

## GP1, HP1 AND SP1 DUCT AND PLENUM PROBE INSERTION MOUNT INSTALLATION

### OVERVIEW

This document provides the instructions necessary to install Standard insertion mount probes as shown in Figure 1. Insertion mount probes are installed externally through the sidewall of the duct/plenum. Installation consists of marking and preparing the mounting holes and then installing and securing the probes. For detailed probe information, refer to the Duct/Plenum Probe technical manual under separate cover. For detailed information on transmitter set up and operation of the complete airflow measurement station, refer to the associated transmitter technical manual (under separate cover). Observe the following precautions during installation:



Figure 1. Insertion Mount Probe

### CAUTION



Location of the probe(s) is critical for proper performance of the airflow station. Probes must be installed in accordance with the engineer's plans and *EBTRON* Minimum Placement Guidelines (Figures 4 and 5) for the specified location. For additional probe placement detail, refer to the probe technical manual under separate cover.



Ensure that adequate installation/service clearance exists at the installation site to permit installation of the probe into the duct/plenum, and that the cable length for the probes is sufficient to reach the planned transmitter installation. Refer to the mechanical details of Figure 2.



On applications where multiple probes are to be installed at a single measurement location, install probes in accordance with Figure 3 (Insertion Mount Probe Spacing/Configuration). In addition, when traverse data is desired (Gold Series GP1 probes only), place the lowest numbered probe at the top of the duct for horizontal mounting. For vertical mounting, place the lowest numbered probe on the left side of duct when viewed from the upstream side of the mounting location, with cables exiting on the higher side to prevent any potential moisture from accumulating on the heated sensors.



Insulation that may interfere with mounting should be temporarily removed prior to installation and replaced afterwards.

### INSERTION MOUNTING OVERVIEW

Figure 2 provides Standard insertion mount probe installation details. Standard probes 18 in (457.2 mm) and longer include a terminal stud (and, for rectangular ducts, a terminal bracket plate) for additional support at the far end of the probe. On these longer probes, a terminal stud mounting hole is required on the other side of the duct (opposite the insertion side). Shorter standard probes (under 18 in / 457.2 mm) do not require a terminal bracket or end stud hole, and are fabricated 0.25 in (6.3 mm) less than the overall duct size. Install probes as follows. Convenient check boxes are included at each step.

## INSERTION MOUNT MARKING AND PREPARATION

1.  Each probe package is factory labeled for the specific location and duct size for which it is designed. Orders for locations requiring multiple probes at a specific location are typically banded and packaged together. Determine the specific duct location for the probe(s) as indicated on the engineer's plans showing where the airflow measuring station is to be located. Refer to Figure 3 for probe spacing and orientation.
2.  Carefully open the probe packaging and inspect for damage. Proceed to the specific additional installation instructions for rectangular ducts (at step 3), round ducts (at step 6) or flat oval duct applications (at step 9).

### For Rectangular Ducts

3.  The first dimension of the probe size indicates the length of the probe. The second dimension indicates the specific duct insertion side dimension 'X'. Refer to Figure 2 and verify that the probe is the correct size for the application duct size. Mark a point at the center of the insertion side of the duct at 'X'. Draw a line on the insertion side of the duct at this point that is perpendicular to the edge of the duct. This line will be used to locate the position of the hole(s) to be drilled for probe insertion. The number of probes for the specific measurement site determines the probe installation location and orientation as shown in Figure 3.
4.  Using the applicable Rectangular Insertion Mount Probe Spacing/Configuration detail of Figure 3, locate and mark the location(s) on the insertion side of the duct (where the probe(s) will be inserted) at the line drawn in step 3.
5.  Prepare a 1.25 in (31.75 mm) insertion hole on the side of the duct where each probe will be inserted and complete the appropriate step 5a or 5b for the corresponding probe terminal end.
  - 5a.  **For Standard probes 18 in (457.2 mm) and greater**, a terminal end bracket and terminal stud is provided on the non cable probe end opposite the insertion side bracket. Mark the location for the probe terminal stud hole to be prepared on the duct wall that is opposite the insertion side hole.
    - 5a1.  Using the terminal end bracket as a guide and while keeping the top of the bracket parallel to the edge of the duct, mark the locations of the four terminal end bracket mounting holes.
    - 5a2.  Prepare the 1.25 in (31.75 mm) hole for the probe end bracket at the duct location marked in 5a.

### OR

- 5b.  **For Standard probes under 18 in (457.2 mm)**, no terminal end bracket or stud is supplied, therefore no additional marking or drilling is required on the opposite side of the duct.

## For Round Ducts

6.  Mark and draw a line around the circumference of the duct at the probe(s) insertion point(s). The number of probes for the specific measurement site determines the probe installation locations and orientation as shown in Figure 3. Applications with multiple probes must be staggered 1.5 - 2 in (38.1 to 50.8 mm) from each other as shown in Round Duct Probe Spacing detail of Figure 4 to prevent probes from intersecting at the center of the duct.
7.  Using the applicable Round Duct Probe Spacing detail of Figure 3, locate and mark the probe insertion location(s) on the circumference line drawn in step 6 where each of the probe(s) will be inserted.
8.  Prepare a 1.25 in (31.75 mm) insertion hole on the insertion side of the duct where each probe will be inserted.
  - 8a.  **For Standard probes equal to and greater than 18 in (457.2 mm)**, a terminal stud is included at the probe end opposite the insertion side bracket. For these probes, mark and prepare a 0.5 in (12.7 mm) terminal stud mounting hole for the terminal stud on the opposite side of the duct for each probe.
  - 8b.  **For Standard probes under 18 in (457.2 mm)**, no terminal stud is supplied, therefore marking and drilling is not required on the opposite side of the duct.

Proceed to step 12, Final Assembly.

## For Flat Oval Ducts

9.  Mark and draw a line around the circumference of the duct at the probe(s) insertion point(s). For oval duct applications, orientation is determined by duct size application as shown in the Oval Duct Probe Spacing table and detail application illustrations of Figure 3. Configuration '2b', '3b' and '4b' probes must be staggered 1.5 to 2 in (38.1 to 50.8 mm) from each other to prevent probes from hitting one another (intersecting) at the center of the duct.
10.  Using the Oval Duct Probe Spacing table and detail applications shown in Figure 3, locate and mark the probe installation location(s) on the circumference line drawn in step 9 where each of the probe(s) will be inserted.
11.  Prepare a 1.25 in (31.75 mm) insertion hole on the side of the duct where each probe will be inserted.
  - 11a.  **For probes equal to and greater than 18 in (457.2 mm)**, a terminal stud is included at the probe end opposite the insertion side bracket. For these probes, mark and prepare a 0.5 in (12.7 mm) terminal stud mounting hole for the terminal stud on the opposite side of the duct for each probe.
  - 11b.  **For probes under 18 in (457.2 mm)**, no terminal stud is supplied, therefore marking and drilling is not required on the opposite side of the duct.

Proceed to step 12, Final Assembly.

#### FINAL ASSEMBLY FOR STANDARD PROBES

12. □ Carefully insert each probe assembly through the insertion side mounting hole, making sure that the larger insertion side gasket is firmly seated against the insertion side bracket. On probes with terminal studs, ensure that the terminal stud passes through the hole prepared on the opposite side of the duct. Fasten the insertion side mounting plate to the duct at four places with appropriate sheet metal screws, making sure that the printed airflow arrow on the plate and probes is in the actual direction of duct air flow and that the plate is parallel to the edge of the duct. On probes without terminal studs, proceed to step 15.

**NOTE:**

If the airflow direction labels are not visible on the probe or bracket, orient the probe so that the SET SCREWS (two per sensor insert) face the DOWNSTREAM side of the probe. (Setscrews are only on the downstream insert side).

13. □ For rectangular duct applications with probes of 18 in (457.2 mm) or greater, place the terminal end bracket plate onto the terminal stud that is protruding through the opposite side of the duct. **(On round and oval duct applications with probes 18 in / 457.2 mm and greater, the terminal end bracket is not required.)** Pass the bracket over the end stud and locate it using the marks prepared in step 5a1. Fasten the terminal end bracket plate to the duct at the four marked locations using appropriate fasteners.
14. □ Place the smaller foam shock absorber/gasket over the terminal mounting stud, then place the large flat washer against the shock absorber/gasket. Tighten the lock nut onto the terminal mounting bolt until snug. A tight fit is not required, and can limit probe movement that can cause air leakage when the duct is pressurized.
15. □ Connect all sensor probes to the transmitter. This completes probe installation. Complete the installation, wiring and set up of the associated transmitter as detailed in the separate Transmitter Installation Guide and Installation, Operation and Maintenance Technical Manual (under separate cover).

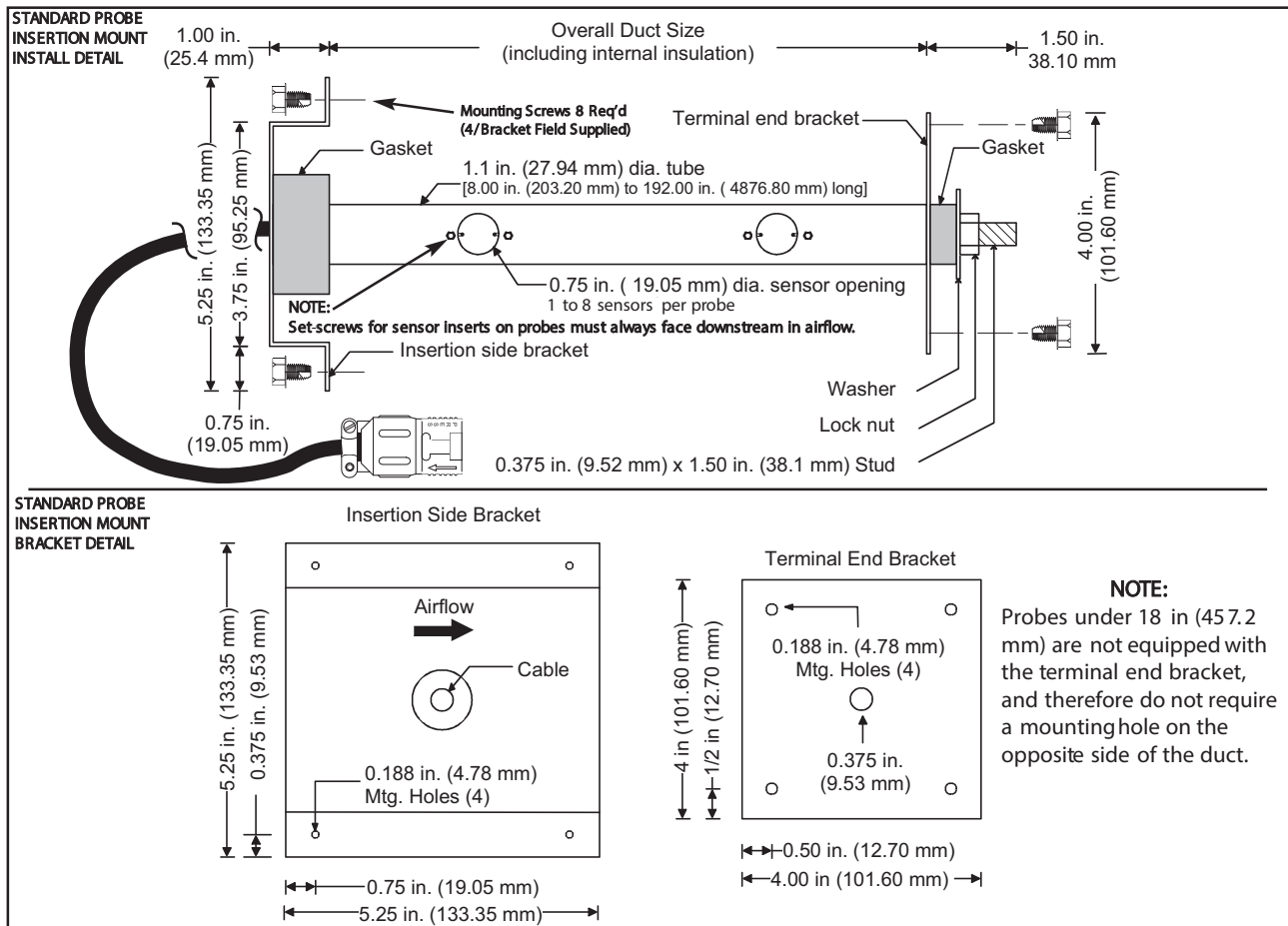


Figure 2. Standard Insertion Mount Probe Mechanical Detail

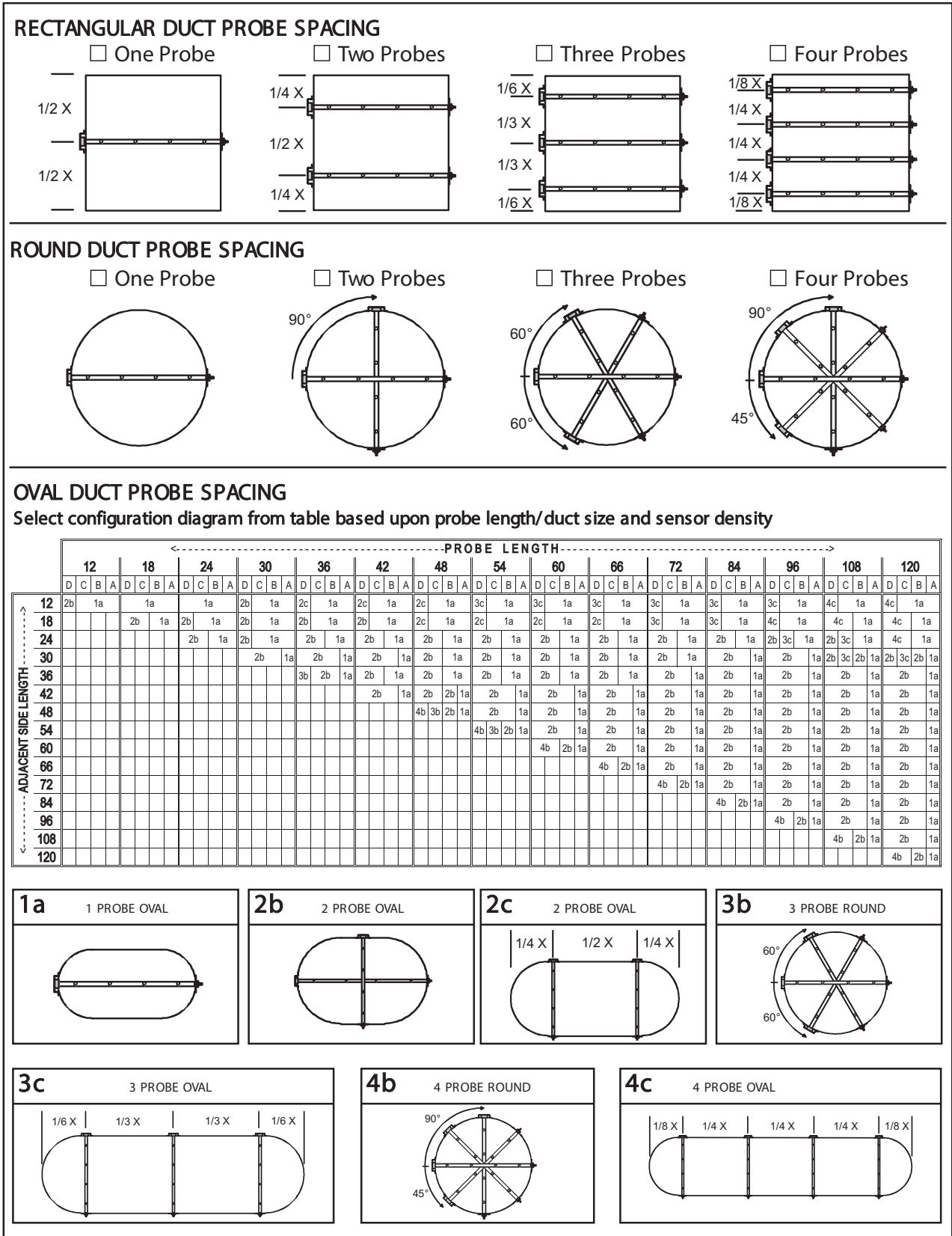


Figure 3. Insertion Mount Probe Spacing/Configuration