

# INSTALLATION PROCEDURE



## ELECTRA-flo 5 Series

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### INSPECTION & HANDLING

- The ELECTRA-flo/S5 Probe Arrays or Stations should be carefully inspected for damage prior to installation. In the event of a damaged item, please contact the Customer Service Department (see last page).
- Almost any means of handling can be utilized depending on the length of the probes or weight of the stations, however, it is important not to drop or mishandle such that damage is done to the probes, sensors, or flanges.

### LOCATION OF PROBE ARRAYS & STATIONS

- When installing the ELECTRA-flo/S5 Probe Arrays, or Stations, select a location that meets or exceeds the **Minimum Installation Requirements**.
- When more than the combined upstream and downstream minimum requirements for undistributed straight duct is available, distribute the excess duct length in proportion to the minimum requirements.
- Avoid locating the probes or stations where they will be exposed to condensing moisture, such as downstream of a coil or humidifier.
- Locating the probes or stations too close to upstream sources of thermal influence (heaters, coolers) may cause a short delay on the ELECTRA-flo G5 Transmitter display due to the step change in temperature.
- Field characterization of the ELECTRA-flo G5 Transmitter may be required in the event of probes or stations installed in less-than-ideal locations.
- Contact Air Monitor's Applications Engineering Department for guidance when the intended installation location does not meet the **Minimum Installation Requirements**.

### MINIMUM INSTALLATION REQUIREMENTS

- Considerations when installing ELECTRA-flo/S5 Probe Arrays or Stations are as follows:

**Turbulent Airflow.** The aerodynamic design of the ELECTRA-flo/S5 sensor aperture will permit accurate flow measurement in the presence of moderate air turbulence. The distances from air turbulence producing fittings, transitions, etc., shown in Figure 1 are required to assure accurate airflow measurement.

**Stratified Airflow.** The ELECTRA-flo/S5 Probe Array or Station should be mounted so that the probes cross any stratified airflow - not parallel to stratification. This mounting arrangement will permit the probe to sense the wide range of velocities present in stratified airflow.

## MINIMUM INSTALLATION REQUIREMENTS (Continued)

**Airborne Contaminants.** The levels of air filtration and cleanliness associated with commercial HVAC systems are satisfactory for the ELECTRA-flo/S5 Probe Array or Station. Applications containing airborne contaminants or condensing moisture may impair measurement accuracy and functionality.

**Minimum Requirements.** The ELECTRA-flo/S5 Probe Array or Station locations shown are the **minimum** clearances required from air turbulence producing sources. Wherever possible, the ELECTRA-flo/S5 Probe Array or Station should be installed where greater runs of straight duct or clearances

## MINIMUM INSTALLATION REQUIREMENTS VARY DEPENDING ON SENSOR DENSITY

- There are 3 different Minimum Installation Requirements, depending on the product selected, and it's sensor density (Level 1, Level 2, or Level 3). Care should be taken to reference the correct one for your equipment.

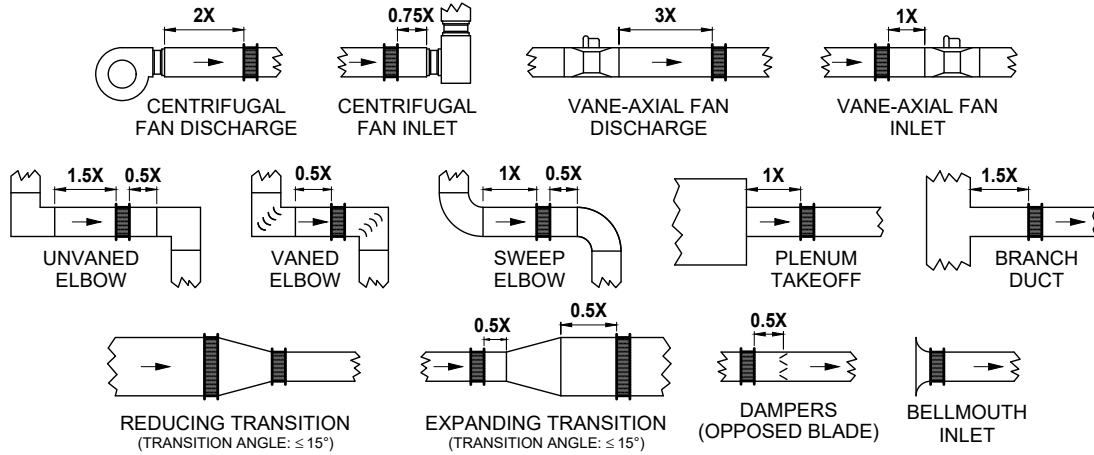
<u>Product:</u>	<u>Refer to:</u>
ELECTRA-flo/S5 Probe Array, Level 1	Figure 1
ELECTRA-flo/S5 Probe Array, Level 2	Figure 2
ELECTRA-flo/S5 Probe Array, Level 3	Figure 3
ELECTRA-flo/S5-MM Station, Level 1	Figure 1
ELECTRA-flo/S5-MM Station, Level 2	Figure 2
ELECTRA-flo/S5-MM Station, Level 3	Figure 3
ELECTRA-flo/S5-CM Station, Level 2	Figure 1
ELECTRA-flo/S5-CM Station, Level 3	

- "X" represents the duct diameter for circular ducts.
- To determine the equivalent duct diameter for rectangular ducts, use the following equation:

$$\text{Rectangular Duct: } X = \frac{2(H \times W)}{H + W}$$

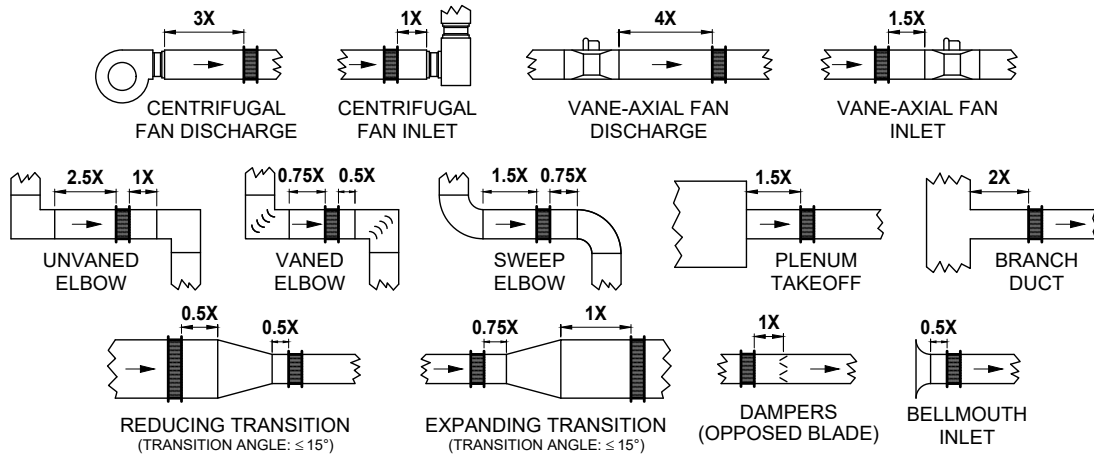
- Note that "X" distances are to the leading (or trailing) edge for STATIONS (shown), or to the centerline of PROBES.

**MINIMUM INSTALLATION REQUIREMENTS VARY DEPENDING ON SENSOR DENSITY, cont'd.**



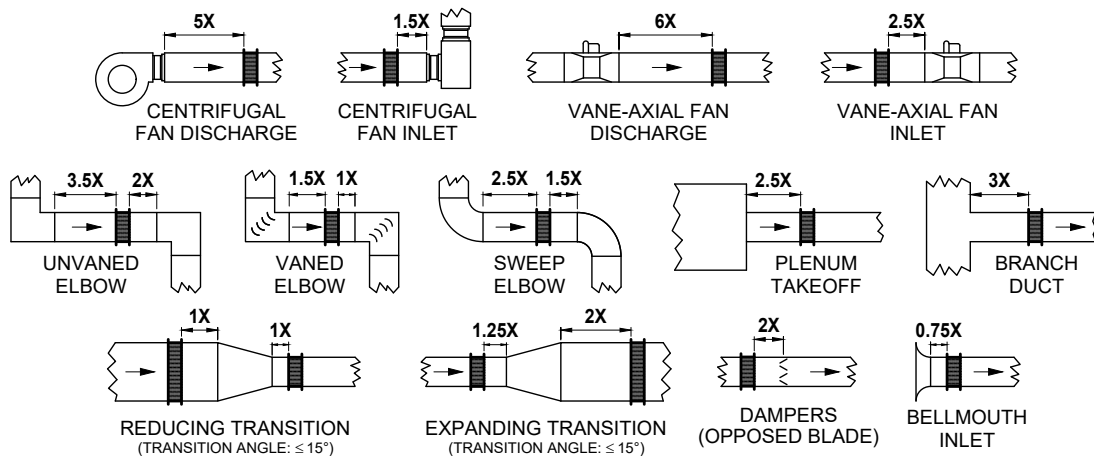
**Figure 1**

ELECTRA-flo/S5 Probe Array (Level 1), ELECTRA-flo/S5-MM Station (Level 1), ELECTRA-flo/S5-CM Station (Level 2)



**Figure 2**

ELECTRA-flo/S5 Probe Array (Level 2), ELECTRA-flo/S5-MM Station (Level 2), ELECTRA-flo/S5-CM Station (Level 3)



**Figure 3**

ELECTRA-flo/S5 Probe Array (Level 3) & ELECTRA-flo/S5-MM Station (Level 3)

### GENERAL INSTALLATION - ELECTRA-flo/S5-MM & ELECTRA-flo/S5-CM STATIONS

- The station may have been ordered with the transmitter mounted at the Factory. If not, the stations and transmitter that go together for a particular measurement location can be identified by means of the serial number on the end of each station, the transmitter package, and the transmitter itself.
- Each station has an airflow arrow on the side wall to assist in correct installation relative to the direction of airflow in the duct.
- If the station was ordered WITHOUT the transmitter mounted to the station, the cable connecting the station to the transmitter will be attached to the station. This has a standard length of 10', but may have been ordered with an optional 25', 50', or 100' long cable.

### GENERAL INSTALLATION - ELECTRA-flo/S5 PROBE ARRAY

- All probes for an array are packaged together when shipped from the factory. The probes and the transmitter for a particular measurement location can be identified by means of the transmitter S/N on the end of each probe, transmitter package, and the transmitter itself.

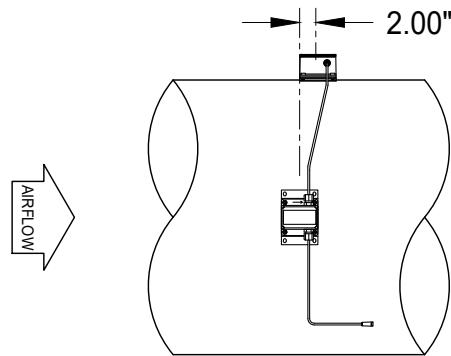
**The Transmitter S/N on the Probe(s) must match the Transmitter they are connected to.**

**DO NOT MIX AND MATCH**

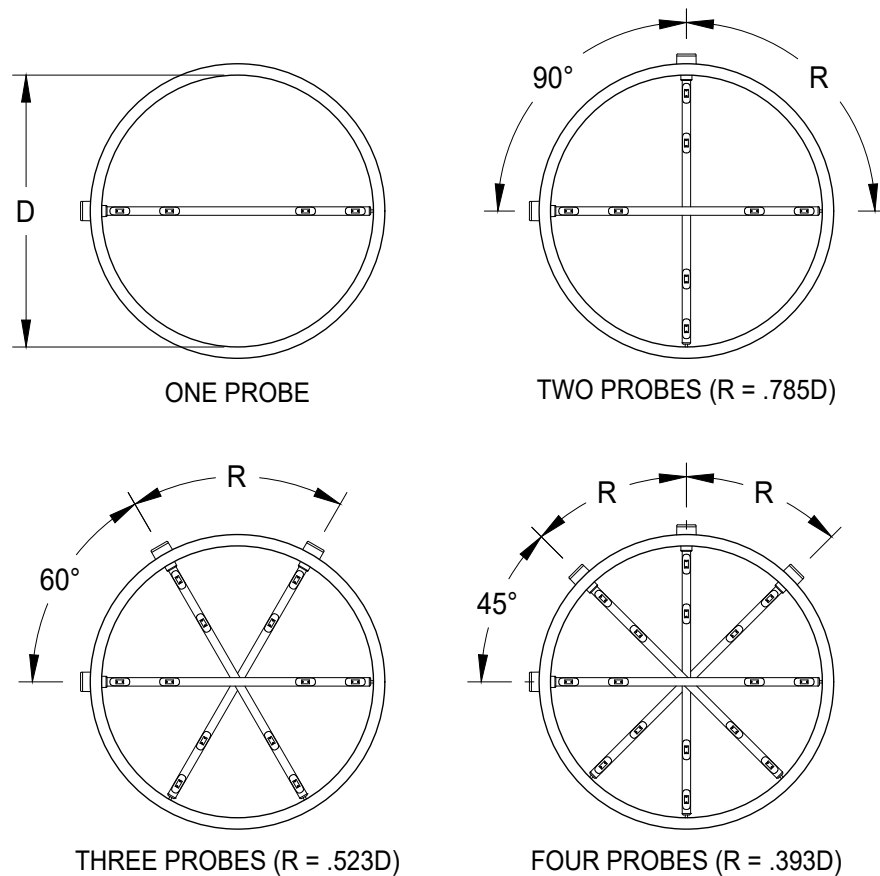
**Each probe will identify the number of probes in the array and the transmitter serial number it should be paired with.**

- Each probe has an airflow arrow on the electronics enclosure to assist in correct installation relative to the direction of airflow in the duct.
- For rectangular ducts, the standard arrangement is for the probe(s) to be mounted on the short side (usually the height) of the duct, with the probe(s) running parallel to the long dimension (usually the width) of the duct. Refer to page 6 to determine probe spacing.
- For circular ducts with more than one probe, the probes must be staggered along the axis of the duct to provide clearance as they cross over each other in the center. See Figure 4.

## GENERAL INSTALLATION - ELECTRA-flo/S5 PROBE ARRAY (Continued)

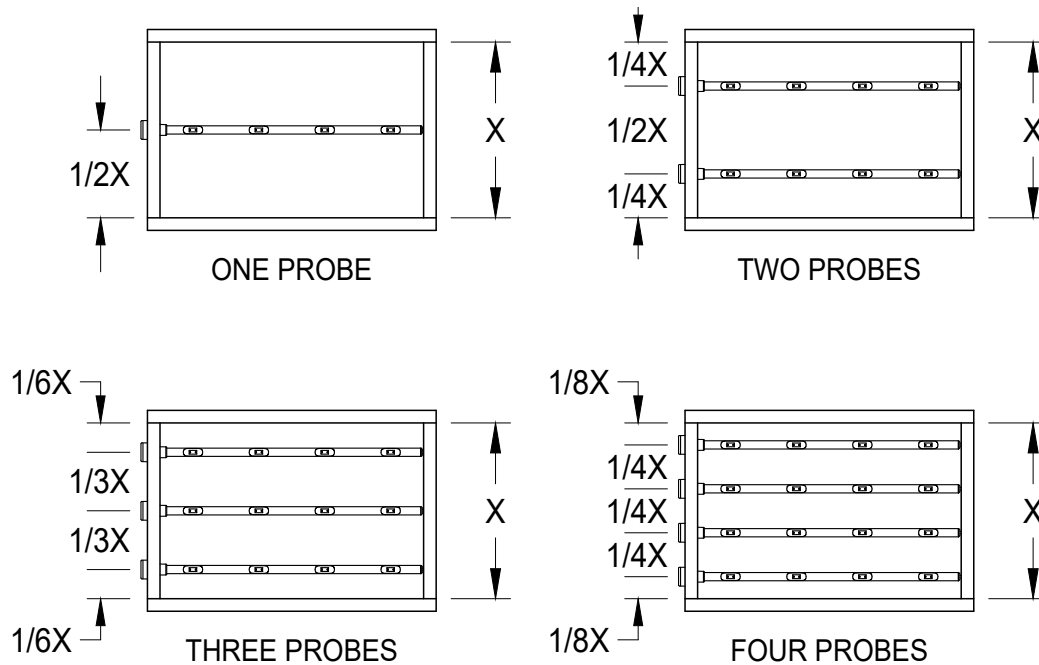
**Figure 4**

- Depending upon the diameter of a round duct the quantity of probes per array will range between one and four. Based upon the quantity of probes in a particular array, see Figure 5 to determine proper probe spacing. Probes mounted in circular duct with a diameter "D" have a radial space "R" on the outside surface of the duct.

**Figure 5**

## GENERAL INSTALLATION - ELECTRA-flo/S5 PROBE ARRAY (Continued)

- ELECTRA-flo/S5 Probe Arrays for rectangular ducts are based on equal area spacing. See Figure 6 for examples.



**Figure 6**

### - CAUTION -

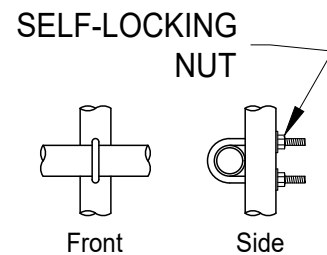
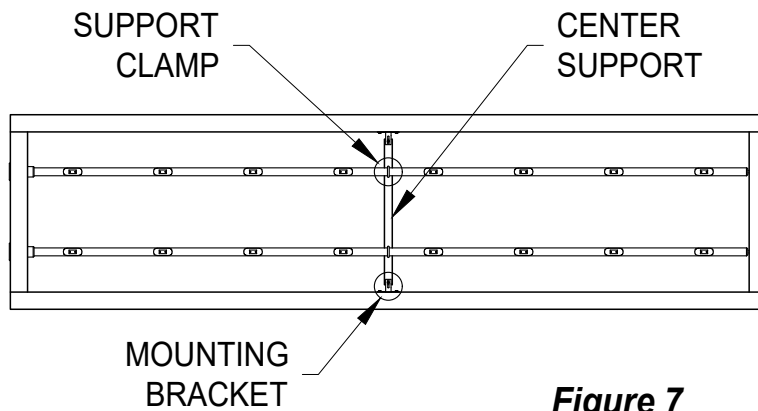
**Do not attempt to install ELECTRA-flo/S5 probes longer than 72" with just one person.**

## INSTALLING ELECTRA-flo/S5 PROBE ARRAYS 96" OR MORE IN LENGTH

- ELECTRA-flo/S5 Probe Arrays having probe lengths between 96" and 144" are provided with a probe center support assembly to structurally support against the effects of gravity, vibration, and the force of the moving airflow.
- All ELECTRA-flo/S5 Probe Arrays must be handled carefully during installation to avoid damaging any of the thermal sensors. Due to their greater cantilevered weight, larger probes will require two people during installations; one outside the duct to insert the probe, and a second person inside the duct to support and guide the probe into its end support hole.

## INSTALLING ELECTRA-flo/S5 PROBE ARRAYS 96" OR MORE IN LENGTH (Continued)

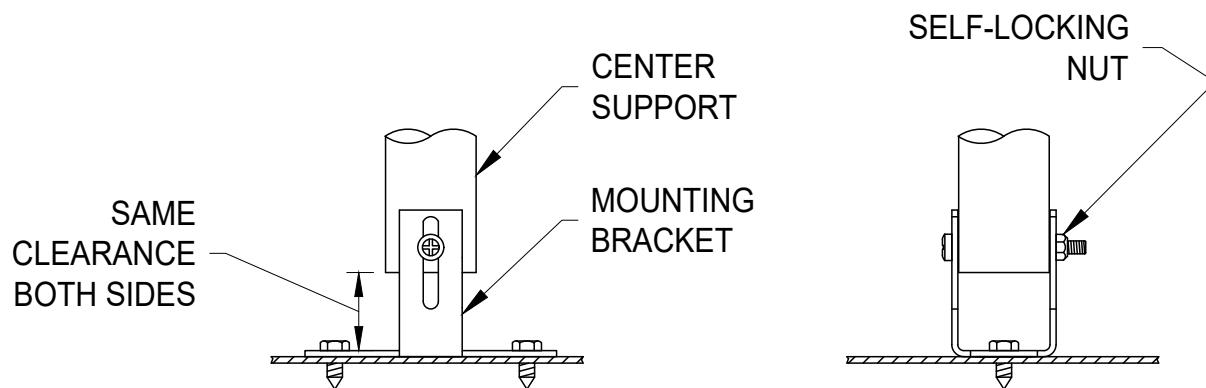
- After the ELECTRA-flo/S5 Probe Array is fully mounted in the duct, install the center support by connecting it to the individual probes using the U-bolt hardware provided. The center support goes on the downstream side of the ELECTRA-flo/S5 Probe Array. See Figure 7.



SUPPORT CLAMP DETAIL

***Figure 7***

- Finger tighten the self-locking nuts so the center support is attached to the probe(s). Slide the center support mounting brackets outward so they come in contact with the duct walls, then secure in place with the end support screws provided.
- Position the center support so that the clearance between the center support and the duct wall is the same at both ends, then tighten the mounting bracket bolts. See Figure 8.

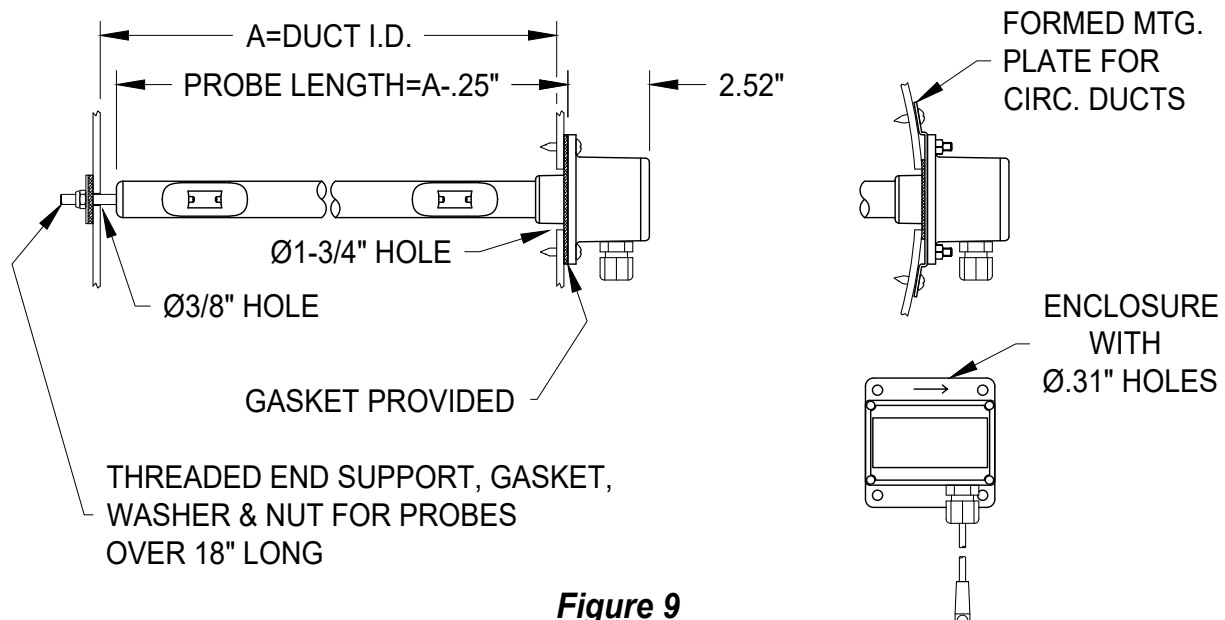


***Figure 8***

- Finally, tighten the self-locking nuts to firmly attach the center support to the probe(s), but not so tight as to deform either the center support or the probe(s).

## EXTERNALLY MOUNTED ELECTRA-flo/S5 PROBES

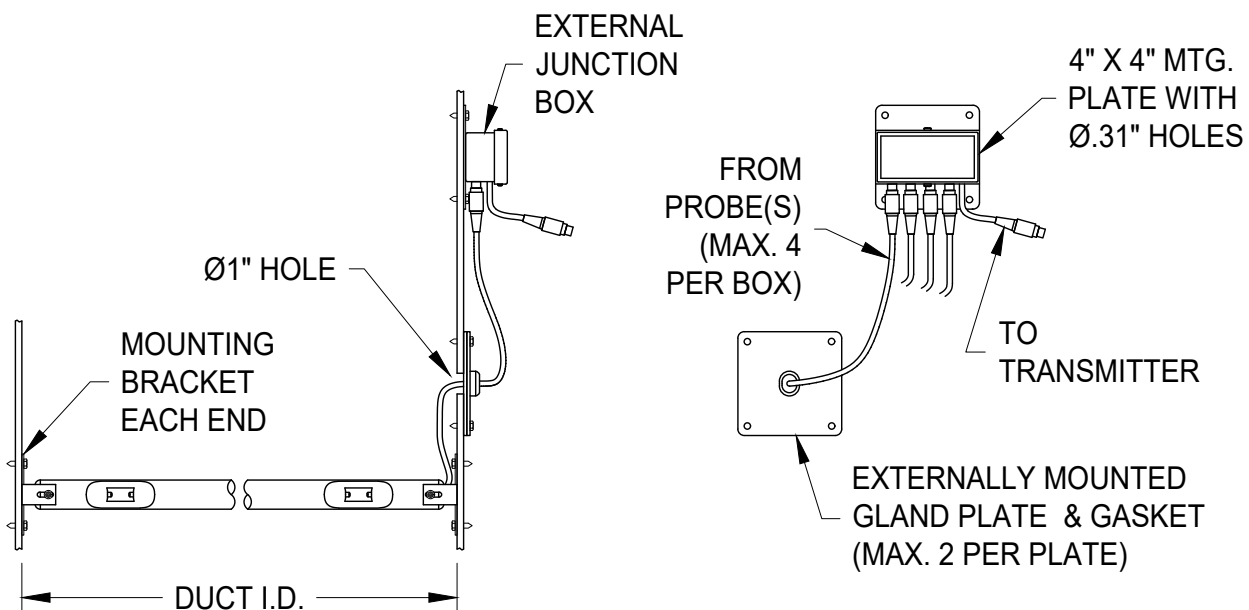
- Mounting requires a 1 3/4" hole on one side of the duct, and a 3/8" hole on the opposite side for the threaded end support (for probe lengths longer than 18"). See Figure 9 for mounting details.



**Figure 9**

## INTERNALLY MOUNTED ELECTRA-flo/S5 PROBES

- Mounting requires a 1.00" diameter hole to allow the signal cable to be run to the junction box, which connects to the transmitter. See Figure 10 for mounting details.

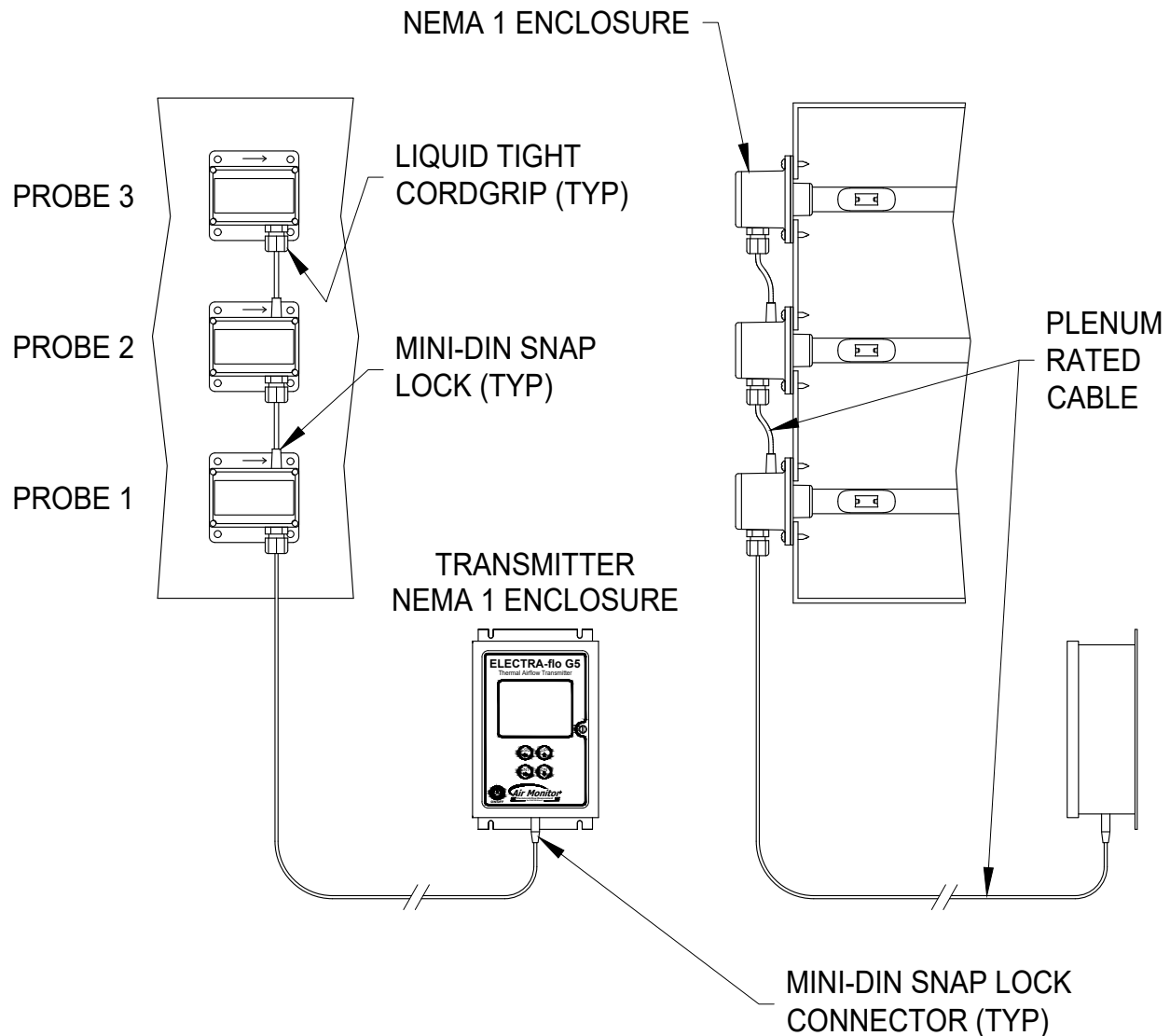


**Figure 10**



## CABLE CONNECTIONS FOR EXTERNALLY MOUNTED ELECTRA-flo/S5 PROBE ARRAYS WITH NEMA 1 CONFIGURATION

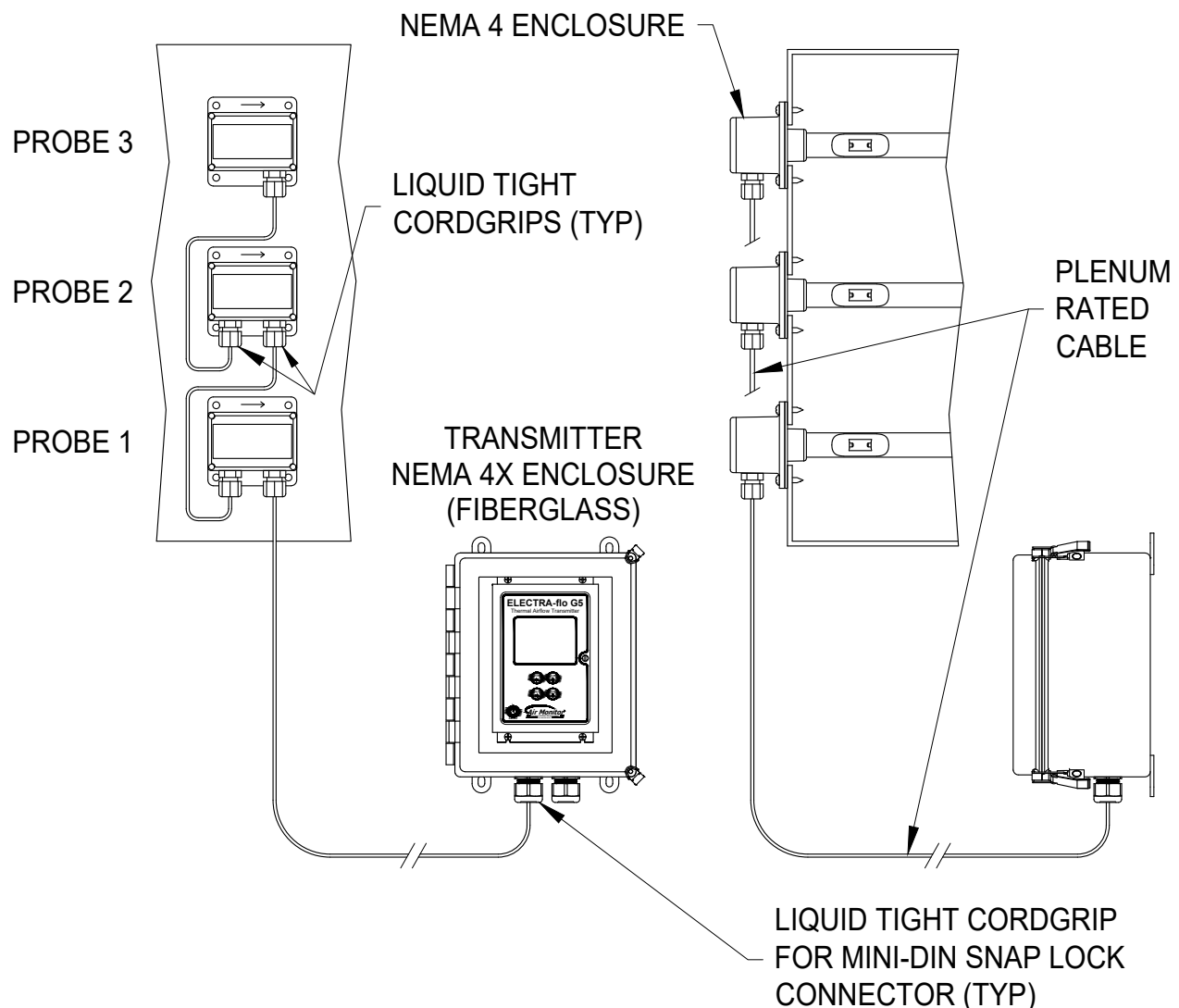
- All probe-to-probe and probe array to transmitter cables are included.
- All probes have integral plenum rated cables terminated with positive locking mini-DIN connectors.
- The cable length on each probe has been factory selected based upon size of the duct and the quantity of probes. Probe-to-probe cables will range in length from 3' to 6'. The one probe that connects to the transmitter will have a standard length 10' cable, with optional 25', 50', and 100' long cables.
- Multiple **externally** mounted probes connect to each other in a daisy chain method, with one probe in the chain connecting to the transmitter. See Figure 11.



**Figure 11**

## CABLE CONNECTIONS FOR EXTERNALLY MOUNTED ELECTRA-flo/S5 PROBE ARRAYS WITH NEMA 4 CONFIGURATION

- All probe-to-probe and probe array to transmitter cables are included.
- All probes have integral plenum rated cables terminated with weathertight IP68 connectors.
- The cable length on each probe has been factory selected based upon size of the duct and the quantity of probes. Probe-to-probe cables will range in length from 3' to 6'. The one probe that connects to the transmitter will have a standard length 10' cable, with optional 25', 50', and 100' long cables.
- Multiple **externally** mounted probes connect to each other in a daisy chain method, with one probe in the chain connecting to the transmitter. See Figure 12.
- Outdoor installations of transmitters and probes require conduit fittings, conduit is to be provided by the customer.

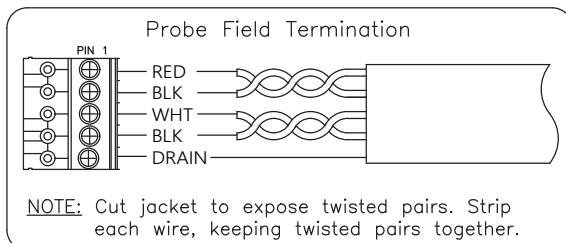


**Figure 12**

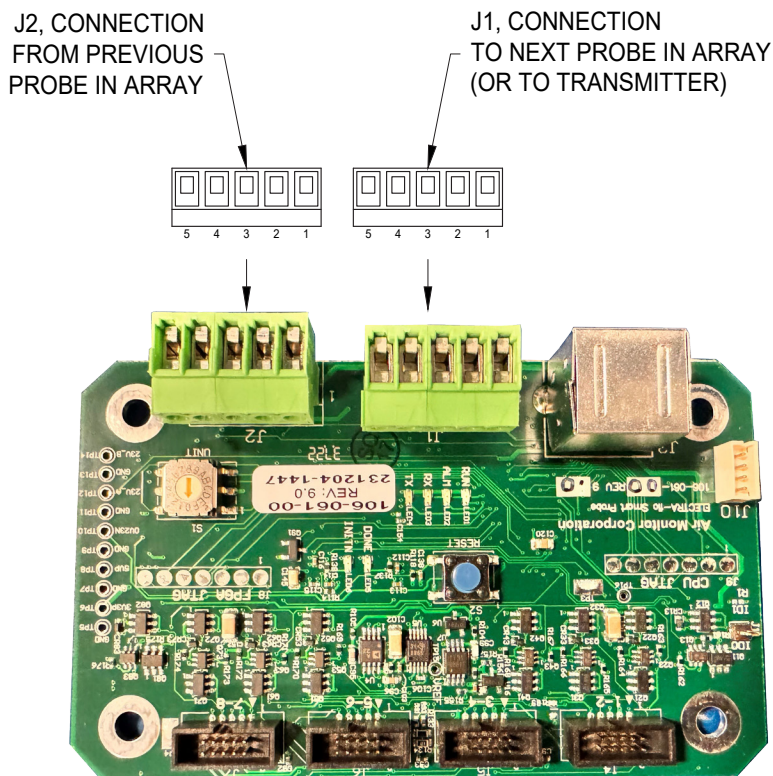
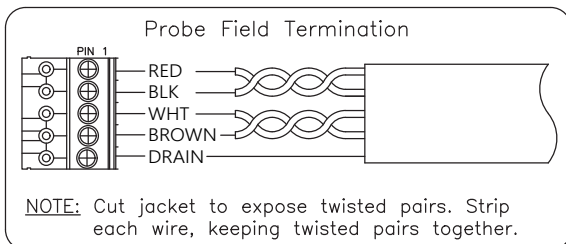
## CABLE CONNECTIONS FOR EXTERNALLY MOUNTED ELECTRA-flo/S5 PROBE ARRAYS WITH NEMA 4 CONFIGURATION (Continued)

- Probe-to-probe cables require field wiring connections inside probe enclosure, see Figure 13.

### Shipments Prior to 2024



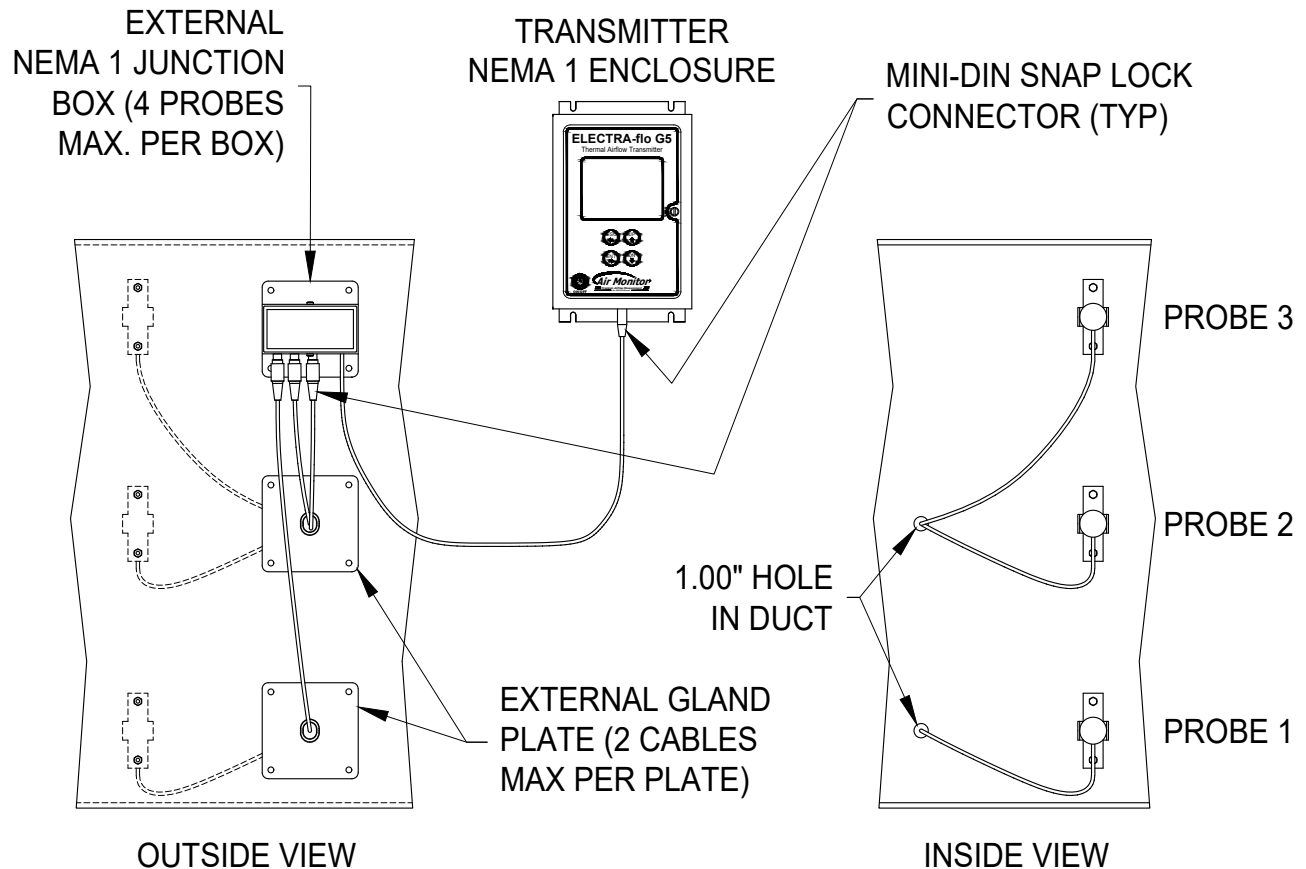
### Shipments starting 2024



**Figure 13**

## CABLE CONNECTIONS - INTERNALLY MOUNTED ELECTRA-flo/S5 PROBE ARRAYS WITH NEMA 1 CONFIGURATION

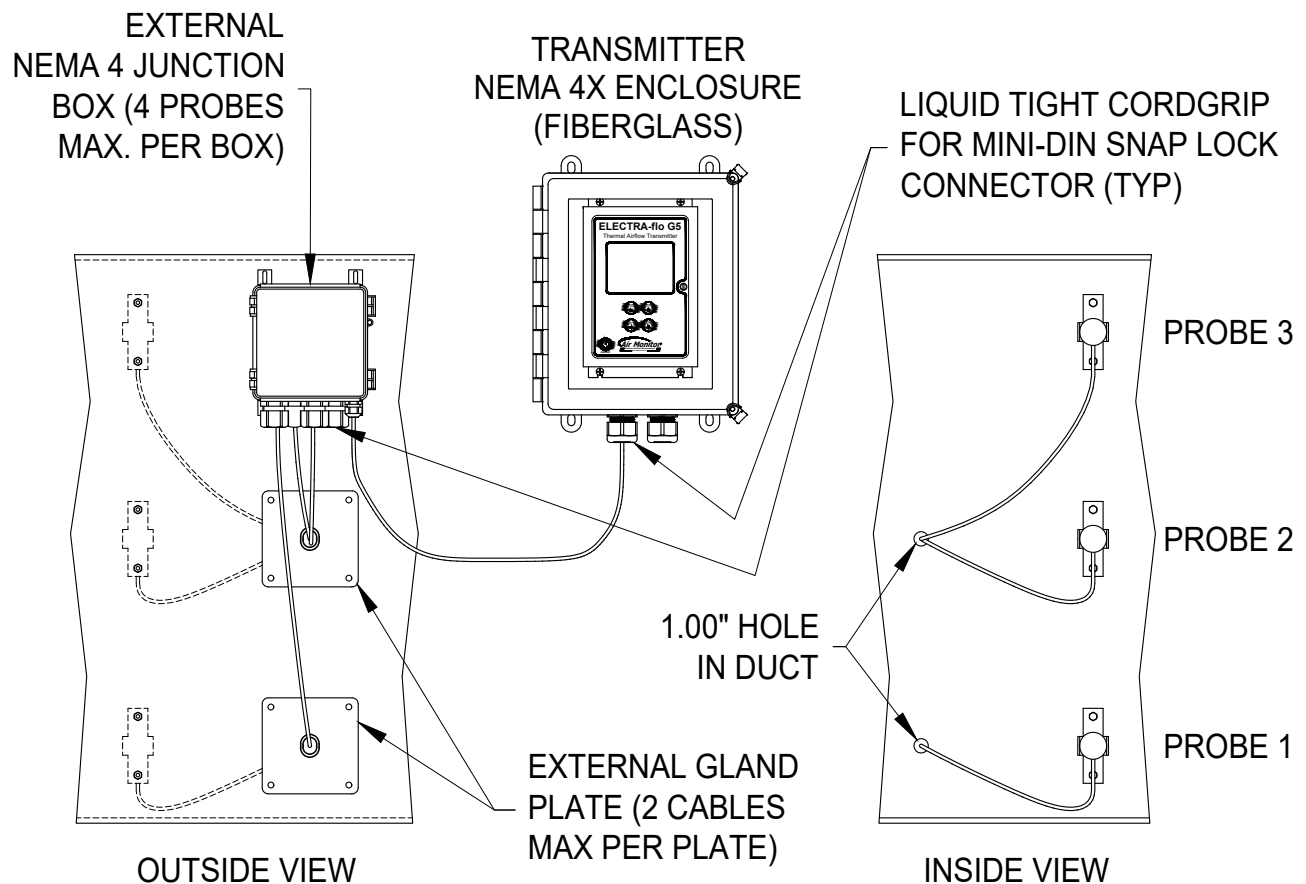
- All probe to junction box and junction box to transmitter cables are included.
- All probes have integral 6' plenum rated cables terminated with positive locking mini-DIN connectors.
- The one probe that connects to the transmitter will have a standard length 10' cable, with optional 25', 50', and 100' long cables.
- Multiple **internally** mounted probes are connected in parallel to the externally mounted junction box, by routing the probe cables through an externally mounted gland plate. The junction box connects to the transmitter. See Figure 14.



**Figure 14**

## CABLE CONNECTIONS - INTERNALLY MOUNTED ELECTRA-flo/S5 PROBE ARRAYS WITH NEMA 4 CONFIGURATION

- All probe to junction box and junction box to transmitter cables are included.
- All probes have integral 6' plenum rated cables terminated with positive locking mini-DIN connectors.
- The one probe that connects to the transmitter will have a standard length 10' cable, with optional 25', 50', and 100' long cables.
- Multiple **internally** mounted probes are connected in parallel to the externally mounted junction box, by routing the probe cables through an externally mounted gland plate. The junction box connects to the transmitter. The junction box connects to the transmitter. See Figure 15.



**Figure 15**

### INSPECTION - ELECTRA-flo G5 TRANSMITTER

- Carefully remove the transmitter from the shipping container and inspect for any damage. In the event of a damaged item, please contact the Customer Service Department (see last page).
- Review the serial number of the transmitter and match those to the Electra-flo S5 probes.

### LOCATION - ELECTRA-flo G5 TRANSMITTER

- The standard ELECTRA-flo G5 transmitter has a NEMA 1 enclosure suitable for most clean indoor locations. If additional protection is required, mount the transmitter in an enclosure with an adequate NEMA rating.
- The ambient temperature of the selected mounting locations must be between -20°F to 140°F. Consideration should be given to units exposed to direct sunlight to prevent accelerated wear of parts.
- The selected mounting location should be rigid and free of vibration.

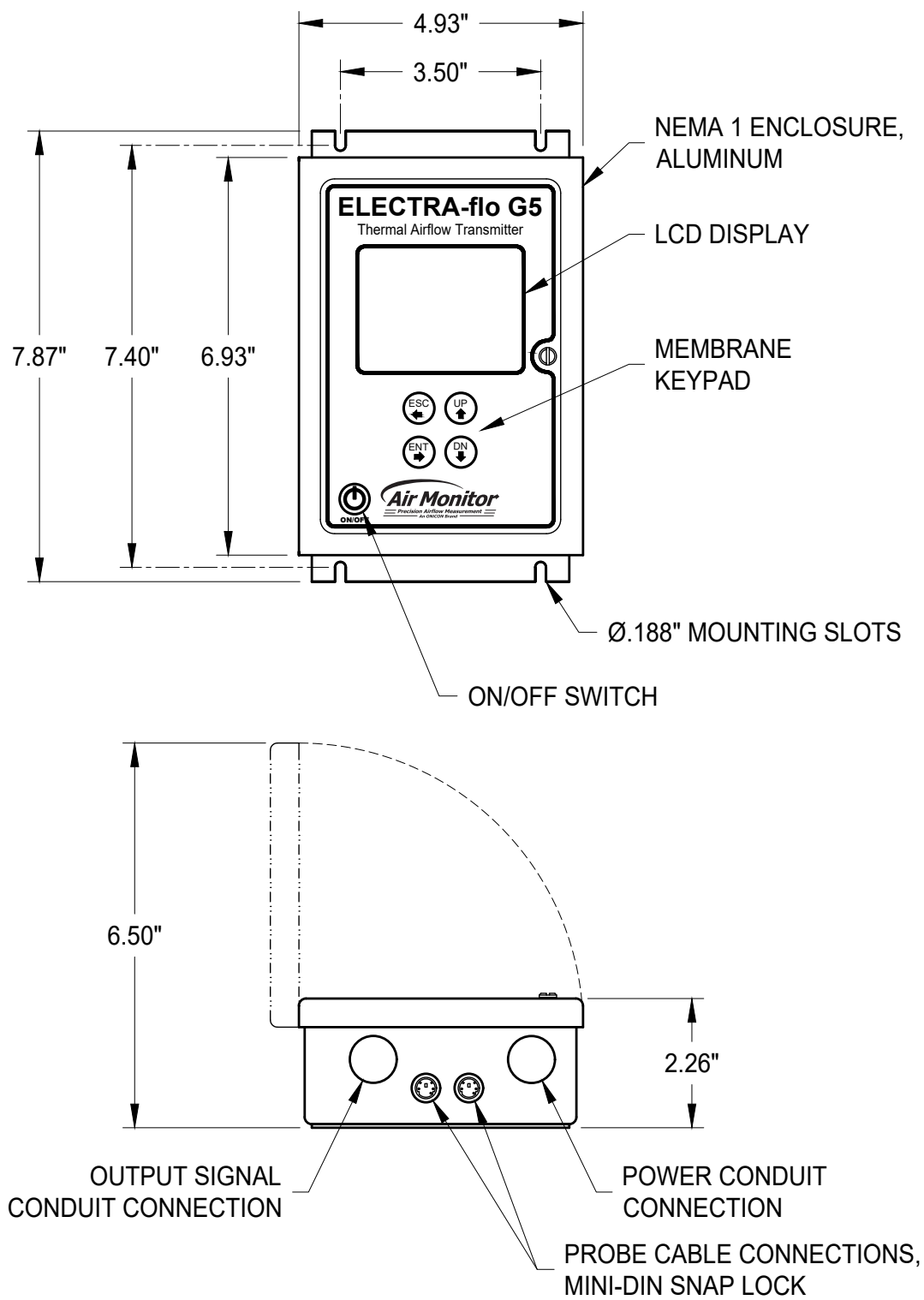
### INSTALLATION - ELECTRA-flo G5 TRANSMITTER

- The transmitter must be located so that the single cable from the probe array or station will reach the receptacle in the bottom of the transmitter. Standard cable length is 10', with optional 25', 50', and 100' cables available.
- Mount the transmitter to a vertical surface in an upright position.
- See Figure 16 for transmitter dimensions and installation clearances.

### MOUNTING - ELECTRA-flo G5 TRANSMITTER ENCLOSURE

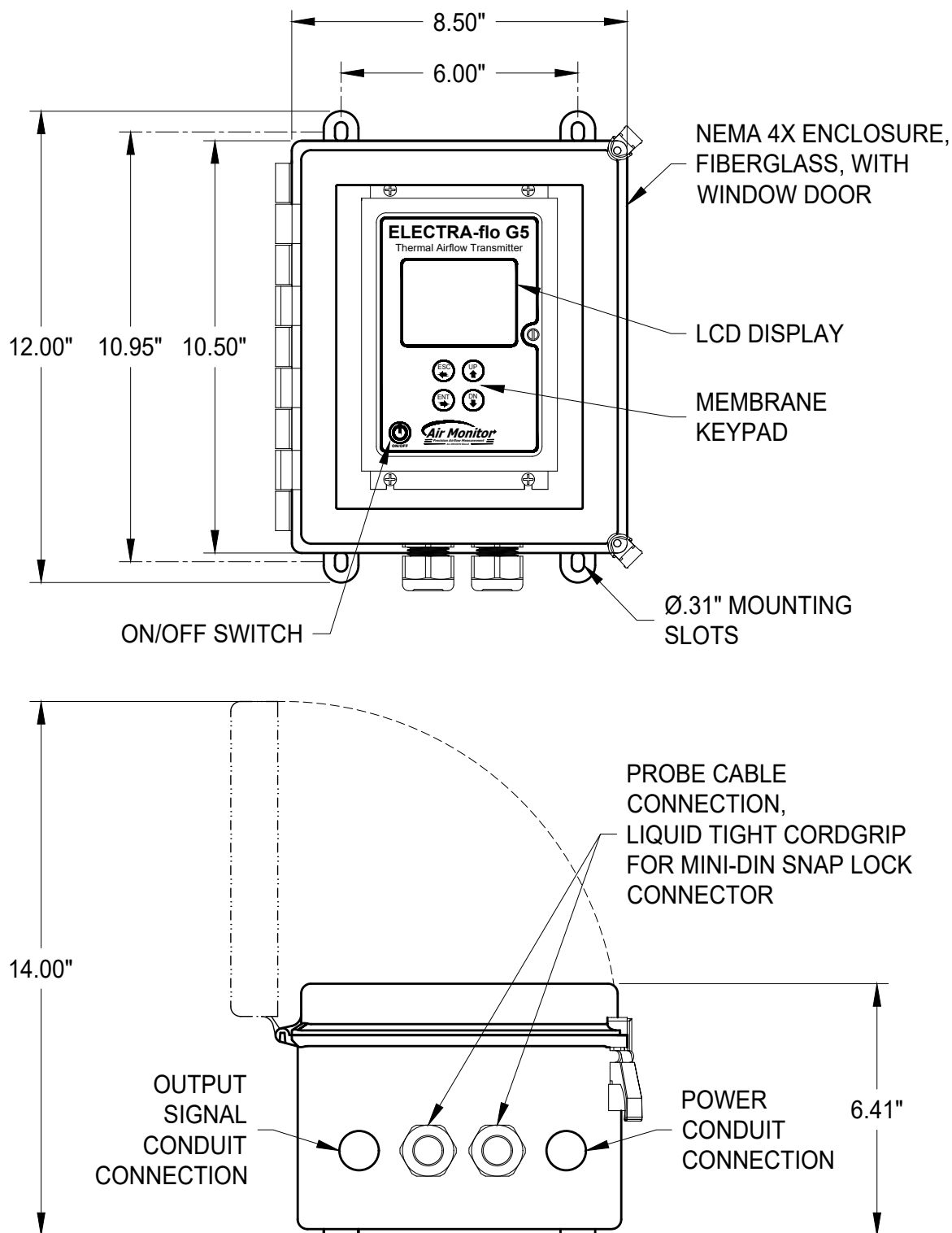
- For NEMA 1 Aluminum Enclosure (see Figure 16): Tools Required: Electric drill, #25 (0.1495") bit, screwdriver or nut driver, and four #8-32 self-tapping machine screws.
- For NEMA 4X Fiberglass Enclosure (See Figure 17): Tools Required: Electric drill, #1 (0.228") bit, screwdriver or nut driver, and four 1/4-20 self-tapping machine screws and flat washers.
- For NEMA 4X Stainless Steel Enclosure (see Figure 18): Tools Required: Electric drill, #1 (0.228") bit, screwdriver or nut driver, and four 1/4-20 self-tapping machine screws and flat washers.
- The ELECTRA-flo G5 can be mounted in any position provided it is secured using all four mounting holes.
- Reasonable consideration should be given to clearances for electrical connections.
- Once a suitable location is found, use the unit as a template to mark the centers of the four mounting holes.
- Drill four pilot holes at the marked locations. With the unit in position, install the four fasteners.

**MOUNTING - ELECTRA-flo G5 TRANSMITTER IN NEMA 1 ALUMINUM ENCLOSURE**



**Figure 16**

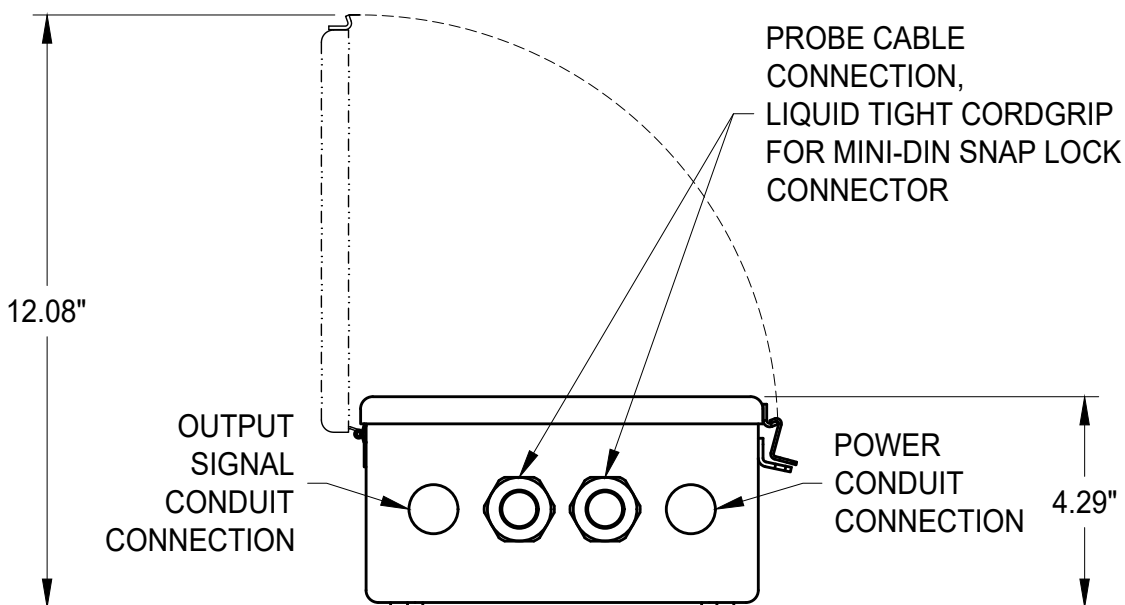
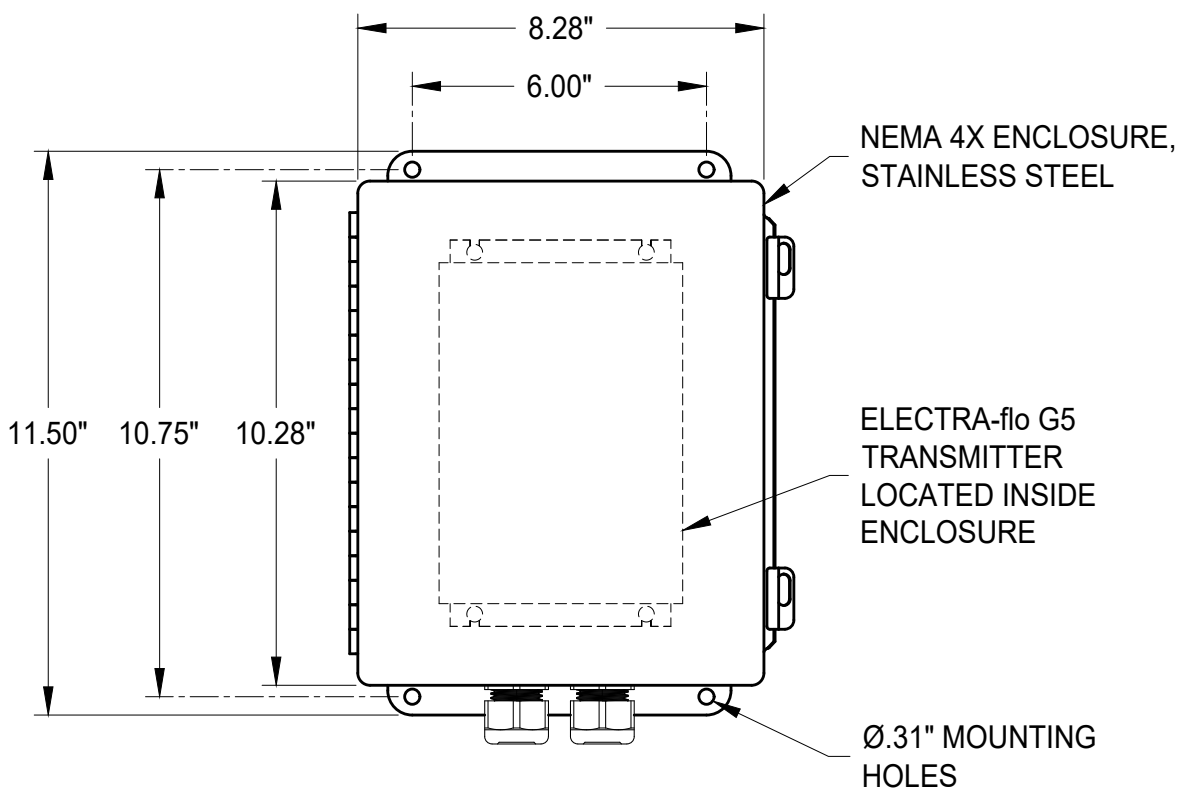
**MOUNTING - ELECTRA-flo G5 TRANSMITTER IN NEMA 4X FIBERGLASS ENCLOSURE**



**Figure 17**



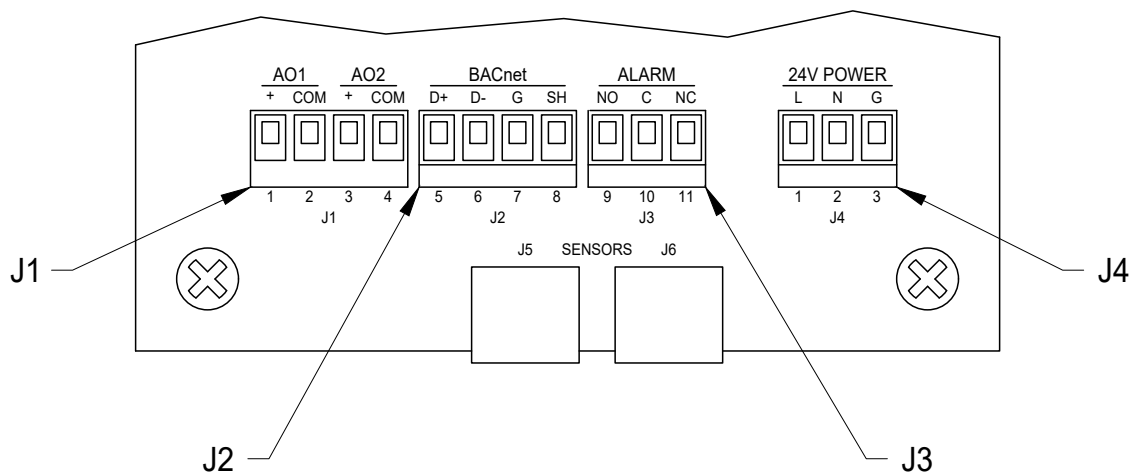
**MOUNTING - ELECTRA-flo G5 TRANSMITTER IN NEMA 4X STAINLESS STEEL ENCLOSURE**



**Figure 18**

## POWER & SIGNAL CONNECTIONS

- **WIRING NOTES**, Two conduit openings are provided on the bottom of the transmitter enclosure for power and signal wiring. AMC recommends power wiring be 18 AWG to 14 AWG (max), and signal wiring be 22 AWG to 14 AWG (max). No more than two wires should be connected to an individual terminal. For ease in making connections, the power and signal terminals are removable by pulling the terminal strip straight up and off the circuit board. Once the wiring has been completed, replace the terminal strip by aligning with receptacle and pressing firmly. See Figure 19 for locations of field wiring terminal strips.
- **POWER 24VAC/DC**, Terminal Strip J4, terminals L, N, & G. Connect AC Line (or DC Positive) to terminal L. Connect AC Neutral (or DC Negative) to terminal N. Connect earth ground to terminal G. Power supply must be 20-28VAC or 20-40VDC.
- **ANALOG OUTPUT 1**, Terminal strip J1, terminals 1 (+) & 2(COM).
- **ANALOG OUTPUT 2**, Terminal strip J1, terminals 3 (+) & 4 (COM).
- **NETWORK COMMUNICATION**, Terminal strip J2, terminals 5 (D+), 6 (D-), 7 (G) & 8 (SH).
- **ALARM OUTPUT**, Terminal strip J3, terminals 9 (NO), 10 (C), & 11 (NC).
- Consult the Factory Set-Up sheet and the O&M manual for details related to configuration options and start-up.



**Figure 19**

## CUSTOMER SERVICE

Air Monitor Corporation provides in-house technical support for all our products,  
if a problem arises contact Air Monitor

Phone: 727-447-6140  
 hvacsales@airmonitor.com  
 www.airmonitor.com/hvac/  
 Thank you for choosing Air Monitor Corporation!