



Form: OM Med Install/Ops
Revision: 1
Date: December 2024

Installation and Operating Instructions For The:

Ohio Medical Automatic Hybrid Manifold and Manifold Controller



Read installation and system operations instructions prior to installing or operating system.
For questions regarding installation or operations call 847-855-6234
www.ohiomedicalparts.com

Safety

This product is not intended for use with flammable or toxic gases.

Follow all warnings and caution instructions in this manual.

If parts have been damaged or contaminated during shipment or installation, do not use, and call Customer Service at 847-855-6234.

User Responsibility

It is the responsibility of the assembler and operator of this system to read instructions before installing and operating equipment. The system should be checked periodically for broken or defective components. If service is required, contact Ohio Medical or their distributor.

All system components should not be repaired or altered without contacting Ohio Medical. Failure to use authorized replacement parts will void all warranty on this product.

Ohio Medical accepts no responsibility for damage or injury if this product has been modified in any way.

It is important that when installing the system using low-pressure liquid cylinders, to check with the cylinder manufacturer for cylinder gas withdrawal rate information. Over withdrawing gas from low-pressure cylinders may damage components and void warranty.

Keep operating manual for future reference.

Operating Environment

- Temperature Range: -20°C (-4°F) to +50°C (+122°F)
- Condition Rating: Gas Manifold: IP65 Rated (Gas Manifold door closed and latched with J1 cable connected)
Control: IP65 Rated (Control cover closed and latched with J1 cable connected)
- Location: Non-hazardous

Cautions and Warnings:



Caution: Action to prevent damage to Equipment



Warning: Action to prevent injury

Operations Overview of Fully Automatic System

The fully automatic system is designed to switchover from the in-use source to the reserve (standby) source without an interruption of gas service. The fully automatic system will also reset a depleted source condition to ready for use condition without operator intervention once the depleted gas supply has been replenished.

The Automatic Manifold Cabinet can be used with any pressure up to 3000 PSIG from high-pressure (HP) cylinders on both the left and right supplies or can utilize low-pressure (LP – 500 PSIG or below) cylinders or a Microbulk supply with high-pressure cylinders. This feature allows you to use one control box whether you use HP or a combination of HP and LP supply and the ability to switch gas sources based on your operation considerations without the manifold becoming obsolete. (The left and right inlet gas source must have the same type of gas cylinders or gas supply. Example: All HP or LP of same class.

The fully automatic system has the capability to dictate an operating side as always primary (Prioritization is normally used when using one supply with LP cylinders or a Microbulk application). The system monitors both inlets and the delivery pressure during operation. When the switchover set point is reached, a signal is sent to the manifold solenoid valves and the depleted supply is closed as the standby/ready for use side is opened. The Control Unit LEDs indicate the status of the individual Left or Right supply of gas.

The fully automatic system will reset the depleted side to a standby condition from empty (Automatic reset) when the empty (“RED” LED) side has been replenished with a supply pressure that is 20 PSIG higher than the switchover set point.

A leak detection system for the standby gas supply is also included. The system stores the inlet pressure after it detects the change from empty status to standby status. If the standby supply decreases by 10% while in standby mode, a leak has been detected. The LEAK LED will turn on to indicate a leak condition. Once the leak has been stopped, the RESET button is pressed to clear the condition and establish the new baseline.

The parameters for customer selected operating parameters are stored in non-volatile memory and will not change even if all power is lost to the system. Upon power up, the unit will return to its last active state and maintain the previous setting.

The systems solenoid valves will fail safe open during a loss of power. The system will continue to flow gas as long as the gas supply is maintained. The internal gauges are mechanical indicators of the right and left inlet gas pressure and the intermediate pressure to the dual delivery regulators.

If an alarm condition exists, a set of relay contacts will activate the remote status panel of the condition and/or provide dry contact closure for any customer defined alarms to supply an alarm condition. An alarm condition will also be immediately reported through the telemetry system if in use.

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Features of Fully Automatic System

Use of any gas source:

- High pressure x High pressure
- High Pressure x Low Pressure (Dewars) (Right or Left supply)
- Low pressure x Low pressure (Dewars)

Gas Status LED's

- 3-LED status indicators for each gas supply (In Use, Standby, Empty)

Leak detection: On standby gas supply (left or right)

- Separate left and right LED indicator when leak condition is detected
- Only on HP

Gas Supply Priority:

- Select a supply to be the priority or primary supply (Used in Hybrid configuration)

“Economizer”:

- Detects and uses gas from over-pressurized low pressure standby cylinder prior to cylinder venting through relief valve

“Delayed Alarm”:

- Delays the empty alarm signal when using low pressure cylinders to verify pressure loss is an empty cylinder and pressure loss is not due to over withdrawal rate.

Accurate Switchover pressure setting:

- 1-PSI increments

Accurate Inlet pressure reading:

- Accurate 1-PSI increments

Wi-Fi and LAN port

- Reports data to website on specified intervals
- Empty alarms & leak indication report as occurred
- Email & text for alerts

Serial 232/485 connection (Modbus capable)

Secured controller:

- User settings password protected (Default password will override)
- Admin access password protected (Factory use only)

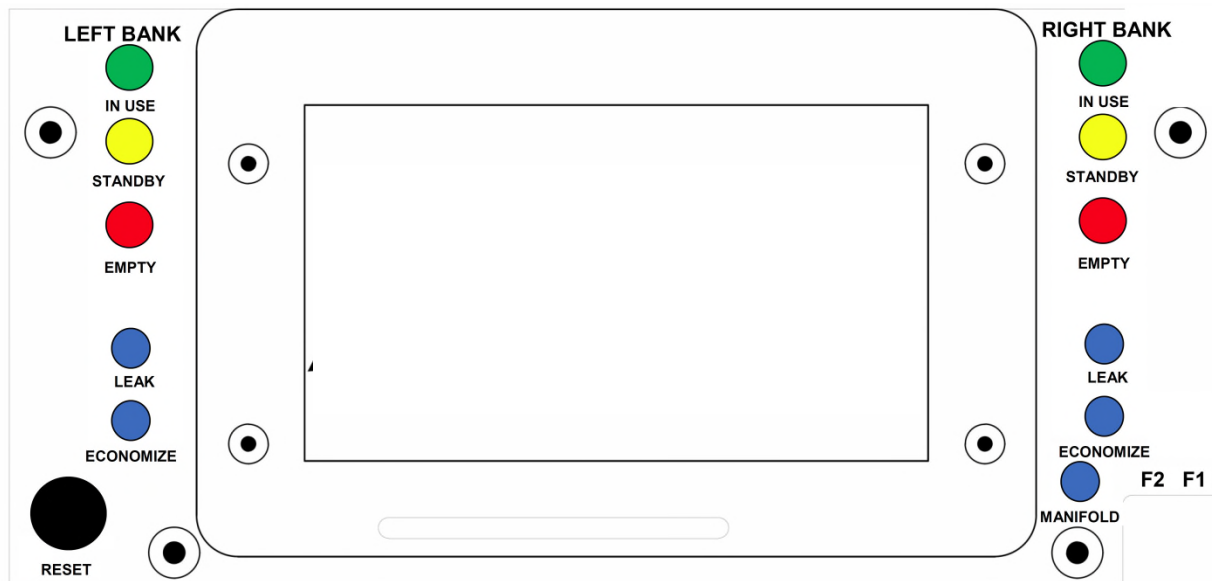
International Power input:

- Power Cord: US Standard 6ft SJT cable with NEMA 5-15P Plug.
- Power supply: UL-508, 100VAC -240 VAC, 50/60Hz, 0.7Amp Typical

Any installation location:

- Temperature -20C to +50C.
- Rated for IP65 locations (Direct water spray)

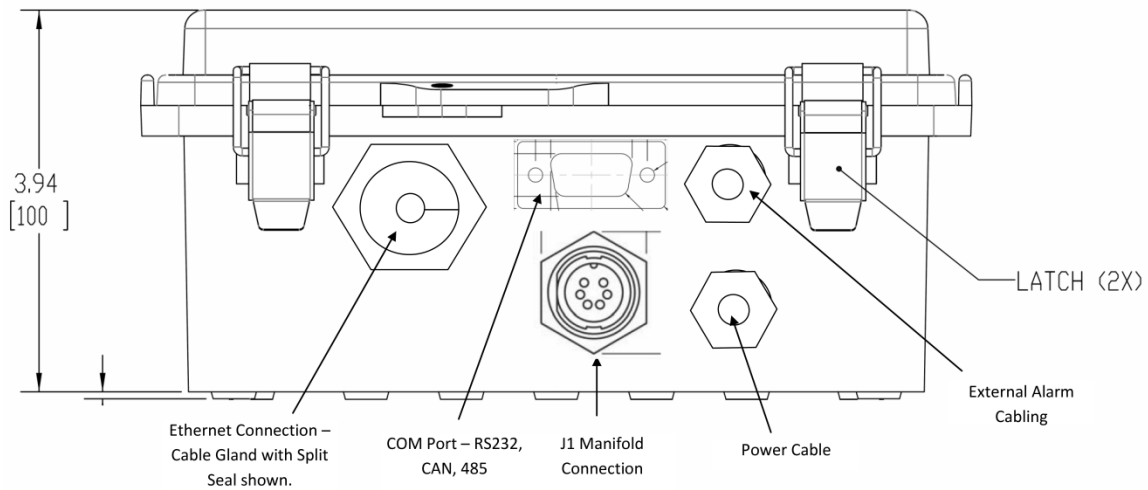
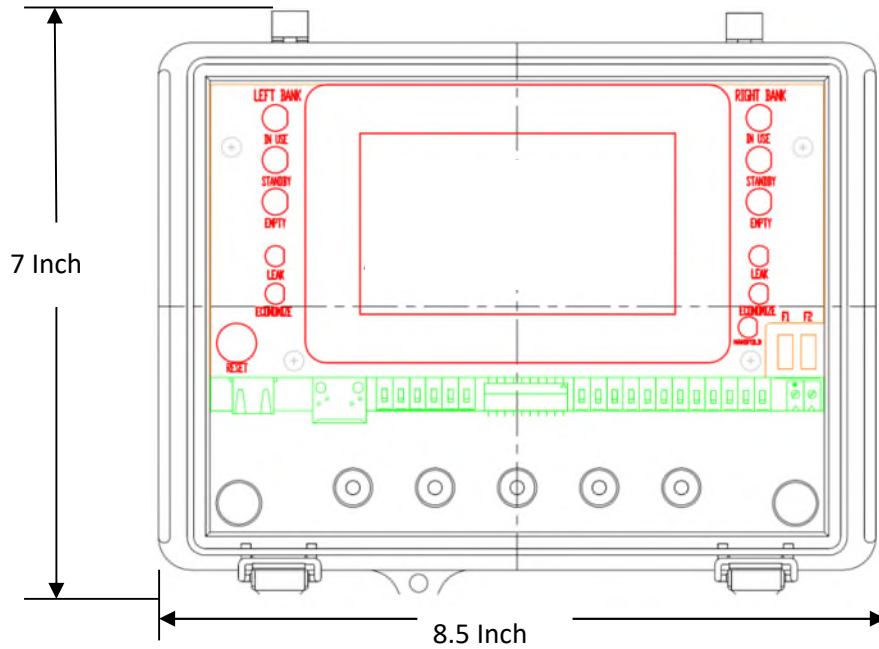
Control Unit Features and Indicators



- 1) 4.3" Display with Touch screen (3.75" x 2.25")
- 2) Indicator LED status conditions:
 - a) Green, "In Use" left and right supply
 - b) Yellow, "In Standby" left and right supply
 - c) Red, "Empty" left and right supply
 - d) Blue, "Leak" left and right supply (New feature)
 - e) Blue, "Economizer On" left and right supply
 - f) Blue, "Manifold is Powered" (Mechanical Cabinet)
- 3) Display default screen displays basic control information at a glance
 - a) Left gas supply and right gas supply pressure in PSI
 - b) Delivery gas pressure in PSI
 - c) Left supply cylinder type applied, (HP, LP-235RV, LP-350RV, LP-500RV)
 - d) Right supply cylinder type applied, (HP, LP-235RV, LP-350RV, LP-500RV)
 - e) Priority supply delivery setting "Left." "Right" or "None"
 - f) Economizer Mode "ON" or "OFF" (only valid for LP type)
 - g) WI-FI / LAN is "Connected" or "No Connection"
 - h) Control Unit Firmware version
 - i) "Setup" touch box for user setup access (Password protected)
 - j) "Admin" touch box for factory access (Password protected)
- 4) Ethernet 10/100TX connection
- 5) WI-FI Wireless B/N connection
- 6) USB port (WI-FI configuration and firmware updates only)
- 7) Reset button for updates or Status clearing.
- 8) Spring Terminal Blocks for Alarm wiring access.
- 9) Blade Fuses for Control Unit and Manifold power

Control Unit Enclosure Views

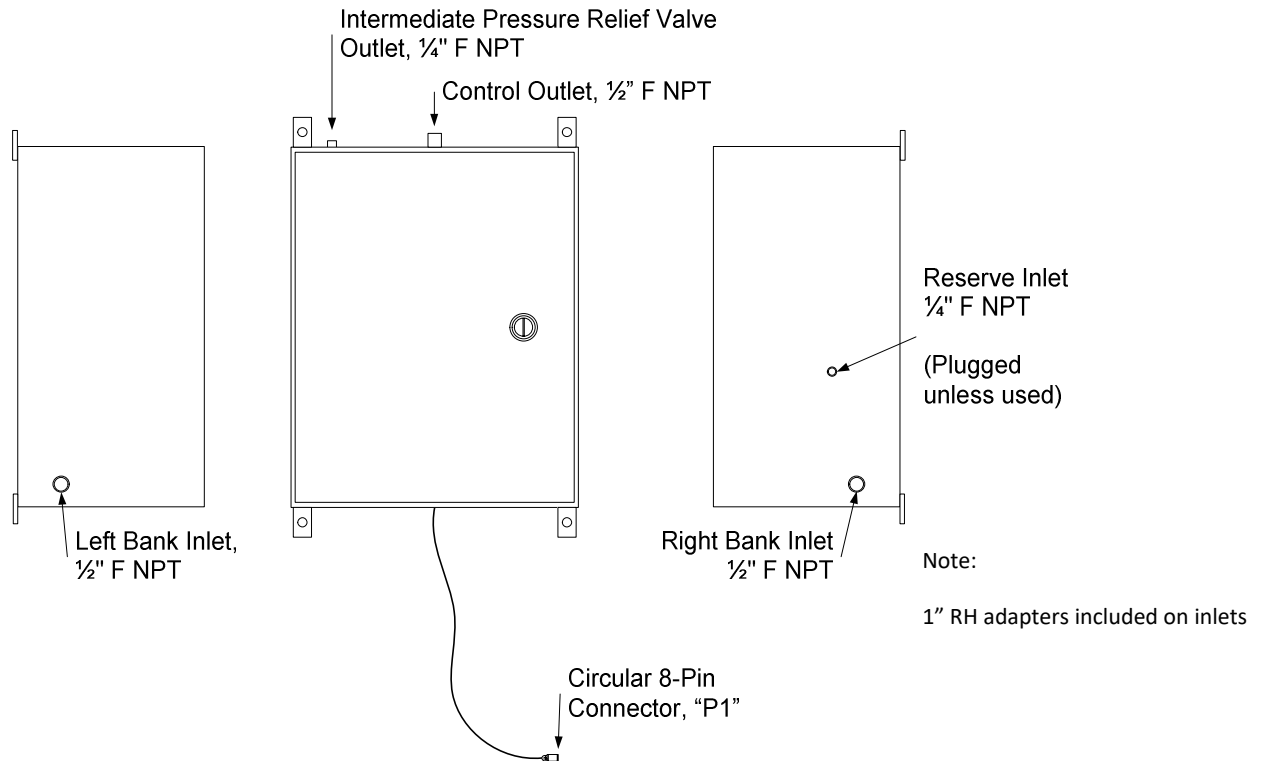
- 1) IP and UV rated high impact plastic with clear lid.
- 2) The lid is hinged with 2 latches, lockable.
- 3) The lid will hinge open for easy access.



Manifold Enclosure:

Physical Cabinet Size: 20" x 16" x 10"

- 1) Mild steel, Type 1, 3R,4, 12, 13
- 2) Removable door
- 3) One-piece polyurethane gasket
- 4) Powder coated finish
- 5) Set of 4 steel mounting tabs
- 6) ¼ Turn latch



Internal Components

- 1) Dual delivery regulators
- 2) Delivery regulator isolation valves (For removal of 1 delivery regulator for repair)
- 3) Intermediate pressure check valves (For removal of 1 inlet regulator or valve assembly)
- 4) Intermediate pressure relief valve and relief valve port
- 5) 3- points of anti-vibration clamping
- 6) No AC power in cabinet (12-volt DC signal and solenoid valve power)
- 7) Inlet port for regulated gas for a "Emergency Reserve supply"

Description of Feature/ Function:

Manifold Gas Cylinder Sources

No obsolescence of the manifold due to changing gas cylinder type as demand requires. The fully automatic manifold can be used with any combination of gas sources whether it is high pressure cylinders or a low-pressure source (500 PSI and below). Low pressure sources include liquid dewars, micro-bulk tanks, or larger vertical liquid tanks with 230, 350, or 500 PSI relief valves.

When using high pressure and a low-pressure source on the manifold, this is classified as a “Hybrid” system in the NFPA 99. The NFPA requires a 3rd gas supply (Emergency Reserve) when using a “Hybrid” or low-pressure x low pressure gas source configuration. The Emergency Reserve inlet port is installed for this purpose.

Status Indicator LED's

Green Signifies the active supply in use

Yellow Signifies the standby/ready for use supply

Red Signifies the empty/depleted supply

Blue Signifies other selected programmed or built-in programmed operations

- 1) **Leak-** (Feature) Indicates standby supply is losing pressure
- 2) **Economizer** – Indicates when Economizer or Delayed Alarm is active
- 3) **Manifold** – (Fuse F2) Indicates power is available to the manifold cabinet interconnecting cable.

Leak Detection: (Feature, no field adjustment)

The Control Unit will monitor standby supply inlet pressure for a decrease due to leaks. This setting is factory set. If a pressure decrease occurs on the “STANDBY” gas source, the corresponding source supply “LEAK” Indicator will turn on. An alert will be sent to the website for email or text notification if unit is enabled for this communication. (Active only with HP Cylinders)

Factory setting: Standby supply initial pressure decrease of 10 %

To clear the leak condition: Correct the leakage and depress and release the control Unit RESET button.

Priority: Source Supply (Default setting – “None”)

With the default setting of “None,” the IN-USE and STANDBY source supply will alternate at each EMPTY cylinder change out. This setting is applied when similar type cylinders (HP x HP or LP x LP) are used on each supply.

When using the manifold with a combination of gas cylinder types, such as a high pressure with a low-pressure supply, generally the low-pressure side is prioritized to be the primary supply side. Set the Priority “Left” or Priority “Right” depending on which supply is the low-pressure supply.

If a priority is set for the left or the right supply, the prioritized supply will not operate as a STANDBY supply. The Priority set supply status will be “IN-USE” or “EMPTY.” When the source gas supply on the priority supply is replenished, the supply status will default from “EMPTY,” to “IN-USE.” The non-priority supply is treated primarily as the STANDBY supply.

Economizer: (Default setting - “OFF”)

Purpose: Preventing the loss of gas supply by the automatic release of excessive pressure of the STANDBY supply.

This function is active when at least one of the low-pressure cylinder choices has been selected. An issue with the Liquid cylinder (dewars) type is that they will build pressure while in STANDBY status (inactive) and the excess pressure will vent through the gas cylinders self-contained relief valve. This release of gas creates a loss of purchased gas product.

The Economizer feature detects the increase of pressure in the STANDBY low-pressure supply and will temporarily enable the STANDBY supply as the active supply. This operation allows the excessive gas pressure to be directed for use and not lost. The Economizer Indicator will be on with the STANDBY Indicator during the recovery event. The Economizer operation monitors the STANDBY supply decreasing pressure to disable the use of the STANDBY supply and return source of supply to the IN-USE supply. The Economizer feature will cycle “ON” and “OFF” as needed while the low-pressure supply is in STANDBY mode.

Economizer On/Off settings:	<u>Cylinder RV</u>	<u>“ON”</u>	<u>“OFF”</u>	<u>Cylinder Mfg. PBC Setting</u>
	230 PSI	215 PSI	195 PSI	125 PSI
	350 PSI	330 PSI	310 PSI	300 PSI
	500 PSI	480 PSI	460 PSI	400 PSI

Delayed Alarm (Feature, no settings or field adjustment)

Purpose: Prevention of unnecessary EMPTY Supply alarms during reduced pressure event(s) in partial or full supplies.

The Delayed Alarm verifies the gas pressure loss is an EMPTY supply and not a pressure loss due to a temporary over withdrawal rate event or an unopened Pressure Build Circuit (PBC).

This alarm feature is active automatically when both (Left and Right) cylinder supply selection is one of the low-pressure choices. Liquid cylinders (Dewars) have a calculated delivery flow rate in which the cylinder internal pressure building circuit (PBC) will maintain delivery pressure. A liquid cylinder will decrease delivery pressure either by not turning the PBC on, or by over withdrawing the gas volume from the cylinder. In each situation, the cylinder pressure will decrease to an unusable pressure (Control Unit - Supply Switchover Setting).

The "Delayed Alarm" feature will add a delay to the "EMPTY" condition alarm signal for the "IN-USE" supply and enable the STANDBY supply to be active. The "Economizer" LED will turn on to indicate the STANDBY supply is in use. The "Delayed Alarm" will monitor the IN-USE supply for pressure recovery. If the IN-USE supply pressure does not recover within the Alarm Delay time the supply will be declared "EMPTY" and alarm provided. The indicated IN-USE supply will remain the gas source if it does recover pressure within the delay time and no alarm will be generated.

Factory setting: (no adjustment)

<u>PSI Activated</u>	<u>PSI “OFF”</u>	<u>Time: (Min)</u>
1 PSI above Switchover Setting	Switchover Setting +20 PSI	20

Switchover Pressure Setting: (Field adjustable)

The switch over setting is the point in which the “IN-USE” gas supply is declared “EMPTY,” and the “STANDBY” side will become the IN-USE” supply. Switchover setting is set independently for the left and right gas supplies. The adjustments can be made in 1 PSI increments.

Minimum pressure setting: 25 PSI

Maximum pressure setting: 2000 PSI

Manifold reset pressure: Switchover setting + 20 PSI

WI-FI/LAN Communication:

Controller is WI-FI or LAN ready. The WI-FI is configured using USB thumb drive in the PC board USB port. The controller will report data to the website on specified intervals. Empty and Leak conditions will report as occurred. Website will be configured for email and text alerts. Website can be viewed using PC, tablet, or phone.

The data reported to the website will be stored for each registered user and units, therefore a user can have multiple units that are being monitored from one location. The data files can be saved or printed in a PDF or CSV (Comma-Separated Values) format.

For security concerns, the controller cannot be accessed through the website/server which could leave the controller vulnerable to web-based attacks.

To access the web site, users will be required to register with a valid controller ID. (See: Connecting to Wi-Fi/LAN)

Website will display and retain data logs for:

- Inlet and delivery pressures
- Economizer Status
- Priority setting
- Cylinder supply configuration
- Alerts (Empty or Leak)

Secured Settings:

The user settings section is password protected by a factory default setting. User can customize their password. (Factory default password will override customized password)

Default Password/Override: (996633)

Admin User Section: Password protected (Factory use only, no field override)

Installation of Equipment:

Locate the Manifold Enclosure for the desired gas system pipeline connection. The interconnecting Control Unit must be located within 5 feet of the Manifold Enclosure and 5 feet of an AC mains connection for default configuration connection. Control Unit default AC Mains connection is a standard NEMA 5-15 or same AC mains outlet. For custom AC mains connection, the NEMA plug may be removed from the cable and wire connections applied in a suitable junction box by qualified personnel.

The fully automatic system should be installed in accordance with state and local codes, using guidelines established by the National Fire Protection Association, Compressed Gas Association, and Occupational Safety and Health Administration.

The fully automatic systems are designed with weather resistant seals to operate in conditions that are rated up to IP65 locations. The system control unit should be installed per National Electric Code.

Warning: It is important that when installing components of the manifold, that no oil or contaminants come in contact with any system parts. If parts have been contaminated during shipment, do not use and contact Ohio Medical 847-855-6234 for replacement.

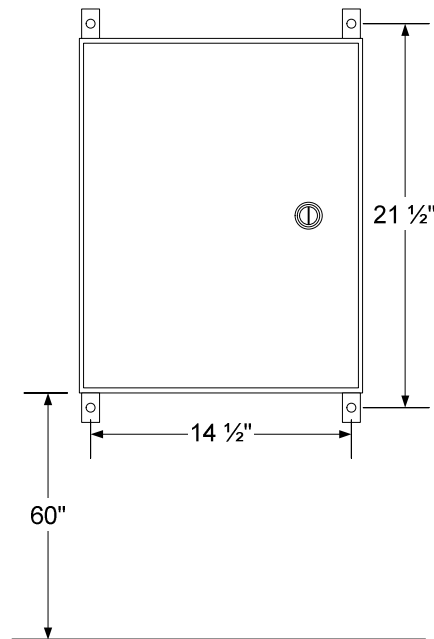


Caution: If the manifold is used in a Hybrid configuration, (Low-pressure on one supply) check with the cylinder manufacturers for cylinder withdrawal rate information. Over withdrawal of low-pressure cylinders may damage components and void warranty.



Installation of Manifold Enclosure

Figure 1: Manifold Enclosure Mechanical



Manifold Enclosure Mounting

Refer to Figure 1 for Manifold Enclosure detail.

1. Locate the desired center line for the manifold control cabinet, (Fig. 1)
2. Locate horizontal and vertical mount locations.

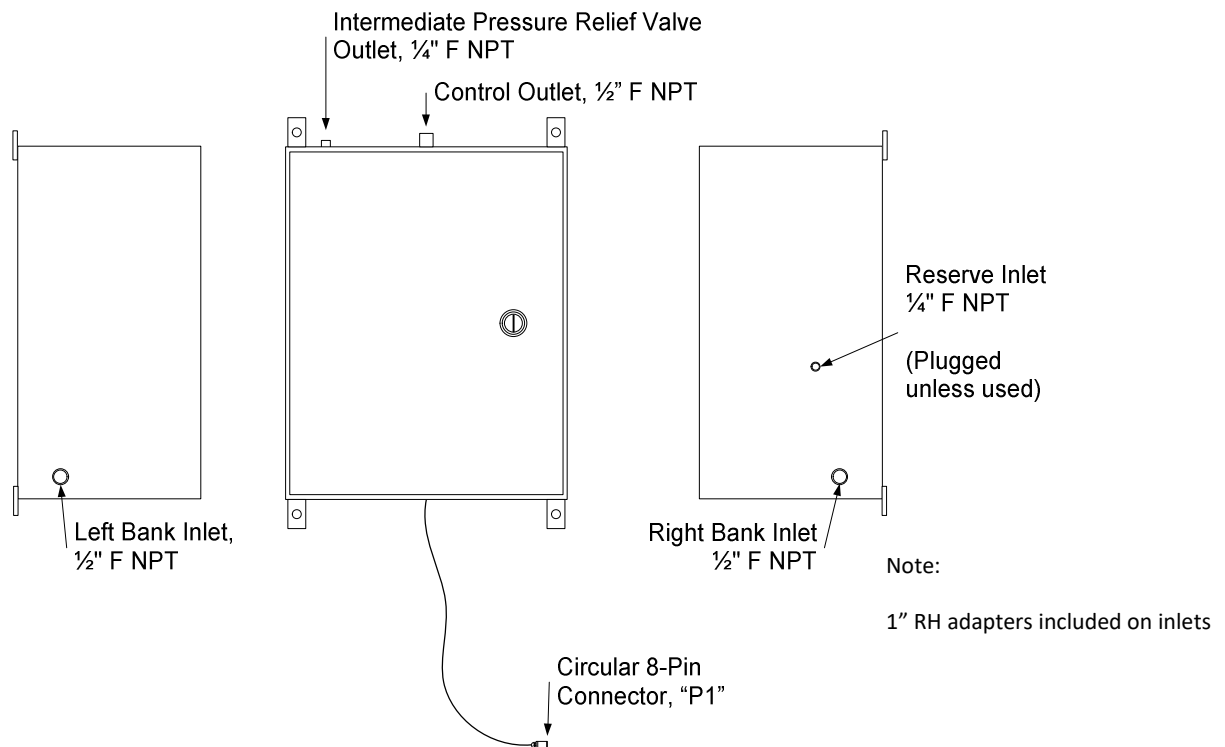


Warning: Heavy Object. To avoid muscle strain or back injury, use lifting aids and proper lifting techniques.

3. Mount mechanical enclosure to wall or other suitable structure using existing enclosure mounting tabs. Mounting weight is 50lbs. Structure mounts shall be rated for 200 lbs.

Manifold Enclosure Connection

Figure 2: Connections to Manifold Enclosure



Refer to Figure 2 for Manifold connection and port positions.



Warning: This equipment has been cleaned and capped prior to shipment. Care must be taken during the connection of components and piping so that grease, oil, or dirt does not contact parts. If cleaning is required, refer to Compressed Gas Association Pamphlet G-4.1.



Caution: Use a suitable thread sealant or tape. When using Teflon™ tape as a thread sealant, ensure the tape is a minimum 1 1/2 threads from the edge of the fitting.



Warning: When making mechanical enclosure connections, it is required that two wrenches be used to tighten the connection. One wrench is used as a backup wrench on the enclosure fitting to prevent twisting of the enclosure fitting. If not used, torque damage can occur.

Note: It is required that inlet gas supply shutoff valves be installed.

Note:

Mechanical enclosure Left and Right Supply Inlet Ports have a maximum working pressure rating of 3000 PSIG

1. Attach left and right inlet gas source piping or header to mechanical enclosure Left and Right Supply Inlets.
2. Attach outlet piping to Control Outlet
3. Attach outlet piping to Intermediate Pressure Relief Valve Outlet

Note: Relief valve needs to be vented to a safe location, and the terminus of the pipe to in a rounded or hooded fashion protected against water and bug entry.

Reserve Inlet Use:

Reserve inlet port is plugged during manufacturing and is only used when a 3rd supply of gas is used as an emergency reserve supply.

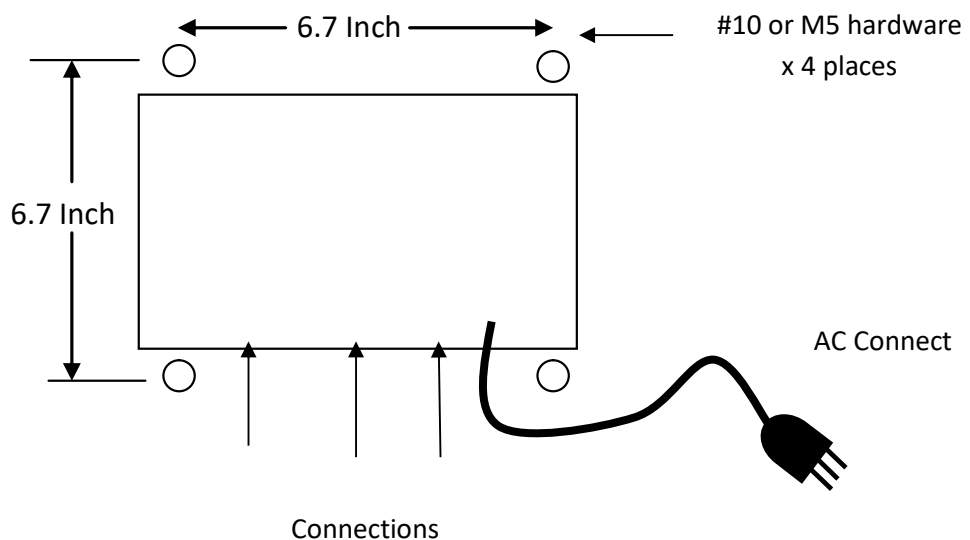


Warning: Mechanical enclosure Reserve Inlet Port has a maximum working pressure rating of 250 PSIG

Installation of Control Unit

Figure 3: Control Unit Mechanical

Control Unit wall mounting with wall brackets applied. **Mounting tabs have been reversed for shipping. Loosen mounting tab screws and reposition mounting tabs in the outward mounting position, retighten mounting tabs screws.**

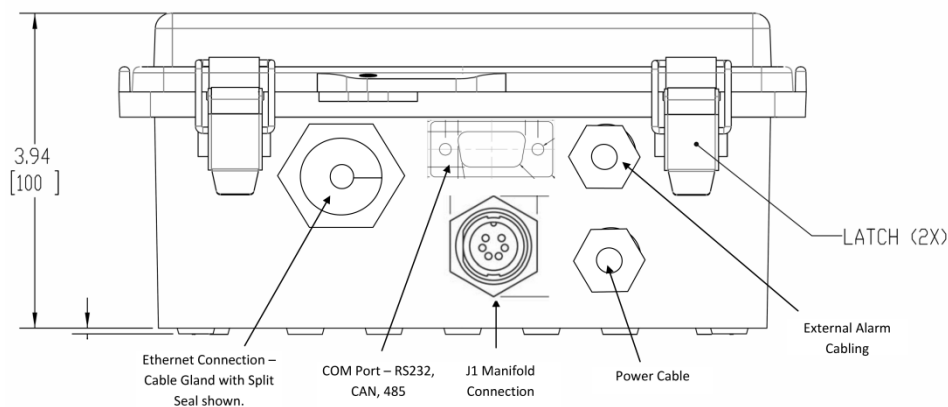


Control Unit Mounting

Refer to Figure 3 for Control Unit Enclosure Mount.

1. The exact mounting location of the Controller is flexible based on the 6' interconnecting cable from the mechanical enclosure. It is recommended to be mounted at a height that affords good access to the control, and eye level.
2. The Control unit must mount on a wall with the enclosure lid Hinges facing upwards, latches facing downwards. Do not mount sideways or reversed.
3. Locate vertical and horizontal mounting locations
4. Mount controller to wall or other suitable structure using the existing enclosure mounting tabs. Mounting weight is 4 lbs. Structure mounts shall be rated for 16 lbs.
5. The control unit requires 4 mounting brackets installed on the back side of the enclosure for wall mount. The brackets are provided in a pouch inside the unit as shipped. Install brackets with provided screws in single (non-slotted) bracket hole into the four rear corner holes on unit enclosure.
6. Position the brackets with slots vertical above the enclosure hinges and below the enclosure latches. #10 or M5 hardware may be applied to mount to the wall.

Control Unit Connection



- 1) Connect Manifold circular 9-pin plug (P1) into the Control Unit circular socket receptacle (J1) and twist clockwise to latch.
- 2) Connect COM Connection if applied.
- 3) Refer to optional Alarm and Ethernet connections prior applying AC power to unit.
- 4) Unit will power up with an AC power connection, no ON/OFF switch available. See Initial Start-up to apply power.

Optional Ethernet and Alarm Cable Installation

Ethernet and Alarm cables are provided mounted Cable glands on the Control Unit. These cables are optional application. The associated cable glands are provided environmental sealing plugs by default that must be removed to apply a cable.



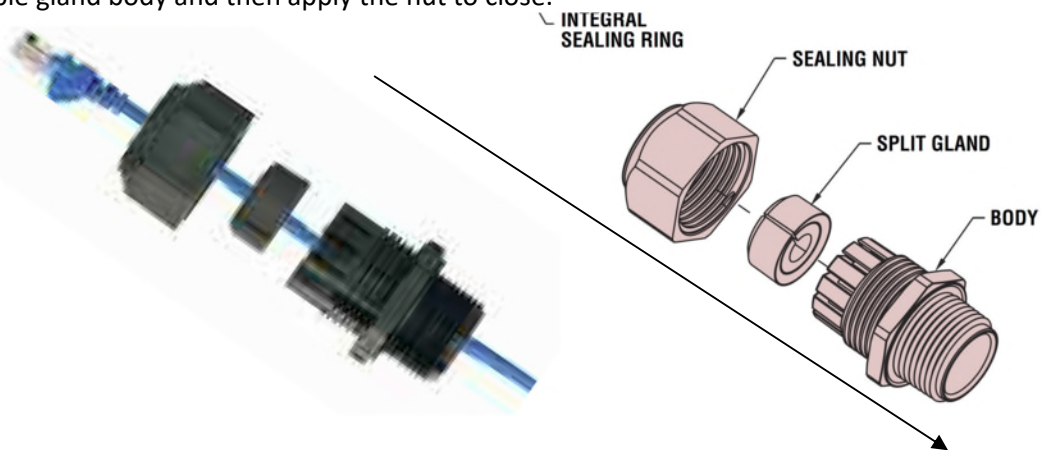
Caution: Properly sized cable must be applied for the optional Ethernet and Alarm wiring to maintain the Control Unit IP65 environmental protection.

Ethernet Cable: Apply a cable with an outside jacket diameter of .210 inch to .321 inch for proper seal. The Ethernet CAT-5x cable may be installed with the RJ45 cable connector in place. Remove the cable gland sealing nut, gland, and seal plug.



Caution: Apply provided Cable Grease to the portion of the Ethernet cable inside the cable gland seal to maintain the Control Unit IP65 environmental protection.

Insert Ethernet cable connector through the seal nut, into the cable gland body and inside of the Control Unit. Make the Ethernet connection inside the Control Unit. Slip the Split Gland over the cable between the nut and the cable gland body. Slide the split gland up the cable into the cable gland body and then apply the nut to close.



Note: Cable enters opposite of picture

Connector direction into Control Unit

Alarm Cable: Apply a cable with an outside jacket diameter of .181 inch to .312 inch for proper seal. Loosen Cable gland nut and insert cable through the gland into the enclosure.



Caution: Apply the provided Cable Grease to the portion of the Alarm cable inside the cable gland seal to maintain the Control Unit IP65 environmental protection.

Tighten cable gland sealing nut until cable will not move inside of gland.

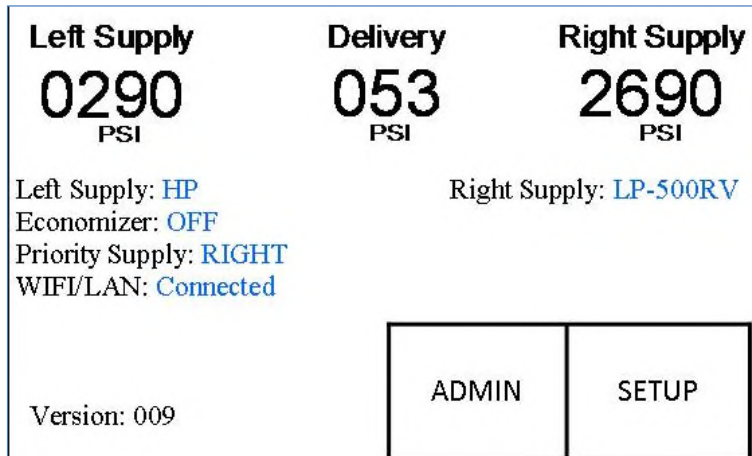
Refer to “Control Unit Alarm Output wiring” for connection details.

Initial System Startup

1. Apply Manifold and signal connections prior to applying AC power.
2. Open Controller cover by unlatching cover latches.
3. Plug controller power cable into an approved 115 VAC outlet.
4. The Logo screen will appear, and all indicators will light for function test.
5. Wait for home screen to appear, all indicators will light for light test.

Home Screen:

The home screen is the default screen setting and will host a snapshot of various settings.



Home Screen Displays:

- Delivery Pressure: Displays the final line pressure
- Left Supply Source: Either HP (high-pressure) or LP (low-pressure source with a choice of relief valve setting)
- Right Supply Source: Either HP (high-pressure) or LP (low-pressure source with a choice of relief valve setting)
- Economizer setting: Either ON or OFF depending on the supply source selected (Will not be active if 'ON' unless at least one low-pressure supply source has been selected in the SET UP screen)
- Priority setting: Either LEFT, RIGHT, or NONE (Usually in the NONE position unless using the hybrid configuration)
- Wi-Fi/LAN: Shows if the WI-FI/LAN is properly configured and is connected to internet
- Admin button: ***For Factory use only***
- SETUP: Select the setup button on the home screen

SETUP Screen

- 1) Select SETUP button on the home screen

1	2	3
4	5	6
7	8	9
*	0	#

Enter Password

New Password

Change Password

CANCEL ENTER

1. Touch "Enter Password"
2. Enter Password (Default 996633), touch "ENTER" to gain access to the SETUP screen.

*Now displaying SETUP screen

Note: To modify default password, touch 'New Password' after entering default password

1. Enter NEW password (i.e., 12345)
2. Select 'Change Password,' and then a message will appear saying that password change is CORRECT.
3. Touch "ENTER"

Note: Default Password can be used to override modified password.

*Now displaying SETUP screen:

Economizer	ON	<input type="radio"/> Alarm Mode 1
Priority	NONE	<input type="radio"/> Alarm Mode 2
Switchover		
Cylinders		
		Cancel Save

Selecting Inlet Supply Type:

*Factory default is High Pressure x High Pressure

Note: Select either High Pressure Cylinders (Compressed Gas) or Low-Pressure Dewar (Gas Phase from Liquid Cylinder) for each supply side.

When selecting the low-pressure option, select the appropriate relief valve setting for the corresponding cylinder supply. Each supply side must have the same type of cylinders but may have independent types on the Left and right.

1. Select the "Cylinders" option on SETUP Screen
2. Select "Right Supply Cylinder" setting.
3. Choose cylinder type.
4. Select "Left Supply Cylinder" setting.
5. Choose cylinder type.
6. Press "Save" and return to SETUP screen.

Left Supply Cylinder	Right Supply Cylinder
High Pressure Cylinder	Dewar 350 PSI Relief Valve
Dewar 230 PSI Relief Valve	Dewar 500 PSI Relief Valve
<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

Setting Switchover Pressures:

*Factory default is 105

*Minimum pressure setting: 25 PSI

*Maximum pressure setting: 2000 PSI

Left and right supply switchover can be set independent pressures.

- 1) Select "Switchover: from SETUP Screen"
- 2) Select "Right Supply Switchover Setting"
- 3) View factory setting or touch "Change."
- 4) Enter pressure setting & touch "Change."
- 5) Select "Left Supply Switchover Setting"
- 6) Repeat steps 2 through 4
- 7) Once both sides have been setup, touch "SAVE."

Left Supply Switchover	Right Supply Switchover
0 2 0 5	<input type="button" value="▲"/> PSI <input type="button" value="▼"/>
<input type="button" value="View Current"/> <input type="button" value="Change"/>	
<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

Setting a Priority:

* Factory default is none

1. Priority has three settings (LEFT, RIGHT, or NONE) that can be changed by pressing 'Priority' which will cycle through the options.
2. Do Not press "Save."

Economizer	ON	<input type="radio"/> Alarm Mode 1
Priority	NONE	<input checked="" type="radio"/> Alarm Mode 2
Switchover		
Cylinders	<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

Turning Economizer “ON” or “OFF”

* Factory default is OFF

1. Economizer has two settings (ON, OFF) that can be changed by pressing “Economizer” and cycling through the option.
2. Do Not press “SAVE.”

* Will not be active if ‘ON’ unless at least one of the low-pressure supply sources has been selected in the SET UP screen

Selecting Alarm Mode:

Alarm Mode 1 provides an alarm active condition on the LEFT alarm when either the Left or Right supply is low or empty. The RIGHT alarm will activate if both the LEFT and RIGHT supplies are low or empty.

Alarm Mode 2 provides an active condition for the LEFT and RIGHT supply respectfully when the corresponding supply is empty or low.

*Factory default is Alarm Mode 1

1. Press the Alarm Mode 1 or Alarm Mode 2 round button to set the Alarm Mode wanted.
2. Press “SAVE” to save the settings and exit to the Home Screen.
3. Press “RESET” button to apply Alarm Mode change.

SETUP is complete and the system is now ready for operation.

*If using remote alarms see “Control Unit Alarm Output Wiring” Section for connection details.

Decrease Delivery Pressure:

Use regulator outlet isolation valve to isolate 1 regulator outlet pressure while decreasing the pressure on the other (turn T-handle counterclockwise). Once each regulator has been adjusted, open the second outlet isolation valve allowing flow capability from both left and right regulator.

Leak Testing:

When using a liquid leak test solution is used, caution should be used to ensure liquid does not come in contact with the electrical connections. Only approved solution should be used.

1. Shut off pipeline flow at control outlet
2. Shutoff supply inlets
3. Apply leak test solution to joints and fittings and monitor for bubbles
4. If leak is detected, relieve pressure before repair

Trouble Shooting:

Symptom	Comments	Action
No Display or LEDs on controller	<ul style="list-style-type: none"> •No power to unit •Blown fuse •Display PC board failure •Control internal power failure 	<ul style="list-style-type: none"> •Check power source •Check fuse F1 •Contact Ohio Medical
Manifold Blue LED OFF	<ul style="list-style-type: none"> •No power to unit •Blown Fuse •Manifold Wiring 	<ul style="list-style-type: none"> •Check power source •Check fuse F2 •Inspect Manifold J1/P1 cable for damage. (Disconnect P1 from J1 and see if LED comes on) •Inspect manifold terminal blocks and internal connections for damage. •Inspect alarm wiring connected to TB3, disconnect alarm wires if suspect.
No Power in mechanical enclose to solenoids or transducers	<ul style="list-style-type: none"> •Power lost from controller •Loose connections at J1 and controller •Loose connection in mechanical enclosure •Broken Interconnecting cable 	<ul style="list-style-type: none"> •Check Manifold Blue LED is on •Check interconnecting cable for secured connection •Check mechanical enclosure TB2 & TB3 connection •Check cable run for continuity •Replace interconnecting cable
Leak LED ON	Leak is detected	<ul style="list-style-type: none"> •Depressurize unit, repair, and clear leak condition by pushing "RESET" button
Error message on pressure readings	Bad signal from transducer	<ul style="list-style-type: none"> •Check transducer wiring, push "RESET" button to reinitiate controller •Replace transducer
Pressure Reading on inlet pressure display but 0 on delivery	<ul style="list-style-type: none"> •Regulator inlet shutoff valve closed •Regulators are not adjusted 	<ul style="list-style-type: none"> •Open regulator inlet valves •Adjust delivery regulator
Delivery pressure starts to drop before switching over to the reserve supply	<ul style="list-style-type: none"> •Too high of flow for switchover point •Too high of flow rate for liquid dewar 	<ul style="list-style-type: none"> •Increase switchover point to a higher setting •Add additional supply
Gas escaping out the intermediate relief valve port	<ul style="list-style-type: none"> •Intermediate regulator has a creep condition •Inlet regulator relief valve is bad 	<ul style="list-style-type: none"> •Replace regulator •Replace relief valve

Control Unit to Manifold Cabling

The manifold is connected to the Control Unit by the J1 connector and cable. Internal to the manifold enclosure the cable wiring is terminated into a terminal block to provide power and signal connections to the manifold components. Refer to Manifold Wiring for details.

J1 Cable Wiring

J1 Pin Number	Wire Color	Signal Name
1	Red	+12VDC - Fused by control Unit Fuse F2
2	Black	Ground
3	Orange	Valve 1 Control (Left Supply)
4	Green	Valve 2 Control (Right Supply)
5	Yellow	Transducer 1 +Out (Left supply, Input to Control Unit)
6	Blue	Transducer 2 +Out (Right supply, Input to Control Unit)
7	Brown	Transducer 3 +Out (Delivery, Input to Control Unit)
8	White	Transducer Ground
9	X	Not applied

Control Unit to Manifold Wiring

J1 Pin	Wire Color	TB2 Position	Signal	Application
1	RED	1	+12V Fused – F2	Manifold Transducer Power, Blue Indicator
2	BLK	2	Ground	Manifold Value Ground Return
5	YEL	3	Transducer 1	Manifold Left Supply Pressure
6	BLU	4	Transducer 2	Manifold Right Supply Pressure
7	BRN	5	Transducer 3	Manifold Delivery Pressure
8	WHT	6	Transducer Ground	Pressure Transducer Ground Return
		TB3 Position		Control Board JP3 and JP4 are “Wet” Optioned to +12V.
		1-6	Alarm Wiring, See Alarm Charts	Not Applied for Valves
3	ORG	7	K3 – NO	Valve 1 Enable (Left Supply)
		8	K3 – COM	+12V (See alarm Charts)
		9	K3 – NC	Option signal
4	GRN	10	K4 – NO	Valve 2 Enable (Right Supply)
		11	K4 – COM	+12V (See alarm Charts)
		12	K4 – NC	Option signal

Control Unit Alarm Output Wiring

Control Unit provides two dry contact form C relays for alarm wiring. The Alarm relays operate in two modes (See SETUP Screen). Alert messages may also be sent if control unit communication is provided. Standard connections shown, other connection options are possible to provide alarm indications.

Mode 1 Alarm Operation

Alarm Mode 1 provides an either supply is empty indication on the LEFT (K1) relay and a both supplies are empty indication on the RIGHT (K2) relay.

TB2	Relay	Application
1	K1 – NO	K1 active, One of the supplies is empty
2	K1 – COM	K1 Common connection
3	K1 – NC	K1 idle, No supply is empty.
4	K2 – NO	K2 active, Both supplies are empty.
5	K2 – COM	K2 Common connection
6	K2 – NC	K2 idle, Both supplies are not empty. Note that K1 will indicate if one of the supplies is empty.

Mode 2 Alarm Operation

Alarm Mode 2 provides an alarm indication for the respective empty supply.

TB2	Relay	Application
1	K1 – NO	K1 active, Left side supply is empty.
2	K1 – COM	K1 Common connection
3	K1 – NC	K1 idle, Left side supply is not empty.
4	K2 – NO	K2 active, Right-side supply is empty.
5	K2 – COM	K2 Common connection
6	K2 – NC	K2 idle, right-side supply is not empty.

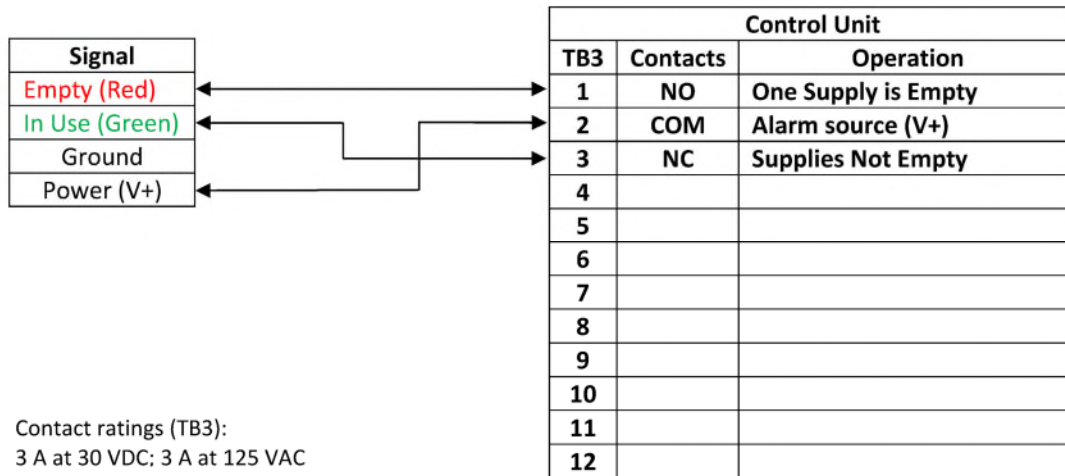
Notes:

- 1) External alarm panel provides necessary signals to detect Alarm conditions.
- 2) Arrows in diagram only for representation of a connection.
- 3) Source connection will be switched to Empty or Not Empty connection.
- 4) Maximum Switching current for each connection is 3 Amps at 30 VDC: 3 Amps at 125 VAC.

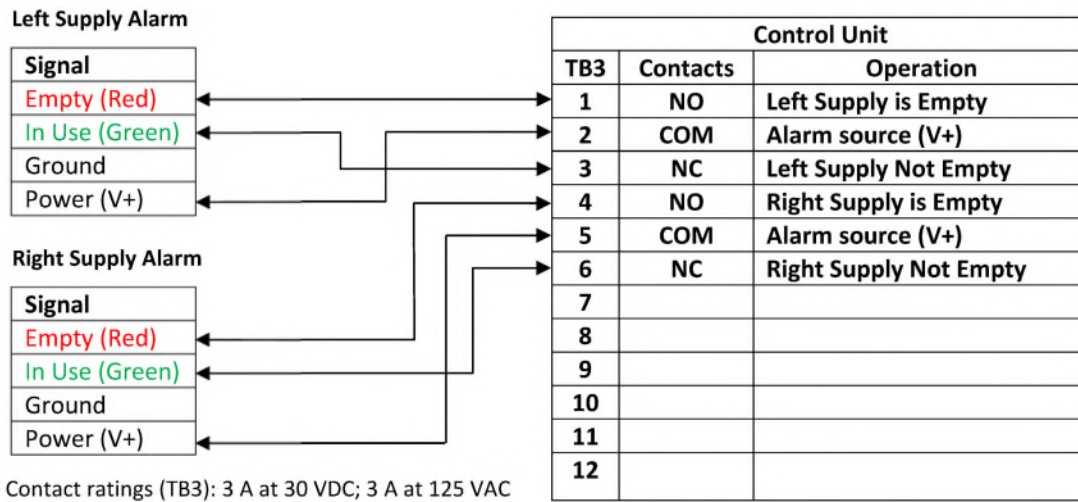
WARNING – Do not exceed the power rating or these contacts will be damaged or destroyed

Single Bank Alarm Connections using Alarm Mode 1 & Mode 2

Mode 1: Primary to Secondary Switchover Signal

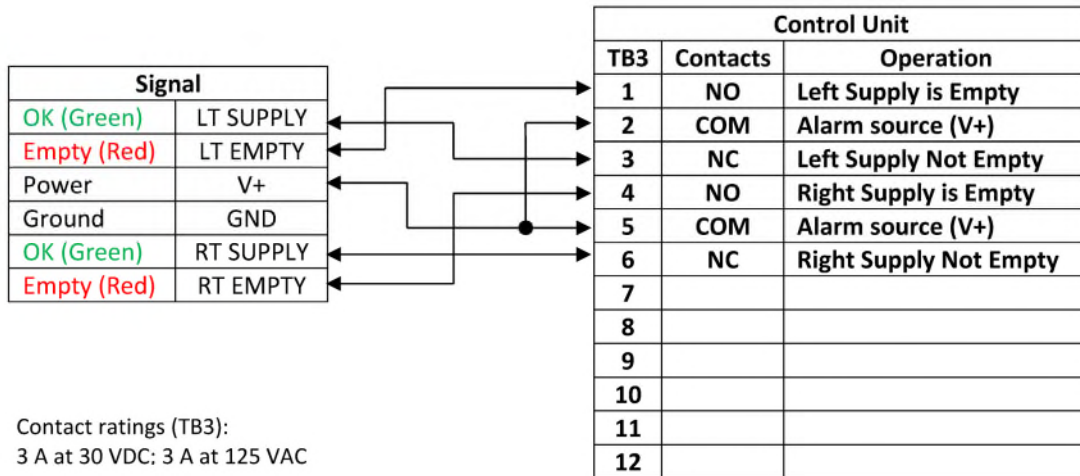


Mode 2: Single Bank Alarms for Independent Left and Right Signals



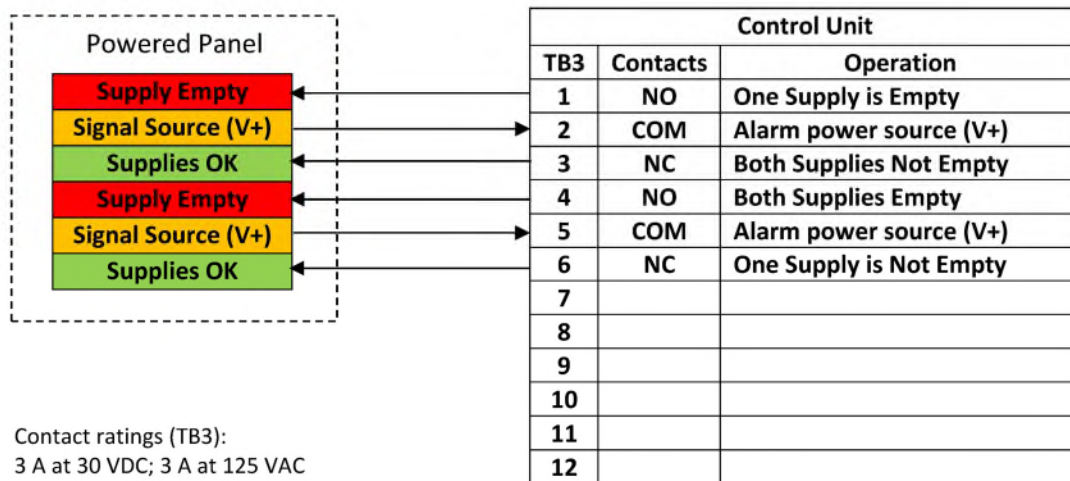
Dual Bank Alarm Connections for Alarm Mode 2

Mode 2: Independent Left or Right Empty Signal

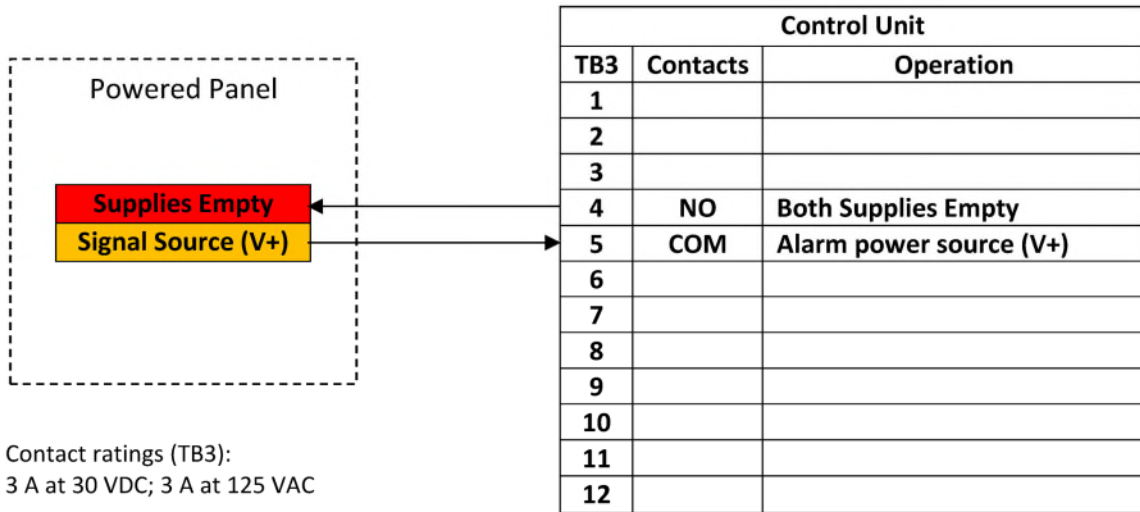


Master Alarm Connections for Alarm Mode 1

Mode 1: Primary to Secondary Switchover and Emergency Reserve In-Use Signals



Mode 1: Emergency Reserve In-Use only Signal

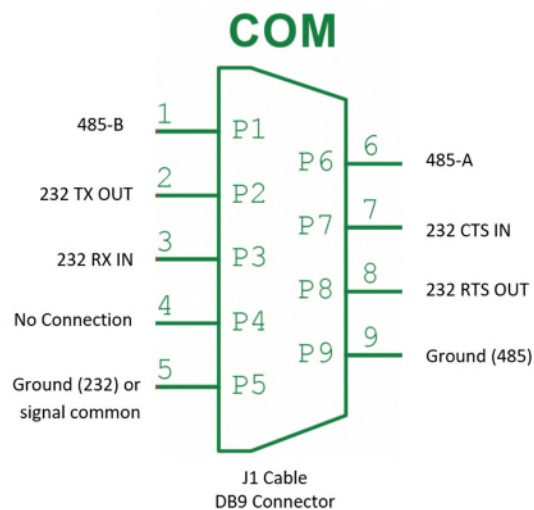


Control Unit COM Connection

The Controller COM port connection provides a RS/IEA 232 level Serial port by default and optional RS/IEA 485 or CAN port media connection options (contact Factory to apply optional media).

Connection is compliant for a serial COM port application on a Personal Computer or same.

Connections:



Control Unit Specifications

Cabinet:	8.6-inch-Long x 6.3-inch-Wide x 3.94-inch High (w/o wall mounts) UL-508 / UL-94V5A
Weight:	3.5lb standard configuration
Wall Mount Hole Dimensions:	6-5/16-inch square pattern, #8 or #10 size Screws.
Environment:	-20C (-4F) to +50C (+122F), IP-65 water resist.
Flame Rating:	UL-94V5A
Power Application:	
US Cordage:	6ft 3x18GA SJT, 125V 10A, 60C, UL-94V0, standard NEMA 5-15P plug.
Input:	85-264VAC, 0.7A, Internally Fused
Ratings:	UL-508, UL-60950-1, FCC-Class B
Power Output:	
Control Unit:	12VDC 4.3A (50W) Available
Fuse F1:	2Amp Mini-Blade, Control Unit internal circuits and display. Replacement Fuse: Littelfuse #0297002-WXNV, Bussmann #ATM-2
Fuse F2:	3Amp Mini-Blade, Manifold Unit and Term Block wiring. Replacement Fuse: Littelfuse #0297003-WXNV, Bussmann #ATM-3
Pressure Reading:	+/- 0.75% Full Scale
Control Response Time:	2 seconds maximum (Pressure change to response)
Wi-Fi IEEE 802.11 b/g/n:	FCC ID = ESP8206MOD (2.4Ghz, +20dBm max)

Cautionary Note: This system is intended for use in industrial environments and has not been evaluated for emissions. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate prevention measures.



Warning: Keep Control Unit cover closed and latched at all times except for required access.



Warning: Do Not Disassemble the Control Unit, no user adjustments or repairs possible.



Warning: Do not connect system cables, wires, or install connectors while Control Unit is plugged into AC Mains outlet or power is applied. Remove power from the Control Unit to adjust any system connection.



Warning: Do not remove and replace F1 or F2 fuses while the Control Unit is powered or plugged into AC mains outlet. Remove power from Control Unit prior to replacing fuses.



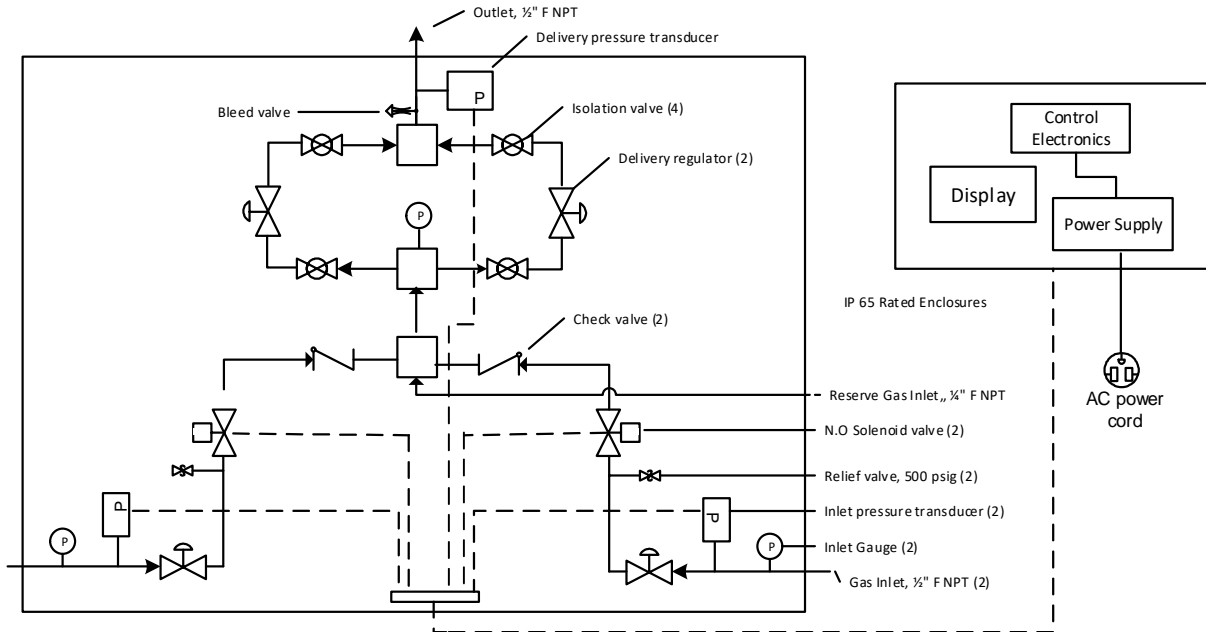
Warning: Remove power from Control Unit prior to any cable or wire connection adjustment in the Manifold.



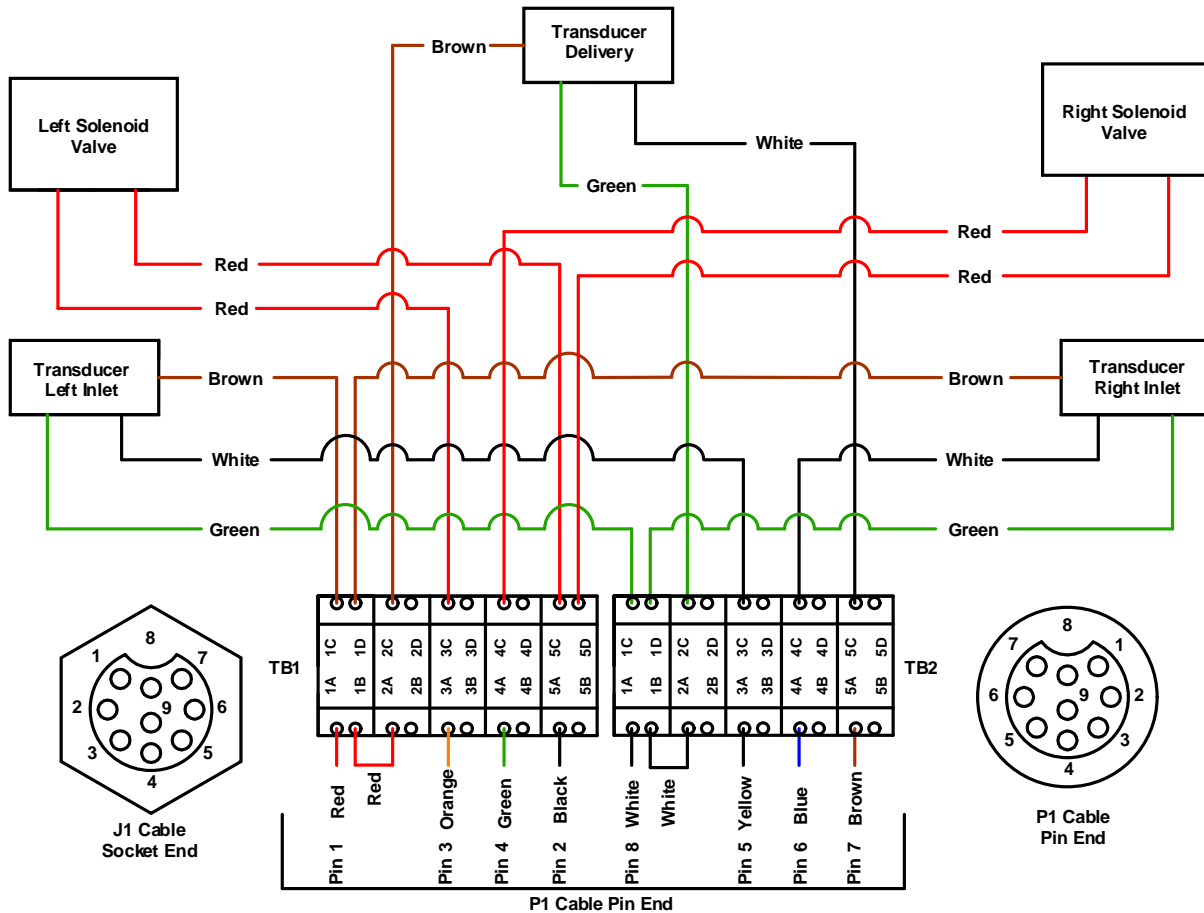
Warning: Any connection made to the system not specifically authorized by Ohio Medical may be hazardous to the user and / or void the equipment warranty. Contact Ohio Medical for information on any external connections not described in the user guide.

Notice: All repair services or replacement components must be purchased from Ohio Medical. Only personnel authorized by Ohio Medical in writing are authorized to service or maintain this system.

Manifold Cabinet Flow P&ID



Manifold Cabinet Wiring Diagram



Connecting to Wi-Fi/LAN

The Manifold Controller applies the USB port on the controller to provide Wireless Network configuration for all installations. A standard USB 2.0 compliant memory stick (Type A, FAT32 format) is required for support.

Wi-Fi Network Configuration

Step 1: Generate the Network password file

- A simple text file generated with Windows – Notepad editor software or other simple text editor software is needed to create the password file. Word processor software such as Microsoft Word, WordPad, or same will not work unless the file is saved in simple text (no formatting).
- Open a new TEXT file or the provided file named “_ACMCFG.cg2”
- **The first text line** in the file is the network name. This is the name of the network viewed when available networks are viewed from a PC or smart phone. Example: Mynetwork
- **The second text line** is the password for the network named in the first line, followed by the Enter key.
- **Third Line** is for cursor position only before saving. (Nothing entered below this line)

Example of provided file, “_ACMCFG.cg2” file contents:

Mynetwork	Line 1: Network Name
Mypassword	Line 2: Your network password
_	Line 3: Cursor position before saving

- Save the file as “_ACMCFG.cg2” (no .txt extension) and copy the file to the USB memory stick.

Step 2: Update the Manifold Controller Network settings

- Manifold Controller is powered and operating.
- Open the cover and install the USB memory stick into the Controller USB port.
- Press and release the RESET button above the USB port next to the display.
- The controller provides status indications with the colored indicators, the graphic display will not be operating.

Status Indications

Step	Indication	Comment
Detect USB drive	RED RED	USB drive is found, searching for files
File found	YELLOW YELLOW	File is being read and saved in memory
Operation successful	GREEN GREEN	File has been saved ok.
Operation Failed	Flashing RED RED	File not found or USB drive not readable

- Remove the USB memory stick from the Controller and press the RESET button to start normal operation.
- Note that a successful operation may not provide a valid network connection when the controller resumes normal operation if an error was made in the configuration file, or the controller is not in range of the network. The display screen will indicate no network connection in these situations.
- If the operation is unsuccessful with flashing RED indicators, review the file on the USB memory to verify correct names. Try a different or empty USB flash drive with only the configuration file present.

Firmware Updates

Any updates release will be available to all authorized users of the Ohio Medical Hybrid Manifold Controller. For registered users, request updates availability by contacting customer service at 847-855-6234

Connecting to Wi-Fi/LAN

Contact Ohio Medical customer service at 847-855-6234 for additional instructions or if a Mac address is required for network connection.

Data Monitoring Website

Contact Ohio Medical customer service for instructions at [847-855-6234](tel:847-855-6234)

Email and text alerts

Once registered on the Data Monitoring website, you can configure Email and Text Alerts messages.

OHIO MEDICAL
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Website: www.ohiomedicalparts.com