

NARKOVET SAV II VENTILATOR FOR SMALL ANIMALS

QUICK OPERATING GUIDE



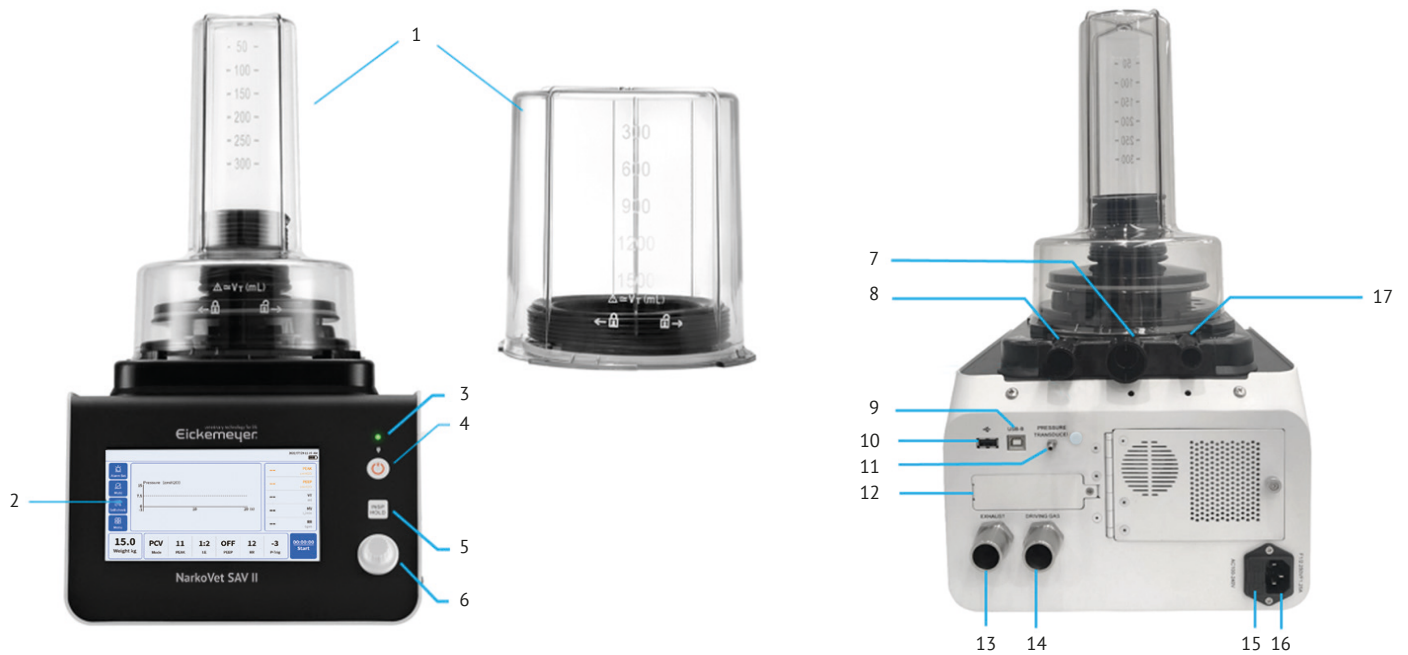
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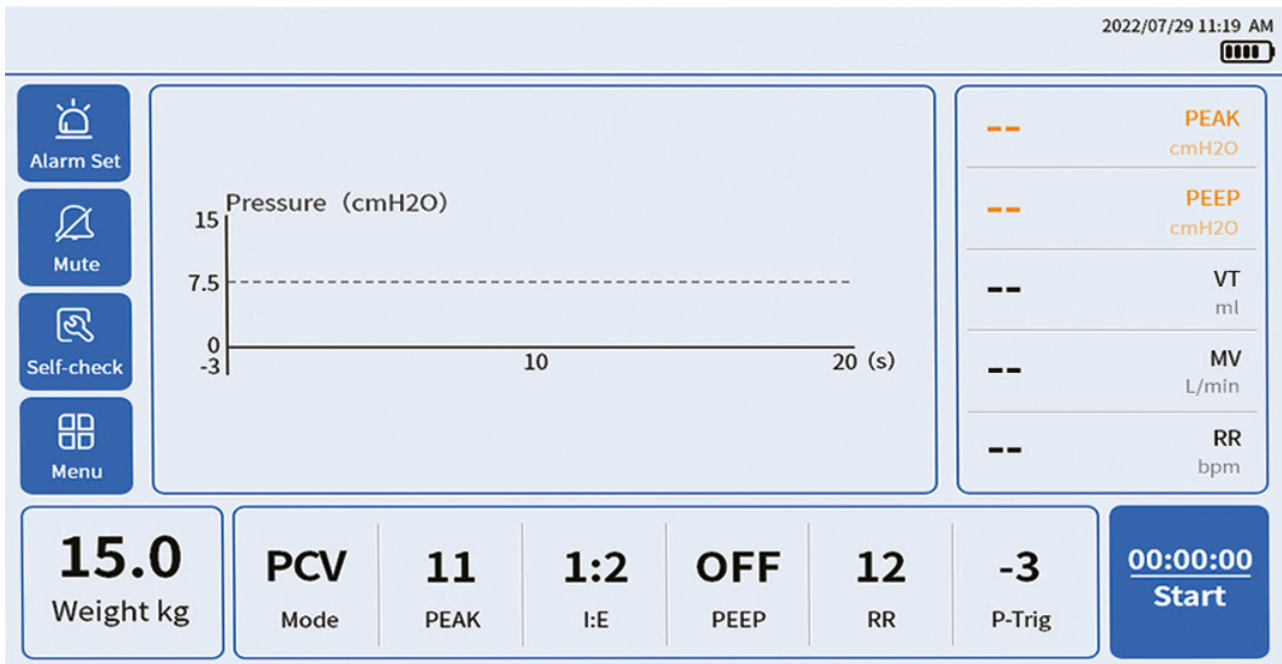
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1. ABOUT INSTRUMENT COMPONENTS



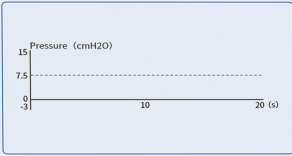

SN. Parts	
1	Bellows components
2	Display
3	External power indicator
4	Power switch button
5	INSP.HOLD (inspiratory hold) button
6	Shuttle knob
7	30 mm port (connects the three-way silicone tube to 16 and 19)
8	22 mm port (connected to 13, connect to the threaded tube and the anesthesia machine)
9	USB-B port (for software update)
10	USB port (for data export)
11	Pressure sensor port (connected to 9)
12	Battery compartment
13	Exhaust outlet (connected to bellows, through the exhaust gas filter tank)
14	Drive gas output port (connects the three-way silicone tube to 8 and 19)
15	Fuse box
16	Power cord socket
17	17 mm port (connected to 8 and 16 with the three-way silicone tube)

2. MAIN INTERFACE DESCRIPTION



Parameter/icon	Description
 Alarm Set	Set alarm items, lower alarm limit and upper alarm limit.
 Mute	Click the “Mute” icon to display  , it is in the mute state at this time, and it will be automatically released after 2 minutes of mute. Or click the mute icon again to unmute.
 Self-check	Click to enter the self-check interface.
 Menu	Click to enter the menu interface. The menu item includes 6 sub-items: parameter list, data record, alarm record, Settings, date and time, and manufacturer maintenance.
	Display the battery status
	Displayed only when an external device is connected to the USB interface
2021/10/14 11:19 AM	Display the current date and time according to the date format and time format in the Settings

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Parameter/icon	Description
	Pressure-time diagram
	Real-time parameter value display during ventilation
PCV Mode	Display the current ventilation mode. Click to switch VCV/PCV/APNEA modes
15.0 Weight kg	The currently set weight. The system will automatically match other recommended parameters based on the weight input
Tidal volume	Displayed in VCV and APNEA modes. The volume of air per inhalation during mechanical ventilation
RR	Respiratory rate per minute
PEAK	The target pressure in the inspiratory phase or the peak airway pressure in the animal's breathing during mechanical ventilation in PCV
I:E	The ratio of each inspiratory time to expiratory time during mechanical ventilation
P-Trig	In VCV/PCV modes: During mechanical ventilation, in the expiratory phase, when the airway pressure reaches the set trigger pressure, but does not reach the set next inspiratory time, the device will immediately start the assist-control ventilation to enter the inspiratory phase. In APNEA modes: This parameter is used to identify Spontaneous Ventilation or mechanical ventilation
MV	Minute ventilation during the animal's mechanical ventilation
PEEP	During mechanical ventilation, a certain positive pressure is maintained in the airway at the end of the expiration
APNEA Time	When it is detected that the animal does not breathe or breathes weakly during the [APNEA Time], so as to fail to reach the set value of [P-Trig], APNEA ventilation is initiated immediately

3. OPERATING PROCEDURES

3.1 Preparation before use

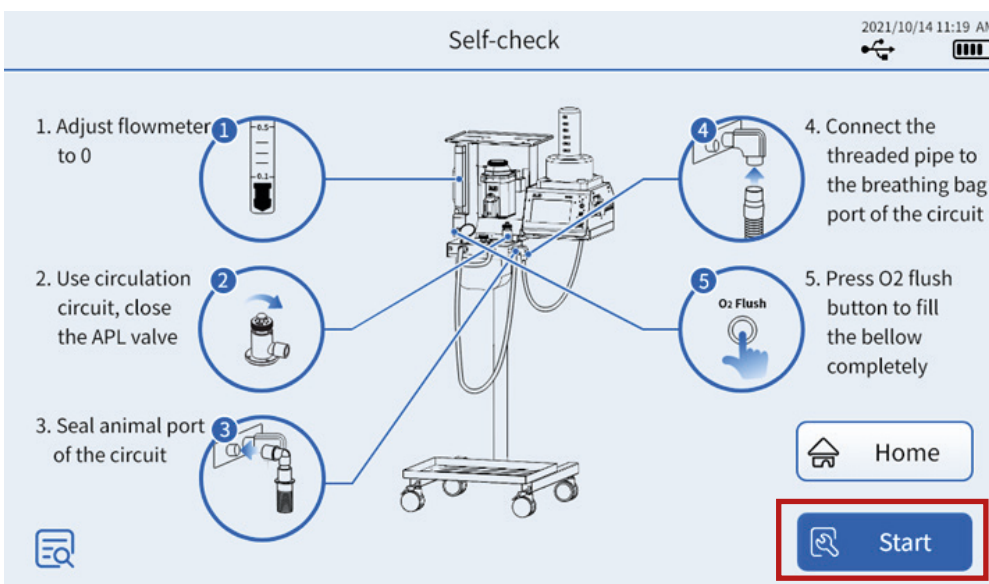
1. Check that the anesthesia machine is working well (connected to a stable oxygen source, and add enough anesthetic agent, effective and sufficient soda lime early).
2. Check that the anesthesia machine is switched to the rebreathing circuit and that the APL valve is closed.
3. Check that the ventilator is connected to the anesthesia machine: Connect the latter's breathing bag port to one end of the threaded tube and connect the other to the 22 mm port on the back of the ventilator.
4. Check that the ventilator is connected to the exhaust gas filter: Connect one end of the bellows to the ventilator EXHAUST port and the other to the exhaust gas filter.
5. Make sure that the ventilator is connected to the power cord. It is recommended to use the device after you connect it to the power cord; the device has a built-in battery, which can last a while when there is no power supply. Please check the battery level before and after use and recharge in time.
6. Confirm whether the bellows need to be replaced: Usually, when the animal weighs 20 kg, you can consider replacing it with a 1,500 mL bellows, and you can estimate whether the tidal volume needs to be greater than 300 ml before the operation.

Replacing the bellows: Rotate the bellows cover counterclockwise to take it off, take off the black folding pouch, fit the replacement folding pouch on the ring, straighten out the ripples of the folding pouch, and turn the bellows cover clockwise until it snaps in the position, with the scale-marked side facing forward.



3.2 Power-on and self-test

Long press the power button for 1 second to turn on the device and enter the self-test program interface. Please follow the system prompts and click [Start Self-Test] on the screen. If the self-test is passed, the interface will indicate that “Self-test is normal, and you will be automatically directed to the home page in 3 seconds, waiting to connect to the animal end. If the self-test is abnormal, refer to the user manual according to the system prompts.



3.3 Initiating mechanical ventilation

- Enter weight:** Click on the “Weight” parameter in the lower-left corner of the screen, select it, and enter the animal’s weight (ideal weight is recommended) by toggling the shuttle knob at the lower-right of the screen, and pressing the knob to confirm. The ventilator has built-in intelligent parameters. After you enter the animal weight, it will give the matched respiratory parameters applicable to healthy animals (dogs and cats).
- Select breathing mode:** You can select “VCV”, “PCV” or “APNEA” mode by tapping the screen or toggling and pressing the shuttle knob.

VCV (Volume Control Mode): The tidal volume (VT) is taken as the reference standard. The inspiration process is complete when the volume of gas inhaled by the animal reaches the set tidal volume value. The same tidal volume is given under different lung compliance and resistance conditions.

PCV (Pressure Control Mode): The peak inspiratory pressure (PIP) is taken as the reference standard. The inspiration process is completed when the gas inhaled by the animal reaches the set peak inspiratory pressure. The tidal volume given varies depending on the airway resistance and compliance of the breathing system in the diseased animal.

APNEA mode: On the basis of the VCV model, the start and stop control of mechanical ventilation is added when the animal appears to breathe on its own.
- Check whether the breathing parameters need to be adjusted:** For young animals, elderly animals, animals with respiratory diseases, and non-mammals, one or more breathing parameters can be adjusted based on intelligent parameters, and the procedure is the same as that for weight input.
- Veterinary induction anesthesia and tracheal intubation:** Before intubating the animal, select a cannula that fits the size of the animal’s trachea. After intubation, inflate the cuff of the cannula with an appropriate amount of air to ensure a tight connection between the cannula and the animal’s trachea and prevent air leakage.
- Connect the animal with the breathing circuit:** Adjust the oxygen flow meter of the anesthesia machine to above 0.5 l/min and adjust the anesthetic gas concentration in time according to the degree of anesthesia of the animal.
- Start ventilation:** Generally, when the animal reaches the expected degree of anesthesia and the spontaneous breathing is weak, click “Start ventilation” at the bottom right of the screen to start mechanical ventilation.
- Intraoperative monitoring:** After you start the mechanical ventilation, the screen displays the airway pressure curve and the real-time breathing parameters are displayed on the right side of the screen. You can check the animal’s real-time breathing condition and parameter changes at any time.
- Detaching the animal from the device:** During the suturing phase of surgery, you can reduce the anesthetic gas concentration or turn off the vaporizer, lower the ventilator respiratory rate, and set the pressure adjustment to “-1” (PEEP off). This will help the animal resume spontaneous breathing and decrease respiratory resistance. When you observe irregular airway pressure profiles or significant spontaneous breathing by the animal, you can hold mechanical ventilation (depending on the situation, this may apply to short-headed dogs and animals undergoing open-heart surgery).
- Device reset:** After detaching the animal from the device, close the breathing circuit, long press the quick oxygenation button of the anesthesia machine for 20–30 seconds to clear the residual anesthesia exhaust gas, and turn off the flow meter of the anesthesia machine. If the ventilator is not used for subsequent surgery, open the APL valve of the anesthesia machine and reconnect the relevant tubing.

4. CLEANING AND MAINTENANCE

4.1 Cleaning the product

Disconnect the device from the power supply before cleaning, and connect it back to the power supply after the cleaned part is completely dry.

Ventilator surface: Wipe the surface of the ventilator housing with a damp cloth soaked in a weak alkaline cleaner (water or soapy water with a pH value between 7.0 and 10.5). To disinfect the surface of the ventilator with UV irradiation, place the ventilator 1 m below a 30 W UV lamp and irradiate for no more than 60 minutes.

Folding pouch: Clean it with water only, and dry it completely before reinstalling it back into the ventilator.

Tubing: After removing it from the ventilator, wipe the ventilator tubing with a cloth soaked in clean water.

4.2 Battery performance maintenance

It is recommended to maintain the battery every 3 months of storage to guarantee its service life.

1. Take out the device, and rest it for more than 2 hours at room temperature 5°C - 30°C;
2. Connect to the external power supply and recharge the battery for 5 - 7 hours;
3. Reposition the device.

4.3 Consumable replacement cycle

Turbo air filter: It is recommended to replace the turbine filter once a year, and check and clean the primary effect cotton every three months.

You can find the detailed manual on our website.

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