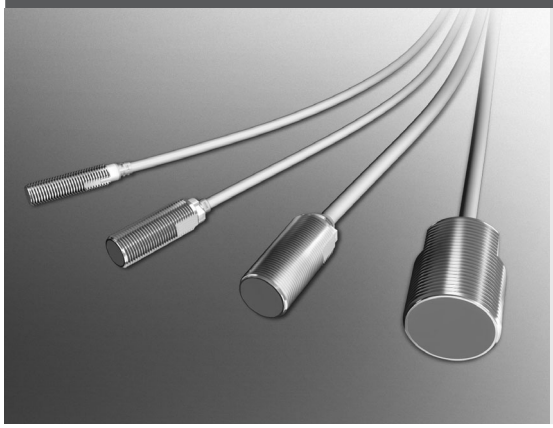
# DC2-Wire Regular Cylindrical Proximity Sensors

# FL7M Series

**Rigid structure, highly waterproof DC 2-wire sensors with improved visibility of indicator lamps.**



- DC 2-wire, for reduced wiring costs.
- Stable sensing area is shown by the setting indicator
- Rigid housing allows higher mounting torque.
- Firefly glow indicator lamp can be seen from any direction
- Lowest current consumption in the industry: 0.55mA
- Sealed to IP67G
- Fastest response time in the industry: 2kHz

## ORDER GUIDE

**● Polarity type**

**Preleaded types**

| Exterior | | Sensing distance | Operation mode | Setting indicator | Oil-resistant cable | Catalog listing |
|---|---|---|---|---|---|---|
| Appearance | Size(O.D.) | | | | | |
| (cable length 2m)  | M8 | 2mm | N.O. | ● | ● | FL7M-2J6HD |
| | | | N.C. | | ● | FL7M-2K6H |
| | M12 | 3mm | N.O. | ● | ● | FL7M-3J6HD |
| | | | | ● | ● | FL7M-3J6HDG (long body) |
| | | | N.C. | | ● | FL7M-3K6H |
| | | | | | ● | FL7M-3K6HG (long body) |
| | M18 | 7mm | N.O. | ● | ● | FL7M-7J6HD |
| | | | N.C. | | ● | FL7M-7K6H |
| | M30 | 10mm | N.O. | ● | ● | FL7M-10J6D |
| | | | N.C. | | ● | FL7M-10K6 |

**Preleaded connector types**

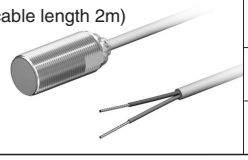
| Exterior | | Sensing distance | Operation mode | Setting indicator | Oil resistant, flexible cable | Connector | | Catalog listing |
|---|---|---|---|---|---|---|---|---|
| Appearance | Size(O.D.) | | | | | + | − | |
| (cable length 30cm)  | M8 | 2mm | N.O. | ● | ● | 1 | 4 | FL7M-2J6HD-CN03 |
| | | | N.O. | ● | ● | 4 | 3 | FL7M-2J6HD-CN03A |
| | | | N.C. | | ● | 1 | 2 | FL7M-2K6H-CN03 |
| | M12 | 3mm | N.O. | ● | ● | 1 | 4 | FL7M-3J6HD-CN03 |
| | | | N.O. | ● | ● | 4 | 3 | FL7M-3J6HD-CN03A |
| | | | N.C. | | ● | 1 | 2 | FL7M-3K6H-CN03 |
| | M18 | 7mm | N.O. | ● | ● | 1 | 4 | FL7M-7J6HD-CN03 |
| | | | N.O. | ● | ● | 4 | 3 | FL7M-7J6HD-CN03A |
| | | | N.C. | | ● | 1 | 2 | FL7M-7K6H-CN03 |
| | M30 | 10mm | N.O. | ● | ● | 1 | 4 | FL7M-10J6D-CN03 |
| | | | N.O. | ● | ● | 4 | 3 | FL7M-10J6D-CN03A |
| | | | N.C. | | ● | 1 | 2 | FL7M-10K6-CN03 |

### Connector types

| Exterior | | Sensing distance | Operation mode | Setting indicator | Connector | | Catalog listing |
|---|---|---|---|---|---|---|---|
| Appearance | Size(O.D.) | | | | + | – | |
|  | M12 | 3mm | N.O. | ● | 1 | 4 | FL7M-3J6HD-CN |
| | | | N.O. | ● | 4 | 3 | FL7M-3J6HD-CNA |
| | | | N.C. | | 1 | 2 | FL7M-3K6H-CN |
| | M18 | 7mm | N.O. | ● | 1 | 4 | FL7M-7J6HD-CN |
| | | | N.O. | ● | 4 | 3 | FL7M-7J6HD-CNA |
| | | | N.C. | | 1 | 2 | FL7M-7K6H-CN |
| | M30 | 10mm | N.O. | ● | 1 | 4 | FL7M-10J6D-CN |
| | | | N.O. | ● | 4 | 3 | FL7M-10J6D-CNA |
| | | | N.C. | | 1 | 2 | FL7M-10K6-CN |

## ●No-polarity type

### Preleaded types

| Exterior | | Sensing distance | Operation mode | Setting indicator | Oil-resistant cable | Catalog listing |
|---|---|---|---|---|---|---|
| Appearance | Size(O.D.) | | | | | |
| (cable length 2m)  | M12 | 3mm | N.O. | ● | ● | FL7M-3W6HDT |
| | M18 | 7mm | N.O. | ● | ● | FL7M-7W6HDT |
| | M30 | 10mm | N.O. | ● | ● | FL7M-10W6DT |

### Preleaded connector types

| Exterior | | Sensing distance | Operation mode | Setting indicator | Oil resistant, flexible cable | Connector | Catalog listing |
|---|---|---|---|---|---|---|---|
| Appearance | Size(O.D.) | | | | | No-polality | |
| (cable length 30cm)  | M12 | 3mm | N.O. | ● | ● | 3 - 4 | FL7M-3W6HDT-CN03 |
| | M18 | 7mm | N.O. | ● | ● | 3 - 4 | FL7M-7W6HDT-CN03 |
| | M30 | 10mm | N.O. | ● | ● | 3 - 4 | FL7M-10W6DT-CN03 |

## ●Accessories (sold separately)

| Name | Appearance | O.D. | Catalog listing |
|---|---|---|---|
| Mounting bracket |  | For M12 | FL-PA112 |
| | | For M18 | FL-PA118 |
| | | For M30 | FL-PA130 |
| Protective cover |  | For M12 | FL-PA12 |
| | | For M18 | FL-PA18 |
| | | For M30 | FL-PA30 |
| Spatter-guarded protective cover |  | For M8 | FL-PA08W |
| | | For M12 | FL-PA12W |
| | | For M18 | FL-PA18W |
| | | For M30 | FL-PA30W |

## SPECIFICATIONS

### ●Preleaded and preleaded connector types

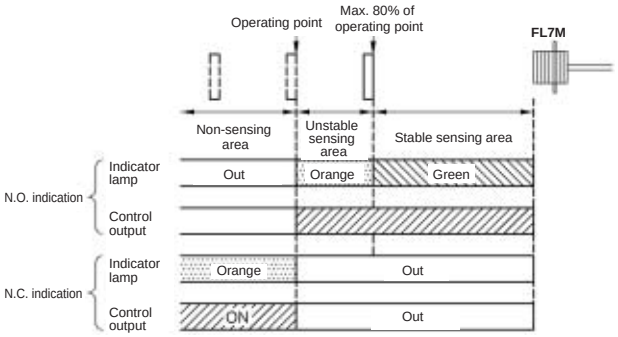
| Catalog listing | | | FL7M-2□6H(D) (-CN03) | FL7M-3□6H(D)(T) (-CN03) | FL7M-7□6H(D)(T) (-CN03) | FL7M-10□6(D)(T) (-CN03) |
|---|---|---|---|---|---|---|
| Actuation method | | | High-frequency oscillation | | | |
| Rated sensing distance | | | 2 ±0.2mm | 3 ±0.3mm | 7 ±0.7mm | 10 ±1mm |
| Usable sensing distance | | | 0 to 1.4mm | 0 to 2.1mm | 0 to 4.9mm | 0 to 7.0mm |
| Standard target object | | | 8 x 8 x 1mm iron | 12 x 12 x 1mm iron | 18 x 18 x 1mm iron | 30 x 30 x 1mm iron |
| Differential travel | | | 15% max. of sensing distance | | | |
| Rated supply voltage | | | 12/24Vdc | | | |
| Operating voltage range | | | 10 to 30Vdc | | | |
| Leakage current | | | 0.55mA max. | | | |
| Control output | Switching current | | 3 to 100mA | | | |
| | Voltage drop | | polarity type: 3V max. (with 100mA switching current, 2m cable), No-polarity type: 5V max. (with 100mA switching current, 2m cable) | | | |
| | Output dielectric strength | | 30Vdc. | | | |
| Operating frequency | | | 2kHz | 1.5kHz | 500Hz | |
| Temperature drift | | | ±15% max. of sensing distance for the -25 to +70˚C range, taking +25˚C as the standard temp. | ±10% max. of sensing distance for the −25 to +70˚C range, taking +25˚C as the standard temp. | | |
| Supply voltage drift | | | ±1% max. of sensing distance with ±15% voltage fluctuation, taking rated supply voltage as standard voltage | | | |
| Indicator lamps | | | N.O. type: Operation indication: lights up (orenge or green) upon output<br>Setting indication: lights up (green) in stable sensing area<br>N.C. type: Operation indication: orenge light goes out in sensing area | | | |
| Operating temperature | | | −25 to +70˚C | | | |
| Insulation resistance | | | 50MΩmin. (by 500Vdc megger) | | | |
| Dielectric strength | | | 1,000Vac, 50/60Hz for 1 minute | | | |
| Vibration resistance | | | 10 to 55Hz, 1.5mm peak-to-peak amplitude, 2 hrs each in X, Y and Z directions | | | |
| Shock resistance | | | 980m/s$^2$ 10 times each in X, Y and Z directions | | | |
| Protective structure | | | IP67 (IEC standard), IP67G (JEM standard) | | | |
| Weight (main unit with 2 m preleaded cable) | | | Approx. 50g | Approx. 60g | Approx. 130g | Approx. 230g |
| Circuit protection | | | Surge absorption, load short-circuit protection, reverse connection protection circuit | | | |
| Wiring method | | | Preleaded connector (30cm cable standard), preleaded (2m cable standard) | | | |
| Material | Sensor | Case | SUS | Ni-plated brass | | |
| | | Sensing face | PBT | | | |
| | Connector | Housing | Polyester elastomer | | | |
| | | Holder | Glass-lined polyester resin | | | |
| | | Contacts | Gold-plated brass | | | |

●**Connector type** **(Polarity type only)**

| Catalog listing | | | FL7M-3□6H(D)-CN | FL7M-7□6H(D)-CN | FL7M-10□6(D)-CN |
|---|---|---|---|---|---|
| Actuation method | | | High-frequency oscillation | | |
| Rated sensing distance | | | 3 ±0.3mm | 7 ±0.7mm | 10 ±1mm |
| Usable sensing distance | | | 0 to 2.1mm | 0 to 4.9mm | 0 to 7.0mm |
| Standard target object | | | 12 x 12 x 1mm iron | 18 x 18 x 1mm iron | 30 x 30 x 1mm iron |
| Differential travel | | | 15% max. of sensing distance | | |
| Rated supply voltage | | | 12/24Vdc | | |
| Operating voltage range | | | 10 to 30Vdc | | |
| Leakage current | | | 0.55mA max. | | |
| Control output | Switching current | | 3 to 100mA | | |
| | Voltage drop | | 3V max.<br>(with 100mA switching current, 2m cable) | | |
| | Output dielectric strength | | 30Vdc. | | |
| Operating frequency | | | 1.5kHz | 500Hz | |
| Temperature drift | | | ±10% max. of sensing distance for the -25 to +70˚C range, taking +25˚Cas the standard temp.<br>(in the -10 to +60˚Crange for the FL7M-7□6H□(D)-CN only) | | |
| Supply voltage drift | | | ±1% max. of sensing distance with ±15% voltage fluctuation, taking rated supply voltage as standard voltage | | |
| Indicator lamps | | | N.O. type: Operation indication: lights up (orenge or green) upon output<br>Setting indication: lights up (green) in stable sensing area<br>N.C. type: Operation indication: orenge light goes out in sensing area | | |
| Operating temperature | | | –25 to +70˚C | –10 to +60˚C | |
| Insulation resistance | | | 50MΩmin. (by 500Vdc megger) | | |
| Dielectric strength | | | 1,000Vac, 50/60Hz for 1 minute | | |
| Vibration resistance | | | 10 to 55Hz, 1.5mm peak-to-peak amplitude, 2 hrs each in X, Y and Z directions | | |
| Shock resistance | | | 980m/s$^2$ 10 times each in X, Y and Z directions | 490m/s$^2$ 10 times each in X, Y and Z directions | |
| Protective structure | | | IP67 (IEC standard) | | |
| Weight | | | Approx. 20g(main unit only) | Approx. 50g(main unit only) | Approx. 170g(main unit only) |
| Circuit protection | | | Surge absorption, load short-circuit protection, reverse connection protection circuit | | |
| Wiring method | | | Connector | | |
| Material | Sensor | Case | Ni-plated brass | | |
| | | Sensing face | PBT | | |
| | Connector | Housing | Ni-plated brass | | |
| | | Holder | Glass-lined polyester resin | | |
| | | Contacts | Tin-plated brass | | |

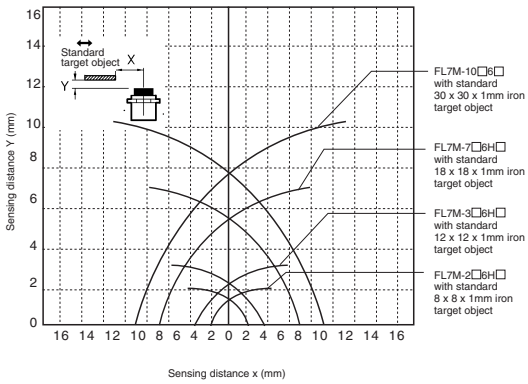
## USING THE SETTING INDICATOR

The proximity sensor can be set up to detect objects reliably by bringing the sensor progressively closer to the target object and installing the sensor at the point where the indicator lamp (N.O. indication) changes from red to green.



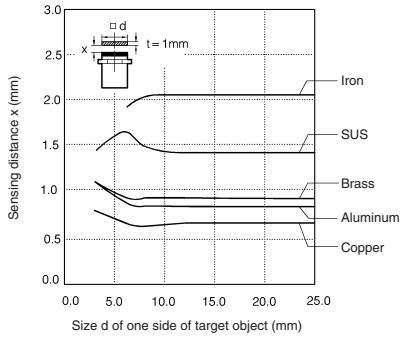

*When the target object is made of a different material (such as aluminum, copper or stainless steel) from the standard target object (iron), the distance at which the indicator lamp changes color is shorter than the 80% maximum.

## SENSING AREA (typical)

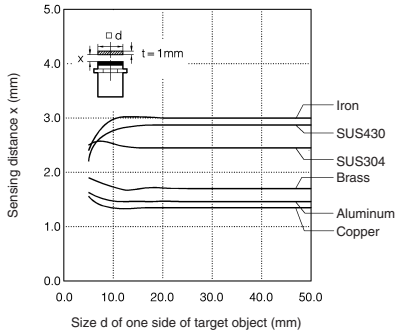



## SENSING DISTANCE ACCORDING TO MATERIAL AND SIZE OF OBJECT (typical)

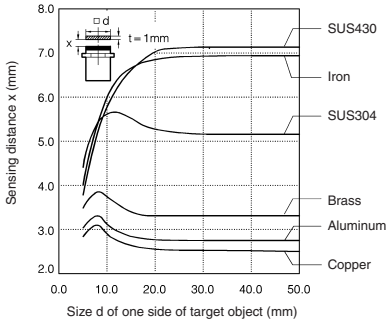
**FL7M-2□6H□**



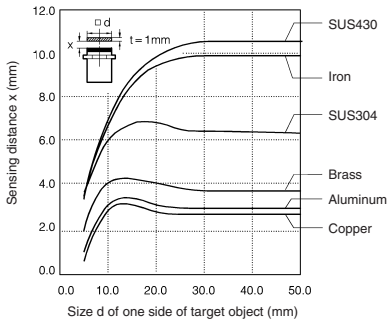

**FL7M-3□6H□**




**FL7M -7□6H□**

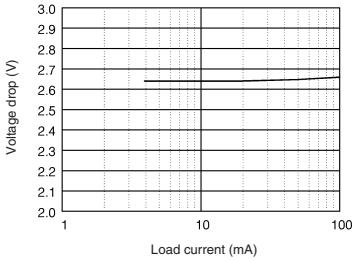



**FL7M -10□6□**

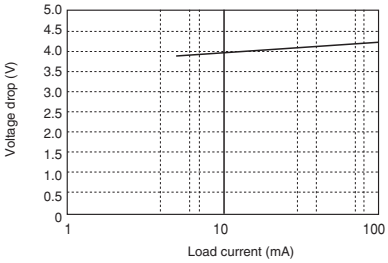



## VOLTAGE DROP (typical)

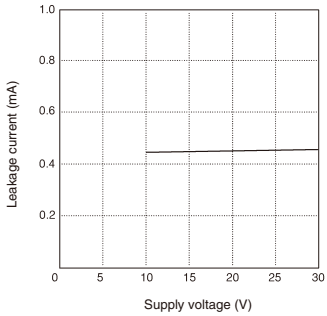
**Polarity type**




**No-polarity type**



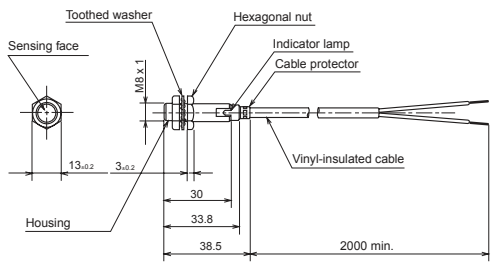
## LEAKAGE CURRENT (typical)




## EXTERNAL DIMENSIONS (unit: mm)

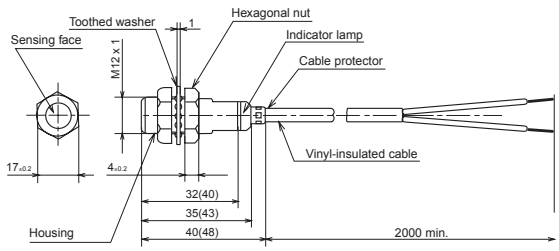
### Preloaded type

**FL7M-2□6H□**



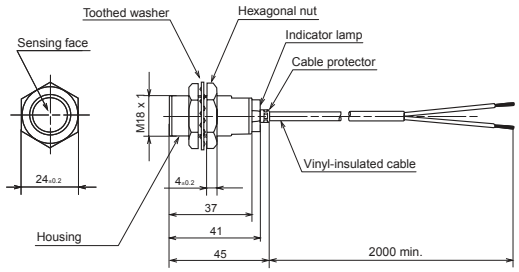

Vinyl-insulated cable (oil-resistant: 0.3mm$^2$, 27/0.12, 2-core), dia. 4.1.
Cap color: blue.

**FL7M-3□6H□□**



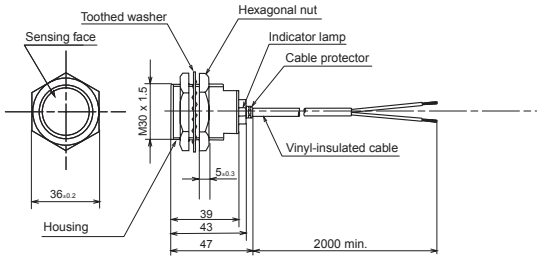

Numbers in parentheses indicate dimensions for the G type.
Vinyl-insulated cable (oil-resistant: 0.3mm$^2$, 27/0.12, 2-core), dia. 4.1.
Cap color: blue.

**FL7M-7□6H□**




Vinyl-insulated cable (oil-resistant: 0.5mm$^2$, 20/0.18, 2-core), dia. 5.7.
Cap color: blue.

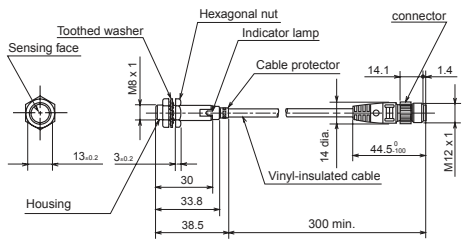
**FL7M-10□6□**




Vinyl-insulated cable (oil-resistant: 0.5mm$^2$, 20/0.18, 2-core), dia. 5.7.
Cap color: blue.

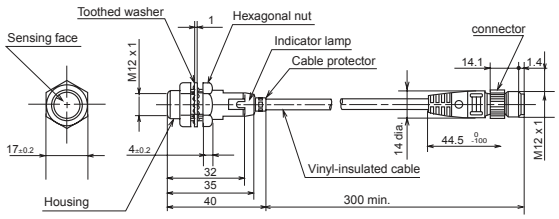
### Preloaded connector type

**FL7M-2□6H□-CN03**




Vinyl-insulated cable (vibration- and oil-resistant:
0.3mm$^2$, 27/0.12, 2-core), dia. 4.1.
Cap color: blue.

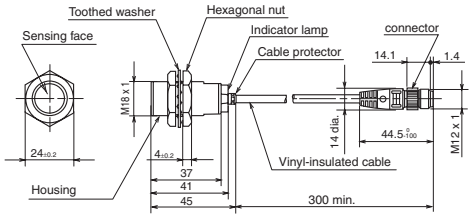
**FL7M-3□6H□-CN03**




Vinyl-insulated cable (vibration- and oil-resistant:
0.3mm$^2$, 27/0.12, 2-core), dia. 4.1.
Cap color: blue.

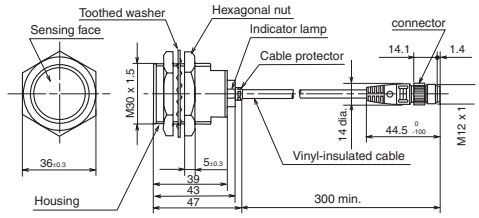
(unit: mm)

**FL7M-7□6H□-CN03**




Vinyl-insulated cable (vibration- and oil-resistant:
0.5mm², 20/0.18, 2-core), dia. 5.7.
Cap color: blue.

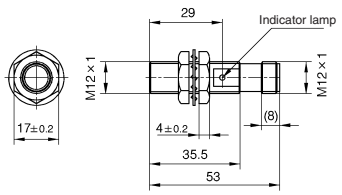
**FL7M-10□6□-CN03**




Vinyl-insulated cable (vibration- and oil-resistant:
0.5mm², 20/0.18, 2-core), dia. 5.7.
Cap color: blue.

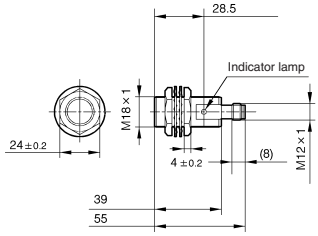
## Connector type (regular type only)

**FL7M-3□6H□-CN**



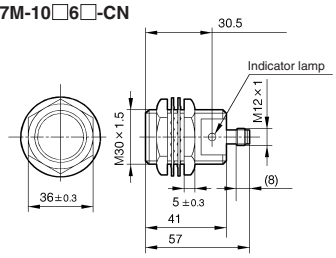

Cap color: blue.

**FL7M-7□6H□-CN**




Cap color: blue.

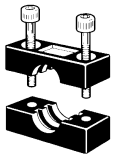
**FL7M-10□6□-CN**

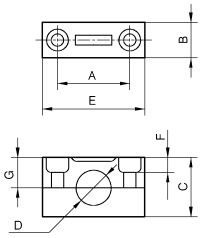



Cap color: blue.

## MOUNTING BRACKET (sold separately)

Mounting brackets are made of polyacetal resin.
Two screws and two washers are provided for each bracket.






**FL-PA118** and **FL-PA130** screw holes are oblong.

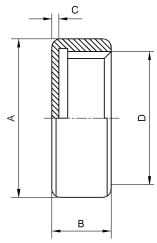
| Catalog listing | Dimensions (mm) | | | | | | | Screw size | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | Dia. | Neck |
| **FL-PA112** | 25 | 12 | 20 | 12dia. | 36 | 6 | 9.5 | M4 | 25 |
| **FL-PA118** | 30/32 | 15 | 30 | 18dia. | 45 | 7.5 | 14.5 | M5 | 35 |
| **FL-PA130** | 40/45 | 15 | 50 | 30dia. | 60 | 10 | 24.5 | M5 | 55 |

### Allowable tightening torque of bracket screws

| Catalog listing | Max. torque (N·m) |
|---|---|
| **FL-PA112** | 0.98 |
| **FL-PA118** | 1.5 |
| **FL-PA130** | 1.5 |

## PROTECTIVE COVER (sold separately)

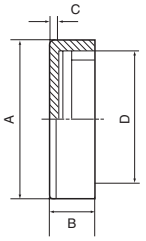
Protective covers made of polyacetal resin are available for shielded models.
Select a model according to the sensor's external dimensions.




| Catalog listing | Dimensions (mm) | | | |
|---|---|---|---|---|
| | A | B | C | D |
| **FL-PA12** | 14dia. | 5 | 0.5 | M12 x 1 |
| **FL-PA18** | 21dia. | 6 | 0.5 | M18 x 1 |
| **FL-PA30** | 33dia. | 8 | 1.5 | M30 x 1.5 |

## SPATTER-GUARDED PROTECTIVE COVER (sold separately)

Spatter-guarded protective covers made of fluorine resin and designed especially for shielded sensors are available.
Select a model according to the sensor's external dimensions.

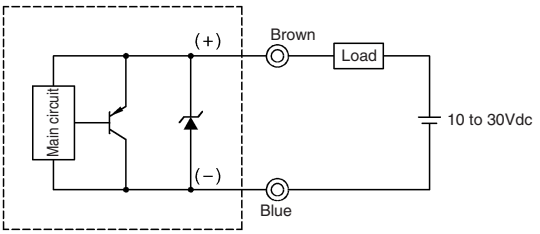



| Catalog listing | Dimensions (mm) | | | |
|---|---|---|---|---|
| | A | B | C | D |
| FL-PA08W | 10dia. | 5 | 0.5 | M8 x 1 |
| FL-PA12W | 15dia. | 5 | 0.7 | M12 x 1 |
| FL-PA18W | 22dia. | 6 | 0.7 | M18 x 1 |
| FL-PA30W | 34dia. | 8 | 1.5 | M30 x 1.5 |

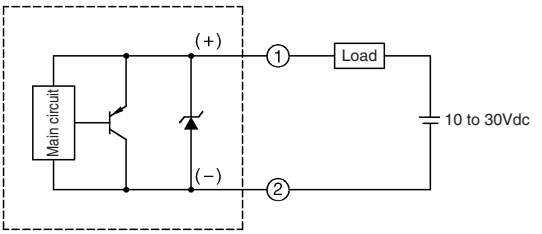
## WIRING DIAGRAMS

### ●Polarity type

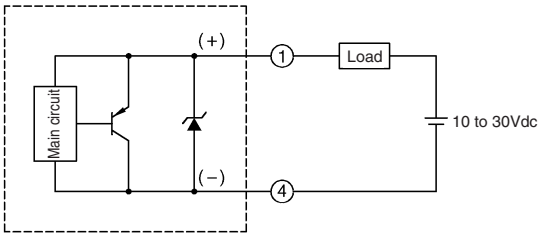
**Preleaded type**



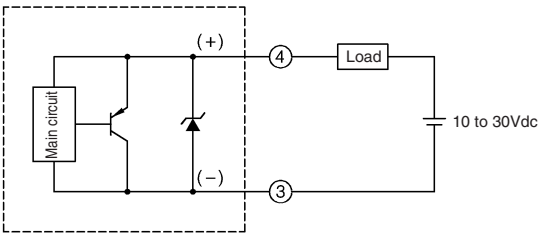

**(Preleaded connector / Connector) type (N.C.)**




**(Preleaded connector / Connector) type (N.O. : CN03, CN)**

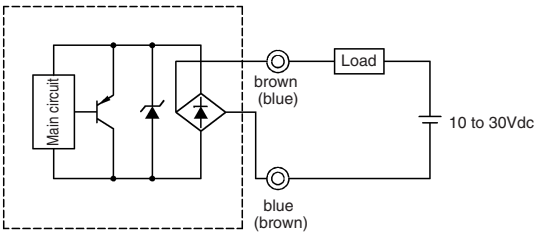



**(Preleaded connector / Connector) type (N.O. : CN03A, CNA)**

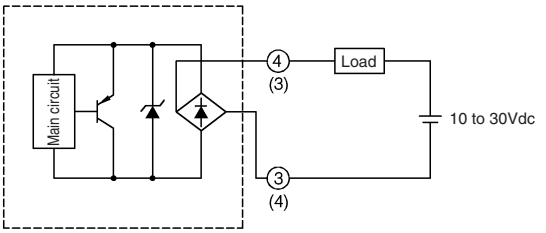



### ●No-polarity type

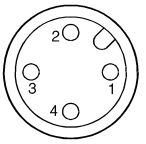
**Preleaded type**




**Preleaded connector type**




- The load may be connected to either pole.
- A load must be used when power is supplied to the sensor. Although there is short-circuit protection, a combination of a short circuit and wrong wiring can permanently damage the sensor.
- The LED operates normally during a load short circuit, so check the wiring if the output is wrong.
- Fasten connectors tightly by hand.



## CONNECTOR SPECIFICATIONS*1

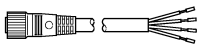
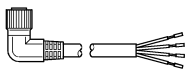
| Item | Specifications |
|---|---|
| **Insulation resistance** | Max. 100MΩ(by 500Vdc megger) |
| **Dielectric strength** | 1,500Vac for 1 minute (between contacts, and between contact and connector housing) |
| **Initial contact resistance** | Max. 40mΩ<br>(with 3A current to connected male and female connectors. Semiconductor lead-specific resistance not included.) |
| **Mating/unmating force** | 0.4 to 4.0 N per contact |
| **Mating cycles** | 50 |
| **Connector nut tightening torque** | Min. 0.8N·m*2 |
| **Cable pullout strength** | Min. 100 N |
| **Vibration resistance** | 10 to 55Hz, 1.5mm peak-to-peak amplitude, for 2 hours each in X, Y and Z directions |
| **Impact resistance** | 300m/s$^2$, 3 times each in X, Y and Z directions |
| **Protective structure** | IP67 |
| **Ambient operating temperature** | −10 to +70˚C |
| **Ambient storage temperature** | −20 to +80˚C |
| **Ambient operating humidity** | Max. 95% RH |
| **Material** | Contacts: Gold-plated brass<br>Contact holder: Glass-lined polyester resin<br>Housing: Polyester elastomer<br>Coupling: Ni-plated brass<br>O-ring: NBR |

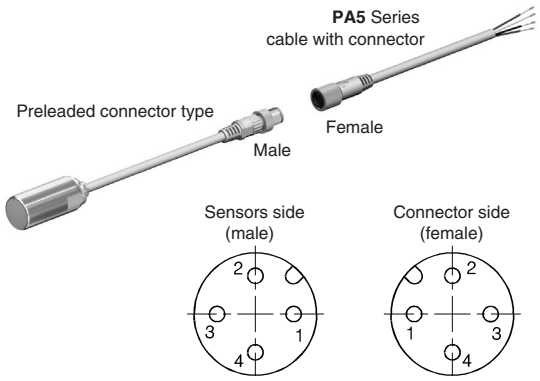
*1: Specifications assume Yamatake male/female connectors.
*2: The recommended torque is 0.4 to 0.6N-m. If fastened poorly, the IP67 protection is lost, or looseness occurs. Fasten the connector securely by hand.

## CABLE WITH CONNECTOR

Be sure to use **PA5** Series cables with connector to connect preleaded type connectors and connector type limit switches.

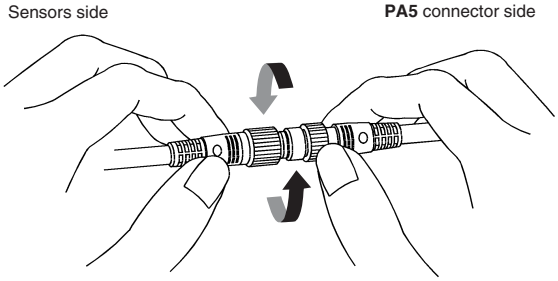
### ●PA5 Series cable with connector

| Shape | Power supply | Cable properties | Cable length | Catalog listing | Lead colors |
|---|---|---|---|---|---|
|  | DC | **Oil-resistant, flexible; UL2464; flame-resistant; EN-compliant** | 2m | **PA5-4ISX2MK-E** | 1: brown, 2: white, 3: blue, 4: black |
| | | | 5m | **PA5-4ISX5MK-E** | 1: brown, 2: white, 3: blue, 4: black |
|  | | | 2m | **PA5-4ILX2MK-E** | 1: brown, 2: white, 3: blue, 4: black |
| | | | 5m | **PA5-4ILX5MK-E** | 1: brown, 2: white, 3: blue, 4: black |




### ● Tightening the connector

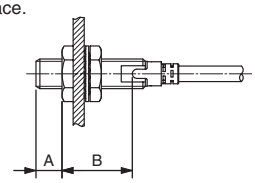
Align the grooves and rotate the fastening nut on the **PA5** connector by hand until it fits tightly with the connector on the sensors side.



# PRECAUTIONS FOR USE

## 1. Mounting

The allowable tightening torque varies according to the distance from the sensing face.

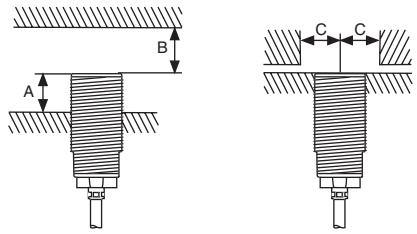



| Catalog listing | | Length A (mm) | Max. tightening torque (N·m) | |
|---|---|---|---|---|
| | | | A | B |
| Firefly indicator type | FL7M-2□6□ | 10 | 9 | 12 |
| | FL7M-3□6□ | 10 | 20 | 30 |
| | FL7M-7□6□ | 0 | — | 70 |
| | FL7M-10□6□ | 0 | — | 150 |
| Window indicator type | FL7M-3□6H□ | 12 | 11.8 | 19.6 |
| | FL7M-7□6H□ | 15 | 29.4 | 49 |
| | FL7M-10□6□ | 17 | 49 | 147 |

*The table shows the allowable tightening torque when toothed washers (provided) are used.

## 2. Influence of surrounding metal

Metal other than the target object surrounding the sensor may influence operating characteristics. Leave space between the sensor and surrounding metal as shown below.




Shaded areas indicate surrounding metal other than the target object.

**A:** Distance from sensing face of proximity sensor to mounting surface

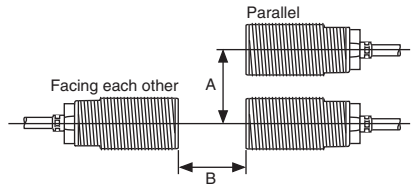
**B:** Distance from surface of iron plate to sensing face of proximity sensor.

**C:** Distance from surface of iron plate to center of proximity switch when A=0

| Catalog listing | A(mm) | B(mm) | C(mm) |
|---|---|---|---|
| FL7M-2□6H□ | 0 | 8 | 8 |
| FL7M-3□6H□ | 0 | 8 | 9 |
| FL7M-7□6H□ | 0 | 20 | 13.5 |
| FL7M-10□6□ | 0 | 40 | 22.5 |

## 3. Mutual interference prevention

When mounting proximity sensors either parallel to or facing each other, mutual interference may cause the sensor to malfunction. Maintain at least the distances indicated in the figures below.



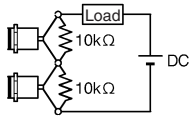

| Catalog listing | A(mm) | B(mm) |
|---|---|---|
| FL7□-2□6H□ | 16 | 20 |
| FL7M-3□6H□ | 20 | 30 |
| FL7M-7□6H□ | 35 | 50 |
| FL7M-10□6□ | 70 | 100 |

## 4. Cautions for series or parallel connection

**4.1 Series connection (AND switching circuit)**

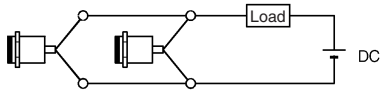
When connecting two or more proximity sensors in series, erroneous output (1 to 3ms) may occur without the rated current being supplied to each of the sensors. For this reason, series connection of proximity sensors is not recommended. However, if proximity sensors must be connected in series, a resistor of 10kΩ must be put in parallel to each of the sensors. Note that the maximum leakage current in a series connection will be 3.5mA. Operation lag also will occur, resulting in increased voltage drop, and the operation indicator lamp will not light.

Operation lag =
40ms x (No. of sensors in series - 1)
Voltage drop =
Voltage drop of single sensor x
No. of sensors in series




**4.2 Parallel connection (OR switching circuit)**

- If two or more proximity sensors are connected in parallel, total leakage current increases according to the following formula, and may result in the load not turning OFF. (Leakage current = Leakage current of single sensor x No. of sensors in parallel)
- When two or more sensors in parallel turn ON, one (or more) of




## 5. Relay loads

The voltage drop of these **FL7M** sensors is 3.3V. Pay attention to this voltage drop when using a relay load. (With 12Vdc relays, switching is not possible.)

## 6. Operation upon power ON

After the power is turned ON, it takes at most 40ms until the proximity sensor is ready for sensing. If the load and the proximity sensor use different power supplies, be sure to turn the proximity sensor ON before turning the load ON.

## 7. Influence of leakage current

A minimal current flows as leakage current for operating the circuits even when the proximity sensor is OFF. Keep this in mind when turning off connected loads.

## 8. Minimum cable bend radius (R)

The minimum bend radius (R) of the cable is 3 times the cable diameter. Take care not to bend the cable beyond this radius. Also, do not excessively bend the cable within 30mm of the cable lead-in port.