CP-UM-5373E

Proximity Switches FL7M Series (3-wire DC Type) User's Manual

Thank you for purchasing our proximity switch.
This manual contains information for ensuring correct and safe use of this product.
Please read and understand the manual thoroughly before using this product, and keep the manual nearby after installation for handy reference.
Please read the "Terms and Conditions" from the following URL before ordering or use:
https://www.azbil.com/products/factory/order.html

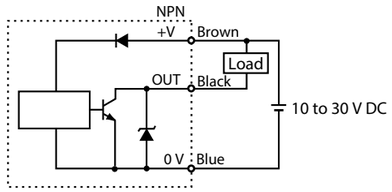
■ Specifications

Shielded type proximity switch(suitable for flush mounting onto metal)

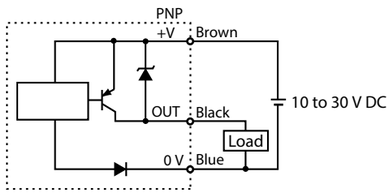
Model number	FL7M-			
	1P5_6_	2_6_	5_6_	10_6_
Size	M8	M12	M18	M30
Sensing distance	1.5 mm	2 mm	5 mm	10 mm
Setting distance	0 to 1.05 mm	0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Standard target (steel)	8×8×1 mm	12×12×1 mm	18×18×1 mm	30×30×1 mm
Hysteresis	10 % max. of sensing distance			
Supply voltage	10 to 30 V DC			
Current consumption	13 mA max.			
Output	Load current: 100 mA max. Voltage drop: 2 V max. Withstand voltage: 30 V max.			
Operating temperature	-25 to +70 °C			-10 to +60 °C
Insulation resistance	50 MΩ min. (500 V DC)			
Dielectric strength	1000 V AC 1min			
Sealing	IP67 (IEC Standard)			
Circuit protection	Surge voltage protection, reverse polarity protection, short circuit protection			

■ Circuit and Wiring

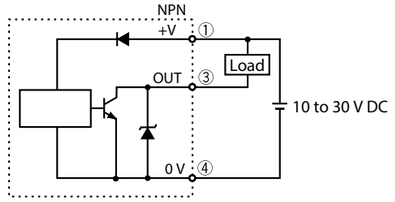
●Pre-wired type (NPN) FL7M-_A/B_



●Pre-wired type (PNP) FL7M-_D/E_



●Pre-wired connector type (NPN) FL7M-1P5A6-CN03



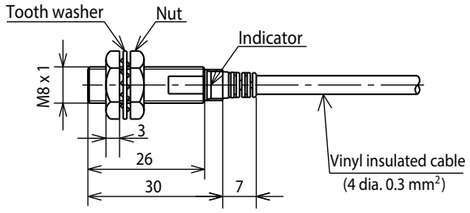
Connector face view

- A load must be used when power is applied to the switch.
- A combination of short circuit and wrong wiring will cause permanent damage, regardless of short-circuit protection.
- When connecting a connector fasten tightly by hand.

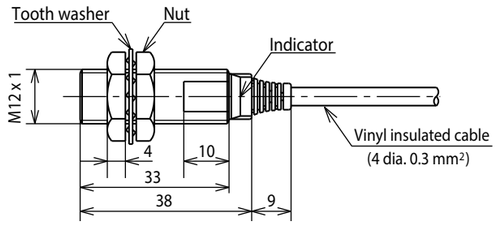
■ Dimensions

●FL7M-1P5_6_

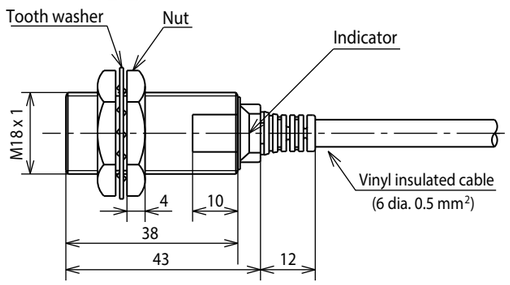
unit: mm



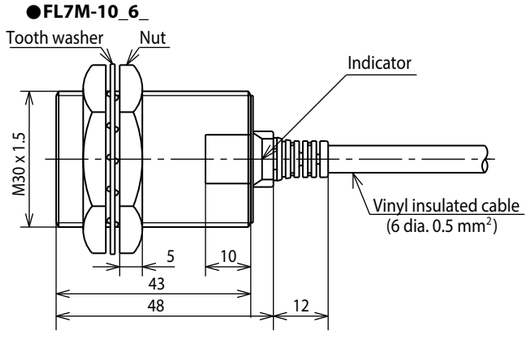
●FL7M-2_6_



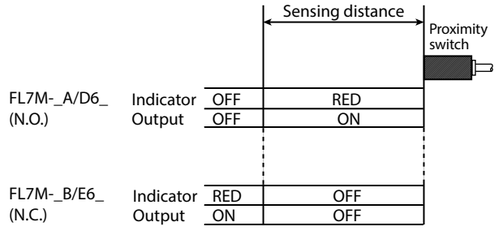
●FL7M-5_6_



●FL7M-10_6_



■ Operating Chart for Output and Indicator

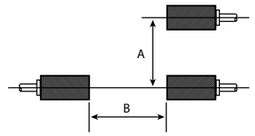


■ Mutual Interference

Erroneous operation due to mutual interference is caused when switches are installed in parallel or facing each other.

Separate the switches by at least the distance specified in the table below.

	A (mm)	B (mm)
FL7M-1P5_6_	15	20
FL7M-2_6_	20	30
FL7M-5_6_	35	50
FL7M-10_6_	70	100

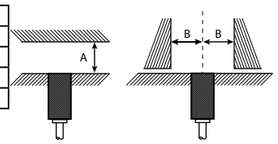


■ Influence from Nearby Metal Objects

If a metal object other than the work piece is located nearby, this switch's sensing distance characteristics will change.

Keep the minimum distances between the switch and metal objects shown in the table below.

	A (mm)	B (mm)
FL7M-1P5_6_	4.5	6
FL7M-2_6_	8	9
FL7M-5_6_	20	13.5
FL7M-10_6_	40	22.5



A : Distance from the sensing surface of the proximity switch to an iron plate in front of the switch.

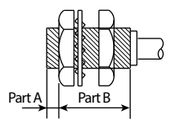
B : Distance from the axis of the proximity switch to an iron plate in front of the switch.

■ Tightening Torque

●When a nut is used

The permissible torque is different depending upon the distance from the top of the switch head. Tighten the body at less than the maximum permissible torque shown below, and always with the enclosed nuts and washers.
The tightening torque varies depending on the mounting plate or housing, the nut and washer material, and the condition of the mounting surface. Check that the torque is suitable for the actual combination of items before use.

	Part A		Part B
	Distance (mm)	Permissible torque (N•m)	
FL7M-1P5_6_	9	9	12
FL7M-2_6_	0	-	20
FL7M-5_6_	0	-	70
FL7M-10_6_	0	-	180



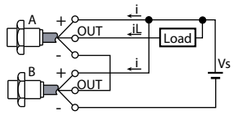
[!] Handling Precautions

- Do not tighten the body by applying torque to the indicator unit (plastic unit).
- Do not mount the body using a setscrew. Doing so might damage the switch.

■ AND Connection (Serial Connection)

When connecting two switches in series, please pay attention to the following:

- Maximum output current (100 mA) ≥ load current + current consumption (13 mA)
- Supply voltage ≥ operation voltage of a load + 2 x voltage drop (2 V)
- If target moves too quickly, switch may operate incorrectly.
- In series, switch A may operate incorrectly on startup, because switch A is supplied power from switch B's output.

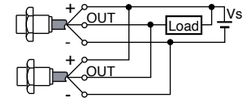


[!] Handling Precautions

- With serial connections the switch may be briefly unusable due to power fluctuation. Check the system before use.

■ OR Connection (Parallel Connection)

Up to three of these switches may be connected in parallel.



■ Points to be Aware of When Handling

- Do not swing the switch by the cable.
- Do not pull the cable with excessive force.
- Do not use the switch outdoors, or where it is surrounded by chemicals (solvents, acids, alkalies, etc.).
- If bending the cable, keep R (the radius of the bend) ≥ (the cable diameter) x 3 at least.
- When disposing of an FL7M Series switch, dispose of it appropriately as industrial waste in accordance with applicable bylaws and regulations.

■ Wiring cautions

- Route the wires of the switch separately from power lines or through an exclusive conduit. Otherwise, electrical noise or a surge may cause faulty operation or damage.
- If an extension of the cable is necessary, use at least a 0.3 mm2 wire of 100 m maximum length.
- When using a commercial switching regulator, ground the FG (Frame Ground) and G (Ground) terminals. Otherwise, switching noise may cause faulty operation.
- When using a load to generate a transient current, connect a current limit resistor between the load and the output terminal. (Otherwise, the short-circuit protection may be activated.)

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Specifications are subject to change without notice. (11)
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1st edition: Sep. 2004 (M)
4th edition: Apr. 2020 (K)