

City of Carmel Utilities

3450 W. 131st. Street
Carmel, In. 46074

317-733-2855
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INSTALLATION INSTRUCTIONS 3 - 4 - 6 AND 8 INCH METER

ALL 3, 4, 6, 8 INCH METERS OPERATE MORE ACCURATELY AND RELIABLE IF INSTALLED PROPERLY. WE ARE CURRENTLY USING THE NEPTUNE MACH 10 900i ULTRASONIC AND THE MASTER METER OCTAVE ULTRASONIC METER FOR ALL INSIDE AND VAULT APPLACATIONS.

ALL METERS SHOULD BE PLUMBED AND INSTALLED IN AN AREA THE IS ACCESIBLE AT ALL TIMES AND MUST HAVE APPROVED BACKFLOW DEVISE DIRECTLY BEHIND METER AND TESTED WITHIN 30 DAYS.

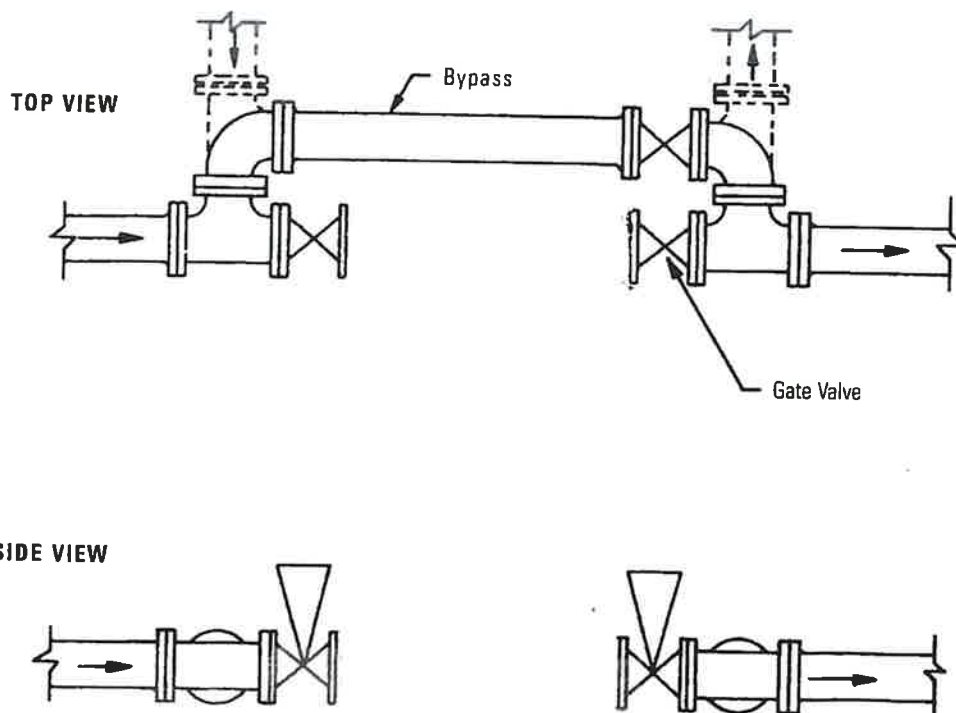
THE OPENING BETWEEN INCOMING GATE VALVE FLANGE AND OUTGOING GATE VALVE FLANGE IS 45 1/2" (THIS METER APLICATION DOES NOT REQUIRE A STRAINER)

THE METER SET NEEDS TO BE HORIZONTAL NOT VERTICAL.

THE METER SET NEEDS TO BE A MINIMUM OF 24" OFF THE FLOOR
IN ADDITION, A MAX HEIGHT OF 48" OFF THE FLOOR.

THE METER SET NEEDS TO BE A MINIMUM OF 24" FROM WALL OR ANY OBSTRUCTION.

FOR A MULTIPLE METER INSTALLATION. PLEASE CONTACT CARMEL UTILITIES FOR APPROVAL.



Superior Accuracy. Zero Maintenance.

Neptune® MACH 10® Ultrasonic Meter



The MACH 10® ultrasonic water meter features solid state ultrasonic technology including a factory-calibrated, replaceable unitized measuring element (UME) with no degradation of accuracy over time. Combined with a corrosion-resistant, lead free, high-copper alloy maincase, the MACH 10 is built to withstand demanding service conditions and deliver sustained accuracy over the life of the meter.

- Sizes 3", 4", and 6"
- Extended low-flow range for superior leak detection
- Accuracy sustained over meter life
- Can be installed in both horizontal and vertical applications
- Open flow path design with low pressure loss
- Advanced ultrasonic technology with easily replaceable UME design
- Lead free, high-copper alloy maincase
- UL Listed and FM Approved (standard)
- Available in standard turbine and compound lay lengths
- No maintenance

Specifications

- AWWA C715 Compliant
- NSF/ANSI 61 Certified
- UL Listed/FM Approved (Standard)

Application

- Cold water measurement of flow in potable, combination potable and fire service, and reclaim/secondary water applications.

Maximum Operating Water Pressure

- 175 psi

Operating Water Temperature Range

- +33°F to +122°F (+0.5°C to +50°C)

Environmental Conditions

- Operating temperature: +14°F to +149°F (-10°C to +65°C)
- Storage temperature: -40°F to +158°F (-40°C to +70°C)

Options

Sizes

- 3"
- 4"
- 6"

Meter Options

- Potable water/fire service (UL & FM certification comes standard)
- Reclaim water

Warranty

- Neptune provides a limited warranty for performance, materials, and workmanship. See warranty statement for details.

System Compatibility

- Compatible with Neptune R900[®] and CMIU. Also available as MACH 10[®])R900i[™] for an integrated radio solution and MACH 10[®])TC for Sensus Touch Coupler compatibility.

Operating Characteristics

Meter Size	Extended Low Flow @ 100% Accuracy (+/- 3.0%)	Normal Operating Range @ 100% Accuracy (+/- 1.5%)	Safe Maximum Operating Capacity	
			Normal Operation (Non Fire Service)	Fire Service
3"	0.50 U.S. gpm	0.75 to 500 U.S. gpm	500 U.S. gpm	420 U.S. gpm
4"	0.75 U.S. gpm	1.5 to 1250 U.S. gpm	1250 U.S. gpm	1100 U.S. gpm
6"	1.0 U.S. gpm	2.0 to 2000 U.S. gpm	2000 U.S. gpm	1800 U.S. gpm

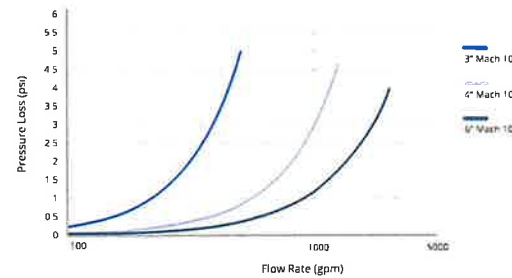
Available Units of Measure

Consumption	Rate
Gallons	GPM
Cubic Feet	GPM
Cubic Metres	LPM
Cubic Metres (International)	LPM
Imperial Gallons	GPM
Acre-Feet*	GPM
Litres*	LPM
Kilolitres*	LPM

*Unit cannot be displayed on LCD

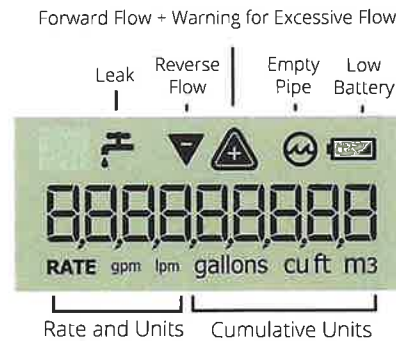
Pressure Loss

Typical meter performance. Individual results may vary.



LCD Display

9-digit display for extra resolution on manual reads.



Dimensions

Meter Size	Length	Height	Weight
3"	12"	9½"	39 lbs
	17"	9½"	42 lbs
4"	14"	11"	51 lbs
	20"	11"	57 lbs
6"	18"	12¾"	79 lbs
	24"	12¾"	91 lbs

Registration

High Resolution (8-digit reading)	3"	4"	6"
1 U.S. Gallons	✓	✓	
10 U.S. Gallons			✓
0.1 Cubic Feet	✓	✓	
1 Cubic Feet			✓
0.01 Cubic Metres	✓	✓	
0.1 Cubic Metres			✓



Unitized Measuring Element (UME)



neptunetg.com

Neptune Technology Group
1600 Alabama Highway 229
Tallahassee, AL 36078
800-633-8754 f 334-283-7293



Available in sizes 1.5", 2", 3", 4", 6", 8", 10", and 12"

UL Certification is available on 1.5" through 8" only.
FM Approval is available on all sizes.

Octave brings the latest in ultrasonic metering technology to Commercial/Industrial (C&I) water meters and puts precise measurement where the real flows exist. An excellent alternative to mechanical compound, single-jet, floating ball, fire-service type and turbine meters, Octave excels at maintaining sustained accuracy for the life of the meter while providing smart AMR capabilities.

Technical Specifications:

Working Pressure - 175 PSI

Liquid Temperature - 33° - 122 °F

Metrological Characteristics - Meets ANSI/AWWA Standards C715-18, C750-19, ISO 4064 rev. 2014

Configuration - Compact-Display built into unit

Power Source - 2 x D Size Lithium Thionyl Chloride batteries - 10 year warranted life time

Environmental Protection - NEMA 6P+ (IP68+), Ambient operation temp. -13 °F / +131 °F for the display

Display Units - Multi line 12 digit LCD (Programmable USG, Cubic Feet, Cubic Meters, Acre Feet for volume and GPM, Lt/s, or M³/h for rate of flow)

Output - Programmable Encoder, Pulse, 4-20, or Modbus; Optional dual output available in encoder + pulse

Features & Benefits:

- Grade 316 Stainless Steel (2"-8") or Epoxy Coated Ductile Iron (10"-12") body design provides full compliance with ANSI/NSF 372 (AB1953 or NSF61G).
- No moving parts. Minimal flow intrusion. Enduring accuracy.
- Easy to install Floating Flanges on 2"-8" and Integrated Flanges on 10"-12".
- No required strainer.
- Wide beam ultrasonic measurement sensors for high accuracy and reliable operation.
- Industry standard communication protocol for integration with most third-party AMR/AMI systems.
- Active leak, burst, reverse flow, empty pipe, measurement failure, and low battery. LCD also displays rate of flow and water temperature.
- Ruggedized NEMA 6P/IP-68+ construction; fully submersible design.
- Designed to meet standards for both North American and International C&I water meters.
- Optional flow measurements; Forward Only, Net Volume or Alternating Display (Forward and Reverse Consumption displayed separately).



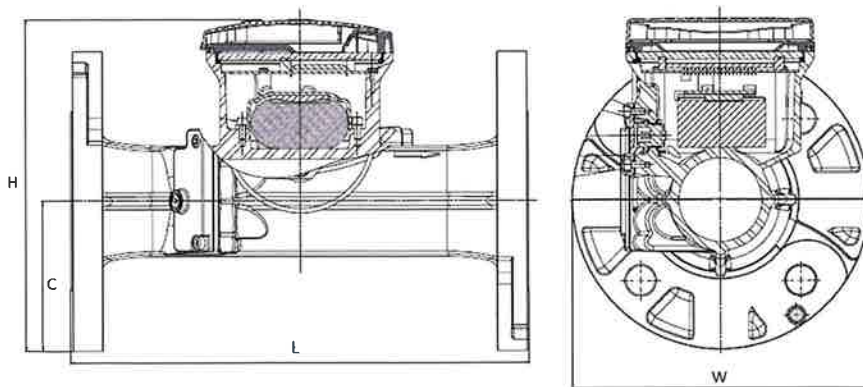
Performance Data & Dimensions

Octave Operating Characteristics and Dimensions	1.5"x13" (40 mm)	2"x10" (50 mm)	2"x15.25" (50 mm)	2"x17" (50 mm)
Safe Maximum Operating Capacity	250 GPM (57 m ³ /h)	250 GPM (57 m ³ /h)	250 GPM (57 m ³ /h)	250 GPM (57 m ³ /h)
Normal Operating Range (98.5% - 101.5% Accuracy)*	0.50 – 250 GPM (0.11 – 57 m ³ /h)	0.50 – 250 GPM (0.11 – 57 m ³ /h)	0.50 – 250 GPM (0.11 – 57 m ³ /h)	0.50 – 250 GPM (0.11 – 57 m ³ /h)
Extended Low Flow (95% - 105% Accuracy)	0.25 GPM (0.06 m ³ /h)	0.25 GPM (0.06 m ³ /h)	0.25 GPM (0.06 m ³ /h)	0.25 GPM (0.06 m ³ /h)
Length	13" (330 mm)	10" (250 mm)	15.25" (390 mm)	17" (432 mm)
Width	5-3/4" (146 mm)	5-3/4" (146 mm)	5-3/4" (146 mm)	5-3/4" (146 mm)
Height	6-3/4" (172 mm)	6-3/4" (172 mm)	6-3/4" (172 mm)	6-3/4" (172 mm)
Height from Center Pipe	2-1/8" (54 mm)	2-1/8" (54 mm)	2-1/8" (54 mm)	2-1/8" (54 mm)
Weight	20 lbs (9 kg)	15 lbs (7 kg)	22 lbs (10 kg)	24 lbs (11 kg)

* In the water temperature of 45° to 85° F (7° to 30° C), meter consumption is accurately measured at:
 • +/- 1.5% in the Normal Operating Range
 • +/- 5% in the Extended Low Flow

Octave Operating Characteristics and Dimensions	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
Safe Maximum Operating Capacity	500 GPM (114 m ³ /h)	1,000 GPM (227 m ³ /h)	1,600 GPM (363 m ³ /h)	2,800 GPM (636 m ³ /h)	5,500 GPM (1,250 m ³ /h)	5,500 GPM (1,250 m ³ /h)
Normal Operating Range (98.5% - 101.5% Accuracy)*	1 – 500 GPM (0.23 – 114 m ³ /h)	1.5 – 1,000 GPM (0.34 – 227 m ³ /h)	3 – 1,600 GPM (0.68 – 363 m ³ /h)	5 – 2,800 GPM (1.5 – 636 m ³ /h)	14 – 5,500 GPM (3.2 – 1,250 m ³ /h)	14 – 5,500 GPM (3.2 – 1,250 m ³ /h)
Extended Low Flow (95% - 105% Accuracy)	0.5 GPM (0.11 m ³ /h)	0.75 GPM (0.17 m ³ /h)	2 GPM (0.45 m ³ /h)	4 GPM (0.9 m ³ /h)	8 GPM (1.8 m ³ /h)	8 GPM (1.8 m ³ /h)
Length	12" (305 mm)	14" (356 mm)	18" (457 mm)	20" (508 mm)	17-3/4" (451 mm)	19-3/4" (502 mm)
Width	7-1/2" (190 mm)	9" (229 mm)	11" (280 mm)	13-1/2" (343 mm)	16" (406 mm)	19-3/4" (502 mm)
Height	8-1/2" (216 mm)	9-7/8" (250 mm)	10-7/8" (276 mm)	12-7/8" (327 mm)	16-1/2" (419 mm)	19-3/4" (502 mm)
Height from Center Pipe	3-1/2" (90 mm)	4-1/2" (115 mm)	5-1/8" (130 mm)	6-3/8" (162 mm)	8" (203 mm)	9-7/8" (251 mm)
Weight	23 lbs (10.5 kg)	35 lbs (16 kg)	51 lbs (23 kg)	78 lbs (35 kg)	150 lbs (68 kg)	210 lbs (96 kg)

* In the water temperature of 45° to 85° F (7° to 30° C), meter consumption is accurately measured at:
 • +/- 1.5% in the Normal Operating Range
 • +/- 5% in the Extended Low Flow



NOTE — For Performance charts please see Engineering Document - Octave | Version 10.17.