

IMPACT® ALARM SYSTEM

FOR HOSPITALS AND LABORATORIES

INSTALLATION AND OPERATING INSTRUCTIONS



INTRODUCTION

Allied Healthcare Products, Inc.'s IMPACT® alarms are designed to monitor the status of piped medical gases, including clinical vacuum, WAGD and the respective delivery pressures of each gas or vacuum. Observe the following guide when designing or installing a specific medical gas alarm wiring system.

Patent Pending

TABLE OF CONTENTS

		Page No.
SECTION I		
1.0	<u>General Information</u>	1
1.1.0	<u>Precautions</u>	1
1.2.0	<u>Specifications</u>	2
1.3.0	<u>Description of Components</u>	4
1.3.1.0	<u>Back Box</u>	4
1.3.2.0	<u>Control Module</u>	4
1.3.3.0	<u>Pressure Module</u>	4
1.3.4.0	<u>Vacuum Module</u>	4
1.3.5.0	<u>Dual Display Module</u>	4
1.3.6.0	<u>10 Switch Signal Module</u>	4
1.3.7.0	<u>8 Transducer Module</u>	4
1.3.8.0	<u>Blank Module</u>	4
SECTION II		
2.0	<u>Theory of Operation</u>	5
2.1.0	<u>Control Module</u>	5
2.2.0	<u>Pressure Display Module</u>	6
2.3.0	<u>Vacuum Display Module</u>	6
2.4.0	<u>Dual Display Module</u>	6
2.5.0	<u>10-Switch Signal Module</u>	6
2.6.0	<u>8 -Transducer Module</u>	7
2.7.0	<u>Power Supply</u>	7
SECTION III		
3.0	<u>Back Boxes, Front Panels & Universal Wall Plates</u>	8
3.1.0	<u>Back Boxes</u>	8
3.2.0	<u>Front Panels</u>	8
3.3.0	<u>Universal Wall Plate</u>	8
SECTION IV		
4.0	<u>Installation</u>	12
4.1.0	<u>Installing New Back boxes</u>	12
4.2.0	<u>Installing Universal Wall Plate</u>	13
4.3.0	<u>Installing Pressure & Vacuum Transducers</u>	14
4.4.0	<u>Installing Front Panel</u>	15
4.5.0	<u>Labeling the Modules</u>	15
4.6.0	<u>Wiring</u>	17
4.7.0	<u>Wiring the 115 or 230 VAC Mains</u>	17
4.8.0	<u>Wiring the Control Module</u>	18
4.9.0	<u>Wiring the Pressure and Vacuum Modules</u>	18-19
4.10.0	<u>Wiring the Dual Display Module</u>	20
4.11.0	<u>Wiring the 10-Switch Signal Module</u>	20
4.12.0	<u>Wiring the Wiring the 8 Transducer Module</u>	21
4.13.0	<u>Wiring the Pressure/Vacuum Transducers</u>	21
SECTION V		
5.0	<u>Set-Up</u>	22
5.1.0	<u>Program Mode</u>	22-23
5.1.1	<u>Transducer Types and Set Points</u>	22
5.1.2	<u>Set PC Address</u>	23
SECTION VI		
6.0	<u>Typical Wiring Diagram</u>	24
SECTION VII		
7.0	<u>Replacement Parts For IMPACT Alarm</u>	25-27

SECTION I

1.0 GENERAL INFORMATION:

1.1.0 PRECAUTIONS:

1.1.1 **WARNING:** Warnings are provided to alert the user to situations that may cause personal injury.

1.1.2 **CAUTION:** Cautions are provided to alert the user to situations that may cause equipment damage.

WARNING: ELECTRIC SHOCK HAZARD. DO NOT REMOVE POWER SUPPLY COVER. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: ELECTRIC SHOCK HAZARD. INSTALLATION TO BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY.

WARNING: ELECTRIC SHOCK HAZARD. DISCONNECT ALL POWER FROM ALARM INCOMING SIGNAL AND POWER MAINS BEFORE PERFORMING ANY WIRING.

WARNING: GAS MUST BE SHUT OFF BEFORE PERFORMING STEP 4.3.2 AS PERSONAL INJURY MAY OCCUR.

CAUTION: ELECTROSTATIC DISCHARGE SENSITIVE COMPONENTS. USE GROUNDING STRAP WHEN WORKING ON INSIDE OR WHEN INSTALLING ALARM SYSTEM.

CAUTION: OVERHEATING OF THE LOWER PORTION OF THE PIGTAILS WILL CAUSE DAMAGE TO THE INTERNAL PARTS OF THE DISS FITTING.

CAUTION: A PRESSURE TEST MUST BE PERFORMED WITHOUT PRESSURE/VACUUM TRANSMITTER IN PLACE IN ORDER TO PREVENT DAMAGE TO THE TRANSMITTER.

CAUTION: THE CABLE USED FOR REMOTE TRANSMITTERS MUST HAVE A STRAIN RELIEF TO KEEP TENSION OFF THE TRANSMITTER LEADS.

CAUTION: TURN POWER SWITCH OFF. DO NOT INSTALL FRONT PANEL WITH POWER ON, AS THE MODULES MAY BE DAMAGED.

CAUTION: DO NOT SUBSTITUTE PARTS WITHOUT PERMISSION FROM ALLIED HEALTHCARE PRODUCTS, INC.'S TECHNICAL SUPPORT CENTER. SUCH SUBSTITUTIONS CAN CAUSE PREMATURE PRODUCT FAILURE AND MAY VOID THE WARRANTY.

1.2.0 Specifications:

1.2.1 Electrical Requirements:

AC 115 50/60 Hz , 0.5 Amps Max

AC 230 50/60 Hz, 0.3 Amps Max

1.2.2 Classification:

Protection Class I

1.2.3 Operation:

Continuous

1.2.4 Operating Conditions:

1.2.4.1 Temperature: 50°F to 100°F (10°C to 37.8°C)

1.2.4.2 Humidity: 30% to 75% RH

1.2.5 Shipping/Storing Conditions:

1.2.5.1 Temperature: -40°F to 140°F (-40°C to 60°C)

1.2.5.2 Humidity: 30% to 75% RH

1.2.6 Accuracy:

1.2.6.1 100 PSI Module Assy. ± 3 PSI

1.2.6.2 300 PSI Module Assy. ± 9 PSI

1.2.6.3 Vacuum Module Assy. ± 1 Inch Hg

1.2.6.4 3000 PSI Module Assy. ± 60 PSI

The following description of components is included to familiarize you with the terminology used in this manual.

CAUTION: PROTECT THE INTERNAL COMPONENTS WITHIN THE BACK BOX BY KEEPING THE DUST COVER IN PLACE UNTIL THE FRONT PANEL IS READY TO BE INSTALLED.

CAUTION: ELECTROSTATIC DISCHARGE SENSITIVE COMPONENTS. USE GROUNDING STRAP WHEN WORKING ON INSIDE OR WHEN INSTALLING ALARM SYSTEM.

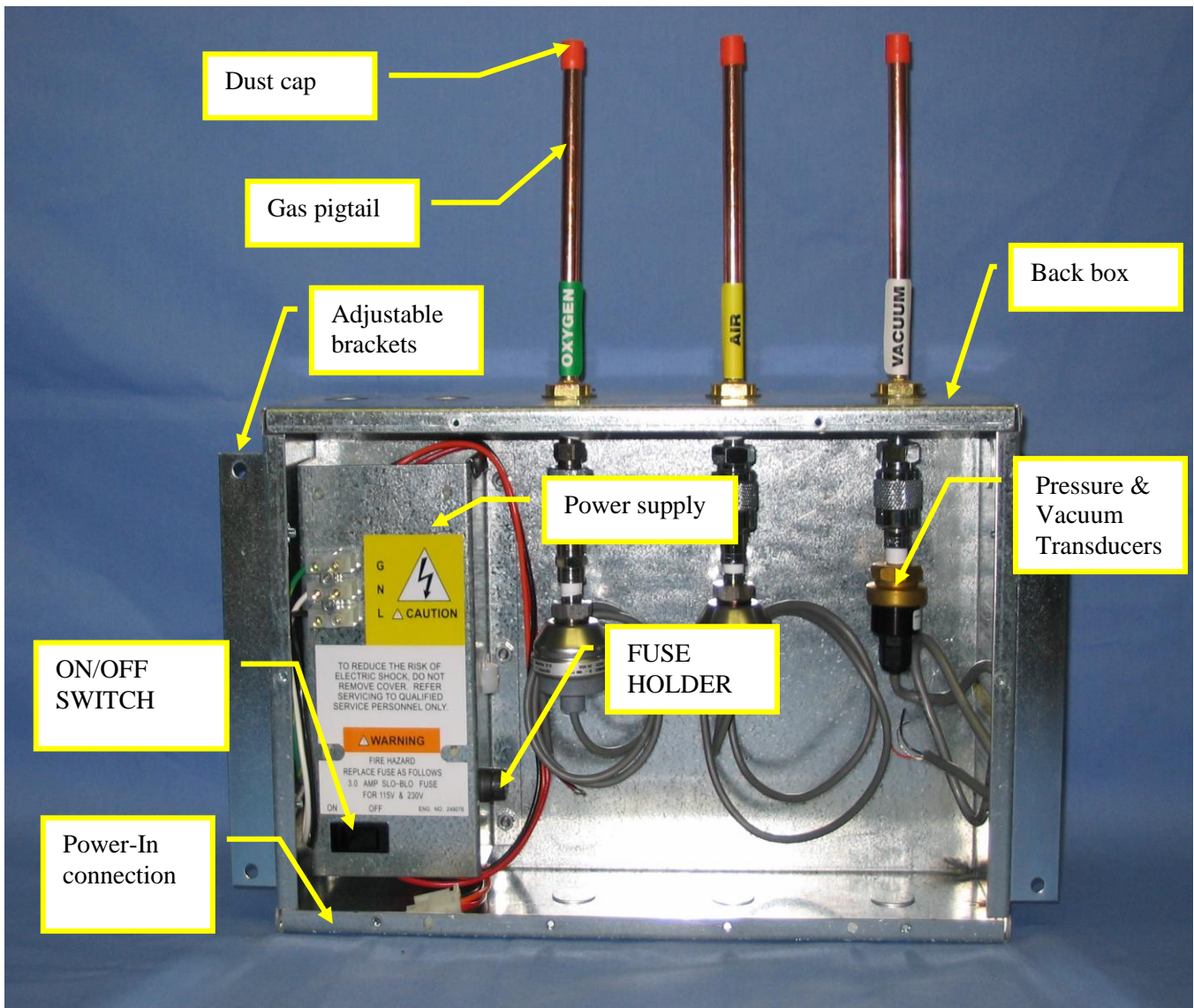


Figure 1 – Back Box with Pigtails and Power Supply

1.3.0 Description of Components:

1.3.1 The Back Box:

1.3.1.1 The Back Box (see [Figure 1](#)) contains the system power supply, adjustable angle brackets, and gas Pig tail(s).

1.3.1.2 Two types of back boxes exist:

1.3.1.2.1 Type 1(see [Figure 1](#)) contains copper pigtails to which an installer directly connects gas or vacuum.

1.3.1.2.1 Type 2 (not pictured) does not contain pigtails. This back box is designed to incorporate any combination of Modules with remote Transducers, and for Master Alarm panels.

1.3.2 The Alarm Modules

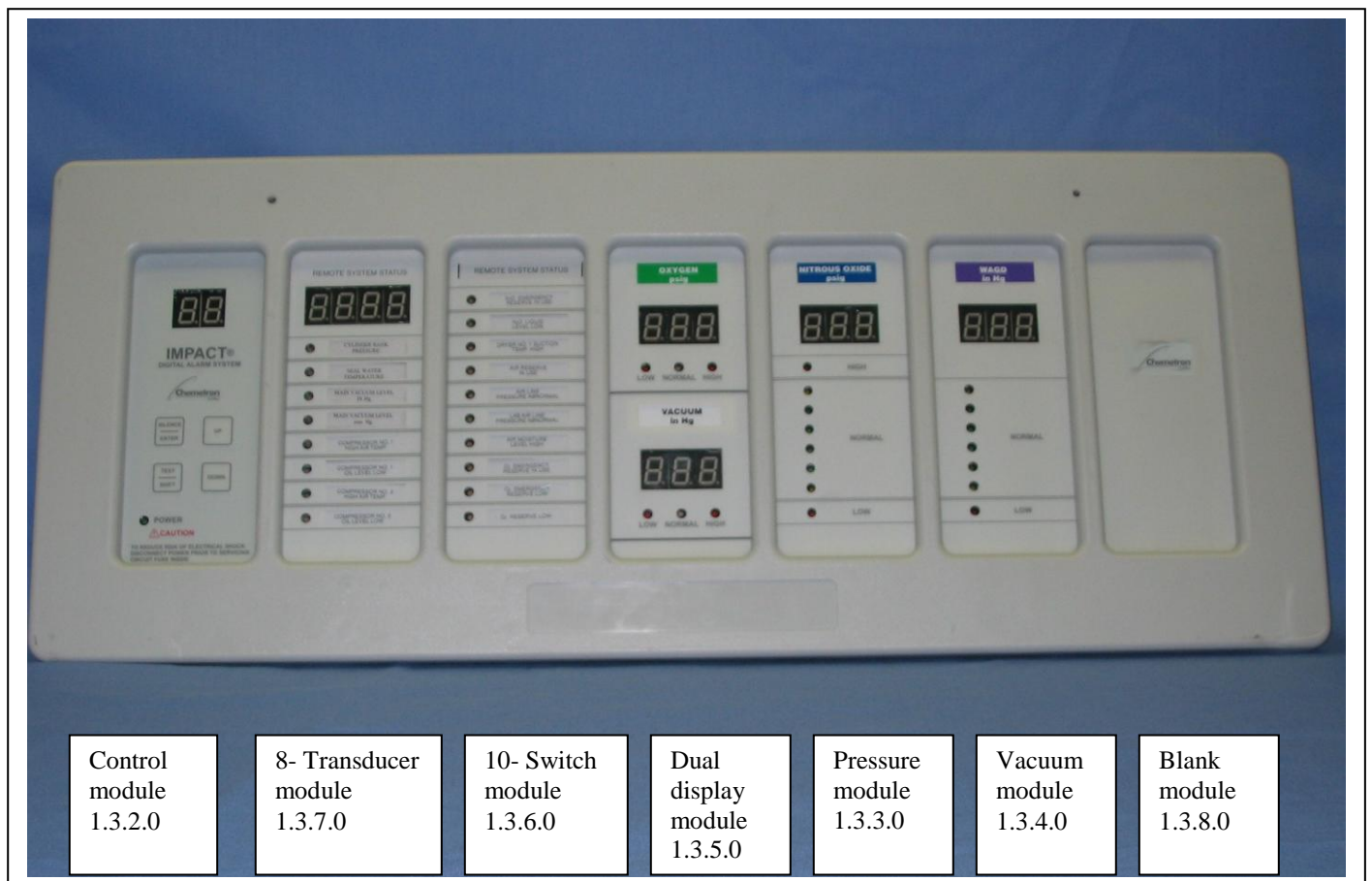


Figure 2- Alarm System modules

SECTION II

2.0 THEORY OF OPERATION:

2.1.0 Control Module:

- 2.1.1 The Control Module (see [Figure 2](#)) is microprocessor based and controls the functions of the entire alarm system. When power is on, the light (LED) at the bottom of the module will be green. If an alarm condition is detected the audio alarm will sound. Pressing the ENTER/SILENCE button on the module will turn off the audio alarm.
- 2.1.2 The Silence/Enter button (see [Figure 3](#)), is used to Silence the buzzer when the Panel is in alarm. When in Program mode it is also used to Enter commands.
- 2.1.3 The Test/Shift button (see [Figure 3](#)), is used to run the self test and to Shift a digit to the left when in program mode.
- 2.1.4 The Up button (see [Figure 3](#)), is used to increment the right digit up when in program mode. It is also used to command any 8-Transducer Module to display the next sensor.
- 2.1.5 The Down button (see [Figure 3](#)), is used to increment the right digit down when in program mode. It is also used to command any 8-Transducer Module to display the next sensor.
- 2.1.6 **Test** - The **TEST** Button on the panel of the Control Module will initiate a system test that will sequentially test each Pressure, Vacuum, 10-Switch Signal and 8 Transducer Module. The system should be tested at least once per year. The test for each Panel Module consists of several tests in the following order:
LED Display Test - To ensure that all the display segments are functional and under the control of the system, they will first all be activated. The displays should read **88, 888, or 8888**.
Board Address - The display will show its local address. The Control Module will display 01, and each additional board will display 2, 3 etc. 10-switch modules will illuminate the appropriate LED, counting down from the top, to indicate its address.
Sensor Type and Set Point – Each Module will display its Transducer Type (A – F) and then its 2-digit set point. (See Set Up)
Buzzer Test – At the end of the Self Test, the buzzer will put out a short beep
- 2.1.7 **Alarm Silence** - When an alarm condition is detected, the **ENTER/SILENCE** button can be used to cancel the audio alarm. The 2 digit display will show A2 to indicate an Alarm on board 2, and so forth.
- 2.1.8 **Multiple Alarm Conditions** - Silencing the initial fault will not prevent the audio alarm from sounding due to subsequent alarm conditions from other modules. You will have to press the silence button for each alarm.

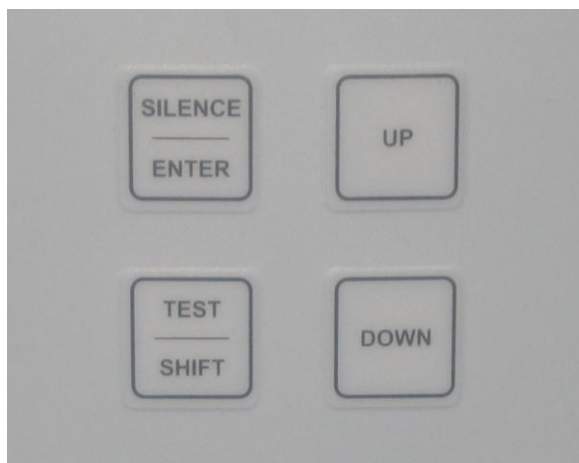


Figure 3-Control Module keypad

2.2.0 Pressure Display Module:

- 2.2.1 The Pressure Module (see [Figure 2](#)) contains an LED display which provides continuous pressure readings for a single gas pressure line. During normal operation, four green colored LED's indicate a normal operating range. Once the pressure monitor deviates from the normal operating pressure to $\pm 17\%$ from the nominal, a yellow LED will light on either side of the green or normal LED's. Once the pressure deviates more than $\pm 20\%$ a red LED activates and an alarm will sound.
- 2.2.2 **Alarm State** - When an alarm condition occurs, one LED will turn red, and the audio alarm will be activated. Actual pressure and vacuum levels can be observed on the digital display at all times. The visual indicator will remain red until the alarm condition is cleared. The audio indication will remain active for the duration of the alarm condition unless silenced by the alarm silence button (see Figure 3) on the Control Module.

2.3.0 Vacuum Display Module:

The Vacuum Module (see [Figure 2](#)) contains an LED display, which provides continuous vacuum readings for a single gas vacuum line. During normal operation, green colored LED's indicate a normal operating range. Once the vacuum value deviates below 14.0 in Hg for sensor type C or 355 mmHg for sensor type B, the yellow LED lights up. When the vacuum deviates below 12.0 in Hg for sensor type C or 304 mmHg for sensor type B, the red LED activates and an alarm will sound.

2.4.0 Dual Display Module:

- 2.4.1 The Dual Display Module (see [Figure 2](#)) contains two LED displays and two sets of LED operating range indicators. The two displays can show Pressure, Vacuum or a combination of both. During normal operating range the center single LED will indicate a Normal situation with a green light. Once a Vacuum deviates below 14 in Hg or 335 mm Hg, the yellow LED lights up. When the vacuum deviates below 12 in-Hg or 304mm Hg, the red LED activates and an alarm will sound. When a pressure sensor is used the Display will indicate its continuous pressure reading for a single gas. During normal operating range the center single LED will indicate a Normal situation with a green light. Once the Pressure deviates 17% of nominal, the yellow LED lights up. When the Pressure deviates more than the 20% the appropriate (high or low) red LED activates and an alarm will sound.

2.5.0 10-Switch Signal Module:

- 2.5.1 The 10 Switch Signal Module (see [Figure 2](#)) is used exclusively to monitor normally closed remote switch signals. These discrete ON/OFF signals can represent conditions such as "Reserve in Use", "Liquid Level Low", High/Low Line Pressure or the status of another alarm panel. The 10 Switch Signal Module contains ten dual colored LED's located adjacent to the signal label being monitored. Each input has 3 modes of operation: 0 – Off, 1 – Normal, 2 – Indicator Only

Mode 0 - Off, the input will be inactive and the LED off.

Mode 1 - Normal, during normal operation, the LED is green. If any input in Normal mode switches from normal to a fault condition, the audio alarm will sound and the red LED (Fault Indicator) next to the label of the fault condition will turn red. Pressing the alarm silence button on the Control Module will silence the audio alarm. Subsequent activation of any other signal will cause the silenced audio alarm to sound again. Only correction of the fault monitored by the individual Fault Indicator will cause the red LED to turn green.

Mode 2 - In Indicator Only Mode, during normal operation, the LED is green. If any input in Indicator Only Mode switches from normal to a fault condition, the audio alarm will not sound and the LED next to the label of the fault condition will turn yellow. This mode can be used to monitor non alarming inputs such as pumps running.

2.6.0 8-Transducer Module:

2.6.1 The 8-Transducer Module (see [Figure 2](#)) is used exclusively to monitor up to 8, 4-20 mA sensors and indicate a numerical value on a LED Display. The 8-Transducer Module contains 8 dual colored LED's located adjacent to the signal being monitored. During normal operation, each LED is green. The 4-digit display will show each sensor output in sequence, flashing the LED next to the sensor display. The LED's will turn red should one or more of the eight-signals switch from normal to a fault condition.

2.7.0 Power Supply:

2.7.1 The Connection to the 115/230 Volt, 50/60 Hertz mains are provided in the back box (see [Figure 10](#)). The fuse is located on the power supply cover. The fuse should be a 250V 3A fuse.

SECTION III

3.0 BACK BOXES, FRONT PANELS & UNIVERSAL WALL PLATES:

3.1.0 Back Boxes:

3.1.1 The Back Boxes are available in two sizes.

3.1.1.1 The first back box ([Figure 4](#)) is 14.0 inches long and will accommodate one Control Module and three other modules.

3.1.1.2 The second back box ([Figure 5](#)) is 23.875 inches long and will accommodate one Control Module and six other modules.

3.2.0 Front Panels, New Installation:

3.2.1 The Front Panels are available in two sizes.

3.2.1.1 The first front panel ([Figure 6](#)) is 16.0 inches long and will accommodate one Control Module and three other modules.

3.2.1.2 The second front panel ([Figure 7](#)) is 25.75 inches long and will accommodate one Control Module and six other modules.

3.3.0 Universal Wall Plates (For Retro-fit Installation):

3.3.1 The Universal Wall Plates are intended to be installed over an existing back box. There are two sizes available.

3.3.1.1 The first universal wall plate ([Figure 8](#)) is 17.5 inches long, 16.0 inches tall, and is used to adapt the 3-module Front Panel to the 3-module Universal Wall Plate.

3.3.1.2 The second universal wall plate ([Figure 9](#)) is 27.375 inches long, 16 inches tall, and is used to adapt the 6-module Front Panel to the 6-module Universal Wall Plate.

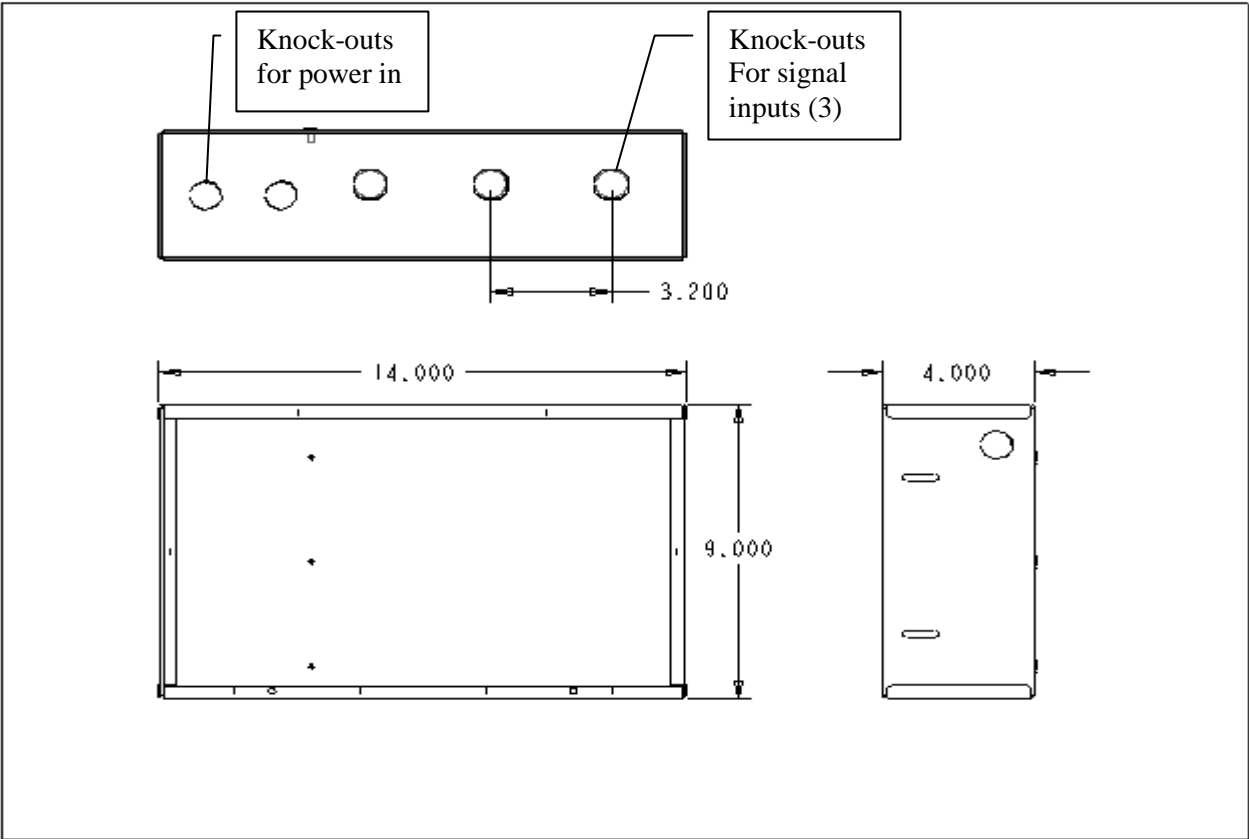


Figure 4, 3-Module Back Box

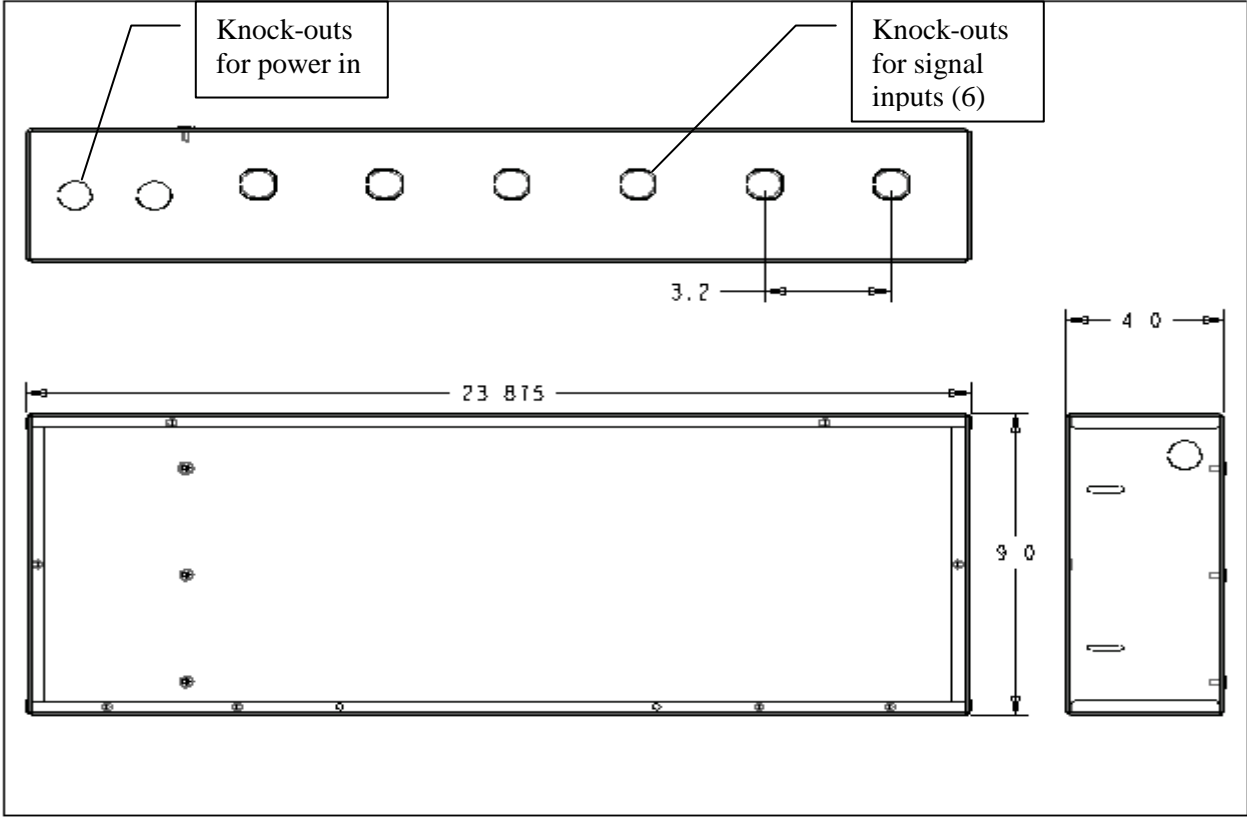


Figure 5, 6-Module Back Box

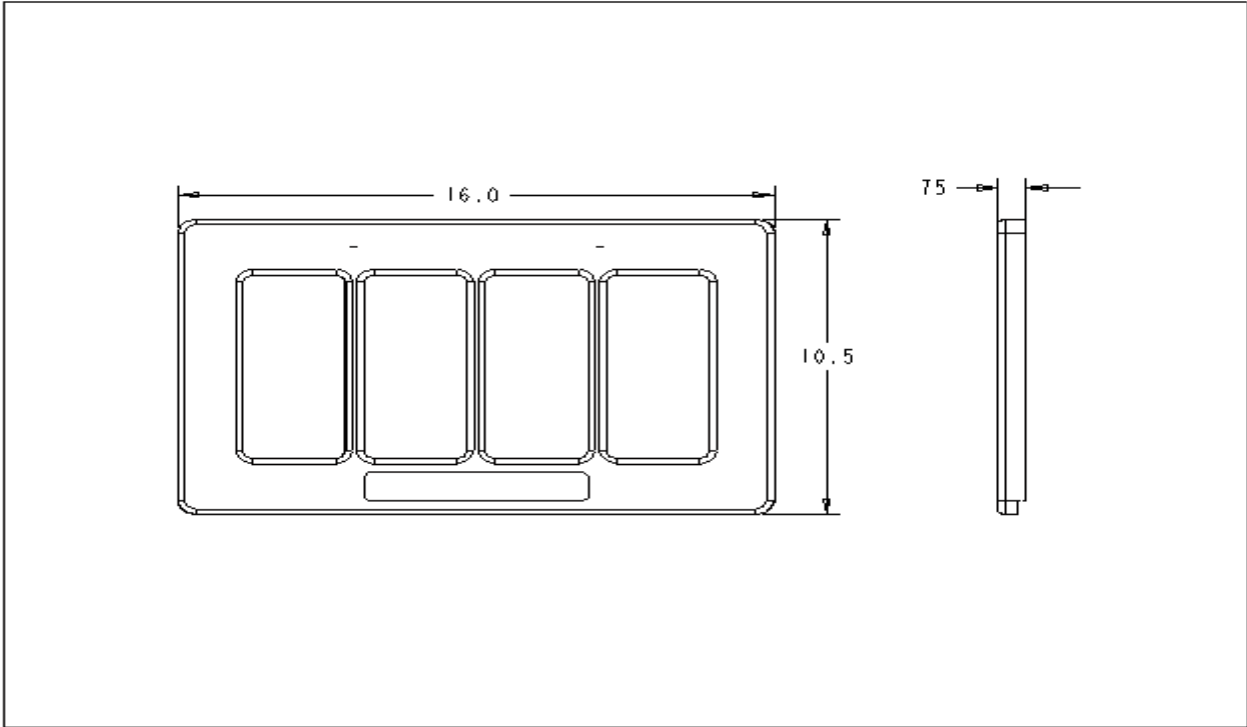


Figure 6, 3-Module, Front Panel

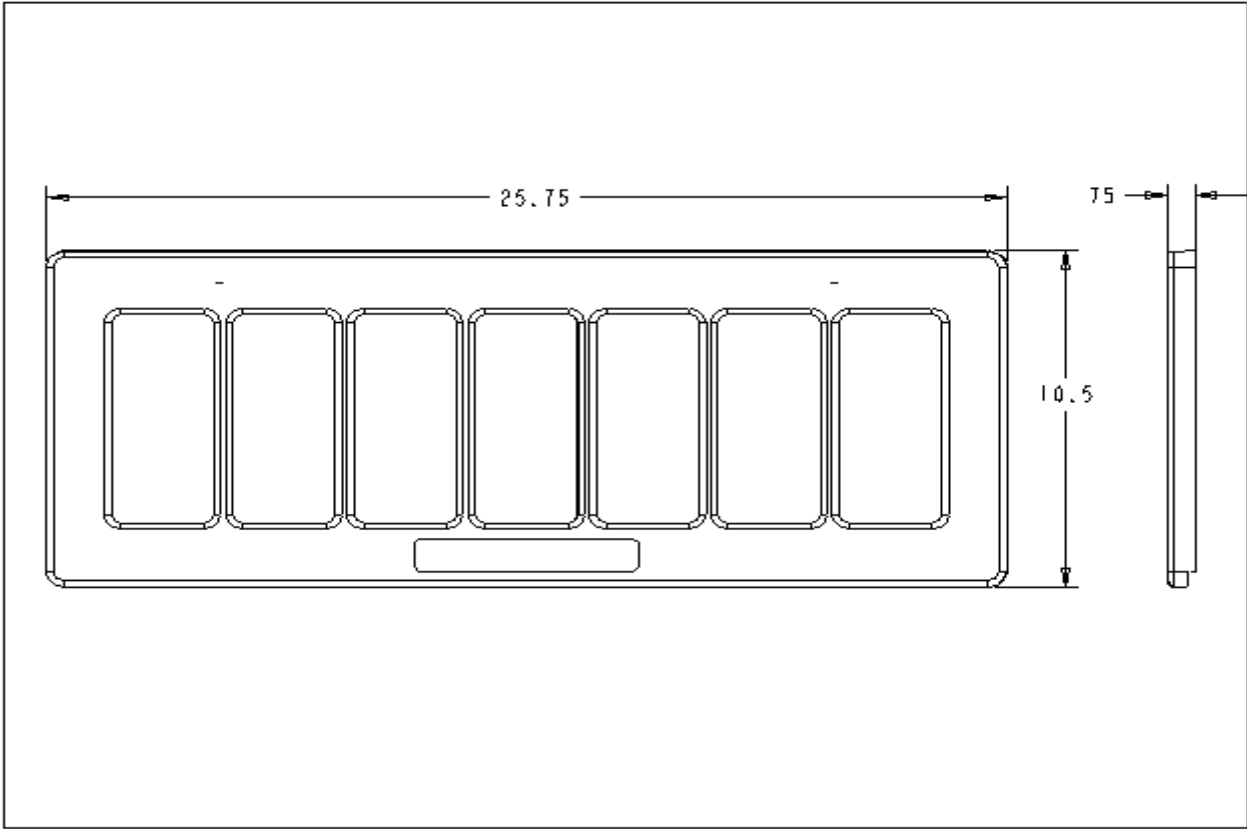


Figure 7, 6-Module, Front Panel

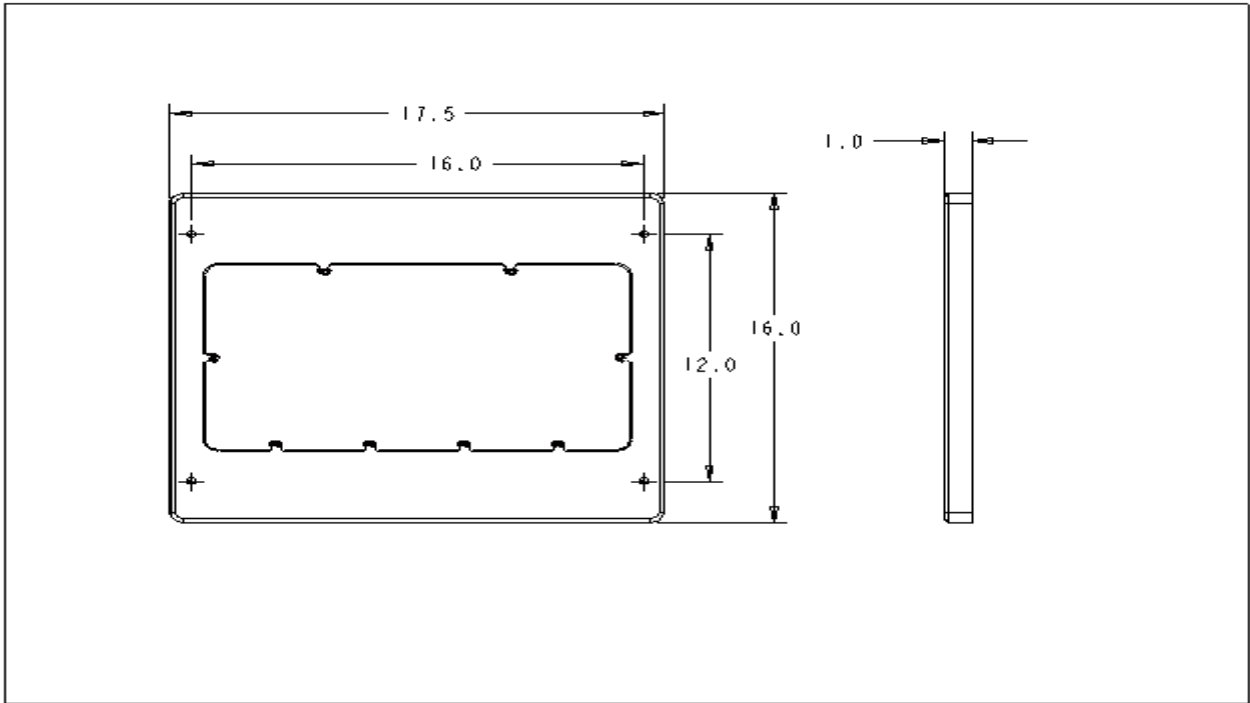


Figure 8, 3-Module, Universal retrofit Panel

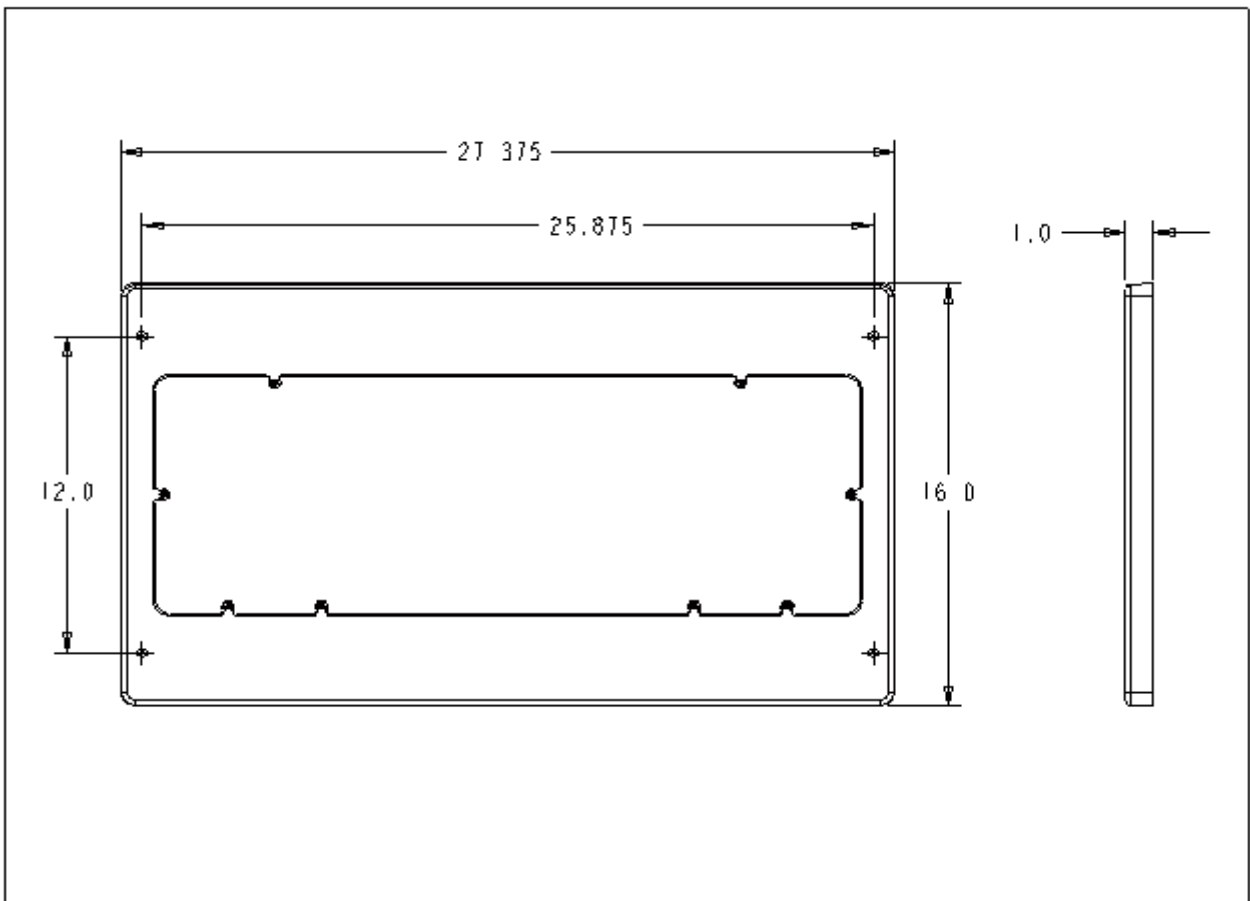


Figure 9, 6-Module, Universal Retrofit Panel

SECTION IV

WARNING: ELECTRICAL SHOCK HAZARD. INSTALLATION TO BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY.

4.0 INSTALLATION:

4.1.0 Installing New Back Box:

- 4.1.1 Remove the back box from the shipping carton, and store carton with Front Panel in a safe dry place, until all plastering and wiring is complete.
- 4.1.2 Install the back box at the specified height, in a rough-in wall (see [Figure 10](#)). Fasten it securely to the wall framing. **Make sure the front face of the back box is level and flush with the finished wall surface.** The contractor is reminded to coordinate with other trades in anchoring alarms rigidly into the wall. **It is not sufficient to simply grout them in.** The adjustable flanges on either side of the back-box are used for various thicknesses of drywall.
- 4.1.3 For general installation guidelines, refer to NFPA 99, "Health Care Facilities", and NFPA "National Electrical Code".
- 4.1.3 Remove Dust Caps and Dust Cover to connect pigtails to appropriate laterals. Do not discard Dust Cover fasteners as they are used to attach Front Panel hinge and lanyards.
- 4.1.4 For Transducers installed within the back-box, as the connections are being made, identify each line inside the Back Box with the furnished labels. Be careful not to damage the DISS fitting (by over-heating the lower portion) while silver brazing. Wrap the pigtail with a damp cloth or use a commercially available heat sink to minimize over-heating (see [Figure 11](#)).
- 4.1.5 Replace the Dust Cover until it is time to pressure test the system.

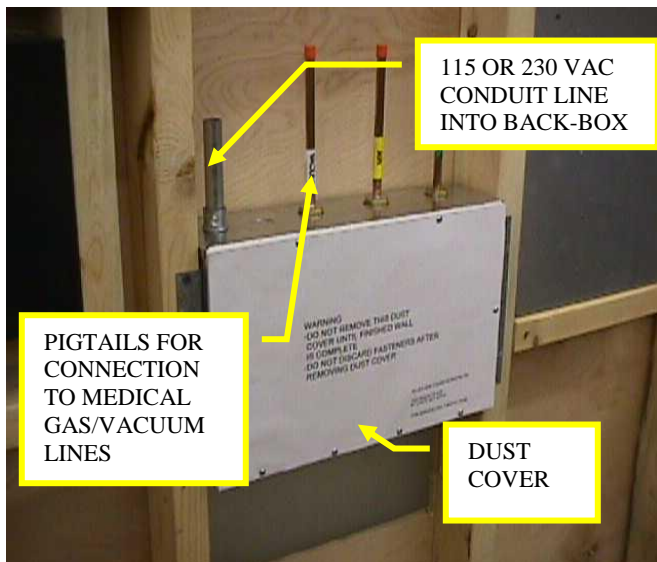


Figure 10 – Box Installed In Wall

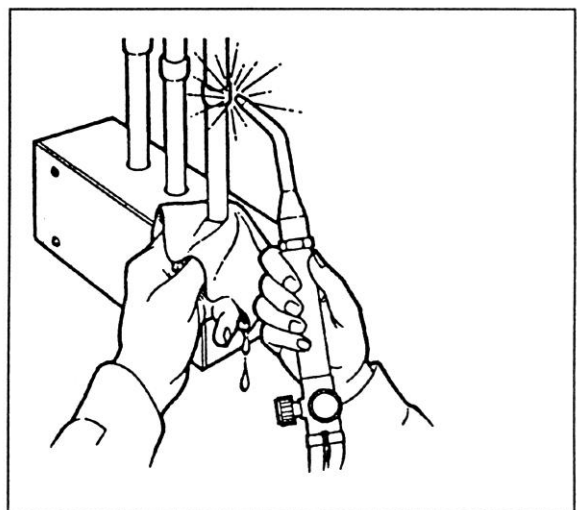


Figure 11 – Minimize Overheating Of Valve

CAUTION: OVERHEATING OF THE LOWER PORTION OF THE PIGTAILS WILL CAUSE DAMAGE TO THE INTERNAL PARTS OF THE DISS FITTING.

4.2.0 Installing Universal Wall Plate for Retrofit Installation

- 4.2.1 Remove the Universal Wall Plate with Front Panel from the shipping carton (see [Figure 12](#)). Locating the Universal Wall Plate will require that you check to make sure all electrical and mechanical components do not interfere with the specific back-box being retro-fit. Open the hinged front panel from the Universal wall plate. Gently place it over the back-box, looking for any component interference by slowly closing and opening the front panel. Make certain the Universal wall plate is level. Then, using the hole pattern in the Universal Wall plate, scribe the hole locations for either wall anchors or screws for existing wall studs. Screws and Wall anchors are provided.
- 4.2.2 When using the Wall anchors pilot drill thru the drywall with a 5/16" drill. Then insert flush to flange on wall anchor.
- 4.2.3 Attach the Universal Wall Plate with the four 2-1/2" stainless screws provided. (see [Figure 12](#))
- 4.2.4 Opening the Front Panel will reveal the Alarm modules, as well as the existing back box.
- 4.2.5 To install the required power supply, (see [Figure 13](#)) disconnect and discard existing power supply, as it may not be appropriate for this application. All existing electronics should be discarded, as the Chemetron retrofit alarm is a self contained unit requiring no additional electronics.
- 4.2.6 Using the three holes in the Chemetron Power Supply sheet metal cover as a template, scribe the three hole locations into the back box. Make certain there is room for the Pressure/Vacuum Transducers when locating Power Supply in the Back Box.
- 4.2.7 To assemble the Chemetron Power Supply unit, pilot drill the three holes with a number 35 drill (0.110" diameter).
- 4.2.8 Using the three 6-32 x 1/4" Lg., self-tapping sheet metal screws provided, install the Power Supply.
- 4.2.9 Connect the power supply cable to the Control Module making certain no power is connected to the power supply in the back box.
- 4.2.10 See section 2.7.0 for wiring details

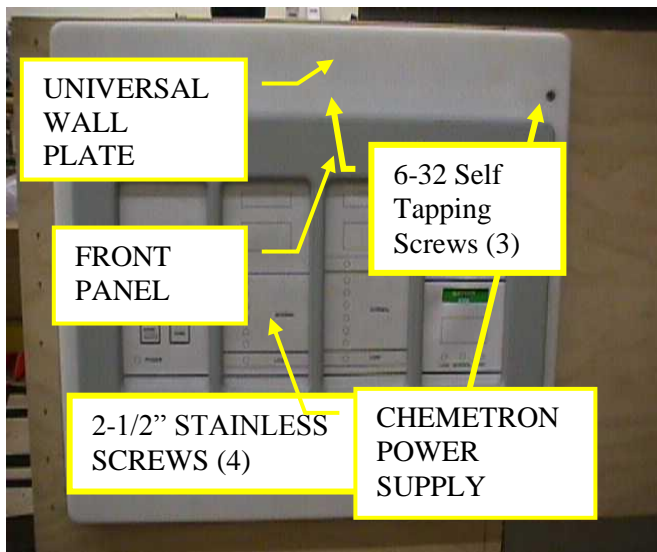


Figure 12 – Install Universal Wall Plate



Figure 13 – Install Power Supply

CAUTION: A PRESSURE TEST MUST BE PERFORMED WITHOUT PRESSURE OR VACUUM TRANSDUCER IN PLACE IN ORDER TO PREVENT DAMAGE TO THE TRANSDUCER.

4.3.0 Installing Pressure or Vacuum Transducers:

4.3.1 Installing the Pressure or Vacuum Transducers inside the Back Box. For each Module, assemble the transducer to the correctly labeled male DISS fitting (see [Figure 14](#)). Repeat this step for each Transducer. Refer to Section 4.13.0 for wiring instructions.

WARNING: GAS MUST BE SHUT OFF BEFORE PERFORMING STEP 4.3.2 AS PERSONAL INJURY MAY OCCUR.

4.3.2 Installing the Pressure or Vacuum Transducers outside the Back Box (see [Figure 14](#)). Install a 1/8-27 NPT connection in the hospital piping system at intended location of Transducers (install per NFPA 99). Screw a male DISS fitting into the above installed connector.

Assemble the transducer to the male DISS fitting (see [Figure 14](#)). Repeat this step for each Transducer. Refer to Section 4.13.0 for wiring instructions.

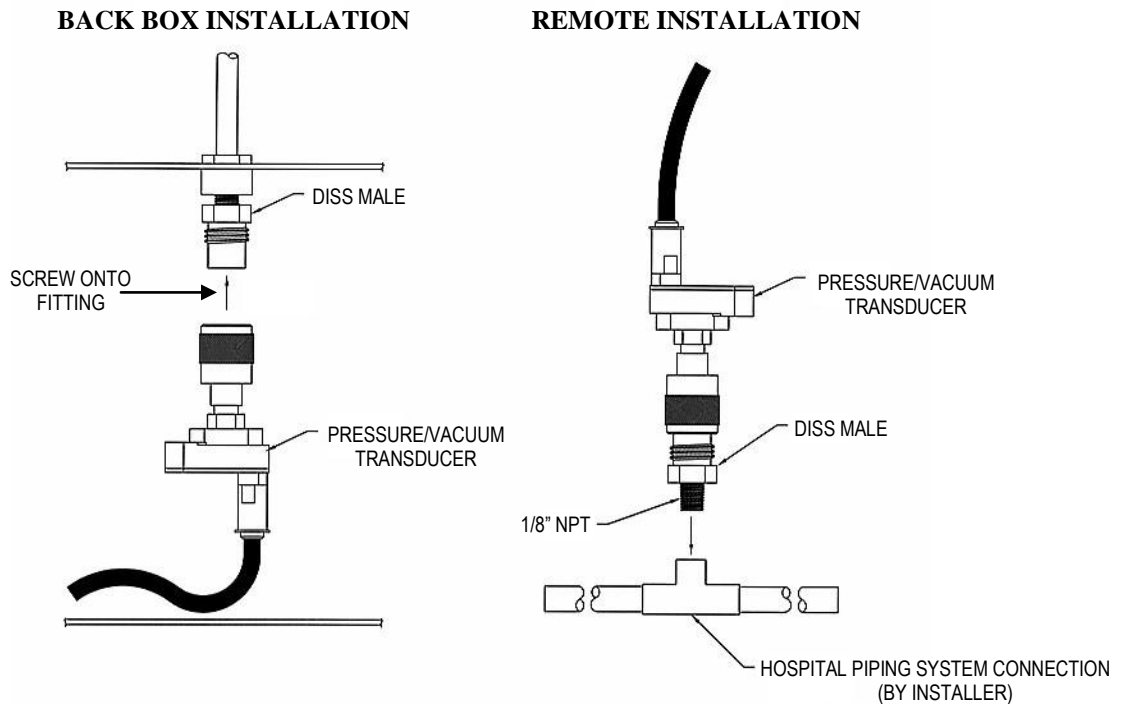


Figure 14 – Transducer Installation

WARNING: DO NOT INSTALL TRANSDUCERS UNTIL AFTER ALL SYSTEM PRESSURE TESTS ARE COMPLETED PER NFPA 99. CONDUCTING PRESSURE TESTING WITH VACUUM TRANSDUCERS INSTALLED WILL DESTROY THE TRANSDUCER.

4.4.0 Installing the Front Panel:

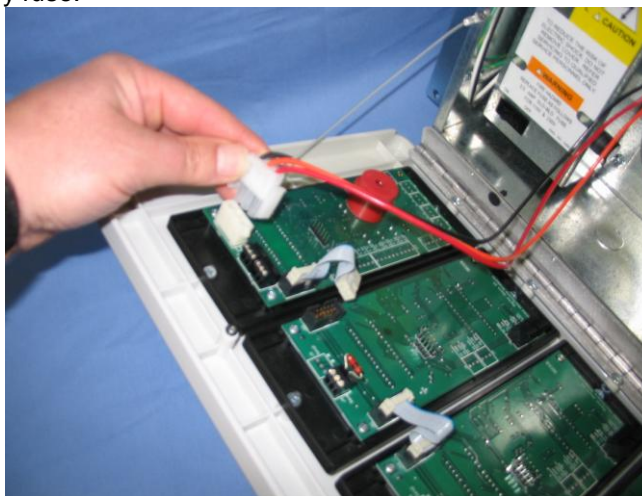
- 4.4.1 Remove Front Panel from carton and unwrap protective cover.
- 4.4.2 Using the pre-assembled Christmas tree plugs located on the hinge, gently install the plugs into the back box holes, (2) which do not contain threaded inserts (See [Figure 15](#)). These plugs are used as a temporary holding device to aid assembly in the field.
- 4.4.3 While supporting the front panel, attach the hinge to the back box using four of the 6-32 fasteners provided to hold the dust cover on the back box (See [Figure 16](#)).
- 4.4.4 While supporting the front panel, finish installation by attaching both lanyards with the fasteners used to hold the dust cover on the back box (See [Figure 16](#)).

4.5.0 Labeling the Modules:

- 4.5.1 Disconnect the power supply cable from the Control Module.
- 4.5.2 Support the Front panel and remove the individual modules to be labeled (see [Figure 17](#)).
- 4.5.3 Lift the overlay of each Module and label it with the appropriate Gas Service Label (see [Figure 18](#)). Each label has a locating pocket in the plastic module. Double-sided tape is provided at the top of the module. The installer is to remove the protective cover from the tape, install labels, then press down on the overlay to reattach the overlay to the plastic module. Make certain holes in overlay align with register pins in plastic module.
- 4.5.4 Lift the overlay of each 10-Switch Signal and 8-Transducer module (see [Figure 19](#) & [Figure 20](#)) and label it with the Main Annunciator labels and the 10-Switch Signal Labels. Double-sided tape is provided at the top of the module. The installer is to remove the protective cover off the tape, install labels, then press down on the overlay to reattach the overlay to the plastic module. Make certain holes in overlay align with register pins in plastic module.
- 4.5.5 Reinstall the modules in the front panel assembly.

CAUTION: TURN POWER SWITCH OFF. DO NOT INSTALL FRONT PANEL WITH POWER ON AS THE MODULES MAY BE DAMAGED.

- 4.5.6 Plug the power cable from the Power Source to the Control Module on the front panel (see Figure below). Replace the primary fuse.



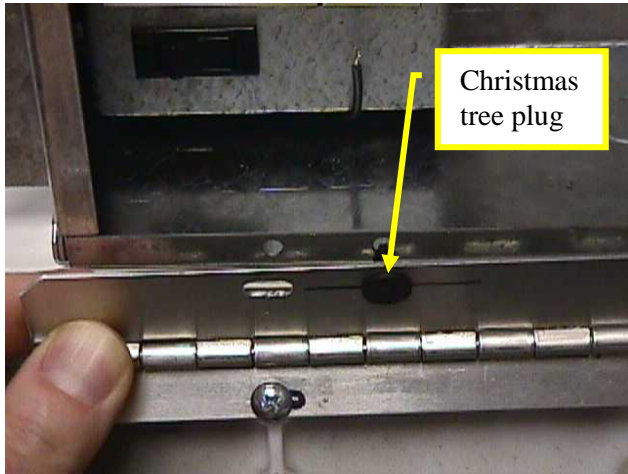


Figure 15 – Christmas tree plug installation

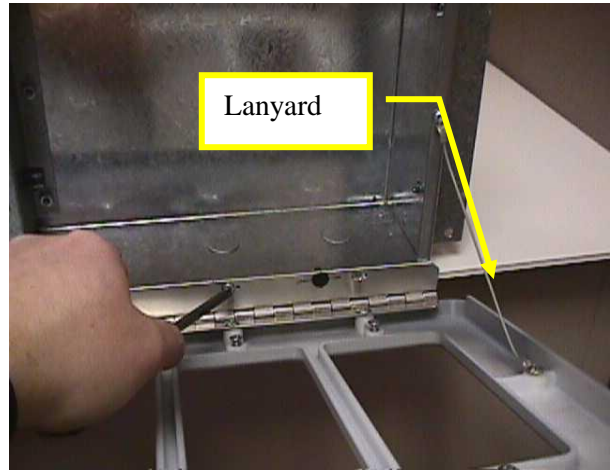


Figure 16 – Installing hinge and lanyards

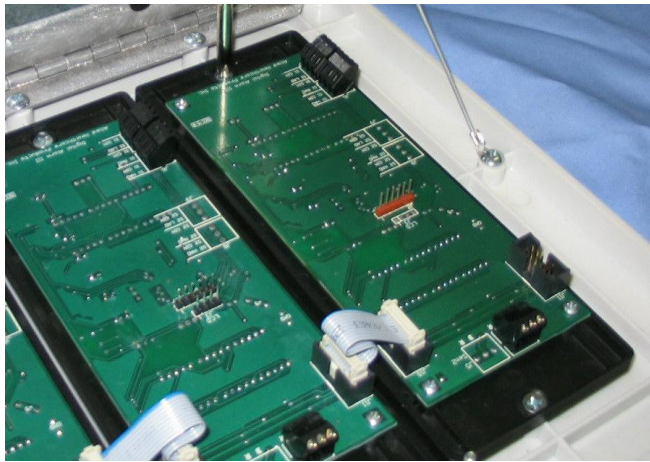


Figure 17 – Remove Module for Labeling

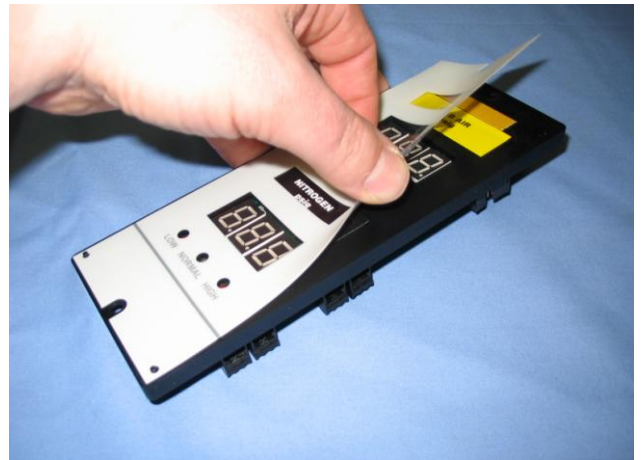


Figure 18 – Installing Gas Service Labels



Figure 19 – Labeling 10 Switch Signal Module



Figure 20 – Labeling 8- Transducer Module

4.6.0 **Wiring:**

4.6.1 Remove the dust cover from front of back box. Box should be level and flush with finished wall.

4.6.2 Do not remove the Power Supply Cover.

4.7.0 **Wiring the 115 or 230 VAC Mains:**

WARNING ELECTRIC SHOCK HAZARD. DISCONNECT ALL POWER FROM ALARM INCOMING SIGNAL AND POWER MAINS BEFORE PERFORMING ANY WIRING.

4.7.1 Bring 115 or 230 volts AC line, thru conduit, to the left top side of the Back Box (see [Figure 10](#)) and connect conductors to the terminal block mounted on the outside of the power supply: Hot wire to terminal labeled “**L**” ; Neutral wire to terminal labeled “**N**”; and the Ground wire to terminal labeled “**G**”. Note, strain relief should be used to attach Main Power to back box. Power for master and area alarms from the life safety branch of the emergency electrical system as described in Chapter 4, Electrical Systems. Power for local alarms, dew point sensors, and carbon monoxide sensors permitted to be from the same essential electrical branch as is used to power the air compressor system. Wiring from switches or sensors that is supervised or protected as required by Section 517.30(C) (3) of NFPA 70 National Electrical Code, for emergency system circuits.

Electrical supply should be from the standard and essential electrical system, life safety branch.

4.7.2 Pull Signal and Common wires from remote switches and slave panels through the bottom of the Back Box. Knock outs are provided. Unless otherwise specified, all signal wiring shall be #24 AWG stranded shielded wire or better:

4.7.3 Knockouts are provided for making conduit connections to the box. The maximum recommended wire length to any Remote Switch is 2,000 feet. For distances greater than 2,000 feet, use a lower gauge (larger diameter) wire, such as #20 AWG, or contact your local Allied Healthcare Products, Inc. representative. All wiring should be installed according to local and national codes (**N.E.C. Article 800**).

4.8.0 Wiring the Control Module:

Connect the 3 pin power cable from the power supply to the J11 connector on the Control Module. Connect a ribbon cable from the J16 connector to the adjacent module. If the computer monitoring system is to be used connect the incoming RS-485 cable (Belden # 9841) to one of the terminal blocks J9 or J10. Connect the outgoing RS-485 cable to the other terminal block. The RS-485 can work out to 5,000 feet from Data Converter to the furthest panel. The shielding wire must be connected to the (G) position, the white wire to the (W) and the blue wire to the (B) position, as in [figure 21](#). Be careful to ensure that there is no contact between the connections, short circuits can be very hard to find and will disable the communications. Carefully prepare the wire as shown in [figure 24](#). See the PC Software Installation Manual for more details on setting up the computer monitoring system.

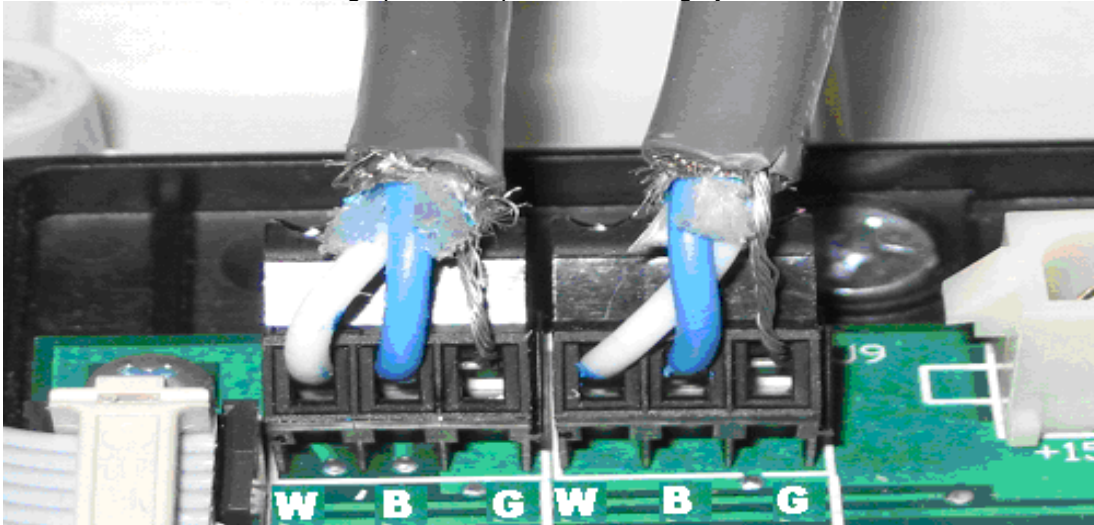


Figure 21

NOTE: THE MAXIMUM OPEN CIRCUIT VOLTAGE ON THE ELECTRONIC DRY CONTACTS IS TO BE 40 VOLTS DC OR 40 VOLTS AC PEAK. 0.35 AMPS PEAK CURRENT.

4.9.0 Wiring the Pressure and Vacuum Modules:

Connect the ribbon cable from the adjacent module to the J10 connector and if there is another module connect it to the J11 connector with another ribbon cable. Connect the transducers red wire to the (R) position of the J4 terminal block and the black wire to the (B) position. Optionally the shielding of the transducer may be connected to the remaining position on J4 used to connect the transducer shielding to ground on the board. (See [Figure 22](#).)

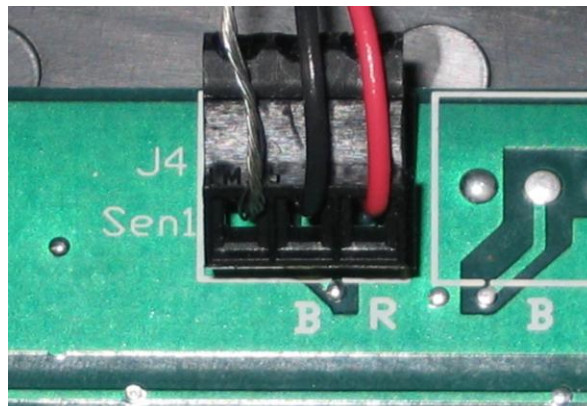


Figure 22

Terminal blocks J6 and J7 can provide switch signal outputs for high alarm (HAO), normal (NmO) and low alarm (LAO), each output signal has a corresponding ground input (GIN). (See [Figure 23](#).)

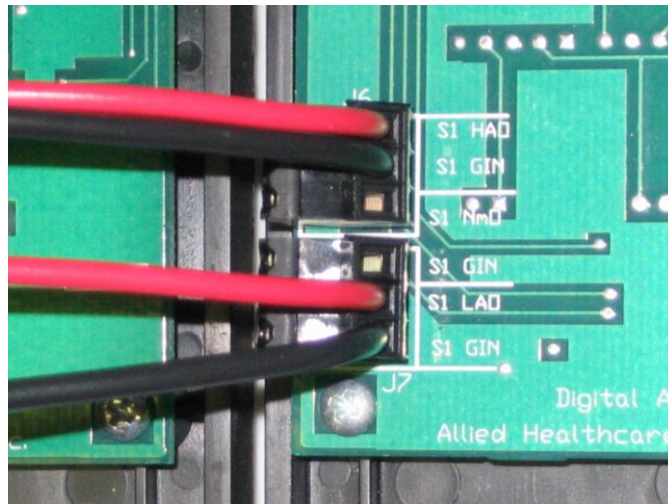


Figure 23

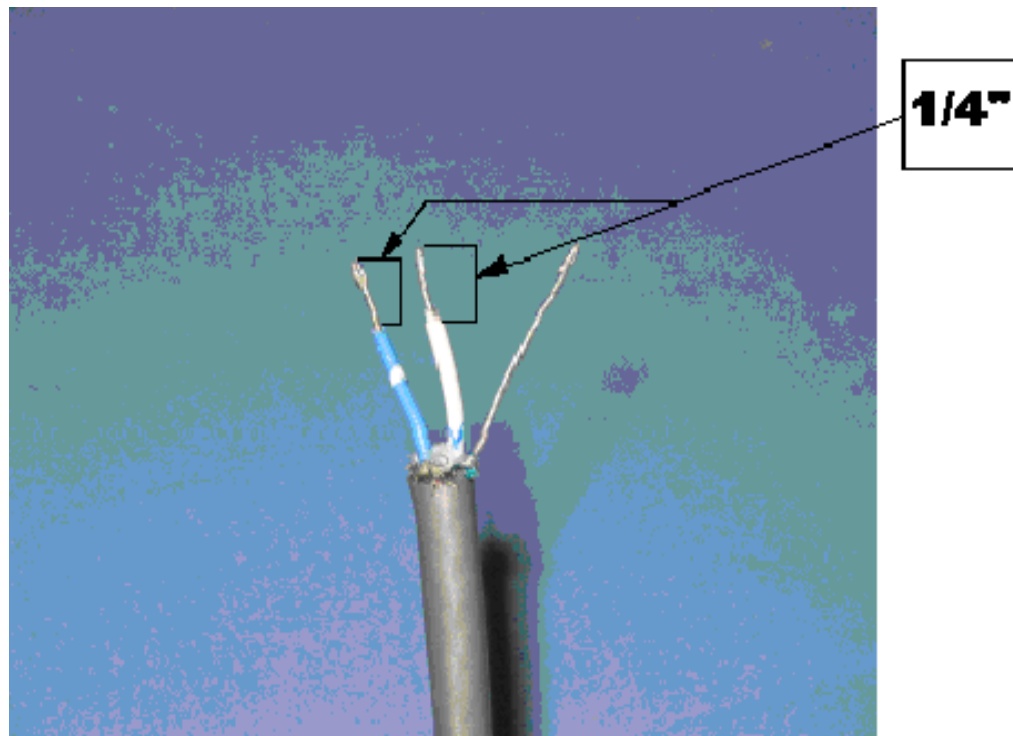


Figure 24

CAUTION: THE CABLE USED FOR REMOTE TRANSDUCERS MUST HAVE A STRAIN RELIEF TO KEEP TENSION OFF THE TRANSDUCER LEADS.

4.10.0 Wiring the Dual Display Module:

Connect the ribbon cable from the adjacent module to the J10 connector and if there is another module connect it to the J11 connector with another ribbon cable. Connect transducer 1's red wire to the (R) position of the J4 terminal block and the black wire to the (B) position. Optionally the shielding of the transducer may be connected to the remaining position on J4. Connect transducer 2 to the J5 terminal block. Terminal blocks J6 – J9 can provide switch signal outputs for high alarm (HAO), normal (NmO) and low alarm (LAO), each output signal has a corresponding ground input (GIN). Transducer 1 outputs on J8 and J9 and transducer 2 outputs on J6 and J7. (See [Figure 25](#).)

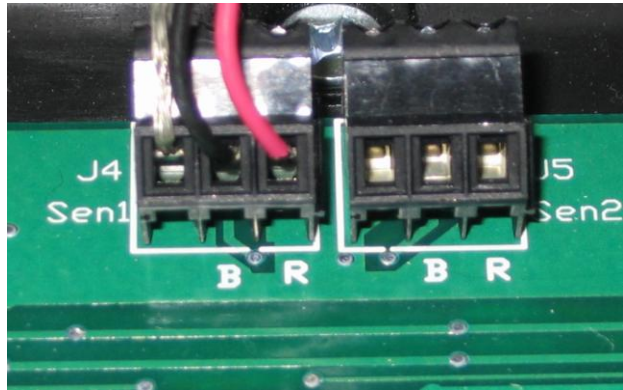


Figure 25

4.11.0 Wiring the 10-Switch Signal Module:

Connect the ribbon cable from the adjacent module to the J15 connector and if there is another module connect it to the J16 connector. The terminal blocks J13 and J14 can take up to 10 switch signal inputs. If the signal to be monitored is coming from a Pressure Vacuum or Dual Module connect the Alarm or Normal signal output from that module to one of the signal input (SI) positions and the ground in from that module to the ground output (GI) position. (See [Figure 26](#).)

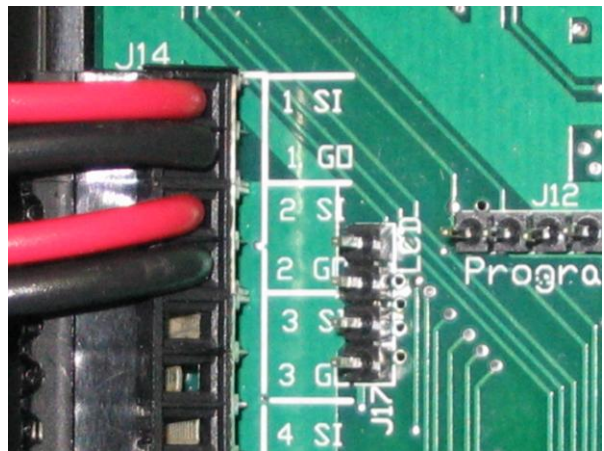


Figure 26

4.12.0 Wiring the 8 Transducer Module:

Connect the ribbon cable from the adjacent module to the J15 connector and if there is another module connect it to the J16 connector with another ribbon cable. Connect up to 8 transducers to the terminal blocks at the bottom of the board. Connect the transducers red wire to the (R) position of the terminal block and the black wire to the (B) position. Optionally the shielding of the transducer may be connected to the remaining position on the terminal block. The transducer connected to the S1 terminal block will correspond to the top LED indicator. (See [Figure 27](#).)

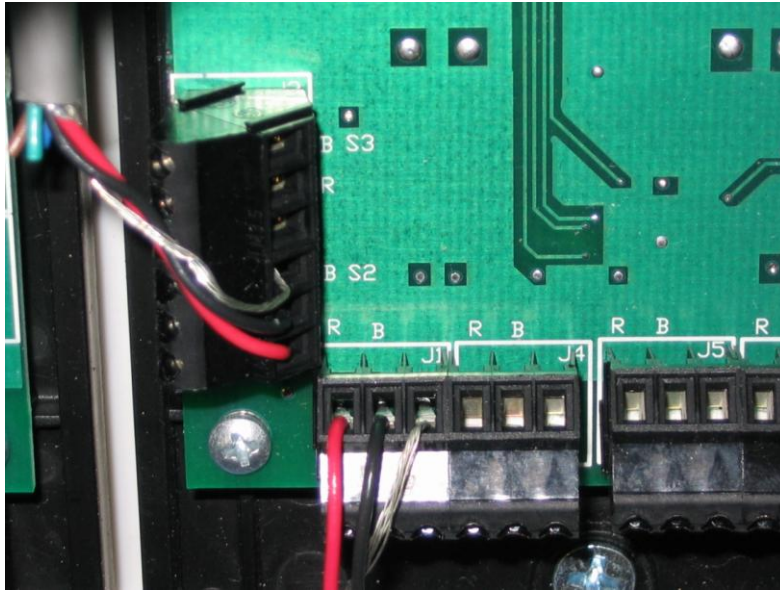


Figure 27

4.13.0 Wiring the Pressure/Vacuum Transducers

For Transducers installed in the Back box, the Transducers are wired to the three pin terminal block. The blocks are labeled Sen1 – Sen8 depending on the number of possible transducer inputs. Connect the red wire to the R position and the Black wire to the B position of the terminal block. The third position on the terminal block may optionally be used to connect the transducer shielding to ground on the board. For Transducers installed remotely, the transducer can be located up to 2,000 feet from the Alarm Back Box. When remote Transducers are used, a 2 wire 24 AWG stranded shielded cable or better is required.

SECTION V

5.0 Set-up:

5.0.1 Setup is performed without removing the front panel from back box. All Set-Up procedures are performed through the keypad located on the front panel on the Control Module.

5.1.0 Program Mode:

To enter program mode press and hold the Test/Shift button down for about 6 seconds. If the 2 digit LED display is off when program mode is entered the LED display will turn on. If the LED display is already on prior to pressing the button, once program mode is entered the LED display will flash off and then back on. Once in program mode the PC address will be displayed.

5.1.1 Transducer Types and Set Points:

To set up the transducers first enter program mode. Once in program mode use the SHIFT UP and DOWN buttons to enter a command of 28. Press the UP button until a 2 is displayed on the right digit, then press the SHIFT button to shift the 2 to the Left digit, then press the down button until an 8 is displayed on the right digit. Once the LED's are displaying 28, press the Enter button to send a Set Sensor command. The LED displays on modules 2 – 7 will all shut off and a 1A (default) will be displayed on the Control Module, the 1 signifies the sensor number 1, and A the sensor type. If the first sensor has already been set up to something other than a type A that will be displayed instead of 1A. Sensors will be setup starting with module 2 sensor 1 and continue through to the last sensor on the last module in order. Use the UP and DOWN buttons to select the sensor type, then press ENTER. The modules LED's will then turn on and display the new sensor type. Next use the SHIFT UP and DOWN buttons set the two digit set point for the sensor type just entered and press enter. You will only enter the two most significant digits for each sensor. For example, for sensor type D use a 10 for a set point of 100. For sensor type E use a 01 for a set point of 100 and a 10 for a set point of 1000. Press enter after setting the 2 digits of the set point on the control module and the pressure module will then display the full set point. Continue this process until all sensor types and set points have been entered. If a mistake is made you will have to repeat the entire process. Entering a set point of 0 will disable that input.

5.1.1.1 If one or more 10 Switch Signal Modules are included in the panel for each of the 10 inputs enter a 0 to disable that input, 1 – for normal operation or a 2 – for Indicator Only operation. Mode 0, the input will be inactive and the LED off. Mode 1, during normal operation, the LED is green. If any input in Normal mode switches from normal to a fault condition, the audio alarm will sound and the red LED (Fault Indicator) next to the label of the fault condition will turn red. Pressing the alarm silence button on the Control Module will silence the audio alarm. Subsequent activation of any other signal will cause the silenced audio alarm to sound again. Only correction of the fault monitored by the individual Fault Indicator will cause the red LED to turn green. Mode 2, Indicator Only Mode, during normal operation, the LED is green. If any input in Indicator Only Mode switches from normal to a fault condition, the audio alarm will not sound and the LED next to the label of the fault condition will turn yellow.

5.1.1.2 All transducers used must provide a 4 – 20 mA output to function properly. Sensor type A is for 0 – 99.9 PSI sensor. Sensor type B & C are for 0 – 14.7 PSI vacuum sensors, type B will display 0 to 760 mm Hg and C will display 0 – 29.9 in Hg. Sensor type D will display 0 – 300 PSI. Sensor type E (for the 8 transducer board only) is for 0 – 3000 PSI. Sensor type F is for any other 4 – 20 mA sensor such as flow or temperature and will display 0 – 99.9 % of full scale.

5.1.1.3 Sensor type A and D will alarm at +/- 20% deviation from the set point. Sensor type B will alarm below 305 mm Hg. Sensor type C will alarm below 12.0 in Hg. Sensor type E will only alarm if the pressure goes below the actual set point, there is no Hi alarm. Sensor type F will only alarm if the input goes above the set point, there is no Low alarm

Sensor Types:

<u>Designator</u>	<u>Range</u>	<u>Default Set Point</u>	
A	0-100 psi	50	
B	0-760 mmHg (V)	483	No Hi Alarm
C	0-30 inHg (V)	19	No Hi Alarm
D	0-300 psi	165	
E	0-3000 psi	1500	No Hi Alarm *
F	0-100%	50	No Low Alarm *

(V) - Vacuum

* Set Point is the Actual Alarm Point

5.1.2 Set PC Address:

- 5.1.2.1 If the PC monitoring program is to be used each alarm on a line must have a unique address. To set the address enter program mode, once in program mode the current address will be displayed if the address has not been set up yet a 00 will be displayed. Once in program mode enter a command of 29, (Set PC Address) and then enter the desired address. If the same address is used more than once on a line communications errors could result. See the PC Software Installation Manual for more details on setting up the computer monitoring system. To check the PC Address, enter program mode and the PC Address will be displayed.

SECTION VI

6.0 TYPICAL WIRING DIAGRAM:

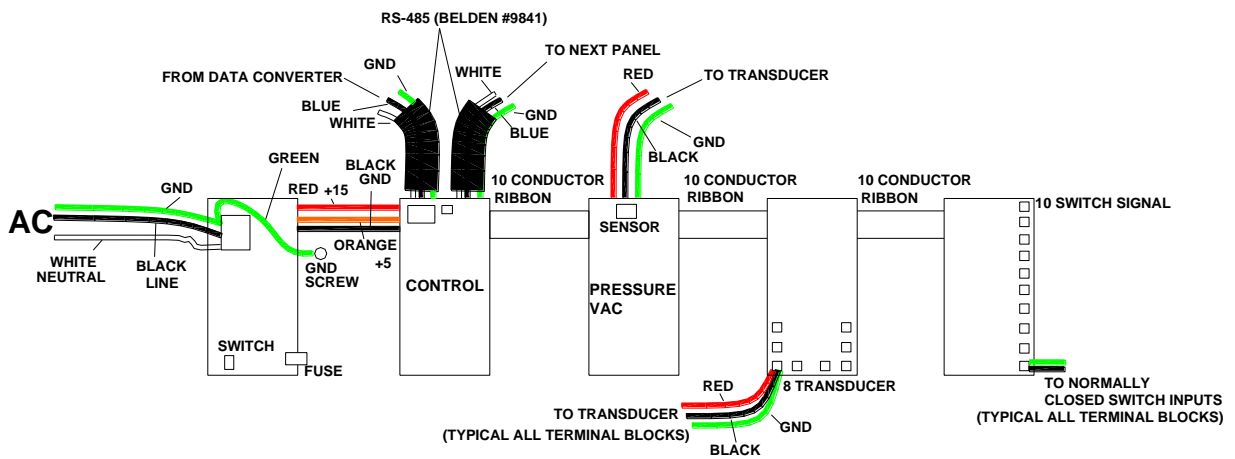


Figure 28 – Typical Wiring Diagram

SECTION VII

7.0 REPLACEMENT PARTS FOR IMPACT ALARM :

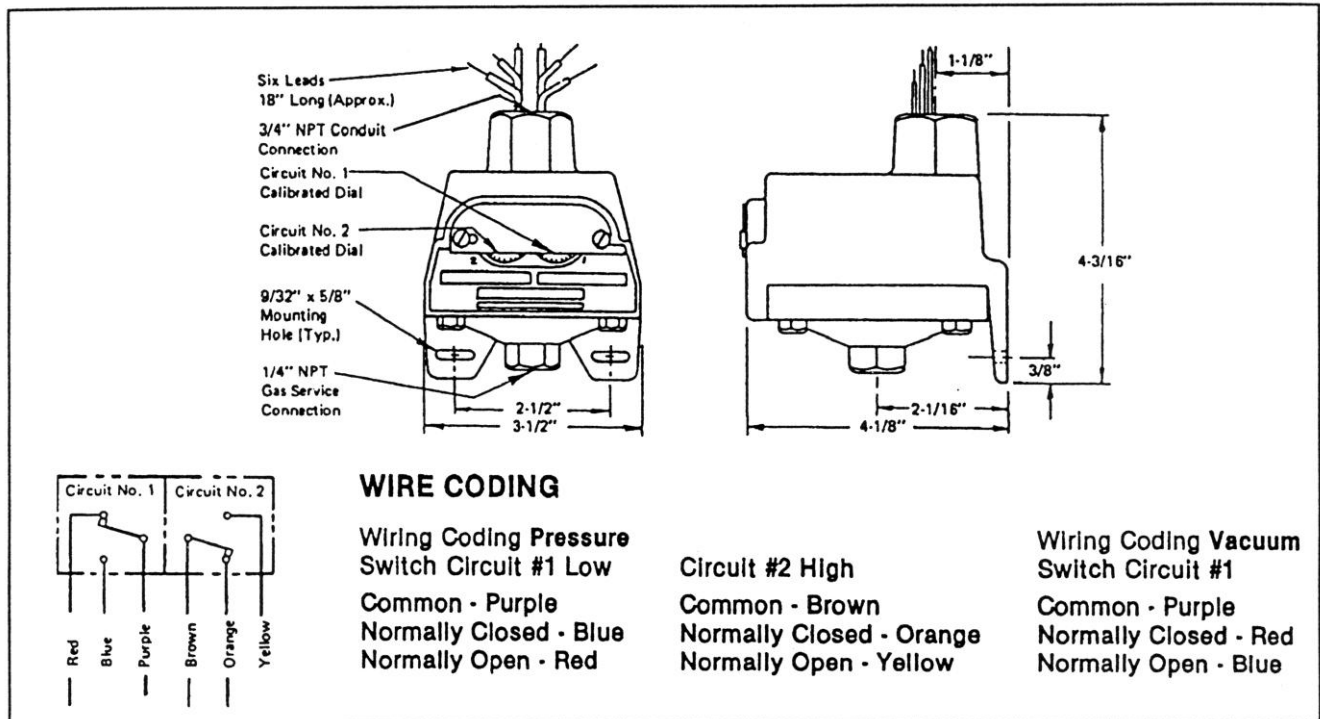


Figure 29 – Pressure/Vacuum Switch

NOTE: When wiring the pressure switch, if you want to get an alarm when the pressure is abnormal (either Hi or Low) use the wiring from the Abnormal section. This will only take one input on your 10 switch signal board and will alarm if the pressure goes either Hi or Low.

If you want to get a specific Hi or Low alarm, follow the Wiring for Hi/Low you will need to use one input on the 10 switch signal board for the Hi and one for the Low

1. **Wiring for Abnormal** – Wire purple and brown wires together. The blue wire gets wired to the alarms’ 10-switch signal PCB labeled “SI” (signal input). The orange wire gets wired to the alarms’ 10-switch signal PCB labeled “GO”(ground out). See [Figure 29](#).
2. **Wiring for Hi/Low** - Wire purple wire to alarms’ 10 switch signal PCB labeled “GO”, and wire the blue wire to alarms’ 10-switch signal PCB labeled “SI” for one channel. Wire the brown wire to the alarms’ 10-switch signal PCB labeled “GO”, and the orange wire to the alarms’ 10-switch signal PCB labeled “SI”, for the other channel.

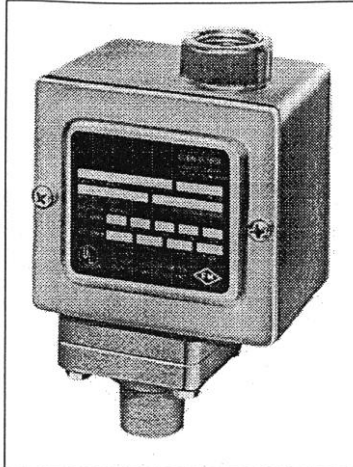


Figure 30 – Pressure Switch - Nitrogen

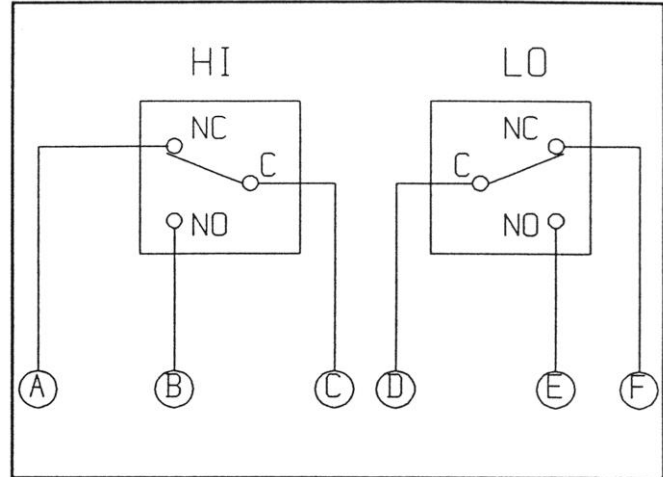


Figure 31– Wiring For Nitrogen Pressure Switch

NOTE: When wiring the pressure switch, if you want to get an alarm when the pressure is abnormal (either Hi or Low) use the wiring from the Abnormal section. This will only take one input on your 10 switch signal board and will alarm if the pressure goes either Hi or Low.

If you want to get a specific Hi or Low alarm, follow the Wiring for Hi/Low you will need to use one input on the 10 switch signal board for the Hi and one for the Low

1. **Wiring for Abnormal** – Wires “C” and “D” are wired together. Wire “A” is wired to the Alarms’ 10-switch signal PCB, labeled “SI” (signal input). Wire “F” is wired to the Alarms’ 10-switch signal PCB labeled “GO” (ground out). (See [Figure 31](#)).

2. **Wiring For A Hi-Lo Input** – Wire “A” is wired to Alarms’ 10-switch signal PCB labeled “SI” and wire “C” is wired to “GO”, for one input. Wire “F” is wired to Alarms’ 10-switch signal PCB labeled “SI” and “D” is wired to “GO” for other input. (See [Figure 31](#).)

All Repair Parts listed are field replaceable.

NOTE: Parts not identified as field replaceable are not considered to be such and in the event of malfunction or breakdown of one of these parts, the entire assembly should be replaced or returned to our factory.

Contact our Factory Technical Support Center at 800-411-5136 if you have any questions.

CAUTION: DO NOT SUBSTITUTE PARTS WITHOUT PERMISSION FROM ALLIED HEALTHCARE PRODUCTS, INC.'S TECHNICAL SUPPORT CENTER. SUCH SUBSTITUTION CAN CAUSE PREMATURE PRODUCT FAILURE AND MAY VOID THE WARRANTY.

7.0 Replacement Parts for the IMPACT Alarm System:

Catalog Number	Description	Figure No. Where Shown
74-90-9002	Transducer, Vacuum	
74-90-9001	Transducer, 100 psi	
74-90-9005	Transducer, 300 psi	
74-90-9006	Transducer, 3000 psi	
74-13-0100	Pressure Switch for Oxygen	
74-13-0101	Pressure Switch for Vacuum	
74-13-0102	Pressure Switch for Nitrous Oxide	
74-13-0103	Pressure Switch for Medical Air	
74-13-0104	Pressure Switch for Carbon Dioxide	
74-13-0105	Pressure Switch for Nitrogen *	
74-13-0106	Pressure Switch for Oxygen/Carbon Dioxide	
74-13-0107	Pressure Switch for Waste Anesthetic Gas Disposal (WAGD)	
74-14-9051	Kit, Transmitter, Oxygen (Diss. Fitting included)	
74-14-9052	Kit, Transmitter, Vacuum (Diss. Fitting included)	
74-14-9053	Kit, Transmitter, Nitrous Oxide (Diss. Fitting included)	
74-14-9054	Kit, Transmitter, Air (Diss. Fitting included)	
74-14-9055	Kit, Transmitter, Carbon Dioxide (Diss. Fitting included)	
74-14-9056	Kit, Transmitter, Nitrogen (Diss. Fitting included)	
74-14-9057	Kit, Transmitter, Waste Anesthetic Gas Disposal (Diss. Fitting included)	
74-90-0100	Copper Pigtail	Figure 1
74-91-0001	Label, Gas Service Identification, USA/ISO	
74-91-0002	Label, ANNUNCIATOR,	
74-91-0003	Main Label, Annunciator,	
74-92-0007	Dual Display Module	Figure 2
74-92-0004	Vacuum Module	Figure 2
74-92-0003	Pressure Module	Figure 2
74-92-0001	Control Module	Figure 2
74-92-0005	10 Switch Signal Module	Figure 2
74-92-0006	8 Transducer Signal Module	Figure 2
74-92-0002	Blank module	Figure 2
74-92-0070	Fuse, Main Power 3 Amp (115/230 Volt SYSTEM)	
74-92-0072	Fuse Holder	
74-92-0071	Switch On/Off	
74-92-0073	10 Pin ribbon cable	
74-92-0074	Power supply harness cable	
74-92-0075	Power supply	
74-91-1001	Label, Gas Service Identification, CSA	

* Two Required For Low and High Signals

If any problems are noted with this product, contact the Allied Healthcare Products, Inc.'s Technical Support Center for assistance at **800-411-5136**.

LIMITED WARRANTY

The seller makes no warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, except as expressly stated in the seller's contract or the sales acknowledgment form.

Allied Healthcare Products, Inc.

1720 Sublette Avenue
St. Louis, MO 63110-1968
Telephone: 314-771-2400
Toll Free: 800-444-3954
FAX: 800-477-7701

© Allied Healthcare Products, Inc. 2005