

InVue® Electronic Flowmeter, NT4400

Provides simultaneous flow and pressure outputs

Whether it's automation, process control or safety concerns that require flow and pressure measurement, the instrumentation must be clean, accurate and reliable. To meet the needs of the semiconductor industry, Entegris combines the latest electronic sensing technology and high purity materials to create leading-edge products that allow for greater control of process variables.

- No moving parts to generate particles
- Nonmetallic sensing technology for reliable measurement
- Integral pressure transducer for additional process information
- Flow-through design to minimize dead volume
- 1% full scale accuracy for critical measurements
- Easy installation in any orientation

Constructed for Compatibility

The InVue® NT4400 Electronic Flowmeter is designed for use in ultra high-purity applications in the semiconductor industry and is compatible with highly corrosive processes. The flow-through design minimizes dead volume, reducing the possibility of process contamination. This instrument features PTFE and other high purity fluoropolymers for all wetted parts.

Sensing Technology

Using a nonmetallic pressure sensing technology, the instrument utilizes differential pressure to provide an accurate and reliable flow and pressure measurement. Flow and pressure measurements are not affected by bubbles or trapped vapor. All products are factory calibrated and 100% verified, require no field calibration and are simple to install. Standard electronic outputs enable easy integration with PLCs, control systems and electronic displays.



APPLICATIONS

Measuring flow and line pressure allows the user to obtain valuable and critical diagnostic information which is used for monitoring or controlling process applications, such as:

- Chemical, DI water and slurry dispense
- Precision blending and metering
- Totalized flow for custody transfer
- System diagnostics

DIFFERENTIAL PRESSURE MEASUREMENT

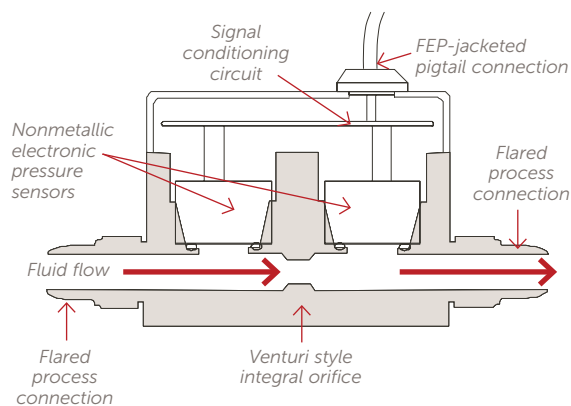
Entegris' patented technology for differential pressure flow measurement incorporates two pressure sensors. The pressure sensors are separated by a venturi style orifice in the process flow path. The orifice in the flow stream creates a differential pressure proportional to fluid flow rate. If there is no flow, the differential pressure is zero. As the flow rate increases, the differential pressure increases.

$$\text{Flow} \propto \sqrt{\text{Inlet pressure-outlet pressure}}$$

The flowmeter electronics provide a linear flow signal (4 – 20 mA output signal) corresponding to the calibrated flow rate. The flowmeter also provides a pressure signal (4 – 20 mA output signal) corresponding to the pressure measured at the outlet sensor of the flowmeter.

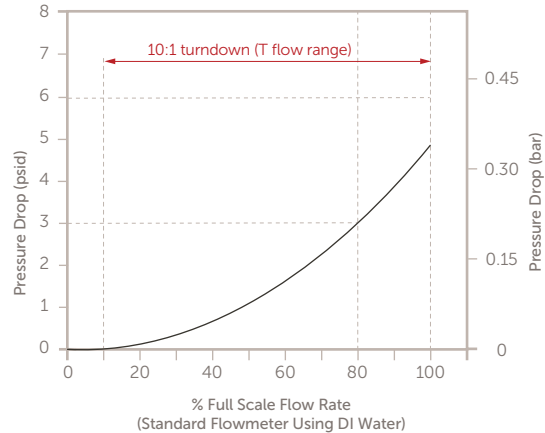
Advantages of Differential Pressure Technology

- Ability to measure in many types of fluids
- Proven technology in many industries, including chemical, petroleum and natural gas
- Capable of measuring flow in the presence of trapped vapor and bubbles
- Provides repeatable measurements and reliable performance
- Reduces cost of ownership with easy installation and low maintenance





Pressure Drop vs. Flow Rate

(Approximate – values vary slightly by flow range)



SPECIFICATIONS

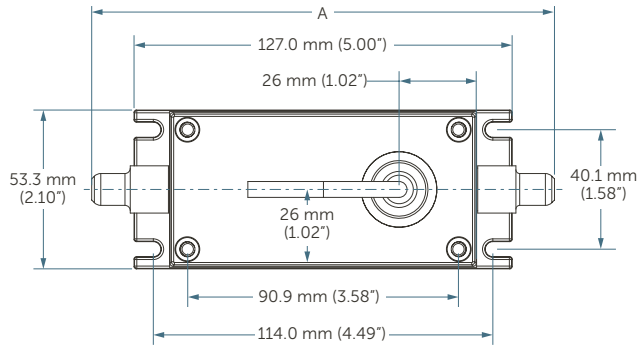
Materials	Wetted parts	Body	PTFE
		Sensor interface	PFA or CTFE
		Primary seal	Kalrez®
	Nonwetted parts	Polypropylene, polyethylene, PVDF and PVC or FEP- jacketed cable (in addition to materials listed above)	
Process temperature	10° – 65°C (50° – 149°F) Consult factory for higher temperatures		
Electrical input	24 VDC (12 – 28 VDC input voltage)		
Electrical output	Two 4 – 20 mA electrically isolated outputs, one for flow and one for outlet pressure		
Pressure drop	21 kPa (3 psid) at 80% flow, 10:1 turndown		
Flow measurement accuracy	20 – 100% of range: ±1.0% FS 10 – 20% of range: ±2.5% FS Accuracy stated as % of full scale using DI water at 23°C (70°F) and includes the combined effects of linearity hysteresis and repeatability		
Repeatability	20 – 100% of range: ±0.5% FS 10 – 20% of range: ±1.0% FS		
Pressure measurement range	0 – 414 kPa (0 – 60 psig)		
Minimum operating pressure (at the outlet)	7 kPa (1 psig)		
Maximum operating pressure	414 kPa (60 psig)		
Over-pressure limit	690 kPa (100 psig)		
Pressure measurement accuracy	±1% of full scale (includes combined effects of linearity, hysteresis and repeatability)		
Electrical enclosure	IP54		
Approvals	 	Conforms to ANSI®/ISA® Standard 12.12.01, UL Standard 61010-1 Class I, Division 2, Groups A, B, C, D, T6	

Specifications are subject to change without notice. Please consult the factory for the most current information.

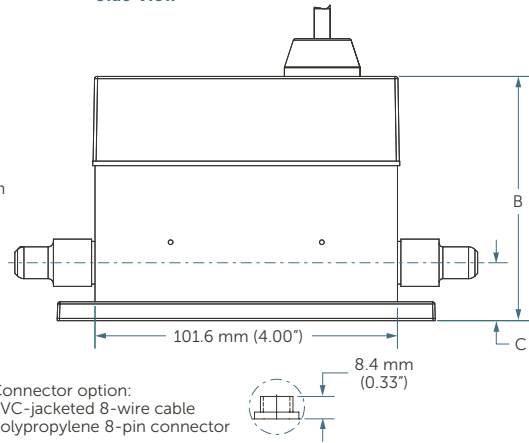
DIMENSIONS

Flaretek® Connection

Top View



Side View



DIMENSIONS

Inlet/outlet port connections	A	B	C
¼" Flaretek tube fitting	151.9 mm (5.98")	86.4 mm (3.40")	19.6 mm (0.77")
⅜" Flaretek tube fitting	155.4 mm (6.12")	87.9 mm (3.46")	19.6 mm (0.77")
½" Flaretek tube fitting	159.5 mm (6.28")	91.7 mm (3.61")	21.6 mm (0.85")
¾" Flaretek tube fitting	165.6 mm (6.52")	99.1 mm (3.90")	25.7 mm (1.01")
1" Flaretek tube fitting	177.8 mm (7.00")	106.9 mm (4.21")	30.5 mm (1.20")

FLOW RANGE

The InVue Electronic Flowmeter is available in the following fitting sizes and flow range combinations.

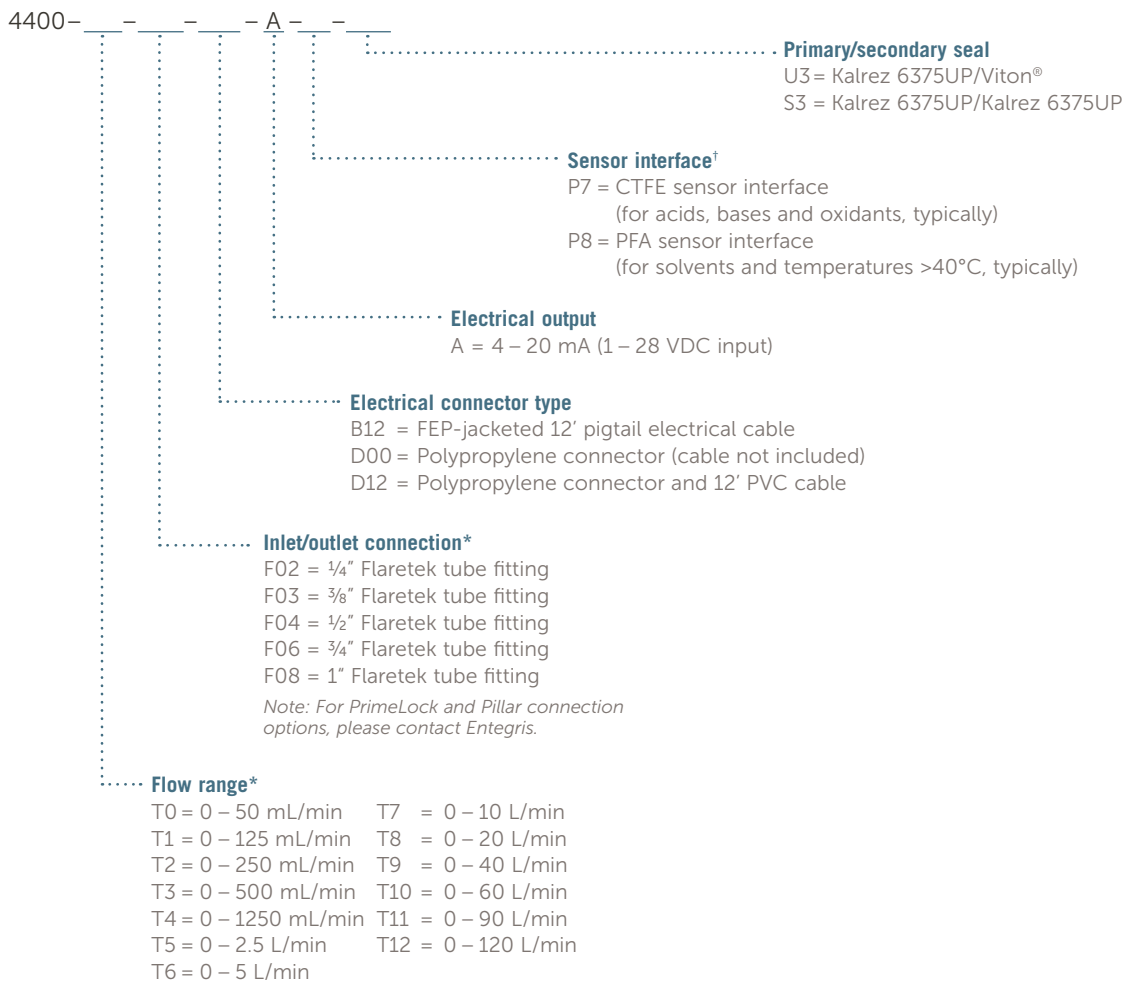
FLOW RANGE

Fitting size (Flaretek connection)	T0 0-50 mL/min	T1 0-125 mL/min	T2 0-250 mL/min	T3 0-500 mL/min	T4 0-1250 mL/min	T5 0-2.5 L/min	T6 0-5 L/min	T7 0-10 L/min	T8 0-20 L/min	T9 0-40 L/min	T10 0-60 L/min	T11 0-90 L/min	T12 0-120 L/min
¼"	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	-
⅜"	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-
½"	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	-	-	-
¾"	-	-	-	-	-	-	Yes	Yes	Yes	Yes	Yes	-	-
1"	-	-	-	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes

For PrimeLock and Pillar connection options, please contact Entegris.
Please consult the factory for custom fitting size and flow range combinations.

ORDERING INFORMATION

InVue Electronic Flowmeter, Model NT4400: part number



†Selection is dependent on application and chemical media. Please contact Entegris for best selection.

**Please refer to the Flow Range section on the previous page for fitting size and flow range combinations available.*

Product specified with a flared connection is packaged with two PVDF nuts.

For alternative nut material or custom configurations and specifications, please contact the factory.

FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you.

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