



FF1225-A

Ultrasonic Gas Flow Meter

Unprecedented rangeability, and tolerance to gas impurities

Description

The Lauris FF1225 Series Ultrasonic Flare Gas Flow meter is designed and manufactured for accurate flare gas metering. Lesser meter technologies, not “Fit For Purpose” are at times selected in a cost cutting effort. These inferior solutions can result in inaccurate flow measurements and higher maintenance costs. The FF1225 delivers accurate flare gas measurement over a wide range with minimal maintenance intervention. The flow meter is offered with several options including local or remote mount transmitter, temperature and pressure transducers, and a multi-path version that provides fiscal grade flow uncertainty of 0.5% in clean gases. Both the local or remote LCD display shows velocity, flow rate, total flow, temperature and pressure. The onboard memory of the transmitter/display allows for storage of up to 250,000 data points. Total data stored is defined by the sample rate programed by the user.

Consult with Lauris engineering team on your specific requirements of your flow measurement.



Features

- Lowest Minimum Detectable Velocity
- No Pressure Drop
- Totalized Flow, Flow Rate
- Wide Range of Metallurgy
- Variety of Pressure Ratings



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Unprecedented rangeability, and tolerance to gas impurities

Specifications

Transducer Type	Ultrasonic, wetted, non-intrusive, in-line
Operating Principle	Transit Time Measurement
Transducer Material	SS316, SS316L, Titanium, Hastelloy, Monel
Cable Length	Up to 30m
Performance Characteristics	
Velocity Range	0.01m/s to 150m/s (0.03ft/s to 500ft/s)
Accuracy	+/-1.0% to 2.5%, up to 0.25% in Multi-path design
Repeatability	0.1%
Measurement Parameters	Standard & Actual Flow, Flow Rate, Totalized Flow, Molar Mass, Pressure, Temperature
Operating Conditions	
Pipe Diameter	0.04m to 5m (1.5" to 200")
Recommended Pipe Length	10 Diameters Upstream & 5 Diameters Downstream
Process Temperature	-40°C to +250°C (-40°F to 480°F)
Process Pressure	0.5bar to 285bar (7psi to 4150psi) Absolute
Presence of Liquids	No affect on flow measurement
Mechanical Characteristics	
Design	Pipe mount, NPT or Flanged Connections
Transducer Mount	Retractable
Length	Dependent upon pipe size
Electrical Characteristics	
Supply Voltage	24VDC Nominal (20V to 32V), 120/220VAC optional
Power Consumption	2.5W max
Inputs	2 @ 4-20mA for pressure and temperature
Outputs	ModBus, Frequency/Pulse, 1 @ 4-20mA, HART
IP Rating	NEMA 4X
Hazardous Area Approval	CSA/ULClass 1, Div.1., Group BCD T4 ATEX (Zone 1), IECEx (Zone 1)
Sunshade	Optional

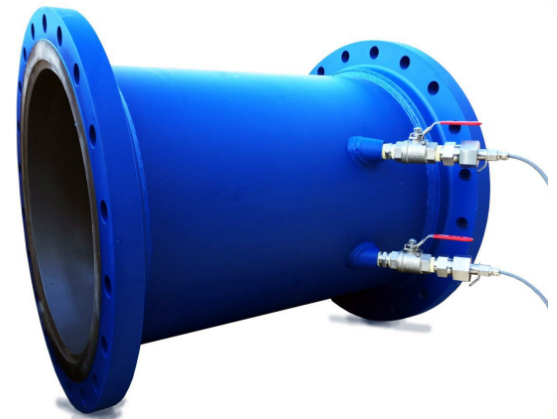


FF1225 Ultrasonic Gas Flow Meter

Description

The FF1225 ultrasonic gas flow meter is focusing on flare gas applications which are cost sensitive. Attempts on cost saving stimulate some users to installation of target flow meters, thermal dispersion mass flow meters, Pitot tubes or other simplified solutions. That usually ends up by the need of replacing the meters.

The FF1225 is based on proprietary ultrasonic transit-time measurement with minimum detectable gas velocity of 1cm/s. The flow meter is supplied in several options including the multi-path version when flow uncertainty less than 1% is required.



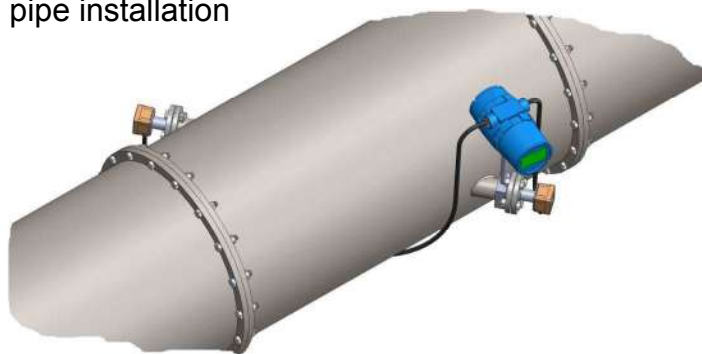
Features

- Lowest minimum detectable velocity of $V_{min}=0.01\text{m/s}$
- No pressure drop
- Immunity to gas composition
- Volumetric and molecular & mass flow measurement

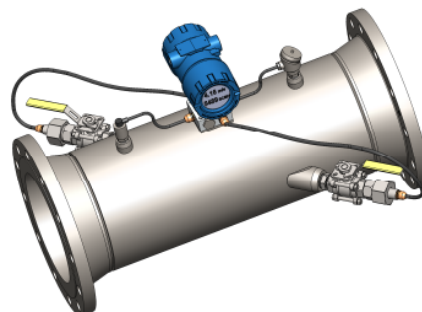


FF1225 Ultrasonic Gas Flow Meter

FF1225 on pipe installation
Pipe 24"



FF1225 -10
Spool 10"



Specifications

Transducer Type	Ultrasonic, wetted, non-intrusive, in-line
Operating Principle	Transit-time measurement
Transducer Material	SS 316
Cable Length	10m (30ft), maximum 30m (100ft)
Performance Characteristics	
Velocity Range	Regular from 0.02 to 85m/s (0.05 to 250ft/s), extended 0.01 to 135m/s (0.03 to 400ft/s)
Accuracy	±1.5% to ±3%, up to ±0.5% in multipath version
Repeatability	Better than 1%
Measurement Parameters	Standard and actual volume flow, totalized volume flow, molecular weight, mass flow, pressure, temperature, gas velocity
Operating Conditions	
Pipe Diameter	8 cm to 200 cm (3" to 80")
Recommended Pipe Length	10D (upstream) & 5D (downstream)
Process Temperature	-40°C to +135°C (-40°F to 275°F)
Process Pressure	barA to 20 barA (7 psiA to 300 psiA)
Presence of Liquids	Not affected
Mechanical Characteristics	
Design	Pipe mount, NPT or flanged connections
Transducer Mount	Retractable
Length	Depending on pipe diameter, typical arrangement is 45-degree to the flow
Electrical Characteristics	
Supply Voltage	24VDC (20-32 VDC)
Power Consumption	3.5W (max)
Inputs	Two 4-20 mA for external pressure and temperature sensors
Outputs	Digital-ModBUs, analog 4-20mA, pulse-frequency, HART (optional)
Hazardous Area Approval	CSA/UL Class 1, Div.1, Group ABCD T4

FIT1225 Ultrasonic Gas Flow Meter

Description

The FIT1225 is the insertion model of the ultrasonic gas flow meter specifically developed for large flare pipes and stacks. Insertion probe design overcomes inherent difficulties of conventional non-intrusive wetted designs caused by the low signal level at long ultrasonic paths and signal blow-out at high gas velocity.

The FIT1225 utilizes the proprietary ultrasonic transit-time measurement with minimum detectable gas velocity of 1cm/s. The insertion probe meter is provided in several options including the multi-probe version for better accuracy, retractable probe version, etc.



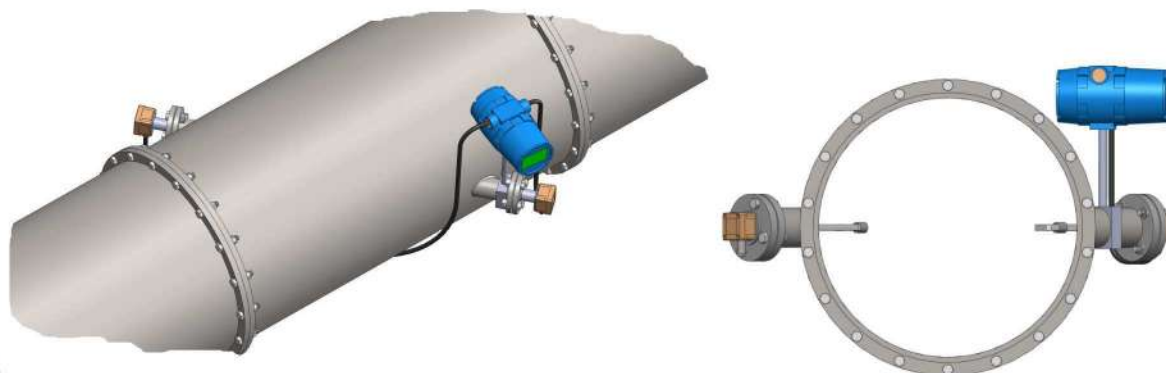
Features

- Lowest minimum detectable velocity of $V_{min}=0.01\text{m/s}$
- Very large pipe diameters
- Wet and dry flare gases
- Flue gases up to 250C with high particulates content



FIT1225

Ultrasonic Gas Flow Meter



Specifications

Transducer Type	Ultrasonic, wetted, intrusive
Operating Principle	Transit-time measurement
Transducer Material	SS 316
Cable Length	10m (30ft), maximum 30m (100ft)
Performance Characteristics	
Velocity Range	0.01 to 100 m/s (0.03 to 330 ft/330)
Accuracy	±1.5% to ±3%, up to ±0.5% in multipath version
Repeatability	Better than 1%
Measurement Parameters	Standard and actual volume flow, totalized volume flow, pressure, temperature, gas velocity
Operating Conditions	
Pipe Diameter	from 15 cm (6")
Minimum Pipe Length	10D (upstream) & 5D (downstream)
Process Temperature	-40°C to +250 °C (-40°F to 485°F)
Process Pressure	0.5 barA to 20 barA (7 psiA to 300 psiA)
Presence of Liquids	Not affected
Mechanical Characteristics	
Design	Insertion probe, 3" flanged connection, optional 3" ball valve
Transducer Mount	Optionally retractable with 3" ball valve
Length	Measuring path from 15 cm (6") to 30 cm (12")
Electrical Characteristics	
Supply Voltage	24VDC (20-32 VDC)
Power Consumption	5W (max)
Inputs	Two 4-20 mA for external pressure and temperature sensors
Outputs	Digital-ModBUs, HART, analog 4-20mA
Hazardous Area Approval	CSA/UL Class 1, Div.1, Group ABCD T4

FH1225 Ultrasonic Gas Flow Meter

Description

The FH1225 gas flow meter combines advantages of two complimentary ultrasonic flow metering methods: transit-time and transit phase.

This results in unprecedented turn-down ratio, starting from the minimum velocity of 0.02m/s to the maximum gas velocity of 175m/s. The meter is insensitive to entrained liquids and clogging of transducers with heavy hydrocarbons and paraffins.

Applications include flare gas measurement in small and medium pipes and associated gas flow measurement at wellheads.



Features

- Highest turn-down ratio from $V_{min}=0.02\text{m/s}$ to $V_{max}=175\text{m/s}$ in one device
- No pressure drop
- Volumetric and molecular & mass flow measurement



FH1225

Ultrasonic Gas Flow Meter



Specifications

Transducer Type	Ultrasonic, wetted, non-intrusive, in-line
Operating Principle	Transit-time and transit-phase measurement
Transducer Material	SS 316
Cable Length	10m (30ft)
Performance Characteristics	
Velocity Range	0.02 m/s to 175 m/s (0.06 ft/s to 585 ft/s)
Accuracy	±1.5% to ±3%
Repeatability	Better than 1%
Measurement Parameters	Standard and actual volume flow, totalized volume flow, molecular weight, mass flow, pressure, temperature, gas velocity
Operating Conditions	
Pipe Diameter	5 cm to 100 cm (2" to 40")
Minimum Pipe Length	8D (upstream) & 4D (downstream)
Process Temperature	-40°C to +135°C (-40°F to 275°F)
Process Pressure	0.8 barA to 20 barA (10 psiA to 300 psiA)
Presence of Liquids	Not affected
Mechanical Characteristics	
Design	Spool type, flanges ANSI 150, pipe Sc.40, material SS316
Transducer Mount	Retractable, one-by-one
Length	60cm to 120cm depending on pipe diameter
Electrical Characteristics	
Supply Voltage	24VDC (20-32 VDC)
Power Consumption	5W (max)
Inputs	Two 4-20 mA for external pressure and temperature sensors
Outputs	Digital-ModBUs, two analog 4-20mA, pulse-frequency
Hazardous Area Approval	CSA/UL Class 1, Div.1, Group ABCD T4

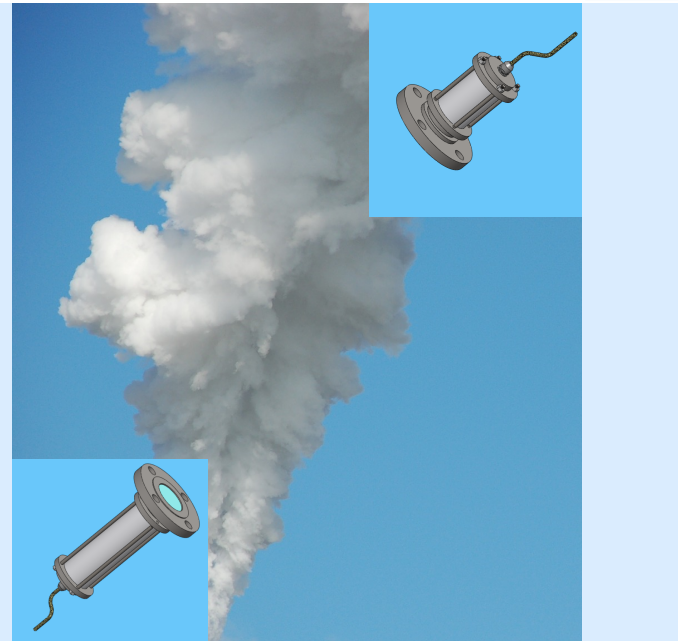
VG 0950

Flue Gas Flow Meter

Description

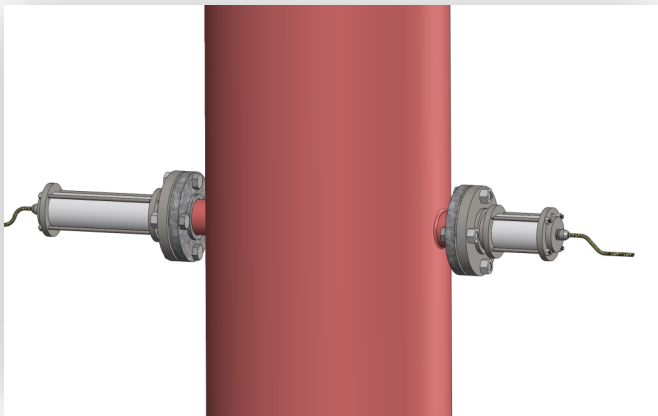
The VG series of gas flow meters is based on revolutionary flow visualization technology. Flow visualization as a tool for studying 2D and 3D flow patterns has been known to flow researchers for years. However, it has never been developed for industrial flow metering

VG series is filling this gap now. This is not only a practical implementation of the novel flow metering approach but also a beginning of the advanced instrumentation technique with adds-on capabilities of turbidity measurement, particle counts and distributions, etc. All are required by the modern continues emission monitoring (CEM).



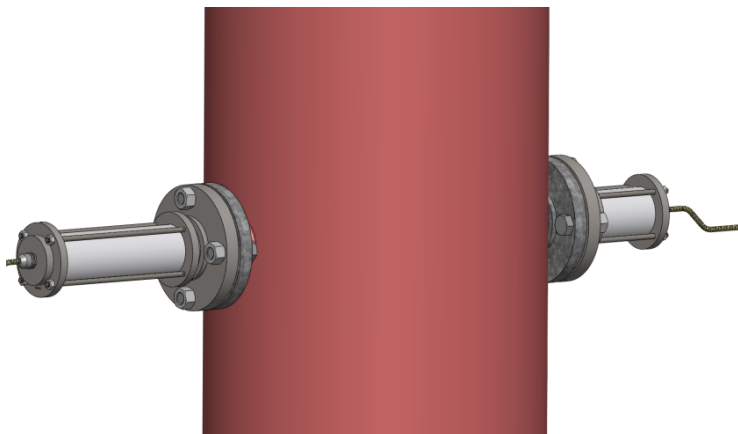
Features

- **Process temperature: up to 1000C, Highest in the industry**
- **Short upstream and downstream piping**
- **Adds-on capabilities: turbidity measurement, particle distribution, etc.**



VG 0950

Flue Gas Flow Meter



Specifications

Design	Two head, 4" flange connection
Material:	SS321, ceramics, sapphire sight windows
Flange Rating	#150,
Bore and Pipe Schedule	2", Sch 40
Velocity Range	0.1m/s to 40 m/s (0.3 ft/s to 120 ft/s)
Accuracy	1.5% to 2.5%
Repeatability	Better than 1%

Operating Conditions

Pipe Diameter	20cm to 200cm (8" to 80")
Process Temperature	+100C to +1000C (212F to +1830F)
Maximum Process Pressure	NA
Ambient Temperature	-45C to +60C (-49F to +140F)

Electrical Characteristics

Supply Voltage	24VDC (20-32VDC)
Power Consumption	5W (max)
Output	4-20mA, ModBus
Input	NA
LCD Display	Standard, can be excluded for low temperature operations
Hazardous Area Approval	NA

FC1223 Ultrasonic Gas Flow Meter

Description

The FC1223 gas flow meter is specifically developed for flare gas and associated gas flow measurement where conventional ultrasonic gas flow meters are experiencing problems due to high turbulence or presence of liquids. The FC1223 is an efficient gas accounting system which brings together high performance, reliability, and low cost. The design is based on proprietary ultrasonic transit-phase measurement method with in-line positioning of transducers (no beam reflections). Besides volumetric flow, the "M" version, model FC1223-M, additionally offers molecular weight & mass flow measurement

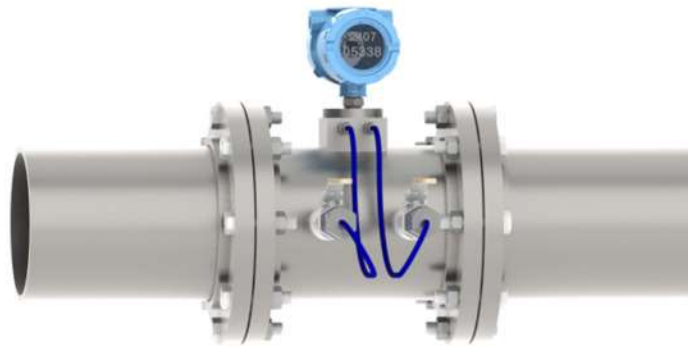


Features

- Not affected by presence of liquids
- Reliable operation in short piping
- High tolerance to heavy deposits
- Volumetric and molecular & mass flow measurement
- No pressure drop



FC1223 Ultrasonic Gas Flow Meter



Specifications

Transducer Type	Ultrasonic, wetted, non-intrusive, in-line
Operating Principle	Transit-phase measurement
Transducer Material	SS 316
Cable Length	10m (30ft)
Performance Characteristics	
Velocity Range	0.10 m/s to 175 m/s (0.3ft/s to 85 ft/s)
Accuracy	+/- 1.5% to 3%
Repeatability	Better than 1%
Measurement Parameters	Standard and actual volume flow, totalized volume flow, molecular weight, mass flow, pressure, temperature, gas velocity
Operating Conditions	
Pipe Diameter	0.05m to 2.0m (2" to 80")
Minimum Pipe Length	6D (upstream) & 3D (downstream)
Process Temperature	-40°C to +135°C (-40°F to +275°F)
Process Pressure	8.7 psia to 167 psia (0.6 barA to 11.5 barA)
Presence of Liquids	Not effected
Mechanical Characteristics	
Design	FC1223 – installed on pipe, four 1" weldolets, beam spacing 120 to 150mm FC1223-SP – spool type, flanges ANSI 150, Pipe SCH. 40, Material SS 316 Retractable, 1" Ball Valve, 1" NPT Weldolets 40cm (pipe sizes from 2" to 16"), 50cm (pipe sizes above 16")
Transducer Mount	
Length (Model FC1223-SP)	
Electrical Characteristics	
Supply Voltage	24VDC (20-32 VDC)
Power Consumption	5W (max)
Inputs	Two 4-20mA for external pressure and temperature sensors
Hazardous Area Approval	CSA/UL Class 1, Div.1, Group ABCD T4

FP2200

Ultrasonic Process Gas Flow Meter

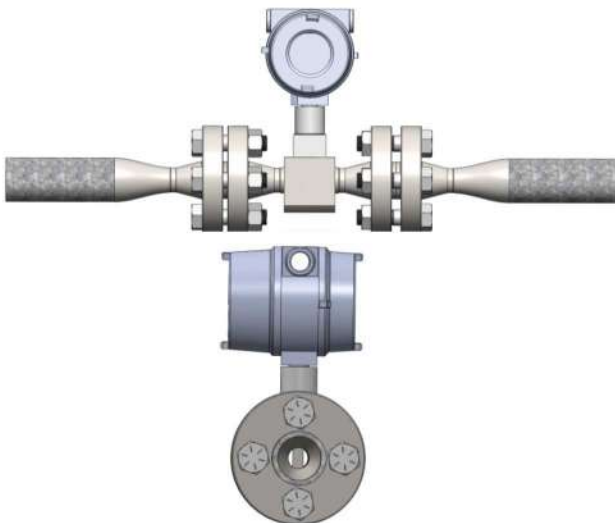
Description

The FP2200 series of ultrasonic gas flow meters extend the capabilities of Lauris' transit-phase measurement technology into various process applications.

It's minimum measurable velocity starts at the beginning of the turbulent regime and the maximum velocity exceeds 175m/s. Simple in operation, flow meters of this series are essentially maintenance free as they are inherent resistance to intrained liquids and clogging of transducers with heavy hydrocarbons.



Flow Obstruction and Pressure Drop
Vortex Meters



Open Bore, Turn-Down 1000:1
FP2200



FP2200

Ultrasonic Process Gas Flow Meter



Specifications

Design	Wetted, non-intrusive, inline
Material:	SS316
Flange Rating	#150, #300, #600, #900, #1500, #2500
Bore and Pipe Schedule	Sc.40, Sc.80, Sc.160, Sc.XX
Velocity Range	0.1m/s to 175m/s (0.3ft/s to 585ft/s)
Accuracy	1.5% to 2.5%
Repeatability	Better than 1%

Operating Conditions

Pipe Diameter	2cm to 15cm (1" to 6")
Process Temperature	-50C to +135C (-58F to +275F)
Maximum Process Pressure	150barg (2175psig)
Ambient Temperature	-45C to +60C (-49F to +140F)

Electrical Characteristics

Supply Voltage	24VDC (20-32VDC)
Power Consumption	5W (max)
Output	4-20mA, ModBus
Input	Two 4-20mA for pressure and temperature sensors (optional)
LCD Display	
Hazardous Area Approval	CSA/ULClass 1, Div.1., Group ABCD T4

FR1100

Ultrasonic Single Port Gas Flow Meter

Description

The FR1100 series of ultrasonic gas flow meters were developed specifically for retrofitting insertion type flow meters such as thermal mass flow meters, optical, Pitot tubes, etc. in applications with low gas velocity. Existing flowmeters are insensitive to gases flowing under 0.1m/s or 0.3ft/s. Gas vented from storage tanks shall be measured below this limit.

The FR1100 series flow meters are able to measure gas flows as slow as 0.01m/s with rangeability of 4000:1 which is not achievable by any other technology today. With insensitivity to gas composition and dirt the FR1100 flow meters are indispensable up-to-date flow metering tools.



Features

- Gas velocities: from 0.01 to 60 m/s independent on gas composition
- Immune to presence of liquids and dirt, no cleaning required
- Flow averaging along beam path
- Single port, direct retrofit of thermal mass flow meters, optical, Pitot tubes, etc. for bores from 1/2"



FR1100

Ultrasonic Single Port Gas Flow Meter



Specifications

Design	B- Ball Valve, F-Flange
Material:	SS316
Bore Size	1/2", 3/4", 1", 1.5"
Velocity Range	0.01m/s to 60m/s (0.003 ft/s to 180 ft/s)
Accuracy	1.0% to 2.5%
Repeatability	0.2%

Operating Conditions

Pipe Diameter	from 150mm (6")
Process Temperature	-50C to +135C (-58F to +275F)
Maximum Process Pressure	40barg (600psig)
Ambient Temperature	-45C to +60C (-49F to +140F)

Electrical Characteristics

Supply Voltage	24VDC (20-32VDC)
Power Consumption	2.5W (max)
Output	4-20mA, ModBus, HART
LCD Display	Standard, can be excluded for low temperature operations
Hazardous Area Approval	CSA/ULClass 1, Div.1., Group ABCD T4

Ordering:

FR1100-(bore)-(mount: B or F). If F, add flange size, body length
Examples: FR1100-075-B; FR1100-100-F-1/150-04