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FS 10000 DRY MATERIAL FLOW SWITCH

OWNERS' MANUAL

- * OPERATION
- * INSTALLATION
- * CALIBRATION
- * WARRANTY

FS-OM-A

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FS 10000 DRY MATERIAL FLOW SWITCH

1. DESCRIPTION

A. General Description

The FS 10000 is a dry material flow switch, designed to sense the flow of dust, granular or powdered materials, in a pneumatic conveying line or chute.

This unit is especially suited to detect the flow of dust resulting from a ruptured filter bag in a bag house or dust collector.

SPECIFICATIONS

ELECTRICAL

Power: 115 VAC (±15%) 50/60 Hz
Output: 2 Form C Contacts, DPDT Relay,
5 Amp Resistive @ 125, 250 VAC;
30VDC
Time Delay: Select: ON or OFF Delay
Adjust: 1/8 Sec.-2 Hrs.
Fuse: On-board 1/2 Amp

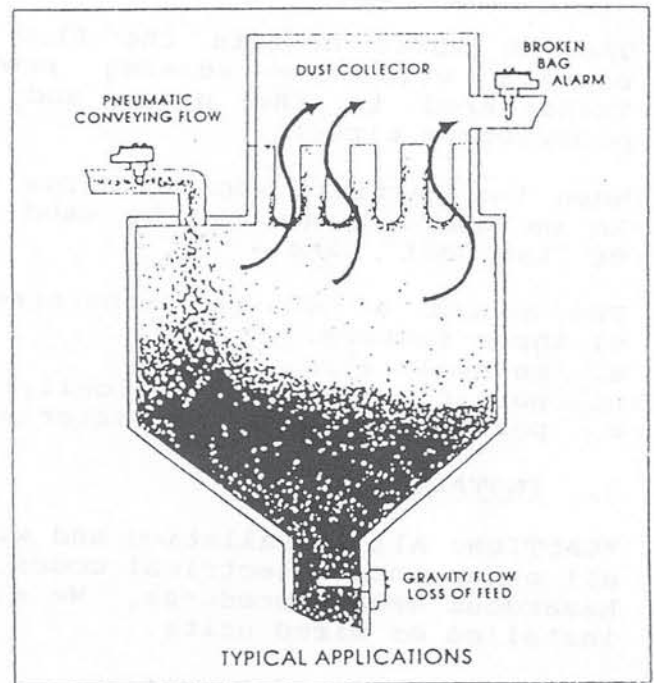
MECHANICAL

Process Entry: 3/4" NPT
Conduit Entry: 3/4" NPT
Probe: 1/2" Diameter, 316 Stainless Steel,
1 1/2" or 3" or 6" length
standard
Insulator: Ultra High Molecular Weight
Polyethylene
Enclosure: Probe: Copper free cast aluminum
Electronics: Non-metallic
10" x 8" x 5" with clear
acrylic window

ENVIRONMENTAL

Temp. Electronics: -30° to 170°F
Temp. Probe: -30°F to 200°F Standard
(400°F Optional)
Pressure: 85 PSI
Housing Probe: Class I, Grp. C&D, Class II,
Grp. E, F, G, Class III
Enclosure Elec: NEMA 4X-12-13

Specifications subject to change without notice.



The FS 10000 comes complete with the electronic circuit board mounted in a NEMA 4X enclosure, 15 feet of coaxial cable and connectors, and a 316 stainless steel probe mounted in an explosion proof housing.

On the bench, hook up the appropriate power to L1,L2 and G. The operating voltage of the FS 10000 is marked on the electronics card.

Connect the coaxial cable to the probe using the ring lug. (See Diagram 1). The center conductor of the coaxial cable is connected to the top of the probe assembly with a 10-32 screw. The shield of the coaxial cable is attached to the green grounding screw.

Connect the BNC connector to the silver box on the electronic card.

Apply power to the unit. When the probe is touched with your hand, the RED LED will turn on. The green LED indicates relay status and may turn on or off depending on dip switch selction (See chart page 6).

B. Physical Installation

1) The FS 10000 probe assembly is mounted in a 3/4" NPT process connection. Typically a 3/4"NPT half coupling is welded to the vessel or piping.

2) The probes' insulator should be flush or slightly protruding into the vessel or pipe to eliminate a space for product accumulation.

3) **CAUTION:** Always take the necessary safety precautions when cutting or welding the coupling for the FS 10000.

a) Tag & lock out electrical power to the equipment that services the vessel.

b) Check for explosive gas or dust in vessel.(ALL DUST CAN EXPLODE)

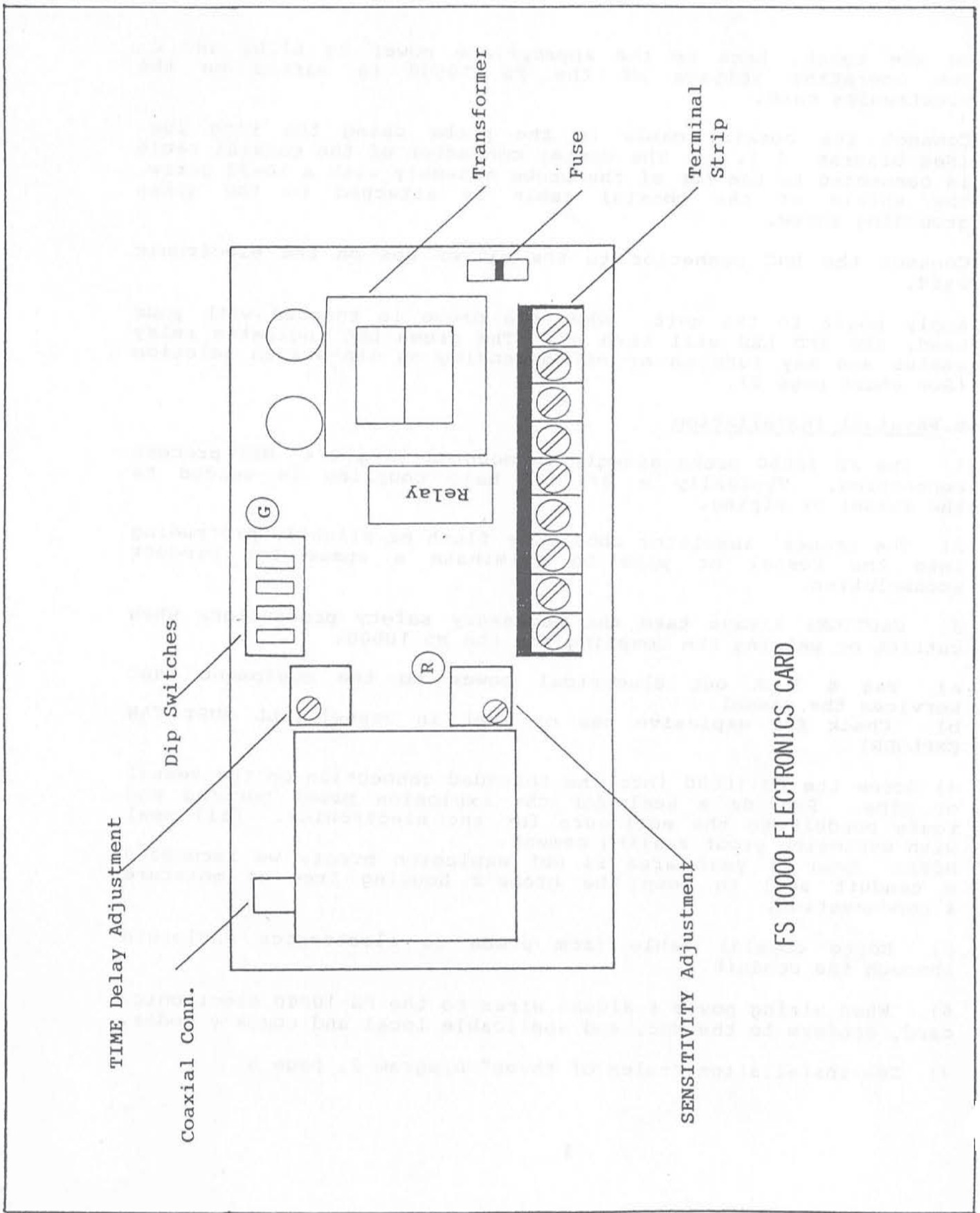
4) Screw the FS 10000 into the threaded connection on the vessel or pipe. Provide a seal for the explosion proof housing and route conduit to the enclosure for the electronics. Fill seal with explosion proof sealing cement.

NOTE: Even if your area is not explosion proof, we recommend a conduit seal to keep the probe's housing free of moisture & condensation.

5) Route coaxial cable from probe to electronics enclosure through the conduit.

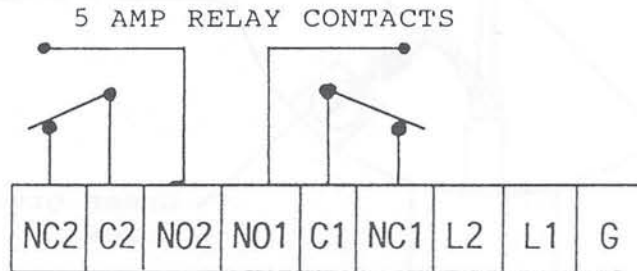
6) When wiring power & signal wires to the FS 10000 electronics card, conform to the NEC, and applicable local and company codes.

7) See installation "rules of thumb" Diagram 2, page 5.



FS 10000 ELECTRONICS CARD

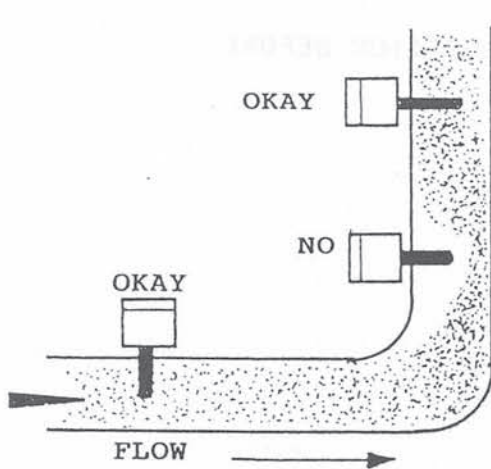
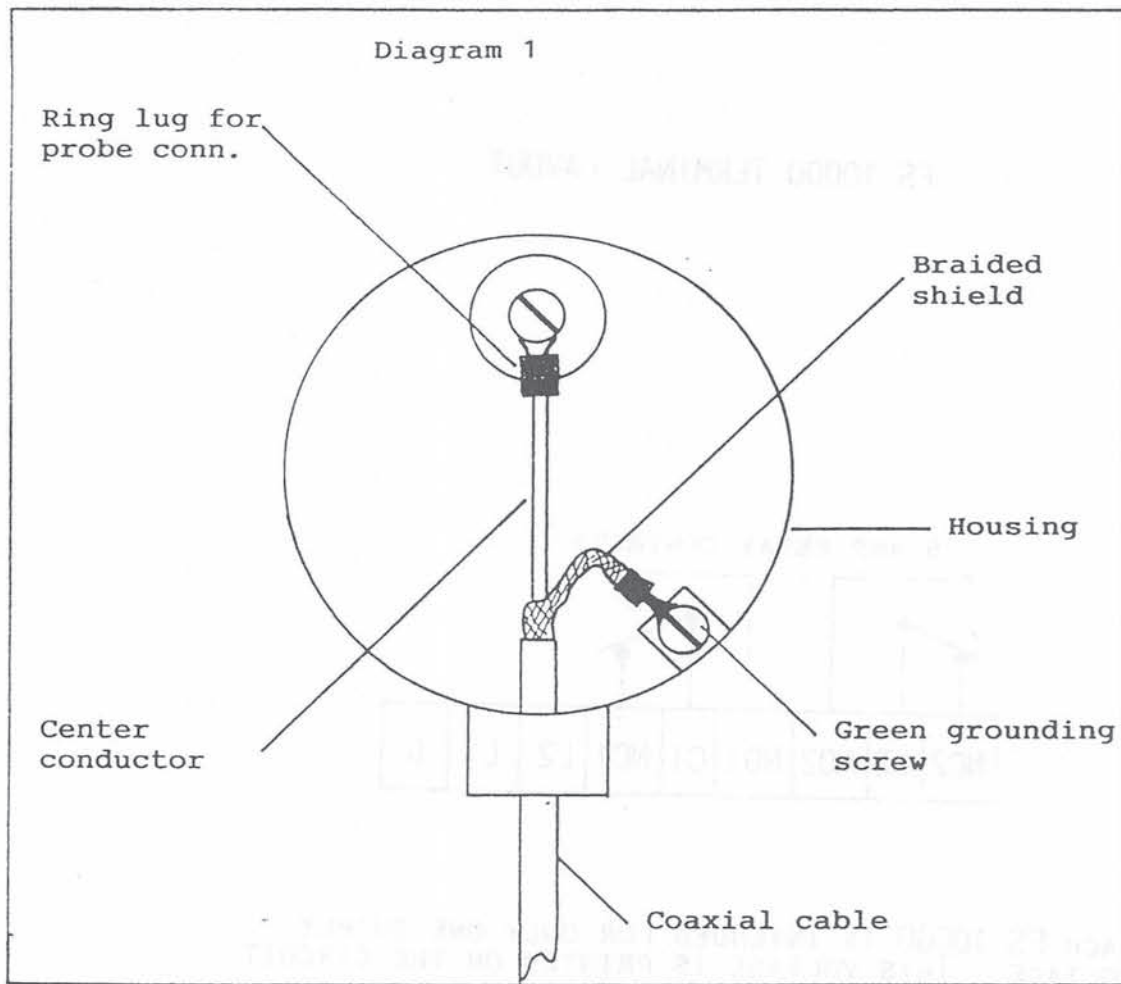
FS 10000 TERMINAL LAYOUT



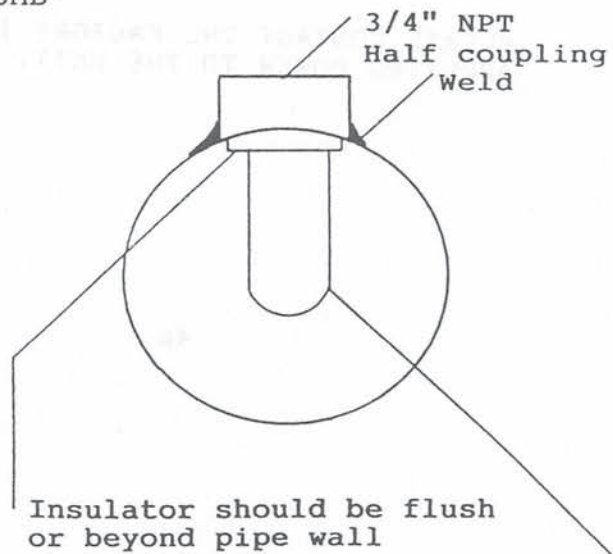
NOTE: EACH FS 10000 IS INTENDED FOR ONLY ONE SUPPLY VOLTAGE. THIS VOLTAGE IS PRINTED ON THE CIRCUIT BOARD.

PLEASE CONTACT THE FACTORY IF YOU HAVE A QUESTION BEFORE APPLYING POWER TO THE UNIT.

4a



Mount probe in a straight section of pipe, at least 2 pipe diameters away from elbows



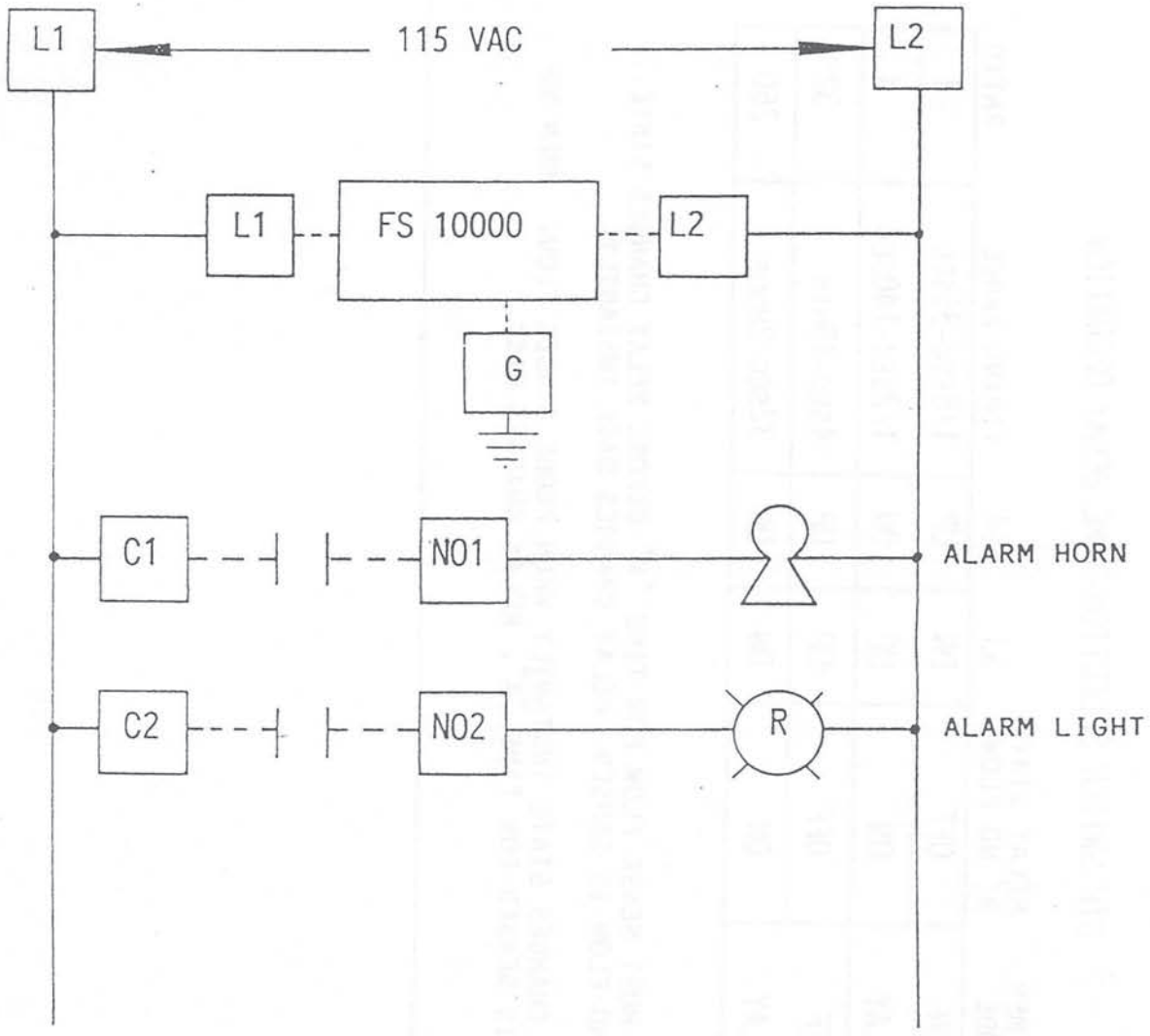
Probe length should be 1/2 pipe diameter minimum

DIP SWITCH SELECTION-TIME DELAY OPERATION

S1	S2	TIMER MODE	RELAY STATE W/ NO FLOW	S3	S4	TIMING RANGE	RATIO
UP	UP	ON	OFF	DN	UP	1/8SEC-35SEC	1
UP	DN	DELAY	ON	UP	DN	1/2SEC-140SEC	4
DN	DN	OFF	OFF	UP	UP	4SEC-18MIN	32
DN	UP	DELAY	ON	DN	DN	32SEC-2HOUR	260

"ON DELAY" = PROBE MUST SENSE FLOW FOR TIME "X" BEFORE RELAY CHANGES STATE. WHEN NO FLOW IS SENSED, RELAY CHANGES BACK INSTANTLY.

"OFF DELAY" = RELAY CHANGES STATE INSTANTLY WHEN PROBE SENSES FLOW. WHEN NO FLOW IS SENSED FOR TIME "X", RELAY CHANGES BACK.



TYPICAL CONTROL WIRING

4. CALIBRATION

A. General instructions

The FS 10000 has three calibration adjustments, and two LED indicators.

ADJUSTMENTS	LED INDICATORS
1. Dip Switches (See Page 6)	Green LED = Relay State
2. Time Delay Potentiometer	Red LED = Flow Sensed
3. Sensitivity Potentiometer	

As a rule of thumb, to increase the time or sensitivity by turning the potentiometers, turn clockwise to increase. Counter-clockwise will decrease the time or sensitivity adjustment.

The green LED is illuminated when the relay coil is energized

The red LED is illuminated when the probe is sensing product.

For many applications, a time delay is desirable. For example, your application may be for a broken bag alarm. The FS 10000 may see a small quantity of dust due to back wash controls, that can not be tuned out with the sensitivity adjustment. If this is the case, a brief ON DELAY time can be set on the unit to null out nuisance alarms. When the probe senses flow for longer than the set time, the alarm will sound.

Another example would be when using the FS 10000 to detect flow in a pneumatic conveying line for a dense phase system. The product comes down the piping in slugs. A brief OFF DELAY will hold the relay energized (indicating flow). When the timer times out (no flow detected for the time set) the relay will change states.

B. Sensitivity adjustment

When the FS 10000 is installed and wired, turn on the equipment to its normal operating speed.

This should be done with a no flow condition.

Observe the red LED. If it is flashing, the unit is too sensitive. Turn the SENSITIVITY POT CCW until the red LED goes out. Then introduce or simulate flow to check the calibration.

If the red LED is steady off, turn the SENSITIVITY POT CW until the red LED flashes, then back it off CCW until it does not. Check for proper operation with flow.

If the red LED never comes on when the pot is turned fully CW, the unit is at its maximum sensitivity. (The pot is a 20 turn pot

that has a clutch at the end to allow it to freewheel). Check the unit by simulating flow.

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT YOUR LOCAL DISTRIBUTOR OR THE FACTORY.

5. WARRANTY

All components of the FS 10000 are warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty applies to the general purchaser and to components installed, serviced and operated according to instructions.

Babbitt International, Inc. will repair or replace, at its option, FOB at its plant or any other location designated, any part which proves defective in manufacture or workmanship.

All claims must be made in writing within the warranty period. No claims outside of the warranty period will be honored.

Warranties are not applied to any components which have been damaged by improper installation, use, exposure to unusual atmospheric conditions or components which have been misused, abused, damaged by neglect or accident. This warranty shall not apply to any components which have been altered or repaired without prior written consent of Babbitt International, Inc.

Babbitt International, Inc. assumes no responsibility or liability for any labor or material back charges, without written authorization. Any product returned must have prior written authorization.

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