

13.0 RETURNING PRODUCTS FOR REPAIR

Before returning the unit for repair, please contact a Setra application engineer (800-257-3872, 978-263-1400) to review information relative to your application . Many times only minor field adjustments may be necessary. When returning a product to Setra, the unit should be carefully packaged and shipped prepaid to:

Setra Systems, Inc.
159 Swanson Road
Boxborough, MA 01719-1304
Attn: Repair Department

To assure prompt handling, please refer to return instructions on our Web site at http://www.setra.com/tra/repairs/cal_rep.htm.

Allow approximately 3 weeks after receipt at Setra for the repair and return of the unit. Non-warranty repairs will not be made without customer approval and a purchase order to cover repair charges.

Calibration Services

Setra maintains a complete calibration facility that is traceable to the National Institute of Standards & Technology (NIST). If you would like to recalibrate or recertify your Setra pressure transducers or transmitters, please call our Repair Department at 800-257-3872 (978-263-1400)

for scheduling.

14.0 WARRANTY AND LIMITATIONS OF LIABILITY

Setra warrants its products to be free from defects in materials and workmanship, subject to the following terms and conditions:

Without charge, Setra will repair or replace products to be found to be defective in materials or workmanship within the warranty period; provided that:

- a.) the product has not been subjected to abuse, neglect, accident, incorrect wiring not our own, improper installation or servicing, or use in violation of instructions furnished by Setra;
- b.) the product has not been repaired or altered by anyone except SETRA or its authorized service agencies;
- c.) the serial number or product code has not been removed, defaced, or otherwise changed; and
- d.) examination discloses, in the judgement of SETRA, the defect in materials or workmanship developed under normal installation, use and service;
- e.) SETRA is notified in advance of and the product is returned to SETRA transportation prepaid.

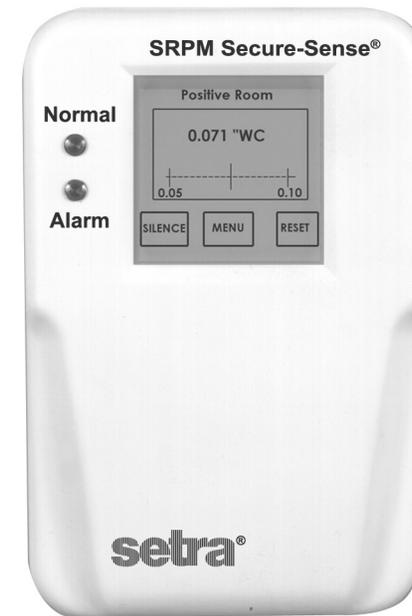
Unless otherwise specified in a manual or warranty card, or agreed to in a writing signed by a SETRA officer, SETRA pressure and acceleration products shall be warranted for one year from date of sale.

The foregoing warranty is in lieu of all warranties, express, implied or statutory, including but not limited to, any implied warranty of merchantability for a particular purpose.

SETRA's liability for breach of warranty is limited to repair or replacement, or if the goods cannot be repaired or replaced, to a refund of the purchase price. SETRA's liability for all other breaches is limited to a refund of the purchase price. In no instance shall SETRA be liable for incidental or consequential damages arising from a breach of warranty, or from the use or installation of its products.

No representative or person is authorized to give any warranty other than as set out above or to assume for SETRA any other liability in connection with the sale of its products.

Model SRPM Room Pressure Monitor Installation and Operating Manual



159 Swanson Road, Boxborough, MA 01719,

Tel: 800-257-3872; Fax: 978-264-0292;

Email: sales@setra.com; Web: www.setra.com



SS-SRPM Rev. A 5/1/2008

11.0 SRPM Specifications

Performance Data

Accuracy RSS* (at constant temp.)	±0.5%
Non-Linearity (Terminal Method) (BSSL Based)	±0.35% ±0.25%
Hysteresis	±0.05%
Non-Repeatability	±0.05%
Zero Setting Tolerance	±0.5% FS
Span Setting Tolerance	±0.5% FS

Thermal Effects**

Compensated Range °F (°C)	±0.03% FS (±0.05% FS)
Overpressure	±1 psi

* RSS of Non-Linearity, Non-Repeatability and Hysteresis

**Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.

Environment Data

Temperature	
Operating* °F (°C)	+32 to 120 (0 to +50)
Storage °F (°C)	-20 to +160 (-30 to ±70)
Operating Humidity	5 to 95% RH (Non-condensing)

*Operating temperature limits of the electronics only.

Physical Description

Case	Fire Retardant Plastic (NEMA 1 Rated for Indoor Applications)
Dimensions	8"H x 5.4"W x 1/8"D (20.3H x 13.7W x 4.1D cm)
Electrical Connection	Removable Terminal Block
Pressure fittings	Barbed Fittings for 1/4" Tubing
Weight (approx.)	1.5 lbs (680g)
Mounting	(Mounts to double gang electrical box.)
Display	
LCD	128 x 128, RGB Backlit
Status Indicators	Green LED, Normal; Red LED, Alarm; Backlit LCD

Electrical Data (Voltage)

Circuit	3-Wire (Exc., Out, Com)
Output*	0 to 5 VDC 0 to 10 VDC

Excitation

Code V1	85-265 VAC, 50-60 Hz
Code A1	18- 32 VAC, 50-60 HZ
Power Consumption	5W
Alarm Output	SPDT Relay 1A @24 VDC 1A @ 120 VAC

*Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.

Electrical Data (Current)

Circuit	2-Wire
Output	4 to 20 mA
External Load	0 to 510 ohms

Excitation

Code V1	85-265 VAC, 50-60 Hz
Code A1	18- 32 VAC, 50-60 HZ

Pressure Media Air or Nonconductive, Nonexplosive Gases.

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Ceiling

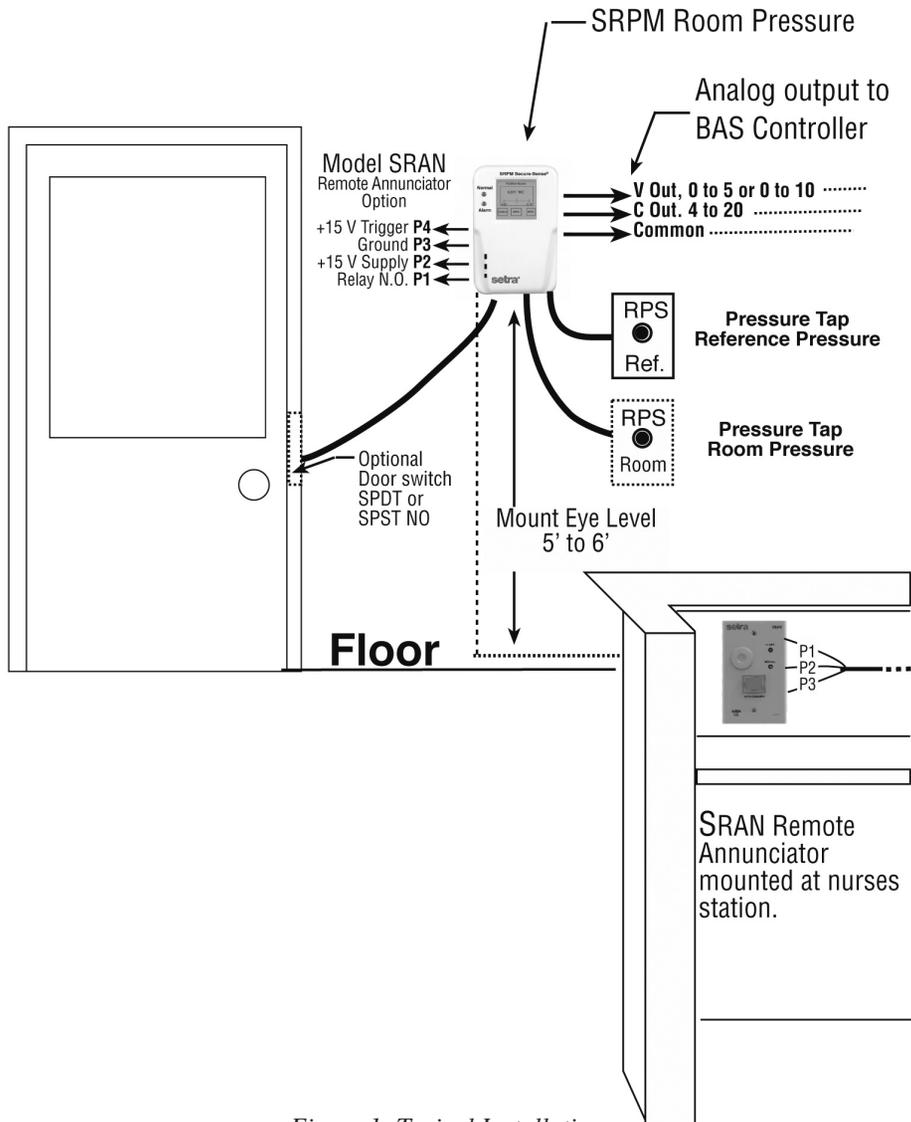


Figure 1: Typical Installation

9.0 Maintenance

The SRPM is designed to operate in an indoor environment, monitoring clean, dry (see humidity specifications) air.

9.1 Cleaning

Important

Do not blow into the pressure tubing or fittings with mouth. Compressed air, or canned air. Such actions may permanently damage the pressure sensor.

Cleaning your SRPM

Do not clean or wash-down the SRPM with industrial cleaners or solvents. The housing may be wiped down with soap and water or isopropyl alcohol; and, the LCD display with isopropyl alcohol only. Do not immerse unit.



For 120/240 VAC Version, only
CAUTION: Do not open or remove SRPM cover (tool required) with input power applied unless performed by a licensed electrician. "Hazardous Live" voltage is present at connector J3 when power is applied. Please observe the warning symbol (⚠) near the J3 power connector.

10.0 Agency Electrical Standards

This device falls into CSA "Pollution Degree 2" for pcb insulation and CSA "Installation Category 2".

The SRPM meets the following requirements:

General Requirements - Canadian Electrical code

CSA Standard C22.2 No 0-M 91

-General Requirements - Canadian electrical code, Part 1

CAN/CSA C22.2 No. 0.4-04

-Bonding of Electrical Equipment

CAN/CSA-C22.2 No. 61010-1-04

-Safety requirements for electrical equipment for measurement, control and laboratory Use Part-1: General Requirements

ANSI/UL61010-1 (Second Edition)

-Safety requirements for electrical equipment for measurement, control and laboratory Use Part-1:

7.0 Model SRAN Remote Annunciator

Setra's Remote Annunciator (SRAN) provides remote indication of room status.



Green LED

Visual indication of normal room condition

Red LED

Visual Indication of a breach in room pressure protection.

Audible Alarm

Buzzer sounds to indicate a breach in room pressure protection

Acknowledge Switch

Press to Silence the buzzer.

Operation

Under normal conditions the Green LED remains on. When an alarmed condition occurs (i.e., room pressure falls outside preset range), a signal is triggered by the SRPM, the Green LED shuts off, the Red LED flashes and the Audible Alarm sounds. The acknowledge button can be pressed to momentarily turn-off the Audible Alarm and the Red LED will continue to flash until the alarmed condition is corrected. When the alarmed condition is corrected the annunciator will reset itself. The Green LED will turn-on, the Red LED and Audible alarm will shut-off.

1.0 Introduction

Congratulations, and thank you for purchasing Setra's Room Pressure Monitor (Model SRPM). Its ease of operation and durable construction will provide years of reliable service. While the SRPM is easy to operate, it is advisable to read this guide carefully before use. It is designed to help you take full advantage of the function and performance of the SRPM.

1.1 Intended Use

The SRPM is designed to monitor critical air environments, providing room static pressure indication, alarming, and communication functions. The applications include:

- 1.) hospitals - patient isolation and protection rooms, operating suites, intensive care and emergency rooms.
- 2.) pharmaceutical, semiconductor, and precision manufacturing and clean rooms.
- 3.) laboratories - medical research and BSLs (Bio-Safety Labs), radiation, toxic metals and chemicals.

1.2 SRPM Function

The SRPM senses very low differential pressure using Setra's patented, high accuracy capacitive sensor technology. The pressure difference for these application is the difference in static pressure between a critical environment room and its surrounding reference area (usually a hallway or another room) see Figure 1.

Maintaining and monitoring a static room pressure difference insures that the critical environment room is either protected or isolated from a surrounding environment. Protection strategy requires a net positive room static pressure difference, while isolation requires a net negative static pressure difference. The SRPM can be programmed to monitor either positive or negative room static pressure. The SRPM low pressure sensing technology is coupled with multifunctional alarming and simple, intuitive touch-screen user interface with selectable security protection.

2.0 Parts List

1.1 SRPM Parts List

Qty

- (1) Setra SRPM assembly
- (2) Barbed Coupling, Brass
- (2) 1/4 inch Tube, Silicone, Inter-Connect
- (4) 6-32 x 1/2" Mounting Screws for SRPM Base

Not Included: Supplied by User

- (2) Single Gang Electrical Box for RPS Plates
- (1) Double Gang Metal Electrical Box with Grounding Stud
- (1) 4 x 4 inch Metal Plaster Ring
- (1) Door Switch SPDT or SPST, N.O., as needed

1.2 Model SRAN (Option) Parts List

Qty

- (1) Annunciator Assembly

Not Included: Supplied by User

- (1) Single Gang Electrical Box

1.3 Accessories (Option) Parts List

Qty

- (2) Part # RPS, Static Pressure Fitting Plate

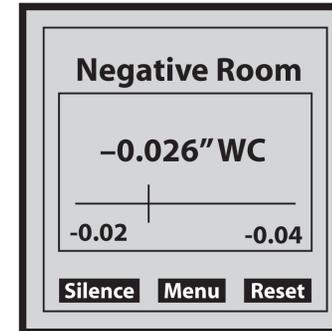
Not Included, Supplied by User

- (2) Single Gang Electrical box for RPS Plates

8.8 Pressure Monitoring Screens

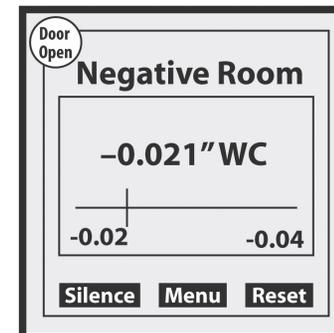
The actual room static pressure is shown as a number on the LCD and visually as a "Moving Bar" indicator operating between the preset pressure limits.

Normal room pressure condition within the preset pressure limits is verified by a Green colored screen



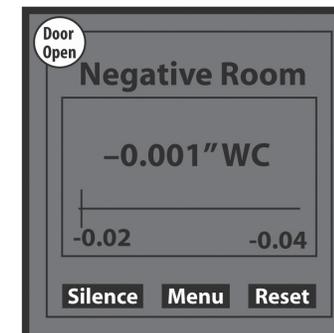
**Green Screen
Normal**

Normal room pressure condition within limits turns screen to yellow when door is open, indicating "Pre-alarm".



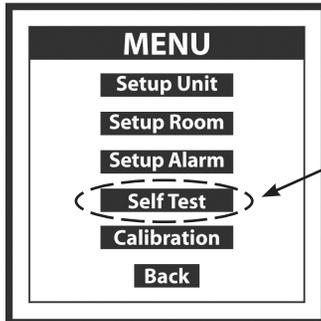
**Yellow Screen
Pre-Alarm**

Room static pressure outside preset limits is indicated by a Red screen after expiration of alarm "time delay".

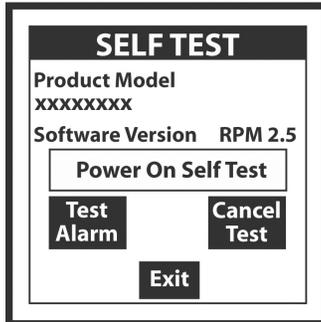


**Red Screen
Alarmed**

7.6 SELF TEST SCREEN



Press to Access Screen



7.6.1 Self Test Operation

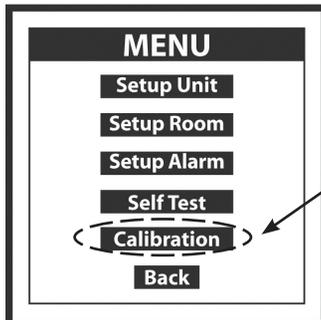
This screen identifies the Product Model and Software Version. User can also perform a Self Test of the SRPM to verify that the data in memory hasn't been corrupted and also test the alarm to verify the sound level and alarm setup.

Press "Power On Self Test" button to initiate test sequence.

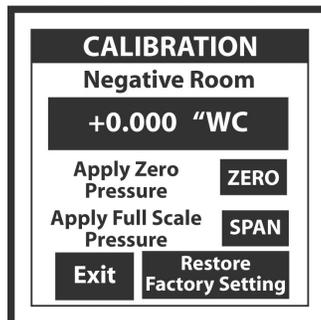
Press "Test Alarm" to test buzzer and visual Red LED Alarm.

Press "Exit" to return to Main Menu.

7.7. CALIBRATION SCREEN



Press to Access Screen

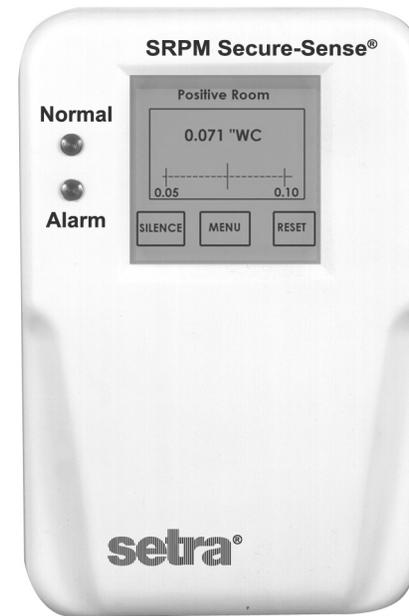


7.7.1 Calibration

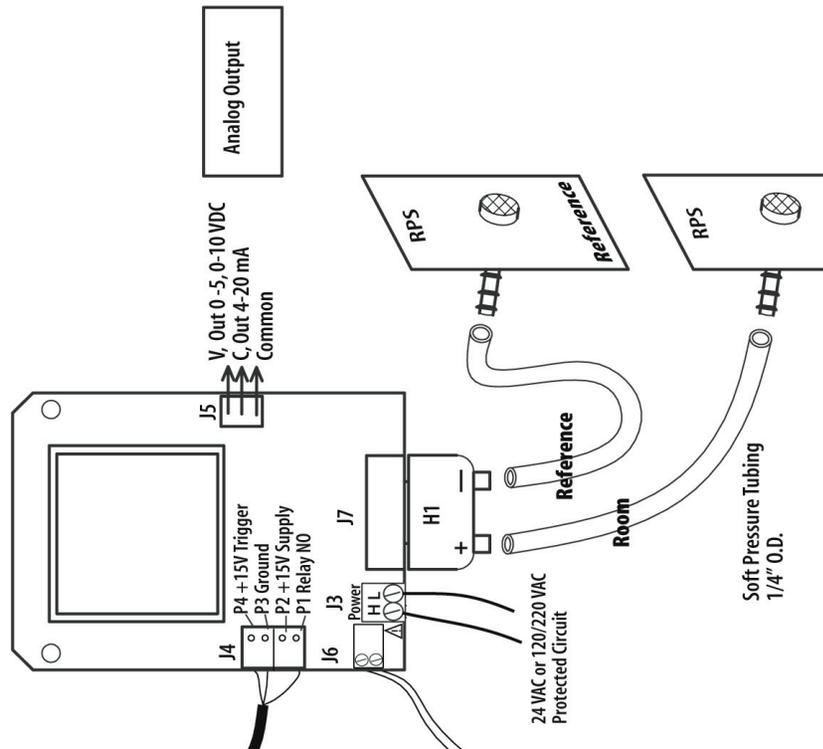
Perform a simple two-step, key tap calibration process. To re-zero the device, disconnect the "room pressure" tube and lightly press (or tap) the "Zero" button. Then apply a steady full scale pressure signal to the "+" or "room pressure" tube or fitting and press (or tap) the "Span" button. Reconnect the room pressure tube and calibration is complete. Calibration must be within + or - 5% of original calibration. The original factory pressure calibration can be restored, if desired, by pushing the "Restore Factory Setting" button.

Note: The SRPM pressure header plugs into the Setra Model 869 Expert System Calibrator for quick and secure automatic calibration. Exit to return to main menu, then press the "back key" to enter normal monitor mode.

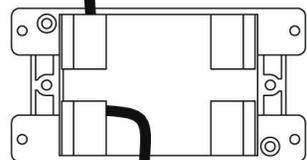
Installation Instructions



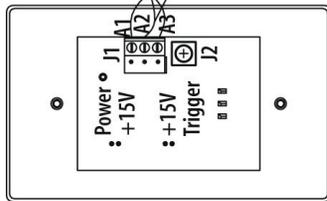
Inside View



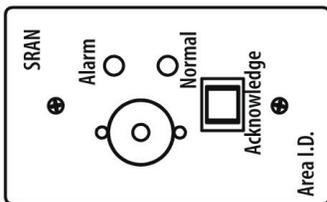
Door Switch
SPDT or SPST NO



Back Plate View



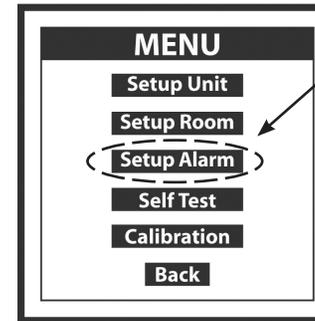
Model SRAN
PC Board View



Model SRAN
Front View

Figure 2: Location of Components and Accessories

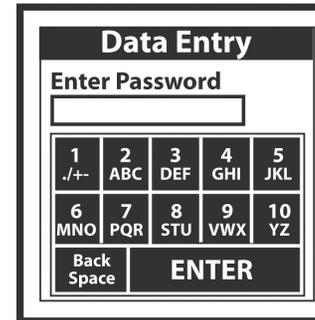
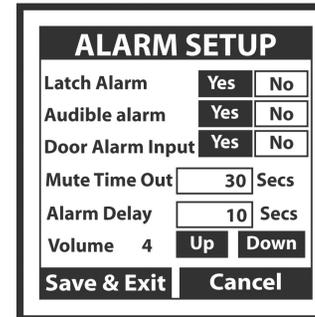
7.5 SETUP ALARM SCREEN



Press to Access Screen

The user can:

- Latched Alarm requires the pressure to return to normal and be acknowledged before alarm can be "Silenced" and "Reset".
- Enable the audible alarm "Yes" or use visual only alarm "No" signaling
- Provide a door "open" pre-alarm visual indication. When activated the door status "open" condition is indicated by the touch screen display turning from green to yellow, and door open indicated on Default Screen.
- Set the time in seconds that the alarm can be silenced in the latched alarm mode before the alarm resumes. This assumes that the room static pressure is still outside the normal or set operating limits. The Mute Time Out can be set from 0 to 60 seconds.
- Set the Alarm Delay in seconds from the time that the room pressure goes out of the preset limits until the alarm activates. The alarm delay may be set from 0 to 60 seconds.
- Set the alarm volume or sound level. Using the Up and Down keys, the volume can be set at level 1-4. Level 4 alarm volume is the loudest and corresponds to a sound level of 85 db at a distance of 4 inches.



7.5.1 Alarm Setup Operation

Lightly Press (or tap) button to select "Yes" or "No" for Latch Alarm, Audible alarm, or Door Alarm Input. Selected box background will change from clear to black.

7.5.2 Entering Data

7.5.2.1 Mute Time Out/Alarm Delay

Pressing (or tapping) the "Mute Time Out" or "Alarm Delay" box activates the "Data Entry" screen (see 7.5.3) to set the time.

7.5.3 Data Entry Screen

Enter numbers by pressing each key in sequence until the desired character is displayed in the data entry box above the keypad. (Note: The cursor will blink for one to two seconds then stop and display the character.) Erase any mistakes by using the "Back Space" key. When finished entering data, "Press Enter" key and return to SETUP UNIT screen, press "Save and Exit" to return to MAIN MENU, then press "Back" to return to PRESSURE MONITORING SCREEN.

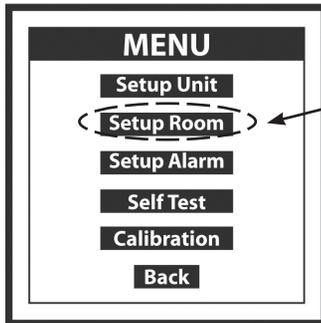
Example:

Enter number 3, press (or tap) 3/DEF key once

Enter the letter T, press (or tap) the 8/STU key three times in succession.

Note: Use the eraser end of a pencil or back-end of a pen to press (or tap) box on screen to increase accuracy of inputs.

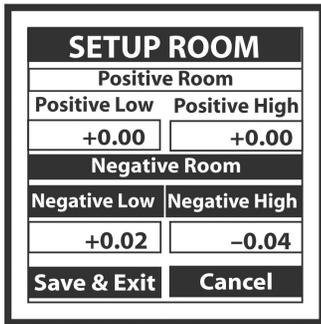
7.4 SETUP ROOM SCREEN



Press to Access Screen

7.4.1 Setup Room Operation

Monitor either “protective” positive room static pressure or “isolating” negative room static pressure.



7.4.2 Entering Data

Press lightly or tap Positive Room or Negative Room button. Background of selection will change from clear to black, then enter high and low limits as follows:

Simply press lightly (or tap) either the “Positive Room” or “Negative Room” box to activate the “Data Entry Screen” (see 7.4.3.), then proceed to enter the low and high limits of the room pressure to be monitored. Save and Exit.



7.4.3 Data Entry Screen

Enter numbers by pressing each key in sequence until the desired character is displayed in the data entry box above the keypad. (Note: The cursor will blink for one to two seconds then stop and display the character.) Erase any mistakes by using the “Back Space” key. When finished entering data, “Press Enter” key to return to SETUP UNIT screen, press “Save and Exit” to return to MAIN MENU, then press “Back” to return to PRESSURE MONITORING SCREEN.

Example:

Enter number 3, press (or tap) 3/DEF key once

Enter the letter T, press (or tap) the 8/STU key three times in succession.

Note: Use the eraser end of a pencil or back-end of a pen to press (or tap) box on screen to increase accuracy of inputs.

3.0 Mounting and Wiring

3.1 Mounting

For 120/240 VAC Version, only

CAUTION: Do not open or remove SRPM cover (tool required) with input power applied unless performed by a licensed electrician. “Hazardous Live” voltage is present at connector J3 when power is applied. Please observe the warning symbol (⚠) near the J3 power connector.

The Setra Room Pressure Monitor is designed to be mounted on a standard double gang metal electrical box using a 4 x 4 inch plaster ring adaptor. Remove the SRPM cover and mount the baseplate to the plaster ring adaptor using (4) 6-32 1/2 inch long mounting screws, see Figure 2. Note: The plaster ring external mounting face needs to be positioned flush to recessed, relative to the surface of the wall. Also note the orientation of the 4 mounting screws in the plaster ring, the plaster ring is rotated 90° from conventional mounting.

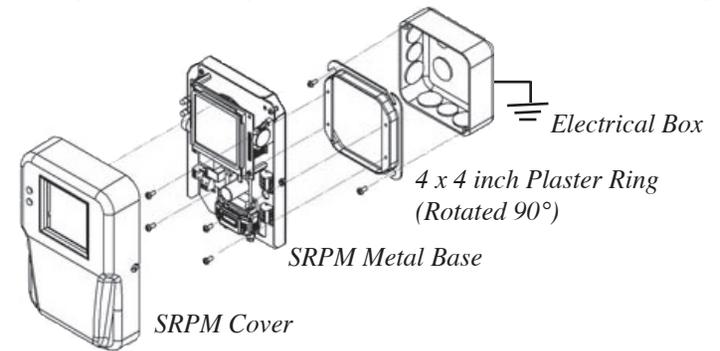


Figure 3: Mounting the SRPM

3.2 Wiring Electrical box (rough in)

Pre-wire electrical box with power (24 VAC or 120/240 VAC depending on SRPM model), and provide grounding to the electrical box and plaster ring adaptor. Note: For CSA Safety Certification it is necessary to ground the metal electrical box to building earth ground. The safety ground path consists of the (4) 6-32 x 1/2” metal screws that connect the RPM metal base to the 4” x 4” metal plaster ring. The plaster ring is grounded to the 4” x 4” electrical by 2 mounting screws.

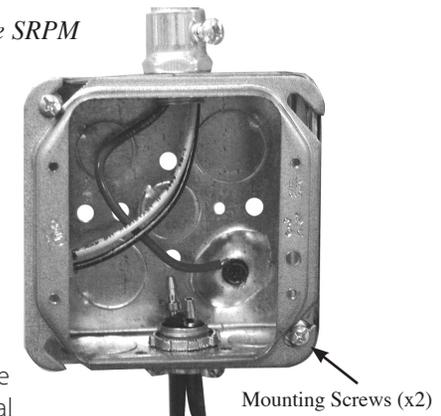


Figure 4: 4” x 4” Electrical Box

Power leads and wiring should be 14 to 22 AWG braided wire. 18 AWG braided wire is recommended for wiring J3 power connector to SRPM (see J3, Figure 2). For 120/240 VAC the hot wire connects to H and neutral to L.

3.3 Attaching Pressure Tubing

Typically a Room Pressure Snubber (RPS) is installed in the monitored room. Attach pressure tubing as follows:

1.) Connect the 1/4 inch O. D. tubing (Figure 5) from the RPS to the 4" x 4" electrical box for the SRPM by pushing the 1/4 inch tube onto one end of the barbed, male to male, tube adaptor, then push the silicone tube (supplied) onto the other end (see Figure 6). Thread the tubes, with installed adaptor, through the conduit opening at the bottom of the electrical box (see Figure 7).

2.) Next push the open end of the silicone tubing onto the removable SRPM header (H1), port labeled "+" (see Figure 7).

Note: The header is an Electro-Pneumatic (EP) assembly. "+" indicates (Positive) pressure, and "-" indicates (Negative or Reference) pressure.

3.) For the most pressure stable operation an RPS installed in the reference pressure area is also recommended. In this case, install the RPS in a hallway or anteroom. Plumb to the SRPM in the same way as "+" pressure, except plumb the tube to the "-" port on Header H1. Tighten swivel fittings on the EP assembly if they become loose.



Figure 5: Room Pressure Snubber (RPS)



Figure 6: Silicone & RPS Tubing connected by barbed Male to Male Tubing Adaptor

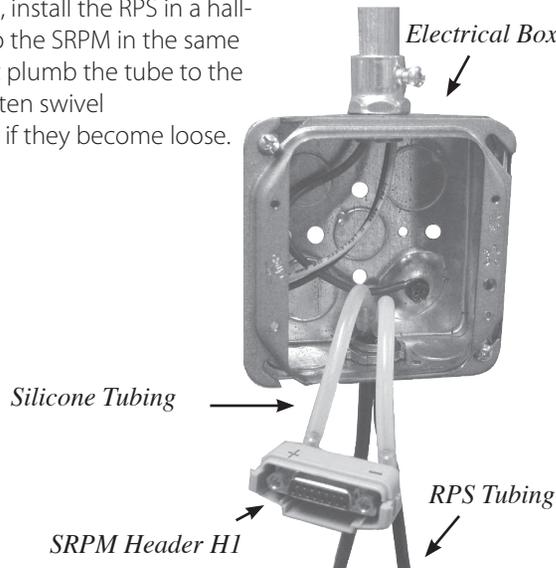
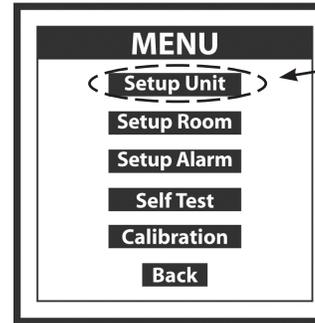


Figure 7: Example of Completed Tube Installation

7.3 SETUP UNIT SCREEN



Press to Access Screen

7.3.1 Setup Unit Operation

Press (or tap) button to select an output or engineering unit. Selected button background will change from clear to black.

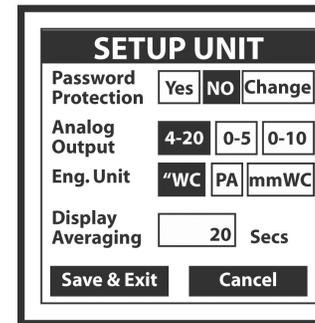
7.3.2 Entering Data

7.3.2.1 Password Protection

Lightly pressing (or tapping) the "Yes" button activates the "Data Entry Screen" (see 7.3.3 to enter your password.) Enter password, then press "Enter". "Password Setting Screen" will pop-up, enter new password, enter password again to confirm, then press "Save". (See MENU TREE, page 16 for password entry operation.)

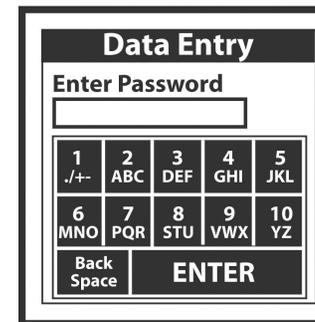


Password Setting Screen



7.3.2.2 Display Averaging

Lightly pressing (or tapping) the box activates the "Data Entry Screen" (see 7.3.3). Enter from 0 to 60 seconds. Display averaging affects the analog output. Increase display averaging time to "Smooth" the pressure readings.



7.3.3 Data Entry Screen

Enter letters or numbers by pressing each key in sequence until the desired character is displayed in the data entry box above the keypad. (Note: The cursor will blink for one to two seconds then stop and display the character.) Erase any mistakes by using the "Back Space" key. When finished entering data, "Press Enter" key to return to SETUP UNIT screen, press "Save and Exit" to return to MAIN MENU, then press "Back" to return to PRESSURE MONITORING SCREEN.

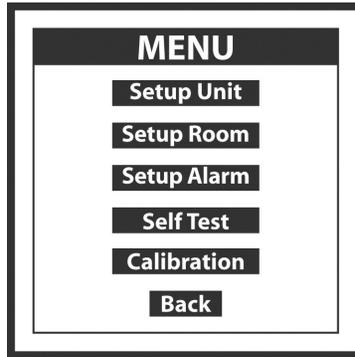
Example:

Enter number 3, press (or tap) 3/DEF key once.

Enter the letter T, press (or tap) the 8/STU key three times in succession.

Note: Use the eraser end of a pencil or back-end of a pen to press (or tap) box on screen to increase accuracy of inputs.

7.2 MAIN MENU SCREEN



Button	Description
Setup Unit	Setup password, output, engineering units, and display averaging
Setup Room	Setup high and low pressure limits to monitor positive or negative room
Setup Alarm	Setup latch alarm, audible alarm, door alarm input, mute time out, alarm delay, and volume
Self Test	Identifies product model and software version. Verifies SRPM operation and alarm sound level and setup
Calibration	Perform zero and span calibration
Back	Returns to monitoring screen

4.0 Model SRAN Room Annunciator Installation

4.1 Alarm Relay Output

The Single Pole Double Throw (SPDT) relay output can be used for remote signaling of alarm condition. A form "C" contact rated at 1A is available. Connect to J4, Pins 1 and 4.

4.1.1 Model SRAN Remote Annunciator Wiring

(see Figure 8 below or Figure 2, pg. 8)

Remote Annunciator Connector (J1), SRPM Connector J4:

Connect pins 1 & 2 (short) and then connect pin 2 (+15 V Exc.), pin 3 (Ground, pin 4 (Annunciator Trigger).

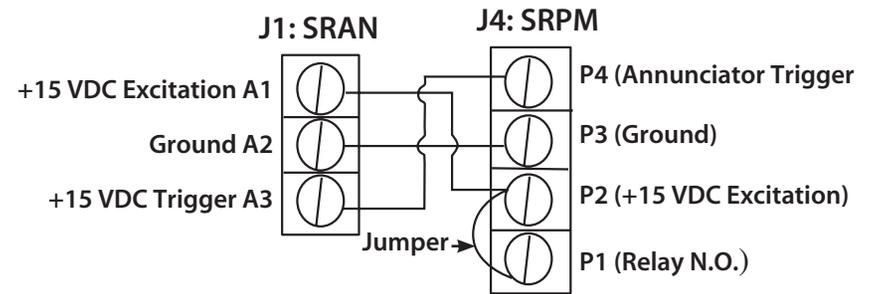


Figure 8: Model SRAN Wiring

4.1.2 Non-Setra Remote Annunciator

The SRPM can drive other annunciators that are powered by a 15V supply, 50 mA max., and accept a 15V trigger. If purchased separately, the SRAN can also be driven as shown in Figure 9.

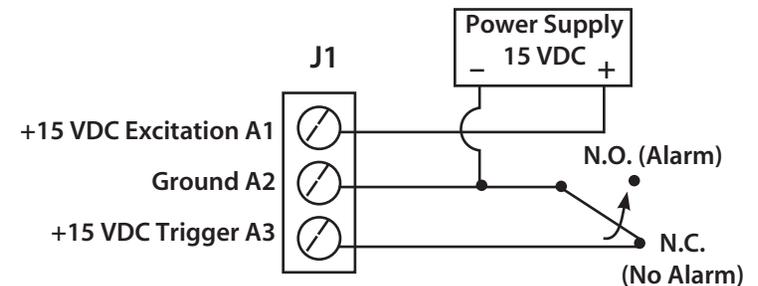
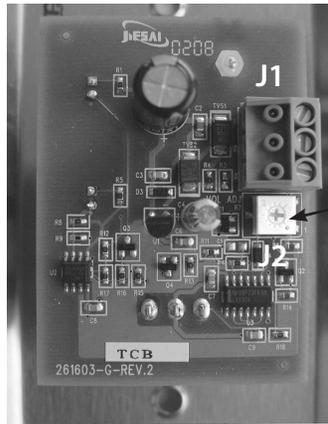


Figure 9: Remote Annunciator Wiring

4.2 Audible Alarm

Alarm potentiometer adjusts from 0 to 85 dBA. Using a screwdriver, rotate potentiometer clockwise to increase volume and counterclockwise to decrease volume.



Audible Alarm Potentiometer

Figure 10: Model SRAN PC Board View

5.0 Door Status Switch Wiring (see Figure 2, J6)

5.1 Wiring

Use normally open (N.O.) side of contact switch. The RPM will indicate status of door position. A contact closure indicates that the door is closed. This is a low voltage circuit (5 VDC).

7.0 Startup and Operation

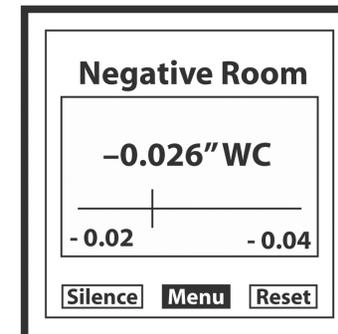
The SRPM is designed with an easy to use touchscreen interface. In its normal state the "Monitoring Screen" displays the actual room static pressure.. The buttons at the bottom of the screen give you access to the functions that can be performed.

7.1 Power-up

Apply power to the SRPM and observe the welcome screen and subsequent transmission to the pressure monitor screen.



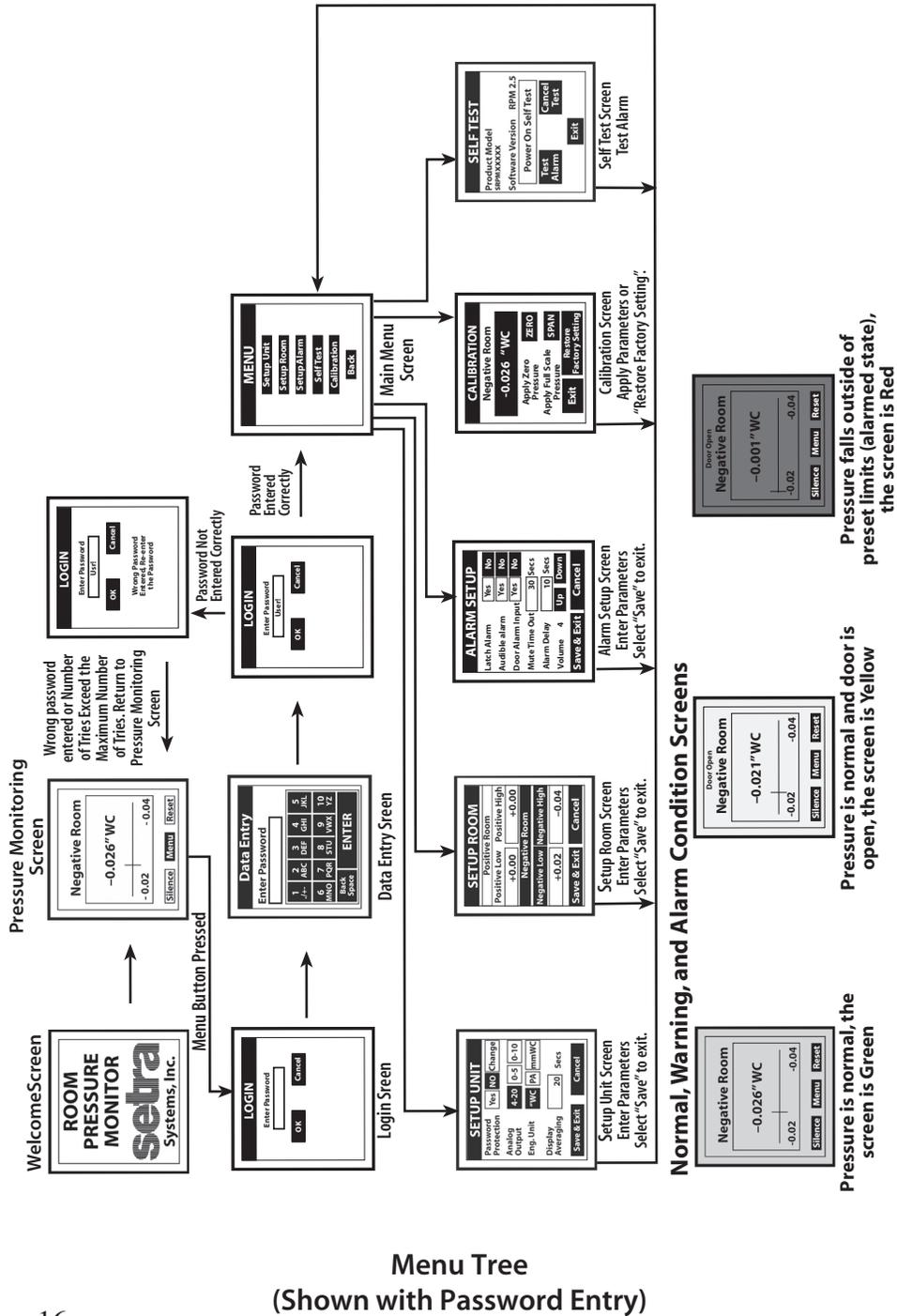
Welcome Screen



Monitoring Screen

The actual room static pressure is shown as a number on the LCD and visually as a "Moving Bar" indicator operating between the preset alarm units. The "Vertical Bar" is an indicator of the pressure.

Button	Description
Silence	Shuts off Alarm
Menu	Access to setup functions
Reset	Resets the unit in "Latched" mode. See Alarm Setup Screen.



6.0 Electrical Installation

6.1 Analog Output (J5)

SRPM can be configured as current (4 to 20 mA) or voltage (0 to 5 or 0 to 10 VDC). Voltage output pin 1, Current output pin 2, Common pin 3. *Note. No external excitation is required.*

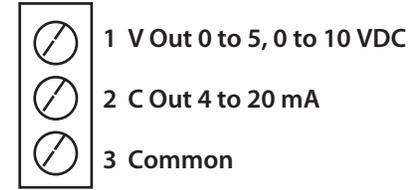


Figure 11: Analog Output (J5)

User's Operating Instructions

