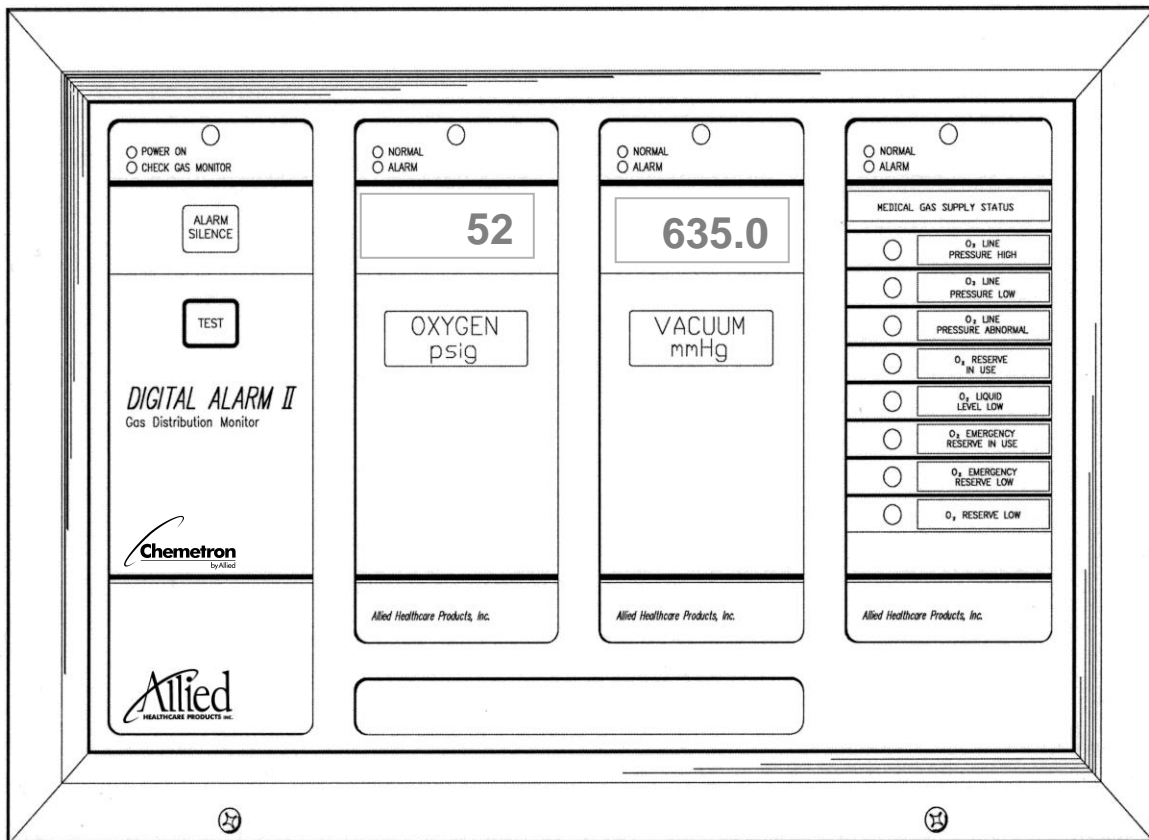


DIGITAL ALARM II

FOR HOSPITALS AND LABORATORIES

INSTALLATION AND OPERATING INSTRUCTIONS



INTRODUCTION

Allied Healthcare Products, Inc.'s Digital Alarm II alarms are designed to monitor the supply status of piped medical gases, including clinical vacuum, 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.

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**SECTION I
GENERAL INFORMATION**

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 TRANSFORMER 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 4.2.7.2 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 (1/8 Amp maximum)

AC 230 50/60 Hz (1/16 Amp maximum)

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

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

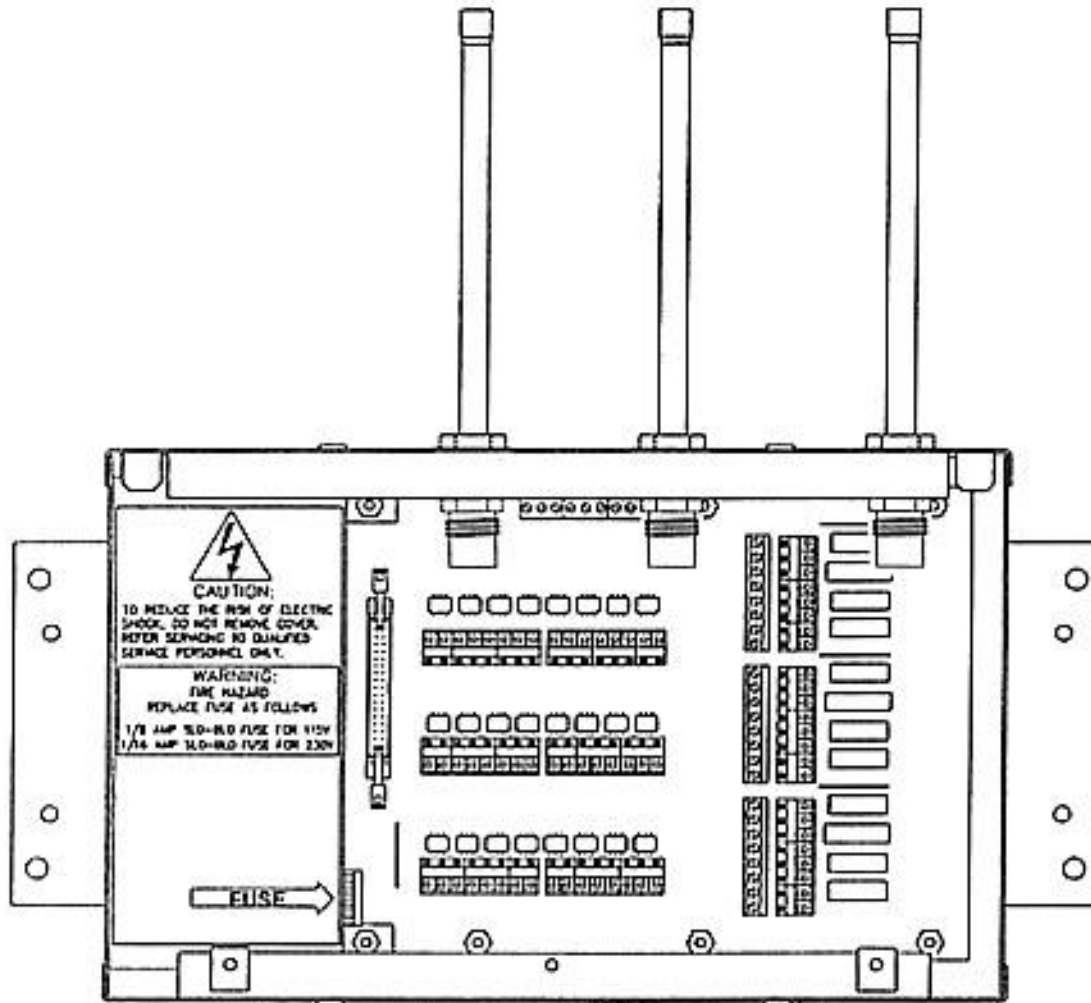


Figure 1 – Back Box with Pigtailed

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.

1.3.0 Description of Components:

1.3.1.0 The Back Box:

1.3.1.1 The Back Box (see Figure 1) contains the electronic “Mother Board”, step-down transformers, system power supply, front panel connector, and terminal blocks to interface with external circuits.

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 Pressure/Vacuum Modules with remote Transmitters. Additionally, it is used for units which contain Eight-Signal Annunciator Modules.

1.3.1.3 The Mother Board:

1.3.1.3.1 The Mother Board is installed in the Back Box and supplies the power for the alarm and all of the electrical inputs and outputs. There are 2 different types of Mother Boards.

1.3.1.3.1.1 Type 1 has the capabilities to handle one Control Module and three display Modules (i.e. any combination of Pressure/Vacuum, Eight-Signal or Blank Modules).

1.3.1.3.1.2 Type 2 has the capabilities to handle one Control Module and 6 other modules (i.e., any combination of Pressure/Vacuum, Eight-Signal or Blank Modules).

1.3.2.0 The Control Module

1.3.2.1 The Control Module contains a microprocessor that controls all of the input and output functions of the alarm (audible, visual and electronic). At power up, and after being reset, the microprocessor determines what types of modules are included in the alarm.

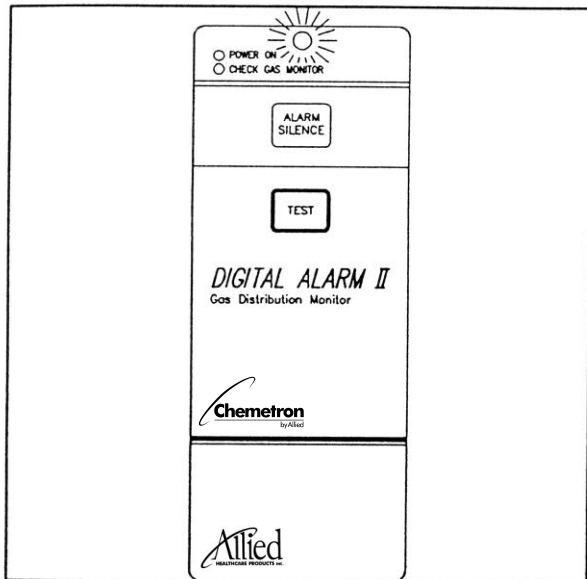


Figure 2 – Control Module
(Overlay # 74-91-0021)

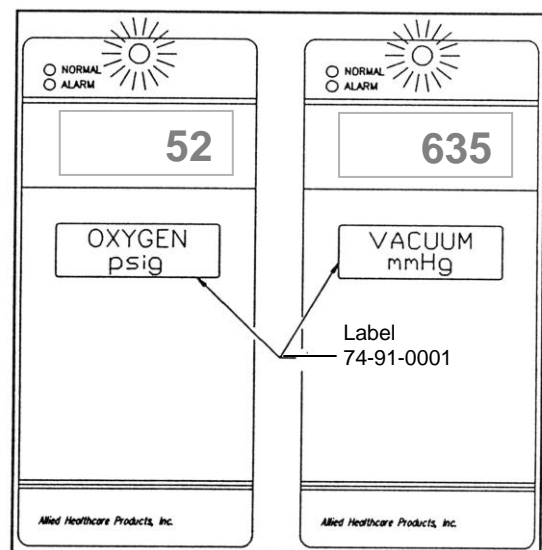


Figure 3 - Pressure/Vacuum Module
(Overlay # 74-91-0020)

1.3.3.0 The Pressure/Vacuum Module:

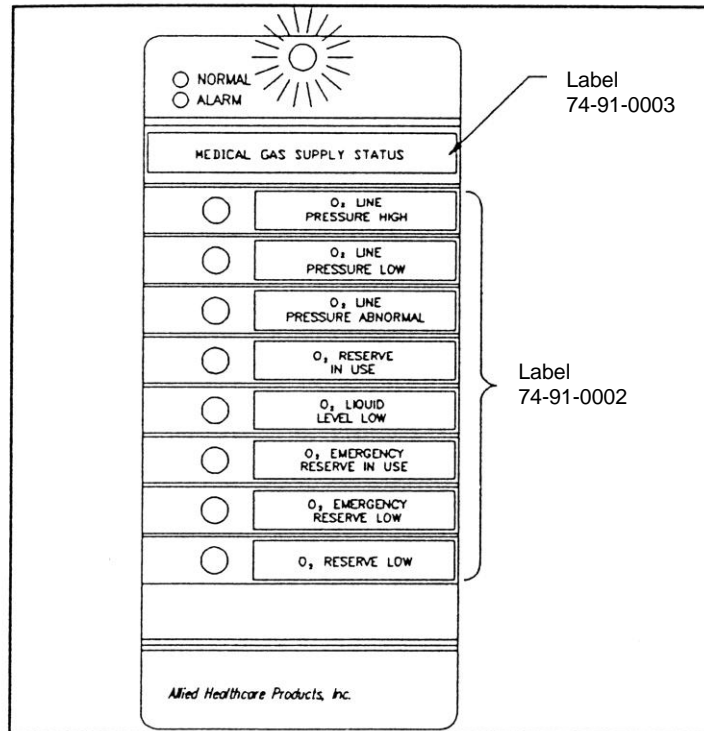
1.3.3.1 The Pressure/Vacuum Module displays the output from the Control Module with its Liquid Crystal Display (LCD). During power up, and after reset, it tells the Control Module what type of a module it is. It can be configured a low pressure (0 to 100 PSIG), a high pressure (0 to 250 PSIG for software revision below 4.0 and 0 to 300 PSIG for software revisions 4.0 and greater), or a Vacuum (0 to 30 inches Hg) Module.

1.3.4.0 The Eight-Signal Annunciator Module:

1.3.4.1 The Eight-Signal Annunciator Module (see Figure 4) displays the condition of remote switches. During power up, and after reset, the Eight-Signal Annunciator Module tells the Control Module what type of module it is.

1.3.5.0 The Blank Module:

1.3.5.1 Blank Modules (not shown) are used in configurations where the alarm employed contains positions that are unused.



**Figure 4 - Eight-Signal Annunciator Module
(Overlay # 74-91-0022)**

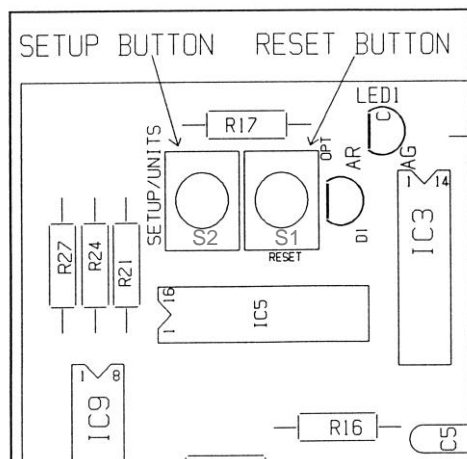
SECTION II THEORY OF OPERATION

2.0 Theory of Operation:

2.1.0 Control Module:

- 2.1.1 The Control Module is microprocessor based and controls the functions of the entire alarm system. Under normal conditions, the light (LED) at the top of the module will be green, showing that the unit has power. Should the internal electronics detect a Control Module problem, the light will turn red and the audio alarm will sound. Pressing the alarm silence button on the module will turn off the audio alarm.
- 2.1.2 The Set-up Button (see Figure 5) is used to enter Set-up Mode, which allows user to modify factory set parameters. The Set-up Button, Silence Button, and Test Button are used to modify factory set values for nominal pressures or minimum vacuum levels. Also, during Set-up of Pressure/Vacuum Modules, the Reset Button changes units of measure. During Set-up of the Eight-Signal Module, the Set-up Button changes the output from Normally Closed to Normally Open or Normally Open to Normally Closed.
- 2.1.3 The Reset Button (see Figure 5) resets the microprocessor, and must be pressed when the Set-up procedure is complete.

The Reset Button also should be pressed if abnormal alarm operation is observed. When the button is no longer pressed, the microprocessor will conduct several internal tests. If all tests are successfully completed, the audio alarm will sound three times, and normal alarm operation will follow.



**Figure 5 - Set-up and Reset
Button Location on Control Module (Rear View)**

- 2.1.4 The alarm silence button (see Figure 2) silences the audio alarm during normal operation. Refer to Set-up Section for details of its other functions.
- 2.1.5 The Test Button (see Figure 2) puts the alarm in the test mode during normal operation. Refer to the Set-up sections for details of its other functions.

2.2.0 Pressure/Vacuum Display Module:

- 2.2.1 The Pressure/Vacuum Display Module contains a LCD that provides continuous pressure/vacuum readings for a single gas pressure or vacuum line. During normal operation, a dual color LED will remain green. Once the pressure monitor deviates by more than $\pm 20\%$ from the nominal, the LED will turn red. When monitoring vacuum lines, the LED will turn red when the vacuum level drops below the minimum vacuum level.
- 2.2.2 **Alarm State** - When an alarm condition occurs, the LED will turn red, and the audio alarm will be activated. Actual pressure/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 2) on the Control Module.
- 2.2.3 **Alarm Silence** - When an alarm condition is detected, the alarm silence button can be used to cancel the audio alarm. An "Alarm Wake Up" feature will reactivate the audio alarm if the silenced alarm remains in alarm for 30 minutes. This will ensure that a prolonged alarm condition is not left without attention.
- 2.2.4 **Multiple Alarm Conditions** - Silencing the initial fault will not prevent the audio alarm from sounding due to subsequent alarm conditions from other modules.
- 2.2.5 **Test** - The Test Button on the panel of the Control Module will initiate a system test that will sequentially test each Pressure/Vacuum Module or Eight-Signal Annunciator Module. The test for each Pressure/Vacuum Module consists of several tests in the following order:
- 2.2.5.1 **LCD 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 display should read 8888. After a short delay, the entire display will be blanked. The High Pressure Module will display "HI P" if the software is configured for operation with a 300 PSIG transmitter.
- 2.2.5.2 **Low Pressure/Vacuum Simulation** - The display will show a pressure/vacuum reading that is one unit below the minimum acceptable pressures (one unit below the set minimum vacuum level). At the same time, the LED will turn red and the audio alarm will sound. The audio alarm can be canceled by pressing the alarm silence button on the Control Module.
- 2.2.5.3 **Nominal Pressure/Minimum Vacuum Level** - If the module is configured as a Pressure Module (high or low pressure), the display will turn green to suggest normal conditions. Please note that the alarm automatically determines the high and low limits. These limits are + and - 20% of the nominal pressure, as indicated on the display.
- For modules configured to monitor vacuum, the display will show the minimum level allowable, and the light will turn green to suggest normal conditions.
- 2.2.5.4 **High Pressure Simulation** - During this phase of the test, the display will show a pressure level that is one unit above the maximum allowable pressure. Additionally, the audio alarm will sound and the LED will turn red to indicate an alarm condition. Pressing the Audio Silence Button on the Control Module will silence the audio alarm. If the module is configured as a Vacuum Module, this part of the test is not implemented.

2.3.0 Eight-Signal Annunciator Module:

2.3.1 The Eight-Signal Annunciator Module (see Figure 4) is used exclusively to monitor remote 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 Eight-Signal Module contains a dual color status LED at the top of the module. During normal operation, this LED is green. This LED will turn red should one or more of the eight-signals switch from normal to a fault condition. At the same time, the audio alarm will sound and the red LED (Fault Indicator) next to the label of the fault condition will be illuminated. Pressing the alarm silence button on the Control Module will silence the audio alarm. An "Alarm Wake Up" feature will reactivate the audio alarm if the silenced alarm remains in that state for 8 hours. This will ensure that a prolonged alarm condition is not left without attention. 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 it to be extinguished. Only correction of all faults will cause the red status LED to turn green.

2.3.2 Test - To ensure that the Status LED and that each of the 8 signal lights (Fault Indicators) is functional, the Control Module does the following test:

2.3.2.1 Initially all Fault Indicators are extinguished and the Status LED turns green.

2.3.2.2 Next, starting at the top, each Fault Indicator is turned on in succession until all 8 indicators are on. Each time an additional indicator is turned on, the audio alarm will sound briefly. The audio alarm may be silenced for the rest of the test of this module by pressing the alarm silence button. The Status LED alternates colors (red and green) whenever an additional Fault Indicator is activated.

2.3.2.3 Once all 8 indicators are turned on, the reverse of Paragraph 2.3.2.2 above occurs until the system returns to its normal operating condition.

2.4.0 Mother Board:

2.4.1 The Mother Board serves several functions as follows:

2.4.1.1 **Power Supply** - Connection to the 115/230 Volt, 50/60 Hertz mains is provided on the Mother Board. Three current overload devices are installed in each alarm. One is a fuse that is part of the ON/OFF Switch Circuit located on the Power Supply Cover. The other two are solid state components soldered on the board and are under the Power Supply Cover. Incoming power is transformed to low voltages that in turn are rectified, filtered and regulated to 20 Volts DC and 5 Volts DC.

2.4.1.2 **Transmitter Interface** - All Pressure/Vacuum Transmitter Inputs are connected to the Mother Board.

2.4.1.3 **Eight-Signal Annunciator Module Inputs** - All Eight-Signal Module Inputs are connected to the Mother Board.

2.4.1.4 **All Electronic Dry Contact Outputs** - All Electronic Dry Contact Outputs are located on the Mother Board.

2.4.1.5 **Front Panel Interface** - All appropriate signals and power supply voltages are supplied through the ribbon connector on the Mother Board.

**.SECTION III
TYPICAL WALL BOX**

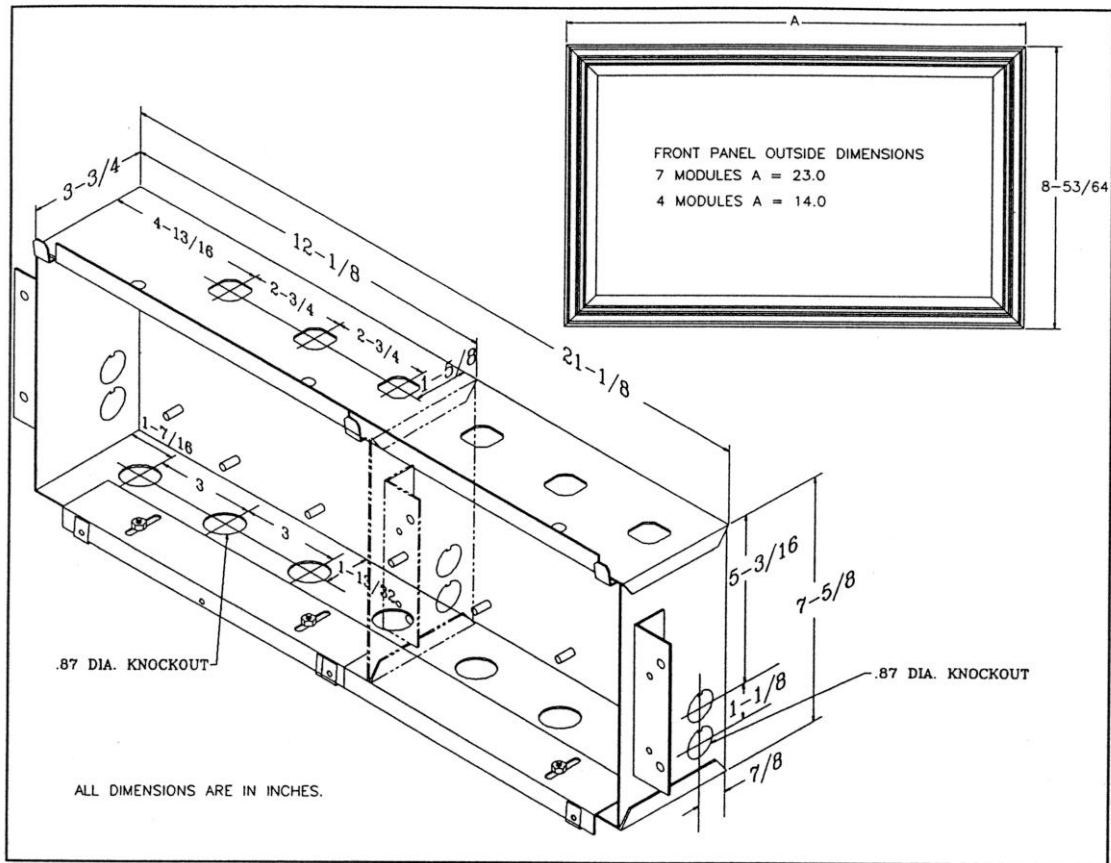


Figure 6 - Sizes of Boxes and Front Panels

3.0 Typical Wall Box:

3.1.0 Wall Boxes:

3.1.1 The Wall Boxes are available in two sizes.

3.1.1.1 One is 12.12 inches long and is meant for one Control Module and three other modules.

3.1.1.2 The second one is 21.12 inches long and is meant for one Control Module and six other modules.

SECTION IV INSTALLATION

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

4.0 Installation:

4.1.0 Mounting Box Installation:

- 4.1.1 Remove the back box from the 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 7). Fasten it securely to the wall framing. **Make sure the box is parallel, squared 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.**

Note: For Remote Transmitters refer to Step 4.2.7.2. For Transmitters to be installed in Back Box continue with Step 4.1.3.

- 4.1.3 For general installation guidelines, refer to NFPA 99, "Health Care Facilities".
- 4.1.3 Remove Dust Caps and Dust Cover to connect pigtails to appropriate laterals.
- 4.1.4 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 8).

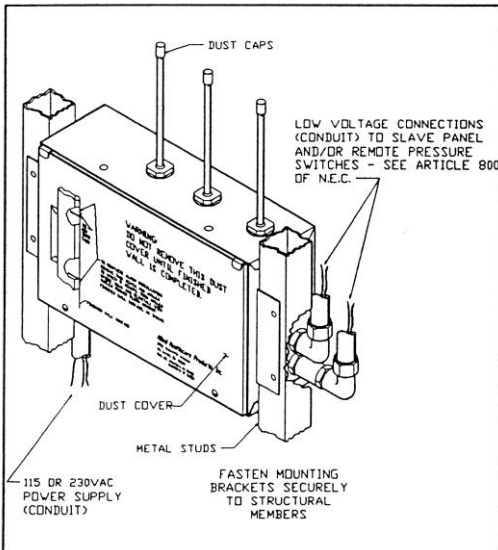


Figure 7 – Box Installed In Wall

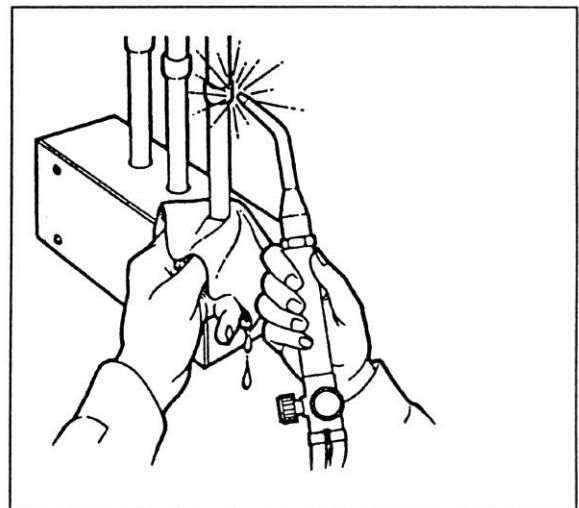


Figure 8 – Minimize Overheating Of Valve

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

4.1.5 Replace the Dust Cover until it is time to pressure test the system.

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

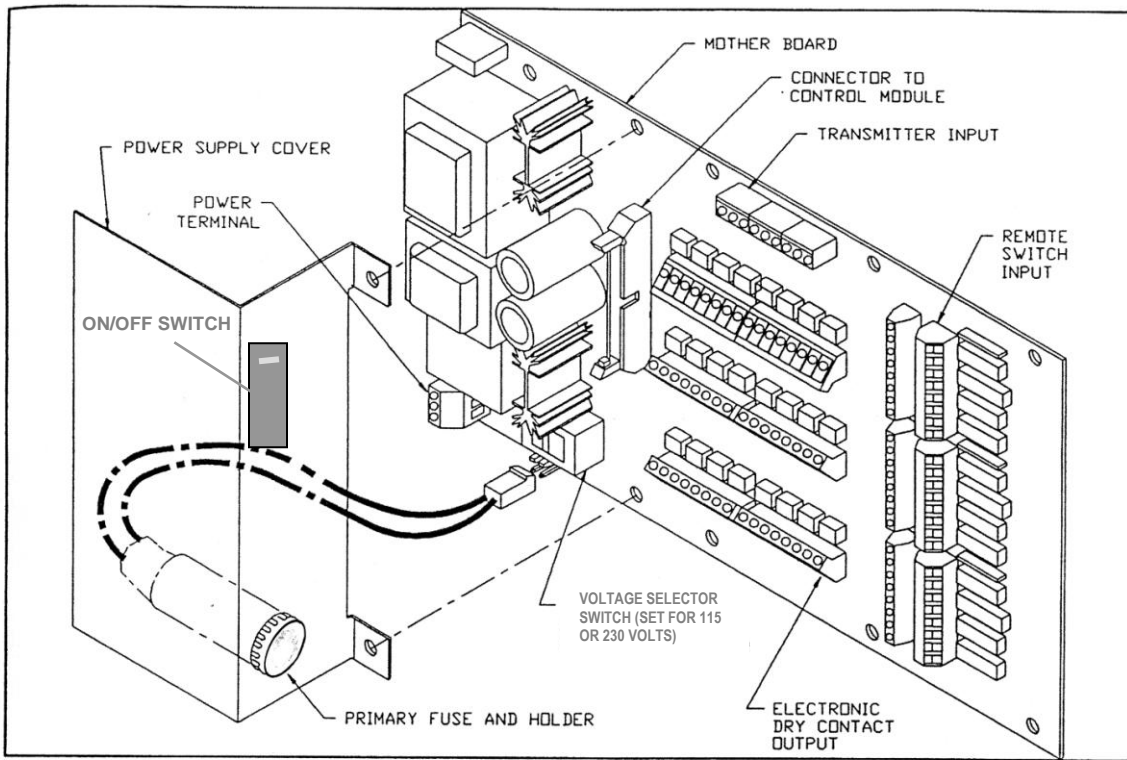


Figure 9 – Mother Board and Power Supply Cover

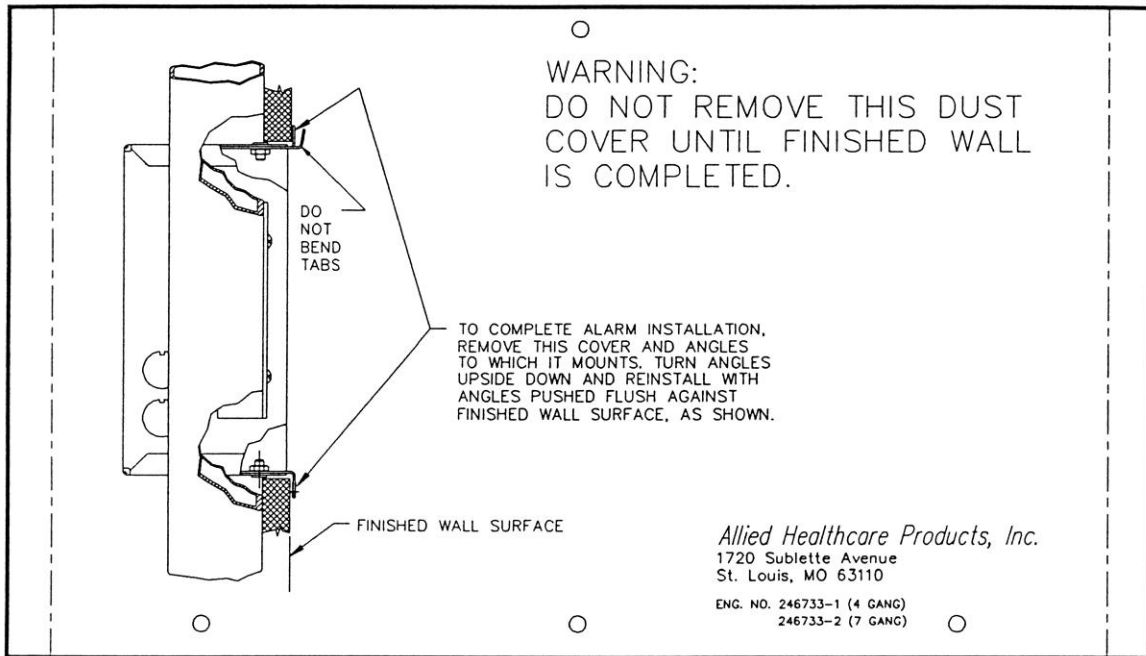


Figure 10 – Dust Cover and Angles Orientation

4.2.0 Wiring:

4.2.1 Remove the Dust Cover and angles, to which it mounts, from the Back Box (see Figure 10). Turn angles upside down and reinstall with angles pushed flush against finished wall surface.

4.2.2 Remove the Power Supply Cover.

Insure that the primary fuse is not installed. If fuse is installed, remove by pushing in on fuse cap and rotating counterclockwise then pulling out (see Figure 9). **Do not** install the primary fuse until after the Front Panel is connected.

4.2.2.1 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.

4.2.2.2 Bring 115 or 230 volts AC line to the left bottom side of the Back Box (see Figure 7) and connect conductors to: Hot side to terminal 1 of the Power Input; Neutral side to terminal 3 of the Power Input Terminal Block and Ground to the grounding post or terminal 2 (see Figures 9 and 19). **Electrical supply should be from the standard and essential electrical system, life safety branch.** Verify that the Selector Switch is set for proper voltage (see Figure 9).

4.2.3 Pull Signal and Common wires from remote switches and slave panels through the bottom or right side of the Back Box. Unless otherwise specified, all signal wiring shall be #18 gauge insulated wire. The maximum wire size for use as signal wire is #14 gauge. Use Belden Multi-wire shielded cables or equivalent for five or more wires:

Belden Cable:

# 9773	-	3 Pairs
# 9774	-	6 Pairs
# 9775	-	9 Pairs
# 9776	-	12 Pairs
# 9777	-	15 Pairs

4.2.4 Knockouts are provided for making conduit connections to the box. The maximum recommended wire length to any Remote Switch is 1,500 feet. For distances greater than 1,500 feet, contact your local Allied Healthcare Products, Inc. representative. All wiring should be installed according to local and national codes (**N.E.C. Article 800**).

4.2.5 Wiring the Eight-Signal Module:

4.2.5.1 **Inputs** - After pulling remote signal wires to the alarm panel, make connections to the terminal blocks on the Mother Board (see Figure 19): J3 and J4 for Module #1; J11 and J12 for Module #2; J20 and J21 for Module #3; J5 and J6 for Module #4; J13 and J14 for Module #5; J22 and J23 for Module #6.

NOTE: The Input Terminal Blocks have a vertical orientation.

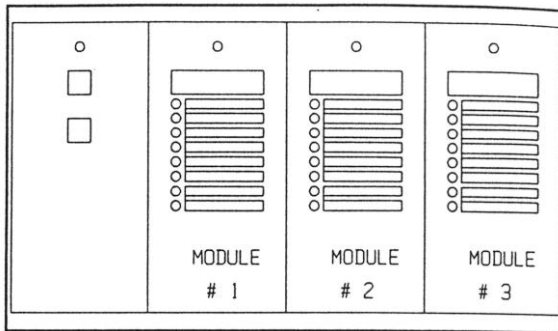


Figure 11 – Module Number

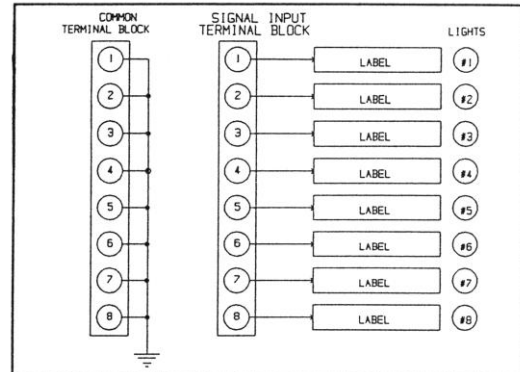
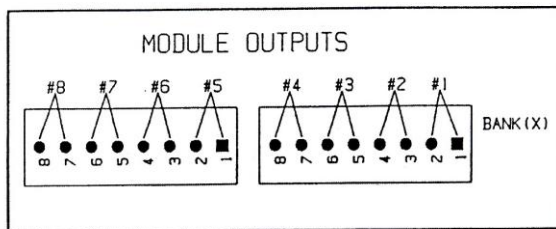


Figure 12 Input Wiring Sequence

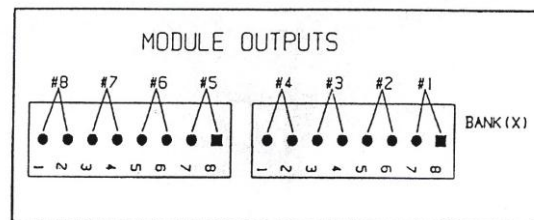
4.2.5.2 **Outputs**- Each Eight-Signal Module has 8 outputs per module. Each output is isolated and has 2 connections (See Figures 13 and 19).

Make the connections to the output terminal blocks on the Mother Board: Bank 1 is output for Module # 1; Bank 2 is the output for Module #2; Bank 3 is the output for Module #3; Bank 4 is the output for Module #4; Bank 5 is the output for Module #5; Bank 6 is the output for Module #6. There are two terminal blocks for each Bank (see Figure 13).

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.



**For 4 Gang (Rev. D) and earlier
and 7 Gang (Rev. A)**



**For 4 Gang (Rev. E) or later
and 7 Gang (Rev. B) or later**

Figure 13 – Output Locations

4.2.6 Wiring the Pressure/Vacuum Modules:

4.2.6.1 The Pressure/Vacuum Modules (See Figures 13 and 18) have 8 outputs per module. Each output is isolated and has 2 connections.

After pulling the wire from the Slave Alarm or other external device (i.e. Building Automation System), make connections to the appropriate terminals as identified in Figures 13 and 19. The outputs are factory configured.

4.2.6.2 Factory configuration of Pressure/Vacuum Outputs:

Output Number	Description
1	Contact opens on low pressure
2	Contact opens on high pressure
3	Contact opens on abnormal pressure
4	Contact opens on any fault condition of inputs (all modules) *
5	Contact closes on low pressure
6	Contact closes on high pressure
7	Contact closes on abnormal pressure
8	Contact closes on any fault condition of inputs (all modules) *

* Note: Outputs 4 and 8 only work on 7 Gang Boards when all inputs are connected.

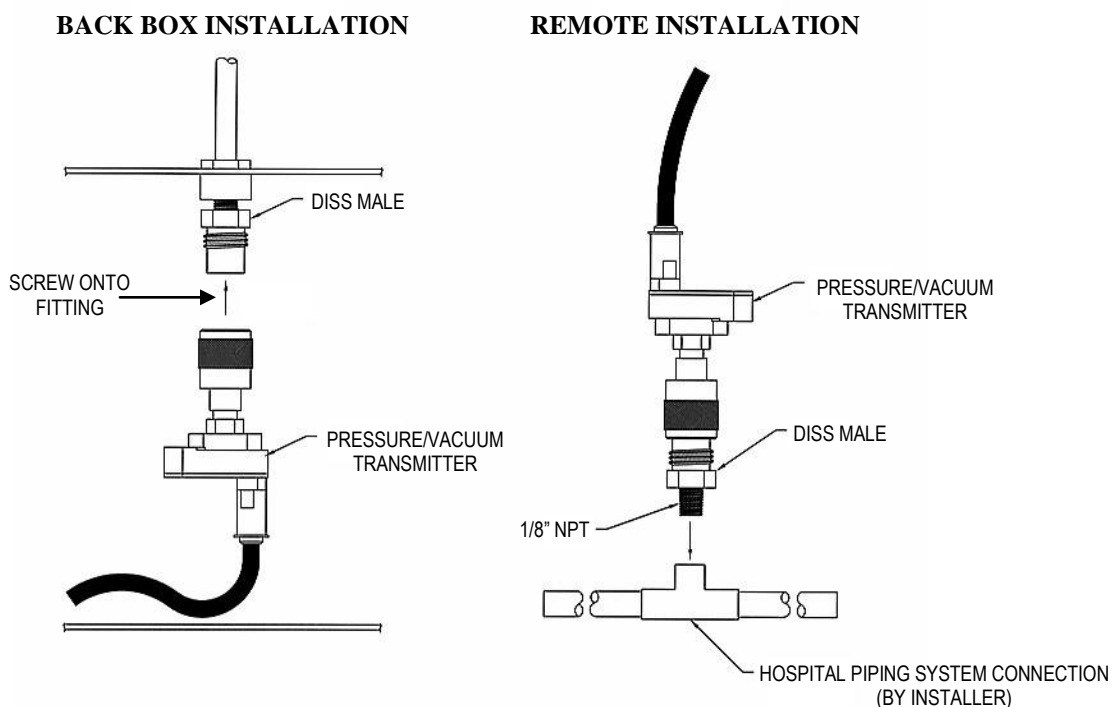


Figure 14 – Transmitter Installation

4.2.7 Installing the Pressure/Vacuum Transmitters:

4.2.7.1 Installing the Pressure/Vacuum Transmitter inside the Back Box. For #1 Module, assemble the transmitter to the left male DISS fitting (see Figure 14). Repeat this step for each Transmitter. Refer to Paragraph 4.2.8.1 for wiring instructions.

WARNING: GAS MUST BE SHUT OFF BEFORE PERFORMING STEP 4.2.7.2 AS PERSONAL INJURY MAY OCCUR.

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

Assemble the transmitter to the male DISS fitting (see Figure 14). Repeat this step for each Transmitter. Refer to Paragraph 4.2.8.2 for wiring instructions.

4.2.8 Wiring the Pressure/Vacuum Transmitters:

- 4.2.8.1 For Transmitters installed in the Back box, the Transmitters are wired to the terminal blocks starting on the left for Module #1 (see Figure 19) with the red wire to the terminal X1 position 1 and the black wire to X1 position 2. If the Transmitter has a shield wire, it is to be put in terminal X1 position 3. Repeat the above operation for each Transmitter moving to the next three terminal pins, Module #2-terminal X2, Module #3-terminal X3, etc. the right.

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

- 4.2.8.2 For Transmitters installed remote, the Transmitters can be located up to 5,000 feet from the Alarm Back Box. When remote Transmitters are used, a 2 wire shielded cable is required (Belden # 8760 or equivalent). The minimum wire size is #18 gauge. The black wire of the cable is to be spliced to the black wire of the Transmitter. The clear insulated wire is to be spliced to the red wire of the Transmitter end of the cable. The shield is not to be connected as this can cause noise in the cable. At the Back Box end of the cable, the clear insulated wire is terminated at terminal X(x) position 1, the black wire is terminated at X(x) position 2, and the shield is terminated at X(x) position 3. Repeat the above with the remaining Transmitters.

4.2.9 Final AC Connection:

- 4.2.9.1 Connect the primary fuse connector to the plug (see Figure 9) on the Mother Board. Replace the Power Supply Cover. Do not replace the primary fuse until after the Front Panel has been installed.

4.2.10 Installing the Front Panel (See Figure 18):

- 4.2.10.1 Ensure that the mounting angles have been turned over (See 4.2.1 and Figure 10).

- 4.2.10.2 Remove Front Panel from carton and unwrap protective cover.

4.2.11 Labeling the Modules:

- 4.2.11.1 Pop the modules and the retaining angle brackets out of the frame (see Figure 16).

- 4.2.11.2 Lift the overlay of each Pressure/Vacuum Module and label it with the appropriate Gas Service Label (see Figure 15). Double-sided tape is provided at the bottom of the module. The installer is to remove the protective cover off the tape, then press down on the overlay.

- 4.2.11.3 Lift the overlay of each Eight-Signal Module (see Figure 15) and label it with the Main Eight-Signal label and the Remote Signal Labels. Double-sided tape is provided at the bottom of the module, the installer is to remove the protective cover off the tape, then press down on the overlay.

- 4.2.11.4 Installing Gas Distribution Monitor - Main Monitor Label.

- 4.2.11.4.1 Type or print, on the label (refer to the illustration on the label), the area that is being monitored and the person or persons to be called if an alarm condition occurs (i.e., Intensive Care Unit 3 - John Doe at Ext. 333).

- 4.2.11.4.2 Install the label in the backside of the Front Panel (refer to illustration and instructions on label).

- 4.2.11.5 Pop the modules back into the Frame Assembly.

- 4.2.11.6 Pull the Wire Hook out from the frame (see Figure 17) and hang the Front Panel on it (see Figure 18), using the tab on the left side of the top mounting bracket.

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

- 4.2.11.7 Plug the ribbon cable from the Control Module into the connector on the Mother Board (see Figure 18).
Replace the primary fuse.
- 4.2.11.8 Alarm is now ready for operation. If Set-up has not been completed, proceed with Set-up.

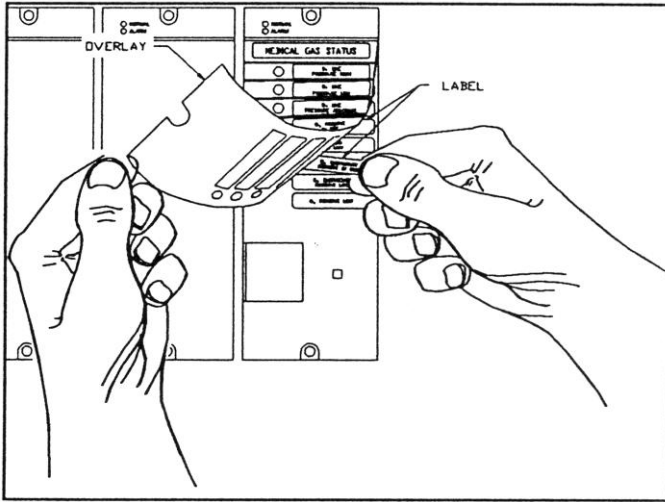


Figure 15 – Label Installation

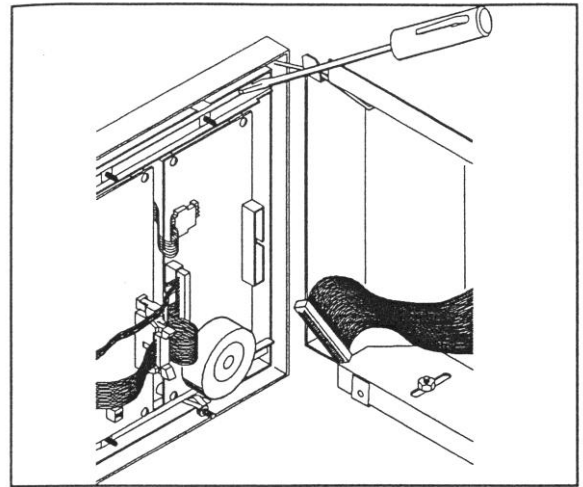


Figure 16 – Removing Module

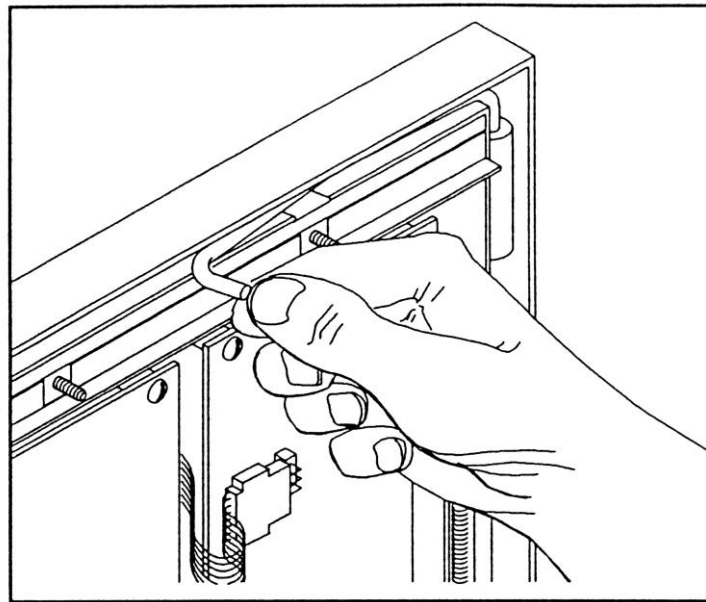


Figure 17 – Wire Hook

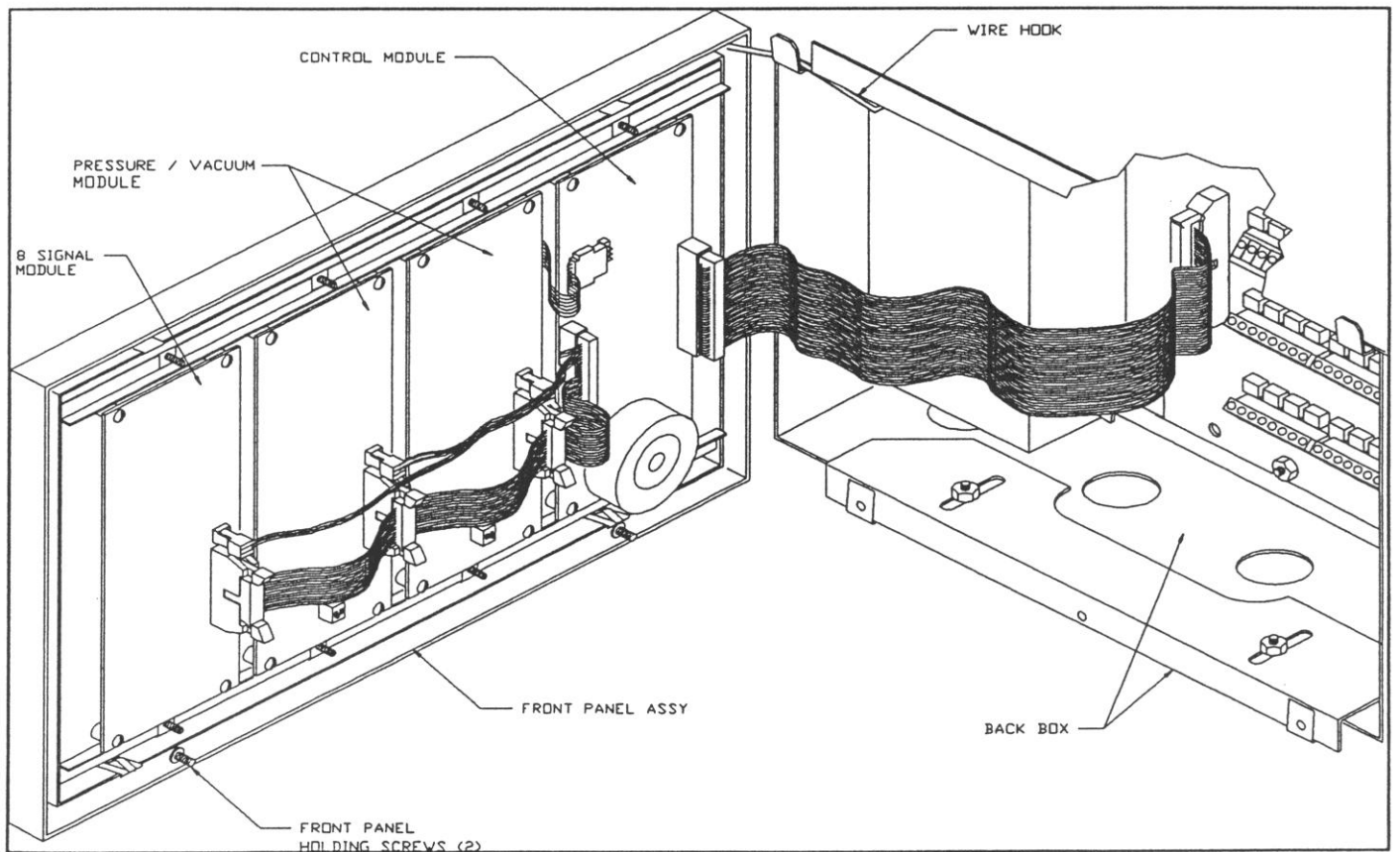


Figure 18 – Front Panel Installation

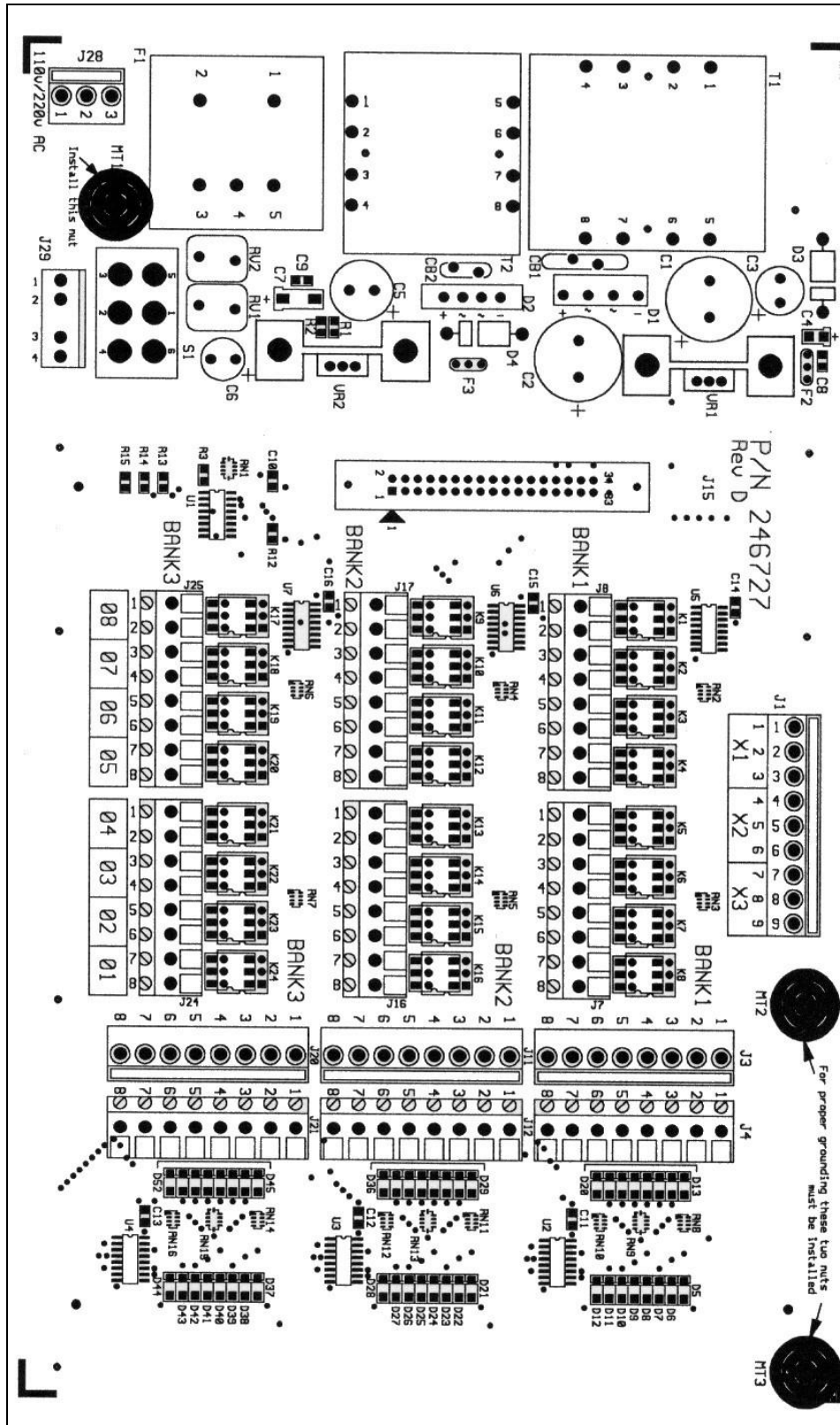


Figure 19(B) – 4 Module Mother Board

**SECTION V
SET-UP**

5.0 Set-up:

5.1.0 Hang the Front Panel on the Wire Hook provided (see Figure 17). Install ribbon cable per Installation Instructions and turn Power Switch on.

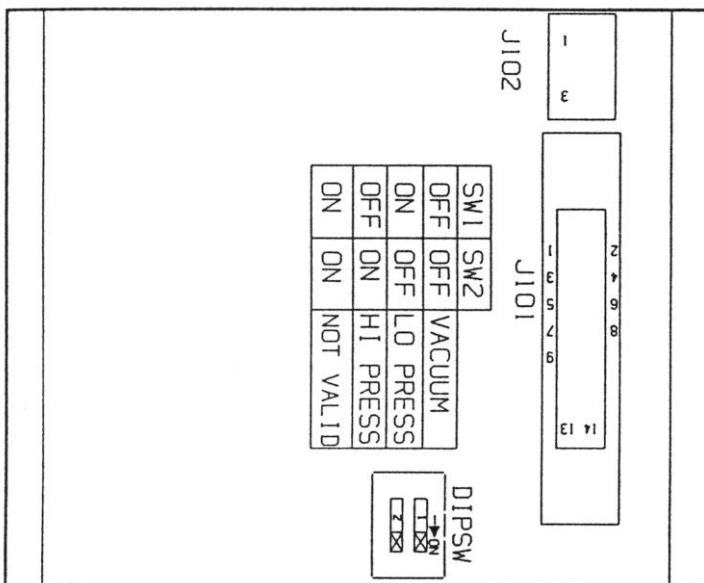


Figure 20 – Pressure/Vacuum Switch

5.2.0 Pressure/Vacuum Mode Switch Setting:

5.2.1 On each Pressure/Vacuum Module there are two switches (see Figure 20) that tell the Control Module what pressure range to display on that particular module. These switches must be set before proceeding with the rest of the Set-up. After setting the switches on all Pressure/Vacuum Modules, press the Reset Button – S2 (see Figure 5) on the Control Module.

Note: Do not set both SW1 and SW2 to the ON position. This is not a valid setting and will result in abnormal operation.

5.3.0 Press Set-up Button – S1 (see Figure 5) to enter the Set-up Mode.

5.4.0 Pressure/Vacuum Module Set-up:

5.4.1 Three configurations of the Pressure/Vacuum Modules are available, depending on the Mode Switch setting (Lo Pressure, Hi Pressure or Vacuum).

5.4.2 Lo Pressure Range Set-up (0-100 PSI):

5.4.2.1 The Normal/Alarm LED is alternately flashing green and red.

- 5.4.2.2 “50” PSI is displayed. This is the factory setting for nominal. To change units of measurement to Kilopascals, press the Set-up Button (see Figure 5). Each time the Set-up Button is pressed, during this part of the Set-up, the units of measure on the module will toggle (i.e., from PSI to Kilopascals; from Kilopascals to PSI).

To change the nominal pressure setting, press the Test Button on the Control Module. The display increments by 1. Each time you press the Test Button, the display will increment, until it reaches 80. After 80, the display will jump down to 40. The nominal pressure settings are presently 40 to 80 PSI for low pressure modules. The microprocessor automatically sets the alarm pressures at $\pm 20\%$ of nominal. After you have the display at the desired nominal pressure, press the alarm silence button. This stores the new nominal pressure into non-volatile memory. If Set-up is complete, press the Reset Button on the Control Module.

5.4.3 Hi Pressure Range Set-up (0-300 PSIG):

- 5.4.3.1 The Normal/Alarm LED is alternately flashing green and red.

- 5.4.3.2 “160” PSI is displayed. This is the factory setting for Hi Pressure Modules. Refer to Paragraph 5.4.2.2 for units of measure set-up. Again, press the Test Button to increment the display. The display will increment up to 240 then will jump down to 140. Press the alarm silence button to program this value into non-volatile memory. If Set-up is complete, press the Reset Button on the Control Module.

5.4.4 Vacuum Range Set-up (0-30 Inches Hg):

- 5.4.4.1 The Normal/Alarm LED is alternately flashing green and red.

- 5.4.4.2 “12.0” Inches of Hg is displayed. This is the factory setting for minimum vacuum. To change the units of measure to mm Hg press the Set-up Button (see Figure 5). Each time the Set-up Button is pressed, during this part of the Set-up, the units of measure for this module will toggle (i.e., from inches of Hg to mm Hg; mm Hg to inches of Hg). To change the vacuum setting, press the Test Button.

The display will increment by 0.5 each time you press the Test Button. The display will increment up to 14.0 by 0.5 steps. After 14.0 it drops down to 10.0. The minimum range that is presently allowed for Vacuum Modules is 10.0 to 14.0. The microprocessor automatically sounds the alarm when the vacuum goes below this minimum setting. After you have the display set at the desired minimum, press the alarm silence button. This programs the non-volatile memory to this value. If Set-up is complete, then press the Reset Button on the Control Module.

5.5.0 Eight-Signal Module Set-up:

- 5.5.1 The Normal/Alarm LED is alternately flashing green and red.

- 5.5.2 The Eight-Signal Module displays the Remote Switch normal condition and the Output Electronic Dry Contact normal condition. The factory setting is for normally closed circuit for both input and output.

- 5.5.3 Light # 1 and Light # 8 will be illuminated red. This is the factory setting of this module.

- 5.5.3.1 To change all inputs of this module to Normally Open Circuit, press the Test Button. Each time you press the Test Button, the top light or # 1 Light will alternate from ON to OFF then OFF to ON. ON indicates Normally Closed Circuits. OFF indicates Normally Open Circuits.

- 5.5.3.2 To change the outputs, press the Set-up Button – S1 on the Control Module, Light # 8 will turn OFF. Press the Set-up Button again and Light # 8 will turn back ON. Light # 8 ON indicates Normally Closed Circuit Output and Light # 8 OFF indicates Normally Open Circuit Output.

- 5.5.3.3 After you have both the input and output circuits set to the conditions you want, press the alarm silence button. This programs the non-volatile memory with this module's configuration. If you have finished Set-up, press the Reset Button on the Control Module.

SECTION VI

6.0 TYPICAL WIRING DIAGRAM

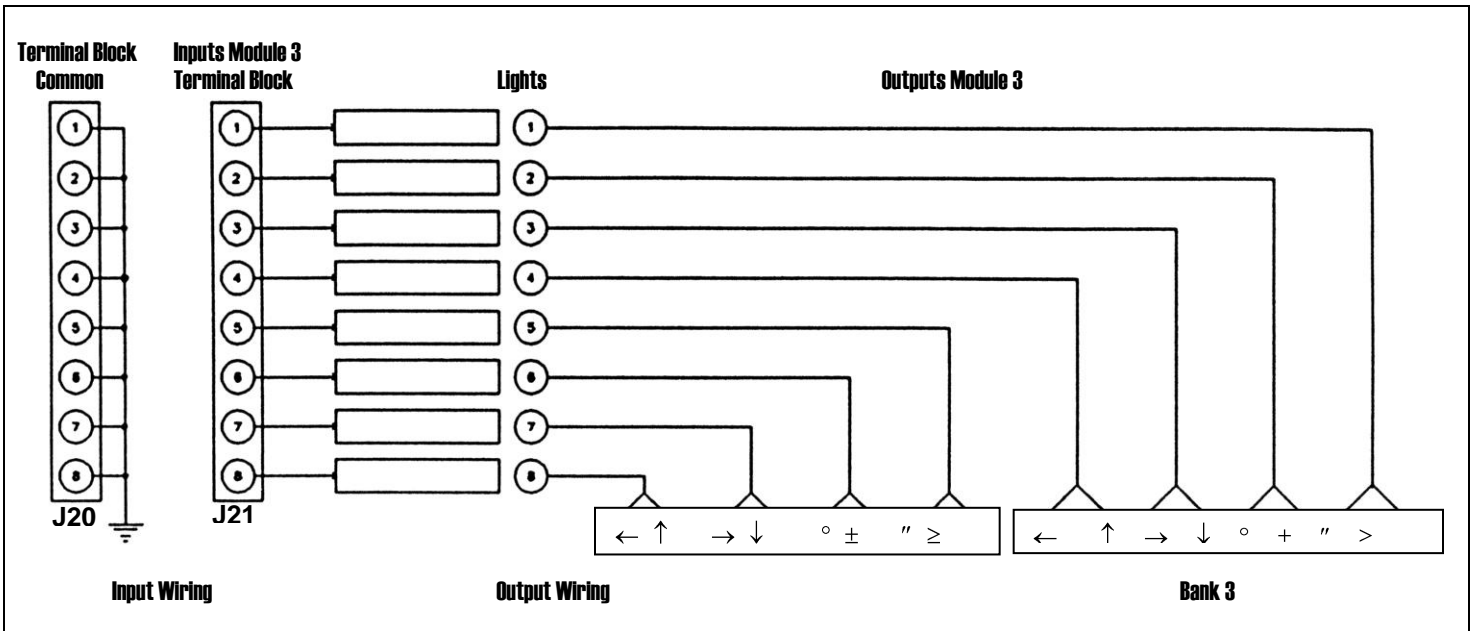


Figure 21 – Typical Wiring Diagrams For 8 Signal Modules

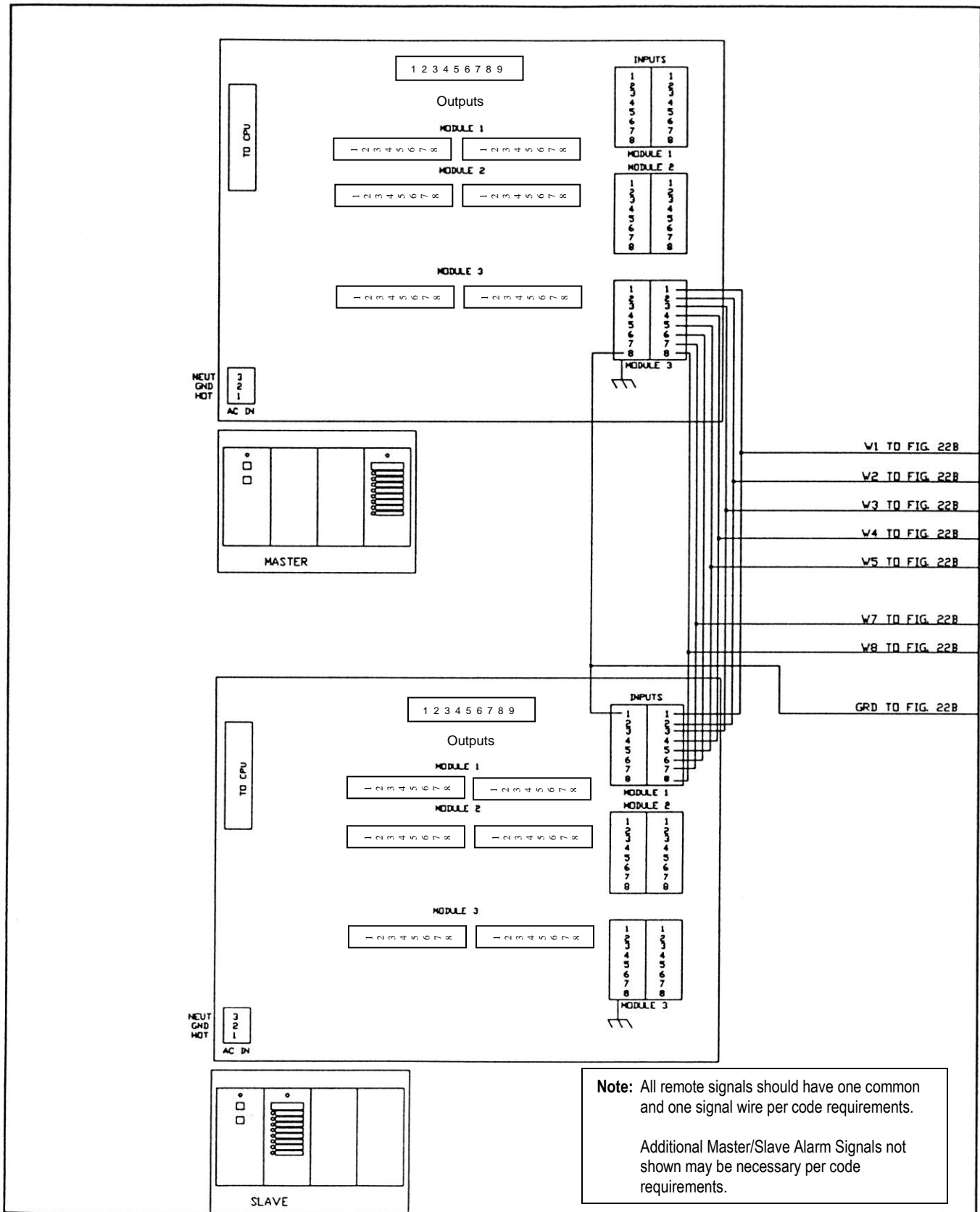


Figure 22(A) – Typical Wiring Diagram

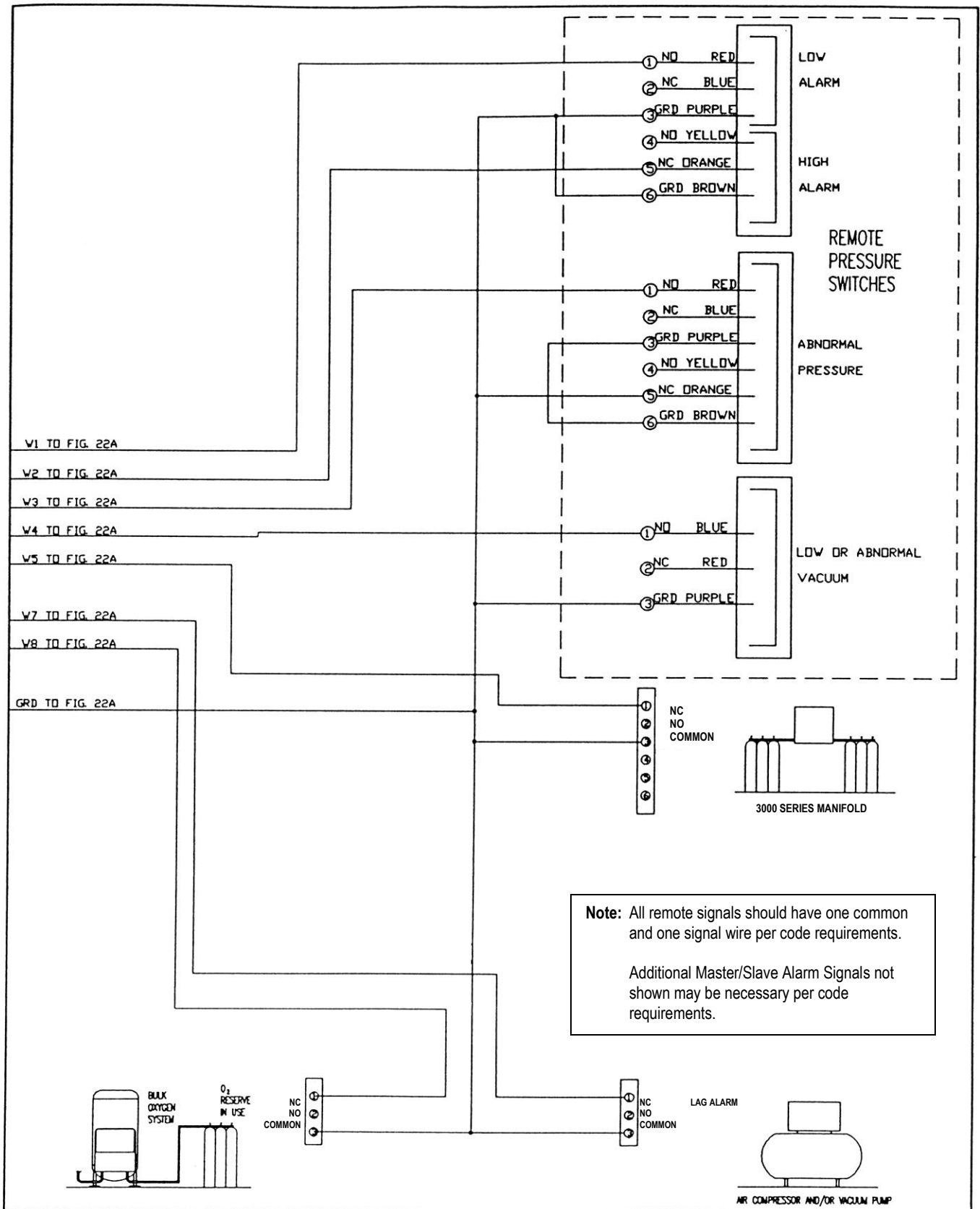


Figure 22(B) – Typical Wiring Diagram

**SECTION VII
REPLACEMENT PARTS FOR DIGITAL ALARM II**

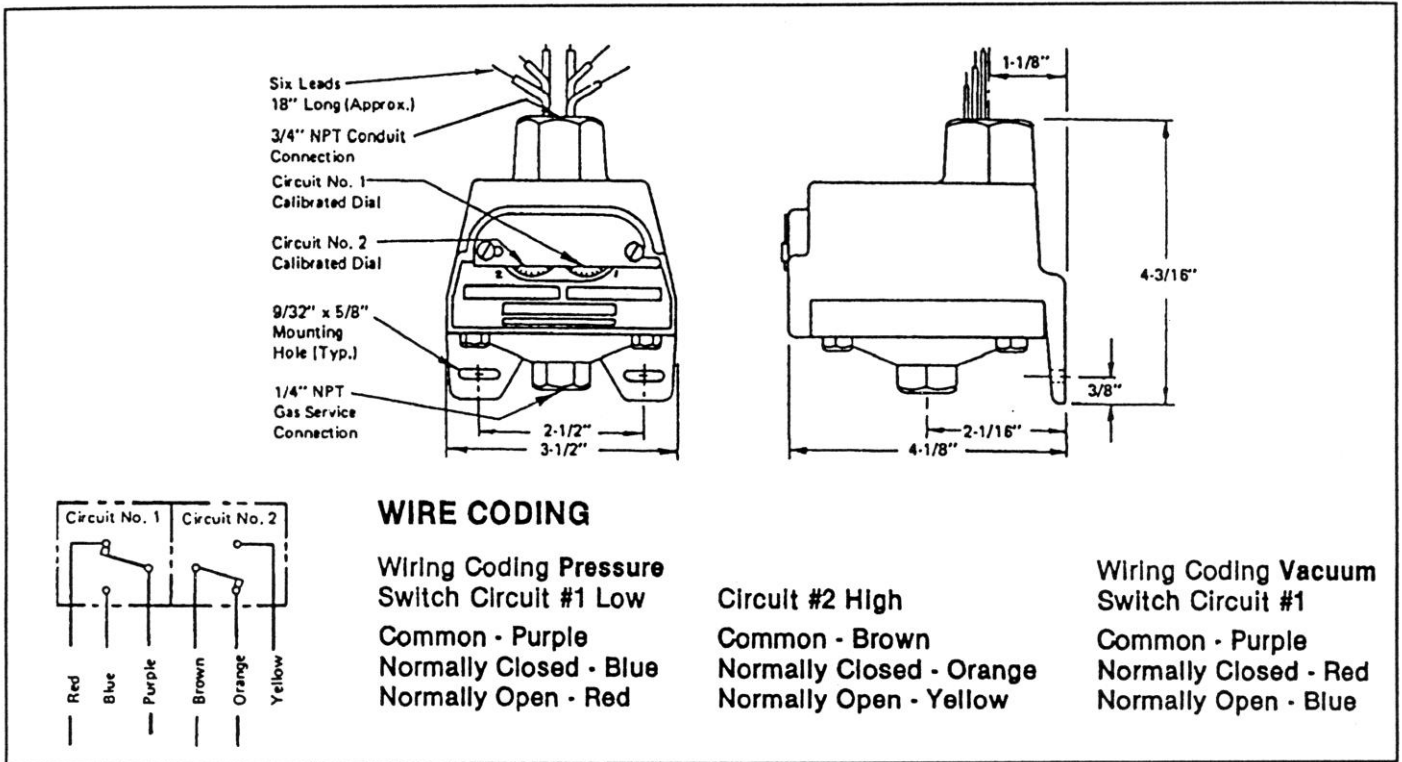


Figure 23 – Pressure/Vacuum Switch

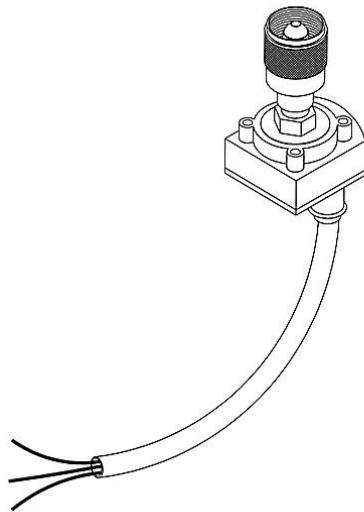


Figure 24 – Pressure/Vacuum Transmitters

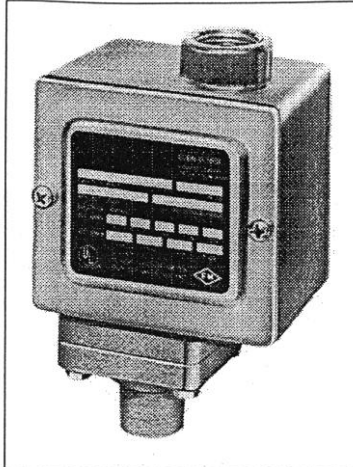
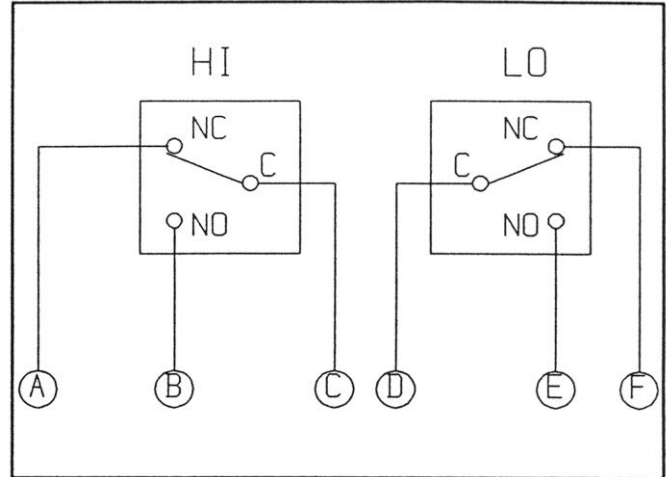


Figure 25 – Pressure Switch - Nitrogen



**Figure 26 – Wiring For Nitrogen Pressure Switch
Catalog # 74-13-0105**

- NOTE:** Wiring of the high pressure switch for the Hi-Lo or Abnormal indications requires 2 switches.
1. **Wiring for Abnormal** - Wire A is wired to Alarm 8 Signal Input. Wire C and D are wired to each other. Wire E is wired to the Alarm Common Input.
 2. **Wiring For A Hi-Lo Input** - Wire A is wired to Alarm 8 Signal Input. Wire C is wired to the Alarm Common Input. Wire E is wired to Alarm 8 Signal Input. Wire D is wired to the Alarm Common Input.

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 Chemetron Digital Alarm II:

Catalog Number	Description	Figure No. Where Shown
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	Figure 24
74-14-9052	Kit, Transmitter, Vacuum	Figure 24
74-14-9053	Kit, Transmitter, Nitrous Oxide	Figure 24
74-14-9054	Kit, Transmitter, Air	Figure 24
74-14-9055	Kit, Transmitter, Carbon Dioxide	Figure 24
74-14-9056	Kit, Transmitter, Nitrogen	Figure 24
74-14-9057	Kit, Transmitter, Waste Anesthetic Gas Disposal (WAGD)	Figure 24
74-90-0100	Copper Pigtail	Figure 1
74-91-0001	Label, Gas Service Identification, USA	
74-91-0002	Label, Layout Eight-Signal Annunciator, Digital Alarm II	
74-91-0003	Main Label, Eight-Signal Annunciator, Digital Alarm II	
74-91-0004	7 Gang Mother Board Assy. W/Electronic Dry Contact Outputs	Figure 19(A)
74-91-0010	Main Label, Digital Alarm II	
74-91-0020	Overlay, Pressure/Vacuum Module	Figure 3
74-91-0021	Overlay, Control Module (Chemetron)	Figure 2
74-91-0022	Overlay, Eight-Signal Annunciator Module	Figure 4
74-91-0023	Overlay, Composite, Digital Alarm II (Chemetron)	
74-91-0024	Overlay, Blank, Digital Alarm II	
74-91-0026	Overlay, Composite, Digital Alarm II (Oxequip)	
74-91-0050	Pressure/Vacuum Module	
74-91-0051	4 Gang Mother Board Assy. W/Electronic Dry Contact Outputs	Figure 1
74-91-0053	Control Module	
74-91-0054	Eight-Signal Annunciator Module	
74-91-0055	Blank Insert, Digital Alarm II	
74-91-0070	Main Power Fuse 1/8 Amp (115 Volt Units)	Figure 9
74-91-0071	Main Power Fuse 1/16 Amp (230 Volt Units)	Figure 9
74-91-0072	Fuse Holder	Figure 9
74-91-0074	Transformer Housing Assembly	Figure 9
74-91-0104	4 Gang Mother Board Assembly - No Outputs	Figure 1
74-91-0105	7 Gang Mother Board Assembly - No Outputs	Figure 19(A)

* 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, express 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.



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