

City of Leavenworth Request for Proposals Purchase of
Advanced Metering Infrastructure (AMI) System
RFI Request

Alternative Equipment Request
March 18, 2020

REQUEST:

Neptune 3" Tru/Flo Compound Meter to be approved as an alternate for the Quantity of
12 – 3" meters specified under Section 1 – Scope of Work

DECISION: APPROVED



Cold Water Meters/Compound Type

GENERAL

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

LEAD FREE LEGISLATION

There have been federal changes to the acceptable amount of lead in the drinking water system. Knowing that water meters have a life expectancy of approximately twenty (20) years, the Utility wishes to ensure that meters purchased meet the Safe Drinking Water Act (SDWA) per NSF/ANSI 372:

- > The Utility wishes to assure the safety of its drinking water.
- > The Utility wishes to safeguard its investment in metering infrastructure.
 - Meter inventory that does not meet the SDWA lead free requirements will have to be returned to the manufacturer or scrapped at a cost that the Utility is not willing to incur.
 - 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 and NSF/ANSI 372. Specifically:

- > Meters shall be made of “lead free” alloy as defined by NSF/ANSI 61 and NSF/ANSI 372.
- > Manufacturer shall provide a copy of a letter from NSF International on NSF letterhead documenting compliance with NSF/ANSI 61.
- > Manufacturer shall provide a copy of a letter from NSF International on NSF letterhead documenting compliance with NSF/ANSI 372, which allows a maximum weighted average lead content level of 0.25% of the wetted surface area.
- > Manufacturer will provide documentation that its US-based foundry uses only lead free materials in the manufacture of its water meters. This documentation shall be signed by an authorized officer of the company.

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.	Maximum Intermittent Flow (gpm)	Low Flow (gpm)
2"	½ - 200	200	8	200	⅙
3"	½ - 450	450	8	450	⅙
4"	1 - 1000	1000	8	1000	½
6"	1½ - 2000	2000	8.5	2000	¾
6" x 8"	1½ - 2000	2000	10.5	2000	¾

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:

Size	Laying Length
2"	15¼"
3"	17"
4"	20"
6"	24"
6" x 8"	55⅜"

CASE AND COVER

The maincase and cover shall be cast from an NSF/ANSI 61 and NSF/ANSI 372 certified lead free, high-copper alloy containing a minimum of 85% copper. The size, model, NSF certification and arrows indicating direction of flow shall be cast in raised characters on the maincase or cover. The covers all contain a stainless steel calibration vane for the purpose of calibrating the turbine measuring element while the meter is inline 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. The registers shall be serviceable without interruption of the meter's operation. Registers shall be guaranteed for at least ten (10) years.



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"- $\frac{5}{8}$ " disc; 4"- $\frac{3}{4}$ " 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 lead free, 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 90%.

Registration at the extended low flow rate shall not be less than 95%.

REMOTE CAPABILITY OPTIONS

All meters shall be equipped with encoder remote registers per AWWA C707 and shall meet all AWWA C702 performance standards.

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



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A PRODUCT SHEET OF NEPTUNE TECHNOLOGY GROUP

TRU/FLO® Compound Meter

SIZES: 2"HP, 3", 4", 6", AND 6"X8"



All TRU/FLO® Compound water meters meet or exceed the latest performance and accuracy requirements set by the AWWA C702, and maximum continuous flow rates may be exceeded by as much as 25% for intermittent periods.

Application

The TRU/FLO Compound water meter is designed to register wide flow ranges where varying flow rates are typical. TRU/FLO meters combine the low-flow sensitivity of a disc-type meter with the high-flow capacity of a turbine-type meter.

Operation

The hydraulic valve transfers flow smoothly between the disc section and turbine section of the meter, minimizing the loss of accuracy in the crossover range. The turbine measuring element registers high flows and the disc measuring element registers low flows, ensuring accurate measurement at all flow rates.

Construction

The TRU/FLO consists of a durable, lead free, high-copper alloy maincase, Neptune® High Performance (HP) or Trident® Turbine measuring element, Neptune T-10® chamber, and two magnetic-driven, roll-sealed registers.

The 6" x 8" TRU/FLO assembly consists of two 6" x 8" concentric reducers, a 6" Neptune strainer, and a 6" Neptune TRU/FLO Compound meter.

The lead free, high-copper maincase is corrosion-resistant, lightweight, and easy to handle.

A calibration vane allows field calibration of the UME to lengthen service life and to ensure accurate registration.

The two magnetic-driven, roll-sealed registers simplify the meter's design and reduce long-term maintenance by eliminating complicated combining drive mechanisms. For reading convenience, the registers can be mounted in any one of four positions on the meter.

Warranty

Neptune provides a limited warranty with respect to its TRU/FLO Compound water meters for performance, materials, and workmanship.

When desired, owner maintenance is easily accomplished by in-line replacement of major components, or a factory-calibrated UME.

KEY FEATURES

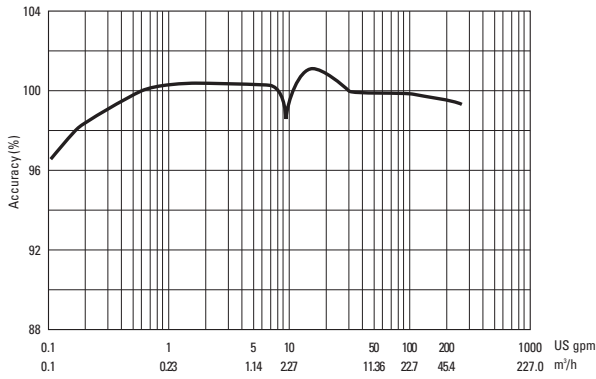
Minimum loss of accuracy in the crossover range increases revenue

Spring-loaded valve eliminates need for frequent adjustment and service

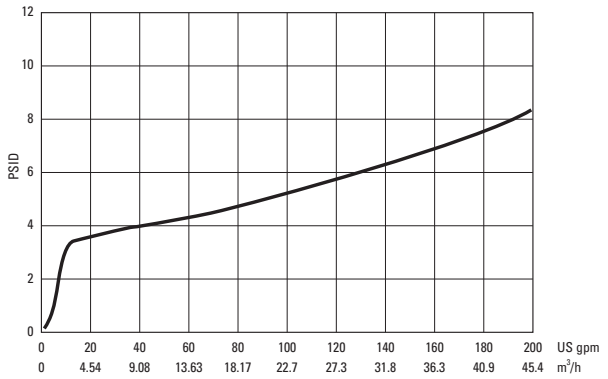
Combined turbine and disc measuring elements

- Industry-leading flow ranges at 98.5%–101.5% accuracy ensure maximum revenue
 - Direct coupling of rotor to gear train ensures accurate registration
 - Unitized Measuring Element (UME) makes maintenance easier and faster with less downtime
 - Calibration vane allows in-line service to extend life and ensure accurate registration
- Compact maincase**
- Made from lead free, high-copper alloy
 - NSF/ANSI 372 certified and NSF/ANSI 61 compliant
 - Lifetime guarantee
 - Compact, lightweight design provides for easy installation and in-line serviceability

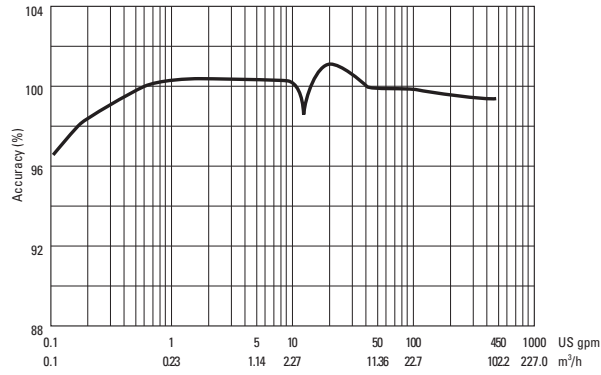
2" Accuracy



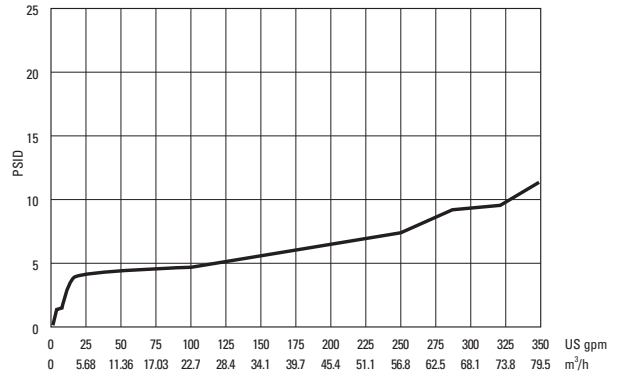
2" Pressure Loss



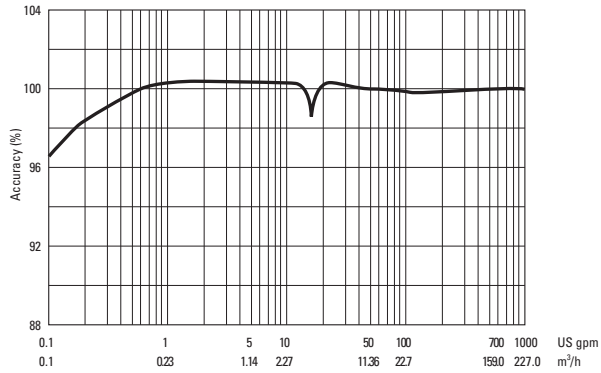
3" Accuracy



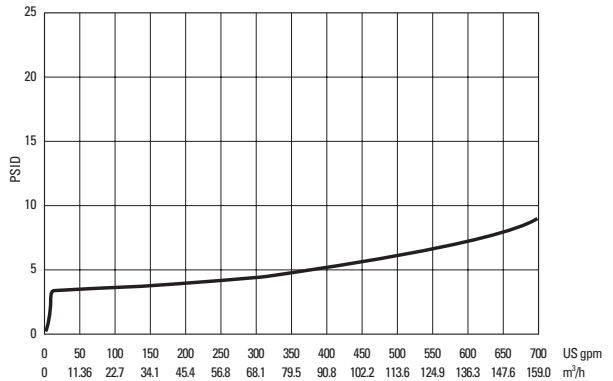
3" Pressure Loss



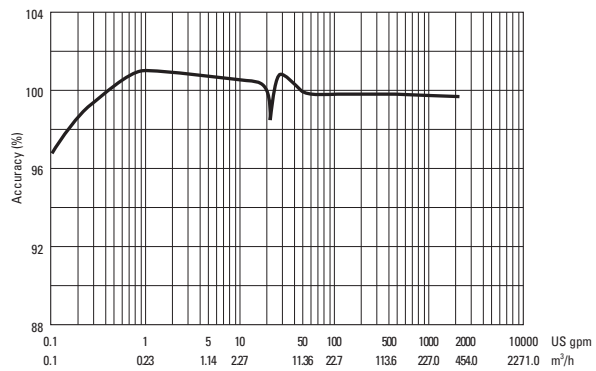
4" Accuracy



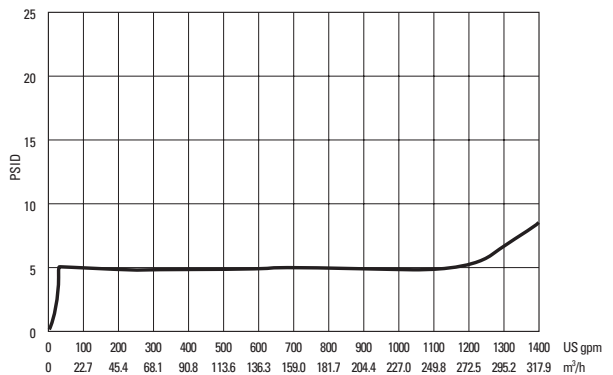
4" Pressure Loss



6" Accuracy



6" Pressure Loss



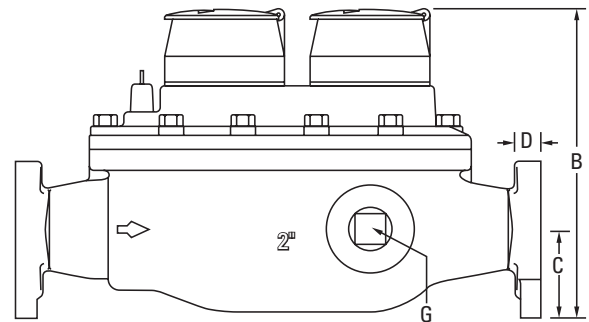
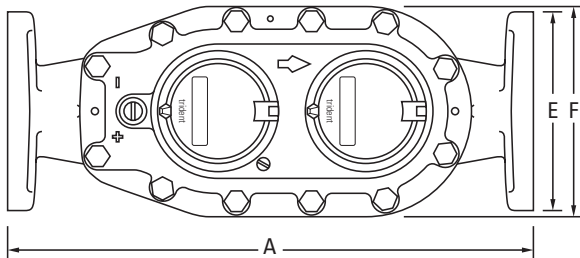
Operating Characteristics

Meter Size	Normal Operating Range @100% Accuracy (±1.5%)	AWWA Standard	Low Flow @ 95% - 101% Accuracy
2"	½ to 200 US gpm 0.11 to 45.4 m³/h	1 to 160 US gpm .227 to 36.34 m³/h	⅛ US gpm 0.03 m³/h
3"	½ to 450 US gpm 0.11 to 102.2 m³/h	2 to 350 US gpm .454 to 79.5 m³/h	⅛ US gpm 0.03 m³/h
4"	1 to 1000 US gpm 0.23 to 227.1 m³/h	3 to 600 US gpm .68 to 136.3 m³/h	½ US gpm 0.11 m³/h
6"	1 ½ to 2000 US gpm 0.34 to 454.2 m³/h	5 to 1350 US gpm 1.14 to 306.6 m³/h	¾ US gpm 0.17 m³/h
6" x 8"	1 ½ to 2000 US gpm 0.34 to 454.2 m³/h	16 to 1600 US gpm 3.63 to 363.4 m³/h	¾ US gpm 0.17 m³/h

*Accuracy at changeover 90% -103% per AWWA C702

Dimensions

Meter Size	B				C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	Flange Type	Weight lbs/kg
	A in/mm	E-CODER® OR ProCoder™ in/mm	ProRead™ in/mm	E-CODER®) R900i™ or ProCoder™) R900i™ in/mm							
2" HP	15 ¼ 387	9 ⅜ 238	9 ⅞ 243	9 ⅜ 238	2 ½ 64	1 ⅜ 21	5 ⅞ 149	6 152	1 ½ NPT 38	2" Oval 150lb	32 14.5
3"	17 432	11 ½ 292	11 ¾ 298	11 ½ 292	3 ¾ 95	⅝ 16	7 ½ 191	8 ½ 216	1 ½ NPT 38	3" ANSI 150lb	72 32.7
4"	20 508	13 ⅜ 340	13 ⅞ 345	13 ⅜ 340	4 ½ 114	1 ⅛ 17	9 229	9 ⅞ 232	2 NPT 51	4" ANSI 150lb	100 45.4
6"	24 610	16 ⅜ 416	16 ⅞ 421	16 ⅜ 416	5 ½ 140	1 25	11 279	12 ¾ 324	2 NPT 51	6" ANSI 150lb	208 94.3
6" x 8"	55 ⅜ 1407	16 ⅜ 416	16 ⅞ 421	16 ⅜ 416	5 ½ 140	1 25	11 279	12 ¾ 232	2 NPT 51	8" ANSI 150lb	460 208.50



Guaranteed Systems Compatibility

All Neptune TRU/FLO Compound meters are guaranteed adaptable to our ARB®V, ProRead™ (ARB VI), ProCoder™, E-CODER®, E-CODER®)R900i™, E-CODER®)R450i™, E-CODER®)L900i™, TRICON®/S, TRICON/E®3, and Neptune meter reading systems without removing the meter from service.

Systems Compatibility

Adaptability to all present and future systems for flexibility.

Registration

Registration (per sweep hand revolution)	Turbine Side		Disc Side
	2", 3", 4"	6", 6" x 8"	2", 3", 4", 6", 6" x 8"
1,000 US Gallons		✓	
1,000 Imperial Gallons		✓	
100 US Gallons	✓		
100 Imperial Gallons	✓		
100 Cubic Feet		✓	
10 US Gallons			✓
10 Imperial Gallons			✓
10 Cubic Feet	✓		
10 Cubic Metres		✓	
1 Cubic Foot			✓
1 Cubic Metre	✓		
0.1 Cubic Metre			✓

Register Capacity (6-wheel odometer)	Turbine Side		Disc Side
	2", 3", 4"	6", 6" x 8"	2", 3", 4", 6", 6" x 8"
1,000,000,000 US Gallons		✓	
1,000,000,000 Imperial Gallons		✓	
100,000,000 US Gallons	✓		
100,000,000 Imperial Gallons	✓		
100,000,000 Cubic Feet		✓	
10,000,000 US Gallons			✓
10,000,000 Imperial Gallons			✓
10,000,000 Cubic Feet	✓		
10,000,000 Cubic Metres		✓	
1,000,000 Cubic Feet			✓
1,000,000 Cubic Metres	✓		
100,000 Cubic Metres			✓

Specifications

Application

- Cold water measurement of flow in one direction

Maximum Operating Pressure

- 150 psi (1034 kPa)

Maximum Operating Temperature

- 80°F

Register

- Direct reading, center sweep, roll-sealed, magnetic drive with low-flow indicator

Measuring Element

- AWWA Class II Turbine, hydrodynamically balanced rotor
- Nutating disc

Options

Sizes

- 2" HP, 3", 4", 6", and 6" x 8"

Units of Measure

- U.S. gallons, imperial gallons, cubic feet, cubic metres

Register Types

- Remote reading systems: ProRead, ProCoder, E-CODER, E-CODER)R900i, E-CODER)R450i, E-CODER)L900i, TRICON/S, TRICON/E3

- Reclaim

Companion Flanges

- 2", 3", 4" bronze or cast iron
- 6", 6" x 8" cast iron

Strainer

- 2", 3", 4", 6" NSF/ANSI 372 and NSF/ANSI 61 lead free, high-copper alloy

