



PORTER

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CABINET MOUNT FLOWMETER SYSTEMS

COMPONENT DIAGRAM AND INSTALLATION INSTRUCTIONS

MODELS: 2050W, 2055W, 2060W, 2065W, 2070W and 3065W (65% Max N₂O Concentration)
Special Cabinet Mount: 2066W and 3066W (50% Max N₂O Concentration)



WARNINGS AND PRECAUTIONS

These warnings and precautions are to help you to understand how to safely install and function test the Cabinet Mount Flowmeter System. A WARNING alerts you to a possible hazard to people. A CAUTION alerts you to the possibility of equipment damage.

WARNING: Porter Instrument flowmeter systems utilize the **cross+protection** system. The copper tubing is diameter indexed; 3/8" O.D. for Nitrous Oxide and 1/2" O.D. for Oxygen. The **cross+protection** system is designed to prevent misconnection of Oxygen and Nitrous Oxide piping. **DO NOT ATTEMPT TO CHANGE THE DIAMETERS!** 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: 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.

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.**

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 void the warranty.

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 3, Step 11.

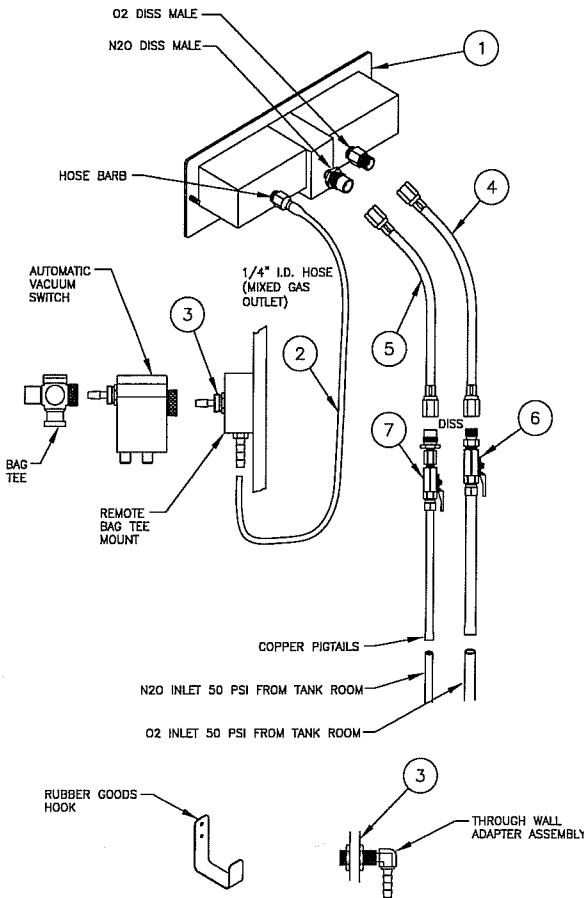
EQUIPMENT PACKAGE FLEXIBLE INSTALLATION		
Item	Part Number	Description
1		Flush Mt Meter, Back Connections Flush Mt Meter, Bottom Connections
2	PA-450-1-001	O ₂ Hose, Green 20 Feet Long
3	A-1679 or A-2633-000	Remote Bag Tee Mount Through Wall Adapter Assy for Bag Tee
4	8005	O ₂ DISS / DISS Hose, 5 Feet 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)

- Use type K or L, pre-cleaned, degreased, capped copper tubing ONLY.
- Use 3/8" O.D. for Nitrous Oxide, use 1/2" O.D. for Oxygen. DO NOT CHANGE TUBING DIAMETERS!!
- 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.
- 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).

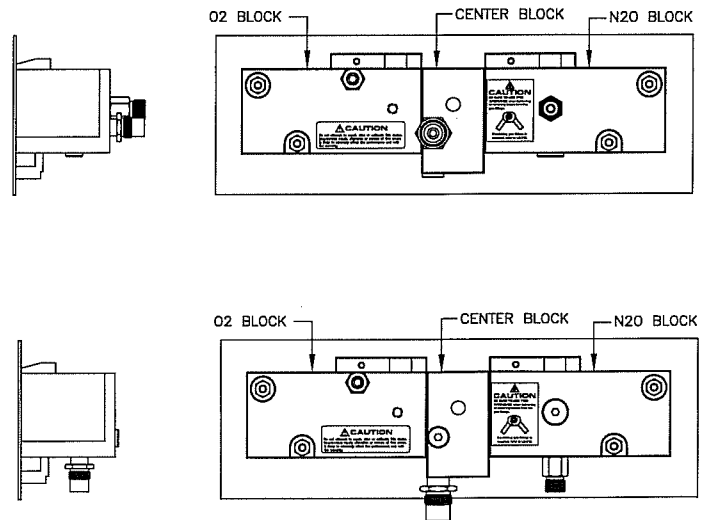
Important: Prior to installation, turn OFF central gas supply system and close all tank valves in tank room. DISS Shut-off valves should be in closed position throughout installation of flowmeter.

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.

- Verify that the Universal DISS connections for O₂ and N₂O are in the desired location on the flowmeter (back or bottom).



Back Connections



Bottom Connections

- 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.

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:

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.

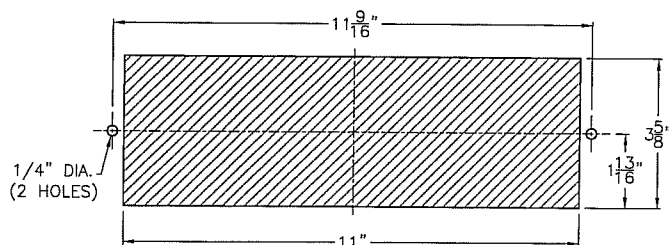
3.1. The o'rings are lightly lubricated with Dow Corning High Vacuum Grease. (This is the only approved lubricant.)

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

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.

4. Determine desired location of flowmeter. Use cut-out dimensions below 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.



5. 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.

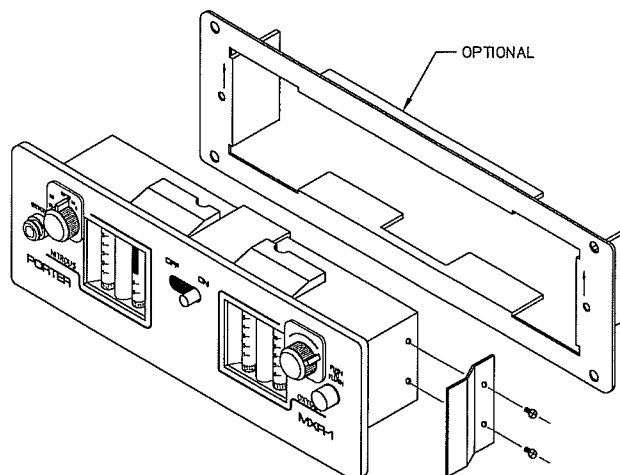
6. Connect the O₂ DISS hose (green) to the O₂ shut-off valve and the N₂O DISS hose (blue) to the N₂O shut-off valve.

7. 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.

8. 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

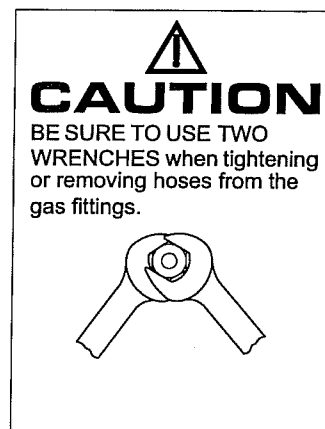
System. Note: Bag Tee ideally is to be installed within 10 feet of the flowmeter.

9. Install flowmeter mounting frame, if used, in opening, arrows facing up, and fasten securely. Use cut-out dimensions as a guide to drill holes for mounting screws. Note: When using the (bottom) connections, it will be necessary to remove the N₂O connector before installing the meter into the mounting frame and cabinet. Once the meter is in place, replace the N₂O connector.



10. Pull O₂ and N₂O DISS hoses and mixed gas hose through opening in mounting frame.

11. 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.

12. Place the mixed gas hose on the flowmeter mixed gas outlet hose barb.
13. Attach retaining spring to meter body using two screws. Repeat for opposite side.
14. Seat flowmeter into position by pressing it firmly into the mounting frame.
15. Perform the Check for Crossed Lines, the Leak Test of the Flowmeter Installation, and the Flowmeter Function Testing. Flowmeter installation is now complete.

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/off switch to the 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.)

FLOWMETER FUNCTION TESTING

Perform final installation checks by function testing the flowmeter. Refer to FM-286 MXR 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 (2) 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/off switch to the 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.)