

VANGUARD "A" EZ INSTALL OPERATOR'S MANUAL

Please read this manual carefully before operating the Vanguard Manifold System.

Remove product from package and inspect for damage. If there is any damage, do not use (Contact your dealer.). Complete Warranty Card and return to Porter.

To assure safe operation and conformation to local fire codes, all Porter Instrument Manifold Systems are designed to be used with sedation delivery systems mounted inside walls and they meet or exceed the guidelines established by the National Fire Protection Association for Nonflammable Medical Gas Systems, NFPA 99. Copies of NFPA 99 or portions thereof may be obtained by writing to:

National Fire Protection Association
Batterymarch Park
Quincy, MA 02269-9904
Or call: 1-800-344-3555

These warnings and precautions are to help you to understand how to safely operate or troubleshoot the Porter Vanguard A Manifold System. A **WARNING** alerts you to a possible hazard to people. A **CAUTION** alerts you to the possibility of equipment damage.



WARNING

Dental workers are exposed to N₂O during administration of N₂O / O₂ conscious sedation analgesia. NIOSH has recommended that exposures should be minimized. Contact NIOSH (1-800-35-NIOSH) to receive NIOSH Publications on *Control of Nitrous Oxide in Dental Operatories*. Exposure can be minimized by effective controls. National Institute for Occupational Safety and Health (NIOSH) publications state that controls, including System Maintenance, Ventilation and Work Practices can effectively reduce N₂O concentrations in dental operations. Your Porter Scavenger System is an important part of the system of controls.

CAUTIONS

Static Damage Hazard: Computer and other electronic components can be permanently damaged by static electric discharge. Use caution when working with the molded manifold cover off, especially in the area of the RESET1 button.

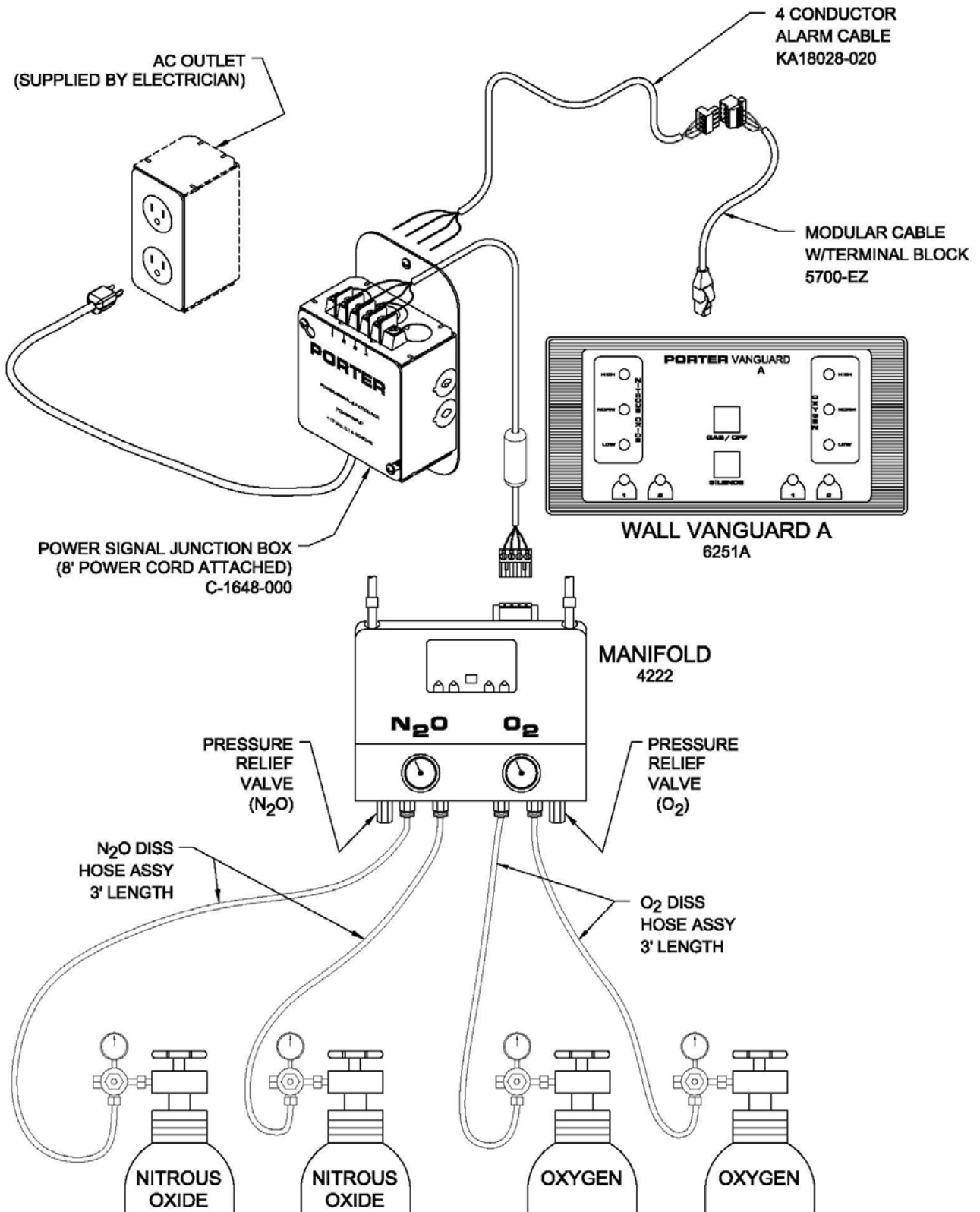
Use no Oil: Never use oils, greases, organic lubricants or any combustible materials on or near this product.

Power Outage: During any power outage, remember to turn **OFF** the flowmeter and manually turn **OFF** the tank valves. When the power is restored, the Vanguard will come back to its status prior to the power outage. If gas was flowing when the power went out, gas will be flowing when the power is restored.

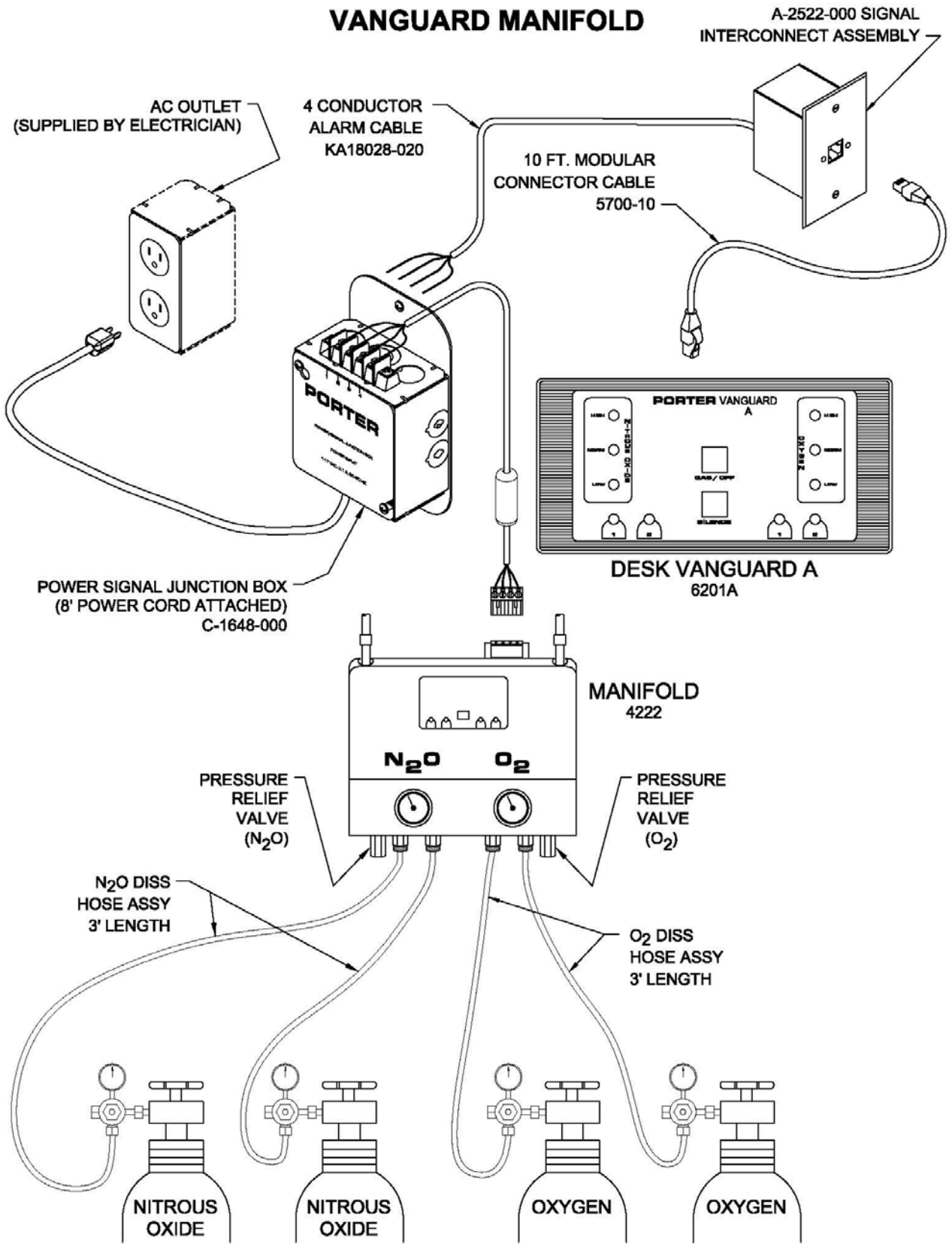
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4222 EZ INSTALL WALL MOUNT VANGUARD MANIFOLD



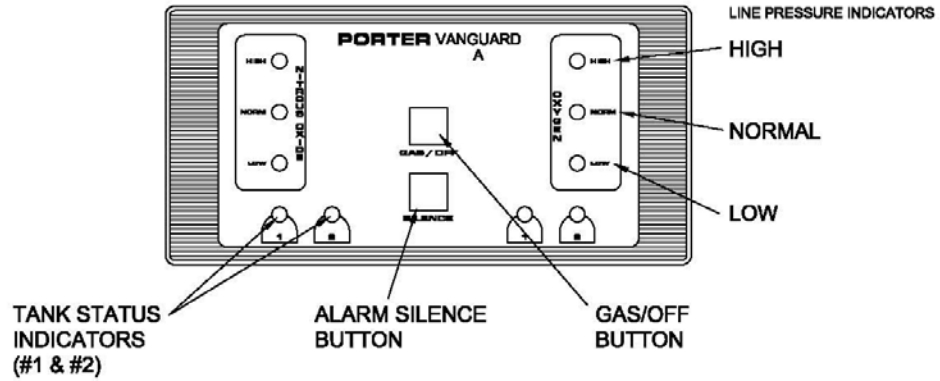
4222 EZ INSTALL DESK MODEL VANGUARD MANIFOLD



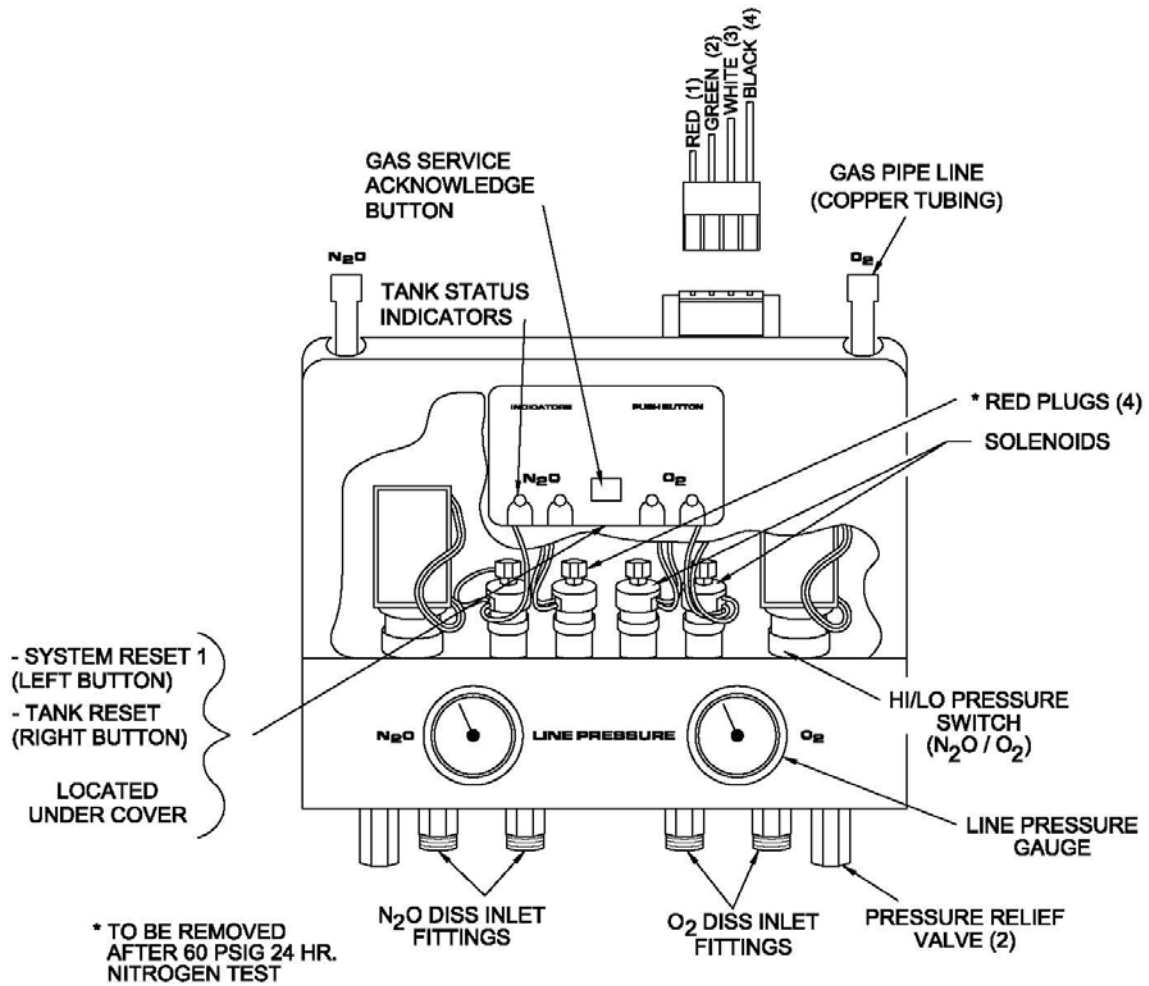
VANGUARD A ALARM

Stock Number 6251A
(WALL)

Stock Number 6201A
(DESK)



4222 EZ INSTALL VANGUARD MANIFOLD



PORTER 4222 AUTOMATIC CHANGEOVER MANIFOLD SYSTEM

The system that monitors and switches to your reserve tank when your primary tank is empty, all of which is accomplished **automatically** with only the gas serviceman maintaining the gas supply and tank status light entry condition by pushing the gas service acknowledge button located on the manifold.

IMPORTANT FEATURES TO KNOW ABOUT THE PORTER AUTOMATIC CHANGEOVER MANIFOLD

HOW THE SYSTEM OPERATES

Make sure oxygen and nitrous oxide tanks are hooked-up and turned ON. Regulators must be set at 50 PSIG regulated pressure to insure normal operation.

At alarm station PUSH (GAS / OFF) button to start up system.

The alarm should indicate **normal line pressure** condition lights and the tank status light should lock on tank position **1** or **2** after a few seconds.

NOTE: It is important to know that on **initial start-up** of your manifold system, when there is no pressure in the lines, it may require the **service acknowledge button** on the manifold to be depressed several times to allow the manifold to switch back and forth between tanks to **initially fill** piping system to the **50 PSIG** level.

If pressure in the system is at **40 PSIG** or below, the alarm will indicate a low-pressure light and audible tone.

If a reserve tank is available, the manifold will switch over automatically after 10-20 seconds of **low** status to the reserve tank. The low-pressure light and audible tone will change to the normal light when the pressure reaches the safety zone. Normal line pressure is 50 PSIG (gauge observable on the manifold).

The tank that is now **empty** and off-line will indicate a flashing light signal at the alarm and manifold. This condition will remain until the **service acknowledge button** on manifold is depressed to turn OFF flashing signal.

This should be done only when the gas supply is replenished by the gas service man. System must be ON to reset tank at **service acknowledge button**.

Now your tank status lights should indicate one light **ON** and one light **OFF** indicating primary tank is in use and reserve tank is available for back-up.

FAILSAFE IN MANIFOLD

The 4222 manifold has a built-in **failsafe feature**. For your patients' safety, the manifold will not deliver nitrous oxide through to the piping system if oxygen supply pressure is depleted or turned off.

WIRING IN MANIFOLD SYSTEM

The alarm connection to the system is accomplished by either a two foot length modular male connector cable that connects to a plug-in terminal block, for the Wall Mount version, or a ten foot length modular male connector cable that connects to the signal interconnect assembly, for the Desk Mount version. From this point through to the manifold, all connections for transferring DC power and signal is carried through the four-conductor alarm cable.

The colored wires in the alarm cable must terminate to the same terminal throughout the system.

- Terminal 1 (Red) carries DC power to system.
- Terminals 2 (Green) and 3 (White) carry signal for changeover.
- Terminal 4 (Black) is a power ground.
- Voltage reading (12 Vdc \pm 2 Vdc) should be taken with voltmeter negative (-) on #4 (Black) ground, voltmeter positive (+) on #1 (Red).
- Voltage at terminal 2 (Green) is nominally +1.5 Vdc and at terminal 3 (White) is nominally +0.4 Vdc.

SHUT-OFF OPERATON

Depress the OFF button. Alarm beeps **3** times and all lights flash before shutting down.

SILENCE BUTTON

The silence button is used to turn OFF the audible alarm condition.

NORMAL OPERATION INDICATIONS FOR ALARM STATION

1. The yellow LED flashing and one short beep indicates that the oxygen or nitrous oxide line pressure(s) is below 40 PSIG.
2. The red LED flashing and two short beeps indicate that the oxygen or nitrous oxide line pressure(s) is above 60 PSIG.
3. Four beeps indicate that the system has a hardware problem, usually signifying that a pressure switch has failed.
4. Five beeps indicate that the alarm has lost communications with the manifold and that the alarm is no longer indicating the status of the oxygen and nitrous oxide tanks.
5. The green LED light indicates that the line pressure is at normal pressure.

FUNCTION TESTING CHANGEOVER MANIFOLD

Initial Start-up and Testing Procedure

1. Make sure oxygen and nitrous oxide tanks are hooked up and turned ON. Regulators must be set at **50 PSIG** regulated pressure to insure normal operation.
2. At Alarm Station – PUSH – (GAS / OFF) button to start up system.
3. The alarm should indicate **normal line pressure** condition lights and the tank status light should lock on tank position **1** or **2**.

NOTE: It is important to know that on **initial start-up** of your manifold system, when there is no pressure in the lines, it may require the **service acknowledge button** on the manifold to be depressed several times to allow the manifold to switch back and forth between tanks to **initially fill** piping system to the **50 PSIG** level.

4. Now that the piping system is filled and the manifold has conducted its initial start-up function, it must be checked for its automatic changeover capability.

5. Steps to Check Tank Switching Process

- 5.1. Turn down set pressure on primary tank regulator to **35 PSIG** (note how much of a turn is made on regulator adjusting stem) while bleeding down system pressure through dental meter at **5 L/min** rate of flow.
- 5.2. At **40 PSIG** the manifold will announce an audible and visual alarm condition for **10 to 20** seconds and switch to **reserve** tank. The manifold will shut the primary solenoid and open the reserve solenoid, which will deliver gas at 50 PSIG and signal the normal light. After changeover has occurred, reset regulator on Tank #1 to original condition position 50 PSIG.
- 5.3. Manifold display panel and alarm will show a **blinking light** at the primary tank location.
- 5.4. Push **service acknowledge button** on manifold to turn OFF blinking light at **Tank 1** location.
- 5.5. Reverse the procedure to switch back to Tank #1. Turn down pressure to **35 PSIG** on **reserve** regulator while continuing to flow gas at 5 L/min downstream at a dental meter. Manifold will again announce alarm condition and switch back to **primary** tank. Reset Tank #2 regulator back to 50 PSIG setting.
- 5.6. Push **service acknowledge button** on manifold to turn OFF blinking light at **Tank 2** location.
- 5.7. Repeat this process for both oxygen and nitrous oxide.

TROUBLE SHOOTING

Symptom	Possible Cause / Remedy
1. Tanks will not changeover.	Defective pressure switch will not create a low-pressure signal to produce changeover response.
2. Tanks change over before tanks are empty.	This may result from piping system having a leak and bleeding down pressure over night. Tank pressure will remain the same due to the manifold and alarm system being turned OFF and holding cylinder pressure stable. Inspect line pressure in the morning for setting to remain between 45 to 55 PSIG.
3. System has no lights.	Remove cover on Power/Signal Junction Assembly (Refer to page 4) and check if Red LED indicator is on to show power supply is working. Defective OFF / Button, or electronics. Contact Porter for further assistance.
4. Tanks change over, but pressure does not come up to 50 PSIG.	Check regulator for correct pressure setting. DISS inlet fitting has a check valve stuck shut restricting pressure. Depress or hold service acknowledge button to fill system to bring up line pressure. Defective solenoid prevents pneumatic circuit from opening for delivering line pressure.
5. The yellow and red LEDs are <u>flashing</u> and the unit is beeping four beeps.	The pressure switch is defective on the gas for which the yellow and red LEDs are flashing. Replace the pressure switch.

CAUTION

Static Damage Hazard: Computer and other electronic components can be permanently damaged by static electric discharge. Use caution when working with the molded manifold cover off, especially in the area of the **RESET1** button.

6. Lights Flashing; locked into a random flashing pattern.	Caution, carefully depress Reset1 button only on manifold. (Refer "Caution" above and page 6.) Defective electronics or timing problem. Contact Porter for further assistance.
7. Alarm will not silence.	Caution, carefully depress Reset1 button only on manifold. (Refer to "Caution" above and page 6.) Defective electronics or timing problem. Contact Porter for further assistance.
8. Cannot turn OFF system	Caution, carefully depress Reset1 button only on manifold. (Refer to "Caution" above and page 6.)

WARRANTY

THIS WARRANTY IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

Under no circumstances shall Parker Hannifin Corporation be liable for incidental or consequential damages as those terms are defined in the uniform commercial code.

Parker Hannifin Corporation, Porter Instrument Division warrants that each product or part shall be free from defects in workmanship and materials, under normal use and with appropriate maintenance, for one (1) year from the date of delivery to customer unless otherwise specified in writing. All rubber and plastic parts and accessories are warranted under the same conditions for a period of ninety (90) days from date of purchase.

No statement or claim about the product by any employee, agent, representative, or dealer of Parker Hannifin Corporation shall constitute a warranty by Parker Hannifin Corporation or give to rise to any liability or obligation of Parker Hannifin Corporation.

Parker Hannifin Corporation shall not be liable for any damage, injury or loss arising out of the use of the product, whether as a result of a defect in the product or otherwise, if, prior to such damage, injury or loss, the product was (1) damaged or misused; (2) repaired, altered or modified by persons other than Parker Hannifin Corporation; (3) not installed in strict compliance with applicable codes and ordinances; or (4) not installed by an authorized Parker Hannifin Corporation dealer. Parker Hannifin Corporation's obligation for breach of this warranty, or for negligence or otherwise, shall be strictly and exclusively limited to the repair or replacement of the product or part. This warranty shall be void on any product on which the serial number has been altered, defaced or removed.

ORDERS All orders are to be made through authorized Parker Hannifin Corporation distributors. All billing will be done through said distributors. Direct orders will be handled through the authorized local dealer as determined by Parker Hannifin Corporation.

RETURNS No returns will be accepted unless authorized in writing by Porter Instrument Division, and accompanied by a properly completed return goods authorization. All returns are subject to a re-stocking and possible rework charges to be determined by Porter Instrument Division.

Policies subject to change without notice.