DIFFERENTIAL ROOM PRESSURE MONITOR OWNER'S MANUAL

Model: RPM-RT1/RPM-RT2

CONTENTS

1 INTRODUCTION

1.1 Overview

This manual will outline the operation and functionality of the Abatement Technologies Room Pressure Monitor in detail. Visual aids have been added for additional help in proper setup and installation as well as navigating the system's interface.

Features
- Real-time monitoring of differential pressure.
- Color touch screen display.
- USB port for on-site firmware upgrading and archive history downloading.
- Visual and audible alarm system.
- Optional external alarm connection.
- Capable of pressure measurement units in Inches WC and Pascals.
- Differential pressure measurement in the ranges of -25Pa (-0.1 inWC) to +25Pa (+0.1 inWC).
- Operating temperature range of 41°F (5°C) to 131°F (55°C).
- Optional remote temperature and relative humidity sensor.

RPM-RT2 Extended Features
- Ability to monitor two rooms on the same display.
- Optional ability to monitor remote temperature and relative humidity from remote sensors

Accessories
- 12VDC @ 1A power supply.
- 2 x 1/8" barb elbow reduction connectors for 1/8" ID tubing.
- 2 x 10 micron in-line filters with 1/8" barbs.

2 CONNECTIONS

2.1 Pressure Sensors

There are three pressure sensor input ports on the pressure monitor (only two for the RPM-RT1 model). There are two room pressure input ports labeled ROOM A and ROOM B on the RPM-RT2 model. There is only one room pressure input labeled ROOM A on the RPM-RT1 model. These input ports should be connected to the hose of the room(s) being monitored.

Both models have an input port used as a reference pressure labeled COM. If the pressure monitor is located in the room with the reference pressure, no hose is needed on this input. If the reference pressure is in another area, tubing must be connected from this COM port to that area.
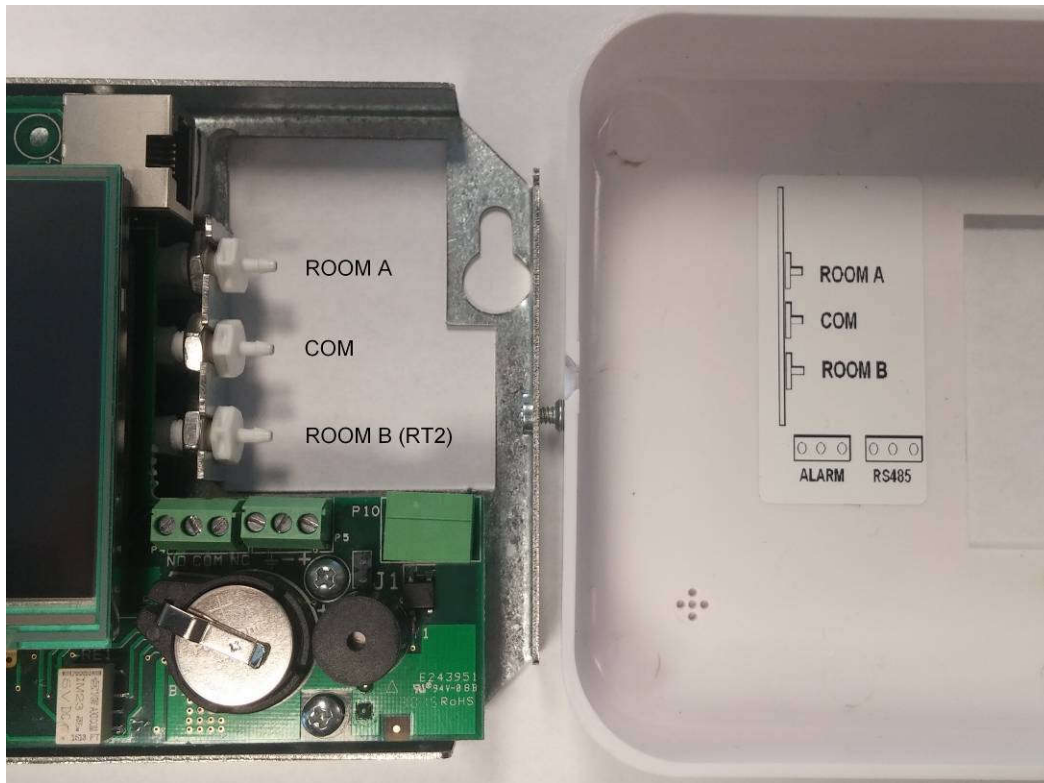
WARNING: Do not blow into the hose or ports. Doing so may result in permanent damage to the sensor.

2.2 Alarm Relay Output

The alarm relay output provides the end user with an external alarm option. There is no voltage output by the alarm relay. When an alarm is triggered the relay will short the inputs of the normally open (NO) and common (COM) inputs of the external relay connector, P4. See 2.6 Wiring Diagram for connection details.

2.3 USB Connector

A USB connector is provided for downloading the history file and for uploading new versions of firmware. The USB connector is designed for USB flash drives only. Do not connect any other USB device into this connector.

2.4 RS485 Communication

The room pressure monitor is equipped with a RS485 communications bus which has support for the BACNET and Johnson Controls N2 building automation protocols. Both the BACNET and N2 communications will be detailed later in this document. See 2.6 Wiring Diagram for proper connections to the communications bus.

2.5 Remote Temperature RH Sensors

The room pressure monitor is equipped with the capability to connect to a maximum of two external temperature/relative humidity sensors. Each sensor has a temperature/humidity sensor built in and will automatically report the temperature and humidity back to the room pressure monitor for archival, display and alarming purposes. See 2.6

2.6 Wiring Diagram

The following wiring diagram has been provided for proper installation of any external alarms and RS485 communications.

Pin Label	Description
P4 - NO	Relay Normally Open
P4 - COM	Relay Common
P4 - NC	Relay Normally Closed
P5 - Gnd	REF – 100ohms to GND
P5 - **-**	RS485 N-
P5 - **+**	RS485 N+
PWR In 1	Power supply input: 9-24V AC or DC.
PWR In 2	
Temp/RH sensor	Connects to remote Temp/RH sensor with standard Cat5E cable terminated with RJ45 connectors.

*All wire terminals will accept a wire size between 18-26 AWG.
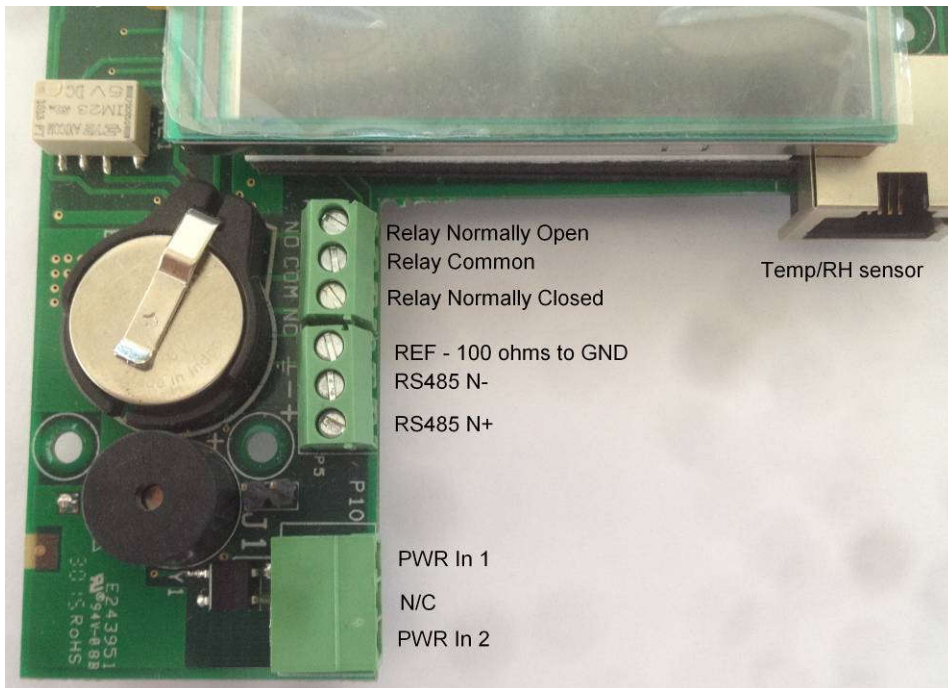
Note: Temperature/Relative Humidity sensor port is NOT A COMPUTER NETWORK/ETHERNET PORT. **DO NOT CONNECT TO COMPUTER ETHERNET CABLE/NETWORK** or equipment damage may result!

3 OPERATION SET UP

The room pressure monitor has been provided with the necessary components for installing the pressure monitor on the wall.

3.1 Installation

A wall cut out template has been provided with the room pressure monitor to help with mounting and proper installation of the unit. Position the template onto the wall in a suitable area so that the power and pressure tubes can be routed into the unit. Cut a hole in the wall where it is shown on the template. This allows the tubing and power to come through the wall and be connected through the back of the pressure monitor. Install the anchor plugs to line up with the mounting holes of the backplate. Insert the 2 woodscrews provided into the anchors leaving enough room so that the metal bracket will slide down on to the screws. Remove the fascia from the room pressure monitor by loosening the 2 screws on the sides of the unit and sliding the plastic fascia forward. Slide the metal bracket down onto the screws through the keyhole slots and tighten the screws to secure the pressure monitor against the wall. Connect the tubing as required. Plug the power supply connector into the power supply port on the pressure monitor board. Remount the fascia onto the metal bracket until it is flush with the wall and tighten the screws on the side. **Note: Only use the Abatement supplied power supply (MSS182) or a power supply outputting 9-24V (AC or DC). Use of a power supply outside this voltage range may result in improper operation and/or damage to equipment.**

3.2 System Start Up

Plug the pressure monitor power supply into an AC outlet (115 VAC, 60 Hz). The pressure monitor will startup and the main display will show. If the hose to the room being monitored is connected properly, the pressure monitor will display the differential pressure between the reference area and the room being monitored. If a positive pressure room is showing negative pressure, the room input and reference hoses are connected improperly. Switching these inputs will correct the problem. This also applies for a negative pressure room showing positive pressure. Upon initial startup the room pressure monitor is set to monitor a single room with a negative pressure limit of 0.0000 inWC (0.000 Pa). Instructions on how to change this setting as well as other functions of the room pressure monitor are detailed later in this document.

3.3 Power Down Mode

The Room Pressure Monitor now has the ability to be turned off in the event that it is not being used. The administration menu now holds a "TURN OFF MONITOR" section which will ask the operator if they would like to turn off the monitor. Doing so will turn the display off and halt all pressure monitoring for the room. To start monitoring again, simply touch the screen and the system will resume normal operation. The Room Pressure Monitor's settings are retained when the Power Down mode is entered or in the event of a power failure. Therefore, there is no need to reconfigure the system if this new mode is entered or in the event of a power interruption.

4 MENU SCREENS

The pressure monitor settings may be accessed using the menu system. The menu system is comprised of a main menu screen and several sub screens. The main menu (shown on the right) is accessed by pushing the menu button on the main screen. The title of the menu is shown at the top. There are four submenu buttons in this menu screen which can be pushed to access the respective submenu. The BACK button is used for navigating to the previous menu. In an alarm condition, the STOP ALARM button can be found on the main menu screen. Pressing the STOP ALARM button will silence the audible alarm as well as any external alarms that are connected. The main screen will remain red until the differential pressure is within the user specified limit. The EXIT button is used for returning to the main screen and can be pressed at any level of the menu structure.
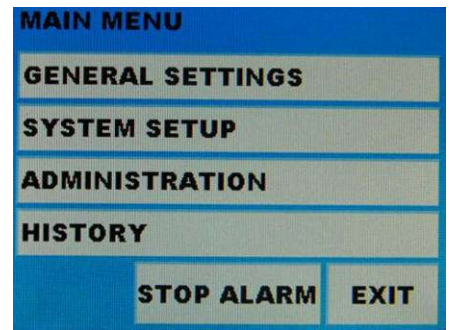
4.1 Number Input Screen

The operator uses the number input screen for all menu items that require a numerical input. In some instances, the menu item being set does not require the decimal button to be active. In these number input screens, the decimal point button will be disabled. The DEL button is used to remove the last character entered and can be pushed multiple times to clear the number entry. The OK button saves the number that has been entered by the operator and returns to the submenu screen. The EXIT button returns to the submenu, disregarding the user's input.

4.2 Option Select Screen

The option select screen is used for setting options in the menu. The options displayed will be based on the available options for the specific menu item. To select an option, press anywhere on the text or button of the option. The black dot will move to indicate which option is selected. The BACK button will return to the submenu screen without saving any changes. The SAVE button will save the selection and return to the submenu screen.
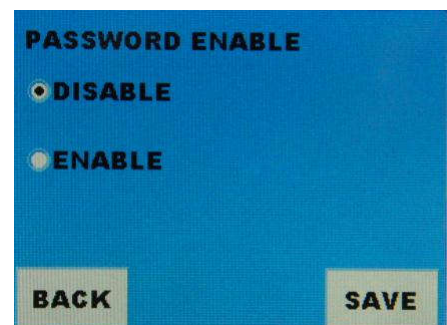
4.3 Confirmation Screen

The confirmation screen is used to alert the operator that they are entering a section of the menu which requires their attention. The screen will ask the operator to confirm with a "YES" or "NO" if they wish to continue. For example, when the operator selects the ERASE HISTORY menu item, the confirmation screen will read "ARE YOU SURE YOU WISH TO ERASE THE HISTORY ARCHIVE?" The "YES" button will proceed with the selected task. The "NO" button will return the operator to the previous submenu.

4.4 Date/Time Change Screen

The date change screen is used to change the date on the system. There is a setting for the DAY, MONTH and YEAR. The settings can be changed with the UP and DOWN buttons for each item. The SAVE button will save the date and exit back into the submenu. The BACK button will exit back to the submenu and disregard the user's input. Changing the time follows the same format as mentioned above. There is a setting for HOURS, MINUTES and SECONDS which are changed by the use of UP and DOWN buttons.

5 MENU STRUCTURE

The following chart outlines the menu structure of the features which can be modified in the system.

Main Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4
GENERAL SETTINGS	DATE/TIME	CHANGE DATE		
		CHANGE TIME		
	PASSWORDS	OPERATOR PASSWORD		
		ADMIN PASSWORD ENABLE		
		OPERATOR PASSWORD		
		OPERATOR PASSWORD ENABLE		
SYSTEM SETUP	PRESSURE SETTINGS	ROOM COUNT[1]		
		ROOM TYPES	ROOM A TYPE	
			ROOM B TYPE[1]	
		ROOM LIMITS	ROOM A LIMIT	
			ROOM B LIMIT[1]	
		ROOM ALTITUDE		
	REMOTE TEMP RH SETTINGS	TEMPURATURE LIMITS	TEMP. HIGH LIMIT	
			TEMP.LOW LIMIT	
		RELATIVE HUMIDITY LIMITS	RH. HIGH LIMIT	
			RH. LOW LIMIT	
		REMOTE TEMP RH 1 ENABLE		
		REMOTE TEMP RH 2 ENABLE[1]		
	ALARM SETTINGS	SILENCE DELAY		
		ALARM VOLUME		
		PRESSURE ALARMS	PRES. AUDIBLE ENABLE	
			PRES. ALARM DELAY	
		TEMP RH ALARMS	TEMP/RH AUDIBLE ENABLE	
			TEMP/RH ALARM DELAY	
	OTHER SETTINGS	USER INTERFACE	KEYPRESS BEEP	
			BRIGHTNESS	
			UNIT SETTINGS	PRESSURE UNITS
		INTERVAL RECORDING	PRESSURE INTERVAL	
			TEMP.RH INTERVAL	
		QUICK ROOM TYPE ENABLE		
		COMMUNICATION SETTINGS	BACNET SETTINGS	BACNET ENABLE
				BACNET BAUD RATE
				BACNET ADDRESS
				BACNET OBJ INST
			METASYS N2 SETTINGS	N2 ENABLE
				N2 ADDRESS

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[1] RPM-RT2 Only

ADMINISTRATION	ADVANCED SETTINGS	CALIBRATION	ZERO CALIBRATION	
		RESTORE FACTORY DEFAULT		
		FIRMWARE UPGRADE		
		USB LOAD/SAVE	SAVE SETTINGS TO USB	
			LOAD SETTINGS FROM USB	
			LOAD CUSTOM ROOM NAMES[1]	
	SYSTEM INFORMATION			
	TURN OFF MONITOR			
	PRESSURE SCALE	SCALE MAX		
		SCALE MIN		
HISTORY	VIEW HISTORY			
	DOWNLOAD HISTORY	DOWNLOAD ALL HISTORY		
		DOWNLOAD X DAYS		
	ERASE HISTORY			

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[1] RPM-RT2 Only

5.1 "GENERAL SETTINGS"

The general menu is used to change settings of the date/time and passwords.

5.1.1 "DATE/TIME"

- **"CHANGE DATE"**
  Allows the date (Year, Month, Date) to be set.

- **"CHANGE TIME"**
  Allows the time (Hours, Minutes, Seconds) to be set.

5.1.2 "PASSWORDS"

When enabled, a password prompt will appear before allowing access to various menus. Two types of passwords available; an administrator password and an operator password. The administrator password allows access to the main menu and all related submenus. The operator password will only allow access to the quick room type menu.

- **"ADMIN PASSWORD"**
  Allows a 4 digit administrator password to be set. You will be prompted to re-enter the password to confirm.

- **"ADMIN PASSWORD ENABLE"**
  Enable/disable the password prompt for access to the main menu.

- **"OPERATOR PASSWORD"**
  Allows a 4 digit operator password to be set. You will be prompted to re-enter the password to confirm.

- **"OPERATOR PASSWORD ENABLE"**
  Enable/disable the password prompt for access to the quick change.

5.2 "SYSTEM SETUP"

The system setup menu provides access to all of the options for configuring the way the pressure monitor functions.

5.2.1 "PRESSURE SETTINGS"

The pressure settings menu allows the operator to change the settings for measuring the differential pressure. Please note that ROOM B is only supported in model RPM-RT2

- **"ROOM COUNT"**
  Allows the operator to choose between monitoring the differential pressure of one or two rooms. Factory default is set to single room. Room count only appears on RPM-RT2.

- **"ROOM TYPES"**
  Sets the type of differential pressure (positive, negative) to be monitored for each room
  Options are: positive, negative, or unoccupied. Factory default is negative pressure.

- **"ROOM LIMITS"**
  Sets the pressure alarm limits for each of the two rooms. If the room type is negative, anything above the set pressure limit will cause the system to alarm. If the room type is positive anything below the set limit will cause the system to alarm.
  Range: -9.960 Pa (-0.0400 inWC) ~ 9.960 Pa (0.0400 inWC). Factory default is set to 0.0000 inWC.

- **"ROOM ALTITUDE"**
  Allows the altitude of the room(s) to be set; this allows the system to compensate for the altitude and helps improve sensor accuracy. Only 1000 ft. increments are accepted (i.e. 900 ft. is not valid). Range: 0 – 9000 ft. Factory default is 1000 ft.

5.2.2 "REMOTE TEMP RH SETTINGS"

This menu enables/disables and sets the limits for the temperature and relative humidity sensors .

- **"TEMPERATURE LIMITS"**
  Allows the upper and lower temperature limits to be set.

- **"RELATIVE HUMIDITY"**
  Allows the upper and lower relative humidity limits to be set.

- **"REMOTE TEMP RH 1 ENABLE"**
  Enables/disables the Temperature / Relative Humidity sensor on the main screen for room 1. The temperature/humidity will still be logged in the archive if interval recording is enabled.

- **"REMOTE TEMP RH 2 ENABLE"**
  Enables/disables the Temperature / Relative Humidity sensor on the main screen for room 2. The temperature/humidity will still be logged in the archive if interval recording is enabled.

5.2.3 "ALARM SETTINGS"

The Alarm menu will give access to the settings which pertain to alarm conditions.

- **"SILENCE DELAY"**
  When the silence button is pressed, the alarm will be muted for the duration set. The range of time is 0 – 300 seconds. Factory default is 60 seconds.

- **"ALARM VOLUME"**
  Allows the alarm volume to be set from 1 (low) to 4 (high). Factory default is set to 4.

- **"PRESSURE ALARMS"**

  - ♦ **PRES. AUDIBLE ENABLE -** Enable/disable the audible alarm when the pressure goes outside of the set limits.

  - ♦ **PRES. ALARM DELAY –** Sets the delay time for which the room pressure must remain out of range before an alarm is triggered. When the pressure is out of range, the display background immediately becomes yellow. If it stays out of range for this "Alarm Delay" period, the display background turns red and the alarm is triggered. The delay timer will reset every time the pressure returns to within the set limit. The range of time is 0 – 300 seconds. Factory default is set to 180 seconds.

- **"TEMP RH ALARMS"**

  - ♦ **TEMP/RH AUDIBLE ENABLE -** Enable/disable the audible alarm when the temperature/relative humidity goes outside of the set limits.

  - ♦ **TEMP/RH ALARM DELAY –** Sets the delay time for which the temperature and RH must remain out of range before an alarm is triggered. When the temperature or RH is out of range, the display background for the affected temperature and/or humidity window immediately becomes yellow. If it stays out of range for this "Alarm Delay" period, the display background turns red and the alarm is triggered. The delay timer will reset every time the pressure returns to within the set limit. The range of time is 1 – 8 hour. Factory default is set to 4 hours.

5.2.4 "OTHER SETTINGS"

- **"USER INTERFACE"**

    - **"KEYPRESS BEEP"**
    Enable/ disable beep upon button press. Factory default is set to enable.

    - **"BRIGHTNESS"**
    Allows the brightness of the display to be set. Factory default is set to 50%.

    - **"UNIT SETTINGS"**
    Allows the operator to change the units in which the pressure is displayed.
        - **"PRESSURE UNITS"**
            - ♦ **InWC** - Pressure displayed in Inches of Water Column (Factory Default)
            - ♦ **Pascal** - Pressure displayed in Pascal.
        - **"TEMPERATURE UNITS"**
            - ♦ **Fahrenheit** - Temperature displayed in degrees Fahrenheit (Factory Default)
            - ♦ **Celsius** – Temperature displayed in degrees Celsius

- **"INTERVAL RECORDING"**
Allows the user to configure time intervals at which the system automatically records the room parameters into the history log. The time, date, temperature, humidity and pressure reading are recorded into the log at the selected interval.

    - ♦ **PRESSURE INTERVAL** – Allows user to set time intervals at which room pressures are logged. The user can choose to disable this function or to set the recording interval to 5, 10, 15, 30 or 60 minutes.

    - ♦ **TEMP/RH INTERVAL** – Allows user to set time intervals at which temperature and RH are logged. The user can choose to disable this function or to set the recording interval to 1, 4, 8, 12 or 24 hour(s).

- **"QUICK ROOM TYPE ENABLE"**
Enables/disables the "quick room type" feature; this is a shortcut that allows the room type to be changed quickly without having to navigate the menu. It can be accessed by simply tapping on the meter background on the main screen.

- **"COMMUNICATION SETTINGS"**

   This menu contains settings for synchronization with a Remote Annunciator (RPM-DX only) and settings to configure BACnet and Metasys N2. Note that the BACnet and the N2 protocols cannot be used together. The user chooses only one or the other.

   - **"BACNET SETTINGS"**
      Contains the settings to configure BACnet

   - **"BACNET ENABLE"**
      Enables or disables BACnet on the room pressure monitor. (Automatically disables N2 if N2 protocol previously enabled)

   - **"BACNET BAUD RATE"**
      Allows the operator to assign a baud rate for the room pressure monitor to use. The baud rate must be the same as the rest of the BACnet network.

   - **"BACNET ADDRESS"**
      Allows the operator to set a MAC address. The address must be a unique number on the network between 1 and 127.

   - **"BACNET OBJ INST"**
      Allows the operator to set an object instance for the room pressure monitor. The object instance must be a unique number on the network between 1 and 4,194,303.

- **"METASYS N2 SETTINGS"**

   - **"N2 ENABLE"**
      Enables or disable N2 communications on the room pressure monitor. (Automatically disables BACnet if BACnet previously enabled)

   - **"N2 ADDRESS"**
      Allows operator to set the address of this node. The address must be a unique number on the network between 1 and 255.

5.3 "ADMINISTRATION"

The administration menu provides information, calibration, restoration, and upgrade functionality of the pressure monitor.

5.3.1 "ADVANCED SETTINGS"

The advanced settings menu contains sub menus that allow the operator to perform functions that are not typically used.

- **"CALIBRATION"**

Calibrate after applying zero pressure to all pressure inputs and waiting for the differential pressure to stabilize. The operator will be prompted to remove all pressure inputs and press a button to continue. The calibration will take place and will return to the zero calibration menu when completed.

- **"RESTORE FACTORY DEFAULT"**

Restore all settings to the factory default.

- **"FIRMWARE UPGRADE"**

Allows the device firmware to be upgraded via USB. The USB device must not be removed during firmware upgrade. If the upgrade is interrupted due to device removal, the system will not function. If this occurs, replace the USB device into the connector and wait for the unit to reload the firmware. Once the firmware is loaded the main display will appear. Firmware upgrades do not restore factory default settings. Check the "System Information" screen to verify the software version.

- **"USB LOAD AND SAVE"**

    - ♦ **SAVE SETTINGS TO USB** – Allows the current configurations and settings of the system to be saved to a USB drive.

    - ♦ **LOAD SETTINGS FROM USB** – Allows previously saved configurations and settings to be loaded into the system from a USB drive.

    - ♦ **LOAD CUSTOM ROOM NAMES**** – Allows custom room names to be loaded onto the device. To upload the room names to the RPM, a file named ROOMNAME.txt should be created on a computer. The user can enter names for each room (6 characters max) on the unit separated by a comma. The quotation marks should be included in the text, they will automatically be removed by the RPM. The text file is then transferred on a USB drive loaded to the room pressure monitor.

        The following are examples of a ROOMNAME.txt file:
         "ROOM 1","ROOM2"   RT2 room names will be set to: ROOM 1 and ROOM 2

        ** Feature Only Available on RPM-RT2 Models

5.3.2 "SYSTEM INFORMATION"

Displays the product name, revision, serial number, and date/time information of the RPM. These values are for information purposes only.

5.3.3 "TURN OFF MONITOR"

The Room Pressure Monitor has the ability to be turned off in the event that it is not being used. The administration menu now holds a "TURN OFF MONITOR" section which will ask the operator if they would like to turn off the monitor. Doing so will turn the display off and halt all pressure monitoring for the room. To start monitoring again, simply touch the screen and the system will resume normal operation. The Room Pressure Monitor's settings are retained when the Power Down mode is entered or in the event of a power failure. Therefore, there is no need to reconfigure the system if this new mode is entered or in the event of a power interruption.

5.3.4 "PRESSURE SCALE"

- **"SCALE MAX"**
  Allows the maximum value on the pressure meter scale to be set. Factory default is 0.040 inWC

- **"SCALE MIN"**
  Allows the minimum value on the pressure meter scale to be set. Factory default is -0.040 inWC

5.4 "HISTORY"

The history archive menu allows the operator to view, export and erase events logged by the system.

5.4.1 "VIEW HISTORY"

Allows the user to view and scroll through all logged events. Events are organized in chronological order.

5.4.2 "DOWNLOAD HISTORY"

This option allows for the export of the event logs in CSV format which can be viewed using any text based editor or a spreadsheet program. The operator will be prompted to plug in a USB flash drive to transfer the data. A file titled "ARCHIVE.CSV" will be loaded onto the USB drive and the operator will be returned to the previous menu when the download is complete. Do not remove the USB device until the download is complete. All pressures recorded in the file are displayed in inWC units.

- **"DOWNLOAD ALL HISTORY"**
  Downloads the entire logged history file.

- **"DOWNLOAD X DAYS"**
  Downloads the history file for X number of days from the current date.

5.4.3 "ERASE HISTORY"

This option allows the operator to erase all of the previously archived messages. A new entry will be added to the archive history stating that the history has been erased.

6 DETAILED OPERATION

This section presents a comprehensive description of the operation of the system.

6.1 Main Display

The main display of the pressure monitor is the pressure display. It contains the current pressure information for the area being monitored, a silence button (only displayed when audible alarm is enabled and the system is in alarm), and a menu button. If two rooms are present the display will show the current pressure for both rooms. Each room is identified by the input it is connected to, either ROOM A or ROOM B. The image in the bottom right hand corner shows the audible alarm status. The audible alarm image is present if the audible alarm is enabled, otherwise no image will appear. If the alarm has been stopped manually within the menu system, the image will have a red circle with a slash through it when the operator returns to the main display screen. If the quick change option is enabled, clicking anywhere on the pressure window will open up the setting to change the room type. If the operator password is enabled, the operator will be asked to enter the password before they are allowed to change the setting.
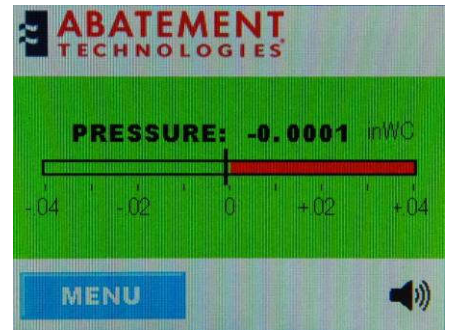
6.2 Current Pressure information

The differential pressure is displayed in two ways. The first way is a numerical representation in the center of the screen. The differential pressure will be displayed regardless of the room setup and will display the full range of pressures of the pressure monitor. The second differential pressure representation is a slider which gives a graphical display of the current differential pressure against the pressure limit. The pressure limit is marked by the bar's transition from green to red. If the system is disabled, the bar will be white. The cursor marks the current differential pressure along the slider.

6.3 Current Temperature/Humidity Information

The temperature and humidity is displayed on the screen along the top edge of the room's window. In the event that the connection to the remote sensor is lost, the current temperature will remain on the screen for 15 seconds before it is replaced with "- - -". If the alarm is enabled for the temperature/humidity, a lost connection will result in the system alarming.

6.4 Background Color

There are four different background colors representing the pressure monitor state. A description of each color is provided below.

Color	Description
Green	Differential pressure is within the pressure settings limit.
Yellow	Pre-alarm to signal that the differential pressure is outside of the set limit. The background will remain yellow until the differential pressure is once again within the set limit or the Alarm Delay time has passed.
Red	The system is in an alarm state. The background will remain red until the differential pressure is once again within the set limit.
Blue	The pressure monitor room type is set as unoccupied and there are no alarms active.

6.5 Menu Button

To access the menu, push the MENU button. By default, access to the menu system does not require a password. If the operator password option is enabled, a number screen will appear and you will be prompted for a password. If the password screen is left for 10 seconds or an incorrect password is entered, the system will return to the main screen.

6.6 Silence Button

If the audible alarm is enabled, pushing this button will silence any alarm conditions for the time allotted by the Silence Delay option. The silence button will only be visible on the main screen if the system is currently alarming and the audible alarm is enabled. The silence button will not turn off the external alarm if it is connected.

6.7 Alarm Condition

In the event of an alarm condition, the following events will occur:
- The background will immediately turn yellow upon the detection of a differential pressure outside the set limit for that specific room.
- If the alarm condition does not clear within the duration of the Alarm Delay setting, the Alarm Relay will activate enabling an optional external alarm if fitted. In addition, the background color will change to red, and the audible alarm will turn on (if it is enabled).
- If the SILENCE ALARM button is pushed, only the audible alarm will be disabled for the duration of the Silence Delay setting. The screen color and the Alarm Relay will continue to indicate the alarm condition. If both rooms are enabled and the other room goes into an alarm state, the audible alarm will be reset if the SILENCE ALARM button has been pushed.
- The alarm can be manually turned off by accessing the main menu and pushing the STOP ALARM button. This will turn off the Alarm Relay and disable both the audible alarm and external alarm. If both rooms are enabled and the other room goes into an alarm state the audible and external alarms will not turn on if the STOP ALARM button has been pushed.
- If changes have been made within the menu system when the alarm occurs, pressing the STOP ALARM button or EXIT button will prompt the operator to save changes before returning to the main display. If the operator selects YES after either button is pushed, the changes made will be saved and the alarm will be reset. If the operator selects NO after pressing the STOP ALARM button the changes will not be saved but the alarm will be stopped. If the operator selects NO after pressing the EXIT button the changes will not be saved and the system will still alarm.
- The background will still display red until the differential pressure for both rooms is within the set limit.
- If the differential pressure returns to within the set limit before the alarms have been manually turned off, the alarms will automatically be turned off
- The alarming for the temperature, humidity and pressures are all handled separately from each other. It is therefore possible that after one alarm has been silenced/disabled, another alarm may retrigger the alarm.

6.8 Zero Calibration

If there is no pressure applied to the system and the differential pressure is not 0.0000, the system must be calibrated. Zero calibration should be done on installation of the system. Subsequent calibration is necessary only on an annual basis.

To calibrate the system, insure that all pressure inputs are at the same pressure. This can be accomplished by removing the faceplate and disconnecting all pressure tubes if necessary. Wait until the differential pressure reading on the unit has stabilized. If the reading is between -0.0005 inWC (-0.013 Pascals) and +0.0005 inWC (+0.013 Pascals) at this time, no calibration is necessary. If the reading is outside of these limits, navigate to the zero calibration menu option and select zero calibration. Push YES to proceed with the zero calibration. Save the changes before returning to the main display by pressing EXIT and saving the changes.

6.9 BACnet Communication

The Room Pressure Monitor is equipped to run on a BACnet network as a MSTP Master. To setup the Room Pressure Monitor it must be first connected to the BACnet networking using the wiring diagram shown in section 2.6. Connect the network's positive line to the "RS485 N+" terminal, the negative line to the "RS485 N-" terminal and the ground line to the "REF – 100 Ohms to Ground" terminal. If required, a termination jumper can be inserted onto the jumper position J1 (located beside the RS485 screw terminals). The addition of the jumper will add a 120 ohm resistor between the RS485 N+ and RS485 N-lines. In the menu enable BACnet, and then setup the desired Baud Rate, MSTP Address and Object Instance of the RPM. The Room Pressure Monitor will now begin functioning as a BACnet Smart Sensor. Using a remote terminal you should be able to perform read requests for information from the objects listed in the table below. The Room Pressure Monitor only supports the reading of objects. Please refer to the Statement of Conformance for more information regarding the Room Pressure Monitor's BACnet capabilities.

The following table outlines the objects which are accessible via the BACnet network.

Object Type	Instance	Description	Values	Notes
Analog Input	1	Room A Pressure	+/- 0.1 INWC	-0.1 <= Pressure <= +0.1
Analog Input[1]	2	Room B Pressure	+/- 0.1 INWC	-0.1 <= Pressure <= +0.1
Analog Input	3	Temperature 1	0-210°F	Not available without remote sensor
Analog Input	4	Relative Humidity 1	0-100%RH	Not available without remote sensor
Analog Input[1]	5	Temperature 2	0-210°F	Not available without remote sensor
Analog Input[1]	6	Relative Humidity 2	0-100%RH	Not available without remote sensor
Analog Value	1	Room A Limit	+/- 0.04 INWC	
Analog Value[1]	2	Room B Limit	+/- 0.04 INWC	
Binary Value	1	Room A Out Of Limit	1 – YES / 0 – NO	Pressure out of limits. Does not depend on alarm delay
Binary Value	2	Room A Occupied	1 – YES / 0 – NO	
Binary Value	3	Room A Positive/Negative	1 – POS / 0 – NEG	Not Valid if Room is Unoccupied
Binary Value	4	Room A Alarm	1 – YES / 0 – NO	Pressure out of limit and alarm delay expired.
Binary Value[1]	5	Room B Out Of Limit	1 – YES / 0 – NO	Pressure out of limits. Does not depend on alarm delay
Binary Value[1]	6	Room B Occupied	1 – YES / 0 – NO	
Binary Value[1]	7	Room B Positive/Negative	1 – POS / 0 – NEG	Not Valid if Room is Unoccupied
Binary Value[1]	8	Room B Alarm	1 – YES / 0 – NO	Pressure out of limit and alarm delay expired.
Device	Set Via Menu	Device Identification	Various	Various parameters regarding the RPM

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[1] Not available on RPM-RT1

6.10 Johnson Controls Metasys N2 Communication

The Room Pressure Monitor is equipped to run on a N2 network as a slave. To setup the Room Pressure Monitor it must be first connected to the N2 networking using the wiring diagram shown in section 2.6. Connect the network's positive line to the "RS485 N+" terminal, the negative line to the "RS485 N-" terminal and the ground line to the "REF – 100 Ohms to Ground" terminal. If required, a termination jumper can be inserted onto the jumper position J1 (located beside the RS485 screw terminals). The addition of the jumper will add a 120 ohm resistor between the RS485 N+ and RS485 N- lines. In the menu enable N2, and then setup the N2 Address of the RPM. The Room Pressure Monitor will now begin functioning as an N2 Slave. Using a remote terminal you should be able to perform read requests for information from the objects listed in the table below. The Room Pressure Monitor only supports the reading of objects, the N2 COS (Change of State) and write features are not supported. The table below outlines the objects which are supported by the Room Pressure Monitor.

Object Type	Object Number	Description	Data Type	Notes
Analog Input	1	Room A Pressure	Float	+/-0.1 INWC
Analog Input[2]	2	Room B Pressure	Float	+/-0.1 INWC
Analog Input	3	Temperature 1	Float	0 – 210°F
Analog Input	4	Relative Humidity 1	Float	0 – 100%RH
Analog Input[1]	5	Temperature 2	Float	0 – 210°F
Analog Input[1]	6	Relative Humidity 2	Float	0 – 100%RH
Binary Output	1	Room A Out Of Limit	Bit	1 = Out Of Limit, 0 = In Limit
Binary Output	2	Room A Occupied	Bit	1 = Occupied, 0 = Not Occupied
Binary Output	3	Room A Pos/Neg	Bit	1 = Positive, 0 = Negative
Binary Output	4	Room A Alarm	Bit	1 = Alarming, 0 = No Alarm
Binary Output[1]	5	Room B Out Of Limit	Bit	1 = Out Of Limit, 0 = In Limit
Binary Output[1]	6	Room B Occupied	Bit	1 = Occupied, 0 = Not Occupied
Binary Output[1]	7	Room B Pos/Neg	Bit	1 = Positive, 0 = Negative
Binary Output[1]	8	Room B Alarm	Bit	1 = Alarming, 0 = No Alarm
Internal Float	1	Room A Limit	Float	+/-0.04 INWC
Internal Float[1]	2	Room B Limit	Float	+/-0.04 INWC

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[2] Not available on RPM-RT1

7 MAINTENANCE

The following outlines instructions on how to replace consumable components. Contact the manufacturer for replacement information.

There are no user serviceable parts internal to this unit. Maintenance consists only of Zero Calibration as recommended and replacement of external filters.

7.1 Filter Replacement

The inline filters should be used at all times while the pressure monitor is in operation. This will prevent any dust or moisture from damaging the internal sensors. Using a filter not specified by the manufacturer could result in delayed or incorrect differential pressure readings. Filter replacement is recommended to be done annually for very dirty environments. In normal, clean indoor environments, the filters can be used for up to 5 years.

7.2 Cleaning Display

To clean the TFT display use a soft, damp cloth to gently wipe away any dirt or oil. It is best to do this with the system turned off so that dirt and oil is easily identified on the black screen. Use a horizontal or vertical motion to wipe the display. After using the damp cloth, use a dry cloth to wipe away any traces of moisture that may be left on the display. Do not use chemical cleaners on the display. Such actions may cause permanent damage to the display.

8   CALIBRATION AND REPAIR SERVICES

Abatement Technologies Inc. (ATI) provides in-house services for calibration and repair of all pressure monitors purchased from ATI. Calibrations are traceable to the national institute of standards & technology (NIST). If you would like to recalibrate or recertify your pressure monitor, please call our customer service department at 800-634-9091(US) or 800-827-6443 (Canada) for scheduling. Typical turnaround time is approximately 3 weeks after receipt at ATI.

Non-warranty repairs will not be made without customer approval and a purchase order to cover repair charges.

Limited Warranty

All models of room differential pressure monitors sold by ATI are warranted for a period of 1 year against defects in materials and workmanship. Goods found by ATI to be defective or not to conform to specification shall upon return be repaired, replaced* or refunded (at ATI's discretion) without any additional charges provided that:

a. the product has not been subject to abuse, neglect, accident, incorrect power supply or installation wiring, improper installation/servicing or use in violation of instructions furnished by ATI;
b. the product has not been repaired or altered by anyone except ATI or its authorized service agencies;
c. the serial number has not been removed, defaced or otherwise changed;
d. examination by an authorized ATI service representative reveals a defect in materials or workmanship developed under normal installation, use and service;
e. ATI is notified in advance and the product is returned to ATI. ATI will pay return transportation charges on returned goods not exceeding the transportation charges applicable to shipment from original destination.

ATI does not warrant that the goods sold are merchantable or fit for any particular purpose. ATI makes no warranties other than as stated in this paragraph. All other warranties, guaranties, or representations, express or implied, by operation of law or otherwise, are expressly disclaimed. Returned goods which are found by ATI to be free from defect and to conform to specifications shall be held for Purchaser's shipping instructions, which instructions Purchaser shall furnish promptly upon request. **ATI's liability shall in no event extend beyond replacement, repair or refund of the purchase price and ATI shall not be liable under any circumstances for special, contingent or consequential damages, nor for loss, damages, or expenses directly or indirectly arising from the use of the goods, including without limitation, warehousing, labor, handling and service charges, die, equipment, or machine breakage, nor for costs, lost profits or loss of good will. The remedies set forth herein are exclusive.**

*ATI reserves the right to replace with factory refurbished units for goods returned beyond 90 days from date of purchase

9 PRESSURE MONITOR SPECIFICATIONS

Input voltage:	9-24V AC or DC
Max Power Consumption:	150 mA at max display brightness
Pressure Units Displayed:	Inches of Water Column (inWC), Pascal (Pa)
Range of Measurement:	+/- 0.10 inWC, +/- 25 Pa
Accuracy of Measurement:	+/- 3% Full Scale
Display:	3.5" 262K color TFT display, 320 x 240 resolution
Display Resolution:	0.0001 inWC, 0.025 Pa
Alarms:	Custom alarm set points from -0.0400 InWC (-9.964 Pa) to 0.0400 InWC (9.964 Pa) at a resolution of 0.0001 InWC (0.025 Pa)
Types of Alarms:	Audible internal speaker with sound pressure level of 85dB at 10 cm; display warning (yellow for pre-alarm, red for alarm)
Aux Alarm Connection:	Normally open and common; relay output rated at 2 amps @ 30 volts DC; no power is provided
Pressure Ports:	1/8" barbs for 1/8" ID tubing.
Burst Pressure:	Greater than 5 atmospheres
Operating Temperature:	41°F to 131°F (5°C to 55°C)
Storage Temperature:	- 22°F to 176°F (-30°C to 80°C)
Operating Humidity:	0% - 85% relative humidity (non-condensing)
Operating Altitude:	9000 feet maximum.
USB Port:	USB V1.0 type A for connecting USB flash drive
Data Type:	Data transmitted in CSV file via USB flash drive can be imported into any text based editor
Data Storage Capacity:	4 mega bits; >12000 logged events in non-volatile memory (no power or battery required)
Data Logging:	Date and time are shown with a logged event. Events are; alarm condition with current pressure for a specific room, system startup, alarm reset, configuration change, archive erased, and calibration
Internal Clock:	Powered by a lithium ion battery that provides years of clock operation when neither AC nor DC power is present
Physical Dimensions:	5.98"L x 4.02"W x 1.11"H
Weight:	0.5 lbs
Inline Filter:	10 micron Polypro HDPE inline filter with 1/8" barbed ends

10 REMOTE SENSOR SPECIFICATIONS

Operating Temperature:	-40°F to 176°F(-40°C to 80°C)*
Storage Temperature:	-40°F to 176°F (-40°C to 80°C)*
Operating Humidity:	0% to 95% relative humidity (non-condensing)*
Temperature Accuracy:	+/-0.7°F (+/-0.4°C), 14°F to 176°F (-10°C to 80°C)
Extended Temperature Accuracy:	+/-1.6°F (+/-0.9°C), -40°F to 176°F (-40°C to 80°C)
Relative Humidity Accuracy:	+/-4%, 0-80% relative humidity (non-condensing)
Ext. Relative Humidity Accuracy:	+/-5.5%, 80%-95% relative humidity (non-condensing)

*Temperature and humidity limits for the remote sensor exceed the specifications of the room pressure monitor.

Temperature and humidity limits for the room pressure monitor are listed above in section 9.