

Metron-Farnier General Specifications

The Spectrum Single-Jet Meter is the widest range, single measuring element meter available to U.S. utilities. They have been designed to replace limited range displacement and multijet meters. The Spectrum meters can accurately measure 10 times lower flow rates than modern displacement meters of comparable size. The combination of design simplicity, superior grade materials, and high quality manufacturing standards allows for years of virtually new meter performance with no maintenance.

Spectrum features include:

- High accuracy
- Wide range – 1000:1 turndown
- Superior low flow registration
- No maintenance
- Excellent performance in adverse conditions
- Unaffected by sand or small debris in line
- No straight pipe requirements upstream or downstream of meter
- No strainer requirement
- 5-year flange-to-flange warranty
- 5-year register warranty
- State-of-the-Art Hawkeye Optically-Encoded Register
- Universal AMR compatibility

Physical Specifications

Model – MP-4

Body – Low lead Brass

Impeller – Polypropylene

Register – Optically-encoded straight read register. Magnetically coupled to shielded gear-box in meter body.

Impeller Bearing – Sapphire

Impeller Pivots – 440C Stainless Steel

Dimensions – See Table 2

Weight – See Table 2

Residential Meters Spectrum 22



Functional Specifications

Fluids measured – Potable cold water
(hot water optional)

Flow Range – See Table 1.

Accuracy – $\pm 1.5\%$ See Figure 1.

Pressure Loss – See Figure 1.

Repeatability – 0.5 % of flowrate

Maximum Operating Pressure – 230 PSI

Maximum Operating Temperature –
140° F (60° C)

194° F (90° C) optional

End Connections – NPSM Threads

Registration – See Figure 5.

1,000,000 Gallons

0.02 Gallon dial resolution

1,000,000 Cubic Feet

.002 Cubic Ft. dial resolution

Warranty – 5 Yr. – Flaws and defects
5 Yr. - Register

Applicable Standards

ISO - 4064-1, Class C Approved
NSF-61 Approved



Operation

Incoming water rotates a suspended impeller that is magnetically linked to the register. A low friction tungsten carbide bearing supports the impeller at low flow rates while a thrust bearing provides the support at high flow rates. This patented “dual bearing” design provides unparalleled accuracy and durability at both high and low flows.

All MP-4 model water meters utilize the OER (optically-encoded register) register. The OER utilizes a light transmitter and light-pipe to detect the various positions of the encoder wheels. This non-mechanical sensing technology offers many advantages, including extremely low drag on the measuring element and minimal chance of mechanical wear/failure.

The OER is a field replaceable register available in indoor and outdoor materials and in multiple output configurations. Reference the OER technical specifications for more information.

Tamper-Proof Features

The MP4 model employs a tamper resistant and tamper-evident register housing.

The OER register is fixed to the meter body with an ABS plastic snap ring. This snap ring must be removed with a special tool. Unauthorized removal will break the snap ring and indicate tampering.

Automatic Meter Reading

All Model MP-4 water meters utilize the OER register and thus can be utilized within virtually any AMR system. The OER employs defacto communications standards for 2-wire (touchpad) and 3-wire (radio) interfaces. Reference the OER technical specifications and AMR application notes for more information.

Installation

The Spectrum meter should be stored as shipped with register face down until installation. To maintain accuracy, the meter is to be installed horizontally ($\pm 10^\circ$) in the direction of water flow, with the register face up. In most applications, no straight pipe length, upstream or downstream is necessary. Under normal usage conditions the Spectrum is not affected by sand or suspended particles and does not require a strainer.

Detailed reference sheets for meter installation can be provided by Metron-Farnier upon request.

Options

1. The spectrum meters can be teflon (PTFE) coated for use with other liquids.
2. The meters can be specially fabricated for use on hot water ($< 195^\circ\text{F}$).

Accuracy Testing

For optimal performance during meter accuracy tests observe the following:

1. Register is level to the horizontal
2. Upstream pipe should be the same diameter or larger than meter connection
3. Upstream valve should be fully opened during test, use downstream valve to regulate flow rates
4. Inspect for leaks between the Spectrum and downstream volumetric tank or reference meter
5. Time low flow test to confirm accuracy of flowrate indicator

Detailed reference sheets for meter testing can be provided by Metron-Farnier upon request. The next revision of the AWWA M6 manual will include testing methods for single-jet meters.

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Residential Meters Spectrum 22

Table 1

Flow Specifications
Residential Spectrum 22 Water Meters

Model - MP4	Size	Std App ¹	Minimum Test Flow (95%-101.5%) gpm	Normal Operating Range (98.5%-101.5%) gpm	Maximum Continuous Duty ² gpm	Peak Flow Rate ³ gpm	Head Loss @ Max Continuous Flow psi	
Spectrum 22	3/4"	X	0.100	0.125	30	22	30	7.25

All flow specifications assume typical, consistent system pressure conditions. Adverse pressure conditions will effect the performance of the meters.

1 The standard application is to be used for general specifications.

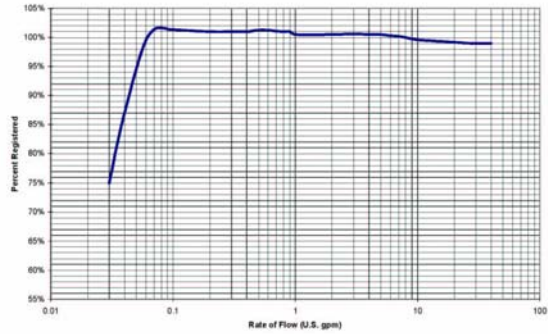
2 Max Continuous Flow: This is defined as the flow rate which can be maintained 24 hrs/day for 7 days/week

3 Peak Flow: This is defined as the flow rate which can be sustained for approximately 1 hr per day average.

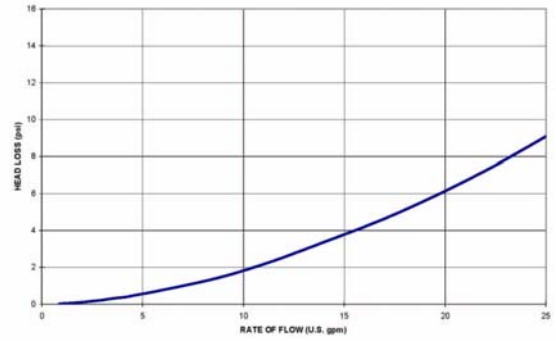
Accuracy Curves

Pressure Loss Curves

Spectrum 22 (5/8" x 3/4" or 3/4")



Specifications may be subject to change



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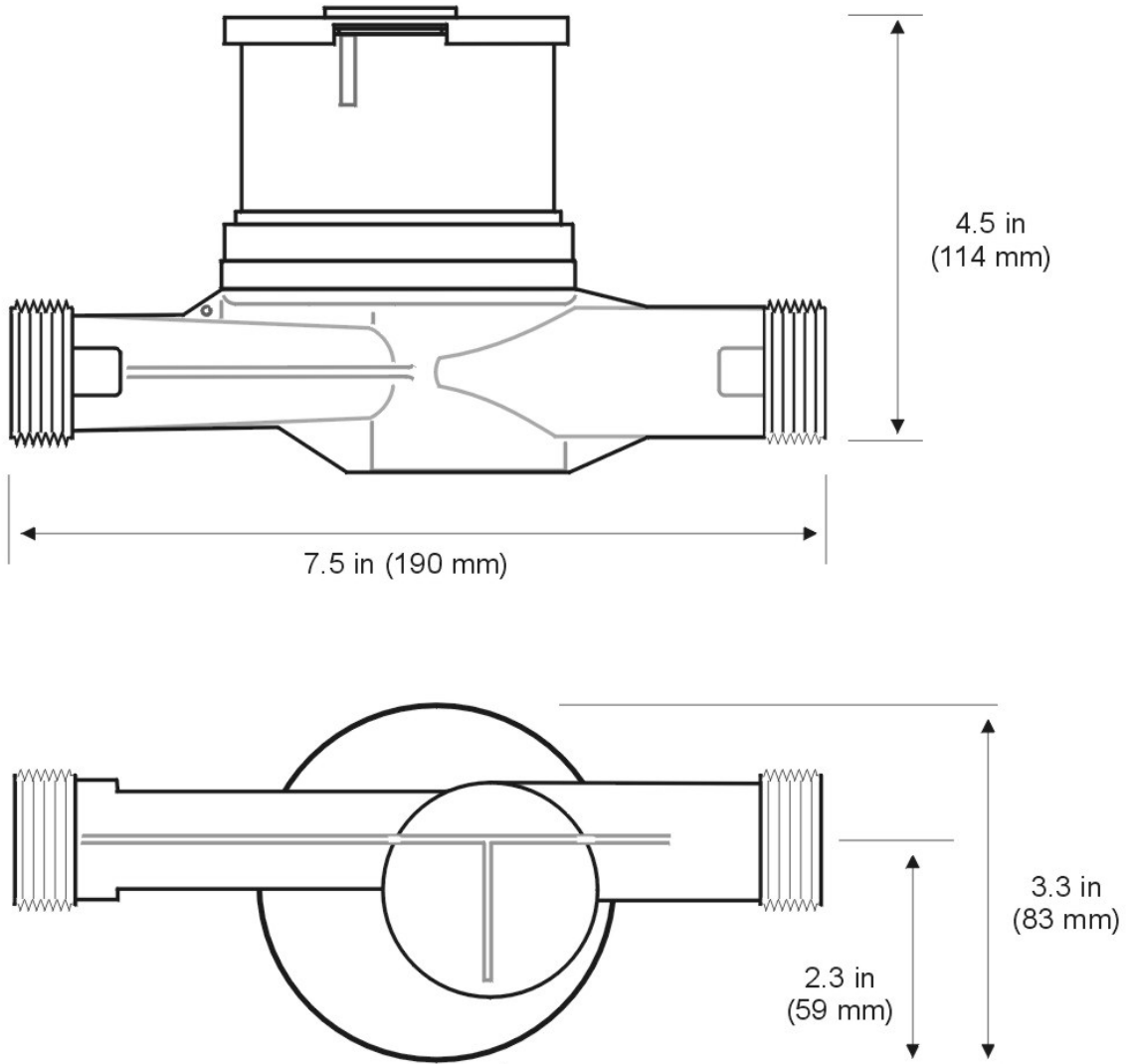
Meter Dimensions

Spectrum 22

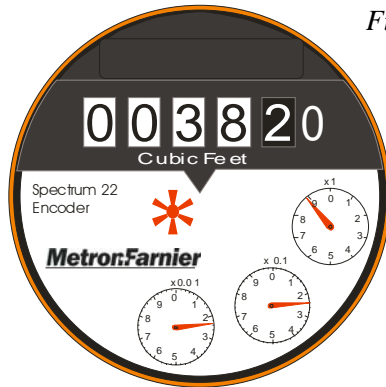
AWWA C700 Reference: 5/8" x 3/4"

Extension Available for 9" LL (AWWA 3/4" meter)

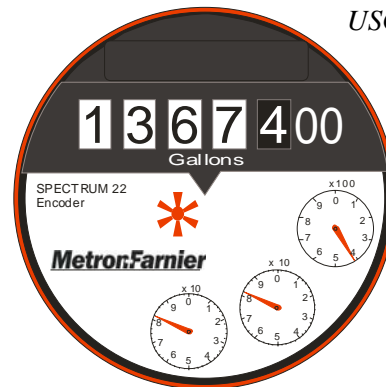
Thread Size: 3/4" NPSM



Register Information



Ft3 Register

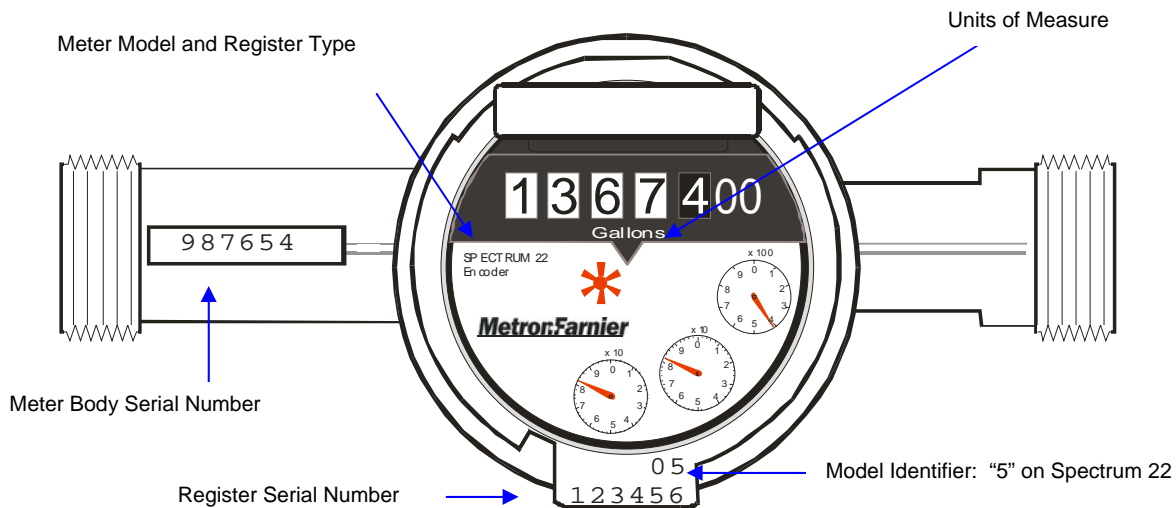


USG Register

Resolution:	0.02 Ft ³
Registration:	0.1 Ft ³
Capacity:	1M Ft ³
Sample:	3,828.22 Ft ³
Billing:	38 100's Ft ³

Resolution:	0.2 G
Registration:	1 G
Capacity:	1M G
Sample:	1,367,488 G
Billing:	1367 1000's G

ID Ring Information



Electronic Output

ID format and data format are configurable. See OER Configuration reference documentation.

- Standard ID output on Spectrum 22 is < Model ID + Register Serial Number >. i.e. 5123456
- Standard data format is 4-dial output in 1000's G or 100's Ft³.

Meter Extensions

The Spectrum 22 MP4 can be utilized in AWWA standard applications for 5/8" x 3/4" sizes. This corresponds to a 7.5" lay length with 1" threads. In addition, Metron-Farnier can provide a threaded extension to adapt the Spectrum 22 to a AWWA 3/4" size. This corresponds to a 9" lay length with 1" threads.



Meter Setting Equipment

Metron-Farnier can provide standard meter setters, vertical setters and tandem resetters in standard lay lengths for all residential sizes.



Standard Meter Setter



Tandem Resetter



Vertical Meter Setter