E-Series®
Ultrasonic Flow Meters

E-Series G2® Ultrasonic Meters

Lead-Free Bronze Alloy, 5/8, 5/8 x 3/4, 3/4, 1 inch

DESCRIPTION

The next generation E-Series G2® Ultrasonic meter uses solid-state technology in a compact, tamper protected, weatherproof and UV-resistant housing, suitable for residential applications. Electronic metering provides information—such as rate of flow and status and alarm indication—and data not typically available through traditional, mechanical meters and registers. Electronic metering minimizes measurement errors due to sand, suspended particles and pressure fluctuations.

Ultrasonic Meter Features

- Flow tube design prevents obstruction of flow, and provides greater turn-down ratio for extended flow ranges and increased revenue
- No moving parts for increased performance and maximized revenue
- Easy-to-read, 9-digit LCD display for consumption, rate of flow, unit of measure, pressure, temperature, alarm conditions (reverse-flow, no usage, empty pipe, exceeding max flow, suspected leak, pressure*, temperature, end of life and measurement error) and firmware version
- High resolution industry standard ASCII encoder protocol sends alarms and data to ORION® endpoints and BEACON® Software as a Service (SaaS) suite to establish a smart water solution for better visibility and management
- Pressure* and temperature data and alarms reported at meter and through ORION endpoints and BEACON SaaS
- Field programmable registration and maintains an hourly internal logging capacity of 160 days of data
- Maximum flow reporting analytics available to improve meter right sizing and monitor irrigation events
- Single and dual outputs include encoder, scaled/unscaled and 4-20 mA

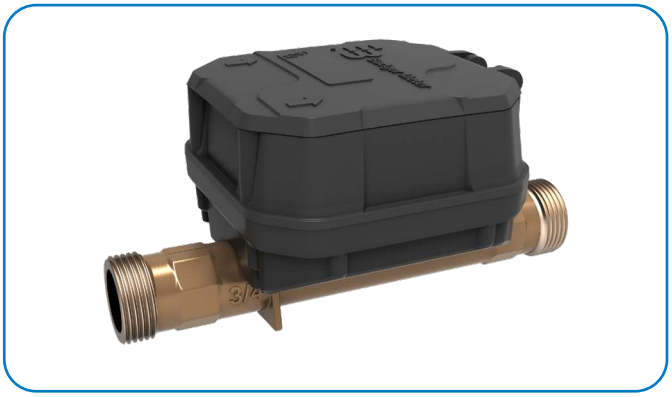
**available with optional integrated pressure sensor*

OPERATION AND PERFORMANCE

As water flows into the measuring tube, ultrasonic signals are sent consecutively in forward and reverse directions of flow. Velocity is then determined by measuring the time difference between the measurement in the forward and reverse directions. Total volume is calculated from the measured flow velocity using water temperature and pipe diameter.

The LCD screen toggles to total volume, unit of measure, rate of flow, pressure*, temperature, firmware and alarm conditions (reverse-flow, no usage, empty pipe, exceeding max flow, suspected leak, pressure*, temperature, end of life and measurement error).

When connected to ORION endpoints, both the pressure and temperature information are communicated to and presented in BEACON, helping utilities understand and proactively manage their water systems faster and more efficiently.



In the normal temperature range of 45…122° F (7…50° C), the "new meter" consumption measurement is accurate to:

- ±1.5% over the normal flow range
- ±3.0% from the extended low flow range to the minimum flow value

**available with optional integrated pressure sensor*

APPLICATIONS

Use the E-Series Ultrasonic meter for measuring potable cold water in residential applications. The meter is also ideal for non-potable, reclaimed irrigation water applications, or less than optimum water conditions where small particles exist.

E-Series Ultrasonic meters meet and exceed ANSI/AWWA C715 Standards. The lead-free bronze alloy meters comply with the lead-free provisions of the Safe Drinking Water Act and NSF/ANSI/CAN Standards 61 and 372.

The 3/4 and 1 inch Ultrasonic meters are UL Listed under UL Subject 327B, inferential type water meters used in residential fire service applications. These applications are regulated by local codes and requirements established by the Authority Having Jurisdiction (AHJ). Additional application information is provided in NFPA 13D, one- and two-family residences.

CONSTRUCTION

The E-Series Ultrasonic meter features lead-free bronze alloy meter housing, ultrasonic transducers, a meter-control circuit board with associated wiring, LCD, and battery. Wetted elements are limited to the pressure vessel and transducers. The electronic components are housed and fully potted within a molded, engineered polymer enclosure, which is attached to the meter housing. The transducers extend through the housing and are sealed by O-rings, enabling turbulence-free water flow through the tube. The flow tube is designed to reduce pressure loss and provide long-term accuracy.

Badger Meter

UL LISTED

ESM-DS-03096-EN-11 (December 2024)

Product Data Sheet

METER INSTALLATION

For long-term performance the meter is weatherproof, UV-resistant, fully submersible and can be installed using horizontal or vertical piping. The registration electronics and battery are encapsulated to withstand harsh environments and protect the electronics in flooded or submerged pit applications. The meter will not measure flow when an "empty pipe" condition is experienced.

NOTE: An empty pipe is defined as a condition that occurs when the flow sensors are not fully submerged.

The meter is available with an inline connector for easy installation and connection to ORION endpoints. It is also available with a flying lead for field splice connection.

SPECIFICATIONS

E-Series G2 Ultrasonic Meter Size	5/8 in.	5/8 x 3/4 in.	3/4 in. (7-1/2 in.)	3/4 in. (9 in.)	1 in.
Normal Test Flow Limits	0.08…30 gpm (0.02…6.81 m^3/hr)	0.08…30 gpm (0.02…6.81 m^3/hr)	0.1…35 gpm (0.02…7.95 m^3/hr)	0.1…35 gpm (0.02…7.95 m^3/hr)	0.16…62 gpm (0.04…14.08 m^3/hr)
Minimum Test Flow Limits	0.04 gpm (0.009 m^3/hr)	0.04 gpm (0.009 m^3/hr)	0.04 gpm (0.009 m^3/hr)	0.04 gpm (0.009 m^3/hr)	0.075 gpm (0.017 m^3/hr)
Safe Maximum Operating Condition (SMOC)	30 gpm (6.81 m^3/hr)	30 gpm (6.81 m^3/hr)	35 gpm (7.95 m^3/hr)	35 gpm (7.95 m^3/hr)	62 gpm (14.08 m^3/hr)
Typical Pressure Loss	TBD	2.6 psi @ 15 gpm (0.18 bar @ 3.4 m^3/hr)	4.2 psi @ 25 gpm (0.29 bar @ 5.7 m^3/hr)	4.2 psi @ 25 gpm (0.29 bar @ 5.7 m^3/hr)	4.1 psi @ 40 gpm (0.28 bar @ 9.1 m^3/hr)
UL Approval for Residential Fire Service Meters - File No. EX15653	NA	NA	UL 327B	UL 327B	UL 327B
UL Test Flow Limits (at ±1.5% accuracy)	NA	NA	2…30 gpm (0.45...6.81 m^3/hr)	2…30 gpm (0.45...6.81 m^3/hr)	2…50 gpm (0.45...11.36 m^3/hr)
Typical UL Pressure Loss	NA	NA	4.2 psi @ 25 gpm (0.29 bar @ 5.7 m^3/hr)	4.2 psi @ 25 gpm (0.29 bar @ 5.7 m^3/hr)	4.1 psi @ 40 gpm (0.28 bar @ 9.1 m^3/hr)
Operating Performance	In the normal temperature range of 45…122 °F (7…50 °C), new meter consumption measurement is accurate to: 100% ±1.5% over the normal test flow limits, 100% ±3.0% for the minimum test flow limits				
Storage Temperature	– 40…140° F (– 40…60° C)				
Maximum Ambient Storage (Storage for One Hour)	150° F (66° C)				
Measured Fluid Temperature Range	34…140° F (1…60° C)				
Humidity	0…100% condensing; meter is capable of operating in fully submerged environments				
Maximum Working Pressure of Meter Housing	175 psi (12 bar)				
Maximum Operating Pressure of Pressure Sensor	175 psi (12 bar)				
Pressure Sensor Accuracy	±2% of full scale pressure, up to 175 psi (12 bar)				
Register Type	Straight reading, permanently sealed electronic LCD; digits are 0.28 in. (7 mm) high				
Register Display	• Total consumption (nine digits) • Rate of flow • Temperature • Pressure *(Optional: for meters ordered with integrated pressure sensor)*		• Alarm and operating mode • Firmware version • Alarm indicators • Unit of measure (factory programmed for gallons, cubic feet and cubic meters)		
Totalization Display Resolution	• Gallons: 0.01	• Cubic feet: 0.001		• Cubic meters: 0.0001	
Scaled/Unscaled Output*	Solid-state relay and Open Collector				
Max. Voltage	30V DC				
Current	10 mA				
Pulse Width	50 ms (programmable 25…100 ms)				
Analog 4-20 mA Output*	Two-wire/passive flow rate measurement				
Input Voltage Range	9…50V DC supply				
Current	4…20 mA				
Max. Load Resistance (Ohms)	(50 Ohms + 50 Ohms) × (Supply Voltage - 9V)				
Battery	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing and is not replaceable; 20-year battery life				

*Applicable to meters with dual output options

MATERIALS

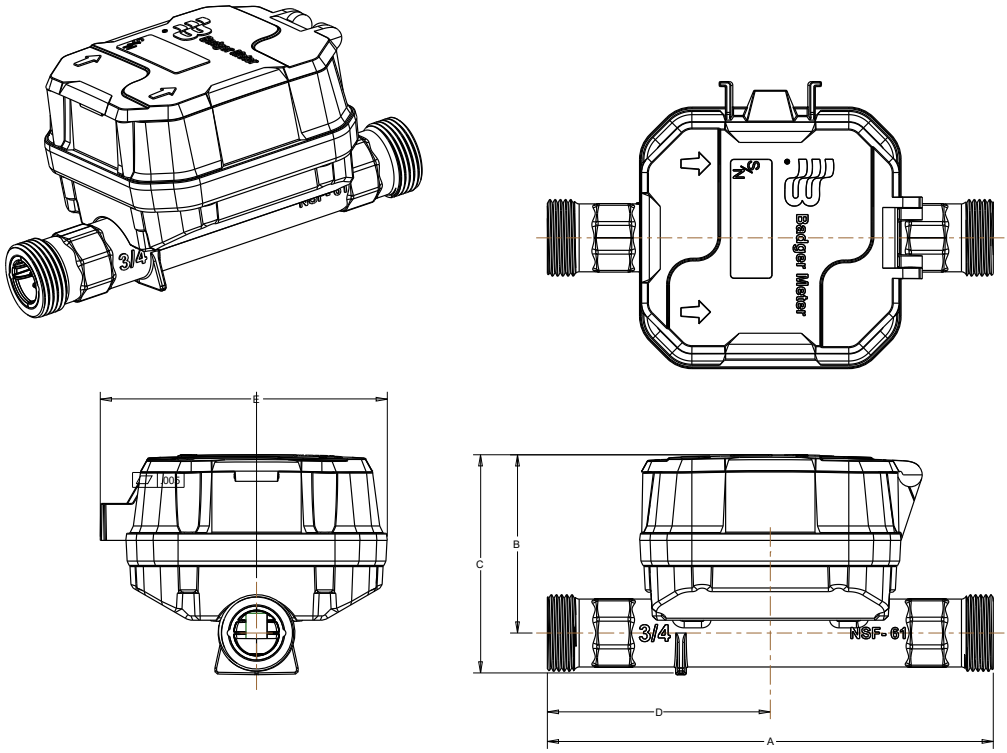
Meter Housing	Lead-free bronze alloy
Measuring Section	Ultrasonic sensors located in the flow tube
Register Housing and Lid	Engineered polymer
Strainer*	Engineered composite

* *Fire Service meters do not have a Strainer*

PHYSICAL DIMENSIONS

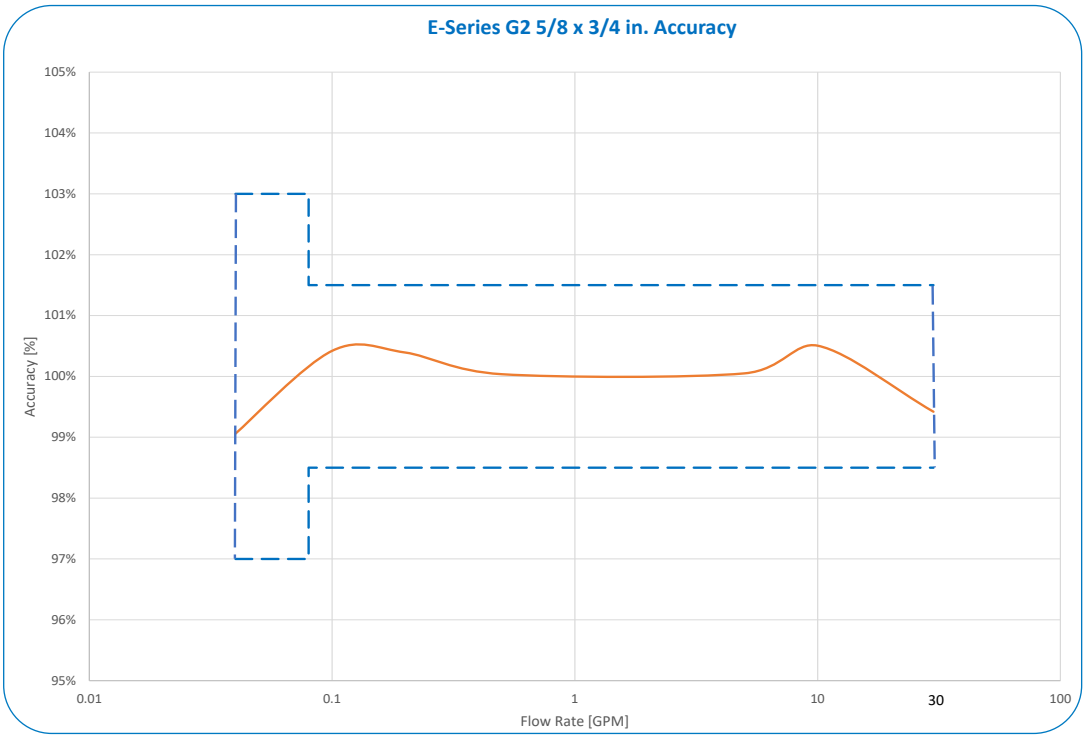
E-Series G2 Ultrasonic Meter Size	5/8 in.	5/8 x 3/4 in.	3/4 in. (7-1/2 in.)	3/4 in. (9 in.)	1 in.
Size Designation X Lay Length	5/8 × 7-1/2 in. (16 × 191 mm)	5/8 × 3/4 × 7-1/2 in. (16 × 19 × 191 mm)	3/4 × 7-1/2 in. (19 × 191 mm)	3/4 × 9 in. (19 × 229 mm)	1 × 10-3/4 in. (25 × 273 mm)
Bore Size	5/8 in. (16 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
Coupling Nut & Spud Thread (NPSM)	3/4 in. (19 mm) × 14 NPSM	1 in. (25 mm) × 11-1/2 NPSM	1 in. (25 mm) × 11-1/2 NPSM	1 in. (25 mm) × 11-1/2 NPSM	1-1/4 in. (32 mm) × 11-1/2 NPSM
Service Pipe Thread (NPSM)	1/2 in. (13 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
Tailpiece Pipe Thread (NPSM)	1/2 in. (13 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
Weight (without AMR)	TBD	2.7 lb (1.23 kg)	2.62 lb (1.19 kg)	2.86 lb (1.30 kg)	4.02 lb (1.82 kg)
See illustration below for Measurement Designations					
Length (A)	7.49 in. (190 mm)	7.46 in. (189 mm)	7.46 in. (189 mm)	8.93 in. (227 mm)	10.75 in. (273 mm)
Height (B)	2.95 in. (75 mm)	2.99 in. (76 mm)	2.99 in. (76 mm)	2.99 in. (76 mm)	3.19 in. (81 mm)
Height (C)	3.55 in. (90 mm)	3.66 in. (93 mm)	3.66 in. (93 mm)	3.69 in. (94 mm)	4.06 (103 mm)
Length (D)	3.74 in. (95 mm)	3.74 in. (95 mm)	3.74 in. (95 mm)	3.77 in. (96 mm)	3.94 (100 mm)
Width (E)	4.82 in. (122 mm)				

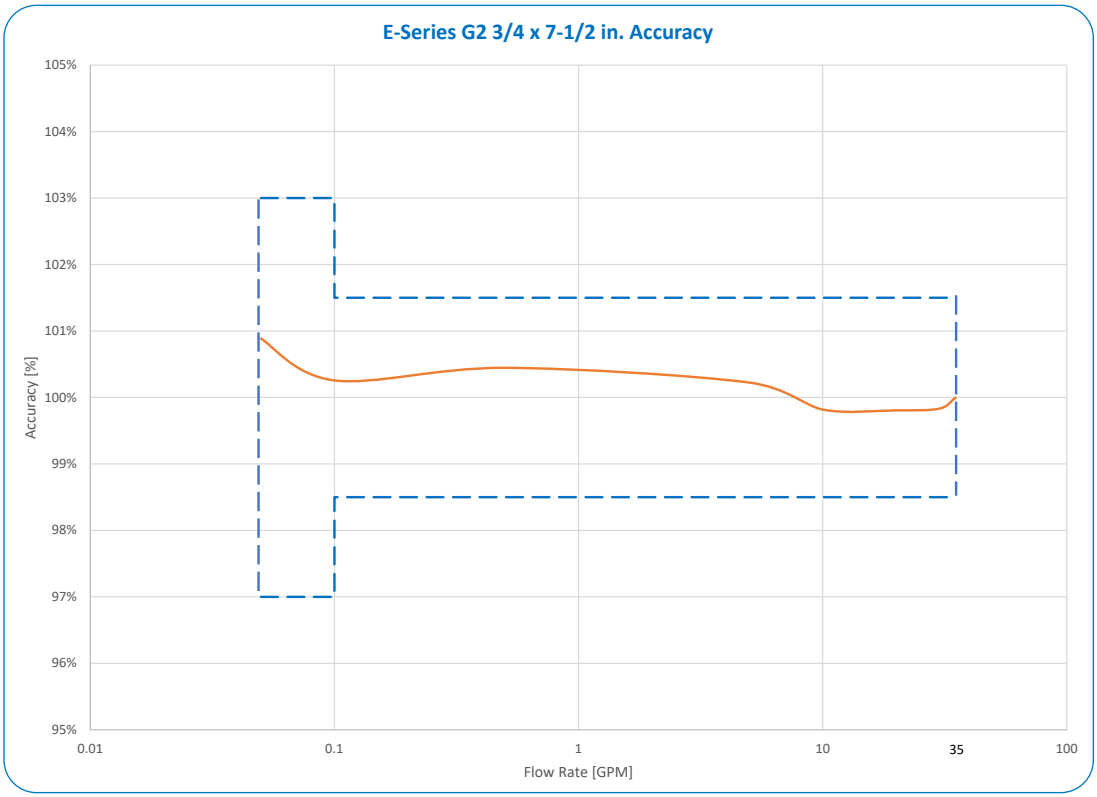
Measurement Designations

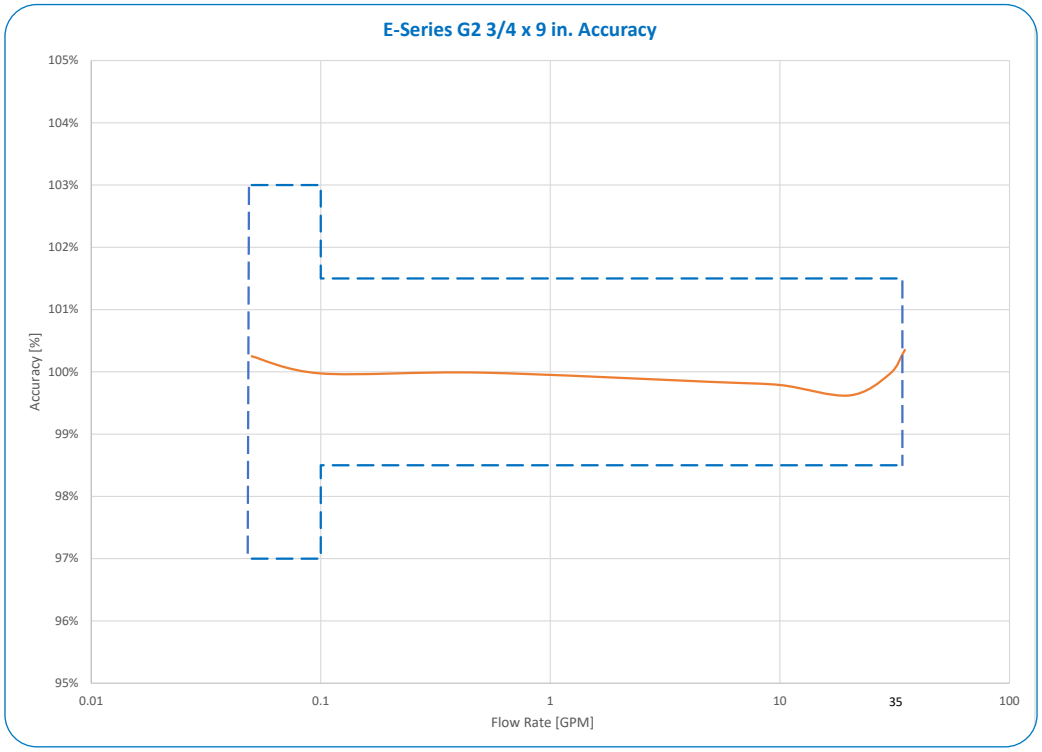


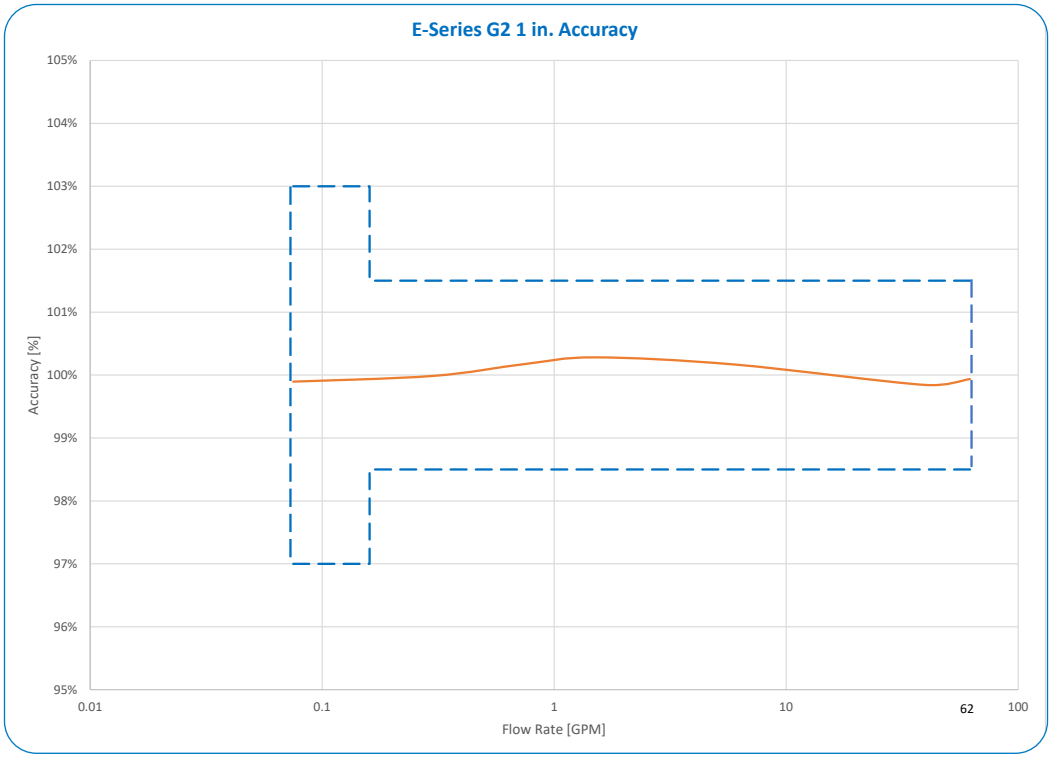
ACCURACY CHARTS

Each chart represents typical meter performance. Rate of flow in gallons per minute (gpm).



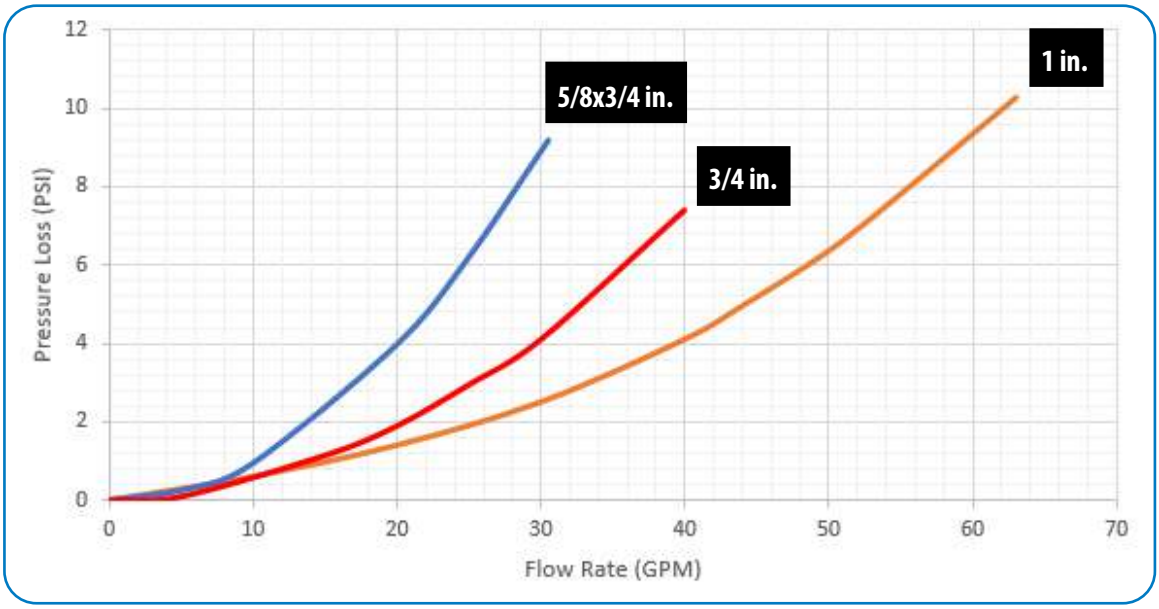



E-Series G2 3/4 x 9 in. Accuracy
105%
104%
103%
102%
101%
100%
99%
98%
97%
96%
95%
Accuracy [%]
0.01
0.1
1
10
35
100
Flow Rate [GPM]


E-Series G2 1 in. Accuracy
105%
104%
103%
102%
101%
100%
99%
98%
97%
96%
95%
Accuracy [%]
0.01
0.1
1
10
62
100
Flow Rate [GPM]

PRESSURE LOSS CHART

Chart represents typical meter performance. Rate of flow in gallons per minute (gpm).



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