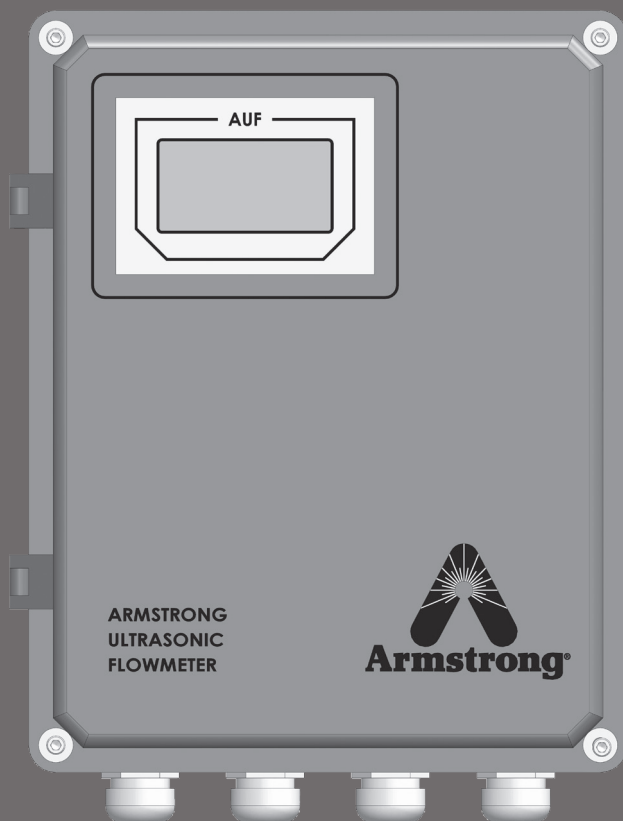


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ARMSTRONG ULTRASONIC FLOWMETER



Introduction - For Permanent Installation

The Armstrong Ultrasonic Flowmeter (AUF) is designed to be installed at a fixed location for long term flow measurement on a closed pipe, carrying pure liquids or liquids with some suspended particles. The AUF will be equipped with clamp-on transducers to meet various application challenges.

Signal Quality Tracking

The AUF flowmeter utilizes cutting-edge technologies such as advanced transducer design, low voltage transmission, digital signal processing, self-adaptation, and more, to achieve high performance. Its proprietary quality tracking mechanism analyzes the quality of the received signal and automatically tunes the meter system to its optimized condition. This mechanism leads the system to be easily adaptable to pipe material variations and liquid property changes.



Multi-Frequency

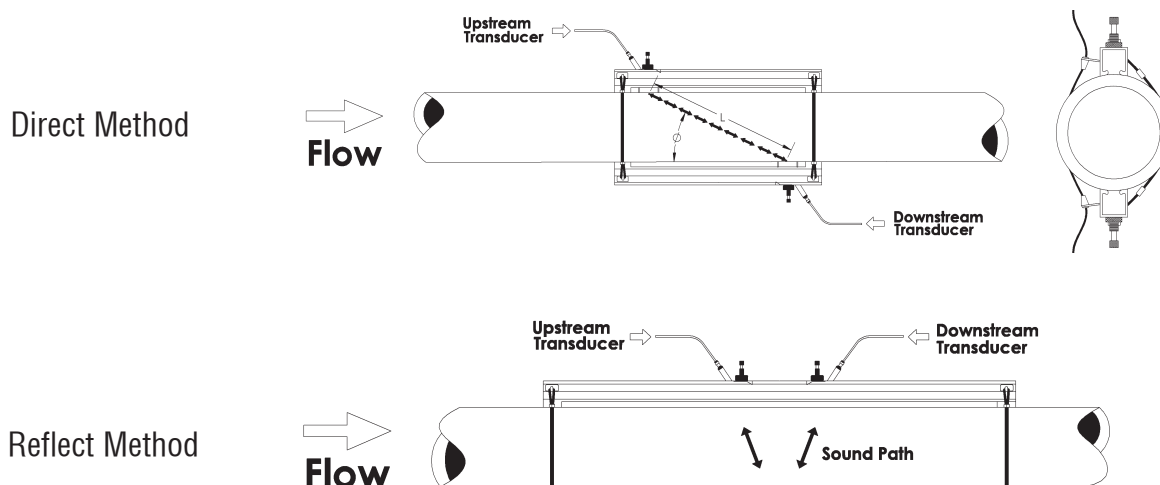
The AUF flowmeter main unit can be programmed to operate at 0.5MHz, 1MHz or 2MHz frequency. Together with transducers of compatible frequency, the AUF can measure flow on pipes from (3/4") up to (120") with various pipe materials.

Transducer Pairing and Wetted Calibration

As quality is of crucial importance, all transducers are carefully paired, and all flowmeters are wet-calibrated on the flow loop in the factory to further ensure the system accuracy and reliability. Every meter comes with a certificate of calibration with NIST traceability. To achieve good accuracy, it is recommended to have 15D straight pipe run: upstream 10D and downstream 5D, where D is pipe diameter.

Thermal Energy Measurement

With a matched pair of 100 OHM 3-wire platinum RTD temperature sensor probes and a thermal energy module, the AUF-B can measure the thermal energy (BTU) using the temperature of the supply and return lines of a heating or cooling circuit. The AUF provides versatile input and output interfaces, such as digital and relay outputs, batch control, alarm and flow/energy totalizing, 4-20mA output, RS485/MODBUS and optional BACnet (IP or MSTP) output, which can be easily used by a host computer, BMS, PLC or a flow controller for process monitoring and control.



Armstrong Ultrasonic Flowmeter

Non- Intrusive - Non-Obstructive

With clamp-on transducers, the installation becomes very simple and easy. No pipe work is required and there is no risk of leaking or contamination. With clamp-on transducers, there is no obstruction to the flow, thus, there is no pressure drop.

Economical to Operate, Economical to Own

The ultrasonic transducers are made from crystal. There are no moving parts to wear and tear. The whole meter system is completely solid state. Therefore, the AUF is a robust and reliable system. It does not require maintenance or downtime which eliminates any potential incurred costs.

Features and Benefits

- No moving parts to wear and tear. No maintenance required
- NIST-traceable factory calibration
- Multi-frequency system. Able to work reliably in a wide pipe size range
- Able to measure thermal energy and temperature with BTU measurement option
- Suitable for pure liquids and liquids with some particles.
- No dependency on conductivity
- Suitable for all commonly used pipes
- Compatible with various types of transducers
- Non-contact, non-invasive, easy and economical installation, no shut downs, no pipe work.
- Large storage data logger for recording flow, temperature, status, and more
- Communication: RS485/MODBUS. Optional BACnet, GPRS, RF wireless
- IP65 protection

Applications

- Water/wastewater
- Hot/chilled water/condenser water in HVAC systems
- Chemical liquids and solvents
- Water management in buildings, metropolitans, water/ wastewater treatment plants, irrigation systems, and more
- Flow monitoring and control in desalination plants, steel plants, power plants, machining plants, pump stations
- Liquid process control in chemical plants and industrial automation
- Retrofit capability, to upgrade or augment existing systems
- Automated batching and scheduling
- Efficiency monitoring and improvement of liquid-based heating/cooling systems, including solar/geothermal systems
- Beverage, food and pharmaceutical processors where non-contact is essential
- Remote flow monitoring network and leakage detection
- Thermal energy measurement, BTU consumption metering, Green building audit, facility and building energy management and district heating/cooling



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Specifications

Accuracy	$\pm 1\%$ of reading $\pm 0.008\text{m/s}$ ($\pm 0.03\text{ft/s}$) in velocity*	
Repeatability	0.2%	
Display	LCD with backlight. 2 x 20 letters. 4 x 4 tactile-feedback membrane keypad.	
	Displays instantaneous flow rate, flow total (positive, negative and net), velocity, time, temperature, energy, analog outputs/inputs	
Outputs	Current	0/4-20mA isolated output for flowrate, velocity or sound speed.
		Impedance 0-1k. Accuracy 0.1%
	Digital	Optically isolated OCT (Open Collector Transistor) output. Up to 0.5A load. Can be programmed as:
		Pulse signal for flow totalization
		ON/OFF signal for special event such as overflow, no flow, reverse flow, leakage alarming, and more
		START/STOP signal for batch control
		Can be used to drive pulse counter, external relay, alarm, PLC counter
	Relay 1A@125VAC or 2A@30VDC. Can be programmed as:	Pulse signal for flow totalization
		ON/OFF signal for special event such as overflow, no flow, reverse flow, leakage alarming, and more
		START/STOP signal for batch control
		Can be used to drive pulse counter, external relay, alarm, and PLC counter, or, to control pump, valve, light
	Sound Alarm	One sound alarm, programmable to specific event such as overflow, no flow, reverse flow, leakage alarm
Inputs	One 4-20mA input for temperature, pressure or liquid level transmitter	
	Two temperature channels for accommodating two PT100 3-wire temperature sensors. This function is only available upon request	
Data Logger	Automatically records the daily total of the last 64 days, the monthly total of the last 64 months and the yearly total of the last 5 years	
Communication Interface	Isolated RS-485 with power surge protection. Supports the MODBUS protocol	
	Optional RF/GPRS module for wireless networking, remote monitoring and remote control	
	Optional BACnet IP or MSTP adapter for BMS	

Armstrong Ultrasonic Flowmeter

Ordering Information

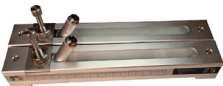
Model	Armstrong Ultrasonic Flowmeter					
AUF	Armstrong Ultrasonic Flowmeter					
	Code	Meter Type				
	F	Flow Only				
	B	BTU Meter				
	Code	Output Options - [(1) 4-20 mA], [(1) Digital], [(1) Relay are Standard]				
	M	MODBUS				
	B	BACnet MSTP				
	BI	BACnet IP				
	Code	Transducer Size				
	AS	3/4 inch - 2.5 inch Pipe				
	AM	2.5 inch - 28 inch Pipe				
	AL	12 inch - 120 inch Pipe				
	Code	Temperature Sensor Type				
	ITA	Insert matched pair RTD with Thermowells (1-2")				
	ITB	Insert matched pair RTD with Thermowells (3-4")				
	ITC	Insert matched pair RTD with Thermowells (5-6")				
	ITD	Insert matched pair RTD with Thermowells (8-10")				
	ITE	Insert matched pair RTD with Thermowells (12-18")				
	ITF	Insert matched pair RTD with Thermowells (20+")				
	CT	Clamp on matched pair RTD				
	XX	None (Flow Only)				
	Code	Transducer Cable Length				
	25	25 Feet				
	50	50 Feet				
	75	75 Feet				
	100	100 Feet				
	Code	Temperature Sensor Cable Length				
	25	25 Feet				
	50	50 Feet				
	75	75 Feet				
	100	100 Feet				
	XX	None (Flow Only)				

AUF	B	M	AM	CT	50	50
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NOTE: All meters come standard with SS mounting straps for the appropriate flow transducers and clamp on RTD's (if applicable). Mounting tracks and hardware for flow transducers will also be provided.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Optional and Replacement Parts

Image	Description
	Small size transducer Pipe size: ¾" - 3" Temperature: 32°F - 312°F
	Medium size transducer Pipe size: 3" - 28" Temperature: 32°F - 312°F
	Large size transducer Pipe size: 12" - 120" Temperature: 32°F - 312°F
	Transducer cable Standard 15' cable for flow transducer
-	Acoustic couplant Lithium grease acoustic couplant for transducer installation

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