

AMERITROL, INC.

INSTALLATION
OPERATION MANUAL
AND
WIRING DIAGRAM

FD SERIES
FLOW SWITCH

Manual Number: FD2200-3

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OVERVIEW

The FD Series is an electronic flow switch designed to detect increasing or decreasing flow in virtually all liquids, gases, or slurries. Please refer to attached wiring diagram for program block (P1) settings.

- The flow switch circuit board program block (P1) is factory configured for liquid flow and relay energized at flow.
- To change from factory default to air flow applications: Change program block (P1) jumper from 1 and 2 to 2 and 3.
- To change from factory default relay energization to relay energized at no flow: Change program block (P1) jumper from A and B to B and C.
- Power input is written on the circuit board.
- The relay rating is 2 amps at 24 VDC or 0.5 amps at 120 VAC resistive.
- The FD series is intended for Nema 4X applications. Our FX Series is available for explosion proof applications.

INSTALLATION

Install flow switch into process. Flow direction is not critical, and it is recommended the flats on the instrument nipple be parallel to flow in horizontal lines and perpendicular to flow in vertical lines.

Conduit Recommendation: Do not place flow switch at low point of conduit, because moisture can collect at the low point. A conduit seal may be beneficial in preventing moisture from entering the enclosure and damaging the electronics.

Insertion depth recommendations:

- The flow switch sensor head is extremely flexible in how it is mounted in the process line.
- Ideally at least a 1/4" of sensor head probe is extended into the flow stream for a typical flow/no flow application.
- Top mounted liquid flow installations where the line can be partially full or contain entrained air call for special consideration. The sensor probe can only sense what it is exposed to and these applications may require more than 1/4" of the probe to extend into the flow stream.

For mounting threaded units to process lines, it is recommended that:

A half-coupling, thread-a-let or the like be used. It is ideal for probes to extend into the line being monitored as discussed above.

If a pipe Tee is used, it is recommended that the leg used to mount the flow switch be the same as the instrument size (3/4" MNPT typical). The standard length flow switch sensor (1.8" long) will fit in a 1-1/4" X 1-1/4" X 3/4" or larger Tee.

For liquid service, fill the process line so that the probe is surrounded by liquid.

See attached drawing for wiring details.

CALIBRATION

Power the instrument and allow 1 minute for the sensor head to reach equilibrium.

TO DETECT A DECREASE IN FLOW (FACTORY DEFAULT):

It is assumed that the user will have the relay energized at flow and will alarm (relay de-energize) on loss or decrease of flow. Please refer to attached wiring diagram for relay energization and program block settings (P1).

Flow product in the process line to the normal /expected rate for 1 minute.

Adjust the potentiometer (R1 on the wiring diagram) on the circuit board until the red LED changes state, as follows:

If the LED is on: Turn the potentiometer clockwise.

If the LED is off: Turn the potentiometer counterclockwise.

Typical backlash for the potentiometer is 1/8 turn.

Once the red LED on/off location is determined, turn the potentiometer in the LED “on” direction (counterclockwise), as follows:

- Air Flow Switch: 4 turns
- Organics/hydrocarbons Flow Switch: 2 turns
- Water Flow Switch: 1 turn

These turn numbers are typical and can be “fine tuned” as required.

TO DETECT INCREASE IN FLOW:

It is assumed that the user will have the relay energized at no flow and will alarm (relay de-energize) on increase of flow. Please refer to attached wiring diagram for relay energization and program block settings (P1). For relay energized at no flow, change program jumper from A and B to B and C.

Flow product in the process line to the normal condition for 1 minute. If zero flow rate is normal/expected, set with line full at zero flow.

Adjust the potentiometer (R1 on the wiring diagram) on the circuit board until the red LED changes state, as follows:

If the LED is on: Turn the potentiometer counterclockwise.

If the LED is off: Turn the potentiometer clockwise.

Typical backlash for the potentiometer is 1/8 turn.

Once the red LED on/off location is determined, turn the potentiometer in the LED “on” direction (clockwise), as follows:

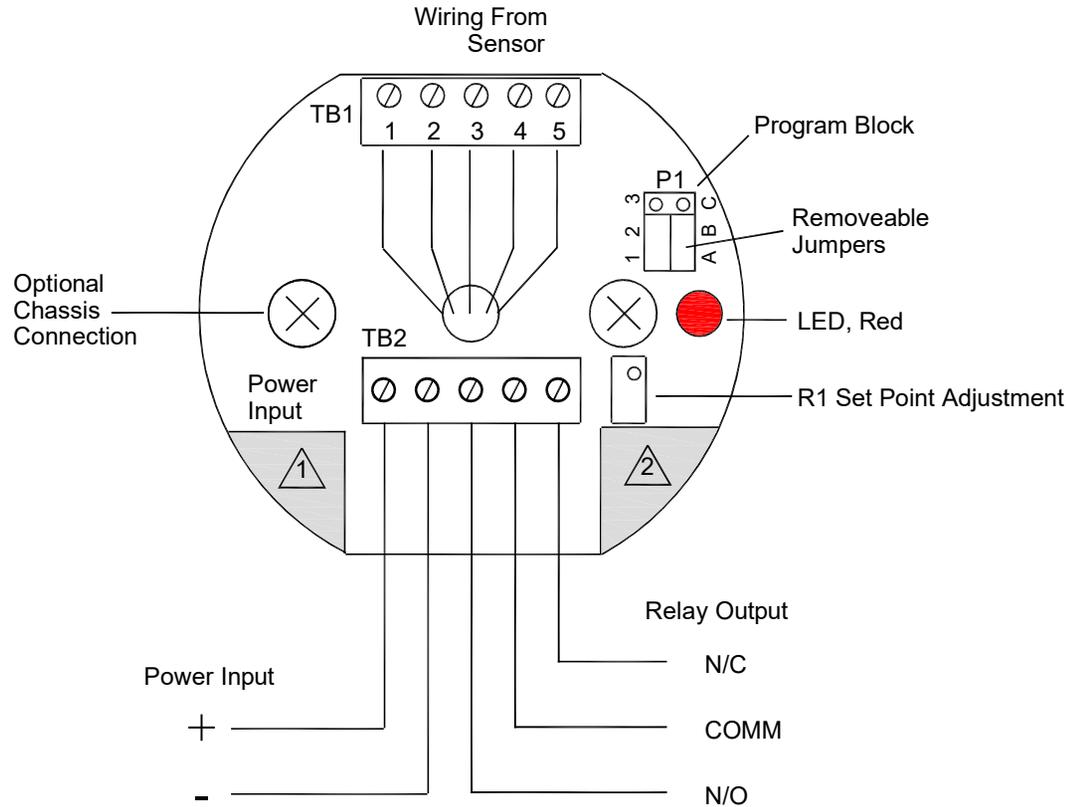
- Air flow switch: 4 turns
- Organics/hydrocarbons flow switch: 2 turns
- Water flow switch: 1 turn

These turn numbers are typical and can be “fine tuned” as required.

Technical service hours are Monday – Friday from 8:00 AM to 4:30 PM Pacific Standard Time

Wiring From Sensor

	Terminal Number (TB1)				
	1	2	3	4	5
Integral Electronics	Red or White	Red or White	Yellow	Black	Green
Remote Electronics Type H Cable	White	Blue + Drain	Yellow	Black	Green



Program Block
Application Setting Jumper Positions

Liquid Flow Switch	1 to 2	Factory Default
Air Flow Switch	2 to 3	
Liquid Level Switch	2 to 3	

Program Block
Relay Energization Jumper Positions

Flow Switch		
Energized at Flow	A to B	Factory Default
Energized No Flow	B to C	

Level Switch

Energized When Wet	A to B	Factory Default
Energized When Dry	B to C	

NOTES

△1 Power Input Written on Board

△2 Relay Rating Written on Board

"12"	VDC ±5%, 225 mA
"24"	VDC ±5%, 150 mA

"2"	2 AMP Relay Rated at 24 VDC Resistive or 0.5 AMP at 120 VAC Resistive
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APPROVALS		DATE	TITLE		SIZE	Sheet	DWG NO.	REV.
DRAWN	BKlatt		Flow Switch Wiring Diagram, FD Series Board		A		2200	5
CHECKED	J. Jackson							
ENGR	J. Jackson							

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