# MJ/MJH-Series

## Pulse Meter Instructions


For Sales & Service Contact

geotech

2650 E. 40th Ave. • Denver, CO 80205
Phone 303-320-4764 • Fax 303-322-7242
1-800-833-7958
www.geotechenv.com



Seametrics
Precision Flow Measurement
An ONICON Brand

ISO 9001

## General Information



## Installation and Operation



## Maintenance

**MJ/MJH-Series** meters use the multi-jet principle, which has been an internationally-accepted standard for many years. This type of meter is known for its wide range, simplicity, and accuracy in low-quality water. The impeller is centered in a ring of jets, with inlet jets on one level and outlet jets on another. A gear train drives the register totalizer dials. For pulse output, one of the pointers is replaced by a magnet, which is detected by an encapsulated sensor attached to the outside of the lens. Pulse rate is determined by the dial on which the magnet is placed, and by the number of sensors (single or double).

Changing the pulse rate requires no special tools and can be done in the field.

MJE (cold water) and MJHE (hot water) meters use a solid-state, long-lasting Hall-effect sensor, which requires power. They are suited for use with Seametrics controls and metering pumps (LMI for instance) that have sensor power.

MJR (cold water) and MJHR (hot water) meters use a reed switch. They provide a dry contact closure and do not require power.

MJT (cold water) and MJHT (hot water) meters do not have a sensor, and they totalize only.

## Specifications*

| | | | | | |
|---|---|---|---|---|---|
| **Power** | | 6 mA at 12 Vdc | | | |
| **Temperature** | **Cold Water** | 105˚ F (40˚ C) max | | | |
| | **Hot Water** | 194˚ F (90˚ C) max | | | |
| **Pressure** | | 150 psi operating (10.3 Bar) | | | |
| **Materials** | **Body** | Cast broze, epoxy powder coated inside and out | | | |
| | **Internals** | Engineered thermoplastic | | | |
| | **Magnet** | Alnico | | | |
| **Accuracy** | | ±1.5% of reading | | | |
| **Pulse Output** | | **MJE/MJHE** | **MJR/MJHR** | **MJT/MJHT** | |
| | **Sensor** | Hall-effect device | Reed switch | Totalizer only | |
| | **Max Current** | 20 mA | 20 mA | n/a | |
| | **Max Voltage** | 24 Vdc | 24 Vdc or Vac | n/a | |
| **Cable Length** | | 12' (4 m) standard (2000' maximum run) | | | |
| **Flow Rates (GPM)**** | | **3/4"** | **1"** | **1 1/2"** | **2"** |
| | **Minimum** | 0.22 | 0.44 | 0.88 | 1.98 |
| | **Maximum** | 22 | 52 | 88 | 132 |

**Specifications subject to change • Please consult our website for current data (www.seametrics.com).*

*** **Caution**: Excessive flow can cause breakage. Do not exceed recommended maximums.*

### Pulse Rates

| | 3/4" | 1" | 1 1/2" | 2" *(MJN only)* |
|---|---|---|---|---|
| **Pulses per Gallon** | 20*<br>10<br>4†<br>2*<br>1 | <br><br>4†<br>2*<br>1 | <br><br>4†<br>2*<br>1 | <br><br>4†<br>2*<br>1 |
| **Gallons per Pulse** | 1<br>5*<br>10<br>50*<br>100 | 1<br>5*<br>10<br>50*<br>100 | 1<br>5*<br>10<br>50*<br>100 | 1<br>5*<br>10<br>50*<br>100 |
| **Cubic Feet per Pulse** | 1<br>5*<br>10 | 1<br>5*<br>10 | 1<br>5*<br>10 | 1<br>5*<br>10 |
| **Pulses per Cubic Meter** | 1<br>10<br>100 | 1<br>10<br>100 | 1<br>10<br>100 | 1<br>10<br>100 |
| **Liters per Pulse** | 1<br>10<br>100 | 1<br>10<br>100 | 1<br>10<br>100 | 1<br>10<br>100 |

**MJPR/MJNR dual reed switch meters only*
*†MJPR/MJNR single reed switch meters only*

### Positions

MJ/MJH-Series meters should be installed horizontally with the register up. Vertical mounting will result in some degree of under-measurement and shortened life of the bearings and may void warranty. No upstream straight pipe is required.


***Caution:*** *These water meters are not recommended for installation in uninsulated suspended ceilings where freezing is possible, or in any overhead indoor piping configuration where leakage may cause damage.*

### Couplings

Male NPT threaded couplings are included with each meter. The threads on the end of the meter are IPS straight threads one size bigger than the meter size. Though it is possible to thread a standard pipe coupling directly onto the meter for close coupling, the included couplings are much preferable because they provide a union connection for meter service. Be sure to use the included gasket between the end of the meter and the coupling.

### Connections

MJE/MJHE and MJR/MJHR sensors are supplied with a color coded output cable (see diagrams below). Optional connectors can be ordered to plug directly into a Seametrics control or LMI metering pump.

**Diagram 1: Single Sensor**

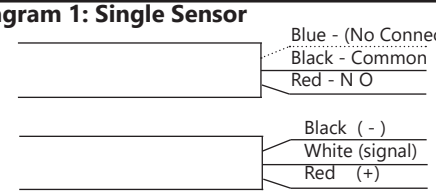
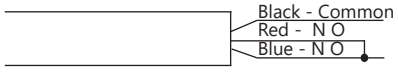



**Diagram 2: Dual Sensor**

**NOTE:** The Dual Sensor is distinguished by a red stripe on the cable at the base of the sensor.




**NOTE:** MJ(H)E not available with dual sensor

### To Distinguish Single Sensor From Dual:

**Single:** (if new from factory) blue wire is cut back on cable end.
**Dual:** A red stripe will be on cable near sensor.

**Note:** Dual sensor can be used as a single sensor also - use either the red OR the blue wire w/black. If using it as a dual sensor then connecting red and blue together will produce two pulses with every revolution of magnet.

## CHANGING PULSE RATES

### Pulse Output

Both MJE/MJHE and MJR/MJHR sensors respond to a magnet that rotates on the face of the meter under the lens. The sensor turns on and off once each time the magnet passes under it. Sensors are designed for electronic control loads, and should not be used to switch power loads or line voltages. See maximum current and voltage ratings, under Specifications.

### Moving the Magnetic Pointer

**NOTE! When removing the large meter nut, Seametrics recommends using a 24" pipe wrench. Larger or smaller pipe wrenches may damage the nut on units!!**

Remove meter top and lens, taking care not to lose the sealing ring. With fingers, lift the magnet pointer off its shaft and remove the plain pointer from the target dial. Reverse their positions and press them firmly into place. Securely seat the sealing ring and replace the lens, matching the tab on the lens to the notch on the meter to align the sensor with the magnetic pointer dial. Thread the meter top on and tighten.

***†NOTE:*** *A special magnet (available from the factory) is required to achieve a rate of 4 pulses per gallon. It should be placed on the x0.1 dial, with non-magnetic pointers on the remaining dials. Otherwise, the procedure is the same.*

### Setting Pulse Rates

The pulse rate is determined by which sensor was ordered from the factory (single reed switch, dual reed switch, or single Hall-effect) and by the dial on which the magnet pointer is located. The pointer is set at the factory, but can be changed in the field as follows.

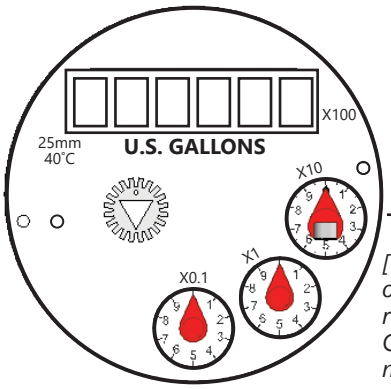
1. Find your desired pulse rate (Column 1)
2. Note the magnet pointer position (Column 2)
3. Move the magnet pointer to the appropriate dial position (see detailed instructions on next page)
4. Use the appropriate Connection Diagram (from Column 3) to wire the sensor to your remote device (using diagrams at right).

| | Col. 1 | Col. 2 | Col. 3 |
|---|---|---|---|
| **Meter Size** | **Pulse Rate** | **Magnet Pointer Dial Position** | **Connection Diagram #** |
| **3/4"** | *20 P/G | x0.01 | 2 |
| | 10 P/G | x0.01 | 1 |
| | †4 P/G | x0.1 | 1 |
| | *2 P/G | x0.1 | 2 |
| | 1 P/G | x0.1 | 1 |
| | *5 G/P | x1 | 2 |
| | 10 G/P | x1 | 1 |
| | *50 G/P | x10 | 2 |
| | 100 G/P | x10 | 1 |
| **1"** | †4 P/G | x0.1 | 1 |
| | *2 P/G | x0.1 | 2 |
| | 1P/G | x0.1 | 1 |
| | *5 G/P | x1 | 2 |
| | 10 G/P | x1 | 1 |
| | *50G.P | x10 | 2 |
| | 100 G/P | x10 | 1 |
| **1-1/2"** | †4 P/G | x0.1 | 1 |
| | *2 P/G | x0.1 | 2 |
| | 1 P/G | x0.1 | 1 |
| | *5 G/P | x1 | 2 |
| | 10 G/P | x1 | 1 |
| | *50 G/P | x10 | 2 |
| | 100 G/P | x10 | 1 |
| **2"** | †4 P/G | x0.1 | 1 |
| | *2 P/G | x0.1 | 2 |
| | 1 P/G | x0.1 | 1 |
| | *5 G/P | x1 | 2 |
| | 10 G/P | x1 | 1 |
| | *50 G/P | x10 | 2 |
| | 100 G/P | x10 | 1 |

*These pulse rates available in MJR and MJHR dual reed switch meters only.
†This pulse rate available in MJR and MJHR single reed switch meters only.

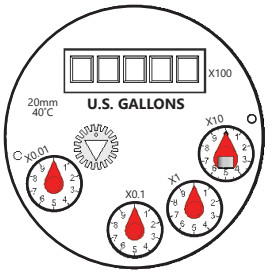
## SAMPLE SET UP

A 1" meter is shown with the magnet pointer set at the x10 dial, with a pulse rate of 100 Gallons per Pulse (that is, 10 increments on the x10 dial, or 10x10=100 Gal/Pulse).

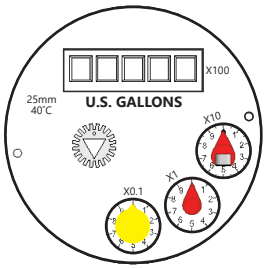



*[With the magnet pointer on the x1 dial, the pulse rate would be 10x1=10 Gal/Pulse. With the magnet pointer on the x0.1 dial, the pulse rate would be 10x.1=1 Gal/Pulse.]*

### Special Configurations



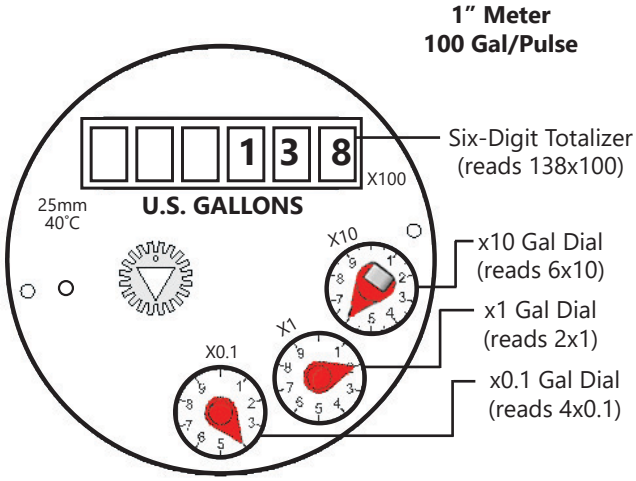

*The **3/4" meter** has a fourth dial, as shown above. The x0.01 dial is used for 20 P/G and 10 P/G rates.Note: The 3/4" meter has a 5 digit totalizer.*




*The **4 P/G rate** requires a special magnet, placed on the x0.1 dial, as shown above.*

### Reading Your Meter

The Total Flow that has passed through your meter is read by starting at the top of the register with the Six-Digit Totalizer, and then reading clockwise around the small dials. In the example below, the Six-Digit Totalizer reads 13,800 (138 x 100), and the dials read 60 (6 x 10), 2 (2 x 1), and .4 (4 x .1) respectively. The Total Flow is 13,862.4 gallons.




*(NOTE: Disregard the **color** of the numbers on the totalizer when reading your total.) The "ones" digit is significant but the fact that it is red is not.*

## MAINTANENCE

Seametrics recommends all service to be performed by an authorized distributor or the factory to maintain the integrity of the protective tamper-proof wire-and-seal.

### Inlet Strainer

Clean the strainer yearly, or as required, depending on water condition. Pull out the strainer or backflush the meter to loosen trapped particulates.

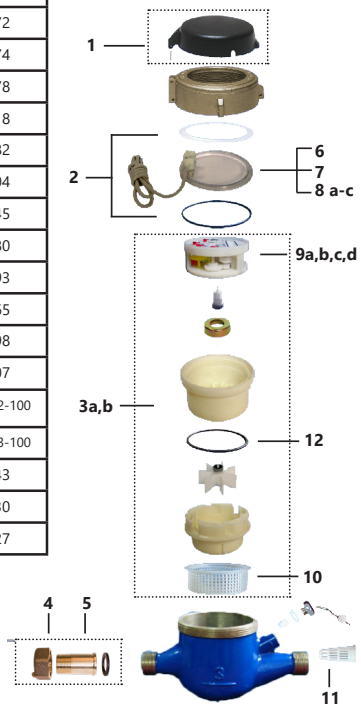
### Calibration

Meters used for billing or billing exemption may be regulated by state or local authorities. New meters are factory-tested to meet the AWWA C-708 Multi-Jet Meter accuracy specification. Some states require retesting at various intervals, typically eight years for 3/4" meters, six for 1", and four for 1-1/2" and 2". Meters used for control should be tested every 5-10 years. Testing may be done by a local mobile meter service or in a private or municipal meter shop. Changes in calibration should be made at an authorized meter shop.

### Internal Parts Replacement

All of the internal parts of an MJ-Series meter lift out as a unit, after the top has been unscrewed. The lens can then be removed and the internal assembly lifted out. If necessary, turn the meter upside down and tap one end lightly on a countertop to loosen the internals. The assembly can be separated by hand.

| COLD WATER MODELS ONLY | | | ¾" | 1" |
|---|---|---|---|---|
| 1 | | Lid and Hinge Pin Assembly | 101068 | 101069 |
| 2 | | Lens Gasket Assembly | 101071 | 101072 |
| 3 | a | Internal Assembly (gallons) | 101073 | 101074 |
| | b | Internal Assembly (cubic feet) | 101077 | 101078 |
| 4 | | Coupling Assembly (incl 2 sets) | 101017 | 101018 |
| 5 | | Coupling Gasket Assembly (incl 2) | 101081 | 101082 |
| 6 | | Lens | 101004 | 101004 |
| 7 | | Sensor Screw | 101045 | 101045 |
| 8 | a | Single Reed Switch Sensor (MJR) | 100980 | 100980 |
| | b | Double Reed Switch Sensor (MJR) | 100993 | 100993 |
| | c | Single Hall-Effect Sensor (MJE) | 101065 | 101065 |
| 9 | a | Register (gallons) | 100997 | 100998 |
| | b | Register (cubic feet) | 101006 | 101007 |
| | c | Register (cubic meters) | 103222-175 | 103222-100 |
| | d | Register (liters) | 103333-075 | 103333-100 |
| 10 | | Internal Strainer | 101016 | 101043 |
| 11 | | Tubular Strainer | 101029 | 101030 |
| 12 | | Register Gasket | 101013 | 101027 |




| HOT WATER MODELS ONLY | | | ¾" | 1" |
|---|---|---|---|---|
| 1 | | Lid and Hinge Pin Assembly | 101354 | 101355 |
| 2 | | Lens Gasket Assembly | 101332 | 101333 |
| 3 | a | Internal Assembly (gallons) | 101350 | 101351 |
| | b | Internal Assembly (cubic feet) | 101346 | 101347 |
| 4 | | Coupling Assembly (incl 2 sets) | 101017 | 101018 |
| 5 | | Coupling Gasket Assembly (incl 2) | 101081 | 101082 |
| 6 | | Lens | 101004 | 101004 |
| 7 | | Sensor Screw | 101045 | 101045 |
| 8 | a | Single Reed Switch Sensor (MJR) | 100980 | 100980 |
| | b | Double Reed Switch Sensor (MJR) | 100993 | 100993 |
| | c | Single Hall-Effect Sensor (MJE) | 101065 | 101365 |
| 9 | a | Register (gallons) | 101372 | 101373 |
| | b | Register (cubic feet) | 101372 | 101373 |
| | c | Register (cubic meters) | 103223-075 | 103223-100 |
| | d | Register (liters) | 103334-075 | 103334-100 |
| 10 | | Internal Strainer | 101379 | 101380 |
| 11 | | Tubular Strainer | 101382 | 101383 |
| 12 | | Register Gasket | 101013 | 101027 |

| COLD WATER MODELS ONLY | | | 1½" | 2" |
|---|---|---|---|---|
| 1 | | Lid and Hinge Pin Assembly | 101070 | 101070 |
| 2 | | Lens Gasket Assembly | 101085 | 101085 |
| 3 | a | Internal Assembly (gallons) | 101075 | 101076 |
| | b | Internal Assembly (cubic feet) | 101079 | 101080 |
| 4 | | Coupling Assembly (incl 2 sets) | 101019 | 101020 |
| 5 | | Coupling Gasket Assembly (incl 2) | 101083 | 101084 |
| 6 | | Lens | 101004 | 101004 |
| 7 | | Sensor Screw | 101045 | 101045 |
| 8 | a | Single Reed Switch Sensor (MJR) | 100980 | 100980 |
| | b | Double Reed Switch Sensor (MJR) | 100993 | 100993 |
| | c | Single Hall-Effect Sensor (MJE) | 101065 | 101065 |
| 9 | a | Register (gallons) | 100999 | 100999 |
| | b | Register (cubic feet) | 101008 | 101009 |
| | c | Register (cubic meters) | 103222-150 | 103222-200 |
| | d | Register (liters) | 103333-150 | 103333-200 |
| 10 | | Internal Strainer | 101044 | 101044 |
| 11 | | Tubular Strainer | 101031 | 101032 |
| 12 | | Register Gasket | 102228 | 102228 |

| HOT WATER MODELS ONLY | | | 1½" | 2" |
|---|---|---|---|---|
| 1 | | Lid and Hinge Pin Assembly | 101356 | 101356 |
| 2 | | Lens Gasket Assembly | 101334 | 101334 |
| 3 | a | Internal Assembly (gallons) | 101352 | 101353 |
| | b | Internal Assembly (cubic feet) | 101348 | 101349 |
| 4 | | Coupling Assembly (incl 2 sets) | 101019 | 101020 |
| 5 | | Coupling Gasket Assembly (incl 2) | 101083 | 101084 |
| 6 | | Lens | 101004 | 101004 |
| 7 | | Sensor Screw | 101045 | 101045 |
| 8 | a | Single Reed Switch Sensor (MJR) | 100980 | 100980 |
| | b | Double Reed Switch Sensor (MJR) | 100993 | 100993 |
| | c | Single Hall-Effect Sensor (MJE) | 101065 | 101065 |
| 9 | a | Register (gallons) | 101374 | 101375 |
| | b | Register (cubic feet) | 101370 | 101371 |
| | c | Register (cubic meters) | 103223-150 | 103223-200 |
| | d | Register (liters) | 103223-150 | 103223-200 |
| 10 | | Internal Strainer | 101381 | 101381 |
| 11 | | Tubular Strainer | 101384 | 101385 |
| 12 | | Register Gasket | 102228 | 102228 |

The limited warranty set forth below is given by Seametrics, with respect to Seametrics and INW brand products purchased in the United States of America.

Seametrics warrants that products manufactured by Seametrics, when delivered to you in new condition in their original containers and properly installed, shall be free from defects in material and workmanship. **Seametrics products are warranted against defects for a period of two (2) years from date of installation, with proof of install date. If no proof of install date can be provided, warranty period will be two (2) years from date of shipment from Seametrics, as defined on Seametrics' invoice.** Seametrics' obligation under this warranty shall be limited to replacing or repairing the part or parts, or, at Seametrics' option, the products, which prove defective in material or workmanship. The following are the terms of Seametrics' limited warranty:

a. Buyer must give Seametrics prompt notice of any defect or failure and satisfactory proof thereof.
b. Any defective part or parts must be returned to Seametrics' factory or to an authorized service center for inspection.
c. Buyer will prepay all freight charges to return any products to Seametrics' factory, or another repair facility. as designated by Seametrics.
d. Defective products, or parts thereof, which are returned to Seametrics and proved to be defective upon inspection, will be repaired to factory specifications.
e. Seametrics will deliver repaired products or replacements for defective products to the buyer (ground freight prepaid) to the destination provided in the original order.
f. Products returned to Seametrics for which Seametrics provides replacement under this warranty shall become the property of Seametrics.
g. This limited warranty covers all defects encountered in normal use of Seametrics products, and does not apply to the following cases:
    i. Loss of or damage to Seametrics product due to abuse, mishandling, or improper packaging by buyer
    ii. Failure to follow operating, maintenance, or environmental instructions prescribed in Seametrics' instruction manual
    iii. Products not used for their intended purpose
    iv. Alterations to the product, purposeful or accidental
    v. Electrical current fluctuations
    vi. Corrosion due to aggressive materials not approved for your specific product
    vii. Mishandling, or misapplication of Seametrics products
    viii. Products or parts that are typically consumed during normal operation
    ix. Use of parts or supplies (other than those sold by Seametrics) which cause damage to the products, or cause abnormally frequent service calls or service problems
h. A new warranty period shall not be established for repaired or replaced material, products, or supplied. Such items shall remain under warranty only for the remainder of the warranty period on the original materials, products, or supplies.
i. In the event that equipment is altered or repaired by the buyer without prior written approval by Seametrics, all warranties are void. Damage caused by equipment or accessories not manufactured by Seametrics may void the product's warranty.
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    iv. The user may not modify or reverse-engineer the software.

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SOME STATES DO NOT ALLOW LIMITATIONS ON THE DURATION OF AN IMPLIED WARRANTY, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. SIMILARLY, SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF CONSEQUENTIAL DAMAGE, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; HOWEVER, YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.