Panametrics

Datasheet

AquaTrans™ AT620

Ultrasonic two-channel flowmeter for liquids

The new AT620 is a next-generation clamp-on ultrasonic flowmeter designed for applications requiring greater flexibility, redundancy, and measurement confidence. Building on the proven performance of the AT600 platform, the AT620 introduces architecture that allows a single transmitter to support two independent measurement paths, either across two separate pipes or one pipe with two channels.
This innovative configuration reduces hardware footprint and installation cost while expanding diagnostic capability and application coverage.

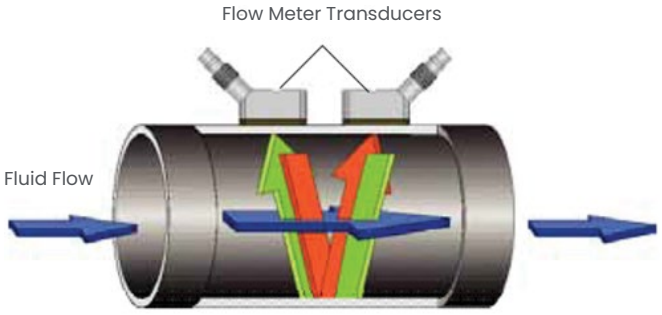
PANA101DS Rev. 1

Liquid flow ultrasonic transmitter

The AquaTrans AT620 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 is designed specifically for industrial applications such as water and wastewater application in full pipes. The AquaTrans AT620 has no moving parts and requires no maintenance with solid couplant. 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 (Two Path Configuration)

The AT620 uses the ultrasonic transit time principle with **two independent ultrasonic signal paths**, each generated by a matched pair of clamp on transducers. For each path, the transducers alternately function as ultrasonic signal transmitters and receivers, enabling bidirectional ultrasonic signal transmission through the pipe wall and flowing fluid.
During operation, each transducer pair transmits a defined sequence of ultrasonic pulses and then receives an identical sequence in the opposite direction. The system precisely measures the transit time of the ultrasonic signals traveling both downstream and upstream. When there is no flow in the pipe, the upstream and downstream transit times for each ultrasonic signal are equal. As fluid begins to flow, the downstream transit time becomes shorter than the upstream transit time.
For each ultrasonic signal, the difference between upstream and downstream transit times is directly proportional to the fluid velocity, while the sign of this difference indicates flow direction. In a dual signal, single pipe configuration, flow velocity is calculated using the combined measurements from both ultrasonic signals to enhance accuracy and measurement reliability. In a two pipe configuration, each ultrasonic signal provides an independent flow measurement for its respective pipe.



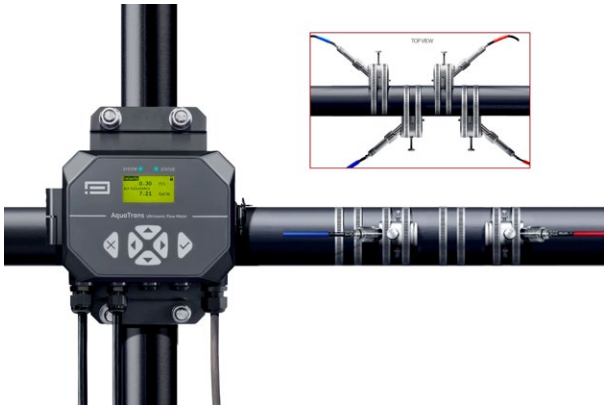
Transducers ultrasonic signal path
Transit-time flow measurement technique

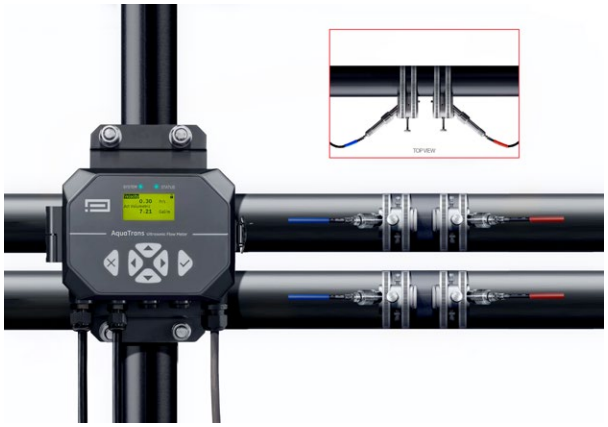
Transit Time Flow Measurement (Dual Path, Single Pipe Configuration)

In a two-path, single-pipe configuration, the AT620 leverages dual independent ultrasonic signal paths to measure the same flow stream, delivering enhanced measurement resilience and accuracy. Each path operates with its own matched pair of clamp-on transducers, continuously measuring upstream and downstream transit times to calculate fluid velocity. By combining data from both paths, the system achieves a more comprehensive characterization of the flow profile, improving immunity to flow disturbances such as swirl, asymmetry, or upstream piping effects. This dual-path approach also introduces inherent redundancy—if one signal path is interrupted or degraded, the second path continues to provide reliable flow measurement, ensuring uninterrupted process visibility and minimizing downtime. The result is a robust, high-confidence measurement solution that enhances both operational continuity and data integrity in demanding industrial applications.

Clamp-on transducers

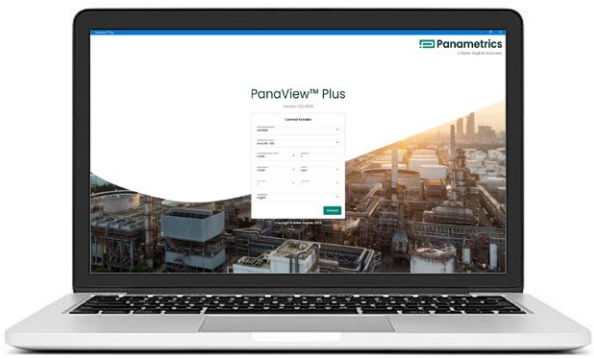
Clamp-on transducers offer maximum convenience, flexibility and a low installation cost compared to traditional flow metering technologies. With proper installation, clamp-on transducers provide better than 1% of reading accuracy in most applications.





PanaViewPlus™ software (optional)

The AquaTrans AT620 can communicate with a PC via our PanaViewPlus interface program. Consult the manual for details on sites, logs, and other operations with a PC.



Technical **Specifications**

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.
Flow Measurement	Patented Correlation Transit-TimeTM mode
Pipe Size	0.5 to 300 in. (15 to 7600 mm)
Pipe Materials	All metals and most plastics. Consult Panametrics for concrete, composite materials, and highly corroded or lined pipes.
Accuracy	• ±1% of reading in application, ≥2 in. (50 mm) pipe and >1 ft/s (0.3 m/s) velocity • ±2% of reading in application, <2 in. (50 mm) pipe and >1 ft/s (0.3 m/s) velocity • ±0.5% in field calibration Installation assumes a fully developed, symmetrical flow profile (typically 10 diameter upstream and 5 diameters downstream of straight pipe run). Final installation accuracy is a function of multiple factors including fluid, temperature range, pipe centricity and others.
Repeatability	±0.2% of reading
Range (bidirectional)	-40 to 40 ft/s (-12.19 to 12.19 m/s) High measurement velocities possible. Please contact Panametrics.
Rangability (overall)	400:1
Flow Measurement Parameters	Velocity, Volumetric, and totalized flow

Clamp-on ultrasonic flow transducer

Temperature Ranges	• Standard: -40 to 302°F (-40 to 150°C) • Optional: -328 to 752°F (-200 to 400°C) See specific transducer for exact temperature ranges.
Mounting Fixture	Anodized aluminum or stainless steel (based on transducer) Stainless steel strapping
Couplant	• Standard: Solid couplant • Optional: Liquid couplant
Rating	Standard: General purpose (IP66 or IP68) Note: See specific transducer model for exact rating.

Electronics

Enclosure	Epoxy-coated aluminum weatherproof Type 4X/ IP67
Dimensions	6.6 x 5.0 x 2.4 in. (168 x 128 x 61 mm) Weight: 3.5lb/1.5 kg
Channels	One or Two Channel (One Path, Two Paths – One Pipe, One Path – Two Pipes)
Display	Graphic LCD (128 x 64 pixels)
Keypad	Six-button keypad for full functionality operation
Error Display Indicator	Green or red light
Power Supplies	• Standard: 85 to 265 VAC, 50/60 Hz • Optional: 12 to 28 VDC, ±5% Note: For DC-powered meters, Class 2 rated supplies must be used for the line power
Power Consumption	10 Watts in-rush 5 Watts normal operation
Operating Temperature	-4°F to 131°F (–20°C to 55°C)
Storage Temperature	–40°F to 158°F (–40°C to 70°C)
Outputs (based on configuration)	• 4-20 mA (24VDC powered, 600Ω maximum load,1500 VDC isolation) • Frequency, pulse, alarm (Passive output, 100VDC,1 A/1 W maximum, 1500 VDC isolation) • HART (FSK modulation, category flow, protocolversion 7.5, device revision 2, MFG ID 157, de vice type code 127, number of device variables 34) • Modbus/RS485 (Half-duplex, 1500 VDC isolation) Note: Analog outputs are Namur NE43 compliant.
Certification	CE, UL, CSA

Ordering Information (AT620)

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

A: Model

AT620 AquaTrans AT620 ultrasonic flowmeter

B: Meter Systems

C1 Single channel clamp-on system
C2 Two channel clamp-on system (1 or 2 Pipes)

C: First Transducer System

0	None (Spare electronics only)
AT05	C-AT transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typ., Tprocess: -40 to 150°C
AT10	C-AT transducers, 1 MHz, IP68, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
AT20	C-AT transducers, 2 MHz, IP68, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
CFLP	CF-LP transducers, 4 MHz, IP66, 0.5 to 2 in./15 to 50 mm, Tprocess: -40 to 230°C
CFJR	CF-JR transducers, 4 MHz, IP66, 0.5 to 2 in./15 to 50 mm, Tprocess: -40 to 150°C
CR05	C-RS transducers, 0.5 MHz, IP66, 12 i.n/300 mm or greater typ., Tprocess: -40 to 150°C
CR05SUB	C-RS submersible transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typical, Tprocess: -40 to 150°C
CR10	C-RS transducers, 1 MHz, IP66, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
CR10SUB	C-RS submersible transducers, 1 MHz, IP68, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
CR20	C-RS transducers, 2 MHz, IP66, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
CR20SUB	C-RS submersible transducers, 2 MHz, IP68, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
CR10HT	CR10HT: C-RS high temperature transducers, 1 MHz, IP66, 2 to 24 in./50 to 600 mm typ., Tprocess: -40 to 230°C

D: First Pipe Size

TEXTUAL Textual

E: First Pipe Units

IN Inches
MM Millimeters

F: First Cable Length

0	None (Spare or no 2nd XDR)
1	10 ft (3mt) transducer cable
2	25 ft (7.5mt) transducer cable
3	50 ft (15mt) transducer cable
4	100 ft (30mt) transducer cable
5	160 ft (50mt) transducer cable
6	230 ft (70mt) transducer cable
7	300 ft (90mt) transducer cable

G: Second Transducer System

0	No second transducer
AT05	C-AT transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typ., Tprocess: 40 to 150°C
AT10	C-AT transducers, 1 MHz, IP68, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
AT20	C-AT transducers, 2 MHz, IP68, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
CFLP	CF-LP transducers, 4 MHz, IP66, 0.5 to 2 in./15 to 50 mm, Tprocess: -40 to 230°C
CFJR	CF-JR transducers, 4 MHz, IP66, 0.5 to 2 in./15 to 50 mm, Tprocess: -40 to 150°C
CR05	C-RS transducers, 0.5 MHz, IP66, 12 i.n/300 mm or greater typ., Tprocess: -40 to 150°C
CR05SUB	C-RS submersible transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typical, Tprocess: -40 to 150°C
CR10	C-RS transducers, 1 MHz, IP66, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
CR10SUB	CR10SUB: C-RS submersible transducers, 1 MHz, IP68, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
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CR20SUB	C-RS submersible transducers, 2 MHz, IP68, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
CR10HT	C-RS high temperature transducers, 1 MHz, IP66, 2 to 24 in./50 to 600 mm typ., Tprocess: -40 to 230°C

H: Second Pipe Size

TEXTUAL Textual

I: Second Pipe Units

IN Inches
MM Millimeters

J: Second Cable Length

0	None
1	10 ft (3mt) transducer cable
2	25 ft (7.5mt) transducer cable
3	50 ft (15mt) transducer cable
4	100 ft (30mt) transducer cable
5	160 ft (50mt) transducer cable
6	230 ft (70mt) transducer cable
7	300 ft (90mt) transducer cable

K: AT620 Input Power

1	85 to 265 VAC
2	12 to 28 VDC

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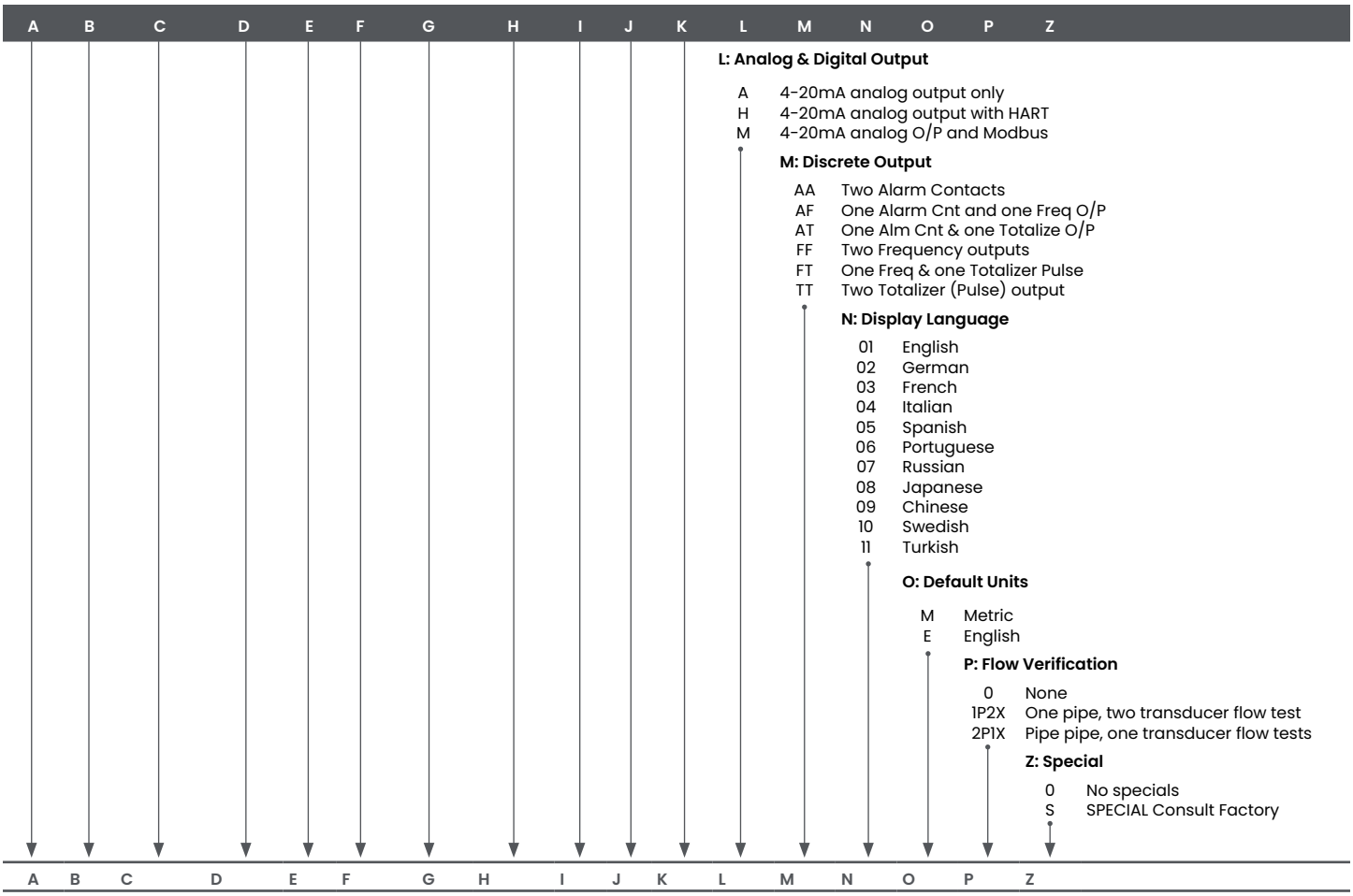

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