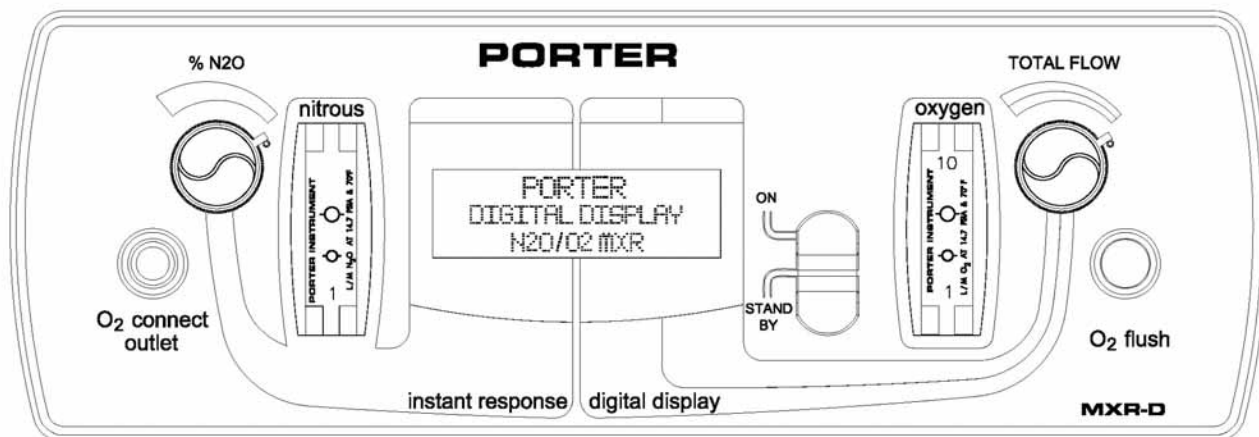




PORTER

Parker Hannifin Corporation
Porter Instrument Division
245 Township Line Rd.
P.O. Box 907
Hatfield, PA 19440-0907 USA
(215) 723-4000 / fax (215) 723-5106

DIGITAL MXR-D
Cabinet Mount Flowmeter
Component Diagram and Installation Instructions
MODEL 4065D



IMPORTANT:
READ MANUAL COMPLETELY BEFORE OPERATING THIS DEVICE

Basic delivery technique is described. Also, this manual contains instructions on periodically required checks to be performed by the user. These checks are necessary to insure the proper performance of this device and its safety features. Retain this manual for future reference.

CAUTION: Federal law (U.S.) requires this device for use by or on the order of a physician, dentist or licensed practitioner.

Date Purchased: _____

MXR-D Model No.: 4065D Serial Number: _____

Dealer Name: _____ Dealer Phone No.: _____



UL Classified to 60601-1: Medical Equipment with respect to electric shock, fire and mechanical hazard only in accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1-M90.

Symbol	Description
A circle containing a vertical line with three horizontal bars at the bottom, representing a ground connection.	Protective Earth Ground, Class I Device
A wavy line representing an alternating current waveform.	Alternating Current
A vertical line with three horizontal bars at the bottom, representing a ground connection.	Earth (Ground)
A triangle containing an exclamation mark.	Attention, consult the accompanying documents.
A stylized human figure.	Type B Equipment

- Distribution of Porter Model 4065D is limited and controlled to United States and Canada only.
- The Porter Model 4065D incorporates fusing only in the ungrounded phase conductor. **This product must not be used in countries other than the United States and Canada and must be used only in health care facilities on grounded systems where conditions of maintenance and supervision ensure that only qualified persons will service the electrical distribution system.**

For Technical Assistance, contact Dental Customer Service:
Parker Hannifin Corporation
Porter Instrument Division
245 Township Line Road
P. O. Box 907
Hatfield, PA 19440-0907 USA
Phone: 215-723-4000 Fax: 215-723-5106
Internet: www.porterinstrument.com

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TECHNICAL SPECIFICATIONS

Physical:

Dimensions: 12.6" W; 4.3" H; 3.9" D
Cut out hole: 11" x 3 5/8" ; Weight: 8 lbs.

Fittings:

Fresh Gas Outlet: 15mm ID x 22mm OD
(Diameter Index Safety System)
Nitrous Oxide Inlet: Male DISS (CGA # 1040A)
Oxygen Inlet: Male DISS (CGA # 1240) (Diameter Index Safety System)

Environmental:

Storage Temperature: -10°F to 150°F (Allow to stabilize to room temperature before operating.)
Operating Temperature: 60°F to 85°F
Humidity: Ambient, non-condensing

Gas Supply:

Oxygen Inlet

Pressure Requirements: 50 +/-10 PSIG
Flow Requirements: 30 L/min Minimum Flow

Note: A minimum Oxygen flow of 120 L/min is required when using the optional Demand Valve Resuscitator

Nitrous Oxide Inlet

Pressure Requirements: 50 +/-10 PSIG
Flow Requirements: 10 L/min Minimum Flow

Gas Delivery:

Oxygen Flush 35 L/min Minimum (50 PSIG input)
Minimum Nitrous Oxide Concentration: 0%
Maximum Nitrous Oxide Concentration: 70%
Minimum Oxygen Concentration: 30%
Maximum Oxygen Concentration: 100%
Flow Range at 100% Oxygen: 1 to 10 L/min
Total Flow Range at % Mixture: up to 12 L/min
(Low end flow limited by 1.0 L/min Oxygen limit.
Accuracy: ± 0.5 L/M Oxygen flow and ± 0.5 L/M Nitrous Oxide flow.

Electrical Power Supplies:

Wall Plug-in:

Input: 115 Vac, 60 Hz, 0.1A Max
(Unit is for 115 Vac use only.)

Output: 12Vdc / 0.3A Max.

The Branch Circuit breaker is the main disconnect.

In Wall Junction Box:

Input: 115 Vac, 60 Hz, 0.1A Max.
Output: 12 Vdc / 0.4A Max.

The main 110 Vac Branch connection is to be wired per NEC and local electrical codes. The branch circuit breaker is the main disconnect. Porter recommends the following: 15A UL circuit breaker two-wire with ground.

TANK REGULATOR SPECIFICATIONS

Oxygen Regulator

Use Porter O₂ Regulator part number 7000-2 or the Oxygen tank regulator should have the following specifications:

- Regulator should be pre-set at 50 PSIG $\pm$ 2 PSIG (static)
- Inlet fitting per CGA 540
- Outlet fitting per O₂ DISS
- 10 micron filter on inlet
- Self-resetting safety relief valve pre-set to 100 $\pm$ 10 PSIG
- 0-4000 PSIG color coded pressure gage
- Maximum flow capacity of no less than 150 LPM
- Droop shall be a maximum change in regulated pressure of 8% from 0-150 LPM when supply is 2000 PSIG.
- Regulation of the supply pressure should not change by more than 4% of set pressure at a flow of 75 LPM.
- UL Listed
- Installation shall conform to local codes with respect to pressure relief.

Nitrous Oxide Regulator

Use Porter N₂O Regulator part number 7500-2 or the Nitrous Oxide tank regulator should have the following specifications:

- Regulator should be pre-set at 50 PSIG $\pm$ 2 PSIG (static)
- Inlet fitting per CGA 326
- Outlet fitting per N₂O DISS
- 10 micron filter on inlet
- Self-resetting safety relief valve pre-set to 100 $\pm$ 10 PSIG
- 0-1500 PSIG color coded pressure gage
- Maximum flow capacity of no less than 100 LPM
- Droop shall be a maximum change in regulated pressure of 8% from 0-150 LPM when supply is 800 PSIG.
- Regulation of the supply pressure should not change by more than 4% of set pressure at a flow of 75 LPM.
- UL Listed
- Installation shall conform to local codes with respect to pressure relief.

UL CLASSIFICATION

The Porter Digital MXR-D is UL Classified 82AN: Medical Equipment with respect to electric shock, fire and mechanical hazard only in accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1.UL. The system consists of the Digital MXR-D and Power Supply.

The following are UL classifications for the Porter Digital MXR-D:

1. Is not intended to be used with or in the presence of flammable anesthetic mixtures.
2. Is classified as ordinary equipment and is designed for continuous operation.
3. Has safety protection provided in the equipment. If the equipment is tampered with or used in a manner not specified in this manual the safety protection provided by the equipment might be impaired.

The Porter Digital MXR-D is designed to be used in normal environmental conditions:

1. Indoor use
2. Altitude up to 8000 feet (2,438 meters)
3. Temperature from 5°C to 40°C
4. Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
5. Mains supply voltage fluctuations up to +/- 10% of the nominal voltage
6. Transient over voltages typically present on mains supply
7. Normal pollution degree

The Porter Digital MXR-D controls both Oxygen (O₂) and Nitrous Oxide (N₂O). Both gases could be present in an over pressure event that requires the manifold system to have a safety relief valve to function.

Maximum system pressure is not to exceed 60 PSIG.

Product was tested for Electromagnetic Immunity per IEC 61000-4-3.



WARNINGS AND PRECAUTIONS

These warnings and precautions are to help you to understand how to safely operate the MXR Flowmeter. A **WARNING** alerts you to a possible hazard to people. A **CAUTION** alerts you to the possibility of equipment damage.

WARNING: Do not use this device for the administration of general anesthesia or as a part of, or in conjunction with, a general anesthesia administration system.

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 flowmeter accessory Porter scavenger system is an important part of the system of controls.

WARNING: Porter Instrument equipment utilizes the **cross+protection** system. The flexible hose and connectors that connect to the flowmeter are diameter indexed; 3/8" O.D. for Nitrous Oxide and 1/2" for Oxygen. The **cross+protection** system is designed to prevent misconnection of Oxygen and Nitrous Oxide piping. **DO NOT ATTEMPT TO CHANGE THE DIAMETERS OR CONNECTORS OF THE FLOWMETER!** Tampering with the **cross+protection** system constitutes acceptance of liability by the installer. For your own protection, as well as that of the Doctor and the patients, use 3/8" O.D. tubing for all Nitrous Oxide lines and 1/2" O.D. tubing for all Oxygen lines.

To assure safe operation and conformation to local fire codes, all Porter Instrument flowmeter 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

WARNING: New or modified installations - **properly connected gas pipelines are absolutely essential to patient safety.** The dealer or contractor should provide written documentation that all gas pipelines are connected properly and that the system has been pressure tested prior to use. While this is a good business practice, it is important that the user verify by their own test, independent of the dealer or contractor, that all gas pipelines are connected correctly prior to using the system. **The ultimate responsibility of assuring that lines are not crossed rests with the user.**

WARNING: Do not use an electrical cord with nicks, cuts, or other damage. Do not use the unit with an extension cord as it will be subject to electromagnetic interference (EMI).

WARNING: During any extended power outage, remember to turn the On / Standby (Off) switch to the STANDBY position on the flowmeter and manually turn OFF the tank valves. With centralized, electrically powered gas systems, if gas was flowing when the power went out and the flowmeter is left ON, gas will be flowing when the power is restored.

CAUTION: Federal law (U.S.) restricts this device for use by or on the order of a physician, dentist or licensed practitioner.

CAUTION: Always use clean, dry medical grade gases. Introduction of moisture or other contaminants into this device may result in defective operation.

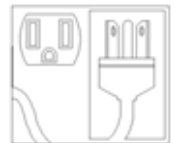
CAUTION: Do not attempt to repair, alter or calibrate this device. Unauthorized repair, alteration or misuse of this device is likely to adversely affect the performance and will void the warranty.

CAUTION: Never oil or grease any part of this system (minimize fire or explosion potential).

CAUTION: There are no user-serviceable parts inside this unit. A shock hazard exists if power is not disconnected prior to any internal servicing or maintenance. Always disconnect the power source before inspection or repair.

CAUTION: Do not change any internal factory set adjustments. The Porter Digital MXR is adjusted and calibrated for proper operation prior to shipment. Any change could alter the specified operation and accuracy.

CAUTION: When installing or if switching gas fittings is required, be sure to **use two wrenches when tightening or removing hoses from the gas fittings.** Instructions for switching gas fittings are detailed on page 10, Section 3.





CROSSED LINES WARNING
NEW OR MODIFIED INSTALLATIONS
ALWAYS ASSURE THAT LINES ARE NOT CROSSED!

WARNING: New or modified installations - **properly connected gas pipelines are absolutely essential to patient safety.** The dealer or contractor should provide written documentation that all gas pipelines are connected properly and that the system has been pressure tested prior to use. While this is a good business practice, it is important that the user verify by their own test, independent of the dealer or contractor, that all gas pipelines are connected correctly prior to using the system. **The ultimate responsibility of assuring that lines are not crossed rests with the user.**

Do not allow crossed lines to defeat the safety features of the dental flowmeter and / or central gas supply manifold systems. Crossed lines will create a dangerous and hazardous condition where 100% Nitrous Oxide will be delivered through the Oxygen dental flowmeter tube and subsequently to the patient. In addition, the resuscitator quick connect would deliver 100% Nitrous Oxide to an Oxygen demand valve.

Maintain patient observation during procedures. Prevent over sedation. If a patient becomes over sedated when being delivered 100% Oxygen, it is a definite indication of crossed lines. If crossed lines are suspected, remove the nasal mask immediately and encourage mouth breathing. Deliver pure Oxygen from an Oxygen demand valve only if the Oxygen source is independent from the suspected crossed lines area.

To check for crossed lines of an installed Porter Vanguard (or Sentinel) Manifold System:

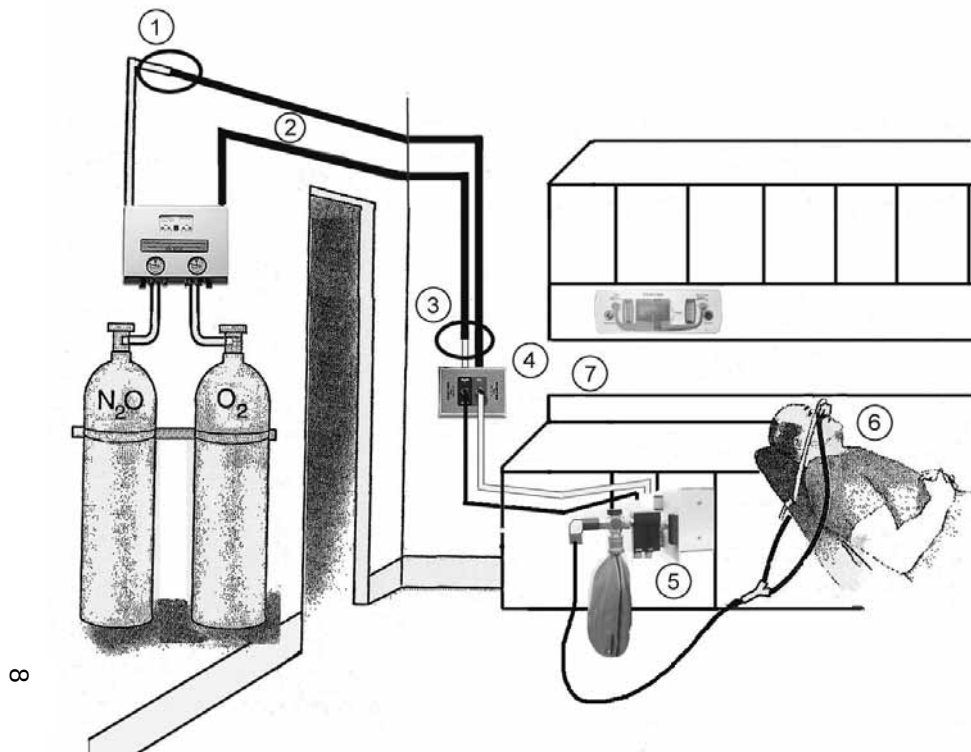
1. At the manifold system (in the tank room), start the check from an operating system with 50 PSI showing on both gauges and the indicator lights turned on – electrical operation and alarms needed for the Vanguard test. Then, turn off both Oxygen tanks and leave both Nitrous Oxide tanks on. (For the Sentinel, only one tank of each gas is on at a time. Turn off the one open Oxygen tank, leave on the one Nitrous Oxide tank, turn off the indicator lights – eliminates alarms during the Sentinel test.)
2. In the operatory, where the flowmeter is installed, flow 5 to 6 liters per minute of O₂ only. Verify that the N₂O flowmeter valve is in the off position and that there is no indicated flow of N₂O - by observing the ball float resting at the bottom of the glass N₂O flow tube.

This action will bleed the Oxygen copper tubing lines (1/2" OD) from the manifold, through the office walls, to the flowmeter. Note: this action does not cause a quick bleed down, as there is a fair sized volume in the lines. O₂ flow would be observed by the position of the ball float in the O₂ flow tube for several minutes.

3. Rather than waiting for the O₂ flow to decrease, go back to the manifold tank room and observe the O₂ pressure gauge on the manifold (normally showing approximately 50 PSIG pressure). The line pressure should start to decrease, indicating bleeding of the O₂ that is no longer being replenished by the tanks. On Vanguard systems, the alarm will beep at 40 PSIG, a switch will occur from one tank to the second tank at a timed interval (increasing the gauge back to 50 PSIG). The gauge then should eventually go down to zero.

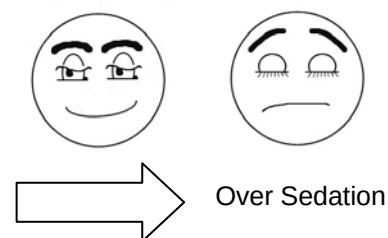
If the O₂ pressure does not go down as described above, and remains at about 50 PSIG, it indicates a crossed lines condition.

4. If O₂ pressure does not go down, proceed to the next crossed line determination check. Turn N₂O tanks off in the manifold tank room and watch the N₂O gauge. Given a crossed line condition, the N₂O gauge will now go down (the Vanguard system will show a switching similar to step 2 above) — this shows the O₂ valve of the flowmeter is bleeding the crossed N₂O lines. The N₂O gauge will go down to zero.



Do Not Allow Crossed Lines to Defeat Equipment Safety Features

Crossed lines in wall structure piping creates hazard of 100% Nitrous Oxide delivery to nasal mask and Oxygen demand valve when Flowmeter is set for 100% Oxygen resulting in over sedation.



The initial installation potential problem:

- 1 DISS (Diameter Index Safety System) is modified at tank room wall when 3/8 inch Nitrous Oxide pipe is increased to 1/2 inch pipe size. Oxygen pipe remains at the normal 1/2 inch size.
- 2 Both Nitrous Oxide and Oxygen piping is maintained at a common 1/2 inch size throughout the building walls leading to operatories.
- 3 At gas outlet station, the Oxygen 1/2 inch pipe is incorrectly decreased down to the DISS 3/8 inch size reserved for Nitrous Oxide lines. Oxygen is fed into the Nitrous Oxide lines.
- 4 At gas outlet station, the common run of 1/2 inch pipe for Nitrous Oxide is incorrectly allowed to remain at the 1/2 inch size and is then falsely connected to the DISS 1/2 inch outlet station. Nitrous Oxide is fed into the Oxygen lines.
- 5 Dental flowmeter valve is set for 100% Oxygen only, but will deliver 100% Nitrous Oxide because of the crossed lines.
- 6 A patient will become over sedated and may appear to fall asleep when the flowmeter is set for 100% Oxygen.
- 7 An Oxygen demand valve connected to the resuscitator quick connect of the Flowmeter will also deliver 100% Nitrous Oxide because of the crossed lines.

SAFETY:

ADA Guidelines

In addition to the failsafe and other safety features found on most sedation machines, effective August 1976, the following specifications were added to those required for acceptance by the ADA Council on Dental Materials and Devices:

1. **Emergency Air Valve**
2. **Rebreathing Check Valve**
3. **Resuscitator Quick Connect**

In addition, the ADA Council requires that:

1. **The gas storage and delivery system meet the recommendations for the National Fire Protection Association. (See NFPA Code.)**
2. **The system be installed by a competent supplier of gases and equipment.**

NFPA Codes

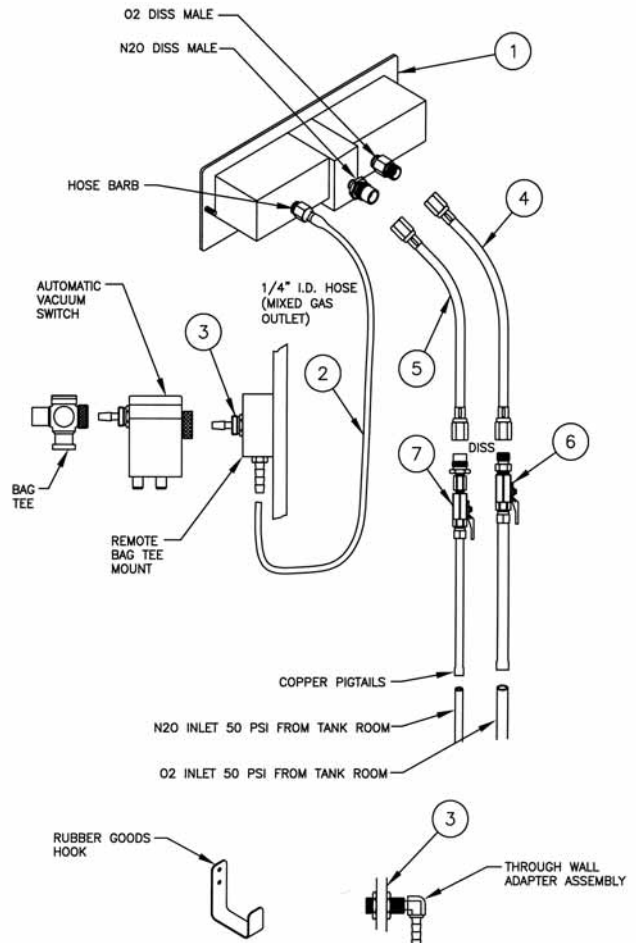
To assure safe operation and conformation to local fire codes, Porter Instrument Nitrous Oxide Sedation Systems meet or exceed the guidelines established by the National Fire Protection Association for Nonflammable Medical Gas Systems, NFPA 99. Copies of NFPA 99 or portions thereof may be obtained by writing to *National Fire Protection Association, Batterymarch Park, Quincy, MA 02269-9904 USA* or call: 1-800-344-3555

INTENDED USE—Flowmeter for Analgesia Delivery System

This device is intended for patient (adult and pediatric) use by an attending physician or dentist properly trained in its use. Porter Instrument recommends the user be thoroughly familiar with the use of Nitrous Oxide - Oxygen Conscious Sedation for patient analgesia and be properly trained in its administration prior to using this product. For training requirements on the administration of Nitrous Oxide - Oxygen Conscious Sedation, contact the appropriate regulatory authority in your country, state, or province. Training is recommended to provide a practical, hands-on capability and an

understanding of the behavioral aspects of Nitrous Oxide Sedation and will complement the safety features of this device.

EQUIPMENT PACKAGE FLEXIBLE INSTALLATION		
Item	Part Number	Description
1	4065D	Digital MXR-D Flowmeter
2	PA-450-1-001	O ₂ Hose, Green 20 Feet Long
3	A-1679 or A-2633-000	Remote Bag Tee Mount Through Wall Adapter Assy for Bag Tee
4	8005	O ₂ DISS / DISS Hose, 5 Feet Long
5	8505	N ₂ O DISS / DISS Hose, 5 Feet Long
6	B-2460-001	O ₂ DISS Shut-off Valve, with Check Valves
7	B-2461-001	N ₂ O DISS Shut-off Valve, with Check Valves
	AVS-5000	Automatic Vacuum Switch (Optional)
	A-2508-000	Rubber Goods Hook (Optional)



INSTALL THE GAS LINES

A qualified plumber can install the delivery piping up to and including the DISS Shut-Off Valves by following the details below and illustrations in this brochure.

Important: The flowmeter systems are designed and intended to be used with gas supply lines installed using NFPA 99 guidelines. Medical grade dry Nitrogen should be used as a “forming gas” while soldering. To prevent oxidation inside supply lines:

- (a) Use type K or L, pre-cleaned, degreased, capped copper tubing **ONLY**.
- (b) Use 3/8” O.D. for Nitrous Oxide, use 1/2” O.D. for Oxygen. **DO NOT CHANGE TUBING DIAMETERS!!**
- (c) All copper to copper joints are to be made using a brazing alloy conforming to AWS Classification BcuP-5 (see AWS Std. A5.8). Flux shall not be used.
- (d) After connecting all gas lines, shut off the DISS shut-off valves and check the system for leaks with dry Nitrogen per NFPA 99, by performing a 150 PSI, 24 hour piping integrity test (5 PSI drop allowed).

Important: Prior to installation, turn OFF central gas supply system and close all tank valves in tank room. DISS Shut-off valves should be in closed position throughout installation of flowmeter.

The dental dealer is responsible for the final connections to the flowmeter, the details of flowmeter installation, checking for crossed-lines, leak testing of connections to the flowmeter, and basic flowmeter operation.

SWITCHING THE UNIVERSAL CONNECTORS

Note: Installations that require the connectors on the bottom of the flowmeter will need the connectors removed prior to mounting into the cabinet or wall. After mounting the flowmeter, the connectors will then be re-installed onto the flowmeter in the bottom position.

1. Verify that the Universal DISS connections for O₂ and N₂O are in the desired location on the flowmeter (back or bottom).
2. The Universal connections may be switched from back to bottom or bottom to back.

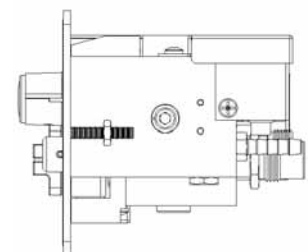
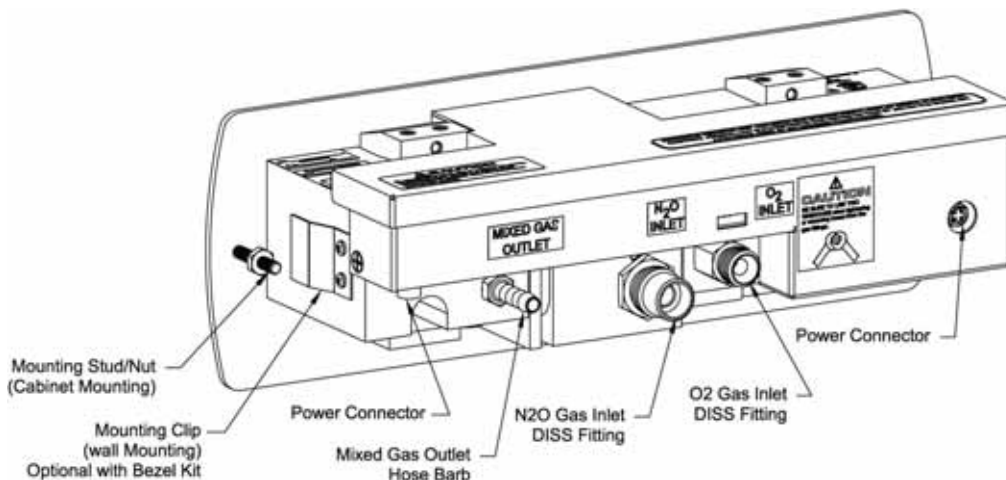
Caution: Perform this procedure with the flowmeter placed on a clean surface and be careful to protect the exposed holes from any possible entering debris.

3. Remove the O₂ plug (3/16” Allen Wrench) and the Universal connection. Carefully place the plug and connection on the clean surface without allowing the sealing o-rings to touch anything.

- 3.1. The o-rings are lightly lubricated with Dow Corning High Vacuum Grease. (This is the only approved lubricant.)

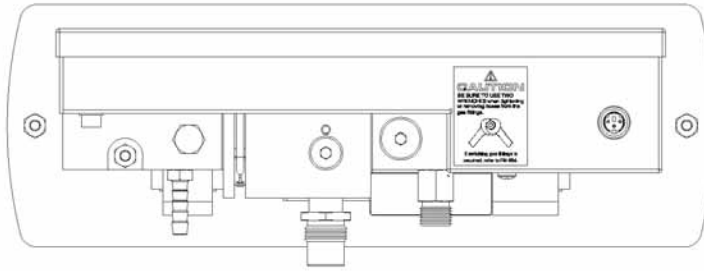
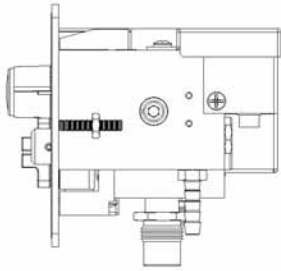
Caution: Do not add any other lubrication to the o-rings.

Rear View of Flowmeter with Connectors in the Back Position



Side View with Back Connectors

Bottom Connections



3.2. Switching the positions, gently hand-tighten the plug and Universal connection into the flowmeter. Do not force. The o-ring will help to center the piece in the cavity and the threading should proceed easily. Tighten all the way until the piece makes metal-to-metal contact with the flowmeter surface. Tighten firmly.

3.3. Repeat the above steps for the N₂O plug (3/16" Allen Wrench) and Universal connection.

CABINET / WALL MOUNT INSTALLATION

IMPORTANT:

- It is not recommended installing unit on an outside wall.
- When using the (bottom) connections, it will be necessary to remove the N₂O, O₂ and Mixed Gas Connectors before installing the meter into the mounting frame and cabinet. Once the meter is in place, replace the connectors. Refer to "Switching the Universal Connectors" in this manual.
- Wall Mount Installations: Requires rear access large enough to install fittings and gas connections. Do not remove red caps on connectors until unit is installed. Place a piece of tape over the rear power supply connector temporarily so dry wall dust does not enter the connector.

Wrenches required: 7/8" for N₂O connector, 5/8" for O₂ connector and 7/16" for mixed gas connector.

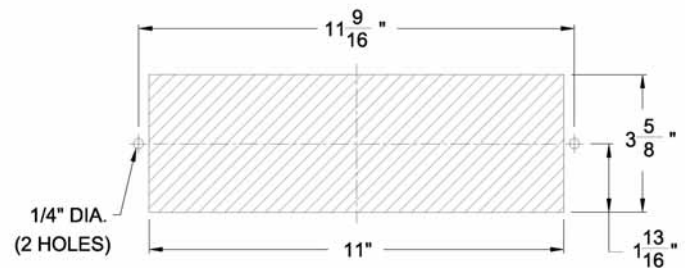
Cabinet Mount Installation:

Bezel kit B-4988 may be used. This kit is optional and must be ordered separately.

Wall Mount Installation:

Installations must use bezel kit B-4988.

- Determine desired location of flowmeter. Use cut-out dimensions below or template FM-383 provided with the kit to cut opening in cabinet or mounting apparatus. **Note:** Flowmeter location needs to accommodate 5 feet DISS hose-to-shut-off valve distance, and 20 feet mixed gas hose-to-remote bag tee distance.



- Install flowmeter mounting frame, if used, in opening with arrows facing up and fasten securely. (Mounting fasteners are not provided.) Use cut-out dimensions as a guide to drill holes for mounting screws.
- Attach retaining spring to meter body using two (2) each screws. Repeat for opposite side.
- Determine desired location of the Universal DISS connections on the flowmeter for O₂ and N₂O (back or bottom). The meter is shipped from the factory with the connectors in the back position.

Back Connection Installation:

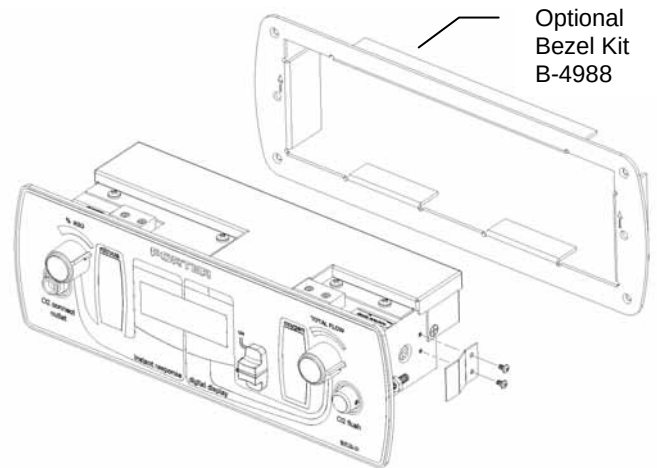
- a.) Remove red caps from connector.
- b.) Connect gas piping to meter and press unit into mounting frame.

Bottom Connection Installation:

- a.) Follow the instructions "Switching the Universal Connectors" in this manual to remove the N₂O, O₂ and Mixed Gas connectors and switch to the bottom position. After removing the connectors, press unit into mounting frame.
 - b.) Re-install connectors in the bottom position following instructions for "Switching the Universal Connectors".
 - c.) Remove red caps from connectors.
 - d.) Connect gas piping to meter.
5. Connect power supply to flowmeter. **IMPORTANT:** Connector from power supply to flowmeter must be fully pressed into mating connector to ensure that locking feature is engaged. Refer to "Power Supply System Illustration".
 6. Connect Porter supplied "Hospital Grade" power cord.
 7. Determine the location of remote bag tee that accommodates visual monitoring of breathing bag during patient treatment. Drill a 3/4" hole in the cabinet that will accommodate the Through Wall Adapter Assembly. Alternatively, use the Remote Surface Mount. **Note:** Bag ideally is to be installed within 10 feet of the flowmeter.
 8. Connect the O₂ DISS hose (green) to the O₂ shut-off valve and the N₂O DISS hose (blue) to the N₂O shut-off valve.



9. Run 20 feet mixed gas hose from flowmeter mixed gas outlet hose barb to hose barb of Remote Surface Mount or Through Wall Adapter Assembly. Cut off any excess hose.
10. Install remote bag tee. Screw knurled seal nut down tight onto remote adapter, making sure the rubber washer is inside the seal nut. Bag tee should not rotate. Refer to FM-809 for User Instructions for Assembly, Installation and Cleaning of Porter Scavenger Rubber Goods System. **Note:** Bag Tee ideally is to be installed within 10 feet of the flowmeter.



11. Pull O₂ and N₂O DISS hoses and mixed gas hose through opening in mounting frame.
12. Hold cabinet mount flowmeter up to the mounting frame and attach O₂ and N₂O DISS hoses to Universal connectors of flowmeter.

Caution: Make certain hoses are not crimped. Always **use two wrenches when tightening**, to assure that the Universal connectors are not loosened from the flowmeter cavities. Verify that the Universal connectors are tightened firmly to the flowmeter and that the DISS hoses are tightened firmly to the Universal connectors.

13. Place the mixed gas hose on the flowmeter mixed gas outlet hose barb.
14. Attach retaining spring to meter body using two screws. Repeat for opposite side.
15. Seat flowmeter into position by pressing it firmly into the mounting frame.

16. Perform the Check for Crossed Lines, the Leak Test of the Flowmeter Installation, and the Flowmeter Function Testing. Flowmeter installation is now complete.

FLOWMETER ACCESSORIES

AVS (Automatic Vacuum Switch) Installation to Remote Bag Tee Mount or Through Wall Adapter Assembly

Screw AVS 5000 knurled seal nut down tight onto remote bag tee mount or wall adapter, making sure the rubber washer is inside seal nut. When tight, AVS should not rotate. Then screw bag tee seal nut onto AVS. Bag tee should not rotate. Refer to FM-809 for User Instructions for Assembly, Installation and Cleaning of Porter Scavenger Rubber Goods System.

Rubber Goods and Bag Tee Storage Remote bag tee can be disconnected with rubber goods for storage by unscrewing the knurled seal nut of the bag tee from the remote surface mount or through wall adapter.

CHECK FOR CROSSED LINES

(Refer to NFPA Gas and Vacuum Systems Code for Type II Systems) (See **cross+protection Warning** in this brochure.) Open both the O₂ and N₂O shut-off valves to allow gas flow to the flowmeter. **Before using flowmeter, check for crossed lines by opening the O₂ valve and making certain that only Oxygen flows through the flowmeter.**

LEAK TEST the flowmeter installation for working pressure leaks. After all hose connections are tightened, turn the flow control knobs to the off position and the On / Standby (Off) switch to the Standby (Off) position. Confirm that the DISS Shut-Off Valves are in the open position. Pressurize the sedation gas supply lines with 50 PSI. Observe any pressure decay after an overnight time period. (5 PSI drop allowed.)

POWER SUPPLY INSTALLATION

Refer to Power Supply Installation Illustration on the following page.

FLOWMETER FUNCTION TESTING

Perform final installation checks by function testing the flowmeter. Refer to FM-1061 MXR-D Flowmeter Instructions and Safety Considerations MXR Models of Porter Conscious Sedation Flowmeters and Bag Tee.

MAINTENANCE AND SERVICE

Flowmeter Service

It is advisable, on a two year cycle, to have the MXR Flowmeter factory checked and serviced.

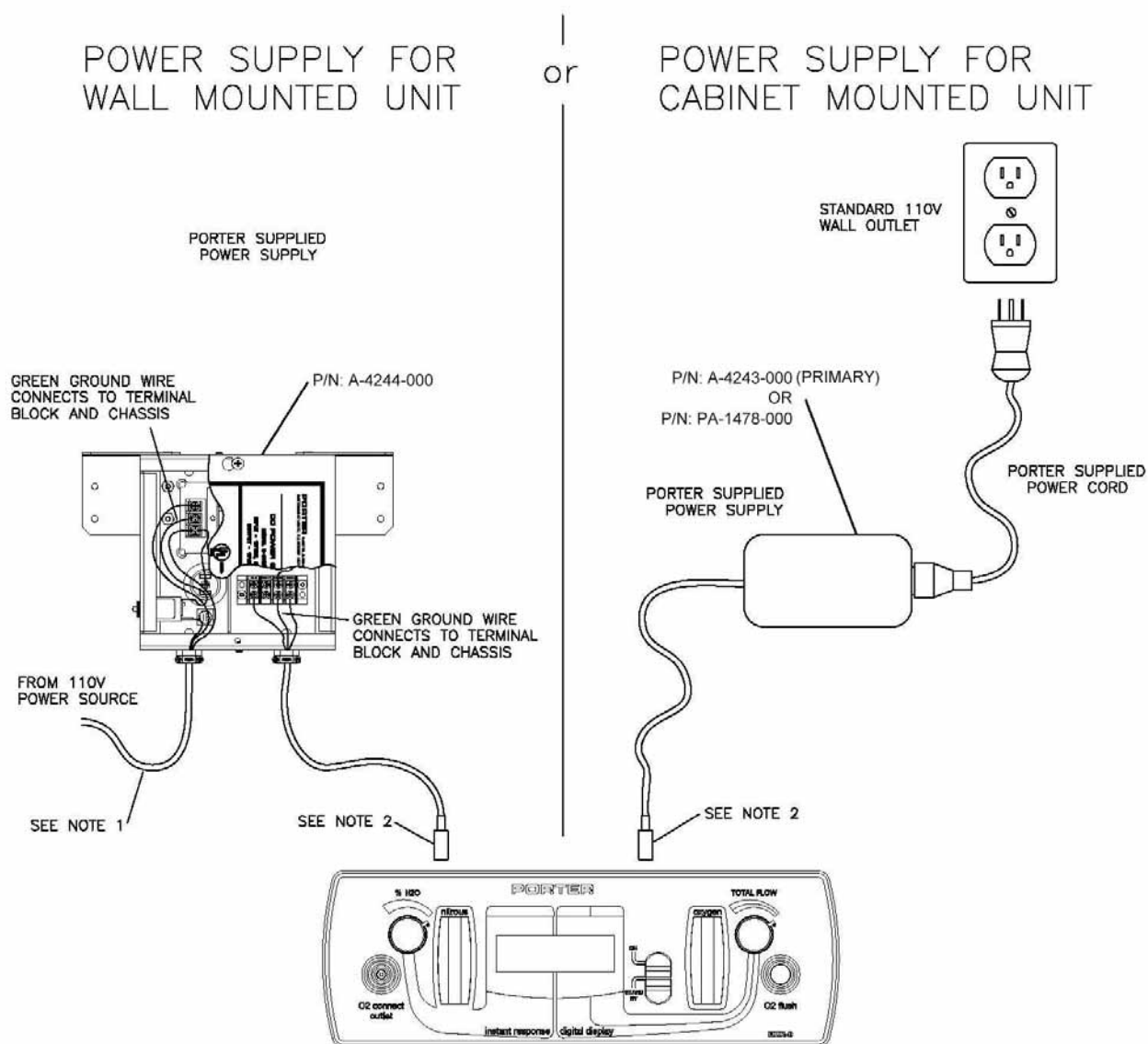
Use Scavenging

Monitor for N₂O in the operatory to insure that controls are effective in achieving low levels of ppm (parts per million) exposure. Contact Porter for details on monitors and testing.

Inspect and maintain the analgesia delivery system to prevent N₂O leaks in all hoses, connections and fittings. Repair all leaks immediately.

YEARLY LEAK CHECK (or if connections to flowmeter are disconnected and then reconnected, such as after a flowmeter service at the factory or if the DISS / DISS hose is replaced): Leak test the flowmeter system for working pressure leaks. After all hose connections are tightened, turn the flow control knobs to the off position and the On / Standby (Off) switch to the STANDBY position. Confirm that the DISS Shut-Off Valves are in the open position. Pressurize the sedation gas supply lines with 50 PSI. Observe any pressure decay after an overnight time period. (5 PSI drop allowed.)

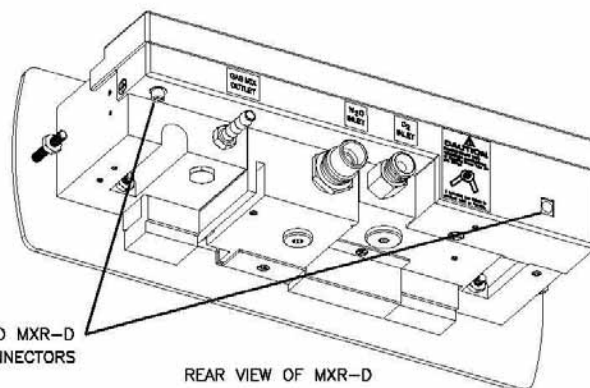
POWER SUPPLY SYSTEM ILLUSTRATION



Notes:

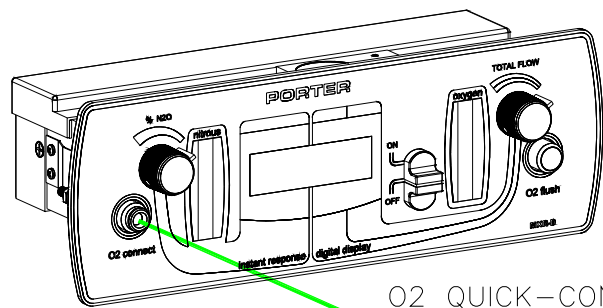
1. The main 110Vac branch connection is to be wired per NEC and local electrical codes. The branch circuit breaker is the main disconnect.
2. **IMPORTANT!**
Connector from power supply to MXR-D must be fully pressed into mating connector to ensure that locking feature is engaged.

POWER SUPPLY CAN BE CONNECTED TO MXR-D AT EITHER OF THESE TWO CONNECTORS



GAS DISTRIBUTION SYSTEM ILLUSTRATION

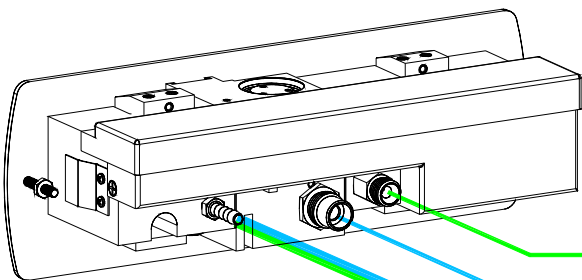
FRONT VIEW
OF ASSEMBLY



O2 QUICK-CONNECT OUTLET
USED FOR O2 RESUSCITATION ONLY

REAR VIEW OF
ASSEMBLY

REAR
CONNECTIONS



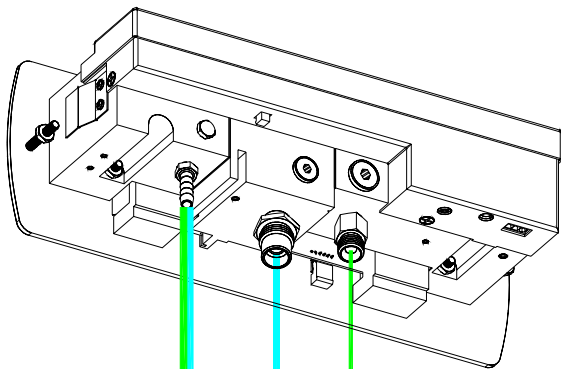
O2 SUPPLY

MIXED GAS OUT

N2O SUPPLY

REAR VIEW OF
ASSEMBLY

BOTTOM
CONNECTIONS



MIXED GAS OUT

O2 SUPPLY

N2O SUPPLY

INITIALIZATION PROCEDURE

These steps are required for new installations or *may be required* when a power interruption / outage occurs and the unit is off for 15 minutes or longer (and failsafe message appears).

1. Confirm power supply is plugged into the power source and the back of flowmeter.
2. Turn On / Standby (Off) switch to the ON position and wait 20 seconds.
3. Then, turn On / Standby (Off) switch to the STANDBY position and wait 20 seconds (auto-zero).
4. Turn On / Standby (Off) switch to the ON position and the unit will display initial sequence startup. See Initial Installation Display / Troubleshooting for appropriate display readings.

INITIAL INSTALLATION DISPLAY / TROUBLESHOOTING

Display / Condition	Meaning	User Action
No display. No power.		• Check the power supply is plugged into the electrical outlet. • Check that the electrical outlet has power. • Check that the power cord is properly connected to the back of the power supply.
Initial installation; no gas hooked up; Slide switch to ON; %N2O and Total Flow Knobs to full mechanical stops.	Installation Check for proper display	STEP 1
%N2O L/M	There is no Oxygen flowing. There is no Nitrous flowing. %N2O and Total Flow valves are shut tightly.	Normal display condition for no flows. Proceed to procedures using gas hook up and flows.
Failsafe / Service Is Required, Turn Off N2O Source	MXR-D housing is too cold or too hot upon initial power up.	Wait for flowmeter to reach room temperature.
Low O2 Flow, Turn Knob to Increase O2 Flow, Check O2 Source (Tanks)	MXR-D housing is closer to room temperature, but cannot yet have proper display.	Wait for flowmeter to reach room temperature.
%N2O Total Flow L/M	MXR-D housing is closer to room temperature, but cannot yet have proper display.	Wait for flowmeter to reach room temperature.
%N2O O2 Flow L/M	MXR-D housing is closer to room temperature, but cannot yet have proper display.	Wait for flowmeter to reach room temperature.
Gas hooked up; Slide switch to ON; %N2O and Total Flow Knobs to full mechanical stops.	Procedure to check for Total Flow valve by-pass leak.	STEP 2
%N2O L/M	There is no Oxygen flowing. There is no Nitrous flowing. %N2O and Total Flow valves are shut tightly.	Normal display condition for no flows.