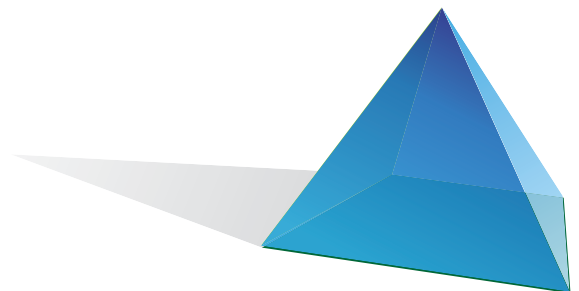






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**GENERAL**

**Specifications**



**Electrical**

Pressure Range .....	±0.2500 "WC
Accuracy of Measurement .....	±0.5 FS
*NIST Traceable / Individual certification available as option	
Power Supply .....	Class 2, 24Vdc ±10% wall adapter provided
Recommended Cable Type .....	Belden 1325A

**Touch Screen User Interface**

LCD Size .....	3.2" diagonal
LCD Type .....	Transmissive
Resolution .....	240 x 320 portrait
Viewing Area .....	50.60 mm x 66.80 mm
Color Depth .....	18-bit or 262K colors
Backlight Color .....	White
Luminous Intensity .....	min 2500 cd/m2
<b>Mechanical</b>	
FMS1650-LITE Surface-mount Enclosure .....	3"W x 5"H x 0.75"D
FMS1650-LITE Flush-mount Enclosure .....	5.6"W x 8.5"H x 0.75"D
External Remote Sensor Housing .....	2"W x 3"H x 2.7"D
Stainless Steel Cover Plate for Flow Tube .....	2.7"W x 4.5"H x 0.2"D
Stainless Steel Cover Plate for Remote Sensor .....	2.7"W x 4.5"H x 0.2"D

### Specifications

FMS1650-LITE w/ Flow Tube Cover Plate .....	approx. 3.5 lb
FMS1650-LITE w/ Optional External Remote Sensor .....	approx. 4.0 lb
FMS1650-LITE Mounting Options .....	Surface, Flush
Flow Tube Cover Plate Mounting .....	Flush
Remote Pressure Sensor Mounting .....	Flush

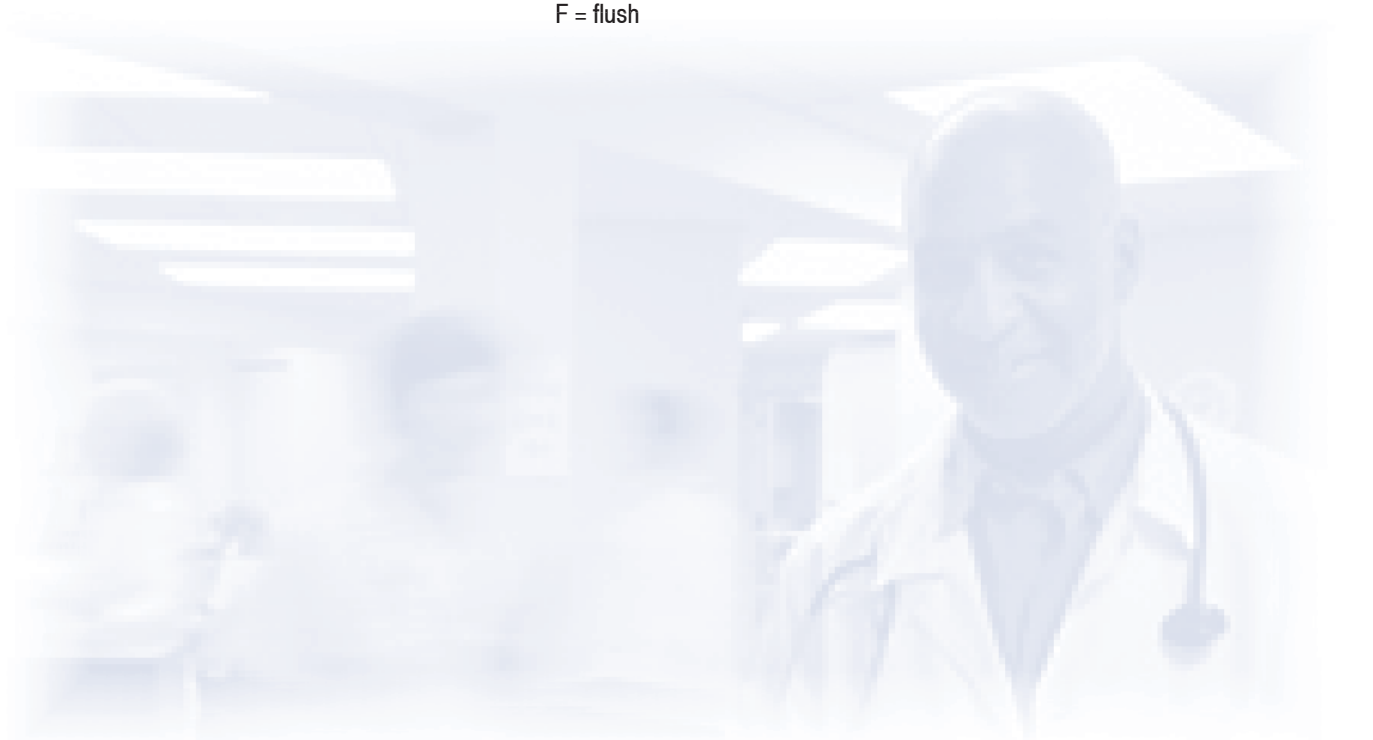
### Environmental

Operating Temperature .....	32° to 125° F Operating
Operating Humidity .....	10% - 95% RH, Non-condensing

### Part Number Guide

FMS1650 – LITE –

Case Style  
S = surface  
F = flush



## GENERAL

### Overview

The TRIATEK FMS1650-LITE Series Isolation Monitor is an ultra-sensitive instrument used to monitor differential pressure in hospital rooms, isolation rooms, surgical suites, laboratories, and clean rooms. This unit is a precision measuring system capable of measuring and displaying differential air pressures as low as 0.0001 "WC (0.0249 Pa).

Key features of the FMS1650-LITE include:

- Full-color touch screen display with programmable display options and adjustable backlight
- Intuitive user interface simplifies setup and configuration of unit
- Display background changes color to indicate room status at a glance
- Custom wallpaper background may be installed at the factory
- Audible and visual alarm annunciation
- Multi-level password protection of touch screen user interface
- Zero Calibration feature allows in-field recalibration of zero pressure reading

The FMS1650-LITE is equipped with a 3.2" diagonal Full-color Touch Screen display in portrait orientation (240 pixels by 320 pixels). The password-protected menu tree is very intuitive and simplifies the setup and configuration of the unit. The menus incorporate touch-based interfaces such as sliders, radio buttons, and dialog pop-ups to facilitate the ease-of-use of the FMS1650-LITE.

The display implements bright background color changes to indicate the three different Room Status indications of the monitored room. These background colors indicate "**Normal**" when pressure is within defined limits, "**Warning**" when pressure is nearing an out-of-limits condition, and "**Alarm**" when pressure is outside defined acceptable limits. The pressure ranges for these conditions are easily set by the user for the specific installation when necessary. The background color changes provide an overview of the monitored room differential pressure conditions at a glance.

Alarm conditions may be defined by the user, in terms of desired differential pressure settings for the room being monitored. When an alarm condition occurs, it may be annunciated in four user-definable ways:

1. On the display
2. With an audible alarm
3. Transmitted via contacts to a remote monitoring station
4. Over the BMS network

The alarm will automatically reset when the unit has sensed that the room differential pressure has returned to proper limits. The attendant may easily mute the audible alarm by touching the **OK** button on the alarm notification message popup window of the touch screen display.

The FMS1650-LITE provides a single **Digital Input** that may be used for monitoring a door switch. The configuration and operation of the door switch input may be configured by the user to define the effect of a change in its state. This door input may have a programmable delay duration associated with it, be configured for either *normally-closed*

or *normally-open* operation, and may also be configured to be *active-high* or *active-low* triggered.

The user may set up multiple multi-level **Passwords** to prevent unauthorized or casual access to the FMS1650-LITE configuration settings. Up to ten passwords of up to eight digits may be programmed, with each having one of four associated access levels. Administrators and Facility Management personnel may have unrestricted access, while general staff may be assigned restricted access passwords which limit the functionality of the user menus.

Room pressure selection of **Positive**, **Negative**, or **Neutral Isolation** may be protected using limited access passwords, thereby eliminating the need for keylock switches and keys. In some locales, it is prohibitive to allow an isolation room controller to switch between positive and negative modes of isolation. To accommodate this situation, the FMS1650-LITE may be configured at the factory for either *Positive-and Neutral-isolation* modes only or *Negative-and Neutral-isolation* modes only.

The FMS1650-LITE isolation monitor is powered by a supplied wall adapter power supply. This power supply also provides power to the differential pressure sensor module. A 10-foot length of 4-conductor cable is supplied with the FMS1650-LITE to interface the remote sensor module with the touch screen display module. If the distance between the remote sensor module and the display module exceeds 10 feet, then this cable may be substituted with the required length of 4-conductor, dual twisted pair, shielded cable (Belden part no. 1325A).

Installation

The FMS1650-LITE model includes a remotely mounted sensor for measuring the differential pressure of the monitored room or space. This remote sensor module must be installed in the wall between the monitored isolation room and the adjoining corridor or anteroom. Port P1 must be oriented towards the isolation room and Port P2 towards the corridor or anteroom. Please see the illustration on pages 5 - 6 for more details.

An included 4-conductor, dual twisted pair, shielded cable serves as the interface cable, and connects the touch screen display module to the remotely mounted differential pressure sensor. An electrical receptacle must be available for the wall adapter that powers the FMS1650-LITE. The loose end of the cable from the wall adapter power supply must be routed down through the wall to the location of the remote sensor module. Leave the wall adapter power supply unplugged during the installation procedure.

**Remote Sensor Mounting Procedure**

1. Cut an opening in the wall of the isolation room to receive the supplied single-gang "old work" low voltage mounting bracket (Figure 1) for the remote sensor module. Nominal dimensions for the cutout are 3.65" H x 2.15" W.
2. Drill a 7/16" hole through the opposite wall for the flow tube.
3. Install the single-gang low voltage mounting bracket in the cutout.
4. Route a length of supplied flow tube through the mounting bracket and through the 7/16" hole in the opposite wall.

5. Pull the loose end of the wall adapter power supply cable through the cutout in the drywall, and attach it to the input power terminals. The positive lead (striped) must be connected to the +V terminal on the pluggable connector of the remote sensor module. Similarly, the negative lead (solid) must be connected to the GND terminal.
6. Confirm that the 4-conductor interface cable between the remote sensor module and the touch screen display module has its red and black conductors securely attached to the +V and GND terminals, respectively. Route the end of this interface cable with the 4-pin connector down the wall to the anticipated location of the touch screen display module.
7. If a door switch is available to monitor the door to the monitored room or space, connect one lead of the switch to the GND terminal and the other lead to the DOOR SWITCH terminal.
8. Attach the pluggable connector to the mating header on the remote sensor module.
9. Attach the end of the flow tube to the open sensor port, and then secure the remote sensor module to the mounting bracket with two supplied 6-32 x 3/4" screws.
10. Install the louvered cover plate onto the installed sensor module using two supplied machine screws.
11. On the opposite side of the wall (corridor

side), attach the end of the flow tube to the barbed fitting of the flow tube mounting plate.

12. Press the mounting plate into place, allowing the excess tube length to go into the wall space. Secure the mounting plate with the supplied screws and wall anchors.
13. Install a louvered cover plate onto the mounting plate using two supplied machine screws.

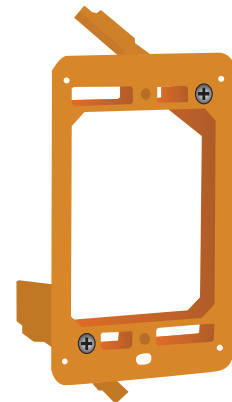


Fig 1. Single-gang, low-voltage mounting bracket.

**Display Mounting Procedure (surface mount)**

1. Cut an opening in the wall adjacent to the door of the isolation room for installing the supplied single-gang "old work" low voltage mounting bracket (Figure 1) for the touch screen display module. Nominal dimensions for the cutout are 3.65" H x 2.15" W.
2. Install the single-gang low voltage mounting bracket in the cutout.

**MOUNTING/WIRING**

**FMS-1650-LITE Basic Programming**

3. Pull the loose end of the interface cable from the remote sensor module through the cutout in the drywall, and then through the hole in the center of the display enclosure backplate (see Figure 2).
4. Attach the backplate to the mounting bracket with two supplied 6-32 x 3/4" screws, carefully aligning it using the two mounting slots on the backplate before tightening.
5. Connect the loose end of the interface cable to the 4-pin header at the top of the display module circuit board (see Figure 3).
6. Attach the display enclosure to the backplate by inserting the tabs at the top of the display into corresponding slots at the top of the backplate. Secure the display enclosure to the backplate by turning the slotted setscrew at the bottom of the enclosure counterclockwise until it is flush.
7. This concludes the installation of the surface mount model of the FMS1650-LITE. Apply power to the monitoring system by inserting the wall adapter power supply into the electrical receptacle.
8. Proceed to the next section for details on programming the FMS1650-LITE to begin monitoring differential pressure.

**Display Mounting Procedure (flush mount)**

1. Using the interior outline of the flush mounting bracket as a template, trace the cutout pattern on the wall where the display is to be mounted.
2. Cut and remove the outlined pattern from the wall at the location for the flush mount touch screen display module, and install the flush mount bracket.
3. Pull the loose end of the interface cable from the remote sensor module through the cutout in the drywall.
4. Connect the interface cable to the 4-pin header at the top of the display module circuit board.
5. Attach the flush mount faceplate to the mounting backplate using the two supplied screws.
6. This concludes the installation of the flush mount model of the FMS1650-LITE. Apply power to the monitoring system by inserting the wall adapter power supply into the electrical receptacle.
7. Proceed to the next section for details on programming the FMS1650-LITE to begin monitoring differential pressure.



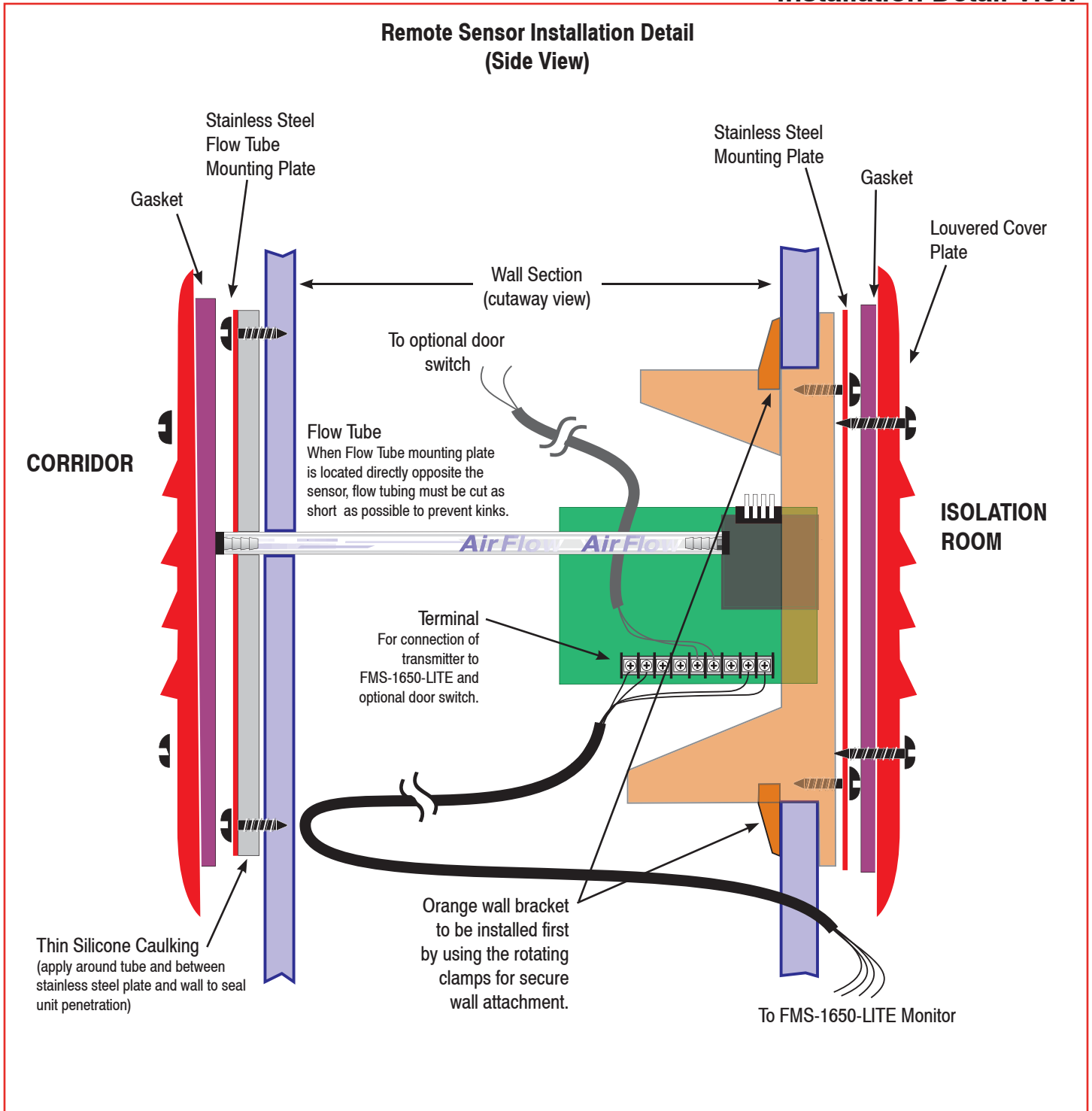
Fig 2. Route interface cable through center hold at display enclosure backplate.



Fig 3. Interface connected to 4-pin header at top of display module.

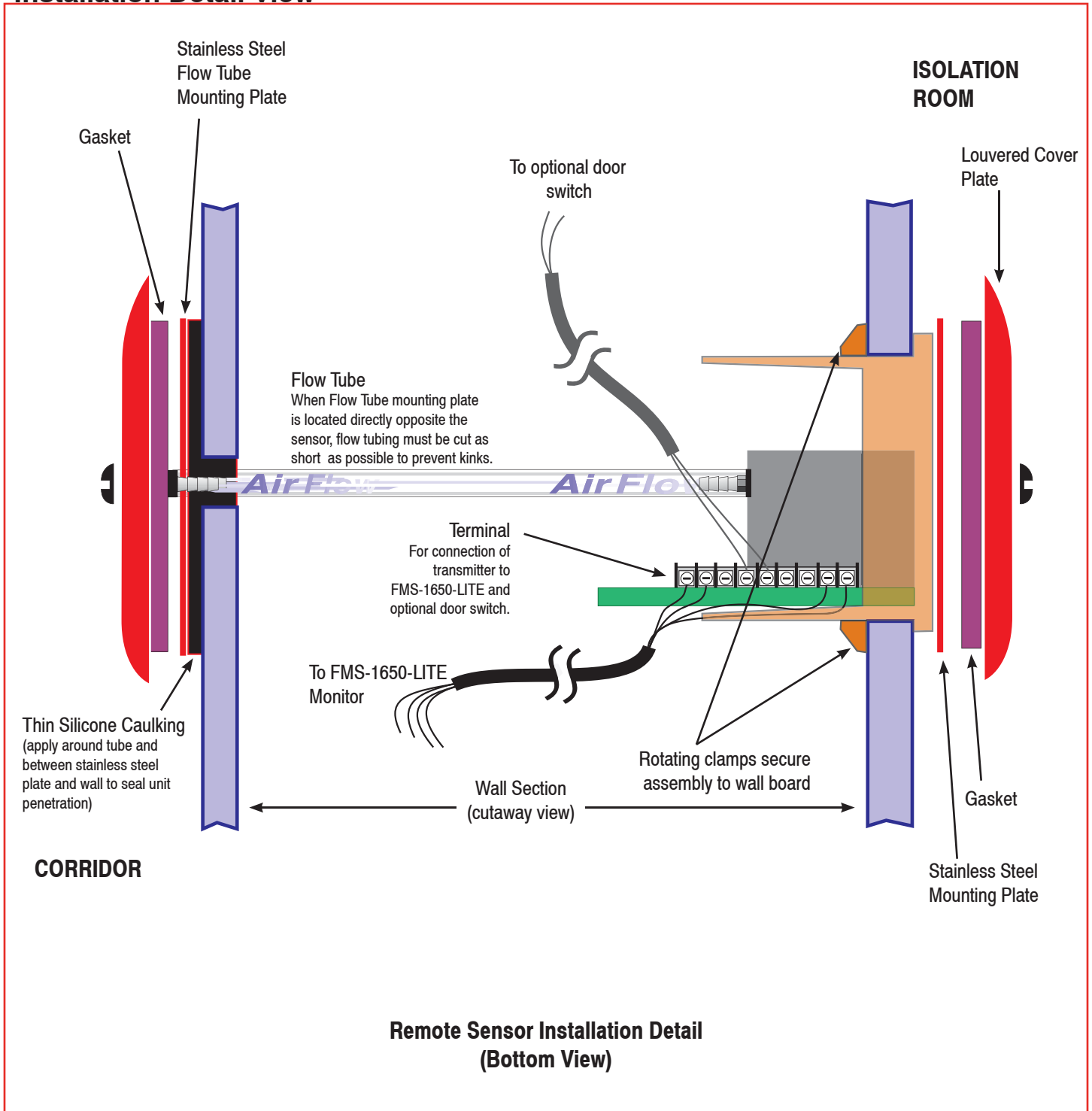
Installation Detail View

Remote Sensor Installation Detail  
(Side View)



**MOUNTING/WIRING**

**Installation Detail View**



## FMS-1650-LITE Basic Programming

### FMS1650-LITE Basic Programming

After the FMS1650-LITE unit has been properly installed, apply power to the unit by inserting the wall adapter into an available electrical receptacle. On power up, the LED backlighting will cycle through the three unit status colors (*green, yellow, red*) as part of the power-up initialization sequence, followed by the displaying of the Triatek splash screen indicating serial numbers, firmware version numbers, and sensor calibration date. This splash screen remains displayed for approximately 5 seconds and then disappears to reveal the main display screen. This splash screen information can also be redisplayed using the About This FMS option on the Diagnostics menu.

### Main Display Screen

All FMS1650-LITE units come shipped from the factory in the **Neutral Isolation** mode. If your FMS1650-LITE order included the custom logo option, then your specified logo will be shown on the main display screen while the unit is in neutral isolation mode. Otherwise, the neutral isolation mode will be represented by white text on a blue background (Figure 4). Information displayed on the main screen includes the following:

- Name of monitored room (up to 20 chars)
- Current isolation mode (positive, negative, or neutral)
- Current room status (occupied or unoccupied)

- Current differential pressure reading in selected engineering units (default is "WC)
- Current time and date

While in neutral isolation mode, the background color of the main display screen is either blue or a custom color that complements the custom logo if installed. However, while in either **Positive** or **Negative Isolation** modes, the background color actively represents that current status of the monitor. A **green background** indicates that the current differential pressure is within allowable limits of the desired setpoint.



Fig 4. Main display shows isolation mode, room status and differential pressure.

A **yellow background** indicates one of two conditions: 1) door to monitored space is open (if door switch is enabled), or 2) current differential pressure has drifted outside of the allowable limits of the desired setpoint and

are in the caution range.

A **red background** indicates that the current differential pressure has reached a critical condition and is outside of the allowable limits of the desired setpoint.

The FMS1650-LITE incorporates a full-color touch screen and includes an extensive easy-to-use menu system that allows the user to quickly setup the monitor for immediate use. Also integrated into the FMS1650-LITE display are several hotspots that provide quick access to various settings. Refer to Figure 13 for details on using these hotspots as display settings shortcuts. Touching the screen anywhere other than one of the reserved hotspots invokes the menu system, unless one or more security passwords have been entered.

### Configuring Room Pressure Monitor

Configuring the FMS1650-LITE isolation room pressure monitor settings is extremely easy using the intuitive user menus integrated in the touch screen display. Within minutes, the FMS1650-LITE may be configured to start displaying the real-time differential pressure of the isolation room being monitored.

### Setting Up Alarm Limits

To determine the various setpoints at which the unit status changes from **normal** to **warning**, and from **warning** to **alarm**, the alarm limits must be configured accordingly.

**Alarm limits are only in effect while the unit is in either positive or negative isolation mode, as the alarms are disabled while neutral isolation mode is active.**

**PROGRAMMING**

**FMS-1650-LITE Basic Programming**

In order to specify the alarm limits for positive or negative isolation mode, set the isolation mode accordingly by selecting the **Room Setup** option from the **Unit Setup** menu, and then select the **Isolation Mode** option from the **Isolation Room Setup** menu. Select the desired isolation mode from the resulting configuration popup window.

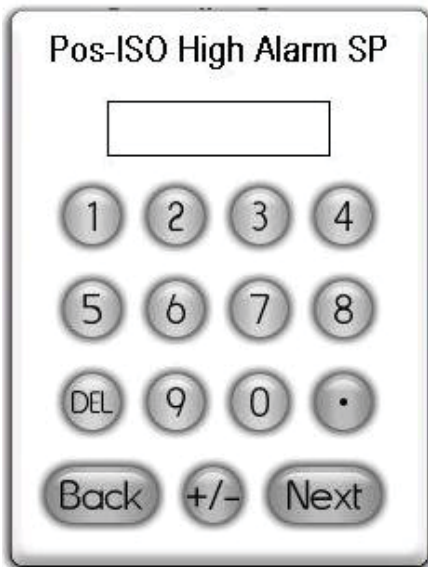


Fig 5. Enter high alarm setpoint for positive isolation mode using keyboard popup.

To begin specifying the alarm and warning setpoints, select the **Alarm Limits** option from the **Unit Setup** menu. The user is prompted to sequentially enter the high alarm and warning limits, followed by the low warning and alarm limits, in that order. For example, if positive isolation mode was selected above, then the configuration popup shown in Figure 5 will be displayed, prompting the user to enter the **Positive Isolation High Alarm Setpoint** using the keypad. These limits should be specified to identify the differential pressure range which is considered normal,

as well as the range which indicates a warning condition, and the range which is considered critical and indicates an alarm condition. The figure on page 12 shows the relationship of these four alarm setpoints and how they relate to the normal operating differential pressure of the monitored isolation room.

**Configuring Alarm Buzzer**

The FMS-1650 alarm resources provide support for both visual and audible alerts. The **Audible Alert** option on the **Unit Setup** menu allows the alarm buzzer settings to be easily configured. Selecting this option invokes the configuration screen shown in Figure 6.

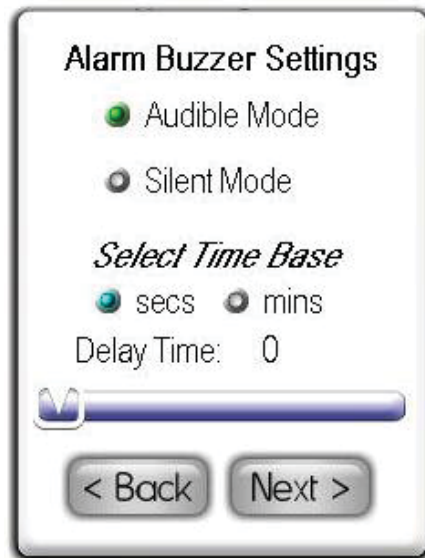


Fig 6. Alarm buzzer may be configured for audible or silent mode.

The alarm buzzer may be selected for one of two modes of operation: **Audible** or **Silent Mode**. If audible mode is selected, a delay

may be specified in seconds or minutes. If silent mode is selected, then the alarm buzzer will not sound whenever the unit encounters an alarm condition. If audible mode is selected, the user may specify an **Alarm Quiet Period**. This feature allows the audible alerts to be suppressed between the specified hours every day, thereby eliminating the potential for nuisance alarms. Hospitals may take advantage of this feature to minimize nuisance alarms during non-visiting hours in patient rooms.

**Selecting Displayed Units**

The FMS1650-LITE displays differential pressure readings in one of two units: **inches of water column (in WC)** or **Pascals (Pa)**. The **Engineering Units** option on the **Unit Setup** menu allows the displayed units to be selected by the user. Selecting this option invokes the **Select Engineering Units** selection screen shown in Figure XX. If the engineering units selection is changed, the corresponding alarm setpoints are automatically converted to the newly selected units.

**Configuring Display Options**

The **Display Setup** menu provides support for configuring all of the display settings on the FMS1650-LITE. Options are available for configuring the main display, selecting an alternate language for the user interface menus, setting the system time and date, and adjusting the display brightness. The **Display Options** menu item allows the main display to be configured as required by the specific application. If so desired, the user may individually enable or disable the display of the isolation mode, room status, and the time/date at the bottom of the screen.

## FMS-1650-LITE Basic Programming

The FMS1650-LITE supports multiple languages for the user interface. Selecting the **Language Options** menu item allows the user to select between **English, Spanish,** and **French** for the user menu system.

The **Set Time & Date** option on the **Display Setup** menu allows the user to specify the current time and date that may be displayed at the bottom of the main display. The FMS1650-LITE will maintain the time and date as long as the unit is not powered down.

The final option available on the **Display Setup** menu allows the intensity of the display backlighting to be adjusted from very dim to very bright. The brightness settings are saved in nonvolatile memory and remain in effect through a power cycle.

### Adding Password Security

Access to the FMS1650-LITE menu system can be protected from unauthorized tampering through the use of multi-level security passwords. Up to ten individual passwords may be entered in the system, each with a specific access level. A password entry may be created by selecting the **Passwords Setup** option from the **System Setup** menu, and then selecting the **Add Password** option. The user is prompted to enter a minimum of four and up to eight numeric digits.

Once a password has been specified, the user is prompted to specify one of four access levels: **Unrestricted, Standard, Basic,** and **Restricted**. All password entries are saved to non-volatile memory, and remain in effect through a power failure. In the event that a password has been forgotten, there is a factory-default “back door” password that will

provide unrestricted access to the user menu system. Please consult with the factory for more information regarding this password.

### Zero Calibrating Sensor

The FMS-1650-LITE may be zero calibrated following installation to ensure that the monitored pressure approaches zero when the door to the monitored room is opened. To perform a zero calibration of the unit, either open the door to the monitored room or cap one port on the remote sensor before proceeding.

Select the **Zero Calibration** option on the **Diagnostics** menu to begin the procedure. Once the reading stabilizes, click the **OK** button to proceed. Exit to the main display and verify that the reading goes to zero. If not, repeat the above procedure.

## CLEANING THE DISPLAY

### Cleaning the FMS-1650-LITE Display

- The cloth may be used dry, or lightly dampened with a mild cleaner or Ethanol.
- Be sure the cloth is only lightly dampened, not wet. Never apply cleaner directly to touch panel surface; if cleaner is spilled onto touch panel, soak it up immediately with absorbent cloth.
- Cleaner must be neither acid nor alkali (neutral pH).
- Wipe the surface gently; if there is a directional surface texture, wipe in the same direction as the texture.
- Never use acidic or alkaline cleaners, or organic chemicals such as: paint thinner, acetone, toluene, xylene, propyl or isopropyl alcohol, or kerosene.

Touching the current room name text brings up an alphanumeric keyboard to quickly change the name of the monitored room.

Touching the current differential pressure reading brings up the secondary pressure reading if the unit is in dual sensor mode.

Touching anywhere else on the screen enters the Main Setup Menu if no password is stored. Otherwise, a password must be entered before the Main Setup Menu can be accessed.

Touching DATE brings up the Date Entry popup to quickly change the current displayed date.

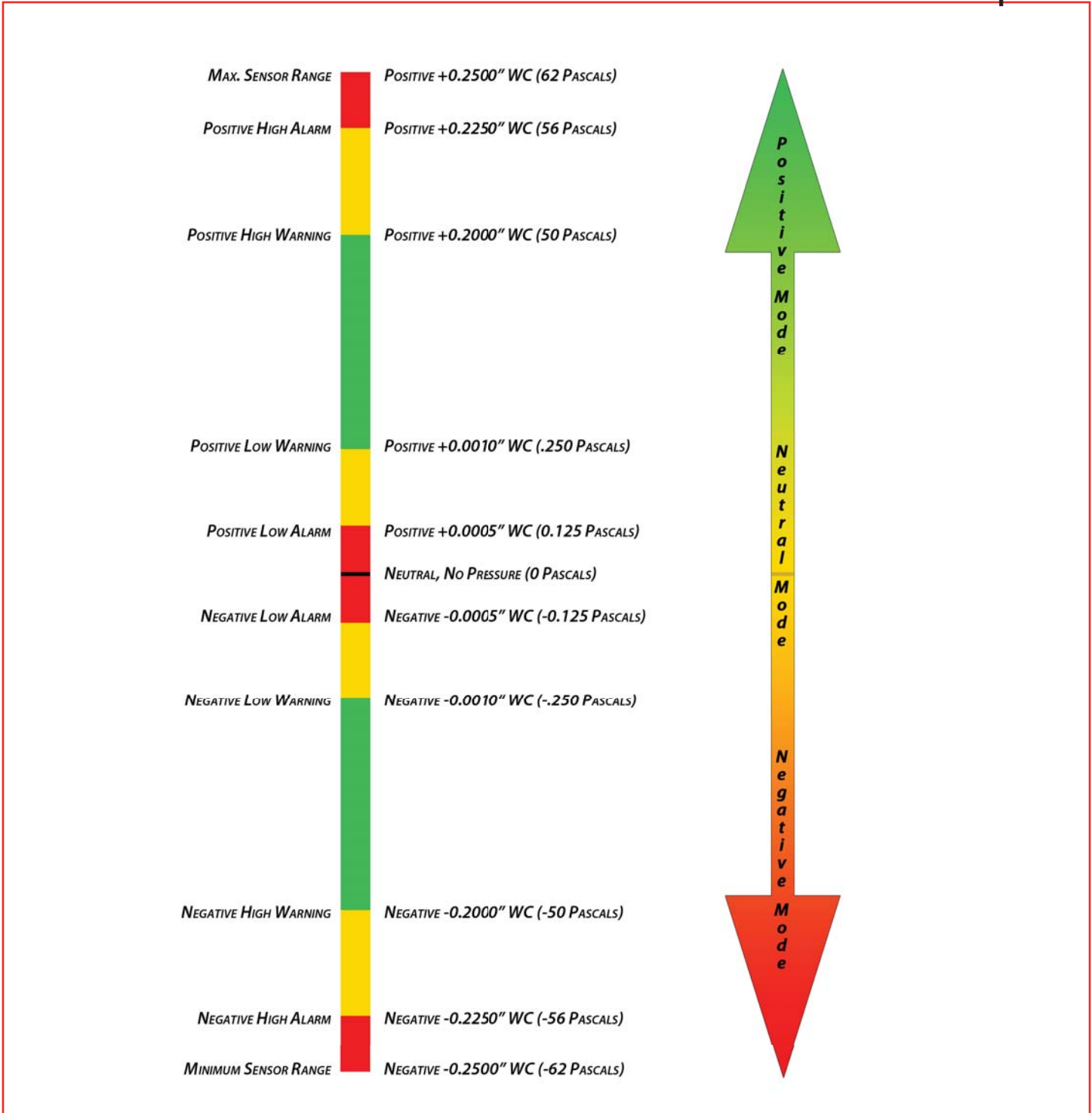


Touching UNITS brings up engineering units selection popup to quickly change pressure measurement units.

Touching TIME brings up Time Entry popup to quickly change the current displayed time.

**Hot-Spot Features of FMS-1650-LITE Touch Screen Display**

## Alarm Setpoints



TRIATEK, located in Norcross Georgia, has an extensive network of manufacturer's representatives located throughout North America to service you. Our helpful, experienced sales team can provide solutions for your Laboratory Controls, Medical Controls, HVAC Controls, and Industrial Instrumentation needs. Call **770-242-1922** or visit our website at: [www.triatek.com](http://www.triatek.com) for more information or to find an agent near you.



Triatek has been a pioneer in controllers since its origins back in the 1980's. Today, Triatek has the most complete line of controllers and monitors in the industry - the latest of which use full color touchscreens. Additionally, Triatek is unique in that the company engineers and sells both venturi valves and controllers or monitors. In other words, Triatek is the one company that can be turned to for a complete air pressure solution.



Laboratories



Classrooms



Vivariums



Hospitals

