



## PC-7 Flowmeter O<sub>2</sub>/N<sub>2</sub>O Sedation Unit Instruction Manual



## **WARNING**

### **IMPORTANT:**

#### **READ MANUAL COMPLETELY BEFORE OPERATING THIS DEVICE**

This manual contains instructions on periodically required checks to be performed by the user. These checks are necessary to ensure the proper performance of this device and its safety features.

RETAIN THIS MANUAL FOR FUTURE REFERENCE

CAUTION: Federal law requires this device for use by or on the order of a physician or dentist.

CAUTION: Do not attempt to repair or alter 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.

The National Institute for Occupational Safety and Health has issued a warning for dental workers exposed to N<sub>2</sub>O during administration of N<sub>2</sub>O/O<sub>2</sub> conscious sedation analgesia. NIOSH has recommended that exposures should be minimized. Contact NIOSH to receive NIOSH Publications on Control of Nitrous Oxide in Dental Operatories at 1-800-232-4036. Exposure can be minimized by effective controls, including System Maintenance, Ventilation, and Work Practices can effectively reduce N<sub>2</sub>O concentrations in dental operations. A scavenger system is a significant part of exposure control.

Your sedation machine includes a fail-safe and other safety features. It also includes the required and accepted specifications by the ADA Council on dental materials and devices. Which includes; emergency air valve, rebreathing check valve, and resuscitator quick connect. The ADA also requires; the system to be installed by a competent supplier of gases and equipment; the gas storage and delivery system meets the recommendations for the National Fire Protection Association. (See NFPA Code)

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# PC-7 Flowmeter

<b>FLOWMETER HEAD DIMENSIONS</b>
8.75"H X 3.75"W X 10.25"D
<b>WEIGHT OF FLOWMETER HEAD</b>
5lbs
<b>BAG AND OUTLET DIAMETER</b>
22mm (approx. 7/8")
<b>OXYGEN FLOW RANGE</b>
3-10 LPM
<b>NITROUS OXIDE FLOW RANGE</b>
0-7 LPM
<b>FAIL-SAFE TYPE</b>
Proportional

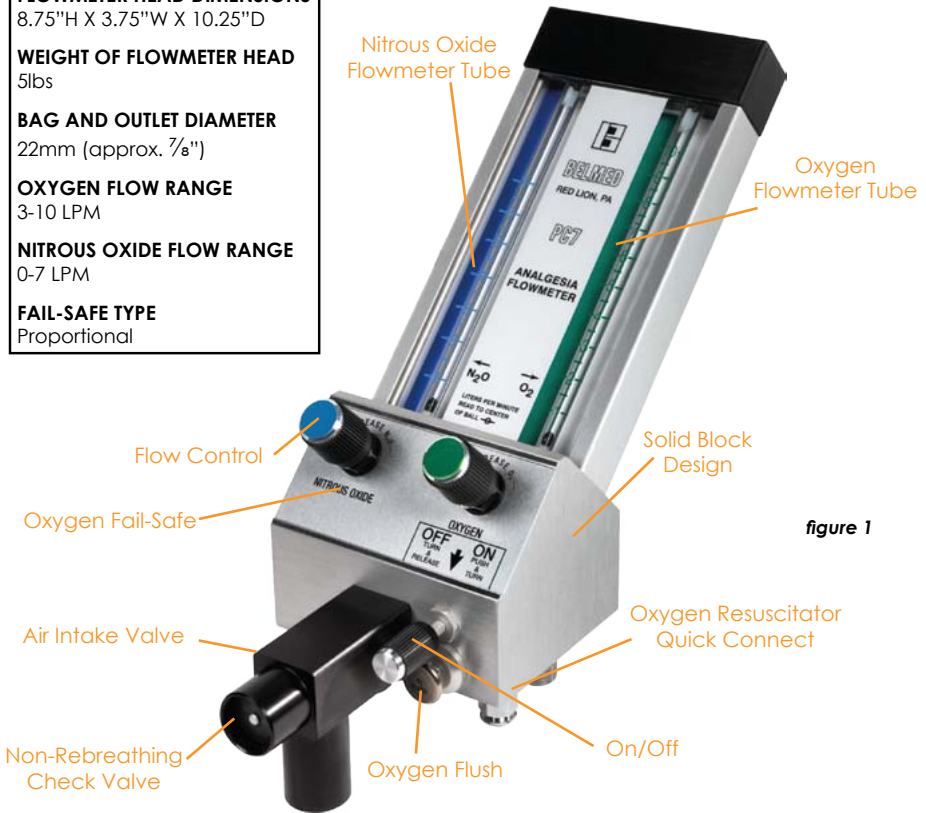


figure 1

**Nitrous Oxide/Oxygen Flowmeter Tubes** are calibrated in liters per minute at ½ liter increments. A minimum of 30% O<sub>2</sub> is achieved by limiting flows to a minimum of 3 liters for O<sub>2</sub> and a maximum of 7 liters for N<sub>2</sub>O.

**Flow Control Valves** allows for quick responsive flow adjustments.

**Oxygen Fail-Safe** automatically and proportionally reduces N<sub>2</sub>O in the event O<sub>2</sub> is reduced or shut off.

**Air Intake Valve** entrains ambient air into the breathing circuit in the event flow from the machine is lost for any reason.

**Non-Rebreathing Check Valve** prevents the rebreathing of expired gases and guards against CO<sub>2</sub> build-up.

**Oxygen Flush** provides a rapid flow of oxygen directly into patient breathing circuit.

**On/Off Control** provides a 3 liter minimum O<sub>2</sub> flow when the unit is turned on.

**Oxygen Resuscitator Quick Connect** provides connection of auxiliary resuscitation equipment.

**Solid Block Design** is designed to eliminate internal gas leaks.

# Test Procedures

Note: Failure of the following test will require unit to be returned for service. These tests must be conducted periodically to ensure proper operation. (Refer to figure 1)

**Test:** Connect unit to a 50psi gas source. Check to make sure control valves are turned off. Gently turn both valves clockwise until unit resistance is felt.

- 1. Minimum oxygen:** Turn on unit by pushing and turning on/off knob. A 3 liter flow of oxygen should be produced through O<sub>2</sub> tube.
- 2. Oxygen flush:** Depress O<sub>2</sub> flush button to determine a rapid flow of oxygen into breathing circuit. Flow should stop when button is released.
- 3. Maximum nitrous:** Turn N<sub>2</sub>O needle valve wide open. N<sub>2</sub>O flow should not exceed 7 LPM.
- 4. Fail safe test:** Establish a 7 LPM N<sub>2</sub>O flow and 3 LPM O<sub>2</sub> flow. Disconnect O<sub>2</sub> supply source or shut off O<sub>2</sub> supply. Both O<sub>2</sub> and N<sub>2</sub>O flows should stop flowing.
- 5. Air intake valve:** Attach breathing bag and corrugated breathing tube to proper ports of tee. Unit should be turned off and bag flattened. Inhale through breathing tube. Room air must enter through air intake located on bottom of breathing circuit tee.
- 6. Non-Rebreathing valve:** Connect corrugated tube to front of tee and attempt to exhale through tube. Valve should be closed preventing exhaled air from going into tube.

## Operation

1. Turn unit on (100% O<sub>2</sub>) and set the oxygen flow rate to equal total gas flow (minute volume) to be administered to patient. Maintain breathing bag about  $\frac{2}{3}$  full.
2. Apply nasal hood to patient.
3. Gradually introduce nitrous oxide flow rate while proportionally decreasing oxygen flow rate (maintaining total gas flow) until determined patient ratio is reached.
4. If oxygen is required, press oxygen flush button.
5. To remove patient from conscious sedation, return to 100% oxygen flow rate established at beginning of procedure.

## Maintenance

1. Ascertain a proper gas supply pressure of 50psi.
2. Inspect machine hoses and connections for damage, wear and leaks daily.
3. Perform functional test periodically.
4. Keep unit clean. Unit and accessories may be cleaned with activated dialdehyde (Cidex). Follow manufacturers directions for use.

**Service:** All Service and repair must be accomplished at Belmed, Inc. Have your dealer return unit to our facility for service.

# Installation Instructions

## Flowmeter on Yoke Block Stand

**Mobile stand assembly:** Remove packaging from the base and column. Push tapered end of column into base (figure 13).

**Flowmeter attachment:** Remove ½ in. diameter height adjustment rod from column. Hand tighten the end of threaded rod into mounting adapter located on bottom of flowmeter. Lock rod into flowmeter adapter by tightening nut with ¾ in. open end wrench while holding rod. Replace rod into column and tighten toggle screw at desired height (figure 2).

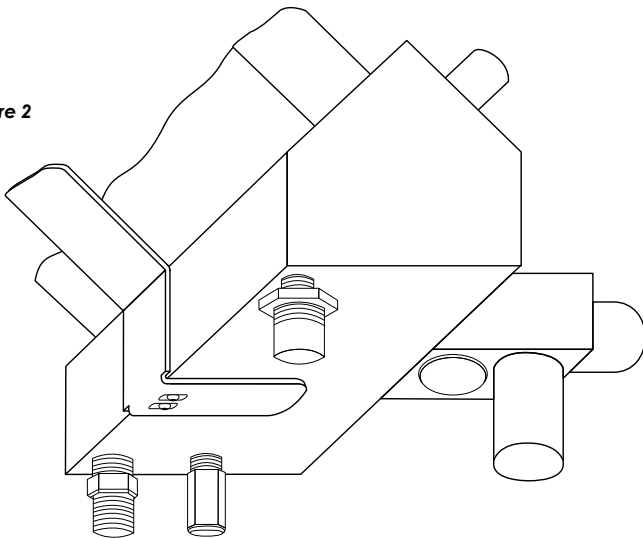
**Rubber goods:** Connect breathing bag to bottom of bag tee. Connect 90° adapter to front of tee. Connect corrugated breathing tube to 90° adapter. Connect nasal inhaler to other end of breathing tube (figure 6).

Connect gas supply hoses to DISS fittings located on bottom of flowmeter (figure 5).

Test machine.

**Note:** If optional O2 resuscitator is purchased with machine, plug hose end into female quick connect located on bottom of machine. Depress button to determine O2 flows through resuscitator. For demand flow test, breathe through face mask (figure 15).

figure 2



Flowmeter Connection  
to Mobile Stand

# Yoke

**Yoke block stand assembly:** Remove packaging from the base, column, and yoke block. Follow the assembly instructions in the yoke block instruction manual to complete the assembly of these parts.

**Flowmeter attachment:** Remove ½ in. diameter height adjustment rod from column. (Z bracket should already be attached to the height adjustment rod). Use the two provided screws to fasten the Z bracket to the Flowmeter. Replace rod into column and tighten height adjustment knob at desired height (figure 3).

**Rubber goods:** Connect breathing bag to bottom of bag tee. Connect 90 adapter to front of tee. Connect corrugated breathing tube to 90° adapter. Connect nasal inhaler to other end of breathing tube (figure 6).

Connect gas supply hoses to DISS fittings located on bottom of flowmeter (figure 5).

Test machine.

**Note:** If optional O<sub>2</sub> resuscitator is purchased with machine, plug hose end into female quick connect located on bottom of machine. Depress button to determine O<sub>2</sub> flows through resuscitator. For demand flow test, breathe through face mask (figure 15).

figure 3





# Installation Instructions

## Flowmeter on Wall Arm or Cabinet Bracket

**Wall Arm/Cabinet Bracket:** Attach arm to wall stud or other similar firm support with lag screws (figure 7). Mount cabinet bracket to roof of cabinet with lag screws (figure 9).

**Flowmeter attachment:** Remove screw and washer assembly from stud on flowmeter mount and attach flowmeter to arm bracket by inserting stud into hole located on arm. Replace screw and washer assembly into stud. Telescoping arm will extend flowmeter approximately a max of 24 in. from mounting surface (figure 4).

**Rubber goods:** Connect breathing bag to bottom of bag tee. Connect corrugated breathing tube to front end of tee. Connect nasal inhaler to other end of breathing tube (figure 6).

Connect gas supply hoses to DISS fittings located on bottom of flowmeter (figure 5).

Test machine.

**Note:** If optional O<sub>2</sub> resuscitator is purchased with machine, plug hose end into female quick connect located on bottom of machine. Depress button to determine O<sub>2</sub> flows through resuscitator. For demand flow test, breathe through face mask (figure 15).

### Arm Mounting Detail

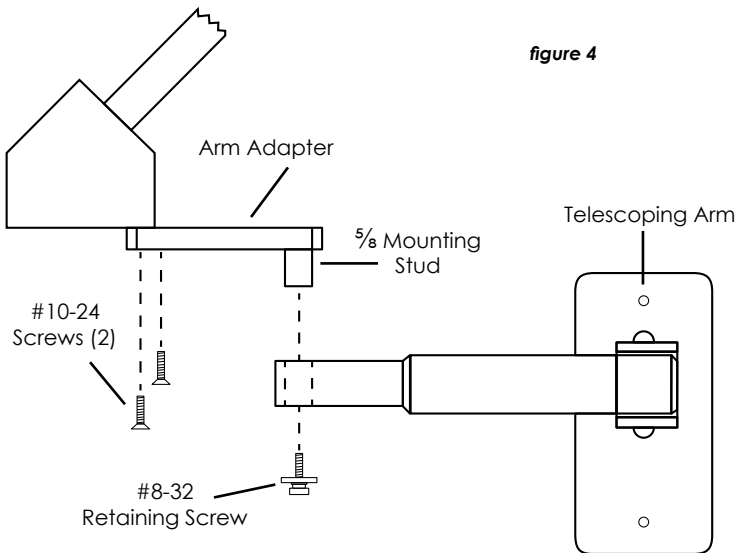
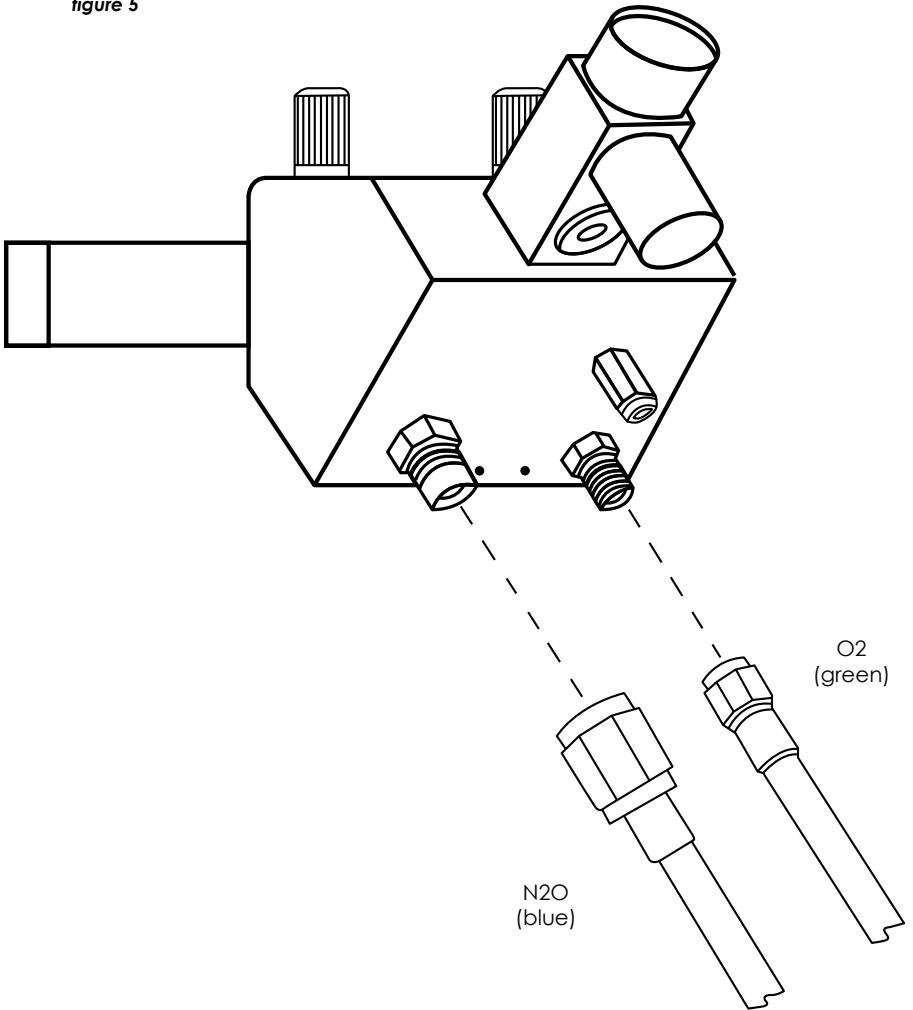


figure 4

# Supply Hose Connections

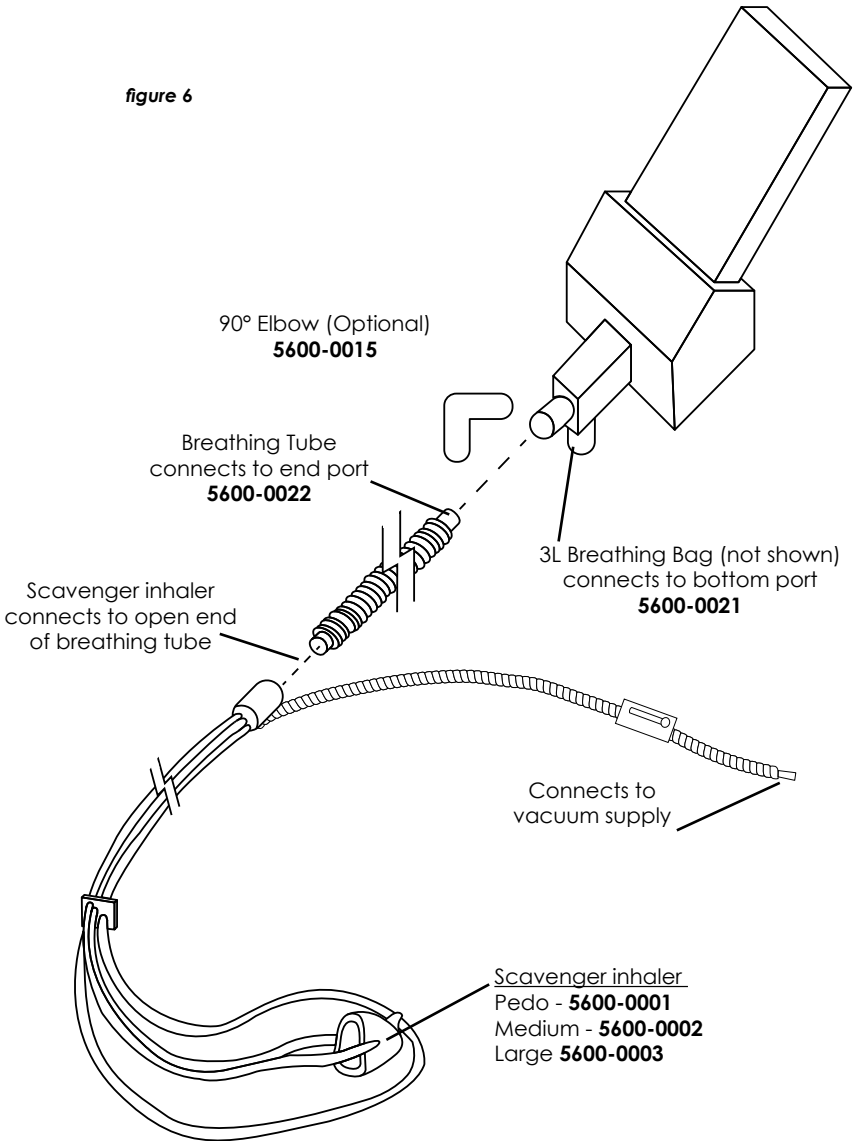
figure 5



# Scavenger Rubber Goods Assembly

(Part #'s 5600-0001, 5600-0002, 5600-0003)

figure 6



# Arm Mounting

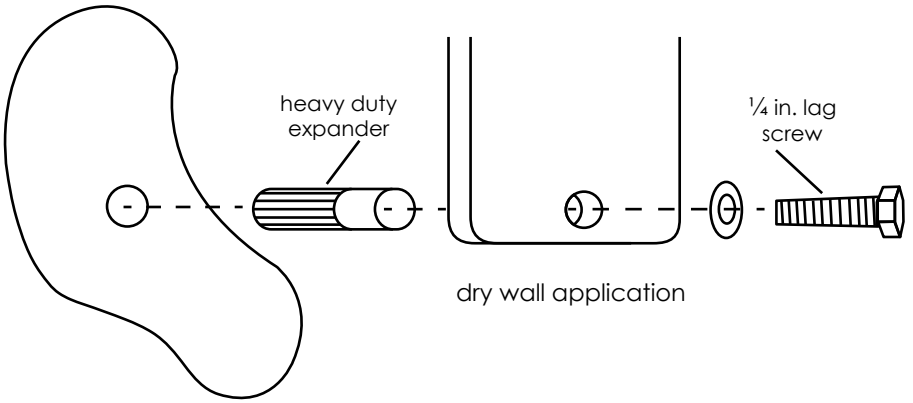
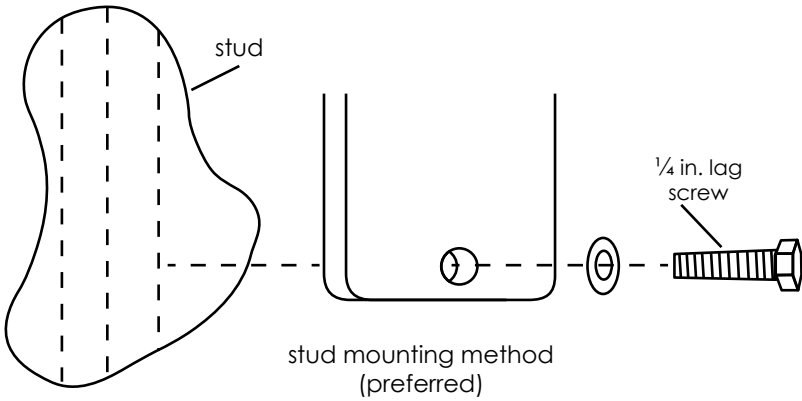
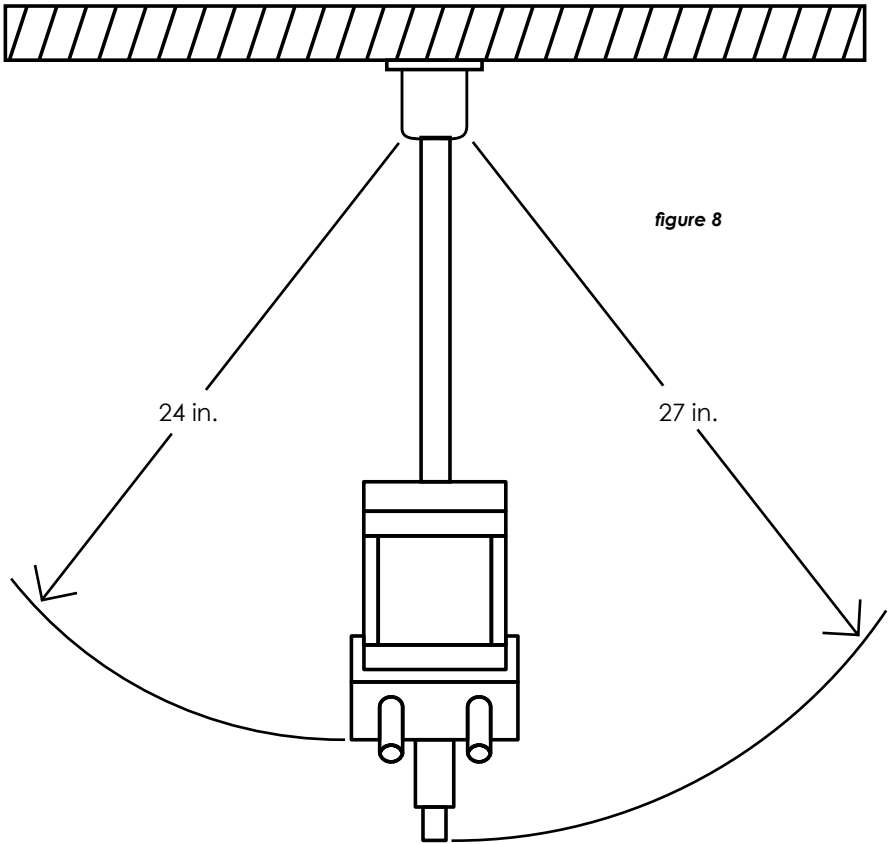


figure 7



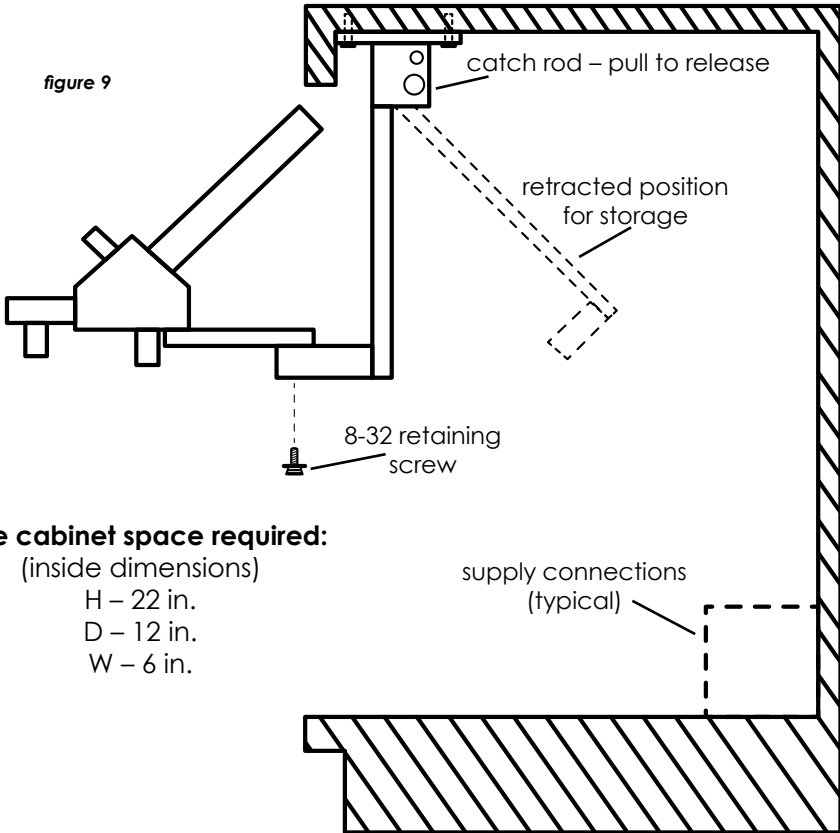
# Top View of Telescoping Arm System



Extends controls up to approximately 24 in. from wall surface

# Cabinet Hinge Bracket Installation

Mount bracket as shown to roof of cabinet with 4 lag screws up to ¼ in. diameter that is suitable for type of cabinet construction and ensures that bracket will not loosen. Note: If the top material inside of cabinet is too thin to secure bracket, it may be necessary to first attach a piece of 1 in. x 6 in. board to the cabinet and then attach cabinet bracket to board.



## Cabinet Bracket Detail

**Operation:** To release bracket for use from its retracted position, hold flowmeter with one hand and release catch (located on upper right of bracket) by pulling knob to right. Allow flowmeter to gently come forward and release pull knob. Catch will release itself when the use position is reached. To stow unit; pull knob to release catch, push unit back, and release knob. Unit will latch itself when stowed position is reached.

# Cabinet Bracket

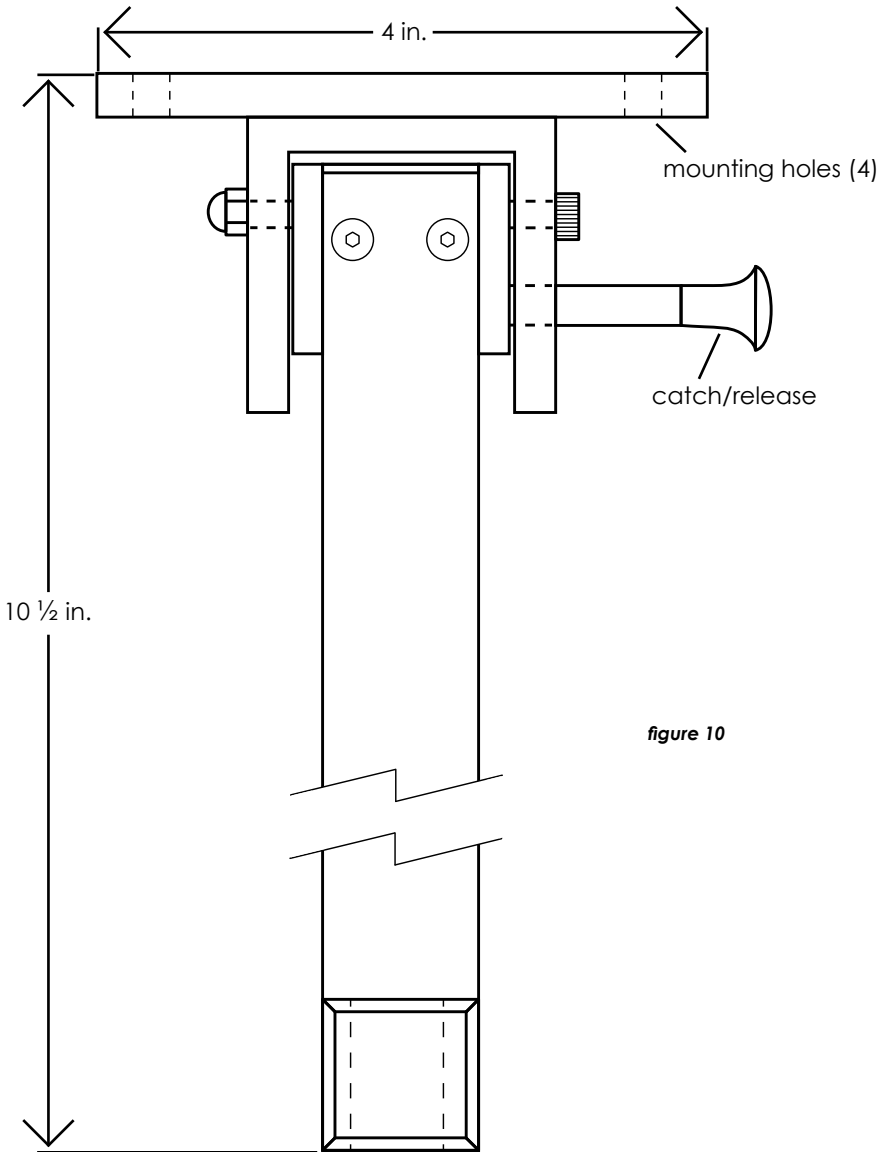


figure 10

# Flowmeter Head Overall Dimensions

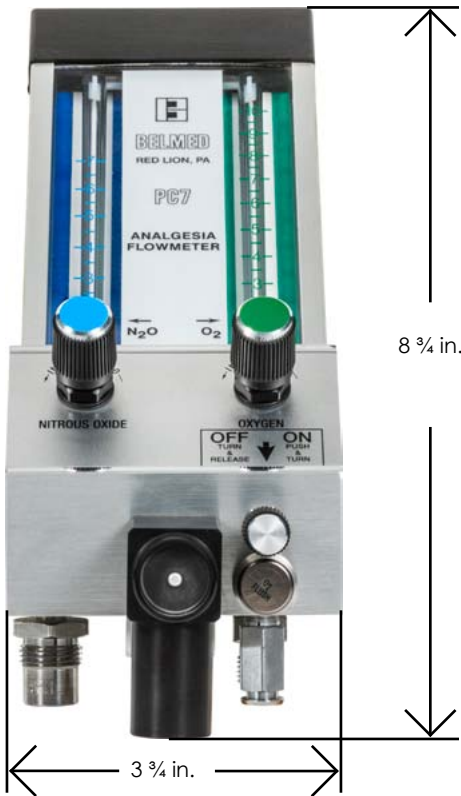
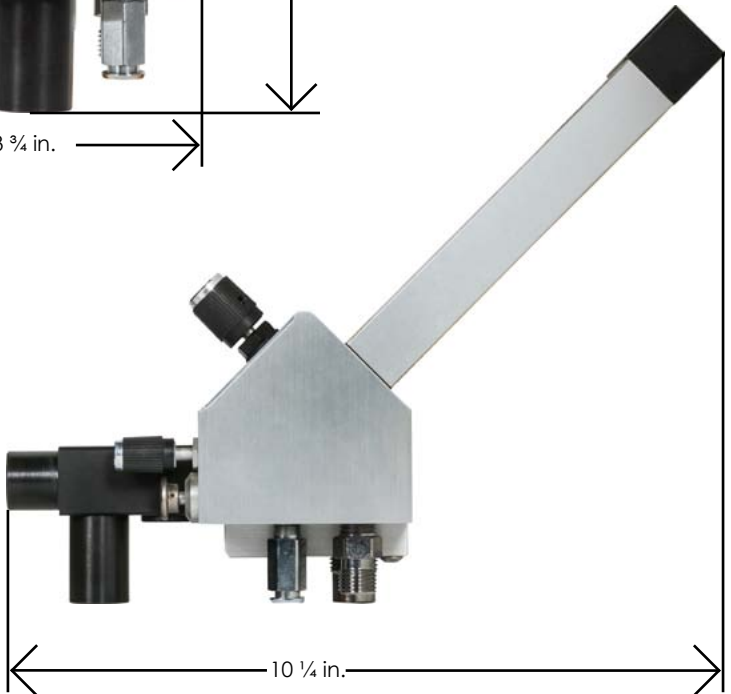


figure 11





## Mobile Stand Detail

figure 12

### SHORT STAND

5300-1001

### HEIGHT

20.5 in.

### WIDTH

19 in.

### HEIGHT ADJUSTMENT

10 in.



figure 13

### TALL STAND

5300-1011

### HEIGHT

30.5 in.

### WIDTH

19 in.

### HEIGHT ADJUSTMENT

10 in.



## Yoke System

**HEIGHT**

31 in.

**WIDTH**

19 in.

**DEPTH**

19 in.



*figure 14*

# O2 Demand Valve Resuscitator Quick Connect (Part# E201)

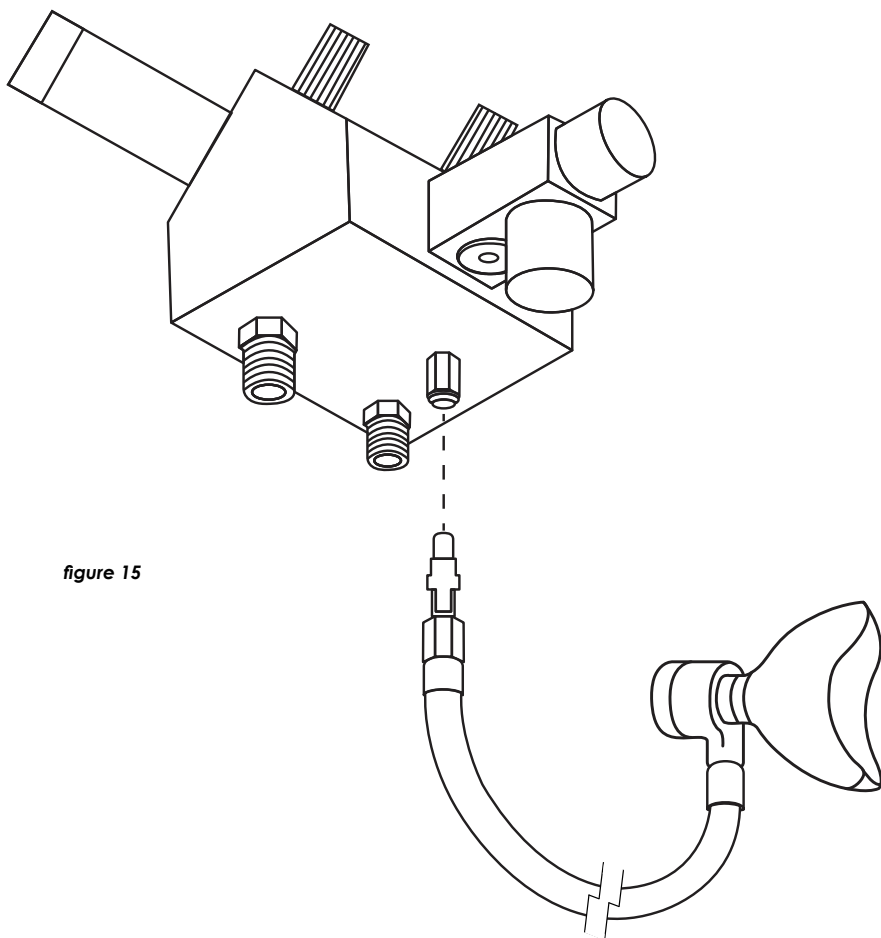


figure 15

# Ratio Flow Control

**O2 flow rate** can be reduced to as low as 1 liter per minute to match patient breathing volumes while still maintaining minimum 30% O2 and 70% maximum N2O

figure 16



**5000-0000-0100**

Ratio Flow Control for PC-7.....\$140.00

# Warranty

Definition of Warranty Return: A product or part covered by the Belmed, Inc. warranty, that fails while the terms of the warranty are in effect.

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

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

Subject to the next sentence, Belmed, Inc 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. For plastic, rubber and disposable parts or items Belmed, Inc. warrants only that each such part and item shall be free from defects in workmanship and materials at the time of delivery to the customer.

Belmed, Inc.'s obligation for breach of this warranty, or for negligence or otherwise, shall be strictly and exclusively limited to Belmed Inc.'s choice of repair or replacement of the product or part. This warranty shall be void for any product on which the serial number has been altered, defaced or removed.

Belmed, Inc. 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, misused, or misapplied; (2) repaired, altered or modified by persons other than Belmed, Inc. (3) not installed in strict compliance with applicable codes and ordinances; or (4) not installed by Belmed, Inc. or an authorized Belmed, Inc. dealer.

UNDER NO CIRCUMSTANCES SHALL BELMED, INC. BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN THE UNIFORM COMMERCIAL CODE.

## **Important: Traceability/Warranty Registration**

Medical device legislation of 1976 mandates traceability of this equipment. Please fill out and return warranty card.

# Purchase Record

MODEL NO.

SERIAL NO.

PURCHASE DATE

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## Notes



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**MEDICAL GAS SYSTEMS & EQUIPMENT**

LPM	OXYGEN																			
	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
N	50%	33%	25%	20%	17%	14%	13%	11%	10%	9%	8%	8%	7%	7%	6%	6%	6%	5%	5%	5%
I	67%	50%	40%	33%	29%	25%	22%	20%	18%	17%	15%	14%	13%	13%	12%	11%	11%	10%	10%	9%
T	75%	60%	50%	43%	38%	33%	30%	27%	25%	23%	21%	20%	19%	18%	17%	16%	15%	14%	14%	13%
R	80%	67%	57%	50%	44%	40%	36%	33%	31%	29%	27%	25%	24%	22%	21%	20%	19%	18%	17%	17%
O	83%	71%	63%	56%	50%	45%	42%	38%	36%	33%	31%	29%	28%	26%	25%	24%	23%	22%	21%	20%
U	86%	75%	67%	60%	55%	50%	46%	43%	40%	38%	35%	33%	32%	30%	29%	27%	26%	25%	24%	23%
S	88%	78%	70%	64%	58%	54%	50%	47%	44%	41%	39%	37%	35%	33%	32%	30%	29%	28%	27%	26%
O	89%	80%	73%	67%	62%	57%	53%	50%	47%	44%	42%	40%	38%	36%	35%	33%	32%	31%	30%	29%
X	90%	82%	75%	69%	64%	60%	56%	53%	50%	47%	45%	43%	41%	39%	38%	36%	35%	33%	32%	31%
I	91%	83%	77%	71%	67%	63%	59%	56%	53%	50%	48%	45%	43%	42%	40%	38%	37%	36%	34%	33%
D	92%	85%	79%	73%	69%	65%	61%	58%	55%	52%	50%	48%	46%	44%	42%	41%	39%	38%	37%	35%
E	92%	86%	80%	75%	71%	67%	63%	60%	57%	55%	52%	50%	48%	46%	44%	43%	41%	40%	39%	38%
	93%	87%	81%	76%	72%	68%	65%	62%	59%	57%	54%	52%	50%	48%	46%	45%	43%	42%	41%	39%
	93%	88%	82%	78%	74%	70%	67%	64%	61%	58%	56%	54%	52%	50%	48%	47%	45%	44%	42%	41%

\* Greater than 70% N2O administered exceeds the amount able to be delivered by sedation machine.



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