



**SIGNET 615 ANAESTHESIA WORKSTATION
USER MANUAL**



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Table of Contents

1	Introduction	6
1.1	Warranty Statement	6
1.2	About this manual	6
1.3	Intended Use.....	6
1.4	Device Classification.....	7
1.5	Background.....	7
1.6	Major features	7
1.6.1	Overall strengths	7
1.6.2	Typical configuration	7
1.7	Safety Precautions.....	8
1.7.1	Powering the unit up for the first time	8
1.7.2	Follow the Instructions for Use	8
1.7.3	Liability for proper function or damage	8
1.7.4	Maintenance and Repairs	8
1.7.5	Use of anaesthetic agents.....	8
1.7.6	Power Connection.....	8
1.7.7	Monitoring and alarms.....	9
2	Major components of the machine.....	10
2.1	Gas controls.....	10
2.2	Flowmeters	10
2.3	Patient Block.....	11
2.4	Vaporisers.....	11
2.5	Ventilator.....	12
2.6	Soda-lime absorber.....	12
2.7	The anti-hypoxic device	12
2.8	Gas manifold.....	12
2.9	Main regulators	13
2.10	Second stage regulators.....	13
2.11	Pressure gauges	13
2.12	Scavenging.....	13
2.13	Auxiliary oxygen outlet.....	13
2.14	Pipeline hose assemblies	13

2.15 Patient circuitry	14
2.15.1 The circle circuit.....	14
2.16 Oxygen failure warning device	14
2.17 Auxiliary Power Outlets	14
2.18 Other accessories	15
2.18.1 Accessory power	15
3 Preparing for use.....	16
3.1 Protocol for checking the Anaesthetic Machine	16
3.2 Operational checklist procedure – pre testing	19
3.2.1 Visual examination	19
3.2.2 General preparation – pre check.....	20
3.2.3 Cylinder Fitting	20
3.2.4 Component integrity	20
3.2.5 General	20
4 Operation	21
4.1 Medical Gas Mixing.....	21
4.1.1 Accuracy and the Effects of Backpressure.....	21
4.2 Circle Systems	21
4.3 Troubleshooting	21
4.3.1 Leaks.....	21
5 Care and Cleaning	23
5.1 Cleaning.....	23
5.2 Disinfecting	23
5.3 Steam Autoclaving	23
5.4 Filters	23
6 Servicing	24
6.1 Service intervals and service components for Signet '615'	24
7 Specifications	25
7.1 Physical.....	25
7.2 Electromagnetic Compatibility	25
7.2.1 Electromagnetic Emissions	25
7.2.2 Electromagnetic Immunity	25

7.2.3	Recommended Separation Distance.....	26
7.2.4	Recommended Separation Distances from Portable and Mobile RF Communication Equipment.....	27
7.3	Symbols	27
7.4	Standard items.....	28
7.5	Optional Items.....	28
8	Terms and conditions	29

1 Introduction

1.1 Warranty Statement

All Ulco products are guaranteed to be free of defects of workmanship or material for a period of one year from the date of delivery. The following are exceptions to this warranty:

1. Defects caused by misuse, mishandling, tampering, or by modifications not authorised by Ulco or its appointed agents are not covered.
2. Rubber and plastic components and materials are warranted to be free of defects at the time of delivery.

Any product, which proves to be defective in workmanship or material will be replaced, credited or repaired with Ulco holding the option. Ulco is not responsible for deterioration, wear or abuse. In any case, Ulco will not be liable beyond the original selling price.

Goods are subject to the terms of applicable warranty. Defective products will be accepted for return at Ulco's discretion, and only during the warranty period. Application of this warranty is subject to the following conditions:

1. Ulco or its authorised agents must be promptly notified, in writing upon detection of the defective material or equipment.
2. Defective material or equipment must be returned, shipping prepaid, to Ulco or its authorised agent.
3. Examination by Ulco or its authorised agent must confirm that the defect is in fact covered by the terms of this warranty.
4. Notification in writing, of defective material or equipment must be received by Ulco or its agent no later than two (2) weeks following expiration of this warranty.

In order to assume complete protection under this warranty, the warranty registration card, and/or periodic manufacturer's service record (if applicable) must be returned to Ulco within 2 weeks of receipt of the equipment.

The above is the sole warranty provided by Ulco. No other warranty expressed or implied is intended. Representatives or agents of Ulco are not authorised to modify or amend the terms and conditions of this warranty.

1.2 About this manual

This manual provides information for the preparation, assembly and care of the Signet 615 anaesthesia machine, together with suitable equipment from the Ulco range. Although this equipment has been carefully designed for simplicity of assembly and use, it is recommended that the contents of this manual be studied before attempting preparation or care of the equipment. Explanatory diagrams are provided in order to help the reader understand the concepts described.

This user manual should be read in conjunction with the user manual(s) for the vaporisers, ventilator and absorbers.

1.3 Intended Use

The Signet 615 Anaesthesia Machine is an apparatus for providing continuous gas inhalation anaesthesia for human adults and children (above 5kg body weight).

The apparatus is intended for use solely in an operating or induction room.

The apparatus is intended to be used with hospital gas supply pressures within the range 300-500 kPa.

The apparatus is intended to be used under the continuous control of a person suitably trained and clinically qualified in its use.

To comply with the Anaesthetic workstation station standard IEC 60601-2-13, the Signet 615 must be used with adequate monitoring and alarms. The stated monitors and alarms can be found in Section 1.7.7 of this manual.

1.4 Device Classification

The Signet 615 Anaesthesia Machine is classified as follows:

- Class I equipment for the purposes of electrical safety
- Type CF applied part
- Continuous Operation

1.5 Background

Anaesthesia machines such as the Signet 615 are engineered to very high standards of design and finish and all units are able to accommodate the most comprehensive specifications required in modern anaesthesia. Ulco machines are manufactured from non-magnetic materials such as stainless steel, anodised aluminium and chromed brass or acetal, with moulded covers made from Kydex.

The construction of the frames provides a stable and unobstructed unit for the mounting of a wide range of anaesthesia equipment accessories. The Signet 615 can be easily upgraded from its basic configuration with optional accessories and attachments including a full range of patient monitors to provide a comprehensive anaesthesia workstation.

If equipment that has not been specifically designed or supplied by Ulco is to be attached to the Ulco machine, it is recommended that customers consult Ulco as to the suitability of the equipment and necessary modifications to the apparatus.

Ulco and its agents provide a comprehensive regular maintenance service and it is recommended that advantage be taken for the safe and reliable upkeep of this equipment. Refer to the accompanying service manual for details on how to maintain your Ulco machine. There is a service contract included with the equipment – please fill it in and return it to Ulco.

Customers requiring further service or advice with operating problems should contact Ulco or one of their accredited agents.

1.6 Major features

- All working surfaces are designed to be easy to clean and front wheels are lockable to prevent unwanted movement
- A monitor shelf is available as an option.
- An aluminium accessory rail is fitted to the sides of the working area for easy attachment of many options
- The absorber post can be mounted either on the left or right hand sides or both, allowing the absorber to be swapped from side to side
- Internally mounted mains outlets used to power options

1.6.1 Overall strengths

- sturdy, strong, durable and easy to understand construction
- high quality and quantity of patient safety features
- pure flexibility of design allowing tailoring of options to exact requirements

1.6.2 Typical configuration

- Signet 615 - 3 gas 5 Tube machine fitted with anti-hypoxic device as standard
- 3 drawers standard
- 4 internally mounted mains power outlets (IEC type)

- 1 external mains outlet for use with powered vaporisers (IEC type)
- EV500 ventilator (OPTIONAL)
- 2kg absorber (OPTIONAL)
- Vaporiser(s) (OPTIONAL)
- Auxiliary flowmeter (OPTIONAL)
- Writing table
- Universal arm (OPTIONAL)
- Second absorber mounting post (OPTIONAL)
- Auxiliary power outlet APB70 (OPTIONAL)

1.7 Safety Precautions

1.7.1 Powering the unit up for the first time

The unit must be connected to an AC mains supply of 240 V only. When power is supplied, the power available lamp at the inlet will light. All Ulco-supplied options such as patient monitors or ventilators will be powered when the main front panel power switch is turned to the ON position. The electro-luminescent backlight of the medical gas flow meters will only be turned on when the driving gas supply is connected to the air or oxygen ports at the rear of the machine.

1.7.2 Follow the Instructions for Use

In order to use the equipment, these instructions must be fully read and understood and strictly followed. Any equipment mentioned is only to be used for the intended purpose.

1.7.3 Liability for proper function or damage

This equipment is an adjunct to patient safety and it must in no way replace the normal monitoring by skilled personnel. The manufacturers accept no responsibility for incidents arising from either incorrect use or malfunction of this equipment.

If the equipment is serviced or repaired by persons not employed or authorised by Ulco, or if the equipment is not used for the purposes for which it is intended, then the liability for the proper function of the equipment is transferred to the owner/operator.

Where, the Signet 615 is assembled with other components of an anaesthetic system, such as ventilators or breathing systems, and Ulco did not supply these components, then the personnel performing the assembly are responsible for providing a checklist for the anaesthetic system.

1.7.4 Maintenance and Repairs

An authorised Ulco Technical Service Representative must perform maintenance of this equipment. Ulco products in need of factory repairs must be sent to the nearest local agent or direct to Ulco.

Ulco recommends that anaesthesia products/equipment be serviced at intervals stated in Section 6.1 of this manual. Periodic Manufacturer's Service Contracts are available for products manufactured and or sold by Ulco. These agreements are available from Ulco Technical Services.

1.7.5 Use of anaesthetic agents

Explosive anaesthetic agents, such as ether or cyclopropane, must not be used due to the risk of fire. Ulco accepts no liability if the wrong anaesthetic agent is used.

1.7.6 Power Connection

Ulco equipment is to be used only in rooms with mains power supply installations complying with national safety standards.

Electrical connections for other equipment not listed here should only be made following consultations with the respective manufacturers or other expert.

For full details of the electrical environment in which the Signet may be used see Section 7.2 of this document.

1.7.7 Monitoring and alarms

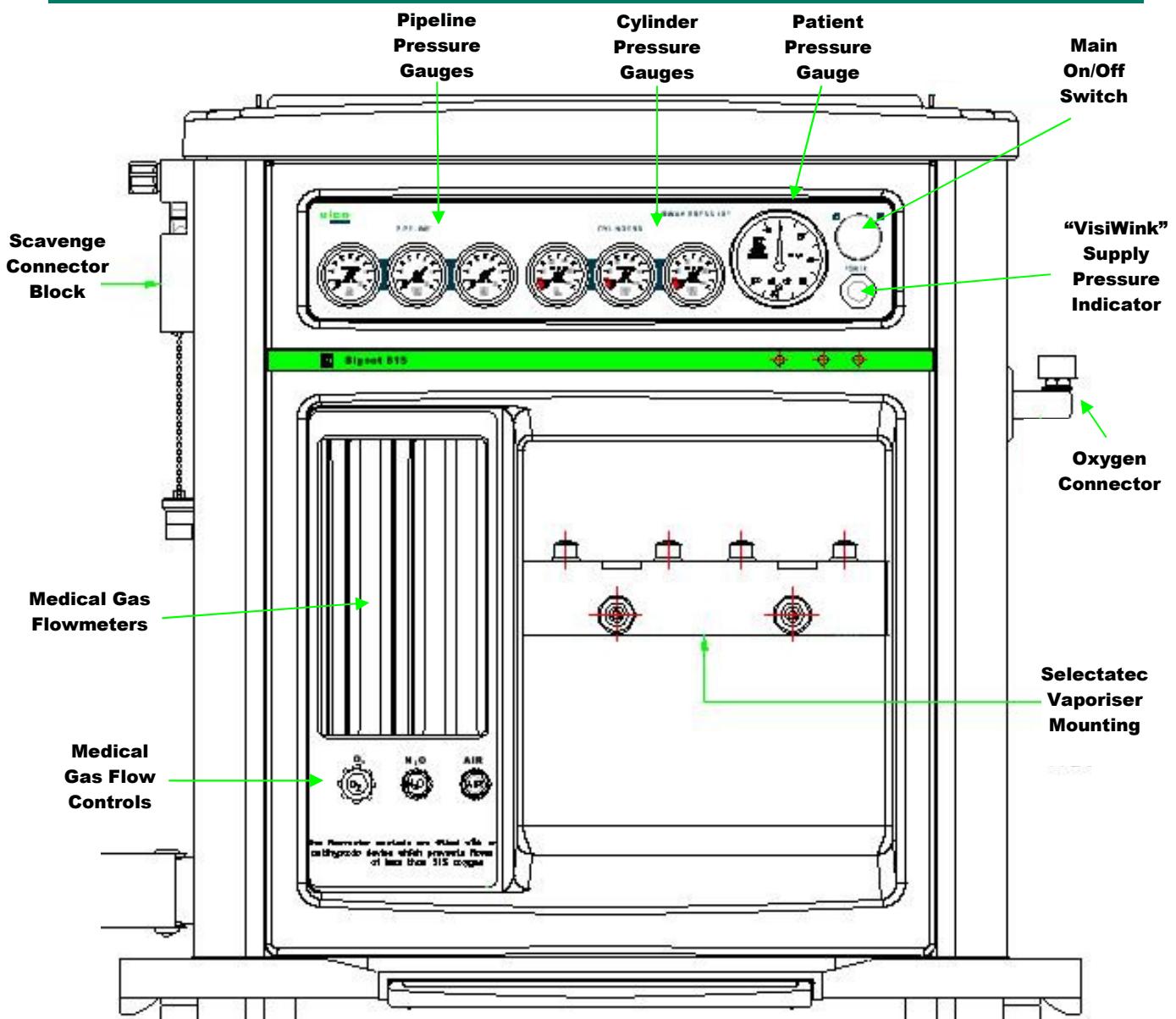
If the unit alarms, check the patient. Establish that the patient is being ventilated correctly.

This unit must be used in conjunction with equipment providing the following alarms and monitoring capabilities:

- Inspiratory oxygen concentration
- Anaesthetic agent concentration
- Airway pressure
- CO₂ concentration
- Exhaled volume
- Breathing system integrity
- Continuing pressure

These will help ensure patient safety, make precise ventilation possible and so achieve the best possible ventilator parameters for the patient.

2 Major components of the machine



2.1 Gas controls

The ON/OFF switch is mounted on the top right hand side and when activated allows for the supply of gases to be made available for use. The ON/OFF switch also turns on the flowmeter backlight.

On the left hand side of the control console are the gas flow controls and rotameters. Gas controls can be differentiated by their shape and colour. The white oxygen (O_2) control is furthest to the left and to international design standards. The nitrous oxide (N_2O) control is dark blue and air is black.

The basic Signet 615 is a three gas, five-tube machine with two tubes each for nitrous oxide and oxygen. It can also be supplied with only two tubes – nitrous oxide and oxygen.

2.2 Flowmeters

Having passed through the system, each gas enters the base of the anti-hypoxic device via the flow control valve into flowmeter. The flow control valves allow for fine adjustment of the flow rate through each of the flowmeter tubes (rotameters). This ensures that accurate gas mixtures are achieved.

When the flow control valve(s) is (are) opened, the gas continues at low pressure upward through the flowmeter tube, whose float responds to indicate the rate of flow in litres per minute or parts thereof.

Note that the rate of flow is indicated by the top edge of the float (bobbin) against the flowmeter scale. Indicated flows are accurate to within $\pm 1.875\%$ of indicated flow +0.625% of the full scale.

Therefore, for a flowmeter with a full-scale reading of 10 L/min set to deliver 7.5 L/min, the maximum permissible error is:

$$\begin{aligned} & \pm \frac{((7.5 \times 1.875) + (10.0 \times 0.625))}{100} \text{ L/min} \\ & = \pm ((0.141) + (0.063)) \text{ L/min} \\ & \equiv \pm 0.204 \text{ L/min} \end{aligned}$$

Gases passing through the flowmeter mix together at rates of flow selected by the anaesthetist. Passing along the back bar, part of the combined gases enter the vaporiser inlet (if selected). If the vaporiser is fitted and is in the OFF position, the gases bypass the vaporising chamber and pass directly to the common gas outlet via the non-return valve fitted in the terminating block of the back bar. From here they pass to the anaesthetic equipment and to the patient.

If the vaporiser is selected ON, gas mixtures entering the vaporiser collect a proportion of the anaesthetic agent from the vaporising chamber within. The percentage volume is determined by setting the vaporiser control at the percentage figure calculated by the anaesthetist. Having passed through the vaporiser, the gas mixture now combined with the anaesthetic agent again enters the back bar and is delivered to the patient as described previously (see the vaporiser manual for further details).

2.3 Patient Block

The patient block is mounted on the side rail of the working area. In its entirety it houses the common gas outlet, the emergency oxygen flush and a patient safety relief valve set to relieve at 50cm/H₂O pressure (which can be set higher or lower). The common gas outlet is a 22/15mm male stainless steel cone with a weight bearing thread for attaching items such as the fresh gas connecting hose to the CO₂ absorber or a Bain adaptor. The patient block can slide along the side rail to the most convenient position where it can be locked into position.

Fresh gas from the back bar is supplied to the patient block via the one-way valve direct to the back of the common gas outlet. This is in turn connected to the patient safety valve housing a safety valve that is adjusted to relieve at 50cm/H₂O pressure. The emergency oxygen flush is supplied with oxygen direct from the oxygen manifold in the console. When depressed, the oxygen flush flow is set by a metered orifice that leads from the high pressure oxygen side of the flush valve to the common gas outlet. The flow is normally 35 to 75 L/min.

2.4 Vaporisers

Various methods of mounting vaporisers are currently used such as the 'off line' or 'fixed' systems. The most common is the 'Selectatec' type mounting system in which a mounting block is permanently attached to the back bar, and the vaporiser is locked on by means of DZUS (aircraft type) quick release fastener. Gas flow is diverted through the vaporiser via the ports when the Vaporiser is placed on the mounting block. The Selectatec system allows for interchangeability of vaporiser(s), either for the use of an alternate volatile agent or for maintenance and servicing, as well as rendering the machine 'vapour free' if necessary.

Vaporisers can be easily mounted on the back bar via the Selectatec mounting and should be securely locked into place.

Vaporisers not attached to the anaesthesia machine must be prevented from tipping over. Storage racks are available to store unused vaporisers. Vaporisers should be emptied prior to being moved.

All vaporisers used with the Signet 615 should be compliant with ISO8835-4.

Note: It is important to read the relevant instruction manual issued with each vaporiser prior to use.

2.5 Ventilator

The EV500 ventilator can be mounted to the left hand upright of the machine. The ventilator mount fits into the bracket. All parts can be tightened into position with locking screws. The base plate is fitted to the mount, and the ventilator is then secured to the base plate with the four nylon screws supplied.

The ventilator drive hose can then be connected. The drive gas connection for the ventilator is the last gas inlet on the right of the gas manifold. Air or oxygen drive are optional. The ventilator drive gas inlet is supplied with the correct gas hose and ring index for the drive gas specified e.g. Oxygen.

Note that the ventilator silencer is connected to the back of the ventilator and that the 30mm male scavenging outlet is on the top of the exhaust.

Further information regarding the operation of the EV500 ventilator can be found in its user manual.

2.6 Soda-lime absorber

The soda-lime absorber mount bracket attaches to the post towards the front of the machine. The absorber mount sits over the upright and should be allowed to seat itself into position. The top locking screw and side locking screw can then be fastened to hold in position. The exhaust hose can then be attached to the 30mm exhaust valve scavenging outlet. The absorber fresh gas hose from the common gas outlet can now be connected to the fresh gas inlet on the side of the absorber. This connection hose is made from strong reinforced hose so it will not perish. No latex tubing is used in Ulco machines.

Further information regarding the operation of the absorber can be found in its User Manual.

2.7 The anti-hypoxic device

The Signet 615 contains many features to ensure patient well-being. The first of these is the anti-hypoxic device. This is a now mandatory device in Australia and many overseas markets. This allows the anaesthetist to deliver 100% oxygen to the patient but never less than nominal 25% oxygen in the presence of nitrous oxide in the mix. This also means that no nitrous oxide can flow without oxygen. Other devices sometimes allow oxygen flow once nitrous oxide has been turned on. No Ulco machines allow this, meaning that oxygen flow must be established first before nitrous oxide flow is able to flow.

The device has been designed to eliminate inherent faults common in other similar products. In some such devices, both the oxygen and nitrous oxide begin to flow as soon as the nitrous oxide control is turned on. The operator can thus become accustomed to setting all flows whilst only using the nitrous oxide flow control. This is a safe practise assuming the anaesthesia machine is fitted with an anti-hypoxic device. Many machines both in Australia and overseas, however, do not have such a device, enabling the operator to deliver a 100% nitrous oxide flow inadvertently.

The Ulco anti-hypoxic device prevents this by ensuring that no nitrous oxide is permitted to flow unless the oxygen flow control is first turned on. The nitrous oxide needle valve is held in place by the oxygen flow control. The nitrous oxide flow control knob is free to rotate, however, in order to prevent damage if force is applied trying to achieve a flow when no flow is allowed. When correctly adjusted and calibrated, the device will prevent the delivery of hypoxic mixtures, and oxygen flow will be maintained at 25% nominal flow ($\pm 5\%$).

The device itself is tamper proof and cannot be interfered with by the operator, but is easy to adjust and calibrate by trained technical staff.

2.8 Gas manifold

The gas manifold is fitted to the rear of the machine. All gases that supply the machine are connected via the manifold. Pipeline air, nitrous oxide and oxygen are connected from the wall, as well as all pin index reserve cylinders. All yokes are pin-indexed, and once cylinders are located, can be secured into position. The Signet 615 is fitted with diameter ring indexed gas fittings, and colour-coded hoses for wall gas supply: white for oxygen, blue for nitrous oxide and black and white for air.

2.9 Main regulators

The regulator and yoke for each gas are assembled in line to reduce the risk of high pressure leaks. The gauge for each gas is connected by a copper tube in parallel. The brass yoke bolt (RG203) which has the Bodok seal (RG204) attached to it and is fitted with a sintered bronze filter (RG2031), passes through the yoke assembly and is screwed into the yoke adaptor body (RG201). A stainless steel banjo bolt (RG206) is used to mount the regulator main body (RG201) to the adaptor body (RG201) and the use of Dowty Seals (RG205) prevent any leaks from occurring. A pressure relief valve (not shown) is fitted to the underside of the regulator body (RG101) and is set to start relieving at 600 kPa.

Note: Bodok seals must be examined and replaced if necessary every time the cylinders are replaced.

2.10 Second stage regulators

There are two, second stage regulators fitted, one each for the oxygen and nitrous oxide supplies. These regulators are situated down stream from the anti-hypoxic device and flowmeter assembly. They are used to calibrate and fine tune the anti-hypoxic device (see separate instructions).

The second stage regulators are also used as a buffer to protect the anti-hypoxic device against any pressure fluctuations that may occur in both the pipeline and the cylinder regulated pressure:

Pipeline pressure 415 kPa
 Cylinder regulated pressure 350-370 kPa

Second stage regulator pressures when set to deliver the correct mixtures on the anti-hypoxic device are usually <220 kPa. This allows for fluctuations in supply pressure of more than 100 kPa before the set flows are affected.

2.11 Pressure gauges

Pressure gauges are well placed at eye level for ease of viewing. The left 3 show pipeline pressure, while the right 3 show the pressure in the reserve gas cylinders.

A simple visible indicator called the Visiwink is mounted below the ON/OFF control. When green, it indicates oxygen is ON. When red it indicates that oxygen pressure is OFF.

2.12 Scavenging

On the left-hand upright of the frame is the scavenging block, which should be connected to wall suction. Adequate scavenging can be achieved by adjusting the ball to the marked line. Vacuum adjustment is via the control at the front.

The vacuum reservoir for scavenging is integrated into the frame of the machine using both the frame upright. The scavenging block has two locations for pink/red scavenging tubing to be connected. If only one is being used, the other can be sealed by using a bung (supplied). The wall vacuum tubing is then connected to the connector on the back of the block. The flow meter tube has a filter silencer fitted, this may require replacement after constant use as the filter can become blocked.

2.13 Auxiliary oxygen outlet

An auxiliary oxygen outlet is mounted on the right-hand frame upright where an oxygen flowmeter can be used. This oxygen flow meter can be used to deliver oxygen to the patient, instead of using the rotameters and standard common gas outlet. This is used, for example, with neurolipse, relative analgesia and local anaesthesia, safely bypassing the possibility of accidental vaporiser delivery or in-circuit complications.

The 0 -15 L/min flowmeter can then be connected to the auxiliary outlet. It should be tested to make sure it is operating correctly.

2.14 Pipeline hose assemblies

The pipeline hose assemblies are fitted with non-interchangeable connectors (handwheels) at both ends of the hose. They are suitable for Australian wall outlets or cylinder regulators. Each type of gas hose and handwheel is

colour coded and diameter size indexed to the ISO (International Standards Organisation) standard for that particular gas. Each hose must be connected to the correct gas inlet and sufficiently tightened to prevent gas leaks. The anaesthesia machine is provided with hooks at the top rear of each leg for hanging the hoses.

2.15 Patient circuitry

ULCO manufactures many different types of patient circuitry.

All are connected to the fresh gas line from the common gas outlet.

The first circuit is the Magill's circuit or Mapleson A. It is a spontaneous breathing circuit and is supplied with a mask. The exhaust valve is fitted with a scavenging connector.

The second circuit is a Bain or Mapleson D or E. Again, a scavenging connector is fitted.

The third circuit is the paediatric circuit which goes by many names and comes in many different configurations from many manufacturers. It is suitable for small children and neonates and comes supplied with three masks.

The circle circuit, however, is the most common option.

2.15.1 The circle circuit

For this, the absorber is connected to the common gas outlet. Ulco supplies absorbers in a 1 or 2kg model with an integrated manual bag/vent switch (Part No AB800). This absorber has separate limbs for the ventilator and manual bag; selection of the limb connected to the circle circuit is made by switching a rotary knob either to the bag or ventilator position. This eliminates the need to remove the manual bag from the single limb to attach it to the ventilator.

The absorber can be fitted with an optional Manometer gauge (Part No AB 400)

2.16 Oxygen failure warning device

This is a nitrous oxide cut-off and whistle alarm. In the event of a complete loss of oxygen from both the wall gas and cylinder gas supply, the machine and the ventilator will continue to operate. Once the pressure drops to approximately 225kPa, an audible alarm will sound and the nitrous oxide supply through the rotameter will be cut off. At the same time the supply of oxygen to the ventilator will cease, ensuring all oxygen is available for the patient. The flow of oxygen can still be seen at the rotameter. At 220kPa there is only about 3 litres of oxygen left in the reservoir cylinder, giving some time for the operator to rectify the pressure problems. This can be achieved by turning on the reserve cylinders amongst other alternatives. Once normal pressure is re-established, the alarms turn off, nitrous oxide will start to flow, and the ventilator will start to cycle again.

The Visiwink only turns red below 125kPa. At this stage, if oxygen is not being supplied, an alternative supply source should be established. If air is connected, there is a safe reserve with a content of around 21% oxygen.

2.17 Auxiliary Power Outlets

The Signet mains power supply is switched by the main front panel on/off switch and is then distributed to 5 IEC outlets mounted internally in the rear of the machine. One of the outlets is used to power the electro-luminescent backlight for the flow tubes, one supplies power to the external auxiliary outlet for use in powering vaporisers and the other 3 are available to power additional options such as monitors and ventilators. These outlets can only be accessed by removing the rear cover; they should only be used with equipment supplied by Ulco in order to ensure compliance with the relevant electrical safety standards (IEC 60601-1-1).

One external IEC outlet is mounted in the side strip of the machine for use in powering vaporisers. The Signet has been safety tested in conjunction with TEC-4 Desflurane vaporisers only.

If a more flexible external outlet solution is required, the APB70 (see Section 2.18.1) may be purchased as an option, but system testing to the safety standard will become the responsibility of the purchaser.

2.18 Other accessories

Suction apparatus. A mounting exists which accepts a special swivel bracket that supports the suction receivers from Abbott or other similar brands. The bracket is an optional item and can be ordered direct from Ulco as P/N ASU203

Another accessory which can be supplied on the side is a fold-down writing tray. This is attached by a simple quick locking mounting block on the rail on the side of the work area. The tray can be secured in a horizontal position by swinging the arm brace out from under the tray. Many other accessories can be mounted on the rail via this method, for example, a universal circuit support arm able to swivel in many directions. The lock screw on the side can control excessive movement.

Hooks are mounted to the bottom back panel and a movable sphygmomanometer mount is positioned on the top monitor tray. An aneroid or mercurial sphygmomanometer can then be used.

2.18.1 Accessory power

The Signet 615 can be fitted with an optional 4 outlet power board at the top rear of the machine. The power board is designed to prevent items other than monitors to be plugged in and is protected by an earth leakage circuit breaker or ELCB. On the bottom right hand corner is a fitting for E P Earth.

If the 4 outlet power board is supplied, a short connector cable is used to power some of the rotameter backlighting. Second, the ventilator power cord may also be connected here leaving the other 3 outlets for the operator's own requirements, eg. patient monitoring.



3 Preparing for use

3.1 Protocol for checking the Anaesthetic Machine

This is one of the College Policy Documents of the Australian and New Zealand College of Anaesthetists. The College Policy Documents set down the formal, council-approved guidelines for practice in a wide range of circumstances.

Hospitals require these documents to be readily accessible to relevant staff at all times for reference as required. The Policy Documents are also referred to by Government and other bodies, especially in the process of accreditation of health care facilities.

Where the Signet 615 is assembled with other components of an anaesthetic system, such as ventilators or breathing systems, and these components were not supplied by Ulco, then the personnel performing the assembly are responsible for providing a checklist for the anaesthetic system.

The College Policy Document ‘Protocol for checking the Anaesthetic Machine’ reads as follows:

1 Introduction

- 1.1 The regulated supply of gases and vapours for anaesthesia and the provision of controlled ventilation for the patient are the main functions of the anaesthetic machine or workstation. Because oxygenation and ventilation are essential for every patient and because even a brief failure to maintain them may cause irreparable harm, every machine must be regularly and thoroughly checked to ensure that all functions are correctly maintained.
- 1.2 There must be a reserve facility to maintain oxygenation and ventilation of a patient should failure of the primary systems occur.
- 1.3 To ensure early detection of any failure in the anaesthetic machine, it is essential that appropriate alarms are present in the machine and that there is monitoring of the state of the patient as specified in IEC 60601-2-13 and Section 1.7.7 of this document.
- 1.4 This protocol incorporates three components:
 - 1.4.1 Level one check. This is very detailed and is required a) on any new machine and b) on all machines after the required regular servicing. This check will usually be performed by the service person – whether from the equipment provider, or from the Bio Engineering Department.
 - 1.4.2 Level Two check. This should be performed at the start of each anaesthetic session.
 - 1.4.3 Level Three check. This should be performed immediately before commencing each subsequent anaesthetic.
- 1.5 Accreditation for checking the anaesthetic machine requires:
 - 1.5.1 Level One. Attendance at a manufacturer’s course or a programme developed by the hospital’s Anaesthesia Department in consultation with a qualified Biomedical Engineer.
 - 1.5.2 Levels Two and Three. Checks must follow protocols specifically developed for the machine under test. All personnel must be trained in correct procedures and accredited to perform them by the Anaesthesia Department. The specific protocols should be attached to the machine.

2 Protocols

- 2.1 Level One check. This must be performed by on anaesthesia machines a) before they enter service and b) following all service inspections, which must be performed at regular and specified intervals.
 - 2.1.1 The Hospital, Anaesthesia Department or body responsible for the equipment shall keep a detailed record of the equipment and the checking procedures. This process requires that a checklist be

maintained. The checklist will be based on manufacturer's recommendations. The protocols shall describe checking and calibration protocols and the intervals at which these must be performed.

2.1.2 The anaesthetic machine must have a prominent label to advise of past service(s) and to indicate when the next check is due. This label must be visible to the anaesthetist.

2.1.3 Gas Delivery System. The check shall include:

2.1.3.1 Quantifying and minimising leaks

2.1.3.2 Excluding crossed pipelines within the machine

2.1.3.3 Ascertaining the correct functioning of non-return valves throughout the system

2.1.3.4 Ascertaining the integrity of oxygen failure prevention and warning devices

2.1.4 Anaesthetic Vapour Delivery System. The check shall include the accuracy of vapour output and delivery devices.

2.1.5 It is essential to ascertain that the machine as supplied complies with the relevant Australian or New Zealand standard.

2.1.6 The check specified above must be undertaken by a suitably qualified person, usually the service provider. The check must be recorded with inclusion of information as to what was checked, and by whom. After servicing, the particular checklist will relate to the actual service performed.

2.2 Level Two check. This check must be undertaken by a suitably qualified person (such as an anaesthetist, technician or nurse) in accordance with a protocol specific for the particular machine. Thus several different protocols may be required in a single hospital. These will serve to verify the correct functioning of the anaesthesia machine before it is used for patient care. Equipment required for the tests must be available on each machine.

2.2.1 High Pressure System.

2.2.1.1 Check oxygen cylinder supply. Ensure that cylinder content is sufficient for its intended purpose.

2.2.1.2 Check that piped gas supplies (where present) are at the specified pressures and that following high pressure system checks, the cylinders are turned off.

2.2.1.3 Confirm correct pipeline supply by using an oxygen analyser or multigas analyser distal to the common gas outlet.

2.2.2 Low Pressure System.

2.2.2.1 Check control valves and flow meters. Turn on each gas and observe the appropriate operation of the corresponding flow meter. Check the functioning of any interactive anti-hypoxic device

2.2.2.2 Check that any required vaporiser is present:

2.2.2.2.1 Check that adequate anaesthetic liquid is present.

2.2.2.2.2 Ensure that the vaporiser filling ports are closed.

2.2.2.2.3 Check correct seating and locking of a detachable vaporiser.

2.2.2.2.4 Test for circuit leaks for each vaporiser in both on and off positions.

2.2.2.2.5 Ensure power is available for electrically operated vaporisers.

- 2.2.2.3 Check for pre-circuit leaks using a method sensitive to 100mL/minute and appropriate for specific machine.
 - 2.2.2.4 Breathing systems. Check the general status to ensure correct assembly and absence of leaks. The precise protocol will depend on the anaesthesia circuit to be used.
 - 2.2.2.4.1 Perform leak test on the breathing system by occluding the patient connection, applying a fresh gas flow of 300mL/min and ensuring that a pressure of greater than 30cm H₂O is sustained.
 - 2.2.2.4.2 In the circle system check its integrity and the functioning of unidirectional valves. This can be accomplished with a breathing bag on the patient limb of the Y-piece. Ventilate the system manually using an appropriate fresh gas flow. Observe inflation and deflation of the attached breathing bag and check for normal system resistance and compliance. Observe movement of unidirectional valves. Check function of adjustable pressure limiting (APL) valve by ensuring easy gas spill through APL when the two breathing bags are squeezed.
 - 2.2.3 Automatic Ventilation System. This should be checked according to the manufacturer's recommendations. This test protocol must be present on the machine. A test lung (such as a suitably compliant bag) may be used to check the function of the ventilator. Where practicable, gas flow should be reduced to check for leaks. The functioning of disconnection and high pressure alarms should be checked at this time.
 - 2.2.4 Scavenging System. This should be checked after connection to APL valve and ensuring a free gas flow. If there is negative pressure in any part of the system, ensure that this does not lead to emptying of the breathing system. With the patient occluded, a full breathing system should not empty with the APL valve open.
 - 2.2.5 Emergency Ventilation System. Verify the presence and functioning of an alternative method of providing oxygen and of controlled ventilation (such as self-inflating bag).
 - 2.2.6 Other apparatus to be used. This should be checked according to specified protocols. Attention should be given to:
 - 2.2.6.1 Equipment used for airway maintenance and intubation of the trachea.
 - 2.2.6.2 Suction apparatus.
 - 2.2.6.3 Gas analysis devices.
 - 2.2.6.4 Monitoring equipment. Special attention should be paid to alarm limits and any necessary calibration.
 - 2.2.6.5 Intravenous infusion devices.
 - 2.2.6.6 Devices to reduce hypothermia during anaesthesia.
 - 2.2.6.7 Breathing circuit humidifiers.
 - 2.2.6.8 Breathing circuit filters.
 - 2.2.7 Final check. Ensure vaporisers are turned off and that the breathing system is purged with air or oxygen as appropriate.
- 2.3 Level three check. Immediately before commencement of each anaesthetic, the anaesthetist should:
- 2.3.1 Check a changed vaporiser using the protocol outlined in 2.2.2.2.
 - 2.3.2 Check a changed breathing circuit using the protocol outlined in 2.2.2.4.
 - 2.3.3 Check that equipment as specified in 2.2.6 is ready for the next case.

This policy document has been prepared having regard to general circumstances, and it is the responsibility of the practitioner to have express regard to the particular circumstances of each case, and the application of this policy document in each case.

Policy documents are reviewed from time to time, and it is the responsibility of the practitioner to ensure that the practitioner has obtained the current version. Policy documents have been prepared having regard to the information available at the time of their preparation, and the practitioner should therefore have regard to any information, research or material which may have been published or become available subsequently.

Whilst the College endeavours to ensure that policy documents are as current as possible at the time of their preparation, it takes no responsibility for matters arising from changed circumstances or information or material which may have become available subsequently.

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3.2 Operational checklist procedure – pre testing

The procedure described below is one method of checking out the Anaesthesia machine that will detect almost any serious problem. (Special procedures may be required if the machine has been modified or has special medical equipment attached to it.)

The complete check-out procedure or its equivalent should be performed prior to the first time a machine is used each day. The main checks should also be carried out before each use of a machine on a different patient.

Ensure that an anaesthetic machine checklist is completed as the procedure is carried out, with all details submitted.

Comprehensive pre-use and or daily inspection procedure is a vital component of a complete anaesthesia patient safety program. It must not, however, be relied upon to prevent all equipment related complications. Some types of failures may not be detected without an exhaustive inspection protocol, and some equipment failures will inevitably occur during use.

There is no substitute for the continuous presence, vigilance and good judgement of a trained anaesthetist during anaesthesia and mechanical ventilation.

Before starting, be sure to have all necessary equipment

Start by verifying that the items necessary for the procedure are present. Appropriate emergency drugs and equipment should be close at hand. Be sure to check Laryngoscopes, as they are the equipment items that fail most frequently.

3.2.1 Visual examination

Visually examine the anaesthesia machine to identify obvious problems, such as broken flowmeter tubes or missing probes and breathing circuit connectors. Identify and log the machine serial number on the anaesthetic record as this may be needed if a problem were to be suspected. Visually check:

- Patient pressure gauge shows zero pressure
- Frame and castors
- Monitor shelf (if fitted)
- Console
- Working table
- Drawer – for easy movement

3.2.2 General preparation – pre check

1. Turn on the monitoring equipment and allow time to stabilise before calibrating.
2. Connect the scavenging system (all fittings should be sequential to prevent misconnection). Activate the system prior to carrying out any procedure and check to avoid polluting the Operating Room.
3. Check back bar integrity and Selectatec type mounts (see figure A3046). Clear all obstructions such as tubes and lines which could prevent correct Vaporiser mounting.
4. The seal between the vaporiser and the Selectatec mounting block is dependent on an 'O' ring retained at the bottom of each of the valve stems. It is therefore important that they be examined each time the vaporiser is removed from the anaesthesia machine.

Note: **Make sure that only one 'O' ring be kept with each machine. Vaporisers not attached to the anaesthesia machine must be prevented from tipping over and should be emptied prior to being moved.**

3.2.3 Cylinder Fitting

1. Check the cylinder for correct gas type.
2. Check that an intact Bodok seal is fitted to the yoke.
3. Remove the seal wrap from the cylinder valve.
4. Open the cylinder valve momentarily to blow any foreign matter from the gas outlet.
5. Insert the cylinder into the apparatus yoke, ensuring that the outlet orifice of the cylinder valve engages with the inlet of the yoke. Tighten the yoke clamping screw.

3.2.4 Component integrity

The apparatus is now ready for testing prior to use. All the components and assembly are fully tested prior to despatch from our works but may have loosened during transport. The following ensures components are secure.

1. Fit the gas cylinders or pipeline supply as detailed above.
2. Test the vaporiser, spacer cone, socket joints and safety valve for leaks by blocking the common gas outlet. Raise the pressure in the back bar using the oxygen flow control valve on the flowmeter until the patient safety valve pressure is obtained. Check for leaks from the outlet back to the flowmeter (a soapy solution can be used to test this).
3. Turn off all gas supplies (clean all traces of soap solution, if used, from the machine).

3.2.5 General

Assuming all hose connections have been established, oxygen flow should first be established at the rotameter. Bellows volume is then adjusted on the ventilator (see user manual for EV500 ventilator for further details), making sure the absorber is on and operational. The ventilator can then be turned on and set for the patient. The patient is then being ventilated.

The first line of safety to the patient is the anti-hypoxic device. Once the nitrous oxide control is fully opened, only the oxygen control needs to be used. The anti-hypoxic device ensures that a nominal ratio of at least one part oxygen to three parts nitrous oxide is delivered at all times should nitrous oxide be used. The anaesthetist can choose to increase the amount of oxygen delivered, or reduce the amount of nitrous oxide, however the 1:3 ratio cannot be breached. Air is available at all times with or without the presence of oxygen, nitrous oxide, or both.

Should pipeline supply fail, the operator simply needs to turn on the supply from the appropriate compressed gas cylinder. The cylinder pressure gauge on the front of the machine will then register a reading.

The normal gas pressure range for the Signet 615 is 300 to 550 kPa.

4 Operation

4.1 Medical Gas Mixing

Flow meters (rotameters) for O₂, AIR and N₂O are used to control the fresh gas flow to the breathing system. Turning the flow control knob counter-clockwise opens the flow to the flowmeter tube; the set flow rate being indicated by the float (or bobbin). The correct flow rate is read by observing position of the upper surface of the float with respect to the engraved scale on the flow tube.

WARNING

Always check that the float rotates freely during use. This proves that the float is free within the tube.

Should the O₂ supply be interrupted, all other gases are cut off.

The O₂ Flush push button activates an O₂ flow of 35 - 75 L/min directly to the common gas outlet. This is also useful for initial filling of ventilator bellows and patient breathing systems, and is always available.

Vaporizers can be mounted to the machine backbar. When vaporizers are fitted with safety interlock systems, only one vaporizer at a time can be selected to ON.

Fresh gas is delivered from the Common Gas Outlet fitted to the patient block. The outlet has a 22/15mm male stainless steel cone with a weight bearing thread for attaching items such as the fresh gas connecting hose to the outlet.

4.1.1 Accuracy and the Effects of Backpressure

The glass tubes are antistatic and electrically conductive, and are manufactured to an accuracy of CLASS 2.5 (VDI/VDE 3513) so that the total tolerance at any given point on the scale is 1.85% of Indicated Flow + 0.625% of Full Scale Reading (with a ceiling value of 10% Indicated Flow - whichever is lower).

Backpressure may depress the float so that the indicated flow is less than the actual flow.

For all normal usage it can be safely assumed that the maximum error in indicated flow will not exceed 10%

4.2 Circle Systems

The Signet should be used in conjunction with Ulco's AB800 soda-lime absorber when used as part of a circle rebreathing system.

1. When the absorber is in use, ensure that the INSPIRATORY and EXPIRATORY one-way VALVES can be seen operating, and check colour change of the CO₂absorbent.
2. For the Switchable version of the absorber; check that the bypass lever is set to the desired position (i.e. OFF allows the gas to by-pass the soda-lime canisters).

4.3 Troubleshooting

4.3.1 Leaks

The problem of leaks anywhere in the patient circuit can be difficult to solve and can occur anywhere from the rotameter block forward to the patient circuit. This includes:

- vaporiser mounts
- vaporisers themselves
- how the vaporisers are mounted
- the common gas outlet connection
- the absorber

- the patient circuit itself

It is important to go through a logical test procedure. Check sheets published by the Australian College of Anaesthetists (supplied) help by suggesting test procedures.

If a vaporiser or absorber or circuit is changed, it is important *not* to assume there is no leak.

In the event of a major leak, the bellows of the ventilator will stop rising and start to fall. The monitor display will start to flash and the low pressure light will illuminate. 15 seconds later an audible alarm will sound which can be silenced by touching the 'off/reset' button on the ventilator, muting the alarm for 60 seconds.

Once the leak problem has been solved, and there is sufficient difference between the end inspiratory pressure and the end expiratory pressure, (6cm H₂O) or the bellows are refilled, the ventilator¹ will cancel all alarms and will begin to cycle normally.

¹ For further details regarding the EV500 ventilator, see the user manual.

5 Care and Cleaning

For the workstation to work safely and reliably, it must have on-going, planned maintenance and cleaning. Service intervals are described in Section 6.1.

The workstation itself requires little cleaning but the actions described in Section 5.1 should be performed at least daily or preferably after each procedure. Only those components in direct contact with expired patient gases, such as breathing circuits and breathing system components like absorbers, ventilator bellows and canisters will require regular disinfection. See the user manual for the particular accessory in order to determine how it should be disinfected. The workstation will require disinfection only if the exterior surfaces become directly contaminated; disinfection in such cases is described in Section 5.2.

WARNING: Always disconnect the workstation from the mains supply prior to carrying out maintenance and cleaning.

5.1 Cleaning

The machine must be disconnected from the mains before cleaning or disinfecting. The workstation's outer surfaces can be cleaned using a soft cloth and mild soap solution such as Lemex. Clean the following surfaces:

- Frame uprights and side panels
- Plastic surfaces (skirt, front panel, top)
- Metal work table
- Absorber mounting posts and side rails

Do not use ammonia, phenol or acetone based cleaners.

After washing, wipe with clean water and allow to dry. Do not allow fluids to penetrate the housing or any of the external connectors.

5.2 Disinfecting

Anaesthetic workstations need not be disinfected unless directly contaminated.

If the equipment has become contaminated and the affected part is removable, it may be cleaned using a washer (Meile or similar).

Chemical disinfecting:

- Wash with a soft cloth and soap solution and then dry
- Wipe again with 2% glutaraldehyde (pH 6.5) solution
- Allow to stand for 20 minutes
- Rinse and dry thoroughly.

5.3 Steam Autoclaving

Normally this is not required for anaesthesia equipment and accessories. There are no components of the Signet workstation which can be autoclaved.

5.4 Filters

Always fit a new single use bacterial filter to the patient "Y" piece connection of the patient circuit. This will minimise or prevent contamination.

6 Servicing

For full information about servicing the Signet 615, please refer to the Service Manual.

6.1 Service intervals and service components for Signet '615'

Item No.	Product.	Interval in Months.	Qty	Part. No.
1.	Anti Hypoxic device	12	1	AHD60-99
2.	Rotameter 5 Tube	12	1	A5047-99
3.	Selectatec Block	12	1	A605-99
4.	Regulator (Primary)	12	3	RG1-99
5.	Regulator (Secondary)	12	2	R07-99
6.	Oxygen Failure Alarm	12	1	A3055-99
7.	Ventilator Drive	12	1	A3056-99
8.	Manifolds	12	3	A3057-99
9.	Patient Block	12	1	A307-99
10.	Scavenge Block	12	1	A3027-99
11.	Signet '615' Service kit	12	1	A600-99

7 Specifications

7.1 Physical

Height 1515 mm
 Width 615 mm
 Depth 925 mm
 Weight 90 kg (not including vaporiser or absorber)

7.2 Electromagnetic Compatibility

7.2.1 Electromagnetic Emissions

The Signet 615 anaesthetic workstation is suitable for use in the electromagnetic environment specified in the table below. The user must ensure that it is used in such an environment.

Emissions test	Compliance	Avoiding Electromagnetic Interference
Radio Frequency (RF) emissions	Group 1	The anaesthetic workstation uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations IEC 61000-3-3	Not applicable	

7.2.2 Electromagnetic Immunity

The Signet 615 anaesthetic workstation is suitable for use in the specified electromagnetic environment. The user must ensure that it is used in the appropriate environment as listed below.

Immunity test	IEC60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC61000-4-2	± 6 kV contact ± 8 kV air		Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines		Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 1 kV common mode		Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T)		Mains power quality should be that of a typical commercial or hospital environment. If the user of the anaesthetic workstation requires continued operation during power mains interruptions, it is

input lines IEC 61000-4-11	for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles $< 5\% U_T$ ($> 95\%$ dip in U_T) for 5 sec		recommended that the anaesthetic workstation be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m		Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note: In the table above, U_T is the AC mains voltage prior to application of the test level.

7.2.3 Recommended Separation Distance

In the following table, P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).

Portable and mobile RF communication equipment should be used no closer to any part of the anaesthetic workstation than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter.

Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range (over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m).

Interference may occur in the vicinity of equipment marked with this symbol:



Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Recommended separation distance: $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	Recommended separation distance: 80 MHz to 800 MHz $d = 1.2\sqrt{P}$ 800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$

Notes:

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the anaesthetic workstation is used

exceeds the applicable RF compliance level above, the anaesthetic workstation should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the anaesthetic workstation.

7.2.4 Recommended Separation Distances from Portable and Mobile RF Communication Equipment

The anaesthetic workstation is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The user of the anaesthetic workstation can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the anaesthetic workstation as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.1	0.1	0.2
0.1	0.4	0.4	0.7
1	1.3	1.3	2.3
10	3.8	3.8	7.3
100	12.0	12.0	23.0

Notes:

- At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

7.3 Symbols

These symbols appear on the workstation and its associated equipment.

Symbols			
	Refer to accompanying documents		Protective Earth
	Equipotential Grounding		Alternating Current
	Manufacturer		Power Off (pneumatic and electrical)
			Power On (pneumatic and electrical)
			Type CF Applied Part
			Date of Manufacture

7.4 Standard items

Gas circuits.....Pipeline oxygen and nitrous oxide (400 kPa) with air gauge as an option
Back bar assemblyAll back bar components Selectatec Type
Flowmeter.....3 gas (oxygen, nitrous oxide and air)
Vaporiser mounts.....Selectatec type x 2
Oxygen failureWarning device with audio-visual warnings
Drawer units.....3
Common Gas outlet:
Emergency O₂ flush>35 L/min flow
Patient safety valve50 cm/H₂O
Male connector22/15 mm

7.5 Optional Items

VaporisersAny agent (Selectatec type)
Absorber/BellowsCombined unit
Anti-hypoxic deviceStandard equipment, maintains 21% O₂ flow
MCS valve.....ADE switch selects Bain or Lack configuration
Paediatric circuitJackson Rees system
Magill circuit.....For spontaneous breathing anaesthesia

Bain adaptorFor controlled breathing anaesthesia
Bain circuitsCo-axial circuits for use with Bain adaptor
CO₂ absorber.....Optional Capacity (1 or 2 kg capacity)

8 Terms and conditions

All merchandise to be returned must have prior written authorisation by Ulco, and a valid Return Goods Authorisation (RGA) number shall appear on the shipping label, packing slip, purchase order and any other related documents.

When requesting authorisation to return material, the following information should be provided:

1. Customer purchase order and date.
2. Ulco invoice number and date, and method of shipment (available from delivery document).
3. Part number, quantity, and description of goods to be returned.
4. Reason for returning goods.

The following are acceptable reasons for return of goods:

1. Material failure within warranty period.
2. Service or repairs.
3. Ordered in error or duplication of order.

Any shipping errors or shortages of goods must be reported to Ulco within seven (7) days of receipt of such goods.

Goods are subject to any terms of any applicable warranty. Premature failure of products shall be accepted for return at Ulco's discretion, and only during the warranty period.

Goods to be returned which are not under warranty should have been purchased within thirty days of request for return, and returned within thirty days after request. Goods shall be returned unused, and in Ulco containers. Goods may be subject to a 20% restocking charge, with the exception of goods failure within the warranty period or due to Ulco error.

The following merchandise is not eligible for return, unless proven defective:

1. Sterile material, unless shipped in error by Ulco.
2. Rubber and plastic components that have been used.
3. Specially ordered or produced items.
4. Goods that have been altered or abused.

All items to be returned shall be shipped, including RGA number, to:

Ulco Medical
25 Sloane St
Marrickville NSW 2204
Australia

In the European Community, returned goods authorities should be obtained from:

Advena Ltd.
PO Box 30, Leominster HR6 0ZQ UK
Telephone +44(0)1568-620080
Fax +44(0)1568-620078

GOODS RETURN AUTHORISATION

RGA Number

Customer Details

Name

Address

State/Country Postcode

Returned Product

Date of Purchase Date of return

Reason for returning goods (please give a short description of the fault):

Signature _____

Return to

ULCO Medical
25 Sloane St
Marrickville NSW 2204
Australia

In the European Community, returned goods authorities should be obtained from:

Advena Ltd.
PO Box 30, Leominster HR6 0ZQ UK
Telephone +44(0)1568-620080
Fax +44(0)1568-620078