

Proximity Switches

Magnetically operated reed switches, PM

PM

Magnetically operated reed switches, PM Standard type

Operating distance: Maximum 35, 70, 120mm
 Reed switch: 1NO, 2 Amps

■ Features

- Power source not required
- Comprises sensing magnetic element and reed switch
- Resin molded construction
- Water- and dust-tight, shock-resistant
- Breaking capacity: 0.5Amps at 220V AC
- Operating distance is longer than oscillating type.
- Economically priced
- 1 meter color-coded lead wires

■ Ordering information

Specify the following:

1. Type number or ordering code (Specify reed switch and magnet separately.)



■ Specifications

Magnet (standard type)

Type	PM-2M	PM-4M	PM-10M
Operating distance	25 – 40mm	50 – 70mm	80 – 120mm
Differential	5 – 15mm	5 – 20mm	15 – 40mm
Ambient temperature	-10° to +65°C	-10° to +65°C	-10° to +65°C

Magnet (High temperature using type)

Type	PM-2MH	PM-4MH	PM-10MH
Operating distance	25 – 40mm	40 – 70mm	100 – 140mm
Differential	5 – 15mm	5 – 20mm	15 – 40mm
Ambient temperature	-20° to +130°C	-20° to +130°C	-20° to +130°C

PM2S, PM-2SH read switches

Rated operating voltage: 220V AC, DC (Max.)

Rated operating current: 0.5A (Max.)

Make and break capacity: 50W DC, 50VA AC (Max.)

Mechanical: durability 100 million operations

Electrical: 2 million operations at 200V AC 0.125A
 1.4 million operations at 100V AC 0.25A

Insulation resistance: Over 100MΩ at 500V DC

Dielectric strength: 700V AC rms. 1 minute (Contact to contact)

Ambient temperature: -10 to +65°C (For 130°C use is also available)

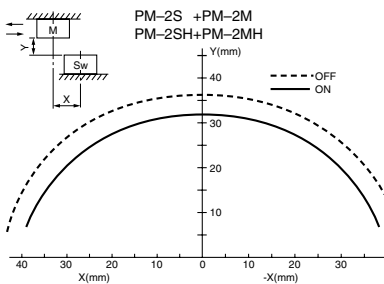
1 meter lead wires are normally provided.

■ Response curves, typical

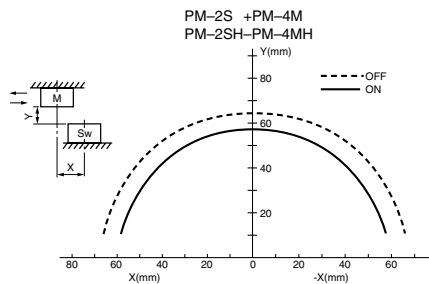
Short axis

M: Magnet

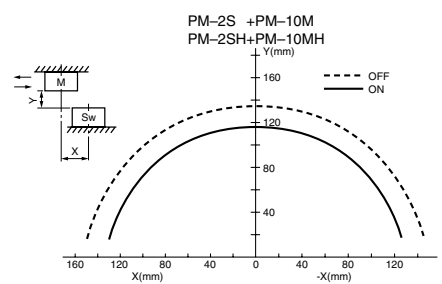
Sw: Reed switch



PM-2S



PM-2S



PM-2S

■ Dimensions, mm

PM-2S Mass: 210g

PM-2SH

PM-2M Mass: 170g

PM-2MH

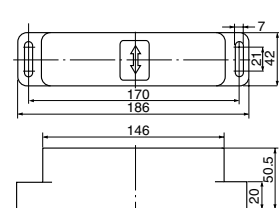
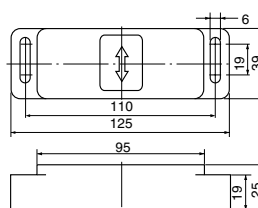
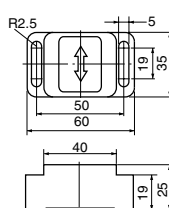
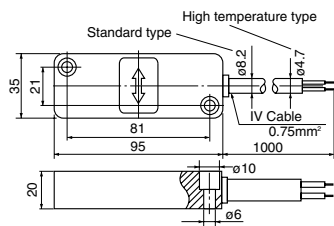
PM-4M Mass: 440g

PM-4MH

PM-10M

Mass: 1300g

PM-10MH



- Notes:
- Reed switch and magnetic element are mounted on anti-magnetic material. The operating distance will be decreased when mounted on magnetized materials.
 - Both reed switch and magnetic element cannot be used in over 5-gauss magnetic fields.

Proximity Switches

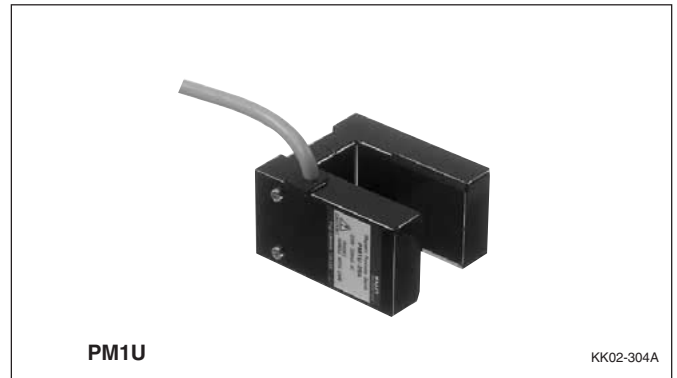
Magnetically operated reed switches - slot type

PM1U

Magnetically operated reed switches—Slot type PM1U

■ Features

- Stable switch operation is ensured by inserting the object for detection 35mm into the switch slot. Ideal for detecting the position of a ferromagnetic-material plate passing in the switch slot.
- Magnetically operated switch using a sealed contact is never affected by electrical noise, ensuring highly reliable detection.
- The built-in permanent magnet enables switching of both AC and DC signals without using a power supply.
- Models with an output indicator are also available.
- Our advanced design assures superior environmental protection complying with IP67 (IEC).



■ Ordering information

Specify the following:

1. Type number (ordering code)

■ Specifications

Operating slot width	Detecting distance*	Hysteresis	Contact arrangement	Output indicator	Type (=Ordering code)	Measurement conditions for an operating position and hysteresis
25mm	+4 ±6mm	10mm (Max.)	1NO (ON: Detected)	Not provided	PM1U-25ALF	
				Provided	PM1U-25ALF2	
	-4 ±6mm	7mm (Max.)	1NC (OFF: Detected)	Not provided	PM1U-25BLF	
				Provided	PM1U-25BLF2	

Note *: The detecting distance and hysteresis are defined in the standard detecting conditions shown above.

Type	PM1U-25ALF	PM1U-25ALF2	PM1U-25BLF	PM1U-25BLF2
Output indicator	Not provided	Provided	Not provided	Provided
Operating slot width	25mm			
Object insertion length	35mm (Min.)			
Rated operating voltage	220V AC, DC (Max.)			
Rated operating current	0.2A (Max.)			
Make and break current	0.2A (Max.)			
OFF → ON response time	2ms (Max.)			
ON → OFF response time	0.5ms (Max.)			
Life expectancy (Mechanical)	1×10 ⁷ operations (Min.)			
Life expectancy (Electrical)	2×10 ⁶ operations (Min.) Load: Miniature control relay HH54P 220V AC/7mA			
	3×10 ⁶ operations (Min.) Load: Miniature control relay HH54P 100V AC/14mA			
	2×10 ⁶ operations (Min.) Load: Resistance (24V DC/0.2A)			
	1×10 ⁷ operations (Min.) Load: Resistance (12V DC/0.2A)			
Ambient temperature	-10 to +65°C			
Humidity	45 to 95%HR			
Vibration resistance	10 to 55Hz, 1.5mm peak-to-peak amplitude, 2-hour for each of X, Y, and Z axes			
Shock resistance	300m/s ² , three-time for each of X, Y, and Z axis			
Output resistance at ON	6Ω (Max.)	—	6Ω (Max.)	—
Switch residual voltage at ON	—	4V (Max.)	—	4V (Max.)
Insulation resistance	100MΩ (Min.)			
Degree of protection	IP67 (IEC standard)			
Maximum signal cable length	300m			

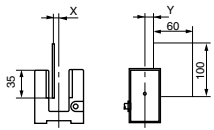
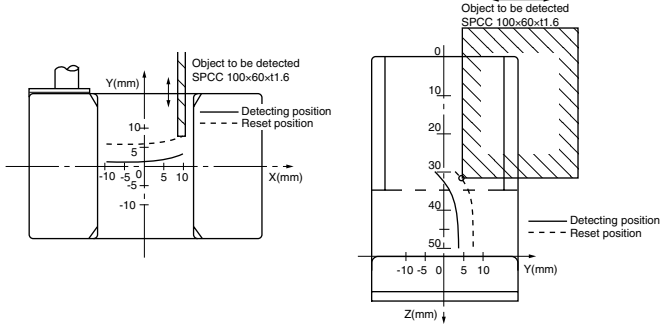
Note: The LED indicator becomes dark when the load current is 10mA or less. (Switches with an output indicator)
1 meter lead wire is provided.

Proximity Switches

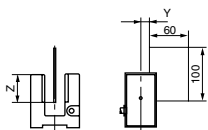
PM1U

Object detection area (Examples)

PM1U-25A

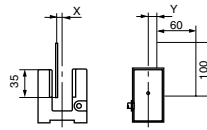
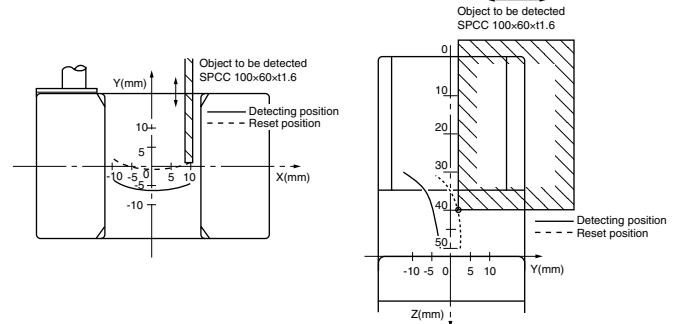


Note: The X - Y characteristics are symmetrical to the X axis.

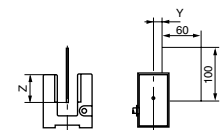


Note: The Y - Z characteristics are symmetrical to the Z axis.

PM1U-25B



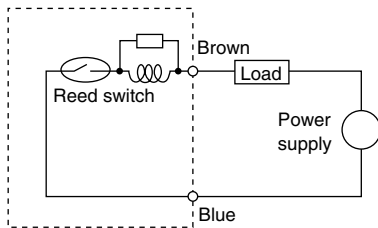
Note: The X - Y characteristics are symmetrical to the X axis.



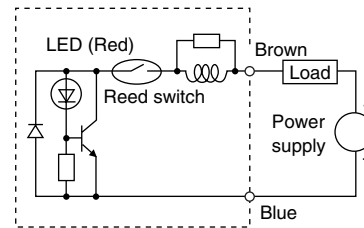
Note: The Y - Z characteristics are symmetrical to the Z axis.

Wiring diagrams

Switch with no output indicators



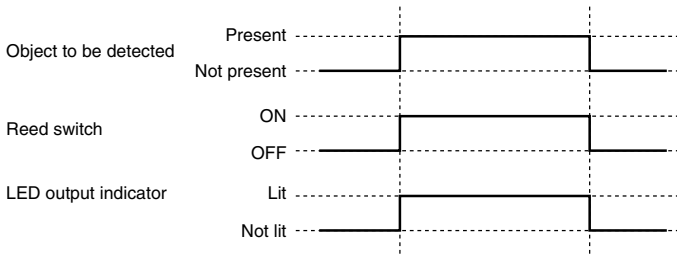
Switch with an output indicator



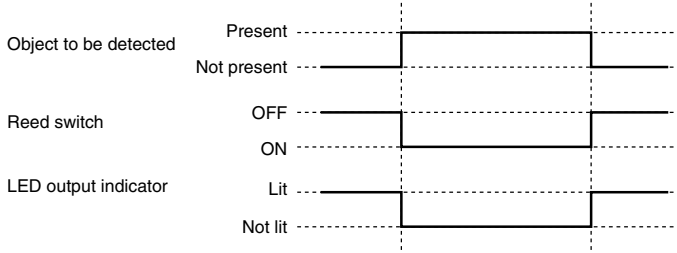
Note: When using a DC power supply, connect the brown terminal to (+) and blue terminal to (0V). Otherwise, the indicator will not go on.

Operation chart

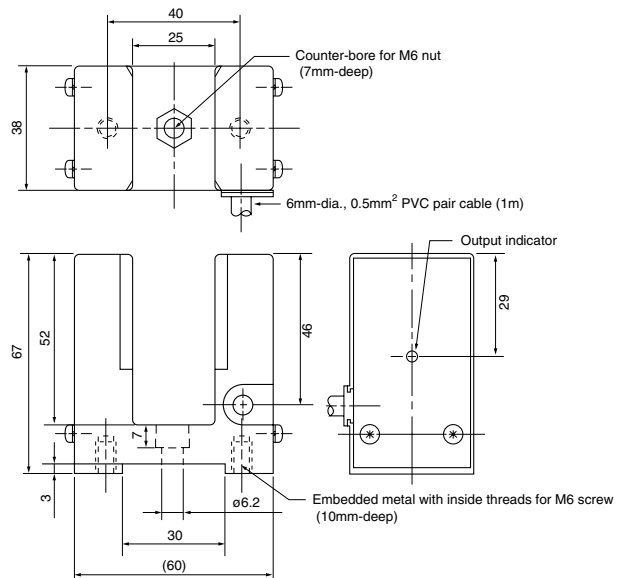
PM1U-25A □



PM1U-25B □



Dimensions, mm



Magnetically operated reed switches AES

Small size

Operating distance: Max. 20, 27mm
 Reed switch: 1NO
 Rated thermal current: 2.5A (AES402)
 2.5A (AES502)

■ Features

- Power source is not required.
AES402 is small size, soldering terminal.
- AES502 is provided with lead wire.
- Epoxy resin molded, shock-resistant.
- Make and break capacity:
Max. 50VA, 50W (AES402)
Max. 50VA, 50W (AES502)
- Operating voltage:
Max. 220V AC, DC (AES402)
Max. 220V AC, DC (AES502)

■ Ordering information

Specify the following:
 1. Type number or ordering code



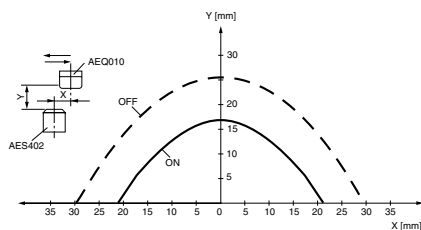
■ Specifications

Type	Contact Magnet	AES402B-1A AEQ010-1A	AES502L-3A AEQ020-1T
Ordering code	Contact Magnet	PM2B PM34	PM2D PM35
Contact		1NO	
Operating distance		14–20mm	20–27mm
Differential		1–12mm	1–14mm
Repeat accuracy		0.5mm or less	
Ambient temperature		–20°C to +80°C	
Dielectric strength	Between open contacts Terminal to ground	700V AC, 1 min. 1500V AC, 1 min.	350V AC, 1 min. 1500V AC, 1 min.
Insulation resistance		100MΩ or more at 500V DC	100MΩ or more at 500V DC
Life expectancy	Mechanical	10 million operations	
	Electrical	2 million operations at 100V AC 3.3VA	2 million operations at 100V AC 3.3VA

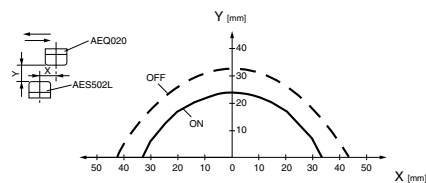
■ Response curves

Short axis

Contact: AES402B-1A
 Magnet AEQ010-1A

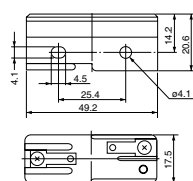


Contact: AES502L-3A
 Magnet AEQ020-1T

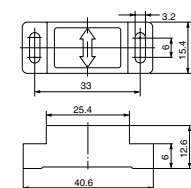


■ Dimensions, mm

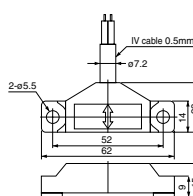
AES402B-1A



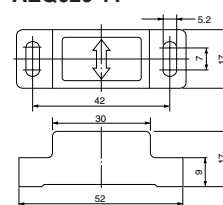
AEQ010-1A



AES502L-3A



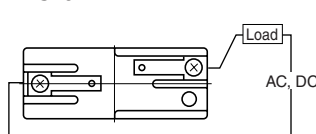
AEQ020-1T



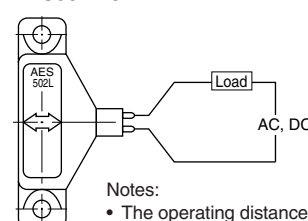
Mass:
 AES402B-1A: 20g
 AES502L-3A: 85g
 AEQ010-1A: 20g
 AEQ020-1T: 25g

■ Wiring

AES402B-1A



AES502L-3A



Notes:

- The operating distance will be decreased when mounted on ferromagnetic material such as iron.
- Both reed switch and magnetic elements can not be used in over 5-Gauss magnetic fields.

Proximity Switches

Magnetically operated reed switches

AER

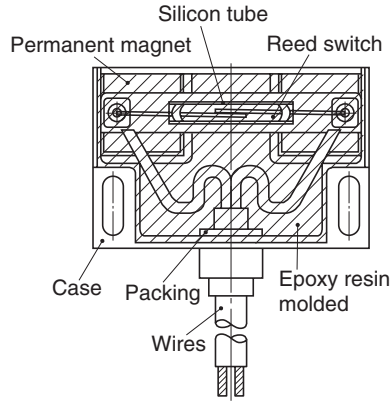
Magnetically operated reed switches AER

Operating distance: 4.0–5.5mm (at 1NO)
 Reed switch: 1NO or 1NC
 Rated thermal current: 2.5A

■ Features

- Sensing magnetic element and reed switch element are integrated in an epoxy molded housing.
- Power source is not required.
- Travelling direction of the metal object is not limited.
- Make and break capacity:
 Max. 50VA AC, 50W DC
- Operating voltage: Max. 220V AC, DC
- Water- and dust-tight

■ Construction



- Notes:
- The operating distance will be decreased when mounted on ferromagnetic material such as iron.
 - This switch cannot be used in over 5-Gauss magnetic fields.
 - Keep a distance of over 100mm from other limit switches.

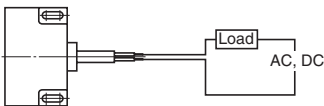


■ Specifications

Type (Ordering code)	AER201L-1A (PM1A)	AER211L-1A (PM1B)	
Contact arrangement	1NO	1NC	
Rated voltage AC, DC	220 max.	220V max.	
Rated thermal current	2.5A	2.5A	
Make and break current	Max. 0.5A AC, DC	Max. 0.5A AC, DC	
Operating distance	4.0–5.5mm	3.5–5.0mm	
Differential	1–5.5mm	1–5.5mm	
Repeat accuracy	Less than 0.5mm	Less than 0.5mm	
Ambient temperature	–20° to +80°C	–20° to +80°C	
Dielectric strength	350V AC rms. 1 minute (Between open contacts) 1500V AC rms. 1 minute (Terminal to ground)		
Insulation resistance	Over 100MΩ at 500V DC		
Life expectancy	Mechanical	10 million operations	
		Electrical	2 million operations at 100V AC 3.3VA (Inductive) 2 million operations at 100V DC 1.6W (Inductive) 10 million operations at 12V DC 6W (Resistive)

- Notes:
- 1 meter lead wires are normally provided.
 - The standard detected object is iron plate of 50 × 50 × 2 (mm). If the object is smaller, the operating distance is reduced.

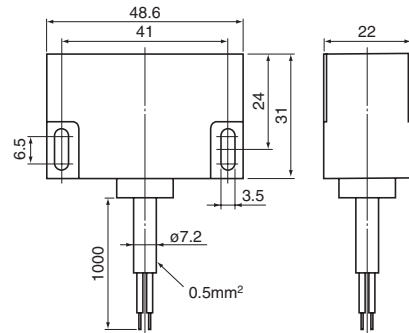
■ Wiring



■ Ordering information

Specify the following:
 1. Type number or ordering code

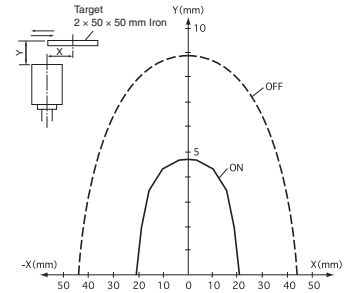
■ Dimensions, mm



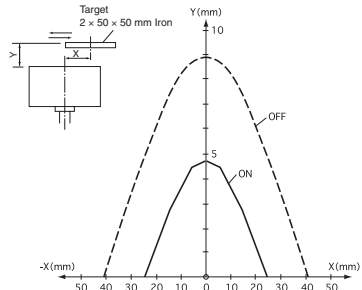
Mass: 100g

■ Response curves

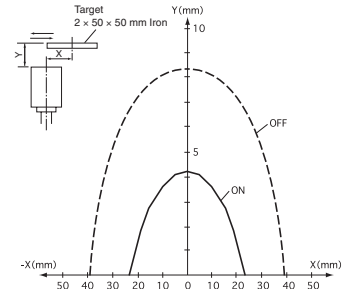
AER20 Short axis



AER20 Long axis



AER21 Short axis



AER21 Long axis

