



- Cooling Water and Fluids
- Leak Detection
- Lubricant Flow Assurance
- Ventilation Verification
- Chemical Injection Assurance
- Nitrogen Purge Verification
- Compressor Leakage

Wherever detection and user warning of a flow rate that is either too high or too low is required, the FS10i is the solution. For either liquids or gases, the FS10i is a flow sensing instrument that provides a highly accurate, repeatable and fast-responding flow trip point or alarm setting. The FS10i comes standard with both a 1A relay output for alarm/trip point setting, and a 4-20mA analog output for trending and monitoring. The trip point can be set as high or low, and can be adjusted with hysteresis and/or time delay. The FS10i is easily set-up in the field using either the two-button keypad, or with a PC connection to the FS10i's serial port. The instrument features a ten (10) LED array to indicate actual flow range and, when trip point is reached, the LED will begin to flash to provide an immediate visual indication to the user. To ensure best performance and installation ease, the FS10i is available in a choice of three flow element lengths (insertion depth) and process connections: a 2 inch [50 mm] length with a 1/4" NPT (M); or a 6 inch [150 mm] length, variable depth, with 1/2" NPT (M) compression fitting, with either a Teflon or metal ferrule.

The FS10i is the only product in its class to carry a SIL 2 compliance rating with a 90% Safe Failure Fraction (SFF).

FS10i Features

- For Liquid or Gas Flow Detection
- Relay and 4-20 mA Monitoring Outputs Standard
- Ultra Reliable, No Moving Parts Design
- Easy, User Set-up
- 10 LED Display Array and Two-Button Key Pad
- SIL 2 Compliance Rating
- Optional Div 2 / Zone 2 Approvals
- Standard M12 connection to electronics

FS10i Specifications

Instrument

Measuring Principal: Thermal dispersion

Response Time: 4 sec. (1 time constant)

Process Connections: 1/4" NPT (M) or 1/2" NPT (M) compression fitting with either Teflon or metal ferrule

Repeatability: $\pm 0.5\%$ of reading

Agency Approvals

FM, FMC	Nonincendive, Class I Division 2 Groups A, B, C, D; Class II, Division 2 Groups E, F, G; Class III, T4@Ta=71°C, Type 4X
ATEX, IECEx,	Nonincendive for gas and dust, Zone 2
EAC (TRCU) Russia*	II 3 G Ex nA IIC T4 Gc II 3 D Ex tc IIIC T81 °C Dc IP64

* Pending; contact FCI for current status

Ingress Protection IP65, IP66, IP67 in non-hazardous locations

CE Marking, CRN, complies with Canadian Electrical code requirements of ANSI/ISA 12.27.01-2011 as a single seal device

IEC 61508 (SIL) SIL 2 Compliant; Safe Failure Fraction (SFF) 90%

Warranty: 1 Year

Flow Element

Materials of Construction (Wetted Parts)

316L SS with Hastelloy-C22 thermowells

Flow Sensitivity/Setpoint Range

Water: 0.01 FPS to 0.5 FPS [0,003 MPS to 0,15 MPS]

Air: 0.25 FPS to 400 SFPS [0,076 MPS to 122 MPS]

Repeatability: $\pm 0.5\%$ of reading

Temperature Coefficient For temperatures $> \pm 30^\circ\text{F}$ [$\pm 16^\circ\text{C}$]

Gas: Maximum $\pm 0.025\%$ of reading/ $^\circ\text{F}$ up to 250°F [$\pm 0,05\%$ of reading/ $^\circ\text{C}$ up to 121°C]

Liquid: Maximum $\pm 0.2\%$ of reading/ $^\circ\text{F}$ up to 250°F [$\pm 0,367\%$ of reading/ $^\circ\text{C}$ up to 121°C]

FS10i specifications continued on next page

FS10i Specifications

FS10i specifications continued from previous page

Sensor

Operating Temperature

-40 °F to 250 °F [-40 °C to 121 °C]

Teflon ferrule maximum temperature is 200 °F [93 °C]

Operating Pressure

2000 psi [138 bar]

Teflon ferrule maximum pressure is 150 psig [10 bar(g)]

Insertion "U" lengths

2" [50 mm] fixed

6" [150 mm] with variable insertion depth, compression fitting with Teflon or metal ferrule

Electronics

Display

10 segment LED array, sequential lighting related to flow rate and flashing when trip point exceeded

Output Signals

Relay: SPDT, 1A @ 24 Vdc, 120 Vac

Analog: 4-20 mA trending *

Serial: RS232C I/O

* 500 ohm maximum load; user scalable, general purpose, uncalibrated output proportional to flow rate for trend monitoring or assignable to temperature; fault indication per NAMUR NE43 guidelines, user-selectable for high (>21.0 mA) or low (<3.6 mA) default

For linearized and calibrated analog outputs, see FCI's line of thermal mass flow meter products

Operation

Two top-mounted buttons to program switch/trip point, zero and span setting, fail-safe, relay hysteresis and relay time delay; button operation may be user disabled to prevent unwanted changes; all set-up function are also user programmable via the RS232C serial port

Trip Point Hysteresis Control: 0-100% of span

Trip Point Time Delay: user settable for 0-65,000 seconds

Input Power: 24 Vdc (21.5 Vdc to 30 Vdc); 2.5 watts maximum

Operating Temperature: -40 °C to 160 °F [-40 °C to 71 °C]

Enclosure / Housing

Material: stainless steel body; aluminum end-cap/top with polyester overlay and clear, silicone sheath impact guard

Protection Ratings

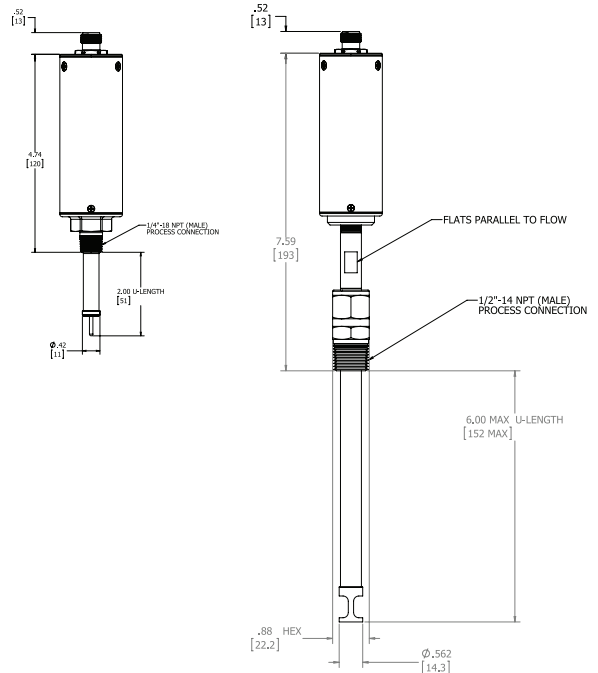
Non-Ex installations: IP65, IP66, IP67

FM, FMc approved: NEMA 4X

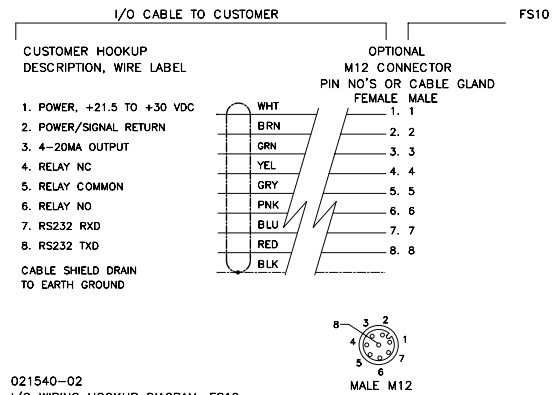
ATEX, IECEx approved: IP64

Dimensional Drawings

Integral Mount



Input/Output Wiring Diagrams



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FS10i -

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Block No. 1 2 3 4

INSTRUCTIONS: To order an **FS10i** in an integral configuration, please fill in each numbered block above by selecting required codes from the corresponding categories below. Use of any "W" or "*" codes requires prior approval from FCI. For special data, documentation, test reports or required quality reports, refer to FCI's Engineering and Quality Assurance Order Information Sheets (OIS).

Code	[BLOCK 1] Process Connection and "U" Length
B	1/4" NPT fixed; 2" [50 mm] length
E	1/2" NPT compression fitting with Teflon ferrule; 6" [150 mm] length
F	1/2" NPT compression fitting with metal ferrule; 6" [150 mm] length
W	Other, agency approved, customer specified
Code	[BLOCK 2] Power and Signal Output Connection Type
2	M12 connector only <i>No cable supplied</i> ¹
1	Fixed, watertight cable gland to wire pigtail; 15' [5 m] ⁴
W	Agency approved, customer specified
Code	[BLOCK 3]
0	<i>Block 3 Code is always "0" with FS10i integral version</i>
Code	[BLOCK 4] Agency Approvals <i>CE marking always included</i>
0	None; CE marking only
1	FM, FMc ²
3	ATEX, IECEx ²
5	EAC / TR CU (Russia) <i>Pending</i> ³
*	Other <i>Contact FCI for other approvals and conditions of use</i>

Notes

1. Connecting cable to be customer supplied, or select from Accessories list and order as separate item
2. Approvals for hazardous area are Division 2 / Zone 2; see specifications for details
3. Contact FCI for current status of approvals
4. Cannot be selected with ATEX/IECEx approval (*i.e. if Block 2 is Code 1, then Block 4 cannot be Code 3*)

Accessories¹

Part Number	Description
022474-A02	2 m [6'] M12(f)-to-pigtail with wire markers interface cable; polyurethane jacketed
022474-A05	5 m [15'] M12(f)-to-pigtail with wire markers interface cable; polyurethane jacketed
022474-A10	10 m [30'] M12(f)-to-pigtail with wire markers interface cable; polyurethane jacketed