

# MJ-SERIES



## PULSE METER INSTRUCTIONS



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**GENERAL INFORMATION**

MJ-Series meters use the internationally-accepted multi-jet principle. A gear train drives the register totalizer dials. For pulse output, one of the pointers is replaced by a magnet arm, which is detected by an encapsulated sensor attached to the outside of the lens.

**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\***

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

**INSTALLATION**

**Position.** MJ-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. 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 diagram, page 4). Optional connectors can be ordered to plug directly into a Seametrics control or LMI metering pump.

**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.

**MAINTENANCE**

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.

## CHANGING PULSE RATES

**Setting Your Pulse Rate.** 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.

In the table below: 1) Locate your meter size (Column 1); 2) Find your desired pulse rate (Column 2); 3) Note the magnet pointer position (Column 3); 4) Move the magnet pointer to the appropriate dial position (using the detailed instructions below the table); 5) Use the appropriate Connection Diagram (from Column 4) to wire the sensor to your remote device (using diagrams on page 4).

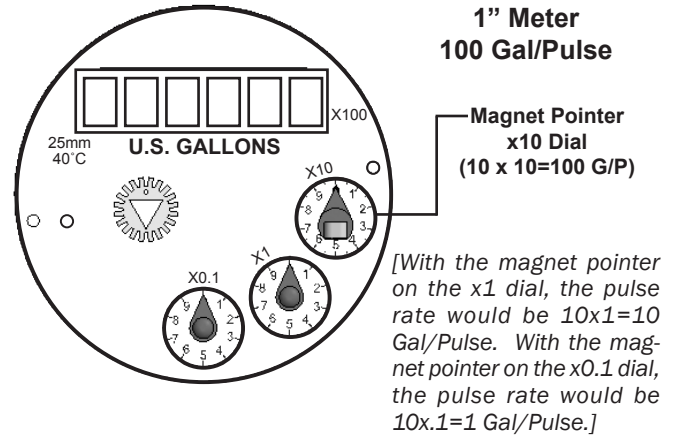
Col. 1	Col. 2	Col. 3	Col. 4
Meter Size	Pulse Rate	Magnet Pointer Dial Position	Connection Diagram #
3/4"	*20 P/G	x0.01	2
	10 P/G	x0.01	1
	†4 P/G	x0.1	1
	*2 P/G	x0.1	2
	1 P/G	x0.1	1
	*5 G/P	x1	2
	10 G/P	x1	1
	*50 G/P	x10	2
1"	†4 P/G	x0.1	1
	*2 P/G	x0.1	2
	1 P/G	x0.1	1
	*5 G/P	x1	2
	10 G/P	x1	1
	*50 G/P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

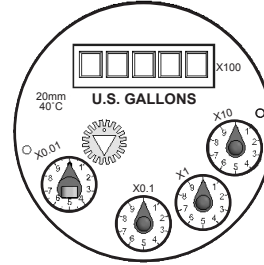
**Moving the Magnetic Pointer.** Remove meter top and lens, taking care not to lose the sealing ring. With fingers, lift the magnet pointer off its shaft and remove the plain pointer from the target dial. Reverse their positions and press them firmly into place. Securely seat the sealing ring and replace 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.

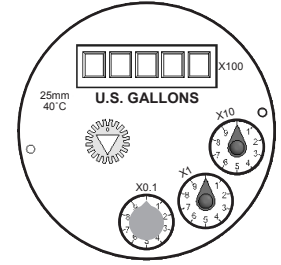
**Sample Set-Up.** A 1" meter is shown with the magnet pointer set at the x10 dial, with a pulse rate of 100 Gallons per Pulse (that is, 10 increments on the x10 dial, or  $10 \times 10 = 100$  Gal/Pulse).



### Special Configurations.

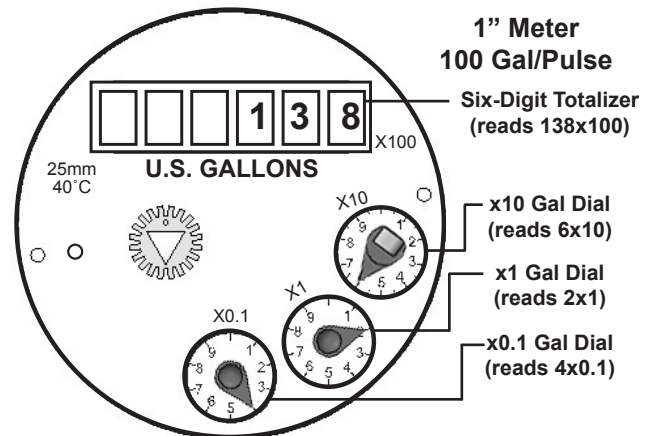


The 3/4" meter has a fourth dial, as shown above. The x0.01 dial is used for 20 P/G and 10 P/G rates. Note: The 3/4" meter has a 5 digit totalizer.



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.

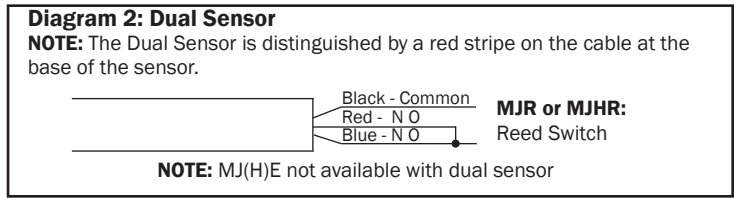
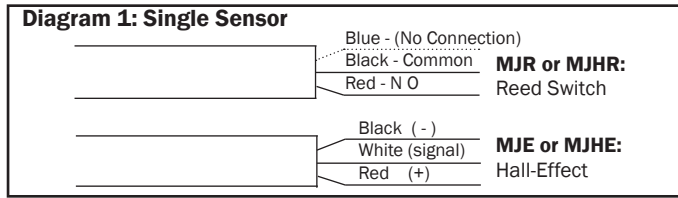


(NOTE: Disregard the color of the numbers on the totalizer when reading your total.)

The "ones" digit is significant but the fact that it is red is not significant.

# CONNECTIONS, MAINTENANCE and REPAIR

## CONNECTION DIAGRAMS



### 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.

**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 as-

**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.

sembly 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.

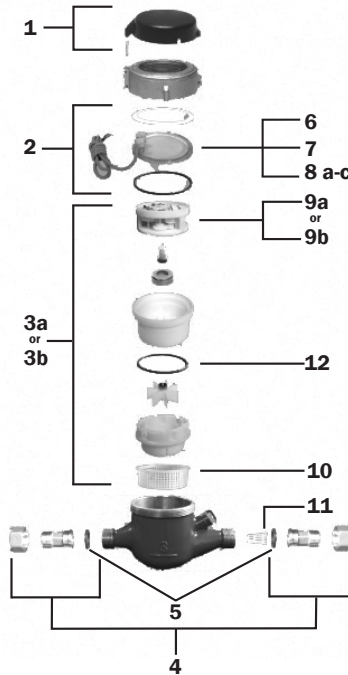
## MJ-SERIES PARTS

COLD WATER MODELS ONLY		3/4"	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
10	Internal Strainer	101016	101043
11	Tubular Strainer	101029	101030
12	Register Gasket	101013	101027

COLD WATER MODELS ONLY		1 1/2"	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	101081
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	101000
	b Register (cubic feet)	101008	101009
10	Internal Strainer	101044	101044
11	Tubular Strainer	101031	101032
12	Register Gasket	102228	102228

HOT WATER MODELS ONLY		3/4"	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)	101368	101369
10	Internal Strainer	101379	101380
11	Tubular Strainer	101382	101383
12	Register Gasket	101339	101340

HOT WATER MODELS ONLY		1 1/2"	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
10	Internal Strainer	101381	101381
11	Tubular Strainer	101384	101385
12	Register Gasket	101341	101341



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