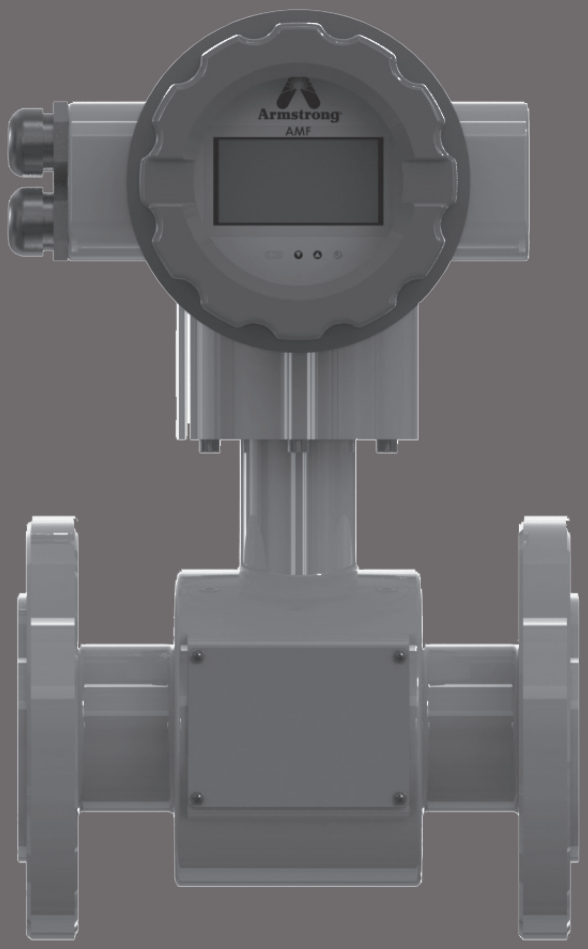
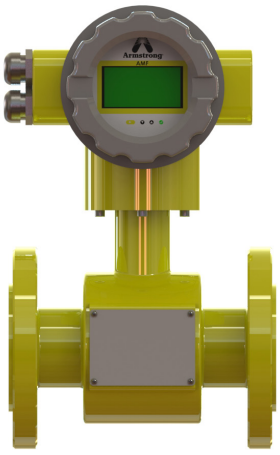
ARMSTRONG
ELECTROMAGNETIC FLOWMETER



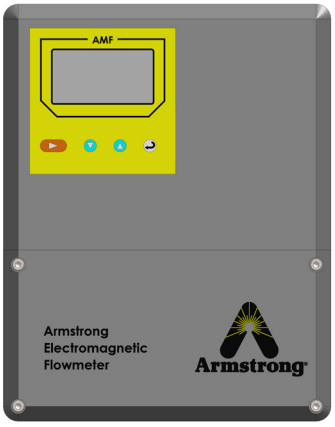
Armstrong Electromagnetic Flowmeter

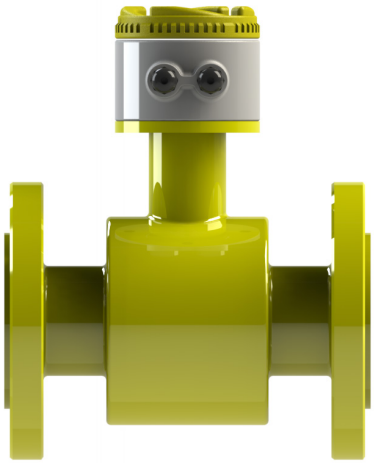
Introduction

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 5µS/cm.



Integral Mount

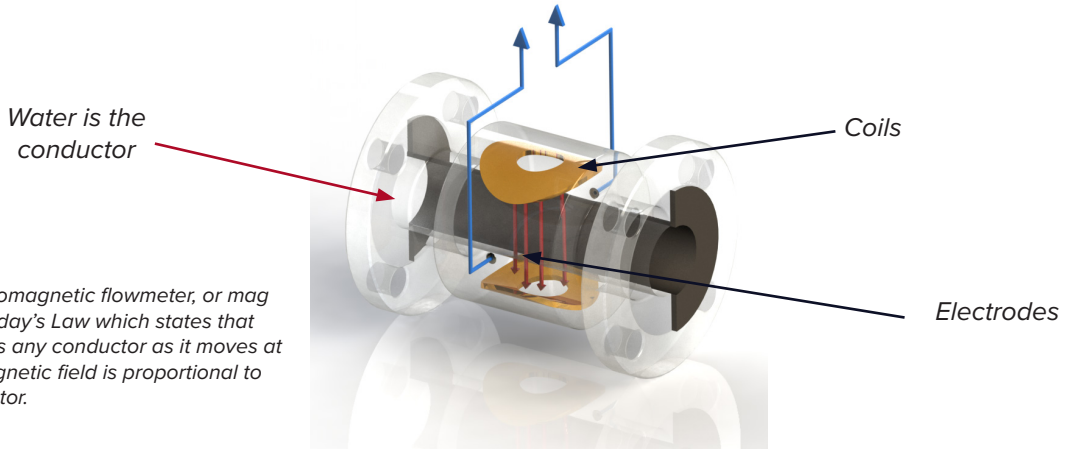




Remote Mount

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 operation of an electromagnetic flowmeter, or mag meter, is based upon Faraday's Law which states that the voltage induced across any conductor as it moves at right angles through a magnetic field is proportional to the velocity of that conductor.

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

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.

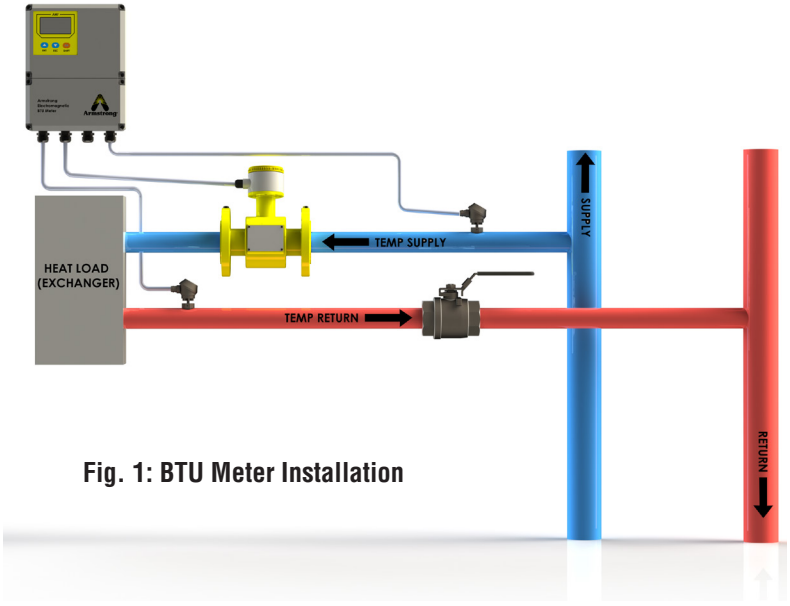


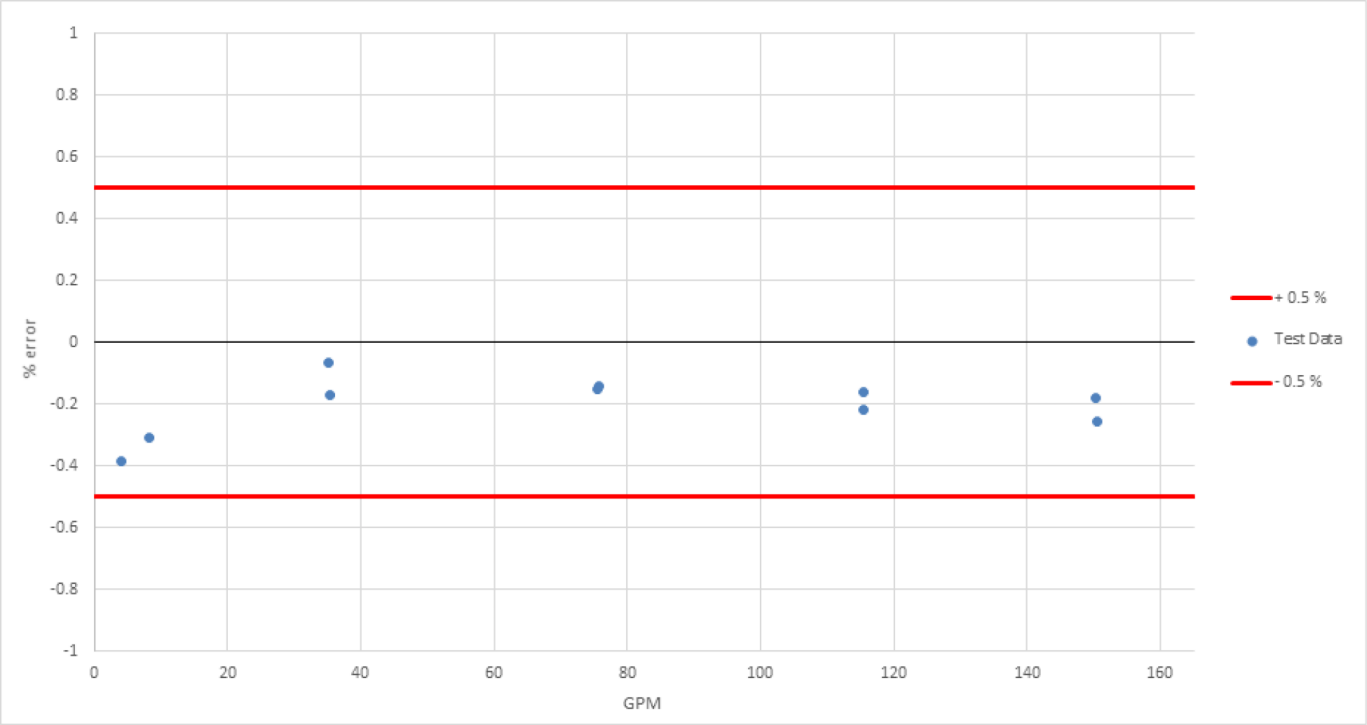
Fig. 1: BTU Meter Installation

Armstrong Electromagnetic Flowmeter - Specifications

Accuracy Class	+/- 0.3% of reading for meter sizes 1”-12”	
	+/- 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 totalizers: forward flow, reverse flow and net	
Outputs	Analog	Bi-directional, isolated 0-10mA – 4-20mA
		Load resistor: 0~1.5KΩ for 0~10mA, 0~750Ω for 4~20mA
	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.	
	BACnet	
Protection Class	Display enclosure rating: IP 65 (outdoor) or IP 67 (optional)	
	Meter enclosure type: IP 65 (outdoor) or IP 68 (submersible, only available for remote type)	
Nominal Pressure Limit	(1/2” ~4”): 2.5MPa (362psig)	
	(5” ~10”): 1.6MPa (232psig)	
	(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	
Sensor Material	Measuring tube: Stainless steel	
	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#	
Fluid Temperature Limits	Integral type - (14°F~176°F)	
	Remote type	Neoprene & Polyurethane Liner - (14°F~176°F)
		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, remote, submersible	
RTD 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

Model	Armstrong Electromagnetic Flowmeter
AMF	Armstrong Electromagnetic Flowmeter

Code	Meter Type
F	Flow Only
B	BTU Meter

Code	Flange Rating
150	ANSI 150# Flange - (Standard)
300	ANSI 300# Flange - (Flow Only)

Code	Tube Size	Code	Tube Size Continued
05	1/2 inch	6	6 inch
75	3/4 inch	8	8 inch
1	1 inch	10	10 inch
125	1.25	12	12 inch
150	1 1/2 inch	14	14 inch
2	2 inch	16	16 inch
250	2 1/2 inch	18	18 inch
3	3 inch	20	20 inch
4	4 inch	24	24 inch
5	5 inch		Above 24" consult factory

Code	Liner
1	PTFE (14 - 302° F) - (Standard)
2	Neoprene Rubber (14 - 176° F)
3	Polyurethane (14 - 176° F)
4	PFA (14 - 400° F)

Code	Electrode Material
A	316 SS - (Standard)
B	Hastelloy B
C	Hastelloy C
D	Titanium
E	Tantalum

Code	Input Power
1	20 - 36 VDC - (Standard)
2	85 - 250 VAC

Code	Outputs
A	Pulse & 4-20 mA
B	Pulse, 4-20 mA, MODBUS - (Standard)
C	HART
D	BACnet MSTP
E	BACnet IP

Code	Accuracy
1	1% (>24")
2	.5% (.5" - 24") - (Standard)
3	.3% (1-12")

Code	Meter Housing Type
A	Integral, CS Housing and Flange (Flow Only) - (Standard)
B	Remote, CS Housing and Flange (Standard)
C	Remote, 304SS Housing and Flange (1/2" - 24")
D	Remote, 316SS Housing and Flange (1/2" - 24")
E	Remote Submersible Housing

Code	Display Enclosure Rating
1	IP65 - (Standard)
2	IP67

Code	Display Enclosure Cable
50	50 feet - (Standard)
100	100 Feet
150	150 Feet
xx	None (Integral Mount)

Code	Temperature Sensor Type
ITA	Insert matched pair RTD with Thermowells (1-2")
ITB	Insert matched pair RTD with Thermowells (3")
ITC	Insert matched pair RTD with Thermowells (4-6")
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	Temperature Sensor Cable Length
50	50 Feet - (Standard)
100	100 Feet
150	150 Feet
XX	None (Flow Only)

AMF	F	150	4	1	A	2	A	2	A	1	XX	XX	XX	

Notes

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