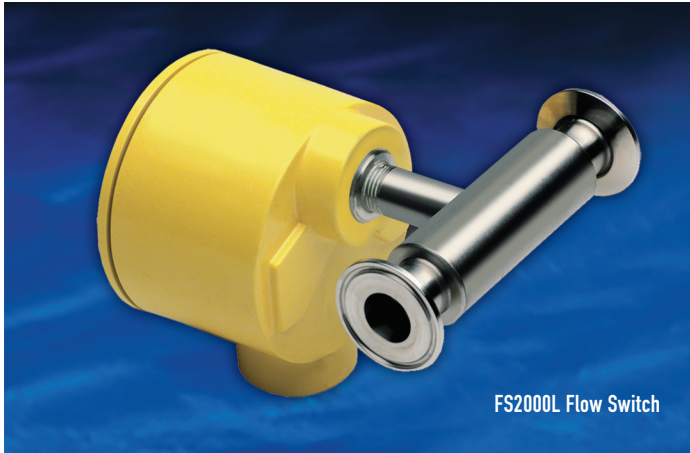


## Non-Intrusive/General Industrial Use/Sanitary/High Purity



FS2000L Flow Switch

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. (For larger line size applications, see FCI model FS2000H.)

### Product Features

- Non-intrusive design
- No moving parts
- Corrosion and erosion resistant, 316L stainless steel for all wetted surfaces
- 24 Vdc/Vac or 100 to 240 Vac input power
- Alarm with SPDT relay or open collector output
- Rated for installation in hazardous locations
- Wide flow range with fast response
- Sanitary and high purity electropolish finishes optional

### Industries

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

### Applications

- |                       |                              |
|-----------------------|------------------------------|
| - Seal leak detection | - Pill coating               |
| - Chemical injection  | - Fermentation               |
| - Pump protection     | - Bottling                   |
| - High purity gases   | - Chip manufacturing         |
| - High flow alarm     | - Liquids, gases or slurries |
| - Low flow alarm      | - Lubricants                 |
| - Clean and Purge     | - Adhesives                  |

### FS2000L Specifications

#### Setpoint Range

##### Water:

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

##### Air/Gas:

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

#### Flow Element

##### Materials of Construction:

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

##### Process Connections:

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

##### Flow Tube Lengths:

- For Male NPT: 8 inches [203 mm]
- For Butt Weld or Sanitary Flange: 5 inches [127 mm]

**Operating Temperature:** -40 °F to +250 °F [-40 °C to 121 °C] (Acceptable for clean and steam in place operation to 350 °F [177 °C] for maximum 45 minutes)

##### 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)]

**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

- 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

- 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). [ATEX approval for 28 Vdc (100mA)]

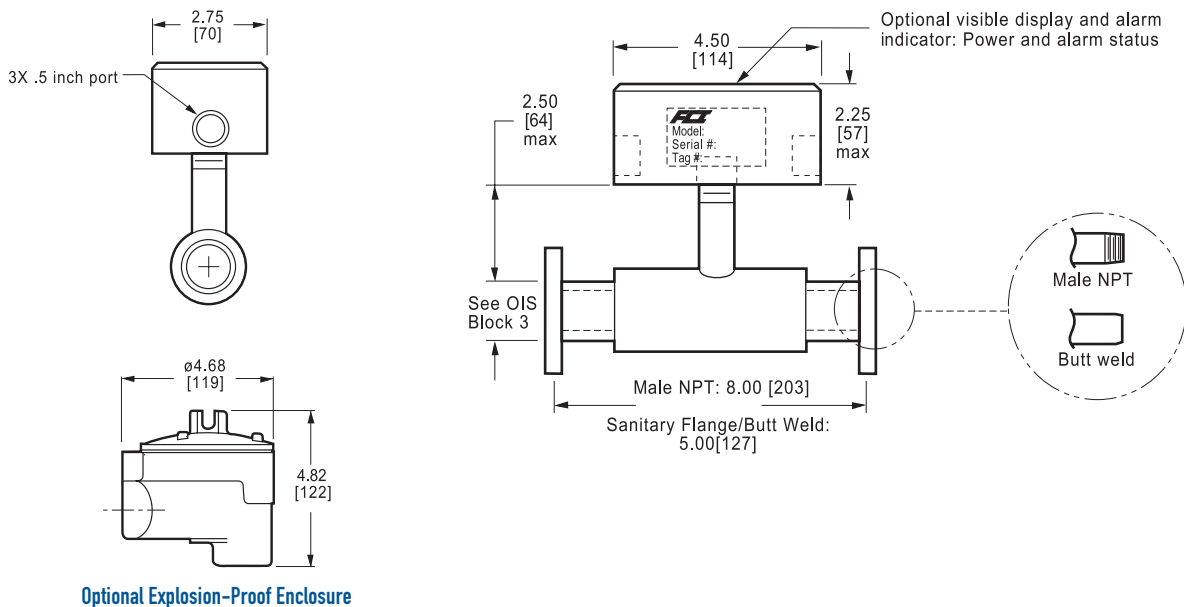
**Instrument Approval and Ratings – FM and CSA:** FM and CSA: Explosion Proof for Class I, Div. 1, Groups B, C, and D; Non-incendive for Class I, Div. 2, Groups A, B, C and D. Dust Ignition Proof for Class II, Div. 1, Groups E, F, and G; Suitable for Class II, Div. 2, Groups F and G; Class III hazardous 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. ASME BPE (2005), **CE** marked.

**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.

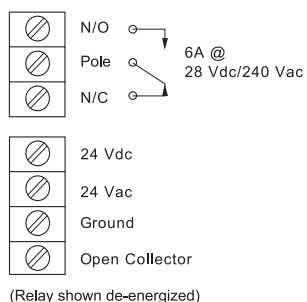
**NuTec FS2000L Inline Flow Switch**



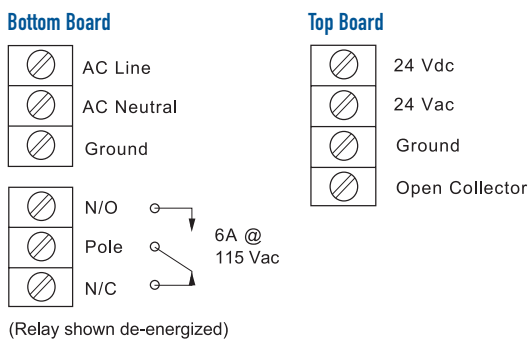
**Optional Explosion-Proof Enclosure**

**Wiring Diagrams**

**Low Voltage**



**High Voltage**



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*\*Please note: FCI area code changes from "760" to "442" effective January 1, 2009*

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**Phone:** 31-13-5159989 **Fax:** 31-13-5799036

**FCI is ISO 9001:2000 and AS9100 Certified**

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