

V500 and V510 VERIS Verabar® **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 Verabar® averaging pitot flow sensor provides unsurpassed accuracy and reliability. With its solid, one-piece construction and bullet shape the VERIS Verabar® makes flow measurement reliable and precise.

The unique sensor shape reduces drag and flow induced vibration. The location of the low-pressure ports eliminates the potential for clogging and improves signal stability.

The V500 model features flanged mounting components. The V510 model includes additional support on the opposite wall of the pipe.

Section 1 Scope

These instructions provide a description of procedures for installing the V500 and V510 Verabar® model flow sensors. Procedures are given for all industrial flow measurement applications including liquid, steam and gas, for both horizontal and vertical piping configurations.

Section 2 Receiving and 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 actual pipe diameter matches the ID stated on the sensor nameplate.
- Check the bullet shaped sensor tube for any signs of damage. Damage to the sensor tube may result in erroneous flow readings.

Section 3 Safety Precautions

The following process should be conducted prior to installing the Verabar® flow sensor:

- 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.
- Check to ensure the pipe is depressurized and drained prior to installation.
- Verify all pressure containing components are properly installed and tightened prior to pressurizing the system.

Section 4 Installation Preparations

4.1 Location

For the most accurate flow measurement, a minimum straight run of pipe is required. Table 1 shows the minimum straight run requirements.

If longer straight runs are available, position the Verabar® such that the ratio of upstream straight run to downstream straight run is approximately 4 to 1. If straight run lengths are less than the values stated in Table 1, consult the factory for additional accuracy and location information. For additional piping configuration, see Table 1.

Straightening vanes should be positioned such that the end closest to the Verabar® is half way between the Verabar® and the closest upstream configuration. For elbow installations, mount the Verabar® in the same plane as the closest upstream elbow.

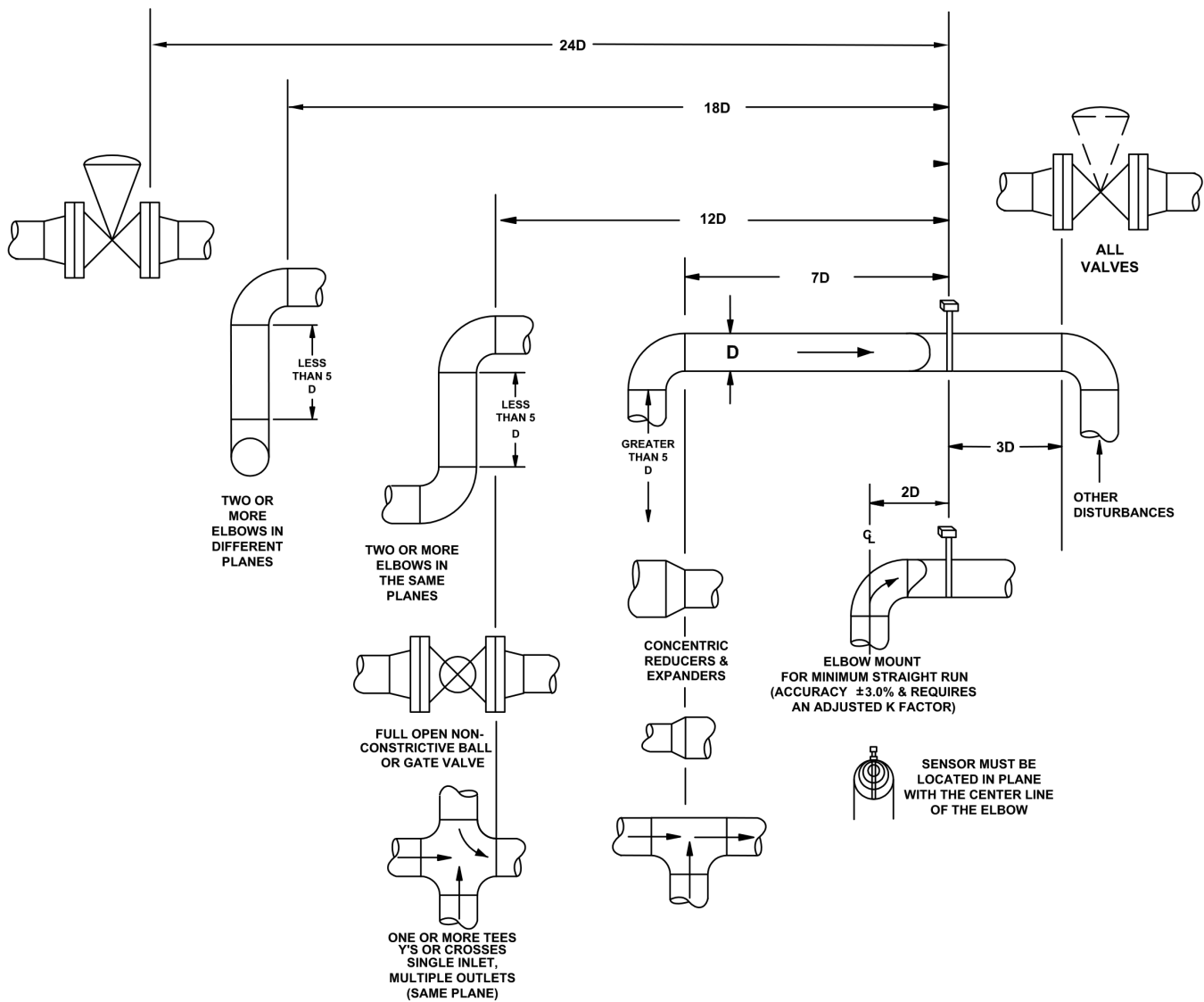


Table 1. Straight Run Requirements

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.

Deviation from the following mounting location instructions may cause inaccuracy in the flow measurement.

4.2.1 Horizontal Piping

For air or gas installations, mount the Verabar® in the upper 160° of the pipe to allow any condensate to drain into the pipe (Figure 1). For liquid or steam installations, mount the Verabar® in the lower 160° of the pipe. This allows any entrained air to bleed back into the pipe for liquid applications and allows condensate to collect in the instrument piping for steam applications.

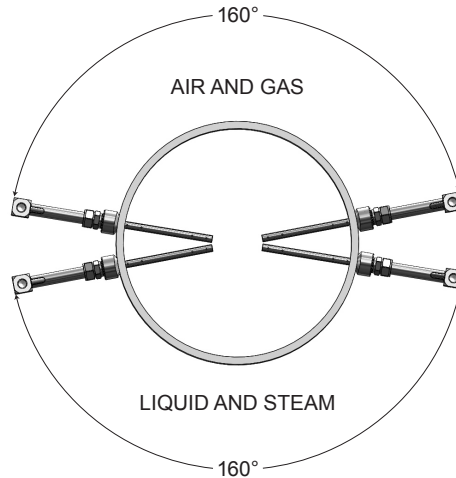


Figure 1. Verabar® Orientation in Horizontal Pipe

4.2.2 Vertical Piping

The Verabar® may be mounted in any location around the circumference of the pipe for vertical piping applications.

4.3 DP Transmitter/Local Indicator Location

When choosing a Verabar® location, consider the DP transmitter/local indicator location:

- The transmitter must be mounted below the Verabar® for liquid and steam applications.
- The transmitter must be mounted above the Verabar® for air and gas applications.

4.4 Installation Drawings and Bill of Materials

Additional information is available in the Installation Drawings and Bill of Materials VB-7061 (Contact factory for access information). It contains standard and alternate transmitter locations and a complete bill of materials based on the fluid type and sensor orientation on the pipe.

Section 5 Installation Procedure

5.1 Preparing the Pipe

- Completely depressurize and drain pipe prior to installation of the Verabar®.
- Mark the location of the hole through which the Verabar® will be mounted. For V510, mark the location of the hole for the opposite end support 180° from the first hole. Use a center punch to mark the hole to prevent the drill bit from walking on the pipe.
- Drill the pipe with the proper sized hole per the following table (Important: Do not torch cut hole(s):

Sensor Size	Hole(s) Diameter
V500-05 & V510-05	½" (13mm)
V500-05 & V510-10	1" (25mm)
V500-05 & V510-15	1-1/2" (38mm)

• IMPORTANT:

Deburr the hole(s) on the inside of the pipe.

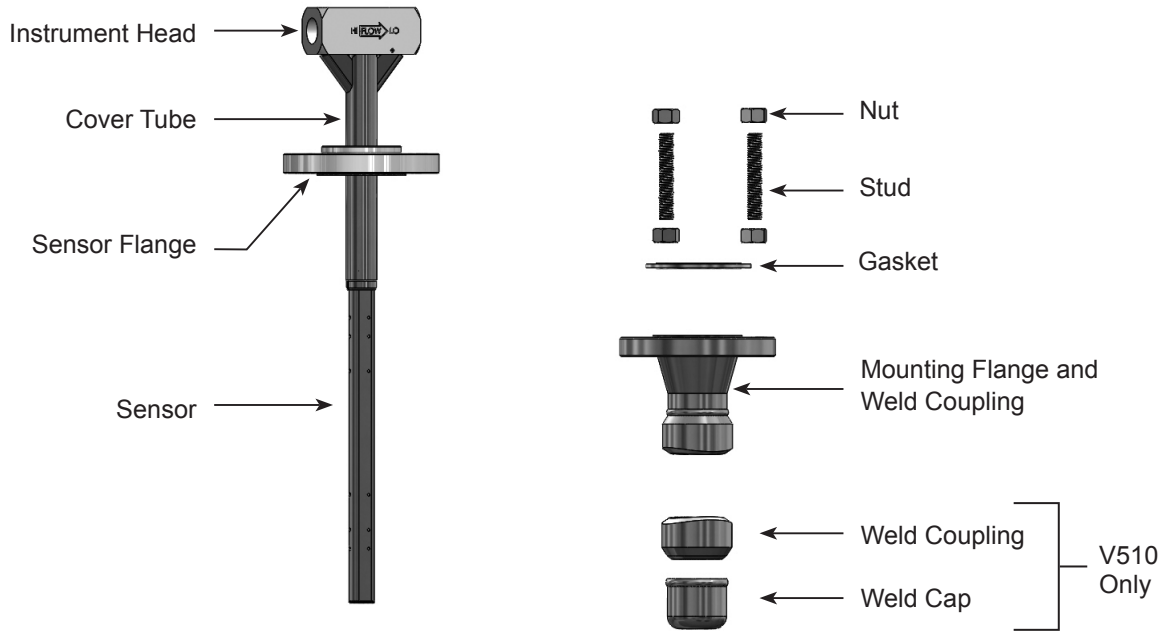


Figure 2. Verabar® Model V500 & V510 Assembly

5.2 Weld Mounting Flange to Pipe

- Loosely bolt together (hand tight) the sensor, gasket and mounting flange. Insert the assembly into the pipe. Align the head of the sensor so that the arrow labeled “flow” on the head is in the direction of the flow to within 3 (degree symbol). The contour of the weld coupling should match the contour of the pipe. Check that the bottom of the weld coupling is in contact with the pipe wall.
- Using the appropriate weld gap (1/16” [1.5mm] typical), tack weld the mounting flange into position (see Figure 3).

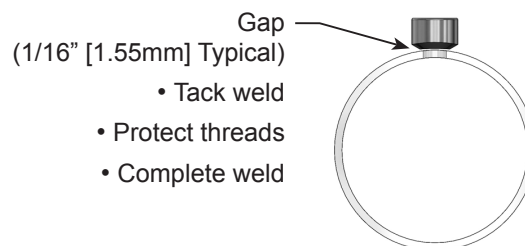


Figure 3. Weld Gap

- Note the flange orientation per Figure 4. The bolt holes on the flange should straddle the centerline of the pipe (2-holing pattern). For V510 models, slide the opposite end weld coupling over the tip of the sensor and tack weld into position.

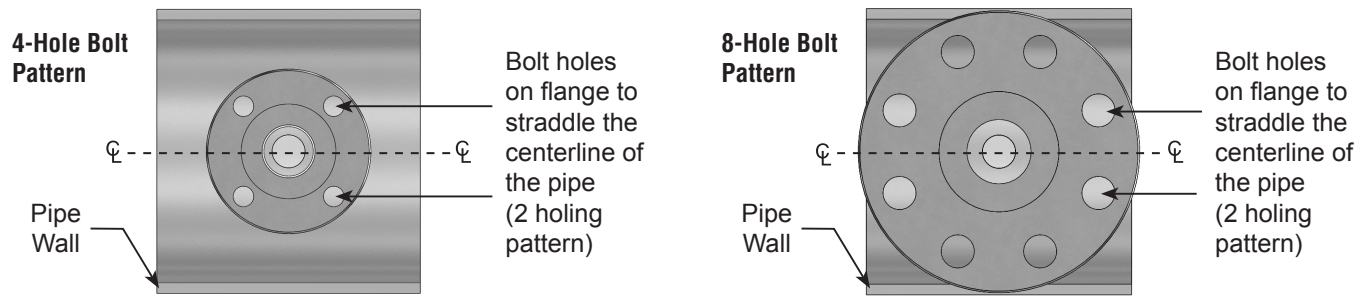


Figure 4. Flange Orientation

- Remove the sensor and sensor flange, and finish welding the weld coupling to the pipe per applicable piping codes. For V510 models, weld the weld coupling and weld cap into position.

5.3 Insert Sensor

- Install the sensor with the gasket between the flanges such that the flow arrow on the head of the sensor is in the direction of the flow (Figure 5). The nuts should be tightened until the gasket is completely crushed (the gasket thickness should be approximately 1/8" [3mm]).

5.4 Insert Instrument Vales or Manifolds

5.4.1 Valves

- If the Verabar® does not have a valve head, install instrument valves using proper thread sealant. Be sure instrument shut-off valves are installed and shut prior to re-pressurizing the pipe.

5.4.2 Manifold

- If the Verabar® has a direct or integral manifold, be sure the high and low pressure block valves are shut off prior to re-pressurizing the pipe.

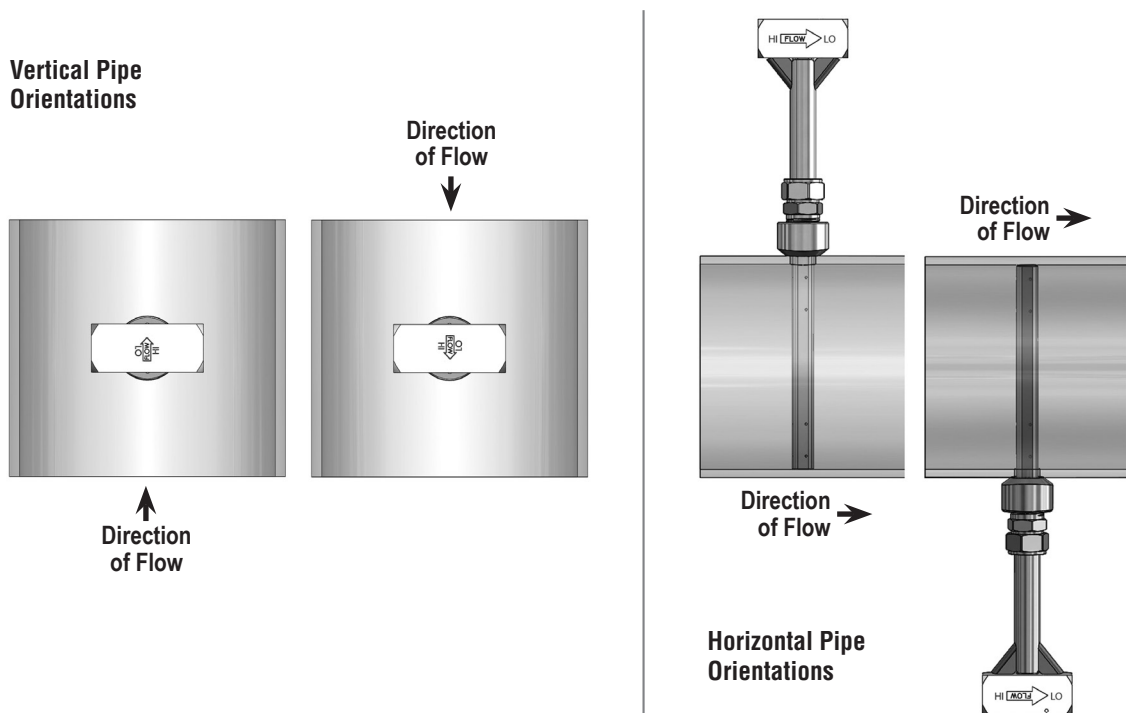


Figure 5. Orientation of Flow Arrow

The Verabar® is now properly installed (Figure 6).

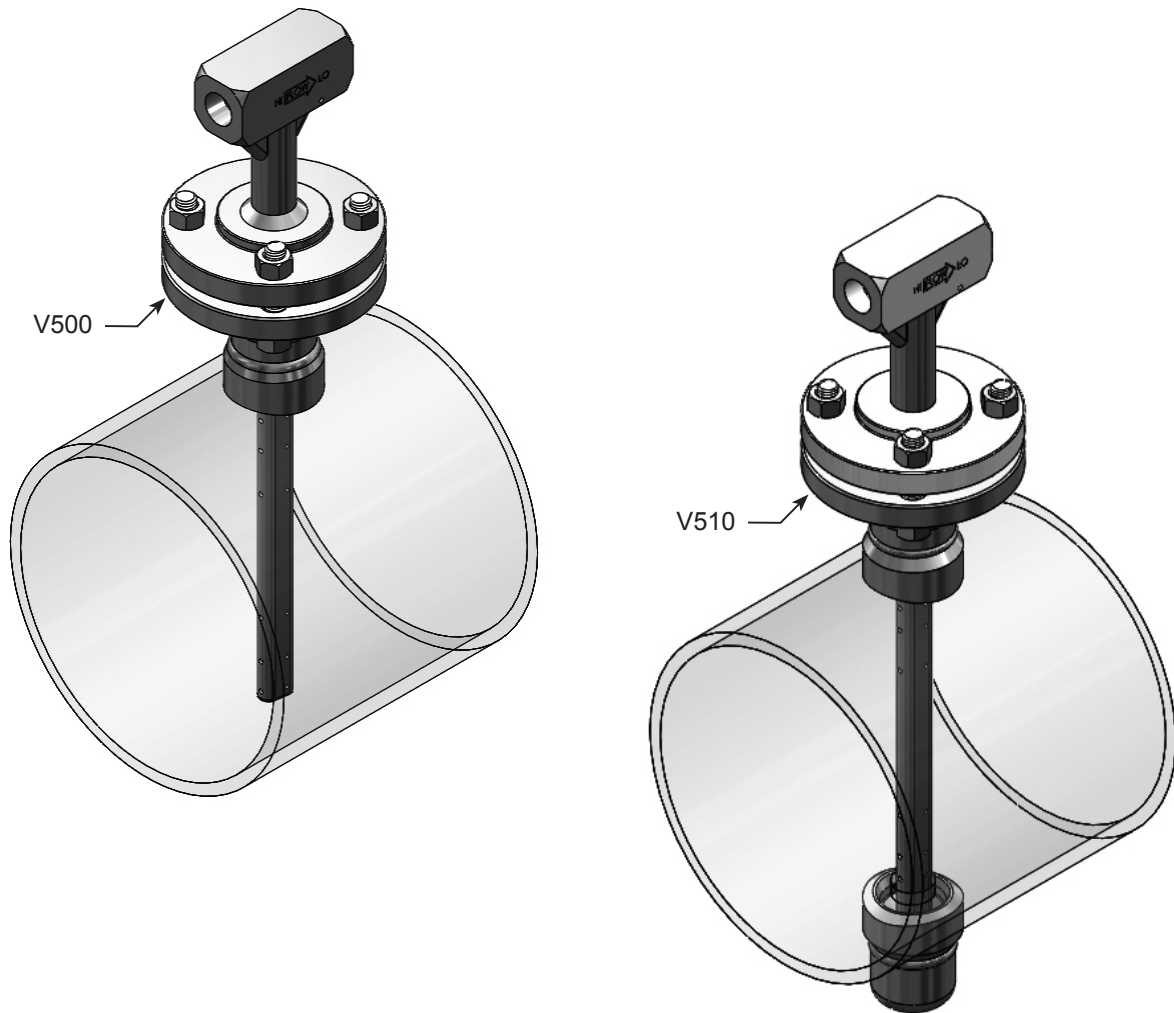


Figure 6. Installed V500 & V510

Section 6 Periodic Maintenance

The assembly should be periodically checked. Verify that no leaks are present.
Inspect sensor for wear or damage.

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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:

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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