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PanaFlow Z3

Panametrics Ultrasonic Flow Meter for Liquids

The PanaFlow Z3 represents the latest generation of Panametrics ultrasonic flow meters. It is a three-path meter designed specifically for dependable, accurate and repeatable flow measurement of process liquids. With a sleek industrial design and ultra-reliable electronics, it provides operators a cost-effective choice when measurement accuracy and reliability are critical. The capabilities of the PanaFlow Z3 make it the right meter for a number of industries and applications, including:

Industries

- Upstream, midstream and downstream oil and gas
- Chemical
- Petrochemical
- Refining
- Power generation
- District energy/HVAC
- Water/wastewater

Applications

- Process control and monitoring
- Allocation measurement
- Batching and blending
- Transfer lines
- Cooling water lines
- Pipeline metering
- Loading/unloading
- Plant utilities
- Tank farms
- Irrigation
- Crude refined products

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Features & Benefits

No drifting, no periodic calibration required	No loss of process control, no downtime, no expense from calibration, and optimization of assets
No pressure drop	No wasted energy from running a pump or need to purchase a larger size pump
No restriction in the pipe	Contamination will not affect meter's measurement (drifting) or cause 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, no downtime, no expense from calibration, and optimization of assets
Field replaceable transducers	No risk in measurement, no shutdown costs for transducer maintenance
All cast design	Precision machined flowcell minimizes flow disturbance for better accuracy
Explosion-proof transducer design	More power to transducers at higher voltages, less risk of attenuation in fluid
Full ultrasonic product line	Meets more needs with full product portfolio; one manufacturer for ultrasonic flow meters

Reliable flow measurement that is easy on your budget

The PanaFlow Z3 is a three-path, wetted ultrasonic flow meter that brings together all of the advantages of ultrasonic technology at a very affordable value. Unlike other flow measurement technologies, the PanaFlow Z3 does not require maintenance since it does not have any obstruction in the flow path that could clog the process line or moving parts to be damaged by the flowing fluid.

Also, due to the inherent nature of our ultrasonic flow measurement, the PanaFlow Z3's measurement is not affected by changing process conditions (temperature, pressure, and conductivity) and does not drift over time, which eliminates the requirement for periodic calibration. Without requirements for maintenance and calibration, the PanaFlow Z3 offers a low cost of ownership and performance.

Fast and Easy Installation

Installation of wetted systems can be difficult and if they are not installed with precision and with close attention to detail, the reliability and accuracy of the system may not meet specifications. With the new PanaFlow Z3 system, the assembly work is done at the factory. The necessary components are already installed, so all the user needs to do is to bolt the end flanges into place.

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.

What is the PanaFlow Z3?

The PanaFlow Z3 consists of the Panametrics PanaFlow XMT1000 electronics, three pairs of LX transducers, and sensor body. The XMT1000 is our latest ultrasonic flow transmitter with state-of-the-art flow measurement capability in a rugged enclosure certified for use in hazardous areas. The LX transducer system is our latest advancement in ultrasonic transducer technology and provides accurate, drift-free, and obstructionless flow measurement.

LX transducer

The LX transducer system consists of our new integrated LX transducers and our uniquely engineered buffers. The design of this system allows for the safe insertion and removal of the LX transducers at any time without isolating the flow meter, shutting down the process or using any special tools. Together with the XMT1000 electronics and LX transducer, the uniquely designed meter body provides a clean and compact flow meter system.

Transit time flow measurement

Overall 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. Maximum void fraction depends on transducer, interrogation carrier frequency, path length, and pipe configuration.

Flow Measurement
Correlation transit time model

Accuracy
- ±0.25% of reading for velocities above 1.6 ft/s (0.5 m/s)
- ±1.25 mm/s for velocities below 1.6 ft/s (0.5 m/s)

Accuracy statement assumes measurement of a single phase homogenous liquid with a fully developed symmetrical flow profile passing through the meter (typically 10 diameters upstream and 5 diameters downstream of straight pipe run). 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.

Calibration
All meters are water calibrated and include a calibration certificate.

Repeatability
±0.15% of reading

Range (Bidirectional)
-82 to 82 ft/s (-25 to 25 m/s)

Meter Body/Transducer System

Meter Body Materials
Carbon steel: ASTM SA216 Gr. WCB
Stainless steel: ASTM SA351 Gr. CF8M
Low temperature carbon steel: ASTM SA352 Gr. LCB
Duplex stainless steel: ASTM SA995 GR. CD3MWCuN

Transducer System and Material
LX transducers with inserts
316L SS or A479 UNS S32760 (Duplex) Wetted components
Seals: FKM or EPDM

Process Fluid Temperature Range
Local mount: -40°F to 185°F (-40°C to 85°C)
Remote mount: -40°F to 302°F (-40°C to 150°C)

Pressure Range
Up to maximum allowable flange operating pressure at temperature per ASME B16.5 or EN1092-1

Piping Design
ASME B31.3
NACE MR0103/MR0175
PED PER B31.3, CAT II, A2
CRN

Weights and Dimensions
See Drawings 712-2166 (Local Mount) and 712-2167 (Remote Mount) for details.

Drawing	Drawing Description
712-2166	Outline & installation, Z3, 2 – 24 in. flowmeter system, local mount
712-2167	Outline & installation, Z3, 2 – 24 in. flowmeter system, remote mount

Electronics

Enclosures
Powder coated aluminum or stainless steel (SS316)

Classifications
US/CAN: Class I, Division 1, Groups B, C, D;
Class I, Zone 1, Ex d IIB+H2 T6...150C;
ATEX/IECEx: Ex d IIB+H2 T6...150C FISCO outputs
Ta = -40°C to +60°C, Type 4X
SINGLE SEAL

Electronics Mounting
Local or remote mounting

Paths
Three paths

Display
English
128 x 64 mono-color LCD display, configurable for single or dual measurement parameters

Keypad
Built-in magnetic, six-button, lockable keypad

Standard Inputs/Outputs
- One 4 to 20 mA isolated output, 600 Ohm maximum load
- One additional output, may be configured as either a pulse or frequency output.

Digital Interfaces
Standard: RS485/Modbus®
Optional: HART® 7.0 protocol, with 4 dynamic variables, includes one additional 4 to 20 mA analog output
NAMUR NE43
Optional: Foundation Fieldbus® FISCO, LAS capable
NAMUR NE107 with 5 AI blocks and a PID block

Power Supplies
Universal 100-240 VAC 50/60 Hz ±10% or 12 to 28 VDC

Cable Entries
¾" NPT
M20 Adapters

Temperature Range
Operating: -40°F to 140°F (-40°C to +60°C)
Storage: -40°F to 158°F (-40°C to 70°C)

Ordering Information

A	—	B	C	D	-	E	F	G	H	-	I	-	J	-	K	L	M	N	O	-	P	-	Q	-	R	-	Z

A - MODEL:

PF10-Z3 — PANAFLOW Z3 LIQUID ULTRASONIC FLOW METER SYSTEM

B - METER BODY SIZE:

-03	3” (80mm) FLOWCELL
-04	4” (100mm) FLOWCELL
-06	6” (150mm) FLOWCELL
-08	8” (200mm) FLOWCELL
-10	10” (250mm) FLOWCELL
-12	12” (300mm) FLOWCELL
-14	14” (350mm) FLOWCELL
-16	16” (400mm) FLOWCELL
-18	18” (450mm) FLOWCELL
-20	20” (500mm) FLOWCELL
-24	24” (600mm) FLOWCELL

C - PROCESS FLANGE RATING:

1	ANSI 150# RF, B16.5
2	ANSI 300# RF, B16.5
3	ANSI 600# RF, B16.5
E	PN10 EN 1092-1
F	PN16 EN 1092-1
G	PN25 EN 1092-1
H	PN40 EN 1092-1
J	PN63 EN 1092-1

D - METER BODY MATERIAL:

CS	SA-216 GR. WCB
LC	SA-352 GR. LCB
S6	SA-351 GR. CF8M
SD	SA-995 GR. CD3MWCuN

E: METER BODY SCHEDULE:

-040	SCHEDULE 40
-080	SCHEDULE 80
-0XS	SCHEDULE XS
-10S	SCHEDULE 10S
-40S	SCHEDULE 40S
-80S	SCHEDULE 80S
-STD	SCHEDULE STD

F - SYSTEM DESIGN:

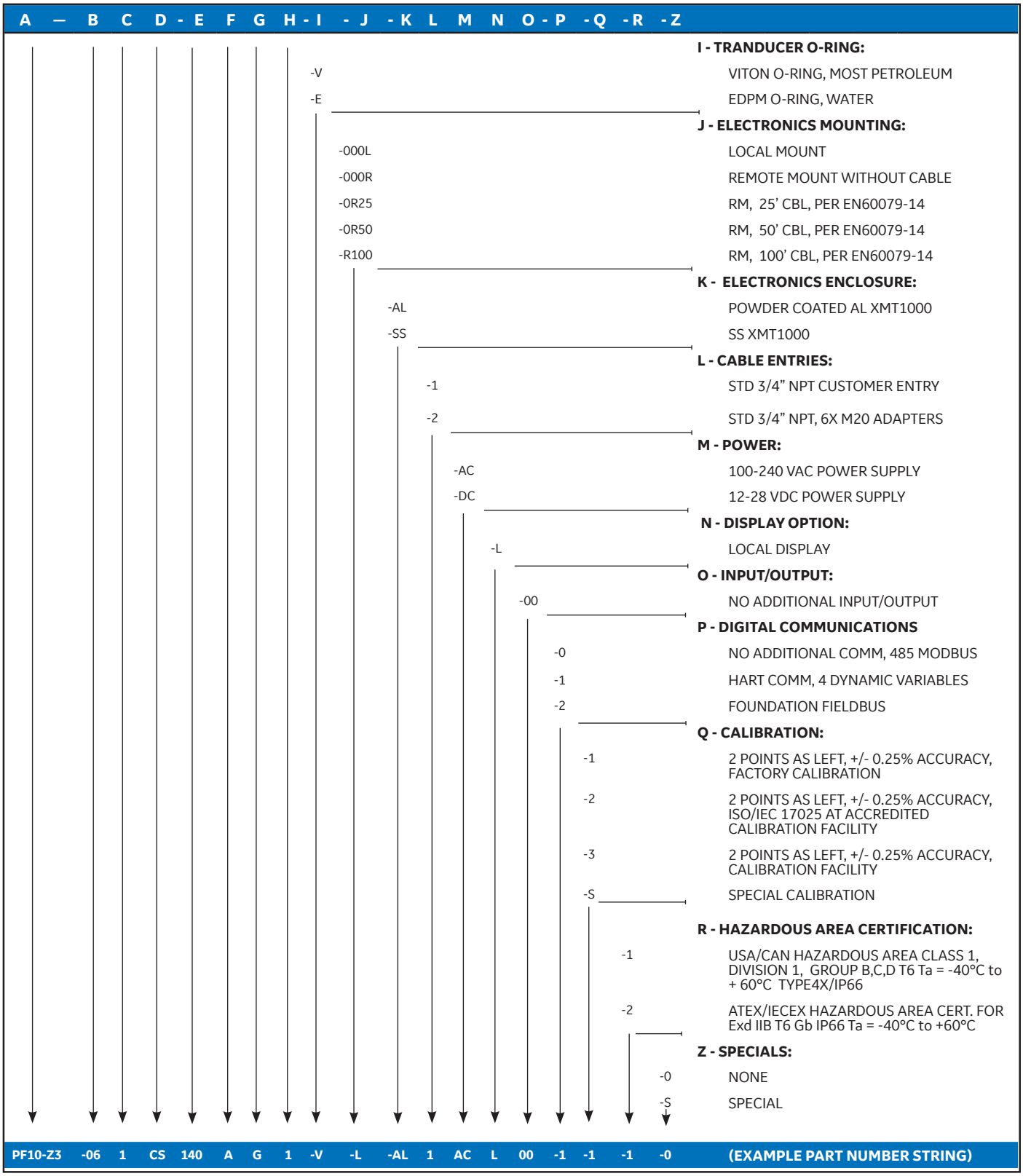
-A	B31.3, NACE MR0175/MR0103
-C	B31.3, CRN, NACE MR0175/MR0103
-P	PED PER B31.3, NACE MR0175/MR0103

G - PAINTING:

-A	NO PAINT
-G	STANDARD PANAFLOW Z3 PAINT

H - NDE:

-0	NO NDE DOCS
-1	STANDARD NDE DOCS
-2	PMI AND NDE DOCS, WETTED PARTS



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