

## Room Pressure Controller CRC-RPC2

### FEATURES:

- Full color energy efficient ultra-thin LCD touch screen interface (LED Backlight)
- Direct pressure measurement with dead ended silicon diaphragm
- Capable of monitoring and controlling two (2) pressure relationship
- Supports positive, negative and neutral environments
- Indicates appropriate precautions to be taken when entering room
- Display resolution to 0.0001" WC
- Supports multiple pressure ranges
- Audible and visual alarms
- Four fully configurable modes
- Full automation of room changeover
- Automated clearing / purging
- Monitors, alarms and allows local set point control of up to eight (8) additional parameters
- Dual Password protected access
- Visual I/O diagnostics of points
- Water spray and dust resistant ultra-thin surface mount enclosure
- Resistive touch control – Use bare finger, gloved finger, or stylus for interaction
- All parameters / settings saved in non-volatile memory
- Field configurable, easy, and intuitive menus
- Ability to “Zero” calibrate the pressure with a touch of a finger
- Supports multiple BMS protocols

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### OVERVIEW:

CRC's Room Pressure Monitor model CRC-RPCM2 accurately monitors two differential pressure relationship where proper pressurization is vital. The CRC -RPC2 can meet the stringent critical environment of; isolation rooms, operating rooms, pharmacies, research facilities and animal rooms. The CRC-RPC2 utilizes direct pressure measurement with industrial quality differential pressure transducer technology capable of displaying pressure to 0.0001"WC.

The primary screen of the RPC2 clearly displays current isolation mode along with differential pressure and optional precautionary information. A secondary screen allows the display, alarm, and set point adjustment of 8 additional network patented points. Room changeover automation and automated clearing / purging functions allow facilities to optimize room utilization while insuring the safety of patients, staff and visitors.

Each Monitor incorporates an easy to navigate microprocessor based controller with full color touch screen interface. All settings/configuring is made by an easy to navigate touch screen interface or via network. The CRC-RPC2 can be configured as a pressure monitor only or part of a complete system. The CRC-RPC2's analog inputs/outputs and/or communications allow the CRC-RPC2, to seamlessly integrate with the CRC-CLV air valve, Critical Room Control system, or building automation systems.

## DISPLAY:

- Description:** Full color LED TFT 16 bit (65,535) color depth, sunlight viewable, 320cdm brightness, touch screen interface - resistive touch (will work with gloved finger), screen is capable of wipe down cleaning and water spray and dust resistant meeting (IP-54)
- Listing:** CSA®, RU(us), UL 60950, UL 94 V-0 (Enclosure)
- Screens:** Five (5) user defined modes, field configurable verbiage, configurable screen color, patented clearing timing features
- Main Screen:** Background color field configurable for green (default), red or blue
- Modes:** Total of five (5) user configurable modes including fully automated room changeover
- More Info:** Supports up to eight user defined network values allowing local display of points descriptor, value, set point change, visual and audible alarming
- I/O Diagnostic:** Graphical display of controller analog inputs/outputs and digital inputs/ outputs
- Mounting:** Low profile surface

## POWER REQUIREMENTS:

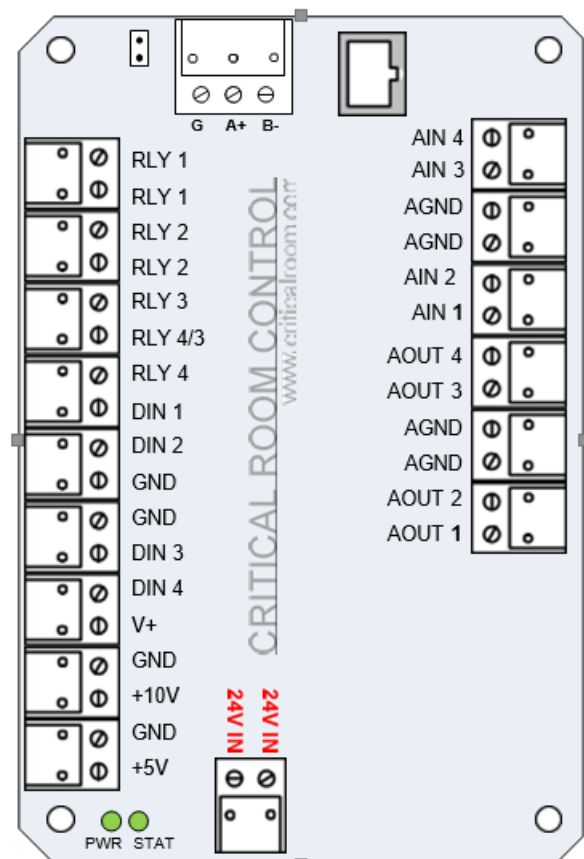
- Input Power:** 22 to 26VAC; 50/60Hz, fully isolated
- Power Draw:** 18 VA MAX
- Primary:** 24VAC Input (Isolated)

## PRESSURE ALARMS:

- Audible:** 2 (pressure alarm & remote alarm)
- Visual:** 2 (amber (loss of pressure), red (alarm))

## CONTROLLER I/O:

- Analog Inputs:** 4 total analog inputs
- Analog Outputs:** 4 (0-10V)
- Digital Inputs:** 4
- Relays:** 4 (normally closed - 0.5 A at 125 VAC; 2 A at 30 VDC)
- Terminals:** Removable screw terminals (18ga - 26ga wire)
- Enclosure:** Fire retardant, extruded acrylic/PVC Alloy UL94V
- Communication:** RS-485
- Onboard power:** 10vdc (80mA max.), 5vdc (80mA max.), and onboard loop power circuit 22VDC (80mA max.)



## ENVIRONMENTAL CHARACTERISTICS:

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### Temperature Limits:

Storage: -40 to 180  
Operating: +0 to 160  
Compensated Range: +35 to 130

### Temperature Coefficients:

Zero:  $\pm 0.03\%$ F.S./ F  
Span:  $\pm 0.03\%$ F.S./ F  
Listing: UL-94-5VA  
EMC: CE compliant to EN61326: 1997+A1: 1998+A2: 2001 annex A (heavy industrial)

## COMMUNICATION:

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**Connection:** RS-485

**Supported Protocol:** BACnet MS/TP: (Modbus, Johnson Controls Incorporated N2 & LON with optional card)

**Network Debug:** Network communication diagnostics screen

**Network Setup:** Baud rate, MAC address and instance ID configured via touch screen

## PERFORMANCE CHARACTERISTICS:

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**Accuracy Class (F.S.):**  $\pm 0.4\%$  (includes the effects of non-linearity, hysteresis, and non- repeatability)

**Stability-Max. Change:**  $\leq 0.25\%$  (Full scale/year)

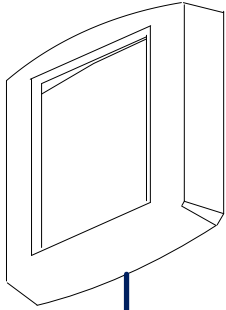
**Unidirectional Range:** 0/0.1, 0/0.25, 0/0.5, 0/0.75, 0/1.0, 0/2.0, 0/2.5, 0/3.0, 0/5.0, 0/10.0, 0/25.0

**Compound Range:**  $\pm 0.1, \pm 0.25, \pm 0.5, \pm 1.0, \pm 2.0, \pm 5.0, \pm 10.0$

**Response Time:** 250msec

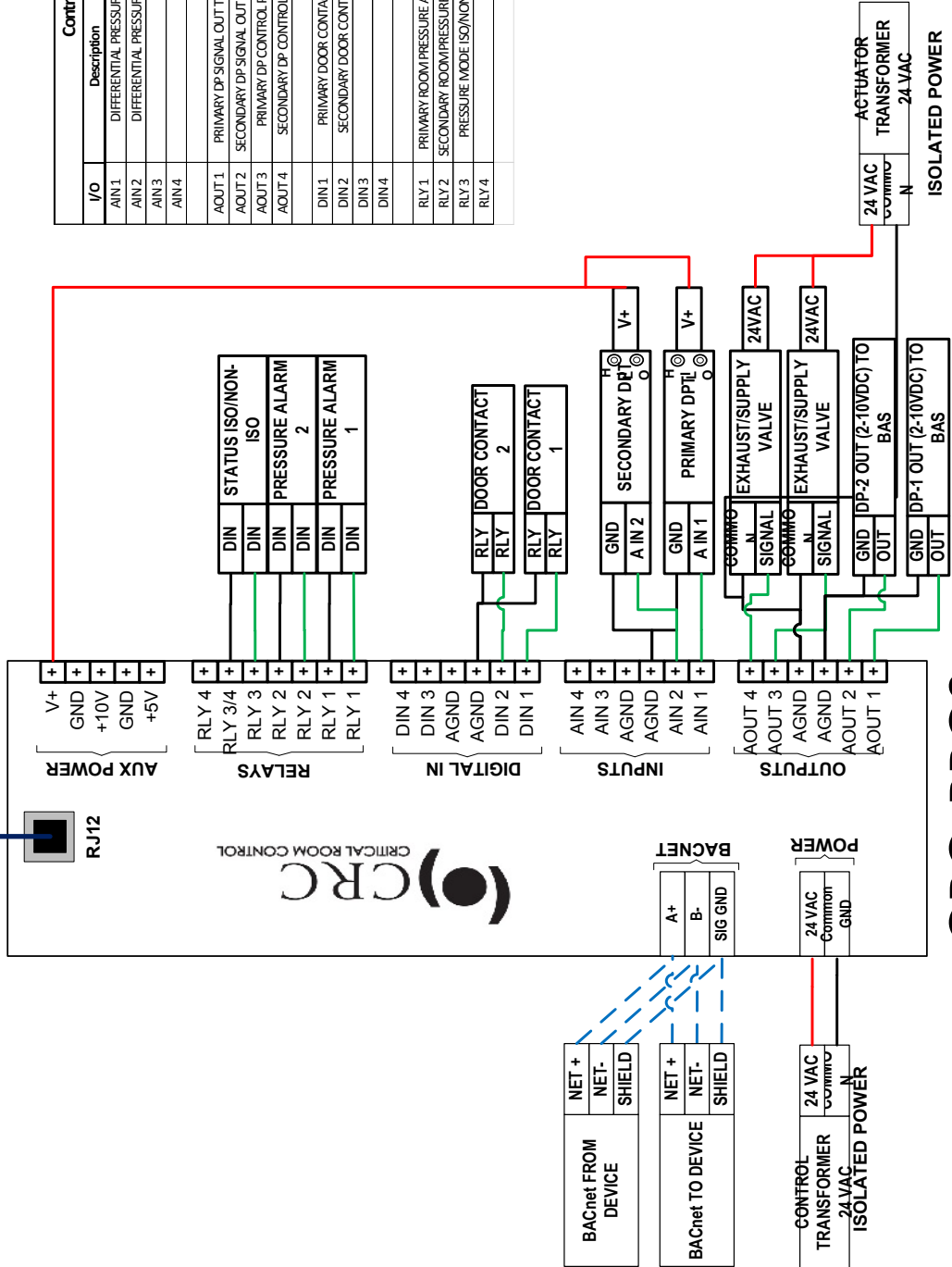
**Over Pressure limits:** Proof Pressure: 15psi  
Burst Pressure: 25psi  
Max. Static Line Press: 25psi

# Typical Wiring



RPC2 DISPLAY

RJ12 CABLE (FACTORY PROVIDED - MAX. 25 FEET)

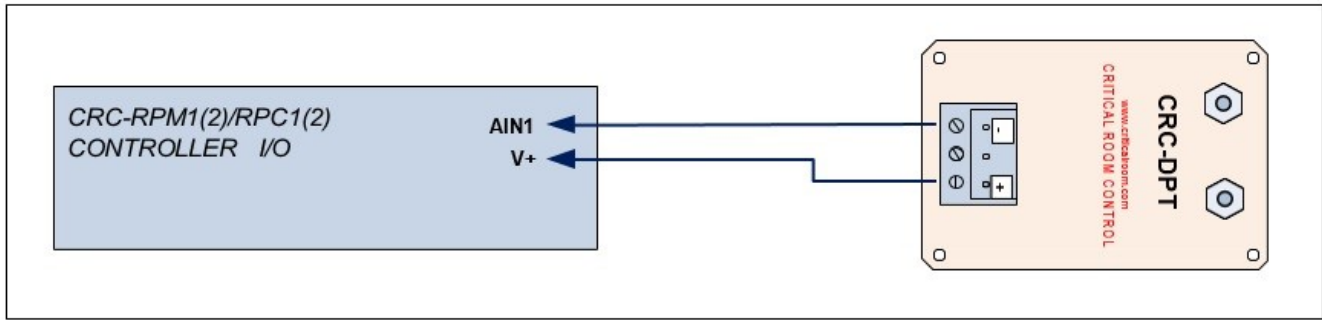


# CRC-RPC2

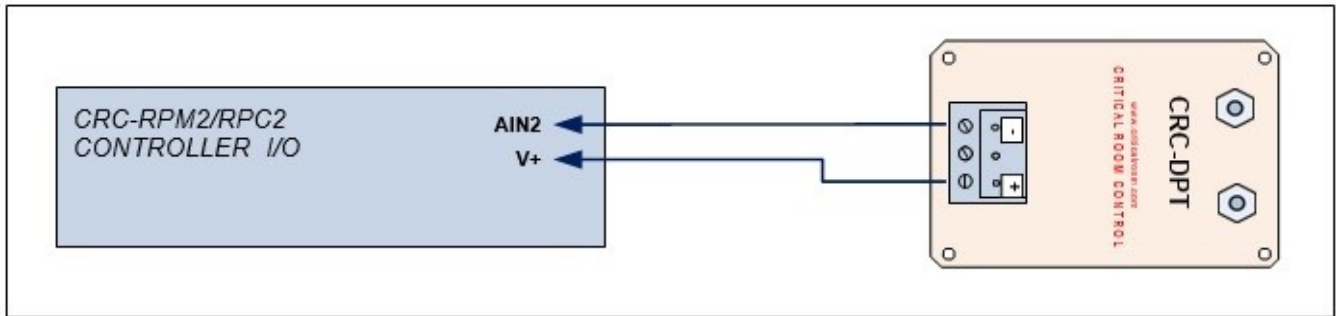
Controller Input/Output Summary				
I/O	Description	Units	Associated Device	Type
AIN1	DIFFERENTIAL PRESSURE	in. w.c.	PRIMARY ROOM DP	0-10 Vdc
AIN2	DIFFERENTIAL PRESSURE	in. w.c.	SECONDARY ROOM DP	0-10 Vdc
AIN3				
AIN4				
AOUT1	PRIMARY DP-SIGNAL OUT TO BAS	in. w.c.	PRIMARY ROOM VALVE DP	2-10Vdc
AOUT2	SECONDARY DP-SIGNAL OUT TO BAS	in. w.c.	SECONDARY ROOM DP	2-10Vdc
AOUT3	PRIMARY DP CONTROL PID	V	PRIMARY ROOM VALVE DP	0-10Vdc
AOUT4	SECONDARY DP CONTROL PID	V	SECONDARY ROOM DP	0-10Vdc
DIN1	PRIMARY DOOR CONTACT	RELAY	DOOR CONTACT	RELAY/DIN
DIN2	SECONDARY DOOR CONTACT	RELAY	DOOR CONTACT	RELAY/DIN
DIN3				
DIN4				
RLY1	PRIMARY ROOM PRESSURE ALARM	RELAY	PRESSURE ALARM	ON/OFF
RLY2	SECONDARY ROOM PRESSURE ALARM	RELAY	PRESSURE ALARM	ON/OFF
RLY3	PRESSURE MODE ISO/NON ISO	RELAY	ROOM MODE	ISO/NON ISO
RLY4				

**Transducer wiring:**

*RPC1 Connection to Primary Room Differential Pressure Transducer (CRC-DPT)*

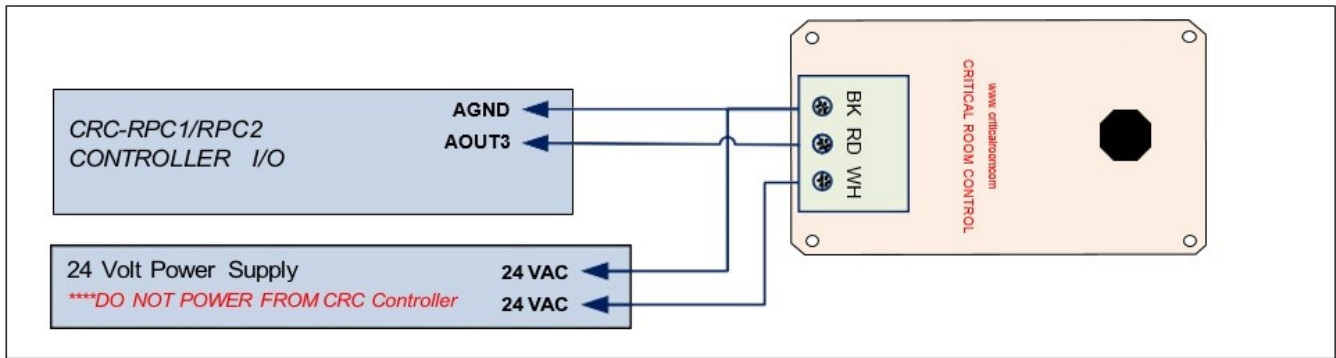


*RPM2/RPC2 Connection to Secondary Room Differential Pressure Transducer (CRC-DPT)*

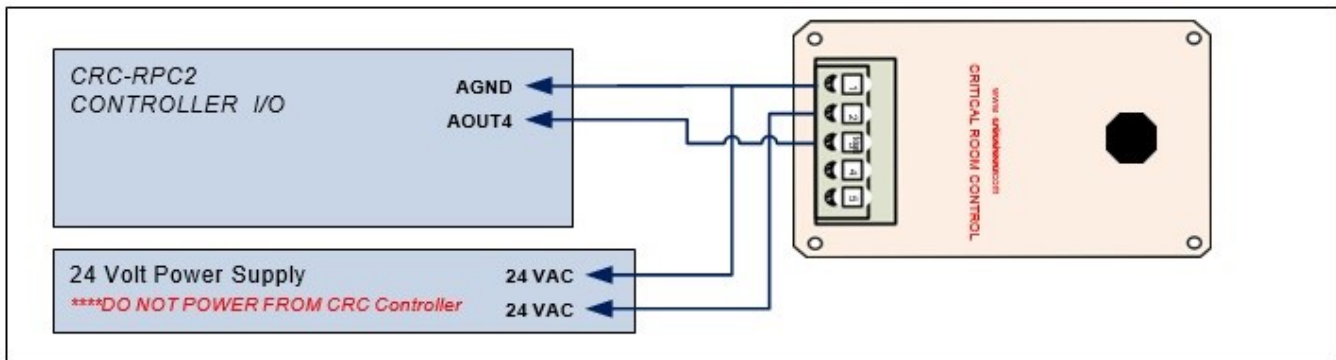


**Fast acting fail safe actuator wiring:**

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

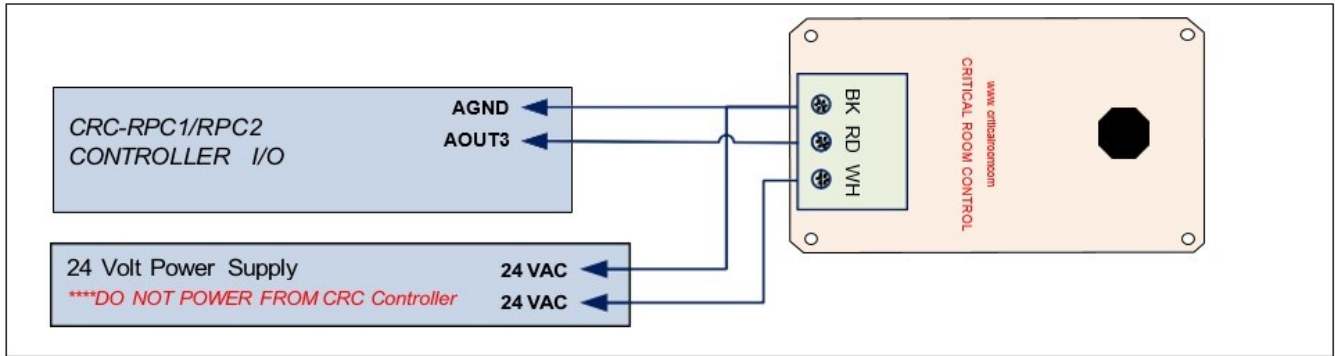


*RPC2 Secondary Room Pressure control connection to fast acting actuator (CRC-ACT)*

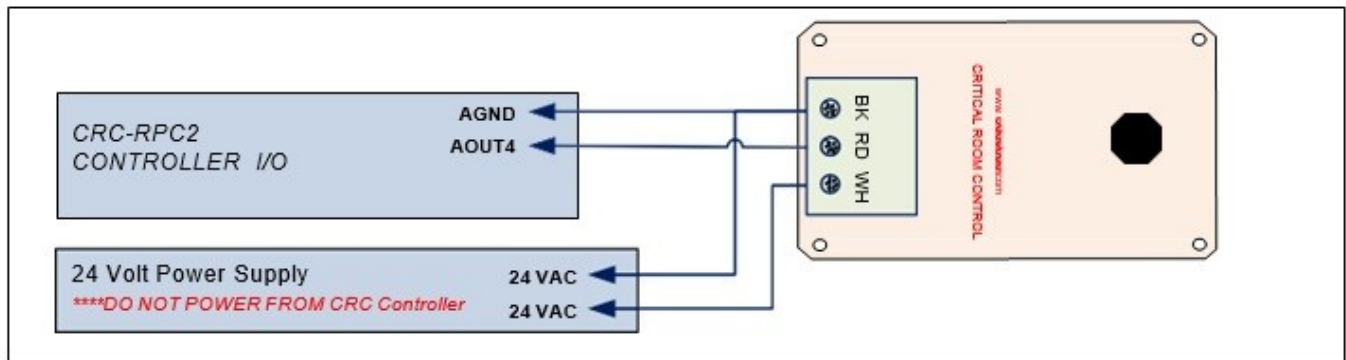


**Standard acting fail safe actuator wiring:**

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

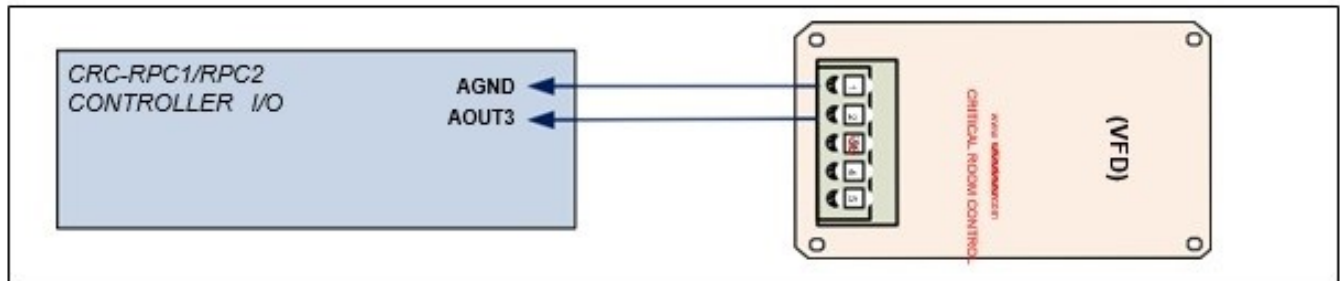


*PC2 Secondary Room Pressure control connection to standard acting actuator (CRC-ACT)*

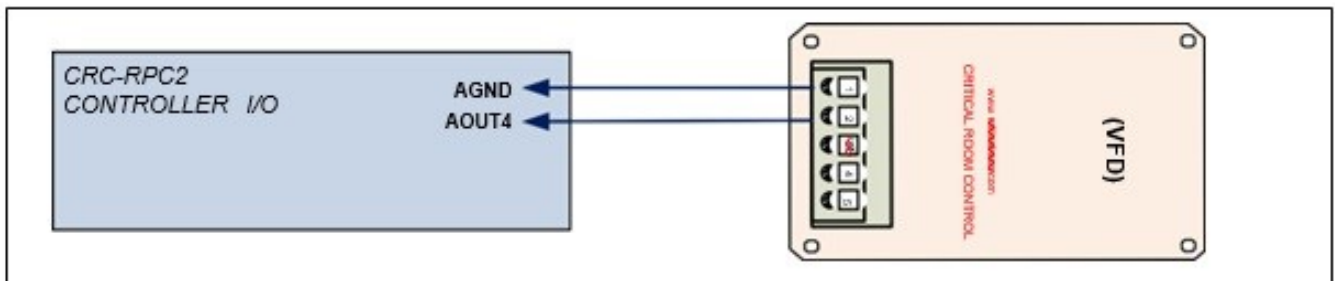


**Variable Frequency Drive wiring:**

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

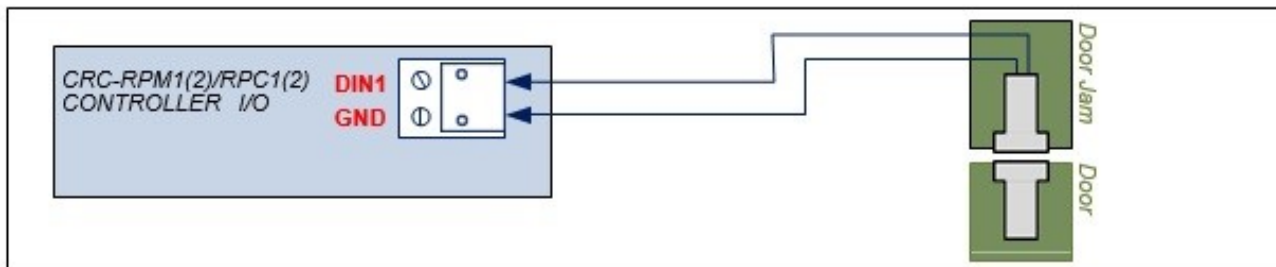


*RPC2 Secondary Room Pressure Control Connection to Variable Frequency Drive*

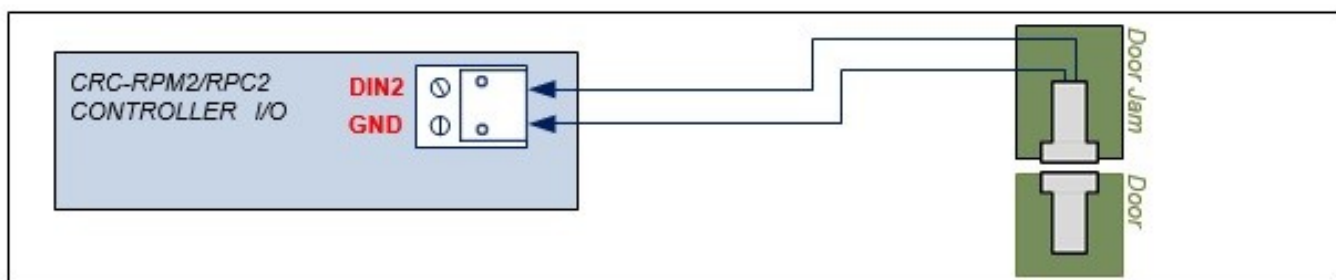


### Door Contact wiring:

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



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



General				
Instance ID	Object Name	Point Type	Value Type	Description
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				
Instance ID	Object Name	Point Type	Value Type	Description
AV 4	Current DP	Float	Read / Write	Inches of water column / Pascals
AV 5	DP Status	Integer	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				
Instance ID	Object Name	Point Type	Value Type	Description
AV 12	Current DP	Float	Read / Write	Inches of water column / Pascals
AV 13	DP Status	Integer	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				
Instance ID	Object Name	Point Type	Value Type	Description
AV 20	Current Mode	Integer	Read / Write	1= Iso, 2= clearing, 3 = non iso, 4 = vacant, 5= cleaning
AV 21	Display Units	Integer	Read Only	1 = "WC, 2 = PA
AV 22	Clearing Time	Integer	Read Only	Minutes
AV 23	Clearing Time Left	Integer	Read Only	Seconds



<b>More Info - Primary</b>				
<b>Instance ID</b>	<b>Object Name</b>	<b>Point Type</b>	<b>Value Type</b>	<b>Description</b>
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 Current Value	Float	Read / Write	
AV 29	Point 2 Current Value	Float	Read / Write	
AV 30	Point 3 Current Value	Float	Read / Write	
AV 31	Point 4 Current Value	Float	Read / Write	
AV 32	Point 1 Alarm Status	Integer	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	Integer	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	Integer	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	Integer	Read / Write	0=Not used (Grey), 1= OK (green), 2= Audible ALARM (red), 3= Muted Alarm (red with white strip)
<b>More Info - Secondary</b>				
<b>Instance ID</b>	<b>Object Name</b>	<b>Point Type</b>	<b>Value Type</b>	<b>Description</b>
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	Integer	Read / Write	0=Not used (Grey), 1= OK (green), 2= Audible ALARM (red), 3= Muted Alarm (red with white strip)

<b>AV 45</b>	Point 2 Alarm Status	Integer	Read / Write	0=Not used (Grey), 1= OK (green), 2= Audible ALARM (red), 3= Muted Alarm (red with white strip)
<b>AV 46</b>	Point 3 Alarm Status	Integer	Read / Write	0=Not used (Grey), 1= OK (green), 2= Audible ALARM (red), 3= Muted Alarm (red with white strip)
<b>AV 47</b>	Point 4 Alarm Status	Integer	Read / Write	0=Not used (Grey), 1= OK (green), 2= Audible ALARM (red), 3= Muted Alarm (red with white strip)
<b>AV 50</b>	Current Precaution	Integer	Read / Write	0 = Hide Precaution Text, 1= None, 2=STANDARD, 3=AIRBORNE, 4=CONTACT, 5=DROPLET

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

**Binary Values**

Instance ID	Object Name	Value Type
<b>BV 0</b>	Digital In 1	Read Only
<b>BV 1</b>	Digital In 2	Read Only
<b>BV 2</b>	Digital In 3	Read Only
<b>BV 3</b>	Digital In 4	Read Only

**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.

The image shows a 'Network Setup' screen with the following fields and callouts:

- Baud Rate:** 38400. Callout: "Select network Baud Rate: 9600, 19200, 38400, 57600, 76800 or 115,200"
- MAC Address:** 25. Callout: "MAC Address: 0 - 254. Note: MAC address must be unique for each device on a specific MS/TP trunk"
- Instance ID:** 33321. Callout: "Instance ID: 1 - 4,194,304. Note: Instance ID must be unique for each device on the overall network"
- Debug Info:** Radio buttons for 'Show' and 'Don't Show'. Callout: "Debug Info: Displays Network information on main screen to assist in debugging network related issues"
- Buttons: "Save Changes" and "Exit-No Change"

A callout at the bottom left points to a 'Debug Info' screen showing network details and a red hand icon with the text "AUTHORIZED PERSONNEL ONLY". Callout: "Debug Info - Please see 'BACnet Trouble Shooting / Debug Screen' for more information"

**More Information : Network Values**

Dashboard showing network values for Patient Room and Ante Room. Patient Room: TEMPERATURE: 72.6° SP 68.7, HUMIDITY: 7.2% SP 4.5%, AIR CHANGE: 5 ACH, HEPA DP: 0.0023"WC. Ante Room: TEMPERATURE: 71.2° SP 69.2, HUMIDITY: 6.2% SP 4.5%, SUPPLY: 4.5 CFM, HEPA DP: 0.0023"WC. Includes an EXIT button.

Modal window for setting the Patient Room Temperature Set Point to 69.0. Includes APPLY and CANCEL buttons. The background shows the same network values dashboard as the previous image.

**Additional Screens**

MODE: POSITIVE PRESSURE  
STANDARD PRECAUTIONS  
\* LOSS OF PRESSURE - CHECK DOOR \*  
AUTHORIZED PERSONNEL ONLY

MODE: POSITIVE PRESSURE  
STANDARD PRECAUTIONS  
\* PRESSURE ALARM - CHECK DOOR \*  
PRESSURE ALARM  
AUTHORIZED PERSONNEL ONLY

MODE: TO BE CLEANED  
STANDARD PRECAUTIONS  
CLEANED  
AUTHORIZED PERSONNEL ONLY

MODE: OCCUPIED - NO ISO  
STANDARD PRECAUTIONS  
AUTHORIZED PERSONNEL ONLY

MODE: CLEARING  
STANDARD PRECAUTIONS  
TIME UNTILL CLEARED: 21:54  
AUTHORIZED PERSONNEL ONLY

MODE: VACANT  
AUTHORIZED PERSONNEL ONLY

## **INSTALLATION:**

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### **Typical rough in work consists of the following:**

- Mount 1 single gang electrical box for the LCD screen on wall next to entry door (Approx. 52" from floor)
- 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.
- Mount controller enclosure (8" x 8" x 4"). *\*Must be mounted less than 25' from LCD screen.*
- Run power (24VAC) 18AWG to controller enclosure. *\*Isolate power from other equipment*
- Run ¼" plenum rated pneumatic tubing from pressure pickup plates to controller enclosure. *Note: \*Pickup plates can be located up to 200' from pressure transducer.*
- Install pressure pickup plates.
- Run RJ45 cable from controller enclosure to Single gang electrical box for LCD screen.
- Run additional wires as needed (network, signal integration to other devices / BAS, etc.)

### **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 manufacturer
- Follow all local and national electrical codes

### **Parts included with CRC-RPM2 and CRC-RPC2:**

- (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-RJ45 Cable
- (4) CRC-RSP Room Static Pick-up Plates

### **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) 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.

### **Optional Equipment:**

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

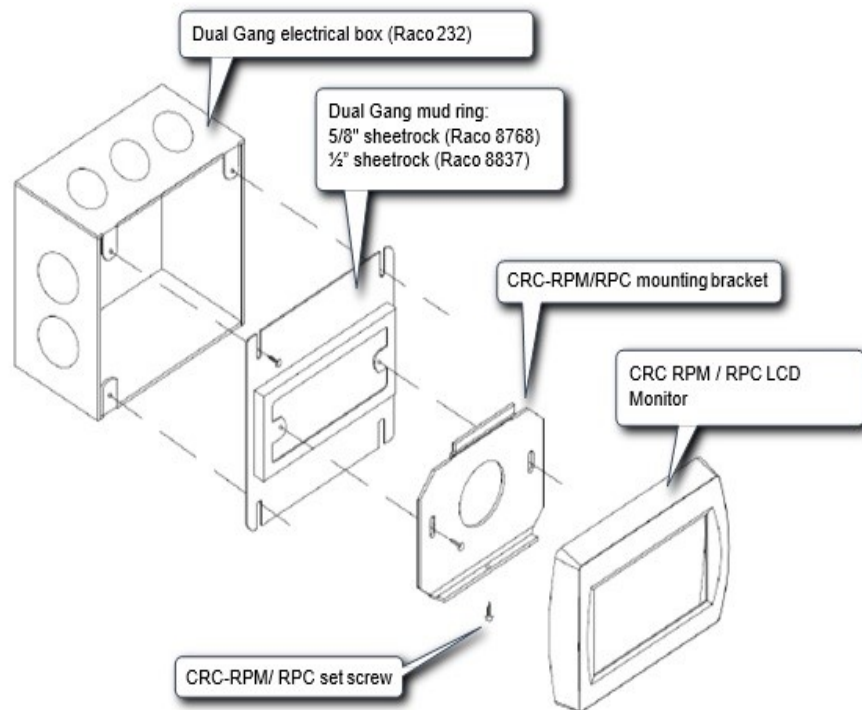
### **Mounting of the monitor (CRC-RPM/RPC):**

The CRC-RPM1 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.

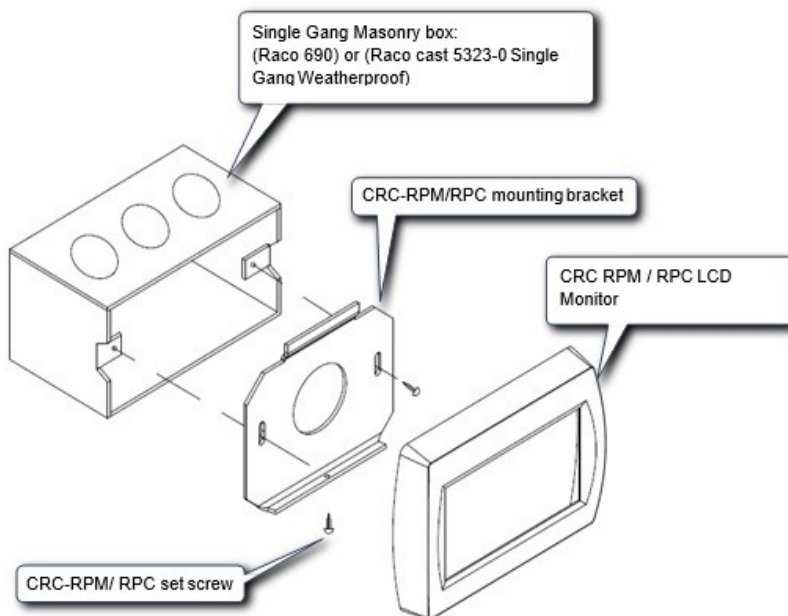
The electrical box must be landscape mounted. The mounting bracket (MB) should be attached to the plaster ring and the monitor (RPM) enclosure slid down over mounting bracket and screwed in from the bottom.

The CRC-RPM touchscreen monitor will receive a single RJ45 cable from the CRC-CONT/DPT. The RJ45 cable will be plugged into both the controller and monitor.

**Option 1: Double gang electrical box with appropriate mud ring (Sheet Rock Application)**



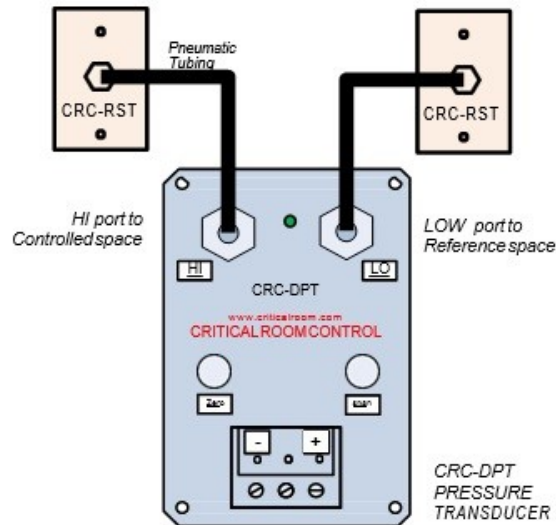
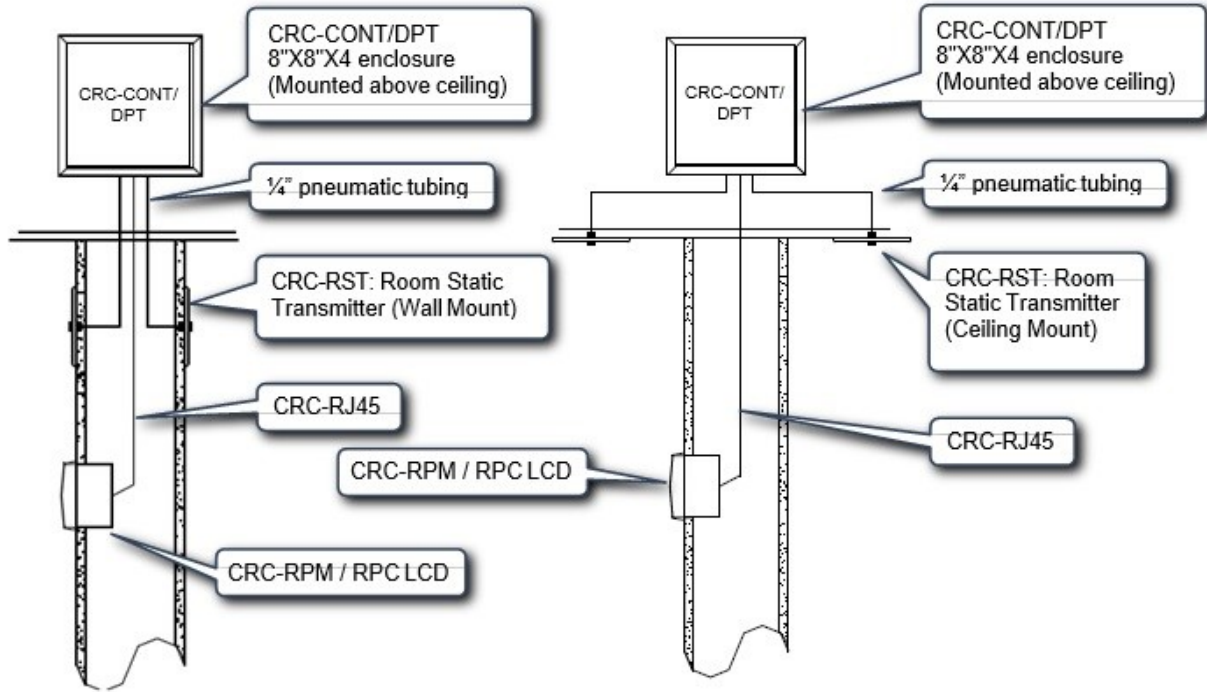
**Option 2: Single Gang Masonry electrical box for block wall installation**



## Mounting of pressure transmitter/controller (CRC-DPT)

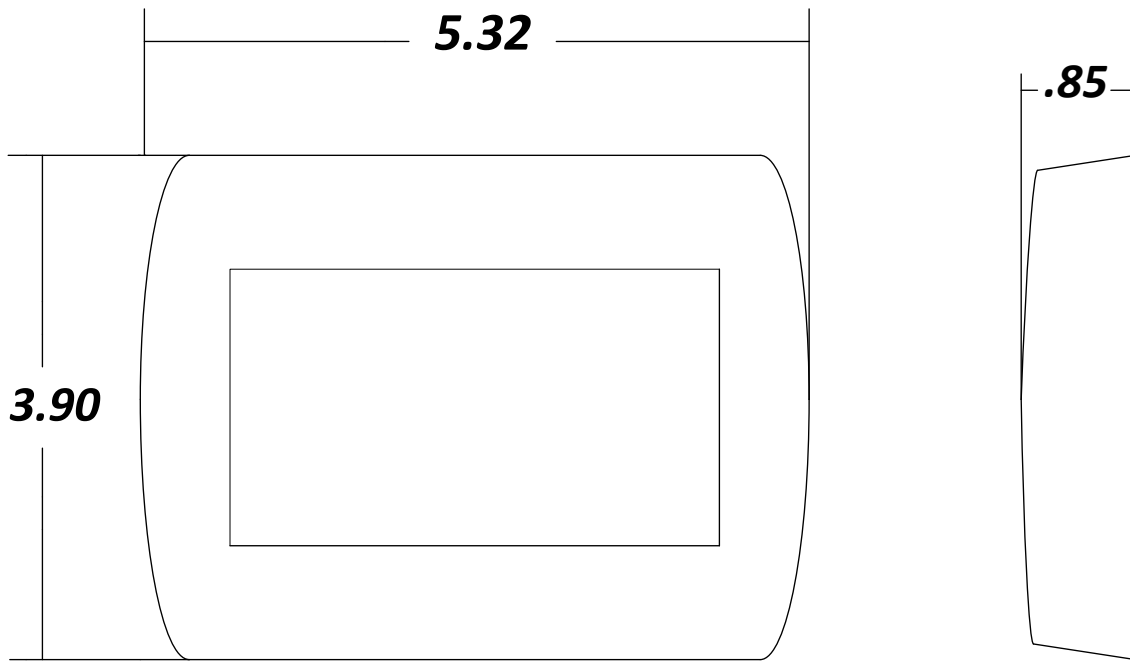
The CRC-DPT/CONT is designed to be mounted remote from monitor (typically above the ceiling).

The CRC-DPT/CONT is powered by 24VAC. Pneumatic tubing ( $\frac{1}{4}$ " ) 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.





**DIMENSIONS:**



**ORDERING NOMENCLATURE:**

**CRC - RPC 2 - 01 - B - 0101 - WP**

**MONITOR FAMILY**

RPM = Pressure Monitor Only  
RPC = Monitor and Control

**NO. OF PRESSURE RELATIONSHIPS**

1 = 1 Room  
2 = 2 Rooms

**ENCLOSURE**

01 = ABS

**NETWORK**

B = BACnet  
0 = None

**PRESSURE PICKUP PLATES**

WP = White Plastic  
SS = Stainless Steel  
00 = None

**PRESSURE TRANSDUCER SIZE**

0101 = -0.1" to 0.1" WC  
2525 = -0.25" to 0.25" WC  
0505 = -0.5" to 0.5" WC  
1010 = -1.0" to 1.0" WC  
2020 = -2.0" to 2.0" WC  
5050 = -5.0" to 5.0" WC

**ADDITIONAL PRODUCT INFORMATION:**

Please contact us at:

**Web:** [www.criticalroom.com](http://www.criticalroom.com)

**Phone:** 414.324.8978

**Address:** Critical Room Control  
6643 West Mill Road  
Milwaukee, WI 53218