

1.0 SCOPE

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

2.0 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 customer number.
- Verify that the meter body ID stated on the sensor nameplate matches the packing list.
- Check for signs of damage to assembly such as a bent flow sensor or a scratched sealing surface on the flange deeper than allowed by ASME B16.5 (consult Veris for ASME B16.5 guidelines, if needed).

3.0 SAFETY PRECAUTIONS

The following should be conducted prior to installing the Accelabar:

- Check the maximum operating conditions on the flow sensor nameplate and verify that they exceed the maximum operating conditions of the application. If any pressure, temperature or flow limits will be exceeded, consult the factory before proceeding.
- Check that the pipe is depressurized and drained prior to installation.
- The Accelabar is available in ASME B16.5 Class 150#, 300# and 600# configurations. Verify that the Accelabar flanges match the pressure rating required by the application.
- Check that all pressure containing components are properly installed and tightened prior to pressurizing the system.

4.0 INSTALLATION PREPARATIONS

4.1 Location

There is no minimum straight run requirement.

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 Verabar sensor nameplate.

4.2.1 Horizontal Piping

For air or gas applications, mount the Accelabar directly to the top of the pipe in the 12 o'clock position. For liquid and steam applications, mount the Accelabar directly to the bottom of the pipe in the 6 o'clock position (see Figure 1). Deviation from these locations may cause inaccuracy in the flow measurement.

4.2.2 Vertical Piping

For vertical air or gas applications, orientation of the Accelabar is not critical. For vertical liquid applications, consult the Factory.

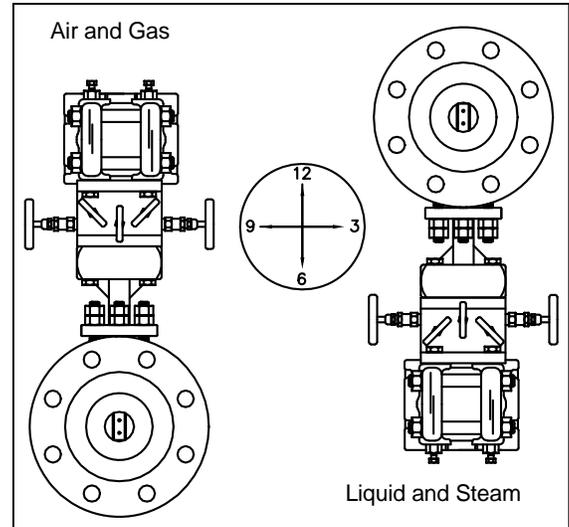


Figure 1. Accelabar Orientation in Horizontal

5.0 INSTALLATION PROCEDURES

WARNING: Large and heavy Accelabars require support at the unit and piping.

5.1 Preparing the Pipe

- Completely depressurize and drain the pipe prior to installation of the Accelabar.
- Remove a section of the pipe large enough to accommodate the face-to-face flange dimension of the size Accelabar listed in Table 1.
- **IMPORTANT:** Locate the Accelabar to allow adequate clearance for a manifold and transmitter, a minimum of 24” from the centerline of the pipe. Bolt the manifold and transmitter to the Accelabar to obtain the exact clearance requirements for your application.

Accelabar: NPS, ASME, and Sensor Size	Face-to-Face [in]	Tolerance
3in, 150#, -05	13.779”	±0.20
3in, 300#, -05	14.529”	±0.20
3in, 600#, -05	15.279”	±0.20
4in, 150#, -05	15.15”	±0.20
4in, 300#, -05	15.9”	±0.20
4in, 600#, -05	17.65”	±0.20
6in, 150#, -10	19.149”	±0.20
6in, 300#, -10	19.899”	±0.20
6in, 600#, -10	21.899”	±0.20
8in, 150#, -10	21.4”	±0.20
8in, 300#, -10	22.15”	±0.20
8in, 600#, -10	24.4”	±0.20
10in, 150#, -10	23.15”	±0.20
10in, 300#, -10	24.4”	±0.20
10in, 600#, -10	27.65”	±0.20
12in, 150#, -10	26.168”	±0.32
12in, 300#, -10	27.778”	±0.32
12in, 600#, -10	29.668”	±0.32

Table 1: Required Face-to-Face

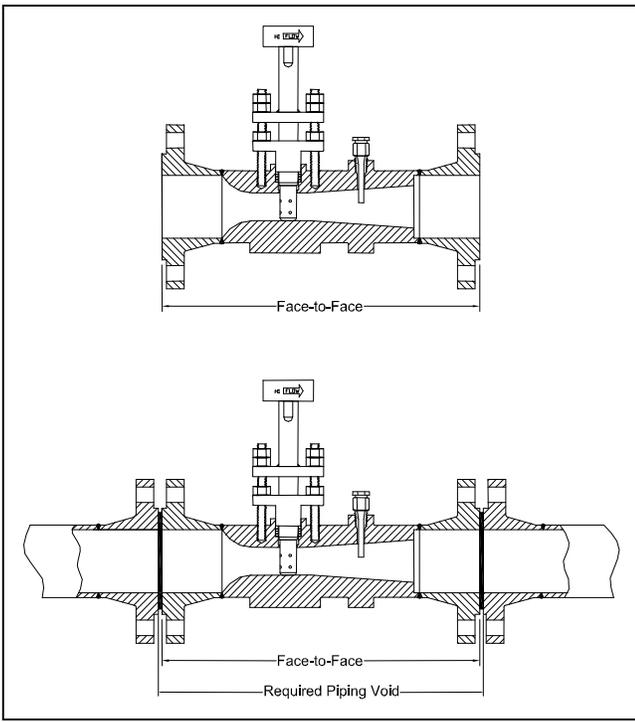


Figure 2. Face-to Face Dimension

NOTE: The face-to-face dimensions do not include gaskets (see Figure 2). Veris recommends adding 0.375" to the above dimensions to obtain the required distance between the piping flanges.

- Weld flanges to existing pipe. Make certain that the pipe flanges and Accelabar flanges are the same NPS size and pressure rating. Bolt hole location must be as shown in Figure 3 (does not show 12 and 20 bolt patterns; orientation is typical).
- **IMPORTANT:** Piping must yield slightly to allow the gaskets to crush and seal completely.

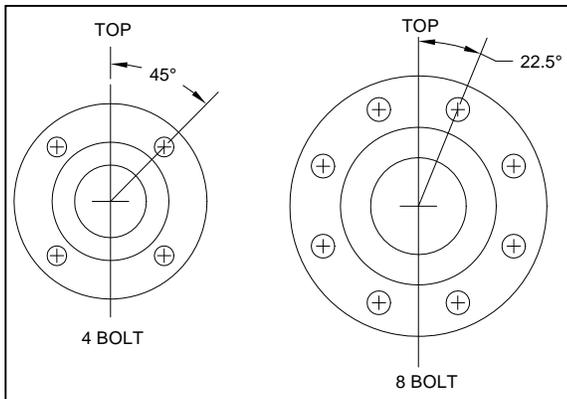


Figure 3. Bolt Hole Location

5.2 Installing the Accelabar

- 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 Figure 2. Be certain that the flow arrow on the Verabar Sensor is oriented in the same direction as the flow in the pipe. Failure to orient the Accelabar correctly could result in poor flow measurement.

- Place the appropriate spiral-wound gasket between the pipe flanges and the Accelabar flanges (see Figure 4).
- Insert the flange bolts through the flanges and tighten the nuts hand-tight on each end of the bolt. Once all the bolts are hand-tight, tighten opposing sets of bolts until the gasket is crushed. The final gasket height should be approximately 1/8".

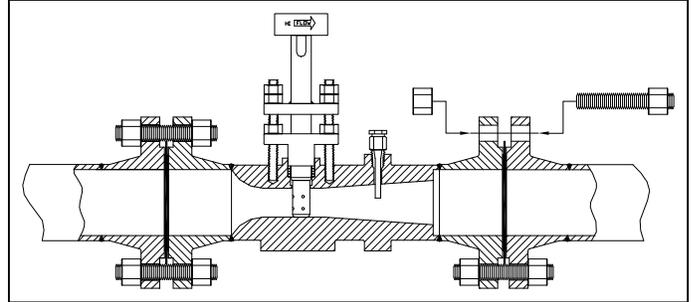


Figure 4. In-Line Accelabar

6.0 COMPLETE SENSOR INSTALLATION

The following instructions describe complete assembly of the Accelabar sensor in the Accelabar meter body (Figures 5 through 8 do not show flanges on the body).

- **IMPORTANT:** Depressurize and drain pipe if Accelabar is already installed in line.
- Parts necessary for Accelabar assembly are itemized in Table 2. Consult factory for specifications if these parts are not factory supplied.

Quantity	Item
3	3/8"-16 UNC Bolts
3	3/8"-16 UNC Retaining Studs
3	3/8" Flat Washers
6	3/8"-16 UNC Nuts
3	3/8" Split Washers
4	Packing Rings (grey)
2	Teflon Rings (white or black)
4	7/16"-20 UNF Transmitter Bolts
1	Packing Follower
1	Verabar Sensor

Table 2. Assembly Parts

6.1 Packing Installation

Insert a tube into the bottom bore of the Accelabar meter body per Figure 5. Use a 0.75" tube for 3" and 4" Accelabars and a 1.00" tube for all other Accelabars.

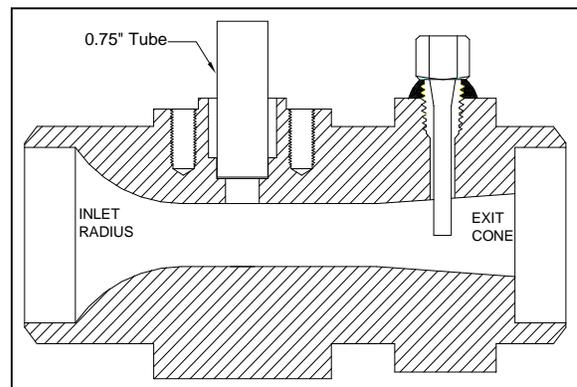


Figure 5. Tube and Accelabar

Install four packing rings one at a time using the following method (see Figure 6):

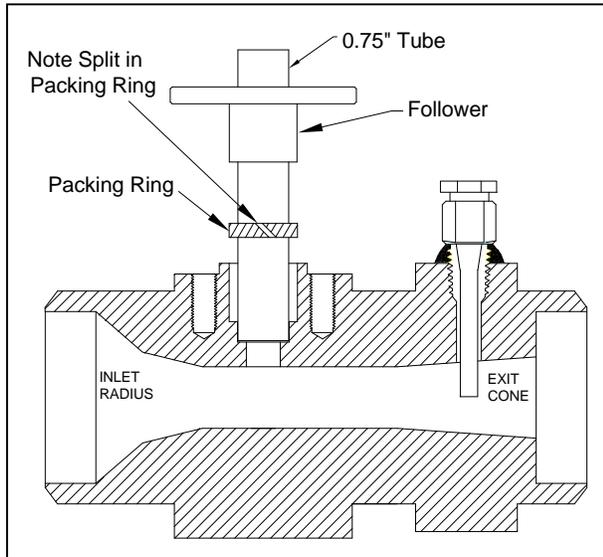


Figure 6. Packing Diagram

- Using a blunt screwdriver, swage the packing material between the outer diameter of the packing box and the outside diameter of the tube. Care must be taken not to twist the packing material or damage the packing box surface during installation.
- After each individual packing ring is swaged around the tube, the follower should be pushed down firmly on the packing ring to seat the ring in the packing box.
- Repeat steps for the other three packing rings, being sure that the splits in the packing rings are 90° apart as shown in Figure 7.
- Remove follower.

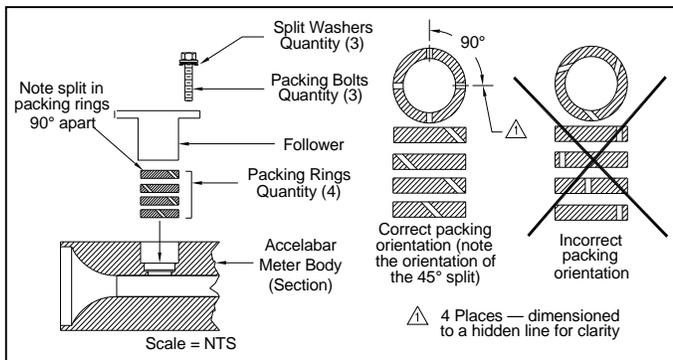


Figure 7. Packing Rings

6.2 Retaining Stud Installation

- Apply a thread-locking product (e.g. Loctite 262) to the first 0.75-inch of stud. Next, install the stud in the threaded hole closest to the exit of the meter, hole #1 in Figure 8. (The inlet is radiused; the exit is conical). Thread the stud into the hole until hand tight.
- Thread a nut about one inch onto the stud. Then thread a second nut onto the stud.
- Place a backup wrench on first nut and tighten the second nut 1/8 turn beyond hand tight onto

the first nut. Do not allow the backup wrench to turn.

- Using the second nut, tighten the stud one half to one full turn beyond hand tight.
- Remove nuts from stud.
- Repeat this process in holes #3 and #5 as in Figure 8.

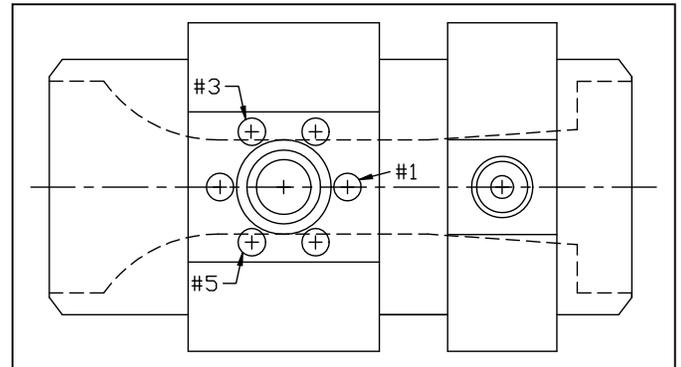


Figure 8. Retaining Stud Locations

6.3 Packing Bolt Installation

- Install the follower in the packing box, taking care not to damage the stud threads.
- Put one split washer on each packing bolt.
- Apply a small amount of anti-gall paste (e.g. Loctite Moly Paste) on first three to five threads of packing bolts.
- Install packing bolts in remaining bolt holes hand tight.

6.4 Accelabar Sensor Installation

- Carefully insert the Accelabar sensor into the Accelabar meter body. The sensor can only be inserted in one direction due to the orientation of the mount disk and the retaining studs.
- Bottom the sensor firmly in the meter body.

6.5 Help

Contact the factory for installation assistance.

7.0 RTD ASSEMBLY INSTALLATION

- When applying thread sealant, fully cover the lead thread and smear the sealant on all the threads a full 360° and make sure to get sealant into the valleys of the threads on the male part.
- When applying thread sealant tape, wrap the tape clockwise. Apply it such that the lead thread is covered two full turns before wrapping up to the vanishing thread. All threads should be covered with three complete turns of tape.
- When installing the plug, insert it into the Thermowell and tighten it as tight as possible by hand. Then using a wrench tighten the plug an additional one to two full turns.
- When installing an RTD assembly, use the following procedure and Figure 9.
 - 1) Apply the thread sealant to the bottom RTD threads and thread into the Thermowell.
 - 2) Apply the same thread sealant to the top RTD threads and thread the union onto the

RTD, rotating side up. Tighten the union so that the top does not spin.

- 3) Gently thread the RTD wires through the elbow. Apply the same thread sealant to the elbow threads and thread into union. If necessary loosen the union and position the elbow so that it points to the side of the body as shown in Figure 9, re-tighten the union.
- 4) Push the RTD wires into the junction box and thread the box onto the elbow in the orientation shown in Figure 9.

- 5) If a cable is supplied, thread it into the junction box and hook up the wires, red-to-red, red-to-red, and white-to-white, refer to Figure 10. Clip the drain wire (uninsulated) off at the base. R, P and T heads are typically not supplied with a cable.

- If the sensor has an F or M head, install the transmitter per the transmitter manufacturer's instructions.
- Place one flat washer and one nut on each stud and thread until it is hand tight against the mount disk of the sensor. Tighten the nut 1/4 turn beyond hand tight. Thread a second nut on the stud until hand tight against the first nut. Place a backup wrench on the first nut and tighten the second nut 1/8 turn beyond hand tight.

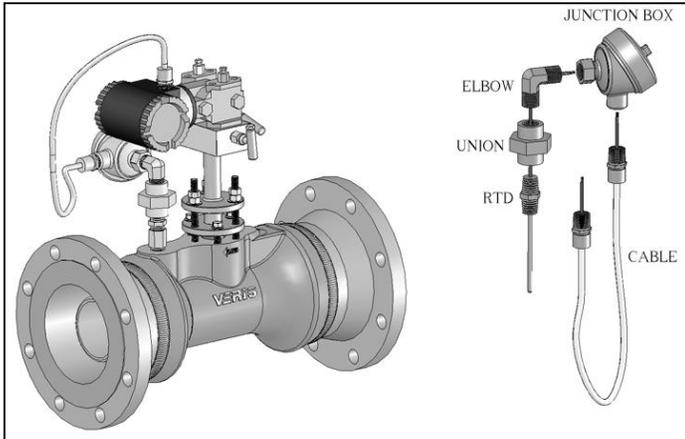


Figure 9. RTD Assembly Installation

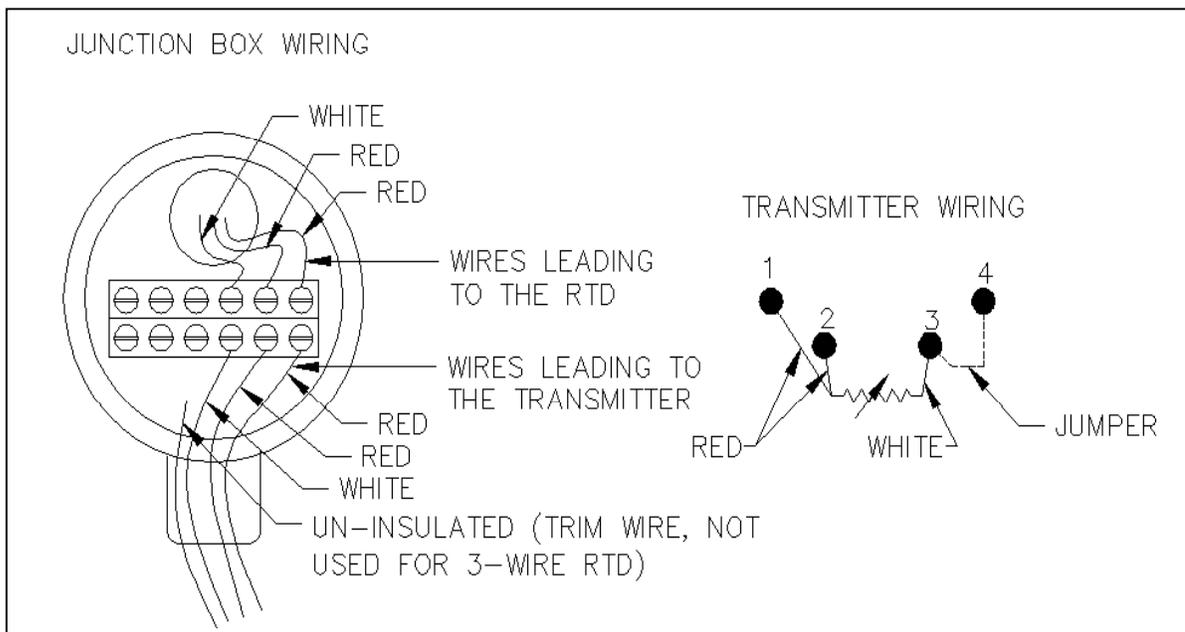


Figure 10. Wiring Diagram of 3-Wire Junction Box and Transmitter

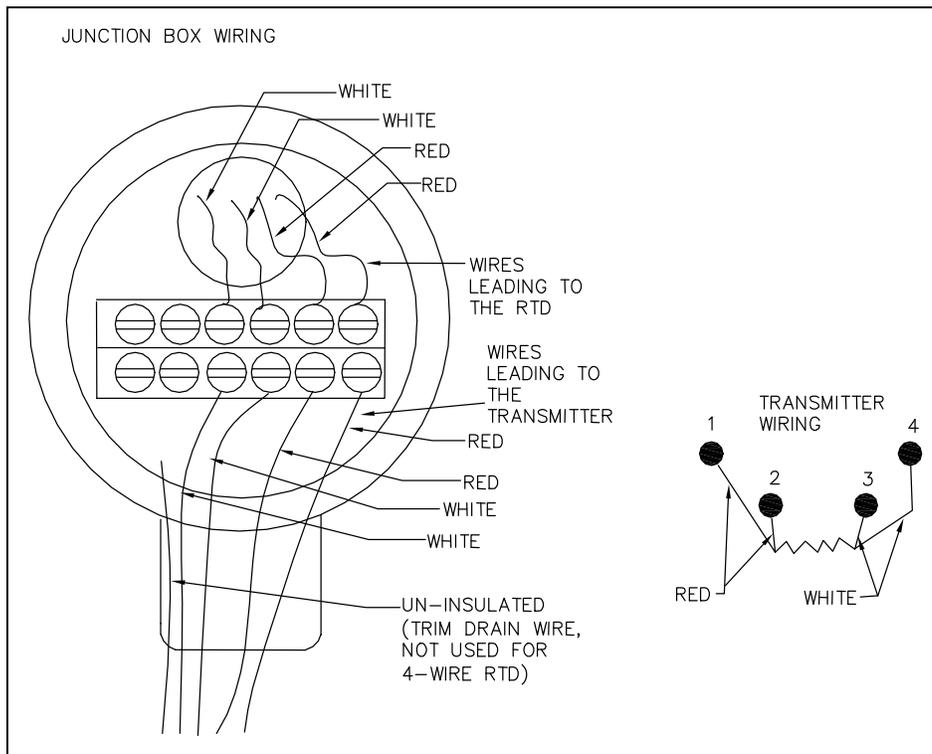


Figure 11. Wiring Diagram of 4-Wire Junction Box and Transmitter

- Tighten the packing bolts to 70 in*lbs torque on -05 models and to 100 in*lbs on -10 models.
- Installation is complete (see Figure 12 for Final Assembly.)

8.0 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 pipe.
- Unbolt and remove transmitter from the Accelabar, or remove instrumentation tubing from head.
- Loosen and remove retaining nuts and washers from retaining studs (see Figure 8).
- Loosen the follower bolts and gently remove the sensor from the meter body.
- Remove the follower bolts and the follower.
- Remove the old packing. Do not damage the surface of the packing box.
- Install the new packing and reinstall the sensor per the procedure described in Sections 6.1, 6.3 and 6.4.
- Reassemble the transmitter or instrumentation tubing to the sensor head.

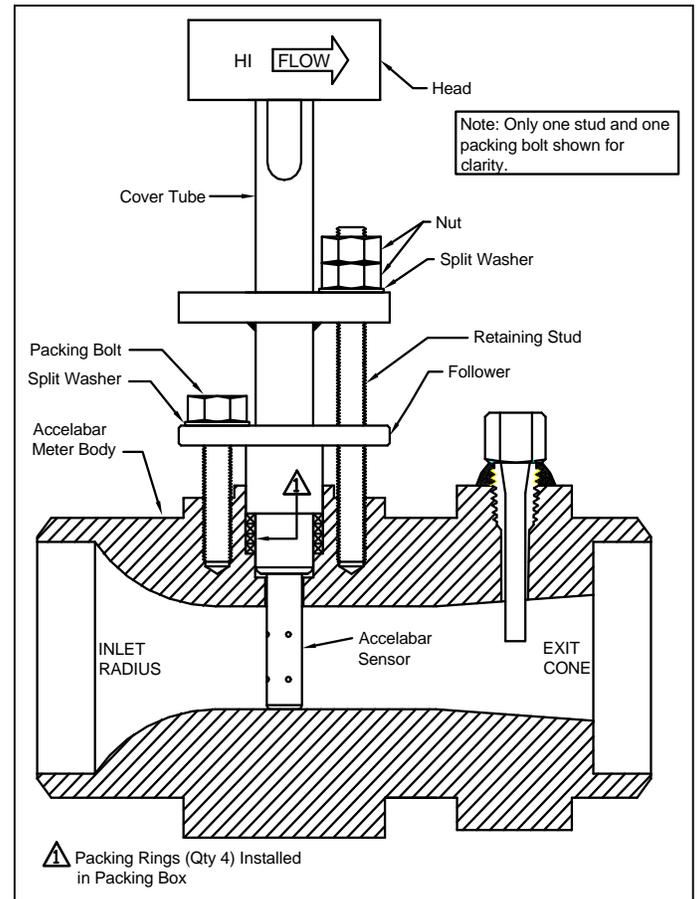


Figure 12. Final Assembly