DigitalFlow™ XGM868i

Panametrics Gas Flow Ultrasonic Transmitter

Applications

The DigitalFlow XGM868i gas flow transmitter is a complete ultrasonic flow metering system for measurement of most gases including:

- Hydrocarbon gases
- Vent gases
- Biogases
- Digester gases
- Fuel gases
- Waste gases
- Incinerator air flow
- Vapor recovery
- Stack gases
- Other gases

Features

- Economical flow measurement in a compact transmitter
- No moving parts
- No pressure drop
- Wide rangeability with 1500 to 1 turndown ratio
- Non-obstructive fl ow measurement
- Tolerance to dirty streams
- Low maintenance
- Suitable for high temperatures
- Two-path measurement available for maximum accuracy

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The DigitalFlow XGM868i gas ultrasonic flow transmitter is designed to measure the flow rate of virtually any gas. The DigitalFlow XGM868i flow transmitter offers a unique combination of rangeability, ease of installation, low maintenance and accuracy in a low-cost transmitter. The state-of-the-art XGM868i shares the many advantages offered by the other products in the Panametrics line of innovative ultrasonic flowmeters. The all-digital XGM868i creates no pressure drop; has no moving parts or parts that foul or collect debris; seldom requires maintenance; and provides reliable, drift-free operation. The flow rate can be displayed locally or transmitted to a remote system via an analog or digital communications link.

Compact housing

All of the DigitalFlow XGM868i's electronic components are housed in a compact transmitter package that can be installed right at the flow measurement point. This greatly simplifies wiring of the transducers and results in trouble-free operation.

Dual-channel model

In addition to the standard single-channel model, an optional two-channel model provides enhanced accuracy when measuring two paths on a single pipe. It can also be used to measure a single path on two pipes.

Low operational costs

Because the DigitalFlow XGM868i installation produces no flow obstruction, the energy-robbing pressure drops and high maintenance requirements characteristic of other flowmeters are eliminated. The special sealed metal transducers supplied with a DigitalFlow XGM868i system are immune to the erosion and stress caused by thermal expansion cycles.

Works under wide range of flow conditions

Unlike limited conventional flowmeters, the DigitalFlow XGM868i transmitter can be used over a wide range of fl ow rates with any gas at pressures up to 3,480 psig (240 bar). Turndown ratio is 1500 to 1.

Tranducer Type	T5 Wetted Transducer				T17 Wetted Tranducer			
	Flow Measurement Range							
Standard Range	-150 to 150 ft/s (-50 to 50 m/s) - bidirectional							
	Applicable Pipe Sizes							
Diagonal 45	3 in to 14 in (50 to 350 mm) OD				14 in to 120 in (350 to 3000 mm) OD			
Bias 90	Note 1 & 2				Not Applicable			
	Design Velocity Accuracy from 1 to 150 ft/s (0.3 to 50 m/s)							
Transducer Type	T5 Wetted Transducer				T17 Wetted Tranducer			
Number of Paths	One Path		Two Paths		One Path		Two Paths	
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe Dia. </= 6 in. (150mm)	+-2.5%	+-2.0%	+-2.0%	+-1.5%	NA	NA	NA	NA
Pipe Dia. >/= 6 in (150mm)	+-2.0%	+-2.0%	+-1.5%	+-1.5%	+-2.0%	+-2.0	+-1.5%	+-1.5%
	Calibrated Velocity Accuracy from 1 to 150 ft/s (0.3 to 50 m/s) - see notes below							
Transducer Type	T5 Wetted Transducer				T17 Wetted Tranducer			
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe Dia. </= 6 in. (150mm)	+-1.5%	+-1.0%	+-1.0%	+-0.75%	NA	NA	NA	NA
Pipe Dia. >/= 6 in (150mm)	+-1.0%	+-1.0%	+-0.75%	+-0.75%	+-1.0%	+-1.0%	+-0.75%	+-0.75%
	Flow Velocity Sensitivity from .1 to 1 ft/s (0.03 to .3 m/s)							
Pipe Dia. = 10 in. (250mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		NA		NA	
Pipe Dia. = 14 in. (250mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		±0.08 in/s(±0.003 m/s)		±0.06 in/s(±0.002 m/s)	
Pipe Dia. >/= 20 in. (500mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		±0.06 in/s(±0.002 m/s)		±0.04 in/s(±0.0015 m/s)	

Note 1 Accuracy and sensitivity are dependent on pipe diameter, molecular weight and temperature. All accuracy specs assume molecular weights greater than 24 kg/kmole and temperatures less than 100 °F (38 °C)

Note 2 Accuracy is dependent on straight run. All accuracy specs assume a fully developed flow profile or a minimum straight run of 20D upstream and 10D downstream

Note 3 Stated accuracy may be achieved with total straight run as little as 10D using flow profile correction - contact factory for details

Specifications

Operation and performance

Fluid Types
Acoustically conductive gases

Pipe Sizes
2 to 120 in. NB (50 to 3,000 mm) and larger

Pipe Materials
All metals. Consult Panametrics for other materials.

Flow Accuracy (Velocity)
+-1.5% Typical two path meter
+-2.0% Typical one path meter

Accuracy depends on pipe size and whether measurement is one-path or two-path. Accuracy to ±0.5% of reading may be achievable with process calibration.

Repeatability
±0.2% to 0.5% of reading

Range (Bidirectional)
–150 ft/s to 150 ft/s (–46 m/s to 46 m/s)

Rangeability (Overall)
1500:1

Specifications assume a fully developed flow profile (typically 20 diameters upstream and 10 diameters downstream of straight pipe run) and flow velocity greater than 3 ft/s (1 m/s).

Measurement Parameters
Mass flow, standard and actual flow, totalized flow, and flow velocity

Electronics

Flow Measurement
Transit time

Enclosures

- Standard: Epoxy-coated aluminum Type 4X/IP66 Class I, Division 1, Groups B,C&D
  Flameproof ISSeP 02ATEX008
  Ⓔx II 2 GD EEx d IIC T5 IP66 T95°C
- Optional: Stainless steel

Dimensions (h x d)
Standard: Size 8.2 in x 6.6 in (208 mm x 168 mm), weight 10 lb (4.5 kg)

Channels

- Standard: One channel
- Optional: Two channels (for two pipes or two-path averaging)

Display
Optional: 2 line x 16 character backlit LCD display, configurable to display up to four measurement parameters in sequence

Keypad
Built-in six-button keypad for full functionality operation

Power Supplies

- Standard: 100-240 VAC ±10%
- Optional: 12 to 28 VDC, ±5%

Note: For DC-powered meters, Class 2 rated supplies must be used for the line power

Power Consumption
20 W maximum

Operating Temperature
–40°F to 140°F (–40°C to 60°C)

Storage Temperature
–67F° to 167°F (–55°C to 75°C)

Standard Inputs/Outputs
Two 0/4 to 20 mA isolated outputs, 600 Ω maximum load
Namur NE043 compliant

Optional Inputs/Outputs
All analog and digital I/O are available in specific combinations. Consult Panametrics for available option cards.

- Two additional 0/4 to 20 mA isolated outputs, 1000 Ω maximum load
- Two 4 to 20 mA isolated inputs, 24 VDC loop power
- Two or four isolated, three-wire RTD (temperature) inputs, –148°F to 662°F (–100°C to 350°C), 100 Ω platinum
- Two or four pulse or frequency outputs, optically isolated, 3 A maximum, 100 VDC maximum, 1 W maximum, from DC to 10 KHz maximum
- Alarm relays:
  - Two or four Form C relays; 120 VAC, 28 VDC maximum, 5 A maximum; DC 30 W maximum, AC 60 VA maximum

Digital Interfaces

- Standard: RS232
- Optional: RS485 (multiuser)
- Optional: Modbus® RS485 or TCP protocol
- Optional: Ethernet
- Optional: OPC server
- Optional: Foundation Fieldbus®

Data Logging

- Standard: None
- Optional: Memory capacity (linear and/or circular type) to log over 150,000 flow data points

European Compliance
System complies with EMC Directive 89/336/EEC, 73/23/EEC LVD (Installation Category II, Pollution Degree 2) and transducers comply with PED 97/23/EC for DN<25

Wetted Ultrasonic Flow Transducers

Temperature Range

- Standard: –58°F to 302°F (–50C° to 150°C)
- Optional (overall): –310°F to 842°F (–190°C to 450°C)

Pressure Range

- Standard: 0 psig to 2700 psig (1 bar to 187 bar)
- Optional: 3480 psig (240 bar) maximum

Materials

- Standard: Titanium
- Optional: Monel® or Hastelloy® alloys

Process Connections
Flanged and compression fittings

Mountings
Flowcell or cold tap

Area Classifications

- Standard: General purpose
- Optional: Weatherproof Type 4X/IP66
- Optional: Explosion-proof Class I, Division 1, Groups B,C,&D
- Optional: Flameproof ⟨Ex⟩ 2 GD EEx d IIC T6

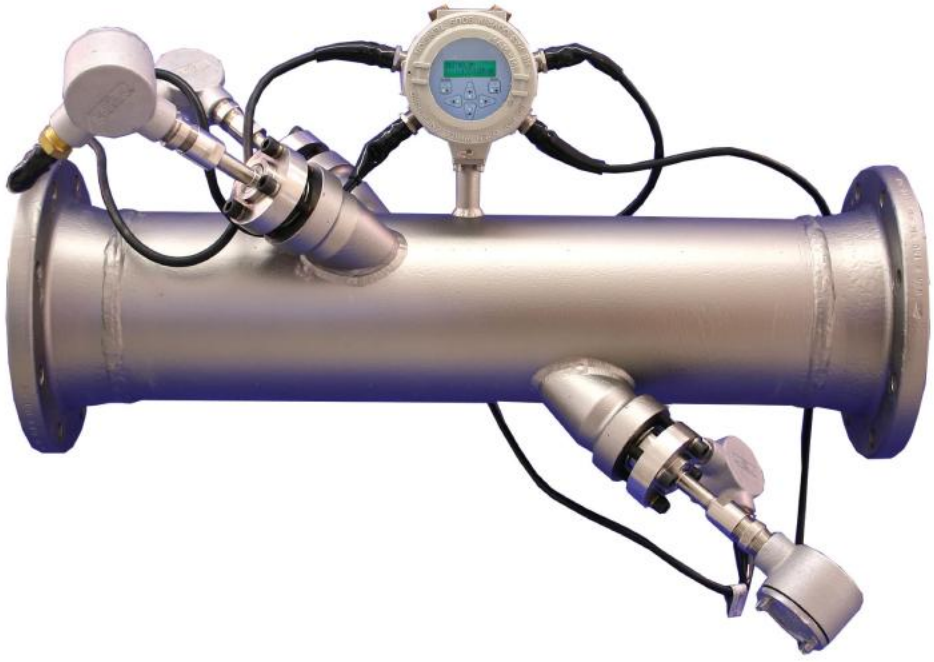
Transducers and flowcells for specific applications are available. Consult Panametrics for details.

Transducer cables

- Standard: One pair of coaxial cables, type RG62 AU, or as specified for transducer type
- Optional: Lengths up to 1000 ft (330 m) maximum

High-temperature and high-pressure ultrasonic flow transducers

Bundle Waveguide Technology™ (BWT) System transducer and holder (see BWT System specifications) are available.



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