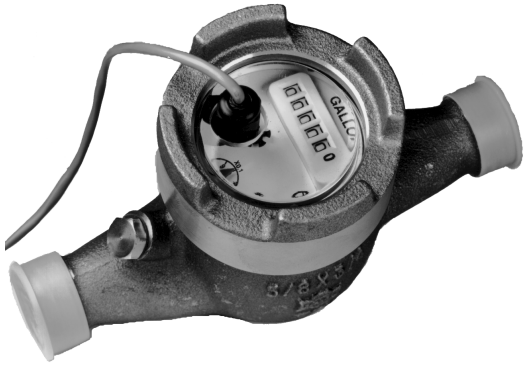
	3/4	1	1-1/2"	2"
• Maximum Flow — GPM	20	50	100	130
• Minimum Flow — GPM	.25	.75	1.5	2.0

- Maximum Operating Pressure — 150 psi
- Maximum Operating Temperature — 105°F (40°C)
- Also Available in Hot Water Applications
- Wide Variety of Pulse Rates



"M" Series Meter
¾", 1", 1½", 2"

MT — Multi-Jet — Totalizing Meter
ME — Multi-Jet — Hall Effect Sensor
Solid State Sensor for long life and highest reliability. This sensor requires a power source provided by metering pumps or electronic controls.
MR — Multi-Jet — Reed Switch
Uses Reed Switch to provide a dry contact closure to metering pumps and controls. Does not require external power source.
C or H — All HAYS "M" Series meters are available in (C) Cold water 105° F (40° C) and (H) Hot water 250° F (120° C).

SPECIAL FEATURES

Low cost accuracy
When accuracy is important but cost is a concern the HAYS "M" Series Flowmeter offers great value you can depend upon. With accuracy that is 1½% of reading above transition flow.

Low maintenance
High quality components insures performance for many years. The impeller and register are contained in a cartridge which can be serviced without taking the meter from the line. Maintenance is easier with less down time.

Wide flow range
HAYS "M" Series Flowmeter offers flow rates from .25 GPM to 130 GPM. This wide range gives flexibility to tailor the "M" Series Flowmeter to the task.

Gears lubricated for longevity
Water lubricated gears and internals provide long life and dependable service.

Sand and debris pass easily
Measuring chamber designed for superior ability to pass sand and debris.

TYPICAL APPLICATIONS

- **Cooling Tower Treatment**
- **Boiler Water Treatment**
- **Proportional Feed**
- **Remote Totalizing**
- **Metering Pump Pacing**
- **Water Conservation**
- **Automatic Regeneration**

HOW TO ORDER

Specify: model, size, temperature and pulse rate

Model

MT — Multi-Jet — Totalizing Only
ME — Multi-Jet — Hall Effect Sensor
MR — Multi-Jet — Reed Switch Sensor

Temperature

C — Cold Water to 105° F (40° C)
H — Hot Water to 250° F (120° C)

Pulse Rates

3/4"		1"		1 1/2"		2"	
Gallons per Pulse	Pulses per Gallon	Gallons per Pulse	Pulses per Gallon	Gallons per Pulse	Pulses per Gallon	Gallons per Pulse	Pulses per Gallon
40	0.025	40	0.025	10	0.10	13	0.077
35	0.029	35	0.029	13	0.077	10	0.10
18	0.056	18	0.056	7	0.143	7	0.143
33	0.03	33	0.03	5	0.20	5	0.20
25	0.04	25	0.04	4	0.25	4	0.25
20	0.05	20	0.05	3.30	0.30	3.30	0.30
10	0.10	10	0.10	2.50	0.40	2.50	0.40
8	0.125	8	0.125	2	0.50	2	0.50
5	0.20	5	0.20	1	1	1	1
4	0.25	4	0.25	0.80	1.25	0.80	1.25
3.30	0.30	3.30	0.30	0.50	2	0.50	2
2.50	0.40	2.50	0.40	0.40	2.50	0.40	2.50
2	0.50	2	0.50	0.33	3	0.33	3
1	1	1	1	0.25	4	0.25	4
0.80	1.25	0.80	1.25	0.20	5	0.20	5
0.50	2	0.50	2	0.10	10	0.10	10
0.40	2.50	0.40	2.50	0.08	12.50	0.08	12.50
0.33	3	0.33	3	0.05	20	0.05	20
0.25	4	0.25	4	0.04	25	0.04	25
0.20	5	0.20	5	0.033	30	0.033	30
0.10	10	0.10	10	0.025	40	0.025	40
0.08	12.50	0.08	12.50	0.02	50	0.02	50
0.05	20	0.05	20	0.01	100	0.01	100
0.04	25	0.04	25				
0.033	30	0.033	30				
0.025	40	0.025	40				
0.02	50	0.02	50				
0.01	100	0.01	100				

Example: ¾" Multi-Jet with Hall-Effect Sensor in a cold water application with a pulse rate of 10 pulses/gallon.

Order: ME — C — ¾"-10 P/G

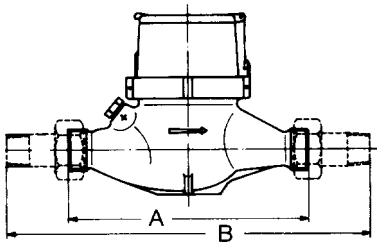
SPECIFICATIONS

Materials

Body: Bronze
Rotor and Gear Train: Thermoplastic
Magnet: Ceramic Permanent
Temperature:
Cold Water 105° F (40° C)
Hot Water 250° F (120° C)
Maximum Operating Pressure: 150 psi
Accuracy: ± 1 1/2% of Reading

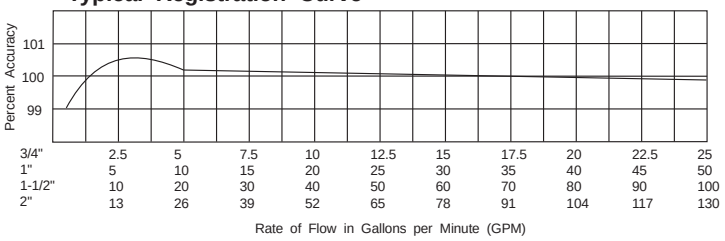
Sensor:
ME — Solid State — Hall Effect - 6 - 24 VDC. 20 mA max. current sinking output
MR — Reed Switch — Dry Contact Closure - 100 mA at 24 volts
Cable Length: 12 feet (std.) 2,000 ft (max.)

TECHNICAL DATA

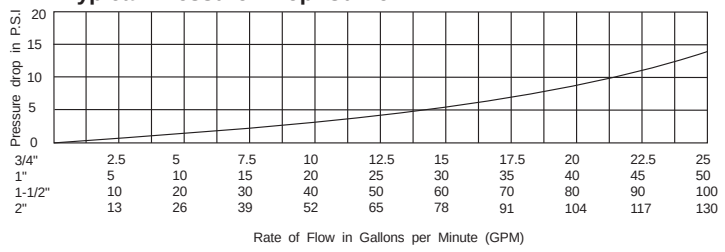


Dimensions		3/4"	1"	1-1/2"	2"
A	**Meter** -Straight Male Iron Pipe Threads	7½"	10¼"	12⅝"	10⅝"
B	**With Couplings** (MNPT)	12⅝"	16⅛"	18½"	16⅞"
Thread Size		**3/4"**	**1"**	**1-1/2"**	**2"**
A	**Meter** - Straight Male Iron Pipe Threads	1"	1¼"	2"	2½"
B	**With Couplings** (MNPT)	¾"	1"	1½"	2"

Typical Registration Curve

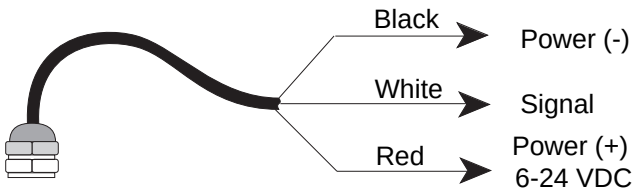


Typical Pressure Drop Curve

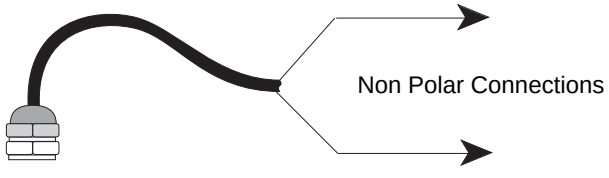


Electrical Connections:

ME Sensor Connection has three conductors



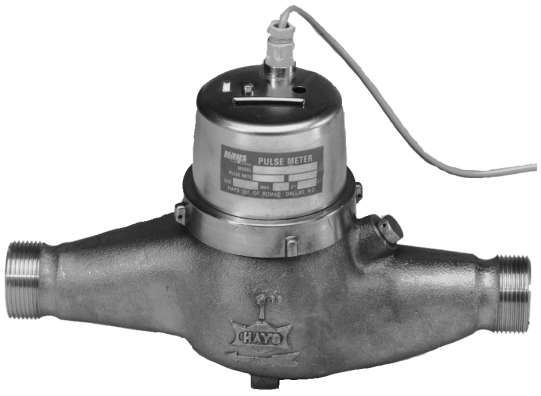
MR Sensor Connection has two conductors



NOTES

- Dry Dial Register
- For Hot Water use to 250° F (120° C)
- For Horizontal Installation
- Operating Pressure — 150 psi

	¾"	1"	1½"	2"
Maximum Flow - GPM	22	52	88	132
Minimum Flow - GPM	2	3.8	7	8.6



MRH Series
Sizes ¾", 1", 1½", 2"

MTH — Multi-Jet — Totalizing Only Hot Water

MRH — Multi-Jet — Reed Switch Sensor Hot Water
Uses Reed Switch to provide a dry contact closure to metering pumps and controls. Does not require external power source.

SPECIAL FEATURES

Low Cost Accuracy
When accuracy is important but cost is a concern the HAYS "M" Series Flowmeter offers great value and accuracy you can depend upon.

Low Maintenance
High quality components insure performance for many years. Hermetically sealed register is exchangeable under pressure conditions. Maintenance is easier with less down time.

Wide Flow Range
HAYS "M" Series Flowmeter offers flow rates from .25 GPM to 130 GPM. This wide range gives flexibility to tailor the "M" Series Flowmeter to the task.

Sand and Debris Pass Easily
Measuring chamber designed for superior ability to pass sand and debris.

TYPICAL APPLICATIONS

- **Boiler Water Treatment**
- **Proportional Feed**
- **Remote Totalizing**

HOW TO ORDER

Specify: model, pulse rate and size

Pulse Rates

¾", 1", 1½", & 2"	
Gallons per Pulse	Pulses per Gallon
200	0.005
100	0.010
50	0.020
40	0.025
30	0.033
25	0.040
20	0.050
12.50	0.080
10	0.100
5	0.200
4	0.250
3	0.330
2.50	0.400
2	0.500
1.25	0.800
1	1.000
0.50	2.000
0.40	2.500
0.30	3.300
0.25	4.000

Model

MTH — Multi-Jet — Totalizing Hot Water
MRH — Multi-Jet — Reed Switch Hot Water

Temperature

H — Hot Water to 250° F (120° C)

Example: Hot Water Multi-Jet Meter ¾" with a pulse rate of 2 gallons per pulse.

Order: MRH — ¾" —— 2 G/P

SPECIFICATIONS

Materials

Body: Bronze

Rotor and Gear Train: Thermoplastic, High Temperature

Magnet: Ceramic Permanent

Temperature:

Hot Water 250° F (120° C)

Maximum Operating Pressure: 150 psi

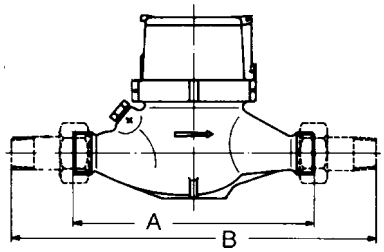
Accuracy: ± 1 ½% of Reading

Sensor:

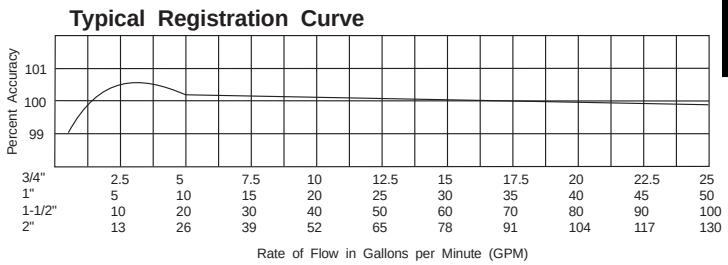
MRH — Reed Switch — Dry Contact Closure - 100 mA at 24 volts

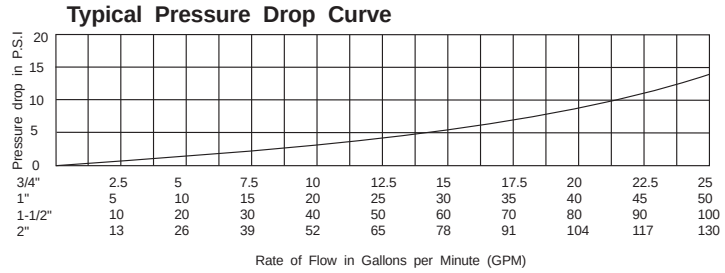
Cable Length: 6 feet (std.) 2,000 ft (max.). 24 awg unshield cable

TECHNICAL DATA



Dimensions		3/4"	1"	1-1/2"	2"
A	**Meter** -Straight Male Iron Pipe Threads	7½"	10¼"	12⅝"	10⅝"
B	**With Couplings** (MNPT)	12⅝"	16⅛"	18½"	16⅞"
Thread Size		**3/4"**	**1"**	**1-1/2"**	**2"**
A	**Meter** - Straight Male Iron Pipe Threads	1"	1¼"	2"	2½"
B	**With Couplings** (MNPT)	¾"	1"	1½"	2"

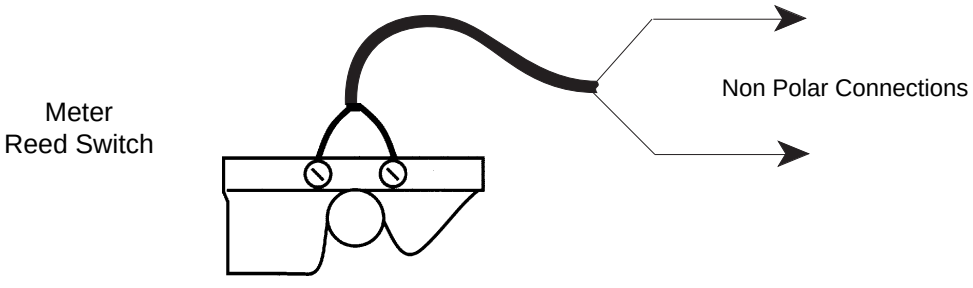




Electrical Connections:

HAYS Hot Water Pulse Meters are supplied with a six foot cable attached to the sensor specified.

MR Sensor Connection has two conductors



INSTALLATION

CAUTION! M SERIES meters are intended for use with water and non-hazardous water based fluids only.

Position. M Series meters should be installed in a horizontal position with register on top. The meter will operate in a vertical position, but will tend to indicate less than actual flow, and bearing life will be shortened.

Couplings. Most M Series meters are installed with meter couplings, and should be ordered with the meter. The meter thread and pipe size are the same. However, the meter couplings are required to install the meter and will be one size larger than the meter thread or pipe size. For example, the thread on a 3/4" meter is 1" IPS. Standard pipe couplings are sometimes threaded onto the meter, but this is not recommended, since the meter thread is for mechanical connection only, and sealing is done by the gasket in the meter coupling. (*Note: when installing meter couplings, check to be sure that the gasket is in place between the coupling and the meter.*) The advantage of meter couplings is that they act as unions for the easy removal of the meter from the line. Meter couplings provide standard male NPT threads the same nominal size as the meter for easy connection to the system. The "Dimensions" table gives overall lengths.

Inlet Disturbance. Multi-jet meters are less sensitive to turbulence than some other types of flowmeters, but five diameters of upstream straight pipe are recommended. All M Series meters have built-in inlet strainers. In installations with a high degree of suspended solids, an in-line strainer upstream of the meter is a worthwhile precaution.

Air Bleed. When the meter is first installed, trapped air should be removed if present in the meter. To do this, loosen meter couplings slightly and rotate the meter to an inverted position. Allow water to flow through the meter, then rotate it back to an upright position and retighten.

Electrical Connections. ME and MR meters are supplied standard with a twelve foot cable attached to the sensor. The MR cable has two conductors and the ME cable has three (see the "Electrical Connections" diagram for correct connections). ME meters are supplied standard with a connector which plugs directly into a specified metering pump or a HAYS control. For an additional charge, MR meters can also be ordered with connectors.

Pulse Contact. Both ME and MR meter sensors respond to a magnet which is turning on the face of the meter under the lens. The sensors give one output "pulse" (on/off) each time a magnet pole passes. The magnets have one, two or four poles. The white dots on the magnet indicate the number of poles. The sensors are designed for electronic control loads. They should not be used to switch power loads such as motors or lights, and they should not be connected to 110 VAC (see "Specifications" for maximum load ratings).

Inlet Strainer Cleaning. Do this yearly, or as required. Remove the meter and gently backflush it to loosen particulates trapped by the strainer.

TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	TO CHECK	TO REPAIR
No pulse signal	Meter not operational	Foreign matter restricting meter movement	Remove obstruction
	Incorrect wiring connections	ME Series meters (check polarity) black: -12VDC, white: input signal, red: +12 VDC MR Series meters (non polar connection) -12 VDC, input signal	Make proper connections
	Non-functional sensor	ME Series meters - check for +12 VDC MR Series meters - check continuity	Contact HAYS
Meter runs in reverse	Meter improperly installed. Flow in wrong direction	Be certain arrow on meter body is in direction of flow	Install meter in proper direction
Inaccurate metering	Not enough straight pipe between meter and flow disturbance	Check distance of straight upstream piping. Should be a minimum of 5 pipe diameters	Re-install at proper distance
Water visible	This is normal (it is a wet dial meter)		
Air bubble	Air trapped during installation		Invert meter. Allow water to flow through meter. Rotate meter to original position. Resume operation