

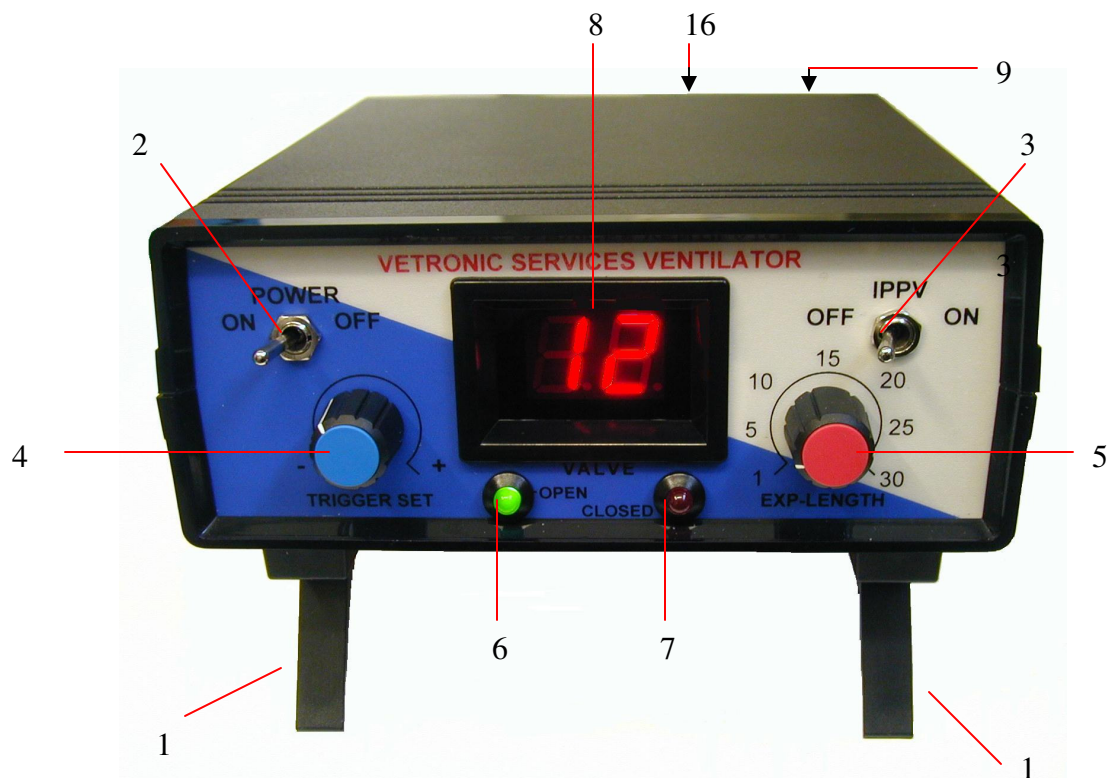
The Small Animal Ventilator Version 3 by Vetronic Services Ltd

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VETRONIC VENTILATOR PARTS AND CONTROLS

- 1 - TILT FEET.
- 2 - MAINS ON/OFF SWITCH
- 3 - IPPV ON/OFF CONTROL
- 4 - SET TRIGGER PRESSURE CONTROL
- 5 - SET EXPIRATORY PHASE LENGTH
- 6 - VALVE OPEN INDICATOR – GREEN
- 7 - VALVE CLOSED INDICATOR – RED
- 8 - TRIGGER POINT LED DISPLAY
- 9 - 9-WAY D-TYPE SOCKET
- 10 - 9-WAY D-TYPE PLUG
- 11 - LOCK SCREWS FOR D-TYPE PLUG
- 12 - VALVE / SENSOR ASSEMBLY
- 13 - EXHAUST PORT
- 14 - OXYGEN INLET PORT
- 15 - PUSH FIT CONNECTOR FOR ET TUBE



FUNCTIONS OF THE VETRONIC VENTILATOR

The VETRONIC VENTILATOR has been designed to perform the repetitive task of Intermittent Positive Pressure Ventilation (I.P.P.V.) when used with an anaesthetic circuit which is configured as a T-Piece System. The VETRONIC VENTILATOR is thus ideally suited to cats and small dogs weighing less than 8-10 Kg. In addition the VETRONIC VENTILATOR enables careful control and monitoring of Intra-Airway Pressure and Ventilation Rate. The unit does not take total control of anaesthesia and thus normal monitoring of the patient during any period of anaesthesia or controlled ventilation must be performed. As in manual I.P.P.V. a good quality cuffed Endotracheal Tube and a system free from leaks is essential. It is suggested that the unit is used as a normal T-Piece system with the IPPV switch OFF until I.P.P.V. is required.

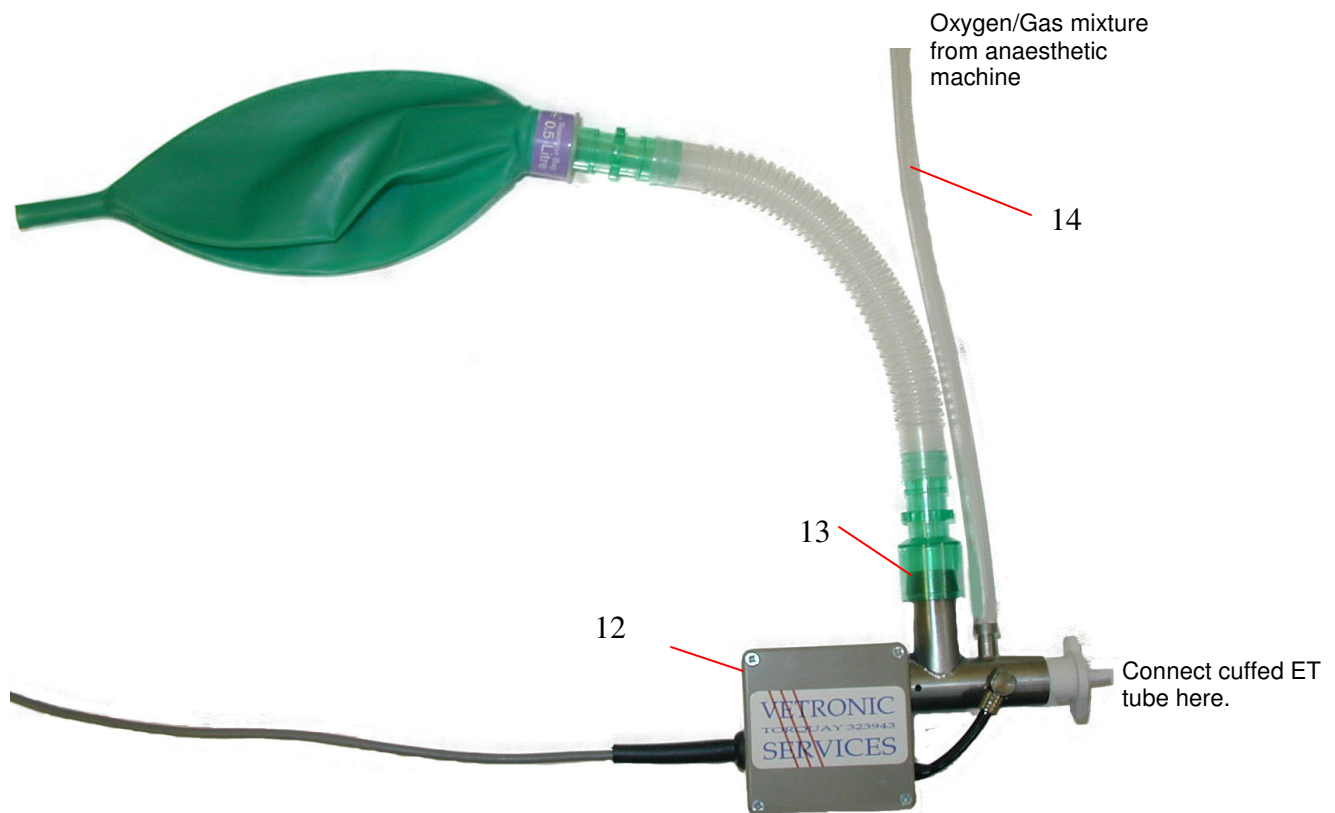
UNPACKING AND FITTING THE VETRONIC VENTILATOR

Take the Main Unit and the Valve Unit from the box and remove the protective packaging. It is advisable to keep this original packaging for use when returning the Units for service or repair. On the rear panel of the Main Unit is a 9 Way D-Type socket which mates with the 9 Way D-Type plug on the lead from the Valve / Sensor Unit. The plug and socket will only mate one way. Offer the plug to the socket and gently press home. There should be little resistance. Tighten the locking screws to firmly hold the plug in place. It is our recommendation that this plug is left connected between uses, as repeated uncoupling will cause deterioration of the contact surfaces and could lead to intermittent functioning of the unit.

USING THE VETRONIC VENTILATOR FOR THE FIRST TIME

Ensure the Valve / Sensor Unit is plugged into the Main Unit and tightly secured. Connect your 19mm corrugated outlet pipe and attached open-ended bag from your existing T-Piece System to the Exhaust Port (13). Connect your Oxygen Inlet pipe to the Inlet Port (14). The Connector Port (15) will accept your standard E.T.plastic connectors and is push-fit. The Valve is thus configured as a T-Piece System as shown on the next page.

SYSTEM CONNECTION FOR AUTOMATIC IPPV USING THE VETRONIC SMALL ANIMAL VENTILATOR



THE CONTROL FUNCTIONS

1. Tilt feet. Adjust for preferred viewing position. These may be raised or lowered as required.
- 2.. Mains ON/OFF switch. Turns the whole unit ON/OFF. The valve will automatically release when the power supply is off.
3. IPPV ON/OFF switch. When this switch is OFF the Valve control is overridden and the valve unit behaves as a normal T-piece.. With the switch ON the valve closes and will release only when the airway pressure equals the preset display value.
4. Trigger Pressure Set control. (Blue Knob) This sets the airway trigger pressure. The value selected is displayed in centimetres of water. (See Appendix 1, page 9 for conversions).

- 5. Expiratory Phase Length Control. (Red Knob).** This sets the time in seconds between expiration (valve opening) and the beginning of the new inspiratory cycle (valve closing). The dial values are in seconds. If the switch on the back panel is set to the "Exp length/5" position, the delivered expiratory length will be one fifth that selected by the front panel knob.
- 6. OPEN Valve indicator.** The GREEN light will illuminate whenever the valve is in the open position.
- 7. CLOSED Valve indicator.** The RED light will illuminate whenever the valve is in the closed position.
- 8. LED Display.** Before use, this displays the airway pressure at which the valve will open. Once in use, this display value will fall as airway pressure increases. See page 7 section 4 for a more detailed explanation
- 9 & 10. Matching 9-way socket and plug.**
- 11. Lock screws for 9-way Plug.**
- 12.. Valve /Sensor assembly.** Connect as shown in the diagram. Do not drop! If any damage is sustained please contact your supplier.
- 13. Exhaust Port.** Connect a 19mm or 3/4" corrugated outlet pipe. When an animal is being ventilated this may be connected directly to a scavenging system. In normal unaided ventilation connect an open-ended bag.
- 14. Oxygen inlet.** Connect the flexible hose from the vaporiser to this port.
- 15. E.T. tube connector socket.** Standard 15mm E.T. tube connectors will push-fit into this socket.
- 16. Back panel switch.** Set to "Exp. Length/5" for the delivered expiratory length to be 1/5 that set by the right hand dial on the front panel. Set in the other position causes expiratory length to be as shown by the dial.

Once you are familiar with the controls proceed with the following introduction to the use of the Ventilator.

INITIAL USE OF THE VENTILATOR

- 1..** Plug in the Appliance to the mains socket and switch it on. Do not yet have any incoming oxygen or gases. Set the Expiratory Phase-Length Control/Red Knob (5) to a point somewhere between 1 and 5 . Turn the Mains operating Switch (2) to ON. The Solenoid may click as you do this. Turn the IPPV Switch (3) to OFF. (Ensure the back panel switch is not set to “Exp. Length/5”).
- 2..** The GREEN (LEFT) LED should now be lit indicating that the valve is permanently OPEN.
- 3..** Rotating the Blue Knob (4) will cause the numbers on the display to change. At the most Anti-clockwise position a value of 00 will be seen. With changes in humidity this may appear as 01. or 01 - this is normal and does not indicate a fault.
- 4..** Now turn the Trigger Set Control/Blue Knob (4) so the display reads 10. Then turn the IPPV Switch to ON. The RED LED will now light indicating that the Valve is CLOSED. Block off the oxygen inlet port (14) with your finger and blow directly into the E.T. connector socket (15). At some point the valve will release and the GREEN LED will light. There will then be a pause of several seconds - depending on the setting of the Red Knob/Expiratory Length (5) - until the valve closes again. Try different display settings and delay times to familiarise yourself with the mode of operation. You will notice that as you blow, the display value falls. This is because it measures the difference between the airway pressure and the preset trigger pressure. When this becomes zero the valve will open. To see the extreme sensitivity of the Unit set the Trigger Set Control to 01 or 02 and gently puff into the open end of the T-Piece. This should be enough to trigger the Unit.
- 5..** The time taken for the Valve to close again after being triggered open is set by the Expiratory Phase Length Control/Red Knob (5) and may be set in the range 1 to 30 seconds. For long periods the Valve may be permanently held open by setting the IPPV Switch to OFF.
- 6..** Note that in the event of Power Failure the Ventilator will fail Safe with the valve permanently open. Manual I.P.P.V. can thus be performed until power is restored.

ROUTINE USE OF THE VETRONIC VENTILATOR

Once you are familiar with the Unit the following procedures should be performed before each use.

1. Set the display value. Remember this is measured in centimetres of water pressure.
2. Check the patency of the Valve and the function of the IPPV ON/OFF switch. Switching on and off should cause the valve to operate.
3. Check the system for any leaks.
4. Run the system as a normal T-piece until IPPV is required.

If any difficulty is experienced in using the Ventilator then set the Valve Override switch to ON and perform manual I.P.P.V. until the source of the problem has been identified and rectified.

Setting of the frequency of respiration should initially be in accordance with the normal for that particular Breed and Type. However the Veterinary Surgeon in charge must be aware of the implications and effects of Controlled Ventilation and set all values in accordance with the needs of each particular case.

In use the most common problem encountered is that of failing to reach the Trigger Point with the result that the Valve stays closed. This can be caused by a) Leaks in the T-Piece System, b) Insufficient gas flow rates and c) Setting the Trigger Value too high. For most cases the initial total gas flow rate into the system should be of the order of the Peak Inspiratory Rate for that animal. (See Appendix 1)

APPENDIX 1

CONVERSIONS.

ATMOSPHERIC PRESSURE = 760mm Hg (mercury)
= 101.3 kPa
= 1013 millibars
= 1033 cm Water.

10 cm Water = 1kPa
1 cm Water = 1 millibar
10 millibars = 1kPa
13.6 cm Water = 10mm Hg

As a guide the safe maximum intrathoracic pressure that can be tolerated by a healthy lung (in a closed chest) is of the order of 5-6kPa or 50 to 60cm water before damage occurs. Most cats & dogs are adequately ventilated at 15 - 20 cm water.

FLOW RATES

The delivered flow rate to the animal should be equal to approximately twice the minute volume requirement for that particular animal. The minute volume requirement can be calculated as equivalent to 0.2 - 0.25 L/min per kg bodyweight. Hence the flow rate is given as 0.4 to 0.5 L/min per kg bodyweight.

IMPORTANT NOTE

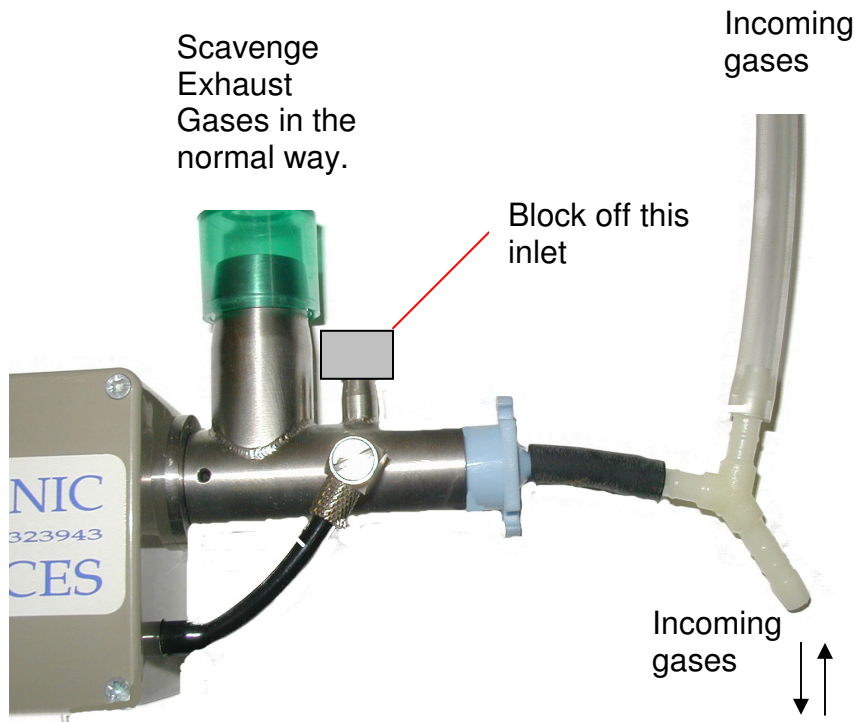
The trigger values and flow rates given are intended to act as a guide only. The actual used values will depend much more on chest compliance and the age and physical state of the individual. Please note that chest compliance is influenced markedly by age, obesity and whether the chest is open or closed. Continual checks and adjustments will need to be made during the various stages of surgery / anaesthesia.

APPENDIX 2

Using the ventilator in very small animals

The Ventilator may be used in some larger rodents and birds in the standard configuration. However in this configuration the set-up presents a large dead space to the animal, which may seriously impede proper respiration during spontaneous breathing. A better approach is to use the ventilator in combination with a Y-piece. Then during IPPV the Ventilator can be used to control the airway pressure and release of exhaust gases in the exit arm of the Y-piece. To maintain the function of the system the inlet pipe to the Ventilator T-piece must be blocked off and the oxygen/gas inlet directed to the inlet arm of the Y-piece as shown.

If the switch on the back panel is set to the “Exp length/5” position, the delivered expiratory length will be one fifth that selected by the front panel knob, allowing finer control of this parameter in very small animals.



VENTILATOR SPECIFICATIONS

INTENDED USE: DOMESTIC ANIMALS UP TO 10KG IN WEIGHT

ANAESTHETIC APPARATUS CONFIGURATION: T-PIECE WITH HALOTHANE / N₂O / O₂ MIXTURE

MODE OF OPERATION:

IPPV BY OUTLET OCCLUSION/PRESSURE CYCLED DEVICE.

PRESET TRIGGER RANGE: 0 - 40 CENTIMETRES WATER PRESSURE

RESOLUTION: 1 CENTIMETRE WATER PRESSURE

EXPIRATORY PHASE RANGE: 1 TO 30 SECONDS

RESPIRATORY RATE RANGE: 2 TO 60 BREATHS PER MINUTE (Depending on Inspiratory Flow Rate)

SUPPLY VOLTAGE: 240 VOLTS 50Hz AC MAINS ONLY.

POWER CONSUMPTION: 10 WATTS

REAR PANEL FUSE RATING: 800 mA

PLUG FUSE RATING: 5 AMPS

Important Information

BEFORE USE

Please read this manual carefully before using this appliance. This appliance is designed to operate on 230v AC, 50Hz mains supply only. Do not attempt to operate the appliance on any other supply voltages or DC.

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code :
BLUE.....NEUTRAL
BROWN.....LIVE
GREEN/YELLOW.....EARTH

The appliance is fitted with a fused plug rated at 5-Amps. No other fuse rating should be used with this appliance. If another plug is fitted the colours in the mains lead may not correspond with the coloured markings identifying the terminals in your plug. In that instance proceed as follows:

The wire which is coloured BLUE must be connected to the terminal marked with the letter N or coloured black.

The wire which is coloured BROWN must be connected to the terminal marked with the letter L or coloured red.

The wire which is coloured GREEN/YELLOW must be connected to the terminal marked with the letter E or coloured GREEN/YELLOW.

There are no user-serviceable parts inside the unit and any guarantees will be rendered void if the Manufacturing seals are broken.

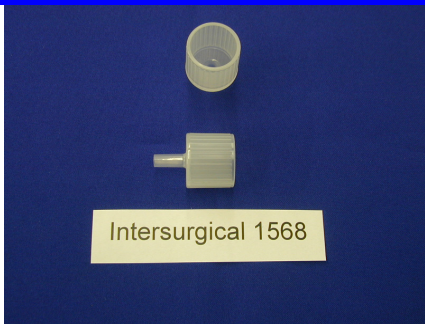
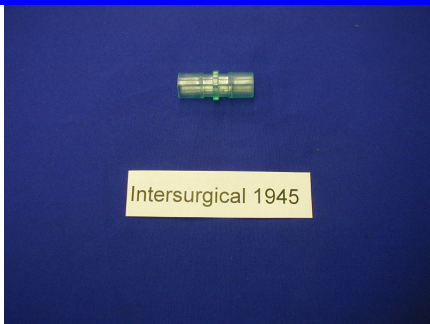
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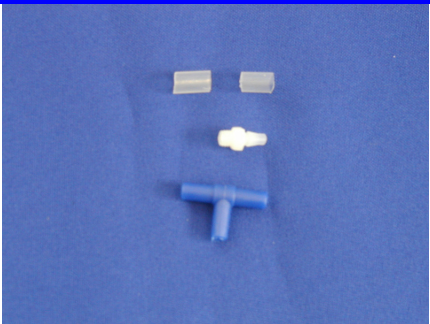
Extras for your Small Animal Ventilator Version 3

Tubing

Part Number: VSL-1180 Description: O2 Tube 5mmID, 7mm OD	Part Number: VSL -1575 Description: 15mm Flextube cuffed at 170mm
	

Adaptors

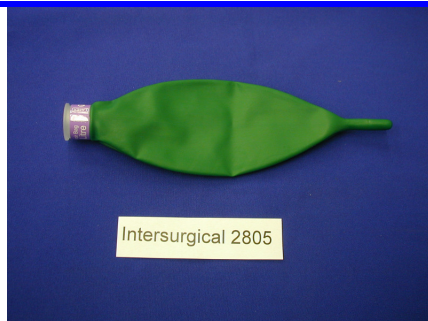
Part Number: VSL-1568 Description: 22F to 6mm O2	Part Number: VSL-1943 Description: 15M-22M	Part Number: VSL-1945 Description: 15M-15M
		

Part Number: VSL-1997 Description: Elbow 15M-22M/15F	Part Number: VSL-LDST Description: Low Dead Space T Piece
	

Specialist Items

Part Number: VSL-2805

Description: 0.5L Reservoir bag with 15mm Female neck



Tubing Kits for SAV03

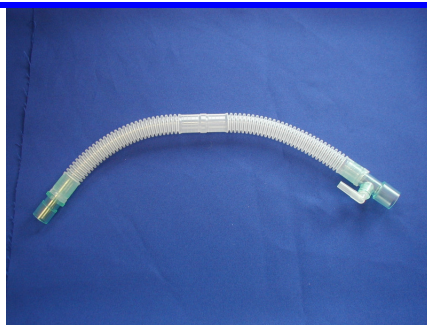
Part Number: SAV03 - CONNKIT

Description: SAV03 Connection Tubing Kit



Part Number: SAV03 - EXTKIT

Description: SAV03 Extension Tubing Kit



Part Number: SAV03 - LDSKIT

Description: SAV03 Low Dead Space Kit



For other products and consumables see our web page:
<http://www.vetronic.co.uk>