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## MOBILE “E” TANK STAND INSTALLATION AND INSTRUCTIONS

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### Warnings and Precautions

**Important:** In addition to these Mobile “E” Tank Stand Instructions, read the Conscious Sedation Flowmeter User’s Manual / Instructions, which includes these flowmeter topics:

- Warnings and Precautions
- Delivery Technique
- Safety Checks
- Maintenance and Troubleshooting.

Also read Regulators Instruction Manual FM-1087

### Examination

Examine shipping carton for signs of external damage.  
Remove contents from carton and inspect for visible damage or missing parts.  
Remove any accessories.  
Check that hoses are connected.  
If damage is discovered or suspected and/or parts are missing, notify Porter or authorized distributor immediately.

Perform initial monthly leak test prior to use.

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[www.porterinstrument.com](http://www.porterinstrument.com)



### WARNING

Verify gas indexing pins locations.  
See illustrations in  
Attachment of Cylinders (Page 5)



## Warnings and Precautions

These warnings and precautions are to help you to understand how to safely operate a Mobile E-Stand in a Conscious Sedation System. A WARNING alerts you to a possible hazard to people. A CAUTION alerts you to the possibility of equipment damage.

**WARNING: New or modified installations - properly connected gas pipelines (external supply to E-Stand) are absolutely essential to patient safety. The ultimate responsibility of assuring that lines are not crossed rests with the user. See next page for details.**

**WARNING:** Porter Instrument equipment utilizes the **cross+protection** system. The flexible hose and connectors that connect to the E-Block and the flowmeter inputs are 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 hoses. **DO NOT ATTEMPT TO CHANGE THE DIAMETERS OR CONNECTORS OF THE E-Block!** Tampering with the **cross+protection** system constitutes acceptance of liability by the installer.

**WARNING:** The E-Stand within a Conscious Sedation System, with Flowmeter, is intended to be used by medical personnel trained in the flowmeter device use and the use of nitrous oxide and oxygen for medical applications.

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

**WARNING:** Inspect and maintain the analgesia delivery system to prevent N<sub>2</sub>O leaks in all hoses, connections and fittings. This includes the delivery system (E-Stand is mounting accessory) and the hoses and connections to the E-Block. Have all leaks repaired immediately.

**WARNING:** Use Scavenging: Medical workers are exposed to N<sub>2</sub>O during administration of N<sub>2</sub>O/O<sub>2</sub> conscious sedation analgesia. Controls

are effective in the patient treatment area to achieve low levels of ppm (parts per million) exposure. Controls include System Maintenance, Ventilation and Work Practices. Your accessory Scavenger System is an important part of the system of controls in medical settings.

**WARNING: (connections for external gas supplies):** 50 - 55 psi line pressure. **Follow safe connection protocol in this order:** Connect external gas supply hoses to DISS (Diameter Indexed Safety System) fittings of Flowmeter (O<sub>2</sub> first); **then connect** to external supply source. Do not disconnect with supply line pressurized [disconnect at supply source per appropriate safe protocol].

**WARNING:** During any power outage, remember to turn OFF the flowmeter and manually turn OFF the tank valves (or external supplies). 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.

**WARNING:** Always use clean, dry medical grade gases. Do not introduce moisture or other contaminants into the system and flowmeter device. **Never oil or grease any part of this system (minimize fire or explosion potential).** **Cylinder mount: Do not clean check valve entrance or sealing washer (replace as needed) with disinfectant.** User should ensure that the cylinder valve is clear of dust or dirt which may be carried to regulator and cause damage or accident. One clearing technique is to "crack" [secure] cylinder valve before installing cylinder to E-Block. Open valve slightly and then close. Do not discharge flow of gas at any person or flammable material.

**CAUTION:** Do not attempt to repair, alter or calibrate the system or flowmeter device (except as directed in Porter User's Manuals). Unauthorized repair, alteration or misuse of the flowmeter device is likely to adversely affect the performance and will void the warranty.



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

**WARNING:** External Source Connections: New or modified central supply installations - **properly connected gas pipelines leading to any external supply of the E-Stand are absolutely essential to patient safety.** Per NFPA 99, the certified medical gas plumber, and verifier, 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 authorized distributor 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 E-Stand, with any external gas supply, and/or central gas supply manifold systems. Crossed lines will create a dangerous and hazardous condition where, under a loss of oxygen supply, 100% nitrous oxide will be delivered through the oxygen delivery path and subsequently to the patient.**

**User should observe the patient to prevent over sedation in the event of an oxygen failsafe malfunction or crossed lines. If a patient becomes over sedated when being delivered 100% oxygen [during an apparent loss of nitrous oxide supply], it is a definite indication of crossed lines or a failsafe malfunction. Remove the 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.**

**INTENDED USE:**

**Flowmeter for a conscious sedation system:**

The flowmeter device is intended for patient use and delivers a mixture of nitrous oxide and oxygen gases during an analgesia (moderate) conscious sedation procedure in a medical healthcare setting by trained medical personnel. 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.

**INTENDED USE:**

**Mobile “E” Tank Stand within a conscious sedation system:**

The Porter Mobile “E” Tank Stand is for use with two “E” tanks of O<sub>2</sub> and two “E” tanks of N<sub>2</sub>O. The two pressure gauges reflect tank pressure only. When the gas supply is opened, gas will flow through the check valves into the block and be regulated down to 53 PSIG at the regulators, out through the hoses to the flowmeter. The check valves prevent the gas from flowing between tanks or out into the room if only one tank is in use. Each Mobile Stand may be adjusted to a desired height for operatory use and storage.

## Model 2045-3 “E” Stand (Figure 1)

The Tall Mobile “E” Tank Stand 2045-3 features swivel yokes for ease of installing and removing the O<sub>2</sub> and N<sub>2</sub>O tanks on the stand. The stand height adjusts from 42” to 50” to top of the meter.

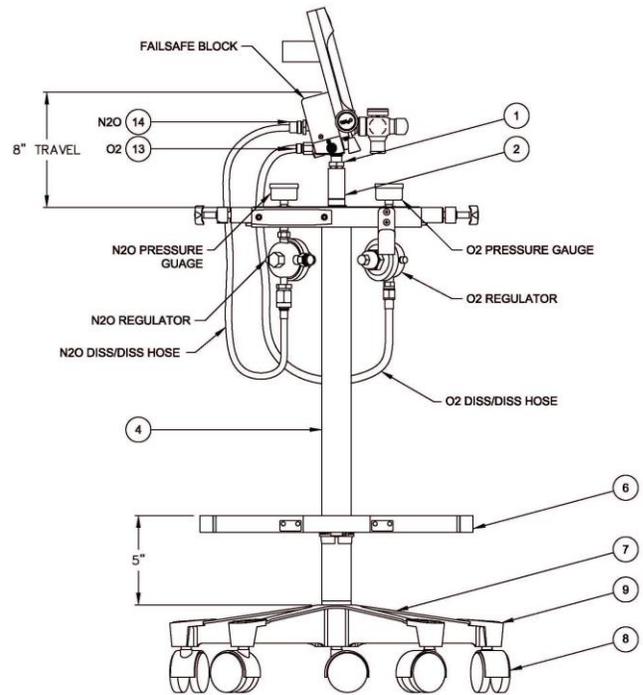
### Mounting Flowmeter to “E” Stand

1. Screw the bottom of flowmeter to the top of the center post on the mobile “E Stand as in Figure 1.
2. To telescope flowmeter, loosen knob (not shown) on rear of “E” block, position flowmeter, retighten knob.

**Caution: Fully tighten the knob after attaching flowmeter. Failure to do so may result in damage to flowmeter or to E-Stand.**

**Caution: Do not remove snap ring or o-ring on inner post assembly (Item 2). Removing either of these items may result in damage to flowmeter or to E-Stand.**

Figure 1 – Model 2045-3  
“E” Stand with Flowmeter



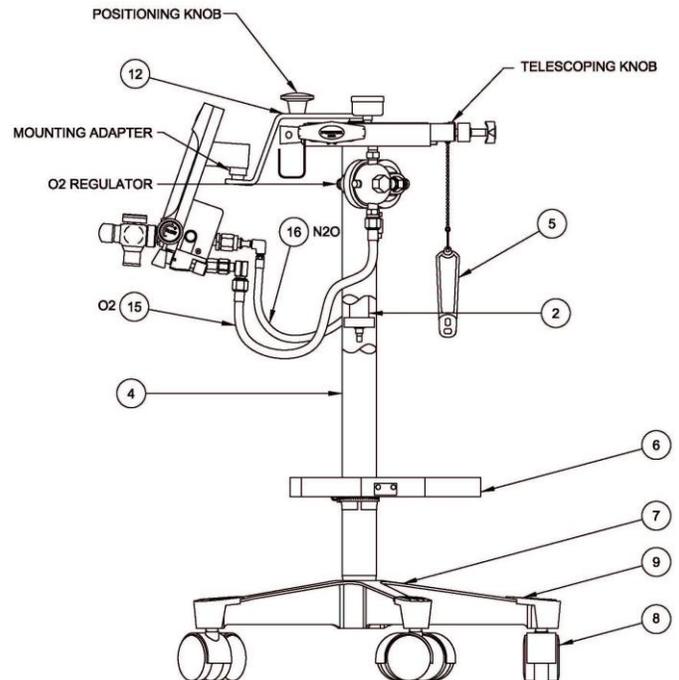
## Model 2045-SHORT3 “E” Stand (Figure 2)

The Porter Mobile “E” Tank Stand 2045-SHORT3 features swivel yokes for ease of installing and removing the O<sub>2</sub> and N<sub>2</sub>O tanks on the stand. The stand height adjusts from 31” to 41” to top of the meter. The mounting bracket design allows for flowmeter installation and adjustment to the desired height for operatory use, and then to be adjusted for under the counter storage.

### Mounting Flowmeter to “E” Stand

1. Remove cap from flowmeter mounting adapter using Philips screwdriver.
2. Slide mounting bracket on back of flowmeter over mounting stem of “E” Stand.
3. Replace cap and tighten screw.
  - Position small diameter of cap “down” to allow for swivel mounting.
  - Position small diameter cap “up” to fix direction of flowmeter.
4. To telescope flowmeter, loosen knob on rear of “E” block, position flowmeter using knob on angle bracket.
5. Retighten knob.

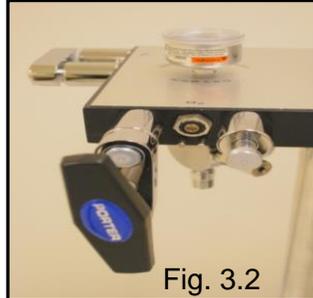
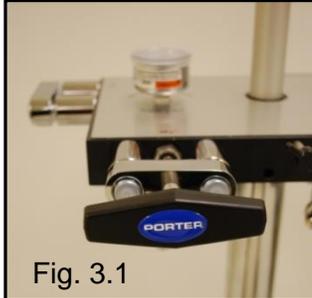
Figure 2 – Model 2045-SHORT3  
“E” Stand with Flowmeter



## Proper Attachment of Gas Cylinders (E-Stand)

**Caution:** When removing cylinders, always be sure valves are closed tightly.

1. Loosen the Tee Handle (Fig. 3.1) until point is even with the inside of the Swivel Arm. Push Tee Handle **inwards** to flip to open position. Align Tee Handle vertically (Fig. 3.2).



2. Undo the Hook & Loop straps on the Cylinder Restraint (Fig. 3.3)



Fig. 3.3

3. Cylinder Preparation: Remove any plastic wrap/washer from the top of cylinder. Keep cylinder top clean. Verify that the rubber washer (Fig. 3.5) provided with the E-Stand is still in place. Do not mount cylinder if washer is missing use the rubber E-Stand washer (replace once/yr. or earlier if needed).
4. Mount the "E" cylinders of Oxygen and Nitrous Oxide (not included) to the E-Stand Block. Insert cylinders correctly on indexing pins and as marked on Block (N<sub>2</sub>O Figs. 3.4, 3.5; O<sub>2</sub> Figs. 3.6, 3.7). Pins assure mounting in appropriate position.



Fig. 3.4



Fig. 3.5

Rubber Washer

N<sub>2</sub>O pins



Fig. 3.6



Fig. 3.7

O<sub>2</sub> Pins

**Warning**  
 Do not remove or alter gas indexing pins  
 Verify correct pin locations (illustrations).

5. Slide the cylinder into place by lining up the pins and pin holes on the cylinder. Push into place. Properly placed, the cylinder should hang on the pins (Fig. 4).
6. Cylinders should hang freely between wheel base. If the wheel base interferes, loosen and rotate cylinder restraint.



Fig. 4

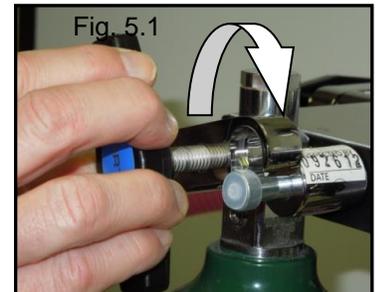


Fig. 5.1

7. Push inwards & Rotate swivel clockwise to close (Fig. 5.1). Pull fully **outwards** on Tee Handle and swivel will lock in place. Assure swivel is in parallel alignment with E-Block surface (Figs. 5.2, 5.3). Gaps between swivel and posts should be equal on both sides and the bolt head should not be evident.

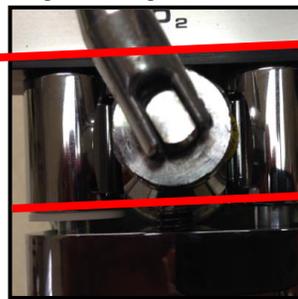


Fig. 5.2 Aligned



Fig. 5.3 Misaligned

8. Swivel should stay in the locked aligned position when Tee Handle is tightened **securely**. **Warning:** Tee Handle not tightened securely may result in cylinder leakage with possible loud hissing or popping sounds. Close cylinder valve and follow procedures to correctly align and tighten Tee Handle.



Fig. 5.4



Fig. 6

9. Secure the Hook & Loop straps to hold cylinder in place (Fig. 5.4).
10. The Valve Wrench (hanging from black Knob) is used to open/close Cylinder Valves (Fig. 6).

## Cylinder (Tank) Operation / Maintenance

**Cylinder Pressure Readings:** Oxygen is a true compressed gas, while in the cylinder, thus the cylinder pressure gauge can be used to determine the amount of gas remaining in the cylinder. For example, 2000 psi indicates full, 1000 psi indicates half full, etc. Nitrous Oxide is a liquefied compressed gas that vaporizes in the cylinder, thus the cylinder pressure gauge cannot be used to determine the amount of gas remaining in the cylinder until all liquid in the cylinder vaporizes. While liquid remains in the cylinder, the cylinder pressure gauge indicates the vapor pressure which depends on and varies with the temperature of the liquid. For example, at 68°F, the vapor pressure is about 750 psi; at 20°F, it drops to about 400 psi; while at 90°F, it increases to about 1000 psi. After all the liquid vaporizes, the pressure will decrease normally as the gas is withdrawn, and the cylinder pressure gauge can then be used to determine the amount of gas remaining in the cylinder.

### Caution

- **NEVER ATTEMPT TO LOOSEN cylinder valve packing nut. If valve stem is tight, return cylinder to supplier.**

 **Warning: Do not remove or alter gas indexing pins. Verify correct pin locations per illustrations.**

**Warning: Always turn on CYLINDER VALVES slowly and fully (minimize fire or explosion potential).**

### Good Practices: Cylinders with E-Stand

1. Two cylinders of O<sub>2</sub> and two cylinders of N<sub>2</sub>O are typically connected at all times.
2. Minimize leak risks: Confirm Yoke Washers are in place before replacing/mounting cylinders. Use Porter #A-3399-000 replacement washers (once/yr. or earlier if needed). Have spare washers.
3. **Warning:** Keep the cylinder top clean while performing attachment so as to minimize possibility of any foreign substance entering the regulator cavities (minimize fire or explosion potential).
4. Minimize leak risks: With cylinder in position, rotate swivel arm and move into secure locked position when Tee Handle is tightened. To prevent movement and potential damage to yoke pins, always fasten the Hook & Loop strap restraints around cylinders.
5. Assure E-Stand is populated with at least one full cylinder of O<sub>2</sub> and N<sub>2</sub>O before starting any procedure.

6. Label each cylinder with a tag or sticker indicating "In-Use" and "Full" ("Full" is reserve).
7. Use Cylinder Valve Wrench to open the "In-Use" cylinders of O<sub>2</sub> and N<sub>2</sub>O. Verify wrench is attached to E-Block.
8. Cylinder pressure gauges on E-Block provide a visual indication of cylinder status (see details on Cylinder Pressure Readings)
9. **Caution:** If all four cylinders (or both cylinders of one gas) are open, the two cylinders of O<sub>2</sub> and N<sub>2</sub>O will deplete in tandem. The "Full" cylinder will empty with the "In-Use" cylinder and will not be available as a future spare.
10. When "In-Use" cylinder is fully depleted, open the spare "Full" cylinder (Close valve on empty cylinder). Do not remove and replace partially full cylinder; only replace with new clean full cylinder.
11. When "In-Use" O<sub>2</sub> cylinder is depleted, the Oxygen Fail Safe will stop N<sub>2</sub>O flow through flowmeter automatically.
12. When "In-Use" N<sub>2</sub>O cylinder is depleted, the flowmeter will deliver 100% O<sub>2</sub>.

After use, turn off cylinder valves.

### Connect to Gas Supply

1. Connect O<sub>2</sub> hose to flowmeter.
2. Connect N<sub>2</sub>O hose to flowmeter.
3. Connect hoses to O<sub>2</sub> / N<sub>2</sub>O outlet fittings on regulators. (Figure 1)

### Connecting Breathing Circuits

Refer to FM-809 for User Instructions for Assembly Installation and Cleaning of Porter Scavenger Rubber Goods System. Also for attachment of AVS (Automatic Vacuum Switch) and Bag Tee (with Quick Disconnect).

Refer to FM-1330 for Assembly and Installation of Medical Breathing Circuit Scavenger System for medical applications.

## Monthly Check

**Leak test the entire system for working pressure leaks.** Attach the hoses to a flowmeter and turn the flow control knobs to the OFF position and the ON / OFF switch to the OFF position.

Turn tanks ON. Pressurize the sedation gas supply lines and "E" block with tank pressure. Turn tanks OFF. Apply masking tape to both gauge faces. Tap lightly on gauges and mark gauge needle positions on the masking tape. There should be little or no movement of the gauge needles after 15 minutes. This test with the flowmeter tubing connections in place tests the seal of the hose connectors, the "E" Block and the flowmeter's on / off switch.

**CAUTION:** When operating the swivel yoke, take care not to catch or pinch fingers.

## "E"-Block Cylinder Pressure Gauge Replacement

 **Warning:** High pressure (up to 2400 psi). Turn OFF all tank valves / supply pressure. Switch flowmeter on/off switch to the "on" position and open both valves to vent the pressure.

1. Unscrew the pressure gauge.
2. Install new pressure gauge; verify PTFE tape is applied to the NPT thread; tighten carefully so as not to cross thread with the E-Block cavity.
3. Turn on tank valve **slowly** at location of the open door.
4. Leak test per Initial and Monthly Check.

## "E" Block Removal Instructions (Figure 8)

 **Warning:** High pressure (up to 2400 psi). Turn OFF all tank valves / supply pressure. Switch flowmeter on/off switch to the "on" position and open both valves to vent the pressure.

1. Unscrew (counter clockwise) the (2) Allen screws that normally secures the block assembly to the stand. (Use 1/8" Allen wrench.)
2. Unscrew knob and the screw that locks telescoping post in position.
3. **CAUTION:** Do not allow post to drop into tube. Push snap ring out of groove on telescoping post.
4. Remove O-ring from post.
5. Lift off "E" block.

## "E" Block Installation

Install new "E" block assembly by reversing removal instructions.

Figure 7 – "E" Block with Swivel Yokes

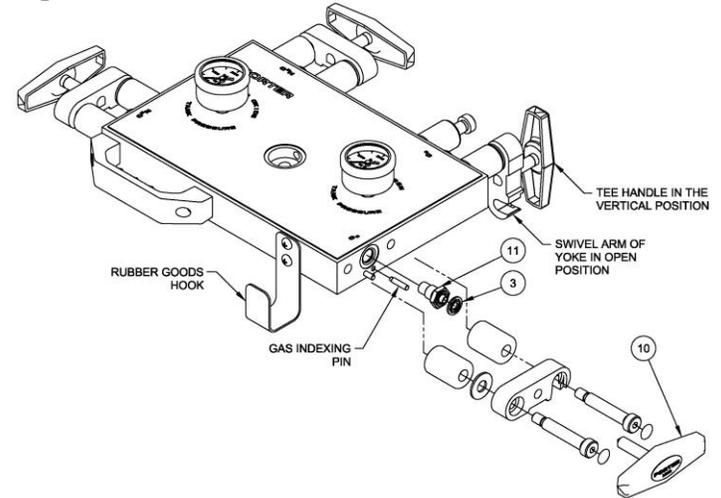
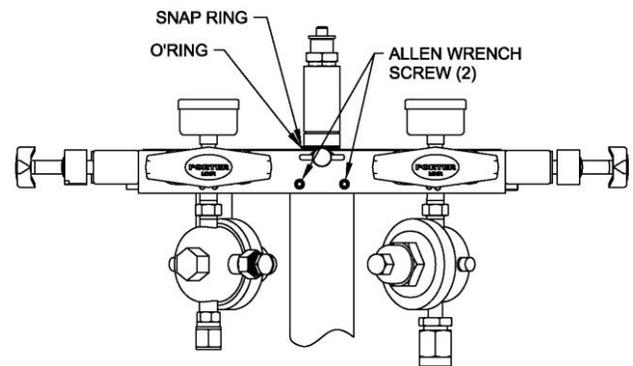


Figure 8 – "E" Block



## Regulator Maintenance

 **Warning:** Do not attempt to replace regulators in the field.

## Troubleshooting:

**Do not use E-Stand if there is a significant change in the attached flowmeter flow capability.**

**Do not use E-Stand if any abnormal sounds (like sputtering, popping, etc.) are heard coming from the regulator area.**

## Maintenance and Service – Recommended Replacement Parts

Part Number		Item	Description	Qty Per Unit
2045-3	2045-SHORT3			
A-3369-000	NA	1	Mounting Stud with Washer	1
A-3372-000	A-4052-000	2	Inner Post Assembly with Mounting Stud	1
A-3399-000		3	Yoke Washers	4
B-1883-001	B-4668-000	4	Tube Assembly Only	1
PA-1185-000		5	Tank Wrench with Chain	1
C-1658-000		6	E-Stand Tank Restraint Kit	1
91505113		7	5 Star Base	1
PA-234-004		8	Caster	5
65958000		9	Ribbed End Cap	5
A-4060-000		10	Tee Bar Handle	4
A-4434K		11	Check Valve Assembly Kit	4
NA	B-4669-000	12	S- Bracket Assembly	1
8003	NA	13	3 Ft Hose, O <sub>2</sub> , Diss / Diss	1
8503	NA	14	3 Ft Hose, N <sub>2</sub> O, Diss / Diss	1
NA	8082	15	2 Ft Hose, O <sub>2</sub> , Diss / Diss Elbow	1
NA	8582	16	2 Ft Hose, N <sub>2</sub> O, Diss / Diss Elbow	1
64900423		17	Gauge O <sub>2</sub> Cylinder Pressure (0-4000 psi)	1
64900422		18	Gauge N <sub>2</sub> O Cylinder Pressure (0-4000 psi)	1
649004C		19	Gauge Cover (Threaded)	2
649004RC		19	Gauge Cover (Snap-on)	2

**Note: Do not recommend replacing regulators in the field. Return to Porter for servicing.**

### Troubleshooting the Attachment of Cylinders:

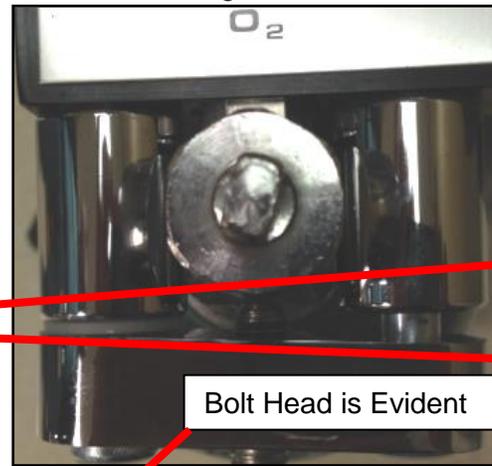


**Warning:** Tee Handle not tightened securely may result in cylinder leakage with possible loud hissing or popping sounds. Close cylinder valve and follow procedures to correctly align and tighten Tee Handle.

Aligned Swivel



Misaligned Swivel



See Attachment of Cylinders Section

- New Gaskets P/N: A-3399-000 (Replace all 4 once a year or earlier if needed).
- Tee Handle is pulled outwards and aligned.
- Swivel is parallel with E-Block
- Bolt head not evident.
- Maintain aligned swivel position as Tee Handle is securely tightened.

## Replacing the Check Valve (Figure 9 & 10)

The check valves are designed to perform for the life of the E-Stand, but are field replaceable.

Replace check valves if leaking occurs.



**Warning:** High pressure (up to 2400 psi). Turn OFF all tank valves / supply pressure. Switch flowmeter on/off switch to the “on” position and open both valves to vent the pressure.

1. Back out Tee Handle (Item 10) until point is even with the inside of the swivel arm.
2. Push Tee Handle “in” to open swivel.
3. Swing swivel arm open. (Figure 9)
4. Remove rubber washer (Item 3). It is recommended that these be replaced once a year.
5. Unscrew check valve assembly using a 5/8” socket with ratchet.
6. Install new check valve assembly (Item 11) by reversing above steps.



### WARNING

Do not remove or alter gas indexing pins.

Figure 9 – Check Valve Replacement

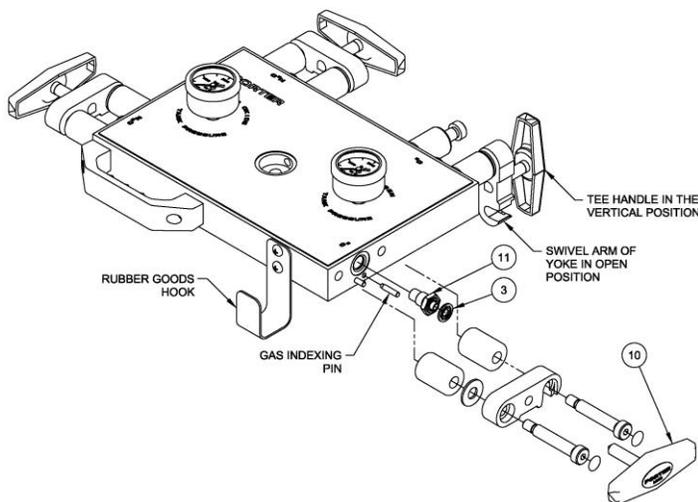
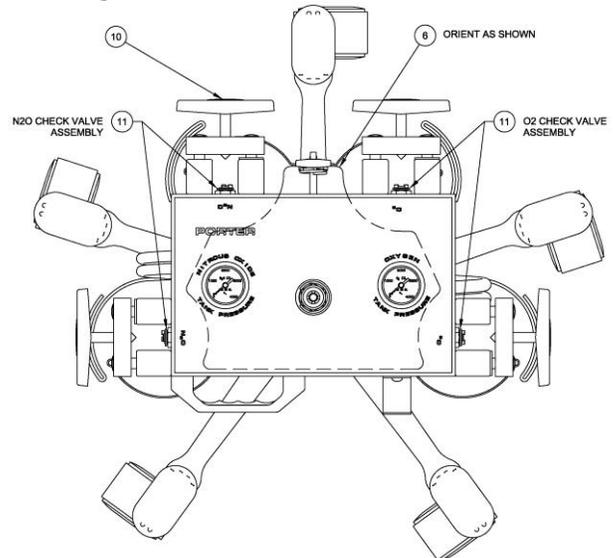


Figure 10 – Check Valve Locations



## Cleaning Methods

We recommend the use of an approved disinfectant for the healthcare patient environment for cleaning the outside of the device. Do not spray disinfectant directly onto parts. Spray disinfectant into disposable towel, or use disinfectant surface wipe (avoid excess disinfectant liquid), and wipe unit thoroughly removing excess disinfectant to eliminate buildup. Follow the disinfectant manufacturer's directions for use.

Introduction of moisture or other contaminants into this device may result in defective operation. Never oil or grease any part of this system (minimize fire or explosion potential). Cylinder mount: Do not clean check valve entrance or sealing washer (replace as needed) with disinfectant.

## CERTIFICATE OF 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** All returned merchandise will be handled through the local Parker Hannifin Corporation distributor. No returns will be accepted unless authorized in writing by Parker Hannifin Corporation and accompanied by the original shipping invoice. All returns are subject to restocking charge.

Policies subject to change without notice.

The Quality System for Porter Instrument is certified to ISO 13485. The scope of our registration is: "The design, manufacture, distribution and servicing of fluidic components and integrated systems for use in the Medical Equipment, Diagnostic, Biopharmaceutical, Agent Detection, Analytical Instrumentation and Industrial markets, Nitrous Oxide – Oxygen Sedation Flowmeters, Gas Scavenging Systems and Gas Distribution products for use by a physician, dentist or licensed healthcare professionals."



This product complies with the Medical Directive (93/42/EEC). A "Declaration of Conformity" in accordance with the directive has been made and is on file.



European Communities should contact the Authorized Representative listed below regarding any Medical Device Directive (MDD) inquiries.

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