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1-inch VERIS Accelabar®

Installation and Maintenance Manual



**Please read and save
these instructions**

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General Safety Information

Instructions and procedures listed in this manual may require special precautions to ensure the safety of the individuals performing the operations. **Review the entire manual, taking note of safety messages prior to performing any operations listed in the manual.**

Product Information

The VERIS Accelabar® is a unique flow meter that combines two differential pressure technologies to produce performance never before attainable in a single flow meter. The VERIS Accelabar® is capable of measuring gases, liquids, and steam at previously unattainable flow rate turndowns—**with no straight run requirements**.

Section 1 Scope

These instructions provide a description of procedures for installing the 1 inch Accelabar® model flow sensor and meter body. Procedures are given for all flow measurement applications including liquid, steam and gas in both horizontal and vertical piping orientations.

Section 2 Receiving Inspection

The following tasks should be performed as part of the receiving inspection procedure:

- Check items received against the packing list.
- Check sensor nameplate for proper model number, serial number and tag number.
- Verify the serial number on the sensor nameplate attached to the sensor and body matches that of the serial number on the packing list.
- Check assembly for signs of damage such as a scratched sealing surface in the flange deeper than allowed by ASME B16.5 (consult VERIS for ASME B16.5 guidelines if needed)

Section 3 Safety Precautions

The following process should be conducted prior to installing the Accelabar®:

- Check the maximum operating conditions on the flow sensor nameplate. Verify that the maximum operating conditions of the application do not exceed the parameters stated on the nameplate. If any pressure, temperature, or flow limits will be exceeded, contact the factory before proceeding.
- Verify enough room available to install the meter (face-to-face and clearance).
- Check to ensure the pipe is depressurized and drained prior to installation.
- The Accelabar® is available in ASME B16.5 Class 150, 300 and 600 and DIN PN 40 and PN 100 configurations; verify the Accelabar® flanges match the required application rating.
- Verify all pressure containing components are properly installed and tightened prior to pressurizing the system.

Section 4 Installation Preparations

4.1 Location

There are no straight run requirements. Allow adequate clearance for manifold, transmitter, and sensor removal.

4.2 Orientation

Verify the proper sensor orientation by checking for an “H” (horizontal piping) or a “V” (vertical piping) in the model number on the Accelabar® sensor nameplate. Deviation from the following mounting location instructions may cause inaccuracy in the flow measurement.

4.2.1 Horizontal Piping

For air or gas applications, the Accelabar® must be mounted directly to the top of the pipe in the upper 160° position. For liquid and steam applications, the Accelabar® must be mounted directly to the bottom of the pipe in the lower 160° position (See Figure 1).

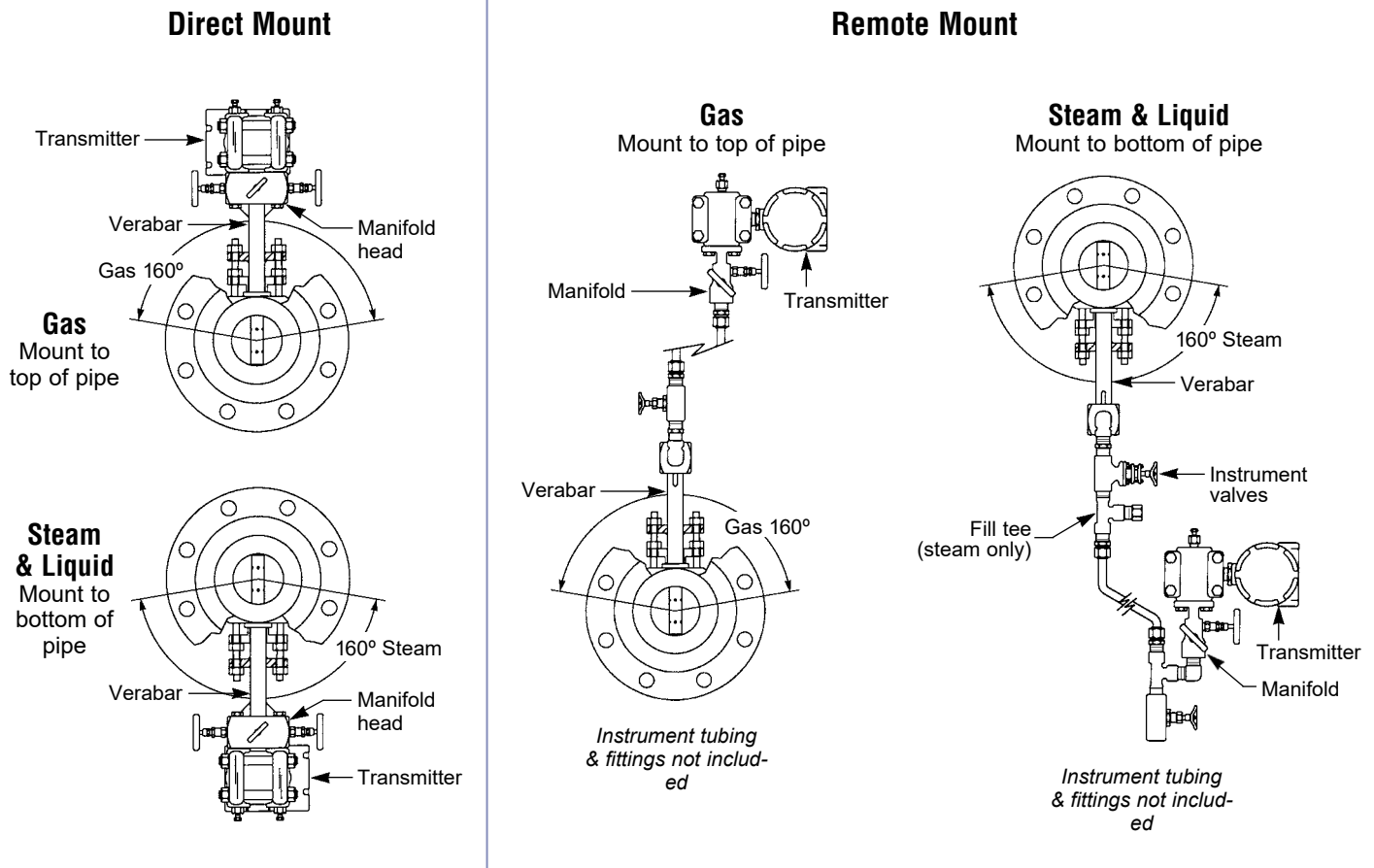


Figure 1. Accelabar® Installation Orientation

4.2.2 Vertical Piping

For vertical applications, the Accelabar® may be mounted in any location around the circumference of the pipe.

Section 5 Installation Procedure

5.1 Preparing the Pipe

- Completely depressurize and drain the pipe prior to Accelabar® installation. 
- Remove a section of the pipe large enough to accommodate the face-to-face flange dimension of the corresponding sized Accelabar® shown in Figure 3.

NOTE: The face-to-face dimensions do not include gaskets (see Figure 4). VERIS recommends adding 0.375" (9.525 mm) to the face-to-face dimension to obtain the required distance between piping flanges.

- **IMPORTANT FOR DIRECT MOUNT APPLICATIONS:**

Locate the Accelabar® to allow adequate clearance for a manifold and transmitter, a minimum of 18" from the centerline of the pipe. Bolt the manifold and transmitter to the Accelabar® to obtain the exact clearance requirements for the given application.

- Weld flanges to existing pipe. Make certain the pipe flanges and Accelabar® flanges are the same Nominal Pipe Size (NPS) and pressure rating. Bolt hole location typically mimics the diagram shown (See Figure 2) where bolts straddle the centerline of the pipe if the desired location of the sensor head is directly above or below the pipe (for horizontal pipes). However, take into consideration mounting as required in Section 4.0.

- **IMPORTANT:**

Piping must yield slightly to allow the gaskets to crush and seal completely.

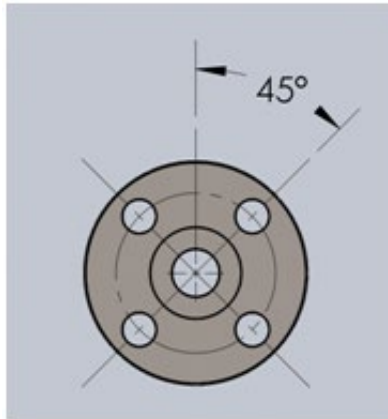


Figure 2. Bolt Hole Orientation

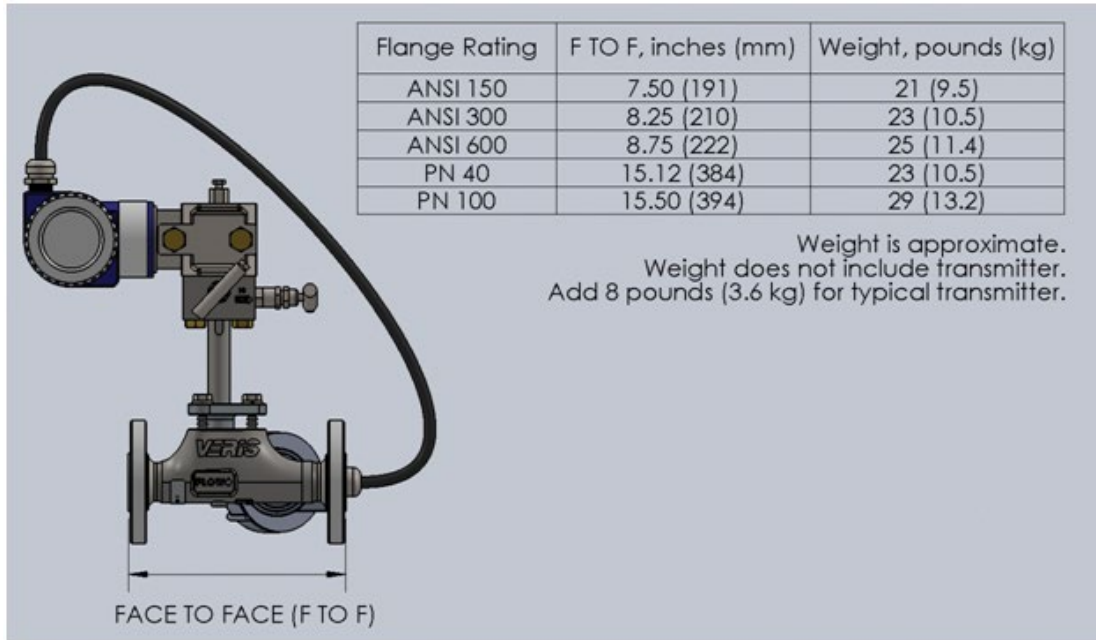


Figure 3. Face to Face Dimensions and Weights

5.2 Accelabar® Installation

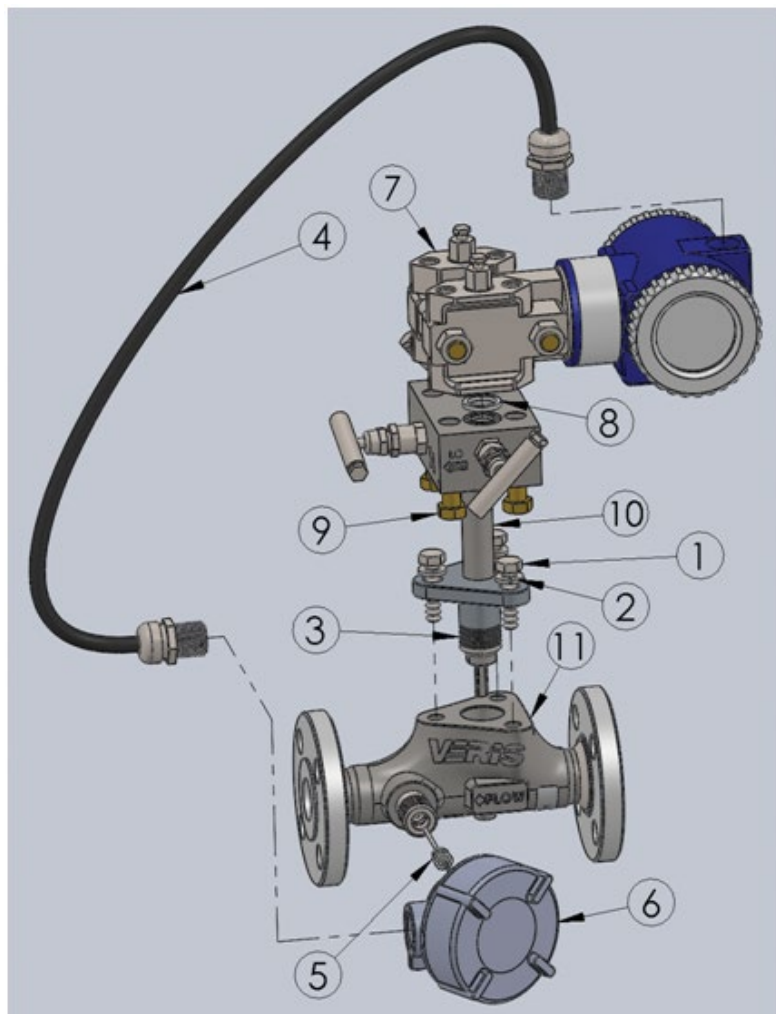
- Refer to Figure 1 for proper Accelabar® orientation for horizontal applications (orientation is not critical for vertical applications).
- Position Accelabar® in piping void that has been prepared per dimension in Figure 3. Be certain the flow arrow on the Accelabar® is oriented in the same direction as the flow in the pipe. Failure to orient the Accelabar® correctly may result in poor and inaccurate flow measurement.
- Place the appropriate gasket between the pipe flanges and the Accelabar® flanges.
- Insert the flange bolts through the flanges and tighten the nuts, hand-tight, on each end of the bolts. Once all the bolts are hand-tight, tighten opposing sets of bolts until the gasket is crushed. The complete crushed gasket height should be approximately 1/8" (0.125") (3.175 mm).

Section 6 Sensor And Component Installation

The Accelabar® sensor assembly is factory installed in the meter body with the packing rings in place. The following instructions are intended for replacement sensors, replacement packing rings, or Accelabars with special handling instructions (i.e. O2 service) that require field installation of sensor and packing.

The following instructions describe complete assembly of the Accelabar® sensor in the Accelabar® meter body.

- **IMPORTANT:** Depressurize and drain the pipe if the Accelabar® is installed in the line. 
- Parts necessary for Accelabar® are itemized in Table 1. Consult factory for specifications if these items are not factory supplied.



Reference	Part Number	Quantity	Item
1	00120-007	3	BOLT,HEX HEAD,3/8 - 16UNC x 1.50,CLASS 2,316
2	00225-002	3	WASHER,LOCK,SPLIT,3/8,316
3	00163-007	4	PACKING,05,GRAPH-LOCK,3/4
4	VARIES	1	RTD CABLE (optional)
5	VARIES	1	RTD (optional)
6	VARIES	1	RTD ENCLOSURE (optional)
7	VARIES	1	DIFFERENTIAL PRESSURE TRANSMITTER (ordered separately)
8	00230-002	2	GASKET,O-RING,MANIFOLD,TEFLON
9	00430-002	4	BOLT,HEX HEAD,7/16 - 20UNF x 2.00,Gr. 8
10	VARIES	1	ACCELABAR® SENSOR ASSEMBLY
11	VARIES	1	ACCELABAR® BODY WELDMENT

Table 1. Accelabar® Parts List with Exploded View

6.1 Sensor and Packing Installation

Insert the sensor into the body with the sensor flat aligned with the flat in the body (See Figure 4). The flow direction arrow on the sensor head will be the same as the flow direction arrow on the body.

- To verify that the sensor is properly aligned and seated, measure the distance shown (See Figure 5) which is approximately 3.78 inches (96mm) when the sensor is properly seated.
- If this dimension measures approximately 3.98 inches (101 mm), remove the sensor and reinstall with the flat properly aligned.

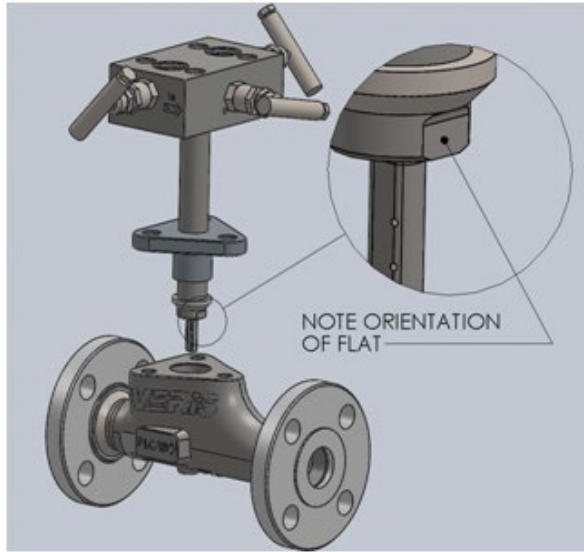


Figure 4. Sensor Installation

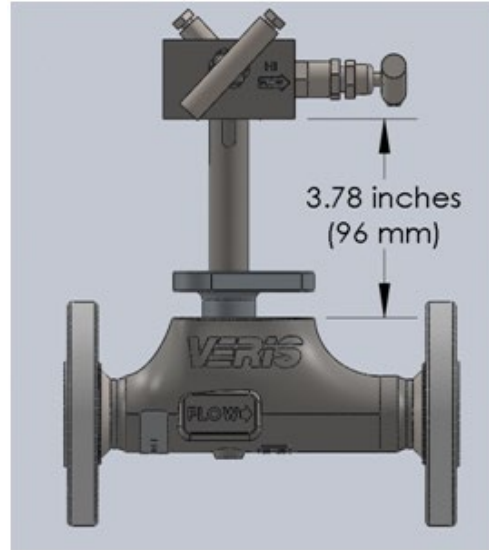


Figure 5. Correct Sensor Position

Install the four packing rings, using the following method:

- Locate one packing ring as shown (See Figure 6). It may be necessary to slide the triangular shaped follower next to the sensor head and temporarily attach it with a piece of tape or wire to hold it away from the body and allow both hands to be used while installing the packing rings.
- Note the orientation of the packing rings as shown (See Figure 7). The gap in each ring is exaggerated to show the orientation of the 45° cut. Also note the final orientation of the rings requires each gap to be staggered 90° from the adjacent ring.
- Use the follower to press the first packing ring into the body between the sensor and packing bore. Care must be taken not to twist the packing material during installation.
- Repeat for each remaining packing ring until all four are installed as shown (See Figure 8).

6.2 Follower Bolt Installation

- Put one split washer on each packing bolt and apply a small amount of “Jet Lube Nikal - Extreme Service Nickel” anti-seize paste onto the first three to five threads of the packing bolts.
- Install packing bolts per orientation shown (See Figure 9), hand tighten.
- Progressively tighten each bolt in an alternating pattern until the torque is 70 in-lb (7.9 N-m) for all three bolts (See Figure 10). 

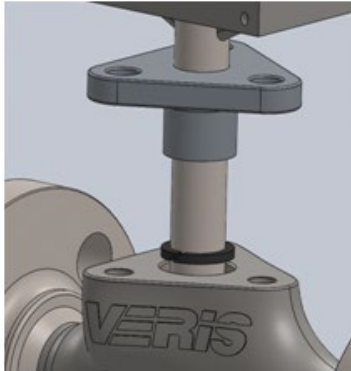


Figure 6. First Packing Ring Installation

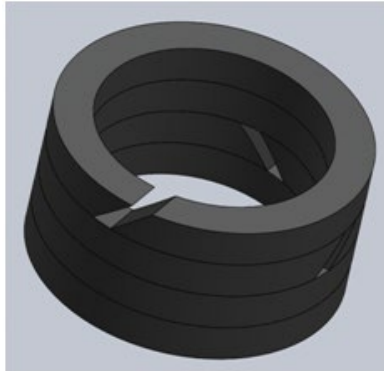


Figure 7. Packing Ring Orientation

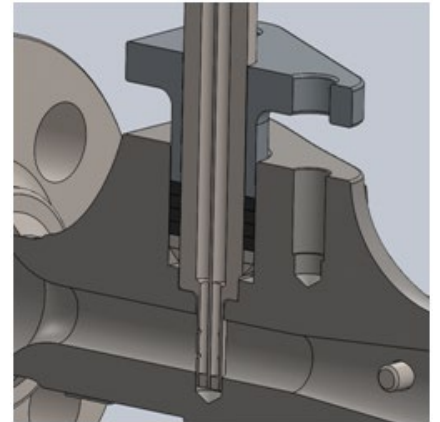


Figure 8. Final Packing Ring Installation

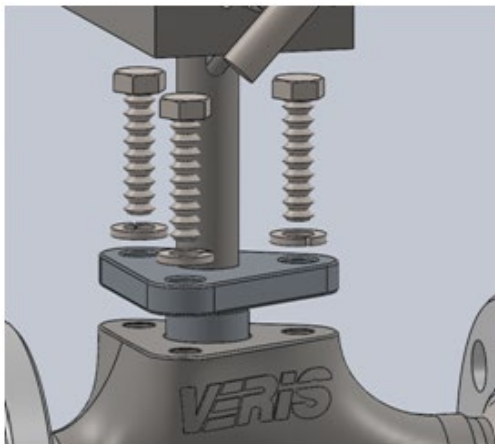


Figure 9. Packing Bolt Orientation

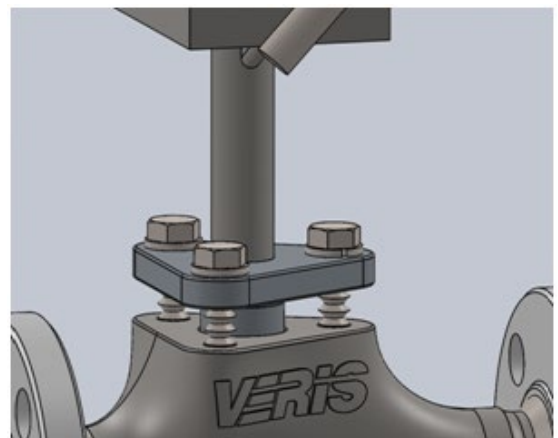


Figure 10. Final Packing Bolt Installation

6.3 Help

Contact the factory for installation assistance.

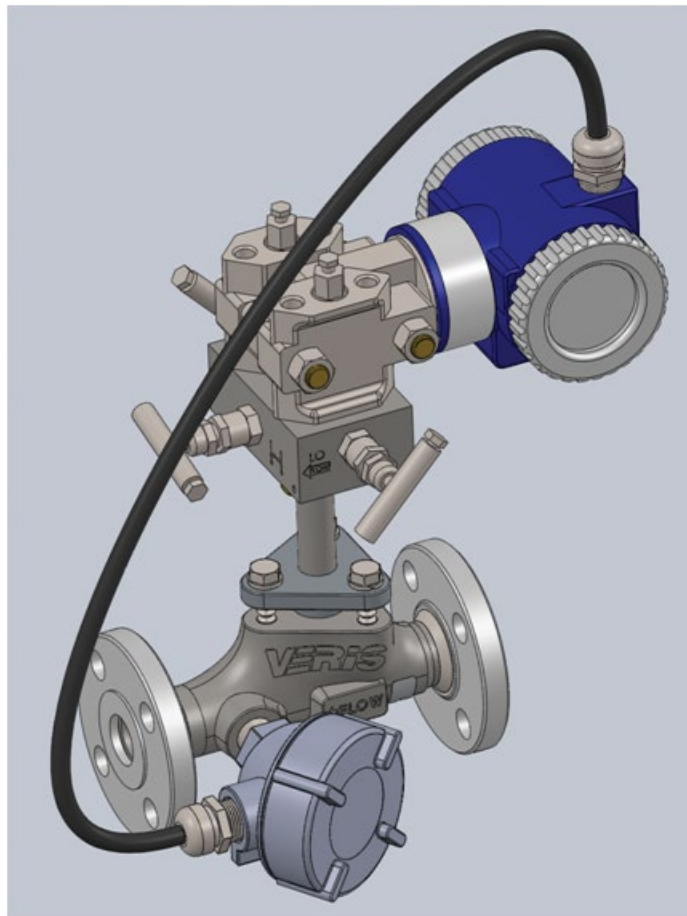
Section 7 RTD Assembly Installation (If Supplied)

Apply thread sealant to all male pipe threads before assembly.

- Apply thread sealant or tape to the bottom RTD threads and thread into the thermowell. Assure that the RTD is bottomed.
- Apply the same thread sealant to the top thermowell threads.
- Push the RTD wires into the junction box and thread the box onto the thermowell in the orientation shown (See Figure 11).

If a cable is supplied, thread it into the junction box and connect the wires using the correct figure based on the model codes as shown (See Table 2).

- R, P, and T heads are typically not supplied with a cable.



**Figure 11. RTD Junction Box, RTD Cable, and Transmitter Orientation
(as applicable)**

	H1, Explosion Proof RTD H2, Non-Incendive RTD NH, Non-Hazardous RTD	HT, High Temperature RTD
N4, NEMA 4 Cable	Figure 12	Figure 14
XP, Explosion Proof Cable	Figure 13	Not Available

Table 2. RTD Wiring Diagram Selection Based on Model Codes

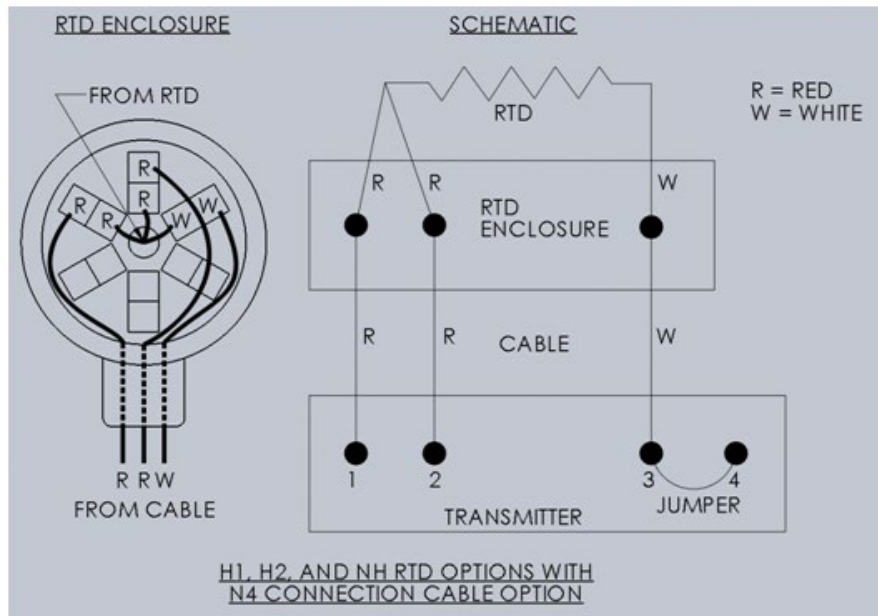


Figure 12. H1, H2, AND NH RTD WITH N4 CABLE

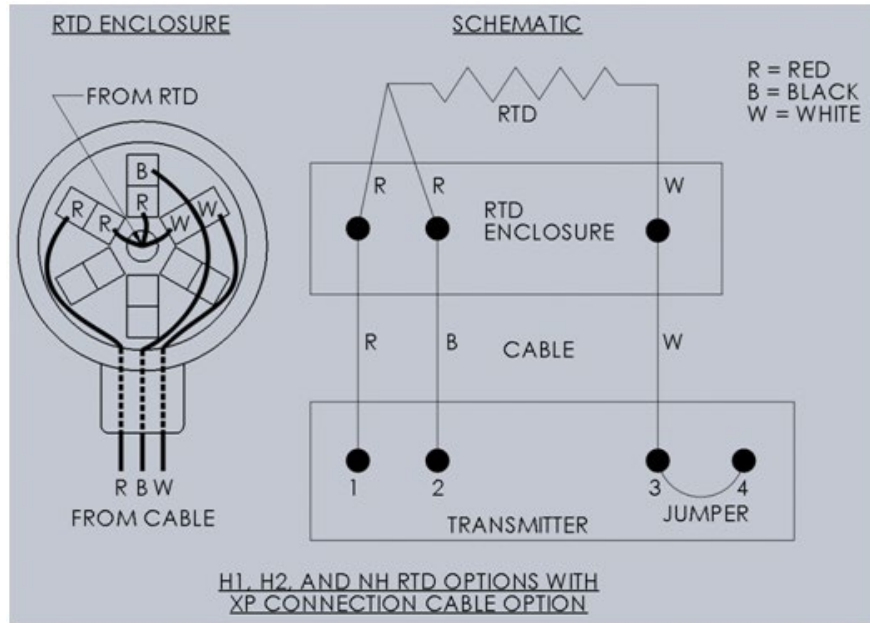


Figure 13. H1, H2, AND NH RTD WITH XP CABLE

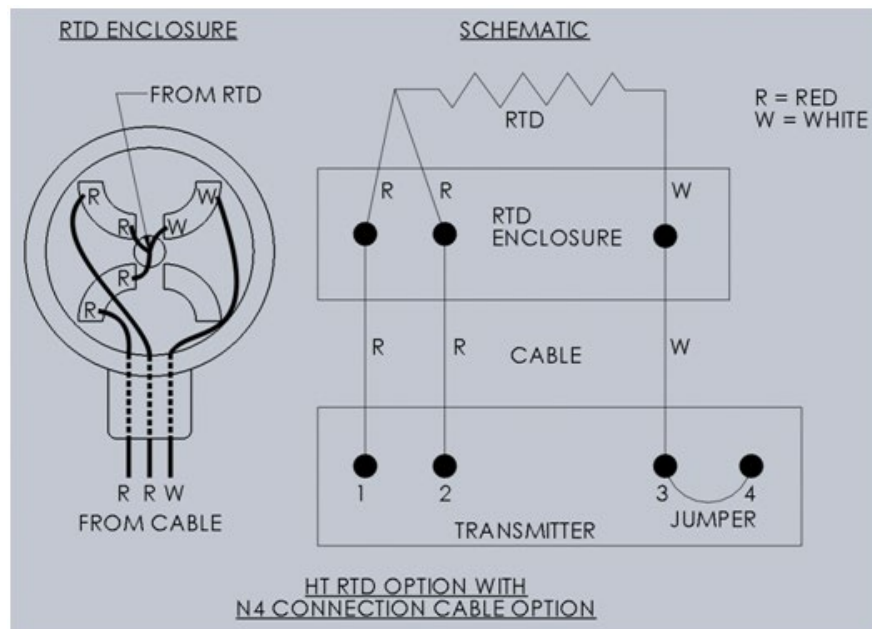


Figure 14. HT RTD WITH N4 CABLE

Section 8 Periodic Maintenance

The assembly should be periodically checked. Verify that no leaks are present. Retaining nuts and packing bolts should be tight.

8.1 Replacing Packing

The following instructions describe removing the Accelabar® sensor from the meter body and replacing the packing rings:

- **IMPORTANT:** Depressurize and drain the pipe. 
- Unbolt and remove transmitter from the Accelabar®, or remove the instrumentation tubing from head.
- Remove the follower bolts and gently remove the sensor from the meter body.
- Carefully remove old packing, taking care in not damaging the surface of the sensor.
- Install new packing and reinstall sensor per procedures described in Section 6.
- Reassemble the transmitter or instrumentation tubing to the sensor head.

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VERIS, Inc.
Limited Warranty and Remedy

Veris, Inc. ("Veris") warrants to the original user of those products supplied by it and used in the service and in the manner for which they are intended shall be free from defects in material and workmanship for a period of five (5) years from the date of installation, but not longer than 63 months from the date of shipment from the Veris factory, unless a Special Warranty Period applies, as noted below. This warranty does not extend to any product that has been subject to misuse, neglect or alteration after shipment from the Veris factory. Except as may be expressly provided in a written agreement between Veris and the user, which is signed by both parties, Veris **DOES NOT MAKE ANY OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

The sole and exclusive remedy with respect to the above limited warranty or with respect to any other claim relating to the products or to defects or any condition or use of the products supplied by Veris, however caused, and whether such claim is based upon warranty, contract, negligence, strict liability, or any other basis or theory, is limited to Veris' repair or replacement of the part or product, or, at Veris' option, to repayment of the purchase price. In addition to replacing any part of parts found to Veris' satisfaction to be defective, Veris will pay the cost of shipment of both the defective part to the Veris plant and the replacement part to the original user. As a condition of enforcing any rights or remedies relating to Veris products, notice of any warranty or other claim relating to the products must be given in writing to Veris: (i) within 30 days of last day of the applicable warranty period, or (ii) within 30 days of the date of the manifestation of the condition or occurrence giving rise to the claim, whichever is earlier. **IN NO EVENT SHALL VERIS BE LIABLE FOR SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF USE OR PROFITS OR INTERRUPTION OF BUSINESS.** The Limited Warranty and Remedy terms herein apply notwithstanding any contrary terms in any purchase order or form submitted or issued by any user, purchaser, or third party and all such contrary terms shall be deemed rejected by Veris.

Special Warranty Periods are as follows:

Vortex Shedders, Venturi, Orifice Plates, Flow Nozzles and Wedge Meters: one (1) year from the date of installation, but not longer than 15 months from the date of shipment from the Veris factory.

Electromagnetic Flow and BTU Meters, Ultrasonic Flow and BTU Meters: 21 months from the date of installation, but not longer than 24 months from the date of shipment from the Veris Factory.

Electronic components, including without limitation, differential pressure transmitters, multivariable transmitters, flow computers, rate or totalizer displays: one (1) year from the date of installation, but not longer than 15 months from the date of shipment from the Veris factory.

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*Designs, materials, weights and performance ratings are approximate and subject to change without notice.
Visit armstronginternational.com for up-to-date information.*



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