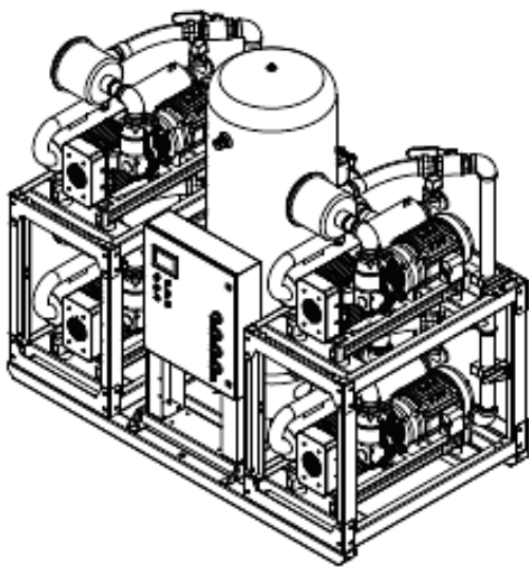
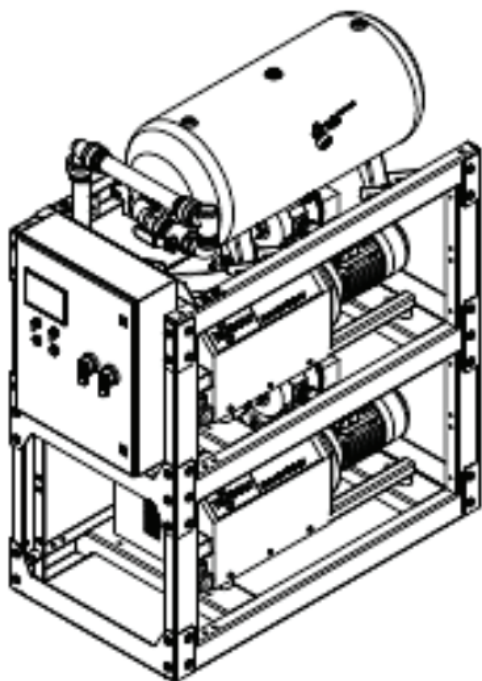




Rotary Claw Lab Vacuum System



Installation Operation and Maintenance Manual 2 - 15 Hp



Oil-Less Rotary Claw Lab Vacuum System

Model Number:	
Serial Number:	
Date Purchased:	
Purchased from:	

For further technical assistance, service or replacement parts, please contact:

Patton's Medical
3201 South Boulevard
Charlotte, NC 28209

Customer Service: 1-866-960-0087
Phone: 704-529-5442
FAX: 704-525-5148

www.pattonsmmedical.com

Please include the unit serial number located on the control panel with all inquiries.

Patton's Medical reserves the right to make changes and improvements to update products sold previously without notice or obligation.

Issue Date: June 12, 2014

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Oil-Less Rotary Claw Lab Vacuum System

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Safety Precautions

The operator should have carefully read and become familiar with the contents of this manual before installing, wiring, starting, operating, adjusting and maintaining the system. The operator is expected to use common sense safety precautions, good workmanship practices and follow any related local safety precautions.

In addition:

- **Before starting any installation or maintenance procedures, disconnect all power to the package.**
- All electrical procedures must be in compliance with all national, state and local codes and requirements.
- A certified electrician should connect all wiring.
- Refer to the electrical wiring diagram provided with the unit before starting any installation or maintenance work.
- Release all vacuum from the package before removing, loosening, or servicing any covers, guards, fittings, connections, or other devices.
- Notify appropriate personnel if repairs or maintenance will affect available vacuum levels.
- This is a high speed, rotating piece of machinery. Do not attempt to service any part while machine is in operation.
- To prevent automatic starting, disconnect all electrical power before performing any maintenance functions.
- Do not operate unit without guards, shields or screens in place.
- Make sure that all loose articles, packing material, and tools are clear of the package.
- Check all safety devices periodically for proper operation.
- **Do not add lubricating oil of any kind to the pump.**
- The "Hand" mode of operation should only be used for emergencies such as a PLC malfunction and should not be used for normal operation.
- Electrical service must be the same as specified on the control panel nameplate or damage to the equipment may occur.
- Vibration during shipment can loosen electrical terminals, fuse inserts, and mechanical connections. Tighten all electrical connections prior to energizing the control panel.

1.0 General Information

System Configurations

The Claw Lab Vacuum systems are either base mounted or tank mounted units in configurations of duplex, triplex, quadruplex or other multiplexed configurations. The systems are constructed as either single point connection (SPC) or modular packages. The complete package is pre-wired, pre-piped, and assembled either on one common base with single point connections for electrical, intake air, discharge air, and condensation drain or as a modular system with connection points for the above.

Vacuum Module

The vacuum pump is an oil-less rotary claw type direct-driven through a shaft coupling. The design is air-cooled, consisting of two claw-type, non-contacting rotors. Sealing fluid is not required. An oil change is required at approximately 5,000 operating hour intervals in the gearbox only. A built-in anti-suckback valve is mounted at the pump inlet and equipped with an inlet filter for removal of particulates.

Vacuum Drive and Motor

The pump is direct driven through a shaft coupling. The motor is a NEMA rated, C-faced TEFC, with 1.15 service factor suitable for 208 or 230/460V electrical service.

Intake Piping

Each vacuum pump has a piped intake with one "hospital type" inlet air filter. An inlet check valve and isolation valve is piped on each pump. The vacuum pumps are connected to a common manifold and piped to a receiver. A flexible connector is located between each pump and the manifold.

Vacuum Receiver

The vacuum system includes a vacuum receiver vertically or horizontally oriented in the package. The receiver is ASME Code stamped and National Board Certified. The receiver is rated for a minimum 200 psig design pressure and includes an integrally mounted valved bypass, manual drain, and vacuum gauge.

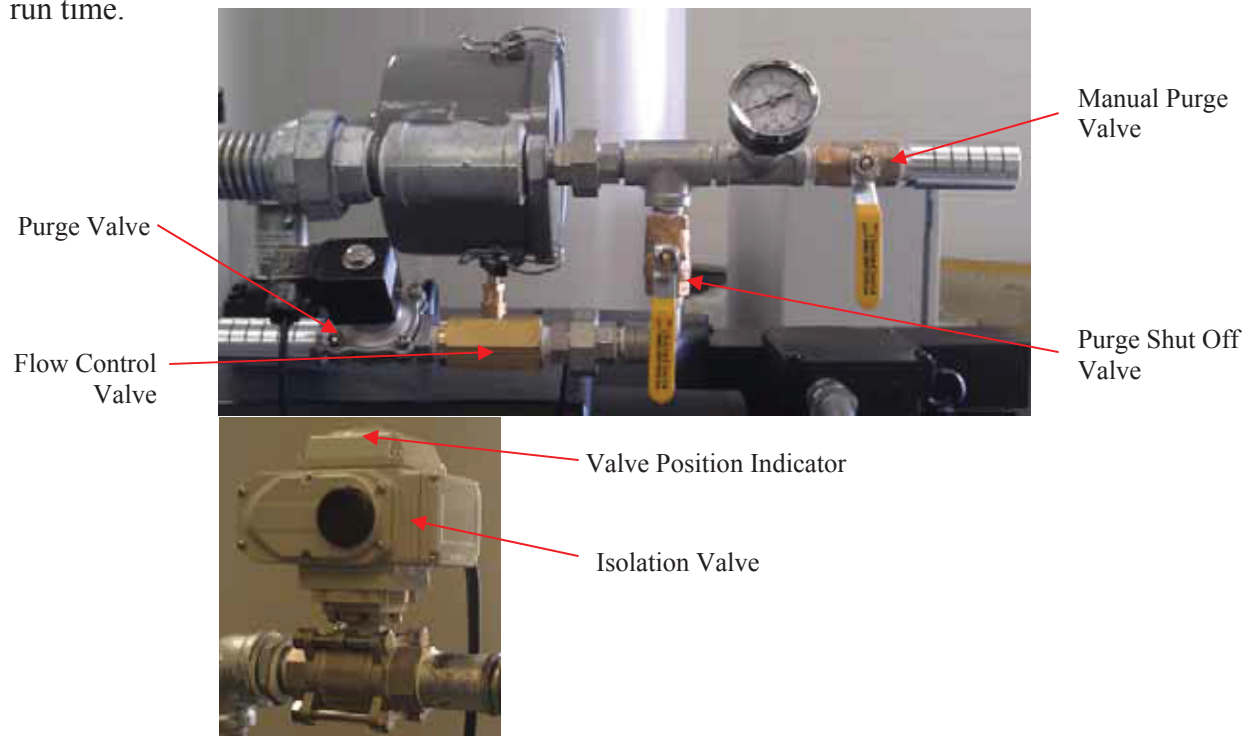
Control System

The mounted and wired control system is NEMA 12 and U.L. labeled. The control system provides automatic lead/lag sequencing with circuit breaker disconnects for each motor. The control panel also includes full voltage motor starter contactors with overload protection, redundant 120V control circuit transformers, visual and audible reserve unit alarm with isolated contacts for remote alarm, hand-off-auto selector switches, a vacuum indicator, and runtime hours indicator. Automatic alternation of vacuum pumps with provisions for simultaneous operation if required, automatic activation of the reserve unit if required. Visual and audible alarms indicators for a high discharge temperature shutdown, with isolated contacts for remote alarm, are included.

1.0 General Information (Continued)

Auto Purge Control (optional)

The Auto purge feature has three operating modes, Manual - Off - Auto Purge. Manual mode puts the selected pump in the purge mode, pump must be turned to the Hand position to operate. The Auto purge mode will purge a pump at the end of it's minimum run time for 15 minutes. The HOA switch need's to be in the Auto mode for the auto purge to operate. The purge feature consists of a purge valve, isolation valve and a manual purge valve. When the auto purge cycle starts the isolation valve will close, 20 seconds later the purge valve will open and flow ambient air at approx 22-23"hg thru pump, after 15 minutes the pump will turn off and wait for it's next run time.



A **Signal 1 System touch screen gateway** is mounted in the control panel door. It includes:

- a vacuum display
- a runtime display
- a vacuum trend display
- a trend display showing number of pumps running
- an alarm history display
- ability to download trending and history files to PC
- a maintenance schedule and history display
- a service indicator
- a replacement parts display
- a battery backup for history data
- a vacuum set point adjustment display
- a system data display



Oil-Less Rotary Claw Lab Vacuum System

2.0 Installation

2.1 Inspection Upon Receiving

The Claw Lab Vacuum system should be carefully inspected upon delivery. Any damage by the carrier should be noted on the delivery receipt, especially if the system will not be immediately uncrated and installed. The system may remain in its shipping container(s) until ready for installation. If the system is to be stored prior to installation, it must be protected from the elements to prevent rust and deterioration.

DO NOT REMOVE the protective covers from the inlet and discharge connection ports of the unit until they are ready for connecting to the lab's pipeline distribution system.

2.2 Handling

!!WARNING!!

USE APPROPRIATE LOAD RATED LIFTING EQUIPMENT AND OBSERVE SAFE LIFTING PROCEDURES DURING ALL MOVES.

The vacuum package can be moved with either a forklift or dollies. Keep all packing in place during installation to minimize damage. If disassembly of the unit is necessary to access doorways or low ceiling clearances, carefully label all electrical connections that are removed for easier re-assembling at the final destination. Units should be placed to ensure easy access to perform maintenance and high visibility of indicators and gauges.

2.3 Location

The Lab Vacuum system should be installed indoors in a clean, well-ventilated environment. Areas of excessive dust, dirt or other air-borne particulate should be avoided.

Secure the package to a flat, level surface capable of supporting the weight and forces of the unit. Make sure that the main base is not bowed, twisted, or uneven. Because of the internal flexible hose connections and vibration isolators, **no special foundation is required**. However, the unit base must be securely bolted using all mounting holes provided in the base. If a raised concrete pad is used, the base must not overhang the concrete pad. A method to drain away moisture is necessary. If a gravity drain is not available, a connection to a drain is necessary. After securing the unit to the floor, remove all packing material.

The area should have an ambient temperature of between 40°F and 104°F.

(If the maximum ambient exceeds 104°F, contact the factory for special instructions). The system should be located as close as possible to the point of usage to prevent excessive loss of operating vacuum due to pressure drop.

2.0 Installation (Continued)

2.4 Space Requirements

The Lab Vacuum system should be placed to ensure easy access to perform maintenance and high visibility of indicators and gauges. It is recommended that a minimum space of 24" be allowed on all sides of the compressor system for ventilation and maintenance. A minimum space of 36" in front of the control panel is required by NEC code. A vertical distance of 36" is required above the unit for ventilation and maintenance.

2.5 Locations Above Sea Level

All vacuum pumps above sea level have reduced flow and should be de-rated. After determining the correct flow needed for the Lab vacuum system, multiple this number by the adjustment factor in the following chart. After determining the new flow required, use this number to size the Lab vacuum system.

Altitude Adjustment Factor		
Altitude (ft)	Normal Barometric Pressure (inches HG)	Multiplier Used for Required SCFM
0	29.92	1.00
500	29.39	1.02
1000	28.86	1.04
1500	28.33	1.06
2000	27.82	1.08
2500	27.32	1.10
3000	26.82	1.12
3500	26.33	1.14
4000	25.84	1.16
>4000	Do NOT use Oil-less Vacuum Pumps. Contact Factory.	

2.0 Installation (Continued)

2.6 Wiring

WARNING!

BE SURE TO DISCONNECT ALL ELECTRICAL POWER TO THE VACUUM SYSTEM BEFORE PERFORMING ANY ELECTRICAL PROCEDURES.

Refer to the electrical diagram provided with the unit before starting any installation or maintenance work.

Do not operate the vacuum system on a voltage other than the voltage specified on the system's nameplate.

All customer wiring should be in compliance with the National Electrical Code and any other applicable state or local codes.

Check the control voltage, phase and amp ratings before starting the electrical installation, and make sure the voltage supplied is the same.

The wire size should be able to handle peak motor amp load of all operating units, refer to the full load amperes on the wiring diagram.

Check all electrical connections within the vacuum system that may have loosened during shipment.

Only qualified electricians should make power connections to the control panel and any inter-connecting wiring.

Ensure that the emergency generator system's electrical supply is consistent with the vacuum system's requirements.

Three-phase power supplied from the emergency generator(s) must match that of the normal supply to allow for correct direction of the motor rotation at all times.

2.0 Installation (Continued)

2.7 Intake Piping

Before connecting any piping, the plastic thread protector installed in the connection port must be removed. The main vacuum line to the receiver should not be reduced below that provided on the receiver. Long piping runs may need to be increased in size to minimize pressure drop. Improper line sizing may result in a loss of capacity. Ideally, piping should be constructed using long radius elbows and a minimum number of turns. All secondary lines should be taken from the top or side of the main line to prevent any accumulated moisture from draining towards the pumps. All lines should slope away from the pumps. Any low points in the piping should be equipped with pipe drains to remove accumulated moisture. All pipe must be either seamless copper tubing or other corrosion-resistant metallic tubing, such as galvanized steel or stainless steel.



Oil-Less Rotary Claw Lab Vacuum System

2.0 Installation (Continued)

2.8 Exhaust Piping (Continued)

Minimum Pipe Sizes

- Notes:**
1. All pipe sizes are based on the following: copper pipe (Type L), 14.7 psia.
 2. The minimum pipe size must be maintained for the total length of the exhaust pipe. Use next larger size pipe in the event the minimum size is not available.
 3. When determining the total pipe length, add all the straight lengths of pipe together in addition to the number of elbows times the effective pipe length for that pipe size. (See the table and example below.)

Example:

Select the pipe size for a Duplex 6.4 HP with 100 feet of straight pipe and four elbows:

A) Select the pipe size of 4" diameter for 100 feet of straight pipe.

B) Determine the eff. pipe length for an elbow of 4" diameter (EPL = 10.0 ft / elbow).

C) Calculate the SYSTEM PIPE LENGTH {SPL (4.0" D) = 100 + (4 x 10.0) = 140 ft

D) Check this SYSTEM PIPE LENGTH to see if it exceeds the minimum pipe size.

Vacuum System	System Pipe Length (ft) - See Notes											
	25	50	75	100	150	200	250	300	350	400	450	500
Duplex 2 HP	1.25	1.25	1.25	1.25	1.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Duplex 3 HP	1.50	1.50	1.50	1.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Duplex 4 HP	2.00	2.00	2.00	2.00	2.00	2.50	2.50	3.00	3.00	3.00	3.00	3.00
Duplex 5.4 HP	2.00	2.00	2.00	2.00	2.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00
Duplex 6.4 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Duplex 7.5 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Duplex 8.7 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Duplex 10 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00
Duplex 15 HP	3.00	3.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
Triplex 5.4 HP	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00
Triplex 6.4 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00
Triplex 7.5 HP	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00
Triplex 8.7 HP	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Triplex 10 HP	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Triplex 15 HP	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
Quad 5.4 HP	3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00
Quad 6.4 HP	3.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00
Quad 7.5 HP	3.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00
Quad 8.7 HP	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
Quad 10 HP	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
Quad 15 HP	4.00	4.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00

Effective Pipe Length Equivalent of a 90 Degree Elbow										
Pipe Size (in.)	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	8.00	
Eff. Pipe Length (ft)	3.6	4.9	6.4	7.9	9.4	10.0	11.9	13.2	14.5	

3.0 Control Panel



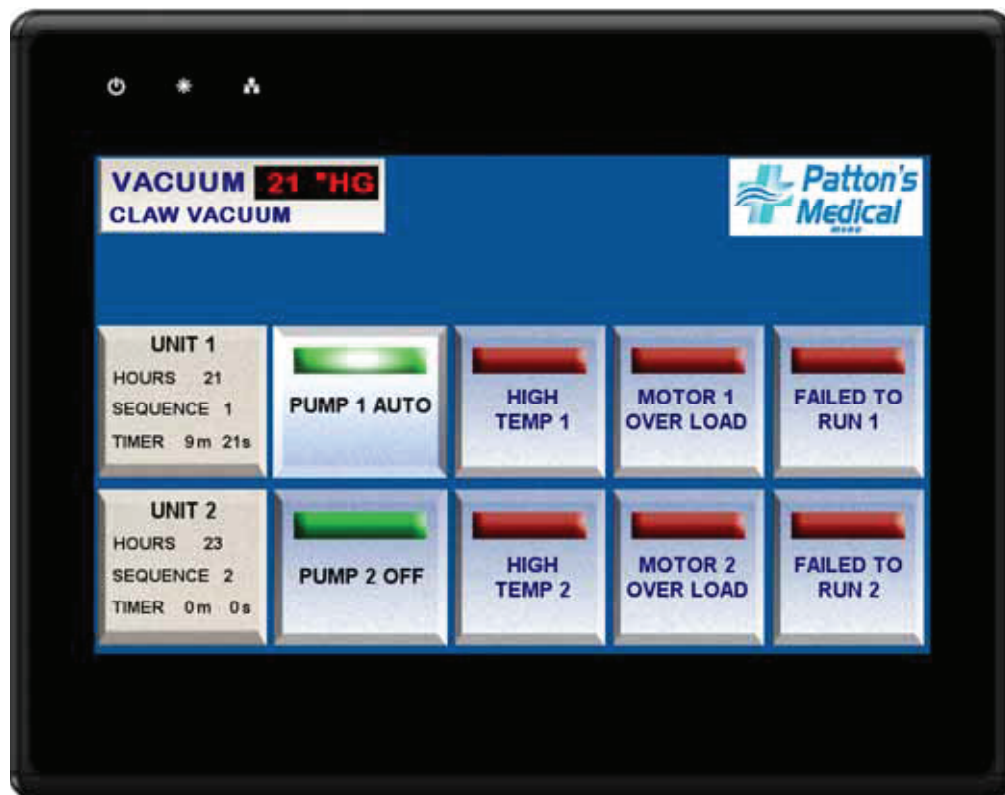
1. **Display Screen** – Displays the systems operating screens.
2. **LED's** – Yellow PWR: Power is correctly supplied
Green CPU: Indicates the Signal 1 is operating correctly
Red COM: Indicates communication with PLC
Not lighted: Power is not supplied
3. **HOA selector switch** – Compressor control switch, Hand – Off – Auto.
4. **Alarm horn** – Sounds when an alarm condition occurs.
5. **Alarm Reset/Horn Silence** – Pushbutton to silence alarm and reset visual alarm on *Signal 1* screen after alarm condition is corrected.
6. **Purge selector switch** – Selects purge control mode.
7. **Motion sensor** – Turns Signal 1 back light on if movement is present
7. **External Operators**– Turns Circuit Breakers On - Off

3.0 Control Panel (Continued)

3.1 Signal 1 System touch screen gateway

The Scroll Lab Air system has a touch screen gateway to control and monitor the complete system operation as well as record service and alarm history of the unit and change pressure setting levels.

3.2 Signal 1 Main Display Screen The main screen for systems will monitor and display the air receiver vacuum level, motor speed, run sequence, individual unit total run hours and run status (HOA switch position). Included on this screen is a service due alarm, transducer fault alarms and lag alarm for the system as well as individual alarms for each compressor unit (motor overload, and high discharge air temperature). The “MENU” button in the upper right corner will allow the operator to navigate through the screens to view the system alarm history, service schedule and records, and vacuum trends, basic troubleshooting, vacuum settings, and system general information. When the **Signal 1** is powered up the main control window will appear on the display screen. This screen displays the systems current vacuum level, total hours run for each module, run sequence, HOA switch setting and status of service schedule and alarm conditions.



Main Screen (Duplex System shown)

3.0 Control Panel (Continued)

3.2 HMI Main Display Screen (Continued)

1. **MENU:** Displays menu screen which allows the operator to access the systems operating history, service requirements, and vacuum trends, troubleshooting info and main system info.
2. **VACUUM (inches Hg):** Display's the current vacuum level inside the air receiver.
3. **SERVICE DUE:** Service intervals and types of service are preprogrammed into the HMI. The button will flash yellow when service is due. Pressing the "service due" button when flashing will display the service schedule screen.
4. **TDC FAULT:** Indicator will flash red and horn will sound if the transducer fails. Vacuum reading on the display screen will default to "30" hg. Selecting the indicator when flashing red will open a trouble shooting window.
5. **LAG ALARM:** (Optional) Indicator will flash red and horn will sound when last available vacuum unit comes on. Press the reset button to silence the alarm. If the condition is corrected both the alarm and indicator will turn off. If a lag condition remains the indicating light on the HMI will remain on. Selecting the indicator when flashing red will open a trouble shooting window. Once the lag condition is corrected, press the reset button again to turn off alarm light.
6. **UNIT RUN HOURS:** Displays total run hours for each vacuum module.
7. **HAND-OFF-AUTO:** Displays status of each vacuum module. The green "HAND" displays when the vacuum is running and the HOA selector switch is in the HAND setting. The green "AUTO" displays when the vacuum is running in the normal sequencing mode. The "OFF" indicator is displayed when the HOA selector switch is in the "OFF" position for the pump that is not running.
8. **MOTOR OVLD:** Display will flash red and sound an alarm when overload switch is tripped in the control panel. The vacuum in question will not re-start until the reset button on the starter inside the main control cabinet is reset. Press the reset button on front panel to silence the alarm. Selecting the indicator when flashing red will open a trouble shooting window. The indicator on the HMI will remain on until motor starter is reset.
9. **FAILED START:** Display will flash red if the vacuum module failed to start/run when signaled to start. This alarm will also activate when a Motor Overload Shutdown occurs. Press the reset button on the front panel to silence the alarm. Selecting the indicator when flashing red will open a trouble shooting window. The indicator light on the HMI will remain on until the problem has been resolved and the reset button pushed again.

3.0 Control Panel (Continued)

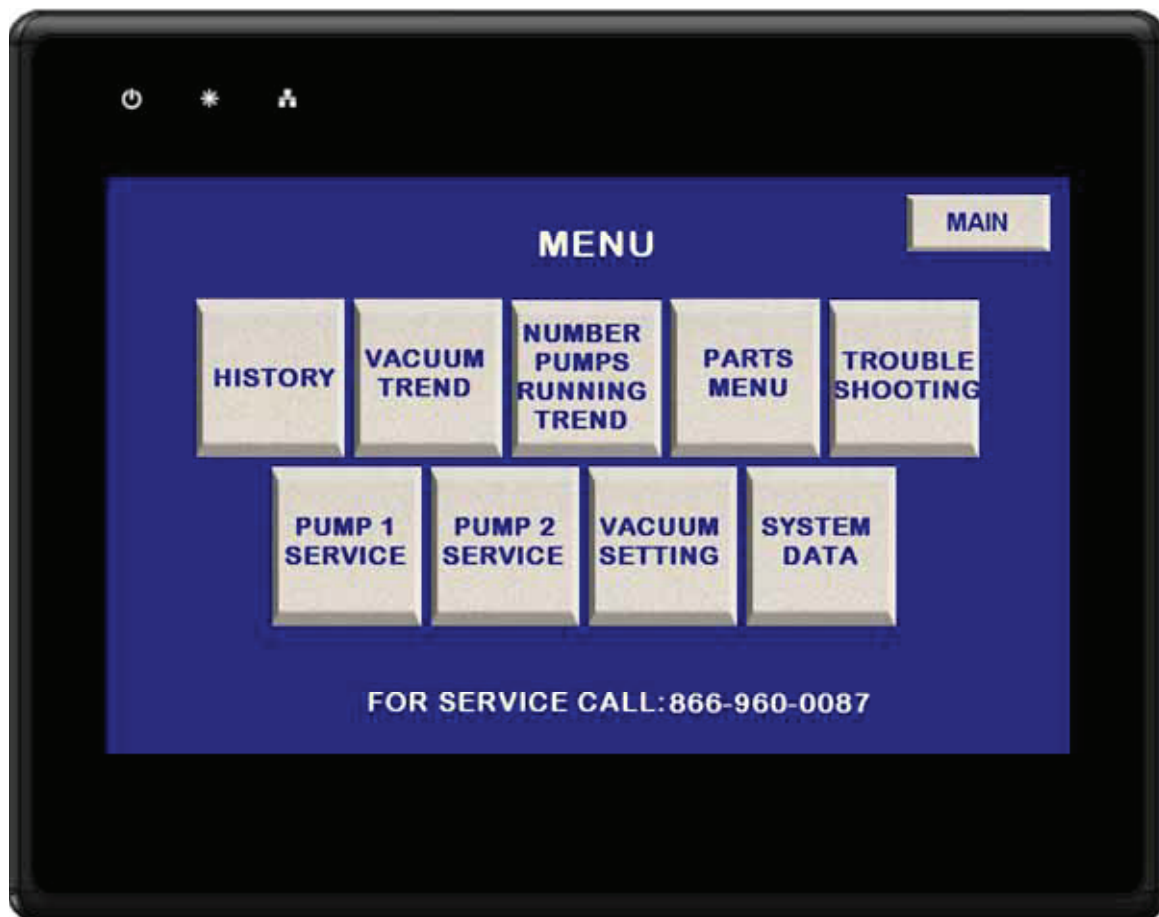
3.3 Control Buttons

3.3.1 MENU

The MENU button in the upper right corner on the main screen when selected will display the “MENU” window that will allow the operator to access information shown on screen below. Each button will be explained in detail in this section.

3.3.2 – “MAIN” Button

The main button can be found on many of the screens within the *Signal 1* Controller. At any time when the “MAIN” button is selected, the *Signal 1* display will return to the Main Display Screen.



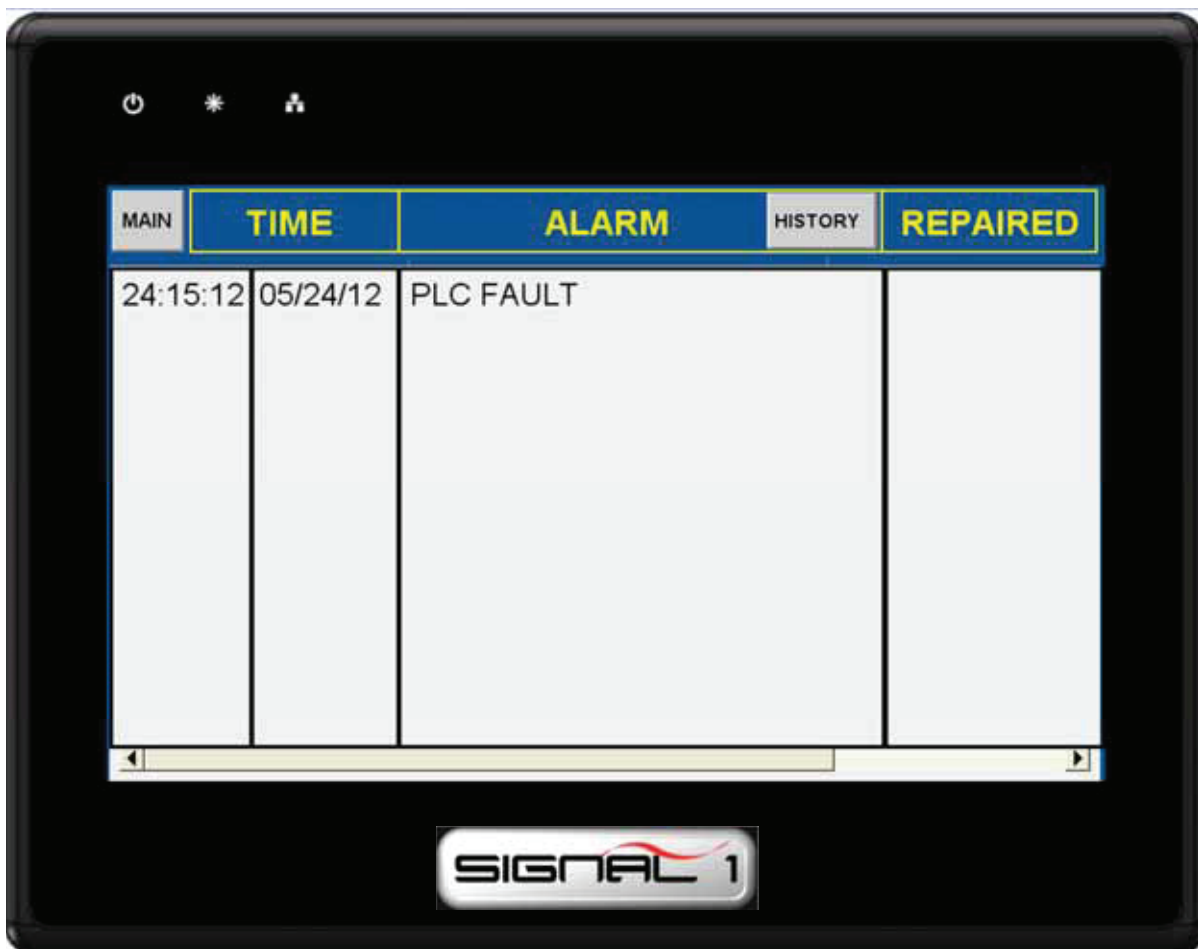
3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.3 – “ALARM HISTORY” Button

The “ALARM HISTORY” button on the “Menu” screen will open a new window listing all the alarm conditions that have occurred as well as routine maintenance alerts. The list will show the date and time of the incident, type of incident and when the condition was cleared/corrected. This creates a permanent record of the history of the unit and cannot be reset.

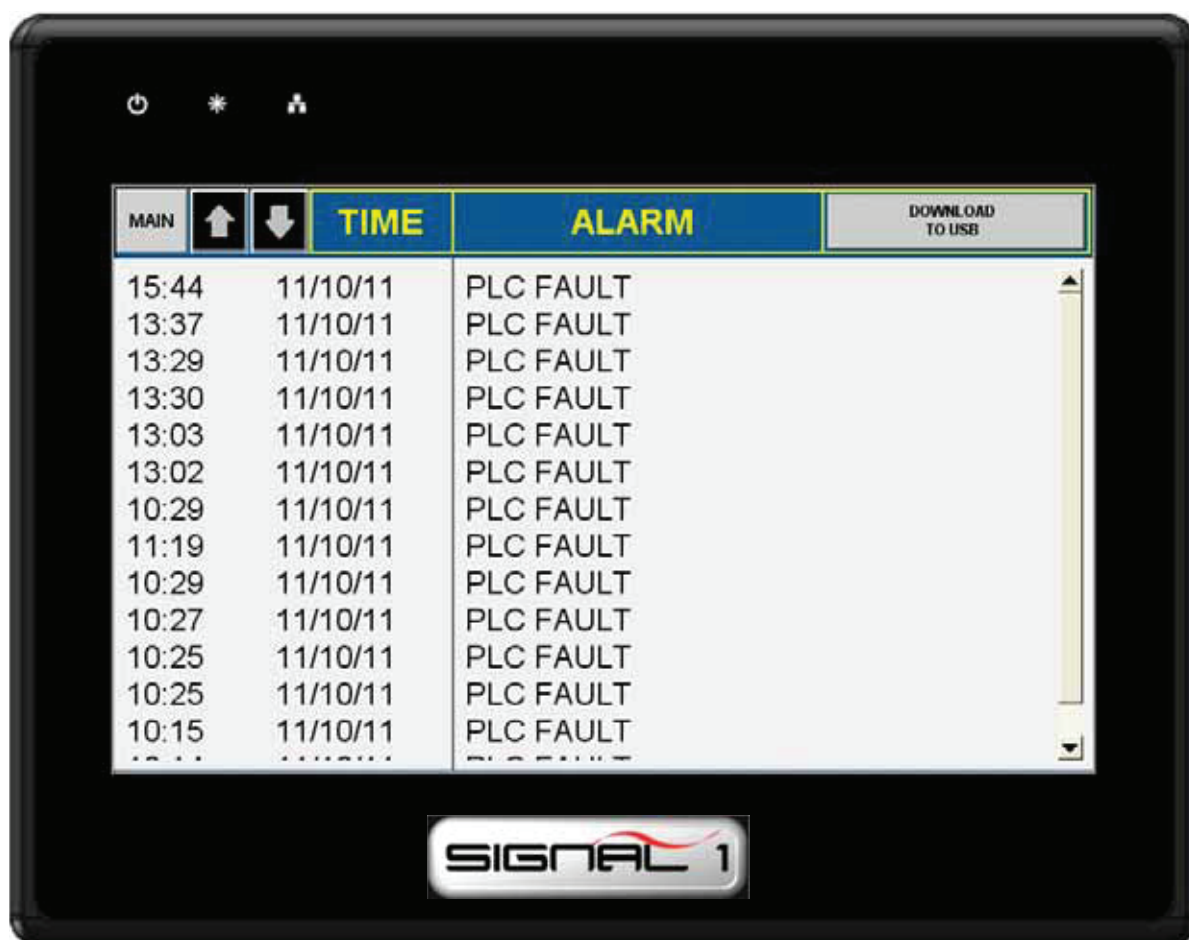
1. “MAIN” button will return you to the main screen.
2. “HISTORY” button will open a new History screen shown on the next page



3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.4 – “HISTORY” screen displayed from pressing “History” button on “Alarm History” screen shown below. Pressing the up and down arrows will display alarm/maintenance history one day at a time. History can be down loaded to a USB memory stick by inserting the memory stick into the USB slot on the back of the *Signal 1* and pressing the “Download To USB” button on the screen. Files can be saved to PC and viewed in an excel format.

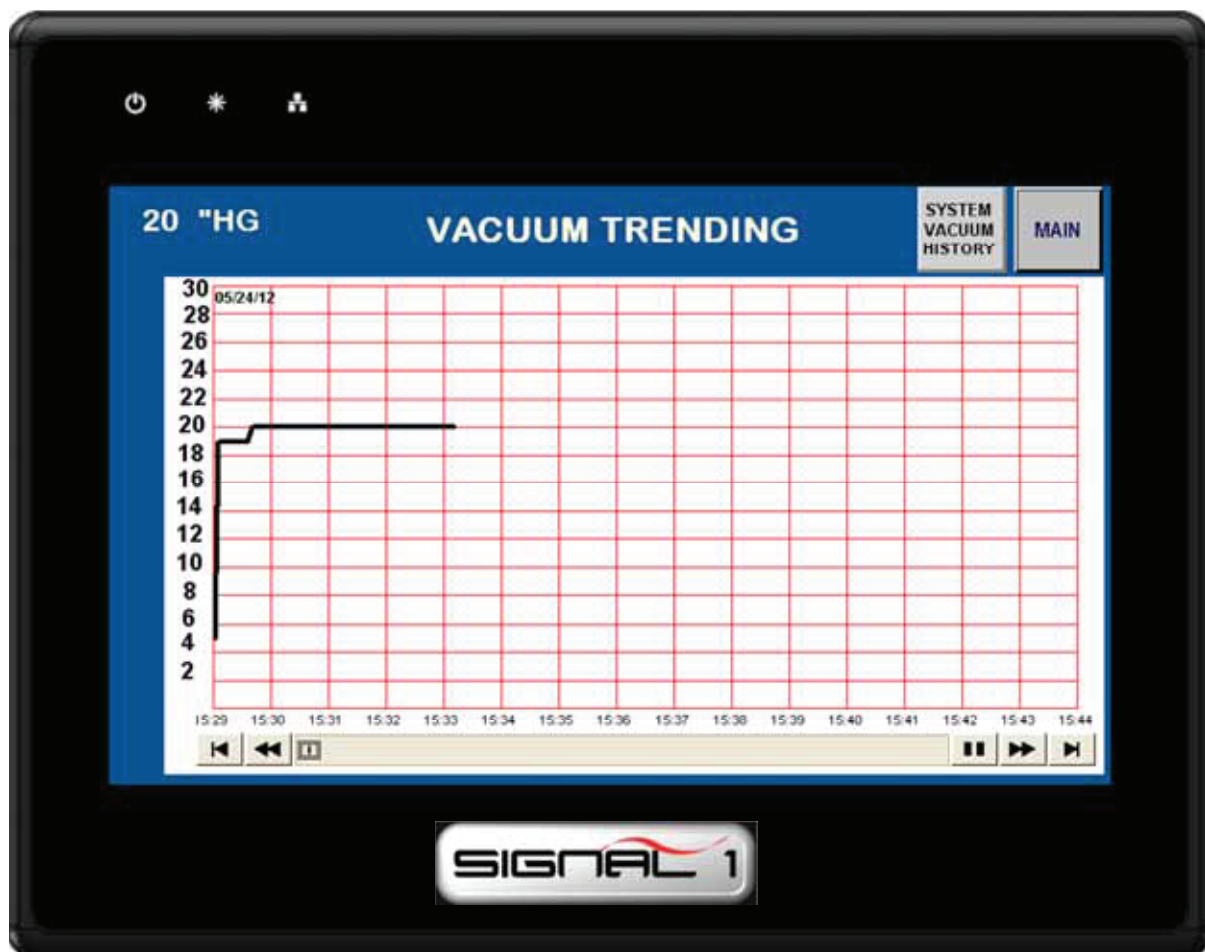


3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.5 – “VACUUM TREND” Pressing the “Vacuum Trend” button on the “Menu” screen will display the screen below. Screen displays 15 minutes of trending and has a scroll bar on the bottom of screen to scroll to different time frame.

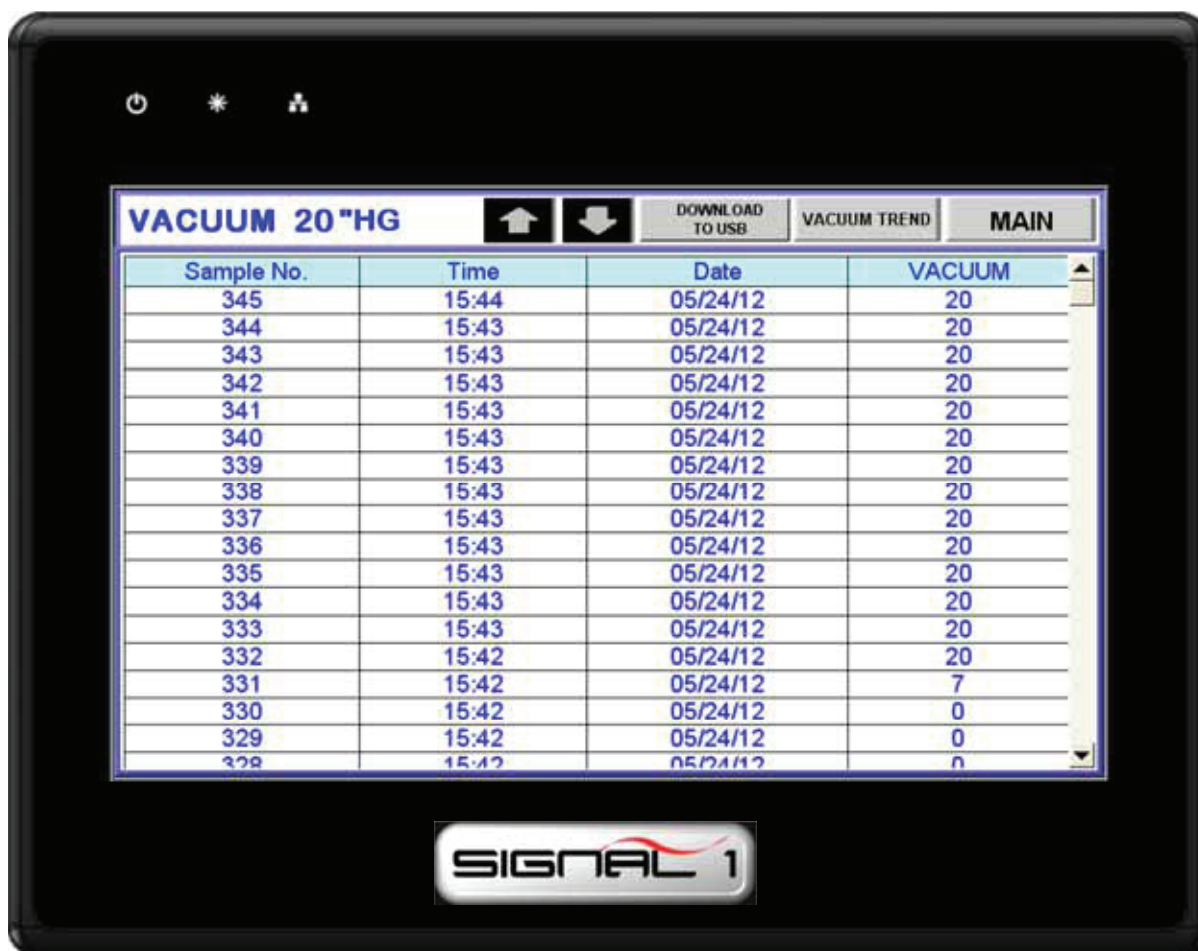
1. “MAIN” button will return you to the main screen.
2. “SYSTEM PRESSURE HISTORY” button will open a new screen shown on the next page



3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.6 – “VACUUM TREND HISTORY” screen shown below. Pressing the up and down arrows will display pressure trending history one day at a time. History can be down loaded to a USB memory stick by inserting the memory stick into the USB slot on the back of the *Signal 1* and pressing the “Download To USB” button on the screen. Files can be saved to PC and viewed in an excel format.



3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.7 – “NUMBER PUMPS RUNNING TREND” Pressing the “NUMBER PUMPS RUNNING TREND” button on the “Menu” screen will display the screen below. Screen displays 15 minutes of trending and has a scroll bar on the bottom of screen to scroll to different time frames.

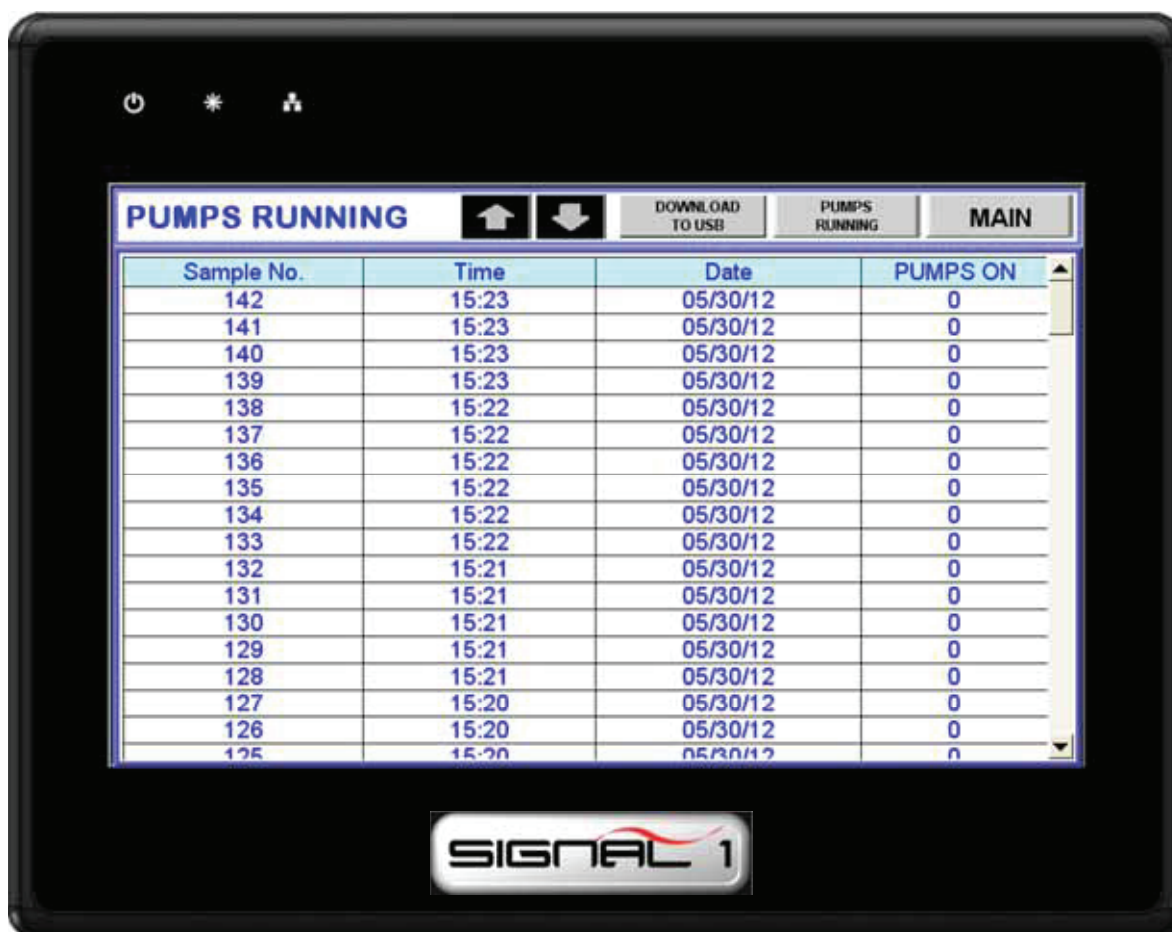
1. “MAIN” button will return you to the main screen.
2. “PUMPS RUNNING HISTORY” button will open a new screen shown on the next page



3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.8 – “PUMPS RUNNING HISTORY” screen shown below. Pressing the up and down arrows will display number of pumps running trending history one day at a time. History can be down loaded to a USB memory stick by inserting the memory stick into the USB slot on the back of the *Signal 1* and pressing the “Download To USB” button on the screen. Files can be saved to PC and viewed in an excel format.

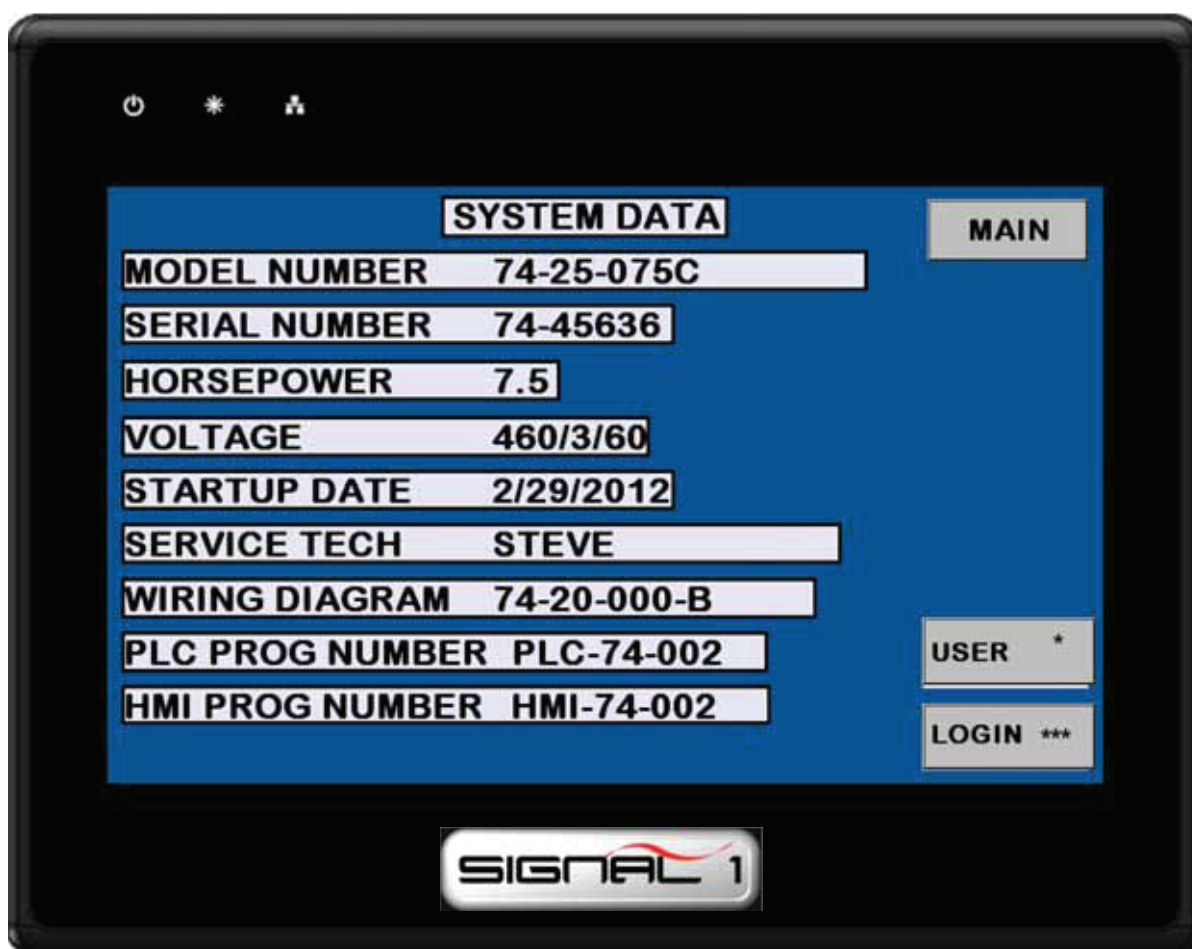


3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.9 “SYSTEM DATA” Button

The “System Data” button displays all the system information required when scheduling maintenance or purchasing spare parts from Patton’s Medical. The information includes model number, serial number, horsepower, system voltage, and unit start up date. This information will be programmed into the *Signal 1* at startup by a Patton’s Medical authorized technician.

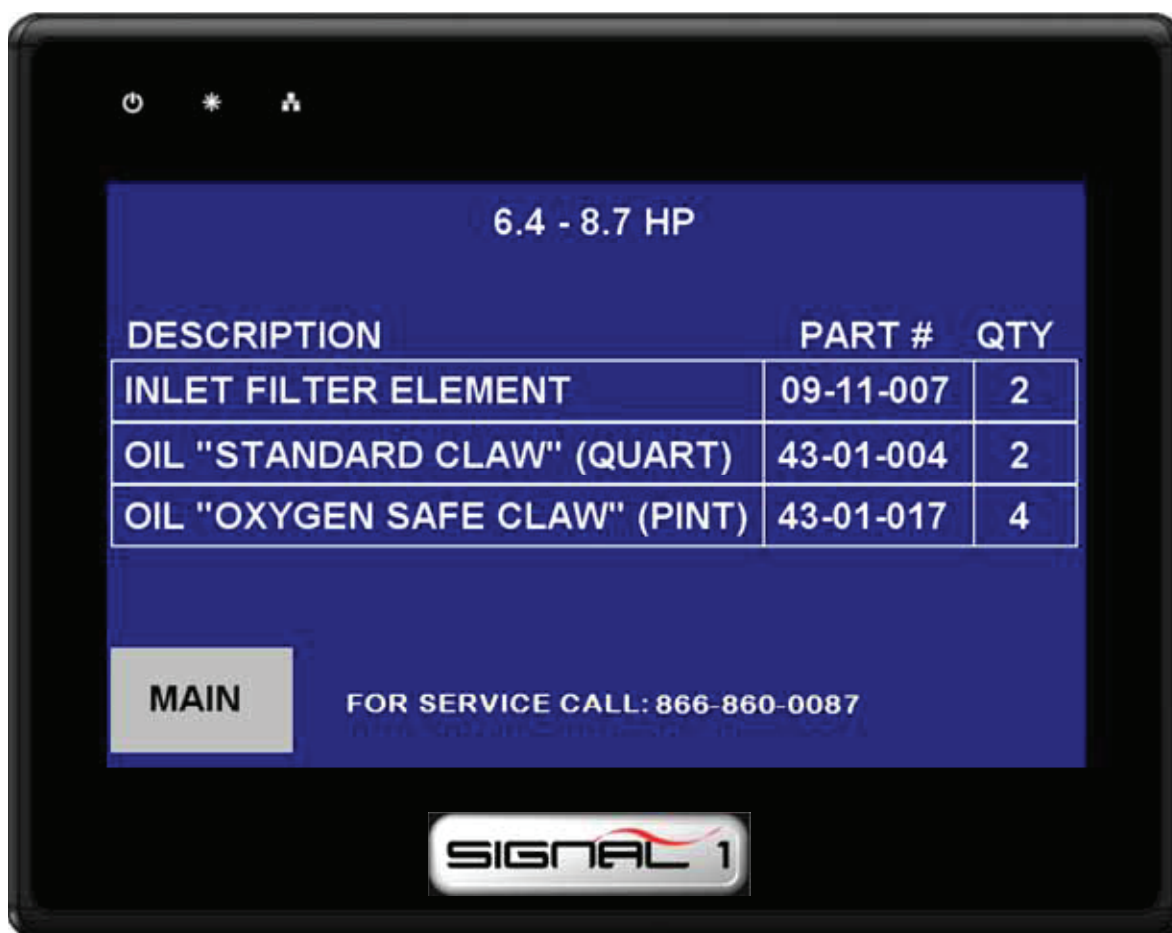


3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.10 “PARTS MENU” Button

The “Parts Menu” button displays routine maintenance parts required when performing scheduled maintenance.

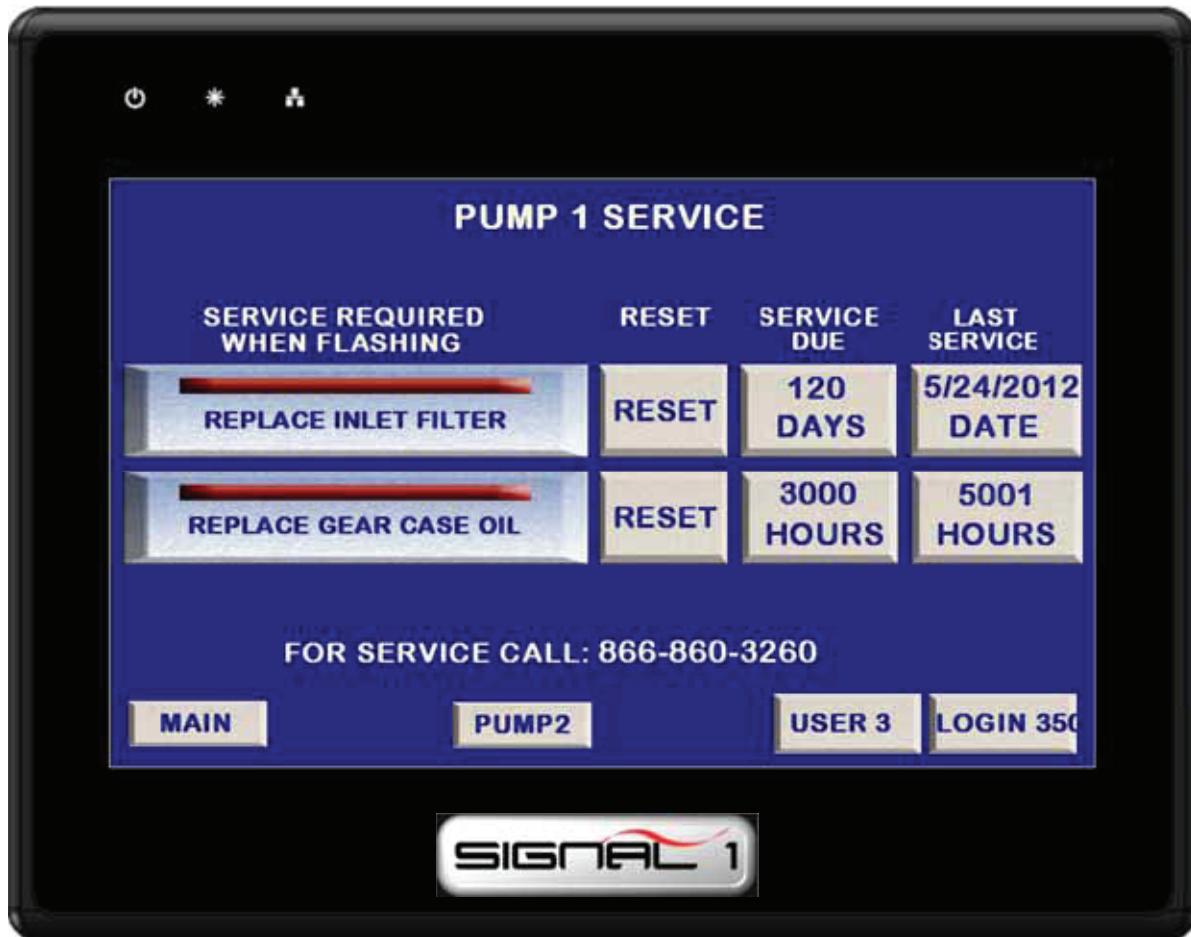


3.0 Control Panel (Continued)

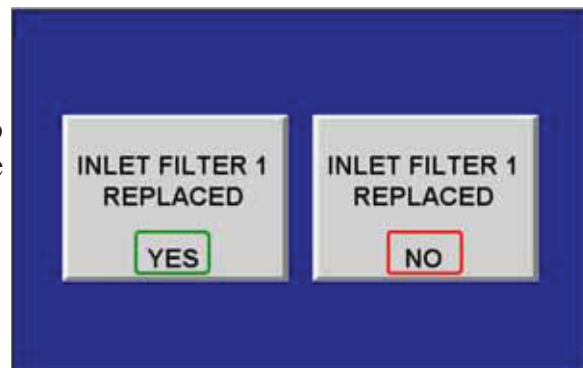
3.3 Control Buttons (Continued)

3.3.11 – “PUMP SERVICE” Buttons

1. Select “USER #” button and enter “3” and press “enter”.
2. Select “LOGIN” button and enter “350” and press “enter”.
3. Press “RESET” button next to item requiring maintenance red light will be flashing.



4. Screen to right will display press “YES” to reset maintenance performed. Service due date and Last Service date will reset.



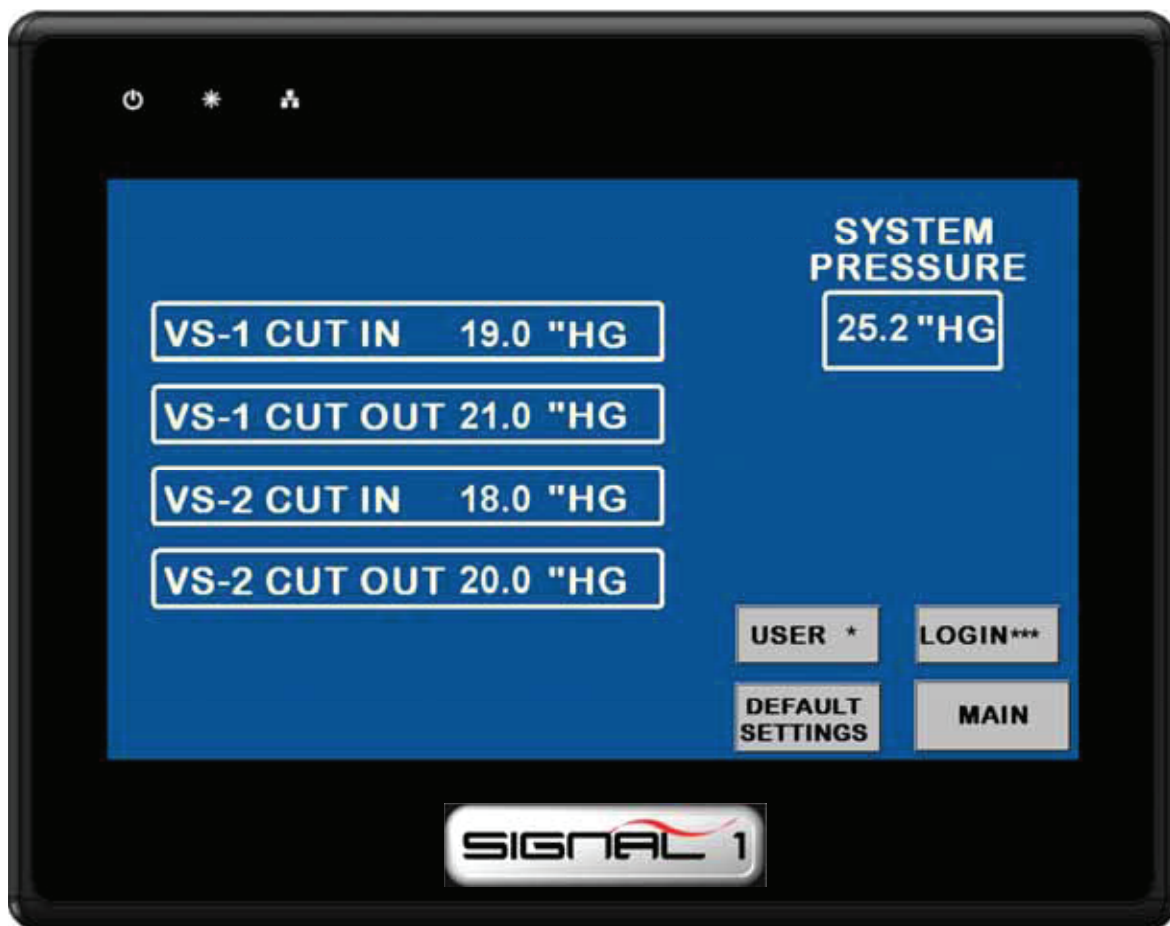
3.0 Control Panel (Continued)

3.3 Control Buttons (Continued)

3.3.12 – “VACUUM SETTING” Button

1. Select “USER #” button. Enter “2” and select “enter”.
2. Select “LOGIN” button. Enter “327” and select “enter”.
3. Press setting to be changed and screen to right will display. Enter pressure setting desired then “ENT”.
4. Pressing “RESTORE DEFAULTS” at anytime will change all settings to original factory settings.

.	/	-
1	2	3
4	5	6
7	8	9
ENT	0	CLR



4.0 System Operation

4.1 Pre-start-up

The contractor should notify **Patton's Medical** two weeks prior to start-up date to schedule an appointment for an authorized technician to review the installation prior to start-up.

WARNING:

CAUTION: Failure to install the unit properly and have an authorized technician from **Patton's Medical** start-up the system can void the manufacturer's warranties.

WARNING:

Have more than one person on hand during prestart-up and start-up procedures to ensure safety and to facilitate certain checks.

Prestart-up and start-up procedures should be performed for a new installation or when major maintenance has been performed.

The main power source to the control panel should be OFF for the duration of the visual inspection.

Ensure that the equipment is installed on a solid level surface. Walk around the system to ensure that there is enough clearance on all sides to perform operational checks/actions and maintenance. The temperature of the area containing the modules should be approximately 70°F (21.1°C) with a minimum ambient temperature of 40°F (4.4°C) and a maximum ambient temperature of 104°F (40°C).

Check the inlet piping for proper size and connection to the vacuum system.

Check all piping system joints that might have come loose during shipment and installation to ensure they are tight.

Check the vacuum receiver, controls, and vacuum pumps for damage.

Check the drain valves on the receiver.

4.0 System Operation (Continued)

4.1 Prestart-up (Continued)

Check all valves for full open and full close travel. Ensure that the system's valves are positioned for proper operation. (Refer to indicators on the valve handles.)

Remove all packing material from the unit.

Check the electrical connections to the control cabinet.

Verify electrical service. Before starting the Lab Vacuum system, check to see that voltage, amperage, and wire size are appropriate.

CAUTION: Electrical service must be as specified or damage to equipment may occur.

WARNING:

To prevent electrical shock, ensure that ALL electrical power to the system is OFF, including the disconnect switches and H-O-A switches on the control panel. The facility's supply circuit breaker should also be locked out.

Open the electrical cabinet by loosening the fasteners on the front.

CAUTION: Vibration during shipment and installation can loosen electrical terminals, fuse inserts, and mechanical connections. Tighten as necessary.

Check the electrical cabinet for any broken switches, lights, etc.

Check that all motor starter connections are tight and that there are no loose objects such as terminal lugs, screws, nuts, etc., in the cabinet.

4.0 System Operation (Continued)

4.2 Initial Start-up

CAUTION: Complete the prestart-up procedure before continuing with the initial start-up procedure

WARNING:

To prevent electrical shock, ensure that **ALL** electrical power to the system is **OFF**, including the disconnect switches and H-O-A switches on the control panel. The facility's supply circuit breaker should also be locked out.

4.2.1 Lubrication

The pump's synchronizing gears are oil lubricated, but **there is no lubricant or sealing fluid inside the pumping chamber**. All Claw vacuum pumps are shipped with the required amount of oil for start-up already in the pumps. The level should be slightly above the middle of the sight glass.

NOTE: DO NOT ADD OIL TO THE VACUUM PUMP.

WARNING:

Ensure that all loose articles, packing material, and tools are clear of the system.

Set the H-O-A switches are to "O" (OFF).

Check all voltages supplied to the system to ensure they are the required value and phases needed by the control panel.

Open the inlet isolation valve on each vacuum pump.

Open the outlet isolation valve on each vacuum pump.

Open the receiver isolation valves.

Close the receiver bypass valve.

Apply power to the system and turn the disconnect switches to "On".

4.0 System Operation (Continued)

4.2 Initial Start-up (Continued)

4.2.2 Pump Rotation

Prior to actual operation, the pumps must be checked for correct rotation.

Using the Hand-Off-Auto switch on the door of the control panel, jog the motor of the specific pump that is to be checked by momentarily turning the switch to "Hand" and back to "Off". By observing the cooling fan of the motor, you can determine the rotation of the pump. Pump rotation should be counterclockwise when looking at the rear of the motor. Directional arrows are located on each pump.

If the pumps are rotating in the wrong direction, rotation can be reversed by switching any two main power leads to the panel. Correct rotation should be confirmed in the previous manner.

WARNING:

REMOVE POWER BEFORE WORKING ON ANY ELECTRICAL CONNECTIONS.

4.3 Initial Operation

Run the pump for two minutes in the correct rotation. Stop the pump and check for correct oil level in the sight glass. Add oil if necessary. The pump is shipped with oil in the gear case. **DO NOT OPEN THE FILLER PORT WHILE THE PUMP IS RUNNING.**

WARNING!

Pumps that have reached operating temperature may have a high surface temperature on the top of the exhaust muffler.

DO NOT TOUCH!

4.4 General Operation

WARNING!

NEVER RUN THE PUMP WITHOUT LUBRICATING OIL!

4.4.1 Electrical Control Panel

The Lab Vacuum's **multiplex** control panel includes a visual and audible lag pump alarm and a 0-30"Hg vacuum gauge. It also has the following for **each pump**: 120V control transformer with fuses, hour meter, vacuum control switch, high discharge air temperature switch with alarm, high vacuum switch, with alarm, illuminated Hand-Off-Auto switch, motor starter and circuit breaker. All components are enclosed in a NEMA 12 enclosure.

4.4 General Operation (Continued)

4.4.1 Electrical Control Panel (Continued)

During normal operation, all H-O-A switches should be turned to the “Auto” position so that the PLC can effectively control the system. The PLC monitors the condition of the vacuum transducer, starts and stops the pumps depending on changing vacuum level and minimum run time values, and automatically alternates the lead position between units.

In a typical **duplex** system, one pump will be able to handle the system load. The PLC will signal the lead pump to start when system’s vacuum level reaches the cut-in set point. If the one pump can carry the load, then the vacuum level will rise to the vacuum set point. At this point, if the minimum run timer for that pump has been satisfied, the PLC will turn off the lead pump. If the minimum run timer for that pump has not been satisfied, the lead pump will continue to run until the timer expires. When the system vacuum drops again, the PLC will automatically sequence the lead role to the other pump and will start it. If the lead pump runs continuously in lead for more than the adjustable minimum run time, the PLC will automatically sequence the pump attempting to evenly distribute the run time among all available pumps. If during operation, the second pump is required to come on in addition to the lead pump, the PLC will turn on the “Lag Alarm” (see section 4.5).

In a **triplex** or **quadruplex** system, the operation is very similar to the duplex operation described above with the following differences. With a triplex or a quadruplex system, the lag unit running alarm may not necessarily correspond to the third or fourth pump coming on. To determine when the PLC turns on the lag alarm, it counts the number of units in the “Auto” position and makes a decision based on the vacuum transducer conditions. For instance, in a quadruplex system with only 2 H-O-A switches in the “Auto” position, the lag alarm will turn on when the second unit is started.

On the **initial** system start-up, when the system vacuum level is below the set points of the vacuum transducer, the first pump will start. After a time delay, the next pump will start if required. The time delay is to prevent high inrush current after a power failure or emergency power switch over. During this initial system start-up, the lag alarm could come on at this point and is normal. It can be reset once the vacuum level has reached the transducer’s set point and the lag pump has cut off after it’s minimum run time has expired.

In an Auto Purge system, The minimum run time is fixed can be set to run from 1 to 8 hours. At the end of a pumps minimum run time with the pump in auto purge mode the pump will purge for 15 minutes before shutting off.

4.0 System Operation (Continued)

4.4 General Operation (Continued)

4.4.2 Minimum Run Timer(s)

All vacuum systems incorporate minimum run timers to minimize the starts and stops on the vacuum pumps. The timers are adjustable or self adjusting and can be adjusted to suit the load of the facility.

4.5 Tank Drain

The standard tank drain consists of a manually operated ball valve.

To drain the liquid from the tank, open the tank bypass valve and close the tank isolation valves. Then open the drain valve. When draining is complete, close the drain valve first, then open the tank isolation valves and close the tank bypass valve.

4.6 Emergency Shutdown / Alarms

The following conditions may arise during operation.

Motor Overload Shutdown - This will shut down the pump in question and will not re-start until the reset button on the starter inside the main control cabinet is reset. See Section 4 for troubleshooting information.

High Discharge Air Temperature Shutdown - This will shut down the vacuum pump in question and will not restart until the appropriate red push button is pressed on the main control panel. Before allowing the unit to re-start, the condition should be checked. Even after pushing the button, the unit may not re-start, depending on system sequencing and system vacuum.

4.0 System Operation (Continued)

4.6 Emergency Shutdown / Alarms (Continued)

Lag Unit Running Alarm (Optional) - This alarm will activate if the last available vacuum pump comes on. In the case of a duplex system, it will activate when the second pump turns on. In the case of a multiplex system, the lag alarm will activate when the last available unit is required to come on. For example, in a quadruplex system, if all four (4) H-O-A switches are set to “Auto”, then the lag alarm will trigger when the fourth unit comes on. If on the same system, three (3) of the four (4) H-O-A switches are set to “Auto” and the other to “Off” or “Hand”, then the lag alarm will activate when the third unit comes on. To silence the alarm, press the alarm reset button. In the event the lag alarm is persistent, check to see if any leaks or valves are open downstream or reduce the system load.

4.7 Relief Valve

The pump is built with an integral vacuum relief valve. The purpose of this relief valve is to prevent the pump from operating at a vacuum level that is too high. The maximum operating point varies by model and is factory set before shipping.

The function of the relief is very important to the successful long-term operation of the vacuum system. Since these pumps have no oil or water to carry away the heat of compression, an adequate flow of air *through* the pump, as well as air circulation *around* the pump, is vital.

**NEVER SET THE VACUUM RELIEF VALVE AT A POINT THAT
EXCEEDS THE FACTORY RECOMMENDED LEVELS!**

5.0 Troubleshooting

Problem	Possible Causes	Solution
Failure to start	Main power disconnected	Turn on main power
	Power failure	Restore power
	Main fuse blown	Replace fuse
	Fuse blown in control circuit	Replace fuse
	Overload tripped on starter	Reset & check for system overload
	High temperature switch activated	Allow unit to cool; reset switch & check for over temperature condition
Power failure	Main fuse blown	Replace fuse
	Fuse blown in control circuit	Replace fuse
Unit lacks sufficient vacuum or lag alarm has occurred	Clogged Filters	Clean filters
	Vacuum relief valves need adjusting	Re-calibrate relief valve
	Restrictions in piping	Open pipe connections and examine for internal contamination or buildup
	Leaks in piping	Tighten all piping connections
	Insufficient pump speed (RPM)	Check voltage and amperage to motor Inspect motor and coupling halves Check that the pump shaft turns freely

5.0 Troubleshooting (Continued)

Problem	Possible Causes	Solution
Unit lacks sufficient vacuum or lag alarm has occurred	Line losses too high	Piping diameter too small replace with larger diameter pipe
	Unit is operating at an elevated altitude	Contact the factory for assistance. Performance may be reduced when operating well above sea level.
Motor breakers trip constantly	Defective motor	Test motor and replace if necessary
	Heaters incorrectly adjusted too small, or defective	Adjust or replace with correctly sized heaters
	Low motor voltage	Check at motor terminals. Contact electric service provider.
	Ambient temperature too high	Reduce ambient temperature
Unit runs rough and cannot be rotated manually	Worn Coupling	Remove motor and inspect coupling element. Replace if necessary.
	Worn bearings	Contact factory for assistance
Pump overheats	Cooling ducts blocked	Clean cooling ducts
	Cooling fan broken	Replace fan
	High ambient temperature	Ventilate or cool room
	Vacuum too high	Adjust vacuum settings or relief valve

5.0 Troubleshooting (Continued)

Problem	Possible Causes	Solution
Pump overheats	Inlet restricted	Remove restriction
	Exhaust restricted	Remove restriction
	The oil tank may be low/empty of oil, has contaminated oil or was filled with an incorrect type of oil	If the oil level is found to be low, immediately shut off the pump, drain the remaining oil from the tank and replenish with fresh oil. If an incorrect oil type or contamination is found, make sure the pump has reached its operating temperature before replacing with fresh oil.
High vacuum level	Vacuum relief valves need adjusting	Re-calibrate relief valve
Excessive noise level	The coupling rubbers may be worn	See “worn coupling” above
	Internal pump damage	Call factory for assistance

For any operational problems not listed here, please contact your local **Patton's Medical Service** representative.

1-866-960-0087

6.0 Maintenance

6.1 Maintenance Schedule

WARNING:
BEFORE STARTING ANY MAINTENANCE PROCEDURES,
DISCONNECT ALL POWER TO THE PACKAGE.

WARNING:
PUMPS THAT HAVE REACHED NORMAL OPERATING
TEMPERATURE MAY HAVE A HIGH SURFACE TEMPERATURE OF MORE
THAN 70°C (158°F).
DO NOT PERFORM ANY MAINTENANCE UNTIL AFTER A
SUFFICIENT COOL DOWN PERIOD.

Never perform any maintenance functions while the unit is in operation.

Maintenance Schedule

Item	Frequency	Action
Exhaust drip leg	Daily	Check for accumulated moisture
Check inlet air filter(s)	Annually	Replace elements
Synchronizing Gear Oil Level	Weekly	Top off when pump is off
Check nuts, bolts, fittings, etc.	Monthly	Inspect and tighten
Synchronizing Gear Oil	Weekly 5,000 hours/Annually	Check oil Change oil
Pump Bearings 2-8.7 hp 15 hp	Not Required 6 months	Not required Grease B side bearings
Motor Coupling	Annually	Remove motor to inspect coupling for wear. Replace as needed.

6.0 Maintenance (Continued)

6.2 General Maintenance for All Units

Pumps

Maintain the pump regularly to achieve the best operating results. Maintenance intervals will depend on the pump's use and ambient conditions. Each pump has oil-lubricated synchronizing gears but there is no lubricant in the pumping chamber.

Do not run pumps without synchronizing gear lubricating oil.

Oil Type

The basic specification for the recommended oil is **non-detergent**. The viscosity must correspond to ISO-VG 220.

The recommended oil is Patton's # 43-01-004 for **Standard units**

The recommended oil is Patton's # 43-01-017 for **Oxygen safe units**

Please contact **Patton's Medical** for more information.

Note: If changing brands, it is important to completely drain out all oil from the pump.

Changing Synchronizing Gear Oil

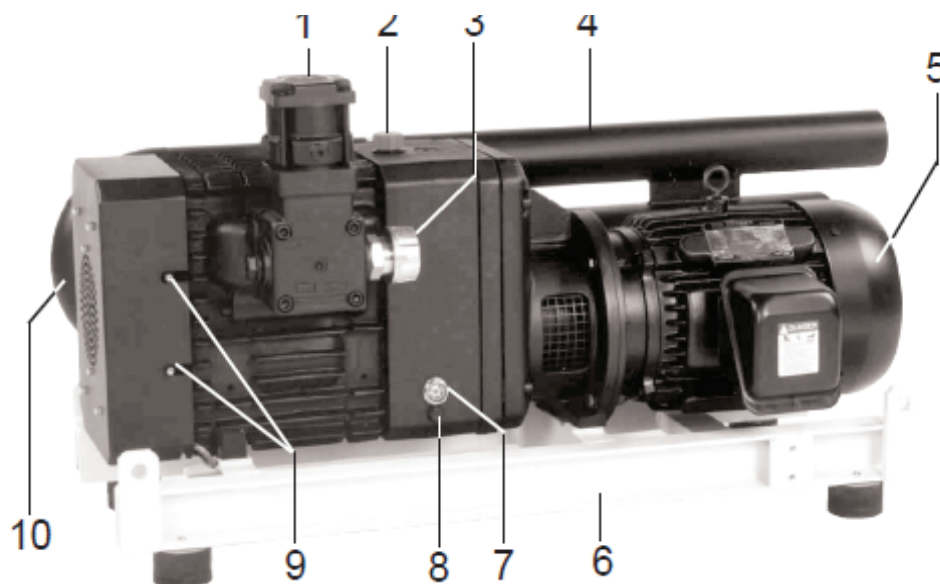
Check the oil level regularly by observing the built-in sight glass. Each pump requires the proper oil to operate correctly. The oil should be changed every 5,000 hours of operation or more frequently when operating at ambient temperatures of 104°F.

To Change the oil:

1. Make sure the vacuum pump is shut down and locked against inadvertent start up.
2. Prior to draining the oil, always depressurize the gearbox by removing the oil fill plug, located on top of the gear box.
3. Place a drain tray underneath the drain plug and drain the oil.
4. Firmly reinsert the drain plug in the drain valve.
5. Fill with new gear oil until the level is slightly above the middle of the sight glass.
6. Dispose of the used oil in compliance with applicable regulations.

Oil Quantity per Vacuum Pump	
System	Oil Quantity (liters)
2 hp	.85
3 hp	.85
4 hp	.85
5.4 hp	.85
6.4 hp	1
7.5 hp	1
8.7 hp	1
10 hp	1
15 hp	.63

6.0 Maintenance (Continued)



- | | | |
|---------------------|-------------------|-------------------|
| 1 Inlet | 5 Motor | 9 Grease fittings |
| 2 Oil fill | 6 Frame | 10 Cooling fan |
| 3 Vac. relief valve | 7 Oil sight glass | |
| 4 Silencer | 8 Oil drain plug | |

6.2

“B-side” Bearing Lubrication (Standard Claw)

The “B-side” bearings of the Standard 15 HP vacuum unit needs to be greased twice a year with the high melting-point grease, Kluber Asonic HQ 72-102. **Patton’s # 43-02-007**

Grease can be added to the bearings by charging the bearings with grease through the grease fittings (9) until grease comes out of the opening.

“B-side” Bearing Lubrication (Oxygen Safe Claw)

The “B-side” bearings of the Oxygen Safe 15 HP vacuum unit needs to be greased twice a year with Oxygen Safe Grease **Patton’s # 43-02-014**

Cover plates will need to be removed to add grease to the bearings.

Pump Fan/Motor Fan Openings

Periodically inspect the pump for accumulation of debris and dirt. Keep the ventilation grills of the motor fan and the pump fan clear of excessive debris. Overheating of the pump or motor could result if these openings are blocked.

Inlet Filters

The inlet filter elements should be checked monthly initially. If filter elements are dirty replace with new elements. Elements should be replaced yearly or after 4000 hrs of operation..

Exhaust Drip Leg Valve

Each pump should have a drip leg installed by others at the exhaust port on the pump. This valve should be checked daily at first, then depending on the moisture accumulated could be checked less frequently.

WARNING:

**BEFORE STARTING ANY MAINTENANCE PROCEDURES,
DISCONNECT ALL POWER TO THE PACKAGE.**

7.0 Inspection/Replacement Procedures**7.1 Air Intake Filter**

Never perform any maintenance functions while the unit is in operation.

The air intake filter element should be changed every 4,000 hours of operation or annually under normal operating conditions. To change the filter:

1. Turn off the vacuum pump being serviced and lock open the appropriate disconnect switches.
2. Close intake isolation valve
3. Remove the protective cover by loosening the latches.
4. Remove the element.
5. Clean inside of housing.
6. Insert a new element (note orientation of the element).
7. Replace protective cover and tighten wing nut (if applicable) and latches.
8. Open intake isolation valve
9. Turn on the vacuum pump.



Oil-Less Rotary Claw Lab Vacuum System

8.0 Replacement Parts

Any information, service or spare parts requests should include the machine serial number and be directed to:

Patton's Medical
3201 South Boulevard
Charlotte, NC 28209

Telephone: 1-866-960-0087
Fax: (704) 525-5148

Medical.service@pattonsmmedical.com
www.pattonsmmedical.com

Duplex System Parts

Description	2 - 3 HP	Qty per System
Inlet Filter Element	09-11-006	2
Oil "Standard Claw" (1 Quart)	43-01-004	2
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	4

Description	4 - 5.4 HP	Qty per System
Inlet Filter Element	09-11-006	2
Oil "Standard Claw" (1 Quart)	43-01-004	2
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	4

Description	6.4 - 10 HP	Qty per System
Inlet Filter Element	09-11-007	2
Oil "Standard Claw" (1 Quart)	43-01-004	2
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	4

Description	15 HP	Qty per System
Inlet Filter Element	09-11-012	2
Oil "Standard Claw" (1 Quart)	43-01-004	2
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	4

8.0 Replacement Parts (Continued)

Triplex System Parts

Description	5.4 HP	Qty per System
Inlet Filter Element	09-11-006	3
Oil "Standard Claw" (1 Quart)	43-01-004	3
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	6
Description	6.4 - 10 HP	Qty per System
Inlet Filter Element	09-11-007	3
Oil "Standard Claw" (1 Quart)	43-01-004	3
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	6
Description	15 HP	Qty per System
Inlet Filter Element	09-11-012	3
Oil "Standard Claw" (1 Quart)	43-01-004	3
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	6

Quadruplex System Parts

Description	5.4 HP	Qty per System
Inlet Filter Element	09-11-006	4
Oil "Standard Claw" (1 Quart)	43-01-004	4
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	8
Description	6.4 - 10 HP	Qty per System
Inlet Filter Element	09-11-007	4
Oil "Standard Claw" (1 Quart)	43-01-004	4
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	8
Description	15 HP	Qty per System
Inlet Filter Element	09-11-012	4
Oil "Standard Claw" (1 Quart)	43-01-004	4
Oil "Oxygen Safe Claw" (1 Pint)	43-01-017	8



Oil-Less Rotary Claw Lab Vacuum System

8.0 Replacement Parts (Continued)

Common Parts

Description	Part Number	Qty. / Pump	Qty. / System
All Systems			
Vacuum Transducer	30-07-025		1
Back up Vacuum Switch	30-07-001		1



Oil-Less Rotary Claw Lab Vacuum System

9.0 Warranty

Lab Vacuum System Warranty

Patton's Medical warrants the total Lab Vacuum system to be free of defects in material and workmanship under normal use for a period of twenty-four months from start-up, not to exceed thirty months from date of shipment. This warranty covers all necessary parts used in repair as well as all reasonable labor expense. Normal consumable parts required for routine scheduled maintenance (such as filters) are not covered under this warranty.

This warranty does not apply to products that are damaged by external causes, or are improperly warehoused, used, installed, serviced, misapplied or maintained by the customer. The sole liability for **Patton's Medical** under this warranty is limited to repairing, replacing, or crediting, at its election, any such products provided that:

- **Patton's Medical** is notified promptly within the warranty period above of any warranty claim.
- The examination of such items by an authorized representative of **Patton's Medical** will disclose to their reasonable satisfaction that claimed products defect has not been caused by misuse, neglect, improper handling, installation, repair, alteration, or accidents.
- **Patton's Medical** requires that all equipment be commissioned by an authorized **Patton's Medical** distributor and requires a start-up report to be filed within 30 days of equipment start-up. Failure to submit a start-up report to **Patton's Medical** will void the warranty.
- Simplex units 5Hp and below do not include factory assisted start-up in their base price unless specifically noted otherwise. Failure to submit a start-up report to Patton's Medical will void the warranty.

Product modification performed by the customer without prior written approval by **Patton's Medical** will invalidate the above warranty.

This warranty is given in lieu of all other warranties, expressed or implied, including implied warranties of fitness for a particular purpose and merchantability. In no event shall Patton's Medical be liable for damages in excess of the value of the defective product or part, nor shall Patton's Medical be liable for any indirect, special or consequential damages, loss of profits of any kind, or for loss of use of the products.

Patton's Medical shall not be liable to the customer for any claims, loss of damage of any kind whatsoever arising from the nonperformance of **Patton's Medical** of any part of this agreement occasioned by acts of God, fire, war, labor difficulties, governmental regulations, or action of government. **Patton's Medical** shall not be liable to the customer for any other cause, whether of a similar or dissimilar nature beyond its reasonable control.



Oil-Less Rotary Claw Lab Vacuum System

10.0 Maintenance Record

Model Number

Serial Number

Installation Date

Notes:

Date of Service					
Hours					
Load					
Ambient Temp.					
Inlet Filter					
Misc.					
Serviced By:					



Oil-Less Rotary Claw Lab Vacuum System

10.0 Maintenance Record

Model Number

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Notes:

Date of Service					
Hours					
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Misc.					
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Oil-Less Rotary Claw Lab Vacuum System

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Inlet Filter					
Misc.					
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Oil-Less Rotary Claw Lab Vacuum System

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Inlet Filter					
Misc.					
Serviced By:					



3201 South Boulevard
Charlotte, NC 28209
1-866-960-0087
www.pattonsmedical.com



Patton's Medical Systems Warranty

Patton's Medical warrants that all systems to be free of defects in material and workmanship under normal use for a period of twenty-four months from start-up, not to exceed thirty months from date of shipment. This warranty covers all necessary parts used in repair as well as all reasonable labor expense. Normal consumable parts as well as parts requiring calibration as part of routine scheduled maintenance (such as filters, Dewpoint/CO sensors/monitors) are not covered under this warranty.

This warranty does not apply to products that are damaged by external causes, or are improperly warehoused, used, installed, serviced, misapplied or maintained by the customer. The sole liability for **Patton's Medical** under this warranty is limited to repairing, replacing, or crediting, at its election, any such products provided that:

- **Patton's Medical** is notified promptly within the warranty period above of any warranty claim.
- The examination of such items by an authorized representative of **Patton's Medical** will disclose to their reasonable satisfaction that claimed products defect has not been caused by misuse, neglect, improper handling, installation, repair, alteration, or accidents.
- **Patton's Medical** requires that systems above 5 Hp simplex be commissioned by an authorized **Patton's Medical** distributor and requires a **legible start-up report and distributor invoice** to be filed within 30 days of equipment start-up, **late documentation will not be considered. Failure to submit a start-up report to Patton's Medical will void the warranty.**
- **Replacement Parts** including pumps and motors carry a limited warranty based upon manufacturer specific terms. Labor for these warranties is not included or implied and is at the sole discretion of Patton's Medical.
- Simplex units 5Hp and below as well as retrofit dryer packages do not include factory assisted start-up in their base price unless specifically noted otherwise.
- **Invoices for work performed, freight, and equipment must be received promptly within 60-days of performance. Invoices received after this date will not be considered.**

Product modification performed by the customer without prior written approval by **Patton's Medical** will invalidate the above warranty.

This warranty is given in lieu of all other warranties, expressed or implied, including implied warranties of fitness for a particular purpose and merchantability. In no event shall Patton's Medical be liable for damages in excess of the value of the defective product or part, nor shall Patton's Medical be liable for any indirect, special or consequential damages, loss of profits of any kind, or for loss of use of the products.

Patton's Medical shall not be liable to the customer for any claims, loss of damage of any kind whatsoever arising from the nonperformance of **Patton's Medical** of any part of this agreement occasioned by acts of God, fire, war, labor difficulties, governmental regulations, or action of government. **Patton's Medical** shall not be liable to the customer for any other cause, whether of a similar or dissimilar nature beyond its reasonable control.



Automatic Changeover Medical Manifold



Installation, Operation and Maintenance Manual



Patton's Medical
Automatic Medical Changeover Manifold

Model Number:	
Date Purchased:	
Purchased from:	

For further technical assistance, service or replacement parts, please contact:

Patton's Medical
3201 South Boulevard
Charlotte, NC 28209

Customer Service: 1-866-960-0087
Phone: 704-529-5442
Fax: 704-525-5148

www.pattonsmmedical.com

Patton's Medical reserves the right to make changes and improvements to update products sold previously without notice or obligation.

Issue Date: March 24, 2016



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1.0 General Information

The NFPA99 compliant dome biased fully-automatic dual line medical manifold offers continuous, fail-safe pressure and flow control from high pressure medical cylinders. The manifold provides an uninterrupted supply to the facility at a constant pressure. Signal contacts are provided to indicate when the “Secondary” Bank is in use. No manual resetting is required when the Primary Bank is replaced and system pressure level returns to the Primary Bank.

Power Requirements

100-240/1/50-60 VAC

Maximum Inlet Pressure

3,000 PSIG (210 BAR)

Temperature Range

0 to 140°F (-18° to 60°C)

Weight

54 lbs.

Filter

40 micron

Inlet Connection

CGA 1340

Outlet Connection

1/2” NPT for Main
Valve (included)

Flow Capacity

1200 SCFH @80psi

Materials:

Bodies

Brass barstock

Seats

Viton®, Neoprene

Seals

PTFE, Neoprene and Viton®

Enclosure

Powder Coated Steel NEMA 1 Enclosure,
removable front cover for ease of service.

Features:

- High Flow Regulators
- NEMA 1 enclosure
- Micro-processor control
- Master alarm interface(Secondary in Use)
- Service button allows technician to manually alternate banks
- Simple Installation and set-up
- Pushbutton for transducer calibration
- Pushbutton bleed valves to aide in setting primary regulators
- Primary Source Valve included (1/2” NPT male x brazed in field)
- Separate Wall Mounting bracket included for ease of installation by single technician
- NFPA 99 compliant

Note: A transfer or manifold room shall maintain a temperature not greater than 52°C (125°F) and not less than -7°C. (per NFPA 9.3.6.8)



2.0 Description

Patton's Medical dome loaded manifold is manufactured to supply an uninterrupted source of gas to a medical facility. Manifold will have multiple cylinders divided into two equal banks on the left side and right side. One bank is the primary side the other is the secondary side. One side will be online or "in use" the other will be in secondary or "ready".

Indicator lights will display the status of the gas supply. When the primary bank of cylinders reaches the low setting the red light will display to "Replace" that bank of cylinders. The normally closed alarm contacts will open sending a signal to the remote indicator (Master Alarm - NFPA).

When cylinders are replaced the red light will go out and green light will illuminate automatically. Alarm contacts will close sending remote signal indicating the cylinders have been replaced.

Supply voltage of 100-240 VAC is converted to 12 VDC to power the manifold. Two sets of remote alarm contacts are supplied.

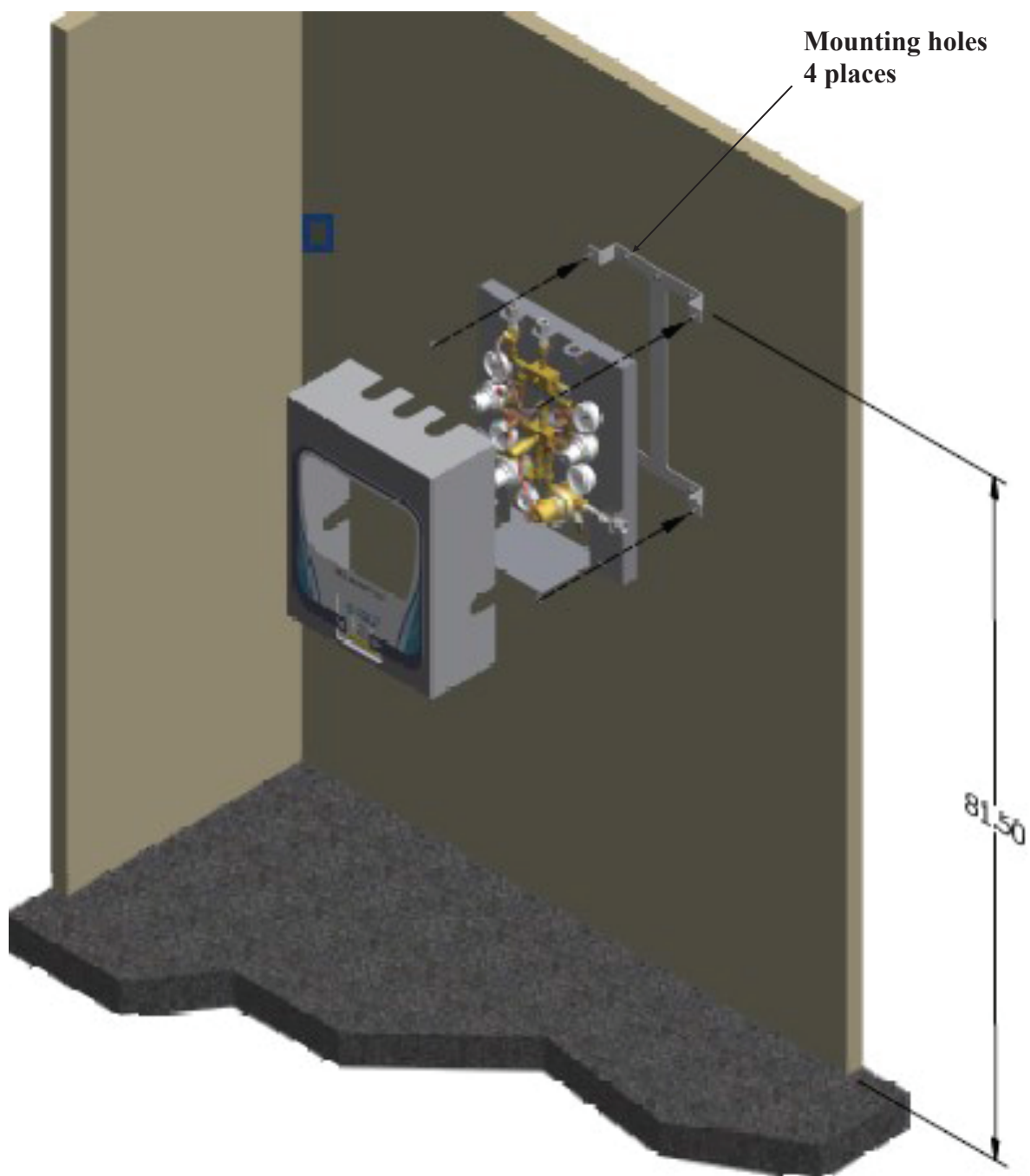
3.0 Shipping Details

The manifold system will be shipped in two or more boxes. The manifold cabinet will be in one box, the wall mounting bracket, CGA fittings, 3/8" washers and nuts for attaching to mounting bracket, 3/4" source valve and Installation and operation manual in another box. Additional boxes may contain appropriate number of header extensions and pigtails. Pigtails for Oxygen and Helium are pre-bent rigid copper. All other gases are use stainless steel flex type. The manifold is made for wall mounting but can be ordered with floor mounting bracket as well.

4.0 Cabinet Mounting Instructions

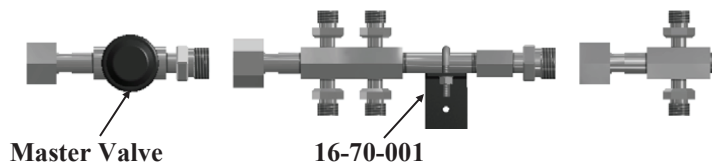
1. Remove manifold from shipping carton and place on cardboard insert face up.
2. Remove manifold cover by removing two screws on sides of the manifold enclosure.
3. Mark top holes in mounting brackets 81.5" from floor. This will allow clearance for "H" size bottles. If taller bottles are used adjust accordingly. Mark all four mounting holes. (See Drawing next page)
4. Drill holes for anchors to mount the bracket (3/8" anchors) supplied by others. Mount bracket to wall.
5. Lift manifold onto four 3/8" studs on mounting bracket. Secure manifold to mounting bracket using four 3/8" washers and nuts.

4.0 Cabinet Mounting Instructions (continued)

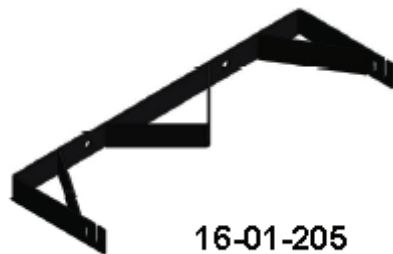


5.0 Header Bar Installation

1. Attach the Master Valve assembly to both sides of the manifold (Do not use Thread sealant on connections)
2. Attach the header bar assembly's using the union nuts to the master valve's. If header bar is larger than a 5x5 a wall mounting bracket (part number 16-70-001) is included on each side for each additional 4th or 5th cylinder (see below). Attach wall bracket to wall using 3/8" anchors (supplied by others). Tighten u-bolts to header pipe.



3. Secure cylinders to wall with optional wall mounting brackets and chain. (see below)

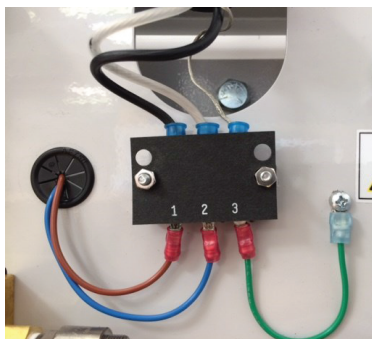


4. Remove plastic caps from header bar and install pigtails to the header bar connections and cylinders.



6.0 Power Supply Connection

1. Supply 100 VAC to 240 VAC 12 to 14 AWG copper wire. Circuit breaker 15 amp max. A 1/2" conduit connection is provided at the top of enclosure. Current draw is .55 amps.



Brown	Hot	1
Blue	Common	2
Green	Ground	3

7.0 Master Alarm Contacts (NFPA) “switch-over has occurred”

Two sets of remote alarm contacts are provided for building automation systems. Contacts will open if a switching failure occurs or a loss of power. The alarm contacts are rated for 0.4 amps @ 24VDC. Connection is made through bottom of enclosure.

8.0 Outlet Valve and Relief Valve Connection

The Source Valve is shipped loose. The source valve is supplied with 1/2" NPT fitting for connection to top of manifold and 3/4" nominal copper for facility connection. A 1/8" plugged port is provided on top of the source valve and can be removed for purging. The relief valve connection is 1/2" NPT located on top of the manifold.

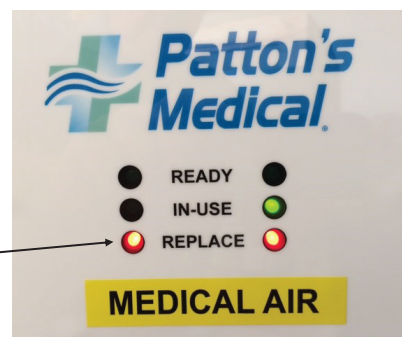


Relief Valve Source Valve



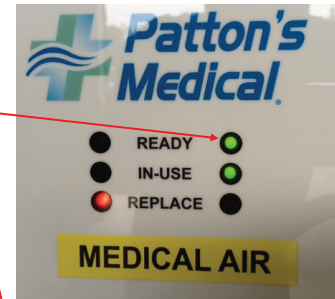
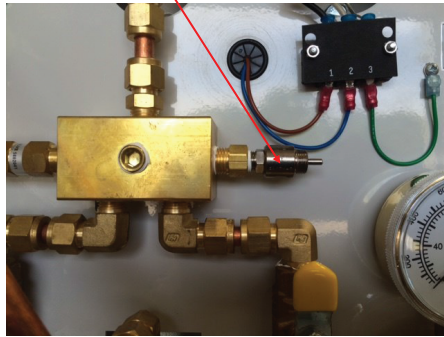
9.0 Initial Start-up

1. Close 3/4" Source Valve.
2. Fully open master valve on both sides of manifold.
3. Open all four regulator isolation valves.
4. Apply power to manifold.
5. “Replace” lights illuminated on both sides.
6. Slowly open one cylinder on right side.



9.0 Initial Start-up (continued)

7. "Ready" and "In use" lights illuminate.
8. Slowly open one cylinder on left side of manifold.
9. "Ready" light illuminates on left side.
10. Slowly close right side cylinder that is open.
11. Press relief valve and drop pressure slowly.



12. When the right side drops below the low limit the red "Replace" light will illuminate, alarm contacts will open and left side "In Use" green light will illuminate. Manifold is now flowing gas from left bank.
13. Slowly reopen one cylinder from right side. Red light turns off and green "Ready" light turns on.
14. Slowly close left side cylinder that is open.
15. Press relief valve and drop pressure slowly.
16. When the left side drops below the low limit the red "Replace" light (local signal) will illuminate, alarm contacts (Remote signal-NFPA to master alarm) will open and right side "In Use" green light will illuminate. Manifold is now flowing gas from the right bank.
17. Reopen one cylinder from left side. Red light goes out and green "Ready" light is illuminated. Alarm contacts should reclose at this time.

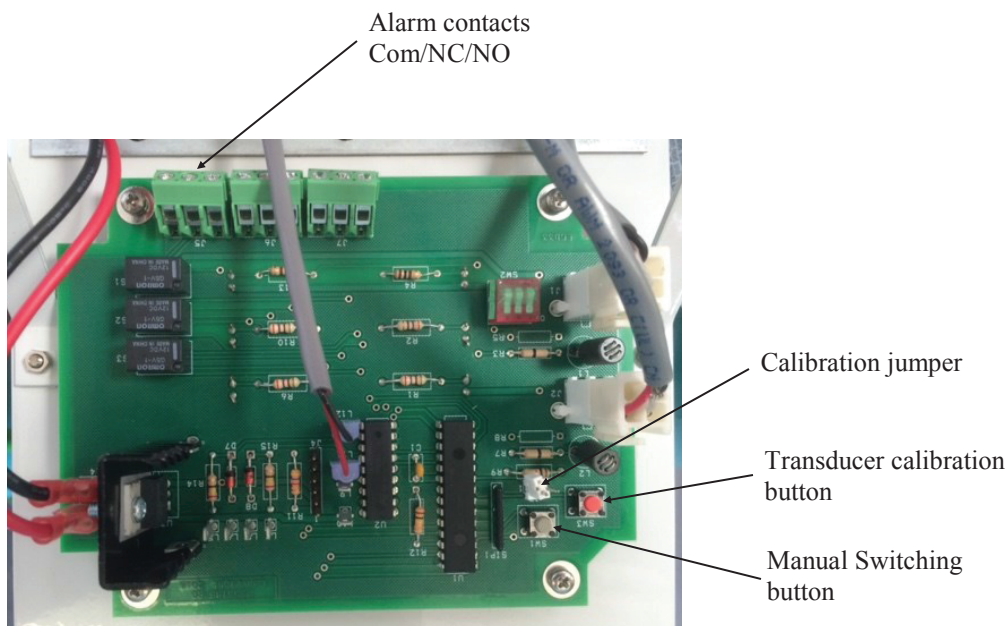
Note:

If a power loss occurs the switching alarm contact will open sending an alarm to master control panel.

The manifold will continue to supply gas until all cylinders are empty.

10.0 Control board

1. Manual switching can be accomplished by pressing gray button on control board.
2. Transducers are calibrated by moving jumper to connect both pins and pressing red calibration button with 0 PSI on transducers. (Required only when replacing transducers). Remove jumper from 1 pin after calibration.
3. Three sets of remote alarm contacts are supplied for connection to master alarm panel or other BMS systems. **(Normally open contact will be closed if no alarm condition is present)**



11. Testing for leaks

1. Close 3/4" source shut-off valve.
2. Make sure master valve is open on the right and left side of manifold.
3. Slowly open a cylinder on both sides of the manifold.
4. Check for leaks at all cylinder extension joints using a commercial leak detector which is compatible with oxygen.
5. If leaks are detected close valves on cylinders that were opened. Repair leaks and verify leaks are eliminated.
6. Wipe off excess leak detector after testing. Avoid getting leak detector on electrical components or connections.

12. Specifications

The Patton's Medical Automatic Changeover Manifold is designed in accordance with the latest revision of NFPA 99.

Three types of Patton's Medical manifolds are available depending on the delivery pressure and gas type.

55 PSI Delivery Pressure

- Oxygen, Nitrous Oxide, Medical Air, Carbon Dioxide, Helium, Argon

100 PSI Delivery Pressure

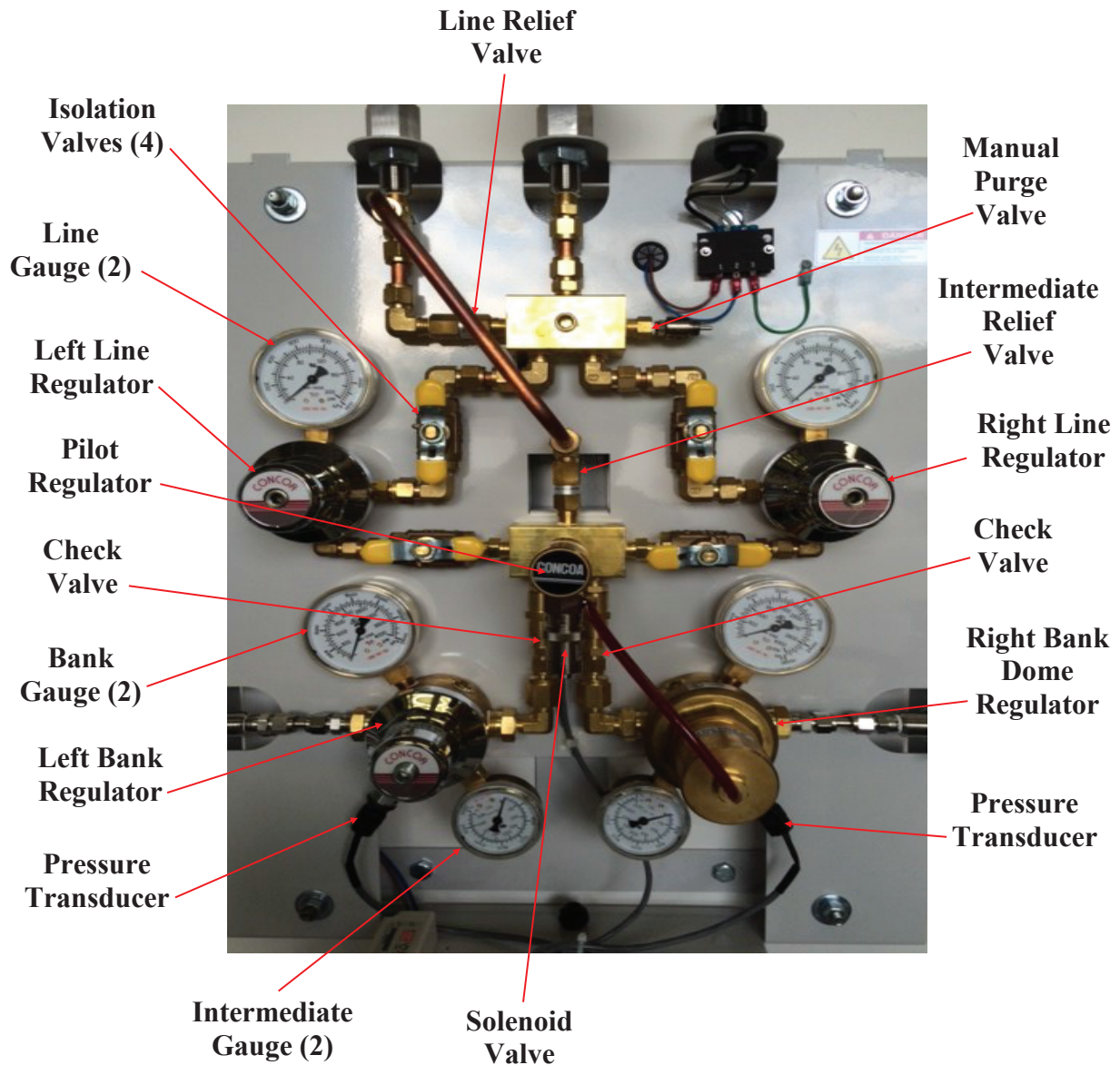
- Medical Air, Oxygen, Carbon Dioxide

180 PSI Delivery Pressure

- Nitrogen, Instrument Air

Delivery Pressure	55	100	180
Intermediate Pressure - Ready Bank	190 PSI	230 PSI	260 PSI
Intermediate Relief Valve	375	375	375
Line Pressure Relief Valve	225 PSI	225 PSI	375 PSI
Maximum Inlet Pressure	3000 PSI	3000 PSI	3000 PSI

13. Manifold Parts Layout

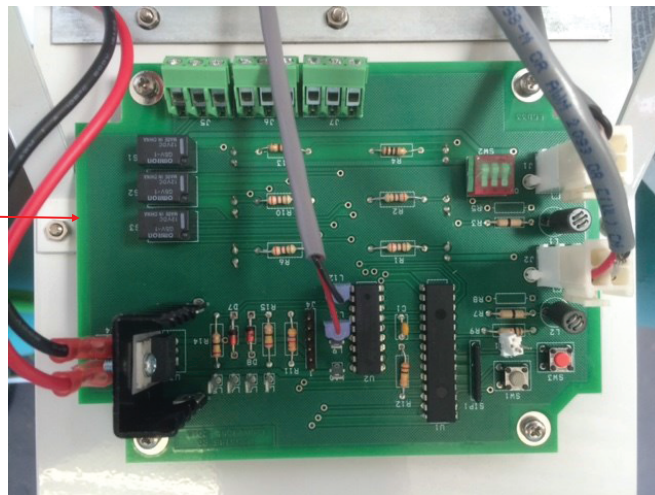


13. Manifold Parts Layout

**Power
Supply
27-80-066**



**Control
Board
27-80-064**





14. Manifold Parts List

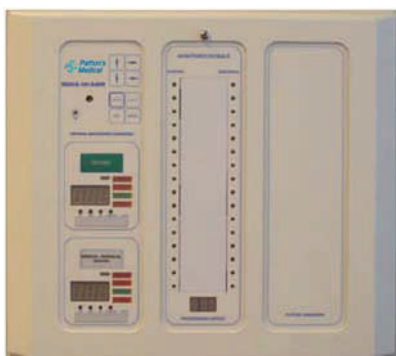
Description	Part #
Pilot Regulator	27-80-050
Dome Regulator (not for CO2 or NO2) 55 PSI Delivery	27-80-052
Left Bank Regulator (not for CO2 or NO2) 55 PSI Delivery	27-80-053
Dome Regulator (for CO2 and NO2) 55 PSI Delivery	27-80-057
Left Bank Regulator (for CO2 and NO2) 55 PSI Delivery	27-80-058
Left Line Regulator 55 PSI Delivery	27-80-054L
Right Line Regulator 55 PSI Delivery	27-80-054R
Dome Regulator (not for CO2 or NO2) 100 PSI Delivery	27-80-052
Left Bank Regulator (not for CO2 or NO2) 100 PSI Delivery	27-80-053
Dome Regulator (for CO2 and NO2) 100 PSI Delivery	27-80-057
Left Bank Regulator (for CO2 and NO2) 100 PSI Delivery	27-80-058
Left Line Regulator 100 PSI Delivery	27-80-055L
Right Line Regulator 100 PSI Delivery	27-80-055R
Dome Regulator (not for CO2 or NO2) 170 PSI Delivery	27-80-052
Left Bank Regulator (not for CO2 or NO2) 170 PSI Delivery	27-80-053
Left Line Regulator 170 PSI Delivery	27-80-056L
Right Line Regulator 170 PSI Delivery	27-80-056R
Bank Pressure Gauge	27-80-061
Intermediate Pressure Gauge	27-80-062
Line Pressure Gauge 0-100 PSI	27-80-063
Line Pressure Gauge 0-200 PSI	27-80-068
Pressure Transducer	27-80-059
Solenoid Valve	27-80-065
Power Supply	27-80-066
Front Cover	27-80-067
Intermediate Relief Valve & Line pressure for 170 PSI systems	27-80-070
Line Pressure Relief for 55 & 100 PSI systems	27-80-069
Isolation Valve for manifold	PMIV-M-07



3201 South Boulevard
Charlotte, NC 28209
1-866-960-0087
www.pattonsmmedical.com



Area, Master & Combination Alarm Systems



Installation and Maintenance Manual

Model Number:	
Date Purchased:	
Purchased from:	

For further technical assistance, service or replacement parts, please contact:

Patton's Medical
3201 South Boulevard
Charlotte, NC 28209

Customer Service: 1-866-960-0087
Phone: 704-529-5442
FAX: 704-525-5148

www.pattonsmmedical.com

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Issue Date: December 11, 2014

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INTRODUCTION

The Patton's Medical gas alarm system monitors the status of the medical gas distribution system and provides audible and visual indicators. The master alarm can be furnished with Relay (BIM) building management system. The alarm can be used in conjunction with the Patton's Medical optional Ethernet compatible system to monitor the status of all alarm and manifold systems on a PC. The Patton's Medical alarm system monitors the status of the medical gas sources in accordance with NFPA 99 and CSA Z7396.1.

The Patton's Medical gas alarm system is a two or three section assembly comprised of a rough-in box, a front panel and transducers (only if it is an area alarm or combination alarm).

Rough-in Box

The rough-in box houses the power supply, fuse, on/off switch, and a terminal strip for electrical wiring. An isolated transformer reduces the 110V or 220V AC input to low voltage DC.

Front panel

The front panel includes enclosed printed circuit boards with programming circuitry.

The **Push Button Module** includes a power on indicator, programming buttons and an audible alarm.

The **Remote Signal Module(s)** can monitor up to 16 signals per circuit board. Multiple remote signal modules can be ordered in a single alarm. The signals can be configured to display an abnormal condition on either a normally closed (NC) or a normally open (NO) circuit. Each signal may also be turned off if it is not being utilized.

The **Remote Signal Module(s) with Relay (BIM module)** are equipped with all of the above described features as standard Remote Signal module(s) described above. In addition, the remote signal module(s) with Relay (BIM) are equipped with an extra set of remote signal dry contacts to interface with a building management system.

The **Gas (Area) module(s)** on the front panel are identified with gas specific, color coded labels (per NFPA 99 or CSA Z7396.1). The gas displays include LED's which indicate high/normal/low pipeline pressure. A digital LED display shows the actual gas pressure. The gas pressure may be displayed in PSI and In Hg, or BAR or kPa. The unit is pre-programmed to display PSI / In Hg from the factory, but may be re-programmed in the field to display BAR or kPa. In addition there are LED's which illuminate to indicate System and Program failures. Each module is supplied with dry contacts for remote signaling of high and low pipeline pressure.

Transducers

The transducers convert pressure to an electrical signal and supply the electrical signal to the alarm circuit board gas module panels. **After the initial 24 hour 150 psi standing pressure test (required per NFPA 99) has been completed** the pressure/vacuum transducers may be connected to the medical gas pipeline. The transducers may be remotely attached to the piping system at distances up to 5,000 feet using standard 18 gauge stranded twisted pair wire. Patton's Medical recommends mounting the transducers in the zone appropriate zone valve box or in the alarm back box. Should a transducer require service or replacement it is considerably more of a safety issue and more time consuming to locate and replace transducers which have been remotely located above the ceiling and eliminates contamination issues - such as having to set up a tent in order to remove ceiling tiles.

Features & Benefits

Microprocessor controlled

State of the art maintenance free electronics provide excellent reliability

Easy to program

One man adjustable digital pressure display
(at the panel, not the transducer)

Remote signal modules

Each circuit board provides monitoring of 16 separate remote devices

Self test program - alarm code display

LED display reveals the nature of the malfunction and reduces maintenance time

Three year PC board warranty

A quality product you can buy with confidence

Independent multiple master alarms

When service is interrupted to one alarm the other(s) continue to operate independently

Transient signal filter

Prevents or reduces nuisance (false) alarm signals (less than 0.7 seconds) created by EMI/RFI interference

Audio & Visual signal indicators

Audible alarm and visual display of both normal and abnormal status of each signal monitored assures prompt and informative indication of a problem

Optional building management interface circuit board(s) - Relay (BIM) boards

Allow communication of remote signals (master alarm points) with building management system

Easy to install and service

Hinged frame with lanyards for easy accessibility

Dry remote signal contacts (high & low) for each gas module

Dry contacts are provided so that both the high & low line pressure alarms may be remotely wired to a remote or master alarm

Programmable remote signals (Master module)

Configure each remote signal independently (either normally closed, normally open or turn unused signals off).

Digitized transducers

Allow remote locating of transducers up to 5,000 feet away from alarm panel. Extremely resistant to RFI

Programmable gas module high and low set points

Pre-programmed from factory at 60/40 psig for 50 psig delivery pressure gases, 200/140 for N₂ and 12 in Hg for Medical Vacuum & WAGD/EVAC. Programmable in 0.5 psig or In Hg increments from 0.5 psig or In Hg up to 30 In Hg or 100 psig or 250 psig (depending on which type of transducer is used).

Compact Unit

Requires minimal wall space. Monitors up to 14 area alarm signals or 64 remote (master) signals in one 5 slot panel.

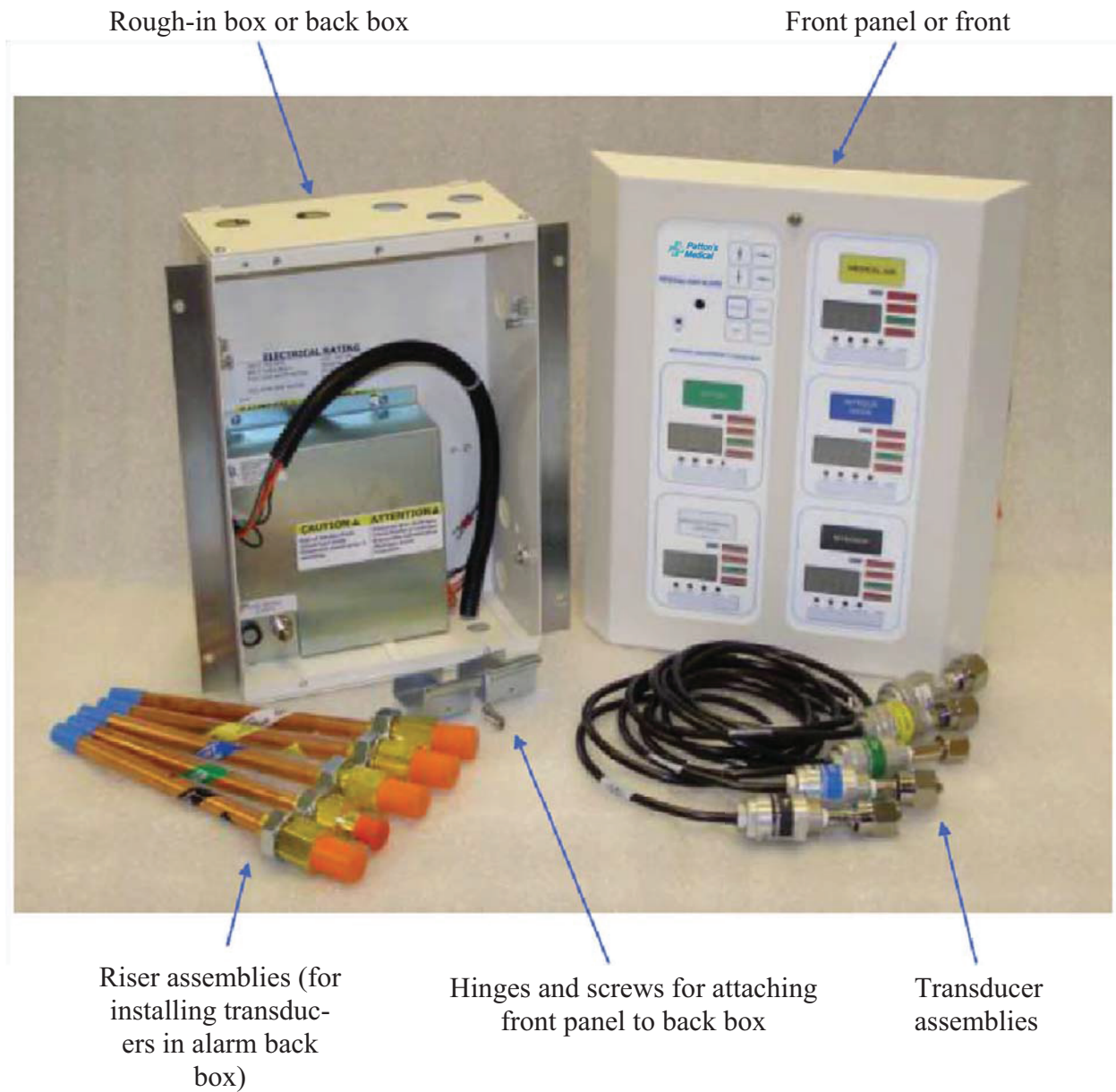
Alarm history recall

Can recall previous alarm signals (both area and master alarms) even after the alarm condition has been corrected and the alarm panel has been cleared

Area Alarm repeat feature

Adjustable from 1 minute to 240 minutes (factory programmed for 10 minutes).

Major Components



Alarm Installation

Installation of the Patton's Medical alarm involves installing the rough-in box, the risers & the transducers (if it is an area alarm or combination alarm) and front panel and making the necessary conduit, plumbing and electrical connections. All installation and testing should be done in accordance with NFPA 99 or CSA Z7396.1.

WARNING: Electrical power intended for the alarm to be installed should be disconnected prior to installation.

WARNING: This device should only be installed by qualified personnel. Installation should not be attempted by anyone not having general experience with the installation of devices of this nature.

Rough-In Box Installation



This is a rough-in box for a combination alarm. Your rough-in box should look the same or similar to this unit. The risers are shipped loose, for protection during shipment, and must be installed. If transducers are to be mounted remotely, it is recommended that they be connected to the DISS demand check valves installed in the corresponding zone valve box.

Refer to the building plans to determine the location of the alarm.

The contractor is to provide rigid mounting that will support the alarm box on both sides. The metal flanges provided on both sides of the rough-in box are to rest against the rigid mounting brackets. Screws (contractor provided) are to be driven thru the holes in the metal flanges into the mounting brackets. Flanges are adjustable to allow for a drywall depth of 1/2" to 1 1/8".

Mount alarm rough-in box so it will be flush or just below the finished wall surface using the adjustment feature on the flanges. Recommended mounting height of alarms is generally 66" (generally accepted) from floor to top of finished alarm unless specifically detailed otherwise.



(Side/end view of rough-in back box)

Alarm Installation

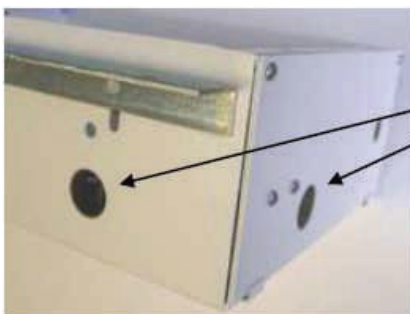


The power supply hole is located in the bottom (left side) of the rough-in box. Remove the plastic cover and panel covering the power supply. Remove the plug from the hole. Make conduit connections for wiring from the facility **emergency power source**.

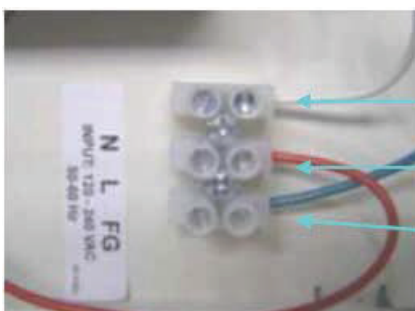


To remove the power supply cover, loosen the two screws at the top of the cover and slide the cover to the right, then lift the cover over the screw heads. Slide the wiring harness strain relief to the left until it is free from the cover.

Wiring



Use either of the two 1/2" conduit knock-outs provided on the lower left side and bottom of the rough-in box to route conduit to supply either 120 or 240 VAC to the power supply. **Note: Separate conduit should be used for low voltage wires (use knock outs provided on the top of the box).**



Neutral
Line (Hot)
Field Ground

Route wires through the power supply conduit installed in the bottom and left side of the rough-in box. Connect the 120 or 240 VAC facility **emergency power source** electrical wiring to the terminal strip provided on the lower left side of the box. (N = neutral, L = Line (hot), FG = field ground)

Alarm Installation

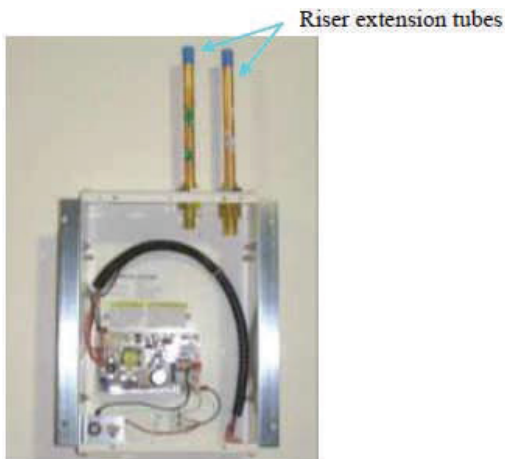


The wiring harness will be provided pre-wired to the power supply. If by chance you are replacing a wiring harness, the single green ground wire should be fastened to the screw on the top left corner of the power supply board. The wiring plug in connector (which should contain the rest of the wires), plugs into the connector terminal on the upper left corner of the power supply board. The black wire will be on the top.

This is how the power supply should look when the wiring is completed.

Replace the power supply cover and plaster cover (to protect the unit while the drywall and wall covering work are being done) after wiring is complete

Plumbing the Riser Extension Tubes



Install the risers in the top of the back box as shown. After removing the protective plastic caps, connect the riser extensions tubes to the gas piping system per NFPA 99. Make sure the drop is for the proper gas service. Using a purge gas to insure cleanliness in the tubes, silver braze the joints. Do not use soft solder. Conduct heat away from the check valves. (A purge kit is required for purge equipment connection to the system). The 150 psi standing pressure test of the piping system must be successfully completed and all pressure removed from the system before connecting the transducers to the system. **Attaching transducers without depleting the 150 psi standing pressure first will result in damage to the transducers.**

Note: It is recommended that gas piping system tubing be connected from the extension tube to the ceiling for a future or blank gas display even though a transducer is not being installed. Cap the unused tube above the ceiling. This will simplify future expansion.

Note: It is possible to install the transducers remotely (not in the alarm box). In this type of installation the risers are connected to the gas piping system up to 5,000 feet away from the alarm panel.

Note: Patton's Medical recommends mounting the transducers either in the zone valve box (remote) in or in the alarm back box - not remotely above the ceiling. Should a transducer require service or replacement it is considerably more time consuming to locate and replace or service transducers remotely located above the ceiling.

Installing the Hinges

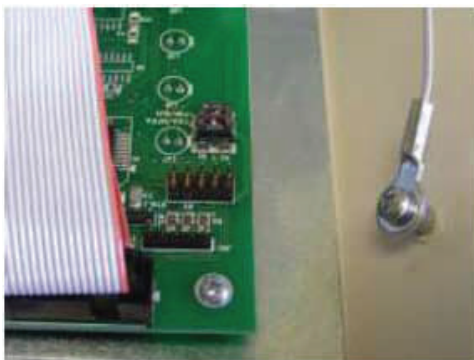


After the walls are finished, the hinges may be installed onto the rough-in box. The two hinges should be fastened to the lower front edge of the rough-in box using the screws provided. The hinge should rest flat against the surface of the drywall.

Installing the Alarm Front Panel

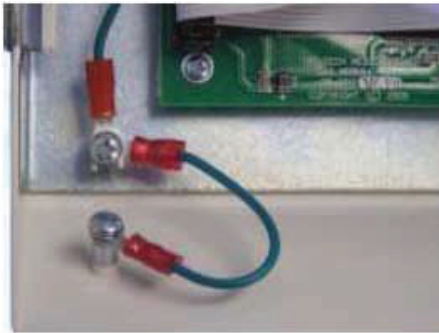


Slide the rectangular holes cut into the bottom edge of the front panel over the front catch of the hinges. Support the front panel in the open position to attach the lanyards.



Attach the two (left & right side) lanyard cables to the alarm front panel using the screws provided.

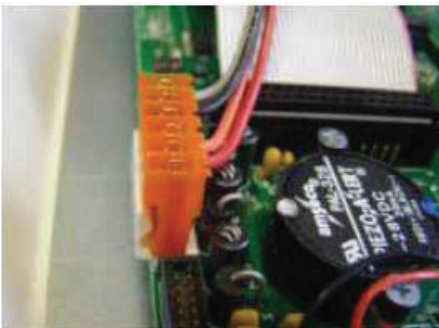
Wiring the Alarm Front Panel to the Power Supply



Attach the green ground wire, which is in the wiring harness, to the ground screw on the left corner of the front panel - just in front of the power supply.



Attach the plug connector at the end of the wiring harness to the appropriate connector located at the top left corner of the button module circuit board. The plug should lock into place. The plug can only be inserted one way.



This is how the wiring harness plug connector should look when properly installed on the back of the button module board.

Installing the Transducers (non remote)



After depressurizing the 150 psig standing pressure from the piping system, install the appropriate transducers to the appropriate riser extension tube connectors inside the rough-in box. Hand tighten then torque lightly with a wrench.

Installing the Transducers (remote)



Transducer assemblies with DISS gas specific fittings have also been provided and, after the 24 hour standing pressure test is completed and normal operating pressure has been restored to the medical gas piping system, they must be connected to the DISS demand valves. Note: maximum mounting distance of each remote transducer is 5,000 feet away from the alarm panel to which it will be wired. Follow the wiring instructions in Appendix F.

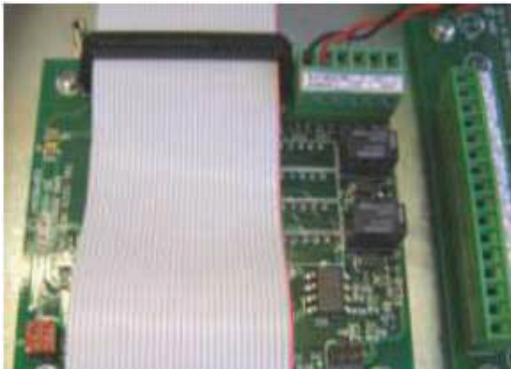


The transducers have been designed so that they may be installed in a standard 4"x 4"x 2 1/8" electrical junction box for added protection.

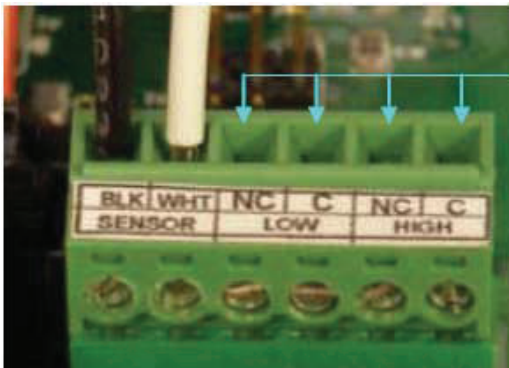


A panel mount feature has been provided to allow mounting of the transducer using standard 1/2" conduit connections and 4"x 4"x 2 1/8" junction boxes. Note: The DISS nut & nipple will need to be removed to allow installation of the conduit nut and the re-installed using oxygen safe Teflon tape.

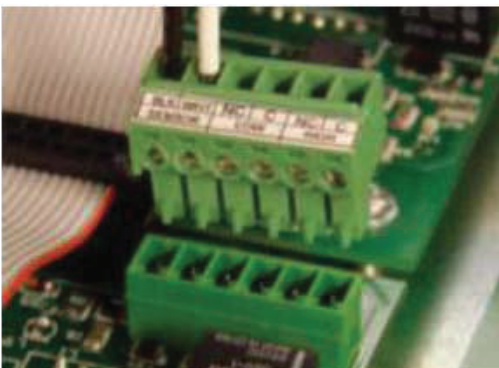
Connecting the Transducer Wiring to the Alarm Front Circuit Board



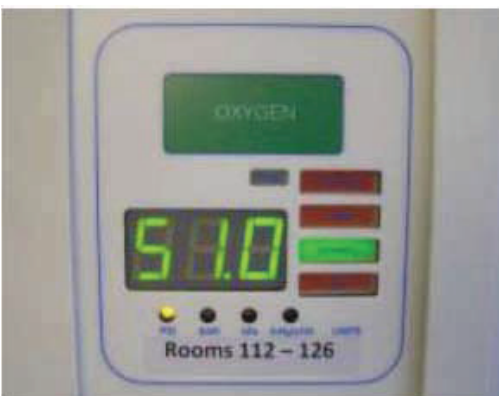
The wire terminal connector on the gas board has six wire connection slots. The two wires from the transducer should be installed in the BLK & WHT SENSOR slots. These are the two slots closest to the center of the gas board (as shown). It is preferred that the black wire be closest to the center of the gas board.



The other four connection slots are for optional remote signals of the low and high line pressure alarms.

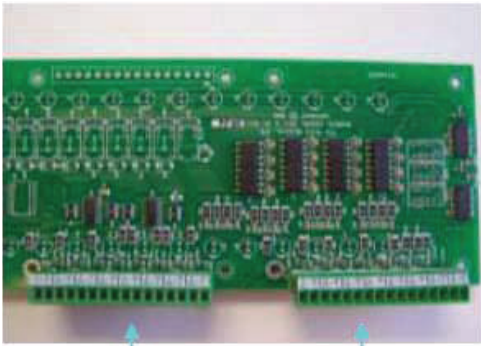


The transducer plug may be removed from the gas module to make it easier to install the wires.

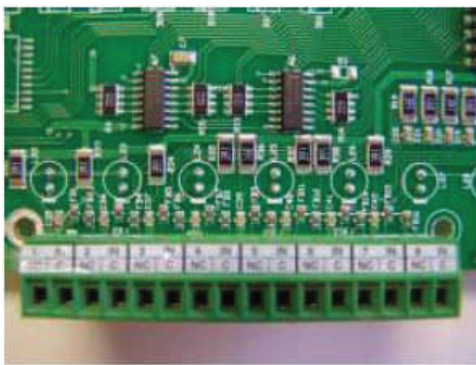


Visually verify that the appropriate transducer wire pair has been attached to the appropriate gas module by looking at the front of the alarm panel. If there is *not* an Error Condition and a System alarm, the proper (matching gas service) transducer has been connected to the gas board.

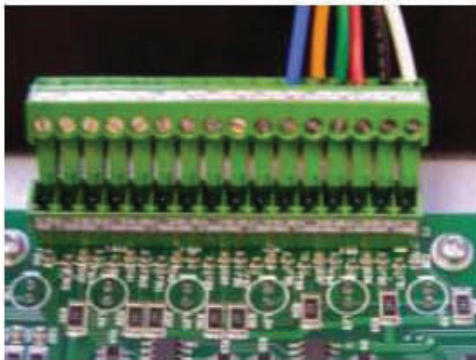
Wiring the Remote Devices to the Remote Signal (Master) Board



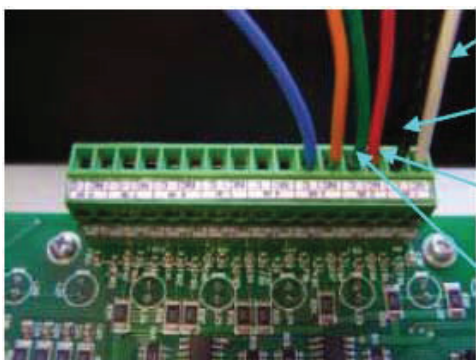
Locate the two banks of 16 terminal connectors on the back of the remote signal (master) board.



There are a total of 32 connection points - two connection points for each remote signal. The pairs are labeled 1 IN thru 16 IN on the circuit board. **The NC (normally closed) labeled terminal of each pair is where the signal wire should be landed.**



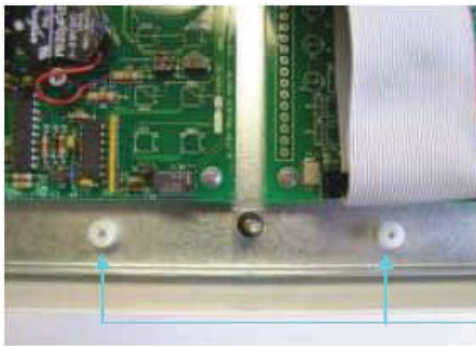
The connector terminal may be unplugged from the circuit board - to simplify installation of the remote signal wires.



- Remote signal #1 –
signal wire (white)
- Remote signal #1 –
common wire (black)
- Remote signal #2 –
signal wire (red)
- Remote signal #2 –
common wire (green)

Land the corresponding common wire on the C (common) terminal of each pair of terminal connectors.

Labeling the Alarm Front



After all remote signal (master) wires have been landed, identified & cataloged (using appendix C in this manual), you are ready to apply the remote signal labels. Remove by unthreading the two nylon nuts shown here from the back of the alarm front panel.



The panel will now lift out of the white frame. Provided in the packaging with the alarm front panel is a long white card and a pre-printed sheet of labels for the remote alarm signals. **Wash your hands before handling these labels and cards!** Apply the labels to the appropriate position on the card using the guide lines on the card. When complete, insert the card into the “Monitored Signals” label pocket of the “Monitored Signals” label.

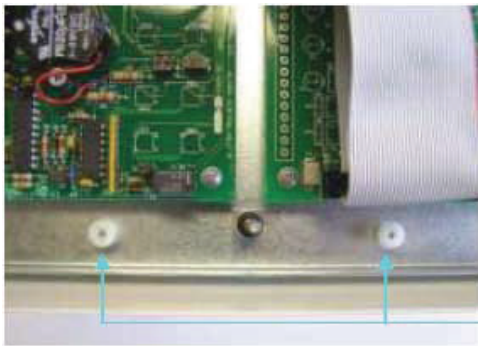


The gas modules are shipped pre-labeled from the factory. If a gas service is changed to a different gas or added to the alarm, it will be necessary to insert the appropriate label in the pocket of the gas module. The new gas label supplied by Patton's Medical will slide into the gas module label pocket of the gas module label.



A blank label has been provided at the bottom of each gas module for room identification. You may type directly onto this label or apply a pre-printed label. The label supplied by Patton's Medical will slide into the gas module label pocket of the gas module label.

Alarm Installation



When the labeling is complete, install the plate into the white frame and re-attach with the two nylon nuts.



You are now ready to supply power to the alarm. Restore power to the circuit feeding this alarm panel. The toggle switch on the front of the power supply should be placed in the ON position.

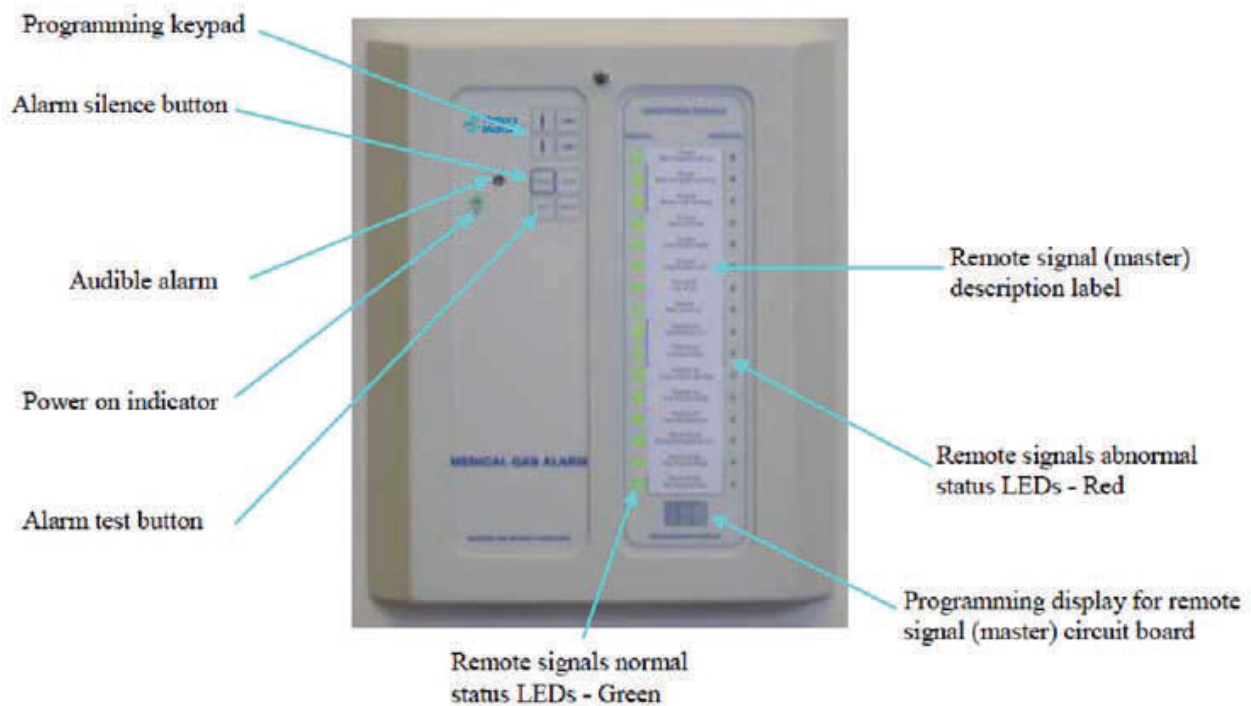
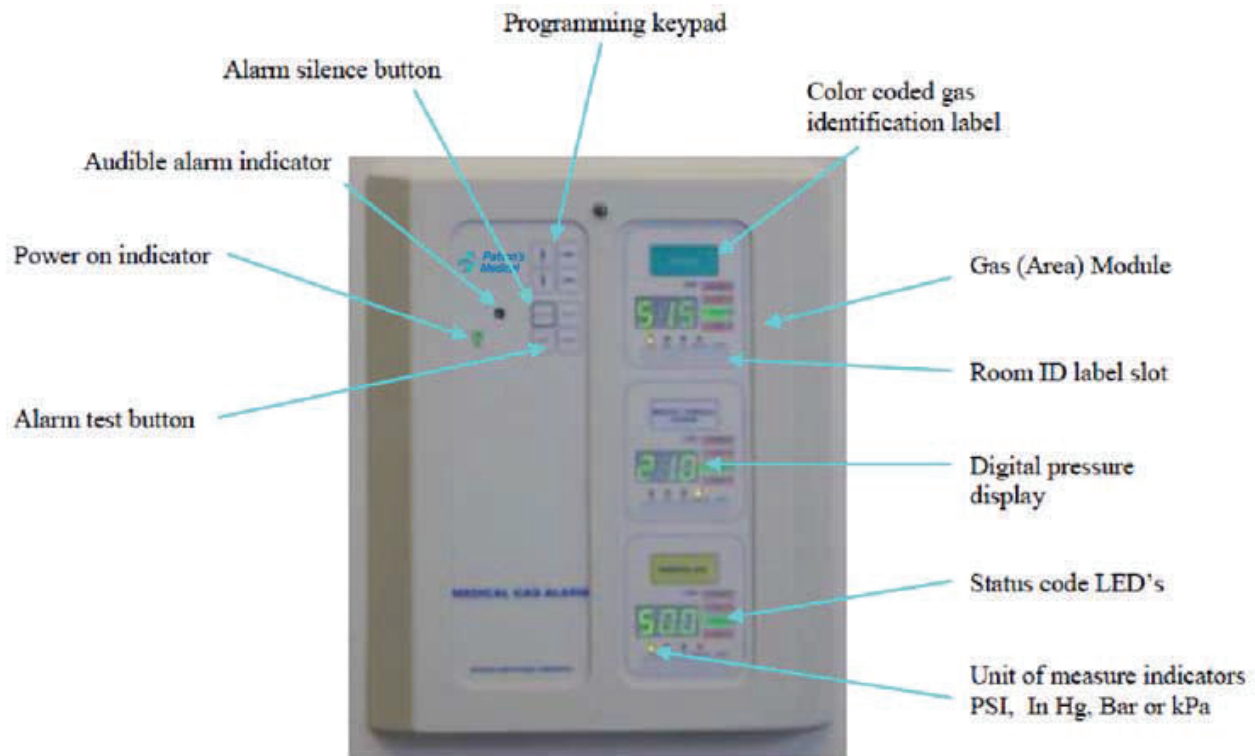


Check the green power LED indicator on the front of the button module. It should be illuminated.



If you haven't already, you are now ready to pressurize the piping system to normal operating pressures. The alarm is shown here with Oxygen & Medical Air at normal operating pressures. All remote signal points (master alarm signals) are shown in normal condition.

Area and Master Alarm Displays & Functions



Alarm Displays & Functions

Button Module

Power on Indicator

The power on indicator (green LED) is illuminated whenever electrical power (120 or 240 VAC) is connected to the alarm and the on/off switch is turned on.

Test Button

When the Test button on the front panel is pressed, the alarm illuminates all segments of all lights and LED's and sounds the buzzer.

Alarm Silence

In the event of an alarm condition an audible alarm sounds. The audible alarm can be silenced by pressing the alarm silence button. The high or low pressure LED or the remote signal LED will remain illuminated until the alarm condition is rectified. If a gas module (area alarm) had alarmed, depressing the silence button will silence the alarm for approximately 10 minutes (factory setting). After approximately 10 minutes, the audible alarm will sound again.

History Button

The History button may be pressed and held at any time to view alarm history. Viewing alarm history is only active while the History button is pressed, releasing the button returns the alarm to normal operation. Pressing the History Button will display the following:

Gas (Area) Module - If there was an alarm condition for any gas (area) module, the High and/or Low Pressure LED's will be illuminated. If both the High and Low Pressure LED's are illuminated, the gas has had both a High and Low alarm.

Remote Signal (Master) Module - If there was an alarm condition for any Remote Signal the Red LED will be illuminated. All other LED's will be off.

Clear Alarm History - To clear alarm history you simply press the history button, hold it down and simultaneously press the clear button.

↑ (up arrow)

The up arrow may be pressed & held at any time to display the high line pressure alarm set points of the gas module (area) boards. When in the program mode, the up arrow is used to raise the high line pressure alarm set point on gas module (area) boards and to toggle between your choice of Green condition, Red condition or Disabled condition on remote signal (master) boards.

↓ (down arrow)

The down arrow may be pressed & held at any time to display the low line pressure alarm set points of the gas module (area) boards. When in the program mode, the down arrow is used to lower the low line pressure alarm set point on gas module (area) boards and to toggle between your choice of Green condition, Red condition or Disabled condition on remote signal (master) boards.

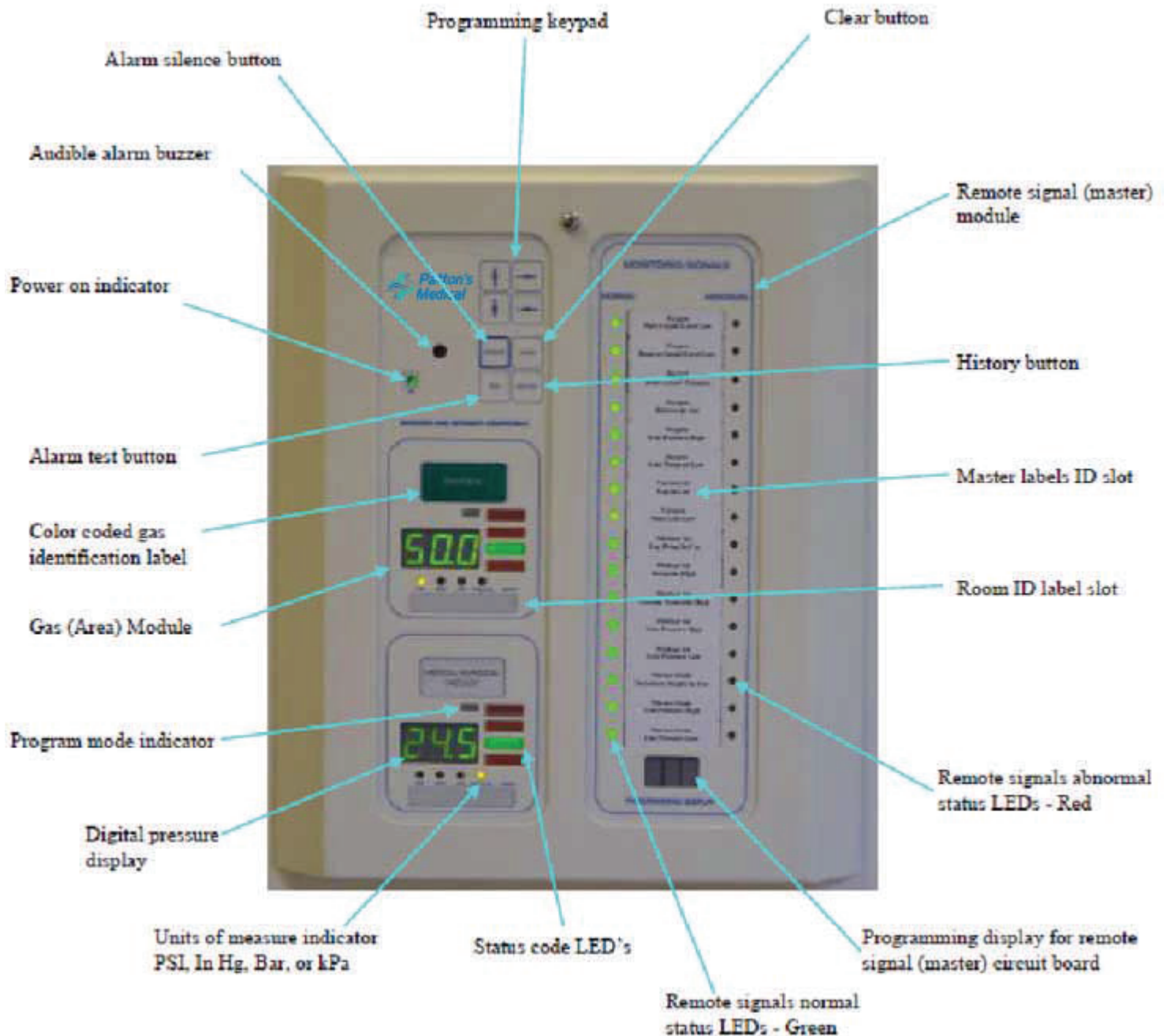
→ (right arrow)

The right arrow may be pressed & held at any time to display the gas service for which the gas module (area) board is currently programmed. When in the program mode, the right arrow is used to toggle between the various options of services on the gas module (area) boards and to toggle to the next remote signal point on the remote signal master boards.

← (left arrow)

The left arrow may be pressed & held at any time to display the type of transducer that is connected to each gas module (area) board. The 3 types are 0 - 30 In Hg, 0 - 100 psig and 0 - 250 psig. When the left arrow is pressed "30" will be displayed for a 0 - 30 In Hg transducer, "100" will be displayed for a 0 - 100 psig transducer and "250" will be displayed for a 0 - 250 psig transducer. When in the program mode, the left arrow is used to save the updated programming information. After the changes have been made and the left arrow is pressed three horizontal lines will appear on the digital pressure display of the gas module being programmed or on the programming display for the remote signal (master) board being programmed.

Combination Alarm - Displays & Functions



Alarm Displays & Functions

Gas Module (Area Alarms)

Pressure Reading Display

The LED Digital Pressure Display displays the pressure as indicated by the transducer. The gas pressure may be displayed in PSIG/In Hg, BAR or kPa. PSIG and In Hg is the factory setting.

Note: Vacuum & EVAC/WAGD are actually displayed as inches of Hg in the PSI mode. In kPa mode the Nitrogen gas display indicates one tenth of the actual pressure when the pressure exceeds 999 kPa (i.e. 1100 kPa is displayed as 110 and the kPa and (x 10) LED is lit).

Note: Alarm settings are maintained even if power is interrupted.

Units of Measure Indicator

The Units of Measure Indicator illuminates PSIG/In Hg, BAR or kPa (whichever is selected during programming - PSIG and In Hg is a factory setting) providing the unit of measure displayed on the LED pressure reading. In the kPa model the Nitrogen gas display indicates one tenth of the actual pressure when the pressure exceeds 999 kPa (i.e. 1100 kPa is displayed as 110 and the kPa and (x 10) LED is illuminated).

High / Normal / Low Status Lights

Should the line pressure of a gas exceed the programmed alarm set points for low or high line pressure LED will be illuminated simultaneously with the buzzer sounding to announce an alarm condition has occurred. When the line pressure is neither high nor low it is considered within the normal range and the green Normal LED is illuminated. These indications are relative to the high and low pressure set points which have been programmed into the alarm. These high and low set points should be set in accordance with NFPA 99 and CSA Z7396.1 at $\pm 20\%$ of the normal operating pressure.

System LED

The System LED illuminates in the event of a system problem or malfunction. The following codes will be displayed when a System Error or Failure is detected, or when the History button is pressed:

<u>Code</u>	<u>Error</u>
0	No error (History only)
1	Flash EE corrupt, defaults
2	Sensor: open or broken line
3	Sensor: com timeout, data not received when expected
4	Sensor: Noise on line, or data errors
5	Sensor: Gas type/range mismatch
Actual low psig	Low pressure (history only)
Actual high psig	High pressure (history only)

Remote Signal Status LED's (Master Module)

Normal Status Light (Green)

The normal green status light when illuminated signifies that the equipment being monitored is not in an alarm condition.

Abnormal Status Light (Red)

The abnormal status light when illuminated signifies that the equipment being monitored is in an alarm condition

Note: If no LED is illuminated the remote signal status LED's have probably been set in the disabled or off position. This can be verified by placing the Remote Signal circuit board in the programming mode and pressing the → to view the status of the remote signal point in question or by simply pressing the Test button to verify that the LED's are functional.

Program Mode

When a circuit board is placed in the program mode (see Programming Modules - page 23) the board may be re-programmed. The brightness level of the circuit boards other than the one in the program mode is decreased. In addition, on Gas Displays (Area Modules) the PGM (Program) LED is illuminated, on Remote Signal Displays (Master Modules) the first Remote Signal point will blink.

Alarm Operation

This section deals with the daily operational aspects of the alarm panel. *The Programming The Alarm* section covers the procedures to follow in order to configure the alarm if the preprogrammed settings are not appropriate, a module is added or deleted or if the alarm is being incorporated into a T-Net system. After installation has been completed and the alarm has been properly configured, it is ready for operation.

Master Alarm Panels

Remote Signal (Master Module)

With electrical power applied to the alarm, it will monitor the status of the medical gas distribution system and the remote equipment connected to it.

The remote signals (master module displays (via LED indicators) the normal/abnormal status of the remote equipment connected to the alarm. All alarm panels are pre-programmed upon leaving the factory to monitor normally closed signals (per NFPA 99). In normal operation all active signals will be green. Whenever an abnormal status signal is detected the corresponding green LED will illuminate. Simultaneously an audible alarm will sound. Pressing the Silence button silences the audible alarm (the Red LED continues to be lit). The appropriate personnel should be notified immediately of the alarm condition. When the alarm condition has been rectified the Red LED is automatically extinguished and the Green LED illuminates. *Note: master alarm signals do not repeat - only area (gas) modules are equipped with the Repeater Delay feature.*

Silencing the Alarm

Press the **Silence** button when the alarm is sounding and the alarm will be silenced.

Testing the Alarm

Pressing and holding the **Test** button initiates a self-test of the alarm. All LED's and seven segment displays will illuminate for as long as the Test button is depressed. In addition the buzzer will sound. If any LED or seven segment display does not illuminate - it is faulty and the circuit board should be replaced. If the buzzer does not sound, it is faulty and the circuit board should be replaced.

Note: The alarms (both Area & Master) are programmed to ignore transient signals that are less than 0.7 seconds in duration.

Area Alarm Panels

Gas Modules

With the electrical power applied to the alarm and the gas systems adequately pressurized, the following indicators are illuminated: 1) the Power On LED, 2) the pressure readings of the gas on each gas display, 3) the Normal LED (green) on each gas display.

If the pressure of one of the gases drops below the programmed low limit setting, the following events take place simultaneously: 1) the Normal LED will be extinguished, 2) the Pressure Low LED (red) will illuminate, 3) an audible alarm will sound.

If the pressure of one of the gases rises above the programmed high limit setting, the following events take place simultaneously: 1) the Normal LED will be extinguished, 2) the Pressure High LED (red) will illuminate, 3) an audible alarm will sound.

Silencing the Alarm

Press the **Silence** button when the alarm is sounding and the alarm will be silenced.

The area alarm is equipped with a **Repeater Delay** feature which monitors only the Gas Module (area) alarms. The Repeater Delay has been factory programmed to make the alarm re-sound every 10 (ten) minutes as long as the alarm condition exists. *Note:* Remote Signal (master) alarms are **not** monitored by the Repeater Delay.

Alarm Operation



System Alarm

The audible buzzer will sound, the System LED will illuminate and an Error Code "Err" will be displayed on the digital pressure display when a system failure occurs or the history button is depressed. The System LED and "Err" will illuminate and flash on and off and alternate with a number (per table below) being displayed on the digital display.

Note: If "Err" should be displayed on the Gas Pressure Display of any gas module, this indicates a problem. Some possible problems and corrective actions are:

The transducer is not connected to the Gas Module. To correct, check the transducer connection to the back side of the Gas Module.

A transducer for a different gas service has been connected to the Gas Module. To correct, check the transducer and the Gas Module gas identification labels and make sure they match.

If the above corrective actions do not correct the problem, contact the factory for assistance.

<u>Code</u>	<u>Error</u>
0	No error (History only)
1	Flash EE corrupt, defaults loaded
2	Sensor: open or broken line
3	Sensor: Com timeout, data not received when expected
4	Sensor: Noise on line, or data errors
5	Sensor: Gas type/range mismatch
Actual Low psig	Low pressure (history only)
Actual high psig	High pressure (history only)

PGM Notification

The **PGM** (program mode) LED will flash off & on when a gas module circuit board is manually placed in the program mode. *It is important to note that while a gas module is in the program mode, it is not monitoring the medical gas pipeline.* See the "Programming the Alarm" section of this manual for instructions on programming the gas module.

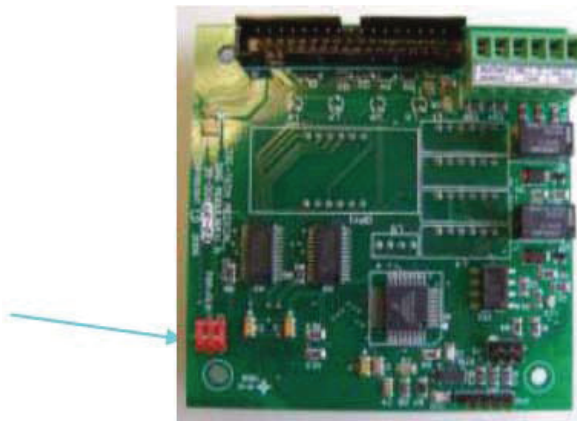
Programming the Alarm

Button Label



Gas Board (back view - showing dip switch)

DIP Switch PGM/RUN
(only outer switch labeled
PGM/RUN should be used)

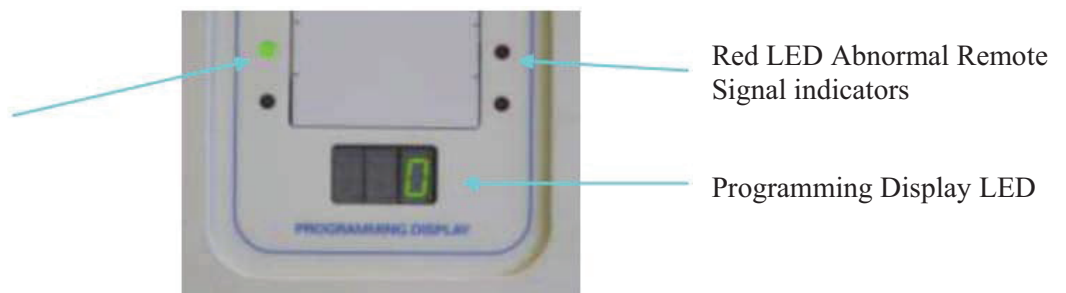


Gas Board



Remote Signal (Master) Board

Green LED Normal Remote
Signal indicators



Programming the Alarm

The alarm has been programmed at the factory prior to shipment. Programming of the alarm may be necessary if:

- A) the high or low pressure limits for a gas need to be modified
- B) if a future gas module is being put into service for an added gas service
- C) if a gas service is being deleted
- D) if a gas service is being changed
- E) if a remote signal alarm point needs to be re-configured
- F) if a remote signal module is being added in the place of a blank module
- G) if the alarm identification number needs to be changed
- H) you wish to change the repeater delay time
- I) you wish to change the units of measure
- J) the alarm panel is being set up on the T-NET system

Note: Only authorized personnel should program the alarm! It is important to note that while the alarm is in the program mode, it is **not** monitoring the medical gas system and alarm conditions will **not** trigger an alarm.

Accessing the Alarm Program Mode

To program the alarm, the circuit boards must be placed individually, one at a time in the program mode. To place a circuit board in the programming mode, the dip switch located on the back side of the circuit board to be re-programmed, must be changed from the “run” to the “pgm” position.

After this is done, the gas module (area) board being reprogrammed will be brighter than the rest of the gas module (area) boards (when viewed from the front) and the yellow “PGM” LED indicator will be flashing to indicate that the alarm is in the program mode and the board which is illuminated more brightly and has the flashing “PGM” LED is ready to be reprogrammed.

The remote signal (master) board being reprogrammed will have the top (first) signal point flashing and the programming display LED's (at the bottom of the board) will illuminate displaying either an “O” (open circuit) or a “C” (closed circuit) or a “d” (disabled).

The programming buttons, located on the front of the alarm, upper left corner (see photo on page 22) may now be used to make the needed program changes.

When you have successfully accessed the program mode, it is important to note that some of the buttons revert to their sub-functions:

When programming a gas (area) module:

The UP key ↑ is used to raise the pressure set point and / or to toggle upward thru the list of sub- options. The DOWN key ↓ is used to lower the pressure set point and / or to toggle downward thru the list of sub- options.

The RIGHT key → is used to toggle (scroll) thru the list of major options.

The LEFT key ← is used to SAVE the new programming options after they are selected.

When programming a remote signal (master) module:

The UP key ↑ is used to toggle between the choices of the green LED or the red LED or both the green & reds illuminated (disabled).

The DOWN key ↓ is used to toggle between the choices of green LED or the red LED or both the green & reds illuminated (disabled).

The RIGHT key → is used to toggle (scroll) down to the next remote signal point.

The LEFT key ← is used to SAVE the new programming options after they are selected.

Note: In order to perform any of the following programming features you must first set the alarm in the program mode.

Programming the High & Low Gas Pressure set points

Immediately upon entering a gas module (area) board in the program mode, the high line pressure set point major option is displayed. If the gas module being programmed is a typical 50 psig delivery pressure gas, the board has been pre-programmed at the factory with the high line pressure set point at 60 psig, so the display should show the number 60. If you wish to raise or lower this setting, simply use the up ↑ or down ↓ keys to adjust the pressure setting.

Programming the Alarm

After the setting has been changed to the new desired setting, press the LEFT key ← (SAVE) to save the new setting. Note: if the SAVE ← LEFT key is not pressed after making the change to the programming and before pressing any other keys, the new setting will not be saved and the alarm will revert to the previously saved setting(s). When the SAVE key ← is depressed, three horizontal dashes will appear in the display.

Press the → key to move on to the low line pressure and repeat the above procedure.

Note: The alarm is designed with a safety feature so that the high and low set points must be at least 0.5 (psig / in Hg), 0.05 (bar) or 5 (kPa) increments apart. The high set point will not be able to be set below the low set point and visa versa.

Programming the Remote Signal (Master) Alarm Points

While in the program mode, the top signal point LED will be blinking. At the bottom of the same remote signal board, the Programming Display LED set will display the contact state for the blinking signal point. "O" = open, "C" = closed and "d" = disabled. The contact point that is flashing is capable of being re-programmed. (Note: in compliance with NFPA 99, all contacts are programmed as closed contact equals a normal condition from the factory). If it is necessary to re-program a signal point; press the → key to view the next Remote Signal Alarm Point, when the desired Remote Signal (Master) point is flashing, use the ↑ or ↓ keys to alter the point to the desired status, after the desired change is achieved, press the ← to save the change.

Note: Any contact point that has been disabled will have both the green (normal) and red (alarm) LED illuminated only when in the programming mode, to make it easy to identify them. In the normal mode of operation, both LED's of a disabled signal point will not illuminate nor will this signal point trigger an alarm.

Note: When an alarm condition occurs the audible buzzer sound simultaneously with the corresponding red LED illuminating and the green corresponding LED being extinguished. When the silence button is depressed, the audible buzzer is silenced and remains silenced until another alarm condition occurs.

Master Alarm signals do not repeat.

Programming the Gas Alarm Repeater Delay

After placing a gas board in the program mode, press → until "dLY" is displayed on the digital display of the gas module then let go of the → key. A number will be displayed on the digital display. This number is the setting (in minutes) of the repeater delay. Using the ↑ or ↓ keys, adjust the repeater delay to the desired length of time (0 - 240 minutes). (Note: the repeater delay is preprogrammed from the factory at 10 minutes - per NFPA 99). To save the change and return the alarm to the normal alarm mode, press the ← button, then change the dip switch back to the "run" setting. **Note: this procedure must be repeated for all gas boards on the alarm panel.**

Note: master alarm signals do not repeat.

Note: If a valve of 0 (zero) is programmed and saved for any board, the repeater is disabled. If left programmed this way after 72 hours, the board(s) will automatically revert back to the preprogrammed factory setting of 10 minutes.

Programming the Units of Measure Displays

While in the program mode, press the → button until "-U-" is displayed on the digital display of the gas module then let go of the → key. The letters "PSI" or "bAÍ" or "PA" will be displayed on the digital display. This is the unit setting that the gas board is set to display. If you wish to alter the unit display, use the ↑ or ↓ keys to select the desired unit display, then press the ← SAVE key.

Note: this procedure must be repeated for all gas boards on the alarm panel.

Note: Vacuum & EVAC / WAGD Gas Modules will automatically display in in/Hg when PSI is selected.

Note: The kPa and x10 LED's will both illuminate on all high delivery pressure Gas Modules (i.e. - Nitrogen and Instrument Air) when kPa is selected. Because the Gas Pressure LED Display is only able to display three digits and high delivery pressures viewed in kPa are four digits, the Gas Pressure LED must be read as a four digit number by multiplying the displayed number by ten. I.E. - the Gas Pressure LED Display is displaying 125 in kPa. The pressure should be read as 1,250 kPa (125 x 10).

Programming the Alarm

Adjusting the Digital Line Pressure

The digital line pressure may be adjusted slightly (per the chart below) by following the simple procedure below. **This can be done by one person at the alarm panel - no need to open/adjust the transducers!**

1. Put the gas module you want to adjust into the PROGRAM MODE.
2. Using the TOGGLE → (right arrow) button go to the CAL mode.
3. Use the UP ↑ ARROW button to increase the pressure reading and the DOWN ↓ ARROW to decrease the pressure reading. The adjusted reading will be displayed as the changes are made.
4. Press the SAVE button ← (left arrow) to save the setting.
5. You can return to the original calibration setting by pressing CLEAR then press the SAVE button ← (left arrow) while at CAL in the PROGRAM MODE. This should be done if a transducer is ever replaced, as the reading offset will be applied to the new transducer readings.

Range of adjustment

VAC or EVAC / WAGD ± 0.5 In Hg
 100 psig transducers ± 2.5 psig
 250 psig transducers ± 6.0 psig

Programming the Board Identification

Note: This feature is only used when the alarm is used in conjunction with a Patton's Medical T-Net system.

Note: Each gas and master (remote signal) circuit board must have a unique Identification Number - no two can share the same number.

After placing a gas board in the program mode, press → until "Cld" is displayed on the digital display of the gas module then let go of the → key. A number will be displayed on the digital display. This number is the board identification # assigned to the circuit board. Using the ↑ or ↓ keys, select the desired board identification #. Use the ← SAVE button when you are finished.

Note: Each gas and master (remote signal) circuit board must have a unique Identification Number - no two can share the same number.

Note: Valid identification numbers are 1 - 999. The alarm is pre-programmed at the factory with 0 (zero) as the zone identification number.

Adding/Removing Modules or Changing the Gas Service of a Gas Board

To remove either a gas board or a remote signal master board from an alarm - you simply need to turn off the power to the alarm panel (using the switch on the outside of the power supply in the back box), unplug the ribbon cable from the board being removed and then turn the power back on. The alarm will automatically reset itself.

To add a remote signal master board to an alarm - you follow the same instructions above.

Note: The following feature is only used if; an additional gas service is being added to an area alarm, a future gas module is being set up for a new gas service or and existing gas module board is being changed to a different gas service.

The gas boards are pre-programmed for a specific gas service from the factory. After placing a gas board in the program mode, it is possible to change the gas service of the board. The following list cross references the number that is actually displayed on the gas board numeric display with the full names of the gases:

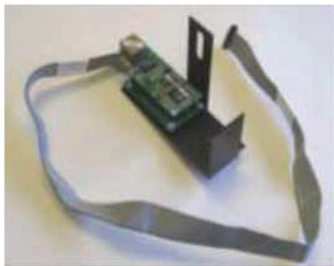
Gas # Displayed	Gas Service	Transducer Type
12	Nitrogen	250
24	Oxygen	100
04	Nitrous Oxide	100
08	CO2 or CO2-O2 mix	100
22	Medical Vacuum	30
32	WAGD / AGSS	30
16	Medical Air	100
06	Helium or Heliox	100
H16	Instrument Air	250
H24	Hyperbaric Oxygen	100
H08	Medium pressure Carbon Dioxide	100
SP	Gas Mixture	100
HSP	High Pressure gas mix	250
3SP	Tri-Gas	100

T-Net™ Interface, Circuit Board Installation



Patton's Medical A1A/A1M series alarms may be ordered without T-Net Interface Circuit boards. The T-Net Interface Circuit boards may be installed later.

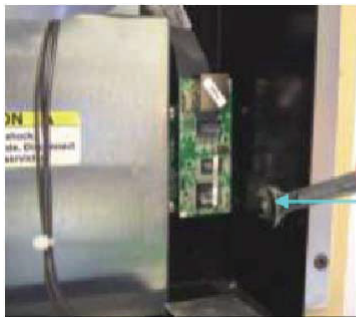
The toggle switch on the front of the power supply should be placed in the OFF position.



You will be installing one of three types of interface circuit boards, bracket and cable connector; RS485, Ethernet or Wireless. The Ethernet Interface board is shown here left and the Wireless board is shown here right.

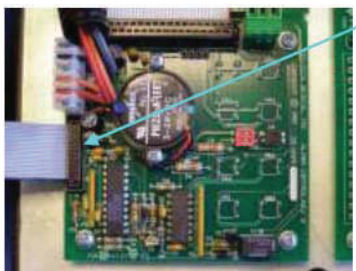


Note: Units incorporating the wireless interface circuit board - contains FCC ID OUR-9XTEND. The enclosed device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device just accept any interference received, including interference that may cause undesired operation.



Any of the three types installs into the bottom right corner of the alarm back box. The wireless antenna drops thru a hole in the bottom of the back box.

The bracket mounts to the existing flange nut.



The cable must be installed into the socket on the Button Board properly - per the instructions of the cable.

All of the gas boards and remote signal (master boards) will need to be re-programmed with a unique identification number and set up in the T-Net software per the T-Net installation instructions provided with the T-Net software.

The power may now be restored to the alarm. The alarm is fully functional - even if the T-Net software is not yet installed or is out of service.

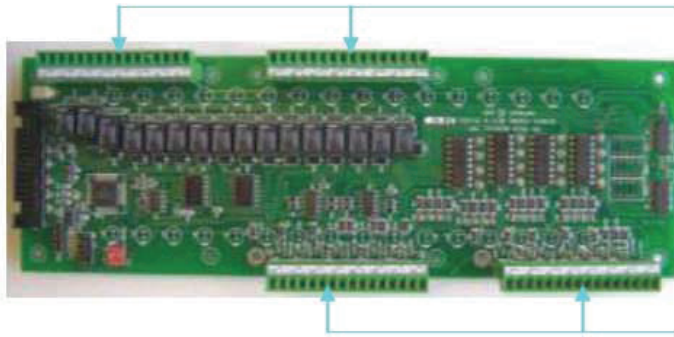


Building Management Interface, Relay (BIM) Board Wiring



Patton's Medical A1A/A1M series alarms may be ordered with standard remote signal circuit board(s) or with the building management interface circuit board(s). The building management interface circuit board(s) may be installed later, replacing the standard remote signal circuit board(s). It is only necessary to install building management interface board(s) in one of the master alarm panels.

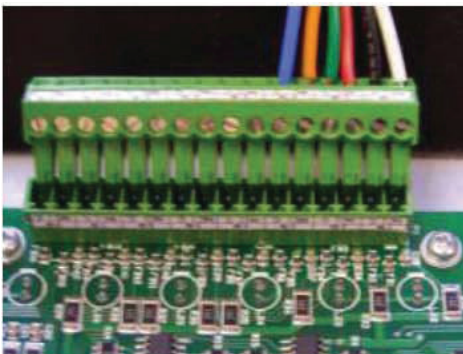
The toggle switch on the front of the power supply should be placed in the OFF position.



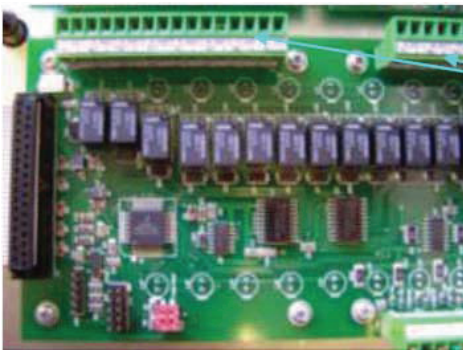
Outlet connections - to building management system

Refer to Wiring Remote Devices to Remote Signal (Master) Board page 13 - the building management interface circuit boards (Relay boards) are wired the same way as the standard remote signal circuit boards. The additional two sets of connection terminal are the connection points for the wires outputting the signal information to the building management system.

Input connections - from remote signal devices



The connector terminals may be un-plugged from the circuit board - to simplify installation of the remote signal wires. There is no need to remove the wires, simply unplug the connectors from the standard remote signal board and plug them back into the new building management interface circuit board. Be certain to match the label on the socket with the label on the plug.



The additional connector terminals are labeled 1 OUT thru 16 OUT are located on the left edge of the new building management interface circuit board. These correspond with the pairs labeled 1 IN thru 16 IN on the right edge of the circuit board. **The NC labeled terminal of each pair is where the signal wire should be landed. The C labeled terminal of each pair is where the common wire should be landed.**

Appendix A

Glossary of Terms

AC *Alternating Current*

An electric current that reverses direction or polarity at regular intervals.

DC *Direct Current*

An electric current that flows in one direction. The current can be steady or pulse.

IN Hg *Inches of Mercury*

A measurement of the force in a gas vacuum system.
1 IN Hg = 3.38 kPa.

kPa *Kilopascals*

A measurement of the force in a compressed gas system.
1 kPa = .14 PSI

LED *Light Emitting Diode*

A semiconductor diode that converts applied voltage to light.

NFPA *National Fire Protection Association*

The National Fire Protection Association is an association engaged in standards development.

NO *Normally Open*

An electrical circuit in which the switch is normally open. No current flows through the circuit in normal operation. Only when the switch is closed is the flow of current started.

NC *Normally Closed*

An electrical circuit in which the switch is normally closed. Current flows through the circuit in normal operation. Only when the switch is opened is the flow of current stopped.

PSI *Pounds per Square Inch*

A measurement of the force in a compressed gas system.
1 PSI = 6.9 kPa

Transducer

A device that converts pressure into an electrical signal.

V *Voltage*

Voltage is electrical pressure or force. One volt is equal to the difference of electrical potential between two points on a conducting wire carrying a constant current of one ampere when the power dissipated between the points is one watt.

Transient Signal

An intermittent and brief signal that quickly corrects and returns the alarm to a normal operating mode before monitoring personnel can silence the alarm.

Appendix B - Medical Gas Alarm Specifications

Operating Ambient Temperature range: +10C (50F) to +50C (122F)

Storage Temperature: -20C (-4F) to +85C (185F)

AC Input: 120 - 240 volts AC - 50-60 Hz

DC output (to remote signal devices): 5 VDC

Input Fuse: 5 amp input AC line fuse protects the input wiring to power supply

Power Consumption: 45W maximum @ 120 V
50W maximum @ 240 V

Pressure Measurement Accuracy: 0-30 inHg transducer +/-1%
Vacuum, Gas Evacuation

0-100 PSIG transducer +/-1%
Oxygen, Nitrous Oxide, Medical Air, Carbon Dioxide

0-250 PSIG transducer +/-1%
Nitrogen

Dimensions

Rough-in Box - All dimensions are in inches and cover the basic box only (mounting flange excluded)

Two Vertical Slot Panel
8.125W x 11.875H x 4.000D

Three Vertical Slot Panel
13.625W x 11.875H x 4.000D

Five Vertical Slot Panel
19.625W x 11.875H x 4.000D

Front Panel

Two Vertical Slot Panel
8.125W x 11.875H x 4.000D

Three Vertical Slot Panel
13.625W x 11.875H x 4.000D

Five Vertical Slot Panel
19.625W x 11.875H x 4.000D

Transducers: Housing dimensions: 1.990W x 1.990H x 3.625L including inlet fittings

Appendix C - Signal Wire Color Code Log

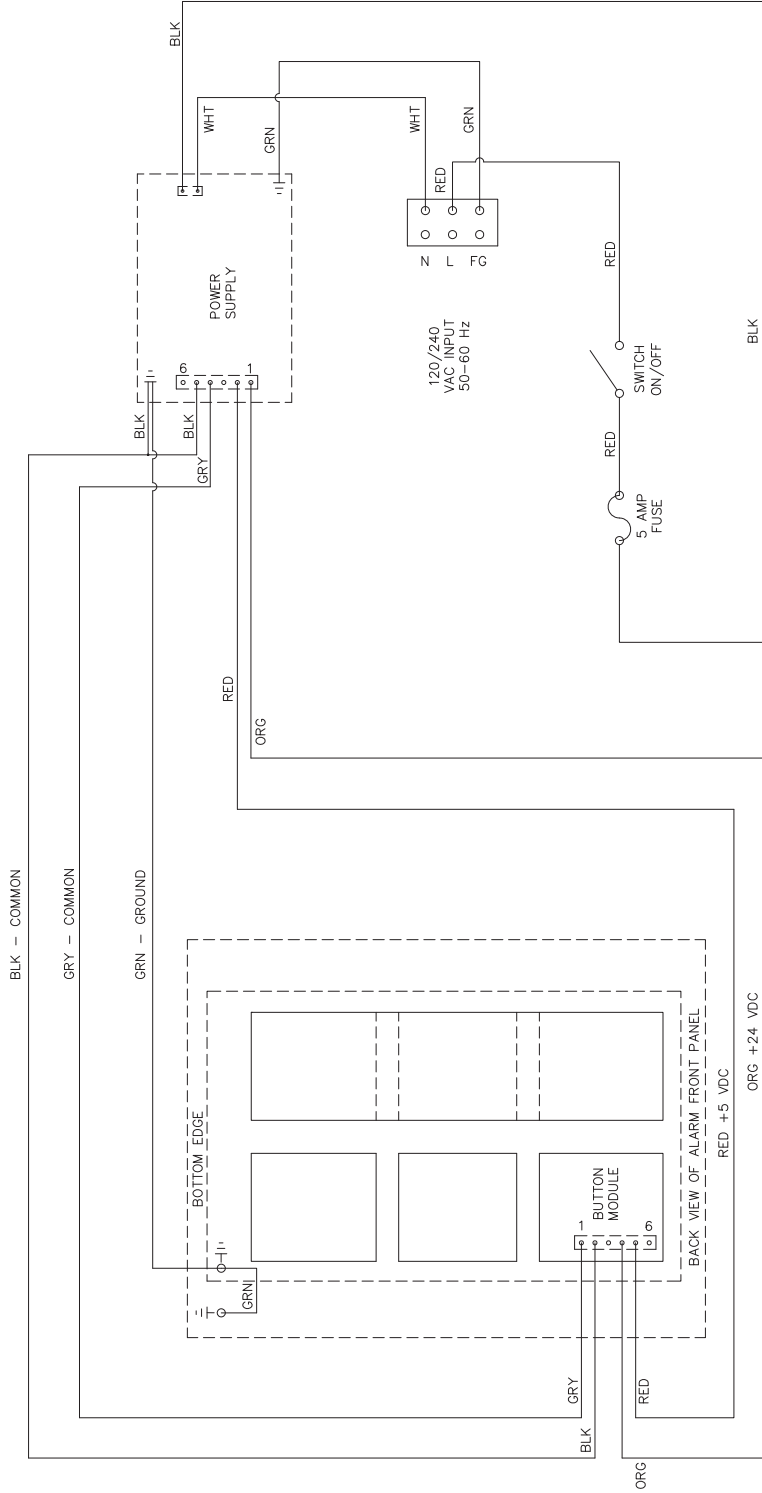
Remote Signals

Signal Position #	Remote Signal Label	Signal Wire Color	Common Wire Color

Remote Signals

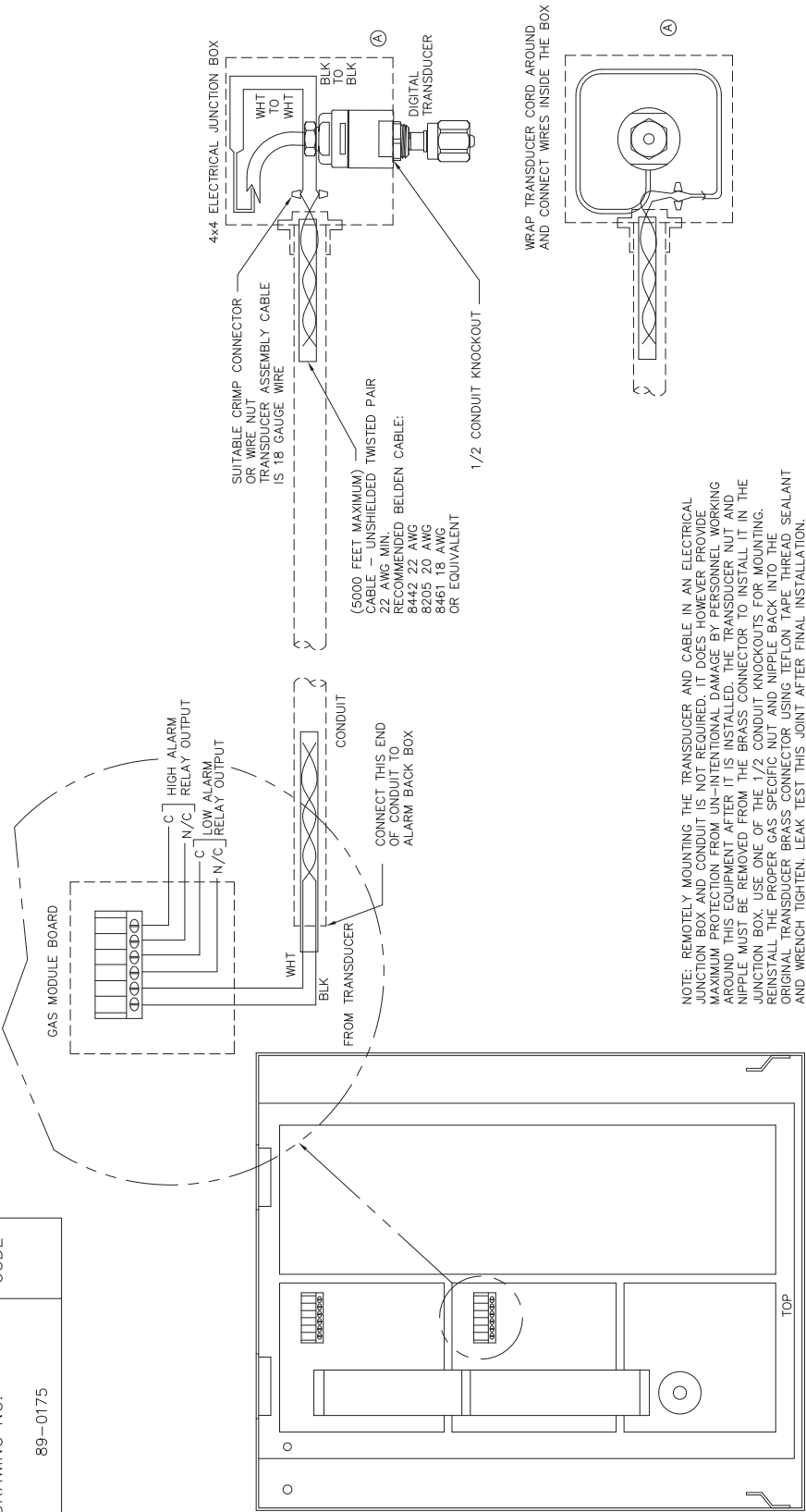
Signal Position #	Remote Signal Label	Signal Wire Color	Common Wire Color

DRAWING NO.	CODE
89-0173	



TOLERANCES UNLESS SPECIFIED	DECIMAL DIAMETERS LENGTHS	± .003 ± .010	CONCENTRICITY WITHIN .010 FIM ANGULAR ± 0°30'	125 ✓	MAX FINISH ALL SURFACES	SCALE 1=1
						
Note: This drawing is confidential and the sole property of Tri-Tech Medical. It is not to be reproduced or submitted to others without prior approval of Tri-Tech Medical.	Drawn by	SERRANO	Date	10-07-06	MATERIAL CODE FINISH	
	Check by		Date			
	Approved by	D. SIMO	Date	10-10-06	REV. ECN DATE	
	Disk No		Release			
DESCRIPTION DIGITAL AREA OR MASTER ALARM WIRING SCHEMATIC					PART NO. 89-0173	
					DWG. SIZE C	

DRAWING NO.	CODE
89-0175	



INSIDE ALARM FRONT PANEL

TOLERANCES UNLESS SPECIFIED		DECIMAL DIAMETERS	LENGTHS	± .003	± .010	CONCENTRICITY	WITHIN .010	125	MAX FINISH	SCALE
						ANGULAR ± 0°30'		✓		1=1
	Drawn by	SERRANO	Date	10-07-06	MATERIAL		CODE		DESCRIPTION	
	Check by		Date						REMOTE MOUNTING OF DIGITAL ALARM TRANSODUCERS	
	Approved by	D. SIMO	Date	10-13-06	FINISH					
	Disk No		Release							
Note: This drawing is confidential and the sole property of Tri-Tech Medical. It is not to be reproduced or submitted to others without prior approval of Tri-Tech Medical.				A		5755	09-17-13	PART NO.		DWG. SIZE
				REV.		ECN	DATE	89-0175		C

NOTES:



3201 South Boulevard
Charlotte, NC 28209
1-866-960-0087
www.pattonsmedical.com



Zone Valve Box



Installation Operation and Maintenance Manual



Model Number:	
Date Purchased:	
Purchased from:	

For further technical assistance, service or replacement parts, please contact:

Patton's Medical

3201 South Boulevard
Charlotte, NC 28209

Customer Service: 1-866-960-0087

Phone: 704-529-5442

FAX: 704-525-5148

www.pattonsmmedical.com

Patton's Medical reserves the right to make changes and improvements to update products sold previously without notice or obligation.

Issue Date: January 7, 2015

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Safety Precautions

1.0 General Information

2.0 Installation

3.0 Brazing

4.0 Gas Identification

5.0 Pressure Test

6.0 Gauge Installation

7.0 Install Aluminum Frame

Safety Precautions

Pressurized air from the system may cause personnel injury or property damage if the unit is improperly operated or maintained. The operator should have carefully read and become familiar with the contents of this manual before installing, operating, and maintaining the product. The operator is expected to use common sense safety precautions, good workmanship practices and follow any related local safety precautions.

Patton's Medical explicitly excludes all responsibility and liability for damage and/or injury caused by failure to follow the instructions described in this manual, or by failing to pay necessary attention when operating handling or servicing this product, even if not specifically stated in individual cases.

1.0 General Information

Zone valve box assemblies are assembled in single and multiple configurations. Assemblies should be installed in specified locations per NFPA 99 or CSA Z7396.1. All Valves Supplied are cleaned for oxygen. Care should be taken during installation to keep debris from entering valves and pipeline assemblies.

2.0 Installation

Allow sufficient space to accommodate the zone valve box. The rough-in of the zone valve box comes with a cardboard shield covering it's front. The cardboard shield will need to be removed to install the box but needs to be replaced before the walls are finished. Anchor the valve box to the structural frame supports so that the front edge will be flush or slightly recessed with the finished wall. Box mounting height is suggested at 66" from floor to top of finished box. Box should be level and installed at a specified height and location on wall.

Note: The valve handles should point downstream for pressurized gases.

Structural
Frame
Supports
(Horizontal)

Handles



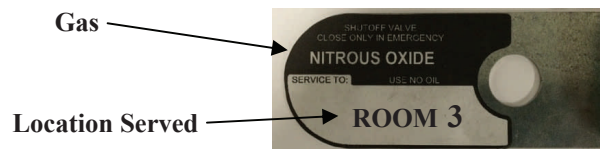
Mounting Bracket

3.0 Brazing

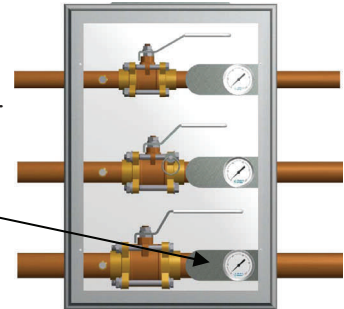
Braze tube extensions to piping per NFPA 99. Use heat sink techniques appropriate to protect the valve seals and sealing material in gauge port plug. Purge with oil-free dry nitrogen while brazing.

4.0 Gas Identification

Install the correct gas identification label to the label holders in box. Mark location serviced by each valve in the space below the gas label.



Label Holders



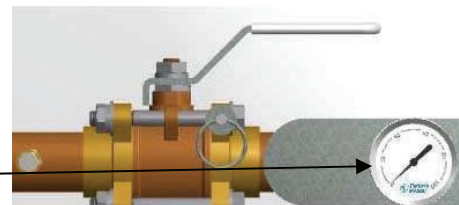
5.0 Pressure Test

Test each system per NFPA. After pressure test is finished replace cardboard shield until wall is finished to keep dust and debris out of box.

6.0 Gauge Installation

Remove cardboard shield (keep screws). Install Gauges (if required) after wall is finished using Teflon tape or oxygen compatible pipe sealant.

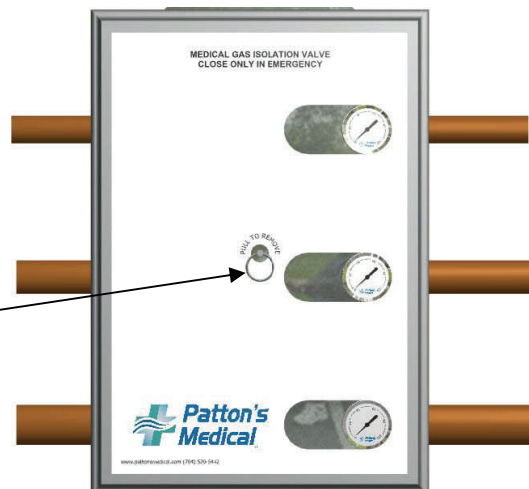
Gauge



7.0 Install Aluminum Frame

Pull ring to remove window from frame. Secure aluminum frame to box using screws from cardboard shield. Replace window into frame. Clean Window with soap and water, do not use strong solvents that will damage the window.

Pull Ring



NOTES:



3201 South Boulevard
Charlotte, NC 28209
1-866-960-0087



Medical Gas Outlets



Installation and Maintenance Manual

Model Number:	
Date Purchased:	
Purchased from:	

For further technical assistance, service or replacement parts, please contact:

Patton's Medical
3201 South Boulevard
Charlotte, NC 28209

Customer Service: 1-866-960-0087
Phone: 704-529-5442
FAX: 704-525-5148

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Issue Date: December 11, 2014

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INTRODUCTION

Patton's Inc., now owned and operated by ELGi USA, began selling custom medical air packages to hospitals in 1980. For years we sold Quincy compressors to the local medical market. Knowing we had to expand our product line, we became a distributor for Powerex in 2003. For the next five years, we were one of their leading distributors for medical gas equipment. In 2012 ELGi USA purchased Patton's Inc. and Patton's Medical as an entre into the US marketplace for their industrial products as well diversification into the medical equipment business.

Deciding to sell and service our own medical gas equipment nationwide, we created Patton's Medical in 2008. This does not mean Patton's Medical is the "new kid on the block." We hired some of the best in the medical gas business with extensive backgrounds in sales, marketing, manufacturing and engineering. Within a short period of time, we were able to create a company and product line that is second to none in the industry. Although the influx of this new talent brought new ideas, products and direction to the company, our "old fashion" commitment to customer service is steadfast.

In order to provide the best equipment for the expanding medical market, we acquired collaborative developmental rights to sell Hitachi Bebicon and Scroll compressors. We knew these compressors had been used for over twenty years in the medical market and had proven to be extremely reliable. With this came the ability to sell parts and service for existing equipment that utilize the Hitachi pumps.

In addition to medical air compressors, we knew we had to offer medical vacuum. After extensive research of vacuum companies and vacuum pumps we chose Busch Vacuum pumps for their excellent reputation in the medical arena. We build multiplex vacuum packages utilizing oil-less rotary vane, lubricated rotary vane and oil-less rotary claw pumps.

Today, a premier offering of medical air and vacuum equipment is manufactured in our Charlotte facility. Additionally, we have embarked on a complete Medical Gas pipeline offering as Patton's Medical. Our products meet or exceed NFPA 99 and CSA standards in addition to being U.L. listed. If our standard products do not exactly fit your requirements, we will work with you to develop special packages to comply with your particular specifications or applications.

Our mission is to be the leading innovator, deliverer, and manufacturer in the world of Medical Gas products. We strive to do this through constant examination of our processes and service to our customers.

We are committed to quality and innovation; we look forward to working with you and your needs to be your preferred partner for Medical Gas Equipment.

While we strive to grow our business, we know the importance of customer relationships, business relationships and providing the best equipment to meet the customer's needs. Our focus will continue to be on our customers. Lead by our product knowledge, experience and dedication to you, we will strive to provide the right equipment for any medical gas application that is specified by you.

Product Description

A complete Patton's Medical Outlet is made up to two separate components, the "Back-Body Assembly" and the "Latch-Valve Mechanism". The "Back-Body Assembly" is designed to be unique to each specific gas but is interchangeable within all "same-gas" outlet types (D.I.S.S, Ohmeda, Puritan-Bennett or Chemetron compatibles).

The gas specific "Back-Body Assembly" includes a check valve that permits removal of the "Latch-Valve Mechanism" for service without requiring the pipeline to be shut down.

A 6" long, 3/8" nom. dia. Medical gas copper tube, per NFPA specifications, is brazed into the body for external pipeline connections. The "Back-Body Assembly" is marked with color-coded labeling on the front plate and on the copper pipe so that the installer can easily identify the correct gas when making the installation. The Patton's Medical gas outlet is designed with a gas specific dual pin indexing arrangement to prevent an incorrect gas "Latch-Valve Mechanism" from being installed into a "Back-Body Assembly".

Patton's Medical Gas Outlets (wall and ceiling styles only) may be ganged together in 5" [127mm] center to center assemblies providing one attractive module of all medical gases without the additional expense of a headwall or console.

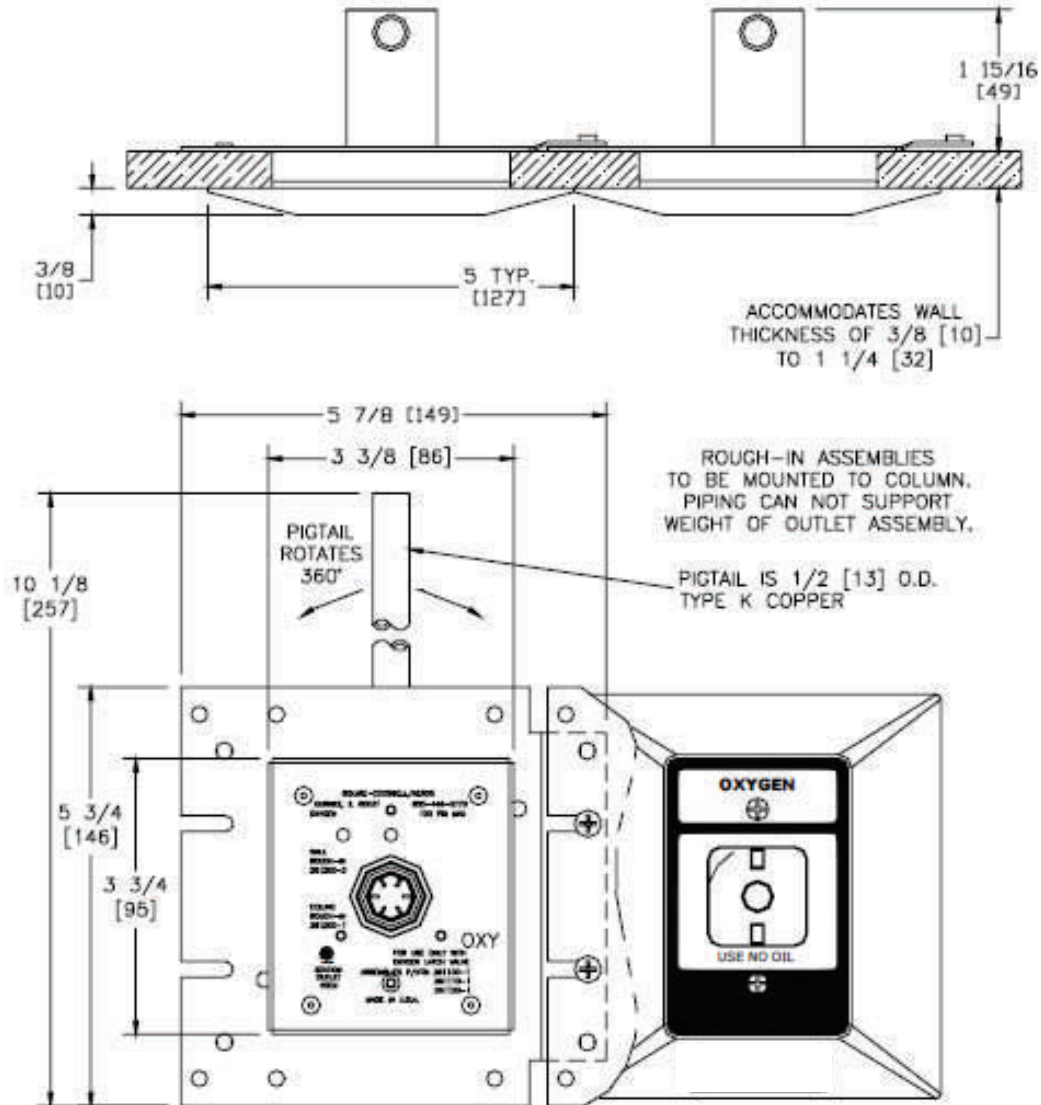
It is the "Latch-Valve Mechanism" which determines which type of adapter that the completed outlet assembly will accept. The "Latch-Valve Mechanism" is available in four different offerings; D.I.S.S. Type, Quick-Connect Ohmeda Compatible, Puritan-Bennett Compatible and Quick Connect Chemetron Compatible. The "Latch-Valve Mechanism" consists of a connector with an internal check valve, an indexing assembly and a color-coded gas specific front plate. A trim plate is also included for wall and ceiling outlets. The "Latch-Valve Mechanism" is designed and manufactured so that its gas specific characteristics cannot be altered during normal use, service or maintenance. The "Latch-Valve Mechanism" is inserted into the "Back-Body Assembly" and secured with plated steel screws to complete the outlet assembly.

The Quick-Connect models are compatible with Ohmeda Diamond, Puritan-Bennett or Chemetron Quick-Connect adapters and only the correct corresponding gas type of adapters can be used with the Quick-Connect outlets.

Since the "Back-Body Assembly" is the same for all types of "Latch-Valve Mechanisms" of the same gas, the Patton's Medical Gas Outlets can easily be converted from one adapter type to another by simply replacing the "Latch-Valve Mechanism".

WALL OUTLETS

D.I.S.S TYPE, OHMEDA COMPATIBLE, PURITAN-BENNETT COMPATIBLE AND CHEMETRON COMPATIBLE

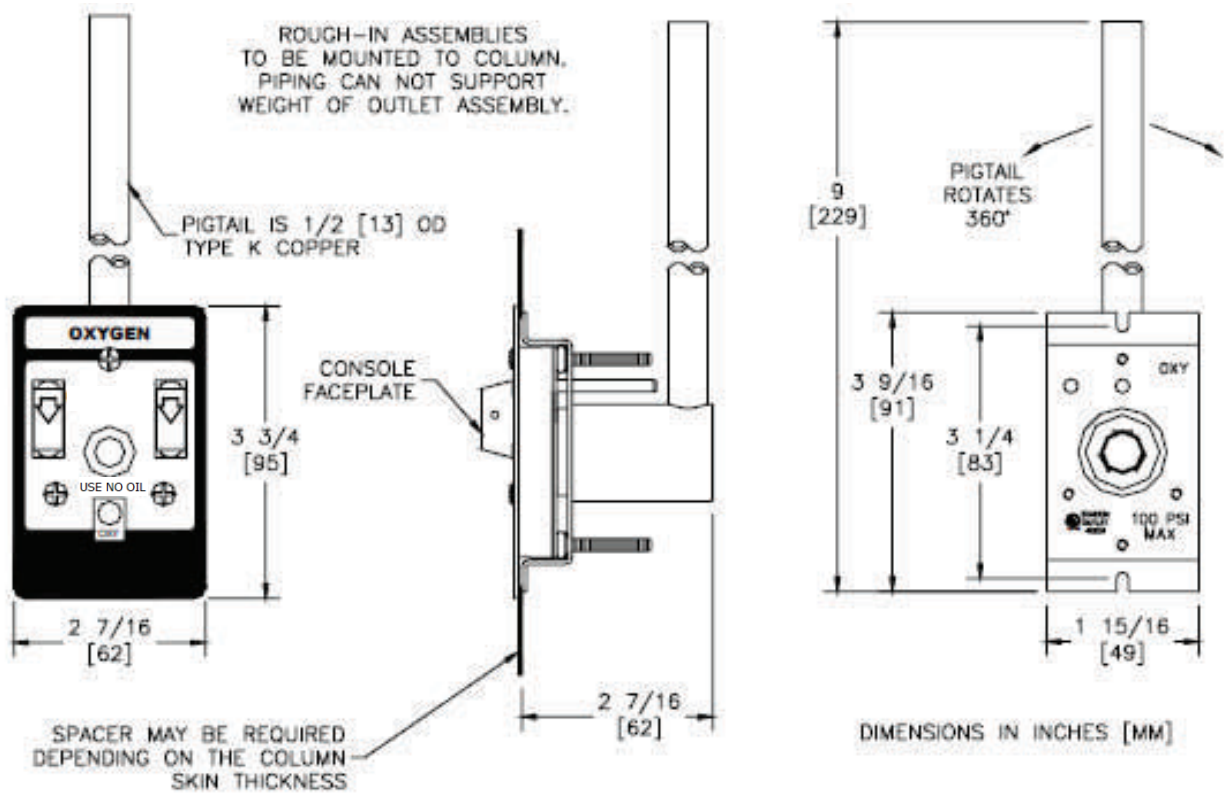


NOTES:

1. Do not cover over the Back-Body Assembly during the drywall and plaster application. Ensure that the clear plastic cover over the Back-Body Assembly is securely in place until the " Latch-Valve Mechanism" can be installed.
2. For W.A.G.D. (Evacuation) and vacuum gases, a round tubing plug and a plug retainer plate are installed on the Back-Body Assembly since a secondary check valve does not exist for these gases. Do not remove these components until the latch valve mechanism is to be installed.

CONSOLE OUTLETS

D.I.S.S TYPE, OHMEDA COMPATIBLE, PURITAN-BENNETT COMPATIBLE AND CHEMETRON COMPATIBLE

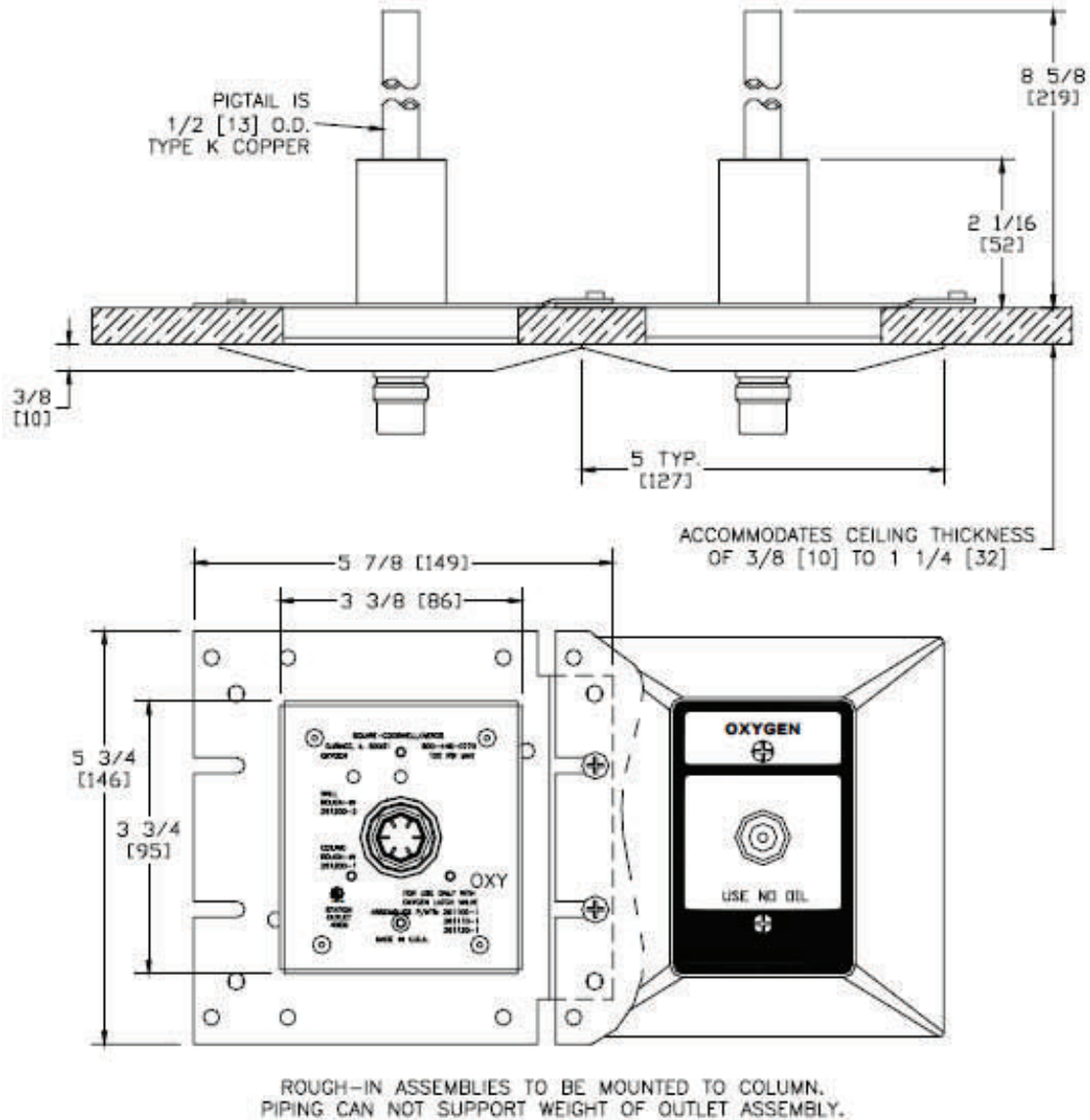


NOTES:

1. For W.A.G.D. (Evacuation) and vacuum gases, a round tubing plug and a plug retainer plate are installed on the Back-Body Assembly since a secondary check valve does not exist for these gases. Do not remove these components until the latch valve mechanism is to be installed.

CEILING OUTLETS

D.I.S.S. TYPE

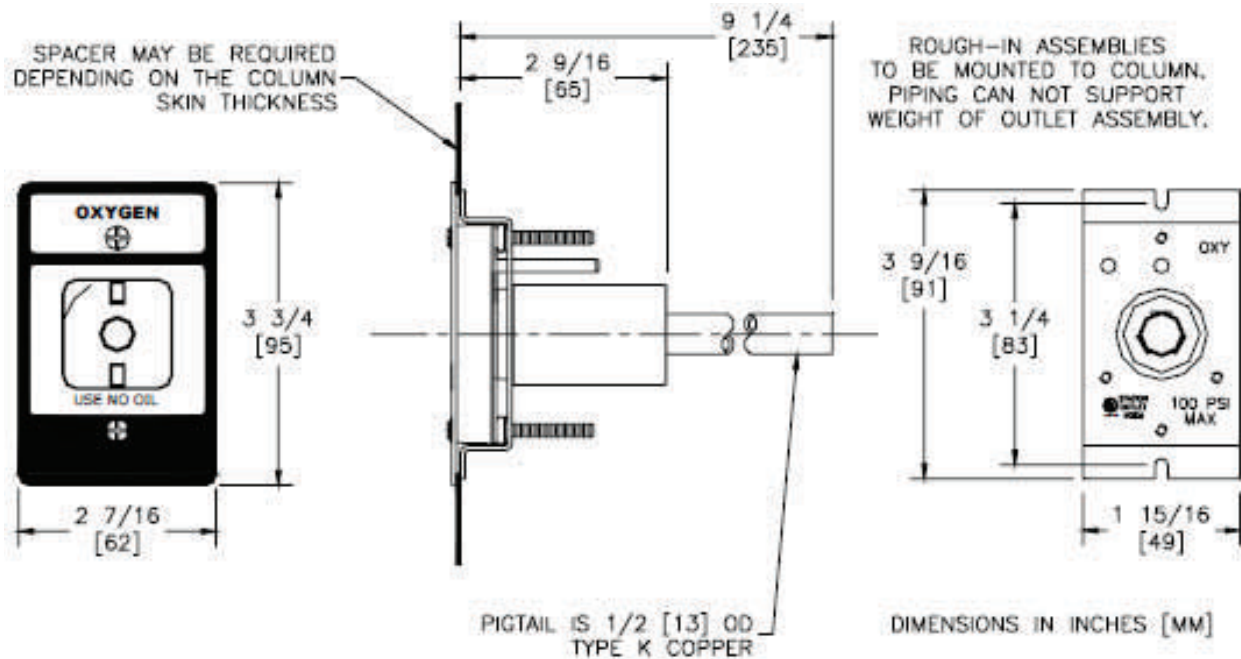


NOTES:

1. Do not cover over the Back-Body Assembly during the drywall and plaster application. Ensure that the clear plastic cover over the Back-Body Assembly is securely in place until the " Latch-Valve Mechanism" can be installed.
2. For W.A.G.D. (Evacuation) and vacuum gases, a round tubing plug and a plug retainer plate are installed on the Back-Body Assembly since a secondary check valve does not exist for these gases. Do not remove these components until the latch valve mechanism is to be installed.

CEILING COLUMN OUTLETS

D.I.S.S TYPE, OHMEDA COMPATIBLE, PURITAN-BENNETT COMPATIBLE AND CHEMETRON COMPATIBLE



NOTES:

1. For W.A.G.D. (Evacuation) and vacuum gases, a round tubing plug and a plug retainer plate are installed on the Back-Body Assembly since a secondary check valve does not exist for these gases. Do not remove these components until the latch valve mechanism is to be installed.

MEDICAL GAS OUTLETS COMPLETE ASSEMBLY PART NUMBERS

OHMEDA Compatible Outlet Assemblies

	WALL	CONSOLE	CEILING COLUMN
OXYGEN	01-QDWAL-OXY	01-QDCON-OXY	01-QDCOL-OXY
VACUUM	01-QDWAL-VAC	01-QDCON-VAC	01-QDCOL-VAC
MEDICAL AIR	01-QDWAL-AIR	01-QDCON-AIR	01-QDCOL-AIR
N2O	01-QDWAL-N2O	01-QDCON-N2O	01-QDCOL-N2O
WAGD	01-QDWAL-WAG	01-QDCON-WAG	01-QDCOL-WAG
NITROGEN	01-QDWAL-NIT	01-QDCON-NIT	01-QDCOL-NIT
CARBON DIOXIDE	01-QDWAL-CO2	01-QDCON-CO2	01-QDCOL-CO2
INSTRUMENT AIR	01-QDWAL-IA	01-QDCON-IA	01-QDCOL-IA

CHEMETRON Compatible Outlet Assemblies

	WALL	CONSOLE	CEILING COLUMN
OXYGEN	01-CHWAL-OXY	01-CHCON-OXY	01-CHCOL-OXY
VACUUM	01-CHWAL-VAC	01-CHCON-VAC	01-CHCOL-VAC
MEDICAL AIR	01-CHWAL-AIR	01-CHCON-AIR	01-CHCOL-AIR
N2O	01-CHWAL-N2O	01-CHCON-N2O	01-CHCOL-N2O
WAGD	01-CHWAL-WAG	01-CHCON-WAG	01-CHCOL-WAG
NITROGEN	01-CHWAL-NIT	01-CHCON-NIT	01-CHCOL-NIT
CARBON DIOXIDE	01-CHWAL-CO2	01-CHCON-CO2	01-CHCOL-CO2
INSTRUMENT AIR	01-CHWAL-IA	01-CHCON-IA	01-CHCOL-IA

PURITAN BENNETT Compatible Outlet Assemblies

	WALL	CONSOLE	CEILING COLUMN
OXYGEN	01-PBWAL-OXY	01-PBCON-OXY	01-PBCOL-OXY
VACUUM	01-PBWAL-VAC	01-PBCON-VAC	01-PBCOL-VAC
MEDICAL AIR	01-PBWAL-AIR	01-PBCON-AIR	01-PBCOL-AIR
N2O	01-PBWAL-N2O	01-PBCON-N2O	01-PBCOL-N2O
WAGD	01-PBWAL-WAG	01-PBCON-WAG	01-PBCOL-WAG
NITROGEN	01-PBWAL-NIT	01-PBCON-NIT	01-PBCOL-NIT
CARBON DIOXIDE	01-PBWAL-CO2	01-PBCON-CO2	01-PBCOL-CO2
INSTRUMENT AIR	01-PBWAL-IA	01-PBCON-IA	01-PBCOL-IA

D.I.S.S. Compatible Outlet Assemblies

	WALL	CONSOLE	CEILING	CEILING COLUMN
OXYGEN	01-DIWAL-OXY	01-DICON-OXY	01-DICEI-OXY	01-PBCOL-OXY
VACUUM	01-DIWAL-VAC	01-DICON-VAC	01-DICEI-VAC	01-PBCOL-VAC
MEDICAL AIR	01-DIWAL-AIR	01-DICON-AIR	01-PDICEI-AIR	01-PBCOL-AIR
N2O	01-DIWAL-N2O	01-DICON-N2O	01-DICEI-N2O	01-PBCOL-N2O
WAGD	01-DIWAL-WAG	01-DICON-WAG	01-DICEI-WAG	01-PBCOL-WAG
NITROGEN	01-DIWAL-NIT	01-DICON-NIT	01-DICEI-NIT	01-PBCOL-NIT
CARBON DIOXIDE	01-DIWAL-CO2	01-DICON-CO2	01-DICEI-CO2	01-PBCOL-CO2
INSTRUMENT AIR	01-DIWAL-IA	01-DICON-IA	01-DICEI-IA	01-PBCOL-IA

LATCH-VALVE MECHANISM & BACK-BODY ASSEMBLY PART NUMBERS

“LATCH-VALVE MECHANISM” Part Numbers

	D.I.S.S.	OHMEDA COMPATIBLE	CHEMETRON COMPATIBLE	PURITAN-BENNETT COMPATIBLE
OXYGEN	O1-FBDI-OXY	O1-FBQD-OXY	O1-FBCH-OXY	O1-FBPB-OXY
VACUUM	O1-FBDI-VAC	O1-FBQD-VAC	O1-FBCH-VAC	O1-FBPB-VAC
MEDICAL AIR	O1-FBDI-AIR	O1-FBQD-AIR	O1-FBCH-AIR	O1-FBPB-AIR
N2O	O1-FBDI-N2O	O1-FBQD-N2O	O1-FBCH-N2O	O1-FBPB-N2O
WAGD	O1-FBDI-WAG	O1-FBQD-WAG	O1-FBCH-WAG	O1-FBPB-WAG
NITROGEN	O1-FBDI-NIT	O1-FBQD-NIT	O1-FBCH-NIT	O1-FBPB-NIT
CARBON DIOXIDE	O1-FBDI-CO2	O1-FBQD-CO2	O1-FBCH-CO2	O1-FBPB-CO2
INSTRUMENT AIR	O1-FBDI-IA	O1-FBQD-IA	O1-FBCH-IA	O1-FBPB-IA

“BACK-BODY ASSEMBLY” Part Numbers

	WALL	CONSOLE	CEILING	CEILING COLUMN
OXYGEN	O1-BAKWAL-OXY	O1-BAKCON-OXY	O1-BAKCEI-OXY	O1-BAKCOL-OXY
VACUUM	O1-BAKWAL-VAC	O1-BAKCON-VAC	O1-BAKCEI-VAC	O1-BAKCOL-VAC
MEDICAL AIR	O1-BAKWAL-AIR	O1-BAKCON-AIR	O1-BAKCEI-AIR	O1-BAKCOL-AIR
N2O	O1-BAKWAL-N2O	O1-BAKCON-N2O	O1-BAKCEI-N2O	O1-BAKCOL-N2O
WAGD	O1-BAKWAL-WAG	O1-BAKCON-WAG	O1-BAKCEI-WAG	O1-BAKCOL-WAG
NITROGEN	O1-BAKWAL-NIT	O1-BAKCON-NIT	O1-BAKCEI-NIT	O1-BAKCOL-NIT
CARBON DIOXIDE	O1-BAKWAL-CO2	O1-BAKCON-CO2	O1-BAKCEI-CO2	O1-BAKCOL-CO2
INSTRUMENT AIR	O1-BAKWAL-IA	O1-BAKCON-IA	O1-BAKCEI-IA	O1-BAKCOL-IA

INSTALLATION NOTES

- On all wall and console outlets the connecting pipe can be rotated a full 360 degrees for ease of connection to the facility gas piping.
- Excessive heat during soldering may damage the secondary check valve; when soldering the pipe connection take extreme care not to apply heat to the check unit body.
- When installing wall outlets, it is very important to keep the plastic protective cover on the “Back-Body Assembly” in place during construction, to protect the outlet from drywall compound or other contaminants.
- For W.A.G.D. (Evacuation) and vacuum gases, a round tubing plug and a plug retainer plate are installed on the Back-Body Assembly since a secondary check valve does not exist for these gases. Do not remove these components until the latch valve mechanism is to be installed.
- When installing the “Latch-Valve Mechanism”, remove the protective cover from the “Back-Body Assembly” and inspect for dirt or debris in the outlet body. Carefully clean out any contaminants necessary.
- The “Latch-Valve Mechanism” should slide smoothly into the “Back-Body Assembly”. If it does not, inspect to verify that there has been no damage to the indexing pins. If the indexing pins are bent or damaged the gas specific characteristics of the outlet may be compromised. In this instance the entire “Latch-Valve Mechanism” should be replaced.
- All “Latch-Valve Mechanisms” with the exception of Nitrogen D.I.S.S. have a maximum pressure rating of 100 PSI [690 kPa]. The Nitrogen D.I.S.S. Latch-Valve Mechanism has a maximum pressure rating of 200 PSI [1,380 kPa].
- After the installation medical gas pipeline systems should be tested in accordance with the NFPA recommendations and/or in compliance with local requirements.
- The “Back-Body Assemblies” may be pressure tested up to a maximum of 200 PSI [1,380 kPa] without the “Latch-Valve Mechanism” installed. **DO NOT PRESSURE TEST THE PIPELINE OVER 100 PSI [690 kPa] IF THE “LATCH VALVE MECHANISM” HAS BEEN INSTALLED.**

SERVICING CAUTIONS

Before performing any service or maintenance on any outlet, the appropriate hospital maintenance or engineering personnel should be notified.

The “Latch-Valve Mechanism” can be removed without interrupting service to other outlets on the same pipeline for all gases other than vacuum, however when servicing the “Back-Body Assembly” the supply pressure must be shut off to the entire zone.

SERVICING INSTRUCTIONS

D.I.S.S. TYPE “LATCH-VALVE MECHANISM”

1. Unscrew the two retaining screws **(I)** until the “Latch-Valve Mechanism” can be removed from the outlet.
2. Remove the Adapter O-Ring seal **(A, B or C)** from the front and replace (NOTE: There is no O-Ring for Oxygen or Evac).
3. Remove the retaining ring **(E)** using the appropriate internal snap ring pliers.
4. Remove the valve stem **(G)**, Primary Check O-Ring **(H)**, primary check valve **(D)** and check valve spring **(F)**. Inspect the items for wear or damage and replace if needed. Replace the O-Ring.
5. Reinstall all internal components and lock in place with the retaining ring.
6. Reinstall the “Latch-Valve Mechanism” into the outlet. Coat the valve body, with a thin coat of oxygen compatible silicone lubricant to aid insertion. Tighten down the retaining screws, **DO NOT OVER TIGHTEN**, as this could damage the Latch-Valve.
7. Connect the proper gas specific adapter to the outlet. The connection should be smooth and hand tightening of the nut should be sufficient to allow the gas to flow without leakage.

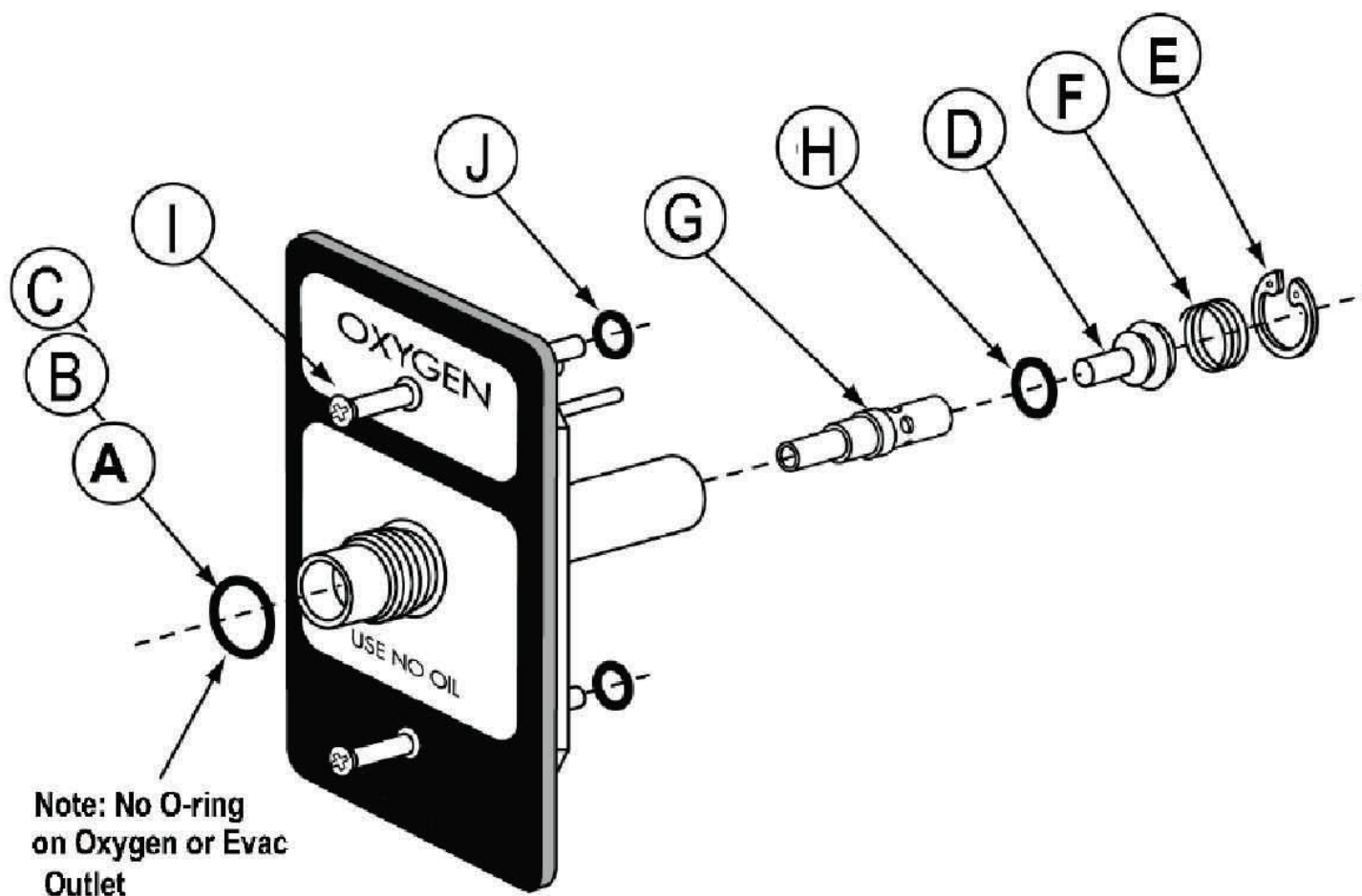
CAUTION: Use caution relative to the type and pressure of the gas so as not to cause injury.
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8. If the assembly does not perform correctly with the adapter installed, replace the entire “Latch-Valve Mechanism”.

REPLACEMENT PARTS

LATCH-VALVE MECHANISMS - D.I.S.S. TYPE OUTLETS

ITEM	DESCRIPTION	PART NUMBER
A	Adapter O-Ring - Vac	O1-DIARINGV
B	Adapter O-Ring - N2O	O1-CVORING
C	Adapter O-Ring - Air/N2, CO2	O1-DIAORINGANC
D	Primary Check Valve	O1-PCV
E	Retaining Ring	O1-RETRING
F	Check Valve Spring	O1-CVS
G	Valve Stem (Oxygen)	O1-DIVSO
(not shown)	Valve Stem (Vac, EVAC)	O1-DIVSVE
(not shown)	Valve Stem (Air, N2O, N2, CO2)	O1-DIVSA2NC
H	Primary Check Valve O-Ring	O1-CVORING
I	Retaining Screw (2 Req'd)	O1-SCREW
J	Screw Retaining O-Ring (2 Req'd)	O1-SRORING



SERVICING INSTRUCTIONS

OHMEDA COMPATIBLE “LATCH-VALVE MECHANISM”

1. Unscrew the two retaining screws (**L**) until the entire “Latch-Valve Mechanism” can be removed from the outlet.
2. Remove the four screws (**O**) holding the connector retaining plate (**A**) in place. Remove the plate.
3. Remove the valve body (**B**) from the valve assembly.
4. Remove the U-spring (**N**), inspect for wear or damage, reinstall or replace the U-spring as necessary.
5. Remove the flat washer (**I**) and valve body O-Ring (**J**) from the front of the valve body. Inspect the items for wear or damage and replace the O-Ring seal (**J**).
6. Remove the retaining ring (**F**) using appropriate snap ring pliers. Remove the primary cap (**K**), primary cap spring (**C**), primary check valve O-Ring (**D**), primary check valve (**E**) and spring (**H**). Inspect all items for wear or damage and replace as necessary. Replace the O-Ring (**D**).
7. Reinstall all internal components and lock in place with retaining ring (**F**). Insert the valve body (**B**) into the latch valve body. Check that the U-Spring (**N**), flat washer (**I**) and valve body O-Ring (**J**) are in place. Reinstall the retaining plate (**A**) and secure with four screws (**O**), do not over tighten.
8. Reinstall the “Latch-Valve Mechanism” into the outlet. Coat the valve body (**B**), with a thin coat of oxygen compatible silicone lubricant to aid insertion. Tighten down the retaining screws (**L**), **DO NOT OVER TIGHTEN**, as this could damage the Latch-Valve.
9. Connect the proper gas specific adapter into the outlet. The connection should be smooth and the adapter should lock and remain in place allowing gas to flow.

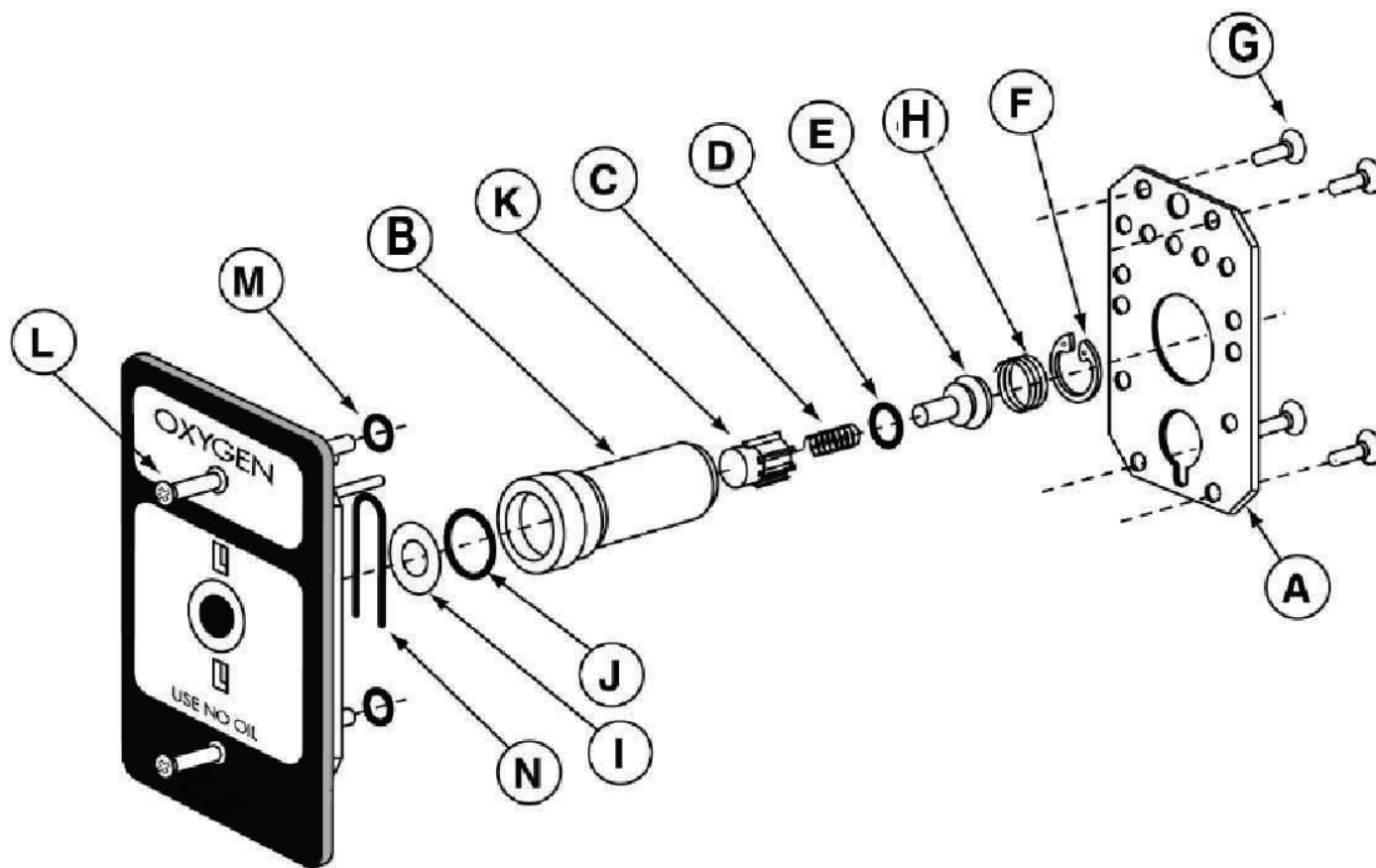
CAUTION: Use caution relative to the type and pressure of the gas so as not to cause injury.

10. If the assembly does not perform correctly with the adapter installed, replace the entire “Latch-Valve Mechanism”.

REPLACEMENT PARTS

LATCH-VALVE MECHANISMS - OHMEDA COMPATIBLE OUTLETS

ITEM	DESCRIPTION	PART NUMBER
A	Plate	O1-PLATE
B	Valve Body	O1-VALVEBODY
C	Primary Cap Spring	O1-PCS
D	Check Valve O-Ring	O1-CVORING
E	Primary Check Valve	O1-PCV
F	Retaining Ring	O1-RETRING
G	Screw (4 Req'd)	O1-SCREW1
H	Check Valve Spring	O1-CVS
I	Flat Washer	O1-FLATWASH
J	Valve Body O-Ring	O1-VBORING
K	Primary Cap	O1-PRICAP
L	Screw (2 Req'd)	O1-SCREW
M	Screw Retaining	O1-SRORING
N	U-Spring	O1-QDUSPRING



SERVICING INSTRUCTIONS

PURITAN-BENNETT COMPATIBLE “LATCH-VALVE MECHANISM”

1. Unscrew the two mounting screws (9) until the entire “Latch-Valve Mechanism” can be removed from the outlet.
2. Remove the two screws (8) holding the retaining ring (7) in place. Remove the retaining ring.
3. Remove the connector (6) from the valve assembly.
4. Remove the seal ring (3), check valve (4), and valve spring (5) from connector (6). Inspect all items for wear or damage and replace.
5. Reinstall all internal components and lock in place with seal ring (3). Insert the connector body (6) onto the latch valve body (1). Reinstall retaining ring (7) and secure with two screws (8).
6. Reinstall the “Latch-Valve Mechanism” into the outlet. Coat the connector (6), with a thin coat of oxygen compatible silicone lubricant to aid insertion. Tighten down the mounting screws (9), **DO NOT OVER TIGHTEN**, as this could damage the Latch-Valve.
7. Connect the proper gas specific adapter into the outlet. The connection should be smooth and the adapter should lock and remain in place allowing gas to flow..

CAUTION: Use caution relative to the type and pressure of the gas so as not to cause injury.
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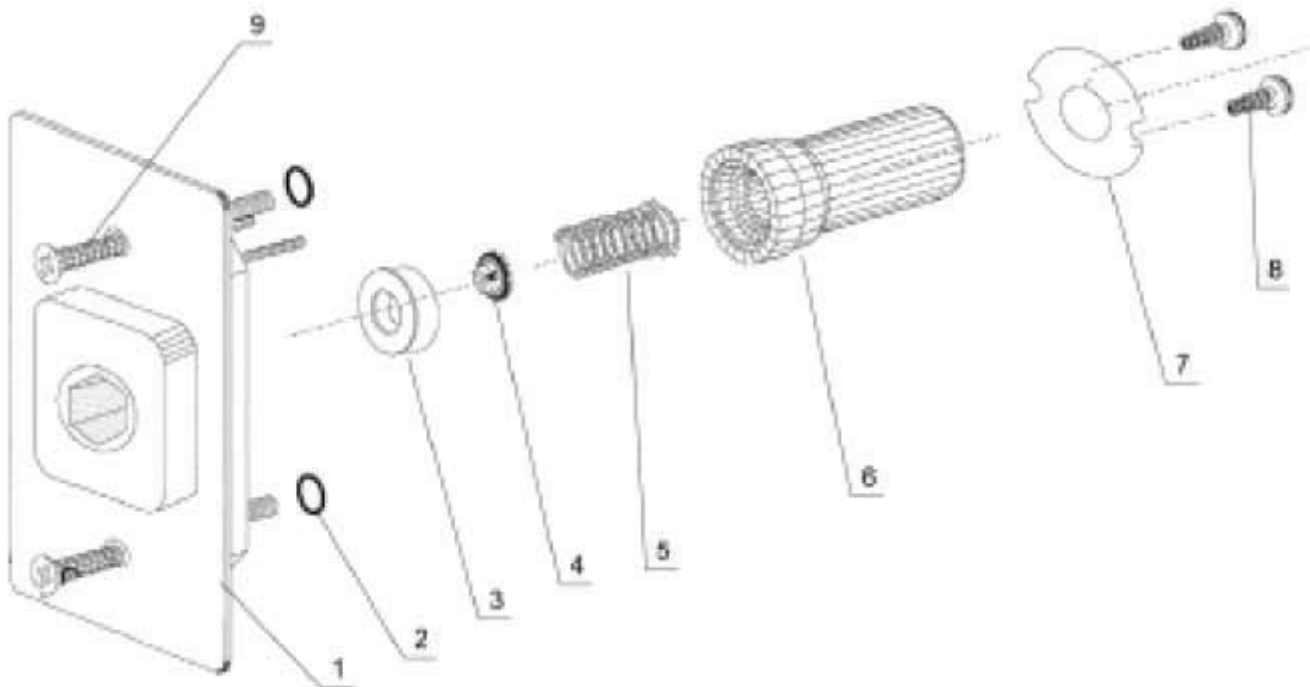
8. If the assembly does not perform correctly with the adapter installed, replace the entire “Latch-Valve Mechanism”.

REPLACEMENT PARTS

LATCH-VALVE MECHANISMS - PURITAN BENNETT COMPATIBLE OUTLETS

ITEM	DESCRIPTION	PART NUMBER
3	Seal Ring	
4	Check Valve	
5	Valve Spring	
6	Connector	
7	Retaining Ring	
8	Screws	
9	Mounting Screw	
2	Mounting Screw O-Ring	
1	Panel Assembly, Oxygen	
1	Panel Assembly, Vacuum	
1	Panel Assembly, Medical Air	
1	Panel Assembly, N2O	
1	Panel Assembly, WAGD	

Seal Ring (#3)
Check Valve (#4)
Valve Spring (#5)



SERVICING INSTRUCTIONS

CHEMETRON COMPATIBLE “LATCH-VALVE MECHANISM”

1. Unscrew the three retaining screws (**M**) until the entire “Latch-Valve Mechanism” can be removed from the outlet.
2. Remove the four screws (**N**) holding the connector retaining plate (**A or B**) in place. Remove the plate.
3. Remove the valve body (**G**) from the valve assembly.
4. Remove the flat washer (**I**) and valve body O-Ring (**J**) from the front of the valve body. Inspect the items for wear or damage and replace the O-Ring seal (**J**).
5. Remove the retaining ring (**F**) using appropriate snap ring pliers. Remove the primary cap (**K**), primary cap spring (**C**), O-Ring seal (**D**), primary check valve (**E**) and spring (**H**). Inspect all items for wear or damage and replace as necessary. Replace the O-Ring (**D**).
6. Reinstall all internal components and lock in place with retaining ring (**F**). Insert the valve body (**B**) into the latch valve body. Check that the flat washer (**I**) and O-Ring (**J**) are in place. Reinstall the connector retaining plate (**A or B**) and secure with four screws (**N**), do not over tighten.
7. Reinstall the “Latch-Valve Mechanism” into the outlet. Coat the valve body (**B**), with a thin coat of oxygen compatible silicone lubricant to aid insertion. Tighten down the retaining screws (**M**), **DO NOT OVER TIGHTEN**, as this could damage the Latch-Valve.
8. Connect the proper gas specific adapter into the outlet. The connection should be smooth and the adapter should lock and remain in place allowing gas to flow.

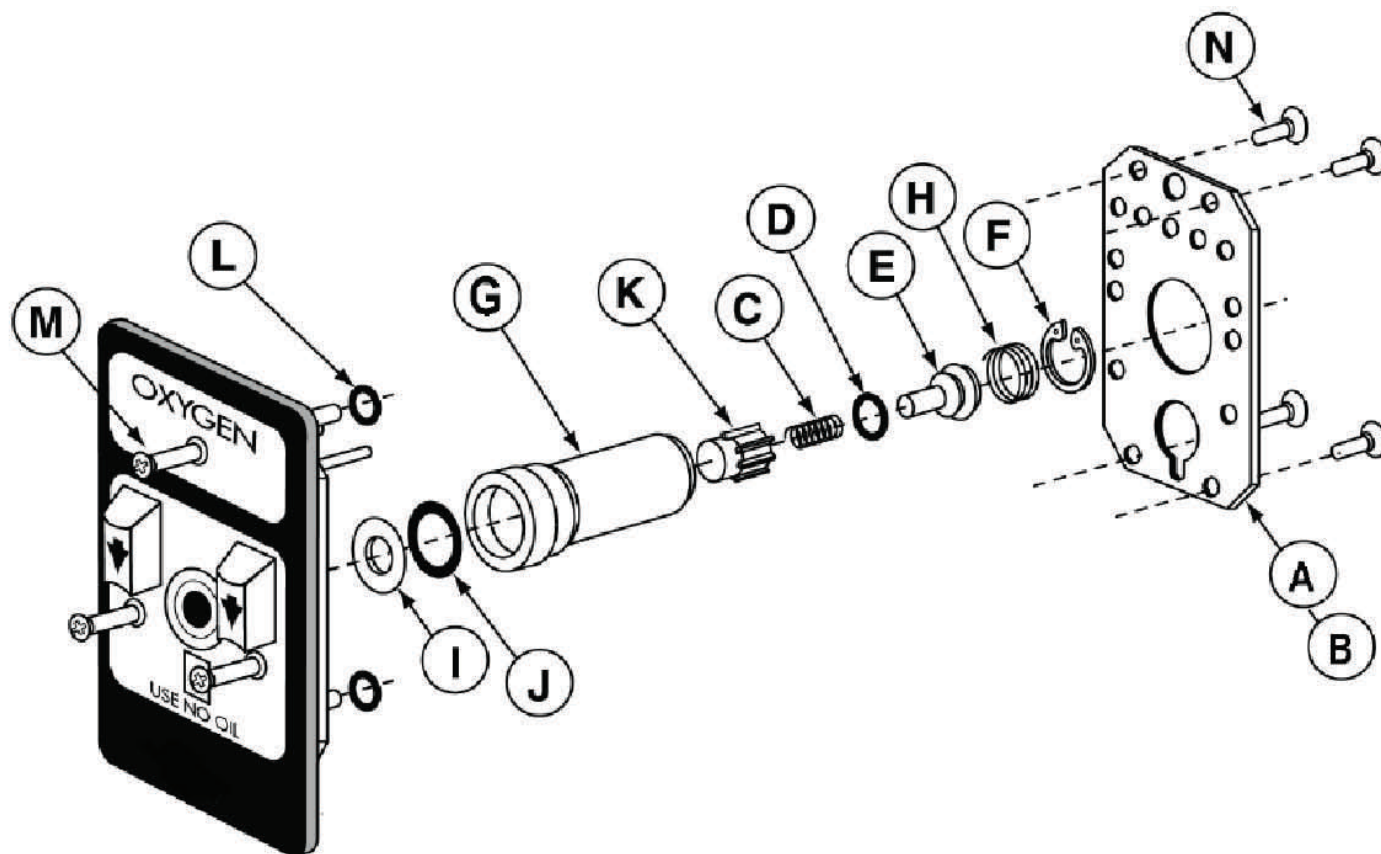
CAUTION: Use caution relative to the type and pressure of the gas so as not to cause injury.

9. If the assembly does not perform correctly with the adapter installed, replace the entire “Latch-Valve Mechanism”.

REPLACEMENT PARTS

LATCH-VALVE MECHANISMS - CHEMETRON COMPATIBLE OUTLETS

ITEM	DESCRIPTION	PART NUMBER
A	Plate- All Gases Except Evac	O1-PLATE
B	Plate—Evac	O1-CHPLATEEVAC
C	Primary Cap Spring	O1-PCS
D	Check Valve O-Ring	O1-CVORING
E	Primary Check Valve	O1-PCV
F	Retaining Ring	O1-RETRING
G	Valve Body	O1-VALVEBODY
H	Check Valve Spring	O1-CVS
I	Flat Washer	O1-FLATWASH
J	Valve Body O-Ring	O1-VBORING
K	Primary Cap	O1-PRICAP
L	Screw Retaining O-Ring	O1-SRORING
M	Screw (3 Req'd)	O1-SCREW
N	Screw (4 Req'd)	O1-SCREW1



SERVICING INSTRUCTIONS

“BACK-BODY ASSEMBLY” - ALL OUTLETS

Inside the “Back-Body Assembly” is a secondary check valve that performs the function of shutting off the gas flow for all pressurized gases when the “Latch-Valve Mechanism” is removed. This seat/seal also prevents leaks around the latch-valve connector.

Back-Body Assemblies for vacuum and evacuation gases do not contain a secondary check valve. If it becomes necessary to remove the Latch Valve mechanism from these outlets for service, the Back-Body Assembly must be plugged with a 3/4” round tubing plug (or equivalent) to prevent excessive draw on the vacuum pump.

The secondary seal will rarely need replacement. However, if the seat/seal does need replacement follow the following procedure:

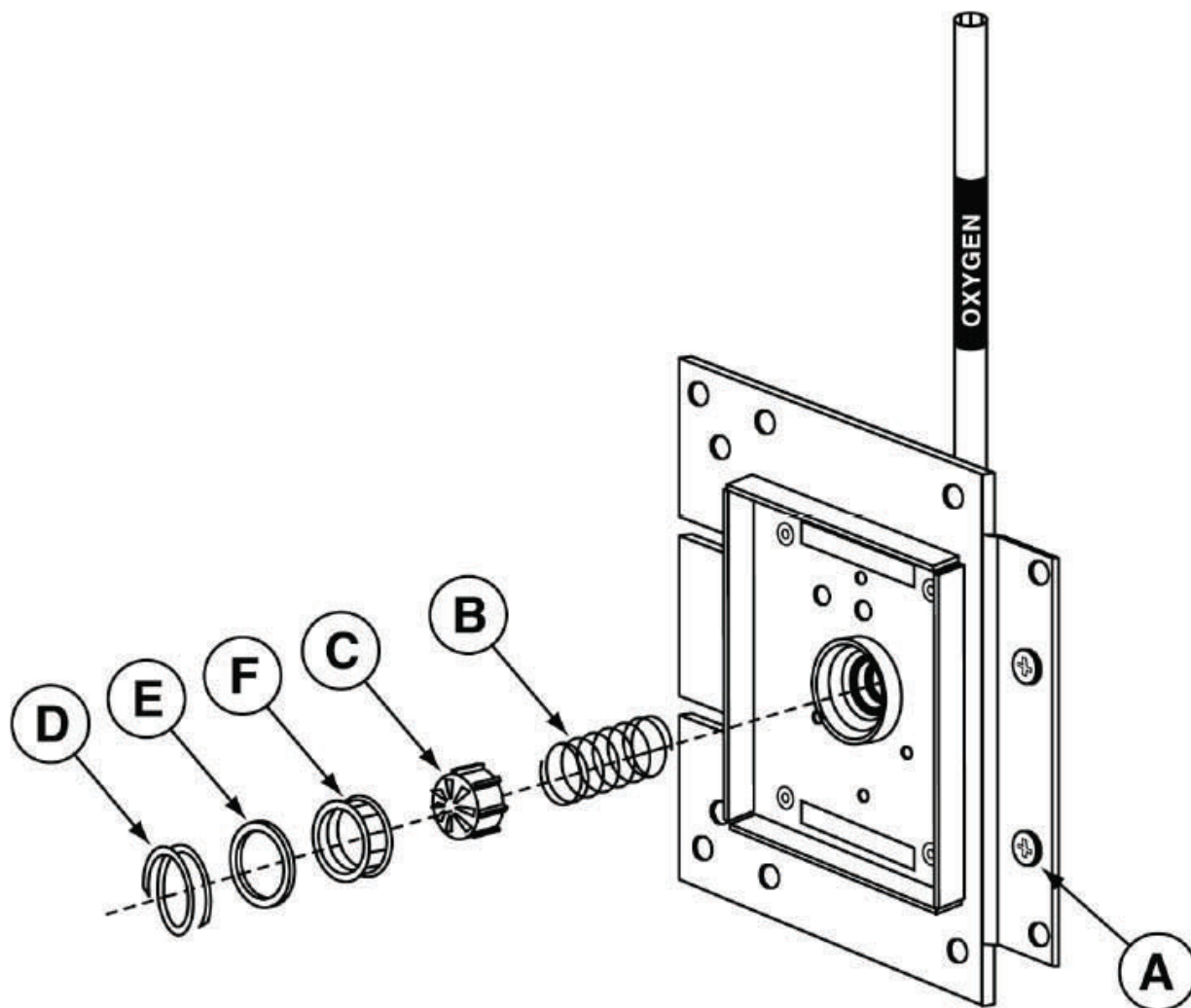
CAUTION: Ensure that the supply pressure is shut off before performing maintenance on the “Back-Body Assembly”.

1. **Ensure that no pressure exists in the assembly or pipeline by depressing the secondary check valve (C) until all gas pressure has been relieved from isolated piping zone. Nitrous Oxide and Carbon Dioxide must not be vented near staff or patients.**
2. Remove the retaining ring **(D)** from the inside of the outlet body.
3. Remove the washer **(E)**, seat/seal **(F)**, secondary check valve ***(C)** and secondary check valve spring ***(B)**. Inspect all items for wear or damage and replace the seat/seal **(F)**; replace other components as necessary.
4. Reinstall the spring ***(B)**, secondary check valve ***(C)**, seat/seal **(F)** and the washer **(E)**. Insert the retaining ring **(D)** into the slot and ensure that the ring is seated properly.
5. Carefully restore pressure to the pipeline and check for leaks.
9. Reinstall the “Latch-Valve Mechanism” and perform appropriate inspection and testing as recommended by NFPA and local requirements.

REPLACEMENT PARTS

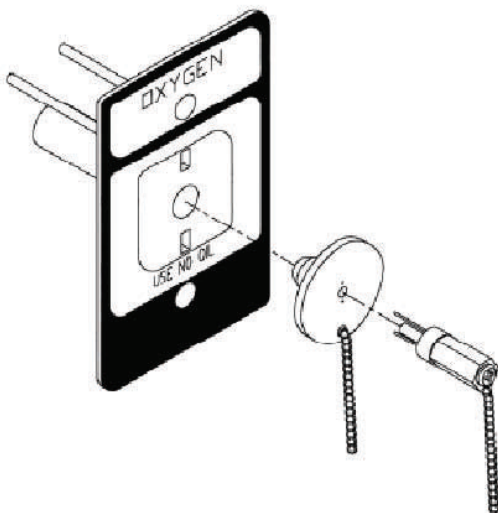
BACK-BODY ASSEMBLY - ALL OUTLETS

ITEM	DESCRIPTION	PART NUMBER
A	Screw-Wall Outlet (2)	O1-SCREWWALL
B	Secondary Check Valve Spring	O1-SCVS
C	Secondary Check Valve	O1-SCV
D	Retaining Ring	O1-BBRETRING
E	Washer	O1-WASHER
F	Seat/Seal	O1-SEATSEAL



OPTIONAL EQUIPMENT:

Ohmeda Locking Device



The Locking Kit shall prevent tampering of the internal primary check valve, located in the latch valve assembly.

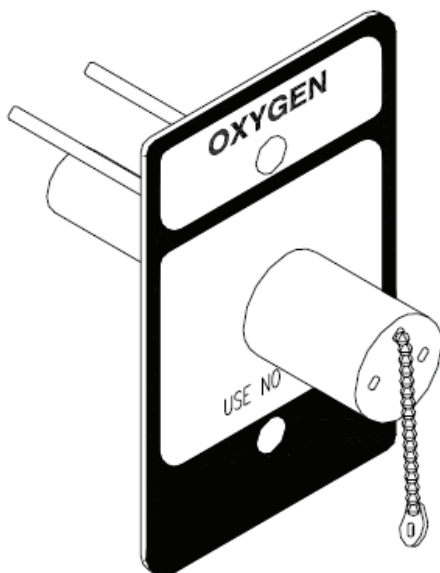
The locking kit consists of a chrome plated locking cap which plugs into the Ohmeda outlet. Inserting and turning the key will pop off the lock and allow flow of the gas.

Part Numbers:

O1-LOCK-QD Ohmeda Locking Kit
(all gases)

O1-LOCK-QD-KEY Key for Ohmeda Locking Kit

D.I.S.S. Locking Device



The Locking Kit shall prevent tampering of the internal primary check valve, located in the latch valve assembly.

The locking kit consists of a chrome plated threaded cap which screws into the DISS outlet. Inserting and turning the key will pop off the lock and allow flow of the gas.

Part Numbers:

O1-LOCK-DISS DISS Locking Kit (all gases
except Oxygen and Evac)

O1-LOCK-DISS-OXY DISS Locking Kit for Oxygen

O1-LOCK-DISS-KEY Key

NOTES:

NOTES:



3201 South Boulevard
Charlotte, NC 28209
1-866-960-0087
www.pattonsmedical.com



Patton's Medical Pipeline Equipment Warranty

Patton's Medical warrants the Medical Gas Pipeline Equipment to be free of defects in material and workmanship under normal use for a period of twenty-four months from date of shipment or twelve months from the date of start-up, whichever occurs first. Patton's Medical will repair replace any part or component, at their sole discretion, which is proven to be defective in either material or workmanship.

This warranty does not apply to products that are damaged by external causes, or are improperly warehoused, used, installed, serviced, misapplied or maintained by the customer. Installation of user replaceable items will be the user's responsibility. The sole liability for **Patton's Medical** under this warranty is limited to repairing, replacing, or crediting, at its election, any such products provided that:

- **Patton's Medical** is notified promptly within the warranty period above of any warranty claim.
- The examination of such items by an authorized representative of **Patton's Medical** will disclose to their reasonable satisfaction that claimed products defect has not been caused by misuse, neglect, improper handling, installation, repair, alteration, or accidents. .
- The user will be required to issue a purchase order for replacement items. Upon receipt and inspection of defective items, **Patton's Medical** will determine if a credit is due and if so determined will issue credit in the amount equal to the replacement parts.

Product modification performed by the customer without prior written approval by **Patton's Medical** will invalidate the above warranty.

This warranty is given in lieu of all other warranties, expressed or implied, including implied warranties of fitness for a particular purpose and merchantability. In no event shall Patton's Medical be liable for damages in excess of the value of the defective product or part, nor shall Patton's Medical be liable for any indirect, special or consequential damages, loss of profits of any kind, or for loss of use of the products.

Patton's Medical shall not be liable to the customer for any claims, loss of damage of any kind whatsoever arising from the nonperformance of **Patton's Medical** of any part of this agreement occasioned by acts of God, fire, war, labor difficulties, governmental regulations, or action of government. **Patton's Medical** shall not be liable to the customer for any other cause, whether of a similar or dissimilar nature beyond its reasonable control.