Cold Water Meters - Fire-Service Type with Bypass
Sizes 3” - 10”

Scope

This Specification covers Cold-Water Meters - Fire-Service Type with ductile iron main cases, sizes 3” though 10”. The fire-service meter shall consist of a combination of a mainline meter, automatic valve mechanism and a bypass meter. The meter shall be so designed for applications where a high degree of accuracy is required over a wide range of water flow rates. The meters must conform to American Water Works Standard C-703, as most recently revised, have UL listing, be Factory Mutual and NSF-61 compliant.

Type

Meters shall be comprised of a horizontal turbine main-line meter measuring element, measuring high flow rates and a bypass meter of the appropriate size for measuring low flow rates. A spring activated valve shall automatically control flows between the mainline and bypass sections of the meter.

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.

Pressure Test

Meters shall be guaranteed to operate successfully at a working pressure of 175 PSI without leakage or damage to any part.

External Bolts

All external bolts shall be of non-ferrous stainless steel composition.

Length

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

Size of Meter	Length	Size of Bypass
3”	33”	3/4”
4”	35”	1”
6”	45”	2”
8”	53”	2”
10”	68”	2”

Main Line Construction

The uni-body main case and strainer shall be constructed of ductile iron and be epoxy coated. The main case shall be a uni-body design that contains both the main line meter measuring element and the strainer to eliminate excess hardware, fasteners, reduce the possibility of leaks and reduce weight and size. A spring loaded valve that automatically controls flows between the main line and bypass shall be attached to the rear of the main case. The main-line measuring element shall be easily accessible by removal of a single top case. The main-line valve shall be easily accessible by removal of a single cover. A test port must be included in the cover of the main line valve. All main cases 3" through 10" shall have flanged ends with the inlet and outlet flange having a common axis.

The size, type and direction of flow through the meter shall be cast in raised characters on the main line. A removable test plug shall permit field testing and re-calibration of both the mainline and bypass meters through the valve cover.

Registration

The registration shall accurately be recorded through the normal test flow limits at not less than 98.5% or more than 101.5% of actual throughput. At crossover, that point when measurement transfers from the bypass meter to the mainline meter, accuracy must be no less then 85%. Accuracy at minimum test flow shall be at least 95% at rate of flow specified in the table.

Size	Normal Test Flow Limits GPM @ ±1.5%	High Intermittent Flow Rates GPM @ ±1.5%	Minimum Flow Rates GPM @ 95%
3"	6 - 600	750	1/2
4"	8 - 1000	1250	3/4
6"	15 - 2000	2500	2
8"	30 - 3500	4400	2
10"	40 - 5500	6900	2

Meters shall have performance capabilities of continuous operation up to the rated maximum flows as outlined above without affecting long-term meter accuracy caused by undue wear. Meter shall also be rated for a 25% flow capacity in excess of the maximum flow listed above. This would be for intermittent high flow capacity only.

Registers

Registers shall be available with center sweep hand, straight reading indicating cubic feet, U.S. gallons or metric registration. All registers for 3" through 10" Fire-Service meters shall be guaranteed for a period of 20 years from the date of manufacture.

Register Box and Lid

The register box and lid shall be made of plastic material. The name of the manufacturer and the meter serial number shall be identifiable and located on the register box lid or register housing. The register box which encloses the register shall be mounted with a bayonet style locking system for orientation in any reading position. No special tools shall be required for removal of the register

Register Box Sealing

The register box shall be fastened to the meter by a locking pin in such a manner that unauthorized removal and tampering is deterred and readily apparent to the customer.

Main Line Valve

The main line valve shall be the spring loaded type, which offers a predetermined and substantial resistance to opening in order to divert the low flow rates of flow through the appropriately sized bypass meter. The spring loaded valve shall open when pressure loss through the bypass section approaches 2 PSI. The mainline valve mechanism shall be constructed in a unitized manner to permit easy replacement of the entire assembly. The valve shall be simple and effective in operation with ease of maintenance not requiring any special tools to remove the assembly.

Measuring Chambers

The main-line measuring element shall be unitized and easily removed from the main case cover.

Meters shall have a design that allows water to flow straight through the measuring element where it turns a rotor at a rate in direct proportion to the quantity of water flowing though the meter. The straight-through design shall allow high volumes to flow with a minimum of head loss.

During low flow, a tungsten carbide bearing shall float against a stainless steel shaft; during high flows, a tungsten carbide bearing shall gently move back against a second stainless steel shaft. During medium flows, the rotor shall float between both tungsten carbide bearings floating in the water on sapphire bushings.

Bypasses

Bypass meters shall consist of an appropriately sized Residential Fire Meter on 3” and 4” fire meters. The 6”, 8”, and 10” sizes shall utilize a high pressure positive displacement meter. Locking ball valves shall be offered as an option on all bypasses. A swing check shall be incorporated in all bypasses to prevent backflow.

Warranty

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