SENSUS METERING SYSTEMS

SPECIFICATIONS

Compound Meters

For SRH Compound Meter
Piston Type with Direct Read Registers
2" Through 6" Sizes

Scope

The meters must conform to American Water Works Standard C-702, as most recently revised, except as modified herein.

Type

Meters shall be of the single register compound type which totalize the output from two (2) interacting measuring chambers. One chamber shall be of the turbine type for measuring high flows; the other a displacement chamber of the oscillating piston type for measuring low flows. An automatic valve mechanism shall direct the flows through the chambers so as to have them function within their normal designed limits. All flows shall first pass through the turbine chamber prior to passing through the oscillating piston measuring chamber so as to ensure continuous registration during low flow to high flow measurement.

Size

The size of the meter shall be determined by the nominal size of the opening of the inlet and outlet flanges of the meter.

Length

The maximum overall length of the unit shall be the face-to-face dimensions as listed below:

Size of Meter	Length
2"	15-1/4"
3"	17"
4"	20"
6"	24"

Cases

Maincases shall be constructed of Water Works bronze, and in no instance shall repaired casings be acceptable. The maincase shall be so constructed as to contain both the turbine and oscillating piston measuring chambers as separate units. Both measuring chambers must be accessible by removal of a single upper shell assembly. The oscillating piston measuring chamber operation shall not be inhibited by the operation of an external valve. Access to both measuring chambers shall be obtainable without disturbing the maincase as set in the pipeline. All sizes of meters shall include flanged ends.

The maincases shall be fitted with drain plugs for ease of removing water or other debris from the bottom of the maincase. A test port of adequate size must be accessible from the top so as to allow testing in pit settings and confined areas. The port outlet shall be threaded and shall be plugged with a bronze plug.

The size, type and direction of flow through the meter shall be cast in raised characters on the maincase.

Strainers

External body strainers may be specified as part of the meter assembly package. When specified, the strainer body shall be constructed of Water Works bronze similar to that of the compound meter body. The strainer body shall contain a cover plate which is removable for inspection and debris removal. The strainer screen shall be externally accessible and easily removable without disturbing the pipeline setting of the meter assembly package.

External Fasteners

All external fasteners on the meter shall be of stainless steel or non-ferrous material.

Connections

Flanges on 2" size meters shall be oval faced and drilled on the horizontal axis with a bolt circle diameter of 4-1/2". Thickness shall be as required for Class 150 bronze round flanges.

Flanges for 3", 4" and 6" size meters shall be of the Class 150 bronze round type, flat faced and shall conform to ANSI B16.24 for specified diameter.

Companion flanges, if required with the meters, shall consist of one (1) standard cast iron flange, tapped with American Standard internal taper pipe threads, of the same nominal size as the meter, and one flanged coupling adaptor. The type and outside diameter of connecting pipe shall be provided for appropriate gasket sizing. All bolts, nuts and gaskets shall be provided for connection to the meter assembly.

Direct Read Register

The meters shall contain one billing register which totalizes the registration from both the turbine and oscillating piston measuring chambers. A coordinator assembly shall be utilized to transfer motion from both measuring chambers to the billing register. The register is to be of the straight reading type, permanently and hermetically sealed against moisture, dirt or other foreign material. It shall utilize a six-wheel odometer and full sweep center located test hand. The outer edge of the dial face shall be divided into (100) equally spaced markings.

A second non-billing register, located on the coordinator assembly, shall totalize the registration of the oscillating piston measuring chamber only. It shall be of the straight reading type with a six-wheel odometer and test dial indicator. This register assembly may be utilized for accuracy testing and determining proper meter sizing after being placed in service.

Register Box

The register box shall be made of the same material as the maincase. The name of the manufacturer and meter serial number shall be clearly identifiable and located on the register box lid. The register box which encloses the register shall be mounted so as to be oriented for reading in any position.

Register Box Sealing

The register box shall be sealed to the meter in such a manner that unauthorized removal is apparent. Construction shall be such that the seal screws are recessed and their removal is prohibited by properly affixing seal wire through appropriate holes provided in the register box casting body.

Intermediate Gear Trains

The intermediate gear trains, including all coordinator parts, shall be located in an oil filled, "O"-ring gasketed cavity which is completely separated from pipeline or surface water. The input into the coordinator and intermediate gear trains from the measuring chamber shall be through two sets of permanent ceramic magnets. The output from the coordinator and intermediate gear trains to the billing register shall be magnetically coupled with a set of face type ceramic magnets. The intermediate gear trains and coordinator, along with the odometer for the displacement chamber shall be assembled into a single unit which is housed in the intermediate cavity area.

Change gears for both measuring chambers shall be located on top of the coordinator assembly. There shall be no need to disassemble or remove the coordinator assembly when replacing the change gears in order to adjust accuracy.

Displacement Measuring Chamber

The measuring chamber shall be a self-contained unit including a strainer, which can be firmly seated and removed as a unit. No part of this chamber shall be cast as part of the maincase. The measuring chamber shall be of the oscillating piston type and shall be composed of Water Works bronze or a suitable synthetic polymer. The piston, piston roller, and division plate shall be of rubber composition or an approved synthetic polymer as well. All other components of the measuring chamber shall be of corrosion-resistant materials such as stainless steel.

Turbine Measuring Chamber

The turbine measuring chamber shall be Water Works bronze or suitable synthetic polymer construction and shall be secured by two stainless steel bolts. The turbine chamber shall be positioned so that water must essentially travel in a straight line path from the meter inlet to the meter outlet during high flow operation. An adjustable tungsten carbide bearing shall be utilized to take up the turbine shaft end-play tolerance. The turbine shall be made of polypropylene, mounted on a replaceable #316 stainless steel shaft and rotate on roller bearings. The entire propeller assembly weight, while in operation, shall effectively be offset by magnetic suspension so that the rotating turbine components are essentially weightless in water.

Automatic Valve

The automatic valve shall be of the weighted, link-mounted, swing type. All moving shafts and linkage shall contain hard rubber bearings and sleeves. The valve and linkage shall be Water Works bronze; all shafts shall be #316 stainless steel. The valve shall be so positioned in the meter that water passing through it will follow a straight line path in passing from inlet to outlet. The valve will open at a pressure differential of two and one-half (2-1/2) pounds per square inch (psi) or less. To gain access to the valve, only the upper portion of the meter's maincase need to be removed. Neither the oscillating piston or the turbine chamber need to be disturbed.

Valve Seat

The valve seat assembly shall consist of a trapezoidal shaped rubber gasket, retained by a bronze or synthetic polymer seat. The valve seat assembly shall be secured by #316 stainless steel screws that are accessible from the maincase opening so as to facilitate easy access for inspection and ease of maintenance.

Registration

The registration shall accurately be recorded through the normal test flow limits at not less than 98.5 percent nor more than 101.5 percent of actual throughput. At crossover, that point when measurement transfers from one measuring chamber to the other, accuracy must exceed 95 percent.

Accuracy at minimum test flow shall be at least 95 percent at the rate of flow specified in the following table:

Size	Normal Test Flow Limits – GPM	Minimum Test Flow – GPM
2"	2-160	1/4
3"	4-320	1/2
4"	6-500	3/4
6"	10-1000	1-1/2

Pressure Test

Meters shall be guaranteed to operate successfully at a working pressure of 150 pounds per square inch, without leakage or damage to any component.

Guarantee and Maintenance Program

Meters shall be guaranteed against defects in material and workmanship for a period of one year from the date of shipment. The meter manufacturer shall also submit, along with the price quotation, a price schedule of its factory maintenance program offering. This maintenance price schedule shall be printed on a brochure which shall be nationally advertised and shall include offerings for both the complete meter on an exchange basis and pre-packaged component repair kits. Individual meter parts shall also be made available for purchase as is necessary.

Intent

Subject specifications are designed to create guidelines for selecting an extremely critical metering device. Ease of installation, operational features, readability and maintenance are of prime concern. A design which 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

SRH Compound Water Meter

AUTHORIZED SENSUS DISTRIBUTOR

SENSUS METERING SYSTEMS

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