M-IX-EN-V1.1

Inductive Proximity Sensors Manual

IA/IB/IC/ID/IE Type

■ English

www.ema-electronic.com

Application

Inductive proximity sensors are applied to sense metallic objects or conductive materials such as mild steel,stainless steel, aluminum, copper and etc.

■ Influence between sensing object and sensing range.(Fig. 1)

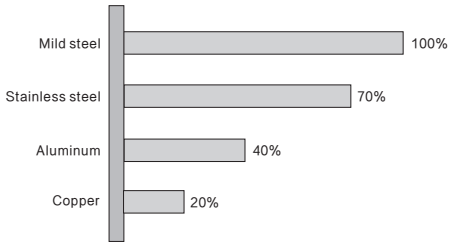


Fig.1

Mounting

The mounting of the Inductive proximity sensors divides into two ways, flush and non-flash mounting, according to different installation conditions and demands. The mounting way is determined by the surrounding.

UL Markings - Please follow the instruction as below:

a. “Maximum Ambient Temperature 40°C”.
b. Type 1 enclosure rating.
c. *Maximum rating of the overcurrent protection maximin 1 A, minimum 36 V dc or equivalent statement for model IA and IB.

■ **Order number & Dimension**

Type	Mounting	Dimension
IA M8	Standard mounting with nut	1. Nut: M8 2. Vent: 8.2<D<10(mm) 3. Flush/Non-flush mounting
IB M12	Standard mounting with nut	1. Nut: M12 2. Vent: 12.2<D<14(mm) 3. Flush/Non-flush mounting
IC M18	Standard mounting with nut	1. Nut: M18 2. Vent: 18.2<D<22(mm) 3. Flush/Non-flush mounting
ID M30	Standard mounting with nut	1. Nut: M30 2. Vent: 30.2<D<34(mm) 3. Flush/Non-flush mounting
IE Ø34	Mounting clamp	1. Nut for clamp: M5 2. Vent: 5.5<D<7.5(mm)x2 3. Non-flush mounting

■ Mounting requirement

1 . There should be a non-metallic area around the sensing face, The range of this area is D and 2S.(Fig. 2)
Notice: S- Sensing range, D- Diameter of sensor
2. Any metallic object should be away from the sensing face by 3S. (Fig. 3)
Notice: S- Sensing range.

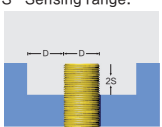


Fig.2

Fig.3

Connection

■ Three-wire: PNP & NPN mode of connection

PNP mode of connection(Fig. 4, Fig. 5)

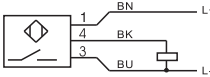


Fig. 4 2M PVC

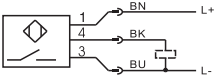


Fig. 5 Socket

NPN mode of connection(Fig. 6, Fig. 7)

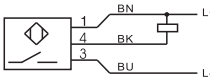


Fig. 6 2M PVC

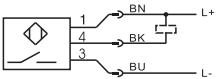


Fig. 7 Socket

■ Two-wire: cable & connector mode of connection

Two-cable(Fig. 8, Fig. 9)

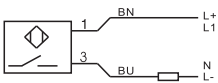


Fig. 8 AC/DC

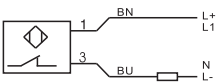


Fig. 9 AC/DC

Two-connector(Fig.10, Fig.11)

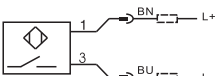


Fig. 10 AC/DC

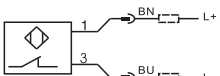


Fig. 11 AC/DC

■ Series connection and parallel connection

1. Series connection of three-wire DC and three-wrie DC sensor.(Fig.12)
2. Parallel connection of three-wire DC and three-wire DC sensor.(Fig.13)
3. Series connection of two-wire AC sensor.(Fig.14)
4. Parallel connection of two-wire AC sensor.(Fig.15)
5. Series connection of mechanical switch and AC sensor.(Fig.16)
6. Parallel connection of mechanical switch and AC sensor.(Fig.17)

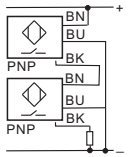


Fig. 12

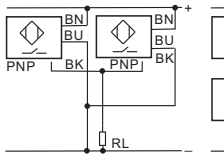


Fig. 13

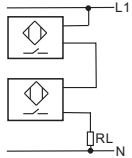


Fig. 14

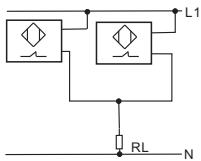


Fig. 15

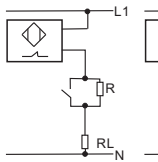


Fig. 16

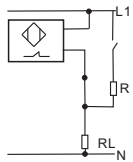


Fig. 17

Sensing range setting

■ Sensitivity

For the safety of operation, the operation range is not allowed to be over the sensing range of inductive proximity sensor.
The size of the sensing range of inductive proximity sensor depends on the material of the sensing object.

Notice

■ Installation

1.Mounting for thread type :Do not twist the torgue too hard (Fig.18)
2.Mounting for cylinder type : To adjust the fixed screw and keep the torque in the range of 2-4kgf-cm. (Fig. 19)
3.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. 20)
4.To prevent the mutual influences between the sensors: When mounting in facing way or apposed way, please follow the instruction in (Fig.21) to avoid of the false operation from the mutual influences.
Notice: S-Sensing Range; D-sensor Diameter.

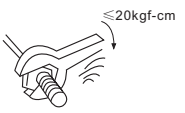


Fig. 18

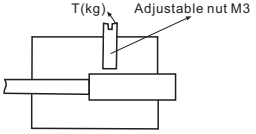


Fig. 19

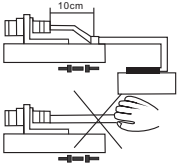


Fig. 20

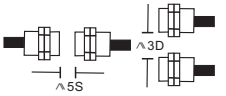


Fig. 21

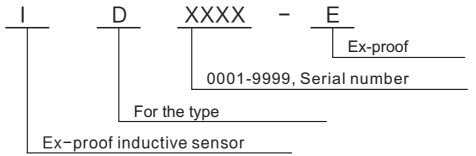
■ Safety Use

1. Please pay attention to the polarity of the power supply to avoid misconnection of wiring; Do not apply voltage and current exceeding the rated range of the product; After powering on, wait for at least 200ms before testing to ensure stable operation of the equipment.
2. If the sensor has a metal housing, it must be effectively grounded to prevent electric shock or other safety hazards. Correctly implement load wiring to ensure a secure and compliant connection. Do not short-circuit the load at both ends to prevent equipment damage or fire.
3. When installing or adding sensors, please be sure to turn off the power to prevent electric shock or equipment damage.
4. Do not disassemble, repair, or modify the product on your own to avoid potential safety hazards or equipment malfunctions.
5. Do not use in a damaged status of the housing to prevent electric shock or other safety hazards.
6. To protect the reliability and lifetime of the product, please avoid using it in applications beyond the temperature range.

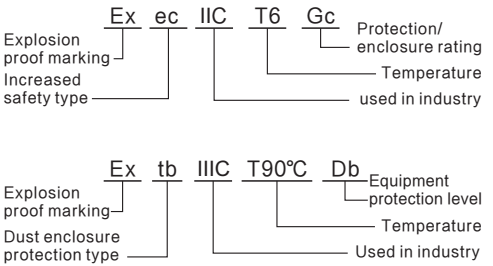
■ Maintenance

In order to ensure the proximity sensor reliable operation for a long time, the following regular examinations should be performed:
1.Check the installation position of detected object and proximity sensor if any deviation, looseness or deformation exists.
2.Check the attached wires and connecting parts if any looseness bad contact or wire breaking off exists.
3.Check if there is any metallic powder accumulation.
4.Check if the temperature condition and environment are normal.
5.Check if the sensing range is normal.

■ Order No. for the sensor and the principle



■ The conception of explosion proof marking.



■ Notice

1. The product is installed on the pipe must be properly connected to the equipotential grounding system.
2. The medium temperature range of the product: -25℃ to +70℃.
3. The electrical safety parameters of the product: rated voltage 10–36 VDC or 20–250 VAC, maximum load current 250 mA.
4. When the product is used or maintained in an explosive atmosphere, "Do not open in the presence of an explosive environment" must be followed.
5. When use or maintain in an explosive environment, the heat resistance temperature of the connecting cables for field wiring must be at least 90℃.
6. When the product is used in an explosive dust environment, its surface should be cleaned regularly to prevent dust accumulation on the housing. However, compressed air must not be used for cleaning.
7. Users must not replace the components of the product on their own. Any failure should be solved with the manufacturer to prevent the damage.
8. The installation, the usage, and maintenance of the product must comply with the product manual as well as the following relevant standards and specifications:
   GB/T 3836.13-2021 Explosive atmospheres
   Part 13: Equipment repair, overhaul, reclamation, and modification
   GB/T 3836.15-2017 Explosive atmospheres
   Part 15: Equipment design, selection, and installation
   GB/T 3836.16-2022 Explosive atmospheres
   Part 16: Inspection and maintenance of electrical installation
   GB 50257-2014 Code for construction and acceptance of electrical apparatus installation engineering in explosive and fire hazardous atmospheres
   GB 15577-2018 Safety regulations for dust explosion prevention