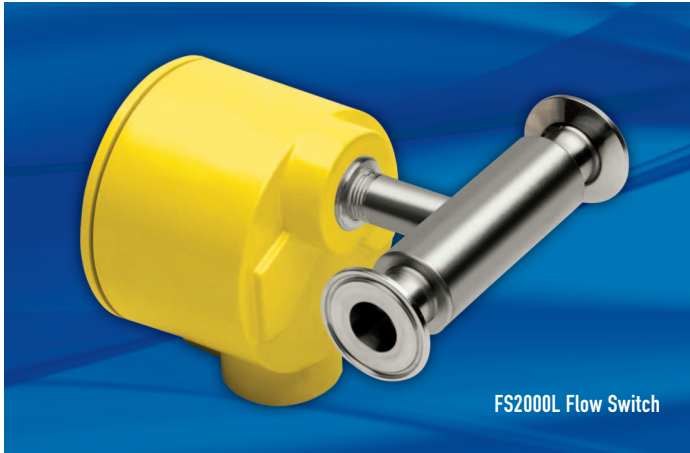


FS2000L NuTec® Inline Flow Switch

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

Applications

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

FS2000L Specifications

Setpoint Range

Water:

1/2" [13 mm] tube: 0.03 GPM to 3.4 GPM [0,11 LPM to 12,9 LPM]

1" [25 mm] tube: 0.18 GPM to 18.5 GPM [0,68 LPM to 70 LPM]

2" [51 mm] tube: 0.85 GPM to 85.5 GPM [3,22 LPM to 324 LPM]

Air/Gas:

1/2" [13 mm] tube: 0.02 SCFM to 13.4 SCFM [0,0006 NCMM to 0,38 NCMM]

1" [25 mm] tube: 0.12 SCFM to 74 SCFM [0,0030 NCMM to 2,10 NCMM]

2" [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 seconds 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:

Male NPT: 8" [203 mm]

Sanitary Flange: 6" [152 mm]

Butt Weld: 5.05" [128 mm]

Operating Temperature: -40 °F to 250 °F [-40 °C to 121 °C] (Acceptable for clean and steam in place operation to 350 °F [117 °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

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 Vac to 26.5 Vdc or Vac at 1 watt

High Voltage: 100 Vac to 240 Vac; power consumption is 5 watts max.

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 (100 mA)]

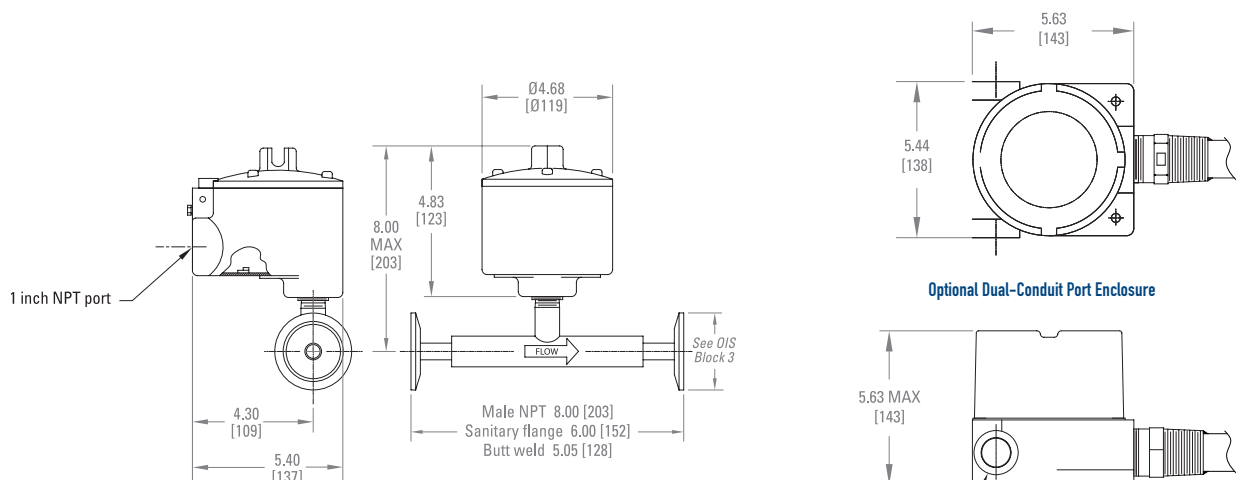
Instrument Approval and Ratings – FM and CSA: FM and CSA: Explosion Proof for Class I, Div. I, Groups B, C, and D; Non-incendive for Class I, Div. 2, Groups A, B, C and D; Dust Ignition Proof for Class II, Div. 1, Groups E, F, and G; Suitable for Class II, Div. 2, Groups F and G; Class III hazardous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

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.

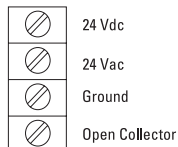
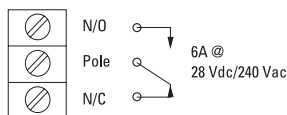
The temperature difference is greatest in a no flow condition and decreases as flow increases, cooling the heated RTD. Changes in media directly affect the extent to which heat dissipates and, in turn, the magnitude of the temperature differential between the RTDs. An electronic control circuit converts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

NuTec FS2000L Inline Flow Switch



Wiring Diagrams

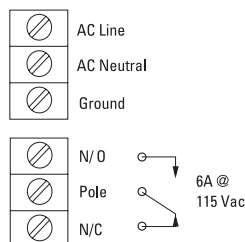
24 Vdc and 24 Vac



(Relay shown de-energized)

100 Vac – 240 Vac

Bottom Board



(Relay shown de-energized)



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