QUICK REFERENCE GUIDE

TO THE

Vortex Control

Face Velocity Monitor

Model # VCTA

Lab Crafters, Inc.
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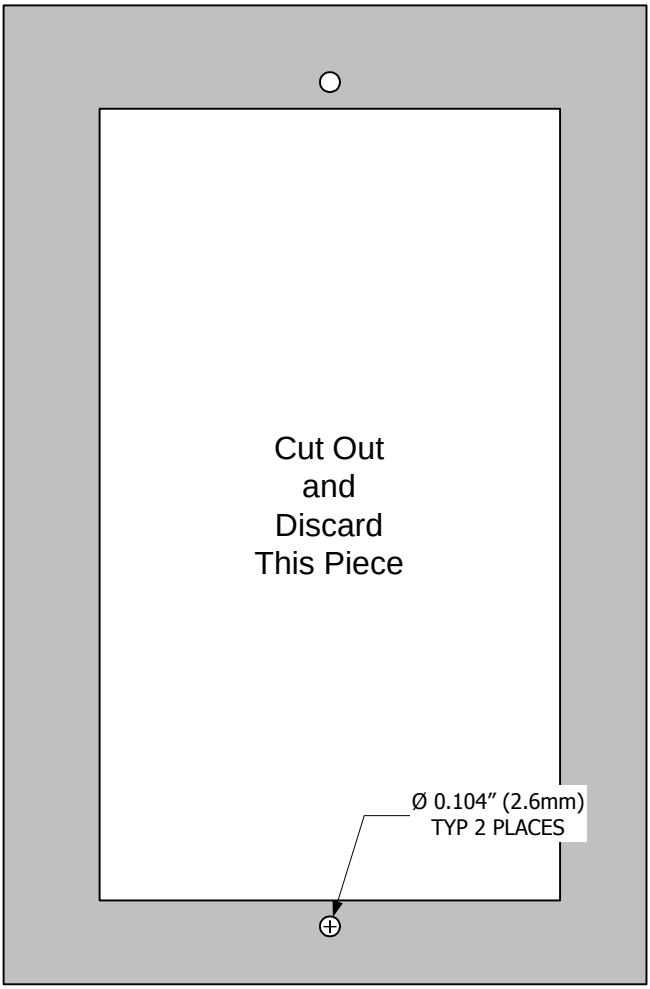
Mounting Hole Dimensions:



- Template should be utilized for proper locating cut-out.
- Shaded area represents the front bezel of monitor which is 3.35" (8.51cm) W x 5.1" (12.95cm) H x 0.5" (1.27cm) D. The cut-out dimensions are 2.4" (6.35cm) W x 4.125" (10.48cm) H.
- A minimum depth of 4" (10.2cm) is required behind cutout for rear of enclosure and tubing clearance.
- Secure monitor to fume hood using the two #6 x 1" sheet metal screws to provided.

Internal Hood Probe:

Refer to Appendix B for a diagram of approximate locations. The hood probe must be located on the same side as the face velocity monitor to keep tubing length to a minimum. Typical installation locations are approximately 4" to 10" (10.2cm to 25.4cm) back from the rear of the sash panel and approximately 2" to 8" (5.1cm to 20.3cm) above the highest vertical opening of the sash.

To Install: (refer to Appendix A) Drill a 7/16" diameter (11mm) hole in the side of the fume hood in a suitable location. Feed the supplied clear tubing through the drilled hole and carefully push it over the sensor port located on the rear of the monitor enclosure. Press the reference probe firmly to seat it properly into the side of the fume hood.

Refer to Appendix A & C for all input/output terminal blocks, wiring sizing, specifications, current and load ratings, etc.

Power:
Standard 24 VAC control voltage is utilized to power the monitor. An optional wall pluggable power supply (shipped with the unit if ordered) can also be utilized. When powering multiple units with a common transformer, polarity must be maintained to ensure proper operation.

Digital Inputs:
When required, connect a set of dry contacts between either digital input 1 (DIG.IN 1) and/or digital input 2 (DIG.IN 2) and ground (GND). Note: both the digital inputs share a common ground terminal.

Relay Output:
When required, connect the dry contacts from relay 2 (RELAY 2) to the device monitoring the alarm status of the monitor.

Analog Output Voltage:
Connect the analog output positive voltage terminal (AOUT) to the positive voltage input of the monitoring device. Connect the ground (GND) terminal to the negative voltage input of the monitoring device. Note: the digital inputs and the analog output share a common ground terminal.

NOTE: Area where monitor is located must be under stable temperature control, approximately 65ºF to 75 ºF (18 ºC to 24 ºC). A warning message will be displayed if temperature is outside of recommended range.

Enter Calibration Menu

1. Press MUTE and SCROLL simultaneously and release after password screen is displayed (approx. 5 sec.)
2. Enter correct password (default is 00000), press ACCEPT
3. Press CAL MENU

ONE POINT (VARIABLE AIR VOLUME):

1. Press ▼ two (2) times, then press ONE-POINT CALIBRATION
2. Open sash to stops or operating height, press screen
3. Perform face velocity verification, press screen
4. Enter face velocity verification reading, press ACCEPT
5. Stand back and wait for the monitor to complete calibration readings
6. Press CONTINUE TO CONFIG MENU or EXIT

TWO POINT (CONSTANT AIR VOLUME):

1. Press ▼ one (1) times, then press TWO-POINT CALIBRATION
2. Defeat the sash stops and open sash to the full/maximum open position, press screen
3. Perform face velocity verification, press screen
4. Enter face velocity verification reading, press ACCEPT
5. Stand back and wait for the monitor to complete calibration readings
6. Move sash to a desired minimum position, press screen
7. Perform face velocity verification, press screen
8. Enter face velocity verification reading, press ACCEPT
9. Stand back and wait for the monitor to complete calibration readings
10. Press CONTINUE TO CONFIG MENU or EXIT

THREE POINT (SPECIAL - NON LINEAR):

1. Press THREE-POINT CALIBRATION
2. Open sash to the full open position with the stops defeated, press screen
3. Perform face velocity verification, press screen
4. Enter face velocity verification reading, press ACCEPT
5. Stand back and wait for the monitor to complete calibration readings
6. Move sash to a desired mid-range position, press screen
7. Perform face velocity verification, press screen
8. Enter face velocity verification reading, press ACCEPT
9. Stand back and wait for the monitor to complete calibration readings
10. Move sash to a desired minimum position, press screen
11. Perform face velocity verification, press screen
12. Enter face velocity verification reading, press ACCEPT
13. Press CONTINUE TO CONFIG MENU or EXIT

NOTE: Calibration Adjustments can only be performed AFTER field calibration is performed. Calibration adjustments are not supported for 3 point calibrations, see CALIBRATION, section 3, for calibration steps.

Enter Calibration Adjustment Menu

1. Press MUTE and SCROLL simultaneously and release after password screen is displayed (approx. 5 sec.)
2. Enter password (default is 00000), press ACCEPT
3. Press CAL MENU
4. Press ▼ three (3) times, then press CALIBRATION ADJUSTMENT

ONE POINT ADJUSTMENT:

1. Enter desired adjustment value, press ACCEPT
2. Verify displayed face velocity reading is correct, press ACCEPT if correct or press RETRY to enter a different adjustment value

TWO POINT ADJUSTMENT:

1. Press desired calibration point to adjust
2. Enter desired adjustment value, press ACCEPT
3. Verify displayed face velocity reading is correct, press ACCEPT if correct or press RETRY to enter a different adjustment value
4. When adjustments are complete, press EXIT

Enter Configuration Menu

1. Press MUTE and SCROLL simultaneously and release after password screen is displayed (approx. 5 sec.)
2. Enter password (default is 00000), press ACCEPT
3. Press CONFIG MENU

LOW ALARM SETTINGS:

1. Press ▼ or ▲ until ALARMS is displayed, press ALARMS
2. Press LOW ALARM
3. Select the alarm point for low face velocity, press ACCEPT
4. Select the delay time required prior to alarming, press ACCEPT
5. Select appropriate range for the monitor to display a caution message prior to going into alarm, note: zero(0) turns off caution band, press ACCEPT
6. If done, press EXIT
7. Select EXIT to return to normal display mode

HIGH ALARM SETTINGS:

1. Press ▼ or ▲ until ALARMS is displayed, press ALARMS
2. Press HIGH ALARM
3. Select the alarm point for high face velocity, press ACCEPT
4. Select the delay time required prior to alarming, press ACCEPT
5. Select appropriate range for the monitor to display a caution message prior to going into alarm, note: zero(0) turns off caution band, press ACCEPT
6. If done, press EXIT
7. Select EXIT to return to normal display mode

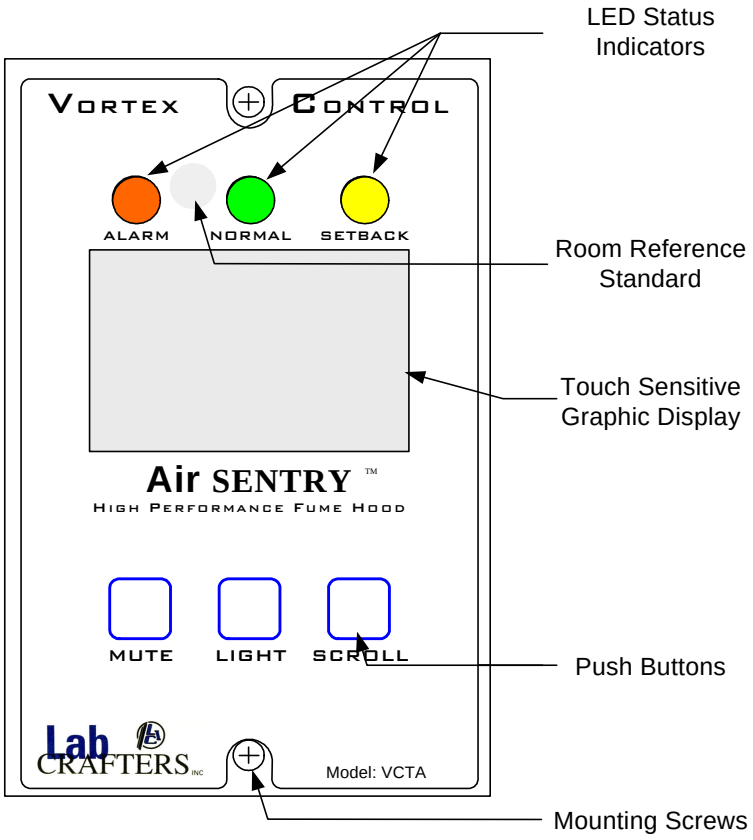
DIGITAL INPUT SETTINGS:

1. Press ▼ or ▲ until DIGITAL INPUTS is displayed, press DIGITAL INPUTS
2. Select either DIGITAL INPUT 1 or DIGITAL INPUT 2
3. Select the proper function of the desired digital input, or press DISABLE D.I. to ignore the digital input completely
    a. If the digital input is configured as an EXTERNAL ALARM INPUT,
        i. Select the desired input contact positions.
        ii. Select the desired message to display on the monitor during an alarm condition on the input.
        iii. Select the desired time delay prior to displaying the alarm condition on the input.
    b. If the digital input is configured as an UNOCCUPIED INPUT,
        i. Select the desired input contact positions.
        ii. As previously described in the low/high alarm settings, select unoccupied low alarm or high alarm set points to configure. Select the desired alarm delay time and caution band for unoccupied mode.
        iii. Press EXIT
4. If done, press EXIT
5. Select EXIT to return to normal display mode

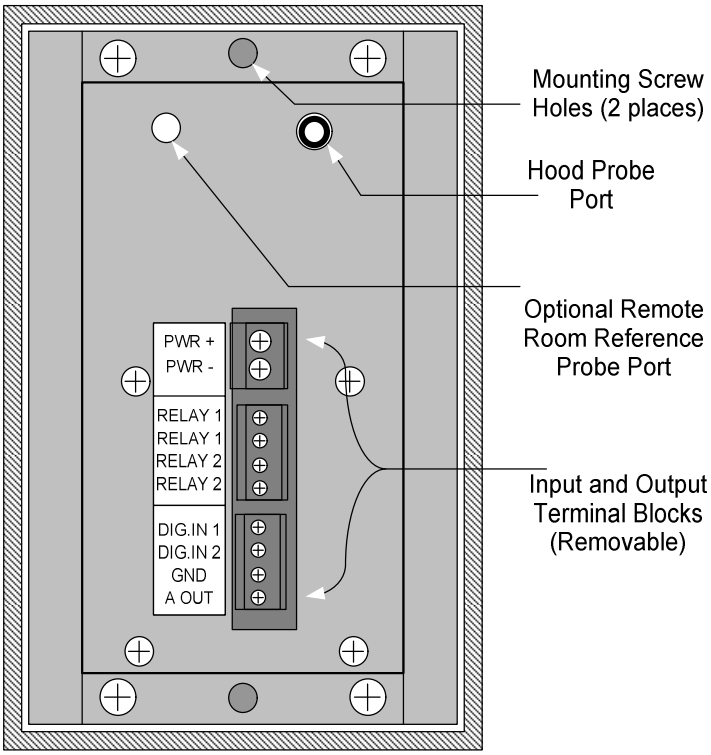
RELAY OUTPUT SETTINGS:

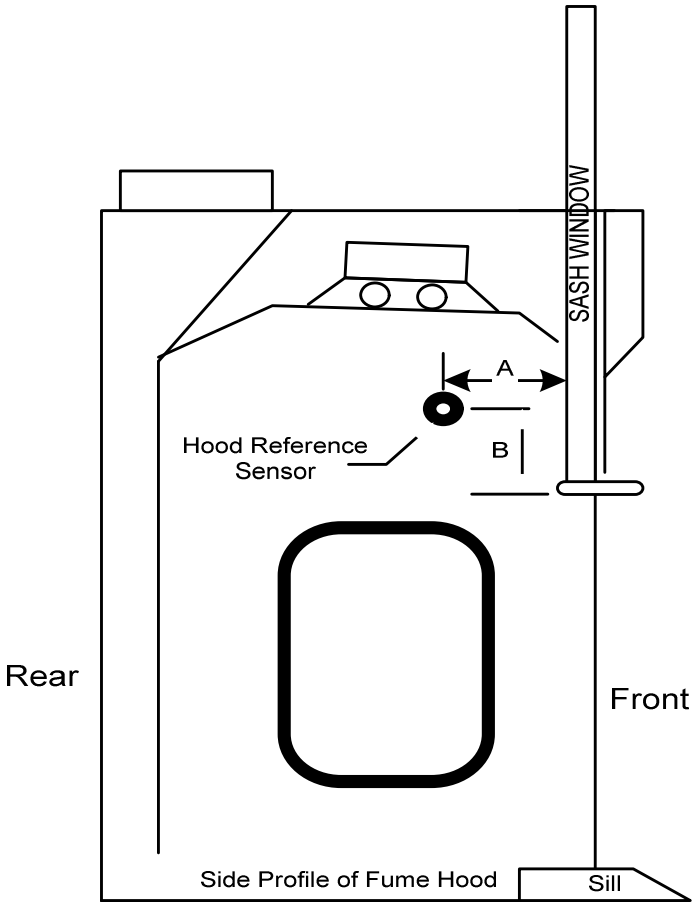
1. Press ▼ or ▲ until RELAY OUTPUT is displayed, press RELAY OUTPUT
2. Select either or DISABLE
3. Select the ALARM function for the relay output, or press DISABLE to ignore the relay output completely
4. If the relay output is configured as an ALARM OUTPUT, select the desired output contact positions.

****** END OF INSTRUCTIONS ******



Monitor Front


Mounting Screw Holes (2 places)
Hood Probe Port
Optional Remote Room Reference Probe Port
Input and Output Terminal Blocks (Removable)
PWR +
PWR -
RELAY 1
RELAY 1
RELAY 2
RELAY 2
DIG.IN 1
DIG.IN 2
GND
A OUT



A dim. = approximately 4" - 10" (10.2 cm - 25.4 cm)
B dim. = approximately 2" - 8" (5.1 cm - 20.3 cm)

Note: Sash is in the full open position

ENVIRONMENTAL

Calibrated Temp. Range: 60º to 80º F (15.6º to 26.7ºC)
Operating Temp. Range: 40º to 120º F (4.4º to 48.9ºC)
Storage Temp. Range: 0º to 150º F (-17.8º to 65.6ºC)
Humidity Range: 20% to 80% RH, non condensing (LCD Display Limits)

DIMENSIONS

Face Plate: 5.1"(H) x 3.35" (W) x 0.5" (D) (13cm x 8.5cm x 1.3cm)
Rear Enclosure: 4"(H) x 2.2"(W) x 2.25"(D) (10.2 cm x 5.6cm x 5.8cm)

WEIGHT

15oz. (425g)

MOUNTING

4.25" (H) x 2.5" (W) (10.8cm x 6.4cm) cutout required.
Mounting Screws: stainless steel sheet metal #6 x 1" flat head
0.437" Diameter (11mm) hole required for hood reference probe

TERMINAL BLOCKS - WIRE SIZE

Power: removable block - 12 to 24 AWG stranded wire
Relay outputs: removable block - 16 to 28 AWG stranded wire
Digital in, Analog out: removable block - 16 to 28 AWG stranded wire

SENSOR TYPE

Factory calibrated mass air flow sensor

ACCURACY

Over the calibrated temp range: +/- 10 FPM (0.051MPS)

DIGITAL INPUTS

Referenced to digital common, accepts closed contact (1000 ohm max)

ANALOG OUTPUT

0-10Vdc output adjustable in 0.1Vdc increments proportional to 0-1000FPM (5.08MPS) adjustable in 1FPM (.005MPS) increments displayed

RELAY OUTPUTS

Two independent SPST relays,
Relay 1 fails to N.O., 5A @250VAC or 30VDC (used for internal hood light)
Relay 2 fails to N.C., 0.5A @120VAC, 1A @30VDC

BACKLIGHT

Dual layer fiber optic, utilizing a single ultra bright green LED

INPUT POWER

24VAC, 50/60Hz, +/- 20%, 8VA or 15VDC, +/-20% @ 250mA

HOOD REFERENCE TUBING

¼"(6.4mm) I.D. clear Ester based polyurethane tubing, 185ºF (85ºC) Max

LCD TOUCH SCREEN

LCD type: 128 x 64 characters, FSTN, Positive, Transflective,

INDICATOR L.E.D.S

0.315" (8mm), Wide viewing angle, diffused lens

ALARM HORN

Sound output at 4" (10cm): min 85dB, typ 90dB @ 2,300Hz, +/-300 Hz