Sophisticated interfaces for controlling and monitoring critical environments
Contents

Introduction .......................................................................................................................... 1
Functionality Overview ......................................................................................................... 1
Feature Summary .................................................................................................................... 1
Product Options ..................................................................................................................... 1
Application ............................................................................................................................ 2
Primary Screens ................................................................................................................... 2
Main Screen .......................................................................................................................... 2
Background Colors (Main Screen) .......................................................................................... 3
Pressure Alarm ....................................................................................................................... 4
Password Protection .............................................................................................................. 5
Changing Modes .................................................................................................................... 5
Set Precautions ..................................................................................................................... 6
Clearing Functionality .......................................................................................................... 6
More Information Screen ...................................................................................................... 7
Administrative Screens ......................................................................................................... 8
Configuration ......................................................................................................................... 8
Primary and Secondary Room Setup .................................................................................... 9
More Information Setup Screen ........................................................................................... 10
Pressure Loop Control Setup Screen .................................................................................... 11
Mode Setup Screen .............................................................................................................. 12
Network Setup Screen ......................................................................................................... 13
BACnet Troubleshooting/Debug Screen .................................................................................... 14
BACnet Point Map .................................................................................................................. 15
Miscellaneous and Password Setup Screen ............................................................................ 16
Diagnostic Screen ................................................................................................................. 17
Installation ............................................................................................................................. 18
Parts Included ......................................................................................................................... 18
Installer Supplied/ Parts Not Included .................................................................................... 19
Optional Equipment ............................................................................................................. 19
Mounting and Wiring Details ................................................................................................ 19
Electrical Box Installation .................................................................................................... 20
Mounting of Pressure Transmitter/Controller ...................................................................... 21
Mounting of Room Static Pressure Pick-up Transmitter ...................................................... 22
Startup and Operation ........................................................................................................... 22
Wiring Network ...................................................................................................................... 22
Physical Network ................................................................................................................... 22
Power up ................................................................................................................................ 22
Controller I/O ......................................................................................................................... 23
Control Wiring ........................................................................................................................ 24
Confirming Pressure Transducer is Working ........................................................................ 24
Fast Acting Fail Safe Actuator Wiring ................................................................................... 25
Standard Acting Fail Safe Actuator Wiring .......................................................................... 25
Variable Frequency Drive Wiring ......................................................................................... 25
Contact Door Wiring ............................................................................................................ 26
RPM1/RPM2 & RPC1/RPC2 Wiring to MRM ........................................................................ 26
Master RPM/RPC Wiring to Slave RPM/RPC Wiring .............................................................. 26
Troubleshooting .................................................................................................................... 27
Recalibrating Touch Screen .................................................................................................. 27
General Steps to Solve Connectivity/Operational Issues ...................................................... 27
Warranty ................................................................................................................................ 28
Introduction

Thank you for purchasing the CRC Room Pressure Monitor (Model CRC-RPM) or Room Pressure Controller (Model CRC-RPC). The CRC-RPM and CRC-RPC product line offers a flexible and easy to use monitor and/or controller for critical spaces where proper pressurization is vital. The CRC-RPM and CRC-RPC incorporates a bright colorful touch LCD screen interface to display a room's pressure status along with its pressure reading accurate to 0.0001" Water Column. The CRC-RPM and CRC-RPC gives personnel a clear, accurate, and unambiguous indication of its environment and alarm status. Even though the CRC-RPM's and CRC-RPC's unique design allows for quick trouble-free set up, we suggest reading this guide before use. This guide will help you take full advantage of the function and performance of the RPM/RPC.

Functionality Overview

The Room Pressure Monitor (CRC-RPM) is designed to monitor (not control) up to two pressure relationships where proper pressurization is vital.

The Room Pressure Controller (CRC-RPC) is designed to monitor and control up to two pressure relationships where proper pressurization is vital. It has all of the functionality of the CRC-RPM, with additional hardware / software that allows for control of one or two pressure relationships.

2. Feature summary of the CRC-RPM and CRC-RPC:

- Monitor differential pressure of one or two rooms.
- Control differential pressure of one or two rooms (CRC-RPC only).
- Ability to display current value and set point of up to eight points – includes the ability to alarm points (visual and audible), mute alarms, and access for users to change set points.
- Clear indication of room status and usage
- Uses direct pressure measurement with industrial quality dead ended differential pressure transducer technology (accurate to 0.0001"WC).
- Can operate as a standalone device, part of a Critical Room Control complete space solution, and / or integrate with the Building Automation System.
- Fully integrated BACnet MS/TP communications
- Measures and displays differential pressure to 0.0001" Water Column
- Full color LCD touch screen with LED backlight
- Fully customizable mode naming – use the terminology that is familiar to your facility
- Display of room precautions (optional)
- Customizable screen color selection for pressurization mode

2.1 Primary Product Options:

- **CRC-RPM1** – Monitor the pressurization of one room (1 pressure transducer included)
- **CRC-RPM2** – Monitor the pressurization of two rooms (2 pressure transducers included)
- **CRC-RPC1** – Monitor and control the pressurization of one room (1 pressure transducer included)
- **CRC-RPC2** – Monitor and control the pressurization of two rooms (2 pressure transducer included)
3 Application: You will find the RPM/RPC wherever accurate and reliable pressure control and monitoring is critical - including:

1. Hospital: Isolation Rooms, Pharmacies, and Operating Rooms
2. Laboratories: Wet Chemistry and Open Bench
3. Animal Research facilities
4. Bio-Containment Laboratories
5. Clean Rooms and Manufacturing

Primary Screens

4. Main Screen:

4.1. Overview: The monitor’s “Main Screen” indicates the current mode of the space and appropriate graphic (up to four user defined modes). Located in the upper right and left corners the RPM/RPC will display up to two room pressure status icons (RPM1/RPC1 will show only one pressure status icon on upper right corner). The room icons will indicate pressure alarm status and current room pressure (current pressure value will slide out when icon is touched). The monitor will also display any precautions that have been selected for that space.
4.2. **Main Screen Color Options for Pressurized Mode**: The CRC-RPM/RPC allows the user to select what background color they would like to have appear on the main screen. Some infectious / isolation rooms where entering the space could be hazardous to personnel opt to have a RED background to stop users from entering, while operating rooms and other positive pressure environments tend to use a green or blue background to indicate that the room is in use.

**Background Colors Available:**

![Background Colors](image)

- **Red**: Symbolizing a RED background, indicating that the room is in use.
- **Green**: Representing a green background, used in operating rooms.
- **Blue**: Showing a blue background, typical in positive pressure environments.

These colors aid in quickly identifying the status and type of environment a user is in.
4.3. **Pressure Alarm**: When the current pressure reading for either the Primary Room OR Secondary Room goes outside of the pressure alarm high and low parameters, then the unit will go into pressure alarm and display which room is in pressure alarm. If an audible alarm delay (nuisance delay) is used - then the "Loss of Pressure" screen with an amber background will be displayed until the timer runs out and the unit goes into pressure alarm (unless room pressurization is restored – in which case the unit will go back to its normal pressure indication).

It is important to note that the RPM’s / RPC’s pressure alarm is **ONLY** active when in a pressure mode (i.e. POSITIVE PRESSURE Mode, and CLEARING Mode). Pressure alarms are not active while in the non-pressurized modes (i.e. VACANT, CLEANING, and OCCUPIED – NON ISO Modes).
4.4. **Password Protection:** The CRC-RPM/RPC is divided into two distinct password protected areas / tiers. The first password is for general staff usage (nurses, technicians, etc.) and gives access to change the unit’s mode. The second tier is for engineers / installers and gives access to the administrative menu for configuring this device.

4.5. **Mode Change:**

User can select one of five modes (mode text is fully customizable via admin menu):

- **Pressurized Mode**
- **No Pressure Mode**
- **Cleaning Mode**
- **Vacant Mode**

- **Clearing** (This mode is not selectable. The clearing mode is enabled / configured from the admin menu. When enabled, the Clearing mode will be active for a period of time between the changeover from a pressurized mode to a non-pressurized mode (i.e. Negative Pressure to Vacant Mode).)
Available Modes:

4.6. Precautions (optional):

A user can elect to display or not display a precaution on the main screen. Precaution selection is located on the Change Mode screen.

Options include:

- **AIRBORNE** (displays "AIRBORNE PRECAUTIONS" on main screen)
- **DROPLET** (displays "DROPLET PRECAUTIONS" on main screen)
- **CONTACT** (displays "CONTACT PRECAUTIONS" on main screen)
- **STANDARD** (displays "STANDARD PRECAUTIONS" on main screen)
- **NONE** (displays "NO PRECAUTIONS" on main screen)
- **HIDE TEXT** (hides all precaution text on main screen)

4.7. Clearing Function (optional):

The CRC- RPM / RPC has the ability to automate the clearing / purging of a pressurized room (e.g. infectious isolation room). When personnel change this unit from a Pressurized mode to a non-pressurized mode, the unit will go into CLEARING mode for the time configured in the administrative menu. This is an optional feature that can be turned off within the administrative menu.

**NOTE:** Pressure Alarms are still active during clearing mode.

The CRC-RPM/RPC allows staff to access additional information, alarms and make set point changes. (More Info points available via network only)

**MAIN SCREEN**

TOUCH anywhere on Main Screen to bring up MODE and MORE INFO button

Press the “MORE INFO” button to access the More Info Screen

NOTE: If one or more of the points on the secondary screen is in alarm or has been muted, then the “MORE INFO” button will look like this:

**MORE INFO SCREEN**

Primary Room Name

Status Icons:  
- = N/A  
- = OK  
- = Audible Alarm  
- = Alarm (Mute)

Secondary Room Name

Set Point Adjustment Icon. Only shows if Set Point Adjustment is enabled in the Admin Menu

**SET POINT CHANGE**

Increase / Decrease set point buttons

Click “APPLY” button to save Set Point changes

Click “CANCEL” button to cancel Set Point changes
Administrative Screens

5. Configuration of the CRC-RPM/RPC / Administrative Menu

5.1. The "Administration Menu" lists all of the functionality that a user is able to configure on the CRC-RPM/RPC. The administrative menu is accessed from the main menu. The administration menu requires the user to enter a password (Password: 9644) to gain access.

- Primary Room setup: used to configure primary pressure relationship, room name, alarms and “More Info” set up.
- Second Room Setup (RPM2/RPC2 Only): used to configure secondary pressure relationship, room name, alarms and “More Info” set up.
- Control Setup (RPC1/RPC2 Only): access to primary and secondary room control loops and air valve control action.
- Mode Text Setup: used to input and change names of user selectable modes.
- Network Setup: used to set up BACnet communication parameters.
- General Setup: used for setting password, display units (“WC or Pa), Display dead band and clearing time.
- I/O Diagnostics: Visual indication and testing of controller inputs and outputs.
- Factory Reset: restores original factory settings
- Restart-touch calib: Restarts the controller to access the touch screen calibration
5.2. Primary and Secondary Room Setup (*Secondary Room" setup is identical)  
*Secondary room not available on RPM1 and RPC1

**PRESSURE INPUT:** Signal from the Pressure Sensor  
- **Network**  
- AI 0-5v, 0-10v  
- AI 1-5v, 2-10v  
- AI 4-20mA  
- **Not Used** (will hide Room Pressure Icon on front screen and disable alarm parameters)

**ISO Set Point:** Value that the RPC1 or RPC2 use to control pressure when in ISO and Clearing Mode (via PID loop). Also used by Alarm High / Low to calculate pressure alarm.

**ALARM TRIGGER:**  
- **Local:** Uses alarm high / low below as an alarm range  
- **Network:** Pressure Alarm triggered via BACnet Point

**ROOM NAME:** Text used for the room icon on the Main Screen

**ALARM DELAY:** The number of seconds of delay before the audible pressure alarm will sound. "Off" will turn off the audible pressure alarm.

**OFFSET (Pressure):** Adds to or subtracts from the room's pressure readout.

**ZERO (Pressure):** Automatically enters a value for OFFSET by calculating current pressure readout as zero or no pressure.

**NO ISO SET POINT:** Value that the RPC1 and RPC2 use to control pressure when in Vacant, Non ISO, and Cleaning Mode (via PID loop).

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*Note: If you are using the door contact feature: When the door is open the audible alarm delay will be active. If the door is closed the audible alarm delay will be inactive and an audible alarm will sound immediately whenever pressure is lost.*
6. More Information setup screen (Secondary room is identical):

6.1 Access to More Information setup is located on the room setup screen
7. **Pressure Loop Control Set Up** (CRC-RPC1 & 2 only)

~~~

**P Gain**: *(Proportional Multiplier)* This value is the proportional multiplier which effects how closely / sharply the control signal (signal output to the air control device) will react to a change in pressure.

**I Gain**: *(Integral Multiplier)* This value is the integral multiplier which effects how closely / sharply the control signal (signal output to the air control device) will react to an overshooting of the pressure set point.

!!! **Important**, Please note: setting the proportional or integral value too high will cause this device to “Hunt” or oscillate around the set point. Setting these values too low will cause this device to react too slowly to changes in room pressure.

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8. **Mode Set Up** (Unit includes five (5) modes)

- **Custom Text**: Facilities can enter custom text labels for each mode (up to 19 characters). Unused modes can be turned off / hidden by clearing the text.

Mode Matrix below outlines user defined verbiage, isolation status, alarm condition, Screen Color and associated graphic for each of the 5 modes.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Verbiage</th>
<th>Pressurization</th>
<th>Alarm Active</th>
<th>Screen Color</th>
<th>Graphic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Text</td>
<td>User Defined</td>
<td>Iso Set Point</td>
<td>Yes</td>
<td>Green, Red, Blue</td>
<td>Stop Hand</td>
</tr>
<tr>
<td>Clearing Text</td>
<td>User Defined</td>
<td>Iso Set Point</td>
<td>Yes</td>
<td>Yellow</td>
<td>Caution</td>
</tr>
<tr>
<td>To Be Cleaned</td>
<td>User Defined</td>
<td>Iso Set Point</td>
<td>Yes</td>
<td>Grey</td>
<td>Broom</td>
</tr>
<tr>
<td>No Pressure Occ</td>
<td>User Defined</td>
<td>Non-Iso Set Point</td>
<td>No</td>
<td>Green</td>
<td>Man in Bed</td>
</tr>
<tr>
<td>Vacant</td>
<td>User Defined</td>
<td>Non-Iso Set Point</td>
<td>No</td>
<td>Blue</td>
<td>Empty bed</td>
</tr>
</tbody>
</table>

**5 Modes** (Health care icons shown):

- **Mode: Positive Pressure**
- **Mode: Clearing**
- **Mode: Occupied (Non ISO)**
- **Mode: To Be Cleaned**
- **Mode: Vacant**
9. **Network Set Up - BACnet MS/TP** (optional):

For BACnet communications over a three wire RS 485 trunk, enter the appropriate network parameters for this device:

- Baud Rates: 9600, 19,200, 38,400, 57,600, 76,800, 115,200
- MAC Address: 0 - 254
- Instance ID: 1 - 4,194,304

**Debug Info**: If selected, this feature will display network traffic and communication info on the main screen.

**Configure as a token passing device or as a slave device**: If the device's MAC Address is set between 0 and 127, it is configured as a token passing device – which enables "Dynamic Binding", response to "Who Is" requests, and participation in token passing.

Setting this device's Slave Address between 126 and 254 will configure this device as a dedicated slave device which will greatly reduce network overhead / traffic, but requires the device NOT to support "Dynamic Binding", respond to "Who Is" requests, or participate in token passing.
9.1 **BACnet Trouble Shooting / Debug Screen:**

The following section gives a brief overview of the network "Debug Info" that can be selected to show on the front screen of the CRC-RPM / RPC.

- **Network Traffic**: This number will increase if there is any network traffic regardless if this unit's BAUD rate is correct. If this number is NOT increasing, then there is no traffic on the network or the unit is not connected to the network.

- **M In (Messages In)**: This number will increase when this unit receives a message addressed specifically to itself.

- **S ACK (Simple Acknowledgement)**: This number increases as this unit responds to requests to WRITE points.

- **C ACK (Complex Acknowledgement)**: This number increases as this unit responds to requests to READ points.

- **M Sent (Messages Sent)**: This number increases when this unit sends out a message (including passing a token).

- **Who Is**: This number will increase when this unit receives a "who is" request that is broadcasted to every device on its bus.

- **Who Is (R) (Ranged Who Is)**: This number will increase when this unit receives a "who is" request for a specific range of Instance IDs.

- **I Am**: This number increases when this unit responds to a Who Is request.

- **Token**: This number increases when this unit receives and passes a token.

- **Framing Errors or Break Errors**: An increase in this number typically indicates that there is noise on the trunk.
9.2 BACnet Point Map:

### ANALOG VALUES

#### General
- **AV 0**: Analog Input 1, float, Read Only (0-100%)
- **AV 1**: Analog Input 2, float, Read Only (0-100%)
- **AV 2**: Analog Input 3, float, Read Only (0-100%)
- **AV 3**: Analog Input 4, float, Read Only (0-100%)

#### Primary Room
- **AV 4**: Current DP *, Float, Read / Write, Inches of water column / Pascals
- **AV 5**: DP Status *, Int, Read / Write, 0 = normal, 1 = loss of pressure, 2 = alarm
- **AV 6**: Iso Set Point *, float, Read / Write, Inches of water column / Pascals
- **AV 7**: Non - Iso Set Point *, float, Read / Write, Inches of water column / Pascals
- **AV 8**: Sensor High, float, Read Only, Inches of water column / Pascals
- **AV 9**: Sensor Low, float, Read Only, Inches of water column / Pascals
- **AV 10**: Alarm High, float, Read Only, Inches of water column / Pascals
- **AV 11**: Alarm Low, float, Read Only, Inches of water column / Pascals
- **AV 48**: Pressure Offset, float, Read Only

#### Secondary Room
- **AV 12**: Current DP *, Float, Read / Write, Inches of water column / Pascals
- **AV 13**: DP Status *, Int, Read / Write, 0 = normal, 1 = loss of pressure, 2 = alarm
- **AV 14**: Iso Set Point *, float, Read / Write, Inches of water column / Pascals
- **AV 15**: Non - Iso Set Point *, float, Read / Write, Inches of water column / Pascals
- **AV 16**: Sensor High, float, Read Only, Inches of water column / Pascals
- **AV 17**: Sensor Low, float, Read Only, Inches of water column / Pascals
- **AV 18**: Alarm High, float, Read Only, Inches of water column / Pascals
- **AV 19**: Alarm Low, float, Read Only, Inches of water column / Pascals
- **AV 49**: Pressure Offset, float, Read Only

#### Room General
- **AV 20**: Current Mode, Int, Read / Write, 1 = Iso, 2 = clearing, 3 = cleaning, 4 = non iso, 5 = vacant
- **AV 21**: Display Units, Int, Read Only, 1 = "WC, 2 = PA
- **AV 22**: Clearing Time, int, Read Only, Minutes
- **AV 23**: Clearing Time Left, int, Read Only, Seconds

#### More Info - Primary
- **AV 24**: Point 1 Current Value *, Float, Read / Write
- **AV 25**: Point 2 Current Value *, Float, Read / Write
- **AV 26**: Point 3 Current Value *, Float, Read / Write
- **AV 27**: Point 4 Current Value *, Float, Read / Write
- **AV 28**: Point 1 Set Point *, Float, Read / Write
- **AV 29**: Point 2 Set Point *, Float, Read / Write
- **AV 30**: Point 3 Set Point *, Float, Read / Write
- **AV 31**: Point 4 Set Point *, Float, Read / Write
- **AV 32**: Point 1 Alarm Status *, Int, Read / Write, 0 = Not used (Grey), 1 = OK (green), 2 = Audible ALARM (red), 3 = Muted Alarm (red with white strip)
- **AV 33**: Point 2 Alarm Status *, Int, Read / Write, 0 = Not used (Grey), 1 = OK (green), 2 = Audible ALARM (red), 3 = Muted Alarm (red with white strip)
- **AV 34**: Point 3 Alarm Status *, Int, Read / Write, 0 = Not used (Grey), 1 = OK (green), 2 = Audible ALARM (red), 3 = Muted Alarm (red with white strip)
- **AV 35**: Point 4 Alarm Status *, Int, Read / Write, 0 = Not used (Grey), 1 = OK (green), 2 = Audible ALARM (red), 3 = Muted Alarm (red with white strip)
9.2 BACnet Point Map (continued):

### More Info - Secondary

| AV 36 | Point 1 Current Value * | Float | Read / Write |
| AV 37 | Point 2 Current Value * | Float | Read / Write |
| AV 38 | Point 3 Current Value * | Float | Read / Write |
| AV 39 | Point 4 Current Value * | Float | Read / Write |
| AV 40 | Point 1 Set Point * | Float | Read / Write |
| AV 41 | Point 2 Set Point * | Float | Read / Write |
| AV 42 | Point 3 Set Point * | Float | Read / Write |
| AV 43 | Point 4 Set Point * | Float | Read / Write |

| AV 44 | Point 1 Alarm Status * | Int | Read / Write |
| AV 45 | Point 2 Alarm Status * | Int | Read / Write |
| AV 46 | Point 3 Alarm Status * | Int | Read / Write |
| AV 47 | Point 4 Alarm Status * | Int | Read / Write |

### Additional Points

| AV 50 | Current Precaution | Int | Read / Write |

* Does not get saved to EEPROM - values revert to values entered from screen when unit’s power is cycled (turned off/on)

### Binary Values

| BV 0 | Digital In 1 | Read Only |
| BV 1 | Digital In 2 | Read Only |
| BV 2 | Digital In 3 | Read Only |
| BV 3 | Digital In 4 | Read Only |

10. Miscellaneous and Password Setup:

- **Display Deadband**: Reduces or eliminates small fluctuations in the differential pressure display. **Note**: Used if very small changes in differential pressure confuse or cause undue concern.

- **Staff Password**: Allows the user to change the password to access the Staff/Main Menu. If the password is set to blank, the monitor will not prompt the user for password. Password can be 0 to 4 numerical characters.

- **Clearing Time**: Set in minutes how long the display will indicate clearing screen. **Note**: If time is set to “OFF” the monitor will bypass the clearing mode.

- **Dim Delay**: Set in minutes the time since last touch or mode change the monitor will automatically dim the screen. If set to off screen will not dim.

- **Precautions**: Turns On/Off the ability to show “Precautions” on the main screen.

- **Dim Percent**: Percent brightness of the screen when dimming feature is activated.
11. **Diagnostic Screen**: This screen allows the installer to easily trouble shoot connections to the CRC-RPM / RPC device. This screen visually shows the incoming signal for all analog and digital inputs, and allows the user to set individual Analog outputs or relays. The diagnostic screen also displays total controller run time. This utility screen bypasses control functions that influence the unit’s I/Os (i.e. PID signal output will not be functional).

- **Run Time**
  Run time displays the total time that the unit has been powered in HOURS:MINUTES:SECONDS:MILLISECONDS - Run time resets on power loss

- **Analog Input**
  Displays associated Analog In (AIN1 thru 4) in bar form based on physical jumper inputs. IMPORTANT NOTE: our unit reads the full range of a mA signal – so receiving 10mA for a 4-20 signal will result in reading of 50%.

- **Analog Output**
  Move the slider(s) up or down to vary the signal output. The value (in percentage of total signal output) will be displayed at the bottom of the slider in red.

- **Digital Input**
  Indicates the status of Digital Inputs (DI-1 thru 4).

- **Digital Output**
  User can open or close a relay by touching any of the Digital Output buttons.
Installation

To simplify installation and to protect the LCD during construction activities, the CRC-RPM/RPC 'rough in' components are packaged separately from the LCD screen.

12.1 Typical rough in work consists of the following:

1. Mount 1 single gang electrical box for the LCD screen on wall next to entry door (Approx. 52” from floor)

2. Mount 2 single gang electrical boxes for the pressure pickup plates – one set per room (if two rooms are being monitored – then 4 single gang boxes will need to be installed for the 4 pressure pickup plates). Wall or ceiling mounting acceptable.

3. Mount controller enclosure (8” x 8” x 4”). *Must be mounted less than 20’ from LCD screen.

4. Run power (24VAC) 18AWG to controller enclosure.

5. Run ¾” plenum rated pneumatic tubing from pressure pickup plates to controller enclosure. *Pickup plates can be located up to 200’ from pressure transducer.

6. Install pressure pickup plates.

7. Run RJ45 cable from controller enclosure to Single gang electrical box for LCD screen.

8. Run additional wires as needed (network, signal integration to other devices / BAS, etc.)

12.2 Installation notes:

- Power draw is 18VA max. (0.75amps at 24VAC)
- Power to Room Pressure Monitors/Controllers should be isolated
- Monitors/Controllers should have dedicated circuit
- 22 ga. stranded wire is preferred for installation
- Do not run wiring near electrical interference
- Spare wires and/or shield should be wrapped / insulated to eliminate contact with circuits
- Do not share common supply power and I/O between different manufacturers
- Follow all local and national electrical codes

12.3 Parts included with CRC-RPM1 and CRC-RPC1:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>CRC-RPM or CRC-RPC - LCD w/Faceplate</td>
</tr>
<tr>
<td>(1)</td>
<td>CRC-RPM or CRC-RPC – Control Unit</td>
</tr>
<tr>
<td>(1)</td>
<td>CRC-MB Room Monitor Mounting Bracket</td>
</tr>
<tr>
<td>(1)</td>
<td>CRC-DPT Differential Pressure Transmitter</td>
</tr>
<tr>
<td>(1)</td>
<td>CRC-RJ45 Crossover Cable</td>
</tr>
<tr>
<td>(2)</td>
<td>CRC-RSP Room Static Pick-up Plates</td>
</tr>
</tbody>
</table>
12.4 Parts included with CRC-RPM2 and CRC-RPC2:

**Quantity:**
- (1) CRC-RPM or CRC-RPC - LCD w/Faceplate
- (1) CRC-RPM or CRC-RPC – Control Unit
- (1) CRC-MB Room Monitor Mounting Bracket
- (2) CRC-DPT Differential Pressure Transmitter
- (1) CRC-RJ12 Crossover Cable
- (4) CRC-RSP Room Static Pick-up Plates

12.5 Installer supplied parts (not included):

- (1) Double gang electrical box with appropriate mud ring (Sheet Rock Application) or
- (1) Single gang Masonry electrical box for block wall installation
- (2) or (4) Single gang electrical boxes (Pressure Pick-up Optional)
  - Power (18 AWG recommended)
  - Signal Wire (22AWG recommended)
  - Plenum rated fire retardant 0.25” polyethylene pneumatic tubing.

12.6 Optional Equipment:

**Quantity:**
- (1) CRC-DC Door Contact
- (1) CRC-MRM Multiple Room Monitor (Supports up to four rooms)
- (1) CRC-RA Remote Annunciator (Single Room)
- (1 OR 2) CRC-CLV Closed Loop Valve(s)

12.7 Mounting and Wiring Details:

12.7.1 Installation

The CRC-RPM/RPC is a two part system designed to reduce installation costs and eliminate problems that occur when wiring and pneumatic tubing have to be run down a wall. The two components are the monitor and the pressure transmitter/controller (CRC-RPM/RPC and CRC-DPT/CONT)

12.7.2 Mounting of the monitor (CRC-RPM/RPC):

The CRC-RPM/RPC and associated back plate (CRC-MB) is designed to be mounted directly to the wall or a standard electrical box and plaster ring. The electrical box and plaster ring should be mounted flush relative to the face of the wall. The electrical box must be rotated 90° from conventional mounting. The mounting bracket (MB) should be attached to the plaster ring and the monitor (RPM/RPC) enclosure slid down over mounting bracket and screwed in from the bottom.

The CRC-RPM/RPC will receive a single RJ45 cable from the CRC-CONT/DPT.
12.7.3 Option 1: Double gang electrical box with appropriate mud ring (Sheet Rock Application)

- Dual Gang electrical box (Raco 232)
- Dual Gang mud ring: 5/8” sheetrock (Raco 8768) ½” sheetrock (Raco 8837)
- CRC-RPM/RPC mounting bracket
- CRC RPM / RPC LCD Monitor

12.7.4 Option 2: Single Gang Masonry electrical box for block wall installation

- Single Gang Masonry box: (Raco 690) or (Raco cast 5323-0 Single Gang Weatherproof)
- CRC-RPM/RPC mounting bracket
- CRC RPM / RPC LCD Monitor
- CRC-RPM/ RPC set screw
12.8 Mounting of pressure transmitter/controller (CRC-DPT/CONT)

12.8.1 The CRC-DPT/CONT is designed to be mounted remote from monitor (typically above the ceiling).

12.8.2 The CRC-DPT/CONT is powered by 24VAC. Pneumatic tubing (¼") will be run from the differential pressure transmitter to the pressure pick-up plates (CRC-RST) - one is located in the controlled space and one is located in the reference space. The high port on the CRC-DPT is connected to the controlled space CRC-RST and the low port is connected to the reference space CRC-RST. The CRC-DPT/CONT will have a single RJ45 cable run to the CRC-RPM/RPC LCD Monitor.
12.9 **Mounting of Room Static Pressure Pick-up Transmitter (CRC-RST)**

The RST is designed to mount on a single gang electrical box. The RST can be wall or ceiling mounted. The RST will be connected to the CRC-DPT Differential Pressure Transmitter located in CRC-DPT/CONT enclosure with ¼” pneumatic tubing.

12.10 **Startup and Operation**

The CRC-RPM/RPC uses an intuitive touch screen interface. The monitor is supplied with a factory default configuration. The user will use the touch screen to make any field specific modifications.

**Wiring Network**

13.1 **Overview**

The CRC-RPM/RPC network interface is used to communicate parameters / settings, sensor readings (analog and digital input signals), and room conditions that the device is reading to external systems and devices (i.e. Building Automation Systems, routers, etc.). The network interface is also used to set / write values within the device (i.e.; temperature and humidity readings), and control parameters (i.e. remote silencing an audible alarm, and changing pressure set point).

13.2 **Physical Network**

The Room Pressure Monitor comes with integrated RS485 network capabilities. Connection to the RS485 requires a three wire bus consisting of a positive, negative, and ground / common wire. Typically, devices on a RS485 network are a series circuit or “Daisy-Chained” together.

An MS/TP EIA-485 network should use shielded, twisted pair cable with characteristic impedance between 100 and 130 ohms. Distributed capacitance between conductors should be less than 100pf per meter. Foil and braided shields are acceptable. The maximum recommended length of an MS/TP segment is 4,000 feet with AWG 18. The maximum number of nodes per segment is 32. An MS/TP EIA-485 network should have no T connections. A termination of 20ohms +5% should be connected at each of the two ends of the segment medium. No other terminations should be used at intermediate nodes.

13.3 **Power up**

When power is applied you first see the welcome screen and the main screen will shortly follow.
**Controller I/O**

14. **Relays and Digital Inputs:**

<table>
<thead>
<tr>
<th>Relay</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLY1</td>
<td>Pressure Alarm Status 1</td>
</tr>
<tr>
<td>RLY1</td>
<td>Pressure Alarm Status 2</td>
</tr>
<tr>
<td>RLY2</td>
<td>Isolation/Non-Isolation Status</td>
</tr>
<tr>
<td>RLY3</td>
<td>Door Contact 1</td>
</tr>
<tr>
<td>RLY3/4</td>
<td>Door Contact 2</td>
</tr>
<tr>
<td>RLY4</td>
<td>Audible Alarm Silence</td>
</tr>
<tr>
<td>DIN1</td>
<td>Mode Change in</td>
</tr>
<tr>
<td>DIN2</td>
<td>Differential Pressure 2</td>
</tr>
<tr>
<td>GND</td>
<td>Differential Pressure 1</td>
</tr>
<tr>
<td>DIN3</td>
<td>Exhaust/Supply PID 1 0-10V</td>
</tr>
<tr>
<td>DIN4</td>
<td>Exhaust/Supply PID 2 or mode out to RPM</td>
</tr>
<tr>
<td>V+</td>
<td>Pressure 2 to BAS 2-10V (RPC2 ONLY)</td>
</tr>
<tr>
<td>GND</td>
<td>Pressure 1 to BAS 2-10V</td>
</tr>
</tbody>
</table>

15. **Analog Inputs and Outputs:**

<table>
<thead>
<tr>
<th>Input</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIN4</td>
<td>Mode Change in</td>
</tr>
<tr>
<td>AIN3</td>
<td>Differential Pressure 2 (RPM2 &amp; RPC2)</td>
</tr>
<tr>
<td>GND</td>
<td>Differential Pressure 1</td>
</tr>
<tr>
<td>AIN2</td>
<td>Exhaust/Supply PID 2 or mode out to RPM</td>
</tr>
<tr>
<td>AIN1</td>
<td>Exhaust/Supply PID 1 0-10V</td>
</tr>
<tr>
<td>AOUT4</td>
<td>Pressure 2 to BAS 2-10V (RPC2 ONLY)</td>
</tr>
<tr>
<td>AOUT3</td>
<td>Pressure 1 to BAS 2-10V</td>
</tr>
<tr>
<td>AGND</td>
<td></td>
</tr>
</tbody>
</table>

16. **Power and Communication:**

<table>
<thead>
<tr>
<th>Power</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24V IN</td>
<td>24VAC</td>
</tr>
<tr>
<td>24V IN</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>RS 485 Network connection</td>
</tr>
</tbody>
</table>
17. Control Wiring:

17.1 Transducer Wiring:

**RPM1/RPM2 & RPC1/RPC2 Connection to Primary Room Differential Pressure Transducer (CRC-DPT)**

```
CRC-RPM1(2)/RPC1(2) CONTROLLER I/O
```

```
CRC-DPT
```

**RPM2/RPC2 Connection to Secondary Room Differential Pressure Transducer (CRC-DPT)**

```
CRC-RPM2/RPC2 CONTROLLER I/O
```

```
CRC-DPT
```

Confirming Pressure Transducer is working

- Confirm that Multimeter is set to read Amps DC
- Confirm that leads are inserted into the "Com" (Common) and "A" (Amps) port
- Confirm that Multimeter is connected in SERIES with CRC-RPM/Cs AIN0 and "-" of pressure transducer
- Confirm that the "Hi" and "Low" ports are shunted (connected) with a 1/4" tube
17.2 Fast acting fail safe actuator wiring:

**RPC1/RPC2 Primary Room Pressure control connection to fast acting actuator (CRC-ACT)**

24 Volt Power Supply

---

24 VAC

---

**RPC2 Secondary Room Pressure control connection to fast acting actuator (CRC-ACT)**

24 Volt Power Supply

---

24 VAC

---

17.3 Standard acting fail safe actuator wiring:

**RPC1/RPC2 Primary Room Pressure control connection to standard acting actuator (CRC-ACT)**

24 Volt Power Supply

---

24 VAC

---

**RPC2 Secondary Room Pressure control connection to standard acting actuator (CRC-ACT)**

24 Volt Power Supply

---

24 VAC

---
17.4 Variable Frequency Drive wiring:

**RPC1/RPC2 Primary Room Pressure Control Connection to Variable Frequency Drive**

17.5 Door Contact wiring:

**RPM1/RPM2 & RPC1/RPC2 Primary Room Connection to Door Contact (CRC-DC)**

**RPM2 Secondary Room Connection to Door Contact (CRC-DC)**

17.6 RPM1/RPM2 & RPC1/RPC2 wiring to MRM:

**RPM1(2)/RPC1(2) Connection to MRM**

17.7 Master RPM/RPC wiring to slave RPM/RPC wiring:

**RPM1(2)/RPC1(2) Master Connection to RPM/RPC Slave**
Troubleshooting

Recalibrating Touch Screen

Sometimes when installing the unit, the installer will touch the screen on initial power up which may cause the screen’s touch calibration to misalign. If the touch sensor does not register the correct position of the area being touched (i.e. unit beeps when touching a button, but the button does not seem to act as if it were being pressed), the user must recalibrate the screen.

Please use the following steps to recalibrate touch screen:

- Power cycle the controller (remove power then power up)
- Press anywhere on the Startup Screen before the text "Initializing Controller - Please Wait"
- Follow the prompts to touch the screen in different areas. - The controller will then restart itself with the new touch calibration - no further steps are needed.

General steps to solve connectivity / operational issues:

If you are having problems with the controller, complete these following steps to ensure that the unit is configured and installed properly.

1. **Reset All Parameters to Factory Defaults**
   This will reset any parameter that may have been incorrectly set or may be conflicting with the proper operation of this unit. Within the Admin Menu – select Factory Reset, press “Reset Controller” and exit screen.

2. **Enter / Confirm Setup Parameters**
   Set the correct parameters within the setup screens for proper operation of the unit.

3. **Confirm Proper Wiring to back of Controller**
   Confirm that all peripheral devices are wired correctly to the back of the device.

4. **Confirm Input Signal on Diagnostic Screen**
   Review diagnostic screen to confirm proper input signals are being sensed by the unit (example: when the door is open the Pressure Transducer [zero pressure] should register 60% on AI:0 ) – and that the outgoing signals are being read by attached devices (example: vary analog output 2 and confirm that the air flow device is opening / closing)
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b. Seller does not provide any warranty on finished goods manufactured by others or on any other consumable materials. Only the original manufacturer’s warranty applies.

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