



MJ/MJH-Series

Pulse Meter Instructions



General Information

General InformationPage 3

SpecificationsPage 3

Pulse RatesPage 4

Installation and Operation

PositionPage 4

Couplings.....Page 4

Connections.....Page 4

Pulse Output.....Page 5

Moving the Magnetic Pointer.....Page 5

Setting Pulse RatePage 5

Sample Set UpPage 6

Special Configurations.....Page 6

Reading MeterPage 6

Maintenance

Inlet StrainerPage 6

CalibrationPage 6

Internal Parts Replacement.....Back

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	Sensor	MJE/MJHE	MJR/MJHR	MJT/MJHT		
		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* 10 4† 2* 1	4† 2* 1	4† 2* 1	4† 2* 1
Gallons per Pulse	1 5* 10 50* 100	1 5* 10 50* 100	1 5* 10 50* 100	1 5* 10 50* 100
Cubic Feet per Pulse	1 5* 10	1 5* 10	1 5* 10	1 5* 10
Pulses per Cubic Meter	1 10 100	1 10 100	1 10 100	1 10 100
Liters per Pulse	1 10 100	1 10 100	1 10 100	1 10 100

*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

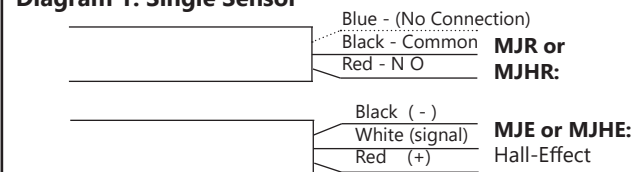


Diagram 2: Dual Sensor

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

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.

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.

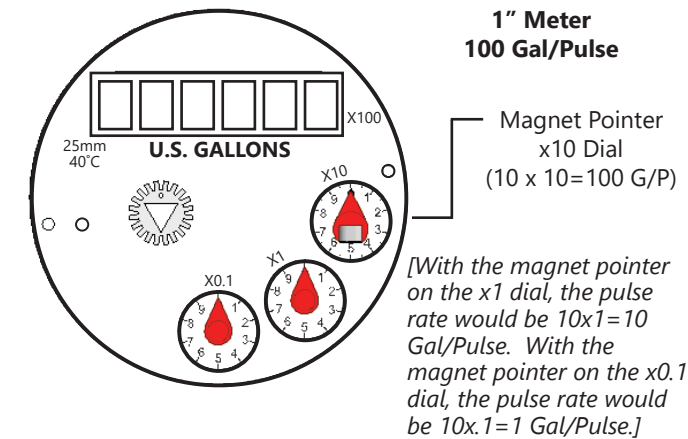
Setting Pulse Rates

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.

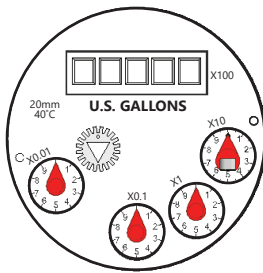
1. Find your desired pulse rate (Column 1)
2. Note the magnet pointer position (Column 2)
3. Move the magnet pointer to the appropriate dial position (see detailed instructions on next page)
4. Use the appropriate Connection Diagram (from Column 3) to wire the sensor to your remote device (using diagrams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

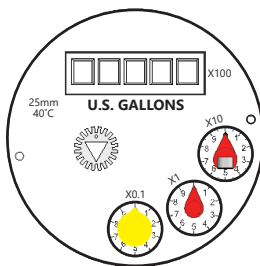
A 1" meter is shown with the magnet pointer set at the x10 dial, with a pulse rate of 100 Gallons per Pulse (that is, 10 increments on the x10 dial, or $10 \times 10 = 100$ Gal/Pulse).



Special Configurations



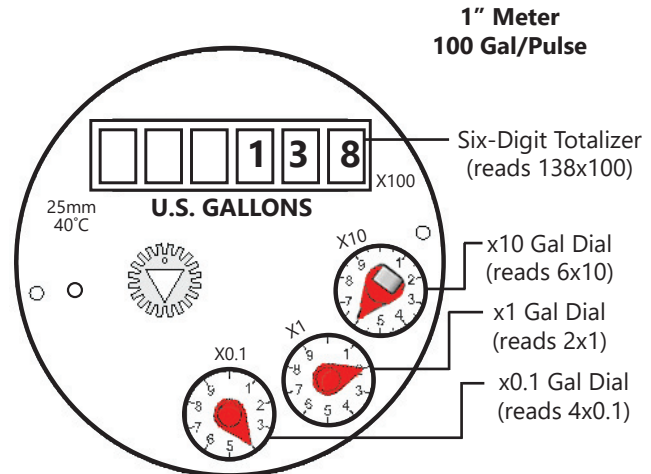
The **3/4" meter** has a fourth dial, as shown above. The x0.01 dial is used for 20 P/G and 10 P/G rates. Note: The 3/4" meter has a 5 digit totalizer.



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 (138×100), and the dials read 60 (6×10), 2 (2×1), and .4 ($4 \times .1$) 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.

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.

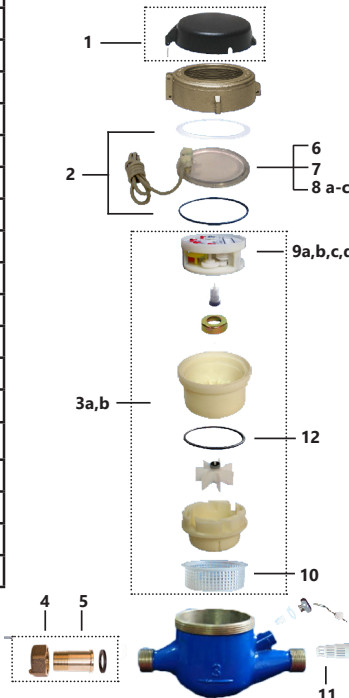
MAINTENANCE

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

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	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	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		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	101339	101340

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	101341	101341

