3PN*1
50 VAC
48 VDC



MK3PN*2
100/110 or 200/220 VAC
100 VDC

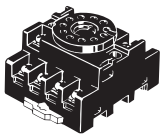
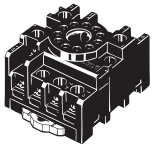
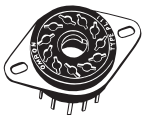


MK3P-DO



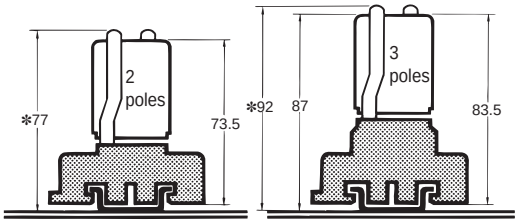
Note: Only the MK2P-DO has coil polarity.
***1.** The operation indicators are pilot indicators.
***2.** The operation indicators are neon indicators.

Connection Sockets Refer to *Common Socket and DIN Track Products* for external dimensions and pricing information.

Sockets / Relay	Front-mounting Sockets		Back-mounting Sockets		
	Track or screw mounting		Solder terminals	Wrapping terminals	Relays with PCB Terminals
2 poles	PF083A	PF083A-E	PL08	PL08-Q	PLE08-0
3 poles	PF113A 	PF113A-E 	PL11 	PL11-Q 	PLE11-0 

Mounting Height with Sockets

Front-mounting Sockets

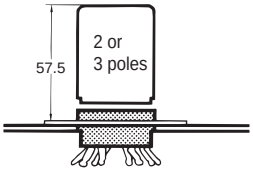


PF083A PF113A

Note: The PF083A and PF113A can be mounted on a track or with screws.

✻ When a PFC-A1 is used.

Back-mounting Sockets

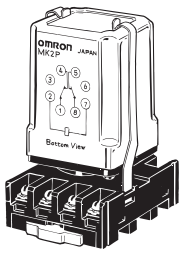


PL□

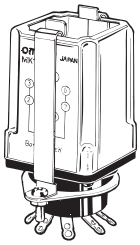
Relay Hold-down Clips Refer to *Common Socket and DIN Track Products* for external dimensions and pricing information.

Secure the Relay with the Hold-down Clips to prevent the Relay from falling out due to vibration or shock.

PFC-A1



PLC



Type

Sockets	Applicable Relay		MK2(Z)P	MK3P MK2KP	MK3ZP MK3LP
Front-mounting Sockets	Track or screw mounting	PF083A	PFC-A1	---	---
	Track or screw mounting	PF113A	---	PFC-A1	PFC-A1
Back-mounting Sockets	Solder terminals and wrapping terminals	PL08(-Q)	PLC	---	---
		PL11(-Q)	---	PLC	PLC-1
	Relays with PCB Terminals	PLE08-0	PLC-10	---	---
		PLE11-0	---	PLC-10	---

Safety Precautions

Refer to the *Common Relay Precautions* for precautions that apply to all Relays.

Precautions for Correct Use

Installation Orientation

There is no specified installation orientation.

About the Built-in Diodes*

The diodes that are built into the Relays are designed to absorb reverse voltage from the Relay's coil. If a large surge in voltage is applied to the diode from an external source, the element will be destroyed.

If there is the possibility of large voltage surges that could be applied to the elements from an external source, take any necessary surge absorption measures.

✻ The MK Series does not have any models with a built-in CR circuit.

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