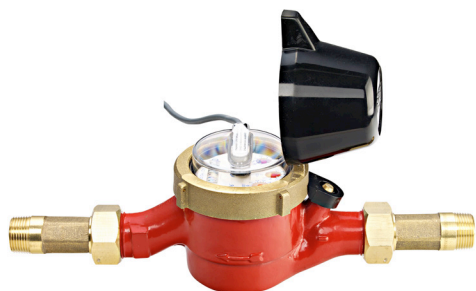


WATER METERS

'M' SERIES WATER METERS

INSTALLATION, OPERATION AND MAINTENANCE GUIDE



METAL 'M' SERIES
WATER METER



PLASTIC 'M' SERIES
WATER METER

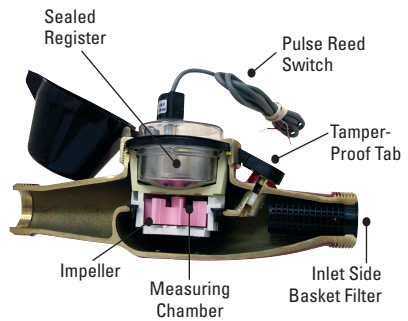
INTRODUCTION

'M' SERIES WATER METERS INDUSTRY'S SMALLEST WATER METERS

Netafim USA's 'M' Series Water Meters are used as sub-meters for residential or commercial applications and the industry's smallest multi-jet water meter. The multi-jet principle assures an equally distributed load on the impeller minimizing wear and maintaining accuracy. These meters offer the best cost and performance, long-life flow measurement instruments. Wide clearances in the measuring chamber and negligible area of contact between static and moving parts are the main reasons for the high reliability of this design even in hard water.

FEATURES:

- Only one moving part - the impeller - in contact with the water for minimum wear and utmost reliability
- Magnetically driven sealed registers with stainless steel/composite encapsulated and guaranteed against fogging due to moisture
- Very accurate over a wide range of flows for flexible and efficient water management



SPECIFICATIONS

AVAILABLE SIZES	3/4" AND 1"
MAXIMUM WORKING PRESSURE	140 PSI
MAXIMUM LIQUID TEMPERATURE	UP TO 122° F
BODY MATERIAL - METAL	CORROSION-PROOF COPPER ALLOY
BODY MATERIAL - PLASTIC	COMPOSITE
CONNECTIONS	MALE PIPE THREAD

DIMENSIONS AND WEIGHT

SIZE/BODY	LENGTH	WIDTH	HEIGHT	WEIGHT
3/4" PLASTIC	11 1/4"	3 3/4"	4 1/4"	1.3 lbs.
3/4" METAL	11 1/4"	3 3/4"	4 1/4"	5.0 lbs.
1" PLASTIC	14 3/4"	4 1/4"	4 1/4"	2.4 lbs.
1" METAL	14 3/4"	4 1/4"	4 1/4"	7.2 lbs.

PERFORMANCE DATA

SIZE	LOWEST FLOW WITHIN ± 5% ACCURACY	LOWEST FLOW WITHIN ± 2% ACCURACY	NOMINAL FLOW WITHIN ± 2% ACCURACY	MAXIMUM FLOW WITHIN ± 2% ACCURACY
3/4"	0.2 GPM	0.9 GPM	11 GPM	14 GPM
1"	0.3 GPM	1.2 GPM	15.4 GPM	20 GPM

REGISTERS

REED SWITCH REGISTER

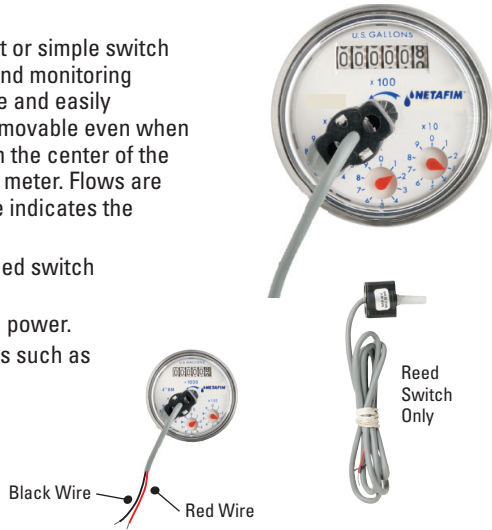
The Reed Switch Register is a dry contact or simple switch closure for communicating with control and monitoring equipment. Registers are interchangeable and easily replaced with common tools. They are removable even when the meter is operating. A leak indicator in the center of the dial registers the lowest flow through the meter. Flows are totalled in U.S. Gallons and each dial face indicates the multiplication factor.

- Magnetic coupling activates the reed switch creating a pulsed output.
- Dry contact uses very little electric power.
- Calculates volume related functions such as data recorders or simple counters.

Maximum contact current is 50mA and maximum contact voltage is 48VDC.

Red Wire = Positive

Black Wire = Negative



NOTE: Always refer to the controller manufacturer's instructions for proper installation and connection requirements.

PHOTO DIODE REGISTER

The Photo Diode Register has a photo coupler sensor that provides pulse output for communicating with control and monitoring equipment. Registers are interchangeable and easily replaced with common tools. They are removable even when the meter is operating. Flows are totalled in U.S. Gallons and each dial face indicates the multiplication factor.

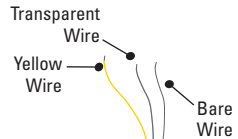
- A sensor combines an IR light source and a light sensitive diode in one package. Signals are created when the light beam created by the IR light is interrupted by a rotating element.
- Requires a constant supply of DC power.

Minimum contact current is 15mA to a maximum of 25mA DC through a resistor and maximum voltage is 28VDC.

Yellow Wire = Positive (20-30mA through a resistor)

Transparent Wire = Output (open collector, max. load 2mA)

Bare Wire = Ground



RECOMMENDED RESISTOR VALUES

VOLTAGE >	5	6	9	12	24
RESISTOR VALUE - Ω	180	220	330	470	1,000
RESISTOR VALUE - W	0.25	0.25	0.25	0.5	1.0

Note: Correct polarity of the leads should be checked carefully to prevent damage of the sensor. Register will not function properly if the register lid is not closed during operation.

REGISTERS

ER (ELECTRONIC) REGISTER

Combines standard digital register features with dry pulse output capabilities. Clearly displays the rate of flow and volume readings in Gallons or Acre Feet. Mounted inside an IP68 stainless steel glass encapsulated cap. Multi-line digital LCD readout displays 9 digits for Total Volume in U.S. Gallons (U.S.G.) or Acre Feet and 4 digits for Rate of Flow in Gallons per Minute (GPM). It's programmable to a wide variety of pipe sizes. Register is interchangeable with common tools.

Minimum voltage is 3.6 VDC. Minimum contact current is 200mA to a maximum of contact voltage of 40VDC.

Maximum distance between meter and control board is 65'.

Yellow Wire = Positive (20-30mA through a resistor)

Transparent Wire = Output (open collector, max. load 2mA)

Bare Wire = Ground



ER Register with Pulse Output Connection

NOTE: Always refer to the controller manufacturer's instructions for proper installation and connection requirements.

READING A REGISTER

READING A REGISTER - STANDARD REED SWITCH AND PHOTO DIODE

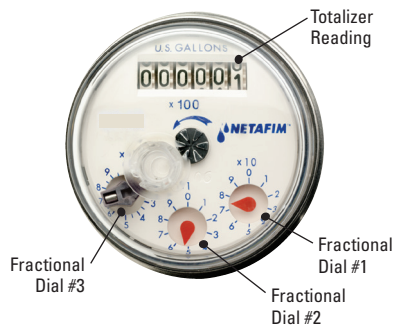
The Total Flow for a Water Meter register is calculated by adding the readings from the Totalizer and the three fractional dials. The three fractional dials measure quantities smaller than the totalizer reading and are continuously turning while calculating the flow.

TOTALIZER READING: Rotates sequentially for each 100 U.S.G. (U.S. Gallons) calculated. Number displayed is multiplied by 100 to reach total U.S.G.

FRACTIONAL DIAL # 1: Each number (1-9) on the dial is multiplied by 10 to reach U.S.G. One complete revolution of this dial = 10 U.S.G.

FRACTIONAL DIAL # 2: Each number (1-9) on the dial is multiplied by 1 to reach U.S.G. One complete revolution of this dial = 1 U.S.G.

FRACTIONAL DIAL # 3: Each number (1-9) on the dial is multiplied by 0.1 to reach U.S.G. One complete revolution of this dial = 0.1 U.S.G.



READING A REGISTER

READING A REGISTER - ER (ELECTRONIC)

Multi-line LCD digital readout displays 9 digits for Total Volume in U.S. Gallons (U.S.G.) or Acre Feet and 4 digits for Rate of Flow in Gallons per Minute (GPM). It's programmable to display a variety of volume and flow units for multiple pipe sizes.

CALCULATING RATE OF FLOW: The bottom row of numbers, four (4) in total, display the current flow rate. Directly to the right of this number is the unit of measurement for the displayed flow rate.



NOTE: If the flow rate is negative (-), the register is reading reverse flow.

CALCULATING TOTAL VOLUME: The top row of numbers, nine (9) in total, display the total volume of water that has passed through the meter. Directly to the right of this number is the unit of measurement for the displayed total volume.



NOTE: If the icon to the left of the totalizer number is positive (+), the register is reading the total amount of water in a forward flow direction. If the icon is negative (-), the register is reading the total amount of water in a reverse flow direction.

INSTALLATION

INSTALLATION REQUIREMENTS

1. Correct direction of flow is indicated on the water meter body (see Figure 1).
2. Dial face must be horizontal and facing upwards (see Figure 2).
3. Register lid must be in the closed position during normal operation (see Figure 3).
4. There are no straight pipe installation requirements. If possible 5" of straight pipe upstream (before the meter) and 2" of straight pipe downstream (after the meter) is recommended to achieve the best performance and accuracy.
5. Prior to water meter installation, the pipeline should be thoroughly flushed.
6. The water meter must be installed so that the pipe will be full of water at all times during metering.
7. Installation of a Continuous Acting Air Vent before the water meter is highly recommended to eliminate air and ensure accurate flow readings (see Figure 4). For additional details on air vent options and installation requirements, refer to the Netafim USA Landscape & Turf Catalog.

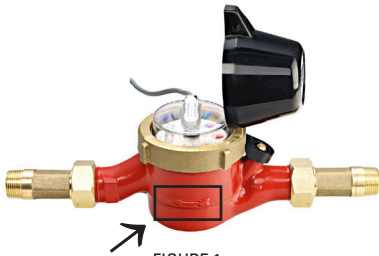


FIGURE 1
Direction of flow
indicated on body



FIGURE 2
Dial face upwards



FIGURE 3
Register lid closed

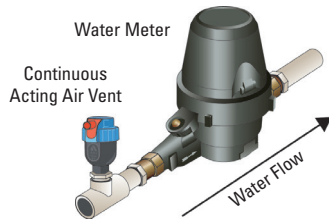


FIGURE 4
Air vent installation

MAINTENANCE

MAINTENANCE REQUIREMENTS

1. Inlet side basket filter should be removed and cleaned every 90 days or as needed based on the water quality at the site (see Figure 5).
2. Inlet side basket filter must remain in place during normal operation in order to avoid debris entering and clogging the metering chamber.
3. Teflon tape should be used on pipe fittings and connections as needed to prevent leaks.

WARNING:

Units must not be subjected to system 'blow out' using compressed air. Subjecting the water meter to this procedure will result in product failure and the resulting damage is not covered under warranty. It is recommended that the water meter be installed in systems or portions of systems that will gravity drain for winterization only.

If the unit is installed in a system which will be winterized with compressed air, please do one of the following:

- Install manual ball valves on each side of the water meter to isolate the water meter from the system blow out procedure. Close the manual ball valve on one side of the water meter, perform the blow out procedure and then open the manual ball valve. Repeat process on the other side.
- Remove the water meter before the blow out procedure and replace it with a section of PVC/Polyethylene tubing. When the blow out procedure is complete, reinstall the water meter.

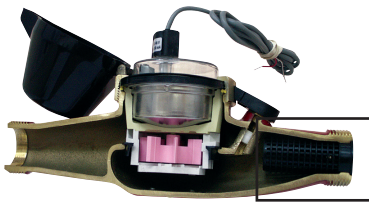
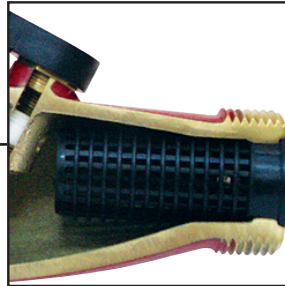


FIGURE 5
Cleaning Inlet Side
Basket Filter



Inlet Side
Basket Filter

'M' SERIES WATER METER WARRANTY

Netafim 'M' Series Water Meters are individually tested, calibrated and inspected to ensure they meet the highest quality standards and the testing documents are included with each meter. They also have the industry's longest warranty.

WARRANTY

METERING COMPONENTS (REGISTER & METERING ASSEMBLY)	3 YEARS
METER BODY	5 YEARS



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