

Linking your system



Features



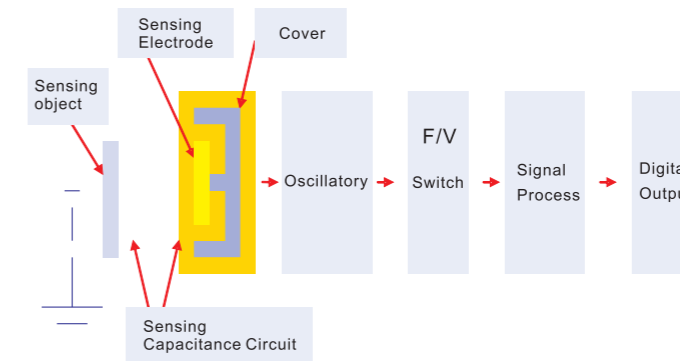
- Plastic thread type and cylinder type; Structure of sensors, durable working, and supply voltage AC/DC available
- Stable Operation: Without adjustable and mechanical components, proximity sensors don't be affected by the qualities of mediums and the variation of density, and it can work immediately after installation
- A variety of size and of outputs, easy installation, user-friendly handling .
- Operating temperature:-25~80(°C); High temperature type:-25~100(°C)
- Protection Classification: IP67
- Certification: CE and RoHS
- Sensing Objects: Solids and liquids
- Output: NPN, PNP, AC, DC, NO, NC
- Display: LED.
- Electric Protection: Overload, short-circuit, reverse polarity

Operating Principle

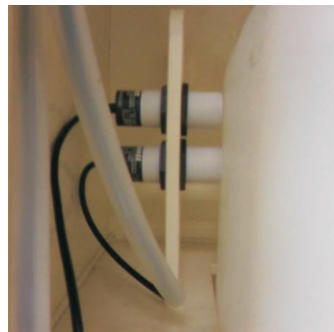
Capacitive proximity sensors belong to a sort of position sensors. Similar to the structure of a capacitor, the probe of sensor acts as one pole of capacitor and another pole is the sensing object. While the sensing object approaches a proximity sensor, the dielectric constant may change between object and sensor. Meanwhile, this causes the circuit to alter. The sensing objects of capacitive proximity sensors can be not only metals but also insulating solids, liquids, and powders. When detecting the low-k objects, proximity sensors can enhance the sensitivity by modifying clockwise the multipotentiometer behind the sensors; furthermore, a normal potentiometer makes a capacitive proximity sensor actuate in the position of sensing range by 70%~80%.

The sensing interface of capacitive proximity sensor is composed of two in-line metal electrodes, and it is similar to an open capacitors. These two electrodes constitute a capacitance with a series connection inside the RC oscillatory circuit. When the power is on, the RC oscillator stop working until a sensing object approaches the sensing interface due to the increasing volume of capacitance. Through the comparison between the signals handled by the post-circuit and the internal signals, a capacitive proximity sensor can detect the existence of objects. It can sense not only the metals but also the non-metals; moreover, the sensing range to the metals can acquire maximum value. The sensing range of the non-metals depends on the dielectric constants of the sensing materials. The higher dielectric constant, the longer sensing ranges.

Operation Procedure of Capacitive Proximity Sensors



Capacitive Proximity Sensors



Capacitive proximity sensors belong to a sort of position sensors. Similar to the structure of a capacitor, the probe of sensor acts as one pole of capacitor and another pole is the sensing object. While the sensing object approaches a proximity sensor, the dielectric constant may change between object and sensor. Meanwhile, this causes the circuit to alter.

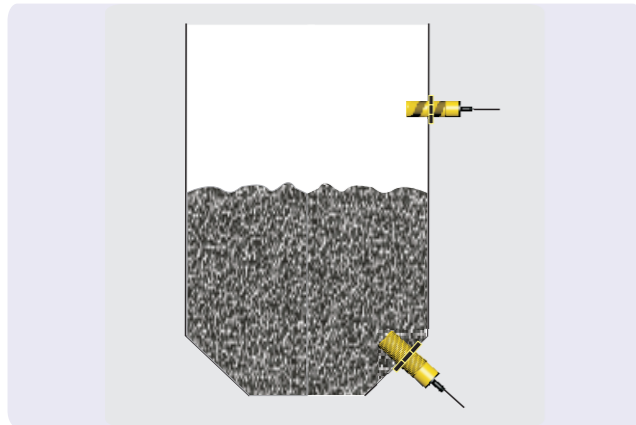


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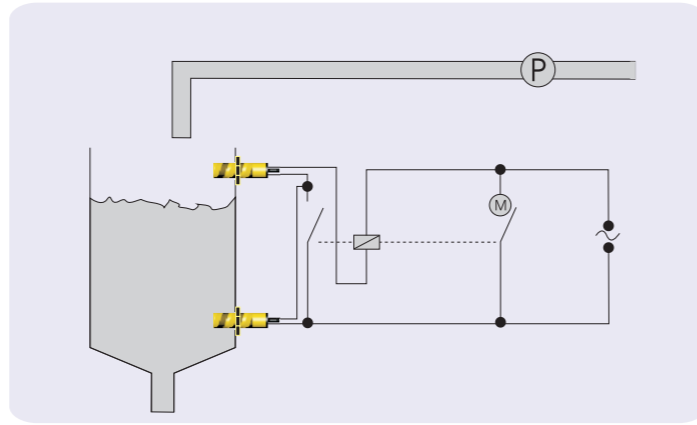
Applications

Capacitive Proximity Sensors can sense metals and non-metals, such as liquids, solids in the funnels, the storage tanks, and the granaries. They are applied extensively in the industry; for example medical, semiconductor, timbering, papermaking, glass, plastics, foods, cement, chemistry engineering, and etc.

Sensing Level of Solids



Sensing Level of Liquids

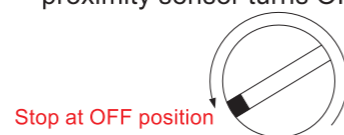


Sensitivity adjustment

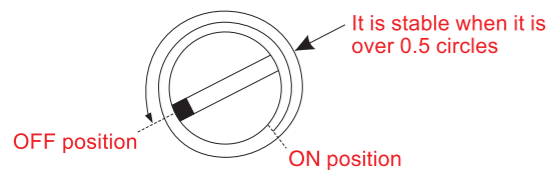
A Without any target in front of the sensing face, turn the sensitivity potentiometer clockwise until the proximity sensor turns ON (LED light turns on).



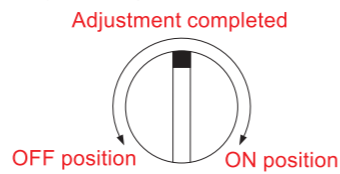
B With a target in front of the sensing face, turn the sensitivity potentiometer anticlockwise from the ON position stated in A until the proximity sensor turns OFF (LED light turns off).



C If the difference between ON position and OFF position in B is more than 0.5 turns, the operation sensor is stable.



D If you set sensitivity potentiometer at center position between ON and OFF position, sensitivity setting is completed.

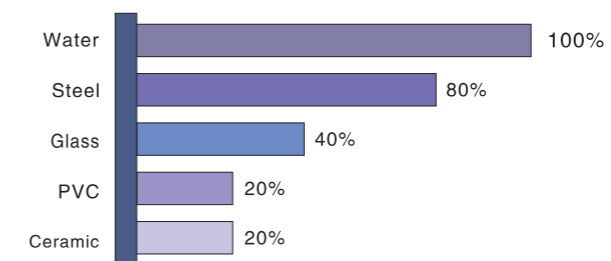


- ※ When there is distance fluctuation between proximity sensor and target, please adjust B with target at farthest from this unit.
- ※ Turning potentiometer clockwise is maximum and turning anticlockwise it is minimum. Number of adjustment should be 6 ± 2 revolution and if you turn right or left excessively, it is non-stop.

Connection



Electric Design	Connection	Wiring/Core Color	Connection
2-Wire	2M PVC	BN Brown BU Blue	
	M12 Socket	WH white BN Brown BU Blue BK Black	
3-Wire	2M PVC	BN Brown BU Blue BK Black	PNP connection NPN connection
	M12 Socket	WH white BN Brown BU Blue BK Black	PNP connection NPN connection





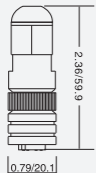
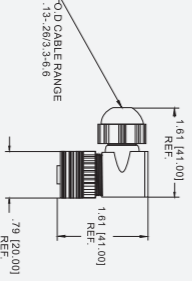
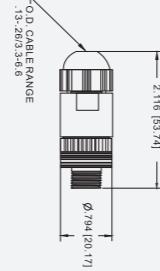
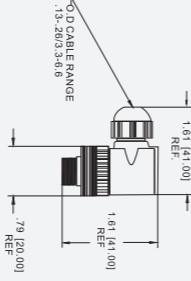
The relationship of object material and detecting distance

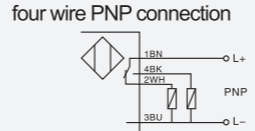

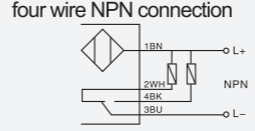

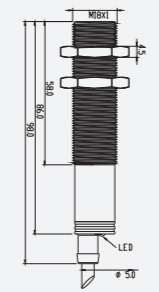
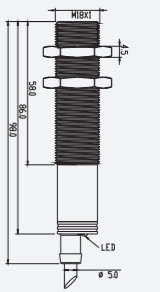


Radar Wave Level Sensors
Guided Radar (TDR)
Ultrasonic Level Sensors
Rotating Paddle Level Sensors
Vibrating Fork Level Switches
Float Level Switches
Capacitive Level Switches

Accessories

Type	Connector Order No.					
	C	02	L	5	C	12
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC shielded wire	Size 12: M12

Type	Socket			
Order No.	US0013	US0014	US0015	US0016
Socket				
Spec.	M12 Straight, 4-Pole, Female	M12 Angled, 4-Pole, Female	M12 Straight, 4-Pole, Male	M12 Angled, 4-Pole, Male
Drawing No.				

Size	M18	
Specification	Cable	
Sensing Range	8mm	8mm
four wire PNP connection		
four wire NPN connection		
Three wire PNP NO	CA0004	
Three wire PNP NC	CA0005	
Three wire NPN NO	CA0006	
Three wire NPN NC	CA0007	
Four wire PNP NO/NC		CA0018
Four wire NPN NO/NC		CA0012
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10~36DC	10~36DC
Current loading [mA]	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	8 ± 10%	8 ± 10%
Operating range [mm]	0~6.5	0~6.5
Switch-point drift [%/Sr]	-15~15	-15~15
Hysteresis [%/Sr]	1~15	1~15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25~80	-25~80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PP+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm²	PVC-Cable /2m;4x0.34mm²
Accessory	Fixed nut and screw driver	
Dimensions (mm)		

Radar Wave Level Sensors

Guided Radar (TDR)



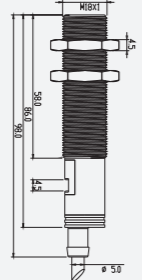
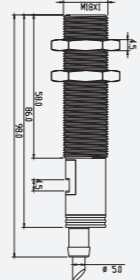
Ultrasonic Level Sensors


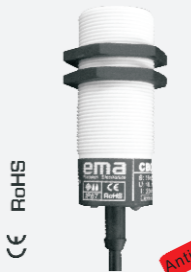

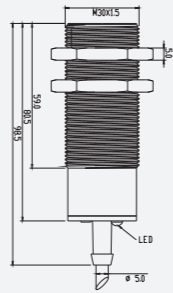
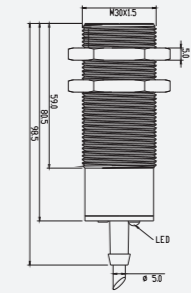
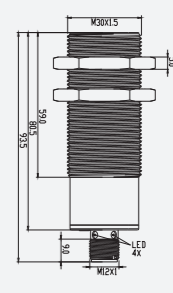
Rotating Paddle Level Sensors

Vibrating Fork Level Switches



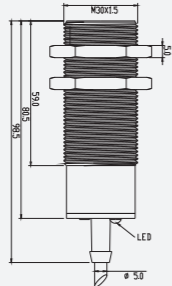
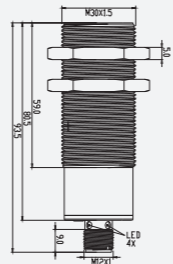
Float Level Switches



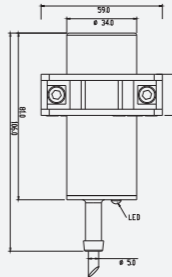
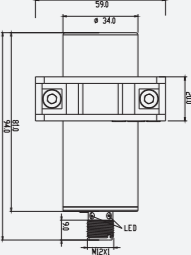
Capacitive Level Switches

Size	M18	
Specification	Cable	
Sensing Range	8mm	8mm
		
Two wire AC/DC NO	CA0001	
Two wire AC/DC NC	CA0002	
Two wire DC NO/NC		CA0008
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	20 ~ 250AC	10 ~ 36DC
Current loading (continuous) [mA]	250 (~50°C) / 200 (~70°C)	250
Current loading (peak) [mA]	1.5 A (20 ms / 0.5 Hz)	
Minimum current loading [mA]	5	
Short-circuit protection	NO	Pulse
Reverse polarity protection	NO	YES
Overload protection	NO	YES
Voltage drop [V]	< 10 AC / < 8 DC	< 4.6
Leakage current [mA]	< 2.5(250 V AC) / < 1.7(110 V AC) / < 1.5(24 V DC)	< 1(24VDC)
Real sensing range [mm]	8 ± 10%	8 ± 10%
Operating range [mm]	0 ~ 6.5	0 ~ 6.5
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	25AC / 40DC	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx.0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm ²	
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Size	M30		
Specification	Cable		Connector
Sensing Range	15mm	15mm	15mm
			
Three wire PNP NO	CB0004		CB0012
Three wire PNP NC	CB0005		CB0013
Three wire NPN NO	CB0006		CB0014
Three wire NPN NC	CB0007		CB0015
Four wire PNP NO/NC		CB0018	
Four wire NPN NO/NC		CB0022	
Sensing Surface	Non-flush	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC	10 ~ 36DC
Current loading [mA]	250	250	250
Short-circuit protection	Pulse	Pulse	Pulse
Reverse polarity protection	YES	YES	YES
Overload protection	YES	YES	YES
Voltage drop [V]	< 2.5	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	15 ± 10%	15 ± 10%	15 ± 10%
Operating range [mm]	0 ~ 12	0 ~ 12	0 ~ 12
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx.0.2 / PVC approx.0.2		
Housing material	PBT+GF	PP+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm ²	PVC-Cable /2m;4x0.34mm ²	M12 connector
Accessory	Fixed nut and screwdriver		
Dimensions (mm)			

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Float Level Switches
Capacitive Level Switches

Size	M30	
Specification	Cable	Connector
Sensing Range	15mm	15mm
		
Two wire DC NO/NC	CB0008	CB0016
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC
Current loading (continuous)	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 4.6	< 4.6
Leakage current [mA]	< 1(24VDC)	< 1(24VDC)
Real sensing range [mm]	15 ± 10%	15 ± 10%
Operating range [mm]	0 ~ 12	0 ~ 12
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm ²	M12 connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
Three wire PNP NO	CC0004	CC0012
Three wire PNP NC	CC0005	CC0013
Three wire NPN NO	CC0006	CC0014
Three wire NPN NC	CC0007	CC0015
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC
Current loading [mA]	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	20 ± 10%	20 ± 10%
Operating range [mm]	0 ~ 16	0 ~ 16
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm ²	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Radar Wave Level Sensors

Guided Radar (TDR)



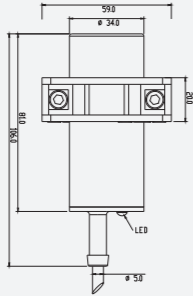
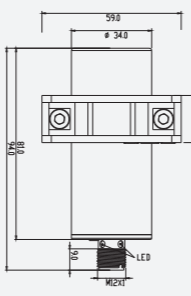
Ultrasonic Level Sensors


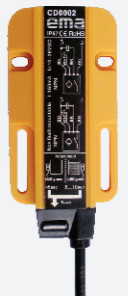
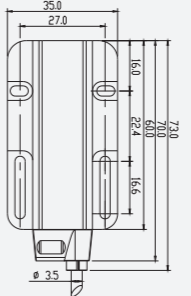
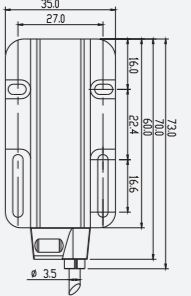
Rotating Paddle Level Sensors

Vibrating Fork Level Switches

Float Level Switches

Capacitive Level Switches

Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
Two wire DC NO/NC	CC0008	CC0016
Sensing Surface	Non-flush	Non-flush
Operating voltage[V]	10 ~36DC	10 ~36DC
Current loading (continuous)	250mA	250mA
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop[V]	< 4.6	< 4.6
Leakage current[mA]	< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0 ~ 16	0 ~ 16
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis[%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature[°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm ²	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions(mm)		

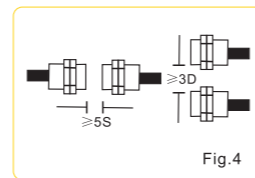
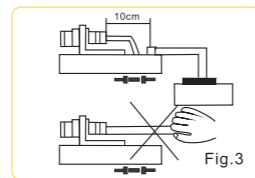
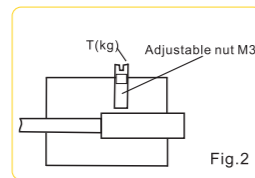
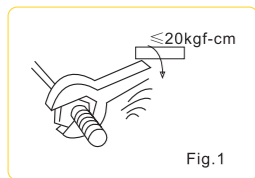
Size	35 × 70mm	
Specification	Cable	
Sensing Range	25mm	25mm
		
Three wire PNP NO/NC	CD0001	
Three wire PNP NO/NC		CD0002
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~36VDC	10 ~36VDC
Current loading [mA]	200mA	200mA
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 30(24VDC)	< 30(24VDC)
Real sensing range [mm]	25 ± 10%	25 ± 10%
Operating range [mm]	0 ~ 20	0 ~ 20
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	5	5
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PA+GF	
Function display	Switching state LED	Yellow(90°)
	Operating LED	Green(90°)
	Function LED	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm ²	
Dimensions(mm)		

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Installation

Type	Mounting	Mounting Size	Mounting Direction
CA	Standard Mounting (with nut)	1、Nut: M18×1 2、Vent: 18.2<D<22(mm) 3、Non-flash mounting	
CB	Standard Mounting (with nut)	1、Nut: M30×1.5 2、Vent: 30.2<D<34(mm) 3、Non-flash mounting	
CC	Mounting Clamp	1、Vent: 34.2<D<40(mm) 2、Fixed Bolt: M5 3、Non-flash mounting	
CD	Fixture Wire	Mount the wire through the holes of sensor, and fix it to the tube.	

Installation Notice



- Mounting for thread type :Don` t twist the torque too hard (Fig.1)
- Mounting for cylinder type : To adjust the fixed screw and keep the torque in the range of 2-4kgf-cm. (Fig. 2)
- Lead protection: Please fasten the lead which is located 10cm far away the sensor by a clip in order to avoid the damage of sensor resulted from the lead affected by an external force. (Fig. 3)
- To prevent the mutual influences between the sensors: When mounting in facing way or apposed way, please follow the instruction in Fig.4 to avoid of the false operation from the mutual influences.
- Notice: S: Sensing distance D:Sensor diameter

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