NEPTUNE TECHNOLOGY GROUP

COLD WATER METERS/ COMPOUND TYPE SPECIFICATIONS

SPECIFICATIONS

GENERAL
All meters furnished shall be manufactured by a registered ISO 9001 quality standard facility. Acceptable meters shall have a minimum of 15 years of successful field use. All specifications meet or exceed the latest revision of AWWA C702.

TYPE
Compound meters shall consist of a combination of an AWWA Class II turbine meter for measuring high rates of flow and a nutating disc type positive displacement meter for measuring low rates of flow enclosed in a single maincase. An automatic valve shall direct flows through the disc meter at low flow rates and through the turbine meter at high flow rates. At high flow rates, the automatic valve shall also serve to restrict the flow through the disc meter to minimize wear.

OPERATING CHARACTERISTICS
The meters shall comply with the operating characteristics shown below:

Size	Normal Operating Range (gpm)	Maximum Continuous Flow (gpm)	Maximum Loss of Head at Max Cont Flow (psi)	Maximum Intermittent Flow (gpm)	Low Flow (gpm)
2"	1/2 - 200	160	8	200	1/8
3"	1/2 - 450	350	8	450	1/8
4"	1 - 1000	700	8	1000	1/2
6"	1 1/2 - 2000	1400	8.5	2000	3/4
6" x 8"	1 1/2 - 2000	2000	10.5	2000	3/4

SIZE
The size of meters shall be determined by the nominal size (in inches) of the opening in the inlet and outlet flanges. Overall lengths of the meters shall be as follows:

Meter Size	Laying Length
2"	15 1/4"
3"	17"
4"	20"
6"	24"
6" x 8"	55 3/8"

CASE AND COVER
The maincase and cover shall be cast from an ANSI/NSF 61 certified no lead high copper alloy containing a minimum of 85% copper . The size, model, and arrows indicating direction of flow shall be cast in raised characters on the maincase and cover. The covers all contain a stainless steel calibration vane for the purpose of calibrating the turbine measuring element while the meter is in-line and under pressure. A test plug shall be located in the maincase or the cover for the purpose of field testing of the meter.

EXTERNAL BOLTS
Casing bolts shall be made of AISI Type 316 stainless steel.

CONNECTIONS
Maincases shall be flanged. The 2" meters shall be oval flanged and 3" through 6" sizes shall be round flanged per Table 4, AWWA C702.

REGISTERS
Separate magnetic-drive registers shall record the flow of the turbine and disc meters and their total will be the registration of the compound meter. The registers shall be permanently roll-sealed, straight reading indicating in cubic feet, gallons, or cubic metres. Registers shall include a center-sweep test hand, a low flow indicator, and a glass lens. The registers shall be serviceable without interruption of the meter's operation.

REGISTER BOXES
Register boxes and covers shall be of bronze composition. The name of the manufacturer shall be clearly identifiable and located on the register box covers.

REGISTER BOX SEALING
Registers shall be affixed to the cover by means of a plastic tamperproof seal pin that must be destroyed in order to remove the register.

METER SERIAL NUMBER
The meter serial number shall be imprinted on the meter flange or cover as well as the register box covers.

MEASURING CHAMBERS
The turbine measuring chamber shall be a self-contained unit, attached to the cover for easy removal. The turbine shaft shall be tungsten carbide with tungsten carbide inserts and shall rotate in removable graphite bushings. Thrust bearings shall be tungsten carbide.

The nutating disc chamber shall be a self-contained unit mounted on the cover and easily removable from the cover. It shall conform to AWWA Standard C700 for the following sizes: 2" and 3"-5/8" disc, 4"-3/4" disc, 6"-1" disc. The inlet to the disc chamber shall be a "single" opening of adequate size not to be susceptible to plugging and water restriction by water-borne debris.

UNITIZED MEASURING ELEMENT
A UME is a complete assembly, factory calibrated to AWWA standards, that includes the cover, registers, and both a turbine measuring element and a nutating disc chamber assembly. It shall be easily field removable from the meter body without the requirement of unbolting flanges.

INTERMEDIATE GEAR TRAIN - TURBINE SECTION
The intermediate gear train shall be directly coupled from the turbine rotor and magnetically coupled to the register through the meter cover. The gear train shall be housed in the turbine measuring chamber. All moving parts of the gear train shall be made of a self-lubricating polymer or stainless steel for operation in water.

AUTOMATIC VALVE
The automatic valve shall be of the spring-loaded, poppet type. All valve parts shall be made of no-lead high copper alloy containing a minimum of 85% copper, stainless steel, or a suitable polymer with a replaceable semi-hard EPDM rubber seat.

Only the cover must be removed to gain access to the valve for inspection or service.

The disc meter shall include a self-actuated valve that directs flow through the disc meter at low flow rates and through the turbine meter at high flow rates. At high flow rates, the self-actuated throttle valve shall restrict the flow through the disc meter to minimize wear.

STRAINER
A strainer shall be provided for the disc meter. It shall be easily removable and have an effective straining area of double the disc meter inlet.

REGISTRATION ACCURACY
Registration accuracy over the normal operating range shall be 98.5% to 101.5%. Registration at the crossover shall not be less than 95% with direct reading registers. Registration at the crossover shall not be less than 90% with absolute encoder or generator remote registers. Registration at the extended low flow rate shall not be less than 95%.

REMOTE CAPABILITY OPTIONS
- **Type A** — All meters shall be equipped with encoder remote registers per AWWA C707 and shall meet all AWWA C702 performance standards.
- **Type B** — All meters shall be equipped with generator remotes per AWWA C706, shall meet all AWWA C702 performance standards and shall include all hardware. Two-wire cable shall not be included in quoted meter prices.

Acceptable meters shall be Neptune TRU/FLO Compounds or approved equal.

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