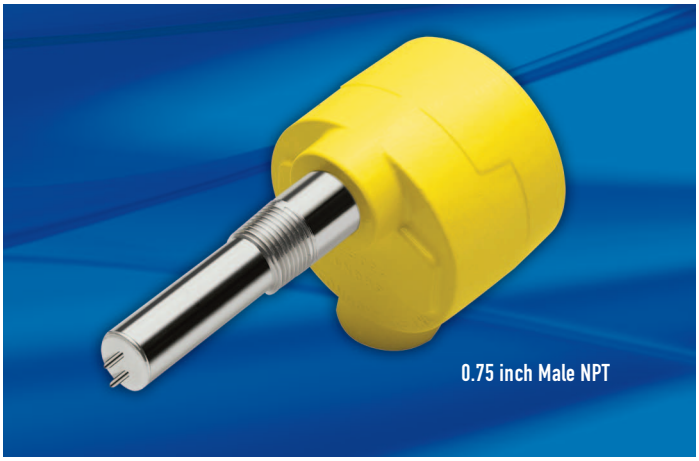
FS2000 Flow Switch & LS2000 Level Switch

FLUID COMPONENTS INTERNATIONAL LLC

Single Alarm / Limit Trip for Liquid and Gas Applications



The FS2000 for flow and the LS2000 for level provide an economical solution for alarm and limit trip switch applications in process and plant installations. These thermal dispersion technology based switches have no moving parts to maintain or foul to ensure long service life and reduce routine maintenance costs. These insertion type switches provide a fast response, highly repeatable trip point with a heavy duty SDPT 6A relay contact. The FS2000 is for use in liquid or gas flow applications. The LS2000 is for use in liquid or slurry level sensing, and as an interface switch between two non-miscible fluids.

Product Features

- Easy to install, insertion type
- Rugged and reliable construction with no moving parts design
- 300 series stainless steel or 316L stainless steel all welded wetted parts
- Heavy duty 6A SPDT relay
- Rated for installation in hazardous locations
- Global agency approvals

Industries

- Chemical
- Food and Beverage
- Mining
- Oil and Gas
- Pharmaceutical
- Pulp and Paper
- Water and Wastewater Treatment
- Power and Energy
- Steel and Metals
- Petrochemical

Flow Applications

- Pump protection
- Seal leak detection
- Lubricant monitoring
- Chemical injection
- HVAC monitoring
- High flow alarm
- Low flow alarm
- Fill/Drain control

Level Applications

- Tank level
- Sump level
- Foam interface
- Overflow detection
- Sludge interface
- Fill/Drain control

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FS2000 / LS2000 Specifications

Flow Setpoint Range

Water: 0.1 FPS to 1.0 FPS [0,03 MPS to 0,30 MPS]
Hydrocarbons: 0.1 FPS to 1.5 FPS [0,03 MPS to 0,45 MPS]
Air / Gas: 1.0 SFPS to 100 SFPS [0,30 NMPS to 30 NMPS]

Flow Repeatability: *± 10 °F [± 5,5 °C] media temperature change*

Without temperature compensation: ± 5%
With temperature compensation option: ± 1%
For higher repeatability, see FCI FLT93 Series

Flow Response Time: 0.5 seconds to 2.5 seconds

Level Accuracy

Top Mount: ± 1/4 ″ [± 6 mm] from element tip
Side Mount: ± 1/8 ″ [± 3 mm] from center line of element tip

Level Response Time

Dry to Wet: Less than 2 seconds
Wet to Dry: Less than 5 seconds
Wet to Wet (Interface): Less than 10 seconds

Flow Element

Materials of Construction: 300 series stainless steel press fit or 316 stainless steel all welded

Process Connections

300 series stainless steel: 1/4 ″ male NPT
316L stainless steel: 3/4 ″ male NPT

Insertion Lengths

300 series stainless steel: 0.98 ″ [25 mm], 2.23 ″ [57 mm] or 3.8 ″ [152 mm]
316L stainless steel: 1.2 ″ [31 mm] or 6 ″ [152 mm]; customer specified lengths optional

Operating Temperature: -40 °F to 250 °F [-40 °C to 121 °C]

Operating Pressure: 500 psig maximum [35 bar(g)]

Enclosure: Aluminum, NEMA 4X [IP66] rated; single or dual conduit ports.

Control Circuit

Operating Temperature: 0 °F to 140 °F [-18 °C to 60 °C]

Input Power

DC: 24 Vdc (21.5 V to 26.5 V); 1 watt
AC: 24 Vac (21.5 V to 26.5 V); 1 watt
AC: 100 Vac to 240 Vac; 5 watts maximum

Relay Rating

SPDT 6A relay, 28 Vdc to 240 Vdc resistive
[ATEX approval for 28 Vdc (100 mA)]

Instrument Approval and Ratings – FM and CSA: Explosion Proof for Class I, Div. I, Groups B (alarm relay version only), C, and D; non-incendive for Class I, Div. 2, Groups A, B, C, and D; Dust Ignition Proof for Class II, Div 1, Groups E, F, and G; suitable for Class II, Div. 2, Groups F and G; Class III hazardous indoor/outdoor Type 4 locations; **ATEX:** (24 V DC and AC powered units only) ⟨Ex⟩ II 3 GD EEx nA II T6 T62 °C or II 3 GD EEx nC IIC T6 T62°C; **CE** marking

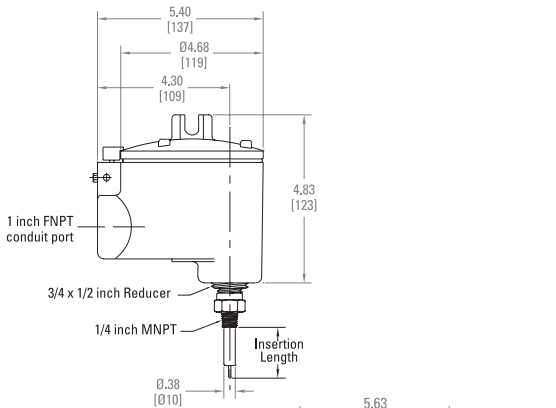
**Secondary alarm indicator is an open collector circuit (250 mA maximum)*

Principle of Operation: Thermal Dispersion

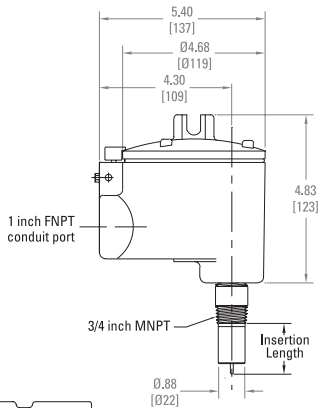
FCI's unique Thermal Dispersion technology provides exceptionally accurate, reliable and repeatable flow and no flow detection. The typical sensing element contains two resistance temperature detectors (platinum RTDs). One RTD is heated and the other RTD senses the process temperature. The temperature difference between the two RTDs is related to the flow rate or level process medium. Higher flow rates or denser media cause increased cooling of the heated RTD and a reduction in the temperature difference.

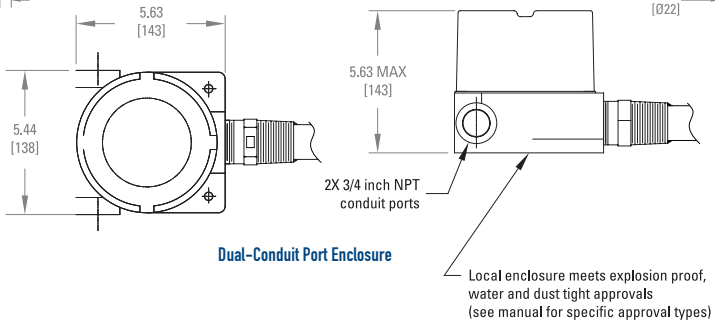
The temperature difference is greatest in a no flow condition and decreases as flow increases, cooling the heated RTD. Changes in media directly affect the extent to which heat dissipates and, in turn, the magnitude of the temperature differential between the RTDs. An electronic control circuit converts the RTD temperature difference into a DC signal that is used to drive an adjustable-setpoint relay alarm circuit.

With 300 Series Stainless Steel Sensor



With 316L Stainless Steel, All Welded Sensor

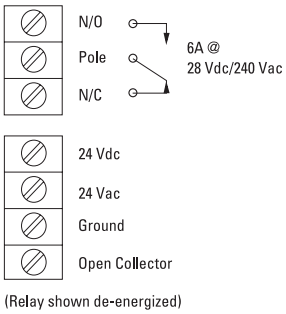




Dual-Conduit Port Enclosure

Wiring Diagrams

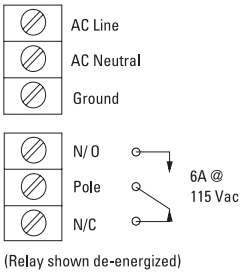
24 Vdc and 24 Vac



(Relay shown de-energized)

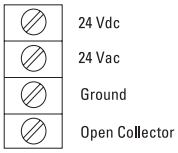
100 Vac – 240 Vac

Bottom Board



(Relay shown de-energized)

Top Board



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