

ARMSTRONG ELECTROMAGNETIC FLOWMETER





Introduction

The high-performance Armstrong Electromagnetic Flowmeter (AMF) accurately measures the volumetric flow of any conductive liquids, such as water, salt water, sewage, pulps, slurry, acid, alkali, or any mixture of liquids and solids that have a minimum conductivity of 5μ S/cm.



How it Works

An electromagnetic flowmeter is an induction type flow instrument based on Faraday's Law, often used to measure the volumetric flowrate of a conductive fluid in closed pipelines.



The advantages of Armstrong's electromagnetic flowmeter are reliable performance, high accuracy, and exceptional ease of use due to the microprocessor and exclusive integrated circuit. High accuracy is achieved with only 7D total straight pipe run: 5D upstream and 2D downstream, where D is pipe diameter. The high speed CPU and advanced signal processing technology ensure a wide measuring range (-39 to 39 ft/s). The two line LCD display makes the readings and parameter settings comprehensive and convenient.

Armstrong Electromagnetic Flowmeter



Advantages

- No moving parts to wear and tear
- Minimal straight run required, thus, suitable for any desired installation location (5D up, 2D down)
- All parameters are pre-configured at the factory. Plug and Play
- High Accuracy: Standard Accuracy to +/- 0.5%. Improved accuracy to +/- 0.3% available for sizes ½" to 12"
- Large Operable Range (-39 to 39 ft/s)
- Bidirectional flow capable
- Reliable and accurate measurement over widely varying flow rates, including minimal flow rates, which occur in typical water distribution networks at night time
- Wide size selection from (1/2"-80")
- Multiple liner and electrode materials for different applications
- No permanent pressure loss
- Standard output: 4-20 mA, pulse, RS232, or RS485/MODBUS
- Optional BACnet HART or PROFIBUS communication interface
- Self-diagnosing capability to minimize operational downtime
- All meters come with certificate of calibration and are wet calibrated at the factory.
- Available BTU system with insert/clamp on 1000 ohm, platinum, matched RTD's
- Integral/Remote displays

Industries

- Higher Education
- Healthcare
- Hospitality
- Government
- Power Supply
- Municipal
- Waste Water Treatment
- Irrigation
- Chemicals
- Industrial Liquid Processes

Specific Target Applications Include:

- HVAC
- Chilled water/Hot water/ Wastewater
- Condensate and heating water circuits
- Boiler feed water
- Thermal storage, geothermal system, solar hot-water system
- District energy management and billing
- Commercial building tenant billing
- LEED/Green building verification, green credit application
- Energy consulting
- Power plant efficiency monitoring
- Facility management in shopping malls, campuses, industrial parks, hospitals, commercial buildings, government buildings, airports
- Flow monitoring and control in desalination plants, steel
- Water supply and drainage
- Plants, power plants, machining plants, pump stations

Fig. 1: BTU Meter Installation

BTU Measurement (see Fig. 1) Thermal energy meters, also called BTU

meters, are the best way to accurately measure the amount of energy transferred in a hydronic system. These meters use a

matched pair of RTD's, one on the supply and the other on the return lines reporting temperatures to the electronics. The BTU measurement is then calculated using the measured flowrate and the temperature differential. BTU meters are typically used

for submetering as well as plant and chiller

optimization.



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Armstrong Electromagnetic Flowmeter - Specifications

	+/- 0.3% of reading for meter sizes 1"-12"									
Accuracy Class	+/- 0.5% of reading for meter sizes 1/2"-24"									
	+/- 1% of reading for meter sizes greater than 26"									
Repeatability	+/1%									
Display	Large LCD display with backlight. Displays the instantaneous flow, total flow, and alarm.									
Totalizers	Three built-in t	otalizers: forward flow, reverse flow and net								
	Anglen	Bi-directional, isolated 0-10mA – 4-20mA								
	Analog	Load resistor: $0 \sim 1.5 \text{K}\Omega$ for $0 \sim 10 \text{mA}$, $0 \sim 750 \Omega$ for $4 \sim 20 \text{mA}$								
Outputs	Frequency	Forward & reverse flow output with a frequency range of 1~5000Hz. The external voltage must be lower than 35V and the max output current must be 250mA when the transistor is turned on.								
	Alarm	Alarm ouput: Two isolated open collector transistor (OCT) outputs for alarm signals.								
Flow Direction Indication	The meter is capable of measuring both forward and reverse flow and recognizing flow direction.									
Communication	RS232, RS485/MODBUS, PROFIBUS or HART Communication selectable. GPRS wireless telemetry available upon request.									
++Repeatability+DisplayLaTotalizersTOutputsTOutputsTFlow Direction IndicationTCommunicationTProtection ClassDProtection ClassMOutputsCImage: CommunicationTProtection ClassCMCMCMCMCMCMCMCMCMCMCPipe ConnectionAFluid Temperature LimitsRFluid Electrical ConductivitySMS	BACnet									
Drotaction Class	Display enclosure rating: IP 65 (outdoor) or IP 67 (optional)									
Protection Glass	Meter enclosure type: IP 65 (outdoor) or IP 68 (submersible, only available for remote type)									
	(1/2" ~4"): 2.5	MPa (362psig)								
	(5" ~10"): 1.6MPa (232psig)									
Nominal Pressure Limit	(12" ~40"): 1.0MPa (145psig)									
	(48" ~80"): 0.6MPa (87psig)									
	Higher pressure rating is available upon request									
Liner Material	Rubber, PTFE, Polyurethane, PFA									
Electrode Type	316SS, Hastelloy B, Hastelloy C, Titanium, Tantalum									
	Measuring tube: Stainless steel									
Sensor Material	Meter Housing: Carbon steel as standard offer. Stainless steel available upon request									
	Flange: Carbon steel as standard offer. Stainless steel available upon request									
Pipe Connection	ASME/ANSI flange 150#, 300#									
	Integral type - (14°F~176°F)									
		Neoprene & Polyurethane Liner - (14°F~176°F)								
Fluid Temperature Limits	Pomoto tuno	PTFE Liner - (14°F~302°F)								
		PFA Liner - (14°F~400°F)								
		Ambient Temperature - (-13°F~140°F)								
Ambient Humidity	5~95%RH (relative humidity)									
Measurement Range	+/- 39 ft/s									
Fluid Electrical Conductivity	≥ 5µS/cm									
Power Supply	16~36VDC or 85~250VAC, <20W									
Meter Types	Integral, remot	e, submersible								
BTD and Thermowell	RTD: 4 wire, platinum, matched									
	Thermowells: 316SS, sized based on pipe									



Independent Flow Lab Testing Data

Test Location: Colorado Engineering Experiment Station Test Date: February 25, 2019 Fluid: Water Meter Size: 2 inch Serial Number: 1807682





AMF Ordering Information

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176° F) 3 3 inch 4 4 inch 5 5 inch Code Electrode Material 1 20 vurthane (14 - 176° F) 4 PKA (14 - 400° F) Code 120 - 36 VOC - (Standard) 1 20 - 36 VOC - (Standard) 8 Hastelloy R 1 2 85 - 250 VAC 1 20 - 36 VOC - (Standard) 1 2 59 3 3 3 3</td><td>Code Meter 19pe F Flow Only B B STU Meter Code Flange - (Standard) 300 ANSI 300# Flange - (Standard) Code Tube Size 05 1/2 inch Code Tube Size 150 1.1/2 inch Code Code Tube Size 2 2 inch Code Code Code Code 2 2 inch Code Code Code Code Code 2 2 inch Code Co</td><td>Code Parage Rating 150 ANSI 150P Flange - (Standard) 300 ANSI 300P Flange - (Rive Only) Code Toto Bite 05 1/2 inch 125 1230 1300 ANSI 300P Flange - (Rive Only) Code Toto Bite 05 1/2 inch 125 126 130 11/2 inch 2 2 linch 2 1 inch 2 2 linch 3 3 inch 4 4 inch 5 5 inch A 316 SS - (Standard) 2 Neoprene Rubber (14 - 176° F) 4 PA(14 - 400° F) Code Electrode Material A 316 SS - (Standard) B Hastelloy B C Hastelloy C D Tranium Code Input Power 1 20 - 36 VDC - (Standard) 2 85 - 200 VAC B Pulse & 4-20 mA</td><td>Code Matter 1999 B BTU Meter 150 ANS1 150# Flange - (Flow Omly) 30 ANS1 150# Flange - (Flow Omly) 05 1/2 inch 10 05 12 10 11 1nch 12 12 15 1/2 inch 11 1 12 2 15 1/2 inch 12 1 12 1 12 1 12 1 13 1 14 2 2 1 15 1 16 20 4 10 12 10 1 12 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1<!--</td--><td>Good Weter F Flow Only B BUU Meer 150 ANSI 1300 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 200 Tole Size Code Code Tole Size Code 73 34 lunch A 112 Inch 14 125 212 12 linch 126 22 linch 18 18 2 2 linch 14 14 linch 2 2 linch 18 18 3 3 linch 20 20 incl 2 Sinch 20 20 incl 2 Sinch 20 20 incl 2 Sinch 20 20 incl 3 Polyurthan (14 - 176" P) 3 4 A 316 SS - (Standard) 3 5 20 - 36 VOC - (Standard) 2 2</td><td>Good Weter / type 8 BTU Meter 190 AMS: 109 Pinop: - (Skndard)). 300 AMS: 300 Pinop: - (Finor Chr) 100 11 101 Status 102 AMS: 109 Pinop: - (Finor Chr) 10300 AMS: 300 Pinop: - (Finor Chr) 11 Inch 10 12 Lizah 12 12 Lizah 12 12 Lizah 12 12 Lizah 12 1300 Hanch 10 1301 1/2 inch 14 1301 1/2 inch 16 1301 Hanch 10 12 Hanch 10</td></td></t<>	Code Meder 1ype F Flow Only B B DTU Meter Code Flange - (Standard) 300 ANSI 1500 Flange - (Flow Only) Code Tube Size 05 1/2 inch 75 3/4 inch 1 1 1 inch 125 125 125 120 1/2 inch 2 2 1/2 inch 2 2 inch 3 3 inch 4 4 4 inch 5 5 inch Code Uner 1 PITE (14 - 302° F) - (Standard) 2 Neoprene Rubber (14 - 176° F) 3 3 inch 4 4 inch 5 5 inch Code Electrode Material 1 20 vurthane (14 - 176° F) 4 PKA (14 - 400° F) Code 120 - 36 VOC - (Standard) 1 20 - 36 VOC - (Standard) 8 Hastelloy R 1 2 85 - 250 VAC 1 20 - 36 VOC - (Standard) 1 2 59 3 3 3 3	Code Meter 19pe F Flow Only B B STU Meter Code Flange - (Standard) 300 ANSI 300# Flange - (Standard) Code Tube Size 05 1/2 inch Code Tube Size 150 1.1/2 inch Code Code Tube Size 2 2 inch Code Code Code Code 2 2 inch Code Code Code Code Code 2 2 inch Code Co	Code Parage Rating 150 ANSI 150P Flange - (Standard) 300 ANSI 300P Flange - (Rive Only) Code Toto Bite 05 1/2 inch 125 1230 1300 ANSI 300P Flange - (Rive Only) Code Toto Bite 05 1/2 inch 125 126 130 11/2 inch 2 2 linch 2 1 inch 2 2 linch 3 3 inch 4 4 inch 5 5 inch A 316 SS - (Standard) 2 Neoprene Rubber (14 - 176° F) 4 PA(14 - 400° F) Code Electrode Material A 316 SS - (Standard) B Hastelloy B C Hastelloy C D Tranium Code Input Power 1 20 - 36 VDC - (Standard) 2 85 - 200 VAC B Pulse & 4-20 mA	Code Matter 1999 B BTU Meter 150 ANS1 150# Flange - (Flow Omly) 30 ANS1 150# Flange - (Flow Omly) 05 1/2 inch 10 05 12 10 11 1nch 12 12 15 1/2 inch 11 1 12 2 15 1/2 inch 12 1 12 1 12 1 12 1 13 1 14 2 2 1 15 1 16 20 4 10 12 10 1 12 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1 </td <td>Good Weter F Flow Only B BUU Meer 150 ANSI 1300 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 300 ANSI 3000 Flange - (Standard) 200 Tole Size Code Code Tole Size Code 73 34 lunch A 112 Inch 14 125 212 12 linch 126 22 linch 18 18 2 2 linch 14 14 linch 2 2 linch 18 18 3 3 linch 20 20 incl 2 Sinch 20 20 incl 2 Sinch 20 20 incl 2 Sinch 20 20 incl 3 Polyurthan (14 - 176" P) 3 4 A 316 SS - (Standard) 3 5 20 - 36 VOC - (Standard) 2 2</td> <td>Good Weter / type 8 BTU Meter 190 AMS: 109 Pinop: - 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