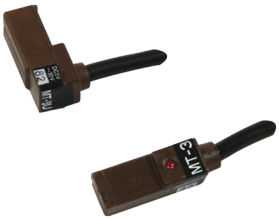
M type proximity switch

3-wire type, 2-wire type

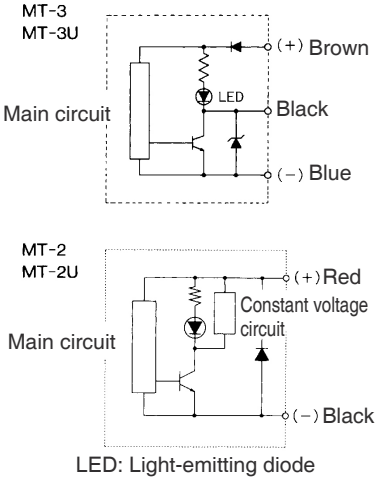


Specifications

Model No.		Unit	MT-3	MT-3U	MT-2	MT-2U
Applications			Relay, PLC, IC Circuit		Relay, PLC	
Rated voltage		V	DC5~30		DC24(DC10~30)	
Rated current range		mA	5~200		5~100	
Maximum current		mA	max. 20(at 24V) max. 10(at 12V) max. 4(at 5V)		—	
Maximum leakage		μA	10		1	
Internal pressure drop		V	max. 1.5		max. 3	
Average response time		ms	1		1	
Shock resistance		G	50		50	
Operating ambient temperature		°C	5~60		5~60	
Protect mechanism			IP67		IP67	
Indicator light			Red LED (Light-up at ON)		Red LED (Light-up at ON)	
Wiring	Color		Black 3-core wire		Black 2-core wire	
	Length	m	1		1	

Note: Standard wire length of 1m is provided; other wire length can be supplied upon request.

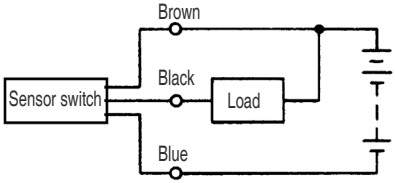
Internal circuit



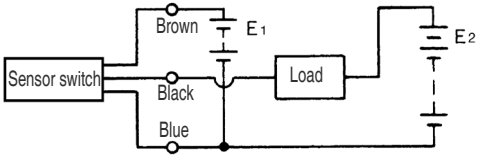
LED: Light-emitting diode

How to use sensor switch

When electricity supply to the load is the common power switch



When electricity supply to the load is not the common power switch

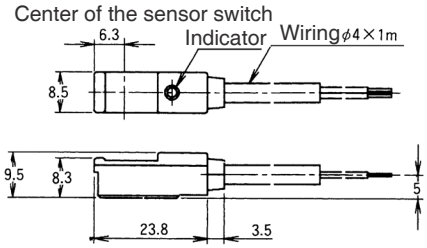


Voltage for E1 and E2 should be the same

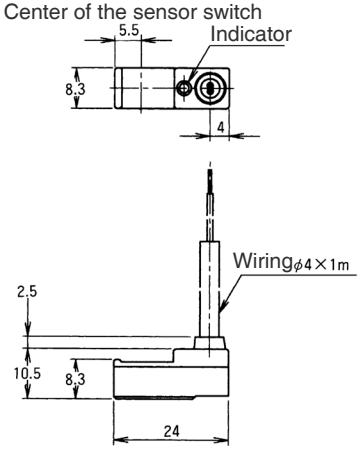
Dimensions

(Unit: mm)

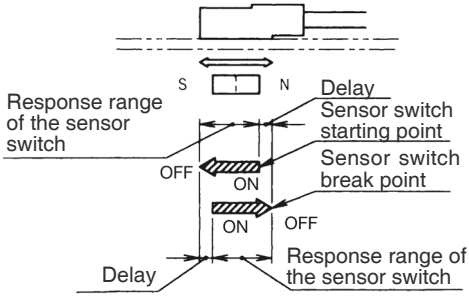
MT-3、MT-2



MT-3U、MT-2U



Delay and response range of the sensor



When the piston moves to the left side, the sensor switch will be activated and an indicator will be on to show it's at its starting point. This status remains at response range.
When the piston return to the right side, the sensor switch will be off (breakpoint) and cause slight delay.

(Unit: mm)

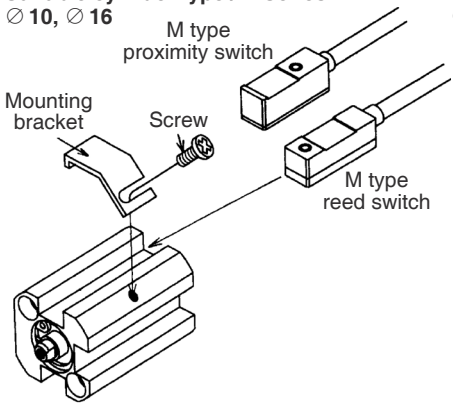
Pneumatic cylinder	Bore	Response range of the sensor switch	Delay
X Series	∅10, ∅16, ∅20, ∅25, ∅32	9±1	about 1
	∅40	7±1	
	∅50	6±1	
	∅63, ∅80, ∅100	9±1	
Z Series	∅6	4±0.5	about 0.5
	∅10	4.5±0.5	
	∅16	5.5±0.5	
J Series	∅20, ∅25, ∅32, ∅40	7.5±0.5	about 0.5
K Series	∅40, ∅50, ∅63, ∅80, ∅100	7±2	about 0.5
A Series	∅125, ∅140, ∅160 ∅180, ∅200	8±2	about 1

⚠ Sensor switch technical information

- Be sure to turn off the power supplies before doing the wiring.
- When the piston moves to the left side, the sensor switch will be activated and an indicator will be ON, showing that sensor switch is at its starting point.
- Check the center position
- When sensor switch is installed far from the end of the stroke, contact will shut off and reset so that the magnet will move off from sensor switch. This will happen regardless of which direction the piston rod is acting toward. The minimum distance between magnet will keep the sensor switch remain active. Please refer to the diagram "Delay and response range of the sensor switch." The time to shut off the sensor switch can be calculated by response range divides the speed of magnet.
- Keep the sensor switch away from other magnetic objects for at least 10mm far will help stablise the sensoring condition.
- Keep the wire away from the electrical circuit to avoid disturbance caused by a large current.
- Pay attention to the magnetic field surrounded which may cause sensor switch become dysfunctional.
- When using 24V DC sensor switch, be sure to check polarity (Red: +, Black: -)
- Avoid connect sensor switch output wire directly to the power supply.
- M type proximity switch has water proof feature of IP67, yet it shouldn't be used in the water for a long period of time; please provide shelter to ensure proper functionality.

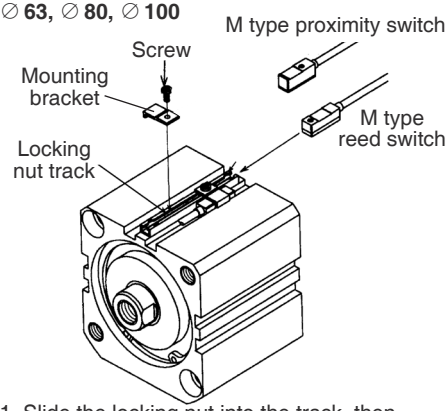
Mounting

Suitable cylinder type / X Series
∅ 10, ∅ 16



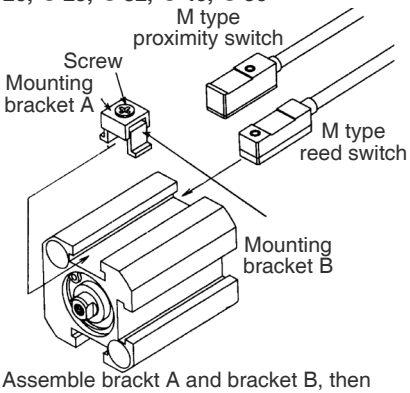
1. Put the M type sensor switch to the groove in the body and adjust the mounting position.
2. Slightly fasten the screw onto the bracket.
3. Check the position of sensor switch, then fasten the screw with 4kgf·cm torque.
4. If sensor switch needs to be repositioned, loosen the screw and simply repeat step 2.

Suitable cylinder type/X Series
∅ 63, ∅ 80, ∅ 100



1. Slide the locking nut into the track, then determine the mounting position.
2. Put the M type sensor switch to the groove in the body and adjust.
3. Mount the bracket above the sensor switch, use screw to slightly fasten the locking nut.
4. Check the position of sensor switch, then fasten the screw with 4kgf·cm torque.
5. If sensor switch needs to be repositioned, loosen the screw and simply repeat step 3.

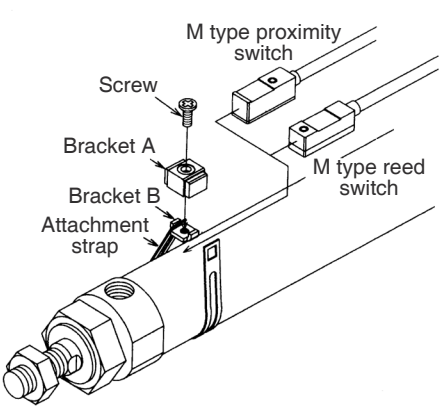
Suitable cylinder type / X Series
∅ 20, ∅ 25, ∅ 32, ∅ 40, ∅ 50



1. Assemble brackt A and bracket B, then put in the screws.
2. Slide the bracket A and B assembled from Step 1 into the groove in the bottom of the body.
3. Put the M type sensor switch to the groove below the assembled bracket A and B, slightly fasten the screw onto the bracket just enough to hold.
4. Check the position of sensor switch, then fasten the screw with 4kgf·cm torque.
5. If sensor switch needs to be repositioned, loosen the screw and simply repeat step 3.

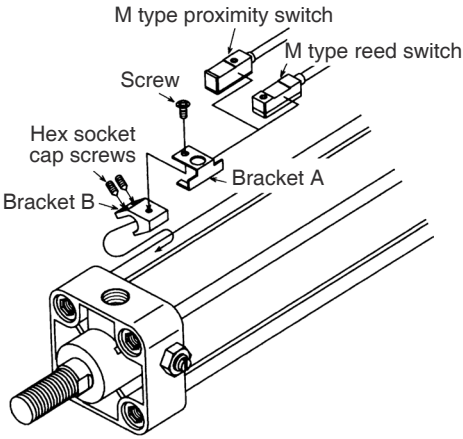
Mounting

Suitable cylinder type/Z, J Series



1. Twine the attachment strap on the outer tube of the cylinder, connect one end of the strap to the hook on the bracket B.
2. Place the sensor switch's groove side below bracket B.
3. Connect the other end of the attachment strap to bracket B.
4. Connect bracket A and bracket B, slightly fasten the screw onto the bracket just enough to hold.
5. Check the position of sensor switch, then fasten the screw with 4kgf·cm torque.
6. If sensor switch needs to be repositioned, loosen the screws and simply repeat step 4.

Suitable cylinder type/K, A Series



1. Place bracket B on the tie rod of the cylinder.
2. Place the sensor switch's groove side below bracket A.
3. Connect bracket A and bracket B, fasten the screw onto the bracket with 4kgf·cm torque.
4. Check the position of sensor switch, then fasten the hex socket cap screws with 4kgf·cm torque.
5. If sensor switch needs to be repositioned, loosen the hex socket cap screws and simply repeat step 4.

⚠ Preventive measures

When adopting pneumatic components, please comply with JIS B8370 (ISO 4414) as the operating standards for pneumatic system. Before operating, one should first read through the following precautions.

Environment

1. Do not operate pneumatic machines in an environment containing gasses, chemical elements, sea water, water, water vapour, etc. If operation in such environment is a must, please first consult with FONTAL.
2. If using in an environment with a temperature lower below 5 °C, please provide air dryer to prevent water frozen which will cause malfunction (the component can endure at a temperature as low as -5 °C).
3. Air supplied for the pneumatic cylinder can only be from industrial air compressing system. To avoid unnecessary hazards, all other gas temperature or pressure that is higher than the maximum permissible range is prohibited.

Air quality

1. Please use an air filter with filtration rate of 5 μm or finer, oil mist separator, poor-quality oil filter to improve the air quality and prolong usage life.
2. Please discharge water and change filter cartridge periodically.

Lubrication

1. Pneumatic cylinder are available with both lubrication and non-lubrication feature. Choose turbine oil Class 1 (ISO VG32) or equivalent for lubricantion.
2. Avoid using spindle oil or machine oil; otherwise, the seal parts may be corroded.

Piping

1. Thoroughly clean the inside of air pipe before installation before doing piping to avoid malfunction caused by impurities entering the inside of the cylinder.
2. When fastening piping with connector, please be careful to avoid iron scrap and other sealing tape from entering the pipe.
3. When mounting piping with a connector, the appropriate torque is listed in the following table. Do not use excessive or insufficient torque to prevent thread stripped or leakage.

Threaded size	Torque N·m(kgf·cm)
M5	1.5~2.0(15~20)
Rc⅛	7~10(70~100)
Rc¼	13~15(130~150)
Rc⅜	18~20(180~200)
Rc½	38~40(380~400)
Rc¾	58~60(580~600)
Rc 1	78~80(780~800)

Mounting pneumatic cylinder

1. When operating, axis should avoid using eccentric load or transverse load.
2. Please take extra care not to scratch or damage axis; otherwise such seal scratch would cause leakage.

Piston speed

A speed controller is set inside of the pneumatic cylinder. Speed can be set within desirable range. When connecting the speed controller, it is highly recommended to provide air outlet specification circuit.

Cushion

Although cushion has been thoroughly inspected before dispatched, an user can still make adjustment depending on operational need.

Maintenance

When mounting or before maintenance, please shut off power supply and air supplies and exhaust residual air from the pneumatic machinery to prevent damage and hazardous situations.