

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 meters. The Spectrum meters can accurately measure 8 to 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-3

Body – Low lead Brass: ASTM C875

Impeller – Polypropylene

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

Impeller Bearing – Tungsten Carbide

Impeller Pivots – 440C Stainless Steel

Dimensions – See Table 2, 3

Weight – See Table 2, 3



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 – See Table 2

Registration – See Figure 5.

100,000,000 Gallons

0.02 Gallon dial resolution

10,000,000 Cubic Feet

.002 Cubic Ft. dial resolution

Warranty – 5 Yr. – Flaws and defects

5 Yr. - Register

Standards

AWWA C712-02 (where applicable)

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-3 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

A factory installed tamper detection seal prevents unauthorized access to the meter.

The OER register is fixed to the meter body with a 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-3 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 on 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. Inspected 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.

Table 1

Flow Specifications
Commercial Spectrum Water Meters

| Model | Size | Minimum Test Flow (95%-101.5%) gpm | Normal Operating Range (98.5%-101.5%) gpm | Maximum Continuous Duty ² gpm | Max Intermittent Flow ² gpm | Peak Test Flow ⁴ gpm | Head Loss @ Max Continuous Flow psi |
|--------------|------|--|---|---|---|------------------------------------|--|
| Spectrum 50 | 1" | 0.250 | 0.500 | 50 | 70 | 100 | 7.25 |
| Spectrum 88 | 1.5" | 0.500 | 0.750 | 88 | 105 | 125 | 7.25 |
| Spectrum 88 | 2" | 0.500 | 0.750 | 88 | 105 | 125 | 7.25 |
| Spectrum 130 | 2" | 0.500 | 1.00 | 130 | 165 | 185 | 7.25 |

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

¹ Max Continuous Flow: This is defined as the flow rate which can be maintained 24 hrs/day for 7 days/week

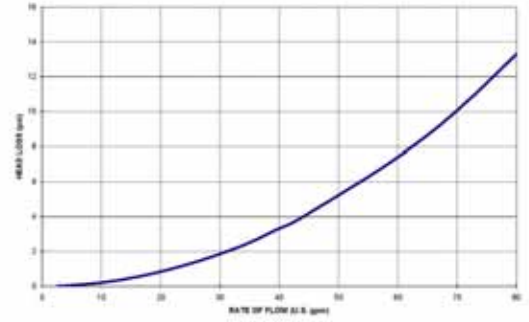
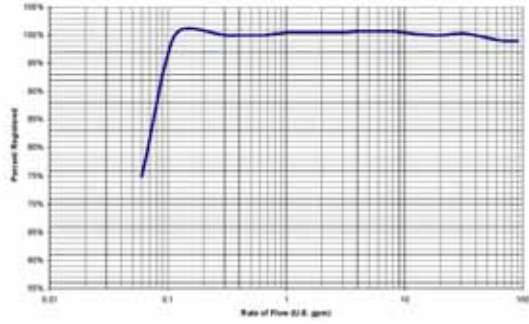
² Max Intermittent Flow: This is defined as the flow rate which can be sustained for approximately 1 hr per day average.

³ Peak Test Flow: This is defined as the absolute maximum test flow rate which can be sustained for very brief periods under controlled conditions.
A downstream pressure of >20 psi should be maintained to prevent cavitation

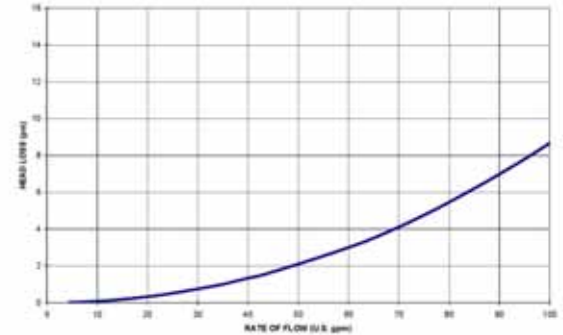
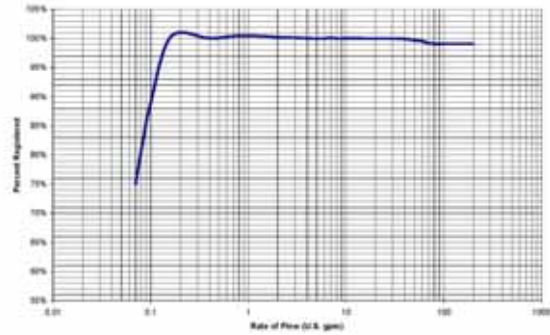
Accuracy Curves

Pressure Loss Curves

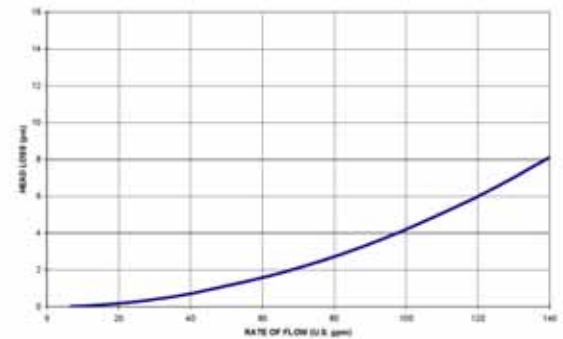
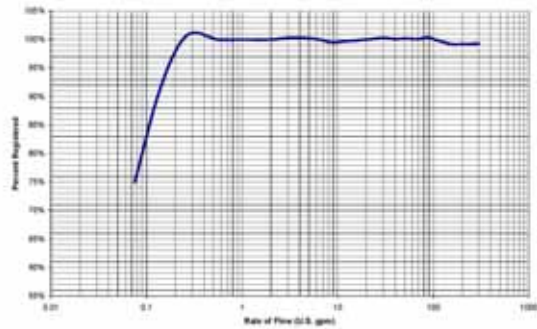
Spectrum 50 (1")



Spectrum 88 (1.5" or Low-Flow 2")

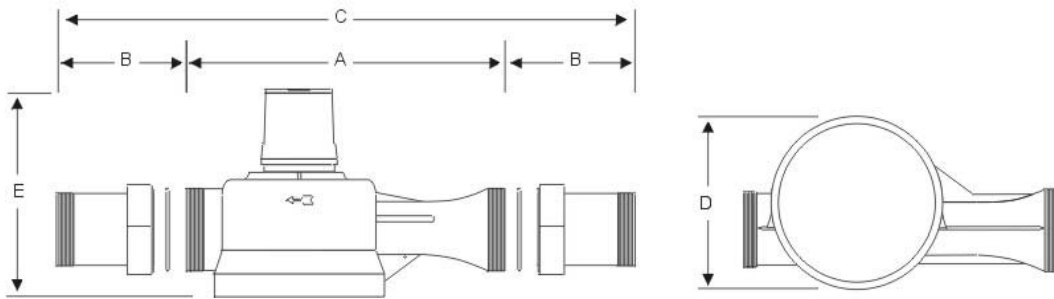


Spectrum 130 (2")



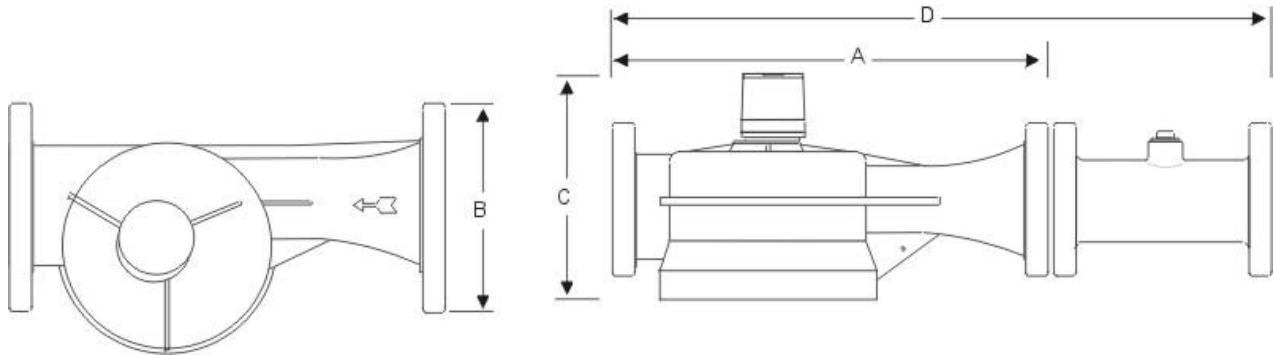
Meter Dimensions

Table 2



| Meter Model | Length A | Length B | Length C | Width D | Height E | Net Weight | Thread Size |
|------------------|------------------|-----------------|-------------------|-----------------|----------------|--------------------|--------------|
| Spectrum 50 - 1" | 6.30" (160mm) | 2.71" (69mm) | 10.75" (272mm) | 3.9" (100mm) | 6.0" (92mm) | 6.05lb (41.8kg) | 1-in NPSM |

Table 3



| Meter Type Pipe Size | Length * A | Width B | Height C | w/Spool D | w/Spool D | Flange Connections | Net Weight |
|-------------------------|-------------------|-------------------|--------------------|-------------------|----------------|----------------------------|-----------------|
| Spectrum 88 - 1.5" | 7 7/8" (200mm) | 5 3/4" (146mm) | 4 5/16" (110mm) | 13" (330mm) | N/A | 1.5" 2-bolt Oval Flange | 12lb (5.5kg) |
| Spectrum 88 - 2" | 7 7/8" (200mm) | 5 3/4" (146mm) | 4 5/16" (110mm) | N/A | 17" (432mm) | 2" 2-bolt Oval Flange | 13lb (5.9kg) |
| Spectrum 130 - 2" | 9 7/8" (251mm) | 6 7/8" (175mm) | 5" (127mm) | 15.25" (229mm) | (432mm) | 2" 2-bolt Oval Flange | 15lb (6.8kg) |

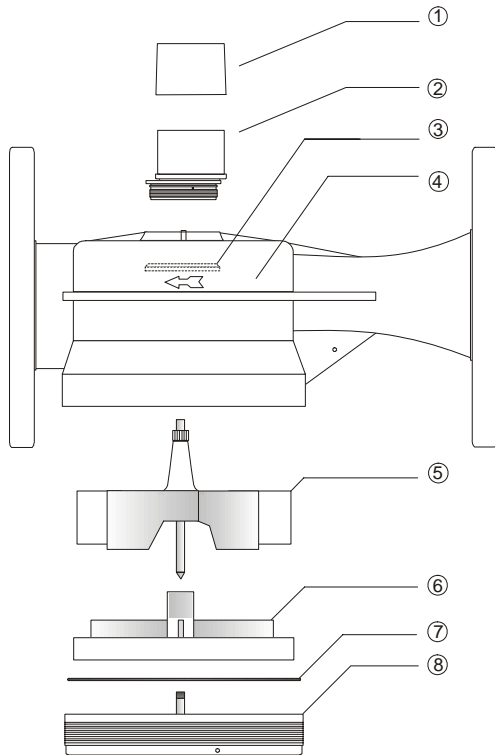
Meter Flanges

All flanges are C875 silicon brass which matches the meter body alloy. All flanges are sealed with a NSF-61 approved threadlocker and pressure tested at 200 psi. All flanges meet AWWA standards per standard C712-02.

Spool Pieces, Strainers, Setters

All 1.5” and 2” Spectrum meters come with a brass spool for standard drop-in lay lengths. 1.5” and 2” spools are cast with the identical brass alloy (C875) as the meters to prevent dissimilar metal issues. All brass spools come with a 1” test port pre-sealed with a plug and pressure-tested. Consult your Metron-Farnier sales manager for options on custom spools, threaded connections, standard and vertical setters and strainers.

Spectrum Part List



Meter Repairs & Refurbishing
 Metron-Farnier can repair and certify meters at customer request. Metron-Farnier can also setup exchange programs for refurbished meters. Consult your Sales Manager for details.

| | |
|---|------------------|
| 1 | Register Housing |
| 2 | Register |
| 3 | Register Box |
| 4 | Meter Body |
| 5 | Impeller |
| 6 | Lifting Vane |
| 7 | Rubber Gasket |
| 8 | Bottom Cap |

Register Information



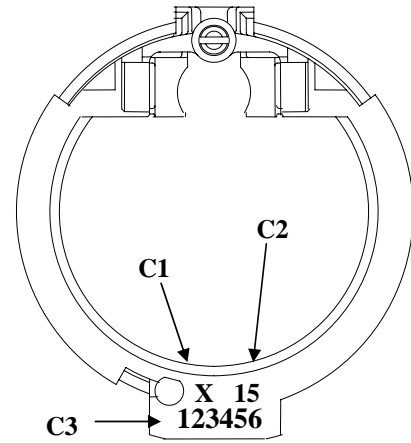
Ft3 Register

| | |
|---------------|---------------------------|
| Resolution: | 0.2 Ft ³ |
| Registration: | 1 Ft ³ |
| Capacity: | 10M Ft ³ |
| Sample: | 62,337.3 Ft ³ |
| Billing: | 623 100's Ft ³ |



USG Register

| | |
|---------------|--------------|
| Resolution: | 2 G |
| Registration: | 10 G |
| Capacity: | 100M G |
| Sample: | 623,482 G |
| Billing: | 623 1000's G |



- C1: Units (G, F, M)
- C2: Model Identifier
 15 – Spectrum 175
 17 – Spectrum 260
 19 – Spectrum 440
- C3: Register ID