

# AirGard® 200 Fume Hood Monitor

Owner's Manual



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## LIMITATION OF WARRANTY AND LIABILITY

Seller warrants that this product, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for a period of twenty four (24) months, or the length of time specified in operator's manual, from the date of shipment to the customer. This limited warranty is subject to the following exclusions:

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- b. With respect to any repair services rendered, Seller warrants that the parts repaired or replaced will be free from defects in workmanship and material, under normal use, for a period of 90 days from the date of shipment to the customer.
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- d. Unless specifically authorized in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, any goods which are incorporated into other products or equipment by the Buyer. All goods returned under warranty shall be at the Buyer's risk of loss, Seller's factory prepaid, and will be returned at Seller's risk of loss, Buyer's factory prepaid.

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### Service Policy

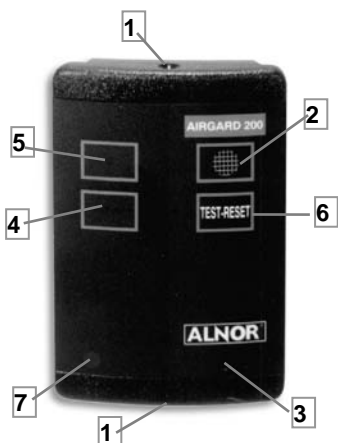
Knowing that inoperative or defective instruments are as detrimental to Alnor as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call TSI's Customer Service department at (800) 874-2811 (USA) and (1) 651-490-2811 (International).

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**Figure 1:**  
Front view of instrument

## General Description

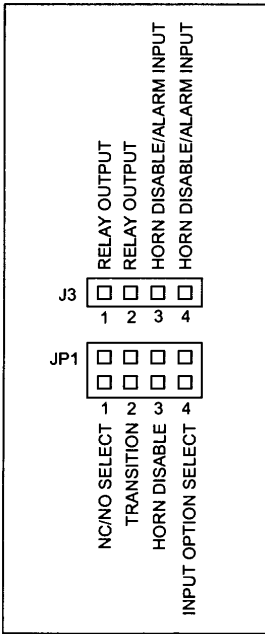
The AirGard® 200 monitor is designed to continuously monitor air flow through fume hoods. This permanently installed device provides both visual and audible alarms to alert the user of abnormal air flow conditions after the instrument is calibrated for the particular installation. A green indicator on the front of the monitor indicates normal flow conditions. When flow conditions lower than the setpoint are encountered, a red indicator is activated along with an audible horn. A test button is provided at the front of the monitor to allow

the user to check the operation of the alarm. See Table 1 for a description of each key function located on the front of the monitor.

**Note:** For proper operation of the instrument, you must install and calibrate the AirGard® 200 monitor. The entire manual should be read first before proceeding with the actual installation and calibration of the instrument.

1. MOUNTING SCREWS	Two screws secure the monitor to the back plate which is then secured to the fume hood.
2. AIR INLET	A portion of the air coming into the hood passes through the air inlet and across the flow sensors.
3. SETPOINT ADJUST	This potentiometer is used to set low flow alarm setpoint.
4. NORMAL FLOW INDICATOR	This green indicator is illuminated when air flow is greater than the setpoint.
5. ALARM INDICATOR	This red indicator is illuminated approximately six seconds after air flow is less than the setpoint.
6. TEST/RESET BUTTON	If no alarm condition is present this button will cause the red indicator to be illuminated and will also cause the horn to sound. If an alarm is present, this button will silence the alarm.
7. POWER ON INDICATOR	This light stays on to indicate power is on.

**Table 1: Description of Features on Front of Monitor**



**Figure 2:  
Configuration/set-up  
options**

## Setup

The AirGard® 200 fume hood monitor contains several configuration options. Two connectors provide access to remote control devices and firmware configuration jumpers. Observe the back of the monitor. Locate the two connectors at the left-center of the printed circuit board marked J3 and JP1. J3 is a polarized header for connection to a remote horn disable switch and a set of single-pole single-throw (SPST) relay contacts. JP1 is a four-pole double-row header in which shorting jumpers may be inserted to configure firmware options. Figure 2 illustrates these connectors.

Poles 1 and 2 of J3 are the relay contacts. Refer to specification section to determine the relay contact ratings before making connections to the relay. The relay contacts may be used to trigger a remote alarm device. The default configuration of the contacts are Normally Closed (NC)

during normal air flow and Normally Open (NO) during low-flow alarm conditions.

Poles 3 and 4 of J3 may be connected to a remote single-pole single-throw (SPST) switch to silence the horn. Closing the switch will silence the horn only during an alarm condition. Opening the switch restores the horn during an alarm condition. It is recommended that this feature be used to disable the horn for night-time operation or fume hood exhaust motor shut-down periods.

Refer to the Step-by-Step Operation section for the Horn Disable from keypad feature.

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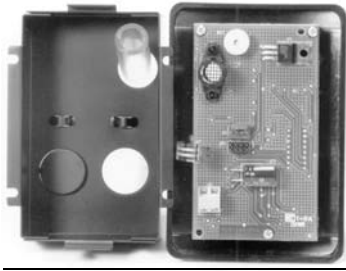
Pole 1 of JP1 is used to select the relay configuration. Without the jumper installed, the relay is Normally Closed (NC) during normal air flow and Normally Open (NO) during an alarm condition. Installing a shorting jumper across pole 1 will cause the relay to be Normally Open (NO) during normal air flow and Normally Closed (NC) during an alarm condition. Install this jumper only when the monitor is powered down. Insertion or removal of this jumper while the monitor is powered up will not have any effect on the relay configuration.

Pole 2 of JP1 is used to select the alarm-to-normal transition delay option. Without the jumper installed, the transition period from alarm to normal occurs in less than one second. Installing a shorting jumper across pole 2 enables a nominal five-second delay before the alarm clears. Install this jumper only when the monitor is powered down. Insertion or removal of this jumper while the monitor is powered up will not have any effect on the delay configuration.

Pole 3 of JP1 is used to permanently silence the horn. Note that this pole is a parallel connection to poles 3 and 4 of J3. Inserting the shorting jumper will silence the horn during an alarm condition. It is recommended that this feature be used to permanently disable the horn if the relay contacts are to be used to trigger an alternate horn.

Pole 4 of JP1 is used to select either a horn disable or an alarm input configuration. Inserting a shorting jumper activates the alarm input option. The switch should have normally open contacts and be connected to poles 3 and 4 of J3. Switch closure will activate the fume hood monitor alarm.

**Note:** *By selecting this option, the horn disable configuration described previously is not possible. A shorting jumper cannot be inserted across both poles 3 and 4 of JP1 or a continuous alarm will occur.*



**Figure 3:**  
**Front view of fascia**

## Installation

### General

Installation of the AirGard® 200 monitor generally requires the fume hood to have a cut out section as shown in Figure 3.

To monitor face velocity, the air outlet port at the back of the AirGard® 200 monitor is connected to the sidewall inside the fume hood as shown in Figure 4. A flexible hose is used to attach the air outlet port to the interior of the hood using a sidewall adapter.



### WARNING

When using tools, always wear proper eye protection. Also, all necessary precautions must be observed when installing or making repairs in the vicinity of electrical equipment.

### Tools Required

1. Electric drill
2. Electric saw or tool for cutting sheet metal
3. Drill bit size 2.5 mm (.104")
4. Phillips head screw driver
5. Flat head screw drivers with 3 mm and 6 mm blade widths
6. Tape measure
7. Eye protection

**Note:** *If the monitor is to be installed in a hood with Hardiboard™ fiber-cement side panels or similar material, use special drill bits designed for glass and other hard, abrasive materials.*

### Procedure

**Step 1:** Use the template enclosed with the AirGard® 200 monitor to cut out an area on the fascia of the hood. The template shows the proper mounting dimensions.



## WARNING

Older hoods may contain asbestos. Always take special precautions when dealing with this material.



**Figure 4:**  
Back view of fascia

**Step 2:** Drill 4 mounting holes in the fascia, 2.5 mm diameter as shown on the template.

**Step 3:** Snap in the snap bushing supplied onto the hole used for the power connection in the back enclosure and mount in the cut out on the fascia with 4 screws supplied. See Figure 3.

**Step 4:** Drill a 13 mm hole in the sidewall of the fume hood approximately 15 cm behind the sash and even with its bottom when fully open. See Figure 4.

**Step 5:** Insert the plastic sidewall adapter (supplied) from the inside of the hood and lock with plastic lock ring (supplied). See Figure 4.

**Step 6:** Slip one end of the air hose on the end of the plastic sidewall tube adapter and insert the other end through the back enclosure.

**Step 7:** Plug the power adapter into the voltage mains. Insert the other end of the power adapter through the snap bushing hole in the back of the enclosure.

**Step 8:** Connect the power cable to the terminal block. When connecting to DC current, the J1-1 terminal is positive (+) and the J1-2 terminal is negative (-).

**Step 9:** Connect the loose end of the air flow hose (sticking out of the back enclosure) to the air outlet port on the back of the front panel assembly.

**Step 10:** Feed the air flow hose and the power wire back through their holes until the front panel assembly mounts on the back enclosure. Install the two mounting screws (supplied).

This completes the first part of the installation of the AirGard<sup>®</sup> 200 monitor. An installation involving surface face mounting is described in the following Simplified Installation section.



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## Simplified Installation

### General Installation

The simplified installation eliminates the need to cut a hole for the back enclosure. Refer to the Installation section for proper tools. A 19 mm (3/4 in.) drill will also be required to create an opening for the air output port and the power cord.

### Procedure

**Step 1:** Drill two mounting holes in the back of the back enclosure and in two matching places on the fascia of the fume hood; then mount the back enclosure with 2 of the 4 screws provided.

**Step 2:** Use the back enclosure as a guide to drill two 19 mm (3/4 in.) holes for the air output port and the power cord. Continue with step 3 in the Installation section.

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## Calibration

Field calibration must be performed since each hood installation is unique.



### WARNING

Calibration of this instrument should only be performed by qualified personnel. Proper guidelines for monitoring any ventilation apparatus are established on the basis of toxicity or hazards of the materials used, or the operation conducted within the ventilation apparatus. Personnel calibrating the AirGard<sup>®</sup> 200 monitor must be completely aware of the regulations and guidelines specific to their application.

## Equipment

1. Calibrated thermoanemometer (TSI Model 9535, Alnor AVM430, or equivalent).
2. Small screwdriver with a 1/8" wide flat tip.

## Procedure

**Step 1:** Double check installation to ascertain that the AirGard<sup>®</sup> 200 monitor, power supply and any ancillary parts are properly installed.

**Step 2:** Allow 20 minutes for the monitor to warm up.

**Step 3:** Determine the low flow setpoint. This is the value of where the monitor will first indicate a low flow condition. The red indicator will be illuminated for this value. Refer to facility's Industrial Hygiene Officer for the proper setpoint. For this example, assume the indicator is to be illuminated when the flow is 70 fpm.

**Step 4:** Adjust fume hood air flow to the low flow setpoint (as described in Step 3). One method to lower the face velocity of the hood is to close the volume damper (if available) in the ductwork.

**WARNING**

This method is only used as a temporary condition to set the low flow point. Make sure air flow is restored to proper level after calibration.

**Step 5:** Using a properly calibrated thermoanemometer, determine the velocity through the face of the hood by taking a detailed velocity traverse. Divide the face area of the hood into equal partitions. One reading per square foot of face area is recommended for an accurate traverse. Compute the average velocity for this area. For this example, assume that the traverse resulted in an average velocity of 70 fpm.

**Step 6:** If the red indicator is illuminated, slowly turn the adjustment screw counterclockwise until the green indicator illuminates. If the green indicator is illuminated, slowly turn the adjustment screw clockwise until the red indicator illuminates; now slowly turn the adjustment screw counterclockwise until the green indicator illuminates. It is important that these adjustments be done in small increments, at intervals of about ten seconds each, to allow for the delayed reaction of the alarm.

**Step 7:** Restore fume hood air flow to a normal level.

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## Step-By-Step Operation

### Alarm Acknowledgment

The horn and red indicator will turn on approximately six seconds after an alarm condition is detected. To mute the horn, press and release the TEST/RESET button. Note that after an alarm condition has been detected, the red indicator will stay on. The horn will remain muted until air flow is restored to normal levels.

### Alarm Test

When no alarm condition is present, the alarm can be tested by pressing the TEST/RESET button. While the button is pressed, the indicator and horn will be activated.

### Horn Disable (from keypad)

Under any operating condition, the horn may be disabled by pressing the keypad for more than 5 seconds. The monitor will continue to drive the appropriate LEDs at a flash rate of 2 pulses per second. The horn will stay in the disabled mode until either of the following two conditions occur:

- a single, momentary press of the keypad
- power to the monitor goes off and then back on.

The relay output will still be active with its contacts closed or open depending on the current flow conditions.

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## APPENDIX A: Maintenance & Troubleshooting

### Maintenance

The outside of the AirGard<sup>®</sup> 200 monitor may be wiped clean with mild soap (dish washing detergent) and water on a damp cloth to remove finger marks, oils or residue. Do **not** use abrasives or solvents. Do **not** immerse the monitor or allow liquids to enter the case. Dry the monitor thoroughly after cleaning.

### Troubleshooting

Symptom	Check
NO INDICATORS	Power supply not plugged into AC supply. Plug in power supply. Power supply cable not properly terminated into terminal block.
NO AUDIBLE ALARM	Horn has been silenced using the TEST/RESET button. Alarm condition must clear before horn may be re-activated. J3 poles 3 and 4 may be closed. Pole 3 of JP1 may have shorting jumper unintentionally installed. If permanent horn silence is not desired, disconnect power, remove pole 3 shorting jumper and reconnect power.
WRONG ALARM SETPOINT	Potentiometer was not properly adjusted. Repeat calibration steps outlined in Calibration section.
CONTINUOUS ALARM	Blower speed has changed. Adjust if required. Check calibration using traverse technique. Recalibrate monitor as instructed in Calibration section of manual if required. Shunts are in both positions 3 and 4 of JP1. See Setup section.
HORN SILENCE WILL NOT STAY ON	An alarm condition must be continuously present before the horn can be silenced. If flow conditions fluctuate near the alarm setpoint, the alarm will automatically reset itself. Action should be taken to bring fume hood air flow to proper condition, or recalibrate the alarm setpoint.

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## **Service Policy**

Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to all service requests. If any malfunction is discovered, please contact your nearest sales office or representative, or call TSI's Customer Service department at (800) 874-2811 (U.S. and Canada only).

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## AIRGARD® 200 MONITOR SPECIFICATIONS

### Instrument Dimensions

Front	3.25" x 4.75" x 0.5" (8.25 cm x 12 cm x 1.3 cm)
Cut-out	2.58" x 4.5" (6.5 cm x 11.5 cm)
Enclosure Depth	1.34" (3.4 cm)

**Instrument Weight** 5 oz (142 grams)

**Shipping Weight** 1 lb 6 oz (625 grams)

**Green Indicator** 0.75" x 0.5" (1.9 x 1.3 cm)

**Red Indicator** 0.75" x 0.5" (1.9 x 1.3 cm)

**Audible Horn** 85 dB @ 4" (10 cm)

**Alarm Setpoint** Set point 80 fpm recommended

**Operating Temperature** 55°F to 86°F (13°C to 30°C), 5% to 95% RH, non-condensing

**Storage Temperature** -40°F to 150°F (-40°C to 65°C), 5% to 95% RH, non-condensing

**Nominal Input Voltage** 12.0 ± 1.0VDC or 9.0 ± 0.5VAC

**Nominal Input Current** 0.12ADC @ 12VDC input

**Transformer Specification** 120VAC ± 10%. 60 Hz input  
9VAC nominal output. 0.50A max.

**Relay Contacts** 1.2A @ 200VDC max.

### Monitor with 24V Input Module (Factory Installed)

Nominal Input Voltage	22.0 ± 4.0VDC or 24.0 ± 6.0VAC
Nominal Input Current	0.12ADC @ 22.0VDC input



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