FS2000L NuTec® Inline Flow Switch

Non-Intrusive/General Industrial Use/Sanitary/High Purity

Extraordinarily responsive and accurate, the versatile NuTec FS2000L inline flow switch offers superior reliability in extreme process conditions. NuTec switches are designed with proven thermal mass flow sensor technology in a rugged package that is easy to install and requires minimal maintenance. The NuTec FS2000L's advanced non-intrusive sensor design is constructed of 316L stainless steel and is available with optional electropolish finishes of 20 Ra and 10 Ra suitable for high purity and sanitary environments. Inline sizes range from 1/2 to 2 inches for easy installation using male NPT, butt-weld or sanitary flanges.

Features

- Non-intrusive design
- 316L stainless steel for all wetted surfaces
- 24 Vdc/Vac or 100 to 240 Vac input power
- Alarm with SPDT relay
- Rated for installation in hazardous locations
- Wide flow range with fast response
- Sanitary 3A and high purity electropolish finishes optional

Industries

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

Applications

- Seal leak detection
- Chemical injection
- Pump protection
- High purity gases
- Pill coating
- Fermentation
- Bottling
- Chip manufacturing

Specifications

Setpoint Range

Water:

- **1/2 inch [13 mm] tube:** 0.03 - 3.4 GPM [0.11 - 12.9 LPM]
- **1 inch [25 mm] tube:** 0.18 - 18.5 GPM [0.68 - 70 LPM]
- **2 inch [51 mm] tube:** 0.85 - 85.5 GPM [3.22 - 324 LPM]

Air/Gas:

- **1/2 inch [13 mm] tube**: 0.02 - 13.4 SCFM [0.0006 - 0.38 NCMM]
- **1 inch [25 mm] tube:** 0.12 - 74 SCFM [0.0030 - 2.10 NCMM]
- **2 inch [51 mm] tube:** 0.57 - 342 SCFM [0.0160 - 9.70 NCMM]

Accuracy: ±3% of alarm setpoint +0.25% of setpoint range over any 100°F [38°C] temperature span.

Repeatability: ±1% of alarm setpoint.

Response Time: Adjustable from 0.5 to 2.5 seconds.

Enclosure:

- **Standard:** Weatherproof
- **Optional:** Aluminum or stainless steel NEMA Type 4X (IP55) rated for hazardous locations Groups B, C, D, E, F, G and EEx d IIC.

Agency Approvals: FM, CSA, ATEX (pending), CE Mark, Sanitary 3A, ASME BPE (1997).

Flow Element

Materials of Construction:

- **Standard:** 316L stainless steel all welded for all wetted surfaces.
- **Optional:** 20 Ra or 10Ra electropolish.

Process Connections:

- **Standard:** Butt weld
- **Optional:** Male NPT or sanitary flange.

Flow Tube Lengths:

- **For Male NPT:** 9 inches [229 mm]
- **For Butt Weld or Sanitary Flange:** 6 inches [152 mm]

Operating Temperature: -40° to +250°F [-40° to 121°C][4]

Operating Pressure:

- **Male NPT or Butt Weld:** 500 psig maximum [35 bar(g)], derated to 250 psig [17 bar(g)] CRN
- **For Sanitary Flange:** 100 psig maximum [7 bar(g)]

Control Circuit

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

Input Power:

- **Low Voltage:** 22.5 to 26 Vdc/21.5 to 26.5 Vac.
- **High Voltage:** 100 to 240 Vac. Power consumption is 5 watts maximum.

Signal Output:

- **For Low or High Voltage:** Alarm indicator is a 6 amp relay, 28 Vdc/240 Vdc resistive. Secondary alarm indicator is an open collector circuit (250 mA maximum).

Theory 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 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.

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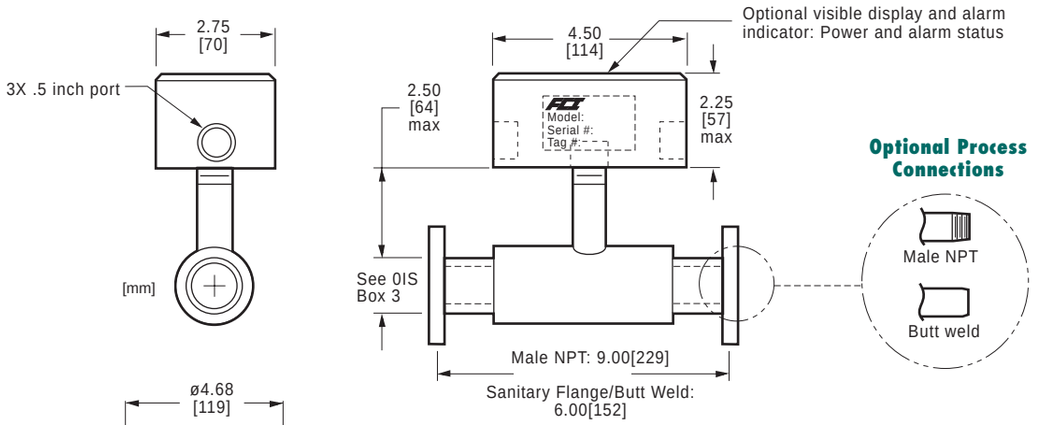
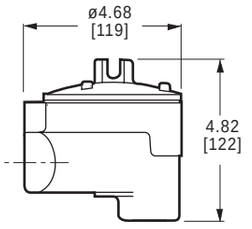
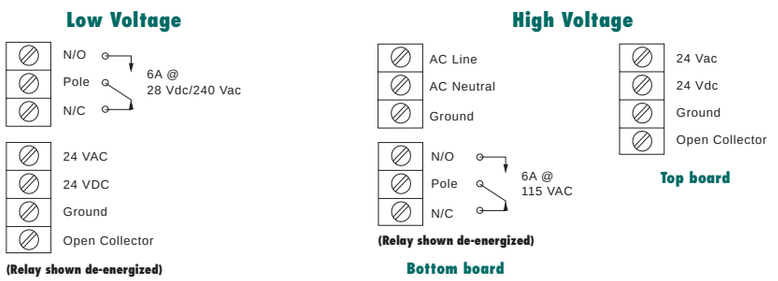




Optional Explosion-Proof Enclosure

Wiring Diagrams



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FCI is ISO 9001 certified/conformance to AS9000

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