

AquaTrans™ AT600

Panametrics Ultrasonic Flow Meter for Liquids



Applications

The AquaTrans AT600 flowmeter is a complete ultrasonic system for the measurement of:

- Potable Water
- Wastewater
- Sewage
- Discharge water
- Treated water
- Cooling and heating water
- Irrigation water
- Other industrial fluids

Features & Benefits

- Economical non-intrusive flow measurement
- Extremely simple setup and installation
- Suitable for a wide range of pipe sizes and materials
- Suitable for lined pipes
- Velocity, volumetric, and totalized flow outputs
- Clamp-on installations
- Permanent solid couplant for clamp-on applications.

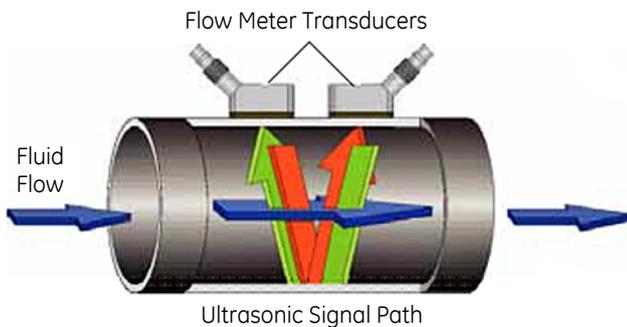
Liquid Flow Ultrasonic Transmitter

The AquaTrans AT600 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 AT600 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

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 specified 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.



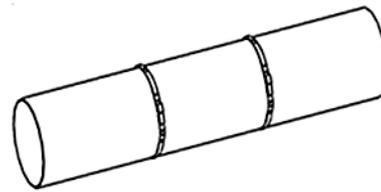
Transit-time Flow Measurement Technique

Clamp-On Transducers

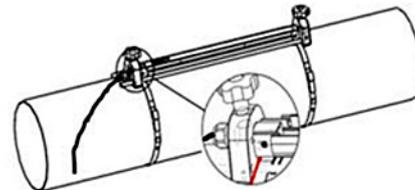
Clamp-on transducers offer maximum convenience, flexibility and a low installation cost compared to traditional flow metering technologies. With proper installation, clamp-on transducers provide better than 1% of reading accuracy in most applications.

Easy Four Step Installation

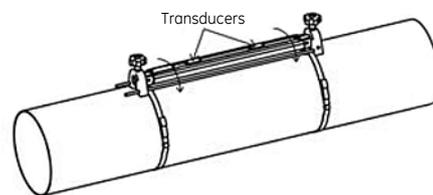
Step #1: Install straps onto pipe.



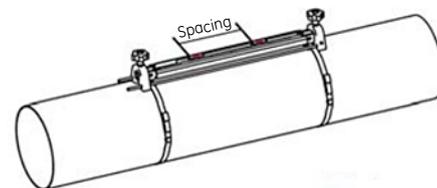
Step #2: Put clamp-on fixture on pipe and move straps onto sides of fixture.



Step #3: Open fixture to set spacing.



Step 4: Set spacing and lock fixture with transducers onto pipe.



Vitality™ Software (Optional)

The AquaTrans AT600 can communicate with a PC via our Vitality interface program. Consult the manual for details on sites, logs, and other operations with a PC.



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-Time™ mode

Pipe Sizes

0.5 to 300 in. (15 to 7600 mm)

Pipe Materials

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

Accuracy

- $\pm 1\%$ of reading in application, ≥ 2 in. (50 mm) pipe and > 1 ft/s (0.3 m/s) velocity
- $\pm 2\%$ of reading in application, < 2 in. (50 mm) pipe and > 1 ft/s (0.3 m/s) velocity
- $\pm 0.5\%$ in field calibration

Installation assumes a fully developed, symmetrical flow profile (typically 10 diameters 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.

Calibration

All meters are water calibrated and delivered with a traceable calibration certificate.

Repeatability

$\pm 0.2\%$ of reading

Range (Bidirectional)

-40 to 40 ft/s (-12.19 to 12.19 m/s)

Rangability (Overall)

400:1

Measurement Parameters

Velocity, Volumetric, and Totalized Flow

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: 3.5 lb/1.5 kg

Channels

One channel

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, $\pm 5\%$

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, 600 Ω maximum load, 1500 VDC isolation)
- Frequency, Pulse, Alarm (Passive output, 100 VDC, 1 A/1 W maximum, 1500 VDC isolation)
- HART (FSK modulation, Category Flow, Protocol Version 7.5, Device Revision 2, MFG ID 157, Device 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, (MCert approval pending)

Clamp-On Ultrasonic Flow Transducers

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 range.

Mounting Fixture

Anodized aluminum with 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.

Ordering Information

A	B	C	D	E	F	G	H	I	J	K	L
AT6											Model: Clamp-on liquid ultrasonic flow meter consisting of an AT600, transducers, clamping fixture, transducer cable and coupling
	C1										Clamp-On System: Single-channel clamp-on system
		AT05									Transducer System: AT05: C-AT transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typ., Tprocess: -40 to 150°C
		AT10									AT10: C-AT transducers, 1 MHz, IP68, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
		AT20									AT20: C-AT transducers, 2 MHz, IP68, 2 to 6 in./50 to 150 mm typ., Tprocess: -40 to 150°C
		UTX40									UTX40: UTXDR transducers, 4 MHz, IP67, 0.5 to 2 in./15 to 50 mm, Tprocess: -20 to 120°C
		CFLP									CFLP: CF-LP transducers, 4 MHz, IP66, 0.5 to 2 in./15 to 50 mm, Tprocess: -40 to 230°C
		CR05									CR05: C-RS transducers, 0.5 MHz, IP66, 12 in./300 mm or greater typ., Tprocess: -40 to 150°C
		CR10									CR10: C-RS transducers, 1 MHz, IP66, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
		CR05SUB									CR05SUB: C-RS submersible transducers, 0.5 MHz, IP68, 12 in./300 mm or greater typical, 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
		CR05JB									CR05JB: C-RS with junction box transducers, 0.5 MHz, IP66, 12 in./300 mm or greater typ., Tprocess: -40 to 150°C
		CR10JB									CR10JB: C-RS with junction box transducers, 1 MHz, IP66, 4 to 24 in./100 to 600 mm typ., Tprocess: -40 to 150°C
		CP05JB									CP05JB: C-PT with junction box transducers, 0.5 MHz, IP66, 12 in./300 mm or greater typ., Tprocess: -20 to 210°C
		CP10JB									CP10JB: C-PT with junction box transducers, 1 MHz, IP66, 4 to 24 in./100 to 600 mm typ., Tprocess: -20 to 210°C
		CP20JB									CP20JB: C-PT with junction box transducers, 2 MHz, IP66, 2 to 6 in./50 to 150 mm typ., Tprocess: -20 to 210°C
			< >								Pipe Size: Nominal outside diameter
			IN								Pipe Units: Inches
			MM								Millimeters
				1							Cable Length: 10 ft (3 m) of transducer cable
				2							25 ft (7.5 m) of transducer cable
				3							50 ft (15 m) of transducer cable
				4							100 ft (30 m) of transducer cable
				7							300 ft (90 m) of transducer cable
					1						AT Power: 85 to 265 VAC
					2						12 to 28 VDC
						A					Analog and Digital Output: 4-20 mA analog output only
						H					4-20 mA output with HART
						M					4-20 mA output and Modbus

A B C D E F G H I J K L

Discrete Output:

- AA Two alarm contacts
- AF One alarm contact and one frequency output
- AT One alarm contact and one totalizer (pulse) output
- FF Two frequency outputs
- FT One frequency output and one totalizer (pulse) output
- TT Two totalizer (pulse) outputs

Language:

- 01 English
- 02 German
- 03 French
- 04 Italian
- 05 Spanish
- 06 Portuguese
- 07 Russian
- 08 Japanese
- 09 Chinese

Default Units:

- M Metric
- E English

Special:

- 0 No specials
- S Special

AT6- C1 -AT05 - 5 - IN - 1 - 2 - A- AA- 01- M- 0

(Example Part Number)

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