

SurgiVetTM

CLASSIC T³TM VAPORIZER

Operation Manual



Model VCT302 Classic T3 Isoflurane Funnel Fill Vaporizer shown above

en English

Catalog Number V1916

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smiths medical

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Warranty and Service Information

Proprietary Notice

Information contained in this document is copyrighted by Smiths Medical PM, Inc. and may not be duplicated in full or part by any person without prior written approval of Smiths Medical PM, Inc. Its purpose is to provide the user with adequately detailed documentation to efficiently install, operate, maintain, and order spare parts for the device supplied. All information contained in this document is believed to be current and accurate as of the date of publication or revision, but does not constitute a warranty.

Warranty

Limited Warranty

Smiths Medical PM Inc Veterinary Division. (Seller) warrants the Classic T³™ Vaporizer shall be free from defects in workmanship, materials and calibration under normal use and service, if used in accordance with its labeling, for a period of three (3) years from the date of its shipment from the factory.

Disclaimer of Warranties

THE FOREGOING EXPRESS WARRANTY, AS CONDITIONED AND LIMITED, IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Conditions of Warranty

Seller's sole obligation under this warranty is to repair or replace, at its option, products that prove to be defective during the warranty period. This warranty is void if the Product has been altered, misused, damaged by neglect or accident, not properly maintained, or repaired by persons not authorized by Seller. Misuse includes, but is not limited to, use not in compliance with the labeling or use with accessories not manufactured by Seller. This warranty does not cover normal wear and tear and maintenance items

This warranty is not assignable.

Limitation of Remedies

The foregoing shall be the sole warranty remedy. Except as specified, Seller makes no warranties, either expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. No warranty is provided if the products are modified without the express written consent of SMPM, and seller shall not be liable in any event of incidental or consequential damage.

Loaner Device

Smiths Medical PM, Inc. (SMPM) will for the period of the warranty make a loaner available at no charge, provided it is the opinion of the Clinical Service personnel that repair of the customer's vaporizer would require a period of time in excess of 3 Days (not including shipping).

After the warranty period has lapsed, loaners are available at a fee.

Repairs are defined as returning the same device to good operating condition, by furnishing and / or installing repair parts as necessary to allow the vaporizer to pass a factory calibration.

Unless specified otherwise, Repair shall not include:

(I) Maintenance repair or replacement of parts resulting from catastrophe, accident, neglect, misuse, fault or negligence of the Customer, its employees or agents, or causes external to the Equipment and causes other than normal use;

(II) Service and repair of accessories, apparatus, attachments or any other devices not included when the device was sold originally;

(III) Changes, modifications or alterations in or to the Equipment and/or accessories, apparatus, attachments or other devices;

(IV) Installation/removal services,

(V) Maintenance service required as a result of Customer's failure to perform preventive maintenance in accordance with "manufacturer's operating manual" or other written instructions from SMPM.

T³ Vaporizer will not require calibration during the initial three years of use. Subsequent calibrations are recommended to be performed on an annual basis.

Customer shall at its expense, ship Equipment to SMPM, Waukesha WI address via the method of their choosing. SMPM shall at its expense, ship repaired Equipment back via the comparable method (Example - Items shipped to Waukesha via over night delivery, will be returned UPS Red - while items returned via standard delivery will be returned UPS Ground).

Excused Nonperformance

SMPM shall not be liable and Customer shall have no right in respect to delay in performance or of the non-performance of any term of condition of this Agreement, directly or indirectly resulting from fire, explosion, accident, flood, labor trouble or shortage, any regulation rule or act authorized by any government agency, Customer's denial to SMPM of full and free access to the Equipment, inability to obtain or shortage of suitable material, components, parts, equipment, machinery, fuel, power, or transportation or act of God or any other cause beyond SMPM control. No obligation is assumed by SMPM to the Customer's clientele or user of Customer's services.

The Customer agrees to maintain environmental conditions, and sited facilities in accordance with SMPM installation recommendation. Furthermore, Customer agrees to use only those supplies, which meet the specifications recommended by SMPM.

Warranty Procedure

To obtain warranty service in the USA, you must request a return number from Clinical Service. Reference the return number when returning the Product, freight and insurance prepaid by Purchaser to:

Smiths Medical PM, Inc.	Telephone: 1-262-513-8500
Veterinary Division	Toll Free: 1-800-745-6562 (U.S.A. only)
N7W22025 Johnson Drive	Fax: 1-262-513-9069
Waukesha, WI 53186-1856	Web: www.surgivet.com

Seller will not be responsible for unauthorized returns or for loss or damage to the Product during the return shipment. The repaired or replaced Product will be shipped, freight prepaid, to the Purchaser.

Vaporizer Exchange Program

Smiths Medical PM, Inc. offers a vaporizer exchange program to help eliminate downtime during the vaporizer cleaning and calibration process. When utilizing the exchange program, place an order for the same agent type and style of vaporizer that you are currently using. A remanufactured vaporizer that has been cleaned and calibrated will be sent to you. Once you receive the vaporizer, drain your current vaporizer, and return it using the shipping label provided. Your original vaporizer will not be returned to you. There is a one year warranty on calibration of vaporizers purchased under the exchange program.

If the vaporizer you return does not have parts that meet the “Original Manufacturer’s Specifications” (i.e. Thermostat, Rotary Valve, etc...), Smiths Medical PM will contact you to determine what steps need to be taken. We will at that time give you three (3) options.

1. We will return your original vaporizer, excluding shipping, un-serviced, and the SurgiVet[®] vaporizer will need to be returned to the factory along with a \$25 processing charge.
2. We will return your original vaporizer, after being serviced with the non-original parts but
 - There is **NO WARRANTY**. The SurgiVet[®] vaporizer will need to be returned to the factory along with a \$25 processing fee.
3. We will return the non-original part(s) to you and charge you for the replaced part(s).

Vaporizer Exchange Return Policy

Your exchanged vaporizer **MUST** be returned to Smiths Medical PM within two weeks to avoid a surcharge of \$25 per week. The **FREE** return label is contained within this box.

Please follow these steps:

1. Vaporizer must be identical to the one being exchanged. If it is not, please call 1-888-745-6562. (US ONLY)
2. Drain present vaporizer of all agent.
3. Remove and replace with the vaporizer provided.
4. Fill the vaporizer with 125 ml of agent on initial fill (it may require topping off after wick is saturated). Please allow the vaporizer to sit for at least one (1) hour once filled. This will allow the wick inside to become fully saturated and ensure proper operation.
5. Place old vaporizer in the same box, apply the enclosed ARS tag, and give the box to UPS. DO NOT let your sales representative take the vaporizer.

NOTICE: THE WARRANTY FOR YOUR EXCHANGED VAPORIZER WILL REMAIN INVALID UNTIL YOUR VAPORIZER HAS BEEN RETURNED TO SURGIVET[®] AND ANY SURCHARGES (SEE ABOVE) HAVE BEEN PAID.

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Chapter 1: Introduction

Classic T³™ vaporizers are precision medical devices designed for the mixing of the vapors of liquid anesthetic agents with anesthetic gases. The Classic T³™ vaporizer is available in two models: the Funnel Fill Vaporizer (the VCT302 Classic T³ Isoflurane Funnel Fill Vaporizer and the VCT305 Classic T³ Sevoflurane Funnel Fill Vaporizer) and the Key Filler Vaporizer (VCT3K2 Iso Key Filler Vaporizer and the VCT3K5 Sevo Key Filler Vaporizer).

User Responsibility

The Classic T³™ vaporizer will continue to provide reliable service only if the manufacturer's operating and maintenance instructions are followed. The Classic T³™ vaporizer, as with any mechanical medical device, requires periodic servicing and calibration verification. The suggested frequency of vaporizer service and calibration verification is annually. Any components, which become worn, distorted, or contaminated, should be replaced only with factory components by factory authorized service centers. A vaporizer that is in need of servicing should not be used until it has been properly tested by a factory-authorized center. Field-testing of vaporizers by using portable test equipment is clearly not recommended as a substitute for factory authorized preventive maintenance. Classic T³™ vaporizers or any of its components should not be modified without approval. The user resumes full responsibility and liability of any use of the vaporizer outside of any written instructions or service and repair performed by persons not authorized by the manufacturer.

KEYWORD	DEFINITION
WARNING	Tells you about something that could hurt the patient or hurt the operator.
CAUTION	Tells you something that could damage the monitor.
NOTE	Tells you other important information.

Warnings

WARNING! Do not fill vaporizer with any agent other than the one specified on the front label. The vaporizer is designed for that agent only. Any other agent than specified, can prove to be dangerous to a patient.

WARNING! Do not try to defeat the "Keyed Filler System" (If equipped). It is a major safety feature.

WARNING! Do not connect any vaporizer directly into the patient breathing circuit. Patient ventilation will be restricted.

WARNING! Do not tilt or tip vaporizer while filled with liquid agent. If unit is accidentally tipped on its side, unit must be purged. Please contact an authorized service center.

WARNING! Do not operate vaporizer without checking for leaks or obstructions such as kinks in rubber lines.

WARNING! Do not modify, tamper, or disassemble the vaporizer. There is a potential danger of damaging the vaporizer and altering the calibration accuracy.

WARNING! Do not connect vaporizer into a system backwards. The inlet and outlet connections are clearly identified.

WARNING! Do not use humidified gases through the vaporizer.

WARNING! Do not use oxygen flush through a vaporizer that is not in the "OFF" position.

WARNING! Do not drain agent into any container other than a properly marked container.

WARNING! Do not turn on two vaporizers that are in series at the same time. Only one should be operated at any one time.

WARNING! Do not ignore maintenance of the vaporizer. A yearly calibration recertification is recommended after initial warranty period.

Cautions

CAUTION! Do not carry vaporizer by control knob. Use two hands, grasping body. Handle with care.

CAUTION! Do not put vaporizer into any liquid, including water.

CAUTION! Do not sterilize vaporizer.

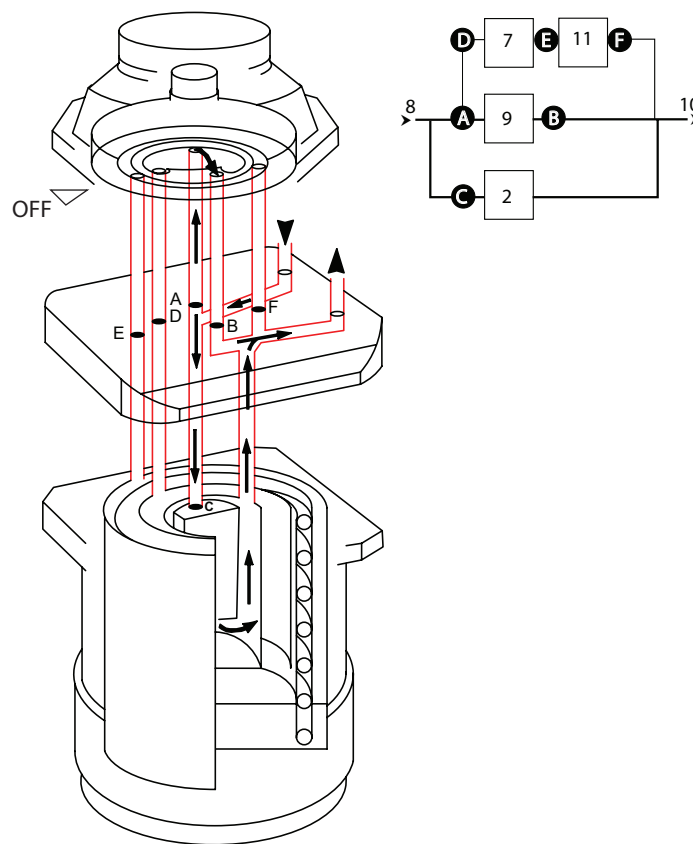
CAUTION! Do not have vaporizer serviced by anyone other than an authorized service center.

Chapter 2: Operating Principles

The vaporizer is comprised of two main sections – the vaporizing chamber, and the upper duct and valve system. Flow through the vaporizing chamber is governed by the concentration setting dial, which splits the metered gas entering the vaporizer between the vaporizing chamber and a bypass chamber, thus altering the percentage of mixed gases.

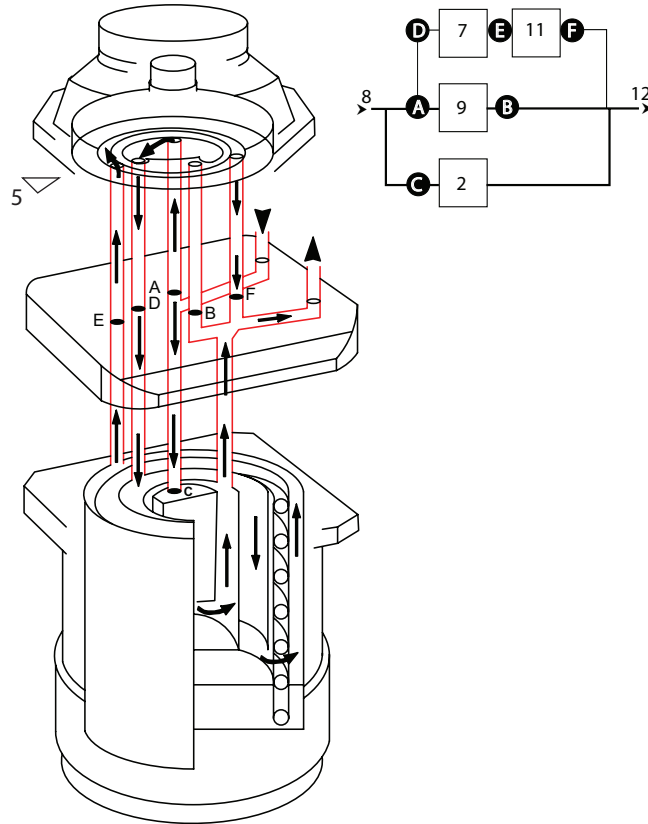
Since the amount of agent picked up in the vaporizing stream will vary due to variation in room temperature or to the cooling which takes place when the agent is vaporized, a temperature sensitive valve automatically adjusts the amount of gas flow through the vaporizing chamber, thus compensating for changes in temperature. Therefore, at a given dial setting the mixed percentage is, for the most part, independent of room temperature.

Control of the concentration delivered by the vaporizer is affected by the rotation of a single control dial. Movement of this control dial rotates a flat, specially treated rotary valve, which opens and closes appropriate ports and controls the proportioned gas passing through the vaporizer chamber. Temperature compensation is achieved automatically by the action of a temperature-sensitive element on a valve, which increases or decreases the amount of gas bypassing the vaporizing chamber.



In the "OFF" position, metered gas enters the vaporizer at the inlet and passes through a filter. The gas then flows along channels in the rotary valve and leaves the vaporizer. A small proportion of the flow passes through the temperature-sensitive valve and joins up with the main flow, which has passed through a channel. When the valve is in the "OFF" position, the inlet to and the outlet from the vaporizing chamber are closed to the gas stream, and no anesthetic agent can enter the gas circuit. To turn the vaporizer on, the locking lever is pushed down; and the control dial is turned to the desired concentration marked on the dial. In this position, the outlet from the channel has been closed, and the inlet port into the vaporizing chamber is opened. The outlet from the sump is also opened, and gas can flow through the control channel.

In the "ON" position, metered gas enters and splits into two streams when leaving the channel. One stream passes through the temperature sensitive valve and flows to the outlet. The other stream passes through a port and enters the vaporizing chamber where there is very close contact between the gas stream and a wick system. The gas becomes saturated with vapor and leaves the vaporizing chamber through a port. From that port the gas flows into the control channel. This control channel is long and wide in relation to the depth. Rotation of the control dial is moved to a position which will give an increased concentration of anesthetic agent.



When the gases, which have passed through the vaporizing chamber, leave the final channel, the flow combines with the flow which has passed through the temperature sensitive valve and leaves the vaporizer through the outlet. The delivered concentration is determined by the relative resistance to flow of the temperature sensitive valve and the last control channel.

Chapter 3: Preparation for Use

Examination and Preparation for Use

1. Examine shipping carton for signs of external damage.
2. Remove contents from carton and inspect for visible damage such as dents or missing parts.
3. If damage is discovered or suspected and or parts are missing, notify customer service immediately.
4. Check that control dial operates freely.

Installation

The standard mounting system requires bolting of the vaporizer directly to a rigid back bar of an anesthesia gas machine. The vaporizer should always be mounted between the gas flow-metering unit and the breathing circuit, always upstream of any absorber or humidifier. Ensure that emergency oxygen supplies or oxygen flush enter the gas circuits downstream of the vaporizer.

Important

- The direction of gas flow must be from “inlet to outlet” in the direction; from left to right when viewing the vaporizer from the front.
- Ensure that the liquid which may accumulate in the breathing circuit or the CO₂ absorber cannot enter the vaporizer while in use or during disassembly of the circuit or when the machine is not in use.

The vaporizer is normally fitted with standard 23 mm inlet and outlet tapers.

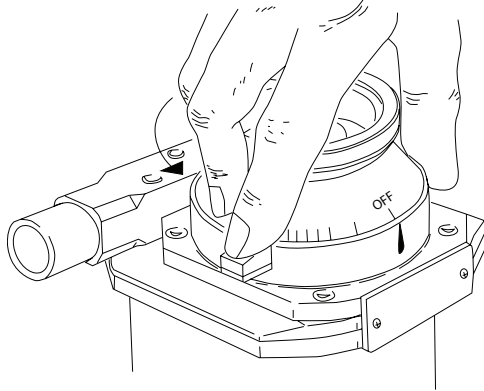
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Chapter 4: Operating Instructions

WARNING! Observe all instructions and warnings on the vaporizer.

Using the Vaporizer

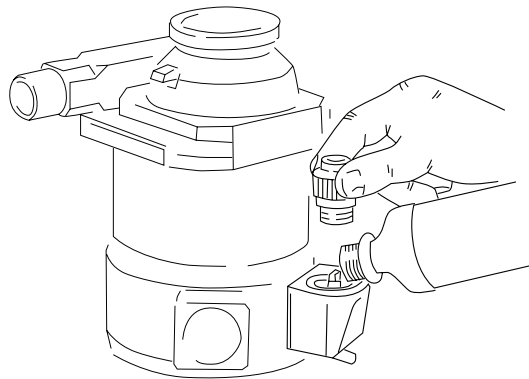
1. To turn control dial to desired concentration, depress (push down) the locking lever on the side of the control dial.



2. Then turn control dial counterclockwise to desired concentration.
3. Vapor flow starts slightly past the "0" marking on the dial.
4. Turn vaporizer "OFF" when not in use.

Filling Instructions - Funnel Fill

WARNING! **DO NOT** fill vaporizer with any agent other than the one specified on the front label. The vaporizer is designed for that agent only. Any agent other than specified could prove to be dangerous to a patient.

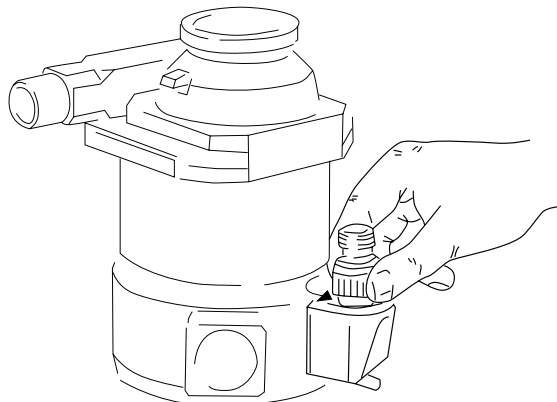


1. Dial should be in "OFF" position. Remove filler cap by turning cap counterclockwise. Be sure drain plug is closed.
2. **Verify that agent is same as label on front of vaporizer.** Pour agent slowly into opening. Observe the proper agent level through sight glass mounted on side. If the vaporizer is dry upon first usage or has been dried following service, the level will fall slightly as the wicks absorb the agent.
3. Replace cap by turning cap clockwise. Cap should be tight to prevent leaks.

NOTE: If vaporizer is dry, allow vaporizer to sit charged with agent for approximately one (1) hour prior to use.

Draining Instructions - Funnel Fill

WARNING! Liquid must be drained from the vaporizer into a properly labeled container.

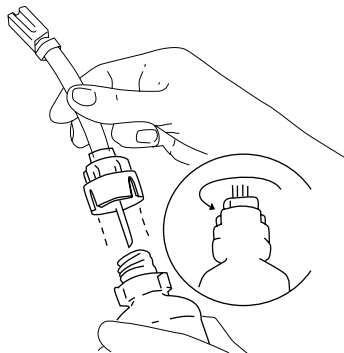


1. Remove the filler cap, invert the cap and place it over the protruding stem inside of the opening.
2. Hold an empty properly labeled container under the spout. Turn the inverted filler cap counterclockwise to open the internal valve.
3. After all liquid is drained, turn the inverted cap clockwise to seal.
4. Replace the filler cap.

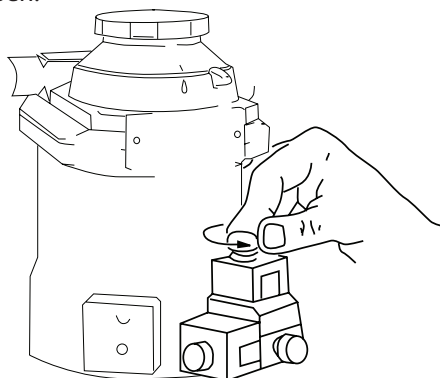
Filling Instructions - Key Fill

NOTE! Top retaining screw and drain valve screw must be tight for vaporizer to function properly.

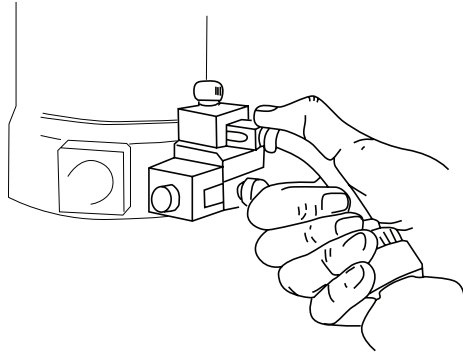
1. Remove cap and seal from anesthetic bottle. Be sure anesthetic bottle neck is not chipped or damaged. Match Keyed Bottle Adaptor to Bottle Collar, and screw together until airtight. The bottle is then ready for filling vaporizer.



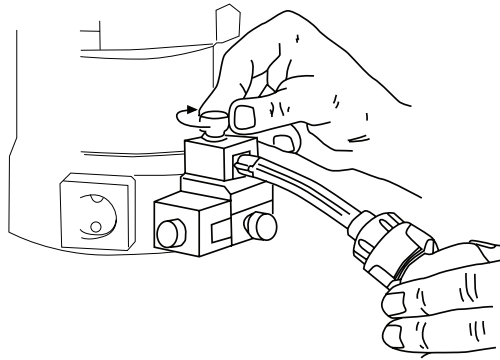
2. Ensure that the vaporizer control is set in the "OFF" position. Turn top retaining screw on Vaporizer Filler unit counterclockwise all the way open.



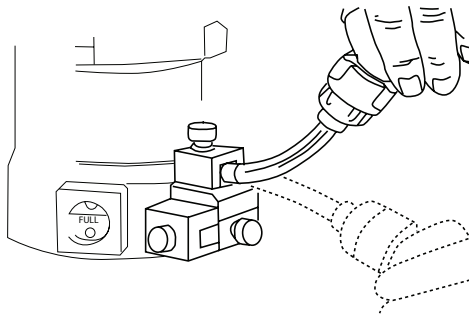
3. Grasp the Keyed Bottle Adaptor and bottle by the plastic tubing with the thumb on top of Adaptor at the keyway and with the two holes DOWNWARD for filling. Fit into the Filler Socket. Only the correct Adaptor will fit into this matching Filler Socket. Take care to bend tube slightly, so bottle is below inlet level to prevent spilling.



4. After insertion, turn the retaining screw clockwise and tighten to seal Adaptor in the Filler Socket.



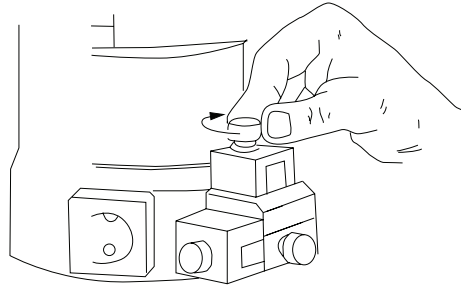
5. Raise bottle above level at Filler Socket, but avoid kinking tube. Gentle up-and-down motion will clear air bubbles and facilitate speedy filling.



NOTE! If agent is not going into vaporizer there may be a vapor lock. If this occurs turn the vaporizer "ON" to release the vapor lock.

- When vaporizer is filled to the “full” level, lower the bottle. Remove Adaptor. If any excess liquid drains from the Filler Socket, allow this to escape completely before tightening top retaining screw (BE SURE to tighten screw or gas will escape through Filler). The vaporizer is then ready for use.

NOTE! If vaporizer is dry, allow vaporizer to sit charged with agent for approximately one (1) hour prior to use.

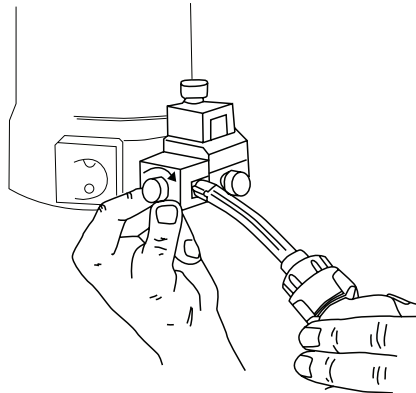


NOTE! Top retaining screw and drain valve screw must be tight for vaporizer to function properly.

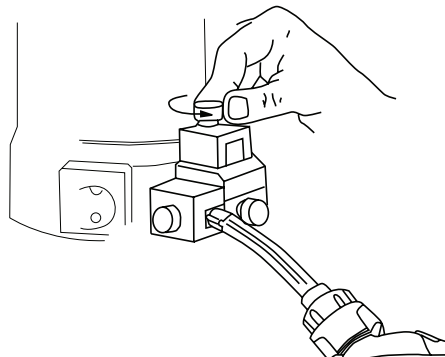
Draining Instructions - Key Fill

- Turn side retaining screw counterclockwise all the way open. Insert the Bottle Adaptor in Drain (lower) socket, with the two holes facing side of the filler unit, and tighten retaining screw (clockwise).

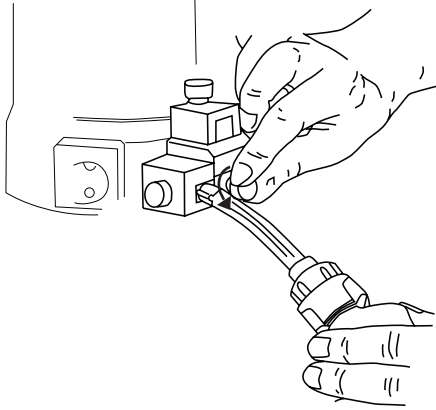
NOTE! ONLY the correct Adaptor will fit into this matching Drain Socket.



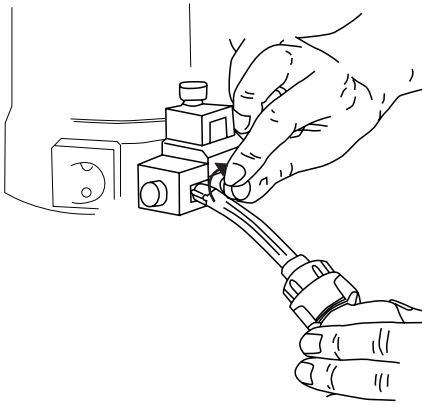
- To let air vent from bottle, and draining to occur, loosen top retaining screw one turn. Hold bottle slightly downward without kinking tube.



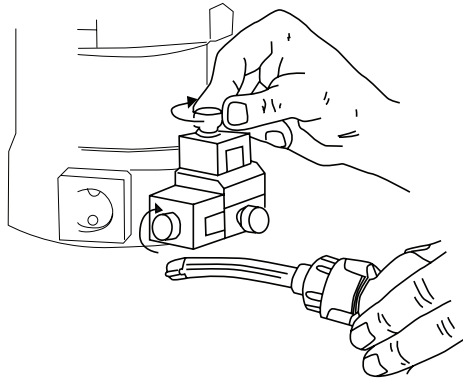
3. Open Drain Valve on front counterclockwise and vaporizer will drain.



4. At completion of draining, close Drain Valve (clockwise).



5. Remove the adapter and tighten both retaining screws (Clockwise).



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Chapter 5: Maintenance

Assuring Performance of the Vaporizer

To assure the continued performance of the vaporizer, the manufacturer recommends that **annual preventative maintenance** be performed. Accurate and efficient anesthetic gas delivery is a primary consideration in patient care. Anesthetic agent vapors are extremely potent, and a very small error in concentration could be hazardous.

Why Proper Maintenance Means Greater Protection for the Patient

Annual maintenance ensures the following:

- That moving parts in the vaporizer are checked for wear, replaced when necessary and calibration is verified.
- That wicks are replaced to prevent the accumulation of non-volatile preservatives and any contamination which can retard anesthetic vaporization and interfere with efficient anesthetic gas delivery.
- That accidental damage to a vaporizer (damage that could alter performance) is discovered and corrected.

Why Proper Maintenance is Important to the Operator

Annual maintenance ensures that vapor leaks are corrected if they exist and prevents the vaporizer from contributing to operating room pollution.

Preventative Maintenance

Preventative maintenance includes:

- Disassembly of each vaporizer.
- Inspection of all parts for damage and wear.
- Cleaning of metal parts.
- Replacement of special cloth wicks and small components.
- Testing of the thermo-control unit and recalibration or replacement if necessary.
- Reassembly of each instrument.
- Testing for and correcting leaks.
- Calibration verification with a precision laser refractometer in a controlled environment.

Smiths Medical PM, Inc. Veterinary Division will maintain a permanent continuous service record, including calibration verification data.

All service will be performed in accordance with procedures and calibration instruments specified by the manufacturer.

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Chapter 6: Performance Characteristics

Calibration

Vaporizers are calibrated at 21° C. The variation in output with temperature, flow rate and duration of use is small, and the variation in output when used with Intermittent Positive Pressure Respiration is negligible.

Resistance to Gas Flow

5 cm.wg at the "OFF" setting at 5 liter/min O₂ at 22° C.

NOTE: cm.wg are centimeters water gauge.

Duration of Use

The rate of consumption of anesthetic agent depends primarily on flow rate and vapor output concentration. As an approximate working figure 1.0 ml of liquid anesthetic is required to provide 200 ml of vapor.

The rate of evaporation of anesthetic agent may with caution be used as an approximate method of checking that the delivered output is not grossly in error, and as a means of estimating how often the vaporizer is likely to need refilling.

The approximate hourly consumption of anesthetic agents can be expressed as follows:

- Approximate rate of agent consumption = $3 \times \% \times F$ (ml/hour)

Where % represents the setting of the vaporizer output percentage, F represents the input flow rate in liter/min.

Example: If a vaporizer is set to deliver 2% at 6 liter /min total input gas flow rate.

- Approximate rate of agent consumption ($3 \times 2 \times 6$) = 36 ml/hour.

The figures are intended only for clinical guidance and are approximate. They will vary depending upon the type of flow meters etc. and will be grossly in error if the vaporizer drain port is not fully close.

Liquid Capacity

- Amount of anesthetic agent to fully charge the vaporizer =125 ml. (nominal)
- Amount retained by Wick System =35 ml. (nominal)

Weight and Dimensions

- Weight (dry) 6.3 kg (16.2 lbs)
- Height 205 mm (7.5 inches)
- Depth 145 mm (5.6 inches)
- Width 135 mm (5.3 inches)

Effects of Variables

Temperature

The effects of variation of temperature are normally negligible at commonly used combinations of dial setting and ambient temperature.

The vaporizer responds very slowly to change in ambient temperature and (to prevent the valve from closing completely) as a safety feature the temperature sensitive valve does not respond to temperature below the range 12-15° C approx.

Should the vaporizer temperature be lower than this, then the output can be expected to be lower than that indicated on the dial.

At temperatures above 35° C, the vaporizer output may be unpredictably high-particularly if the temperature approaches the boiling point of the anesthetic agent.

- The operating temperature range is specified at 15-35° C. (Pressure)

Vaporizers are graduated in v/v percentage at 760 mm Hg. If the ambient pressure changes the v/v % will change so that at an ambient pressure P mm Hg the delivered percentage (D % v/v)

$$D = \frac{\% \times 760}{P} \quad \text{Where \% is the nominal setting of the vaporizer.}$$

It is generally accepted that the depth of anesthesia depends on the inspired partial pressure of agent and not the concentration by volume of agent.

To obtain a consistent depth of anesthesia when gross changes of barometric pressure occur it is necessary to change the v/v % in inverse proportion to the barometric pressure.

The vaporizer automatically does this and for practical clinical purposes the effects of the barometric pressure can be ignored.

Back Pressure Steady

Low and Moderate Pressures

The vaporizer cannot distinguish between pressures at the outlet due to barometric pressure and pressures in excess of barometric due to steady backpressures applied by down stream components. Equation 1 therefore applies with term P now being the absolute pressure at the outlet (i.e. barometric pressure plus back pressure). Steady backpressure reduces the v/v percentage.

High Pressures

Pressures in excess of approximately 400mm Hg should not be imposed on the vaporizer since these may overcome the loads imposed by internal thrust springs.

Low and Moderate Back Pressures

Currently it is unlikely that the steady backpressure imposed by commonly used downstream components (other than some ventilators) will exceed 30mm Hg at commonly used flow rates. Back pressures as high as this would reduce the delivered v/v percentage (at 760 mmHg barometric pressure) to:

$$\frac{760}{790} = 0.96 \text{ of what otherwise would be expected. Under normal clinical circumstances effects of this magnitude can be ignored.}$$

Some ventilators may impose higher steady back pressures of perhaps 100 mm Hg producing more significant depression of the v/v percentage. The increased patient uptake of agent with improved ventilation can often mitigate these effects so as to obviate the need to compensate for increased backpressure at the vaporizer.

High Back Pressures

Pressures in excess of 400mm Hg could conceivably occur during procedures similar to bronchoscopy or because of occlusion of downstream tubing and piping or for other reasons. These effects on v/v percentage cannot be precisely predicted but the most likely effects will be reductions in concentration (or small increases).

Back Pressure Fluctuating

Fluctuating backpressures may be imposed on the vaporizer by downstream components, and assisted or controlled ventilation to the patient. This can affect the vaporizer and increase the concentration by intermittently altering the pressures and hence the flow distribution within the vaporizer. The greatest effects are observed at combinations of very low flow rates and low dial setting with large and rapid pressure fluctuations and become progressively less important as the dial setting and flow rate increase and the magnitude and rate of cycling of the pressure fluctuations decrease.

In clinical use the vaporizers are considered unaffected by all fluctuating backpressures which occur under all normal clinically encountered conditions appertaining to human anesthesia.

Carrier Gas Composition

Small effects can occur when the carrier gas composition is changed from oxygen to air or nitrous oxide /oxygen mixture. As a general rule variation of output with carrier gas composition can be considered of negligible clinical significance since the effects, if any, are normally less than 10% of setting. Where changes occur the usual effect is that the output is slightly depressed when nitrous oxide is employed compared to the output when oxygen is the carrier gas.

Time Out of Service

If the anesthetic machine on which the vaporizer is fitted is left for a period of time with no gases flowing a concentration of agent may be observable at the machine outlet when the gas flow is turned "on" and the vaporizers turned "off". This concentration can be expected to fall rapidly to zero (e.g. within about 15 seconds at 5 liter/ min.). This phenomenon is a normal characteristic of anesthetic vaporizers and anesthetic machines.

Clinically this is considered to be insignificant because of the small volume of vapor involved.

Other Variables

Ambient temperature, input flow rate and duration often can affect delivered concentrations, particularly when the vaporizers are used at extremes of the usual clinical range.

The valve design and temperature compensation system of the Classic T³™ vaporizers reduces the effects to levels where, under most clinical conditions, their effect on vaporizing performance is clinically not significant.

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