RA РусАвтоматизация

ema®

Smart Capacitive Proximity Sensor Manual

IP67 CE UL us RoHS

■ Features:

Smart capacitive proximity switches can be used to detect dry, bulk materials and liquid, especially the material with dielectric constant lower than 20 (e. g. : oil).It can detect whether the medium exist and provide switching signals.
1.Operating zone is sensing face
2.Contacting surface
3.Electrical connection
4.Red,yellow,green LED
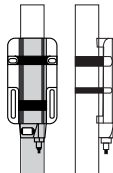5.Four mounting holes
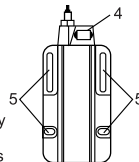
Function:
Detecting medium through wall of container (only used for non-metal container).
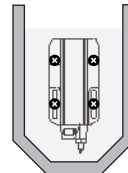The best mode is at full adjustment or empty adjustment.
NO and NC is selectable when the sensor is operating.

■ Mounting

As the following picture, the sensor is surrounded on the pipe and fixed by the wire crossing the mounting holes of the sensor.
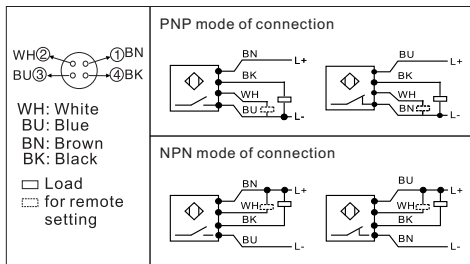

① wire mounting   ② screws mounting

■ Connection

WH② — ①BN
BU③ — ④BK

WH: White
BU: Blue
BN: Brown
BK: Black

□ Load
▒ for remote setting

PNP mode of connection

NPN mode of connection

■ Operation

Operation of this sensor runs by approaching contacting face or remote setting.

I.Approaching contact surface
As the right picture, the contacting face is acting while a metal object (e. g. : metal plate) approaching the label zone⊕. It will stop acting if remove the metal object away from the label zone.

metal plate
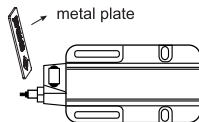
II.Remote setting
Through remote control, the sensor can realize the same function as that of approaching contacting face.
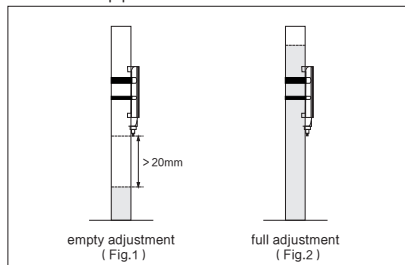
Notice: Approaching contacting face is prior to be considered, compared to remote control.

■ Calibration

Set the system into empty adjustment after installation.
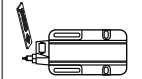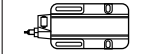Setting Steps: empty adjustment(Fig.1) ➡ full adjustment(Fig.2)

● When setting empty adjustment, keep the medium away sensing face over 20mm.
● During the calibration No object or interference source is behind the pipe.

empty adjustment (Fig.1)   full adjustment (Fig.2)

*Empty Adjustment Setting

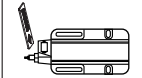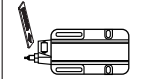|		
	➡	Under unlock mode, enter empty adjustment setting mode through the metal plate approaching to contacting face, Until the LED green start blinking slowly(or enter into remote setting).remove the metal plate in 5 seconds,(or stop remote setting) .then it enter into empty adjustment setting.
	➡	LED green keeps on, indicating the empty adjustment setting is finished .The system can enter operating mode from empty status.

*Full Adjustment Setting

→	Under unlock mode, keep the metal plate approach contacting face about 5 seconds, （or enter into remote setting), LED green would blink slowly first , then it glow quickly . Remove the small screw driver(or stop remote setting) ,then it enter into full adjustment setting .
→	LED green keeps on, indicating the full adjustment setting is finished .The system can enter operating mode from full status.

* Lock/Unlock Setting

Default setting is under Unlock mode when power is ON. The user can calibrate empty adjustment and full adjustment directly. The user can also lock the product in manual if needed.

→	Lock: Approaching metal plate to sensing face, green LED flashes slowly to quickly. Further, green LED and red LED flash alternatively （Lock）.
→	Under lock mode : Approaching sensing face by metal plate, green light flashes for a while, and after 15 second, green LED and red LED flash alternatively （Unlock）.

■ Equipment Setting

After mounting, connect the wire and adjust the status to detect whether the system works orderly. Through empty and full container, it can detect whether the switching status is correct and whether LED display is consistent with its correspondent function. LEDs display and function output detection

LED Green	ON=System being starting status. Flashes slowly=Empty adjustment. Flashes quickly=Full adjustment.
LED Yellow	OFF=Switching output invalid. ON=Switching output valid.
LED Red	ON=Critical point instruction and background automatic correcting instruction. Flash=Under error alarm system work
LEDs Green+Red flash	Lock/Unlock
LEDs Yellow light OFF or flash	Short-circuit protection

■ Notice:

I.Within 5 seconds after power on, the system will detect environment parameter automatically. And metal objects should be far away from the label zone ⊕ on contacting face.

II.There will appear a critical point and switching point automatically while setting empty adjustment. The system will re-scan sensing signals.

III.Setting full status is based on empty adjustment, so setting empty adjustment is required before set full adjustment. Moreover, a sensing target is also required at this moment; otherwise the setting would be wrong with a warning.

IV.When the flow rate is below 1mm/min, it is not recommended to use the product.

■Tips:

I. How to determine whether the system is in lock mode or unlock mode ?

Method: Keep the metal plate approaching contacting face (or remote setting) , then observe the changes with LED green .

(1) If LED green would flash once , it indicates that the system operates under the lock mode. Then remove the metal plate (or stop remote setting) at this time .

(2) If LED green would keep flashing slowly, than keep the metal plate approach contacting face (or maintain remote setting).LED green would flash slowly → LED green flash quickly → both LED green and LED red flash quickly. It indicates that the system operates under the lock mode. Then remove the metal plate (or stop remote setting) at this time .

II. How to restore factory settings ?

Description : Restoring factory settings is an important method for the user to adjust the systemic parameters after running for a long time .

Method : Start to calibrate empty adjustment, then enter into full adjustment without changing the detecting medium.There would be an alert that the system is in an error mode(red light flashes) .At this time , keep the metal plate approach contacting face for a moment, then remove it (or stop remote setting) , both LED yellow and LED red would flash. When LED yellow and LED red are off, the factory settings restoration is finished .