

ARB® UTILITY MANAGEMENT SYSTEMS™



## COLD WATER METERS / DISPLACEMENT TYPE MAGNETIC DRIVE 5/8" - 2"



### SPECIFICATIONS

# OR EQUAL

#### GENERAL

All cold water meters (displacement type - magnetic drive 5/8" - 2") furnished shall be produced from an ISO 9001 manufacturing facility, conform to the "Standard Specifications for Cold Water Meters" C700 latest revision issued by AWWA or as otherwise stated, and be certified to the National Conference on Weights and Measures (NCWM) regulatory standards.

#### LEAD FREE LEGISLATION

Federal changes are on the horizon governing the acceptable amount of lead in the drinking water system. Knowing that water meters have a life expectancy of approximately 20 years, the utility wishes to ensure that meters purchased today will meet the Safe Drinking Water Act (SDWA) per NSF 372 that will become effective in January 2014 for the following reasons:

- The utility wishes to assure the safety of its drinking water.
- The utility wishes to safeguard its investment in metering infrastructure.
  - As of January 4, 2014, meter inventory that does not meet the SDWA (NSF 372) lead free requirements will have to be returned to the manufacturer or scrapped at a cost that the utility is not willing to incur.
  - After January 4, 2014, any meters not in compliance with these requirements that are physically removed from service for testing or repair cannot be reinstalled and will have to be scrapped at a cost that the utility is not willing to incur.

As a result, the utility requires that all water meters submitted in this proposal be compliant with NSF/ANSI 61, Annex G, and Annex F. Specifically:

- Meters shall be made of "lead free" alloy as defined by NSF/ANSI 61, Annex G and Annex F.
- Manufacturer shall provide a copy of a letter from the NSF on NSF letterhead documenting compliance with NSF/ANSI 61, Annex G, which allows a maximum weighted average lead content level of 0.25 percent of the wetted surface area.

#### NATIONAL TYPE EVALUATION PROGRAM CERTIFICATION (NTEP)

The Water Research Foundation (formerly AWWA Research Foundation) identified in its "Accuracy of In-Service Water Meters at Low and High Flow Rates" study that all meter types are not created equal and many manufacturers that advertise compliance with AWWA standards do not consistently meet them. As a result, the utility requires that all residential and intermediate meter sizes and register types supplied be certified to the National Conference on Weights and Measures (NCWM) regulatory standards. Specifically:

- Manufacturer shall provide a copy of the National Type Evaluation Program (NTEP) Certificate of Conformance (COC) certifying and listing the meter size and register type as legal for trade and;
- The NTEP COC shall list the meter size and register type being supplied as approved for use in utility billing, commercial metering, and legal sub-metering applications.

**TYPE**

Only magnetic-driven, positive displacement meters of the flat nutating disc type will be accepted because of enhanced low flow accuracy performance.

**SIZE, CAPACITY, LENGTH**

The size, capacity, and meter lengths shall be as specified in AWWA Standard C700 (latest revision). The maximum number of disc nutations is not to exceed those specified in AWWA C700 latest revision.

The meter maincase and cover shall be cast from NSF/ANSI 61, Annex G and Annex F certified lead free alloy containing a minimum of 85 percent copper. The serial number should be stamped between the inlet or outlet port of the maincase and the register. Maincase markings shall be cast raised and shall indicate size, model, direction of flow, and NSF 61 certification. Plastic maincases are not acceptable.

Maincases for  $\frac{5}{8}$ ",  $\frac{3}{4}$ ", and 1" meters shall be of the removable bottom cap type with the bottom cap secured by four (4) bolts on  $\frac{5}{8}$ " and  $\frac{3}{4}$ " sizes and six (6) bolts on the 1" size. Intermediate meter maincases shall also be made of the same lead free brass material in sizes 1 $\frac{1}{2}$ " and 2" with a cover secured to the maincase with eight (8) bolts. Meters with a frost plug, a screw-on design, or no bottom cap shall not be accepted in  $\frac{5}{8}$ " - 1" sizes. The  $\frac{5}{8}$ " meters shall have a synthetic polymer or cast iron bottom cap option.

All lead free maincases shall be guaranteed free from manufacturing defects in workmanship and material for the life of the meter.

All meters must be adaptable to a field programmable absolute encoder register without interruption of the customer's service.

**BOLTS**

All maincase bolts shall be of 300 series non-magnetic stainless steel to prevent corrosion.

**DIRECT READ STANDARD REGISTER**

The register shall be of the straight reading sealed magnetic drive type and shall contain six (6) numeral wheels. Registers must be roll sealed and dry. All direct reading register cups shall be copper to prevent corrosion and be covered with a high-strength, impact-resistant flat glass lens to prevent breakage. The lens shall be positioned above the register box to allow for runoff of debris. The register lid shall overlap the register box to protect the lens. The register retaining ring shall be designed to absorb impact from the register. Register boxes and lids shall be of high-strength synthetic polymer or approved equivalent. All registers shall have the size, model, and date of manufacture stamped on the dial face. The dial shall have a red center sweep hand and shall contain one hundred (100) equally divided graduations at its periphery.

The register must contain a low flow indicator with a 1:1 ratio to disc nutations to provide leak detection.

Registers shall be secured to the maincase by means of a plastic tamper-proof seal to allow for inline service replacement. Register seal screws are only accepted when supplied with attached sealing wire to at least one bottom cap bolt with seal wire holes of not less than  $\frac{3}{32}$ " in diameter.

Registers shall be guaranteed for at least ten (10) years. All meters will be guaranteed for one (1) year on material and workmanship.

### MEASURING CHAMBER

The measuring chamber shall be of a two-piece, snap-joint type with no fasteners allowed. The chamber shall be made of a non-hydrolyzing synthetic polymer.

The control block shall be the same material as the measuring chamber and be located on the top of the chamber. The control block shall be located after the strainer.

The measuring chamber outlet port shall be sealed to the maincase outlet port by means of an O-ring gasket.

The flat nutating disc shall be a single piece made from non-hydrolyzing synthetic polymer and shall contain a type 316 stainless steel spindle. The nutating disc shall be equipped with a synthetic polymer thrust roller located within the disc slot. The thrust roller head shall roll on the buttressed track provided by the diaphragm.

The chamber shall be warranted for ten (10) years against freeze damage if the meter has been equipped with a frost-proof cast iron or synthetic polymer bottom cap.

### STRAINERS

All meters shall contain a removable polypropylene plastic strainer screen. The strainer shall be located near the maincase inlet port, before the measuring chamber. The strainer shall also function as the device that holds the measuring chamber in place within the maincase. Straps or other types of fasteners shall not be accepted.

### PERFORMANCE

To ensure accuracy, each meter must be accompanied by a factory test tag certifying the accuracy at the flows required by AWWA C700.

All meters shall be warranted as follows:

Size	Low Flow	Low Flow New Meter Accuracy	Low Flow Repaired Meter Accuracy
5/8"	1/8 gpm @ 95%	5 Yrs or 500,000 gallons	15 Yrs or 1,500,000 gallons
3/4"	1/4 gpm @ 95%	5 Yrs or 750,000 gallons	15 Yrs or 2,250,000 gallons
1"	3/8 gpm @ 95%	5 Yrs or 1,000,000 gallons	15 Yrs or 3,000,000 gallons
1 1/2"	3/4 gpm @ 95%	2 Yrs or 1,600,000 gallons	12 Yrs or 5,000,000 gallons
2"	1 gpm @ 95%	2 Yrs or 2,700,000 gallons	12 Yrs or 8,000,000 gallons

Normal meter operating range shall be as follows:

Size	Accuracy Range ± 1.5%
5/8"	1/2 - 20 gpm
3/4"	3/4 - 30 gpm
1"	1 - 50 gpm
1 1/2"	2 - 100 gpm
2"	2 1/2 - 160 gpm

## MANUFACTURER

Meters and meter parts shall be manufactured, assembled, and tested within the United States. Manufacturers may be required to provide proof of where and what percentage of the meter register, chamber, and maincase is manufactured in the United States.

Manufacturers shall have a minimum of fifteen (15) years of field and production experience with all sizes and models quoted.

Manufacturers shall provide only one (1) model of meter which complies with these specifications. Suppliers must have been manufacturing meters for at least one hundred (100) years.

## SYSTEMS GUARANTEE

All meters shall be guaranteed upgradeable to the following Neptune systems without interruption of the customer's service.

**ProRead™ (ARB® VI) AutoDetect Absolute Encoder**

**E-Coder® (ARB VII) Solid State Absolute Encoder**

**R900®**

**FLOSEARCH® II**

**TRICON/E®3**

**TRICON®**

## REMOTE CAPABILITY OPTIONS

All meters shall be equipped with encoder remote registers per AWWA C707 and meet all AWWA C700 performance standards.

Acceptable meters shall be Neptune T-10 or approved equal.

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