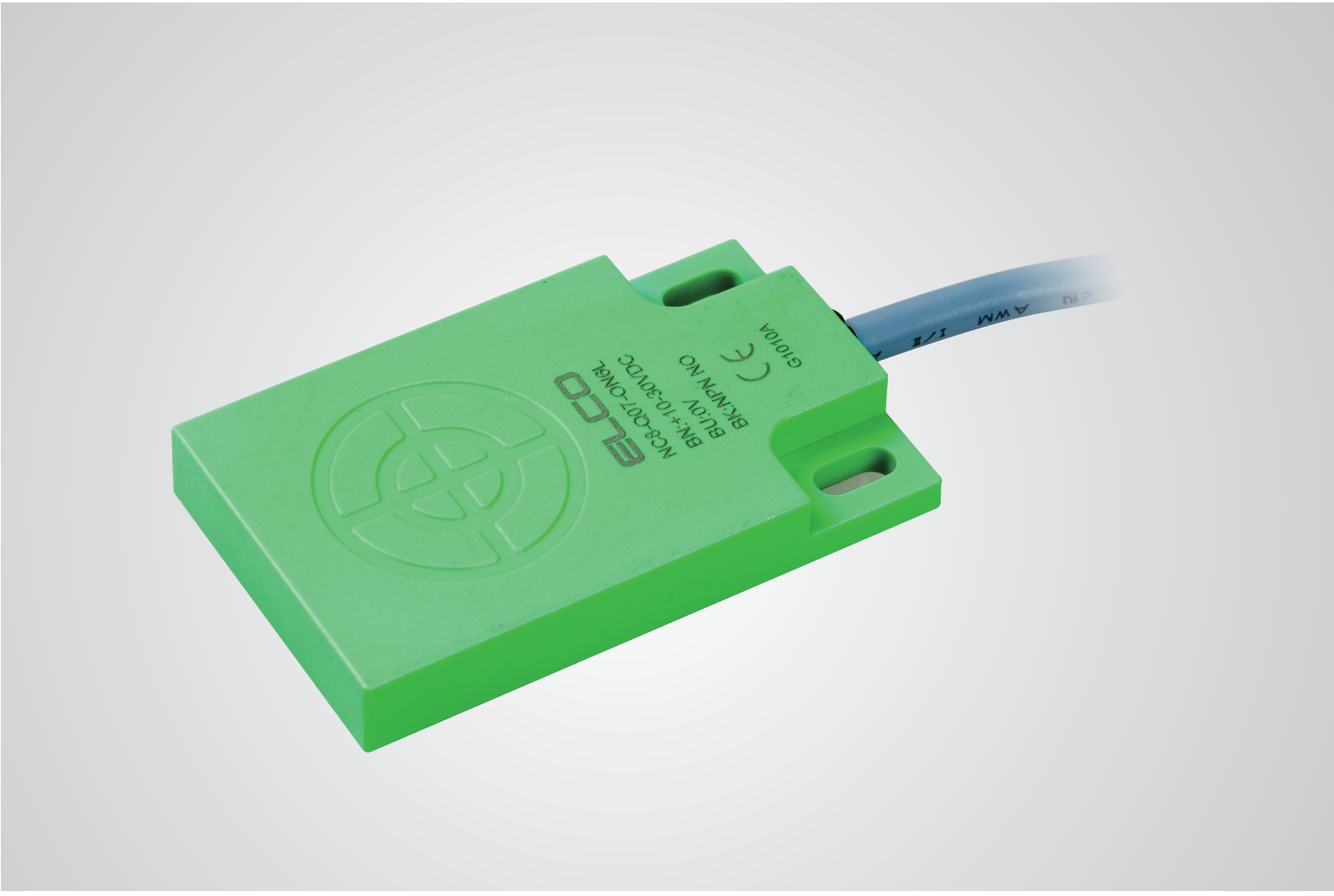


Capacitive Sensors

<< Capactive sensor

Introduction

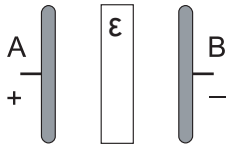
Operating Principle

The active element is formed by two metallic electrodes positioned much like an “opened” capacitor (Fig. 1). Electrodes A and B are placed in a feedback loop of a high frequency oscillator. When no target is present, the sensor’s capacitance is low, therefore the oscillation amplitude is small. When a target approaches the surface of the sensor, it increases the capacitance. This increase in capacitance results in an increased amplitude of oscillation. The amplitude of oscillation is measured by an evaluating circuit that generates a signal to turn on or off the output (Fig.2).

Switching Distance and Dielectric Constants

The switching distance of capacitive sensors is different. The maximum switching distance can be obtained by detecting metallic conductor (metal). When the metal is detected with a capacitive sensor, the attenuation coefficient for different metals is contrary to that of the inductive sensors. The switching distance of dielectric depends on the dielectric constant. The larger the dielectric constant of the object is, the longer switching distance is obtained.

The switching distance (Sr) is dependent on the dielectric constant (εr) of the target object. The maximum switching distance (100 %) is achieved with metallic objects while it is reduced with other materials in proportion to the dielectric constant of the target object.



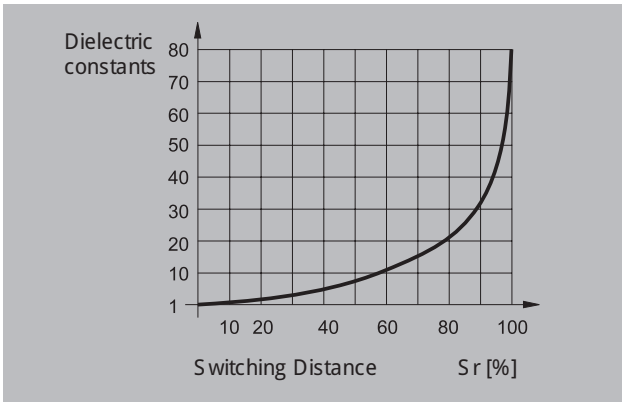


Table 1 (below) shows the dielectric constants of some important materials. As a result of the high dielectric constant value of water, wood exhibits relatively large fluctuations.Damp wood is therefore considerably better detected by capacitive sensors than dry wood.

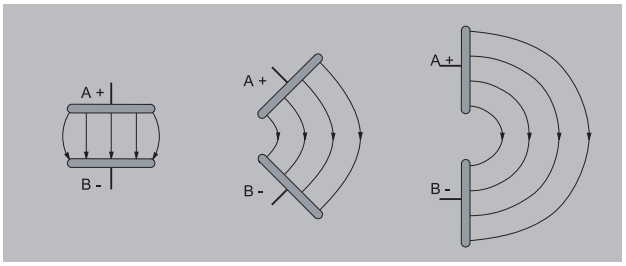


Fig. 1 Sensing Surface

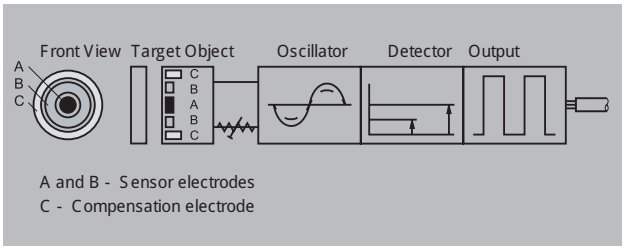


Fig. 2 Capacitive Sensors - Operating Principle

Table 1

Material	Dielectric constants
Air. vacuum	1
Teflon	2
Wood	2...7
Paraffin	2.2
Petroleum	2.2
Terpentine oil	2.2
Transformer oil	2.2
Paper	2.3
Polyethylene	2.3
Polypropylene	2.3
Cable compound	2.5
Soft rubber	2.5
Silicone rubber	2.8
PVC	2.9
Polystyrene	3
Celluloid	3
Perspex	3.6
Araldite	3.6
Bakelite	3.6
Quartz glass	3.7
Hard rubber	4
Oiled paper	4
Pressboard	4
Porcelain	4.4
Laminated paper	4.5
Quartz sand	4.5
Glass	5
Polyamide	5
Mica	6
Marble	8
Alcohol	25.8
Water	80

Housing material

Plastic and metal housing

Target Object

Capacitive sensors are used for non-contact and non-destructive detection of metals (metallic conductor) and nonmetals (dielectric).

Types of interaction

Capacitive sensors are actuated by both conductive and non-conductive objects. Objects made of conductive materials form a counter-electrode to the sensor's active face. This forms two capacities, CA and CB connected in series, with the electrode surfaces A and B (Fig. 3). The capacity of this serial connection is always greater than the capacity of the uncovered electrodes A and B. Metals achieve the highest switching distances due to their very high conductivity. Reduction factors for differing metals – like those of inductive sensors – must be taken into account. Actuation by objects made of non-conductive materials (insulators): when one places an insulator between the electrodes of a condenser the capacity increases with the dielectric constant ε (Fig. 4) of the insulator.

The dielectric constant of all solids and liquids is greater than air (ε air = 1; see Table 2). Similarly, objects made of non-conductive materials have an effect on the active face of a capacitive sensor by increasing the coupling capacity. Materials with greater dielectric constants achieve longer switching distances. When scanning organic materials (wood, grain, etc.) it should be noted that the achievable switching distance is very strongly influenced by the water content (εwater = 80!)

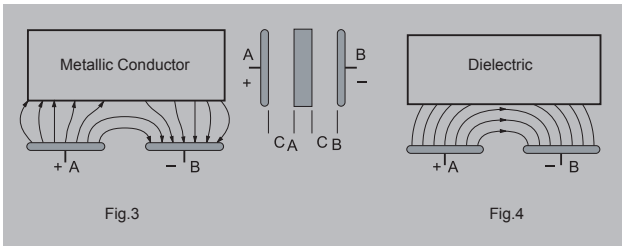


Fig.3 Fig.4

Switching distance adjustment

Almost all ELCO capacitive sensors can be adapted to specific applications by adjusting the potentiometer.

Type Code

Special Function
Null: Standard

Rating Operating Distance Sn
2mm

Principle
C: Capacitive Sensors

Mounting
F: Flush
N:Non-flush

Additional Information
Null:
Standard Length

Size
M12*1

Specifications
M: Metal Threaded Barrel
P: Plastic Threaded Barrel
S: Plastic Smooth Barrel
Q: Rectangular

Housing Material
Null: Brass Nickel-plate
K: Stainless Steel

Function Display
LED

Voltage Range
3:20--250VAC
41:20--250VAC
20--250VDC
6:10--30 VDC

Output Type
N: NPN
P: PNP
SA: AC

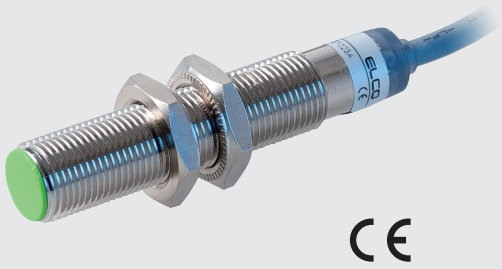
Output Function
O: NO
C: NC
B: Change-over

Special Function
Null: No Special Function

Connection
Null: Cable 2m
Q: Screw Terminal
Q8: M8*1
Q12: M12*1

<< Capactive sensor

Metal Barrel-M12



Description:

Brass nickel-plated, threaded barrel, DC 3-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC2-M12-OP6L	2mm	Flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
FC2-M12-ON6L	2mm	Flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
FC2-M12-CP6L	2mm	Flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
FC2-M12-CN6L	2mm	Flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
NC4-M12-OP6L	4mm	Non-flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
NC4-M12-ON6L	4mm	Non-flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
NC4-M12-CP6L	4mm	Non-flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
NC4-M12-CN6L	4mm	Non-flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
FC2-M12-OP6L-Q12	2mm	Flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
FC2-M12-ON6L-Q12	2mm	Flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
FC2-M12-CP6L-Q12	2mm	Flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
FC2-M12-CN6L-Q12	2mm	Flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
NC4-M12-OP6L-Q12	4mm	Non-flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4
NC4-M12-ON6L-Q12	4mm	Non-flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4
NC4-M12-CP6L-Q12	4mm	Non-flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4
NC4-M12-CN6L-Q12	4mm	Non-flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4

Dimensions:

Fig.1

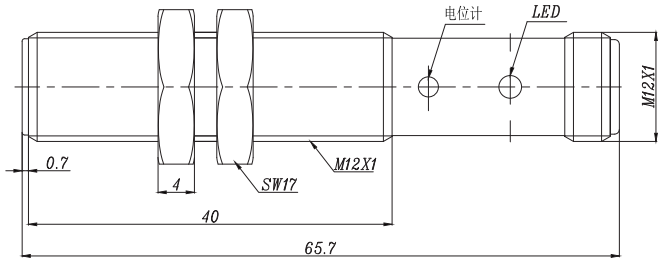


Fig.2

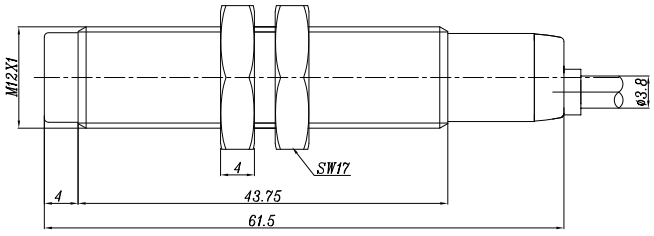


Fig.3

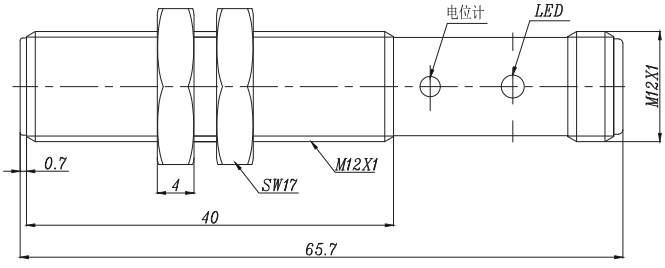
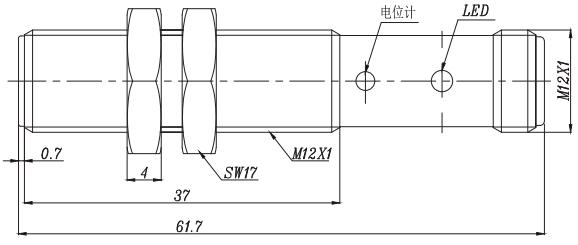


Fig.4



Description:

Brass nickel-plated, threaded barrel, DC 4-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC2-M12-BP6L	2mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
FC2-M12-BN6L	2mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
NC4-M12-BP6L	4mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
NC4-M12-BN6L	4mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
FC2-M12-BP6L-Q12	2mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
FC2-M12-BN6L-Q12	2mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
NC4-M12-BP6L-Q12	4mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4
NC4-M12-BN6L-Q12	4mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4

Dimensions:

Fig.1

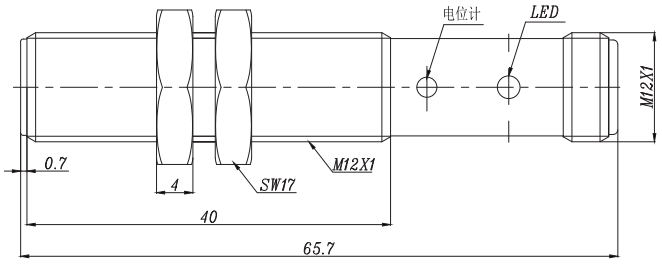


Fig.2

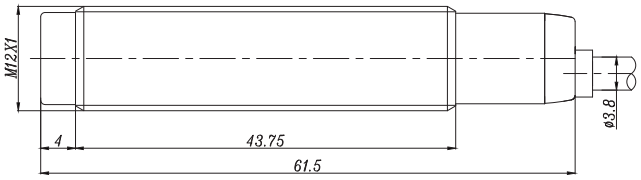


Fig.3

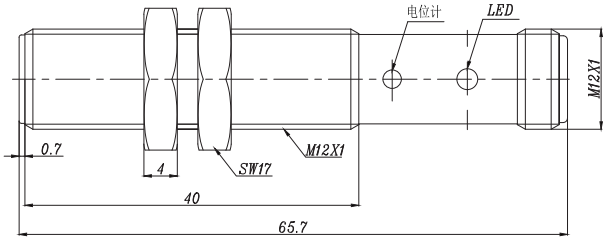
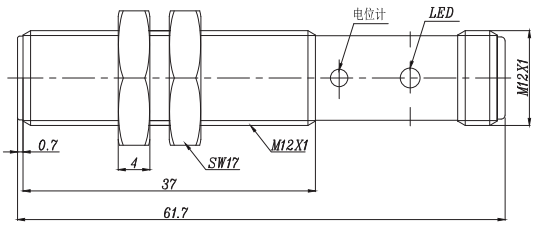


Fig.4



<< Capactive sensor

Metal Barrel-M18

Description:

Brass nickel-plated, threaded barrel, DC 3-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC5-M18-OP6L	5mm	Flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC5-M18-ON6L	5mm	Flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC5-M18-CP6L	5mm	Flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC5-M18-CN6L	5mm	Flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
NC8-M18-OP6L	8mm	Non-flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC8-M18-ON6L	8mm	Non-flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC8-M18-CP6L	8mm	Non-flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC8-M18-CN6L	8mm	Non-flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
FC5-M18-OP6L-Q12	5mm	Flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC5-M18-ON6L-Q12	5mm	Flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC5-M18-CP6L-Q12	5mm	Flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC5-M18-CN6L-Q12	5mm	Flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
NC8-M18-OP6L-Q12	8mm	Non-flush	PNP NO	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC8-M18-ON6L-Q12	8mm	Non-flush	NPN NO	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC8-M18-CP6L-Q12	8mm	Non-flush	PNP NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC8-M18-CN6L-Q12	8mm	Non-flush	NPN NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4

Dimensions:

Fig.1

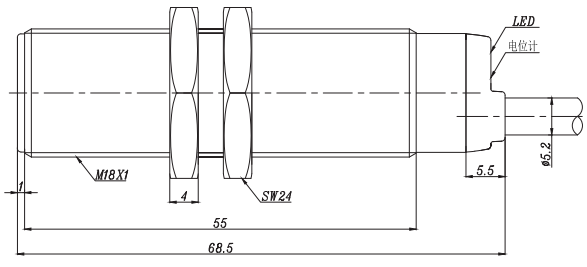


Fig.2

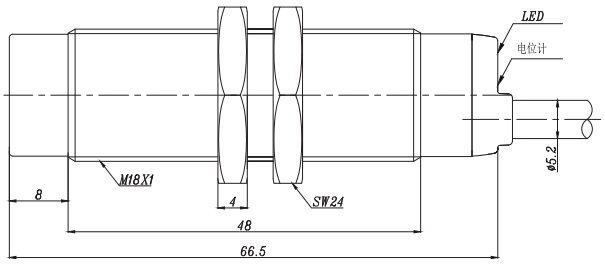


Fig.3

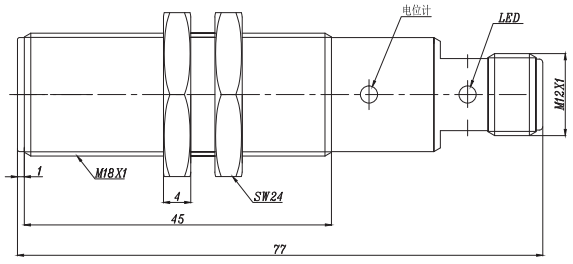
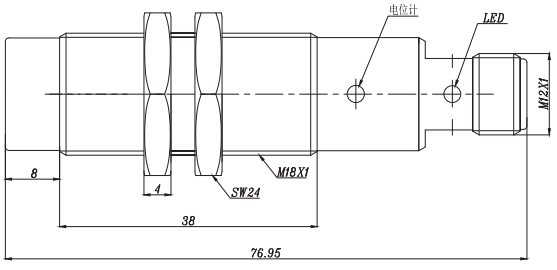


Fig.4



Description:

Brass nickel-plated, threaded barrel, DC 4-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC5-M18-BP6L	5mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC5-M18-BN6L	5mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
NC8-M18-BP6L	8mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC8-M18-BN6L	8mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
FC5-M18-BP6L-Q12	5mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC5-M18-BN6L-Q12	5mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
NC8-M18-BP6L-Q12	8mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC8-M18-BN6L-Q12	8mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4

Dimensions:

Fig.1

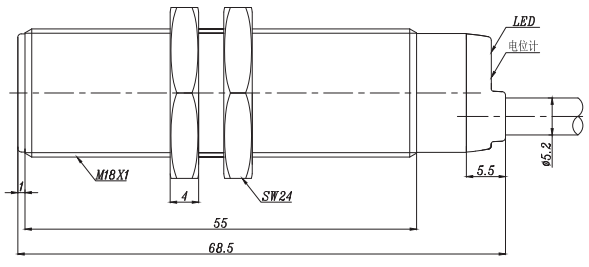


Fig.2

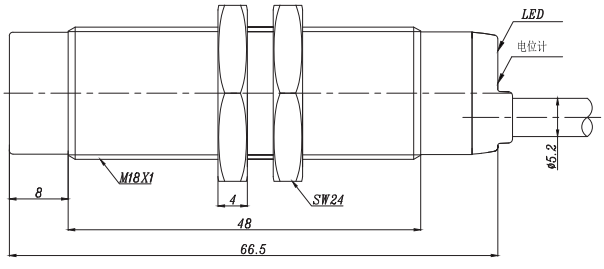


Fig.3

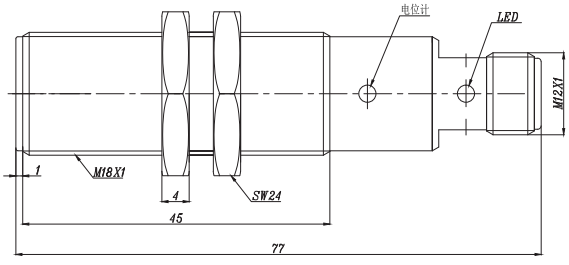
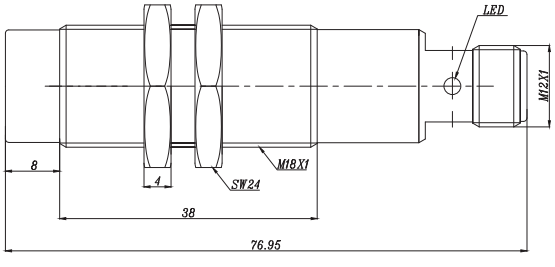


Fig.4



<< Capactive sensor

Metal Barrel-M18

Description:

Brass nickel-plated, threaded barrel, AC 2-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC5-M18-OSA3L	5mm	Flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70˚C	2m cable	Fig.1
FC5-M18-CSA3L	5mm	Flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70˚C	2m cable	Fig.1
NC8-M18-OSA3L	8mm	Non-flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70˚C	2m cable	Fig.2
NC8-M18-CSA3L	8mm	Non-flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70˚C	2m cable	Fig.2
FC5-M18-OSA3L-Q12	5mm	Flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70˚C	M12 Connector	Fig.3
FC5-M18-CSA3L-Q12	5mm	Flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70˚C	M12 Connector	Fig.3
NC8-M18-OSA3L-Q12	8mm	Non-flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70˚C	M12 Connector	Fig.4
NC8-M18-CSA3L-Q12	8mm	Non-flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70˚C	M12 Connector	Fig.4

Dimensions:

Fig.1

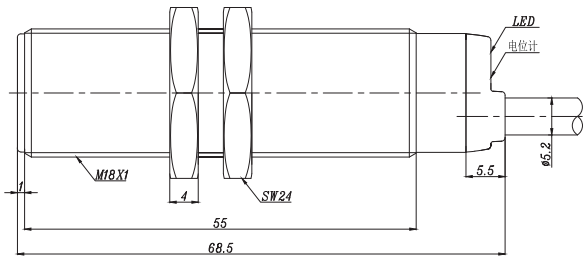


Fig.2

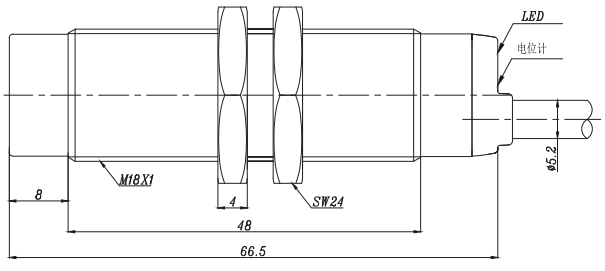


Fig.3

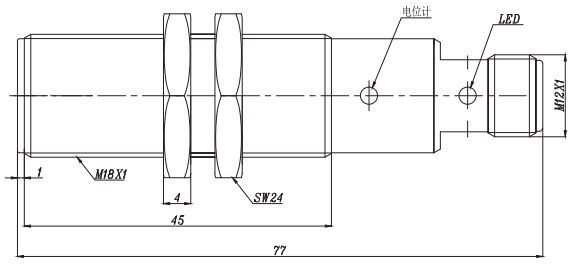
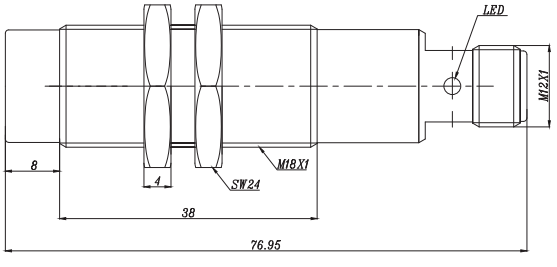
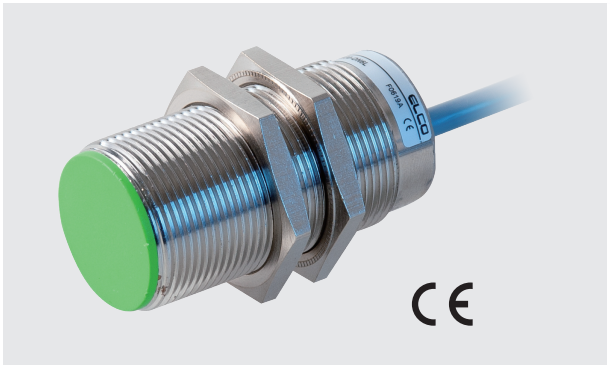


Fig.4





Description:

Brass nickel-plated, threaded barrel, DC 3-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC10-M30-OP6L	10mm	Flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC10-M30-ON6L	10mm	Flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC10-M30-CP6L	10mm	Flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
FC10-M30-CN6L	10mm	Flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.1
NC15-M30-OP6L	15mm	Non-flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC15-M30-ON6L	15mm	Non-flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC15-M30-CP6L	15mm	Non-flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
NC15-M30-CN6L	15mm	Non-flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	2m cable	Fig.2
FC10-M30-OP6L-Q12	10mm	Flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC10-M30-ON6L-Q12	10mm	Flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC10-M30-CP6L-Q12	10mm	Flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
FC10-M30-CN6L-Q12	10mm	Flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.3
NC15-M30-OP6L-Q12	15mm	Non-flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC15-M30-ON6L-Q12	15mm	Non-flush	AC NO	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC15-M30-CP6L-Q12	15mm	Non-flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4
NC15-M30-CN6L-Q12	15mm	Non-flush	AC NC	20...250VAC	≤200mA	50Hz	-25...70˚C	M12 Connector	Fig.4

Dimensions:

Fig.1

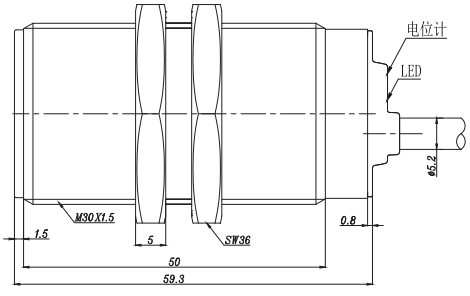


Fig.2

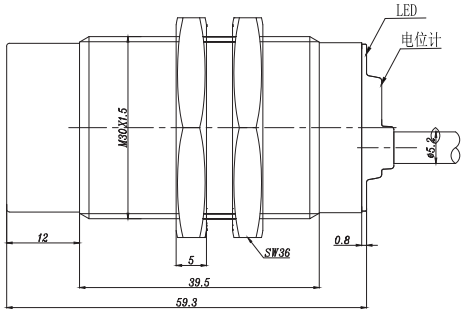


Fig.3

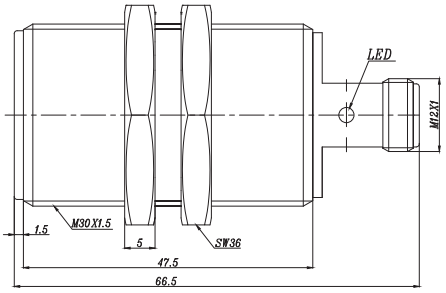
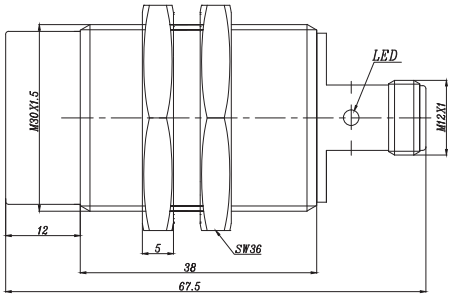
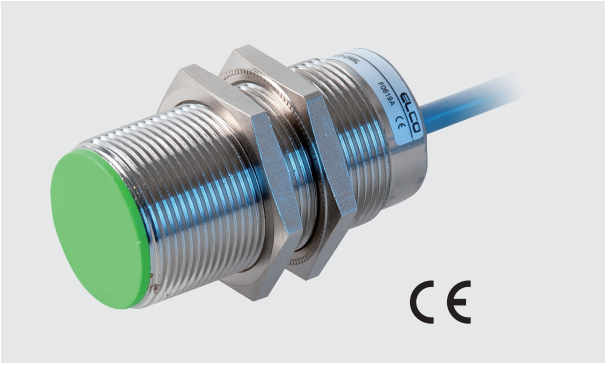


Fig.4



<< Capactive sensor

Metal Barrel-M30



Description:

Brass nickel-plated, threaded barrel, DC 4-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC10-M30-BP6L	10mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
FC10-M30-BN6L	10mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.1
NC15-M30-BP6L	15mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
NC15-M30-BN6L	15mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	2m cable	Fig.2
FC10-M30-BP6L-Q12	10mm	Flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
FC10-M30-BN6L-Q12	10mm	Flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.3
NC15-M30-BP6L-Q12	15mm	Non-flush	PNP NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4
NC15-M30-BN6L-Q12	15mm	Non-flush	NPN NO+NC	10...30VDC	≤200mA	50Hz	-25...70℃	M12 Connector	Fig.4

Dimensions:

Fig.1

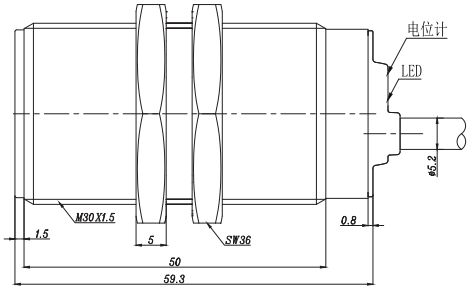


Fig.2

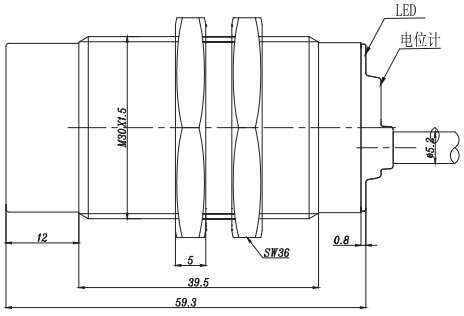


Fig.3

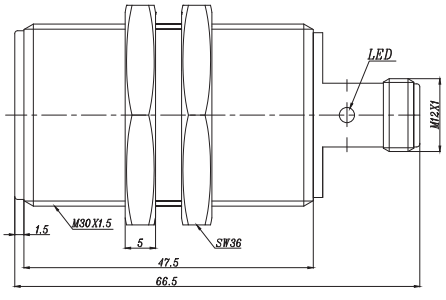
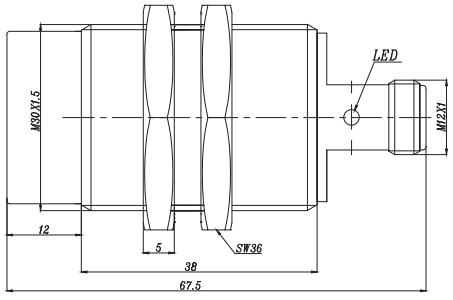
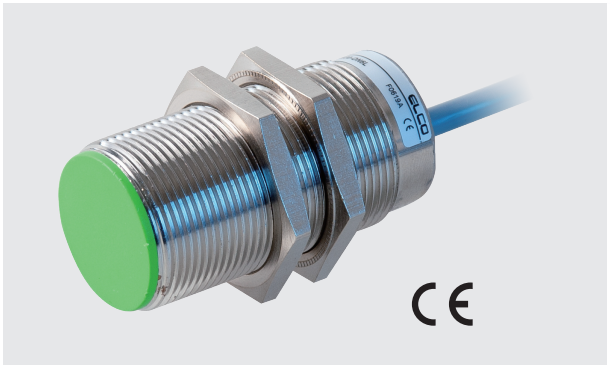


Fig.4





Description:

Brass nickel-plated, threaded barrel, AC 2-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
FC10-M30-OSA3L	10mm	Flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70℃	2m cable	Fig.1
FC10-M30-CSA3L	10mm	Flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70℃	2m cable	Fig.1
NC15-M30-CSA3L	15mm	Non-flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70℃	2m cable	Fig.2
NC15-M30-OSA3L	15mm	Non-flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70℃	2m cable	Fig.2
FC10-M30-OSA3L-Q12	10mm	Flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70℃	M12 Connector	Fig.3
FC10-M30-CSA3L-Q12	10mm	Flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70℃	M12 Connector	Fig.3
NC15-M30-OSA3L-Q12	15mm	Non-flush	AC NO	20...250VAC	≤200mA	15Hz	-25...70℃	M12 Connector	Fig.4
NC15-M30-CSA3L-Q12	15mm	Non-flush	AC NC	20...250VAC	≤200mA	15Hz	-25...70℃	M12 Connector	Fig.4

Dimensions:

Fig.1

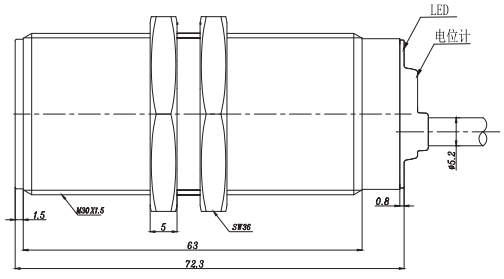


Fig.2

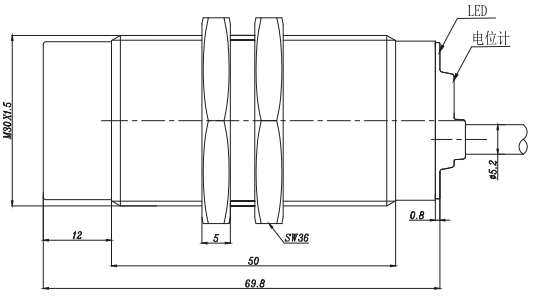


Fig.3

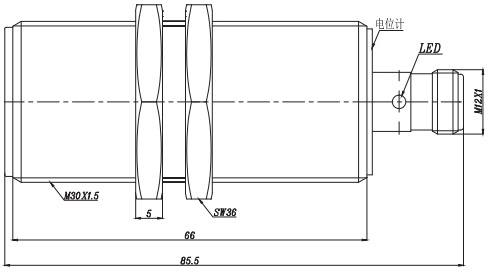
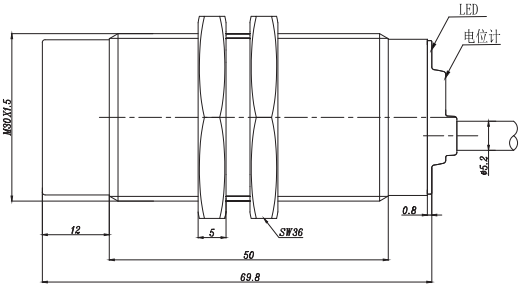


Fig.4



<< Capactive sensor

Plastic Rectangular -Q07

Description:

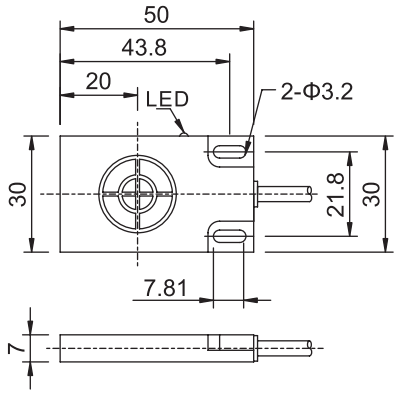
Plastic housing, rectangular 30x50x7mm, DC 3-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

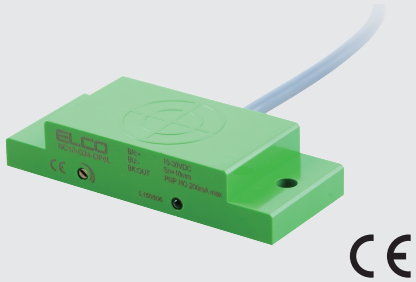
Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
NC8-Q07-OP6L	8mm	Non-flush	PNP NO	10...30VDC	≤200mA	30Hz	-25...70℃	2m cable	Fig.1
NC8-Q07-ON6L	8mm	Non-flush	NPN NO	10...30VDC	≤200mA	30Hz	-25...70℃	2m cable	Fig.1
NC8-Q07-CP6L	8mm	Non-flush	PNP NC	10...30VDC	≤200mA	30Hz	-25...70℃	2m cable	Fig.1
NC8-Q07-CN6L	8mm	Non-flush	NPN NC	10...30VDC	≤200mA	30Hz	-25...70℃	2m cable	Fig.1

Dimensions:

Fig.1





Description:

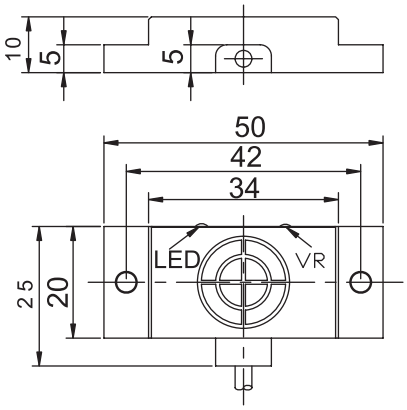
Plastic housing, rectangular 50x20x10mm, DC 3-wire output, potentiometer adjustment, IP67 protection class, LED indicator.

Technical Data:

Type	Rated Operating Distance Sn	Mounting	Output	Voltage Range U_B	Rated Current	Switching Frequency	Ambient Temperature	Connection	Fig
NC10-Q34-OP6L	10mm	Non-flush	PNP NO	10...30VDC	≤200mA	30Hz	-25...70˚C	2m cable	Fig.1
NC10-Q34-ON6L	10mm	Non-flush	NPN NO	10...30VDC	≤200mA	30Hz	-25...70˚C	2m cable	Fig.1
NC10-Q34-CP6L	10mm	Non-flush	PNP NC	10...30VDC	≤200mA	30Hz	-25...70˚C	2m cable	Fig.1
NC10-Q34-CN6L	10mm	Non-flush	NPN NC	10...30VDC	≤200mA	30Hz	-25...70˚C	2m cable	Fig.1

Dimensions:

Fig.1



Type Code

Product Category

C-type
Q-type

Shape

Null: Straight
B: Angled

Gender

Null: Male
O: Female

Size

M8*1
M12*1

No. of Pin

2: 2-pin
(2.2, 2.21, 2.22 different pin sequence)
3: 3-pin
4: 4-pin
5: 5-pin
8: 8-pin

Cable length

Standard Length: 2m

Specification

Null: Single Pre-wired

Product Category

C-type
Q-type

Shape

Null: Straight
B: Angled

Size

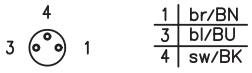
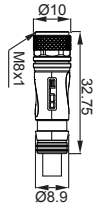
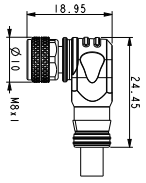
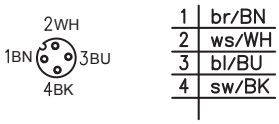
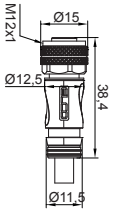
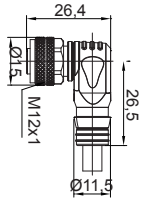
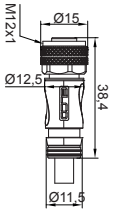
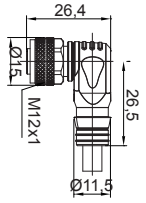
M8*1
M12*1

No. of Pin

3：3-pin
4：4-pin
5：5-pin
8：8-pin

Special Function and Cable Material

Null: PVC
P: PUR
WS: Shielded
L: PNP LED
LN: NPN LED
EWSR: Welding spark resistance

Size and Pin Assignment	Connector	
	Straight	Angled
M8  1 br/BN 3 bl/BU 4 sw/BK	 CO8.3-2 CO8.3-5 CO8.3-10	 CBO8.3-2 CBO8.3-5 CBO8.3-10
M12  1 br/BN 2 ws/WH 3 bl/BU 4 sw/BK	 CO12.4-2 CO12.4-5 CO12.4-10	 CBO12.4-2 CBO12.4-5 CBO12.4-10
M12  1 br/BN 2 bl/BU	 CO12.21-2/NE CO12.21-5/NE CO12.21-10/NE	 CBO12.21-2/NE CBO12.21-5/NE CBO12.21-10/NE

Note:Provide customized sensor with any specification and cable length (2m,5m,10m).

Order code for field-attachable connector

Product Category

L: Field-attachable Connector

Connection

S: Screw
J: Welding①

Shape

Null: Straight
B: Angled

Gender

Null: Male
O: Female②

Size

M8×1
M12×1

Special Function

Null: Special Function③
M/S: Shielded Metal Housing
C: Standard Product④

Thread Standard

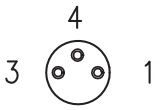
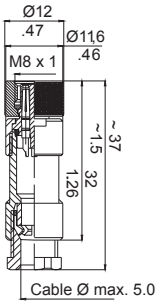
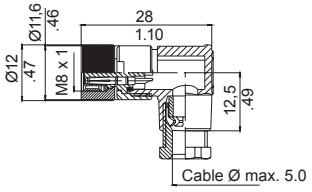
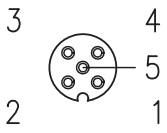
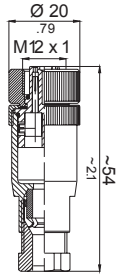
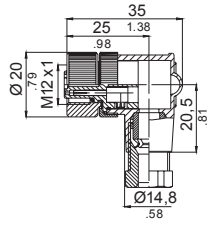
0: PG7
9: PG9

No of Pin⑤

3: 3-pin
4: 4-pin
5: 5-pin
8: 8-pin

Remarks:

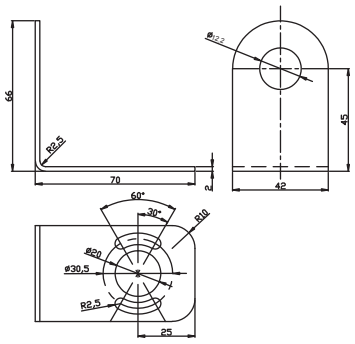
①: Welding wiring for part of M8 and all M23 series products
②: Mark "O" for female end
③: Null for M23 series products
④: If no special requirements, Elco supply preferred products to customer to facilitate field wiring (Only for the M8, M12 series products with screw connection).
⑤: Only supply metal housing for 19-pin products

Sensor	Connector	
	Straight	Angled
M8 	 LSO8.3-0/C	 LSBO8.3-0/C
M12 	 LSO12.4-0/C LSO12.5-0/C	 LSBO12.4-0/C LSBO12.5-0/C

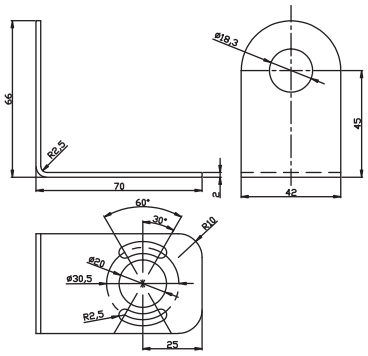
Note: Provide customized sensor with any specification and cable.

Mounting Bracket:

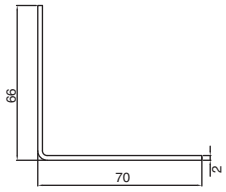
M12 series stainless steel mounting bracket
EO12DF



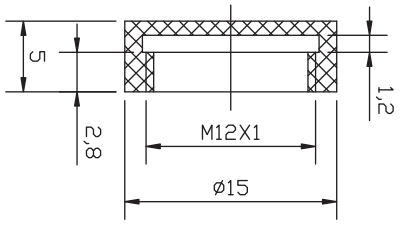
M18 series stainless steel mounting bracket
EO18DF



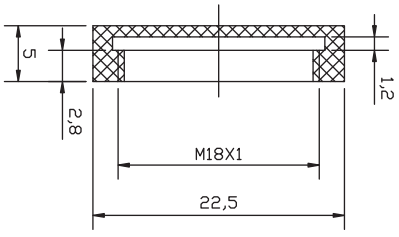
M30 series stainless steel mounting bracket
EO30DF



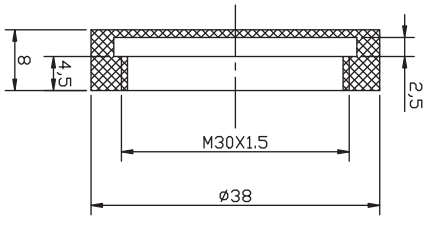
M12 series protective cap
Telfon
AS-FCM12



M18 series protective cap
Telfon
AS-FCM18



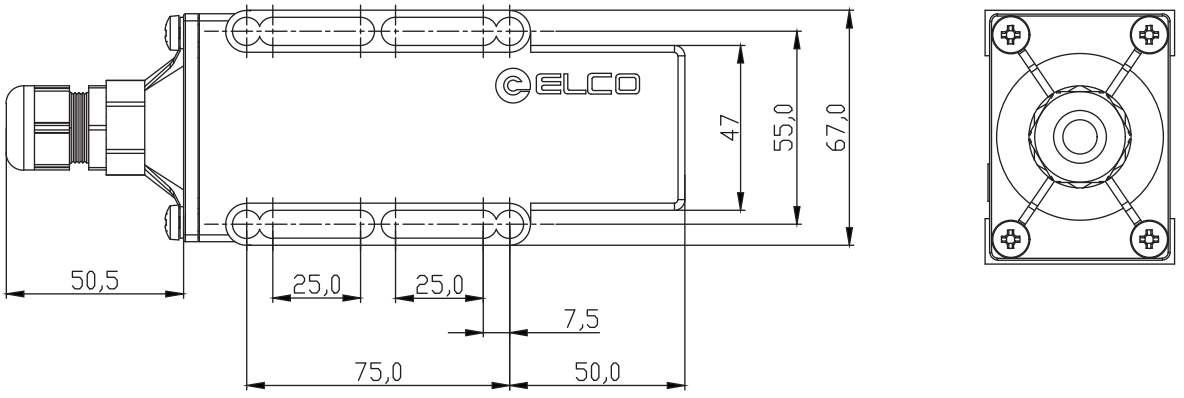
M30 series protective cap
Telfon
AS-FCM30

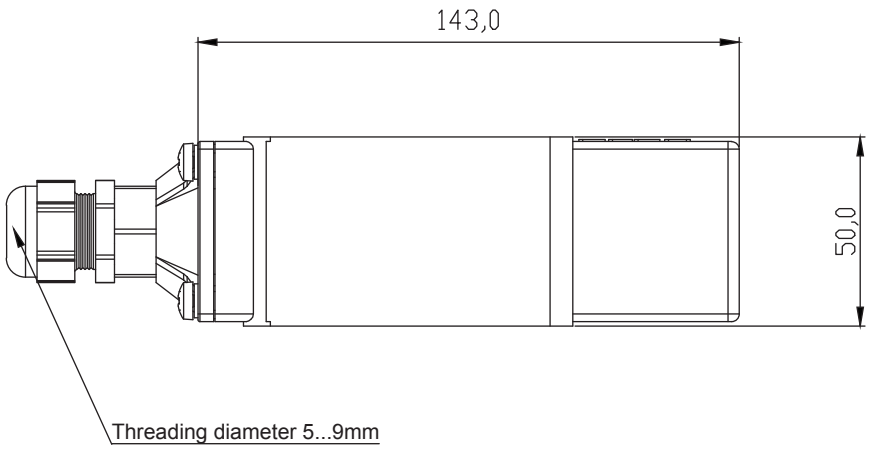


WL40 series stainless steel mounting bracket
ECL40-R

CL40 series stainless steel mounting bracke
ECL40-R1

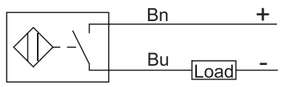
CL40/WL40 series mounting jacket
Main material ULTEM
EWL40-H (for WL40 Series)





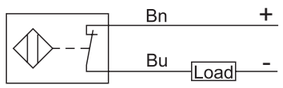
Wiring Diagram

Cable Version



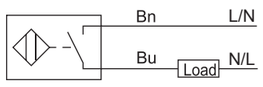
DC-2 wire NO

C01



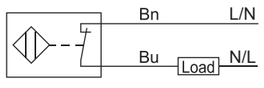
DC-2 wire NC

C02



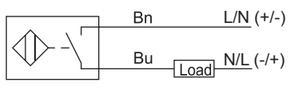
AC-2 wire NO

C03



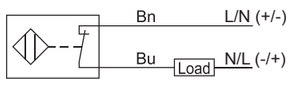
AC-2 wire NC

C04



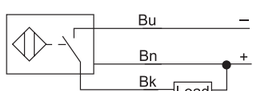
AC/DC-2 wire NO

C05



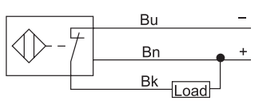
AC/DC-2 wire NC

C06



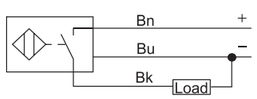
NPN NO

C07



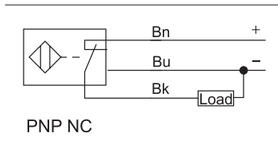
NPN NC

C08



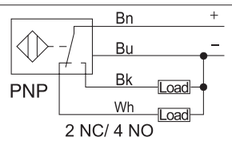
PNP NO

C09



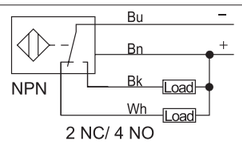
PNP NC

C010



PNP
2 NC/ 4 NO

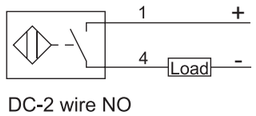
C011



NPN
2 NC/ 4 NO

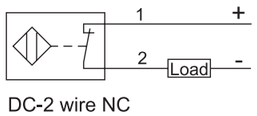
C012

Connector Version



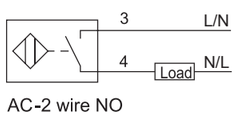
DC-2 wire NO

C013



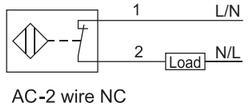
DC-2 wire NC

C014



AC-2 wire NO

C015



AC-2 wire NC

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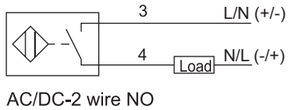

AC/DC-2 wire NO

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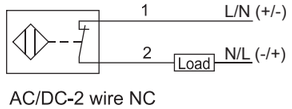
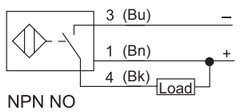


AC/DC-2 wire NC

C018



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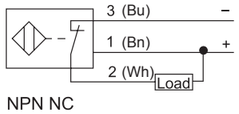
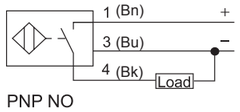


NPN NC

C020



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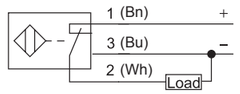
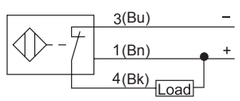


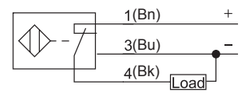
PNP NC

C022



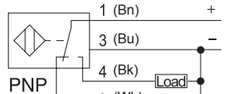
NPN NC

C023



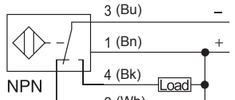
PNP NC

C024



PNP
2 NC/ 4 NO

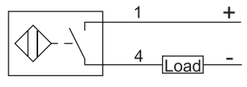
C025



NPN
2 NC/ 4 NO

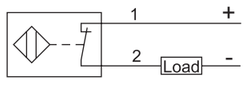
C026

Terminal Version



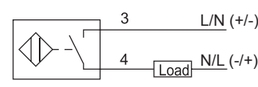
DC-2 wire NO

C027



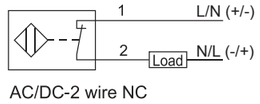
DC-2 wire NC

C028



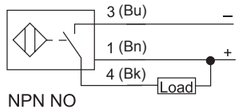
AC/DC-2 wire NO

C029



AC/DC-2 wire NC

C030



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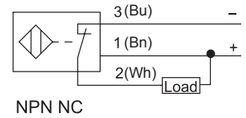
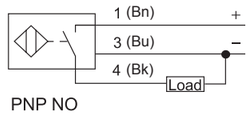


NPN NC

C032



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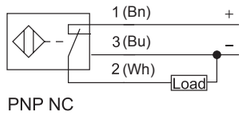
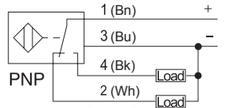


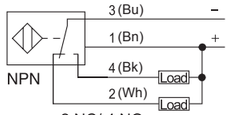
PNP NC

C034



PNP
2 NC/ 4 NO

C035



NPN
2 NC/ 4 NO

C036