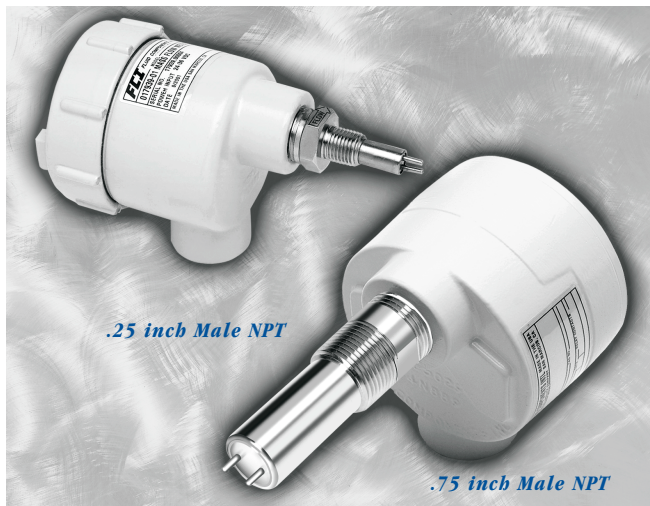


FS2000 Flow Switch and LS2000 Level Switch

Two-Wire, or Alarm with SPDT Relay



FCI's NuTec FS2000 flow and LS2000 level insertion switches represent the first thermal switches designed with 2-wire (loop power) 4-20 mA. Using 24 Vdc input power, this design allows for retrofitting existing failure prone mechanical float and paddle switches without wiring modifications. An alarm with SPDT relay and input power of 100-240 Vac, 24 Vdc or 24 Vac is also available.

Product Features

- › Proven technology at an economical price from the #1 thermal dispersion flow, level and temperature instrumentation supplier in the world
- › Rugged and reliable construction with no moving parts design
- › 300 series stainless steel or 316L stainless steel all welded wetted parts
- › 2-wire design with 24 Vdc replaces existing mechanical devices
- › Alarm with SPDT relay available
- › Rated for installation in hazardous locations
- › Global agency approvals

Industries

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

Flow Applications

- › Pump protection
- › Seal leak detection
- › Lubricant
- › 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

Specifications

Flow Setpoint Range:

- › **Water:** 0.1 - 1.5 fps [0.03 - 0.45 mps]
- › **Hydrocarbons:** 0.1 - 2.0 fps [0.03 - 0.60 mps]
- › **Air/Gas:** 0.5 - 100 sfps [0.15 - 30 nmps]

Flow Repeatability: ±1% of setpoint range.

Flow Response Time: 0.5 to 2.5 seconds.

Level Accuracy:

- › **Top Mount:** ±1/4 inch [±6 mm] from element tip.
- › **Side Mount:** ±1/8 inch [±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 inch male NPT
- › **316L stainless steel:** 3/4 inch male NPT

Insertion Lengths:

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

Operating Temperature: -40° to +250°F [-40° 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° to 140°F [-18° to +60°C]

Input Power:

- › **2-Wire Loop Power:** 22.5 to 33 Vdc. Power consumption is 0.5 watts maximum.
- › **Low Voltage:** 21.5 to 26.5 Vdc or Vac at 1 watt.
- › **High Voltage:** 100 to 240 Vac. Power consumption is 5 watts maximum.

Signal Output:

- › **2-Wire Loop Power*:** Alarm indicator responds to change in current draw between 14 mA and 18 mA.
- › **Low or High Voltage*:** Alarm indicator is a 6 amp relay, 28 Vdc/240 Vdc resistive. [ATEX approval for 28 Vdc (100mA)]

Instrument Approval and Ratings: FM and CSA: Explosion Proof for Class I, Div. 1, 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:** (dc powered units only)  II 3 GD EEx nA II T6 T62°C or II 3 GD EEx nC IIC T6 T62°C . **CE** marked.

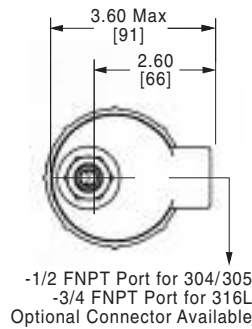
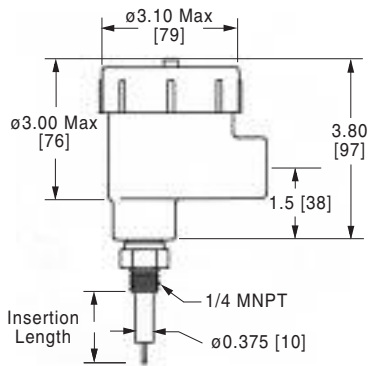
* Secondary alarm indicator is an open collector circuit (250 mA maximum).

Principle of Operation: Thermal Dispersion

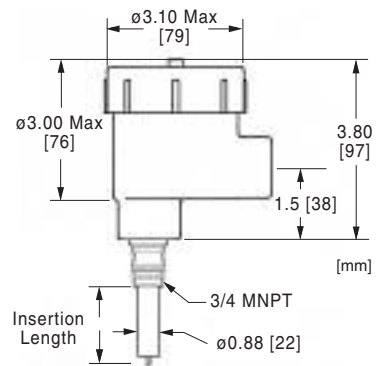
FCI's unique Thermal Dispersion technology provides exceptionally accurate, reliable and repeatable flow and no flow detection. The typical sensing element contains two resistance temperature detectors (platinum RTDs). One RTD is heated and the other RTD senses the process temperature. The temperature 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.

300 series Stainless Steel with 2-Wire



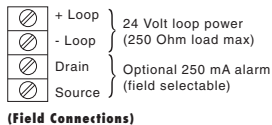
316L Stainless Steel, All Welded with 2-Wire



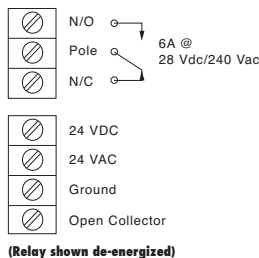
Enclosure for 304/305 or 316L Stainless Steel with Alarm Relay

Wiring Diagrams

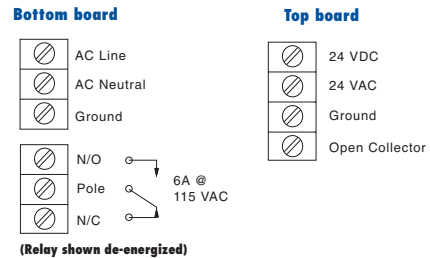
2-Wire Loop Power



Low Voltage



High Voltage



Web: www.fluidcomponents.com

1755 La Costa Meadows Drive, San Marcos, California 92078 USA | Phone: 760-744-6950 | Toll free: 800-854-1993 | Fax: 760-736-6250

European Office: Persephonestraat 3-01 5047 TT Tilburg, The Netherlands | Phone: 31-13-5159989 | Fax: 31-13-5799036

FCI is ISO 9001:2000 and AS9100 certified