



SPECIFICATIONS

Cold Water Meter Specifications for Main Line Propeller Meters

Plain End Tube Type Sizes 4" (DN 100mm)
Through 36" (DN 900mm)

Scope

The meters must conform to American Water Works Standard C-704 as most recently revised, except as modified herein.

Type Description

The meter shall be propeller type, magnetic drive, and plain-end tube design. The basic design shall include two components consisting of the meter tube and meter head assembly.

The meter head assembly shall be connected to the tube by means of a flanged connection designed for easy removal from the tube for inspection, repair, or replacement. A flanged connection-type seal shall be used to seal the meter head to the tube body. Stainless steel fasteners shall secure the meter head assembly to the meter tube.

The meter head assembly shall include a permanently, hermetically sealed register, bronze gear box, '316' grade one-piece separator spindle with ceramic sleeve bearings, and an axially-mounted propeller which shall rotate and accurately measure the water passing through the meter.

Performance and Operation

The size of the meter shall be determined by the nominal size of the opening of the inlet and outlet flanges of the meter. The meters shall comply with the following flow and accuracy requirements by nominal size:

The meter shall accurately record 100% (+) or (-) 2% of actual throughput within the normal operating range listed. The meter shall perform properly when extended intermittent flows exceed the normal operating range upper flow limit by as much as 25% as listed in this section.

The entire meter assembly shall be rated to operate properly, without any performance deterioration, at a maximum operating pressure rating of 150 psig (10 bar) or 300 psig (20 bar) (strike one).

Meter Tube

The propeller meter tube shall be a Fabricated Steel body with plain ends. The meter tube shall have the same nominal inside diameter throughout its length to offer minimum flow obstruction. The meter tube shall be furnished with integral straightening vanes in the tube inlet port so as to minimize water swirl upstream of the meter and to evenly direct water flow past the propeller.

Meter tube coatings shall be included in all sizes unless otherwise specified. The coating shall be a dry, heat applied fusion-bonded epoxy coating of at least 12-mil thickness. The coating shall be FDA approved and equally applied both internally and externally. The fusion-bonded epoxy coating shall be Smith-Blair Flexi-Coat or better.

Size		Normal Operating Range in G.P.M. (M3/H)	Intermittent Max. Rating	Min. Low Flow @ 95%
4"	(100mm)	125 (28) - 500 (114)	625 (142)	82 (18.6)
6"	(150mm)	220 (50) - 1200 (273)	1500 (341)	160 (36.3)
8"	(200mm)	250 (57) - 1650 (375)	2060 (468)	190 (43.2)
10"	(250mm)	330 (75) - 2500 (568)	3125 (710)	260 (59.0)
12"	(300mm)	350 (80) - 3500 (795)	4375 (994)	275 (62.4)
14"	(350mm)	450 (102) - 4500 (1022)	5625 (1277)	350 (79.5)
16"	(400mm)	550 (125) - 5500 (1249)	6875 (1561)	450 (102.2)
18"	(450mm)	725 (165) - 7250 (1647)	9060 (2058)	550 (124.9)
20"	(500mm)	850 (193) - 9000 (2044)	11250 (2555)	700 (159.0)
24"	(600mm)	1300 (295) - 13000 (2952)	16250 (3690)	1000 (227.1)
30"	(750mm)	2100 (477) - 18600 (4224)	23250 (5280)	1600 (363.4)
36"	(900mm)	3000 (681) - 24000 (5450)	30000 (6812)	2400 (545.0)

Registers

The meter shall be equipped with a sealed, direct reading (DR) register with a visible low flow indicator and sweep hand indicator. In lieu of or in addition to the standard, sealed (DR) register, check one or more of the following register / transmitter options:

- Electronic Communications Register Assembly (ECR)
- High Speed Pick Up Transmitter (HSPU)
- Impulse Contactor Register (IC)
- Hall Effect Transmitter Module (HET)
- Electronic Rate of Flow Indicator Register (E-ROFI)

Access to the register assembly for purpose of inspection, replacement, or testing shall not require any disruption of service.

Calibration

Accuracy level adjustments shall be completed by use of change gears located directly below the register assembly. Access to the change gears shall be external to the meter line pressure. Modification to the propeller shall not be acceptable for calibration purposes.

Magnetic Drive

Permanent ceramic magnets, mounted concentrically, shall be utilized to couple the axial rotation of the propeller to the axial drive shaft assembly.

Right Angle Gearing & Bronze Gear Box

A right angle bevel gear connection shall be used to convert from a horizontal drive to a splined, stainless steel vertical shaft, connecting the propeller drive magnet rotation up through the sealed register magnetic coupling. All gearing shall be housed in a stationary, one-piece bronze gearbox. The gearbox shall be oil filled and factory sealed to provide sustained lubrication. The bronze bevel gears shall be completely separated from the measured water.

Bearing Materials

The radial bearing surfaces shall be made of ceramic material and shall be designed to provide extended performance life and prolonged accuracy. A one-piece ceramic bearing cartridge shall be positioned on the center hub of the propeller

and retained in position by a 'C' clip fastener. A ceramic sleeved separator spindle of '316' grade stainless steel shall provide the mating ceramic surface and proper positioning of the propeller in the water way.

The thrust bearings shall be constructed of hardened tungsten carbide. The thrust bearings shall include a thrust pin located at the end of the separator spindle and a thrust disc located in the inlet portion of the propeller. Access for inspection or replacement of the thrust disc shall be provided through a threaded connection located on the propeller inlet. Reverse flow protection shall be provided by means of a retainer nut and washer affixed to the separator spindle.

Propeller

The propeller shall be conical shaped, three-bladed, and molded of polypropylene or other superior thermoplastic material. The propeller shall be considered resistant to normal water flow conditions and corrosion factors. The propeller assembly shall be easily removed for inspection or replacement.

Guarantee and Maintenance

Meters shall be guaranteed against defects in materials and workmanship for a period of one (1) year from date of shipment.

The meter supplier shall also submit a current price schedule of its factory maintenance program offering. The maintenance price schedule shall be printed on a brochure that is nationally advertised and shall include offerings for both complete factory calibrated meter head assemblies and repair parts.

Intent

These specifications are intended as guidelines for selecting a critical metering device. Ease of installation, operational features, readability, and maintenance are of prime concern. A design that best reflects longevity of operation of all elements and a high degree of sustained accuracy through the entire range of the meter is to be considered mandatory.

Recommendation

Sensus Metering Systems

Mainline Propeller Meter, Model 111 / 112

AUTHORIZED SENSUS DISTRIBUTOR



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