

Model # 51403 Airflow Monitor Warranty

1 Year Limited Warranty
(Effective 05.1.2014)

HEMCO warrants UniFlow Laboratory Fume Hoods, that have received U.L. 1805 Classified (catalog #s as listed below) for materials, and workmanship. HEMCO's warranty shall be for a period of (1) year from the date of sale to the original purchaser. HEMCO Corporation will repair or replace products found to be defective in materials or workmanship within the period set forth above, provided that: (a) the product has not been subjected to misuse, contamination, neglect, accident, incorrect wiring, improper installation or servicing, or used in violation of instructions furnished by HEMCO Corporation. And (b) as to any defects in materials or workmanship covered by this warranty, the product shall be repaired or altered by anyone authorized by HEMCO Corporation, and (c) the serial number has not been removed, defaced or otherwise changed, and (d) HEMCO Corporation, does not assume the costs of removal and/or installation of the product or any other incidental costs of removal and/or installation of the product or any other incidental costs which may arise as a result of any defect in material or workmanship, and (e) upon discovery of defect, Buyer shall notify HEMCO Corporation.

Any Warranty implied by law, including warranties of merchantability or fitness, is in effect only for the duration of the expressed warranties set forth above, no person is authorized to give any other warranty, or to assume for HEMCO Corporation any other liability in connection with the sale of its products; HEMCO Corporation shall not be liable for the loss of use, revenue, or profit or for any injury, or for any other consequential or incidental damages, buyer is not relying on seller's judgement regarding original buyer particular requirements, and has had an opportunity to inspect the product to original buyer satisfaction.

This Warranty is in lieu of all other expressed or implied Warranties

This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state.

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Installation, Operation, Maintenance Manual

Analog Airflow Monitor 51403



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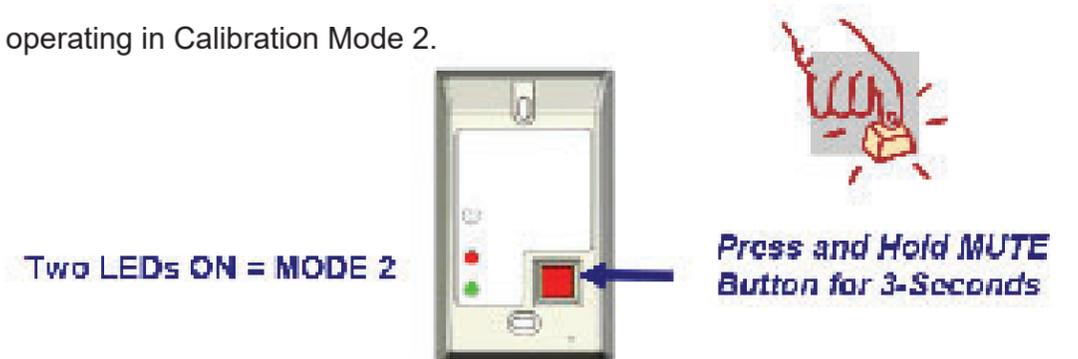
Model # 51403 Airflow Monitor

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Model # 51403 Airflow Monitor Calibration

Mode 2 Calibration

a. Verify unit is operating in Calibration Mode 2.

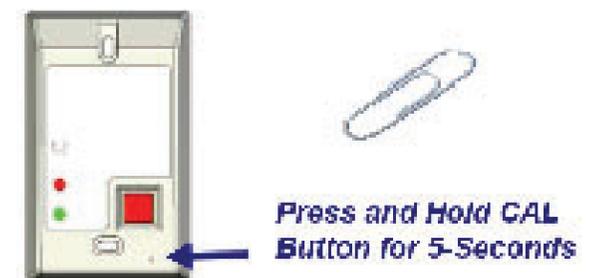


b. Once you have confirmed the Alarm is operating in Mode 2, adjust the exhaust flow volume or fume hood sash to provide velocity 20% greater than the desired alarm set point.

c. Using a calibrated velocity meter, measure the average airflow velocity using appropriate ANSI/ASHRAE method.

If the measured velocity is 20% greater than the desired alarm set point, then proceed to Step d. If not, then adjust exhaust flow or fume hood sash, and repeat Step c until the desired velocity is achieved.

d. To calibrate the alarm set point, press and hold the Calibration Button for 5 seconds, until you hear two quick beeps, then release the Calibration Button and step away from the hood. You will now hear a series of short fast beeps while the microprocessor is acquiring data from the sensor. After about 5-seconds, the buzzer will provide one longer beep to signify calibration set point has been stored.



e. Verify the alarm set point is calibrated properly by modulating the exhaust volume or moving the fume hood sash to achieve the desired alarm set point.



After calibration is verified, you may place a calibration sticker over the Calibration Button to identify date of calibration.



Maintenance

Routine maintenance or service is not required. The ABVA can be inspected and the alarm calibration verified during the periodic Fume Hood or Bio Safety Cabinet performance certification. Inspection of the ABVA should include; alarm calibration verification with re-calibration if required, visual hood probe inspection and visual inspection of the inlet port on the front surface of the ABVA.

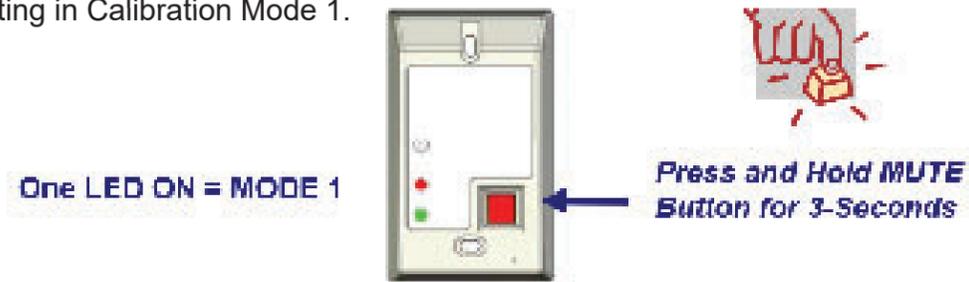
Model # 51403 Airflow Monitor Calibration

Confirm the following checklist items before proceeding:

- ABVA unit is installed properly and has been powered up for at least 20 minutes.
- The laboratory airflow control system is functioning properly and lab pressurization is being maintained per design requirements.
- The fume hood or BSC exhaust control system is functioning properly and maintaining proper control set point.
- The laboratory temperature control system is functioning properly and room temperature is controlled per specification (nominal temp 66 to 74 degrees F)
- All airflow velocity measurements are to be taken using a calibrated meter providing a minimum accuracy of +/- 5% of reading. Consult appropriate ANSI/ASHRAE Standards for methods.

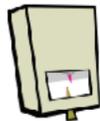
Mode 1 Calibration

a. Verify unit is operating in Calibration Mode 1.



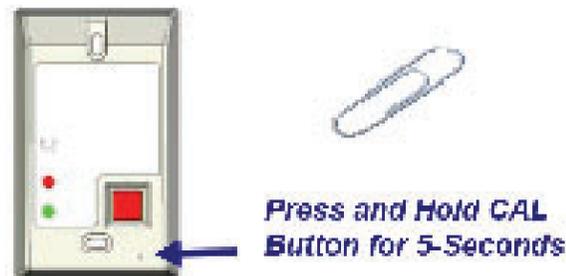
b. Once you have confirmed the Alarm is operating in Mode 1, adjust the exhaust flow volume or fume hood sash to provide the desired velocity for the alarm set point.

c. Using a calibrated velocity meter, measure the average airflow velocity using appropriate ANSI/ASHRAE method.

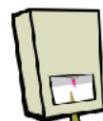


If the measured velocity is within the desired alarm set point, then proceed to Step d. If not, then adjust exhaust flow or fume hood sash, and repeat Step c until the desired velocity is achieved.

d. To calibrate the alarm set point, press and hold the Calibration Button for 5 seconds, until you hear the buzzer beep, then release the Calibration Button and step away from the hood. You will now hear a series of short fast beeps while the microprocessor is acquiring data from the sensor. After about 5-seconds, the buzzer will provide one longer beep to signify calibration set point has been stored.



e. Verify the alarm set point is calibrated properly by modulating the exhaust volume or moving the fume hood sash to achieve the desired alarm set point.



After calibration is verified, you may place a calibration sticker over the Calibration Button to identify date of calibration.



Model # 51403 Airflow Monitor

Introduction

The Basic Velocity Alarm (ABVA) provides a cost-effective means for ensuring your laboratory fume hoods and bio safety cabinets are operating within the appropriate velocity range for their intended application. Lab occupants are alerted of potentially unsafe operating conditions by both audible and visual alarms located on the front panel of the ABVA. The ABVA can also communicate alarms to remote locations, such as the building automation system, and be commanded to operate in "unoccupied mode" from remote locations.

Features

- Precise Measurement of Velocity using Mass Flow Sensor and 24-bit A/D Converter
- Two Alarm Calibration Modes
- Ultra Bright L.E.D.s to Indicate Status at a Glance
- Loud Audible Alarm Provided by 90dB Horn
- Remote Communication of Alarm Status
- Unoccupied Mode Using Remote Mute Function
- No External Reference Probe Required
- Flush Mount or Surface Mount Installation
- Simple Wiring Using Screw-less Terminals
- Operates from Standard 120 VAC Using Wall Plug Power Module Provided
- Side-Mount Bracket Kit Available for Installing to "Box" Type Apparatus
- Dual Hood Probe Kit Available for Large Fume Hoods

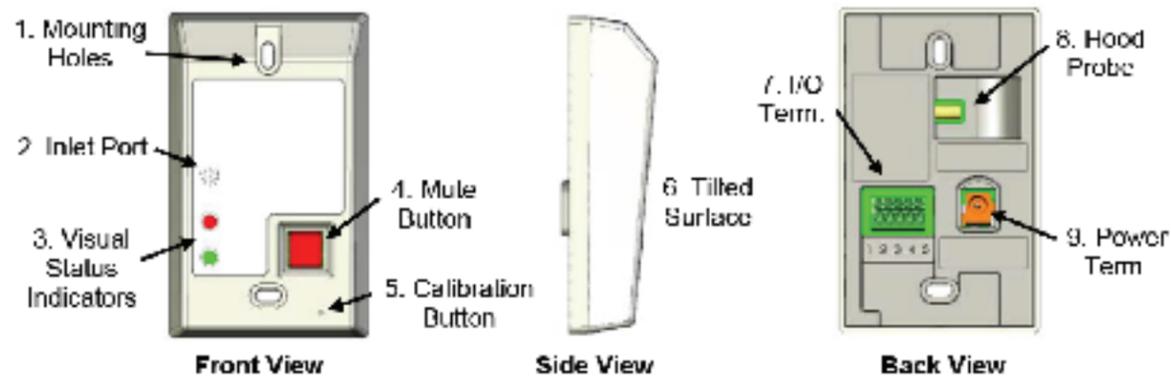
Prior to Proceeding

Before installing and calibrating your velocity alarm, you should be familiar with ANSI/ASHRAE STANDARD 110 for proper methods of testing performance of laboratory fume hoods. The following items are identified by ASHRAE as being important factors contributing to the safe operation of laboratory fume hoods:

1. Cross-drafts. Air currents may, by creating turbulent air pockets, draw contaminants from the hood. Such cross-drafts could be caused by air supply diffusers or grilles, open windows or doors, or rapid movements of people in front of the hood.
2. Work procedures. There is substantial evidence to suggest that all work in a hood should be conducted as far back in the hood as practical. Typically, users have standardized the requirement that all work should occur at least 6 inches behind the face of the hood. However, significantly improved protection can be achieved by working farther than 6 inches from the face of the hood.
3. Internal obstructions. The location of too much laboratory equipment (bottles, glass, etc.) in the hood will disturb airflow patterns into the hood.
4. The procedure being performed. The intrinsic hazard of the procedure being performed can affect the level of safety required by the user.
5. Thermal challenge. Heat produced in the hood can cause significant disturbance in the hood performance and even cause leakage of warm and possibly contaminated air from the top of the hood or from behind the sash.
6. Rate of response. The transient state or interval required for a variable-air-volume hood to respond to a rapid opening of the sash, or the time interval required for a hood to respond to a change in static pressure in the main exhaust duct serving multiple hoods, may affect hood performance.

Model # 51403 Airflow Monitor

General Description



1. Mounting Holes: Both mounting holes are elongated to provide horizontal and vertical adjustment so the alarm can be perfectly aligned with the mounting surface.

2. Inlet Port: Air is drawn in from the room through the inlet port where it is measured by the internal mass flow sensor and then exits into the negatively pressurized fume hood or BSC exhaust duct.

3. Visual Status Indicators: There are two visual status indicators; one Red LED and one Green LED. During normal operation, the Green LED is ON and the RED LED is OFF. During an alarm condition, the Green LED is OFF and the RED LED Flashes. When the Mute Button is pressed and held for 3-seconds, the two LEDs are also used to indicate which calibration mode is presently active.

4. Mute Button: Highly visible and easy to access for quick actuation. Pressing the Mute Button momentarily during an alarm condition will silence the horn. Pressing Mute again, will reactivate the horn. If the horn is muted and the alarm has not cleared, the horn will chirp (re-beep) every five minutes as a reminder that the horn is muted. Pressing and holding the Mute Button for 3-seconds, will provide a visual indication of the present calibration mode. If one LED turns ON, then the unit is operating in Mode 1. If both LEDs turn ON, then the unit is operating in Mode 2. Pressing and holding the Mute Button for 15-seconds, will disable the horn with no re-beep. The horn will remain OFF until the Mute Button is pressed again or the alarm condition clears.

5. Calibration Button: The calibration button is recessed to prevent accidental triggering. To press the calibration button, use the end of a paper clip.

Pressing the Calibration Button momentarily will toggle the alarm calibration mode.

Pressing and holding the Calibration Button for 5-seconds, will initiate the Alarm Calibration.

Pressing and holding the Calibration Button for 10-seconds, will re-zero the sensor. The sensor should not need to be re-zeroed unless directed to do so by the factory. Re-zero should only be performed with the airflow sensor blocked.

6. Tilted Surface: Because the alarm is normally installed above eye level, the front surface is angled downward for easy viewing.

7. I/O Terminal Block: Use stranded wire between 16 and 20 AWG only, stripped back ¼ - ½ inch. Remote Mute: Sending a contact closure to the Remote Mute input will mute the horn same as pressing the Mute Button. Remote Mute is normally used during unoccupied hours.

Alarm Output: Alarms can be communicated to other devices and the building automation system using the relay output at terminals 3, 4 and 5. The relay changes state during alarm condition, and returns to normal when the alarm condition has been cleared.

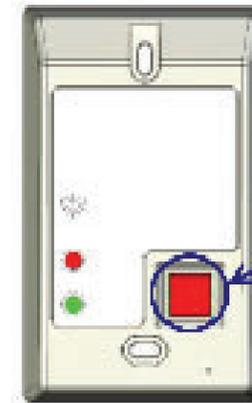
8. Hood Probe Port: This is the exit side of the mass airflow sensor. Tubing from the hood probe or BSC exhaust duct is connected here.

9. Input Power Plug: The DC Power Module provided connects directly to plug on the back of the unit.

Model # 51403 Airflow Monitor Pre-Calibration

Mute Button

The Mute Button has three functions, which are selected based on the time duration the button is held.



Mute Button

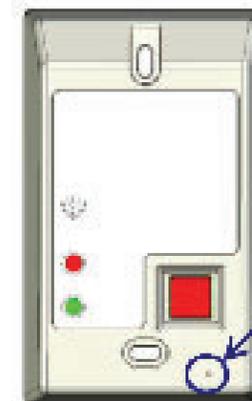
Pressing and releasing once; during alarm condition will silence the horn. Pressing again reactivates the alarm horn.

Pressing and holding for 3 seconds; provides visual indication of the present calibration mode. One LED ON = Mode 1, Two LEDs ON = Mode 2.

Pressing and holding for 15 seconds; disables the horn with no re-beep. The horn will remain off until Mute is held again for 15 seconds.

Calibration Button

To prevent accidental contact, the Calibration Button is located below the hole in the front lower right corner of the ABVA. In order to press the Calibration Button, simply straighten the end of a small paper clip and insert straight into the hole.



Calibration Button

Pressing and releasing; toggles calibration modes.

Pressing and holding for 5 seconds; initiates alarm calibration.

Pressing and holding for 10 seconds; zeros the sensor.

Note: The sensor should not need to be re-zeroed unless directed to do so by the factory. Re-zero should only be performed with the airflow sensor blocked.

Calibration Modes

The ABVA has two different modes for calibrating the alarm set point. Mode 1 calibrates the alarm set point to the velocity at which the fume hood is presently operating and Mode 2 calibrates the alarm set point to 20% less than the operating velocity.

Mode 1 should be used if the desired alarm set point can be achieved by either modulating the exhaust flow or by positioning the fume hood sash. Mode 2 should be used if the desired alarm set point can not be achieved and is 20% less than operating velocity. Two examples are provided below for selecting which Mode is suited best for your application.

Example 1:

Desired Alarm Set Point: 80 FPM

Fume Hood Type: Constant Exhaust Volume

Face Velocity Range: When Sash is 100% Open the Face Velocity is measured at 80 FP.

Calibration Mode: Select Mode 1; because the desired alarm set point can be achieved by opening the sash 100%.

Example 2:

Desired Alarm Set Point: 80 FPM

Fume Hood Type: Variable Exhaust Volume

Face Velocity Range: Face Velocity is controlled to 100 FPM, regardless of sash position.

Calibration Mode: Select Mode 2; because the desired alarm set point is 20% less than the operating velocity.

Model # 51403 Airflow Monitor Installation

Step 3: Locate the Hood Probe

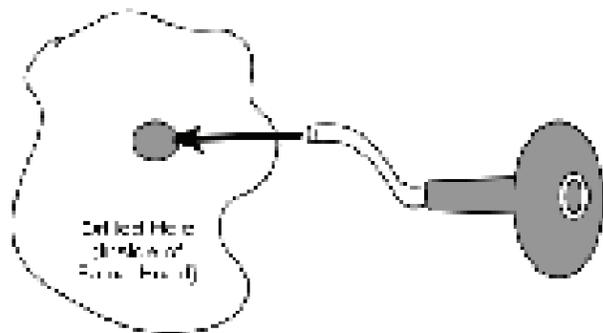
Due to the wide variety of fume hoods and configurations available, there is no single hood probe location that will work for all fume hoods. Contact the fume hood manufacturer to obtain the optimum side wall probe location for the specific model hood being used.

If no information is available, generally good performance is achieved when the probe is mounted as shown in Figure 2.

Step 4: Install the Hood Probe

Before proceeding, reference the fume hood manufacturer recommendations for best method and safety precautions for drilling the fume hood sidewall.

- Drill a 7/16" diameter hole in the side wall of the fume hood in the location selected in Step 3.
- Working from the inside of the fume hood, insert the end of the tubing through the drilled hole feeding the entire length through up to the probe.



- Firmly insert the probe into the predrilled hole. It should not be required; however you may apply some sealant / adhesive to the back of the probe flange to secure the probe to the sidewall if desired.

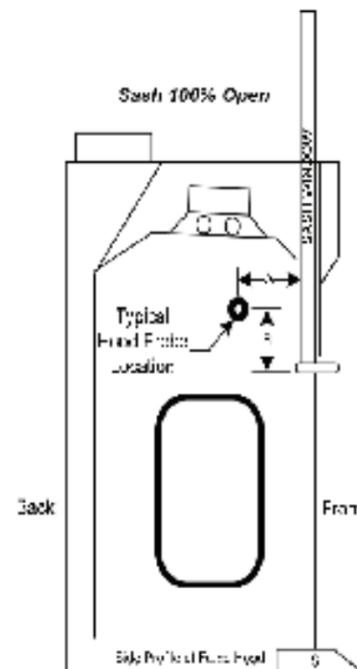


Figure 2

Step 5: Wiring the Terminal Strip

On the back of the ABVA there is a 5-conductor (screw-less) terminal strip used for connecting the "Remote Mute Input" and "Alarm Relay Output". If these features are not being used, proceed to Step 6. Otherwise, route the wires through the appropriate holes or electrical box knock-outs and connect to the respective terminals. Note: Connections to the terminal strip are made by pushing the button above the terminal, inserting the stripped end (1/4") of the wire into the hole and releasing the button.

Step 6: Connecting Input Power

Route the cord end of the DC Power Module through the appropriate hole or electrical box knock-out and insert into the power plug located on the back of the ABVA.

Step 7: Connect the Tubing to the ABVA

Route the hood probe tubing through the appropriate hole or electrical box knock-out, using caution not to cause any kinks. Slide the tubing over the sensor port on the back side of the ABVA.

Step 8: Secure the ABVA

Secure the ABVA to the mounting surface using the appropriate two screws provided.

Model # 51403 Airflow Monitor

Specifications

INPUT POWER

15VDC +/- 20% provided by Class II UL approved wall pluggable power module

VELOCITY RANGE

30 – 2,000 FPM

ACCURACY

+/- 10% of set point or +/- 10 FPM, whichever is greater

VELOCITY SENSOR

Type: micro-bridge mass flow sensor

Overpressure: 25 PSI

ENVIRONMENT

Temperature: Storage; 0°F to 150°F, Nominal Operating; 55°F to 85°F

Humidity: 10% to 90% RH, non-condensing

PHYSICAL CHARACTERISTICS

Enclosure Size: 2.76" W x 4.5"H x 1.25"D

Weight: approximately 5oz.

Hood Probe: 7/16" diameter, feed through bushing, press fit, 5' tubing

Materials: Enclosure; ABS plastic

Tubing; 0.170" I.D., 1/4" O.D., clear polyurethane, ester base

Hood Probe; Polyethylene

LED INDICATORS

Two ultra bright clear lens LEDs, Green indicates normal, Red flashing indicates alarm

AUDIBLE HORN

Sound Level: 90 dB at 10cm

Operation: horn sounds during alarm condition unless Mute is activated

Re-Beep Mode: single fast tone every 5 minutes when horn muted and alarm not cleared.

ALARM DELAY

7 seconds (to reduce false alarms)

ALARM RELAY OUTPUT (I/O Terminal, Positions 3, 4 and 5)

Type: SPDT relay

Specifications: 1A @ 30 VDC, 0.5A @ 125 VAC (resistive load)

Operation:	NORMAL, Power ON	ALARM, Fault or Power Loss
Relay Contact Term. 3 – 4:	OPEN	CLOSED
Relay Contact Term. 5 – 4:	CLOSED	OPEN

REMOTE MUTE INPUT (I/O Terminal, Positions 1 and 2)

Type: un-powered dry contact

Operation: when input is shorted (1000 ohms max), horn is muted and re-beep mode active

MUTE PUSH BUTTON

Pressing Once Momentarily silences horn, enables re-beep mode and resets after the alarm condition is cleared or the Mute Button is pressed momentarily again.

Pressing and Holding Mute for 3 Seconds provides indication of present calibration mode.

One LED ON indicates Cal Mode 1, Both LEDs ON indicates Cal Mode 2.

Pressing and Holding Mute for 15 Seconds while in alarm disables the horn with re-beep inactive. If alarm clears, or mute is pressed for 15 seconds, normal operation is restored.

Model # 51403 Airflow Monitor Description

Model Code Description

Model Number Includes

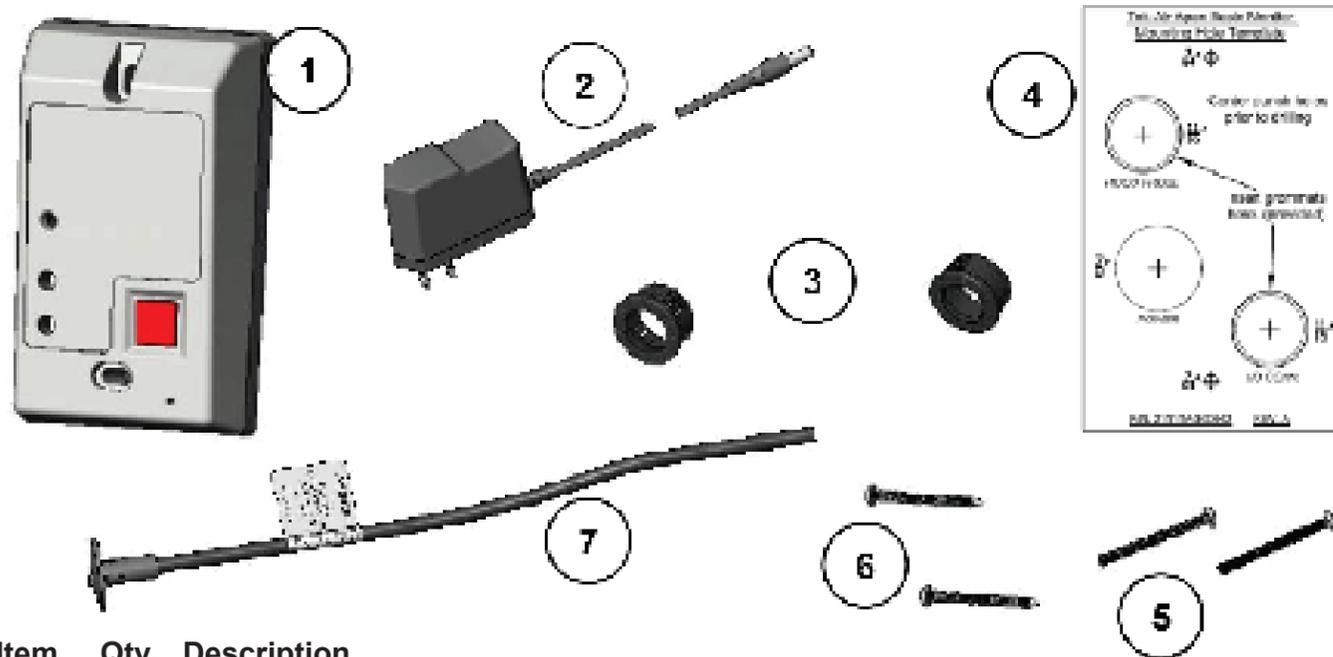
- (1) Basic Velocity Alarm
- (2) 6-32 x 1.5" Mounting Screws
- (2) #6 x 1.5" Sheet Metal Screws
- (1) Reference Guide
- (1) Mounting Template
- (1) Wall Pluggable 15VDC Power Supply
- (2) Bushings for surface mounting

Hood Size and Type

- FH1P = Single Hood Probe Kit (for fume hoods less than 8-feet wide)
- FH2P = Dual Hood Probe Kit (for fume hoods 8-feet wide and greater)
- BS1P = Probe Kit for BSC Duct

Getting Started / Unpacking

Before proceeding, unpack box and verify all components arrived safely through shipping.

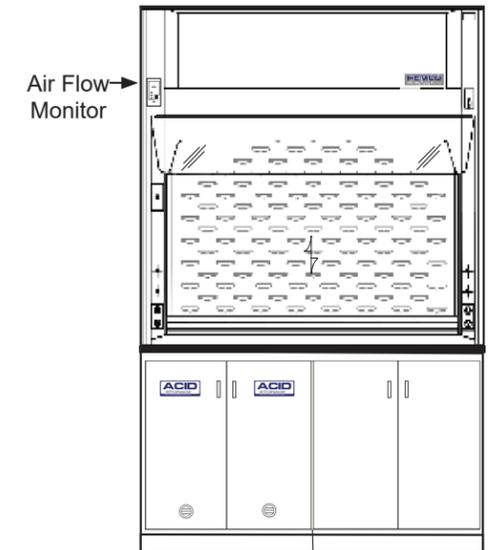


Item	Qty.	Description
1	1	Velocity Alarm Main Unit
2	1	Wall Pluggable Power Module
3	2	Bushings
4	1	Mounting Template
5	2	Screws, SS Machine, # 6-32-1.25"
6	2	Screws, SS Sheet Metal, # 6-32-1.25"
7	1	Hood Probe Kit; Single Hood Probe Kit Shown

Model # 51403 Airflow Monitor Installation

Step 1: Choose Suitable Mounting Location (Fume Hood Installation Shown)

With the fume hood sash fully opened, the ABVA should be mounted at a height above the maximum opening to prevent cross drafts from affecting the performance of the velocity sensor. Figure 1 shows a good mounting location on a standard fume hood.



Step 2: Install the ABVA Alarm

The versatile design of the ABVA allows for various mounting options, three of which are explained below. Choose the option best suited for your application.

Option 1: Installing the ABVA onto a Single-Gang Electrical Box

The ABVA is designed to fit directly onto a 1-gang electrical box. For mounting, use the two machine screws provided, however, do not secure until completing Steps 3 through 7

Option 2: Installing the ABVA Directly to Surface

- a. Remove the backing from the mounting template provided (PN 2111TAG00642) and adhere it to the location selected in Step 1. Be sure to mount the template straight.
- b. Using a center punch or similar tool, mark the 5-hole centers using enough force to dimple the mounting surface.
- c. Using a 7/64" bit, drill the upper and lower mounting holes.
- d. Drill the two 11/16" holes and one 7/8" hole. Suggestion: Use a Step Bit for drilling these three holes.
- e. Install the two bushings provided into the 11/16" holes.
- f. The ABVA will be mounted to the surface using the two sheet metal screws provided, however do not secure until Steps 3 through 7 have been completed.

Option 3: Installing the ABVA Using the Side Mount Kit (Optional Item, Sold Separately)

- a. Using the hardware and instruction sheet provided with the side mount kit, PN T-ABVA-SMKIT, install the bracket to the side panel of the device being monitored.
- b. Install the plastic electrical box provided to the side-mount bracket using the hardware provided.
- c. Install the ABVA to the plastic electrical box, however do not secure until Steps 3 through 7 have been completed.

