

## **Quick Guide – Using the TrueFlow Air Handler Flow Meter and the DG-3 Gauge**

### **1. Measure the Normal System Operating Pressure (NSOP) with the existing filter in place.**

- a) Locate the air handler system filter and replace if it is dirty.
- b) Install a static pressure probe into the ductwork at one of the 3 locations listed below:
  - Insert the static pressure probe into the side surface of the supply plenum. The side of the supply plenum chosen should not have a trunk line, distribution duct or supply register connected to it. The static pressure probe should point into the airstream.
  - Or, insert the tip of the static pressure probe into a "dead-end" corner of the supply plenum. A "dead-end" corner is a corner of the plenum that does not have a trunk line connection, distribution duct connection or supply register within 8 inches of the corner.
  - Or, insert the static pressure probe in the side surface of the return plenum. The side of the return plenum chosen should not have a trunk line, return duct or return register connected to it. The location chosen should also be at least 24 inches upstream from the TrueFlow Metering Plate, and at least 24 inches downstream from any 90 degree corners or return trunk line connections. The static pressure probe should point into the airstream. **Note:** if the Metering Plate will be installed at a remote filter grille, the static pressure probe may not be installed in the return plenum (i.e. install it in the supply plenum).
- c) Connect a piece of tubing between the static pressure probe and the **Channel A Input** tap. If the gauge is in the house during the test procedure, leave the **Reference** tap on **Channel A** open. If the gauge is not in the house during the test procedure (e.g. attic, crawlspace), run additional tubing from the **Channel A Reference** tap to inside the house.
- d) Turn the **CHANNEL** knob to "**A**", the **RANGE** switch to **Low (200.0 Pa)** and the **MODE** switch to **Pressure**.
- e) Turn on the air handler fan to the desired speed and record the normal system operating pressure (NSOP) from the gauge. You may want to use the **5 second**, **10 second** or **long-term** time-average setting if the reading is fluctuating.
- f) After recording the NSOP, turn off the air handler fan. Leave the static pressure probe in place and connected to the gauge.

### **2. Install the TrueFlow Metering Plate in an Existing Filter Slot.**

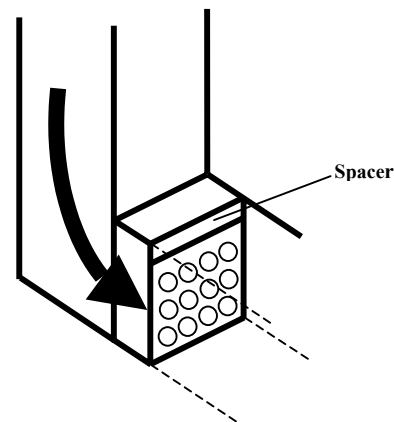
- a) Remove the existing filter and set it aside.
- b) Choose and assemble the metering plate and spacers needed to match the filter slot size.

Filter Slot (in. x in.)	Flow Metering Plate	Spacer Dimension (in. x in.)	
		Spacer 1	Spacer 2
14 x 20	#14	-----	-----
14 x 25	#14	5 x 14	-----
16 x 20	#14	2 x 20	-----
16 x 24	#14	2 x 20	4 x 16
16 x 25	#14	2 x 20	5 x 16
18 x 20	#14	4 x 20	-----
20 x 20	#20	-----	-----
20 x 22	#20	2 x 20	-----
20 x 24	#20	4 x 20	-----
20 x 25	#20	5 x 20	-----
20 x 30	#20	10 x 20	-----
24 x 24	#20	4 x 20	4 x 24

c) Install the assembled metering plate into the filter slot. Be sure the front side of the metering plate is facing into the air flow (front side has two diamond shaped labels on it). The H-channel gasket should provide a seal around the metering plate - all of the air flow should pass through the metering plate and not around it. Be sure that the ends of the flexible tubing connections attached to the plate's pressure sensing grids remain out of the filter slot. Occasionally, drilling holes into the ductwork may be required as a pathway for the ends of the flexible tubing. The flexible tubing can be passed through one of the plate's metering holes if this helps in getting the tubing ends outside of the filter slot.

- Obstructions within 6 inches upstream or 2 inches downstream of the metering plate that are blocking air flow through any of the metering holes may reduce the accuracy of the device.
- If there is an obstruction and there is a spacer attached to the metering plate, try to install the metering plate so that the spacer is directly in front of the obstruction (this will minimize the effect of the obstruction on the flow measurement).
- If the metering plate is installed directly downstream of a 90 degree bend in the duct system, and there is a spacer attached to the plate, install the metering plate so that the spacer is on the inside corner of the bend (see diagram to right).

d) Close the filter access opening. Be careful not to pinch off the flexible tubing connections. Temporarily seal around the filter slot cover with masking tape to prevent air leakage.



**Note:** If you are installing the metering plate at the filter grille of a single return duct system, simply push the plate into the empty filter rack. Make sure that the front of the metering plate is facing out (into the air flow). Keep the filter grille door open for the remainder of the test.

### 3. Re-Measure the System Operating Pressure (TrueFlow Plate Installed).

- Turn the air handler fan back on to the same speed as **Step 1** above.
- Measure and record the new system operating pressure (TFSOP) using the static pressure probe and **Channel A** of the DG-3. The static pressure probe should be in the exact same position as **Step 1** above.

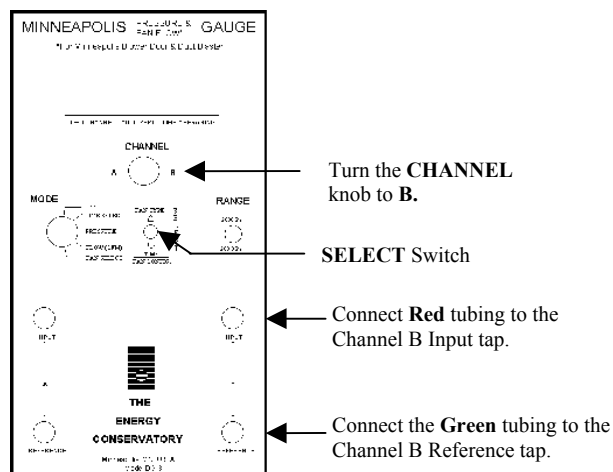
### 4. Measure the Air Flow Through the TrueFlow Metering Plate

- Connect the flexible tubing connections from the metering plate to **Channel B** as shown in the diagram.
- In order for the DG-3 gauge to directly display air flow in CFM from the metering plate, the installed metering plate must be selected in the gauge. To select the metering plate being used in your test, first turn the **MODE** knob to the **Fan Select** position. The gauge display will show "-SEL" to indicate that a flow measurement device has not been selected. The selected flow measurement device is chosen by toggling up the **SELECT** Switch.

**Toggle up 3 times** to select the #14 Metering Plate.  
**Toggle up 4 times** to select the #20 Metering Plate.

**PL 14**                      This indicates that you have chosen the #14 TrueFlow Metering Plate.

**PL 20**                      This indicates that you have chosen the #20 TrueFlow Metering Plate.



Once the proper plate has been selected, turn the **MODE** switch to **Flow**. With the **CHANNEL** knob set to **B**, the gauge will now display the air flow through the metering plate in CFM. You may want to use the **5 second**, **10 second** or **long-term** time-average setting if the flow reading is fluctuating.

**Note:** DG-3 gauges sold prior to March 2001 do not have the **PL14** or **PL20** options when selecting a flow measurement device. These gauges can be retrofitted with a new EPROM by The Energy Conservatory (call for more information). Flow can also be determined by measuring the pressure signal from the metering plate, and using the Flow Conversion Table

### 5. Look up the Flow Resistance Correction Factor

- The Flow Resistance Correction Factor can be determined using the correction factor table provided with the manual, and the two system operating pressure measurements (**Step 1** and **Step 3**). The Flow Resistance Correction Factor is used to adjust the measured air flow through the metering plate for differences in resistance between the existing filter and the TrueFlow Meter.

### 6. Calculate the Adjusted Air Flow

- Multiply the measured air flow through the metering plate (**Step 4**) by the Flow Resistance Correction Factor (**Step 5**) to determine the final adjusted air flow amount. This result is the estimated air flow at the measurement location with the existing filter in place. Turn off the air handler fan.

**Note:** When the TrueFlow Air Handler Flow Meter is installed at a remote filter grille, it is possible to make a correction to the measured flow through the metering plate which increases the accuracy of the flow measurement. See **Appendix C** of the TrueFlow manual for more details.