

Meter-Master

Flow Product Appendices

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Appendix A

SUGGESTED FLUX SENSOR LOCATIONS

Introduction

This Appendix is for use with the Meter-Master flux sensor. The Neptune FloSearch Transmitter provides a pulse output for logging from Neptune meters; see Appendix B for installation. The Meter-Master pulse input cable (purchased separately) allows logging from meters that have a pulse output; see Appendix C for installation.

GENERAL GUIDELINES

- Review the “Troubleshooting” section for additional information concerning specific meters.
- Pictorial representations of the suggested sensor locations appear at the end of this appendix and in the Meter-Master Quick Reference.
- Sensus SRH and SRM meters require the Sensus Compound Adapter (rental only). This same adapter is compatible with Schlumberger/Neptune turbine and ABB/Kent (U.S. models) turbine meters and increases the resolution of data recorder from these meters by a factor of 12. (See Appendix C)
- Some Hersey turbine meters (see table below) require a modified gear train in order to attain compatibility. These gear trains are available as accessories.
- Unless instructed otherwise, place the sensor against a side of the meter which is not over the pipe. Except for Sensus Turbos, Hersey MHR 2”-3”, and Badger Recordall Compounds (turbine side), position the sensor so that the sensor cable extends directly toward the ground or straight up. In the case of Sensus Turbos, Hersey MHR 2”-3”, and Badger Recordall Compounds (turbine side), the cable should extend in a horizontal instead of vertical direction because the drive magnet is in a vertical rather than a horizontal plane.
- Typically, it is easy to get consistently accurate data from any PD meter. Some turbine meters require a more specific sensor location than others.
- We recommend that you familiarize yourself with the optimum sensor locations on a meter test-bench before using the Meter-Master in the field. With water flowing, move the sensor around a meter to determine the size of that meter's “sweet spot”. If

available, use either the Meter-Master's flashing LED or the Realtime Display option in the Meter-Master software to verify that you are getting a good signal.

SUGGESTED SENSOR LOCATIONS TABLE

An asterisk (“*”) preceding a turbine meter indicates that each magnetic pulse equals a relatively large quantity of water as compared to other meters. In such cases, the signal light is programmed to flash each time it sees a pulse instead of each 1/20 of a dial revolution. The number in parentheses after the meter size indicates the gallon equivalent of each magnetic pulse for that meter. If you are using a Neptune FloSearch Transmitter, divide the gallons shown by two. Use the following conversion table for other units of measure:

1 Gallon = 0.1337 Cubic Feet (1 Cubic Foot = 7.48 Gallons)

1 Gallon = 0.8327 Imp. Gallons (1 Imp. Gallon = 1.2009 Gallons)

1 Gallon = 0.003785 Cubic Metres (1 Cubic Metre = 264.2 Gallons)

1 Gallon = 3.785 Litres (1 Litre = 0.2642 Gallons)

Signal Code Identification for the following table:

1. Signal should be clear.
2. Signal is sensitive to location; may require adjustment.
3. Signal is weak. Reading may not be possible.
4. Location untested by F. S. Brainard & Co.; based on knowledge of similar models.

NEPTUNE (SCHLUMBERGER)

If using the Neptune FloSearch Transmitter instead of the flux sensor, see Appendix B for installation.
FloSeach Transmitter LED flash is 1/2 flux sensor values.

Model #	Code	Sensor Location
Trident 8 or Triseal All sizes: 5/8", 3/4", 1", 1-1/2", 2"	1	Place sensor flat against side of register with top of sensor flush with top of register. Alternatively, place sensor flat on top of register (data will be 50% due to 2-pole instead of 4-pole signal). See "Troubleshooting" section for more information. (Similar to Fig. 7)
Trident 10 All sizes: 5/8", 3/4", 1", 1-1/2", 2"	1	Same as Trident 8.
* Trident Turbine All sizes: 2" (4.34), 3" (6.92), 4" (12.50), 6" (43.10), 8" (80.32), 10" (125)	1	Place sensor flat against side of register with top of sensor flush with top of register. (Fig. 6)
* HP Turbine All sizes: 1-1/2" (3.28), 2" (3.28), 3" (1.79), 4" (2.65), 6" (27.5), 8" (26.46), 10" (26.46), 12" (26.46), 16" (264.6), 20" (264.6)	1	Same as Trident Turbine.
* TRU/FLO (all sizes, both high and low flow sides)	2	We strongly recommend using Meter-Masters with Neptune FloSearch Transmitters when logging from Neptune compound meters. The registers are too close together for the flux sensor to pick up a clean signal without interference from the other register. FloSearch Transmitters can be ordered from Neptune (PN: 60337-000). For installation instructions, see Appendix B. (If you must use the Meter-Master flux sensor, see section 5.4.1 in the manual.)
* Protectus III All sizes: 4" (12.5), 6" (43.1), 8" (80.32), 10" (125)	1	Same as Trident Turbine. Ensure that sensor is located against side of register farthest from PD side. Low Side: see instructions for appropriate meter.
* HP Protectus III All sizes: 4" (2.65), 6" (26.46), 8" (32.81), 10" (37.52)	1	Same as Protectus III.
Fire Hydrant Meter (3")	1	Same as Trident Turbine.

LED Flash: * = One flash for each pulse (volume shown in gallons). (blank) = One flash for each 1/20 dial revolution.

Signal Code: 1 = Clear 2 = Sensitive 3 = Weak 4 = Untested

SENSUS (INVENSYS / ROCKWELL)

“Adapter” indicated is Sensus Compound Adapter.

Model #	Code	Sensor Location
SR Sizes: 5/8”, 3/4”, 1”	1	Place sensor flat against shoulder of meter body with top of sensor close to register (or flat on top of register for a stronger signal). (Figs. 5 or 3)
SR Sizes: 1-1/2”, 2”	2	Place sensor flat on top case at base of register (or flat on top of register for a stronger signal). (Figs. 4 or 3)
SRII All sizes: 5/8”, 3/4”, 1”	1	Place sensor flat against side of register. (Fig. 1)
Turbo Sizes: W-120 (1-1/2”), W-160 (2”), W-350 (3”), W-1000 (4”), W-2000 (6”)	1	Place sensor flat against side of meter body with cable extending in a horizontal instead of vertical direction. (Fig. 8)
Turbo Sizes: W-3500 (8”), W-5500 (10”)	2	Same as smaller Turbos except make sure sensor is centered on the side to get as close to the rotor magnet as possible.
Turbo Size: W-10000 (16”)	1	Place sensor flat against the bottom of the register with the sensor cables going straight up or down. (Similar to Fig. 4)
Omni: Cannot be used with a flux sensor; requires a Meter-Master pulse input cable (see Appendix C).		
SRH (with adapter) All sizes: 2”, 3”, 4”, 6”	1	Install Sensus Compound Adapter between the meter and its register. Attach the sensor to the adapter. See Appendix C. Alternatively, you can use a Meter-Master Model 80 to generate pulses from a Sensus compound meter.
SRM (with adapter) All sizes: 2”, 3”, 4”, 6”	1	Same as SRH.
Propeller All sizes: 3”, 4”, 6”, 8”, 10”, 12”, 14”, 16”, 18”, 20”, 24”, 30”, 36”	1	Place sensor flat on the side of register at the bottom with the sensor cable running up or down. (Similar to Fig. 1)
Fire Hydrant Sizes: W-125, W-1125	1	Place sensor flat against side of meter body with cable extending in a horizontal instead of vertical direction. (Fig. 8)

SENSUS (PRECISION)

Model #	Code	Sensor Location
PMM All sizes: 5/8”, 3/4”, 1”, 1-1/2”, 2”	1	Place sensor flat on top of register because of shielding on sides of some PMM registers. If no shielding exists, sensor may be placed against side of register. (Fig. 3)

LED Flash: * = One flash for each pulse (volume shown in gallons). (blank) = One flash for each 1/20 dial revolution.
Signal Code: 1 = Clear 2 = Sensitive 3 = Weak 4 = Untested

BADGER

Model #	Code	Sensor Location
Recordall PD Sizes: 15 (1/2"), 25 (5/8"), LP (5/8"), 35 (3/4"), 40 (3/4")	1	Place sensor flat against upper portion of meter body. (Fig. 2)
Recordall PD Sizes: 55 (1"), 70 (1"), 120 (1-1/2"), 170 (2"), 180 (2")	1	Place sensor flat against side of register. (Similar to Fig. 7)
Recordall Turbo (Turbo I) Sizes: 2", 3", 4"	1	Place sensor flat against side or bottom of meter body with cable extending in a horizontal instead of vertical directions. (Similar to Fig. 8 except put sensor on bottom of meter)
Recordall Turbo (Turbo I) Size: 6"	2	Same as smaller size Turbo I. However, greater distance to the magnet makes the signal weaker for this meter.
* Recordall Turbo II All sizes: 2" (1.35), 3" (1.37), 4" (2.06), 6" (11.76), 8" (18.18), 10" (59.17), 12" (74.91), 16" (129.03), 20" (222.22)	1	Place sensor flat against side of register. (Similar to Fig. 7)
Recordall TSM (Turbo III) All sizes: T160 (2"), T200 (2"), T450 (3"), T1000 (4"), T2000 (6"), T3500 (8"), T5500 (10"), T6200 (12")	1	Place sensor flat against side of register. (Similar to Fig. 7)
Recordall Compound (single register) All sizes: 2", 3", 4", 6" (See "Note" for calculating beginning and ending meter readings.)	2	Turbine Side: Place sensor flat against bottom of meter body with cable extending along axis of pipe, parallel to water flow. (Similar to Fig. 8 except put sensor on bottom of meter to distance it from register magnets) PD Side: With water flowing left to right, place sensor flat against vertical portion of left side of top case (centered). (Similar to Fig. 2 except moved to accommodate meter casing) NOTE: The main register gives the total of both the PD and turbine side consumptions. To calculate the turbine side beginning and ending register readings, subtract the PD side register readings from the main register readings.

Badger Meters continue on next page

BADGER (Continued)

<p>Recordall CSM Compound (dual register) All sizes: 170 (2"), 400 (3"), 800 (4"), 1500 (6")</p>	2	<p>Turbine Side: Place sensor flat against side of register farthest from PD side. Because the proximity of the registers may cause interference, a 1"-2" spacer may be needed to move the sensor farther away from the PD side register. (Similar to Fig. 7 except with sensor moved 90° as described)</p> <p>PD Side: Place sensor flat against side of register farthest from turbine side. A 1"-2" spacer may be needed to move the sensor farther away from the Turbine side register. (Similar to Fig. 7 except with sensor moved 90° as described)</p> <p>For more information, see the Troubleshooting guide.</p>
<p>Easy-Read PD All sizes: 5/8", 3/4", 1", 1-1/2", 2"</p>	1	Place sensor flat against side of register. (Similar to Fig. 7)
<p>Easy-Read Turbine All sizes: 2", 3", 4", 6", 8", 10", 12"</p>	1	Same as TSM.
<p>Easy-Read Compound All sizes: 2", 3", 4", 6", 8", 10", 12"</p>	2	Same as Recordall Compound. (Except, the turbine side register records only the flow through that meter, not the total flow as in the Recordall.)

ELSTER (AMCO / ABB / KENT)

"Adapter" indicated is Sensus Compound Adapter.

Model #	Code	Sensor Location
<p>C-700 All sizes: 5/8", 3/4", 1", 1-1/2", 2"</p>	1	Place sensor flat against side of register with top of sensor flush with top of register. (Similar to Fig. 7) If an antenna is attached to the register, place sensor on side of register opposite antenna.
<p>* 3000 Series (without adapter) All sizes: 1-1/2" (50), 2" (50), 3" (50), 4" (50), 6" (500), 8" (500)</p>	2	Place sensor flat against side of register. (Similar to Fig. 7)
<p>* 3000 Series (with adapter) All sizes: 1-1/2" (4.17), 2" (4.17), 3" (4.17), 4" (4.17), 6" (41.7) , 8" (41.7)</p>	1	Install Sensus Compound Adapter between the meter and its register. Attach the sensor to the adapter. See Appendix C.
<p>* 4000 Series All sizes: 1-1/2" (2.4), 2" (2.4), 3" (2.48), 3" Hydrant (2.4), 4" (2.55), 6" (24), 8" (18.61), 10" (24.76), 12" (37.25)</p>	2	Place sensor flat against side of register. (Similar to Fig. 7)

Elster Meters continue on next page

LED Flash: * = One flash for each pulse (volume shown in gallons). (blank) = One flash for each 1/20 dial revolution.
Signal Code: 1 = Clear 2 = Sensitive 3 = Weak 4 = Untested

ELSTER (Continued)

4000 Series (with adapter) All sizes: 1-1/2", 2", 3", 3" Hydrant, 4", 6", 8", 10"	1	Install Sensus Compound Adapter between the meter and its register. Attach the sensor to the adapter. See Appendix C.
C4000 – Low flow side All sizes: 2" – 4"	1	Place sensor flat against side of register with top of sensor flush with top of register. (Similar to Fig. 7)
evoQ4: Cannot be used with a flux sensor; requires a Meter-Master pulse input cable (see Appendix C).		

HERSEY

Model #	Code	Sensor Location
400 & 500 Series (including ISS) All sizes: 420 (5/8"), 430 (5/8"), 442 (3/4"), 452 (1"), 560 (1-1/2"), 562 (1-1/2"), 570 (2"), 572 (2")	1	Place sensor flat against side of register with top of sensor flush with top of register. (Similar to Fig. 1)
MHD All sizes: 5/8", 3/4", 1", 1-1/2", 2"	1	Same as 400 Series.
MMDII All sizes: 5/8", 3/4", 1", 1-1/2", 2"	1	Same as 400 Series.
MVR Sizes: 30 (3/4"), 50 (1"), 100 (1-1/2"), 160 (2")	1	Place sensor flat against side of meter body. (Similar to Fig. 2)
MVR Sizes: 350 (3"), 650 (4"), 1300 (6")	1	Place sensor flat on top case at base of register or against side of register. (Similar to Figs. 2 or 7). Alternatively, place the sensor flat on top of the register.
MHR Sizes: 2", 3"	1	Place sensor flat against side of meter body with cable extending in a horizontal instead of vertical direction. (Similar to Fig. 8). Alternatively, place the sensor flat on top of the register (signal = 50% of side location).
* MHR Sizes: 4" (3.33), 6" (18.18), 8" (29.85), 10" (74.07)	1	Place sensor flat against side of register. (You must first install a modified Hersey gear train available as an accessory. The gear train may be installed in the field while the meter is operating. Modified gear train P/N B0600 is for 4" and 8"; P/N B0610 is for 6"; and P/N B0620 is for 10".) (Similar to Fig. 7)
Horizon All sizes: 1-1/2", 2", 3", 4", 6", 8", 10"	1	Place sensor flat against side of register. (Similar to Fig. 7)

Hersey Meters continue on next page

LED Flash: * = One flash for each pulse (volume shown in gallons). (blank) = One flash for each 1/20 dial revolution.
Signal Code: 1 = Clear 2 = Sensitive 3 = Weak 4 = Untested

HERSEY (Continued)

<p>RFM Sizes: 30 (3/4"), 50 (1"), 100 (1-1/2"), 160 (2")</p>	<p>1</p>	<p>Place sensor flat against side of meter body. (Similar to Fig. 2)</p>
<p>MFM All sizes: 3", 4", 6", 8", 10"</p>	<p>1</p>	<p>Place sensor flat on top of register (similar to Fig. 3). If you are unable to pick up a signal (unusual), you must install a modified Hersey gear train available as an accessory. The gear train may be installed in the field while the meter is operating. Modified gear train P/N B3100 fits all MCT and MFM sizes.</p>
<p>MFMI All sizes: 3", 4", 6", 8", 10"</p>	<p>1</p>	<p>Place sensor flat against side of register, flat on top case at base of register, or flat on top of register (top of register gives 2-pole signal). (Similar to Figs. 7, 2, or 3)</p>
<p>MCT All sizes: 2", 3", 4", 6", 8"</p>	<p>1</p>	<p>Turbine Side: Place sensor flat on top of register (similar to Fig. 3). Note that register magnets may have either 2 or 4 poles which may double or halve the expected volume in a sensor test, as well as in graphs and reports (see Troubleshooting guide).</p> <p>If you are unable to pick up a signal on the turbine side (unusual), you must install a modified Hersey gear train available as an accessory. The gear train may be installed in the field while the meter is operating. Modified gear train P/N B3100 fits all MCT and MFM sizes.</p> <p>PD Side: Place sensor flat on top of register or flat against top case at base of register. (Similar to Figs. 3 or 2)</p>
<p>MCTII All sizes: 2", 3", 4", 6", 8"</p>	<p>1</p>	<p>Turbine Side: Place sensor flat against side of register, flat on top case at base of register, or flat on top of register (top of register gives 2-pole signal). (Similar to Figs. 7, 2, or 3)</p> <p>PD Side: Place sensor flat against side of register, flat against top case at base of register, or flat on top of register (top of register gives 2-pole signal). (Similar to Figs. 7, 2, or 3)</p>

MASTER METER

Model #	Code	Sensor Location
Multi-jet All sizes: 5/8", 3/4", 1", 1-1/2", 2"	3	Place sensor flat on top of register. Because magnet is weak, Meter-Master must have high-sensitivity sensor circuit configuration. Even with this circuit modification, however, logging may not be possible. Consider using the Master Meter pulse option with a Meter-Master pulse input cable (ordered separately). (Similar to Fig. 3)
HP Multi-jet All sizes: 5/8", 3/4", 1"	3	Same as Multi-jet.
Multi-jet Underlined (1-1/2")	3	Same as Multi-jet.
* Turbine All sizes: 2" (5.57), 3" (5.57), 4" (10.33), 6" (49.47), 8" (85.69)	3	Same as Multi-jet.
* Turbine STR All sizes: 4" (10.98), 8" (89.05)	3	Same as Multi-jet.
Octave: Cannot be used with a flux sensor; requires a Meter-Master pulse input cable (see Appendix C).		

METRON

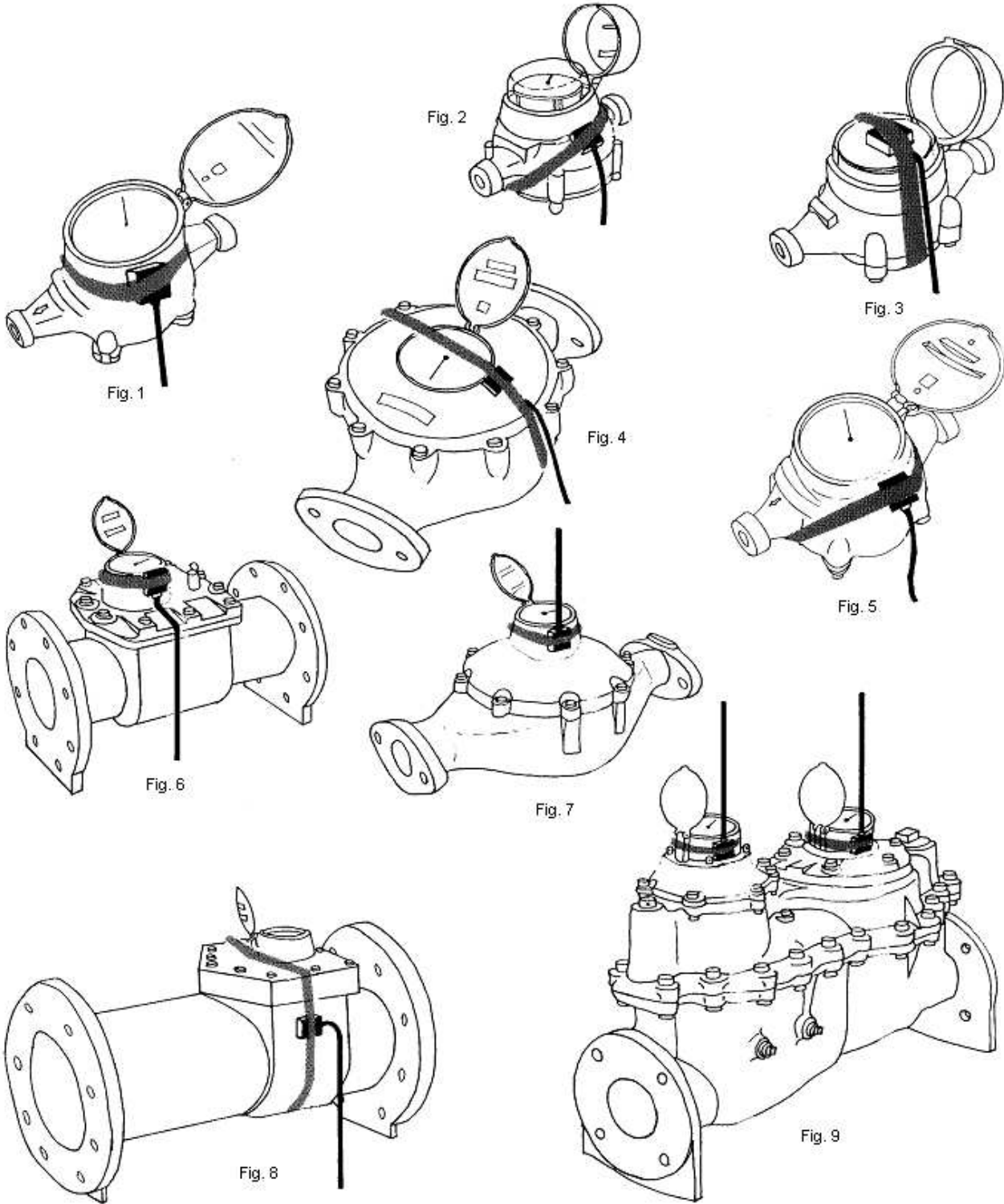
Model #	Code	Sensor Location
Spectrum All sizes: 22/30 (3/4"), 50 (1"), 88 (1-1/2"), 130 (2"), 175/260 (3"), 440 (4")	1	Place sensor flat on the side of the register. (Similar to Fig. 1) Spectrum meters also have a pulse output option that can be used with the Meter-Master pulse input cable (ordered separately).
Enduro: Cannot be used with a flux sensor; requires a Meter-Master pulse input cable (see Appendix C).		

WATER SPECIALTIES

Model #	Code	Sensor Location
ML-03 All sizes: 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48", 54"	1	Place sensor flat against side of register. (Similar to Fig. 1)
* TM All sizes: 1-1/2" (8.75), 2" (8.75), 3" (15.63), 4" (33.56), 6" (32.05), 8" (33.67), 10" (73.80), 12" (121.95)	1	Same as ML-03.

LED Flash: * = One flash for each pulse (volume shown in gallons). (blank) = One flash for each 1/20 dial revolution.
Signal Code: 1 = Clear 2 = Sensitive 3 = Weak 4 = Untested

Sensor Location Diagrams



Appendix B

NEPTUNE FLOSEARCH TRANSMITTER

With 6' Cable: Neptune Part # 60337-000
Standard or Oil-Filled (for submersed environments)

Mounting the Transmitter (see also figure on following page)

If you are installing a Neptune Transmitter on a meter that does not already have a register mounted on it, skip to step 4. If the meter does have a register mounted, begin at step 1.

1. Remove the seal pin from the mounting ring (part # 60320-001) at the base of the register. Using a hammer, drive a punch through the center of the seal pin. The head of the pin should shear off.
2. Twist the register approximately 1/4 turn counter-clockwise and remove it from the meter.
3. Position the Neptune Transmitter on the meter and twist it clockwise until it locks into place.
4. Place the register mounting ring on top of the Neptune Transmitter with the four rounded grooves facing upward.
5. Align the notch in the base of the register mounting ring with the terminal cover of the Neptune Transmitter and snap the ring into place. When properly oriented, the register mounting ring should sit flush on top of the transmitter.
6. Position the register on top of the Neptune Transmitter and register mounting ring, and twist it clockwise until it locks into place.
7. Drive the new seal pins into the register base and Neptune Transmitter base to secure the installation and prevent tampering.

Testing

You cannot test the Neptune Transmitter with an ohm meter unless the water is flowing very slowly; test instead with your input device.

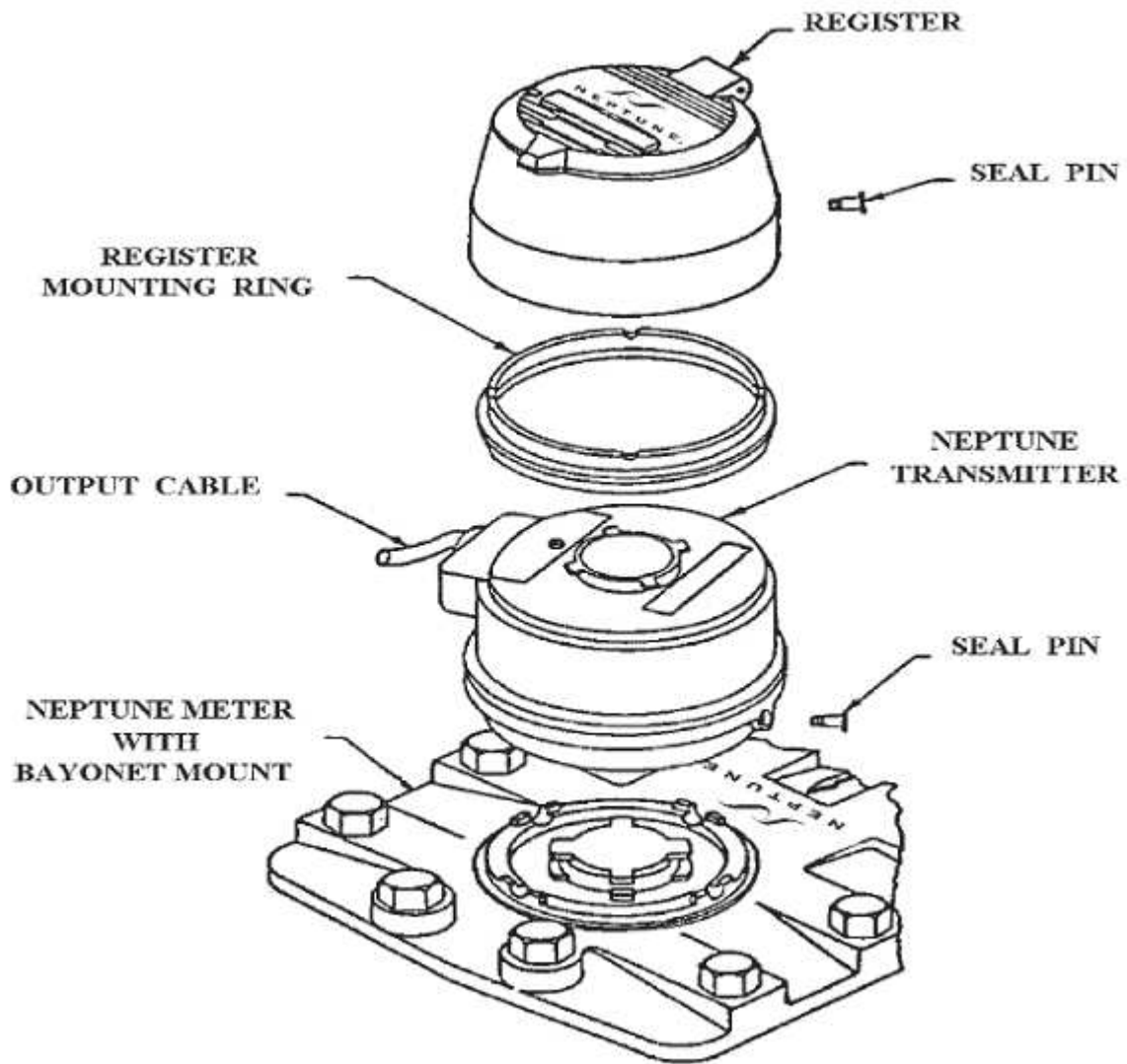
If you are using the Neptune Transmitter with a Meter-Master Flow Recorder:

1. Connect the transmitter to the Meter-Master.
2. Press the rocker switch ON (if it is already on, press down against the spring and release).
3. For PD meters, the LED on the rocker switch will flash once for each 1/20th of a dial revolution of the register's pointer. For turbine meters, consult Appendix A of the Meter-Master Operating Instructions for pulse value.

If you are using the Neptune Transmitter to generate pulses for a PLC or other input device:

1. Before beginning, you should have the pulse value of your meter (volume of water per pulse). If necessary, call F. S. Brainard & Co. for assistance.
2. Connect the transmitter to your input device and use that device to verify that it is receiving pulses.

Mounting the Neptune Transmitter



Appendix C

PULSE INPUT CABLE

Pulse Input Cable Wiring

The Meter-Master Pulse Input Cable attaches to the “Sensor” connector on the Meter-Master.

Connect the two wires to the signal leads from your meter. The red Meter-Master wire with white stripe is plus (+); the green wire is common (-). The Meter-Master provides a pull-up voltage of 3.3 volts.

Pulse Input Cable Wiring

METER-MASTER	Sensus Omni	Actaris (Itron)	Elster evoQ4	Metron	Master Meter
Red/White (+)	Green	no polarity	Red or White	Red	Black
Green (-)	Black	no polarity	Green	Green	Green

IMPORTANT: A number of meter models require external power as well. For example, the Sensus Omni meter needs +12 to +24 volts DC applied to its red (power) wire with the power supply’s ground wire tied to the meter’s black wire.

Appendix D

SAMPLE TEST DATA SHEET

Test ID: _____

Meter-Master S/N: _____

Operator: _____

Customer Name: _____ Account Number: _____

Meter Location: _____

Meter Make: _____ Model: _____ Size: _____ Unit of Measure: _____

Start test date & time: _____

Beginning Meter Reading: _____

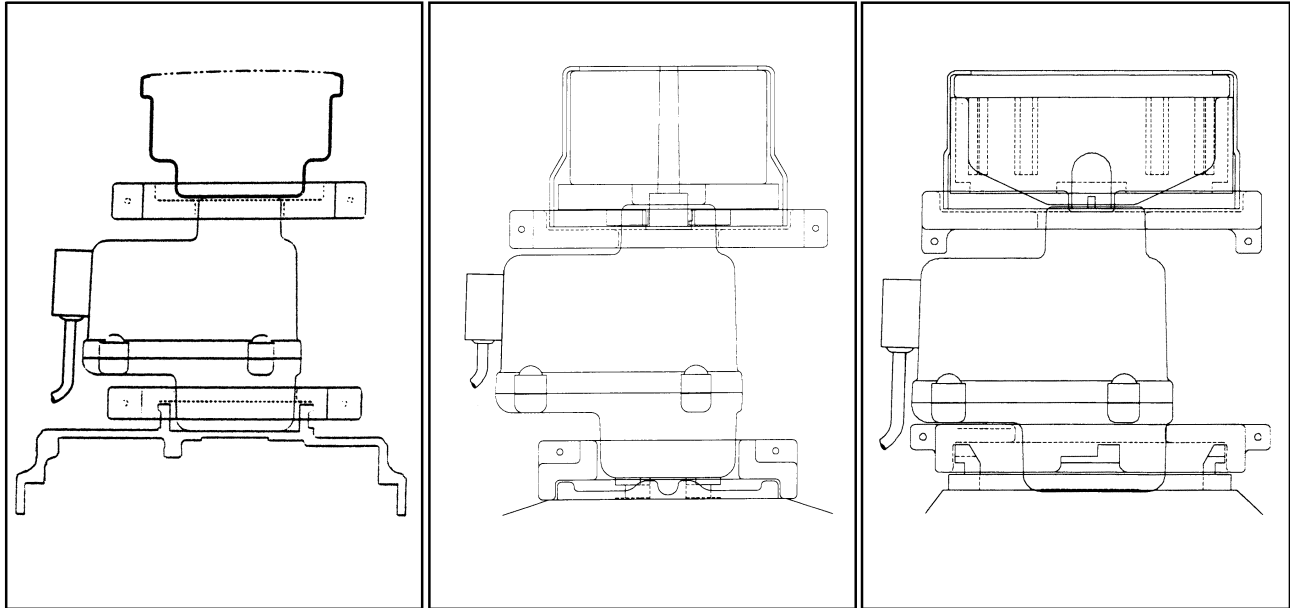
End test date & time: _____

Ending Meter Reading: _____

Notes: _____

Appendix E

SENSUS COMPOUND ADAPTER



SENSUS COMPOUND

NEPTUNE TURBINE

KENT TURBINE

ADAPTER OVERVIEW

The Sensus Compound Adapter was developed for the Sensus SRH and SRM compound meters which use a magnetically coupled coordinator to accumulate volumes from the turbo and positive displacement chambers. The Adapter has also been made compatible with ABB/Kent (U.S. models) turbine and Schlumberger/Neptune turbine meters in order to significantly increase the magnetic pulse frequency available for logging from these meters (by a factor of 12). Increasing the data resolution by a factor of 12 enables the Meter-Master to provide more accurate rate-of-flow information throughout the flow ranges of these meters. If you are using the Meter-Master software, these meter models have a “with adapter” option as a meter setting.

The Compound Adapter includes:

- Compound Meter Adapter
- Top and Bottom Clamp Assemblies (with screws) applicable to the meter being monitored (Sensus, Neptune, or Elster).

TO INSTALL THE COMPOUND METER ADAPTER

1. Remove Register And Seat Adapter on Meter.

- Remove register from the meter. The register may be removed while the meter is operating.
- Loosen screws and place the bottom clamp (clamp with the larger hole) on top of the meter with the rim facing downward. Locate the rim of the bottom clamp on top of the meter body where the register was located prior to its removal.
- Position the Adapter on top of the bottom clamp by placing the larger diameter end (bottom) of the adapter through the hole of the bottom clamp. The Adapter should now rest directly on the meter such that the Adapter and meter couple magnetically. Adjust the clamp around the Adapter and tighten the clamp screws to secure the Adapter.

2. Position Register on Adapter.

- Loosen screws and place the top clamp (clamp with the smaller hole) with the rim facing upward over the smaller diameter end of the Adapter (top).
- Place the register on the Adapter. Ensure that their surfaces touch so that the register and Adapter magnets couple properly. Position the top clamp around the base of the register and tighten the clamp screws. The rim of the clamp will secure the register to the Adapter. As noted above, make sure that the top of the Adapter and bottom of the register are flat against each other in order for the register to function properly.

3. Secure Meter-Master Sensor on Adapter.

- The sensor should be positioned flat against the protruding side of the Adapter with the sensor cable extending straight up or down (see above diagrams). In this location, the sensor is closest to the adapter's internal magnet. It is also good to angle the protruding side of the adapter away from the screwed on cover over the low flow (PD) side odometer so that the adapter's internal magnet and the Meter-Master sensor are as far away as possible from the PD side magnets in the Sensus compound meter's coordinator unit under the register.

Appendix F

GEAR-DRIVEN METER CONVERTER

ABOUT THE GEAR-DRIVEN METER CONVERTER

The Gear-Driven Meter Converter provides a magnetic pick-up from a gear-driven meter. The Converter uses a 4-pole magnet and a 10:1 gear train to improve the magnetic pulse frequency. The Converter provides 20 pulses for each revolution of the sweep hand on a meter's dial face. By providing a good pulse frequency (20/revolution), more accurate flow data can be generated. If you are using the Meter-Master software, there is a "Gear-Driven" option under meter settings. A diagram follows. As an alternative, F. S. Brainard & Co. can permanently add a rotating magnet to most gear-driven meter registers so that the need for the Converter can be avoided. Call for more details.

TO INSTALL THE GEAR-DRIVEN METER CONVERTER

1. Remove The Bonnet (Cover) From The Meter Register.

2. Attach Lower Slotted Arms With Register's Bonnet Screws.

Attach the Gear-Driven Meter Converter's lower slotted arms to the register in the bonnet's place using the existing bonnet screws (and additional washers as necessary).

3. Attach Upper Portion Of Converter.

Locate the upper portion of the Converter as shown in the diagram so that the Converter's drive shaft is positioned directly over the hub of the pointer from which you wish to record. Do not allow the bottom of the drive shaft to reach the pointer while performing this step. Make sure that the drive shaft is aligned vertically straight and is centered over the pointer hub such that the pointer on the meter's dial face will continue to revolve without difficulty once the drive shaft is lowered onto the pointer hub. Tighten thumb nuts on the slotted arms to secure the Converter parts in their desired positions.

4. Position Drive Shaft Over Register Pointer.

Lower the drive shaft using the thumb nuts on the upper slotted arms until the base of the drive shaft is located on top of and centered over the pointer hub. Lower the drive shaft only far enough to cause the pointer movement to rotate the drive shaft. Do not allow the base of the drive shaft to touch the dial face because this contact may impede the movement of the pointer or cause the pointer to snap off.

5. Check To Ensure That There Is No Binding.

Check the drive shaft's coupling with the meter pointer to ensure that no binding is taking place. The drive shaft should remain straight over the pointer hub at all times. It is recommended that a pointer's connection to its hub be verified as solid prior to connecting the Converter. An old or weak solder or other form of connection may require reinforcement (solder, epoxy, etc.) prior to Converter installation.

6. Secure the Meter-Master Sensor To The Converter.

Mount the sensor as shown in the diagram, securing it in place with the hardware on the Converter. The sensor should face the Converter's rotating magnet just as it would the internal magnet of a magnetic drive meter with the sensor cable extending either straight up or down.

7. Check Again; If Necessary, Make Final Adjustments.

Observe the pointer movement until you are certain that no binding exists. Adjust arms if necessary and ensure that all thumb nuts are secure.

When performing a sensor test, a Meter-Master LED will flash every 1/20 of a dial revolution (e.g., every 5 gallons on a 100 gallon dial). If a register has multiple dials, it is recommended that the converter be attached to the dial representing the smallest unit of measure (rotating the fastest) because the larger pulse count will provide more accurate data. If the Meter-Master volume significantly exceeds the register volume on a meter with an extremely slow moving sweep hand, contact the factory. We can loan you a Model 100 unit which may provide more consistent results in such cases.

Gear-Driven Meter Converter Diagram

