CentriFlow® Meter
Integrated Air Entrainment System

INSTALLATION & OPERATION MANUAL

January 2004

Revision 021-4
Purpose:
The IAE system was designed to deliver an even stream of air to the CentriFlow® Meter’s Measurement Pan. The use of this air is intended to aid in the cleaning of the Measurement Pan. Its continuous, dry air should reduce buildup and assist in the flow of product on the measurement surface without affecting the measurement readings.

Requirements:

Included Components:
- Integrated Air Entrainment Device
- Oil Removal Filter
- Pressure Regulator & Gauge
- Seal Plate and Seal (as required for Type II installation)
- ½” NPT x 8” long Pipe Nipple
- ½” NPT x 2” long Pipe Nipple
- Hole Template (as required for Type II installation)
- Sheet Metal Screws (as required for Type II installation)
- IAE Mounting Hardware (Four – ¼”-20 Pan Head Screws)

Also Required, Not Supplied:
- Hex Key, 3/16”
- Screwdriver, Flat Blade
- Air Tubing (Metal or Plastic – see below)
- Air Fittings (based on Table 1) with ½” NPT thread
- Pipe Tape

Compressed Air Line Sizes:
Compressed air lines should be sized to hold pressure drops to a minimum (see Table 1). Do not use restrictive fittings or undersized lines that can “starve” the Integrated Air Entrainment system by causing excessive line pressure drop. If compressed air hose is used, always go one size larger than the recommended pipe size due to the smaller I.D. of hose.

<table>
<thead>
<tr>
<th>IAE Length</th>
<th>Infeed Pipe Size, Length of run</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10’</td>
</tr>
<tr>
<td>6</td>
<td>1/4”</td>
</tr>
<tr>
<td>12</td>
<td>3/8”</td>
</tr>
<tr>
<td>24</td>
<td>1/2”</td>
</tr>
<tr>
<td>36</td>
<td>3/4”</td>
</tr>
<tr>
<td>48</td>
<td>3/4”</td>
</tr>
</tbody>
</table>

Table 1
**Installation:**

Depending on the configuration of the CentriFlow® (i.e. Type I or Type II), the installation of the IAE system will vary. Follow the instructions closely to ensure a proper fit and to maximize the performance. **Install the Shipping Locks to the CentriFlow® Meter before anything else is done** (See your CFM Manuals for help). Product flow must be turned off and access to the Tangential Assembly and Tangential Spacers is needed (see Figure 1). Use all precautions to care for the meter’s Measurement Pan. It should never come in contact with anything, including hands. The meter should be recalibrated after the installation of the IAE system is complete to compensate for the new flow conditions.

**Steps:**

1. Install Shipping Locks as per CentriFlow® manual.
2. Gain access to Tangential Assembly and Spacers (see Figure 1). For Type II, remove the meter from Type II enclosure. This can be accomplished by leaving the meter mounted and removing the enclosure or by leaving the enclosure mounted (if it can be held in place) and removing the meter. Refer to Removing the Type II enclosure document attached with this manual.
3. Remove the Tangential Guides and Tangential Liner by removing the Tangential Guide Mounting Hardware (see Figure 2) using a 3/16” hex key or screwdriver, depending on the hardware type. Keep in mind that once the hardware is removed from each Tangential Guide the Tangential Liner will be released. Ensure that Pan Arm is not hit hard from side, top, or bottom during this step. Again, it is highly important that the Shipping Locks be in place before proceeding so as not to damage the Transducer, Flexures, or Column Wire.
4. Once the Tangential Liner is removed the Tangential Plate is exposed along with the Tangential Plate Mounting Hardware. Remove the Tangential Plate by using a screwdriver to remove the screws mounting the Tangential Plate to the Tangential Spacers (see Figure 3). Be careful not to drop the Tangential Plate on the Measurement Pan.
5. Install the Integrated Air Entrainment system on the meter by mounting it to the Tangential Spacers using the hardware removed from the previous step. Using a screwdriver tighten the screws firmly so as to ensure that the IAE is attached to the spacers (see Figure 4). It is recommended that thread sealant be used on these screws to ensure that they do not come loose and get entrained into the product flowing through the meter. Be careful not to drop or rest the Integrated Air Entrainment System on the Measurement Pan.
6. Attach the Tangential Guides using the Tangential Guide Mounting Hardware that were removed in step 3 (see Figure 5) using a 3/16” hex key or screwdriver, depending on the hardware type.
7. Connect 8-inch long ½” Pipe Nipple to ½” Street Elbow attached to the IAE Air Chamber located on the backside of the IAE system. For a Type I, this would be easily accessed behind the newly installed IAE and below the Tangential Spacers (see Figure 6). For a Type II, an access hole should be cut into the enclosure to allow the pipe nipple to be screwed into the street elbow through the wall of the enclosure (see Figure 7). A template has been provided to help in locating this
access hole (see Figure 10). To seal this opening to the outside a seal plate, seal and hardware are supplied. After the pipe nipple is firmly in place, place the seal over the pipe nipple and push it to the outside of the enclosure. Then place the seal plate over the nipple and push it to the seal. Then drill 1/8” holes by using the seal plate as a template to allow the seal assembly to be fastened to the enclosure with the provided hardware. Fasten the hardware to the enclosure with a wrench or screwdriver (see Figure 8).

8. Connect regulator and filter to the pipe nipple. The air being supplied to Integrated Air Entrainment system must be clean, dry, and debris free. Regulator specified will accept 100-psi inlet pressure, is adjustable to 50 psi, and the filter is 10-micron. Connect the outlet from the regulator to the ½” NPT connection (see Figure 9) by screwing the regulator to the nipple. Connect the 2-inch long ½” nipple to the inlet of the regulator and then screw the outlet of the filter to the other end of this nipple.

9. Connect air supply to regulator and filter assembly. Use table on page 2 of this manual to ensure that correct supply pipe is being used.

10. Turn on supply to regulator and adjust regulator to 10 psi. Ensure that airflow is felt at exit of Integrated Air Entrainment system, along flow path of Pan, and at the discharge of the Pan. If not, then contact Eastern Instruments. If air exiting Integrated Air Entrainment system is not enough to clear Pan, than adjust regulator. However, if adjustment still does not get desired results even after it reaches 20 psi, then contact Eastern Instruments.

11. With air flowing, ensure that Manual Zero is adjust correctly according to CentriFlow® Meter Electronics manual and follow Static Calibration procedure. Be aware that if the inlet pressure to the Integrated Air Entrainment system changes, this requires that the Manual Zero be rechecked or adjusted.

12. Check to see that Manual Zero is not changing due to airflow and then the system is ready for product. If Manual Zero is shifting, then contact Eastern Instruments.

13. The installation is now completed.

Notes:

The Integrated Air Entrainment system requires dry air and must remain clean to operate at peak levels. The purchased system doesn’t contain an oil/water separator and the customer must ensure that the air is clean (provide their own separator). The supply line should be piped to a separator and then to the filter/regulator and then on to the IAE system. These should be installed as close to the IAE system as possible to reduce any condensation that could happen.
The graph below (Graph 1) shows the typical air consumption in SCFM vs. the inlet pressure in PSI into the Integrated Air Entrainment system. To determine the air consumption first look for the size of the Integrated Air Entrainment system in the legend, on the right side, and then follow the graph for the pressure setting on the regulator.
Figure 1

Tangential Liner

Tangential Guides

Measurement Pan

Tangential Guide Mounting Hardware

Tangential Spacers
Tangential Liner

Tangential Guides

Tangential Guide Mounting Hardware (6 Places - 3 per Guide)

Hex Key (3/16") or Screwdriver

Measurement Pan

Tangential Plate

Tangential Spacers

Figure 2
Figure 3

- Tangential Plate
- Tangential Spacers
- Mounting Hardware (4 places)
- Screwdriver
- Measurement Pan

[Image of a diagram showing the parts labeled as described]
Align Holes in IAE with Tangential Spacers

Figure 4
Tangential Guides

Integrated Air Entrainment System

Tangential Spacers

Tangential Guide Mounting Hardware (6 Places - 3 per Guide)

Hex Key (3/16") or Screwdriver

Measurement Pan

Figure 5
Figure 8

Type II Enclosure

Pipe Nipple

Seal Plate Mounting Hardware (4 places)

Screwdriver

Seal Plate

Seal

Pre-Drilled 1/8" holes for sheet metal screws
Figure 9

Integrated Air Entrainment System

Filter

Supply Air Line Inlet

Regulator

1/2" NPT Pipe Nipple

Measurement Pan

1/2" NPT Pipe Nipple
Figure 10

Template for cutting through hole for Pipe nipple in Type II Enclosure