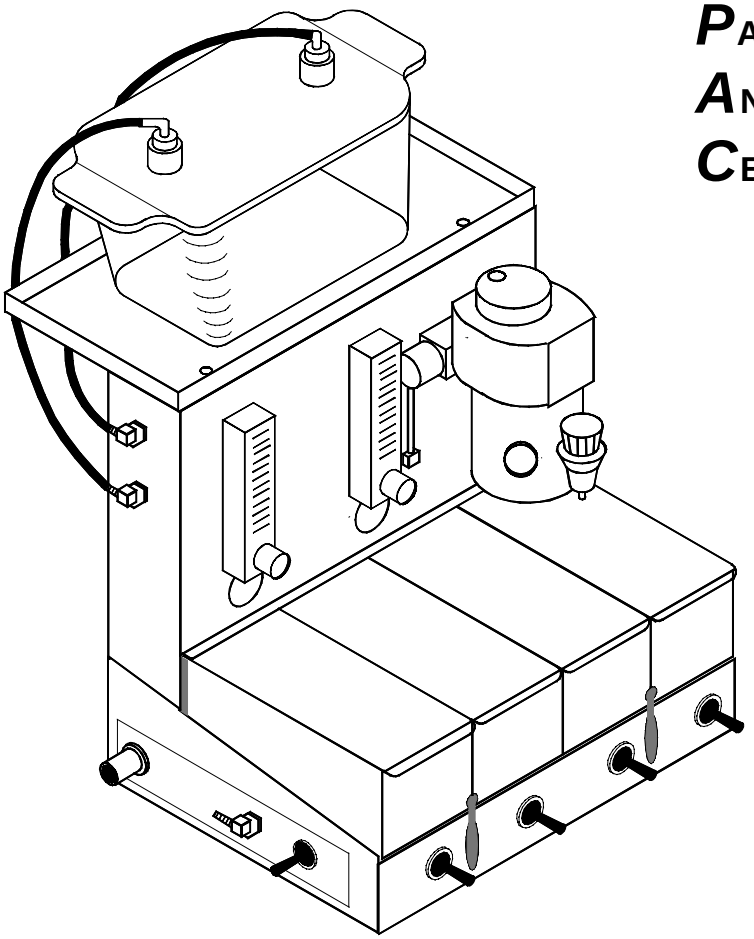
Operating Instructions & Maintenance Guidelines for the *IMPAC*[6]

INTEGRATED
MULTI-
PATIENT
ANESTHESIA
CENTER



VETEQUIP

Examination and Preparation for Use

We want you to be completely satisfied with your ***IMPAC^6***. Please look now to see if it is as you expected. Should anything not be exactly right, please call us now for help.

1. Examine shipping carton for signs of external damage.
2. Inspect ***IMPAC^6*** for visible damage or missing parts.

The ***IMPAC^6*** is to be operated under the normal surveillance and control of a veterinarian trained in its use. However, you need to know more about the ***IMPAC^6*** than just how to operate it. Please read this manual in its entirety.

If you have any questions or comments, we would welcome the opportunity to address them. Please call us.

Thank you!

VETEQUIP

Model #: _____

Serial #: _____

Purchased: _____ / _____ / _____

For Sales or Service support, call:

800-466-6463
or
925-463-1828

Contents

DO NOT ATTEMPT OPERATION UNTIL THIS MANUAL HAS BEEN READ IN ITS ENTIRETY.

Cautions

Failure to comply may result in harm to personnel, patient or equipment.

When the lids are in place, the compartments of the induction chamber are air tight. To avoid patient suffocation, metabolic gas (e.g., oxygen) must be flowing into any compartment containing a patient.

Allow for sufficient flow rate through flowmeter(s) to support all patients on the *IMPAC*^{6}. Each compartment of the induction chamber has a volume of approximately 2.1 liters and represents one individual circuit. Total flow is equally divided by the number of circuits in use at any given time. See formula and chart in Operating Instructions.

Induction chamber must be properly engaged and locked into place to prevent anesthetic gas from escaping into the procedure area.

After anesthetizing a patient in the induction chamber, flush the selected compartment with oxygen for 20 seconds before lifting the lid. Failure to do so may allow anesthetic gas to escape into the procedure area.

Keep induction chamber lid closed on any compartment where anesthetic gas is flowing. Failure to do so may allow anesthetic gas into the procedure area.

Prudent evacuation techniques and guidelines must be followed to minimize investigator exposure to anesthetic gas when the *IMPAC*^{6} is in use.

Always adhere to proper Diameter Index Safety System (D.I.S.S.) hose connections. Failure to comply will void your warranty and could compromise patient safety.

Use only a silicon-based lubricant on the lid gaskets. Do not use a petroleum-based lubricant. Failure to comply may cause a reaction between the lubricant and the oxygen.

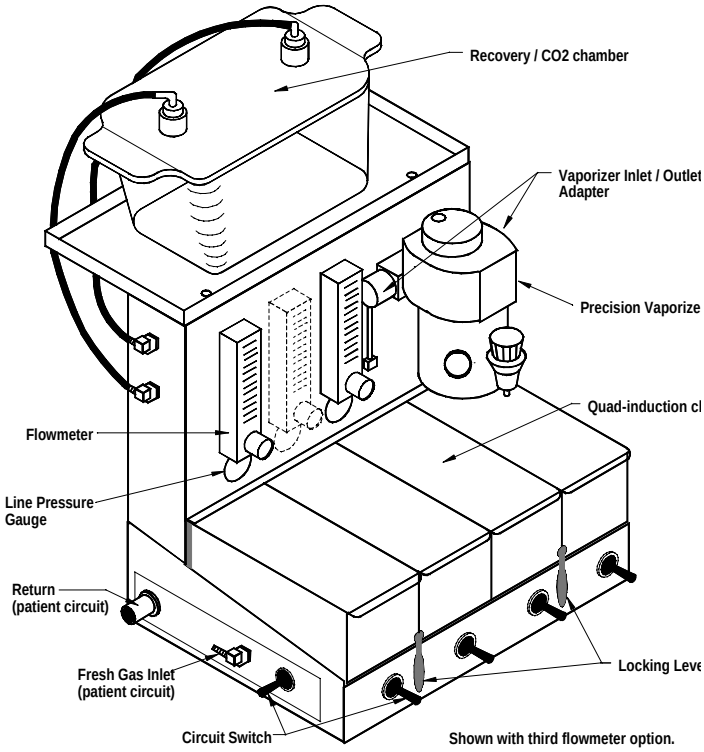
Description

General

IMPAC^6 -- ***Integrated Multi-Patient Anesthesia Center***

Improve procedure safety, efficiency and speed. Simultaneously induce multiple patients, perform procedures on others and monitor those recovering. ***IMPAC^6*** utilizes a precision vaporizer to deliver inhalation anesthesia to rodents by way of a induction chamber and two non-rebreathing circuits. This allows assembly line, sequential rodent procedures to be performed. A recovery / CO_2 chamber allows observation of recovering patients, or fast and humane euthanasia. All waste gas is scavenged and vented into your evacuation system through a single port. ***IMPAC^6***'s design, combined with isoflurane's safety, maximizes patient turnover while minimizing operator exposure to anesthetic gas.

Component Identification



Line Pressure Gauge

Indicates gas supply from in-house source. Pressure can be read in either pounds per square inch (PSI) or kilo Pascal (kPa). The ***IMPAC^6*** comes with a line pressure gauge for both oxygen and carbon dioxide. A third gauge can be added as an option.

Flowmeter

Provides regulation and monitoring of the flow of gas being delivered. Flowmeters incorporate scales graduated in liters per minute (LPM). The flowmeter is read by relating the middle of the ball float to the scale markings. Turning the control knob of the flowmeter counter-clockwise increases the flow rate and turning the control knob clockwise decreases the flow rate. The ***IMPAC^6*** comes with a flowmeter for both oxygen and carbon dioxide. A third flowmeter can be added as an option.

Precision Vaporizer

Provides a controlled means of supplying vaporized anesthetic agent to the breathing circuits and induction compartments. Dial on top of the vaporizer is graduated in % v/v, thus indicating the percentage of vaporized agent in the gas mixture leaving the vaporizer and going to the circuit switches. Refer to the vaporizer instruction manual packed with the ***IMPAC^6*** for detailed vaporizer filling and operating instructions.

Induction Chamber

A compartmented chamber allowing multiple patients to be simultaneously induced to a surgical level of anesthesia. Each compartment has a gasket to minimize leakage, and an easy grip latch for convenience.

Locking Lever

Two toggle-clamp levers that, when engaged, lock the induction chamber into place and create a seal with the gaskets of the ***IMPAC^6*** chamber interface.

Vaporizer Inlet/Outlet Adapter

23mm friction-fit adapters to connect to vaporizer manifold.

Circuit Switch

A three-position switch controlling the flow of oxygen or oxygen/anesthetic mixture to an individual breathing circuit or induction compartment. Functions of the three positions are:

ON"- Allows oxygen or oxygen/anesthetic mixture (if the anesthetic vaporizer is turned on) to flow into the breathing circuit or induction compartment.

"OFF"- Diverts the flow of gas (oxygen or oxygen/anesthetic mixture) away from the breathing circuit or induction compartment and through the exhaust manifold to the exhaust port for evacuation.

"O_2 Flush"- Provides a minimum of 20 LPM of 100% oxygen directly to the breathing circuit or induction compartment (bypassing the anesthetic vaporizer). The circuit switch is spring-loaded to the "OFF" position when released.

Patient Circuit

Bain-style non-rebreathing circuit. Designed to deliver oxygen/anesthetic mixture to patient during procedures.

Fresh Gas Inlet (Patient Circuit)

Hose barb (¼" O.D.) fitting to connect fresh gas inlet of Bain-style non-rebreathing circuit to ***IMPAC^6***.

Return (Patient Circuit)

15mm (I.D.) and 22mm (O.D.) fitting to connect to exhaust end of Bain-style non-rebreathing circuit.

Recovery / CO_2 Chamber

Observe recovering patients, or use CO_2 for fast and humane euthanasia.

Scavenging Port

19mm (U.S. Std.) waste gas outlet which easily connects via tubing to any standard evacuation system.

Setup

CAUTION

Use only a silicon-based lubricant on the lid O-rings. Do not use a petroleum-based lubricant. Failure to comply may cause a reaction between the lubricant and the oxygen.

NOTE

Do not use a lubricant such as K-Y, to lubricate lid O-rings. It will become sticky after time and defeat the purpose. Use only a silicone-based lubricant (provided).

1. Slide the -induction chamber onto the ***IMPAC*^{6}** base, ensuring the 8 holes in the wall of the -induction chamber are facing away from you. As the chamber is pushed onto the base, the 8 gas ports in the base will slip into the 8 holes in the chamber. Once the chamber is in place, press the two red locking levers down until they snap against the base to lock the chamber in place. Press the four lids onto the -induction chamber with the lid handles toward you.

2. Set the Recovery / CO_2 chamber onto the stainless steel shelf. Connect the inlet and outlet fittings to the chamber lid. Place lid onto chamber.

CAUTION

Always adhere to proper Diameter Index Safety System (D.I.S.S.) hose connections. Failure to comply will void your warranty and could compromise patient safety.

3. Connect gas supply hoses to the Diameter Index Safety System (D.I.S.S.) inlet fittings on the back of the ***IMPAC*^{6}**. The D.I.S.S. system prevents cross connection of gases.

4. Connect gas supply hoses to in-house gas supply (e.g., oxygen, carbon dioxide, etc.) as necessary.

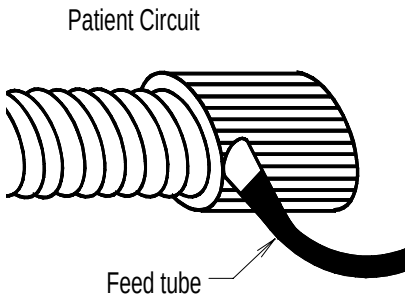
CAUTION

Prudent evacuation techniques and guidelines must be followed to minimize investigator exposure to anesthetic gas whenever the *IMPAC*^{6} is in use.

5. Connect one end of 19mm evacuation tubing (supplied) to the evacuation scavenging port on the back of the ***IMPAC[6]*** and the distal end of the tubing to your evacuation system or activated charcoal filter.

NOTE

If the feed tube on the non- rebreathing circuit is too long to fit correctly between the hose barb and the return fitting on the ***IMPAC[6]***, trim it to an appropriate length.



6. Connect one non-rebreathing circuit (supplied) to <u>each</u> single circuit port located on either side of the ***IMPAC[6]***. To connect the circuit:

   A. Push small (1/4" ID) feed tube of the non-rebreathing circuit onto the hose barb on the side of the ***IMPAC[6]***.

   B. Push the large (return) end of the non-rebreathing circuit onto the evacuation fitting on the side of the ***IMPAC[6]***.

   C. Press one face mask into the distal end of each non-rebreathing circuit, as necessary.

7. Fill the vaporizer with the appropriate anesthetic agent. Refer to vaporizer instruction manual for complete instructions.

Operating Instructions

CAUTION

Allow for sufficient flow rate through flowmeter(s) to support all patients on the *IMPAC*^{6}. Each compartment of the -induction chamber has a volume of approximately 2.1 liters and represents one individual circuit. Total flow is equally divided by the number of circuits in use at any given time. See formula and chart below.

CAUTION

Induction chamber must be properly engaged and locked into place to prevent anesthetic gas from escaping into the procedure area.

NOTE

If the oxygen flowmeter and the vaporizer are set to the "ON" position, the vaporizer will continue to output anesthetic gas, regardless that all circuit switches are set to the "OFF" position. The unused gas is diverted to the waste gas outlet. Therefore, when patients are not utilizing anesthetic gas, anesthetic agent can be conserved by turning the vaporizer to the "OFF" position. If no patients are utilizing oxygen, oxygen can be conserved by turning the oxygen flowmeter off when the *IMPAC*^{6} is not in use.

NOTE

When turning off flowmeters, it is only necessary to turn the control knob clockwise until the ball float reaches the bottom of the tube. Excessive over-tightening will eventually lead to damaging of the valve seat, resulting in a leak at this point and necessitating replacement.

1. Ensure the entire system is set up properly according to the Setup section of this manual.

2. Determine which compartment(s) of the induction chamber you will be using and set the appropriate circuit switch(es) to the "ON" position.

NOTE

The outputs of the oxygen and CO_2 flowmeters are not connected in any way. Carbon dioxide from the CO_2 flowmeter is not delivered to the -induction chamber or patient circuits.

3. Set the oxygen flowmeter to the appropriate flow rate. Please consult the following formula and chart.

$$\frac{\text{Total flow rate (liters per minute)}}{\text{Total "ON" circuit switches}} = \text{Flow rate per circuit}$$

Flow rate to each open circuit (cc's)

Flowmeter Setting (liters/min.)	1	2	3	4	5	6
5.0	5000	2500	1667	1250	1000	833
4.5	4500	2250	1500	1125	900	750
4.0	4000	2000	1333	1000	800	667
3.5	3500	1750	1167	875	700	583
3.0	3000	1500	1000	750	600	500
2.5	2500	1250	833	625	500	417
2.0	2000	1000	667	500	400	333
1.5	1500	750	500	375	300	250
1.0	1000	500	333	250	200	167
0.5	500	250	167	125	100	83
0.0	0	0	0	0	0	0

Total number of open circuits

CAUTION

When the lids are in place, the compartments of the -induction chamber are air tight. To avoid patient suffocation, metabolic gas (e.g., oxygen) must be flowing into any compartment containing a patient.

4. Place patient in the appropriate induction compartment.

5. Replace compartment lid.

CAUTION

Keep induction chamber lid closed on any compartment where anesthetic gas is flowing. Failure to do so may allow anesthetic gas into the procedure area.

6. Turn the vaporizer dial to an appropriate percentage setting.

CAUTION

After anesthetizing a patient in the -induction chamber, flush the selected compartment with oxygen for 20 seconds before lifting the lid. Failure to do so may allow anesthetic gas to escape into the procedure area.

7. After a specific patient reaches the appropriate anesthetic level, move the circuit switch for that compartment to the "O_2 Flush" setting. Hold the switch in the "O_2 Flush" position for 20 seconds. Once released, the switch will reset itself to the "OFF" position.

8. Immediately open the compartment lid and move the patient to a patient circuit on either side of the ***IMPAC***^{6}. Position the patient circuit switch for that circuit to the "ON" position.

NOTE

To perform sequential (assembly-line) procedures, place a new patient into the compartment just vacated. Replace the lid and position the circuit switch for that compartment to the "ON" position.

9. When finished with the patient on the side patient circuit, turn the circuit switch to the "OFF" position and place the patient in the Recovery / CO_2 chamber."

10. If this is a recovery procedure:
    Standard configuration: Do not place the lid on the Recovery / CO_2 chamber. This allows the patient to breathe room air.
    With flowmeter upgrade: Place lid on the Recovery / CO_2 chamber, set upgrade flowmeter (connected to Recovery / CO_2 chamber) to an appropriate flow rate.
    If this is a terminal procedure: Place the lid on the Recovery/ CO_2 chamber and set the CO_2 flowmeter to an appropriate flow rate.

11. Repeat all steps for each patient in each compartment.

Maintenance

Observation of the instructions given previously in this manual, regular cleaning and normal professional vigilance is normally all that is required to maintain the ***IMPAC^{6}*** in a safe working condition.

Induction chamber can go through wash rack.

Clean ***IMPAC^{6}*** with your standard laboratory-cleaning agent. Do not use abrasives or bleach.

Refer to vaporizer instruction manual for details of vaporizer maintenance.

Repairs

Repairs should only be carried out by a VetEquip, Inc. authorized service center. Failure to use VetEquip, Inc. authorized service personnel will void your warranty.