

DORSEY, GRAY, NORMENT & HOPGOOD

ATTORNEYS-AT-LAW

318 SECOND STREET

HENDERSON, KENTUCKY 42420

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STEPHEN D. GRAY  
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January 8, 2015

RECEIVED

JAN 09 2015

PUBLIC SERVICE  
COMMISSION

FEDEX

Mr. Jeff DeRouen  
Executive Director  
Public Service Commission of Kentucky  
211 Sower Boulevard  
Frankfort, Kentucky 40601

Re: Henderson County Water District (HCWD)  
Case No. 2014 - 00402

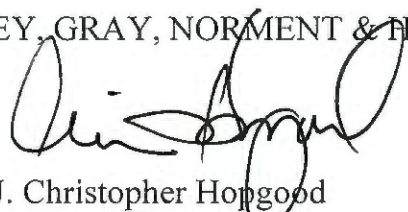
Dear Mr. DeRouen

Enclosed you will find the original and 10 copies of Responses to  
Commission Staff's First Request for Information.

Very truly yours,

DORSEY, GRAY, NORMENT & HOPGOOD

By

  
J. Christopher Hopgood

JCH/cds

Encls.

COPY/w/encls.

Mr. Peter Conrad  
Superintendent  
Henderson County Water District

COMMONWEALTH OF KENTUCKY

Before the Public Service Commission

RECEIVED

JAN 09 2015

PUBLIC SERVICE  
COMMISSION

In the Matter of:

THE APPLICATION OF HENDERSON COUNTY)  
WATER DISTRICT FOR CERTIFICATE OF ) CASE NO. 2014-00402  
PUBLIC CONVENIENCE AND NECESSITY )  
AND APPROVAL OF FINANCING )

RESPONSES TO COMMISSION STAFF'S FIRST REQUEST

FOR INFORMATION

Comes, PETE CONRAD, Superintendent of HENDERSON COUNTY  
WATER DISTRICT ("HCWD), and submits the following in response to Commission  
Staff's initial request for information:

1. Provide the following information regarding the meters that Henderson  
Proposes to purchase.
  - a. A copy of the September 30, 2013, request for proposal or the  
solicitation of bids identified in paragraph (d) of the application.

**RESPONSE:** See attached "Exhibit 1."

- b. A copy of the proposal or bid submitted by Neptune Equipment  
Company.

**RESPONSE:** See attached "Exhibit 2."

c. Refer to the Product Sheet for the T-10 Meter supplied in Exhibit A to Henderson's Verified Response to Deficiency Letter. The Product Sheet states that "Neptune provides a limited warranty with respect to its T-10 meters for performance, materials, and workmanship." State whether the meters purchased will be under a warranty. If applicable, provide a discussion of the terms and conditions of the warranty and include all supporting documentation. If there is no warranty, explain why a warranty is not required.

**RESPONSE: Copies of the warranties are attached as "Exhibit 3."**

**There is a warranty for the brass housing and a separate warrant for the registers.**

2. Is a radio frequency meter similar to a radio read meter? If not, identify differences.

**RESPONSE: Yes. They are the same.**

3. State whether Henderson plans to test the meters before placing them into service. If testing is not planned, state whether Henderson will be relying on the meter manufacturer's testing data. Provide the meter manufacturer's testing data.

**RESPONSE: Attached hereto is "Exhibit 4" which is a meter testing data sheet that accompanies each meter sold by Neptune. HCWD relies on Neptune's testing. Exhibit 4 also contains Neptune's Certificate of Conformance and product information.**

4. If Henderson will be relying on the meter manufacturer's testing data, state whether it be employing any sampling plan to verify the accuracy of new meters before placing them into service.

**RESPONSE: No.**

5. State whether the new meters will be used to replace meters of existing customers. If so, then provide a summary of the replacement plan.

**RESPONSE: The metered requested will be for replacing existing customer meters as well as for installation of meters for any new customers in areas/books that have been changed over to radio read meters. The replacement plan the HCWD is working on is to target areas/books that have the greatest percentage of meters that are over 10 years old and as such are in greater need of replacement.**

6. What does the purchase price of \$175.20 per meter, as given in the Application, include? Provide a breakdown.

**RESPONSE: It includes the brass meter body, with a register and a six (6) foot corded antenna. The brass body and register come connected. HCWD attaches the antenna. Neptune does not break the components down in cost.**

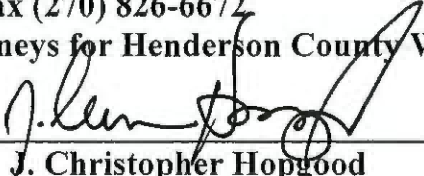
7. Provide a detailed explanation of the cost-effectiveness and the efficiency of this new meter system.

**RESPONSE: HCWD currently has 2,861 active radio read meters that can be read in approximately three (3) days' time. These books/areas**

still have a few manual read meters in them that slow the process down. The remaining manual read meters are being replaced, which will improve the amount of time it takes to read these areas/books. HCWD has 11 areas/books of meter routes. Some have higher concentrations of manual read meters than others. The addition of the existing 2,861 radio read meters has decreased the reading time from 14 days to three (3) days in those areas/books. At \$93.36 per day meter reading cost, this is a monthly savings of \$1,026.96. When we reach our goal of having 6,311 radio read meters (the total in the system) the savings to HCWD will triple. The replacement plan is to focus on the areas/books with the highest concentration of meters that are 10 years old or older, and then proceed to replace the newer meters. Elimination of meter reading duties frees these workers to address maintenance issues which will improve the system's reliability.

Additionally, the meters being replaced have been tested and for the 2014 year approximately 40% of the 1,544 meters tested were over 2% slow. Not only were these meters in need of being replaced, but they have been replaced with meters that are more accurate. It is difficult to quantify that savings.

**DORSEY, GRAY, NORMENT & HOPGOOD**  
318 Second Street  
Henderson, Kentucky 42420  
Telephone (270) 826-3965  
Telefax (270) 826-6672  
Attorneys for Henderson County Water District

By   
\_\_\_\_\_  
**J. Christopher Hopgood**  
[chopgood@dkgnlaw.com](mailto:chopgood@dkgnlaw.com)

**STATE OF KENTUCKY**

**COUNTY OF HENDERSON**

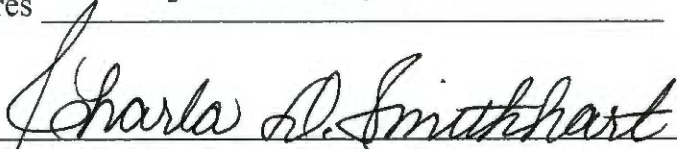
I, PETE CONRAD, Superintendent of **HENDERSON COUNTY WATER DISTRICT**, hereby verify that the foregoing responses contain true and correct information to best of my information and belief.



\_\_\_\_\_  
**PETE CONRAD**

The foregoing was signed, acknowledged and sworn to before me by **PETE CONRAD** this 8<sup>th</sup> day of January, 2015.

My commission expires September 29, 2017

  
\_\_\_\_\_  
Notary Public, State of Kentucky at Large

(seal)

## HENDERSON COUNTY WATER DISTRICT

### INVITATION TO BID

Sealed bids for radio water meters will be received at the office of the Henderson County Water District, 655 South Main Street (Post Office Box 655), Henderson, KY 42419, until September 30, 2013, at 10:00 A.M., CDT, at which time the bids will be publicly opened and read.

The meters specified are 3/4 inch X 5/8 inch radio read water meters. The meters must be compatible with the existing Neptune Radio Read Meters and the existing Henderson County Water District software. The bid price shall be per meter for a fixed price of up to 1,800 meters to be purchased over a 24 month period beginning on the date of bid opening.

For further information about the existing radio read meters and software contact Jim Skaggs at the Henderson County Water District, (270) 826-9802.

The contract for the radio read water meters will be awarded based on the lowest, responsive, responsible bid subject to the approval of the Henderson County Water District Board. The Henderson County Water District reserves the right to reject any or all bids or waive any informality in any bid.

**EXHIBIT**

1

tabbles



# Neptune Equipment

## Radio Read Meter Bid

To: Henderson Co Water District  
P.O. Box 655  
655 S. Main Street  
Henderson, KY 42419-0655

Date: 9/24/2013

Attn: Pete Conrad

### Radio Read Meter Bid

Start Date: September 30, 2013

End Date: September 30, 2015

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1,800	5/8"x 3/4" T-10 E-Coder@R900i Pit, Gs, PL bottom, with 6' antenna. (Stub antenna option at no additional cost)	\$ 175.20	\$ 315,360.00
	<b>Meters are to be purchased over a two year period starting Sept 30, 2013 and ending Sept 30, 2015</b>		
	Meters are NSF61 compliant. All Neptune meters purchased since 2001 meet NSF 61.		
		<b>Total:</b>	<b>\$315,360.00</b>

Edwin McDivitt  
Neptune Equipment  
**Serving water utilities**  
Office - 800-624-6975  
Mobile - 270-924-6975  
[emcdivitt@neptune](mailto:emcdivitt@neptuneequipment.com)





# E-Coder)R900i™ Warranty Statement

E-CODER ) R900i™

ARB® UTILITY  
MANAGEMENT  
SYSTEMS™

## I. Integrated E-Coder and R900 meter interface unit (IMIU)

Neptune Technology Group Inc. warrants that the a fully integrated self-contained solid state absolute encoder register and a radio frequency meter interface unit shall be free from defects in manufacture and design for a period of twenty (20) years for the electronics from the "date of shipment" (such period being the "Warranty Period"). Neptune shall not be responsible for any defects in the E-Coder)R900i (whether due to design, materials, manufacture, or otherwise) which manifest themselves after the expiration of the Warranty Period. Neptune will repair or replace a non-performing E-Coder)R900i free of charge for the first ten (10) years and at a prorated replacement cost of the current list price during the remaining ten (10) years per the table.

## II. Integrated E-Coder and R900 meter interface unit (IMIU) batteries

Neptune warrants that any Neptune-supplied batteries installed in the fully integrated self-contained solid state absolute encoder register and a radio frequency meter interface unit (the "Batteries") shall be free from defects in manufacture and design for a period of twenty (20) years from the "date of shipment" (such period being the "Battery Warranty Period"). Neptune shall not be responsible for any defects in, or failure of, batteries (whether due to design, materials, manufacture, or otherwise) which occur after the expiration of the Battery Warranty Period. Neptune will repair or replace a non-performing E-Coder)R900i Battery free of charge for the first ten (10) years and at a prorated replacement cost of the current list price during the remaining ten (10) years per the table.

## III. Warranties are inapplicable under certain conditions

This warranty does not include field replacement labor or materials costs, which are the responsibility of the utility. This warranty does not apply if product is placed in non-recommended installations; may have been repaired with parts not recommended by Neptune; converted, altered or connected by other than Neptune recommended procedures; is used with other than genuine Neptune meter registers and components or read by equipment not approved or licensed by Neptune; or damaged due to improper care or maintenance, or improper periodic testing (please refer to E-Coder)R900i installation manual and quick install guides). This warranty does not apply to any MIU that has been damaged by, or subjected to, conditions which, in the opinion of Neptune, have affected the E-Coder)R900i MIU's ability of performance, including but not limited to: misuse; improper handling; application or installation; excessive operating conditions; tampering or unauthorized repairs and modifications; accidental or intentional damage; or acts of God. In no event shall Neptune be liable for special, incidental, indirect or consequential damages, including, without limitation, lost revenue.

THE ABOVE WARRANTY FOR THE MIU AND NEPTUNE-SUPPLIED BATTERY IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY NEPTUNE WITH RESPECT TO THE E-Coder)R900i MIU AND NEPTUNE-SUPPLIED BATTERY. **ALL OTHER WARRANTIES, CONDITIONS, TERMS, REPRESENTATIONS, OR OTHER LEGALLY OPERATIVE PROVISIONS CONCERNING THE MIUs AND NEPTUNE-SUPPLIED BATTERY ARE HEREBY EXPRESSLY EXCLUDED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY, CONDITION, TERM, AND REPRESENTATION OR OTHER LEGALLY OPERATIVE PROVISION AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** THIS PARAGRAPH IS EXPRESSLY INTENDED TO EXCLUDE FROM THIS CONTRACT ALL STATUTORY AND COMMON LAW WARRANTIES TO THE MAXIMUM EXTENT PERMITTED BY LAW. TO AVOID ANY AMBIGUITY OR MISUNDERSTANDING, ALL PROBLEMS ARISING WITH AN MIU OR NEPTUNE-SUPPLIED BATTERY AFTER THIS POINT ARE BUYER'S RESPONSIBILITY. NEPTUNE'S LIABILITY SHALL IN NO EVENT EXCEED THE PURCHASE PRICE. NEPTUNE SHALL NOT BE SUBJECT TO AND DISCLAIMS THE FOLLOWING: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY, (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY NEPTUNE, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, SPECIAL, MULTIPLE, EXEMPLARY, AND PUNITIVE DAMAGES WHATSOEVER.

W E CODER R900i 08.09

Year of Failure	Battery Replacement Cost*
1-10	Full replacement
11	30%
12	35%
13	40%
14	45%
15	50%
16	55%
17	60%
18	65%
19	70%
20	75%

\*Replacement cost percentages will be applied towards published list prices in effect for the year product is accepted by Neptune under warranty conditions. Replacement batteries are warranted for one (1) year after date of shipment or balance of original battery warranty, whichever is greater.



**NEPTUNE**  
TECHNOLOGY GROUP INC.



# Neptune T-10, HP Turbine, TRU/FLO® Compound Cold Water Meters Warranty

**ARB®** UTILITY  
MANAGEMENT  
SYSTEMS™

**EXHIBIT**

3

Page 2 of 3

tabbles

## 1. Terms of Limited Warranty.

With respect to its Neptune T-10, HP TURBINE, TRU/FLO® Compound Water Meters (collectively the "Water Meters"), Neptune Technology Group Inc. ("Neptune") warrants the following on meters sold on or after 11/1/92:

The Water Meters will be, at the later of (i) the date of original purchase from Neptune or (ii) the date of original shipment from Neptune-authorized distributor of Water Meters (that later date is referred to as "the Date of Shipment") and will remain for a period of eighteen (18) months from the Date of Shipment, or twelve (12) months from date of installation, whichever comes first, free from manufacturing defects in workmanship and material.

- (a) Maincase. The no-lead high copper alloy or Brass maincase of the Water Meters will be at the Date of Shipment free from manufacturing defects in workmanship and material for the life of the Water Meter.
- (b) Frost Protection. All Neptune T-10 Cold Water Meters shipped with a synthetic polymer or cast iron bottom cap will, commencing upon the Date of Shipment, be warranted against chamber damage for a period of ten (10) years.
- (c) Registers. Standard, roll sealed registers of the Water Meters will be at the Date of Shipment, and shall remain for the following periods, free from manufacturing defects in workmanship and material for a period of ten (10) years. The ARB®, ProRead™ (ARB VI), and E-Coder® (ARB VII) system registers are warranted for ten (10) years from Date of Shipment. All ProRead encoder receptacles shipped after January 1, 2001 shall be warranted for five years from the Date of Shipment. All other components and parts are covered under Neptune's standard one-year material and workmanship guarantee.
- (d) Meter Accuracy for Neptune T-10. Neptune T-10 Meters are warranted to meet or exceed, as listed herein, accuracy standards of the AWWA Standard C700-95 for a period of: (i) five (5) years from Date of Shipment for 5/8", 3/4" and 1" meters; (ii) for a period of two (2) years from the Date of Shipment for 1 1/2" and 2" meters; or (iii) the applicable registration shown below, whichever occurs first. Neptune further guarantees that the Neptune T-10 will perform to at least Repaired Meter Accuracy Standards, according to AWWA Manual M-6 Chapter 5 (1999) Table 5.3 for an additional ten (10) years or the registration shown below, whichever occurs first.
- (e) Meter Accuracy for HP Turbine and TRU/FLO. The HP Turbine and TRU/FLO Compound Cold Water Meters will perform, for a period of one (1) year from the Date of Shipment, to American Water Works Association ("AWWA") accuracy standards for new water meters.

SIZE	EXTENDED LOW FLOW ACCURACY	NEW METER ACCURACY	REPAIRED METER ACCURACY
5/8 & 5/8" x 3/4"	1/8 US gpm @ 95% 5 years or 500,000 gallons	500,000 gallons	1,500,000 gallons
3/4"	1/4 US gpm @ 95% 5 years or 750,000 gallons	750,000 gallons	2,250,000 gallons
1"	3/8 US gpm @ 95% 5 years or 1,000,000 gallons	1,000,000 gallons	3,000,000 gallons
1 1/2"	3/4 US gpm @ 95% 2 years or 1,600,000 gallons	1,600,000 gallons	5,000,000 gallons
2"	1 US gpm @ 95% 2 years or 2,700,000 gallons	2,700,000 gallons	8,000,000 gallons

W METER 03.11

 **NEPTUNE**  
TECHNOLOGY GROUP INC.



## 2. Warranty Return.

If a Neptune Water Meter fails an accuracy test during an applicable warranty period, it may be returned to Neptune for repair or replacement at Neptune's option. An accuracy test shall be conducted by the customer according to AWWA standards. Any meter being returned for repair to Neptune under this performance guarantee must be returned with a copy of the customer's test results. If the meter is returned to Neptune without a copy of the test results or if Neptune's factory test shows the meter to meet current AWWA standards, the customer will be charged a nominal testing fee by Neptune in such cases. Neptune will repair or replace the meter at Neptune's option after the meter has been tested by Neptune. Meters repaired or replaced under the performance guarantee will be guaranteed to perform to AWWA repaired meter accuracy standards.

## 3. Warranties are exclusive.

The warranties set forth in this certificate of warranty are in lieu of any other warranty, guarantee, or representation, whether expressed or implied, including without limitation, the warranty of merchantability and the warranty of fitness for a particular purpose.

## 4. Damages limited to costs of replacement and repair.

If the Water Meter fails to meet the warranties set forth in Paragraph 1 of this Certificate of Warranty, Neptune, at its option shall, without charge of labor or materials, repair or replace the Water Meter or part thereof, provided that (a) the Water Meter is delivered to a Neptune representative, (b) the Water Meter is accompanied by a Return Material Authorization (RMA), and (c) all costs of delivery to Neptune are assumed by the purchaser of the Water Meter. Neptune's liability is limited to its costs of replacement and repair of the defective water meter. Damages resulting from miscalculation of water usage or lost revenue or profit are not recoverable from Neptune. It is the responsibility of the customer to periodically verify the operation and accuracy of its meters.

## 5. Warranties are inapplicable under certain conditions.

The warranties set forth in this Certificate of Warranty do not apply to any Water Meter that has been damaged by, or subjected to, conditions which, in the opinion of Neptune, have affected the Water Meter's ability of performance, including but not limited to: misuse; improper handling, application or installation; excessive operating conditions; foreign materials in the water; aggressive water conditions; tampering or unauthorized repairs or modifications; accidental or intentional damage; acts of God. This Certificate of Warranty shall not apply if product is placed in non-recommended installation, is connected or altered by other than Neptune recommended procedures, is used with other than genuine Neptune meter registers and components, or read by equipment not approved or licensed by Neptune. Neptune makes no claims concerning operability and/or compatibility or third party reading systems. In addition, this Certificate of Warranty shall not apply if third party reading equipment is believed to have caused damage to the meter or register. In order to determine its liability, if any, under this Certificate of Warranty, Neptune shall have the right to inspect any Water Meter or part thereof that is claimed to be defective at Neptune or other location designated by Neptune.

NEPTUNE'S LIABILITY WITH RESPECT TO BREACHES OF THE FOREGOING LIMITED WARRANTY SHALL BE LIMITED AS STATED HEREIN. NEPTUNE'S LIABILITY SHALL IN NO EVENT EXCEED THE PURCHASE PRICE. NEPTUNE SHALL NOT BE SUBJECT TO AND DISCLAIMS THE FOLLOWING: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY NEPTUNE, OR ANY UNDERTAKINGS, ACT OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, SPECIAL, MULTIPLE, EXEMPLARY, AND PUNITIVE DAMAGES WHATSOEVER.



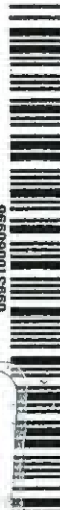
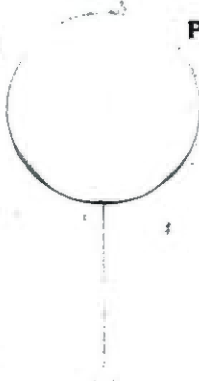
**HIGH**  
99.3

**INT**  
100.6

**LOW**  
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12/09/14  
11:30 PM

Pallet # 11  
Position # 1



5/8 x 3/4  
**68000139**

A horizontal barcode located below the text "68000139".





NATIONAL TYPE EVALUATION PROGRAM

# Certificate of Conformance

for Weighing and Measuring Devices

**For:**

Meter Indicating Volume  
Domestic Water Meter  
Models: Trident 10 and T-10  
Sizes: 5/8" to 2"

**Submitted By:**

Neptune Technology Group Inc.  
1600 Alabama Highway 229  
Tallahassee, AL 36093  
Tel: 334-283-7298  
Fax: 334-283-7293  
Contact: Andre Noel  
Email: [anoel@neptunetg.com](mailto:anoel@neptunetg.com)  
Website: [www.neptunetg.com](http://www.neptunetg.com)

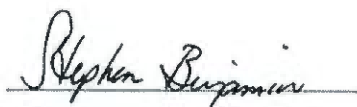
**Standard Features and Options**


- Bronze Case
- Nutating Disc
- Sealed Register with Magnetic Drive
- Direct Reading Register with Low Flow Indicator
- Registers in Gallons or Cubic Feet
- 150 PSI Maximum Operating Pressure
- Register Models:
  - E-Coder – Liquid Crystal Display (LCD) Register
  - E-Coder R900i LCD Register with Integrated Radio Frequency (RF) (RF not evaluated.)
  - ProRead Automatic Reading and Billing (ARB) Encoder Register with Low Flow Indicator (ARB communication link was not evaluated.)

**NOTE:** The American Water Works Association cautions against installing cold-water meters in such locations where the line temperature consistently exceeds 80 °F (27 °C). These devices are to be installed where they are protected from excessive heat and freezing conditions.

Approved for use in "Horizontal" or "Vertical" flow positions.

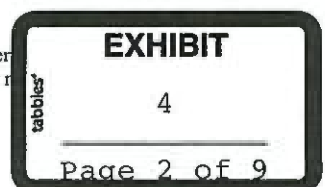
This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

  
Stephen Benjamin  
Chairman, NCWM, Inc.

  
Kurt Floren  
Committee Chair, National Type Evaluation Program Committee  
Issued: October 29, 2012

1135 M Street, Suite 110 / Lincoln, Nebraska 68508

The National Conference on Weights and Measures (NCWM) does not approve, recommend or endorse any proprietary product or material, or a class or group. Results shall not be used in advertising or sales promotion to indicate explicit or implicit endorsement of the product or material.





**Neptune Technology Group Inc.**  
Meter Indicating Volume / Trident 10 and T-10

**Application:** Approved for use as a domestic water meter in utility billing, commercial metering systems and legal sub-metering applications.

**Identification:** The serial number is prefaced with "S/N" or "SN" engraved on the inlet or outlet of the meter body. The flow direction indications are cast into the outlet of the meter body. The Neptune model number T-10 prefaced with "Model NO", model size and NTEP CC number are on the register face.

**Sealing:** The register is secured to the main case via a tamper proof seal pin. All meters are equipped with at least one drilled head bolt that secures the bottom cap to the meter.

**Test Conditions:** The emphasis of the evaluation was on the device design, marking requirements, and performance. Digital pictures were provided to verify the NTEP CC number was correctly displayed on the meter register. The Neptune Model Trident 10 meter is the same as the Model T-10 meter. Model Trident 10 sizes 5/8"x3/4" through 2" were submitted for evaluation. A lower profile meter body for installations in smaller locations was also evaluated. Three 5/8" x 3/4" meters with the lower profile meter body and cubic foot registers were submitted and tested for accuracy. An E-Coder LCD display register and an E-Coder R900i LCD display register with integrated RF were evaluated. Two 5/8" x 3/4" meters with cubic foot and gallon registers were submitted and tested for accuracy. Permanence tests were also conducted after more than 200 000 gallons of throughput was completed.

An ARB system was submitted for type evaluation installed on a Neptune Model T-10 water meter. A joint review of the system components by the National Institute of Standards and Technology and the California Division of Measurement Standards was conducted to evaluate specification compliance and to determine which point of indication or recorded representation should be considered adequate in expressing the final registration value. The "ProRead" register indication (analog) shall represent the final unit of measure for the system. Accessibility to the register for a direct reading (analog) shall be provided when necessary.

**Evaluated By:** J. Roach (CA)

**Type Evaluation Criteria Used:** *NIST Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, [2012] Edition. *NCWM Publication 14 Measuring Devices*, [2012] Edition.

**Conclusion:** The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

**Information Reviewed By:** J. Truex (NCWM)

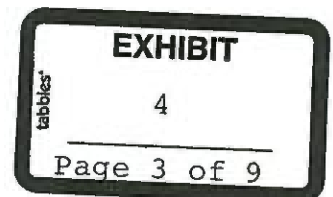
**Example(s) of Device:**



Gallons Register 5/8" Size



Cubic Feet Register 1 1/2" - 2" Size

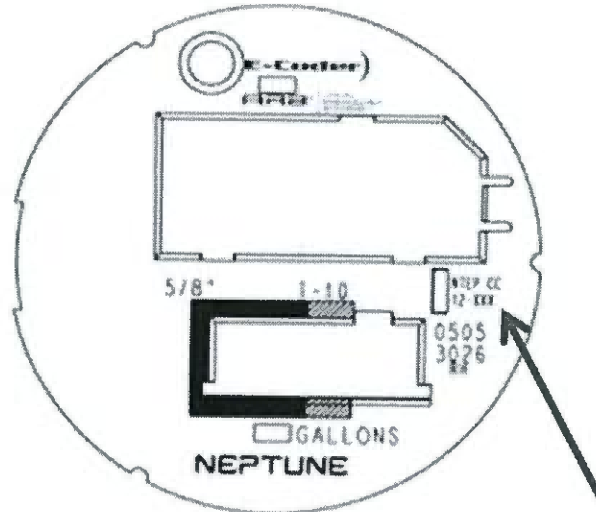




**Neptune Technology Group Inc.**  
Meter Indicating Volume / Trident 10 and T-10



**Cubic Feet ProRead Register**



**Gallon E-Coder with NTEP CC 12-XXX**



**Photograph of the Complete T-10 Lower Profile Meter Body**





**Neptune Technology Group Inc.**  
Meter Indicating Volume / Trident 10 and T-10



Cubic Feet E-Coder. The solar panel supplies the power to light up the display.



Gallon E-Coder R900i Registers. A flashlight shined at the arrow location enables the LCD display for three minutes.



## COLD WATER METERS / DISPLACEMENT TYPE MAGNETIC DRIVE 5/8" - 2"



### SPECIFICATIONS

#### GENERAL

All cold water meters (displacement type - magnetic drive 5/8" - 2") furnished shall be produced from an ISO 9001 manufacturing facility, conform to the "Standard Specifications for Cold Water Meters" C700 latest revision issued by AWWA or as otherwise stated, and be certified to the National Conference on Weights and Measures (NCWM) regulatory standards.

#### LEAD FREE LEGISLATION

Federal changes are on the horizon governing the acceptable amount of lead in the drinking water system. Knowing that water meters have a life expectancy of approximately 20 years, the utility wishes to ensure that meters purchased today will meet the Safe Drinking Water Act (SDWA) per NSF 372 that will become effective in January 2014 for the following reasons:

- The utility wishes to assure the safety of its drinking water.
- The utility wishes to safeguard its investment in metering infrastructure.
  - As of January 4, 2014, meter inventory that does not meet the SDWA (NSF 372) lead free requirements will have to be returned to the manufacturer or scrapped at a cost that the utility is not willing to incur.
  - After January 4, 2014, 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, Annex G, and Annex F. Specifically:

- Meters shall be made of "lead free" alloy as defined by NSF/ANSI 61, Annex G and Annex F.
- Manufacturer shall provide a copy of a letter from the NSF on NSF letterhead documenting compliance with NSF/ANSI 61, Annex G, which allows a maximum weighted average lead content level of 0.25 percent of the wetted surface area.

#### NATIONAL TYPE EVALUATION PROGRAM CERTIFICATION (NTEP)

The Water Research Foundation (formerly AWWA Research Foundation) identified in its "Accuracy of In-Service Water Meters at Low and High Flow Rates" study that all meter types are not created equal and many manufacturers that advertise compliance with AWWA standards do not consistently meet them. As a result, the utility requires that all residential and intermediate meter sizes and register types supplied be certified to the National Conference on Weights and Measures (NCWM) regulatory standards. Specifically:

- Manufacturer shall provide a copy of the National Type Evaluation Program (NTEP) Certificate of Conformance (COC) certifying and listing the meter size and register type as legal for trade and;
- The NTEP COC shall list the meter size and register type being supplied as approved for use in utility billing, commercial metering, and legal sub-metering applications.

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**TYPE**

Only magnetic-driven, positive displacement meters of the flat nutating disc type will be accepted because of enhanced low flow accuracy performance.

**SIZE, CAPACITY, LENGTH**

The size, capacity, and meter lengths shall be as specified in AWWA Standard C700 (latest revision). The maximum number of disc nutations is not to exceed those specified in AWWA C700 latest revision.

The meter maincase and cover shall be cast from NSF/ANSI 61, Annex G and Annex F certified lead free alloy containing a minimum of 85 percent copper. The serial number should be stamped between the inlet or outlet port of the maincase and the register. Maincase markings shall be cast raised and shall indicate size, model, direction of flow, and NSF 61 certification. Plastic maincases are not acceptable.

Maincases for  $\frac{5}{8}$ ",  $\frac{3}{4}$ ", and 1" meters shall be of the removable bottom cap type with the bottom cap secured by four (4) bolts on  $\frac{5}{8}$ " and  $\frac{3}{4}$ " sizes and six (6) bolts on the 1" size. Intermediate meter maincases shall also be made of the same lead free brass material in sizes 1 $\frac{1}{2}$ " and 2" with a cover secured to the maincase with eight (8) bolts. Meters with a frost plug, a screw-on design, or no bottom cap shall not be accepted in  $\frac{5}{8}$ " - 1" sizes. The  $\frac{5}{8}$ " meters shall have a synthetic polymer or cast iron bottom cap option.

All lead free maincases shall be guaranteed free from manufacturing defects in workmanship and material for the life of the meter.

All meters must be adaptable to a field programmable absolute encoder register without interruption of the customer's service.

**BOLTS**

All maincase bolts shall be of 300 series non-magnetic stainless steel to prevent corrosion.

**DIRECT READ STANDARD REGISTER**

The register shall be of the straight reading sealed magnetic drive type and shall contain six (6) numeral wheels. Registers must be roll sealed and dry. All direct reading register cups shall be copper to prevent corrosion and be covered with a high-strength, impact-resistant flat glass lens to prevent breakage. The lens shall be positioned above the register box to allow for runoff of debris. The register lid shall overlap the register box to protect the lens. The register retaining ring shall be designed to absorb impact from the register. Register boxes and lids shall be of high-strength synthetic polymer or approved equivalent. All registers shall have the size, model, and date of manufacture stamped on the dial face. The dial shall have a red center sweep hand and shall contain one hundred (100) equally divided graduations at its periphery.

The register must contain a low flow indicator with a 1:1 ratio to disc nutations to provide leak detection.

Registers shall be secured to the maincase by means of a plastic tamper-proof seal to allow for inline service replacement. Register seal screws are only accepted when supplied with attached sealing wire to at least one bottom cap bolt with seal wire holes of not less than  $\frac{3}{32}$ " in diameter.

Registers shall be guaranteed for at least ten (10) years. All meters will be guaranteed for one (1) year on material and workmanship.

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### MEASURING CHAMBER

The measuring chamber shall be of a two-piece, snap-joint type with no fasteners allowed. The chamber shall be made of a non-hydrolyzing synthetic polymer.

The control block shall be the same material as the measuring chamber and be located on the top of the chamber. The control block shall be located after the strainer.

The measuring chamber outlet port shall be sealed to the maincase outlet port by means of an O-ring gasket.

The flat nutating disc shall be a single piece made from non-hydrolyzing synthetic polymer and shall contain a type 316 stainless steel spindle. The nutating disc shall be equipped with a synthetic polymer thrust roller located within the disc slot. The thrust roller head shall roll on the buttressed track provided by the diaphragm.

The chamber shall be warranted for ten (10) years against freeze damage if the meter has been equipped with a frost-proof cast iron or synthetic polymer bottom cap.

### STRAINERS

All meters shall contain a removable polypropylene plastic strainer screen. The strainer shall be located near the maincase inlet port, before the measuring chamber. The strainer shall also function as the device that holds the measuring chamber in place within the maincase. Straps or other types of fasteners shall not be accepted.

### PERFORMANCE

To ensure accuracy, each meter must be accompanied by a factory test tag certifying the accuracy at the flows required by AWWA C700.

All meters shall be warranted as follows:

Size	Low Flow	Low Flow New Meter Accuracy	Low Flow Repaired Meter Accuracy
5/8"	1/2 gpm @ 95%	5 Yrs or 500,000 gallons	15 Yrs or 1,500,000 gallons
3/4"	1/4 gpm @ 95%	5 Yrs or 750,000 gallons	15 Yrs or 2,250,000 gallons
1"	3/8 gpm @ 95%	5 Yrs or 1,000,000 gallons	15 Yrs or 3,000,000 gallons
1 1/2"	3/4 gpm @ 95%	2 Yrs or 1,600,000 gallons	12 Yrs or 5,000,000 gallons
2"	1 gpm @ 95%	2 Yrs or 2,700,000 gallons	12 Yrs or 8,000,000 gallons

Normal meter operating range shall be as follows:

Size	Accuracy Range ± 1.5%
5/8"	1/2 - 20 gpm
3/4"	3/4 - 30 gpm
1"	1 - 50 gpm
1 1/2"	2 - 100 gpm
2"	2 1/2 - 160 gpm

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## MANUFACTURER

Meters and meter parts shall be manufactured, assembled, and tested within the United States. Manufacturers may be required to provide proof of where and what percentage of the meter register, chamber, and maincase is manufactured in the United States.

Manufacturers shall have a minimum of fifteen (15) years of field and production experience with all sizes and models quoted.

Manufacturers shall provide only one (1) model of meter which complies with these specifications. Suppliers must have been manufacturing meters for at least one hundred (100) years.

## SYSTEMS GUARANTEE

All meters shall be guaranteed upgradeable to the following Neptune systems without interruption of the customer's service.

**ProRead™ (ARB® VI) AutoDetect Absolute Encoder**

**E-Coder® (ARB VII) Solid State Absolute Encoder**

**R900®**

**FLOSEARCH® II**

**TRICON/E®3**

**TRICON®**

## REMOTE CAPABILITY OPTIONS

All meters shall be equipped with encoder remote registers per AWWA C707 and meet all AWWA C700 performance standards.

Acceptable meters shall be Neptune T-10 or approved equal.

Neptune Technology Group Inc.  
1600 Alabama Highway 229  
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