AIR FLOW MONITOR

INSTRUCTION MANUAL

INTRODUCTION

The AFM monitors the mass air flow rate in a duct system. It warns the user by audio and visual alarm that the air flow has decreased below a configurable set point.

FLOW RANGES

The AFM is calibrated for two flow ranges expressed in linear feet per minute (FPM) at 23°C±10°C. Flow ranges are automatically selected by the connected probe. Low-flow is 50 to 500 FPM and high-flow is 500 to 2500 FPM.

If duct air temperature is significantly outside of the tolerance specified above, you may have trouble adjusting for flow rates which are near the AFM flow range extremities.

To determine the appropriate linear flow range (FPM) from volumetric flow rate (CFM), use the following:

1. Calculate duct cross-sectional area in square inches.
    - Rectangular area = length × width
    - Circular area = $3.14 \times (\text{diameter} \div 2)^2$
2. Divide the calculated area by 144 to get square feet.
3. Divide the system CFM by the duct cross-sectional area.

EXAMPLE 1: 12 inch round duct @ 300 CFM volumetric flow:

1. $3.14 \times (12 \div 2)^2 = 113.04$ sq. in.
2. $113.04 \div 144 = 0.785$ sq. ft.
3. $300 \div 0.785 = 382$ FPM (requires *low-flow* probe)

EXAMPLE 2: 8x10 inch rectangular duct @ 600 CFM:

1. $8 \times 10 = 80$ sq. in.
2. $80 \div 144 = 0.555$ sq. ft.
3. $600 \div 0.555 = 1081$ FPM (requires *high-flow* probe)

INSTALLATION

Affix the probe firmly in the duct so that the tip of the probe is in the center of the airstream. Align the probe in the airstream so that the air flows through the slot in the end of the probe. Use the label on the probe marked “toward airflow” to assist in probe alignment.

A compression fitting with a suitable gland is recommended for holding the probe. After insertion and alignment of the probe the fitting is compressed to prevent air leakage. Failure to install the probe properly will result in an inaccurate reading of the air flow rate.

Plug the probe into the control box.

Plug in the supplied power supply.

OPERATION

The green *POWER* LED signals that power is supplied to the unit. Upon power up, the green LED will blink and the red, yellow and blue LEDs light solid, for approximately 20 seconds until airflow is properly recognized.

The yellow *WARNING* LED will activate when the air flow drops below the alarm set point. The unit will go into alarm if low airflow exists for several seconds. This alarm condition is indicated by the red flashing *ALARM* LED, the beeper and the relay changing states. The alarm beeping can be muted for 5 minutes by pressing the *MUTE* button. While muted the blue *MUTE* LED will blink, the relay will remain in alarm condition.

Some models of AFM have and an "Extended Mute Feature." When the unit is in alarm, press and HOLD the *MUTE* button until the blue led goes out (about 5 seconds). The beeper will be muted until the alarm condition clears; the blue LED will continue to blink. This is useful in situations where unplugging the alarm is not feasible. <u>This optional feature must be specified when ordering.</u>

ADJUSTMENT

The AFM alarm set point must be adjusted after the probe is installed in the ductwork. The temperature should be near the expected midpoint of the operational range and the flow rate should be stable during the adjustment procedure. Adjust only at known airflow.

The **ADJ* set screw on the front panel allows fine adjustment of the alarm set point with a range of 50 to 500 FPM for low-flow and 500 to 2500 FPM for high-flow. This adjustment has a range of 4 turns, with no "stops".

Turn the **ADJ* screw at least 4 full turns clockwise (CW) to set the alarm limit at the probes lowest flow rate. Next, slowly turn the screw counter clockwise (CCW) until the unit enters the alarm condition*. Finally, slowly turn the screw CW until the alarm clears and then 1/8 turn more to allow for slight changes in airflow.

If the air in the ductwork varies by more than ±10°C, you may need to readjust the alarm set point.

*Note that "alarm condition" is when the yellow LED lights. The red LED and beeper will activate a few seconds after the yellow LED.

REMOTE MONITORING

The AFM features a single pole double throw relay for remote alarm monitoring. The normally closed (NC) and common (C) contacts will be closed when an alarm condition exists. An alarm condition exists if the airflow across the probe drops to a value below the set point or if power to the AFM is lost.

THE RELAY RATING IS 30 VOLTS AT 1 AMP. EXCEEDING THIS RATING CAN DAMAGE THE RELAY CONTACTS.

INDUCTIVE LOADS (MOTORS AND SOLENOIDS) MAY PRODUCE TRANSIENTS THAT CAN EXCEED THE CONTACT RATING AND MAY ALSO RESULT IN RELAY DAMAGE.

HAMPSHIRE CONTROLS CORP.
P.O. Box 516
Dover, NH 03821-0516
TEL: (603) 749-9424 (866) 496-9424
support@hampshirecontrols.com
https://www.hampshirecontrols.com/