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APEX

High Performance Velocity Alarm

Cost-effective, accurate, reliable velocity alarm

- For all types of fumehoods & biological safety cabinets
- Simple to Install and Operate
- Continuous Monitoring of Velocity
- Reliable, Accurate and Fast Speed of Response
- Unoccupied Mode – Digital Input
- Alarm Status to BAS – Alarm Relay
- Visual Status Indicators
- Audible Alarm

Manufactured in the USA.

The APEX high performance velocity alarm provides the industry with a cost-effective, accurate and reliable velocity alarm to help ensure a safe operating environment for laboratory personnel. The APEX is suited for use on all types of fume hoods and biological safety cabinets (BSC).

The APEX is installed directly onto the exterior of the device which it is monitoring – fume hood or BSC. For fume hood applications, a small probe is provided, which is installed on the interior sidewall of the hood. This probe is connected to the APEX using very small tubing (1/4" O.D.; also provided). For BSC applications, a duct static pressure probe is used in lieu of the sidewall probe and is installed into the exhaust duct serving the BSC.

The APEX measures airflow by drawing an extremely small amount air from the room through the front reference port (see Front View drawing, pg. 3), through the internal air flow sensor and exits through the sidewall probe or static pressure probe. The airflow measured by the sensor is proportional to the fume hood face velocity and the BSC duct static pressure. If at any time the velocity drops below the calibrated alarm set point, the APEX goes into full alarm mode (audible alarm sounds, mute button is initialized, red LED flashes and the alarm relay changes state). The alarm may be silenced by pressing the mute button. However, the red LED and relay remain the same until the alarm condition has been cleared.

Theory of Operation

The APEX Velocity Alarm measures airflow velocity using an ultra-sensitive micro-bridge airflow sensor coupled with a high-resolution (24-bit) A/D converter. The resulting digital airflow measurement is extremely accurate, precise and repeatable. The alarm set point is programmed using a simple one-step operation which calibrates and stores data into the microprocessor's non-volatile memory.

The microprocessor continually compares the real time measured airflow to the programmed alarm set point. When the measured airflow is greater than the calibrated alarm set point, the green LED is illuminated to indicate normal operating conditions. When the measured airflow is less than or equal to the calibrated alarm set point, the unit goes into alarm mode alerting the lab occupants of a potentially unsafe condition. A mute button is provided to silence the audible alarm horn, while the red LED remains in a flashing state until the alarm condition has been cleared. The APEX also includes an alarm relay which can communicate the alarm status to the Building Automation System. In addition, a digital input can be used to remotely mute the audible alarm.

Installation

The APEX can be mounted to a standard single gang electrical box (see Back View drawing, pg. 3) using the included 6-32 machine screws. For instances where an electrical box is not available, the APEX can be surface mounted by using the supplied hole template and drilling 5 holes:

- (2) – 7/64" holes for supplied mounting sheet metal screws
- (2) - 11/16" holes for supplied bushings for tubing and wire
- (1) – 7/8" hole for the power connector

An additional 7/16" diameter hole is required for the mounting of the hood probe into the fume hood sidewall.

Programming the Alarm Set Point

Once all components are functioning (e.g.: hood controls, exhaust and supply fans, power, etc.) the APEX can be commissioned.
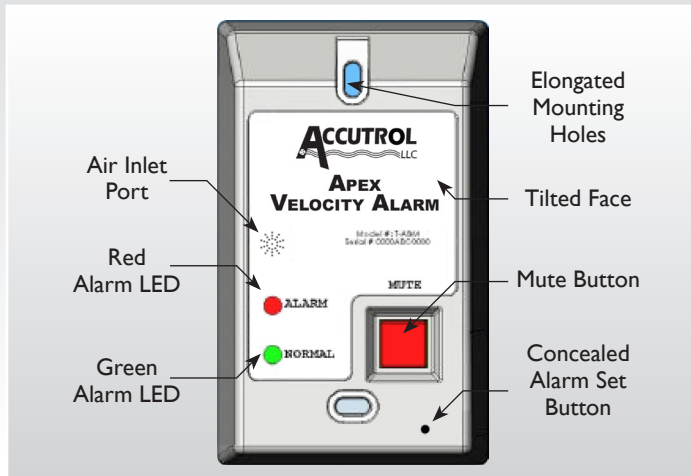
For fume hood applications:
- Confirm the exhaust airflow volume is under accurate and stable control.
- Move the fume hood sash to the position that will achieve the desired face velocity alarm value and verify by traverse measurement.
- Press the concealed set button on the front of the APEX using a paper clip (see front view description for location) and move away from the fume hood.
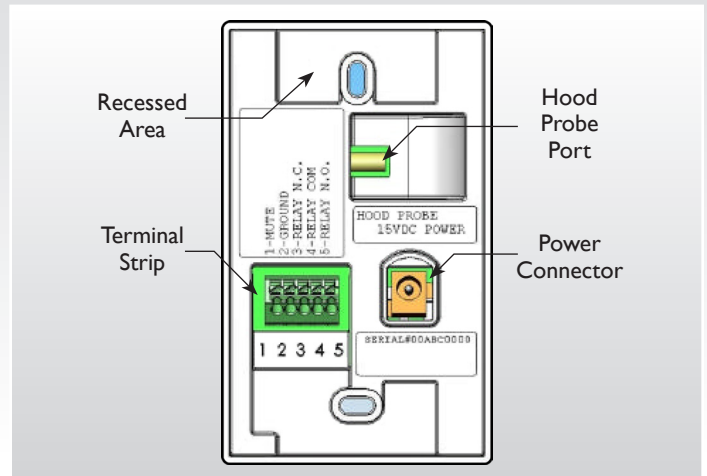- The APEX will chirp slowly 3 times, then fast 10 times then one long chirp.

That's it! The first 3 chirps give the technician time to stand back from the APEX, the next 10 chirps are actual sample readings the unit is gathering and the final long chirp tells the technician the APEX is done. The entire commissioning process, as described, takes only 10 seconds!

To prevent unauthorized calibration, we recommend placing the calibration sticker over the alarm calibration hole.
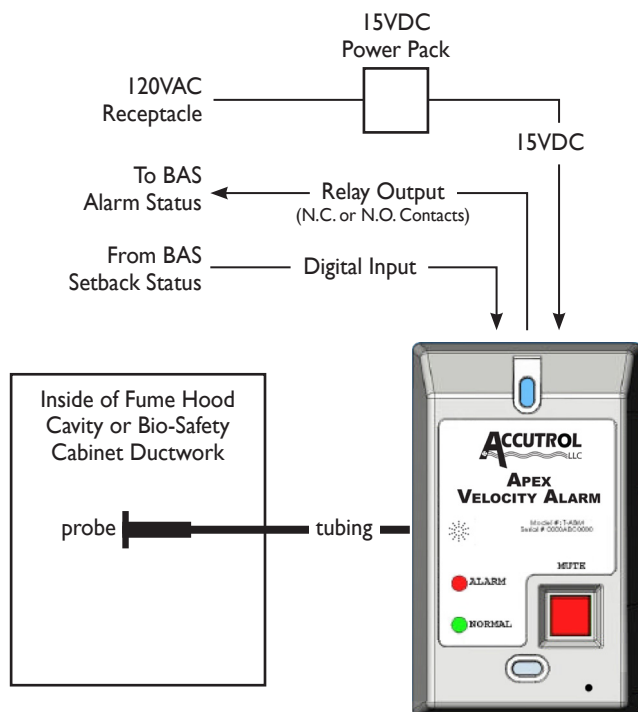
Front View

- Air Inlet Port
- Red Alarm LED
- Green Alarm LED
- Elongated Mounting Holes
- Tilted Face
- Mute Button
- Concealed Alarm Set Button

- Elongated mounting holes for precise alignment
- Slightly tilted front surface for easy viewing
- Highly visible status indicators
- Air inlet port is built-in to the front surface eliminating the need for external room reference probe
- Large and easy to operate mute button
- Concealed alarm calibration button to prevent unauthorized calibration

Back View

- Recessed Area
- Terminal Strip
- Hood Probe Port
- Power Connector

- Recessed area allows mounting to almost any type of electrical box without interference from the box. Also designed for surface mounting without an electrical box.
- Hood reference probe is easily connected to airflow sensor port using 1⁄4" tubing (provided).
- Terminal strips are simple spring actuated press terminals for reliable electrical connections without having to loosen and tighten screws.
- Direct plug-in power connection to UL Listed Class II power supply provided with every alarm.

System Component Connections

- 15VDC Power Pack
- 120VAC Receptacle
- 15VDC
- To BAS Alarm Status
- Relay Output (N.C. or N.O. Contacts)
- From BAS Setback Status
- Digital Input
- Inside of Fume Hood Cavity or Bio-Safety Cabinet Ductwork
- probe
- tubing

Specifications

LED INDICATORS

Type	Ultra bright clear lens
Green	Indicates normal condition
Red	Indicates alarm condition, flashes

AUDIBLE HORN

Sound Level	90 dB at 10cm
Operation	Horn sounds during alarm condition
Re-beep Mode	Provides reminder horn muted and alarm not cleared (single fast tone every 2 minutes)

ALARM CONTACTS

Type	SPDT relay
Specifications	1A @ 30 VDC, 0.5A @ 125 VAC (resistive load)
Operation	On alarm, N.O. contact closes and N.C. contact opens

DIGITAL INPUT

Type	Dry contact input
Operation	When digital input is grounded (via dry contact) audible alarm horn will silence ONLY, Re-beep mode active

PUSH BUTTON

Mute	Silences horn, Enables re-beep mode, Resets automatically after alarm condition is cleared

VELOCITY RANGE

30 – 2,000 FPM

ACCURACY

±5% of set point

INPUT POWER

Voltage	15VDC ±20% provided by Class II UL approved wall pluggable power supply

ENVIRONMENT

Temperature		
Storage	0° to 150° F (-18° to 65° C)
Operating	60° to 80° F (15° to 26° C)
Humidity		
Storage	10% to 90% non-condensing
Operating	20% to 90% non-condensing

VELOCITY SENSOR

Type	Micro-bridge mass flow sensor
Overpressure	25 PSI

REFERENCE PROBE

Internal	Integrated to display face, No external probe required

HOOD PROBE

Type	7/16" diameter, Feed through bushing, Press fit, 5' tubing
Material	Polyethylene
Tubing Type	.170" ID, 1/4" OD clear
Tubing Material	Ester based polyurethane

PHYSICAL CHARACTERISTICS

Size	2.76"W x 4.5"H x 1.25"D (70.1mm W x 114.3mm H x 31.75mm D)
Weight	Less than 5oz. (142 grams)
Materials	Enclosure front & back; White ABS plastic

Model Number T – ABVA

The T-ABVA Model includes the following items:

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

Your representative is:

APEX Ordering Guide

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Application Probe

FH1P = Fume Hood Application, Single Probe Kit
FH2P = Fume Hood Application, Double Probe Kit
BS1P = Biological Safety Cabinet Application, Duct Static Probe