



AquaTrans™ AT868

Panametrics liquid flow ultrasonic transmitter

Applications

The AquaTrans AT868 liquid flow transmitter is a complete ultrasonic flow metering system for measurement of:

- Potable water
- Wastewater
- Sewage
- Discharge water
- Treated water
- Cooling and heating water
- Other liquids

Features

- Economical non-intrusive flow measurement
- Simple setup and installation
- Suitable for wide range of pipe sizes and materials
- Suitable for lined pipes
- Two-channel/two-path version available
- Velocity, volumetric and totalized flow
- Internal keypad for field programming

Liquid flow ultrasonic transmitter

The AquaTrans AT868 liquid flow ultrasonic transmitter combines state-of-the-art flow measurement capability with a low-cost transmitter package that can be installed right at the process measurement point. It's designed specifically for water and wastewater applications in full pipes.

The all-digital AquaTrans AT868 has no moving parts and requires minimal maintenance. An onboard microprocessor uses patented Correlation Transit-Time™ technology for long-term, drift-free operation. Automatic adjustment to changing fluid properties and dynamically configured operating software simplify programming.

Transit-time flow measurement technique

The transit-time technique uses a pair of transducers with each transducer sending and receiving coded ultrasonic signals through the fluid. When the fluid is flowing, signal transit-time in the downstream direction is shorter than in the upstream direction; the difference between these transit times is proportional to the flow velocity. The AquaTrans AT868 measures this time difference and uses programmed pipe parameters to determine flow rate and direction.

Wetted or clamp-on transducers

Ultrasonic flow transducers are classified as either wetted or non-wetted (clamp-on). Clamp-on transducers are clamped onto the outside of the pipe and never come into contact with the process fluid. Wetted transducers are mounted into the pipe or flowcell in direct contact with the process fluid.

Clamp-on transducers offer maximum convenience, flexibility and a low installation cost compared to traditional flow metering technologies. With proper installation, wetted transducers provide maximum accuracy (better than 1% of reading) in most applications.

Two-channel model

An optional second channel provides the capability to measure flow in two pipes or average two paths on the same pipe for increased accuracy.

AT868 specifications

Operation and performance

Fluid types

Acoustically conductive fluids, including most clean liquids, and many liquids with entrained solids or gas bubbles. Maximum void fraction depends on transducer, interrogation carrier frequency, path length and pipe configurations.

Pipe sizes

- Clamp-on transducers: 0.5 to 300 in. (12.7 mm to 7.6 m) and larger
- Wetted transducers: 1 in to 200 in (25.4 mm to 5 m) and larger

Pipe-wall thickness

Up to 3 in (76.2 mm)

Pipe materials

All metals and most plastics. Consult Panametrics for concrete, composite materials, and highly corroded or lined pipes.

Flow accuracy (velocity)

0.5% of reading (achievable with process calibration)

Typical clamp-on flow accuracy (velocity)

- Pipe ID > 6 in (150 mm): ±1% to 2% of reading
- Pipe ID < 6 in (150 mm): ±2% to 5% of reading

Typical wetted flow accuracy (velocity)

±1% of reading

Accuracy depends on pipe size and installation and whether measurement is one-path or two path.

Repeatability

±0.1% to 0.3% of reading

Range (bidirectional)

-40 to 40 ft/s (-12.2 to 12.2 m/s)

Rangeability (overall)

400:1

Specifications assume a fully developed flow profile (typically 10 diameters upstream and 5 diameters downstream of straight pipe run) and flow velocity greater than 1 ft/s (0.3 m/s).

Measurement parameters

Volumetric flow, totalized flow and flow velocity

Electronics

Flow measurement

Patented correlation transit-time mode

Enclosures

Epoxy-coated aluminum weatherproof type 4X/IP66

Dimensions

Standard: Weight 2 lb (0.9 kg), size (h x w x d) 7.25 in x 5.9 in x 3.5 in (184 mm x 150 mm x 89 mm)

Channels

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

Display

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

Keypad

Six-button internal keypad

Power supplies

- Standard: 85 to 265 VAC, 50/60 Hz
- Optional: 12 to 28 VDC, $\pm 5\%$

Power consumption

20 W maximum

Operating temperature

14°F to 131°F (–10°C to 55°C)

Storage temperature

–40°F to 158°F (–40°C to 70°C)

Standard inputs/outputs

- One 0/4 to 20 mA isolated output per channel, 600 Ω maximum load
- One frequency/pulse rate/totalizer output per channel, optically isolated, 3A maximum, 100 VDC maximum, 1W maximum, from 0.1 to 10 kHz
- Namur NE043 compliant

Digital interfaces

- Standard: RS232
- Optional: RS485 (multiuser)

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

Clamp-on ultrasonic flow transducers

Temperature ranges

- Standard: –40°F to 302°F (–40°C to 150°C)
- Optional: –328°F to 752°F (–200°C to 400°C)

See specific transducer for exact temperature range.

Mountings

Stainless steel chain or strap, welded or magnetic clamping fixtures

Area classifications

- Standard: general purpose
- Optional: weatherproof type 4/IP65
- Optional: submersible IP67/68

Wetted ultrasonic flow transducers

Temperature ranges

–40°F to 212°F (–40°C to 100°C)

Pressure range

0 to 3000 psig (1 to 207 bar)

Materials

- Standard: stainless steel
- Optional (for Pan-Adapta® Plugs): Titanium, Hastelloy® alloy, Monel® alloy, duplex, CPVC, PVDF and others

Pan-Adapta plugs allow installation and removal of wetted transducers without interrupting the process or emptying the pipe.

Process connections

- Standard: 1 in or 3/8 in NPTM
- Optional: RF flanged, socket weld, fuse bond and others

Mountings

Flanged flowcell, hot tap or cold tap

Area classifications

- Standard: general purpose
- Optional: weatherproof Type 4/IP65
- Submersible IP67/68

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

Additional options

PanaView™ PC-interface software

The AquaTrans AT868 communicates with a PC through a serial interface and Windows® operating systems.

Consult the manual for details on sites, logs, and other operations with a PC.

