

THE METROPOLITAN GOVERNMENT OF
NASHVILLE AND DAVIDSON COUNTY

WATER DISTRIBUTION SYSTEM

APPROVED MATERIALS
CONSTRUCTION SPECIFICATIONS
&
DETAILS



1600 SECOND AVENUE NORTH
NASHVILLE, TN 37208-2298

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INTRODUCTION

The Metropolitan Government of Nashville and Davidson County, through its Department of Water Services, presents this manual listing the approved manufacturers and distributors of various materials that may be used for construction of Water Distribution System lines and appurtenances.

Standard specification information is also presented as a guideline to architects and engineers in the preparation of detailed plans and specifications. Private contractors are encouraged to use the manual as a guideline in the purchase of materials for installation in the Water Distribution System.

We encourage users to notify Tommy Dodson at (615) 862-4857 of any inaccuracies, problems of performance of materials, or any changes or modifications necessary for the proper function of MWS facilities.

Manufacturers claiming equal status with listed organizations should apply to Metro Water Services, 1600 Second Avenue North, Nashville, TN 37208 ATTN: Tommy Dodson (615) 862-4857.

WATER METER SPECIFICATIONS

All water meters set in the Metro system must be equipped with an encoded register wired to a MXU (meter interface unit) with 25 feet of wire for commercial accounts.

Residential Cold Water Magnetic Drive Meters - Size 5/8" through 1"

Residential water meters shall be manufactured in accordance with standards established by ANSI/AWWA C700-77 or latest revisions. The Manufacturer shall supply affidavits that the meters furnished comply with ANSI/AWWA C700-77 or latest version. The following additional specifications shall be met.

Registers shall be straight reading with 6 numeral wheels registering in cubic feet. Register operates by permanent drive magnets. The register shall include a low flow indicator on the dial face. All reduction gearing shall be contained in a permanently hermetically sealed, tamper proof enclosure made from a stainless steel or copper material, covered with a heat tempered glass lens. The register shall be secure to the main case by means of a tamper-resistant locking screw seal pin so the register cannot be removed by non-utility personnel. Seal wiring or a frangible head screw is not acceptable. Registers must have a guarantee to be free from defective material and workmanship for a period of 25 years. All registers must be convertible to AMR applications. Registers shall have 2 permanently potted wire connection with 6 feet of wire for residential and 25 feet for commercial.

The outer casing shall be of noncorrosive water works bronze with a separate measuring chamber which can be easily removed from the case. All meters shall have serial numbers on them and in raised characters, the size and direction of water flow through the meter. The manufacturer's serial number shall be imprinted permanently on the outer case and the register box lid. The meter shall be equipped with breakable frost proof bottoms or equivalent frost protection safeguards. All meters shall be equipped with plastic liners or corrosion resistant material on bottom plates. All external bolts and washers shall be of corrosion material and be easily removed from the main case. All threaded main case bolt holes must be covered to aid in removal of the bolts for repair. All casings must carry an unconditional 25 year guarantee from the date of the shipments.

Meter coupling washers shall be of vulcanized hard red fiber, 1/8" thick, suitable for use with standard 5/8" and 1" water meters.

The measuring chamber shall be suitable synthetic polymer and shall not be cast as part of the main case. All piston assemblies shall be interchangeable in all measuring chambers assemblies of the same size. The measuring chamber piston shall operate against a replaceable control roller allowing for repair to AWWA standards. Measuring chambers must be of positive displacement type.

All meters must carry an unconditional guarantee that meters will perform to AWWA new meter accuracy standards for a period of 5 years from the date of shipment. Meters must also carry an

unconditional guarantee to perform to at least AWWA repaired meter accuracy standards for a period of 15 years from the date of shipment.

All water meters set in Metro Water's system must be equipped with an encoded register wired to a MXU (meter interface unit).

Meters shall show an accuracy of registration under test of not less than 99% or more than 101% on flows of 1 gallon per minute to flows of 20 gallons per minute, inclusive, 95% or better on flows of 1/4 gallon per minute and 90% or better on 1/8 gallon per minute. The manufacturer shall also furnish a notarized certificate of test of each meter showing the rates of flow at which the meter was tested, the percentage of accuracy of the meter for each flow, and stating that the meters furnished were made and tested in full compliance with the specifications of The Metropolitan Government of Nashville and Davidson County.

Parts must also be available and sold as single items, not as units.

Approved Manufacturers of Residential Cold Water Magnetic Drive Water Meters - Size 5/8" through 1")

Sensus Technologies

5/8" -	SR-I & SR-II
5/8" x 3/4"	SR-I & SR-II
3/4" (full)	SR-I & SR-II
1" -	SR-I & SR-II

Neptune (Trident) Technology Group Inc.

5/8" -	Trident 10
5/8" x 3/4"	Trident 10
3/4" (full)	Trident 10
1" -	Trident 10

Commercial Cold Water Magnetic Drive Water Meters - Size 1-1/2" to 2"

Displacement Type Meters:

Commercial water meters shall be manufactured in accordance with standards established by ANSI/AWWA C700, or latest revision. The manufacturer shall supply affidavits that the meters furnished comply with ANSI/AWWA C700, latest revision.

Turbine Type Meters:

Commercial water meters shall be manufactured in accordance with standards established by ANSI/AWWA C701, latest revision. The manufacturer shall supply affidavits that the meters furnished comply with ANSI/AWWA C701, latest revisions.

Multi-Jet Type Meters:

Commercial water meters shall be manufactured in accordance with standards established by ANSI/AWWA C708, latest revision. The manufacturer shall supply affidavits that the meters furnished comply with ANSI/AWWA C708, latest revision.

General Specifications

Registers shall be straight-reading with 6 numbering wheels -- registering in cubic feet. Register operates by permanent drive magnets. Metal mutilated pinions and white number wheels with black figures shall be furnished. The number wheels may be of plastic, but number wheel gears must be of metal. Register must be hermetically sealed.

The outer casing shall be of bronze composition. The measuring chamber shall not be cast as a part of the outer casing, and may be constructed of bronze, stainless steel, hard rubber, or a suitable synthetic polymer. Pistons and disc may be constructed of hard rubber or a suitable synthetic polymer. Turbines and rotors shall be made of vulcanized hard rubber or other suitable synthetic polymer having sufficient rigidity and strength to operate at the rated capacity of the meters. Turbine spindles shall be made of phosphor bronze, stainless steel, Mondel, or other suitable corrosion-resistant materials. Rotor spindles shall be made of phosphor bronze, stainless steel, nickel alloy, or a suitable synthetic polymer.

The size, model and direction of flow through the meter shall be marked permanently on the outer cases of all meters. The manufacturer's meter serial number shall be imprinted permanently on the outer case and the register box lid (when applicable). The name of the manufacturer shall be cast on the register box lid in raised letters.

Meters shall show an accuracy of registration under test of not less than 99 percent or more than 101 percent on flows of one gallon per minute to flows of twenty gallons per minute, inclusive; 95 percent or better on flows of 1/4 gallon per minute; and 90 percent or better on 1/8 gallon per minute. The manufacturer shall also furnish a notarized certificate of test of each meter, showing the rates of flow at which the meter was tested, the percentage of accuracy of the meter for each flow, and stating that the meters furnished were made and tested in full compliance with the specifications of The Metropolitan Government of Nashville and Davidson County, Department of Water Services.

Approved Manufacturers of Commercial Cold Water Magnetic Drive Meters - Size 1-1/2" to 10"

Displacement Type:

Sensus Technologies
SR - I & SR - II

Neptune Technologies Group Inc.
Trident 10

Turbine Type:

Sensus Technologies

Sensus Series "W" Turbo Meters (1 $\frac{1}{2}$ " - 10")

Neptune Technologies Group Inc.
H.P. Turbines (1 $\frac{1}{2}$ " - 10")

Compound Meters - Size 3"

Compound meters shall be manufactured in accordance with standards established by ANSI/AWWA C702, latest revision. The manufacturer shall supply an affidavit that the meters furnished comply with ANSI/AWWA C702, latest revision. The following additional specifications shall be met:

The use of synthetic polymers is prohibited.

External fasteners shall be of stainless steel. Companion flanges shall be of ductile iron. Companion flanges of the same size and type as the meter flanges, gaskets, bolts and nuts shall be provided. The flanges for 1-1/2" and 2" meters shall be oval. Meters shall be provided with tapped bosses on the top of the case near the outlet for field testing purposes.

Registers shall be straight reading in cubic feet. Registers shall be encoder type (ECR) touchcoupler and read with Sensus MXU (meter interface unit) Drive train revolutions shall be transmitted to the register by magnetic coupling.

Meters shall be equipped with strainers that shall be rigid, easily removed, and shall have an effective straining area at least double that of the water main-case inlet.

Markings: The size, model and direction of flow through the meter shall be cast or stamped in the outer case of all meters. The name of the manufacturer shall be permanently impressed on the lid of the register box. The serial number of the meter shall be imprinted on the lid.

Approved Manufacturers of Compound Fire Meters - Size 3"

Sensus Technologies
Sensus Compound SRH

Neptune Technology Group Inc.
Tru/Flo Compound

Fire Service Meters - Cold Water Type - Sizes 4" and above

Fire meters shall be manufactured in accordance with standards established by AWWA C703, latest revision. The manufacturer shall supply an affidavit that the meters furnished comply with AWWA C703, latest revision. The following additional specifications shall be met.

The use of synthetic polymers is prohibited.

External fasteners shall be stainless steel. Companion flanges shall be ductile iron of the same size and type as the meter flanges. Gaskets, bolts and nuts shall be provided.

Registers shall be straight reading in cubic feet. Drive train revolutions shall be transmitted to the register by magnetic coupling. Electronic pro read, compatible with Sensus MXU.

A separate strainer unit shall be furnished with each turbine meter in size (1 $\frac{1}{2}$ ") and above. The main case and cover of the strainer shall be constructed of bronze or cast iron (cast iron cases shall have an interior coating of approved non-corrosive material). Bolts for the connecting flanges shall be stainless steel. The interior strainer unit shall be stainless steel.

Markings: The size, model and direction of flow through the meter shall be cast or stamped in the outer case of all meters. The name of the manufacturer shall be permanently impressed on the lid of the register box. The serial number of the meter shall be imprinted on the lid as well as the case.

Approved Manufacturers of Cold Water Fire Meters - Sizes 4" and above

Sensus Technologies

Sensus "Fireline"

Neptune Technology Group Inc.

Neptune "Protectus III"