Latching Relay
MKK

CSM_MKK_DS_E_2_5

Latching Relays Designed for Memory and Signaling Circuits

- Low changes in characteristics such as contact tracking and contact pressure for high durable.
- Excellent resistance to vibration and shock.
- Built-in operation indicators for simple operation verification.
- Same external shape with the MK Power Relays.

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

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	
	Model	Rated voltage (V)
Standard models	MK2KP	6, 12, 24, 50, 100/(110), or 200/(220) VAC

Number of poles / Classification	2 poles	
	Model	Rated voltage (V)
Standard models	MK2KP	6, 12, 24, 48, 100, or 110 VDC

Ratings and Specifications

Ratings

Operating Coil

Item / Rated voltage (V)		Set coil		Reset coil		Set voltage (V)	Reset voltage (V)	Maximum voltage (V)	Power consumption (W, VA)	
		Rated current (mA)	Resistance (Ω)	Rated current (mA)	Resistance (Ω)				Set coil	Reset coil
AC	6	286	4.8	29.0	78	80% max.	80% max.	110%	Approx. 1.5 to 2	Approx. 0.1 to 0.7
	12	128	25	14.4	325					
	24	66	105	10.8	965					
	50	31	440	3.2	8,450					
	100/(110)	17.8	1,670	3.6	13,350					
	200/(220)	9.8	6,200	3.2	27,350					
DC	6	390	13	92.5	64			110%	Approx. 2.3 to 2.7	Approx. 0.5 to 1.2
	12	205	52	50	240					
	24	110	210	22.8	1,050					
	48	48.5	990	23.4	2,050					
	100	24	4,160	10.3	9,740					
	110	26.4	4,160	11.3	9,740					

Note:
1. The rated current for AC is the value measured with a DC ammeter in 60 Hz half-wave rectification.
   The 100/(110) and 200/(220) VAC rated voltages are the values at 100 and 200 VAC.
2. 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.
3. The AC coil resistance is a reference value only.
4. Operating characteristics were measured at a coil temperature of 23°C.
5. 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.
6. The initial reverse voltage of the built-in diode is 1,000 V.
   The initial reverse voltage of the built-in diode in some models is 2,000 V. (MK2KPD)

Contact Ratings

Item / Load	Resistive load	Inductive load (cos φ = 0.4, L/R = 7 ms)
Contact structure	Single	
Contact materials	Ag	
Rated load	5 A at 220 VAC, 3 A at 24 VDC	2 A at 220 VAC, 2.5 A at 24 VDC
Rated carry current	5 A	
Maximum contact voltage	250 VAC, 250 VDC	
Maximum contact current	5 A	
Maximum switching capacity (reference value)	1,100 VA, 72 W	440 VA, 60W

Characteristics

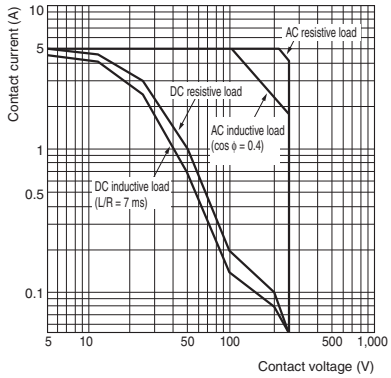
Contact resistance*1		50 mΩ max.
Set	Time	30 ms max. (when rated operating power is applied, not including contact bounce.)
	Minimum pulse width	60 ms
Reset	Time	30 ms max. (when rated operating power is applied, not including contact bounce.)
	Minimum pulse width	60 ms
Maximum operating frequency	Mechanical	1,800 operations/hr
	Rated load	1,800 operations/hr
Insulation resistance		100 MΩ min. for 500 VDC applied to the same location as for dielectric strength measurement
Dielectric strength	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.
	Between set/reset coils	
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 (1.0-mm double amplitude)
Shock resistance	Destruction	500 m/s²
	Malfunction	100m/s²
Endurance	Mechanical	5,000,000 operations min. (operating frequency: 1,800 operations/hr)
	Electrical*2	500,000 operations min. (rated load, switching frequency: 1,800 operations/h)
Failure rate P value (reference value*3)		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. Ambient temperature condition: 23°C
*3. This value was measured at a switching frequency of 60 operations per minute.

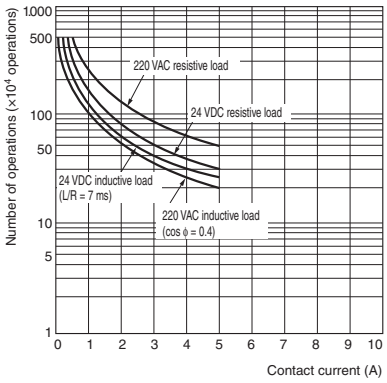
Ambient operating temperature	–10 to 40°C (with no icing or condensation)
Ambient operating humidity	5% to 85%

Engineering Data

Maximum Switching Capacity

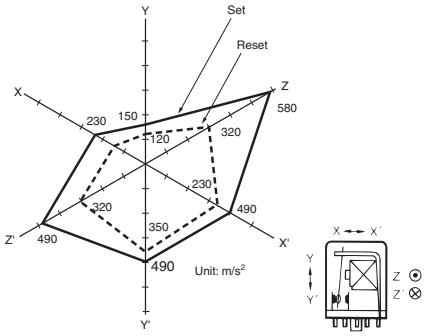


Endurance Curve



Malfunctioning Shock

MK2KP 24 VDC

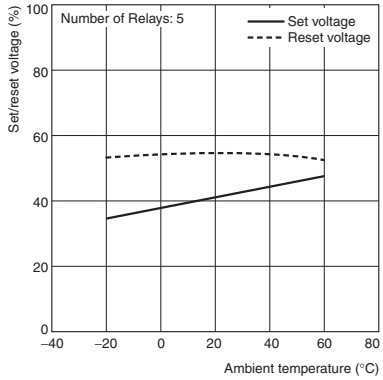


Measurement: Measurement: Shock was applied 3 times each in 6 directions along 3 axes with the Relay set and reset to check the shock values that cause the Relay to malfunction.

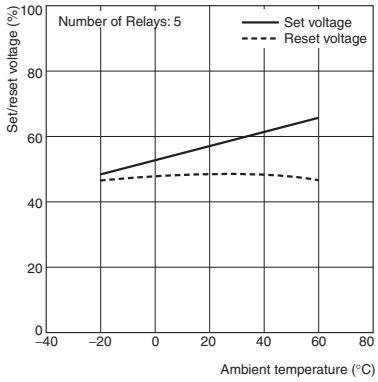
Criteria: 100m/s²

Ambient Temperature and the Set and Reset Voltages

MK2KP 100/(110) VAC

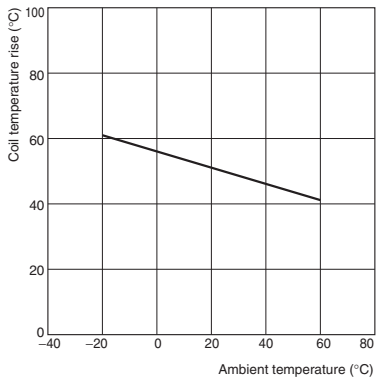


MK2KP 24 VDC

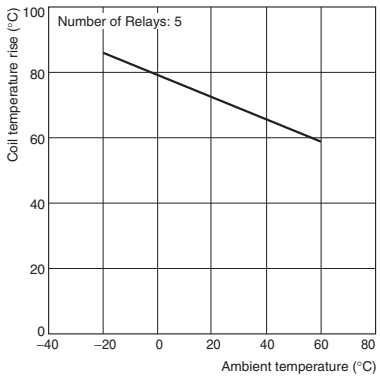


Ambient Temperature vs. Coil Temperature Rise

MK2KP 100/(110) VAC

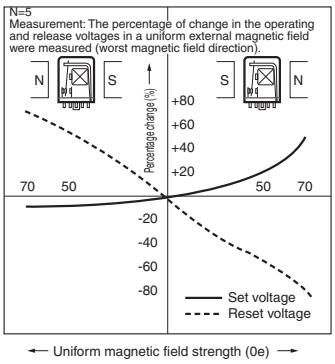


MK2KP 24 VDC



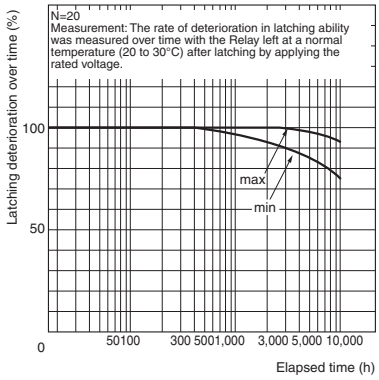
Changes in Operation Characteristics Due to External Magnetic Fields

MK2KP 100 VAC (Average Value)



Degradation in Latching Ability Over Time

MK2KP 200 VAC

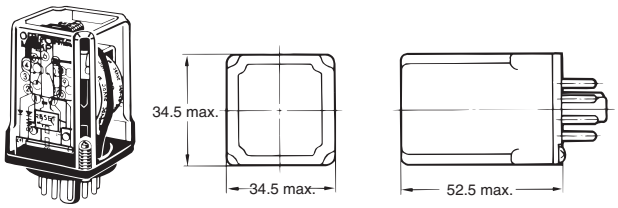


Dimensions

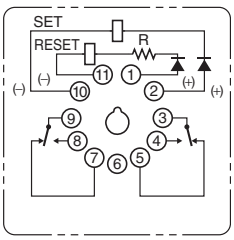
(Unit: mm)

List of Models

MK2KP



Terminal Arrangement/Internal Connections (Bottom View)



Note: 1. R is a resistor for ampere-turn correction. This resistor is included in models for 50 VAC or 48 VDC or higher.
2. For DC models, check the coil polarity for both the set and reset coils and wire all connections correctly. If the connections are not correct, unintended operation may occur.
3. For AC models, the set and reset coils have no coil polarity.
4. The diagram to the left shows the default configuration or the configuration following a reset.
5. The terminals in the Terminal Arrangement/Internal Connections diagram where nothing is connected are unused terminals. These may be empty but this is not a problem.

Connection Sockets (Refer to *Common Socket and DIN Track Products* for external dimensions.)

Front-mounting Sockets	Back-mounting Sockets		
Track or screw mounting	Solder terminals	Wrapping terminals	Relays with PCB Terminals
PF113A(-E)	PL11	PL11-Q	PLE11-0

Note: Details about the Relay Hold-down Clips are the same as for the standard MK Relays.
Refer to *Common Sockets and DIN Tracks*.

Mounting Height with Sockets

The mounting height is the same as the MK. Refer to the information on the MK for details.

Safety Precautions

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

Precautions for Correct Use

Circuit Conditions

- Do not apply a voltage to the set and reset coils at the same time. If you apply a voltage to both coils simultaneously, the Relay will be set.
- There is usually no reason to use a Latching Relay with a constant current flow because the Relay can be latched with a single pulse. Using only a single pulse is also beneficial to reduce power consumption.

Minimum Pulse Width

- The minimum pulse width in the performance column is the value for the following measurement conditions: an ambient temperature of 23°C with the rated operating voltage applied to the coil. The performance values given here may not be satisfied due to use over time and a reduction in latching performance due to changes in the ambient temperature or in the conditions of the application circuit.
  For actual use, apply the rated operating voltage with a pulse width based on the actual load and reset the Relay at least once per year to prevent degradation over time.
- If the Relay is used in an environment with strong magnetic fields, the surrounding magnetic field can demagnetize the magnetic body and cause unintended operation.
  Therefore, do not use these Relays in environments with strong magnetic fields.

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