FLOWguard 310
Operating Instructions

Flow / No Flow Switch for Solids Monitoring

Content

1 About this document

1.1 Function

This operating instruction contains all the information that is needed in various phase of the life circle of the device: product identification, transport, storage, mounting, connection, operation, setup, instruction for maintenance, fault rectification, exchange of parts, disposal. Please read this information before putting the instrument into operation.

1.2 Target group

This operating instruction manual is directed to trained personnel. The operations must be carried out by trained personnel.

2 For your safety

2.1 Authorized personnel

All operations described in this document must be carried out only by trained specialist. The required personal protective equipment must always be worn during work.

2.2 Appropriate use

The FLOWguard 310 is Doppler flow switch for point flow detection of solid. You can find details information about application area for each model in product description and the nameplate Follow instructions and comply with basic conditions. Make sure the operation accord with the instructions in this manual. Only in this way, the reliability of instrument can be ensured.

2.3 Incorrect use

The incorrect or improper use may weaken performance of instrument or cause damage to instrument or personal e.g. vessel overfill through incorrect mounting or adjustment, mounting non anticorrosive instrument for corrosive media, the field condition doesn't comply the limit value of specification of instrument.

The manufacturer is not liable for damage caused by improper or incorrect use.

2.4 General safety instructions.

Danger !!!

For the extremely dangerous area where is rick of people casualty when the instrument is operated incorrectly or instrument misjudges caused by special mounting condition we don't suggest you use this instrument. Manufacturer doesn't responsible for the related damage if the user neglects the warning.

(1) Operate the instrument in proper technical conditions.

(2) If the instrument needs modifications please contact manufacturer for authorization and instruction. Unpermitted modification can lead to unforeseeable danger.

(3) When repair is needed please follow the instruction and use original spare parts and accessories from manufacturer.

(4) The application condition must be in strict accordance with information on name plate (e.g. explosion protection, pressure, temperature)

(5) If there is supplementary document, please observe the specification carefully and operate in accordance with operation instruction and supplementary document.

3. Product description

3.1 Product design

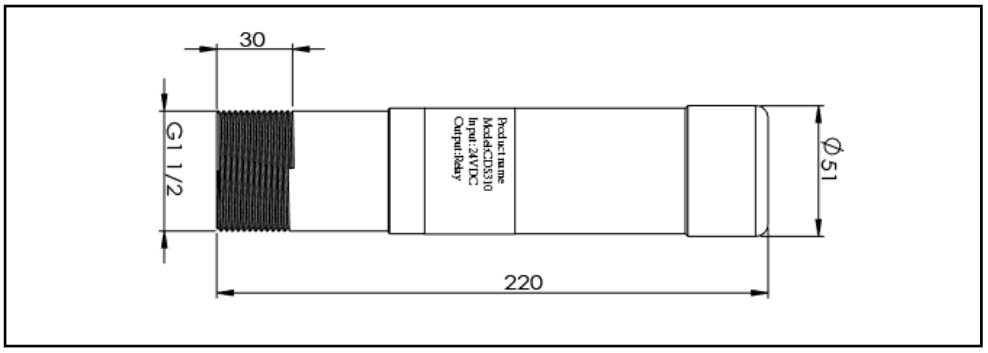

Fig.1

3.2 Operation principle

Doppler flow switch is a material flow detector using the Doppler effect. According to the Doppler effects, the frequency of microwave changes when encountering a moving object. The detector is installed outside the pipeline or above the conveyor belt. The detector emits electromagnetic waves. When there is material flowing, the frequency of the reflected wave changes. When there is no material flowing or blocking, the frequency of the reflected wave won't change. The detector judges whether the material flows according to whether the frequency of the reflected wave changes and outputs a signal through a relay.

3.3 Detecting range

The Doppler flow switch indicates the flow of bulk materials which move through the detection range at a minimal required speed of 0.1 m/s.

The detection is executed by evaluating the Doppler's effect, thus independent of the

flow direction. The material flow, which can be in metallic or nonmetallic tubes, wells, free fall distances and discharge points, is indicated by a relay.

The sensor distinguishes between two conditions:

- material flow
- material jam or standstill

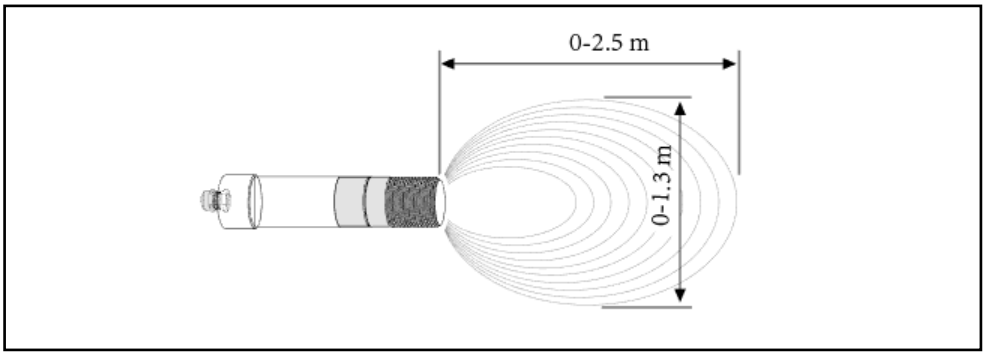

Fig.2

4. Mounting

4.1 General mounting

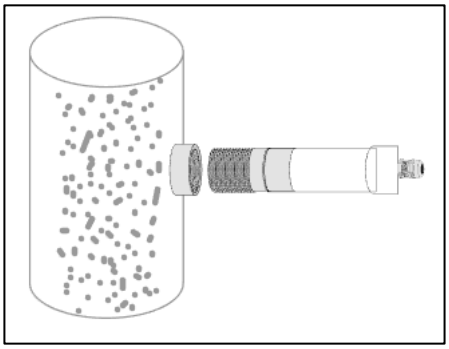

Fig.3

(1) The sensor should be installed in a low-vibration environment.

(2) No moving parts in the detection area. If this is unavoidable, it is strongly recommended to shield the moving parts.

(3) For horizontal or inclined installation situations, installation from above is recommended.

(4) An installation angle to the flow direction between 45 ° ~90 ° should be maintained.

(5) When used on delivery lines made of non-conductive material, the measurement is made through the wall. There is no need for a separate recess in the line.

(a) Mounting through thread G1½

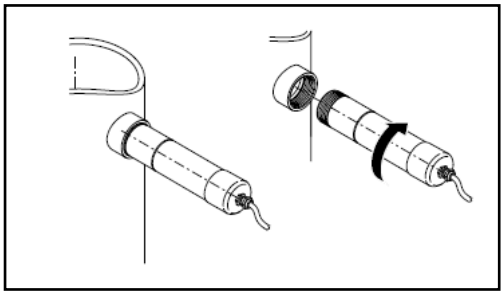

Fig.4

(b) Mounting through flange

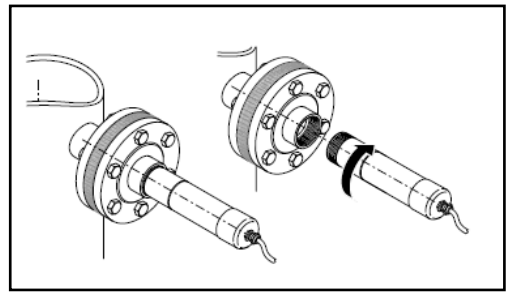

Fig.5

(c) Mounting with clamp

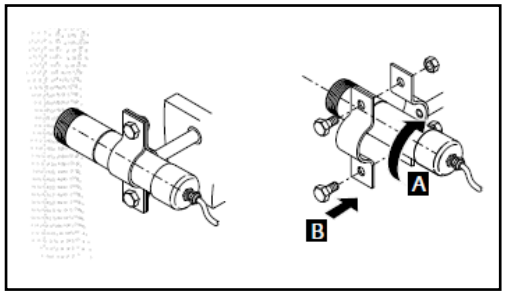

Fig.6

(d) Mounting with separating flange

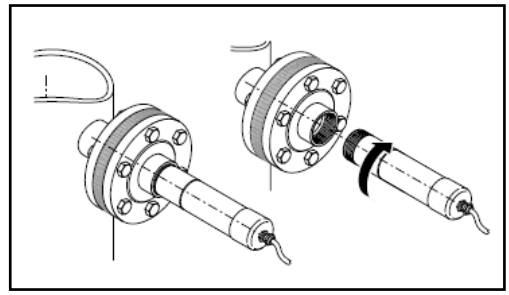

Fig.7

4.2 Mounting on conveyor belt

When the flow switch is used to detect material on conveyor belt it's better to be installed in the area of discharge point. And angle is about 70°~80°.

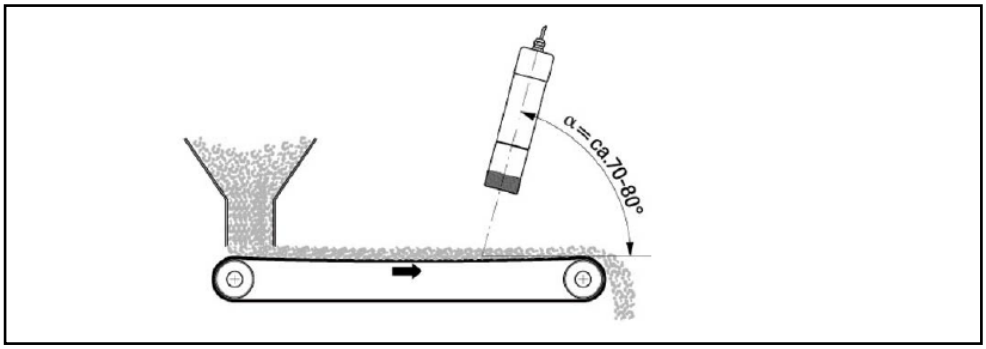

Fig.8

5. Wiring plan

5.1 Power supply

The flow switch work with 18~24VDC power supply only.

5.2 Wiring plan

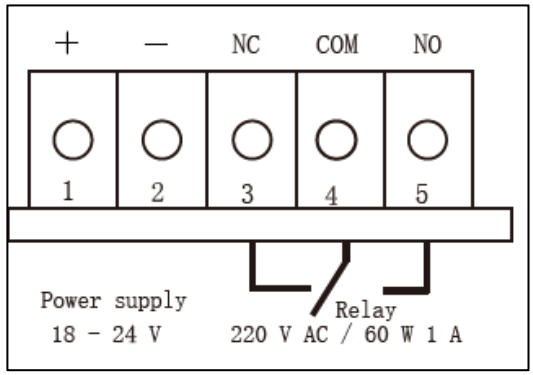

Fig.9

6. Operation

6.1 Control elements

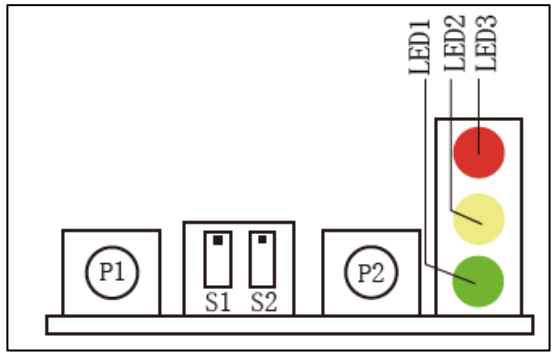

Fig.10

Functions：

Item	Function
P1	**Potentiometer for threshold adjustment** -Left stop: lowest sensitivity -Right stop: highest sensitivity Default： Left stop: lowest sensitivity
S1	**Position switch** -Position 1(up) cause alarm when there is material flow. -Material flow- relay is energized+ contact 4 &5 closed. -No material flow: relay is released+ contact 3 & 4 closed. Position 2(down) cause alarm when there is no material flow. -Material flow- relay is released + contact 3 & 4 closed. -No material flow: relay is energized + contact 4 &5 closed.
S2	**Sensitivity adjustment** -Position 1(up): switch is set to sensitive -Position 2(down): switch is set to insensitive Default： Position 2(down): switch is set to insensitive
P2	**Potentiometer for delay adjustment** -Left stop: 0.25s -Right stop: 15s -Delay adjust: 0.25s,0.5s,1s,2s,4s,8s,15s Default： Left stop: delay 0.25S
LED1	**Green：Switch state of relay contact** -LED on: relay is energized -LED off: relay is released
LED2	**Yellow：Power supply indicator** -LED on and keep flashing: power is on -LED off: power is off
LED3	**Red：Signal strength** -Fast flashing: high signal strength -Slow flashing: low signal strength -Continuous flashing: indication of sensor defect -LED off: no received signal

Fig.11

6.2 Commissioning

(1) Default status: P1 right stop, P2 left stop, S1 (up), S2 (up)

Highest sensitivity and lowest delay.

(2) Turn on power supply and LED 2 (yellow) light up.

(3) Put the process into operation and generate material flow. LED 3 (red) flash when there is material flow. If LED 3 (red) doesn't light flash, check if the switch S2 is set to position 1(up). If the LED 3 (red) still doesn't light up there might be problem with installation. Please check installation and correct it. If the material is detected you can use switch S1 to select whether the relay should be energized (position 1) or released (position 2) when materials flow.

(4) Set threshold by potentiometer P1. The P1 must by turned to right at least until LED1(green) lights up and relay is energized.

(5) Set delay time with potentiometer P2.

7. Trouble shooting

Error	Cause	Action
Relay doesn't switch at material flow	Incorrect sensor parameter Too big distance between sensor and material Incorrect sensor position	Check installation situation; set measuring point to maximum sensitivity: - P1 right stop - P2 left stop - S2 position 1 (up) Repeat commissioning
LED 3 lights up without material flow	Incorrect sensor parameter Detection of vibrations or other moving parts within process	Check installation situation; shield foreign movements; Set measuring point to maximum insensitivity: - P1 left stop - S2 position 2 (down)
LED 3 is flashing continuously	Incorrect cabling Sensor defect	Check cable connection and power supply Sensor defect Contact manufacturer.

Fig.12

Please call GTS, Inc. for additional support:

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Shalimar, FL 32579 USA

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EMAIL: info@onthelevel.com
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