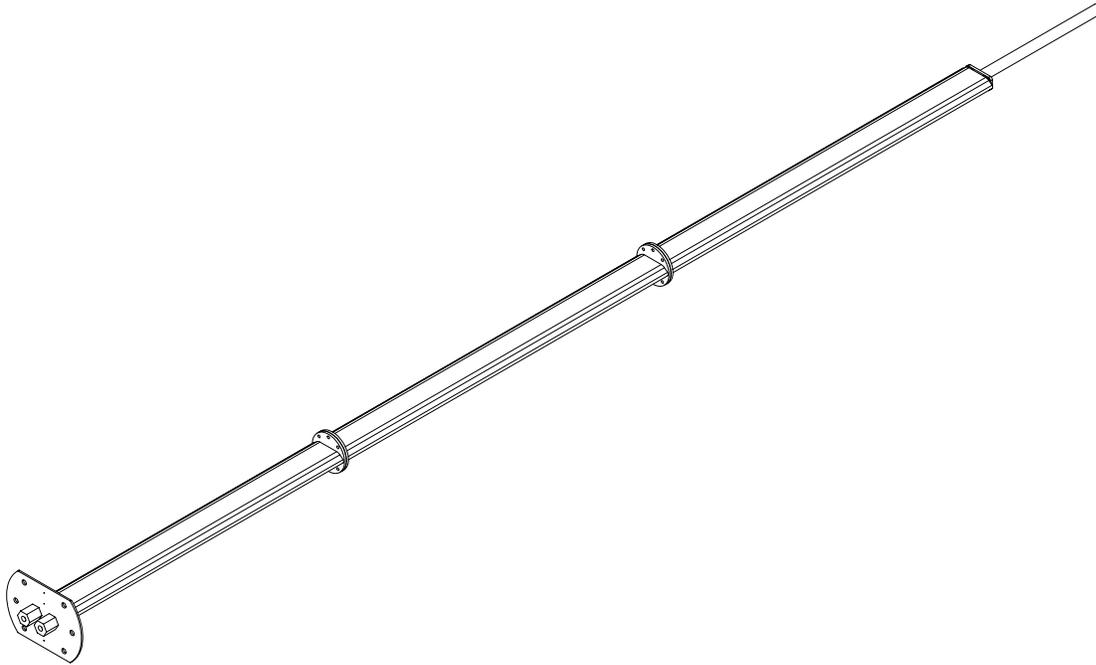




EASTERN INSTRUMENTS

VAP³[®]-XL Probes

PROBE
INSTALLATION & OPERATION
MANUAL



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Installation

Probe Overall View

This installation manual was designed to ensure proper installation and operation of Eastern Instruments' VAP³[®]-XL System. Below are some figures depicting the overall system components with component names that will be used throughout this manual.

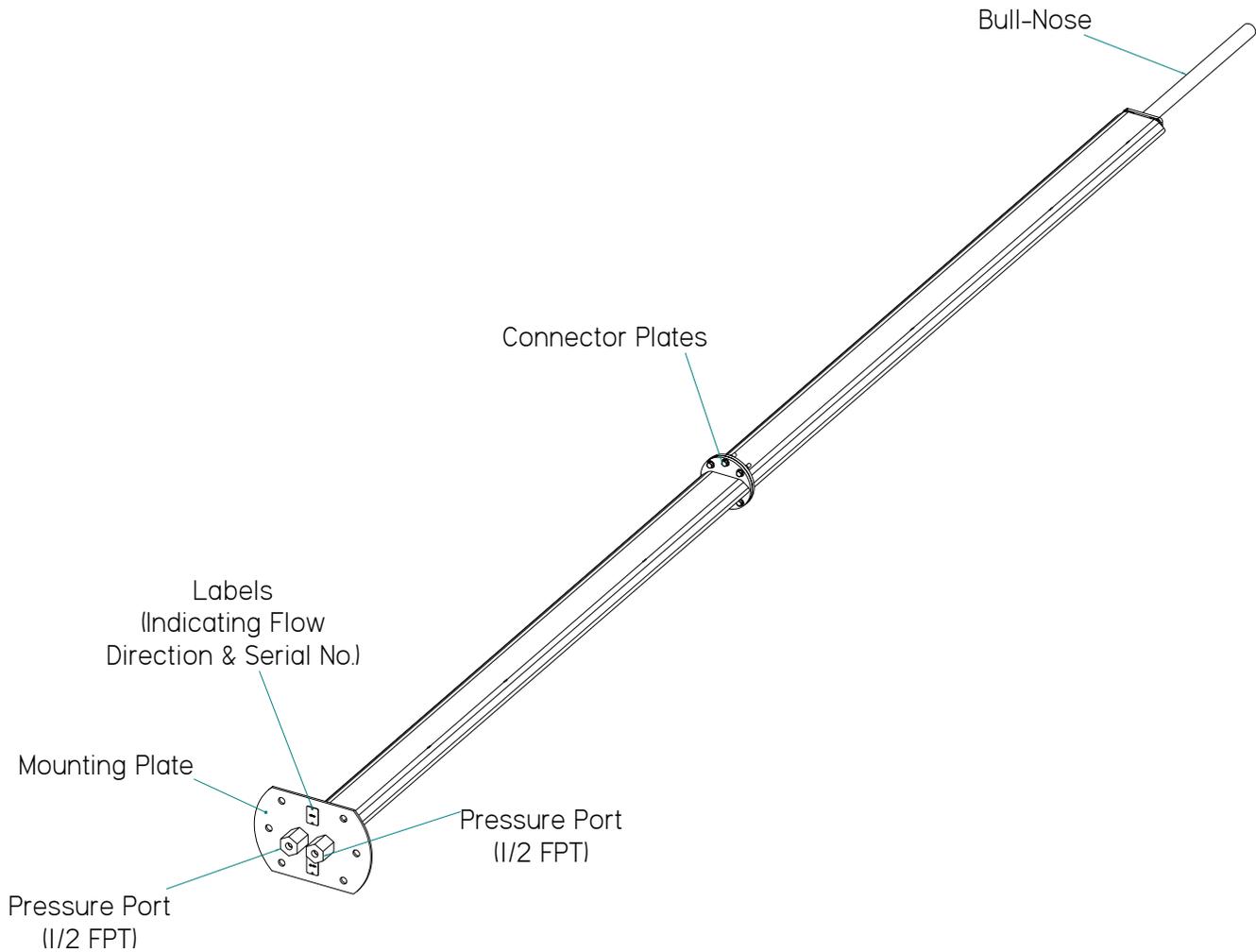


Figure 1 VAP³[®]-XL Probe Overall View

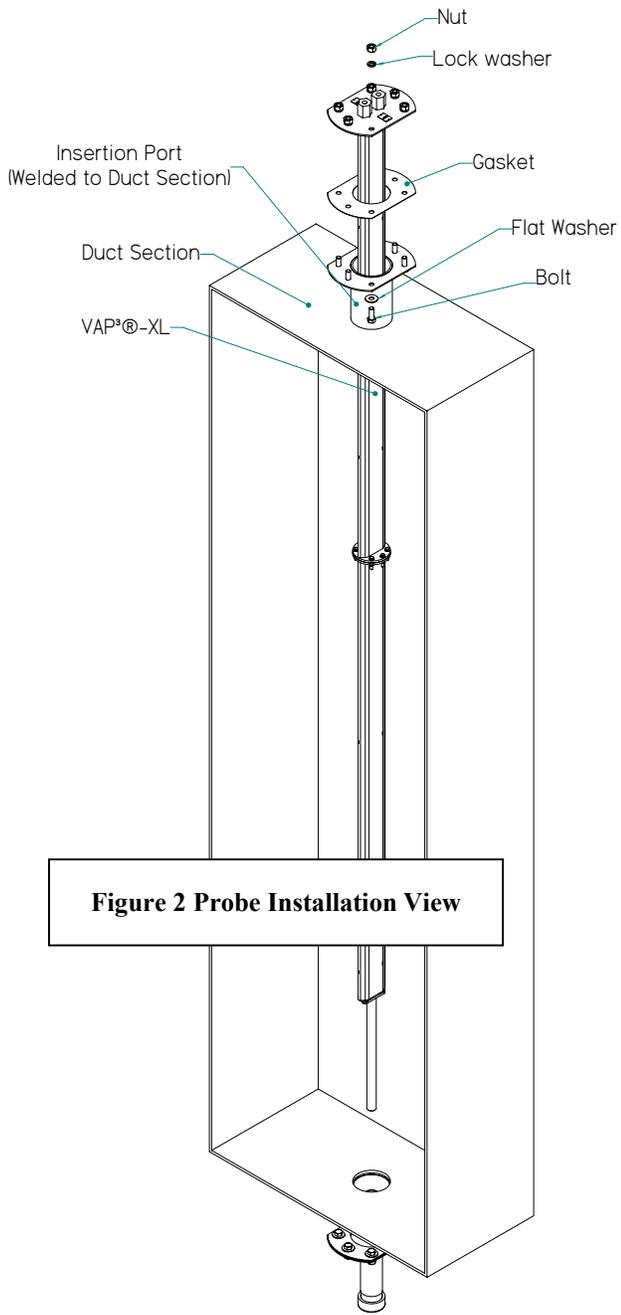


Figure 2 Probe Installation View

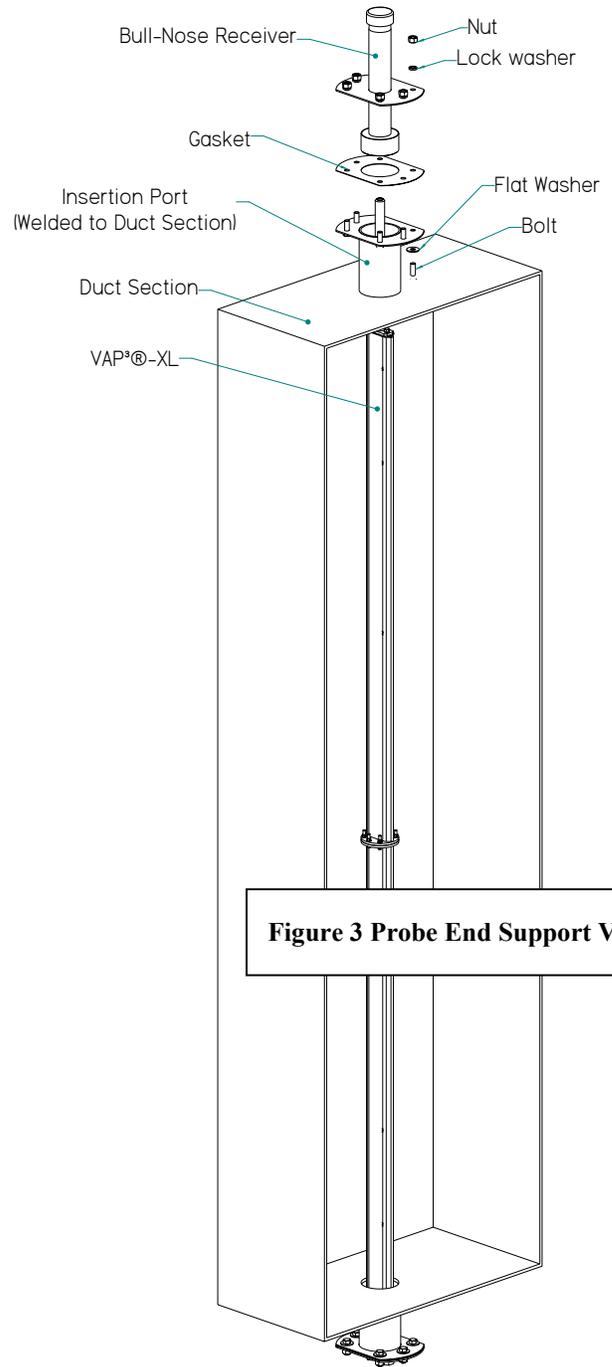


Figure 3 Probe End Support View

Air Duct Preparation:

VAP³[®]-XL Probes can be installed in circular, square, or rectangular ducts. There are many things that you should take into account when mounting the probes. Below is a list of items that should be used as a reference before installing probes:

- Check installation point as per Installation Drawing supplied with probes.
- Check installation orientation as per Installation Orientation Drawing supplied with probes.
- Check for obstructions that could prevent insertion or removal of probes.
- Check to ensure that probes can be connected together as per Tubing Drawing supplied with probes.
- Check that probe connections are lower than connection to measurement transmitter to ensure that possible moisture will not travel to transmitter.
- Check that Insertion Ports are of same material as duct to ensure that continuous weld can be obtained.
- Check that End Supports can be mounted on duct easily.
- Ensure that access to the inside of the duct can be made at this measurement point.

Insertion Ports:

Insertion ports are used to allow easy insertion and/or extraction of the VAP^{3®}-XL Probes into the duct section. They are constructed of material similar to that of the duct to ensure that they can be welded to the duct to ensure a continuous seal. The port consists of a pipe section and mounting plate. Depending on the duct type, circular or rectangular/square, the pipe section may have a curvature to it. It is highly important that the Insertion Port be attached to the duct section in the correct orientation to ensure that the probe will then be oriented correctly. The Insertion Ports come in a 10in length with a 14in diameter flange to match the Mount Plate of the probe. Figure 4 shows a typical port, dimensions and its reference to airflow direction.

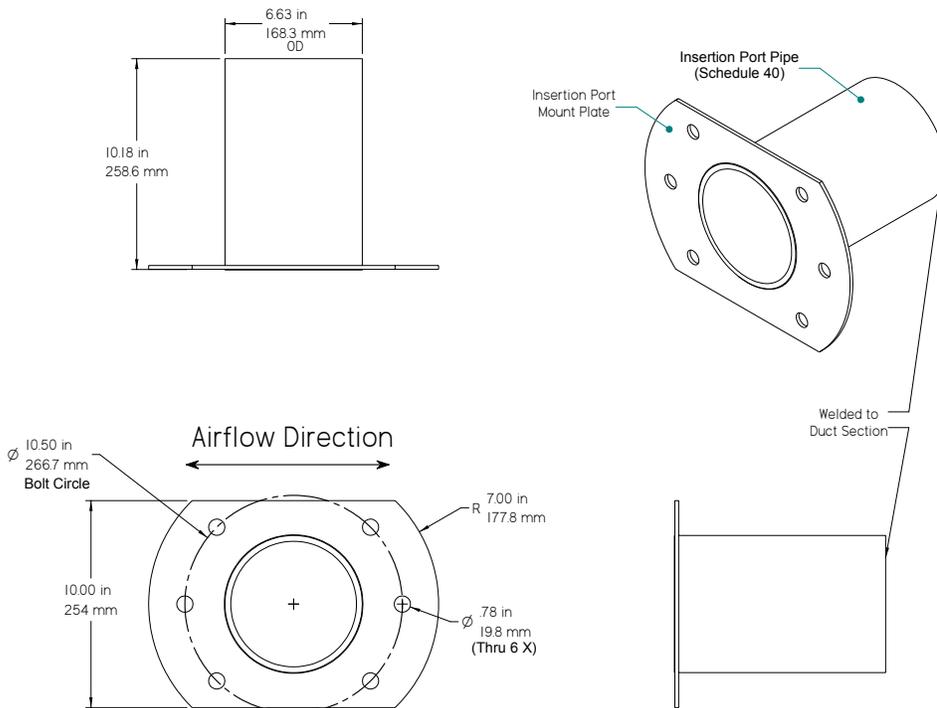


Figure 4 VAP^{3®}-XL Insertion Port – 10” length

Typically a 6.125” (155.58mm) diameter hole should be put into the duct and the Insertion Port welded concentric to that hole. A hole of this diameter will ensure that the probe will fit through the duct wall and allow enough material for the welding of the Insertion Port to the duct. This MUST be a continuous weld to ensure that the port seals to duct. Ports are supplied with Blank-off Plates so that they may be welded in place and probes installed at a different time if necessary. These also can be used to seal off the port if the probe needs to be removed from service.

End Supports:

Due to the length of the VAP³[®]-XL Probes it is required that both ends be supported. The insertion end is support by the Insertion Port and the opposite end is supported by an end support called Bull-Nose Support. This end support incorporates an Insertion Port welded 180° to the Insertion Port that the probe is mounted to, and a Bull-Nose Receiver (See Figure 5). On the probe is a Bull-Nose Rod that extends from the end of the probe. Once installed, the Bull-Nose supports the probe while still leaving it free for expansion and contraction of the duct. This end support is required even when the probe is installed vertically.

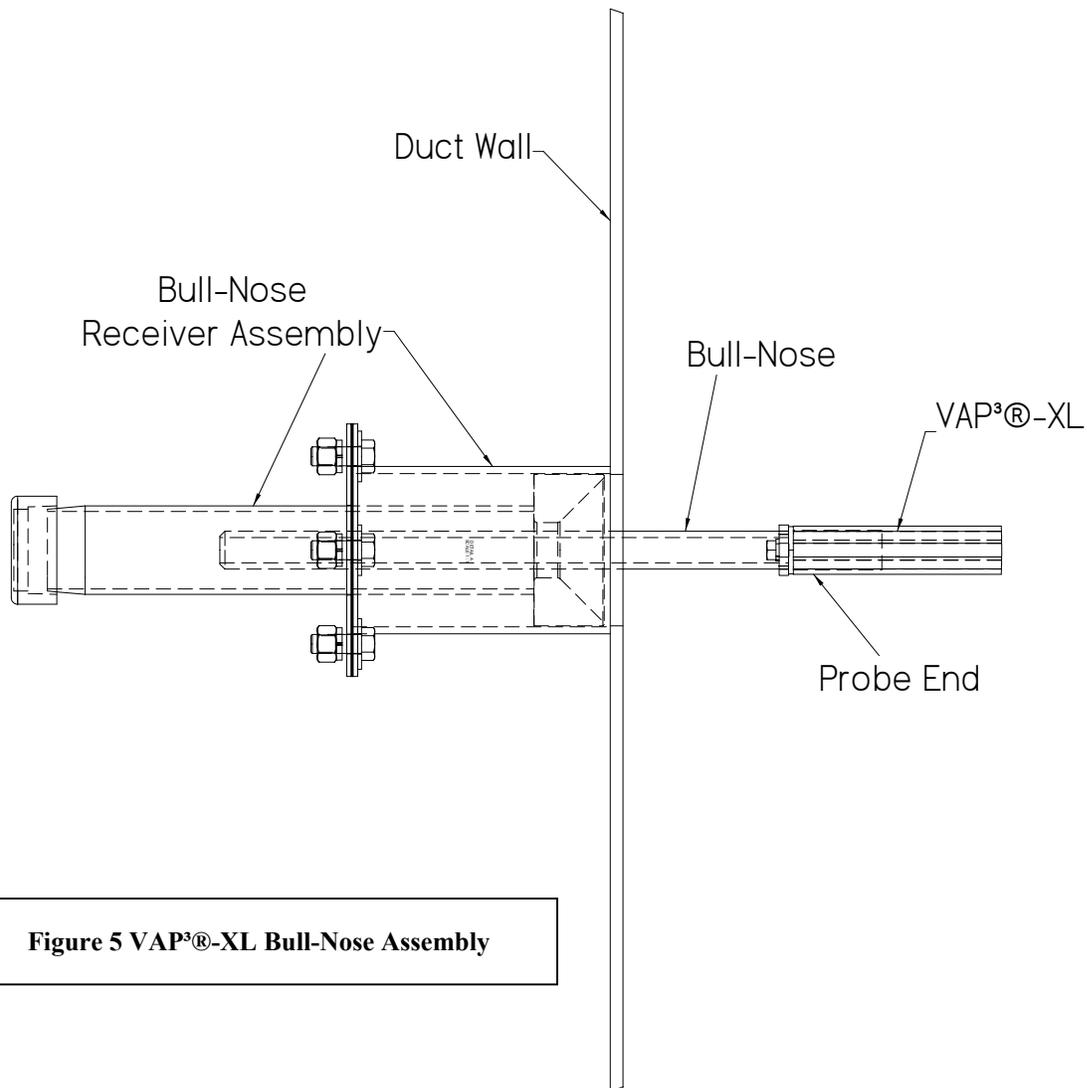


Figure 5 VAP³[®]-XL Bull-Nose Assembly

Tie Bars:

In an installation with more than one VAP³®-XL Probe, Tie Bars are required to raise the frequency of the probes within the duct. The Tie Bar is installed between the probes at each coupling plate location tying the probe at the left and/or right to each other. The Tie Bar is not to be used to tie the probe to the duct wall in any fashion. The Tie Bar is to be installed on the down-stream side of the probe and requires access to the inside of the duct at the location the probes are to be installed. See Figure 6 Steps 1, 2, 3, and 4 for details on how the tie bar is attached to the probe.

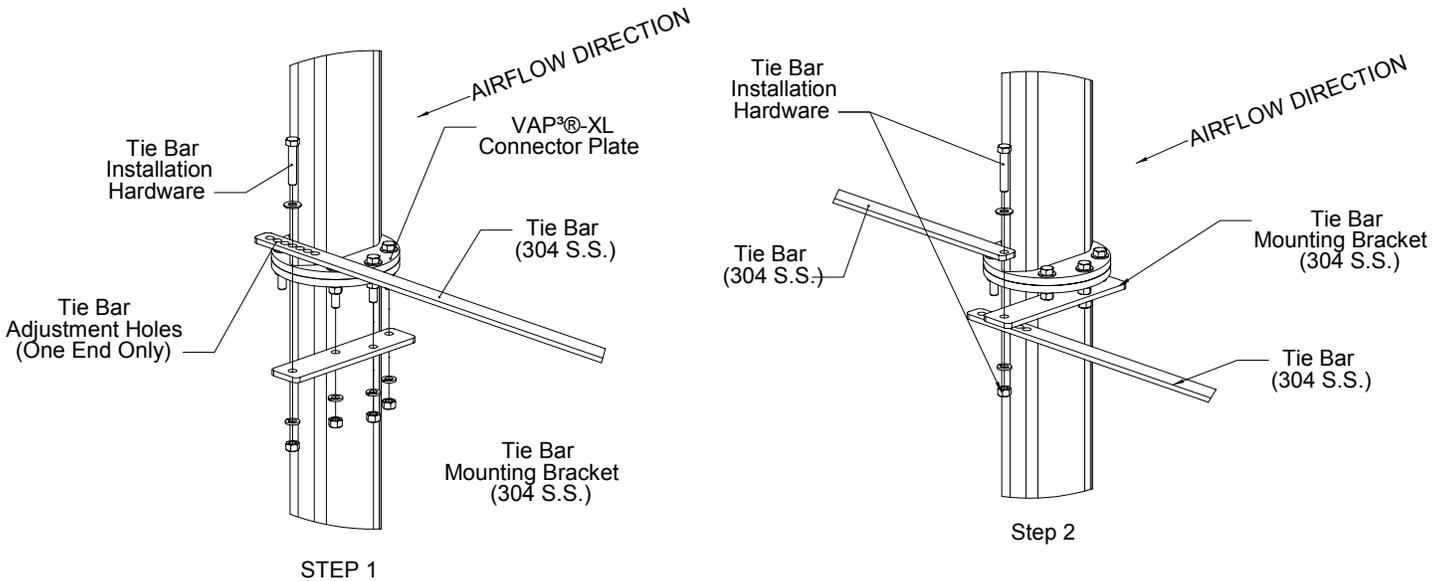
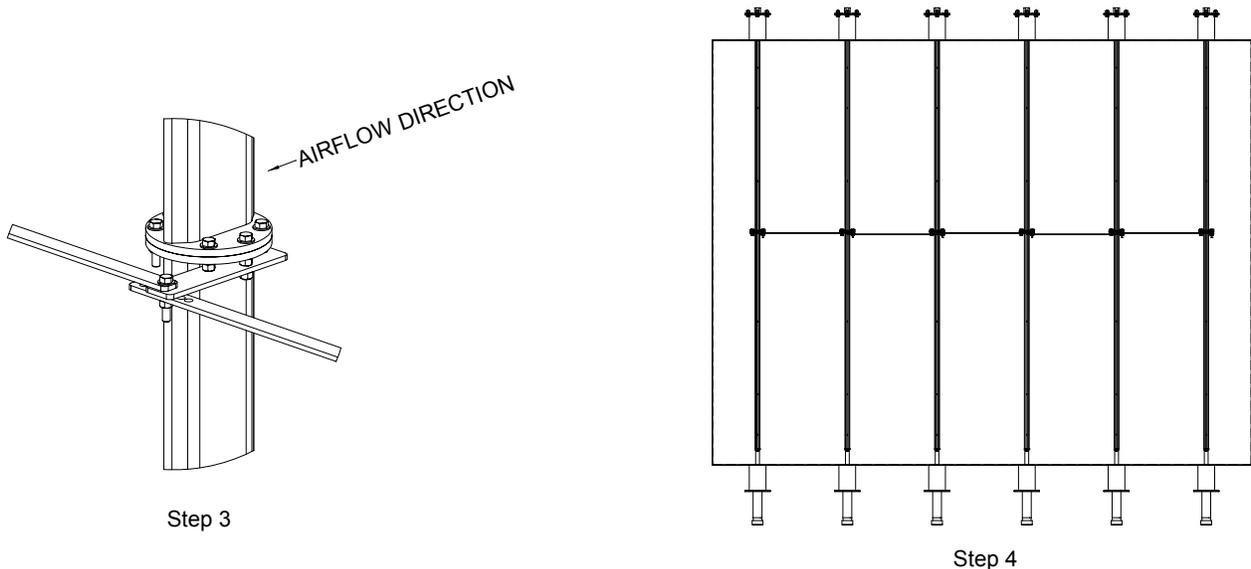


Figure 6 VAP³®-XL Tie Bar Installation



Probe Alignment and Mounting:

The VAP³[®]-XL Probes will be labeled with an airflow direction. Once the Insertion Ports have been properly mounted to the duct the probe just inserts into it and gets attached with the hardware provided (See Figure 7). Ensure that the Gasket is slid over the end of the probe and against the Mounting Plate before inserting the probe into the port. This Gasket will ensure that when the hardware is tightened it will seal the probe to the port. When tightening the hardware ensure that bolts are all checked and that the Mounting Plate is resting firmly against Gasket and port mounting plate. Also ensure that the probes are inserted so that the airflow direction indicated on the probe label is the same as the flow in duct (See Figure 8). Installing probes incorrectly will affect measurement.

Figure 7 Mounting of Probe to port

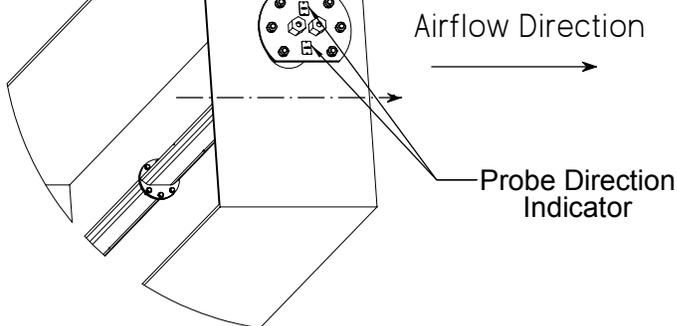
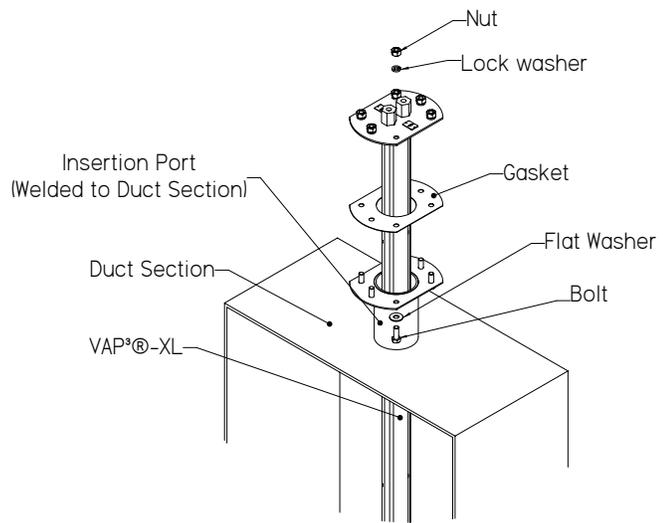


Figure 8 Airflow Indicator

Connections:

Tubing

Connections of the VAP³[®]-XL Probes to the Transmitter may vary depending on the number of probes being used, the environment that the probes are installed in, and the configuration of the ducting. A recommended Tubing Installation Drawing should be supplied with the probes and should be considered to supercede any recommendations that this manual makes since it may be specific to an installation. All **HIGH** port connections should be coupled together using equal length tubing and tee fitting where necessary. When multiple probes are used it is recommended that the “center” probe be the junction point for the tubing to go to the transmitter. All of the **LOW** port connections should also be coupled together and routed similarly to the transmitter. *All connections should have Teflon tape or approved alternative thread locking material* to make sure that there are no leaks at the fittings. Fittings provided on the probe are a 1/2 NPT female thread. The following recommendations are made for tubing the probes:

- For outdoor installation, use of metallic ½” OD tubing or larger with a 0.035” wall tubing and compression fittings is recommended.
- For indoor installation where condensation may be present, use of metallic ½” OD tubing or larger with a 0.035” wall tubing and compression fittings are recommended.
- The transmitter being used for flow measurement should be mounted above the elevation of the probes.

Valves

Connections of the VAP³[®]-XL Probes to the Transmitter may use root valves or ball valves to connect the main line junction of the tubing to the transmitter. These allow for the probes to be ported off from the transmitter so that probes or transmitter may be serviced, replaced, or probes purged. However, when the probes are connected to a continuous purge these are not recommended. It should be remembered that the more connection points in the tubing lines the more possible leak points.

Maintenance:

Cleaning Recommendations

The VAP³[®]-XL Probes should be removed annually and cleaned to deliver the highest performance possible. When installed in harsh environments more frequent monitoring may be necessary.

To clean the probe, detach the connections to the transmitter or close the valves to the transmitter. Using clean instrument air, blow air through the probe from the connection inlets to clear the probe back through the pressure ports of any particulate or moisture. Wipe the exterior of the probe, leaving no lint, oil, or moisture; and reinstall. Make sure the pressure ports are all clear and the probe is reinserted in the correct orientation. The connection tubing should be replaced as necessary when moisture, cracking, or leakage is present.

Purging

Purging whether it is continuous or blast, can keep the probe ports clear of debris and moisture, but should be used cautiously. For example dust or particulate that may get trapped inside the probe may just become impacted material in the end of the probe if moisture-laden air is purged into the ports. Over time this can cause the pressure readings to change. Continuous purging is the better of the two choices because it uses lower pressure purge air to constantly “clear” the probe. However, with the probes installed properly and the system checked annually, the VAP³[®]-XL Probes should perform to the highest degree of accuracy.