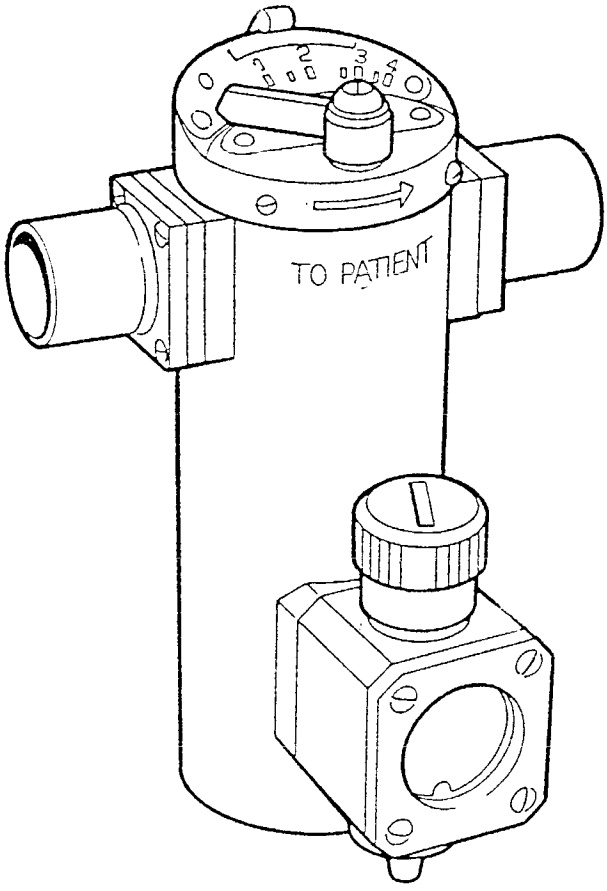
Penlon

Inter Med

OMV Fifty Vaporizer

User Manual



Quality and Assurance in Anaesthesia

THE IMPORTANCE OF PATIENT MONITORING

WARNING

Anaesthetic systems have the capability to deliver mixtures of gases and vapours to the patient which could cause injury or death unless controlled by a qualified anaesthetist.

There can be considerable variation in the effect of anaesthetic drugs on individual patients so that the setting and observation of control levels on the anaesthesia systems does not in itself ensure total patient safety.

Anaesthesia system monitors and patient monitors are very desirable aids for the anaesthetist but are not true clinical monitors as the condition of the patient is also dependent on his respiration and the functioning of his cardio-vascular system.

IT IS ESSENTIAL THAT THESE ELEMENTS ARE MONITORED FREQUENTLY AND REGULARLY AND THAT ANY OBSERVATIONS ARE GIVEN PRECEDENCE OVER MACHINE CONTROL PARAMETERS IN JUDGING THE STATE OF A CLINICAL PROCEDURE.

IMPORTANT
Servicing and Repairs

In order the ensure the full operational life of the OMV FIFTY Vaporizer, servicing by a Penlon-trained engineer should be undertaken periodically.

We recommend that the service should be 3 monthly (6 monthly maximum interval) comprising LEAK TEST and CALIBRATION check.

(Calibration check to be performed using a suitable agent analyser e.g. Riken refractometer).

Should calibration check show unit to be outside specified performance requirement (e.g. ± 20% scale of scale reading) then basic service must be performed.

This may be done on site by:

(a) Trained user.
(b) Authorised Penlon agent.
(c) Penlon service engineer.

For any enquiry regarding the servicing or repair of this vaporizer, contact the nearest accredited Penlon agent, or communicate directly with Penlon's Service Department.

*Agent's name and address:

Service and Repair Department
Penlon Ltd
Abingdon
OX14 3PH
UK
Tel: +44 (0) 1235 547063
Fax: +44 (0) 1235 547062
E-mail: service@penlon.co.uk

Always give as much of the following information as possible:

1. Type of equipment
2. Product name
3. Serial number
4. Approximate date of purchase
5. Apparent fault

FOREWORD

This Manual has been produced to provide authorised personnel with information on the function, routine performance and maintenance checks applicable to the OMV Fifty Vaporizer.

Information contained in the Manual is correct at the date of publication. The policy of Penlon Ltd. is one of continued improvement to their products. Because of this policy Penlon Ltd. reserve the right to make any changes, which may affect instructions in this Manual, without giving prior notice.

Personnel must make themselves familiar with the contents of this Manual before using the apparatus.

Produced by Penlon Ltd. and printed in England

OMV FIFTY

user's instruction manual

This Manual is intended for users of the following vaporizers:

OMV Fifty Drawover (Right to Left flow)	—	halothane 51180
" " " " " "	—	trilene 51224
OMV Fifty (Left to Right flow)	—	halothane 51197
" " " " "	—	trilene 51198
" " " " "	—	enflurane 51222
" " " " "	—	isoflurane 51223

OMV FIFTY VAPORIZER

user's instruction manual

CONTENTS

Section 1
SPECIFICATIONS

All models of the OMV 50 share the following features:

1.1 The liquid capacity of the anaesthetic drug is 50 ml. The level indicator is marked "50" and "10" and the vaporizer should always be filled to a level between these marks.

1.2 All models are of very low resistance to flow ($<1 cmH_2O$ at 40 l/min) and are technically suitable for either drawover or continuous flow use (but see 1.3 below). Performance characteristics are similar for all units for a given anaesthetic drug.

1.3 Differences between the units are as follows:—

(a) OMV Fifty Drawover 51180 etc. are constructed for gas flow from right to left, the convention employed in the E.M.O. range of equipment, and are fitted with ISO 22mm taper connections compatible with breathing circuit components.

(b) OMV Fifty 51197 etc., are constructed for gas flow from left to right, the convention normally employed on continuous flow anaesthetic machines, and are fitted with ISO 23mm taper connectors compatible with connectors used between the flowmeter unit and the common gas outlet, where the vaporizer is often installed permanently.

NOTE

1.4 The calibrated scales are specific to individual vaporizers and must not be interchanged from unit to unit.

1.5 Only use the anaesthetic drug named on the scale.

1.6 The scale is only accurate if the direction of gas flow marked by an arrow engraved on the body is observed.

1.7 These vaporizers are not recommended for use within a closed circuit. Rapid overdosage may result because of their high efficiency and the performance will deteriorate with time because of water condensation on the wick.

Section 2
RECOMMENDED USES

2.1 **Model Nos. 51180, 51224, 51225**

In accordance with ISO recommendations, 51180 etc. with 22mm tapers should be used in drawover systems or may be used for occasional use with a continuous flow gas machine by attaching the vaporizer to the common gas outlet.

2.2 **Model Nos. 51197, 51198, 51199, 51222**

In accordance with ISO recommendations, 51197 and its variants should be selected when the vaporizer is used entirely or mainly as a back-bar mounted unit. Occasional drawover use is possible, using special taper adaptor to connect to anaesthetic breathing circuit.

Section 3
INSTALLATION

3.1 51197 and variants

The OMV Fifty Vaporizer is normally mounted on the back-bar of an anaesthetic machine, secured by the clamp plate and nuts provided. The required size of spanner is 10mm (0.410 in).

The inlet (left-hand side) and outlet (right-hand side) are normally Cagemount taper connectors: male inlet, female outlet. These items are detachable, and as an alternative 22mm tapers to BS3849 can be supplied to special order (female inlet, Part No. 22484; male outlet, Part No. 22485). Shims are provided so that distance from the centre line of the connectors to the back-bar can be adjusted to suit the particular anaesthesia machine.

The taper joints should be engaged securely before the clamp nuts are tightened, while the vaporizer is held in a true vertical position.

After installation, turn on the oxygen supply on the anaesthesia machine and check for leaks at the vaporizer connections by partly blocking the outlet of the machine and painting the joints with soap solution.

These vaporizers may be used with the Penlon Off-line Mounting Block system or the IM500 Clip Mounting system. An attachment fitting is fixed to the back of the vaporizer in place of the back-bar clamp using the existing nut and washer.

3.2 51180 and variants

The vaporizer may be used attached by its taper connector to the outlet of the EMO ether vaporizer. Do not attach it to the inlet of this vaporizer as vapour other than ether may corrode the EMO.

The vaporizer may also be attached by its taper connector to the air/medical gas inlet of a ventilator, such as the Oxford Ventilator, which draws in respirable mixture before delivering it to the patient.

If used freestanding, attached to a breathing circuit, it is recommended that the Triservice base unit (51175) be used to increase stability. This must be factory fitted.

Section 4
PORTABLE MACHINES

The OMV Fifty should be vertical during use whenever possible, although exceptionally an inclination of up to 30° from vertical will not effect the accuracy of calibration. If the vaporizer has been transported full of liquid, 2–3 minutes should be allowed for drainage of liquid to occur before an anaesthetic is administered. The control pointer should be kept in the 'O' position during transit.

Section 5
INSTRUCTIONS FOR USE

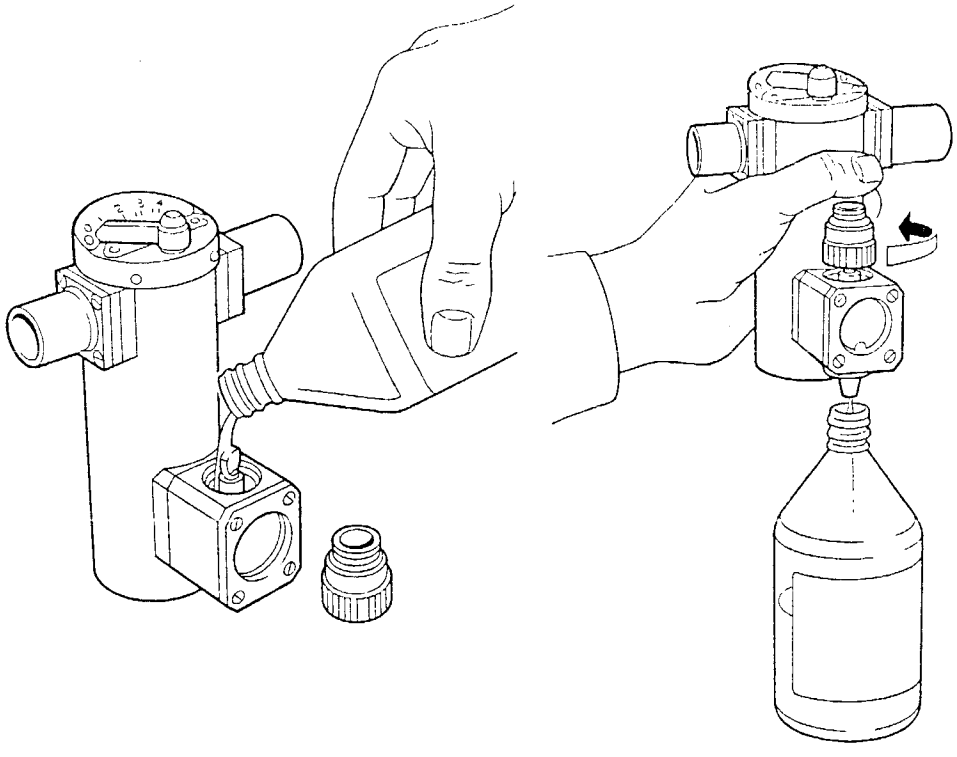
5.1 Use of Controls

The OMV Fifty has a control lever on the top face, with a scale calibrated to indicate the delivered volume concentrations of the appropriate anaesthetic agent. With the control lever turned fully anti-clockwise, a sliding valve completely closes the vapour chamber, but permits free flow of gas from the inlet to the outlet. Rotation of the lever in a clockwise direction opens the vapour chamber valve, producing a gradually increasing vapour output in accordance with the calibration marked on the scale.

5.2 Filling and Draining

Provided the control lever is turned fully anti-clockwise, it is not necessary to turn off any gas flow when filling the vaporizer. Unscrew the filler cap, and fill the vaporizer with the appropriate anaesthetic agent. The level indicator is calibrated at 10 and 50 ml volume and the vaporizer should be filled until the level is between these marks. DO NOT fill with any anaesthetic agent other than that indicated on the scale.

The top of the filler orifice is lower than any of the vapour chamber valve components, and so it is not possible to over-fill the vaporizer to a dangerous degree. Replace the filler cap and tighten firmly with fingers only. DO NOT use any spanner or wrench.



To drain the vaporizer, turn the control lever fully anti-clockwise and remove the filler cap which exposes the head of the drain screw. In the top of the filler cap is a socket which is designed to fit this drain screw, and the screw can be loosened by means of the filler cap. The drain screw can then be opened further using the fingers, releasing the liquid anaesthetic agent into a bottle held beneath the filler block.

The stainless steel wicks on the OMV Fifty Vaporizer retain very little liquid, and it is possible to recover all but 2–4 ml of the anaesthetic agent.

5.3 Calibration Details

All OMV Fifty Vaporizers are individually calibrated at a flow rate of 6 l/min and a temperature of 20 °C. Each vaporizer is supplied with a scale particular to the anaesthetic agent used and the output performance as determined by the calibration procedure.

Although the OMV Fifty does not employ an active thermo-compensator the internal design provides a considerable degree of thermal stability. The output of the vaporizer does not change with temperature as much as the vapour pressure of the liquid changes. Part of this effect is due to the sealed compartment in the base containing an anti-freeze liquid to act as a temperature buffer. Do not attempt to open the sealed filler screw on the base of the vaporizer.

Each vaporizer is supplied with a plastic card showing the variation of output with temperature and with flow rate. It should be borne in mind that the actual temperature of the vaporizer will fall during use so that delivered concentrations are diminished over a period of use.

The designed conditions of use for the OMV Fifty are with continuous flow rates between 3 and 8 l/min or drawover minute volumes between 4 and 10 l/min. Ambient temperatures between 18 °C and 28 °C are covered by the internal design and some adjustment to the output is necessary between 14–18 °C or 28–32 °C.

Pressure fluctuation from IPPV or IPNV have little effect on the output of the OMV Fifty which complies fully with ISO recommendation in this respect.

Section 6
ROUTINE MAINTENANCE AND SERVICE

The OMV Fifty requires very little regular servicing provided it is kept clean. Non-volatile additives to anaesthetic agents such as halothane or trichloroethylene can accumulate in the vaporizer after prolonged use. These may cause the control slider to become stiff in action.

Regular draining of residual liquid from the vaporizer WHICH MUST BE THROWN AWAY AND NOT RETURNED TO THE BOTTLE will largely prevent the accumulation of additives.

If the vaporizer is used in drawover systems in warm, humid climates, water vapour may condense in the vapour chamber. This may result in a gradual reduction of output, affecting clinical performances. Water may be seen as globules floating on the level of the halothane in the level indicator.

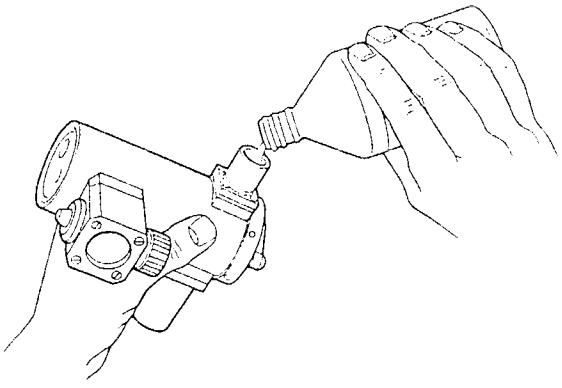
Both the above problems require only simple procedures to restore performance, and these and other aspects of routine servicing are illustrated in the following part of this booklet. DO NOT undertake any work other than that described.

Service contracts are available from Penlon Ltd. and its agents for the regular service and recalibration of the OMV Fifty Vaporizer.

6.1 Cleaning the Vaporizer

1. Remove vaporizer from the anaesthetic circuit. Drain vaporizer.
Stop up the inlet with a bung.

2. Turn vaporizer on its side, with outlet uppermost.
Pour ether into vaporizer, while moving control lever repeatedly from end to end of its travel until movement feels free. If slide remains stiff, refer to Service Manual or contact manufacturer/ service agent.



3. When slider is free, turn control full anti-clockwise, and agitate gently to wash the wicks. Open control fully, and pour the ether out of the outlet.

4. Partly refill vaporizer with ether, again through the outlet. Open filler cap, and drain screw, and allow the ether to run out through the latter. This will ensure that this part of the vaporizer is clean. Leave vaporizer with control lever fully

clockwise until all ether has evaporated.

With control lever in fully open position, pass dry air or gas through the circuit until no trace of ether vapour is apparent. The vaporizer is now ready for recharging with the appropriate anaesthetic agent prior to re-use.

5. Turn control lever to closed position, tighten drain screw, replace filler cap, and replace vaporizer in anaesthetic circuit. If used on a continuous flow gas machine, ensure correct installation and leak tests are undertaken (refer to page 5 of this booklet).

6.2 Removal of Water Vapour Condensation

Condensation of water vapour can be removed by following the procedures described above for washing out the vaporizer, but using alcohol instead of ether. Alternatively, the water may be evaporated by passing dry air or gas through the vaporizer for a sufficient period of time.

Section 7

USE WITH ALTERNATIVE ANAESTHETIC AGENTS

For routine medical use we strongly recommend that the vaporizer should be used with the agent for which it has been calibrated, as named on the scale.

However, the design is such that it is possible to provide additional scales for other agents which can be fitted by removing the two small scale securing screws. This is convenient for research purposes or in remote hospitals where supplies of a particular drug may be unreliable.

When changing from one agent to another, the vaporizer should be drained, washed out with ether, and allowed to dry out completely as described above before refilling with the new agents.

The following scales are available:—

51170	Isoflurane	51178	Trilene
51176	Penthrane	51179	Chloroform
51177	Halothane	51221	Enflurane

When ordering a scale, please quote the serial number of the vaporizer concerned, and the number located on the bottom left-hand corner of the scale originally supplied.

7.1 Recharging the Vaporizer with Different Anaesthetic Agents

If recharging the vaporizer with an alternative anaesthetic agent, ensure correct scale is fitted (see above), and follow the procedures described above for washing out the vaporizer before filling with new agent.

Section 8
REFERENCES

Boulton, T. B. (1972) *Recent advances in anaesthesia and analgesia,* 11th edn, p.143. Churchill Livingstone, Edinburgh and London.

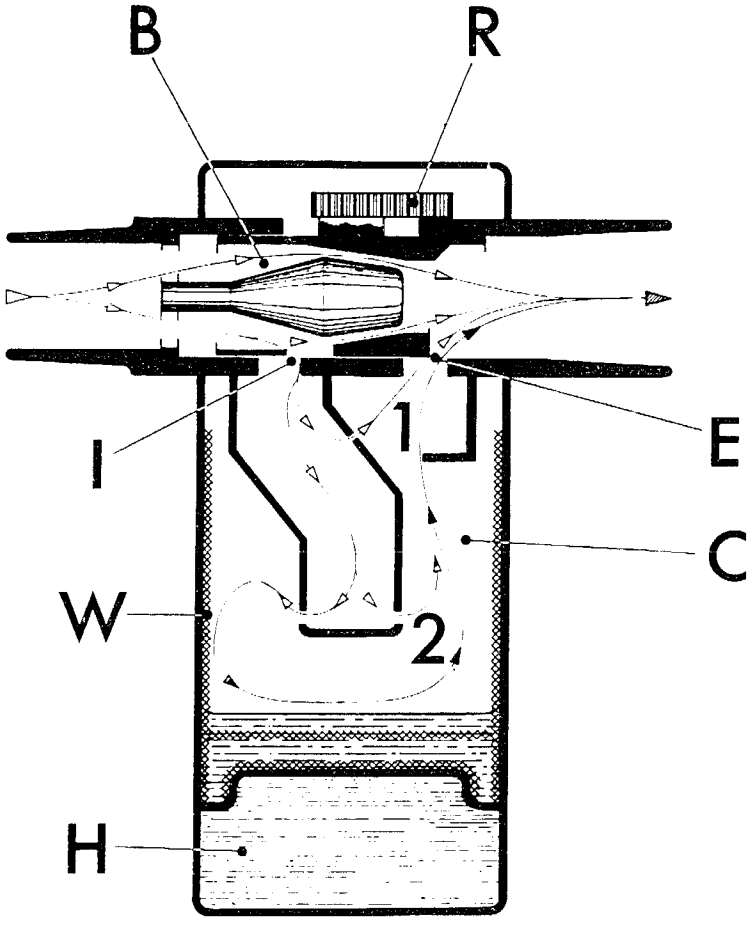
Parkhouse, J. (1966) Clinical performance of the OMV inhaler. *Anaesthesia* **21,** 498.

Jensen, J. K. (1967) Halothankonzentrationen erreich durch den "Oxford Miniature Vaporizer". *Der Anaesthetist* **16,** 54.

Gabbe, D. & Ozorio, H. P. L. (1968) Halothane-Trichloroethylene and air. *Anaesthesia* **23,** 705.

Haldermann, G., Hossli, G. & Schaer, H. (1973) Über die Verdampfungsleistung des OMV für Halothane. *Der Anaesthetist* **22,** 339.

Section 9
CROSS-SECTION OF VAPORIZER



Key: B — By-pass passage — always open.
R — Rack attached to slide valve, engaged by control lever.
I — Inlet to vapour chamber.
E — Outlet for vapour chamber.
C — Vapour chamber.
W — Wicks (stainless steel mesh).
H — Heat reservoir filled with anti-freeze liquid.
1 & 2 — The two gas paths through the vapour chamber, which provide flow compensation and a degree of temperature compensation.

Cat No 51216
April 1997

Penlon Limited,

Abingdon,
OX14 3PH
UK
Tel: +44 1235 547063
Fax: +44 1235 547062
E-mail: service@penlon.co.uk

InterMed Penlon