

About This Manual

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Product Model: Anes V30/V60

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This manual describes all configurations supported by all models of the product, and therefore some descriptions may not apply to your model. Illustrations in this user manual are provided for your reference only and may differ from what is actually displayed on the screen or device.

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- The product is used in accordance with this manual.
- All installations, replacements, tests, modifications, and repairs are conducted by technicians authorized by MEDCAPTAIN.
- All spare parts for repair and replacement, accessories, and consumables used with this product are provided by MEDCAPTAIN.
- All servicing records are kept.

Documentation

Understand the meanings of the following items clearly before reading this manual.

Item	Meaning
	Indicates a potentially hazardous situation that, if not avoided, may result in death or serious injury.
	Indicates a potentially hazardous situation that, if not avoided, may result in device malfunction or damage or performance impairment.
NOTE	Indicates precautions or recommendations that should be used in operating the device.

Item	Meaning
Boldfaced Word	Indicates physical buttons and silk-screen words on the device, or on-screen objects such as menu items or buttons.

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Thanks for purchasing the MEDCAPTAIN product.

- MEDCAPTAIN provides a limited warranty on the product. Within the warranty period, after-sales services for the product are provided free of charge. The length of the warranty period is stipulated in the sales contract. For details, contact your local distributor. However, a product damage or failure is not covered by the warranty if it is caused by:
 - Operation error;
 - Improper use;
 - Out-of-range grid voltage;
 - Force majeure such as natural disasters;
 - Replacement with or use of any component, accessory, or consumable other than authorized by MEDCAPTAIN; or
 - Other causes not related to the product itself.
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Contact our after-sales service department:

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1 Overview

1.1 Intended Use

The Anes V30/V60 animal anesthesia machine of MEDCAPTAIN is intended to be used for inhalation anesthesia of an animal weighing less than 100 kg such as a cat, dog, monkey, or pig.

1.2 Contraindication

None.

1.3 Product Features

- The animal anesthesia machine adopts a closed breathing circulation loop design.
- Two types of oxygen flowmeters are supported: 0.1-4 L/min flowmeter and 0.1-10 L/min flowmeter.
- The animal anesthesia machine supports the oxygen flush feature. This feature is applicable for removing the residual anesthetic gas from the system and for supplying oxygen to the animal in an emergency.
- The adjustable pressure limiting (APL) valve of the animal anesthesia machine provides a discharge pressure ranging from 0 to 50 cmH₂O and supports rapid gas discharges.
- The animal anesthesia machine has a CO₂ absorbent canister with a volume of 1000 ml. The canister is located on the front of the machine for convenience of observation and replacement of the CO₂ absorbing agent.
- The output concentration of the vaporizer (0-5% for isoflurane and 0-8% for sevoflurane) is adjustable and free from the influence of changes in flow, temperature, and pressure. A safety locking mechanism is provided to prevent incidental evaporation of the anesthetic agent.
- The animal anesthesia machine can be used on a tabletop or the trolley provided by the manufacturer.
- The animal anesthesia machine features a compact structure with no tubes exposed and is clean, safe, and easy-to-use.

2 Safety

Read and understand all the information contained in this manual before you operate the Anes V30/V60 animal anesthesia machine. During operation, keep this manual nearby for convenience of reference when needed.



- The animal anesthesia machine must be operated and managed by trained professionals
- The animal anesthesia machine is for veterinary use only, serving clinical and scientific research purposes.
- It is recommended that a spare anesthesia machine should be available for emergency use.
- Use of an inappropriate gas source and anesthetic agent may cause harm to the animal and operator and damage to the machine.
- Unauthorized modification of the animal anesthesia machine may cause harm to the animal and operator and damage to the machine.
- Use of an overpressure gas source may cause harm to the animal and operator and damage to the machine.
- During use, keep the animal anesthetic machine away from heat sources, flammables, and explosives.
- Wear personal protective equipment when using the animal anesthesia machine.
- Before using the animal anesthesia machine, ensure that an oxygen supply hose is properly connected to the machine.
- Before using the animal anesthesia machine, ensure that the oxygen flowmeter has been turned off.
- Turn off the oxygen flowmeter after using the animal anesthesia machine.
- When using the oxygen flowmeter, turn the flow control knob slowly to prevent the airway pressure gauge from being damaged by impact.
- Turn off the vaporizer after using the animal anesthesia machine.
- During use of the animal anesthesia machine, ensure that the animal anesthesia machine is properly connected to the exhaust gas filter canister.
- During anesthesia, the vitals of the animal should be monitored to ensure that the anesthesia extent is appropriate.
- The vaporizer of the animal anesthesia machine can be filled only with an applicable anesthetic agent. Do not fill the vaporizer with water or any other liquid. Read the label on the vaporizer before use.
- Waste and hazardous materials generated during use of the animal anesthesia machine shall be disposed of in accordance with local laws and regulations.



- Ensure that the gas supply from the gas source is stable.
- When using the animal anesthesia machine indoors, ensure that the room is well ventilated.
- The anesthetic gas overflowing due to overpressure shall be collected and disposed of in time.
- Prevent the anesthetic agent from contacting the anesthesia mask and other parts of the anesthesia system. If the anesthetic agent spills, let the spill evaporate instead of wiping it.
- When using the animal anesthesia machine on a tabletop, ensure that the machine is placed stable and away from the edges.
- When using the animal anesthesia machine on the trolley provided by the manufacturer, be sure to lock the wheels of the trolley so that the machine remains fixed in use.
- Keep the animal anesthesia machine out of the reach of animals and irrelevant persons.
- Keep the animal anesthesia machine away from direct sunlight and high-temperature and high-humidity environments.
- If the animal anesthesia machine cannot function properly as described in this manual for some unknown reason, terminate the operation of the machine immediately and report the operating conditions to your local distributor or the after-sales service department of the manufacturer.
- Do not disassemble or modify the animal anesthesia machine without authorization.
- The animal anesthesia machine and its parts shall be inspected on a regular basis.
- Before using the animal anesthesia machine for the first time after a long time, check whether the machine can operate in a proper and safe manner.
- Maintenance of the animal anesthesia machine must be conducted by personnel authorized by the manufacturer. The authorized personnel can ask the manufacturer for materials such as the circuit diagram and component list.

3 Product Specifications

Gas Source	Medical oxygen
	Rated supply pressure: 400±50 kPa
Oxygen Flowmeter	Configuration 1 (standard): 0.1-4 L/min Configuration 2 (optional): 0.1-10 L/min
Vaporizer	Configuration 1 (standard): isoflurane vaporizer Configuration 2 (optional): sevoflurane vaporizer
	Output concentration range and accuracy: Isoflurane vaporizer: 0.2-5%; accuracy: ±0.20 vol.% or ±20% rel. Sevoflurane vaporizer: 0.2-8%; accuracy: ±0.20 vol.% or ±20% rel.
Oxygen Flush	Flow: 30-50 L/min
CO ₂ Absorbent Canister	≥1000 ml
Operating Conditions	Ambient temperature: 10°C to 40°C Relative humidity: 15% to 95%, non-condensing Pressure altitude: 60.0 kPa to 110.0 kPa
Storage and Shipping Conditions	Ambient temperature: -10°C to +60°C Relative humidity: 10% to 95%, non-condensing Pressure altitude: 60.0 kPa to 110.0 kPa
Dimensions	Whole machine (without trolley): 465 mm (W) × 435 mm (H) × 370 mm (D) Whole machine (with trolley): 465 mm (W) × 1285 mm (H) × 370 mm (D)
Weight	Whole machine (without trolley): 18.5 kg Whole machine (with trolley): 25.4 kg
Service Life	10 years
Date of Manufacture	See the product label.

4 Product Introduction

4.1 Product Composition

The Anes V30/V60 animal anesthesia machine consists of a main frame, oxygen flowmeter, vaporizer, breathing circuit, oxygen flush assembly, airway pressure gauge, adjustable pressure limiting (APL) valve, CO₂ absorbent canister, inspiratory port, expiratory port, breathing bag arm, mode switch, auxiliary common gas outlet (ACGO), exhaust gas outlet, and trolley (which is only for Anes V60).

4.2 Main Unit

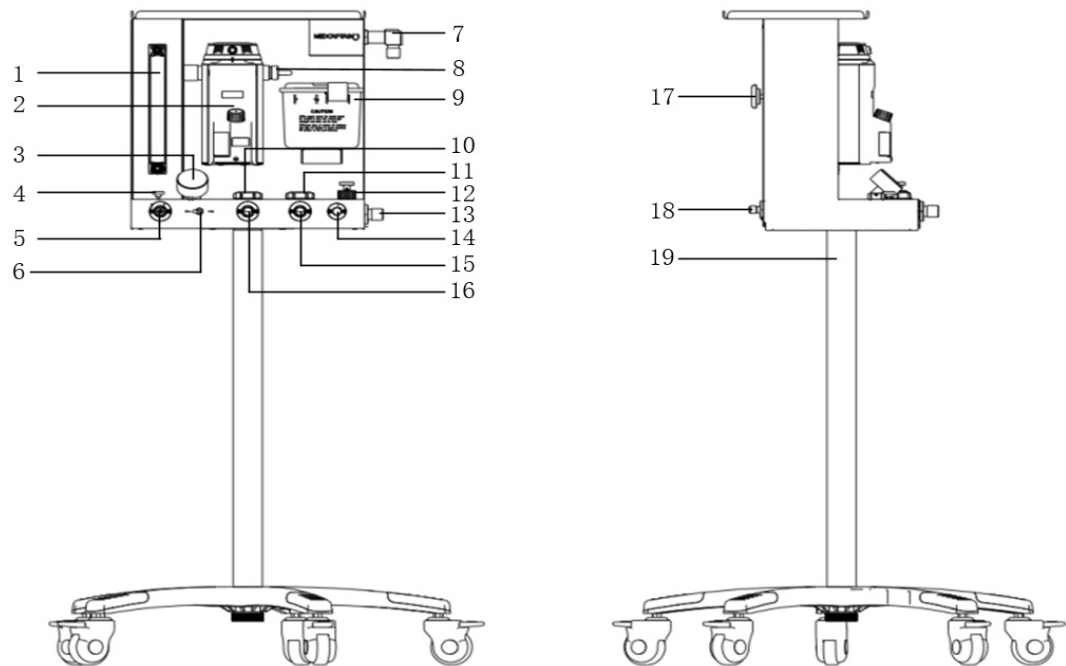


Figure 4-1 Main unit

- | | |
|--|---|
| 1 - Oxygen flowmeter | 2- Vaporizer |
| 3 - Airway pressure gauge | 4 - Oxygen flush button |
| 5 - Auxiliary common gas outlet (ACGO) | 6 - Mode switch |
| 7 - Breathing bag arm | 8 - Vaporizer outlet |
| 9 - CO ₂ absorbent canister | 10 - Inspiratory check valve |
| 11 - Expiratory check valve | 12 - Adjustable pressure limiting (APL) valve |
| 13 - Exhaust gas outlet | 14 - Leak detection port |
| 15 - Expiratory port | 16 - Inspiratory port |
| 17 - CO ₂ absorbent canister locking knob | 18 - Oxygen supply connector |
| 19 - Trolley | |

4.3 Accessories

Oxygen supply hose	1	Dual-limb breathing circuit (15mm)	1
Breathing mask	1	22mm Y-shaped connector	1
0.5L breathing bag (no latex)	1	1L breathing bag (no latex)	1
2L breathing bag (no latex)	1	500 g sodium lime	1
User manual	1	Packing list	1
Hose clamp	2	Coaxial breathing circuit	1
Tracheal tube	1	Tracheal tube support	1
Exhaust gas filter canister	1	Exhaust gas filter canister holder kit	1
400mm corrugated tub	1		

4.4 Optional Parts

Dual-limb breathing circuit (22mm)	Trolley
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5 Operating Instructions



- The animal anesthesia machine must be operated and managed by trained professionals.
- Before using the animal anesthesia machine, ensure that the oxygen flowmeter has been turned off.
- Turn off the oxygen flowmeter after using the animal anesthesia machine.
- When using the oxygen flowmeter, turn the flow control knob slowly to prevent the airway pressure gauge from being damaged by impact.
- Turn off the vaporizer after using the animal anesthesia machine.

5.1 Preparations

For proper operation of the animal anesthesia machine, complete the following preparations before use:

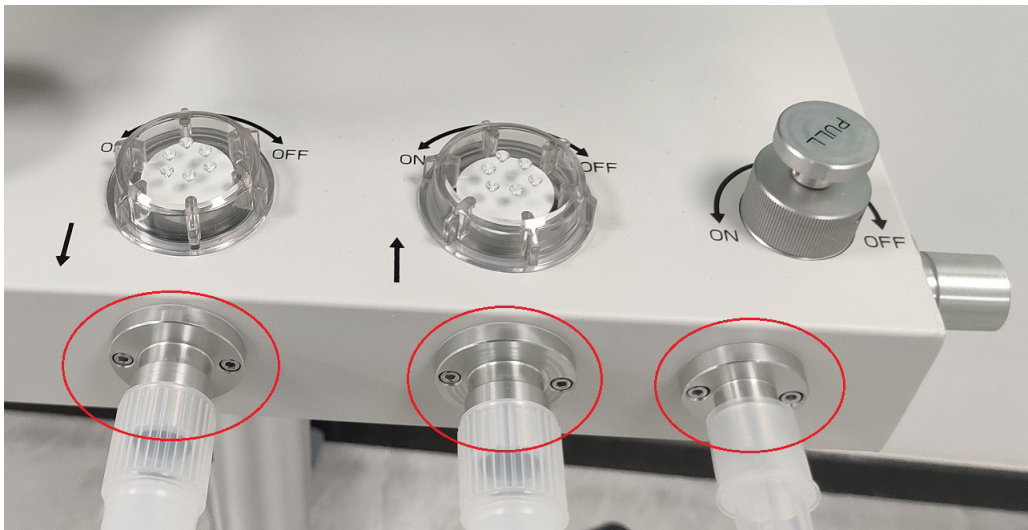
1. Connect an oxygen supply hose to the oxygen supply connector on the back of the machine and adjust the oxygen supply pressure to 400 ± 50 kPa.



2. Adjust the pointer of the vaporizer dial to the zero position. From the liquid level window, check whether the vaporizer contains any anesthetic agent left from last use.



3. Check the oxygen flowmeter. Turn the flow control knob while observing the movement of the ball float in the flowmeter. Ensure that the ball float can go up and down steadily while you adjust the oxygen flow.
4. Check the air-tightness of the animal anesthesia machine by performing the following steps:
 - a. Connect a breathing circuit to the inspiratory and expiratory ports and use a Y-shaped connector to connect the breathing circuit to the leak detection port. Ensure that the breathing circuit is intact.



- b. Close the APL valve.
 - c. Connect a breathing bag to the breathing bag arm.
 - d. Turn the flow control knob of the oxygen flowmeter counterclockwise while reading the airway pressure gauge. When the airway pressure reaches about 45 cmH₂O, adjust the oxygen flow to 0.1 L/min and keep reading the airway pressure gauge. If the airway pressure remains at this level or continues to increase, it can be determined that the air-tightness of the machine meets the requirement.
5. Check whether the CO₂ absorbing agent is within its expiration date.
6. Connect the exhaust gas filter canister to the exhaust gas outlet of the animal anesthesia machine by performing the following steps.
 - a. Install the exhaust gas filter canister holder onto the trolley pole.



- b. Place the exhaust gas filter canister in the holder.



- c. Use the 400mm corrugated tube to connect the exhaust gas filter canister to the exhaust gas outlet of the animal anesthesia machine.



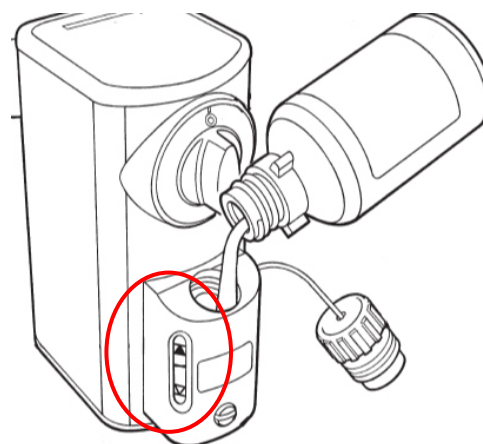
5.2 Anesthetic Agent Filling

Different vaporizers support different anesthetic agent filling methods. The vaporizer equipped in the Anes V30/V60 animal anesthesia machine supports the Pour-Fill method.

1. Open the sealing cover on the fill port of the vaporizer and check whether the sealing ring of the cover is intact.



2. Carefully pour the anesthetic agent into the vaporizer from the fill port and observe the liquid level window. Ensure that the liquid level of the anesthetic agent is between the marked maximum and maximum levels.



3. Tighten the sealing cover back on the fill port.



- If the anesthetic agent spills onto the surface of the machine during the filling process, let the spill evaporate. Do not use a dry cloth to wipe the spill off because doing so may damage the protective material on the surface of the machine.
- Be sure to use an appropriate anesthetic agent. Use of an inappropriate anesthetic agent may cause serious harm to the animal.

5.3 CO₂ Absorbing Agent Filling

For the filling or replacement of CO₂ absorbing agent, perform the following steps:

1. Loosen the CO₂ absorbent canister fixing knob on the back of the animal anesthesia machine to remove the canister from the machine.



2. Open the buckles to remove the canister cover.
3. Evenly sprinkle the CO₂ absorbing agent into the canister and put a layer of dust-proof cotton on the top. Then, put the canister cover back in place and secure the buckles.
4. Install the CO₂ canister back into the animal anesthesia machine and tighten the fixing knob on the back of the machine.

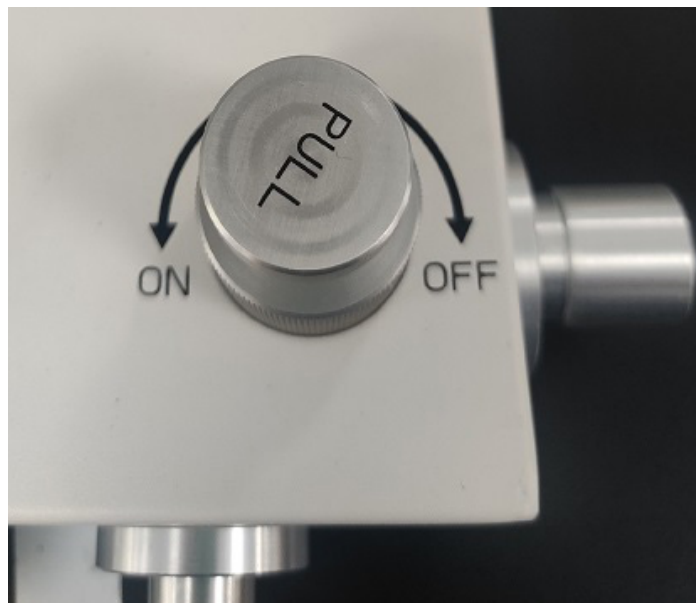


WARNING Ensure that the surface level of the absorbing agent does not exceed the maximum level marked on the canister.

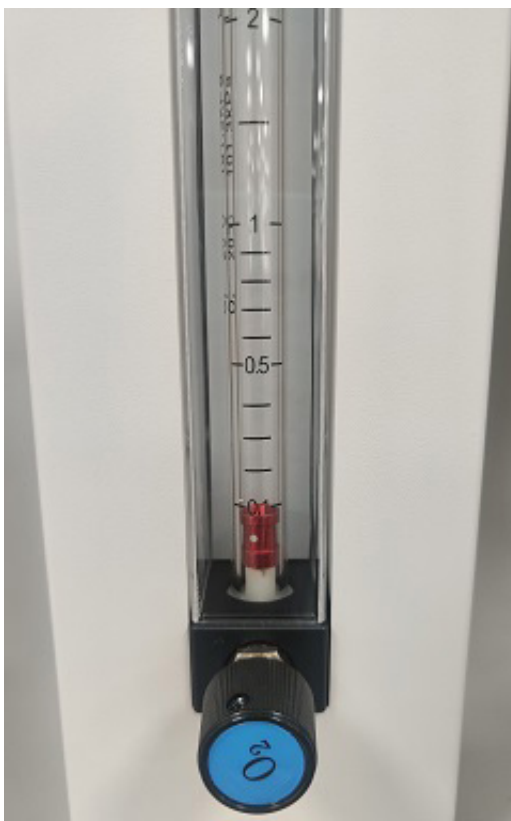
5.4 Airway Pressure Adjustment

To adjust the airway pressure inside the animal anesthesia machine, perform the following steps:

1. Connect a breathing circuit to the inspiratory and expiratory ports and use a Y-shaped connector to connect the breathing circuit to the leak detection port. Connect a breathing bag to the breathing bag arm.
2. Turn the APL valve counterclockwise until the valve is fully open and the airway pressure gauge reads 0.



3. Turn the oxygen flow control knob counterclockwise slowly to set an oxygen flow for animal anesthesia to prevent the airway pressure gauge from being damaged by impact.



4. Turn the APL valve clockwise slowly until the airway pressure remains steady at the pressure level required by the anesthesia. It is recommended that the airway pressure should not exceed 20 cmH₂O.
5. To rapidly reduce the airway pressure in the breathing circuit during anesthesia, pull up the APL valve knob.

5.5 Animal Anesthesia

1. After induced anesthesia, insert a trachea cannula into the animal or put an anesthesia mask on the animal.
2. Turn the oxygen flow knob counterclockwise to set the oxygen flow to the required flow of the surgery.
3. Press the locking button on the vaporizer dial to unlock the dial and then turn the dial to set an anesthesia concentration for the surgery.



4. Connect the breathing circuit to the trachea cannula or anesthesia mask so that the animal can breathe in the anesthetic gas.
5. During the anesthesia, you can adjust the vaporizer dial at any time to change the concentration of the output anesthetic gas so as to control the anesthesia extent.

5.6 Oxygen Flush

The oxygen flush feature is applicable for supplying oxygen to the animal in an emergency and for removing the anesthetic gas and CO₂ from the breathing circuit after an anesthesia process. To use this feature, perform the following steps:

1. Adjust the pointer of the vaporizer dial to the zero position. Disconnect the breathing circuit from the trachea cannula or anesthesia mask and then connect the breathing circuit to the leak detection port.
2. Press the oxygen flush button and squeeze the breathing bag to expel the residual anesthetic gas and CO₂ from the machine.



3. To supply oxygen to the animal in an emergency, reconnect the breathing circuit to the trachea cannula or anesthesia mask.
4. Squeeze the breathing bag to help the animal breathe.

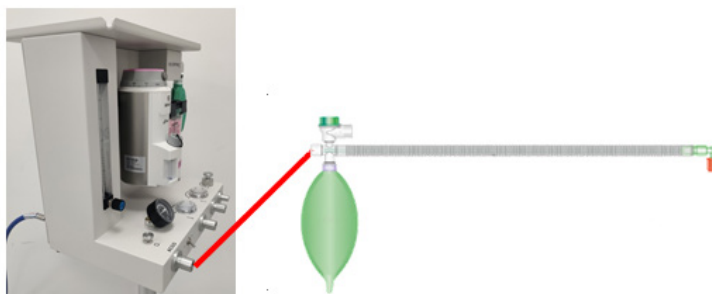


WARNING During oxygen flush, keep a close eye on the airway pressure gauge to prevent the airway pressure from being too high.

5.7 Mode Switching

It is recommended that a single-limb breathing circuit should be used when the animal weighs less than 7 kg. To use a single-limb breathing circuit with the animal anesthesia machine, perform the following steps:

1. Put the mode switch to the left where the ACGO is located.
2. Connect one end of the single-limb breathing circuit to the ACGO of the machine.



3. Connect the other end of the single-limb breathing circuit to a trachea cannula or anesthesia mask so that the animal can breathe in the anesthetic gas.

NOTE:

In this situation, the exhaled exhaust gas does not pass through the CO₂ absorbent canister, but is directly discharged to the exhaust gas absorbent canister or outdoors. Ensure that the APL valve is fully closed in case the exhaust gas enters the dual-limb breathing circuit through the APL valve.



It is recommended that a dual-limb breathing circuit or coaxial breathing circuit should be used when the animal weighs more than 7 kg. To use a dual-limb breathing circuit with the animal anesthesia machine, perform the following steps:

1. Put the mode switch to the right where the inspiratory and expiratory ports are located.
2. Connect the dual-limb breathing circuit to the inspiratory and expiratory ports.
3. Connect the dual-limb breathing circuit or coaxial breathing circuit to a trachea cannula or anesthesia mask so that the animal can breathe in the anesthetic gas.



Figure 5-1 Dual-limb breathing circuit



Figure 5-2 Coaxial breathing circuit

5.8 Operations After Use

After use of the animal anesthesia machine, perform the following steps:

1. Adjust the pointer of the vaporizer dial to the zero position.
2. Disconnect the breathing circuit from the trachea cannula or anesthesia mask and connect the circuit to the leak detection port.
3. Press the oxygen flush button and squeeze the breathing bag to remove the residual anesthetic gas and CO₂ from the system.
4. Stop the oxygen supply and turn off the oxygen flowmeter.
5. Check and record the cumulative use time of the soda lime in the CO₂ absorbent canister. If the soda lime has been used for 10 hours, replace the soda lime. The color change of the soda lime is for reference only. Using the color change as the sole basis to determine whether the soda lime needs replacing may cause the inhalation of CO₂ by the animal.

6 Troubleshooting

Table 6-1 lists the faults that may occur during the use of the Anes V30/V60 animal anesthesia machine and their possible causes and troubleshooting methods.

Table 6-1 Faults, possible causes, and troubleshooting methods

Fault	Possible Cause	Troubleshooting Method
The oxygen flowmeter does not work.	The machine is not connected to any oxygen supply.	Use the oxygen supply hose to connect the machine to an oxygen supply.
	The oxygen supply hose is not properly connected or there is a kink in the hose.	Connect the oxygen supply hose properly or remove the kink in the hose.
	The pressure in the oxygen tank is not high enough.	Replace the oxygen tank.
	The central oxygen supply system is faulty.	Check the oxygen supply pressure or flow.
	No output pressure is set for the oxygen pressure reducing valve.	Check the output pressure gauge of the pressure reducing valve and set an output pressure.
	The oxygen pressure reducing valve is faulty.	Replace the pressure reducing valve.
	The oxygen flow control knob is jammed.	Replace the oxygen flowmeter.
The airway pressure cannot go up.	A leak exists in the anesthesia circuit.	Check the connections of the vaporizer to other parts.
	A leak exists in the breathing circuit.	Check all connections or replace the breathing circuit.
The CO ₂ concentration in the breathing circuit goes up.	The absorption effect of the soda lime is weak.	Evenly sprinkle new soda lime into the CO ₂ absorbent canister.
	The expiratory check valve is not working properly.	Check and clean the expiratory check valve and replace the valve if necessary.

7 Maintenance

7.1 Cleaning and Disinfection

- Before you clean the animal anesthesia machine, stop the oxygen supply, restore the pointer of the vaporizer dial to the zero position, and disconnect the machine from the animal.
- For cleaning, use a neutral cleaning agent or ethanol for disinfection to wipe the surface of the machine.
- Single-use consumables used with the animal anesthesia machine such as breathing circuits shall be disposed of in accordance with local regulations after use. Do not sterilize a single-use consumable and then use it again.
- To clean the inspiratory check valve, remove the valve cover in the direction of the indicating arrow and then clean up the dirt on the valve port and the check valve plate.
- To clean the expiratory check valve, remove the valve cover in the direction of the indicating arrow and then clean up the dirt on the valve port and the check valve plate.
- The CO₂ absorbent canister shall be cleaned in warm water and air-dried.
- Do not use ethyl alcohol, diluent, or other organic solvent to clean the animal anesthesia machine.
- When disinfection is required, use a common disinfectant according to its instructions for use. After disinfection, soak a lint-free cloth with water, wring out the cloth, and then use the cloth to wipe the surface of the machine.



Do not clean or disinfect the animal anesthesia machine while it is in use.

7.2 Periodic Maintenance

To ensure safe use and lengthen the service life of the animal anesthesia machine, perform periodic maintenance on the machine as planned in Table 7-1.

Table 7-1 Maintenance plan

Maintenance Item	Frequency	Operator	Maintenance Method
Pre-operative check	Before each use	User	See section 5.1.
CO ₂ absorbing agent replacement	Every month/Every 10 hours in use	User	See section 5.3.
Cleaning and disinfection	Every week	User	See section 7.1.

Maintenance Item	Frequency	Operator	Maintenance Method
Whole-machine inspection	Every year	Distributor/ Hospital engineer	/

7.3 Repair

- In case of any exceptions during use of the animal anesthesia machine, report the situation to your local distributor and request for repair.
- Do not disassemble or try to repair the animal anesthesia machine without authorization. Violation of this warning may cause a serious hazard. The manufacturer and distributor shall not be responsible for any animal anesthesia machine that has been disassembled, modified, or used for any purpose other than its intended purpose.



- The replacement of accessories or parts of the animal anesthesia machine must be conducted by trained professionals.
- When used on an animal, the animal anesthesia machine or any part of the machine cannot be repaired or maintained.

7.4 Storage

- Avoid water spills on the machine.
- Do not store the animal anesthesia machine in a high-temperature and high-humidity environment.
- Protect the animal anesthesia machine from vibration, dust, and corrosive gases.
- Protect the animal anesthesia machine from direct sunlight and ultraviolet ray.

7.5 Transport

The animal anesthesia machine can be transported in a common vehicle and must be protected from drastic impact, vibration, and rain and snow splash during transport. In addition, the pump must be transported in accordance with the requirements stipulated in the order contract.

7.6 Environmental Protection and Recycling

When the animal anesthesia machine reaches the end of its service life, contact your local distributor to recycle the machine. Alternatively, dispose of the machine in accordance with local laws and regulations.

