



PanaFlow LZ System

Panametrics ultrasonic liquid flow meter

Applications

The PanaFlow LZ is a complete ultrasonic flow meter system for liquid applications, leveraging the state-of-the-art XMT1000 electronics platform. It can be used in applications such as:

- Hydrocarbon liquids
- Crude oils
- Internal allocation metering
- Loading/unloading
- Pipeline metering
- Fuel oils
- Water/cooling water/wastewater
- Chemicals
- Blending
- Solvents
- Weak acid solutions

Features and benefits

No drifting, no periodic calibration required		No loss of process control, optimization of assets and efficiency, no downtime or expense from calibration
No pressure drop		No wasted energy from running a pump or purchase of a larger size pump
No restriction in the pipe		Contamination will not affect meter's measurement (drifting) or any damage to meter
No filters or strainers		No maintenance cost
Bi-directional measurement		No additional meters required
No moving parts		No loss of process control, optimization of assets and efficiency, no downtime or expense from calibration
Field replaceable transducers		No risk in measurement, no shutdown costs for transducer maintenance
All-welded design		No risk of leaks through o-rings not seated correctly or risk of material corrosion
Explosion-proof transducer design		More power to transducer at higher voltages, less risk of attenuation in fluid
Full ultrasonic product line		Meet more needs with full product portfolio; one source for all ultrasonic liquid flow meters

Reliable flow measurement is easy on your budget

The PanaFlow LZ is offered as a one- or two-path wetted, ultrasonic flow meter that brings all of the advantages of ultrasonic technology at a very affordable value.

Unlike other flow measurement technologies, the PanaFlow LZ does not require maintenance because it does not have any obstruction in the flow path that could clog the line nor does it have any moving parts that could be damaged by the flowing fluid. Also, due to the inherent nature of ultrasonic flow measurement, PanaFlow LZ measurements are not affected by changing process conditions, such as temperature, pressure and conductivity variations. In addition, because the measurements do not drift over time, no periodic calibration is required. Thus, the PanaFlow LZ is a very attractive flow meter, providing a lower overall total cost of ownership along with the superb reliability and performance expected from a Panametrics ultrasonic flow meter.

Local or remote electronics

Panametrics offers several electronics packages that can be mated with the PanaFlow meter system. For local electronics that are factory installed on the meter body, select the PanaFlow XMT1000 for liquid applications. Local electronics are not recommended on applications above 149°F (65°C). Electronics platforms other than PanaFlow XMT1000 are also available for remote locations. (Please see flow meter electronics datasheets for instrument specifications and ordering information.)

All electronics packages ordered with PanaFlow LZ meter systems are programmed with setup information based on your application, so the system is ready to use as soon as the meter body is installed. When remote electronics are used, transducer cabling must be run between the PanaFlow meter system and the flow meter electronics. When local electronics are integrated with the system the transducer wiring is already complete, further simplifying the field installation.

Reliable field-proven ultrasonic technology

PanaFlow LZ leverages Panametrics' long heritage of ultrasonic transducer technology, which is proven in thousands of successful installations in liquid, gas, steam, and flare applications. In addition to standard wetted transducers, the PanaFlow LZ offers the option of Bundle Waveguide Technology to expand the range of possible

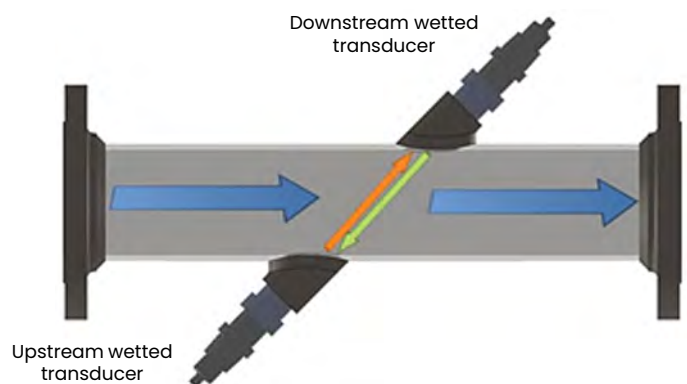
applications. The BWT system consists of buffer assemblies and transducers. The buffer assemblies use waveguide bundles to efficiently concentrate a greater amount of the transducer ultrasonic signal into the process, providing better signal integrity. At the same time, the bundles act as buffers to protect the transducers from extreme temperatures to maximize the transducer life cycle and to allow transducer replacement under operating conditions.

Transit time flow measurement

In this method, two transducers serve as both ultrasonic signal generators and receivers. They are in acoustic communication with each other, meaning the second transducer can receive ultrasonic signals transmitted by the first transducer and vice versa.

In operation, each transducer functions as a transmitter, generating a certain number of acoustic pulses, and then as a receiver for an identical number of pulses. The time interval between transmission and reception of the ultrasonic signals is measured in both directions. When the liquid in the pipe is not flowing, the transit time downstream equals the transit time upstream. When the liquid is flowing, the transit time downstream is less than the transit time upstream.

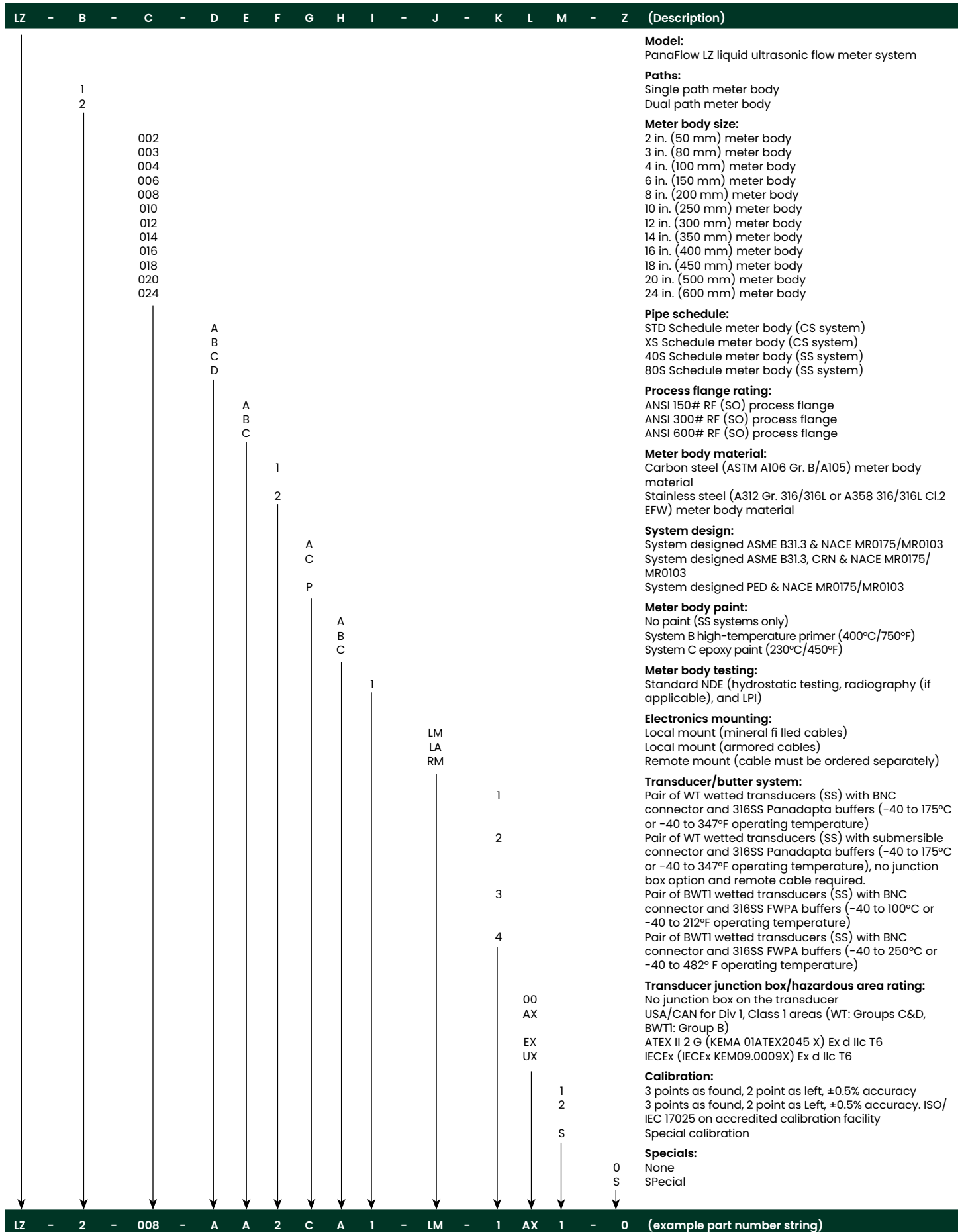
The difference between the downstream and upstream transit times is proportional to the velocity of the flowing liquid, and its sign indicates the direction of flow.



Fast and easy installation

The integrated PanaFlow meter system is fast and easy to install because components are already installed in the meter body. A PanaFlow meter body is composed of a length of carbon steel or stainless steel pipe with flanged ends and transducer ports rated to the application's pressure requirements, and either one or two pairs of pre-installed ultrasonic transducers. The system is factory assembled and tested to ensure that it meets strict quality control standards.

PanaFlow LZ part number



Model:
PanaFlow LZ liquid ultrasonic flow meter system

Paths:
Single path meter body
Dual path meter body

Meter body size:
2 in. (50 mm) meter body
3 in. (80 mm) meter body
4 in. (100 mm) meter body
6 in. (150 mm) meter body
8 in. (200 mm) meter body
10 in. (250 mm) meter body
12 in. (300 mm) meter body
14 in. (350 mm) meter body
16 in. (400 mm) meter body
18 in. (450 mm) meter body
20 in. (500 mm) meter body
24 in. (600 mm) meter body

Pipe schedule:
STD Schedule meter body (CS system)
XS Schedule meter body (CS system)
40S Schedule meter body (SS system)
80S Schedule meter body (SS system)

Process flange rating:
ANSI 150# RF (SO) process flange
ANSI 300# RF (SO) process flange
ANSI 600# RF (SO) process flange

Meter body material:
Carbon steel (ASTM A106 Gr. B/A105) meter body material
Stainless steel (A312 Gr. 316/316L or A358 316/316L Cl.2 EFW) meter body material

System design:
System designed ASME B31.3 & NACE MR0175/MR0103
System designed ASME B31.3, CRN & NACE MR0175/MR0103
System designed PED & NACE MR0175/MR0103

Meter body paint:
No paint (SS systems only)
System B high-temperature primer (400°C/750°F)
System C epoxy paint (230°C/450°F)

Meter body testing:
Standard NDE (hydrostatic testing, radiography (if applicable), and LPI)

Electronics mounting:
Local mount (mineral filled cables)
Local mount (armored cables)
Remote mount (cable must be ordered separately)

Transducer/butter system:
1 Pair of WT wetted transducers (SS) with BNC connector and 316SS Panadapta buffers (-40 to 175°C or -40 to 347°F operating temperature)
2 Pair of WT wetted transducers (SS) with submersible connector and 316SS Panadapta buffers (-40 to 175°C or -40 to 347°F operating temperature), no junction box option and remote cable required.
3 Pair of BWT1 wetted transducers (SS) with BNC connector and 316SS FWPA buffers (-40 to 100°C or -40 to 212°F operating temperature)
4 Pair of BWT1 wetted transducers (SS) with BNC connector and 316SS FWPA buffers (-40 to 250°C or -40 to 482° F operating temperature)

Transducer junction box/hazardous area rating:
No junction box on the transducer
USA/CAN for Div 1, Class 1 areas (WT: Groups C&D, BWT1: Group B)
ATEX II 2 G (KEMA 01ATEX2045 X) Ex d Ilc T6
IECEx (IECEx KEM09.0009X) Ex d Ilc T6

Calibration:
1 3 points as found, 2 point as left, ±0.5% accuracy
2 3 points as found, 2 point as Left, ±0.5% accuracy. ISO/IEC 17025 on accredited calibration facility
S Special calibration

Specials:
None
SPeial

(example part number string)

Specifications

Operation and performance

Fluid types

Liquids: acoustically conductive fluids, including most clean liquids, and many liquids with small amounts of entrained solids or gas bubbles

Flow measurement

Correlation Transit Time model

Paths

1 Path: 2 in. to 24 in. (50 mm to 600 mm) pipe

2 Path: 3 in. to 24 in. (80 mm to 600 mm) pipe

Pipe sizes

2 in. to 24 in. (50 mm to 600 mm)

Pipe material

Carbon steel

Stainless steel (316/316L)

Accuracy

±0.5% of reading for velocity above 2 ft/s (0.6 m/s) up to 40 ft/s (12.2 m/s) with a resolution of ± 2 mm/s

Accuracy statement assumes measurement of a single phase homogenous liquid with a fully developed symmetrical flow profile passing through the meter.

Applications with piping arrangements that create an asymmetrical flow profile may require extended piping straight runs and/or flow conditioning for the meter to perform to this specification.

Repeatability

±0.3% of reading typical

Range (bidirectional)

±0.1 to 40 ft/s (0.03 to 12.19 m/s)

Measurement parameters

Dependent upon meter electronics used. Please refer to individual flow meter electronics product data sheet.

Electronics/transmitter

Temperature range

Operating: -40°F to 140°F (-40°C to +60°C)

Storage: -67°F to 167°F (-55°C to 75°C)

Meter body and transducer

Pressure rating

Up to maximum allowable flange operating pressure at temperature, per ASME B16.5

Temperature range

WT Transducers: -40 to 175°C (-40 to 347°F)

BWT Transducers: -40 to 100°C (-40 to 212°F)
-40 to 250°C (-40 to 482°F)

Temperature rating of -20°C if used with carbon steel meter body.

Transducer material

316L Stainless steel (buffers)

Meter body materials

Carbon steel

Stainless steel (316/316L)

Certification

Electronics/Transducers:
Explosionproof Class I, Division 1, Groups B,C&D
ATEX Flameproof II 2 G Ex d IIC T6
IECEx Flameproof II 2 G Ex d IIC T6 (BWT Only)

Flow Cell:

NACE MR0175 and MR0103

PED 2014/68/EU

Transducer cables

Integral cables

- Mineral insulated cables with potted cable glands (for North America and Canada hazardous locations)
- Armored flame retardant coaxial cables with ATEX/IECEx certified cable glands (for European hazardous locations)

Remote cables

ATEX/IECEx: Armored RG62 for ATEX/IECEx

US/CAN: Non-armored RG62, conduit not included

Remote cables are not included and must be ordered separately. Maximum cable length is 1000 ft (300 m).

Weights and dimensions

(Refer to drawings 712-2122 to 712-2125)

Drawing	Drawing description
712-2122	General arrangement drawing, PanaFlow LZ, 2 in. and 3 in., 1 path, 2 traverse, tilted diameter
712-2123	General arrangement drawing, PanaFlow LZ, 4 in. to 24 in., 1 path, 1 traverse, tilted diameter
712-2124	General arrangement drawing, PanaFlow LZ, 3 in. and 4 in., 2 path, 1 traverse, tilted diameter
712-2125	General arrangement drawing, PanaFlow LZ, 6 in. to 24 in., 2 path, 1 traverse, mid-radius

Panametrics, a Baker Hughes Business, provides solutions in the toughest applications and environments for moisture, oxygen, liquid and gas flow measurement. Experts in flare management, Panametrics technology also reduces flare emissions and optimizes performance.

With a reach that extends across the globe, Panametrics' critical measurement solutions and flare emissions management are enabling customers to drive efficiency and achieve carbon reduction targets across critical industries including: Oil & Gas; Energy; Healthcare; Water and Wastewater; Chemical Processing; Food & Beverage and many others.

Join the conversation and follow us on LinkedIn
[linkedin.com/company/panametricscompany](https://www.linkedin.com/company/panametricscompany)