New Medical Inspiration

EO-150 Ventilator

User Guide

Applies from S/N EO1X00120001S

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Contents

Introduction

The EOVE EO-150 ventilator provides mechanical ventilation for ventilator dependent and non-dependent patients.

Patient circuit for ventilator dependent patients:

- Double branch
- Single branch with proximal flow
- Leak ventilation circuit

Patient circuit for non ventilator dependent patients:

- Double branch
- Single branch
- Single branch with proximal flow
- Leak ventilation circuit

Applied parts are patient circuit components (not provided by EOVE).

EO-150 provides pressure and volume ventilation for adults and pediatric patients as prescribed by an attending doctor.

Indications for use

The EO-150 ventilator device provides continuous or intermittent ventilation support for pediatric and adult patients weighing at least 3.5kg (8lbs) who require mechanical ventilation.

The EO-150 device is intended to be used in home, institution, hospital and portable environments for both invasive and non-invasive ventilation.

Patient and or caregivers are considered as operators (from IEC 60601-1 definition). They are intended to safely perform the following operations (with appropriate mandatory training from the homecare provider):

- Start and stop device
- Start and stop ventilation
- Inhibit alarm sound
- Switch presets
- Change preference settings
- Perform circuit replacement and circuit calibration

Patient and/or caregivers are not intended to:

- Change clinical settings
- Perform any maintenance operation

⚠	**CAUTION**	E0-150 ventilator is not for use with anaesthetic gases, and is not intended for use as an emergency transport ventilator
⚠	**WARNING**	
•	**Do not use EO-150 ventilator in an MRI equipment or in a barotherapy equipments**	
•	**A significant risk of reciprocal interference could be posed by specific investigation or treatment devices.**	
•	**The EO-150 ventilator must not be serviced while in use on a patient**	
•	**The EO-150 ventilator is not intended for use in oxygen enriched environment**	

•	**The EO-150 ventilator is not intended for use with flammable anesthetics and neither for use in conjunction with flammable agents.**

Contraindications

- Severe hypotension particularly with intravascular volume depletion
- Pneumothorax or pneumomediastinum
- After brain surgery or cranial trauma
- Cerebrospinal fluid leak
- Dehydration
- Bullous emphysema

Adverse Effects

- Dry nose or mouth
- Eye irritation
- Bloating
- Gastric distension
- Skin wound
- Sinus discomfort

Definitions

	**WARNING**	**Indicates a condition that may endanger the patient or the device operator**
	CAUTION	Indicates a condition that may damage the device or equipment
	Note:	Advice that makes operation of the device more convenient or efficient

Ventilator dependent patient warnings

	**WARNING**
•	**An alternative means of ventilation should always be available for ventilator-dependent patients. Failure to do this may result in patient injury or death.**
•	**A ventilator dependent patient should always be monitored by trained personnel.**
•	**For ventilator dependent patients, in case of failure of the principal ventilator and using a stand-alone ventilation module (without docking station) as a backup device, the backup ventilation module must be used immediately by pressing on the module keypad buttons without inserting it in the docking station of the faulty ventilator. In any case of failure, contact your technical assistance immediately after ensuring the patient is safely ventilated with the backup device and wait for further instructions.**
•	**Ensure that the home AC mains supply and connections are safe and comply with the applicable regulations. For ventilator dependent patients, consider using a back-up power system. For safe and adapted solutions, refer to Battery Pack (EOBAT9) user manual and to the section "Connecting two power sources with Y cable" below.**
•	**For ventilator dependent patients in mobility we strongly recommend not to use internal battery as primary power source. It is mandatory to use an additional power source such as EOVE Battery Pack (EO-BAT9) when the patient is moving away from an external power source (AC or DC).**
•	**If a "BAT. CHARGE FAIL" or a "BATTERY FAIL" alarm triggers, the ventilator internal battery needs to be changed. For ventilator dependent patients, contact your technical assistance immediately after ensuring the patient is safely ventilated with the backup device and wait for further instructions.**

•	**As the battery ages, the available capacity decreases. When the remaining battery capacity is low, do not rely on the internal battery as the primary power supply and contact your service provider.**
•	**When using the EO-150 as a backup ventilator, check and charge the internal battery level regularly (recommended every month).**
•	**Some circuit and accessories configurations (mainly in leak pediatric configuration) with high resistive pressure in the circuit could lead to ineffective "Disconnection alarm". For ventilator dependent patient, "Disconnection alarm" must be tested after any calibration, setting changes or circuit configuration change. In case the disconnection alarm detection is not efficient, it is mandatory to set a VTI Min alarm (leak configurations) or a VTI Max alarm (valve configurations) as a backup for disconnection events covering.**

General warnings and cautions

	**WARNING**
•	**The user and/or the patient must inform its service provider of any serious incident occurred with the device. This information must be notified to EOVE and to competent local authorities if necessary.**
•	**Read and understand the entire manual before using the EO-150 ventilator**
•	**The EO-150 ventilator is a restricted medical device intended for use by qualified trained personnel, under the direction of a doctor.**
•	**Use the EO-150 ventilator only as directed by a doctor or healthcare provider.**
•	**Information in this manual does not supersede instructions given by the prescribing doctor.**
•	**Install and configure the EO-150 ventilator in accordance with the instructions given in this guide. Non-specialist operators or institutions encountering problems with set-up, operation or maintenance should immediately contact their EOVE representative.**
•	**Verify the effectiveness of ventilation and alarms before connecting a patient to the ventilator.**
•	**Handle the EO-150 ventilator and AC power supply with care during and after use especially if ambient temperatures are high as some surfaces may become hot. Do not leave the EO-150 ventilator in direct contact with the patient for extended periods of time.**
•	**The EO-150 should be kept out of reach of children and domestic animals to ensure their safety and the safety of the patient and to avoid damage to the ventilator and the accessories.**
•	**The battery and all machine parts of the ventilator and accessories (including trolley) should be disposed of appropriately, following correct regulations for waste management in order to minimize the risk for the environment. They should not be disposed of in household waste.**
•	**Ensure that the device and its power charger are placed in a way that allows an easy disconnection from the mains.**
•	**Do not use the ventilator to an altitude higher than 3000 m, or out of the temperature range 5°C-40°C. Using the ventilator out of these conditions can alter ventilation performance and consequently cause patient death.**
•	**Do not supply the ventilator with a wheelchair battery unless this is mentioned in the wheelchair user's instructions or in the ventilator user's instructions.**

•	**Ventilator's accuracy can be degraded when using a nebulizer.**
	CAUTION
	The EO-150 ventilator is not intended for use as an emergency transport ventilator.
	Do not expose the EO-150 ventilator to excessive force, do not shake or drop.
	If the ventilator or its power supply are dropped or mishandled, immediately discontinue use and contact your EOVE representative.
	Repairs and servicing should only be carried out by an authorized EOVE service representative or a qualified and certified Service representative.
	The airflow for breathing produced by the ventilator can be higher than the temperature of the room by up to 6°C. Exercise caution if the ambient air in the room exceeds 35ºC.

Chapter 1 – Description of the EO-150 ventilator

Front Panel

1. Display screen	4. EO device housing unit
2. Ventilation module	5. Inspiratory / Circuit Port
3. Proximal pressure, valve, and proximal flow connectors	6. Menu bar / keyboard

Rear Panel

1. Air inlet and hypoallergenic filter	5. USB-1 port (data retrieval)
2. DC Power connector	6. O_2 input
3. Docking station Power Button	7. FiO_2 / SpO_2 connector
4. USB-2 port (maintenance only)	8. Remote Alarm connector

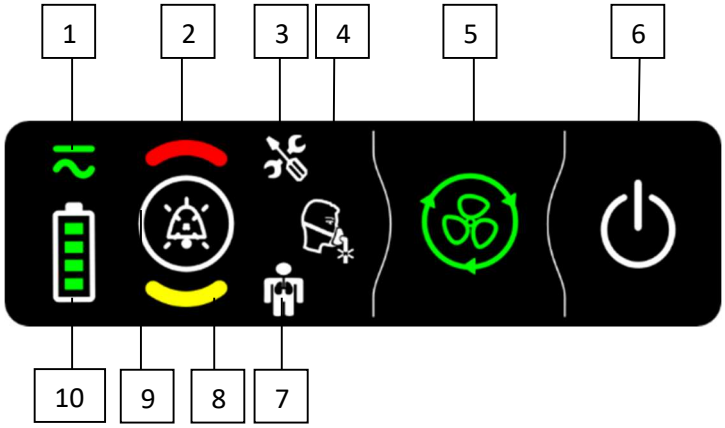
Rear view of ventilator without housing

1.	USB port (Do not use - limited to maintenance operations as described in the maintenance manual)
2.	DC Car charger connection
3.	Connection to outer housing

Ventilation module and docking station references

- EO-150 Complete ventilator: EO-150VNT
- EO-1X0 Docking station reference: EO-DCK1SLT
- EO150 Ventilator module reference: EO-VM150

Menu Bar / Keyboard



1. Power source indicator	6. ON / OFF switch
2. High priority alarm indicator	7. Physiological alarm indicator
3. Technical alarm indicator	8. Medium priority alarm indicator
4. Circuit alarm indicator	9. Alarm reset
5. Ventilation start / stop	10. Battery life indicator

Symbols Table

The following symbols may appear either on your product or its packaging.

Keypad indicators / buttons			
	Alarm priority indicators and mute Button		Patient Alarm indicator
	Technical Alarm indicator		Interface Alarm indicator
	Battery level indicator		AC/DC power indicator
	On/Off button		START/STOP ventilation button
Touch interface symbols			
	Ventilation start		Ventilation stopping
	Menu access button		Preference menu
	Return to Home Screen		Calibration screen access

	Alarm access button		Maintenance menu
	Data menu		Clinical Mode locked
	Monitoring menu		Clinical menu
	Battery charging		Battery power indicator
	Valve circuit		Leak circuit
	Mouth piece configuration		Proximal free configuration
	Adult Patient		Pediatric Patient
	Waveform selection (pressure/Flow/volume)		Waveform selection (normal / loop)
	Waveform play		Waveform pause
	Single branch patient circuit		Single branch patient circuit with proximal flow
	Double branch patient circuit		Inspiration trigger (I) / Exhalation trigger (E) activation symbols
	Inhibition button (change of color according to the alarm priority)		Power off button
	Active settings information button		Help button
	Active alarm (change of color according to the alarm priority)		Connected to a Wi-Fi spot
Device / packaging symbols			
	Exhalation Valve port		Proximal Pressure Port
	Inspiratory Port (to patient)		Do not obstruct
	Expiratory Flow port		Connection ports
	Oxygen inlet		Connection port
	USB connector		Warning
	Alarm repeater connection		Applied part BF type
	Consult operating instructions		Battery replacement warning: Only trained personnel can replace batteries
	DC power inlet	IP22	International Protection Marking, IEC standard 60529. Protection against ingress of water and foreign objects.

	Date of manufacture		This side up
	Complies with European legal requirements		Manufacturer
	High and low temperature limitations for transport and storage	SN	Serial number
	Should not be disposed of in household waste	REF	Product reference number
	Keep dry		Recyclable
	Danger of fire if damaged		Copyright
	Fragile. Handle with care.		Class II device
	Humidity range for transport and storage		Docking station Power Button
	Maximum weight for trolley (including ventilator and accessories)		Do not push (symbol for trolley accessory)
MD	Medical Device		Single patient, multiple use

Chapter 2 – Operating Instructions for the EO-150 ventilator

⚠	**WARNING**
•	**Blocking the air inlet could lead to patient injury.**
•	**Keep machines clear of blankets, soft toys, and dust. Keep out of direct sunlight.**
	CAUTION
	To prevent possible damage to the ventilator always place it on a flat, dry and stable surface. To protect the device during transportation, always ensure that the EO-150 ventilator is transported using the EOVE Transport bag, Nomad bag or Travel bag.
	Always protect the device from water if used outdoors.

Set Up Test

Before using the EO-150 ventilator, perform the following Set Up test.

⚠	**WARNING**
•	**If alarms do not sound during the Set Up test, do not use the ventilator.**
	CAUTION
	Contact your healthcare provider or EOVE for assistance if any of the checks in the set up test fail.
	If the EO-150 has been returned after servicing, ensure it is clearly labelled as disinfected before starting the set-up test or installing.

To perform a Set Up Test

During a first patient installation, it is recommended to check the correct operating status of the device:

1. Connect the device to the AC power source and turn it off.
2. Check the condition of the device and accessories, and the condition of the patient's circuit.
3. Turn on the device (see next page). The device should sound and the display screen should turn on correctly.
4. Disconnect the AC power source. The "AC power loss" alarm should trigger, and the medium priority alarm indicator and the alarm reset button should flash. Press the reset alarm button to stop the alarm.
5. Connect the AC power source to the device. Two beeps should sound. Check that the power source indicator LED is on the ventilation module, and that "AC" is displayed on the patient interface.
6. Perform a circuit calibration (see calibration on chapter 3).
Note: Pressure and Flow sensors are tested during circuit calibration.

⚠	**WARNING**
•	**If any of these steps fails, do not use the EO 150 ventilator. Contact your healthcare provider or your Eove representative for a device checking.**

⚠	**WARNING**
•	**Some circuit and accessories configurations (mainly in leak pediatric configuration) with high resistive pressure in the circuit could lead to ineffective "Disconnection alarm".** **For ventilator dependent patient, "Disconnection alarm" must be tested after any calibration, setting changes or circuit configuration change.** **In case the disconnection alarm detection is not efficient, it is mandatory to set a VTI Min alarm (leak configurations) or a VTI Max alarm (valve configurations) as a backup for disconnection events covering.**

Additional tests for alarms from ISO 80601-2-72:

- Low volume (Low VTE): Set the low VTE alarm to a value higher than the monitored VTE for 3 consecutive breaths or 10 s.
- High pressure alarm: Bloc the test lung during inspiration for three consecutive breaths.
- Obstruction (occlusion alarm): Bloc the inspiration outlet for two consecutive breaths or 5 s.
- Hypoventilation (low rate alarm): Set the low rate alarm to a higher value than set rate and let the ventilator running for 6 consecutive breaths.
- Continuous positive pressure (PEEP alarm): Clamp the proximal pressure tubing in order to obtain a pressure higher than set PEEP + 10 cmH2O during 6 consecutives breaths or 17 s.
- High LEAK alarm (leak modes): Set the leak alarm max threshold to a higher value thant the monitored value for 6 consecutive breaths.

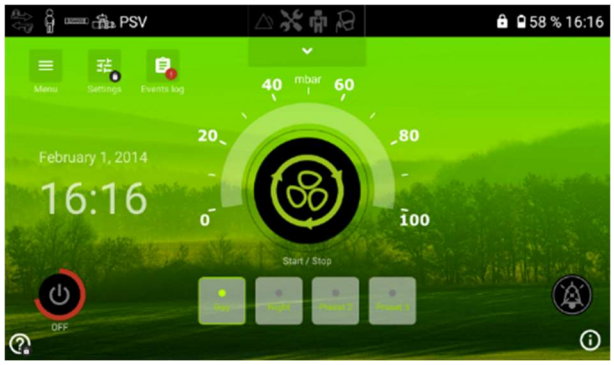
Turning on the device

Ensure the device has been charged prior to use or connect to AC power or DC connector inlet.

1.	Insert AC connector into power inlet.
2.	Turn the screw lock clockwise to secure.
3.	Device will turn on automatically. If starting on battery, press on front panel keyboard to power on the ventilator.

Turning off the device

From the touch interface - Main proceedings

1.	From the Home screen of the touch interface, press and hold until the circle becomes red.
	
2.	A confirmation message is displayed. Validate.
3.	The ventilator turns OFF and the touch interface turns to a deep-sleep mode.

⚠	**WARNING**
•	**The EO-150 ventilator cannot be powered off during ventilation**

From the module - Secondary proceedings

1.	Press and hold until the ALARM key flashes.
2.	Press to confirm.
3.	The ventilator turns OFF.

Starting and Stopping ventilation

Ventilation can be started and stopped from either the touch screen or from the keyboard. Various preset ventilation treatments may be installed on the device by your clinician to ensure the best therapy for you. Use these presets according to the instructions provided by the clinician.

To **START** ventilation using the menu bar:

1. Press  on the Keyboard
2. Ventilation starts.

To **START** ventilation using the Touch Screen:

1. Press  on the touch screen
2. Ventilation starts.

To **STOP** ventilation using the Keyboard:

1. Press and hold  until the alarm key flashes.
2. Press  to confirm.
3. Ventilation stops.

To **STOP** ventilation using the Touch Screen:

1. Press and hold  until: •  flashes • The red line around the START/STOP key completes a full circle.
2. The pop-up on the screen will ask you to validate your choice. Validate or Press  to confirm.
3. Ventilation stops.

	**CAUTION**
	The EO-150 ventilator cannot be powered off during ventilation
	Unplugging from mains power does not power off the device. It will continue to run on the internal battery.
	The device must be turned off manually before disconnecting from AC power for any extended period of time. Failure to do so may result in battery depletion and the alarms may be activated.

Using Stand-by mode

Using Stand-by mode is recommended for an economical use of the battery of EO-150 ventilator, especially in mobile usage. Stand-by mode will reduce luminosity of the screen. That will preserve battery and keep system ready to wake up immediately when needed.

By default, the stand-by mode will occur automatically after 2 minutes of inactivity. This feature could be inactivated in the maintenance menu.

Touching the screen, powering on or inserting the module in the station will wake up the interface as well. If an alarm triggers, it will wake up the interface immediately.

Turning on and off the docking station

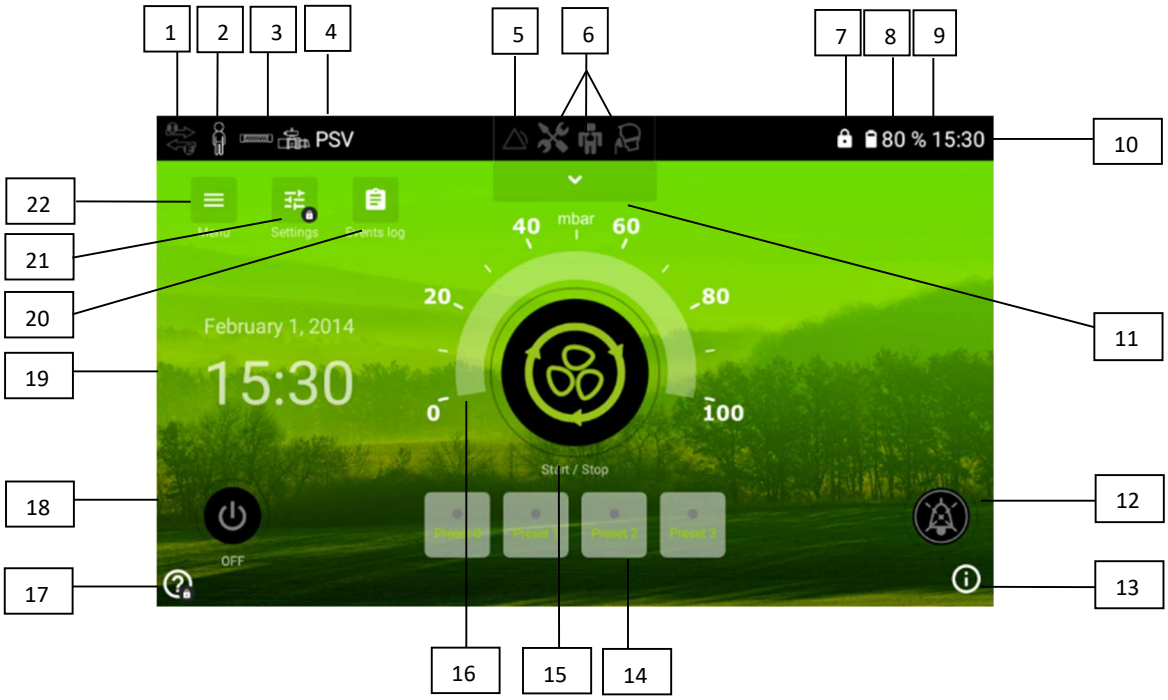
If the module is inserted in the docking station, it will power up and power down automatically following the ventilation module status.

During a storage period or a long period of non-use, the docking station should be switched off.

To switch on and off the docking station and the touch screen, press the docking station Power button for a few seconds.

The Home Screen

On the home screen, there is important information about the alarms, the pressure of ventilation, the preset modes set up by your clinician. It also provides menus for choosing your preferences and calibrating the ventilator. The Home Screen is accessible from all other screens by pressing 



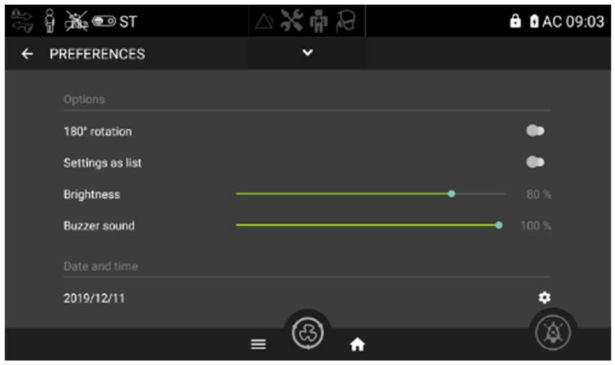
1. Patient triggered breath indicators (Inspiration / Expiration)
2. Patient mode indicator: Indicates whether patient is adult or pediatric. The indicator flashes when the patient triggers a breath.
3. Circuit configuration: Single Limb + Valve, Single Limb with flow sensor + Valve, Double Limb + Valve, Single Limb + Leak, Leak + Proximal Free, Single Limb + Mouth Piece, Mouth Piece + Proximal Free.
4. Ventilation Mode: Choose from (A)VCV, (A)PCV, PSV, MPV, MPP, PSV VT, V-SIMV, P-SIMV, CPAP, PAC, ST, VTS, C-FLOW in the Clinical Menu.
5. Alarm signal: Lights up with the alarm color when there is an active alarm.
6. Alarm indicators: Indicates the type of alarm (technical, interface or physiological).
7. Clinical mode status: Indicates whether the clinical menu is locked or unlocked.
8. Battery life indicator: Indicates the level of charge left in the battery or whether the battery is charging.
9. Power source indicator: Indicates whether the device is operating on mains power (AC) or DC power and battery life.
10. Time: Indicates the time on 24hr clock. This can be set up and changed from the Patient Preferences Menu.
11. Alarm tab: Use to access the alarm screen.
12. Alarm inhibition and pre-inhibition button: Lights up with the alarm color when there is an active alarm. Stop the alarm sound or stop all the alarms sounds for the next two minutes.
13. Active settings information button: Displays the active settings (including presets).
14. Preset selector: Allow to switch from one preset to another
15. Start / Stop button: Starts or stops ventilation.
16. Airway pressure indicator: Indicates the pressure of the breath delivered.
17. Help button: Displays the user manual.
18. Power Off button.
19. Time and date: Can be set and changed from the Patient Preferences Menu.
20. Event log direct access
21. Clinical menu direct access
22. Menu button: Allows access to patient screen and clinical menus.

Navigating the Patient Screen and Menu

From this screen the patient can change preferences and calibrate the ventilator. Calibration should be performed at every circuit configuration change and is explained in Chapter 4 of this manual.

From the Home Screen, choose to access the Preferences, Calibration, Event Logs, Export data and Monitoring menus.

Press on Preferences to choose the Preferences Screen. (see below)



From this screen the patient can adjust the following settings for the device.

Rotation of screen	Allows the screen to be rotated 180°. Press the small circle to rotate the screen.
Settings as list	Allows the display of settings and alarm settings as a list in the clinical menu
Brightness/Contrast	Allows brightness levels from low to high. Simply swipe the blue circle from left to right to choose the preferred brightness.
Buzzer sound	Adjustable sound level for alarms. Simply swipe the blue circle from left to right to choose the preferred sound level.

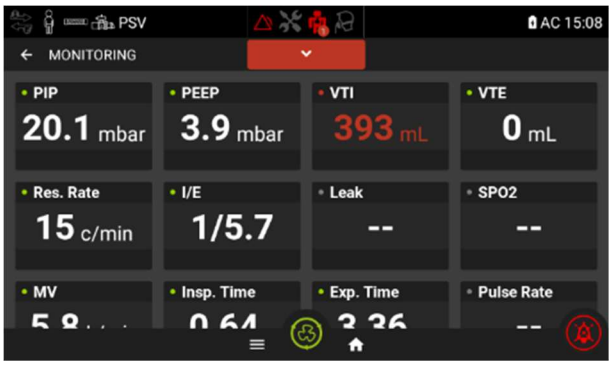
⚠	**WARNING**
•	**The sound level should be adjusted according to the criticality of the patient.**

Current Date	Sets the current day, month and year. To set the date, click on the text and choose the date from the calendar. Press done when completed.
Current Time	Sets the current time on 24h clock. To set the time, choose the time from the dial and press done when completed.

In the preference menu, the user can also access traceability and connection information.

Navigating the Monitoring Menu

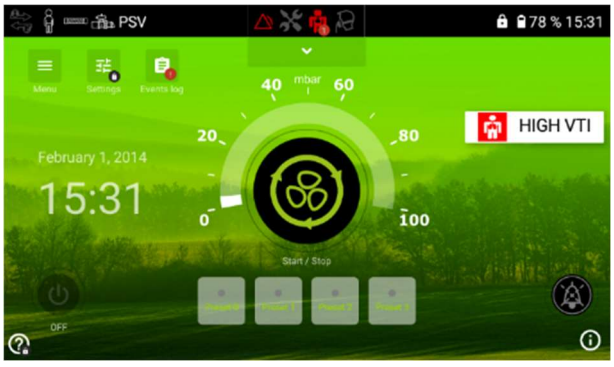
From this screen the patient or caregiver can access the monitoring menu.



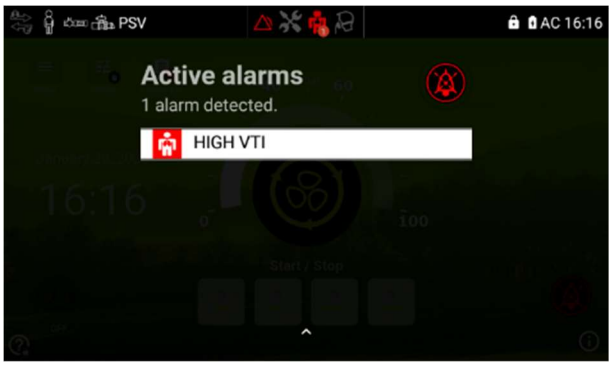
This menu is the same as the monitoring menu that can be found in the Clinical menu.

Active alarm list

To access the list of active alarms for the ventilator, from the Home Screen, touch  active alarm list.



On the screen you will see the list of current active alarms.



See Chapter 4 for more detailed information on alarms and how to respond to them.

Accessing and using the Clinical Menu

NOTE:	Do not access clinical mode (unlocked mode) unless directed by a physician.

To access the Clinical Menu

1. Choose it from the scroll-down list.
2. Hold down the lock button, until it becomes red. Confirm the pop up. The clinical screens can now be accessed.

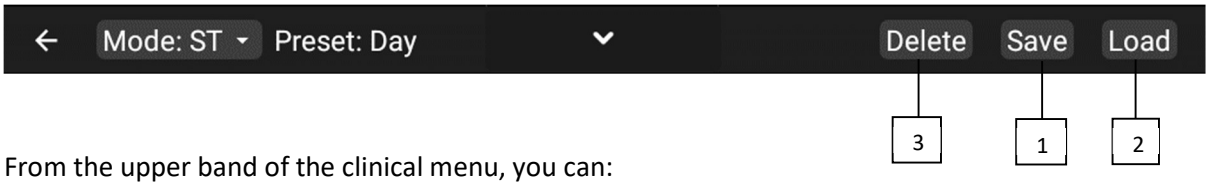
The clinical menu can also be directly accessed by this button on patient screen.

Presets

The EO-Series ventilator can store up to four different ventilation presets. Presets can be configured by your clinician to provide personalized alternative treatment options. These preset configurations allow for different treatments according to the time of day or the activity being undertaken by the patient. The presets can have different circuit, ventilation and alarm settings. It is possible to change between presets during ventilation.

NOTE:	If more than one preset has been set up, follow the instructions of your clinician for when and how they should be used.
	It is not possible to switch from one patient configuration to another (adult to pediatric) during ventilation. Changing patient configuration from adult to pediatric will deactivate the presets previously memorized. Each Preset saves the initial configuration and calibration data when it is set up. Always perform a calibration before saving Presets.
	When performing a circuit calibration or changing a setting while a preset is active, the device will propose to save this new parameter in the current preset and maintain the preset activated. If the user do not want to update the preset, it will be deactivated.

Presets Configuration



From the upper band of the clinical menu, you can:

1. Save the active mode as preset and rename the saved preset,
2. Load a previously saved preset (to visualize the settings contained in the preset).
3. Suppress a preset (displayed only if a preset is loaded)

NOTE :	To change a setting from a preset, change the setting then press Save (1) to make the change available in the preset.

Changing preset mode

1. Current preset / Activated preset	2. Presets saved and not activated
3. Presets not saved	

To change the preset, click on the activable preset you want to switch on.
Click on the Information icon to display the parameters of the activable preset.

Circuit / Patient Configuration Menu

NOTE:	The Clinician Screen can only be accessed when the Clinical menu is unlocked. This should only be unlocked by a doctor or health care provider or at their request.

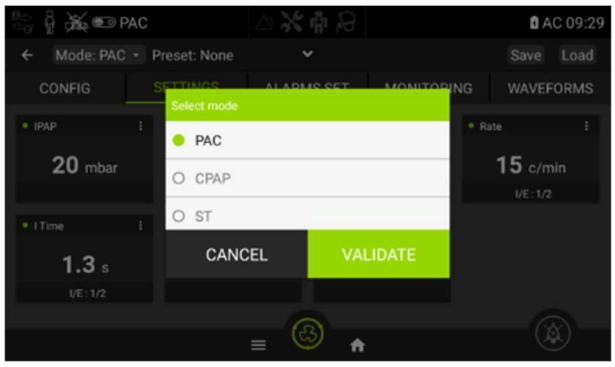
Access the Patient/ Circuit configuration menu by choosing the “CONFIG” tab

From this screen, you can change the settings shown below and perform a calibration. Simply press on the square of the setting you wish to change and it will be outlined in green.

1. Patient Type: Adult or pediatric/child	4. Perform Calibration: To be done after every circuit configuration change.
2. Circuit Type: Valve, Leak or Mouth piece.	5. FIO2 sensor activation (triggers a calibration at 21% with sensor out of O2)
3. Ventilation: Choose the Type (Pressure/Volume) and the mode.	6. Leak Level: Between 0 and 100 l/min at 15 mb (only in leak configuration) or AUTO (correspond to 40 l/min at 15 mb).

Changing ventilation mode

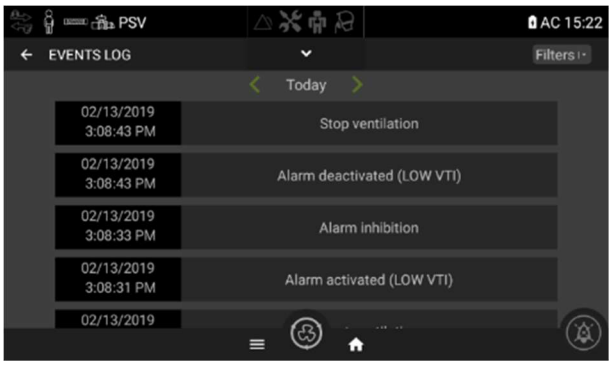
From the circuit / patient configuration menu, select first the circuit type and ventilation type, the ventilator will propose a selectable list of ventilation mode.
From the clinical menu, select the mode bar on the upper left of the screen.



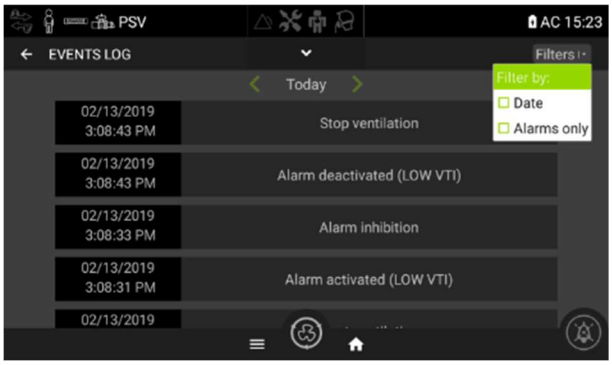
Scroll down to choose the required mode. Modes with background in grey are not accessible.

Other screens

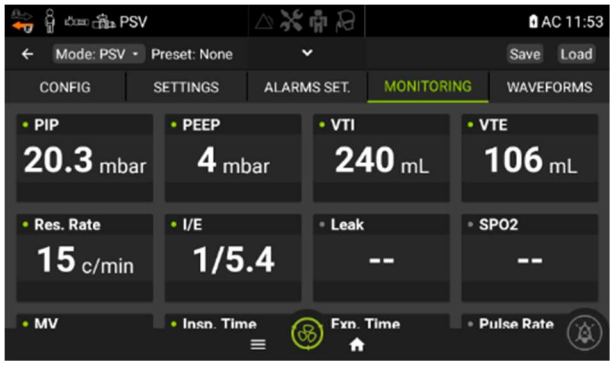
Events Log Screen



This screen shows all alarms, setting changes, configuration changes and any power on/off events. More than 10000 events can be saved and consulted.
The events are displayed by date. To see event from a previous day, click the left or right arrow to rich the expected date or use the available filters.
Two filters are available to sort the event:
- Filter by date to display event of a precise date
- Filter by Alarms only to display only the event related to alarms
The two filters can be activated at the same time.

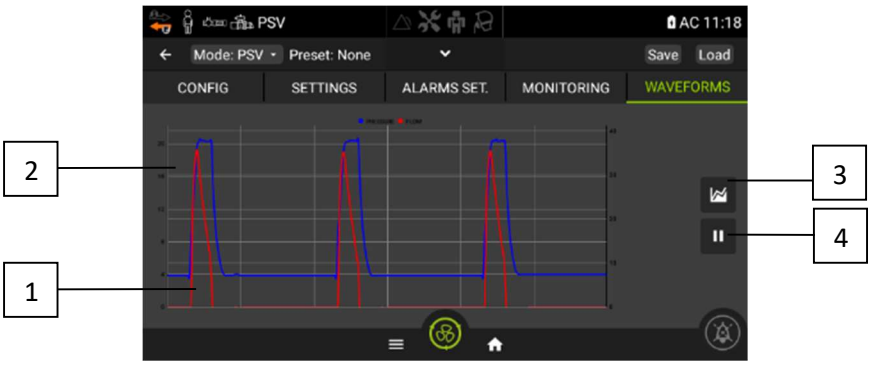


Monitorings Screen



This screen shows patient physiological data.

Wave Forms Screen

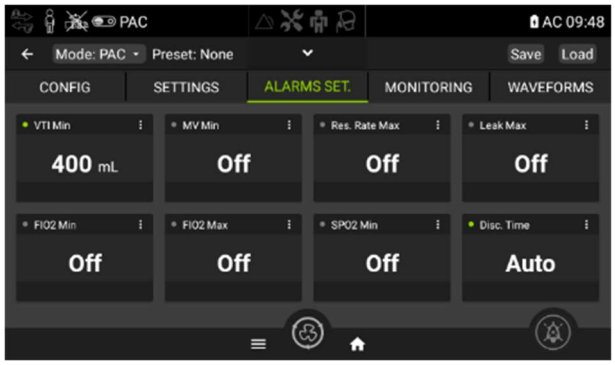


1. Flow in red	3.Curve selection: Pressure, flow
2.Pressure in blue	4.Play / Pause waveforms

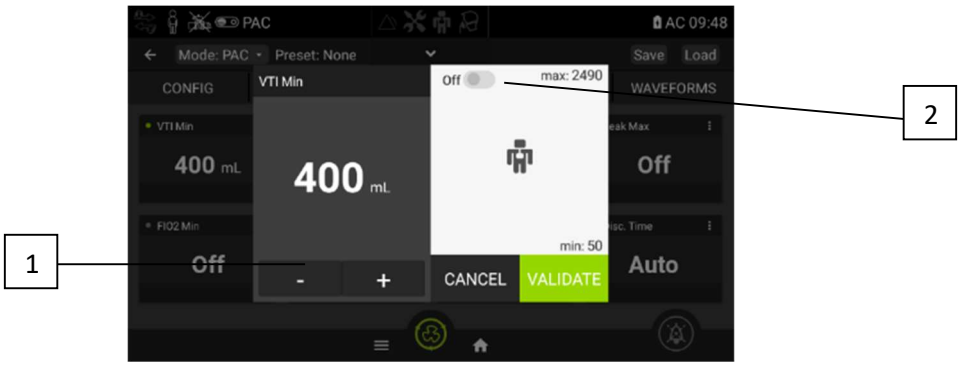
This screen reports the patient data and is updated with every breath. The time scale adapts to the patient's respiration rate every minute. This screen shows 3 ventilation cycles in pressure and flow.

Setting and alarms settings screens (with setting not as a list)

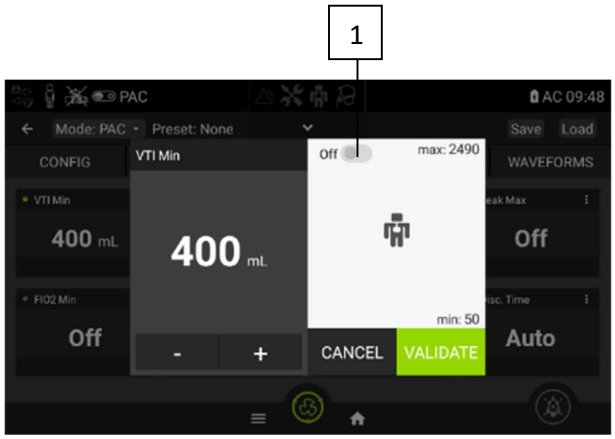
These screens allow to set the parameters for the ventilation settings and the alarm settings.



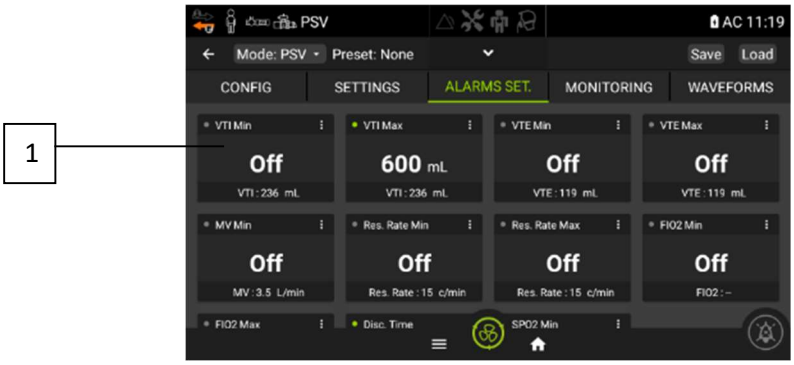
This screen shows the Patient Monitoring values which correspond to the Alarms. Select the value you wish to change.



On this screen, adjust the value with the Plus and Minus signs (1) or slide the selector (2) to turn ON (it will become green) or OFF.



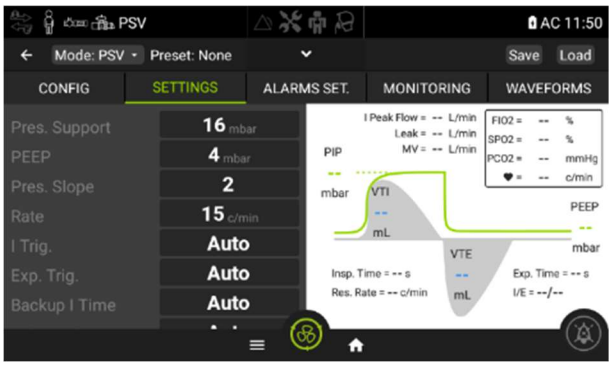
The selector (1) becomes green. Slide back to turn **OFF** the VTI Min alarm and validate your choice.



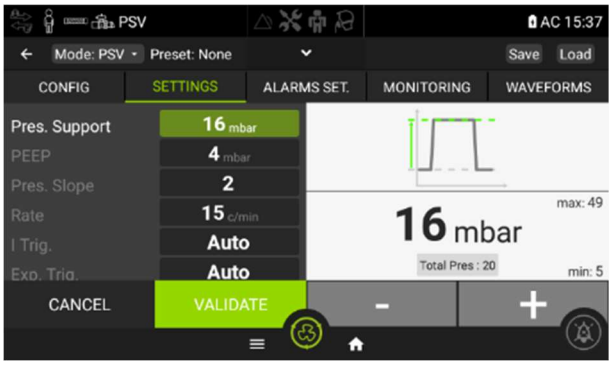
This screen (1) shows that the VTI Min alarm is now **OFF**.

Settings and alarm setting screens (with setting as a list)

These screens allow to set the parameters for the ventilation settings and the alarm settings. When settings are displayed as a list, the right part of the screen displays the monitored data in real time.



1. From the settings menu, click on one of the setting values.



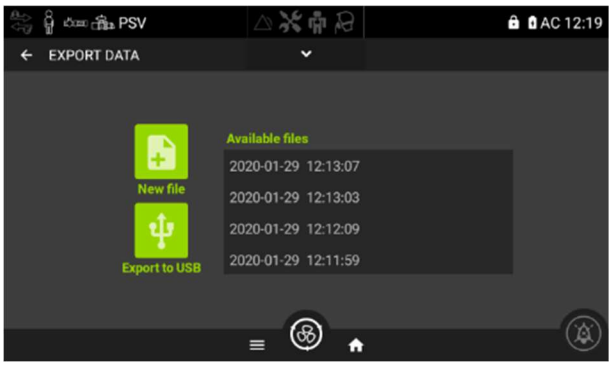
2. Adjust the settings with + and –
3. After all settings are adjusted, press Validate to apply the changes.

Several settings can be pre-adjusted and applied at the same time by clicking on validate.

Some settings can be turned to AUTO or OFF, based on the same principle as described in the Setting not as a list section (previous).

Export Data screen

The data management screen will allow the user to export or generate ventilation data in the form of EOZ files.



One file is automatically generated every day at 08:00 (or at next device startup if not powered on at 08:00)

The last 30 ventilation files corresponding to the last 30 days of ventilation can be retrieved from this menu.

Each file contains 24 hours of ventilation waveforms at 80 ms sampling, one month of monitoring at 1 minute sampling and several months of monitoring history based on daily average values.

Synchronisation screen

The synchronisation screen appears a few seconds at the interface startup. It can also be displayed briefly during usage without any impact on ventilation.

Chapter 3 - Patient circuit, power supplies and accessories configurations

⚠	**WARNING**
•	**Use only CE marked circuit components approved for use with the EO 150.**
•	**When using a non-invasive interface, the measurement of patient exhaled gas volume may be affected by leaks.**
•	**To ensure correct functioning of the circuit, it is recommended that a calibration be performed at the installation of each new circuit.**
•	**Install patient circuit tubing carefully, to avoid risk of strangulation or tripping.**
	CAUTION
	For pediatric patients, ensure that the breathing circuit type is suitable for use with a child. Pediatric patient circuits should be used when tidal volume is lower than 300 ml.

Patient Circuit options

NOTE:	The leak configuration is recommended for non-invasive ventilation, however the EO-150 leak modes are compatible with invasive configurations if using intentional leakage such as whisper accessory.

The EO-150 ventilator can be used with five different circuits, as seen below. All circuits require proximal pressure tubing. Breathing circuits may be 10, 15 or 22 mm in diameter.
See the following table to select suitable circuits and settings for different patient types.

30 ml to 300 ml	Paediatric	10 mm or 15 mm
> 300 ml	Adult	15 mm or 22 mm

The five types of circuits used by the EOVE ventilator can be found in the following table:

Single Limb with valve	Single limb circuit with expiratory valve (expiratory valve integrated into the circuit)
Single Limb with valve + proximal flow	Single limb circuit with expiratory valve and proximal flow sensor
Double Limb (with adapter)	Double limb circuit (expiratory valve integrated into the adapter)
Single limb with Leak	Single limb circuit with intentional leak using proximal free plug or proximal adaptor
Single limb with Mouth Piece	Single limb circuit with mouth piece using proximal free plug or proximal adaptor

⚠	**CAUTION**
	To ensure accurate performance, a circuit calibration is mandatory at every change of circuit configuration.
	The blue proximal flow sensor tube must be connected at the side closest to the patient and according to the symbols on the ventilator ports. If connected in the wrong way, no VTE will be displayed.
	Do not connect patient interfaces before starting the calibration. Patient interfaces include any components such as catheter mount, mask, tracheostomy tube or intentional calibrated leak.

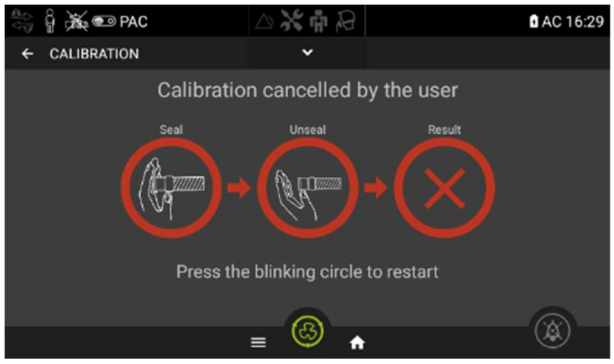
Calibration

The EOVE ventilator can be calibrated in order to allow a wide range of circuit configurations and accessories. This calibration verifies the compliance characteristics of the circuit configuration chosen.

Starting calibration :

1. From either the General or CONFIG menu choose the Calibration sub-menu.
2. Seal the circuit at the patient connection port, either manually or with a cap.
3. Press "Seal"
4. Wait until the circle is completed
5. Unseal the patient circuit extremity and click in the blinking circle
6. Wait until the circle is completed
7. Exit the calibration menu by clicking on "Validate"

8. If the calibration has failed or if clicking on "Abort" button, an error bar will appear with the reason for the failure.



NOTE:	If a caution or warning appears on the touch screen after a calibration, ventilation can proceed if configuration matches with the symbols displayed. Contact your service provider to report the event.

⚠	**WARNING**
•	**Some circuit and accessories configurations (mainly in leak pediatric configuration) with high resistive pressure in the circuit could lead to ineffective "Disconnection alarm".** **For ventilator dependent patient, "Disconnection alarm" must be tested after any calibration, setting changes or circuit configuration change.** **In case the disconnection alarm detection is not efficient, it is mandatory to set a VTI Min alarm (leak configurations) or a VTI Max alarm (valve configurations) as a backup for disconnection events covering.**

Connecting circuit configurations

Single limb circuit with valve:

1. Attach any accessories that may be required (eg. Humidifier or filter)
2. Connect the tubing to the inspiratory/circuit port on the front of the device (see image)
3. Attach the proximal pressure line and the valve to the proximal pressure and valve ports.(see image)
4. Select the circuit type and patient type (adult/pediatric) in the configuration menu and perform a calibration.
5. Attach the patient mask or other interface to the patient circuit.

Single limb circuit with proximal flow:

1. Follow steps 1-3 of the single limb with valve (see above)
2. Add the proximal flow sensor to the patient circuit end (blue tube on patient side)
3. Connect the proximal flow tubes to the proximal flow connectors (blue tube to upper connector)
4. Verify that the blue tube on the flow sensor is closest to the patient side.
5. Select the circuit and patient type and perform a calibration.

Double limb circuit with adapter:

1. Plug the adapter (see image below) into the front of the EO 150 ventilator and screw tightly to ensure the connection.
2. Attach any required accessories (see image below).
3. Connect the inspiratory tubing to the inspiratory port and the exhalation tube to the exhalation port.
4. Select the circuit type and perform a calibration.

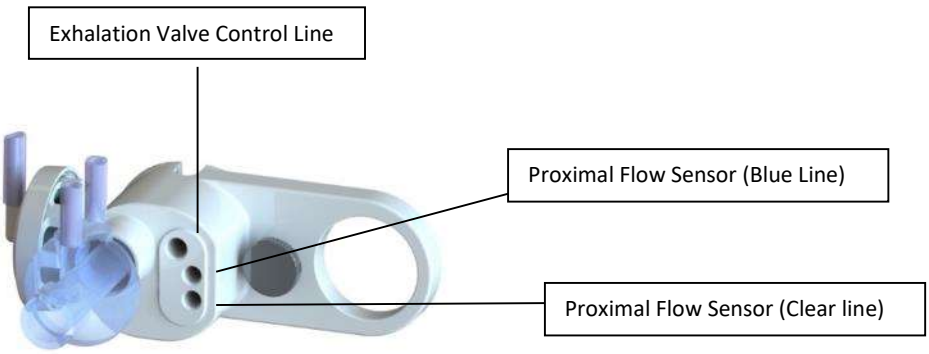
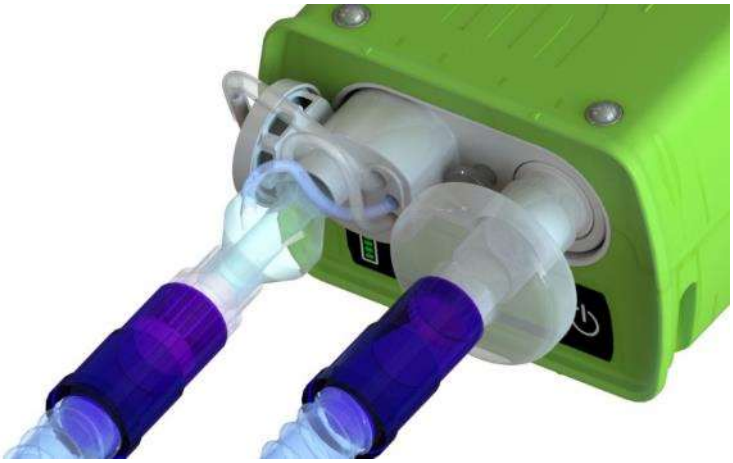
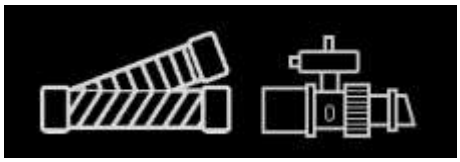


Image: Double Limb Adapter





⚠	**CAUTION**	The double limb circuit adaptor is single-patient-use and disposable. Only using an expiratory filter and observing its manufacturer recommendations can prevent from cross-contamination and allow its reuse.

Single limb with intentional leak:

1. Attach any required accessories e.g. humidifier or filter
2. Connect the inspiratory tubing to the inspiratory port on the front of the device
3. According to the desired configuration, connect the proximal pressure line to the proximal pressure port or connect the proximal free plug as shown below.
4. Ensure the appropriate calibrated leak is integrated in the mask or added to the circuit.
5. Select the Leak circuit type and patient type (adult/pediatric) in the menu and perform a calibration (without the leak).

With proximal pressure adapter

With proximal free plug

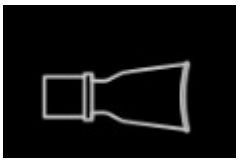
⚠	**WARNING**
•	**Rebreathing may occur when using a single limb circuit with intentional leak if the pressure is too low for a given leak diameter.**
•	**Ensure the vent holes at the mask or constant leaks at the vented interface port are not obstructed.**

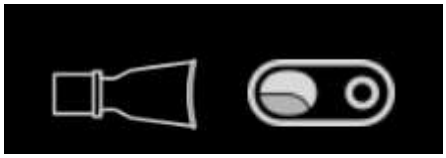
Mouth piece with Single limb:

1. Attach any required accessories e.g. humidifier or filter
2. Connect the inspiratory tubing to the inspiratory port on the front of the device
3. According to the desired configuration, connect the proximal pressure line to the proximal pressure port or connect the proximal free plug as shown below.
4. Select the Mouth Piece circuit type and patient type (adult/pediatric) in the menu and perform a calibration.

With proximal pressure adapter

With proximal free plug





Accessories Compatible with EO-150

The EO-150 ventilator is compatible with a range of accessories.

- AC Power/Charger Mascot 2440 (EO-PWRCHRG)
- FIO2 Cable (O2CELCBL)
- Car Adaptor DC Cable (EO-CARCBL)
- SPO2 Cable (EO-SPO2CBL)
- Transport Bag (EO-CARBAG1X0)
- Nomad Bag (EO-NOMADBAG)
- Travel Bag (EO-TRVELBAG1X0)
- Remote Alarm Cable (EO-ALARMCBL)
- Proximal Flow sensor (EO-PFLOWS)
- Battery Pack (EO-BAT9)
- Y cable (EO-CPLPACK)
- AC Power/Charger for Y cable (EO-YCBLPWR)
- Trolley (KC072283*)
- Adjustable arm for trolley (KB029900*)
  * From Air Liquide Medical Systems S.A. Parc de Haute Technologie 6 rue Georges Besse 92182 ANTONY CEDEX – France)

⚠	**WARNING**
•	**Before using any accessory, always carefully read the accompanying Quick User Guide and User Manual.**
•	**The EO-150 Ventilator should only be used with accessories recommended by EOVE. Connection of other accessories could result in patient injury or damage to the device.**

Attaching patient circuit accessories

⚠	**WARNING**
•	**Adding or removing circuit components can adversely affect ventilation performance.**
•	**A circuit calibration is recommended every time an accessory or component is added to or removed from the patient circuit.**
•	**Do not use electrically conductive or anti-static air tubing.**

Attaching an antibacterial filter

⚠	**WARNING**
•	**To prevent the risk of cross-contamination, an antibacterial filter is mandatory if the device is to be used on multiple patients.**
•	**Regularly check the antibacterial filter and expiratory valve for signs of moisture or other contaminants, particularly during nebulisation or humidification. Failure to do so could result in increased breathing system resistance and/or inaccuracies in expired gas measurement.**
•	**Only use antibacterial filters that comply with the relevant safety standards, including ISO 23328-1 and ISO 23328-2.**
	CAUTION
	The antibacterial filter must be used and replaced according to the manufacturer's specifications.

To attach an antibacterial filter to the EO-150:

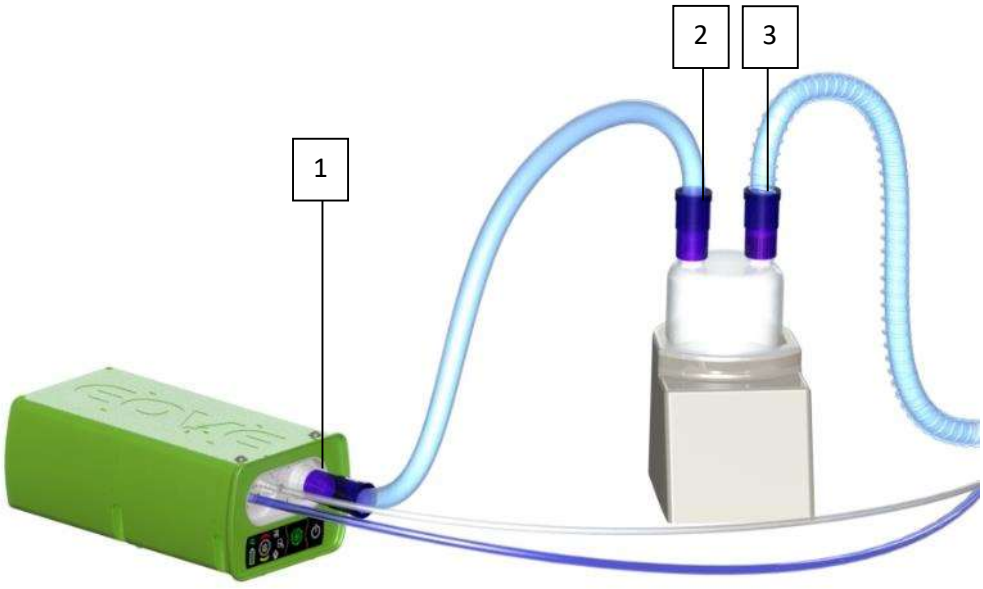
1. Attach the antibacterial filter to the inspiratory port of the device.
2. Connect the breathing tube to the other side of the filter.
3. Perform a calibration.
4. Connect the patient interface to the other end of the breathing tube.

Attaching a humidifier

⚠	**WARNING**
•	**Humidification of the inspired gas is required for invasive ventilation in order to prevent any lung injury.**
•	**Always place the humidifier on a level surface lower than level of the ventilator and the patient in order to prevent the mask and tubing filling with water.**
•	**Ensure that the humidifier is set up according to the manufacturer's instructions.**
•	**Use appropriate precautions to prevent water in the circuit transferring to the patient (e.g., a water trap).**
•	**Only use HMEs that comply with the relevant safety standards, including ISO 9360-1 and ISO 9360-2.**
	CAUTION
	Make sure that the water tub is empty and thoroughly dried before transporting the humidifier.

To attach a humidifier to a circuit configuration:

1. Connect the air tubing to the inspiratory port on the device.
2. Connect the other end of the air tubing to the inlet port on the humidifier.
3. Connect the patient circuit to the outlet port on the humidifier.



Attaching oxygen

	WARNING
•	**Use only medical grade oxygen.**
•	**Ensure that the device is ventilating before the oxygen supply is turned on.**
•	**The oxygen flow must be turned off when the device is not ventilating so that oxygen does not accumulate within the device. The accumulation of oxygen presents a fire risk.**
•	**Oxygen supports combustion. Only use oxygen in well-ventilated rooms. Using oxygen while smoking or in the presence of an open flame creates a fire hazard.**
•	**Supplemental oxygen must be added into EO 150 Ventilator's oxygen inlet at the rear of the device.**
•	**Monitor supplemental oxygen using the optional FiO2 cell kit and relative alarms.**
•	**O2 inlet is designed for functioning up to 50 kPa during ventilation, however oxygen sources up to 400 kPa can be used since a flow regulator limits flows below 20 l/min. If O2 pressure rises above 50 kPa when stopping ventilation, there is no risk for the ventilator, but the oxygen source tubing may disconnect from the oxygen adaptor. In this case, the oxygen supply must be cut off immediately.**
•	**To connect to ventilator inlet adaptor, always use flexible tubing without additional fastening means. Never use a collar or anything to increase tubing resistance to pressure at ventilator inlet, this could result in damaging the ventilator.**
•	**Always turn off the oxygen supply when ventilation is stopped for any reason.**
•	**The EO-150 Ventilator is not designed for use with anesthetic gases.**
•	**Oxygen can be added up to a maximum flow of 20 l/min. However, the ventilator is not adapted to provide Fi02 concentrations above 50%.**
•	**For a given O2 flow, O2 concentration may vary with many parameters such as volume, inspiratory time, rate, PEEP, leak, interface, patient circuit.**

To add supplemental oxygen:

1. Unlock the oxygen inlet at the rear of the device by pushing up on the locking clip.
2. Plug in the oxygen adaptor (supplied with the EO 150) to the oxygen inlet.
3. Attach the end of the oxygen supply tube (provided with the EO 150) to the oxygen adaptor.
4. Attach the other end of the oxygen supply tube to the oxygen source.
5. Start ventilation.
6. Turn on the oxygen and adjust for the prescribed flow rate or FiO2 level.

To remove supplemental oxygen:

1. Turn off the oxygen source.
2. Unlock the low flow oxygen inlet at the rear of the device by pushing up on the locking clip.
3. Remove the oxygen adaptor from the oxygen port.

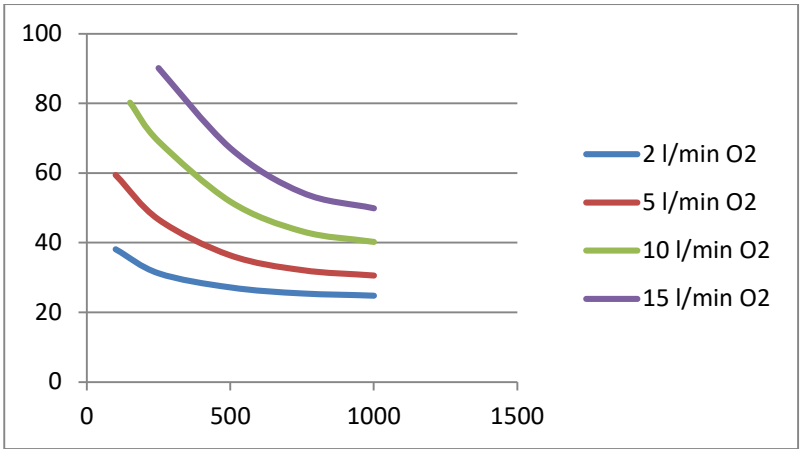


Image: Theoretical variation of the % FIO2 in function of tidal volume in ml

⚠	**CAUTION**	Ensure oxygen supply has been turned off before removing supplemental oxygen.

Attaching an FiO_2 sensor

⚠	**WARNING**
•	**The EO-150 Ventilator can be used with an optional Fi02 sensor with minimum and maximum concentration alarms. This sensor should always be used in order to ensure that the prescribed oxygen concentration is delivered to the patient.**

1. Plug the FiO2 cable into the FiO2 port**.**
2. Plug the FiO2 sensor into the other end of the Fi02 cable.
3. Attach the T-adaptor to the Inspiratory Patient Port
4. Plug the Fi02 sensor into the T-adaptor.

⚠	**CAUTION**
NOTE:	In order to display the FiO2 measurements and to set the alarms, activate FiO2 monitoring in the Patient/Circuit configuration menu. When activating the sensor, it will perform a calibration at ambient 21%. The sensor needs to be free from O2 for this calibration.

Attaching a pulse oximeter

⚠	**WARNING**
•	**Only use compatible NONIN finger pulse sensors**
	CAUTION
	Some factors may degrade the performance of the pulse oximeter or affect the accuracy of the readings (e.g. blood flow restrictors (arterial catheters, blood pressure cuffs, infusing lines, etc.), excessive ambient light, excessive motion, electromagnetic interference, moisture in the sensor, improperly applied sensor, incorrect sensor type, a sensor not at heart level, poor pulse quality, venous pulsations, anemia or low hemoglobin concentrations, cardiogreen or other intravascular dyes, carboxyhemoglobin, methemoglobin, dysfunctional hemoglobin, artificial nails or fingernail polish.

To connect the pulse oximeter:

1. Connect the plug of the pulse oximeter to the SpO2 (pulse oximeter) connector at the rear of the device.
2. Attach to patient.

⚠	**CAUTION**
	To remove the cable, pull firmly on the locking ring. Do not twist.
NOTE:	In order to display the SP02 measurements and to set the alarms, activate SP02 monitoring in the Patient/Circuit configuration menu.

Attaching a remote alarm

A remote alarm can be connected to the EO-150 ventilator with the Remote Alarm Cable Accessory. This alarm alerts you to an event that requires immediate attention. An audible and visual alarm is triggered when an alarm is activated on the ventilator. For full instructions on using the Remote Alarm, see the Remote Alarm User Guide.

Attaching EO-BAT9

Please, refer to the EO-BAT9 user guide.

Power Connections

	WARNING
•	**Beware of electrocution. Do not immerse the device, power supply or power cord in water.**
•	**Make sure the power cord and plug are not damaged and the equipment is in good condition.**
•	**Keep the power cord and device away from hot surfaces.**
•	**Explosion hazard—do not use in the vicinity of flammable anesthetics.**
•	**Ensure that the device and its power charger are placed in a way that allows an easy disconnection from the mains.**

The EO 150 ventilator can be used with three different power sources:

- Mains power
- Internal battery
- External DC power supply (e.g., car 12V power outlet).

For information on power supplies and sources see the Technical Specifications.

Connecting to mains power

	WARNING
•	**Ensure that the power cord does not pose a tripping or choking hazard.**
•	**Ensure that the home AC mains supply and connections are safe and comply with the applicable regulations. For ventilator dependent patients, consider using a back-up power system. For safe and adapted solutions, refer to Battery Pack (EOBAT9) user manual and to the section "Connecting two power sources with Y cable" below.**

To connect to mains power:

1. Connect the DC plug of the supplied external power supply unit to the rear of the EO 150 module or docking station. Ensure the connection is correctly aligned. Secure the connection by screwing the connector firmly in place.
2. Plug the other end of the power cord into the power outlet.

NOTE:	Do not twist or tug the power cord or the outer housing of the connector.

Running the ventilator on internal battery

	WARNING
•	**When using the EO-150 as a backup ventilator, check and charge the internal battery level regularly (recommended every month).**
•	**As the battery ages, the available capacity decreases. When the remaining battery capacity is low, do not rely on the internal battery as the primary power supply and contact your service provider.**
•	**For ventilator dependent patients in mobility we strongly recommend not to use internal battery as primary power source. It is mandatory to use an additional power source such as EOVE Battery Pack (EO-BAT9) when the patient is moving away from an external power source (AC or DC).**
•	**The internal battery should be replaced every two years, or when a service notification is displayed.**
•	**Replacement of lithium batteries or fuel cells by anyone other than trained personnel will result in dangerous risk (e.g., excessive temperatures, fire or explosion)**

•	**The internal battery and any other device component should be disposed of following appropriate waste management regulations.**
	CAUTION
	Plug device into AC mains power when the remaining capacity of the battery is low.
	The internal battery may stop charging when ambient temperatures of 35°C or more are reached.
	If AC power is lost, the battery is guaranteed to continue to provide ventilation for a limited duration. Find an alternate supply or alternative means of ventilation e.g. back-up ventilator or manual ventilation means.
	If the EOVE device is left in storage for an extended period of time the internal battery will become depleted. If storing your device, recharge the internal battery once every two months (four months from SN EO1500518022). Never store a device with an empty battery.
	Storing the ventilator at temperatures higher than 50°C for extended periods will accelerate battery ageing. This will not affect the safety of the battery or the device.

The internal battery of the EOVE ventilator allows your ventilator to operate even when mains power is disrupted or when the device is not connected to the mains. When the EOVE ventilator is operating on internal battery power, you are notified of the level of charge in the battery by the battery power source indicators both on the keyboard and touch screen.

NOTE:	The internal battery continues to charge when the device is connected to mains power, even when it is operating or on standby.
	The internal battery takes **6 hours** to fully charge from empty without ventilation and **6 hours** when ventilating.
	To preserve the internal battery from too repetitive charges occurring, the internal battery may not charge if battery level is higher than 95%. To obtain a 100% charge it could be necessary to discharge the battery below 95% before plugging back the AC power.

Battery run time

When the internal battery is being used to power the device, the amount of charge remaining in the battery is displayed as shown in the following table.

Touch Screen	Keyboard	Display Description
		When the internal battery is in use, the battery charge level is displayed by percentage on the touch screen and by 4 LEDs on the keyboard.
		When the internal battery is charging, the charge battery symbol is displayed on the touch screen and by scrolling LEDs on the keyboard.
		When the internal battery is charging but may be not enough charged to supply the device, the yellow charge battery symbol is displayed on the touch screen and by scrolling LEDs on the keyboard (also displayed in case of some battery failure alarm).
		When the internal battery power is low, the charge battery symbol is displayed with an exclamation mark on the touch screen and the LED's on the keyboard are red.

Alarms will alert the user when the battery power is getting low.

Internal battery run time is determined by:

- Environmental conditions (operating conditions See Technical Specifications)
- The condition and age of the battery
- The device settings
- The current circuit in place and unintentional leak

The ventilation module internal battery will operate for approximately 5 hours (+/-10%) when the device is used according to the following configuration for an adult patient (Resistance: 20 mb/l/s, Compliance: 25 ml/mb): Inspiratory pressure: 20 cmH2O, Ventilation Rate: 15 bpm, I/E ratio: 1/2, PEEP: OFF

The ventilation module internal battery will operate for approximately 4,5 hours (+/-10%) when the device is used according to the following configuration for an adult patient (Resistance: 5 mb/l/s, Compliance: 50 ml/mb): Inspiratory volume: 800 ml, Ventilation Rate: 20 bpm, I/E ratio: 1/2

- The ventilation module internal battery will operate for approximately 3,5 hours when the device is used according to the following configuration for an adult patient (Resistance: 20 mb/l/s, Compliance: 25 ml/mb): Inspiratory pressure: 30 cmH2O, Ventilation Rate: 15 bpm, I/E ratio: ½, PEEP: 10 mb

	**WARNING**
•	**Those reference internal battery run time are given for a ventilation module without docking station. When used with docking station, the resulting operation time will depend on luminosity setting and stand-by mode option and can be reduced by 20% to 30%. Always look at the device indication to know the real conditions expected autonomy.**

Storing and recharging

If the device is being stored, its internal battery must be recharged every two months during the storage period.

Prepare the battery for long-term storage

1. The battery charge level should be 100%.
2. Turn off the device.
3. Remove the power cord from the device.

Connecting to an external DC power source

	**WARNING**
•	**When using a car auxiliary adapter, start the car before plugging in the DC Adapter of the device and unplug the ventilator before stopping the car.**
•	**If the external DC power source drops to below 12V, the EO 150 Ventilator will switch to internal battery.**

To connect to DC power:

1. Connect the DC power cord into the rear of the device.
2. Plug the other end of the power cord into the power outlet.

EO-150 Car lighter DC cable (Ref EO-CARCBL) - Instructions for use

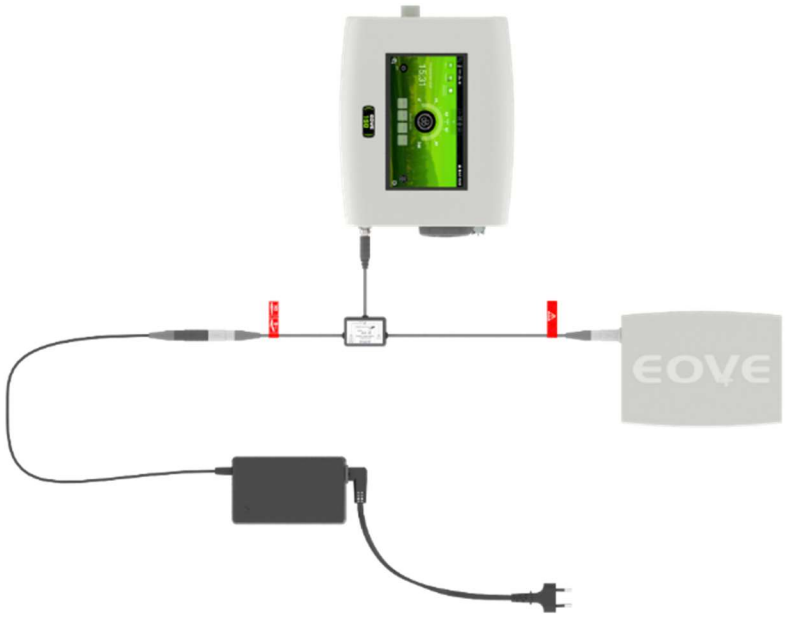
⚠	**WARNING**
•	Instability of the DC power electrical system of a car might lead to severe damage of the ventilator when the car engine is started or stopped while the device is connected. Therefore patients / care givers should strictly notice the following : ➢ When the EO-150 ventilator is intended to be connected to the DC power supply system of a car, the engine "Auto START & STOP function" must be deactivated. ➢ Start the car prior plugging in the Car lighter DC cable into the socket in the car. ➢ Unplug the Car lighter DC cable from the socket in the car prior stopping the engine of the car. ➢ If the Car lighter DC cable (Ref: EO-CARCBL) is damaged or the connector does not show the correct contact arrangement don't use it. In such case, use the EO-BAT9 external battery as additional power source. ➢ In case of any doubt about the stability of the DC power supply system of the car or lack of information from the car manufacturer, EOVE recommends to use for ventilator dependent patients the EO-150 Ventilator with the EO-BAT9 external battery as external power source.  disable the engine "Auto START & STOP function" of the car  start the car prior to plugging in the Car lighter DC cable into the socket in the car  unplug the Car lighter DC cable from the socket in the car prior to stopping the engine of the car

Connecting two power sources using the Y cable (EO-CPLPACK or EO-CPLPACKBOX):

A Y cable is available to secure ventilator dependent patients in mobility or when the AC power connection is unsafe. The solution is based on Battery Pack (EO-BAT9) accessory.

Refer to the Battery Pack (EO-BAT9) user manual for more details on the Battery Pack usage.

Connecting a Y cable with Battery Pack (EO-BAT9) and AC Power/Charger (EO-YCBLPWR):

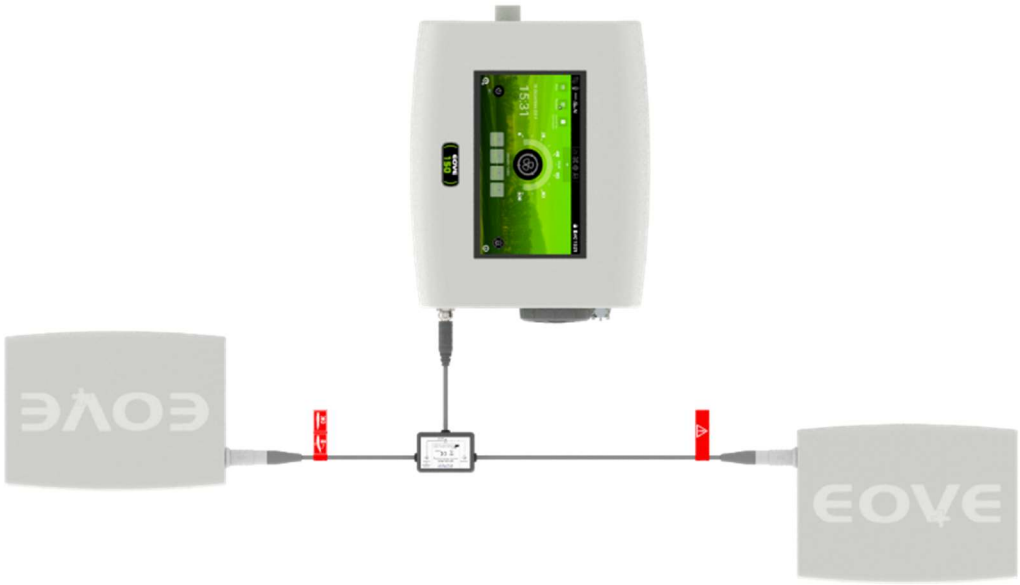


⚠	**WARNING**
•	**When using the Y cable solution with (EO-BAT9) and AC Power/Charger (EO-YCBLPWR) or when using EO-CPLPACKBOX cable, The Battery Pack (EO-BAT9) needs to be charged at least every two weeks with its own charger. Check regularly the Battery Pack autonomy level indicated on the Battery Pack keypad.**

	CAUTION
	The shorter part of the Y cable needs to be connected to the primary power source (AC Power/Charger)

NOTE:	In case of AC power loss combined with a battery failure while using the Y cable solution with (EO-BAT9) and AC Power/Charger (EO-YCBLPWR), the ventilator can reset and restart ventilation normally within 5 seconds.

Connecting a Y cable (EO-CPLPACK or EO-CPLPACKBOX) with 2 Battery Packs (EO-BAT9):

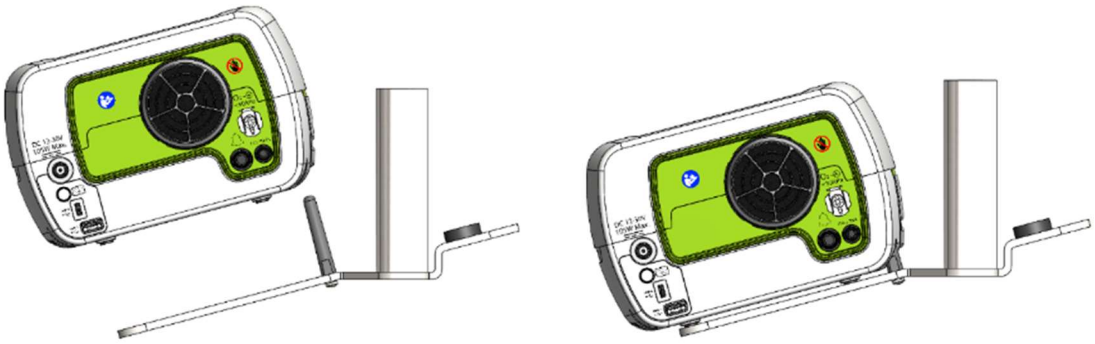


Mounting EO150 on trolley (KC072283)

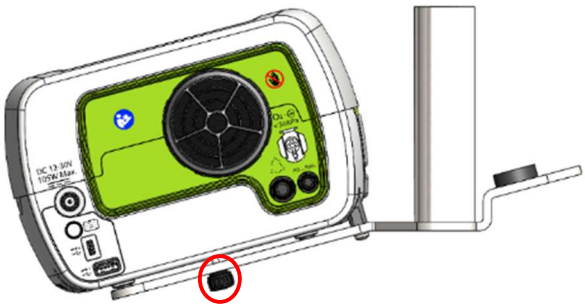
⚠	**WARNING**
•	**When using the trolley in combination with EO150 and other accessories, always verify a maximum weight of 20 kg is not exceeded.** **Always use the handle to move the trolley (always pull, do not push).** **Not respecting this could result in damaging the ventilator or causing patient injury.**

The EO-150 ventilator must be mounted on the trolley KC072283 according to the following:

1 – insert the device on the trolley columns



2 – Fix the device on the trolley with bottom screw



3 - Insertion of the arm

Insert the arm inside the dedicated trolley port and secure with screw.

4 - Insertion of humidifier

Insert the humidifier inside the dedicated trolley port.

⚠	**Warning**
•	Use only screws delivered by Eove. Otherwise there is a risk to damage the ventilator or its accessories.

Travelling with EO150 Ventilator, the Click-and-Go system

Several solutions are available which allow you freedom and mobility with the EO 150 Ventilator, whether for a short time or for travelling longer distances. See the table below for the recommended use of each EOVE Bag.

⚠	**WARNING**
•	**The EO-150 Ventilator should not be operated while in the Transport bag. To ventilate while travelling, use the EO-Series Ventilator accessory bags: Nomad bag or Travel bag.**
•	**For ventilator dependent patients in mobility, we recommend the usage of an additional power source such as Battery Pack (EO-BAT9).**
	CAUTION
	Do not place any heavy or bulky objects in the zippered pocket on the inside front of the bag. This could result in damage to the touch screen.

Type of Bag	Recommended Use
Transport	Use for storing the EOVE device with its docking station. Use whenever the device is not in use to prevent damage. Use to store cables and patient circuits.
Travel	Use for travelling and using the device while it is in its docking station. Use to store cables and patient circuits.
Nomad	Use for travelling and using the device without its docking station.

Using the Nomad Bag (no docking station)

The Nomad Bag

1. Remove the safety screw at the bottom of docking station (if in place).
2. Remove the ventilator from the docking station by pressing at the back of the module.

3. Place the device in the bag with the front face of the ventilator to the top opening of the bag. Carefully close the zipper. You can now attach the circuit accessories and use the bag while moving around.

NOTE:	For best autonomy use nomad with the touch screen separated. (remote vision)

Using the Transport bag

⚠	**WARNING**
•	**The Transport bag is only to be used to transport the ventilator. Ventilation cannot take place when the ventilator is in this bag.**

Before placing the EOVE device in the bag:

1. Remove the power cord from the rear of the device
2. Remove all patient circuit components
3. Remove all accessories
4. Place the device carefully into the bag, ensuring that the touch screen is facing upwards.
5. Ensure all zippers are completely closed and the device is secure before lifting the bag.

Using the Travel bag

1. Place the device in the bag with the front face of the ventilator to the top opening of the bag.
2. Carefully close the zipper.
3. You can now attach the circuit accessories and use the bag while moving around and use the touch screen.

Chapter 4 - Alarms

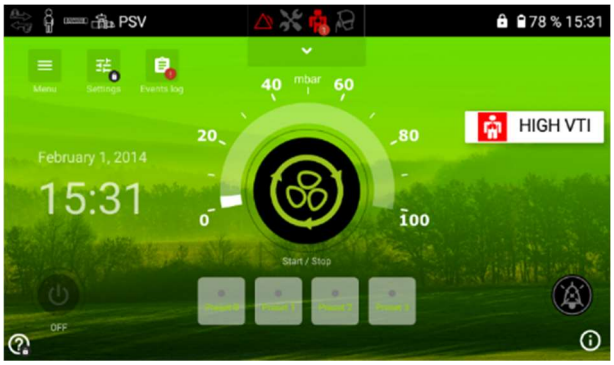
⚠	**WARNING**
•	**Test the effectiveness of the alarm after any changes to the circuit, ventilation settings or co-therapy. Alarm settings are sensitive to these changes.**
•	**Alarms may deactivate if the alarms are set to extreme values. This could put the patient at risk.**

The EO-150 is equipped with alarms to ensure the safety of the patient and to alert the user to certain conditions that require a response. When an alarm is activated, it is both audible and visible.

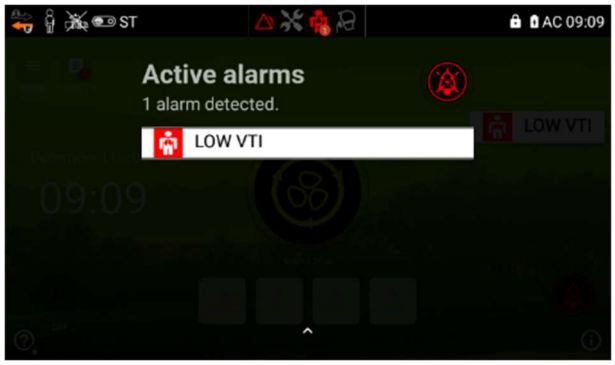
When an alarm is activated:

1. A series of beeps will sound
2. A message will appear on the touch screen showing the priority of the alarm and giving the reason for the alarm
3. A pop-up on the Home Screen will show the nature and priority of the alarm and the red arrow on the touch screen will flash until it is selected
4. The alarm button on the top panel of the machine will also flash and the icons will indicate the nature of the alarm.

Viewing active alarms



1. Press  to access the alarms Log screen from the Home Screen.



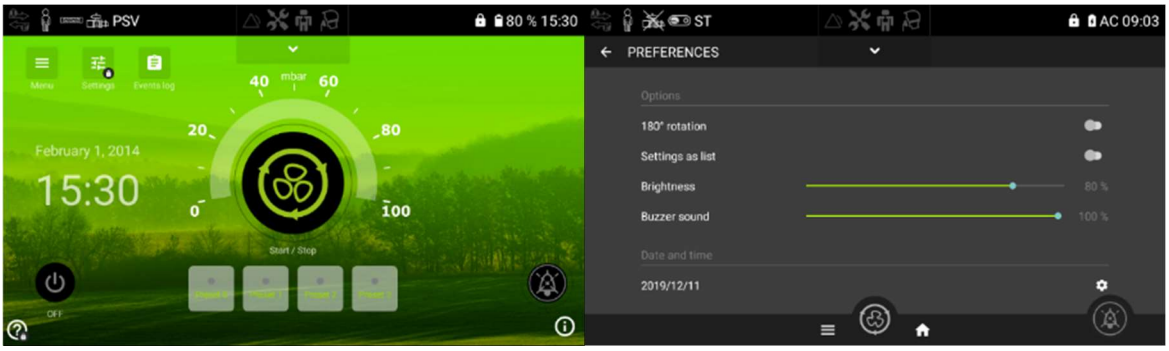
2. Hold  to temporarily mute the alarm. The alarm sound will be temporarily muted for two minutes. If after two minutes the conditions of the alarm are still present, the alarm sound will be set off again.

3. Touch the screen or swipe upwards to get back to the Home Screen.

NOTE:	The red arrow in the touch screen display is visible from all screens and indicates that there are one or more active alarms not already consulted in the alarm menu.

Alarms inhibition and pre-inhibition

Alarms can be inhibited from all the different menus of the interface with this button .



The button takes the color of the active alarm (red or yellow). Click on the button to inhibit the active alarm for two minutes. In this state, any new alarm will make the alarm sound to come back.

If the inhibition button (only in patient menu) is maintained pushed for a few seconds and the confirmation message is validated, the device goes in pre-inhibition. For the next two minutes, no alarm will sound. The button stays lighted in red or yellow if alarm in progress or white if no alarm in progress. In this state, even a new alarm will not make the alarm to sound until the end of the two minutes.

Pre-inhibition can also be activated directly on the module keypad by maintaining A single press on the alarm button during the pre-inhibition cancels its activation.

Alarm priority

Alarms are classified into relative priority (High and Medium) according to the severity and urgency of the alarm condition. The alarm will appear on both the keyboard and the touch screen. See details below in the table.

Alarm priority	Keyboard	Touch Screen	Audible alert
High	Red flashing light	Red Alarm Type symbol	10 beeps every 6 seconds
Medium	Yellow flashing light	Yellow Alarm Type symbol	3 beeps every 15 seconds

NOTE:	All alarms should be responded to, but an immediate response is required for high priority alarms.

Troubleshooting Alarms

Note:	Check the patient's status before responding to an alarm. Switch to back-up ventilator if necessary.
	If extreme alarm settings are set, alarms may not trigger.

Alarm	Cause/Ventilator response	Action needed	Type of Alarm
Total Power Loss	Continuous sound: Alarm activates immediately	Check power connections If the power loss alarm continues, contact your service provider and use a backup ventilator.	No Display
Disconnection High Priority	A tube or accessory has become disconnected. Alarm activates after 1 cycle.	Check all tube and accessory connections.	
Prox. Fail High Priority	Proximal sensor fails. Alarm activates after 1 second.	Contact your service provider	
Prox. Disconnection High Priority	Proximal sensor disconnected. Alarm activates after 1 second.	Reconnect proximal sensor	
Valve Disconnected High Priority	Valve disconnected. Alarm activates after 1 cycle.	Reconnect valve	
Occlusion High Priority	Patient circuit is blocked. Alarm activates after 5 seconds or 2 cycles.	Check that the patient mask or tubing are not obstructed.	
Valve Leak High Priority	There is a leak in the circuit configuration. Alarm activates after 6 cycles.	Inspect the circuit, expiratory valve and proximal lines for leak. Check for leaks around the mask if one is being used.	
Ventilation stop High Priority	Ventilation stopped voluntarily by clinician or patient. Alarm activates after 1 second.	Confirm that the ventilation stop is appropriate or necessary.	
Close O2 Source High Priority	O2 source is still opened and ventilation is OFF. Alarm activates after 20 seconds	Close O2 source.	
Rebreathing High Priority	Not enough leak in LEAK mode or valve not correctly functioning in VALVE mode. Alarm activates after 6 cycles.	Check calibrated leak is the right size or if expiratory pressure is high enough. (LEAK mode) Check valve function. (VALVE mode)	
PEEP out of range High Priority	PEEP not correctly regulated. Alarm activates after 6 cycles or 17 s	Check the circuit and expiratory valve for occlusion. Check for occlusion in proximal lines, if in use.	
Abs. Pres. Fail High Priority	Alarm activates after 1 second.	Contact your service provider	
Expi. Flow Fail High Priority	Alarm activates after 1 second	Contact your service provider	
End of Battery High Priority	The battery is depleted. Alarm activates after 1 second. Guaranteed ventilation time after alarm is triggered: 10 min. This alarm can be triggered in combination with "Battery Fail" alarm.	Reconnect to mains power Or Refer to "Battery Fail" alarm if both alarms are displayed	
Speed Fault High Priority	Turbine speed too low and temperature too high. Alarm activates after 1 cycle.	Contact your service provider	
Check Settings High Priority	Settings are not within limits or settings reset to default due to new Software upload. Alarm activates after 1 second.	Check the settings are within the parameters. Call your service provider	
Memory Fail High Priority	Failure to save parameters set. Alarm activates after 1 second.	Contact your service provider	
Vol. out of range High Priority	Maximum volume reached. Alarm activates after 6 cycles.	Contact your service provider	
Turbine Fail High Priority	The turbine is not functioning properly. Alarm activates after 1 cycle.	Contact your service provider	
Turbine overheat High Priority	Alarm activates after 1 cycle	Contact your service provider	

INSP Flow Fail High Priority	Inspiratory flow sensor fails. Alarm activates after 1 cycle.	Contact your service provider	
Sec. Pres. Fail High Priority	Security pressure sensor fail. Alarm activates after 1 second.	Contact your service provider	
Gauge com fail	Battery Gauge not functional. Alarm activates after 1 minute.	Contact your service provider	
Reversed IE setting High Priority	Reversed I/E setting. Activates when the Rate and I-Time settings are leading to a reversed I/E ratio.	Adust Lower Rate or a lower I-Time. Cancel the alarm if the setting is intentional.	
High VTI High Priority	Inspired tidal volume is too high. Alarm activates after 3 cycles or 10 s.	Inspect the circuit and expiratory module for leaks.	
Low VTI High Priority	Inspired tidal volume is too low. Alarm activates after 3 cycles or 10 s.	Inspect the circuit and expiratory module and check the pressure settings.	
Low SPO2 High Priority	The Pulse Oximeter is recording low SPO2 levels. Alarm activates after 6 cycles or 20 s.	Check the patient and check that the pulse oximeter is correctly attached.	
Remote Fail Medium Priority	Remote Alarm control fail. Alarm activates after 1 cycle	Contact your service provider	
Low FiO2 Medium priority	The level of oxygen delivered by the ventilator is below the Min FIO2 level set. Alarm activates after 6 cycles or 20 s.	Check for leak. Check and adjust the oxygen supply settings and the connections.	
High FIO2 Medium Priority	The level of oxygen delivered by the ventilator exceeds the Max FIO2 level set. Alarm activates after 6 cycles or 20 s.	Check and adjust the oxygen supply and settings.	
High Leak Medium Priority	The leak estimated by the ventilator exceeds the maximum Leak threshold. Alarm activates after 6 cycles.	Inspect the circuit, expiratory valve and proximal lines for leak. Check for leaks around the mask, if in use.	
Low VTE Medium Priority	Expired tidal volume is too low. Alarm activates after 3 cycles or 10 s.	Inspect the expiratory valve and check the settings.	
High VTE Medium Priority	Expired tidal volume is too high. Alarm activates after 3 cycles or 10 s.	Inspect the expiratory valve and replace, if necessary.	
High Pres Medium Priority	Inspiratory pressure is too high. Alarm activates after 3 cycles.	Inspect the circuit for occlusion.	
Low MV Medium Priority	Low tidal volume. Alarm activates after 6 cycles.	Check for leaks or loose connections.	
Apnea / Low Rate Medium Priority	Patient respiratory rate is too low. Alarm activates after 6 cycles.	Check the patient and the ventilator settings.	
High Resp. Rate Medium Priority	Patient respiratory rate is too high. Alarm activates after 6 cycles.	Check the patient and the ventilator settings.	
AC Power Loss Medium Priority	Connection to AC power has been lost. Alarm activates after 1 second.	Check the power cord is correctly plugged in to mains power and to the ventilator.	
DC Power Loss Medium Priority	Connection to DC power has been lost. Alarm activates after 2 seconds.	Check the power cord is correctly plugged into the DC source and into the ventilator.	
Battery < 2h Medium Priority	Battery life is < 2 hours. For ventilator dependent patients, if battery life is < 2h, don't use battery as principal power source anymore.	Plug the ventilator in to either AC or DC power source. (for ventilator dependent patients)	
Low Batt. Medium Priority	Battery power is low. Alarm activates after 1 second. Guaranteed ventilation time left: 15 mins.	Plug the ventilator in to either AC or DC power source.	
Bat. Charge Pause (T°>) Medium Priority	Temperature is too high to charge the battery. Charge will automatically restart after temperature has decreased. Alarm activates after 30 min.	Check the level of the battery charge.	
Batt. Temp. High Medium Priority	Battery has high internal temperature while powering the ventilator. Alarm activates after 1 second.	Check the level of the battery charge.	
Supply Fail Medium Priority	Power supply not detected. Alarm activates after 1 second.	Contact your service provider.	

Battery Fail Medium Priority	The ventilator cannot be used on internal battery. Alarm activates after 10 seconds. **Warning: If a "BAT. CHARGE FAIL" or a "BATTERY FAIL" alarm triggers, the ventilator internal battery needs to be changed. For ventilator dependent patient, contact your technical assistance immediately after ensuring the patient is safely ventilated with the backup device and wait for further instructions.**	Switch to backup ventilator (for ventilator dependent patient). Contact your service provider.	
Buzzer Fail Medium Priority	One of the buzzers is not functioning properly. Backup buzzer activated. Alarm activates after 1 buzzer cycle	Contact your service provider	
Buzzer Batt. Low Or Buzzer Batt. Fail Medium Priority	The buzzer battery is too low to sound the SUPPLY FAIL alarm. Alarm activates after 1 second	Contact your service provider	
CPU Fail Medium Priority	Internal failure	Contact your service provider	
Valve Fail Low	Exhalation control valve failure. Alarm activates after 1 cycle.	Contact your service provider	
Keyboard Fail Medium Priority	Keyboard stopped working. Alarm activates after 20 seconds.	Contact your service provider	
Batt. Charge Fail Medium Priority	Internal battery cannot be charged. Alarm activates after 2 seconds. **Warning: If a "BAT. CHARGE FAIL" or a "BATTERY FAIL" alarm triggers, the ventilator internal battery needs to be changed. For ventilator dependent patient, contact your technical assistance immediately after ensuring the patient is safely ventilated with the backup device and wait for further instructions.** NOTE : This alarm is merged into "BATTERY FAIL ALARM" for CPU software versions from C150000417.	Switch to backup ventilator (for ventilator dependent patient). Contact your service provider.	
Device Data Lost Medium Priority	Maintenance Serial information or counter lost	Contact your service provider	
Interface system messages	If the screen is displaying one of the following messages: "Com.eove150 keeps stopping" Or "Com.eove150 isn't responding" Or "Unfortunately, system UI has stopped" It means the interface software needs to reboot. Clicking on "OK" or "Close App" will reboot the interface software without any impact on ventilation if running.	Follow pop-up instructions	-

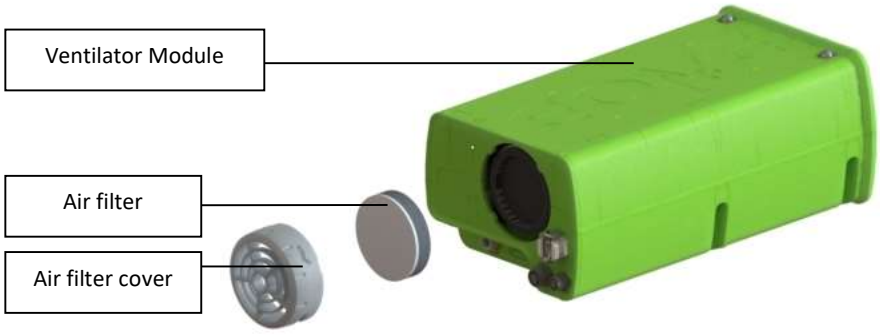
Chapter 5 - Routine Cleaning and Maintenance

⚠	**WARNING**
•	**The EO-150 ventilator must not be serviced while in use on a patient**
•	**Ventilation dependent patients are vulnerable to infections. All equipment should be regularly cleaned and disinfected.**
•	**Keep the device, and accessories away from water. Always turn off and unplug the device before cleaning and verify that it is dry before plugging it back in.**
	CAUTION
	Clean only exterior surfaces of the EO150 Ventilator device.
	If necessary, wipe the exterior of the device with a damp cloth using a mild cleaning solution.
	For all circuit components and hoses, follow the manufacturer's recommendations for cleaning and maintenance.

Proper cleaning and maintenance of your EOVE device is essential. Cleaning described in this section should be carried out regularly.
Refer to the user guides of any accessories in use for detailed instructions specific to those devices.

Maintenance	Method	Frequency
Inspect the condition of the connections and circuit adapters for any moisture or contaminants	Replace and clean as necessary using appropriate cleaning solutions	Weekly
Test the alarm sounds	See Set Up Test, Chapter 1	Weekly
Check the condition of the air filter	Check for dirt or dust particles.	Monthly
Check the charge level of the internal battery	1.Unplug the device from external power and operate the device on internal battery for a minimum of 10 minutes. 2.Reviewing the remaining battery capacity. 3.Restoring external power once the test is complete.	Monthly
Replace the air filter (See image below)	1.Unlock the air filter cover at the rear of the ventilation module by turning in an anti-clockwise direction. 2.Pull the air filter cover from the device. 3.Remove the air filter from the cover and discard. 4.Insert a new filter into the cover. 5.Insert the air filter and cover back into the device using the four tabs. 6.Turn in a clockwise direction to secure in place.	Every six months (with normal daily use) Change more frequently in a dusty environment.

⚠	**CAUTION**
	The air filter cannot be washed or reused.



Instructions for hygienic reprocessing at patient change

The following process must be followed before change of patient:

- Wipe disinfection (of device housing exterior)
- Replacement of Bacterial filter or HME filter
- Replacement of patient circuit or sterilization of reusable circuit system (according to manufacturer's instructions)
- Replace Air filter
- Function Check

Follow this procedure also for devices which have been previously been used by patients in whom MRSA infection, for example, has been verified. Please take all precautions for your own protection when reprocessing a device.

For disinfection, we recommend usage of products such as Mikrozid® sensitive liquid from schülke or WILAsil® from WILAmed. For other product usage, please contact our customer service.

For trolley and its accessories disinfection, Air Liquide Medical Systems recommends Anioxy spray WS, Anios Surfa'safe premium, Aniosyme X3, Wip'Anios Excel and Mikrozid Lingettes AF.

List of parts potentially contaminated by exhaled gas:

- Double branch adaptor (if not protected by a bacterial filter)
- Patient circuit

Servicing

	**WARNING**
•	**Maintenance of the ventilator should be carried out by a trained technician. Attempting to repair the machine yourself could result in patient injury or damage to the machine.**
•	**It is forbidden to modify the EO 150 without manufacturer authorization.**
	NOTE: Retain the original packaging to use when shipping to/from service agent.

Maintenance Timetable

The EO-150 should be regularly serviced by an authorized EOVE technician according to the following schedule. The ventilator will provide safe and reliable ventilation for 10 years provided that it is operated and maintained in accordance with the instructions given in this manual. As with all electrical devices, if any problem arises with your EO 150 device, you should exercise caution and have it inspected by an authorized EOVE technician.

Servicing schedule from the date of first use:

Recommended Service	Conducted by	Instructions
Every 6 months	Person trained in the use of EO-150	Check the air filter and replace if necessary (replace earlier if dirty or dusty). Check Double limb circuit adapter membrane, if used. Replace if necessary.
Every 2 years	Qualified EOVE technician	Replace internal battery or if service notification is displayed.
Every 20,000hours of use	Qualified EOVE technician	Replace turbine depending on the settings chosen and the patient profile (adult or pediatric)

Chapter 6 - Device information

Technical specifications

⚠	**WARNING**
•	**Due to their resistance to flow, accessories such as filters, water traps and humidifiers many decrease patient pressure during inspiration and increase patient pressure during exhalation.**

Physical Specifications

Docking Specifications:	Weight: 1.5 kg	Size: 25x21x13 cm
Ventilation Module Specifications	Weight: 1.8 kg	Size: 24.5x14.5x10 cm

Ventilation Sound Pressure weighted A (tested according to ISO80601-2-72)	45 dB +/- 10% (in 3 standard configurations)

Ventilation Specifications

The EO-150 can be used in the following ventilation modes:

- (A)VCV : Volume Assisted Controlled Ventilation (with expiration valve)
- (A)PCV : Pressure assisted/Controlled Ventilation (with expiration valve)
- PSV : Pressure support Ventilation (with expiration valve)
- MPV : Mouth Piece Volume Ventilation
- MPP : Mouth Piece Pressure Ventilation
- PSV VT : Pressure support ventilation Volume regulated (with expiratory valve)
- V-SIMV : Volume Synchroneous intermittent Mandatory Ventilation (with expiratory Valve)
- P-SIMV : Pressure Synchroneous intermittent Mandatory Ventilation (with expiratory valve)
- CPAP : Continuous Positive Airway Pressure (with leak)
- ST : Synchronised Timed (with leak)
- PAC : Pressure Assisted/ Controlled (with leak)
- VTS : Volume Target Synchronised (with leak)
- C-FLOW : Continuous Flow

(A)VCV: Volume Assisted Controlled ventilation (Valve)

This mode delivers breaths according to the set volume (**VT**), based on a flow control (**Rectangle or Decelerated Flow Ramp**). Inspiration lasts a set constant time (**I Time**). Exhalation controls the set exhalation pressure (**PEEP**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig**.).

Setting	**Adult**	**Pediatric**	**Limitations**
VT (ml)	300-2500	30-600	None
PEEP (mb)	OFF / 1-25	OFF / 1-20	None
Flow Ramp	1 (Rectangle), 2 (Decelerating)		None
Rate (c/min)	5-60	5-80	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Trig.	OFF / AUTO / 1-5	OFF / AUTO / 1-5	None

*A cancellable alarm "Reversed I/E" will trigger when the set I/E ratio exceeds 1/1

(A)PCV: Pressure Assisted Controlled Ventilation (Valve)

This mode delivers breaths according to the set total pressure, **Pres. Sup.** added to the set exhalation pressure (**PEEP**). Inspiration lasts a set constant time (**I Time**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig.)**. An optional **Vt Target** can be activated.

Setting	**Adult**	**Pediatric**	**Limitations**
Pres. Control. (mb)	5-48	5-48	**Pres. Control.** + **PEEP** ≤ 49 mb **Pres. Control.** < **P. Contr. Max**
PEEP (mb)	OFF / 1-25	OFF / 1-20	**Pres. Control.** + **PEEP** ≤ 49 mb **P. Contr. Max** + **PEEP** ≤ 50 mb
Pres. Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Trig.	OFF / AUTO / 1-5	OFF / AUTO / 1-5	None
Vt Target (ml)	OFF / 300-2500	OFF / 30-600	None
P. Contr. Max (mb)	10-49	10-49	Inactive when **Vt Target** is OFF **P. Contr. Max** + **PEEP** ≤ 50 mb **Pres. Control.** < **P. Contr. Max**
Target Speed	1-3	1-3	Inactive when **Vt Target** is OFF

*A cancellable alarm "Reversed I/E" will trigger when the set I/E ratio exceeds 1/1

PSV: Pressure Support Ventilation (Valve)

This mode delivers breaths according to the set total pressure, (**Pres. Sup.)** added to the set exhalation pressure (**PEEP**). Inspiration time is variable adapting to patient flow (**E Trig.**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig.)**.

During backup breaths, the set **Backup I Time** defines the inspiration time. If set to AUTO, **E trig.** still applies to backup breaths. **E Trig**. is allowed between **I Time Min** and **I Time Max**.

Settings	Adult	Pediatric	Limitations
Pres. Support (mb)	5-49	5-49	**Pres. support** + **PEEP** ≤ 50 mb
PEEP (mb)	OFF / 1-25	OFF / 1-20	**Pres. support** + **PEEP** ≤ 50 mb
Pres. Ramp	1-5(100ms-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
Backup I Time (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Time Min (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Time Max (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**I Time Min** ≤ **I Time Max**

PSV VT: Pressure Support Ventilation with VT Target (Valve)

This mode delivers breaths according to the set target volume (**VT**), based on pressure control adapting breath by breath, between the set total pressure limits (**Pres Sup Min and P Sup Max**) added to the set exhalation pressure (**PEEP**). **Target Speed** adapts the maximum pressure increments between two breaths. Inspiration time is variable according to patient flow (**E Trig**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig**.). During backup breaths, the set **Backup I Time** defines the inspiration time. If set to AUTO, **E trig.** still applies to backup breaths. **E trig.** is allowed between **I Time Min** and **I Time Max**.

Settings	Adult	Pediatric	Limitations
VT (ml)	300-2500	30-600	None
Pres Sup Min (mb)	5-48	5-48	**Pres Sup Min** < **Pres Sup Max**
Pres Sup Max (mb)	10-49	10-49	**Pres Sup Min** < **Pres Sup Max** **Pres Sup Max** + **PEEP** ≤ 50 mb
PEEP (mb)	OFF / 1-25	OFF / 1-20	**Pres Sup Max** + **PEEP** ≤ 50 mb
Press Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
Target Speed	1-3	1-3	None
Backup I Time (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Time Min (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Time Max (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**I Time Min** ≤ **I Time Max**

VSIMV: Volume Synchronized Intermittent Ventilation (Valve)

This mode delivers mandatory breaths according to the set volume (**VT**), at set minimum rate (**Rate**) and a set constant inspiration time (**I Time**). Patient can trigger additional spontaneous breaths (**I Trig**.) according to the set total pressure (**Pres. Sup.**) added to the set exhalation pressure (**PEEP**) with a variable inspiration time adapting to patient flow (**E Trig**). During spontaneous breaths, **E Trig**. is allowed between **I Time Min** and **I Time Max**.

Settings	**Adult**	**Pediatric**	**Limitations**
VT (ml)	300-2500	30-600	None
Pres. Support (mb)	5-49	5-49	**Pres. Support** + **PEEP** ≤ 50 mb
PEEP (mb)	OFF / 1-25	OFF / 1-20	**Pres. Support** + **PEEP** ≤ 50 mb
Press Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-40	5-60	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1) **Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1)
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I_Time** (I/E ≤ 1/1)
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
I Time Min (s)	0.3-2.5	0.3-2.5	**I Time Min** ≤ **I Time Max** **Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1)
I Time Max (s)	0.3-2.5	0.3-2.5	**I Time Min** ≤ **I Time Max**

PSIMV: Pressure Synchronized Intermittent Ventilation (Valve)

This mode delivers mandatory breaths according to the set total pressure (**Pres. Contr.)** added to the set exhalation pressure (**PEEP**) at set minimum rate (**Rate**) at a set constant inspiration time (**I Time**). Patient can trigger additional spontaneous breaths (**I Trig**.) according to the set total pressure (**Pres. Sup.)** added to the set exhalation pressure **(PEEP**) with a variable inspiration time adapting to patient flow (**E Trig**). During spontaneous breaths, **E Trig**. is allowed between **I Time Min** and **I Time Max**.

Settings	**Adult**	**Pediatric**	**Limitations**
Pres. Control. (mb)	5-49	5-49	**Press. Control.** + **PEEP** ≤ 50 mb
Pres. Support (mb)	5-49	5-49	**Pres. support** + **PEEP** ≤ 50 mb
PEEP (mb)	OFF / 1-25	OFF / 1-20	**Press. Control.** + **PEEP** ≤ 50 mb **Press. support** + **PEEP** ≤ 50 mb
Pres. Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-40	5-60	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1) **Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1)
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1)
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
I Time Min (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Time Max (s)	0.3-2.5	0.3-2.5	**I Time Min** ≤ **I Time Max**

MPV: Mouth Piece Volume Ventilation (Valve or no valve)

This mode delivers breaths according to the set volume (**VT**), based on a flow control (**Rectangle or Decelerated Flow Ramp**). Inspiration lasts a set constant time (**I Time**). The minimum rate (**Rate**) is an optional setting. Exhalation control is delivering the set flow (**Bias Flow**), based on a flow control. Patient triggering (**I. Trig**.) and alarms are specific to the mouth piece configuration needs.
:

Settings	**Adult**	**Pediatric**	**Limitations**
VT (ml)	300-2500	100-600	None
Bias Flow (l/min)	1-20 l/min	1-20 l/min	None
Flow Ramp	1 (Rectangle), 2 (Decelerating)		None
Rate (c/min)	OFF / 5-60	OFF / 5-80	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1)
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1)
I Trig.	OFF / AUTO / 1-5	OFF / AUTO / 1-5	None

MPP: Mouth Piece Pressure Ventilation (Valve or no valve)

This mode delivers breaths according to the set pressure (**Pres. Control.**), based on a pressure control. Inspiration lasts a set constant time (**I Time**). The minimum rate (**Rate**) is an optional setting. Exhalation control is delivering the set flow (**Bias Flow**), based on a flow control. Patient triggering (**I Trig**.) and alarms are specific to the mouth piece configuration needs.
:

Settings	**Adult**	**Pediatric**	**Limitations**
Pres. Control. (mb)	5-49	5-49	None
Bias Flow (l/min)	1-20 l/min	1-20 l/min	None
Pres. Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	OFF / 5-60	OFF / 5-80	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1)
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time** (I/E ≤ 1/1)
I Trig.	OFF / AUTO / 1-5	OFF / AUTO / 1-5	None

CPAP: Continuous Positive Airway Pressure (Leak)

This mode delivers continuous pressure to the patient. All breaths in this mode are spontaneous breaths.

Settings	**Adult**	**Pediatric**	**Limitations**
CPAP Pressure (mb)	4-20	4-20	None

ST: Synchronized Timed mode (Leak)

This mode delivers breaths according to the set inspiration pressure (**IPAP**) and set exhalation pressure **(EPAP**). Inspiration time is variable adapting to patient flow (**E. Trig.**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I. Trig.**). On backup breaths, the set **Backup I Time** defines the inspiration time. If set to AUTO, **E trig.** still applies to backup breaths. **E Trig**. is allowed between **I Time Min** and **I Time Max**.

Settings	Adult	Pediatric	Limitations
IPAP (mb)	6-50	6-50	**IPAP** ≥ **EPAP** + 2
EPAP (mb)	4-25	4-20	**IPAP** ≥ **EPAP** + 2
Pres. Ramp	1-5 (100-500ms)	1-5 (50-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
Backup I Time (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
I Time Min (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Time Max (s)	0.3-2.5	0.3-2.5	**I Time Min** ≤ **I Time Max**

PAC: Pressure Assisted Controlled mode (Leak)

This mode delivers breaths according to the set inspiration pressure (**IPAP**) and set exhalation pressure (**EPAP**). Inspiration lasts a set constant time (**I Time**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig**.). An optional **Vt Target** can be activated.

Settings	Adult	Pediatric	Limitations
IPAP (mb)	6-49	6-49	**IPAP** ≥ **EPAP** + 2
EPAP (mb)	4-25	4-20	**IPAP** ≥ **EPAP** + 2
Pres. Ramp	1-5 (100-500ms)	1-5(50-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Time (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 45 / **I Time** (I/E ≤ 3/1)*
I Trig.	OFF / AUTO / 1-5	OFF / AUTO / 1-5	None
Vt Target (ml)	OFF / 300-2500	OFF / 30-600	None
IPAP Max (mb)	7-50	7-50	Inactive when **Vt Target** is OFF
Target Speed	1-3	1-3	Inactive when **Vt Target** is OFF

*A cancellable alarm “Reversed I/E” will trigger when the set I/E ratio exceeds 1/1

VTS: Volume Target Synchronized mode (Leak)

This mode delivers breaths according to the set volume (**VT**) based on pressure control adapting breath by breath, between the set pressure limits (**IPAP Min** and **IPAP Max**). **Target Speed** adapts the maximum pressure increments between two breaths. Inspiration time is variable adapting to patient flow (**E Trig.**). Breaths are guaranteed at a set minimum rate (**Rate**). Patient can increase rate by inspiration triggering (**I Trig.**). On backup breaths, the set Backup I Time defines the inspiration time. If set to AUTO, exhalation trigerring (**E trig.**) still applies to backup breaths. **E Trig**. is allowed between **I Time Min** and **I Time Max**.

Settings	Adult	Pediatric	Limitations

VT (ml)	300-2500	30-600	None
IPAP Min (mb)	6-49	6-49	**IPAP Max** ≥ **IPAP Min** + 5 **IPAP Min** ≥ **EPAP** + 2
IPAP Max (mb)	7-50	7-50	**IPAP Max** ≥ **IPAP Min**
EPAP (mb)	4-25	4-20	**IPAP Min** ≥ **EPAP** + 2
Pres. Ramp	1-5 (100-500ms)	1 -5(5-250ms)	None
Rate (c/min)	5-60	5-80	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Trig.	AUTO / 1-5	AUTO / 1-5	None
E Trig. (%)	AUTO / 10-90	AUTO / 10-90	None
Backup I Time (s)	AUTO / 0.3-2.5	AUTO / 0.3-2.5	**Rate** ≤ 30 / **Backup I Time** (I/E ≤ 1/1)
Target Speed	1-3	1-3	None
I Time Min (s)	0.3-2.5	0.3-2.5	**Rate** ≤ 30 / **I Time min** (I/E ≤ 1/1) **I Time Min** ≤ **I Time Max**
I Time Max (s)	0.3-2.5	0.3-2.5	**I Time Min** ≤ **I Time Max**

C-FLOW: Continuous Flow (Leak)

This mode delivers continuous flow to the patient. The set flow (**Flow**) is delivered continuously through the humidifier and nasal cannula. If the maximum pressure (**Press. Max**) is reached, the device will still deliver flow but within the limit of this pressure.

Settings	**Adult**	**Pediatric**	**Limitations**
Flow (l/min)	10-60	2-25	None
Press. Max (mb)	7-50	7-50	None

	WARNING
•	**The C-Flow mode cannot be considered as a ventilation mode since it is not providing pressure and flow directly to the patient.** **No disconnection alarm will trigger if the patient interface is disconnected from the patient.**

Accuracy of ventilation settings

- Valve volumes: ± (5 ml + 10%) under BTPS conditions
- MPV volumes: ± (10 ml + 15%) under BTPS conditions
- Leak volumes: ± (10 ml + 10%) under BTPS conditions
- Pressure: ± (1 mb + 10%)
- Time: ± 0.1 s
- Rate: ± 1 breath/min
- Flow: ± (0.5 l/min + 10%)

Measurements uncertainties

- Pressure: ± 0.75% or ± 0.1 mb*
- Flow: ± 1.9% or ± 0.1 l/min*
- Volumes: ± 2% or ± 0.2 ml*
- Time: ± 0.02 s

*Whichever is greater

Monitored Parameter Specifications

(Rounded values for readings)

Parameter	Range	Display method / Filtering
Peak Inspiratory Pressure (PIP)	0 to 99 mbar	Computed for each inspiration
Positive End Expiratory Pressure (PEEP)	0 to 60 mbar	Computed for each exhalation
Inspiratory Tidal Volume (VTI)	0 to 4000 ml	Computed for each inspiration
Exhalation Tidal Volume (VTE)	0 to 4000 ml	Computed for each exhalation
Total Breath Rate (Rtot)	1 to 99.9 bpm	Computed for each breath
I E Ratio (I E)	33.3:1 to 1:99.9	Computed for each breath
Inspiratory Time (I Time)	0.1 to 9.9 s	Computed for each inspiration
Exhalation Time (E Time)	0.3 to 59.9 s	Computed for each exhalation
I Peak Flow	0 to 100 l/min	Computed for each inspiration
E Peak Flow	0 to 100 l/min	Computed for each exhalation
Inspiratory Minute Volume (Min VI)	0 to 99.9l	Computed for each breath
Leaks	0 to 200 l/min	Computed for each breath
FiO2	21% to 100%	Computed for each breath
SpO2	80% to 100%	According to NONIN or Sentec
Heart Rate	30-250 (Sentec) 18-300 (NONIN)	According to NONIN or Sentec
PCO2	0-200	According to Sentec

A monitored value displayed as "--" means that the measurement is not available or invalid.

Accuracy of monitoring data

- Inspired volume in valve modes : ± (5 ml + 10%)
- Expired volume in double limb circuit : ± (5 ml + 20%)
- Leak volume : ± (10 ml + 10%)
- Pressure : ± (2 mb + 4%)
- Time : ± 0.1 s
- I/E : Calculation based on Inspiratory Time and Exhalation Time
- Rate : ± 1 breath/min
- Flow : ± (1 l/min + 10%)
- Peak flow : ± (2 l/min + 15%)
- FIO2 : ± 3%
- SPO2 : According to NONIN or Sentec specifications
- Heart Rate : According to NONIN or Sentec specifications
- PCO2 : According to Sentec specifications

Alarm Parameter Specifications

Alarm sound level: 55 - 75 dB ± 10%

The ventilator has the following alarm settings in specific ventilation modes:

Settings	Adult	Pediatric	Modes
Pres. min (mb) *	2-55	5-55	(A)VCV, MPV, VSIMV, C-FLOW
Pres. max (mb) *	10-80	10-80	(A)VCV, MPV, VSIMV
VTI Min (ml)	50-2490	20-600	All except (A)VCV, MPV, MPP, C-FLOW
VTI Max (ml)	60-3000	40-800	(A)PCV, PSV, PSV VT, VSIMV, PSIMV
VTE Min (ml)	50-2490	20-600	All valve modes
VTE Max (ml)	60-3000	40-800	All valve modes
MV Min	1-25	0.5-6	All except (A)VCV, C-FLOW
Rate Min	6-65	6-85	PSV, PSV VT, ST, VTS, CPAP
Rate Max	10-70	20-90	All except MPV, MPP, CPAP, C-FLOW
FIO2 Min	18-80	18-80	All
FIO2 Max	30-100	30-100	All
SPO2 Min	80-95	80-95	All
Disc. Time	AUTO / 5-120	AUTO / 5-60	All except MPV, MPP, C-FLOW
Disc. Time	OFF / 5-120	OFF / 5-60	C-FLOW
Disc. Time	OFF / 5-900	OFF / 5-900	MPV, MPP
*PWmax and PWmin according to ISO 10651-2 / ISO 80601-2-72			

	WARNING
•	**Delaying or deactivating the disconnection alarm must be done only with patients that have the corresponding capacity of breathing spontaneously. Failure to apply this recommendation can lead to a life-threatening risk for the patient.**

Power specifications

⚠	**WARNING**
•	**This device is intended to function with external power supply 2440 from Mascot, never use any other power supply unless recommended by Eove.**
•	**To disconnect the device from the mains, unplug power supply.**

AC Inlet Voltage	100-240V
AC Inlet Power	1.6 A max
AC Inlet Power	50-60 Hz
DC inlet voltage Max current	12 to 30 V 2.5 to 5.8 A
Power	105 W maximum (peaks) 70 W nominal
Module Embedded battery life	5 hrs
Internal battery (not replaceable by user) : capacity voltage discharge current	Lithium-ion 2,8 Ah 21,6 V nominal 7 A max.
Interface/touchscreen start up time	< 50 s
Ventilator unit start up time	5 seconds

Environmental Specifications

Storage and transport conditions:

Ambient temperature	From -20°C à +60°C.
Relative humidity	From 10% à 95%, (non-condensing)

Operating conditions:

Ambient temperature	From +5°C to +40°C (after conditioning at 23° for 20 minutes)
Relative humidity	From 10% à 95%, (non-condensing).
Atmospheric pressure	From 660 hPa à 1100 hPa. (by default EO150 compensates for atmospheric pressure variations e.g. related to altitude up to 3000 m).
O2 pressure source	O2 pressure source: up to 50 Kpa with flow up to 20 l/min and flexible tubing used. (from hospital O2 network, always use a flow or pressure limiter)
Bluetooth maximum distance	4 to 8 m

Breathing system Specifications

Inspiratory resistance at 60 l/min Ventilation stopped / Failure	< 3 mb
Expiratory resistance at 60 l/min Ventilation stopped / Failure	< 3 mb

Software versions

Main: C150 0006XX	Power: P150 0004XX	Interface: 2.X.X

Guidance and Manufacturer's Declaration Electromagnetic Emissions & Immunity

	**WARNING**
•	**The ventilator should not be used in close proximity to other equipment or stacked on top of other devices. If this kind of use is unavoidable, the ventilator should be checked carefully and observed to ensure correct functioning of the device.**
•	**Only accessories recommended for the EO 150 should be used. Using any other accessories could result in risk to the device or the patient.**
•	**Any additional equipment connected to medical electrical devices must comply with the respective IEC or ISO standards (eg, IEC 60950 for data processing equipment). Furthermore, all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of the 3Ed. of IEC 60601-1, respectively). Adding additional equipment configures a medical system and this system must comply with the requirements for medical electrical systems. Any person undertaking this kind of addition shall be responsible to ensure that all requirements are complied with. It is important to note that local laws take priority over the above mentioned requirements. If in doubt, consult an EOVE representative or the technical service department.**
•	**Interference may occur in the vicinity of equipment marked with the following symbol:** 
•	**EO150 is designed for use in the electromagnetic environment described below. Those using the device should ensure that the EO 150 is used in such an environment.**

Electromagnetic emissions

Emissions test	**Level of compliance**	**Guidance for EM environment**
RF emissions CISPR 11	Class B	EO150 is suitable for home health care environment and a professional health care establishment
Harmonic Emissions IEC 61000-3-2	Complying	
Voltage Fluctuations/Flicker Emissions IEC 61000-3-3	Complying	

Electromagnetic immunity

Immunity Test	**IEC 60601 level**	**Level of compliance**	**Guidance for EM environment**
Electrostatic discharge (ESD) IEC 61000-4-2	8 kV contact 15 kV air	8 kV contact 15 kV air	for home health care environment and a professional health care establishment
Electrical fast transient/burst IEC 61000-4-4	2 kV for power supply lines 1 kV for input/output lines	2 kV for power supply lines 1 kV for input/output lines	for home health care environment and a professional health care establishment
Surge IEC 61000-4-5	1 kV differential mode 2 kV common mode	1 kV differential mode 2 kV common mode	for home health care environment and a professional health care establishment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% Ut for 0.5 cycle With 0°, 45°, 90°, 135°, 180°, 225°, 270° et 315° 0% Ut for 1 cycles 70% Ut for 25 cycles at 50 Hz For 30 cycles at 60 Hz Monophased at 0°	0% Ut for 0.5 cycle With 0°, 45°, 90°, 135°, 180°, 225°, 270° et 315° 0% Ut for 1 cycles 70% Ut for 25 cycles at 50 Hz For 30 cycles at 60 Hz Monophased at 0°	Mains power quality should be as home health care environment and a professional health care establishment If operating during power cuts, it is recommended to use other power sources.

Immunity Test	**IEC 60601 level**	**Level of compliance**	**Guidance for EM environment**
Voltage Interruption IEC 61000-4-11	0 % UT for 250 cycles at 50 Hz for 300 cycles at 60 Hz	0 % UT for 250 cycles at 50 Hz for 300 cycles at 60 Hz	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	for home health care environment and a professional health care establishment
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 V in ISM band and from 0.15 MHZ to 80 MHZ, amateur radio band included 80% MA at 1 KHz	3 Vrms 150 kHz to 80 MHz 6 V in ISM band and from 0.15 MHZ to 80 MHZ, amateur radio band included 80% MA at 1 KHz	for home health care environment and a professional health care establishment
Electromagnetic fields Radiated RF* IEC 61000-4-3	10 V/m 80 MHz to 2.5 GHz	10 V/m 80 MHz to 2.5 GHz	for home health care environment and a professional health care establishment

Immunity Test	IEC 60601 level	Level of compliance	Guidance for EM environment
Proximity fields emitted by RF wireless communication devices IEC 61000-4-3 (provisional method)	9 V/m : 710 MHz, 745 MHz, 780 MHZ, 5240 MHz, 5550 MHz, 5785 MHz 27 V/m : 385 MHz 28 V/m: 450 MHz, 810 MHz, 870 MHz, 930 MHz, 1720 MHz, 1845 MHz, 1970 MHz, 2450 MHz	9 V/m : 710 MHz, 745 MHz, 780 MHZ, 5240 MHz, 5550 MHz, 5785 MHz 27 V/m : 385 MHz 28 V/m: 450 MHz, 810 MHz, 870 MHz, 930 MHz, 1720 MHz, 1845 MHz, 1970 MHz, 2450 MHz	for home health care environment and a professional health care establishment

Recommended separation distance

EO150 device must be used in an electromagnetic environment in which the perturbations due to RF are controlled.

The user or installer of the device can help to prevent any electromagnetic interference by maintaining a minimum distance depending on RF emitter maximum power. Portable RF devices (included cables and antennas) must not be used closer than 30 cm (12 inches) from any part of the EO150, including specified cables. Not respecting this recommendation could lead to performance alteration.

NOTE:	Additional technical description (pneumatical description, theory of operation, measurement uncertainty, functional tests) can be found in the technical manual

Standards compliance

The EO-150 meets the following standards:

EN ISO 14971: Medical Device Risk Management
IEC 60601-1 Ed3 (&CSA22.2): Medical Electrical Equipment –Part 1: General Requirements for Safety 1: Collateral Standard: Safety Requirements for Medical Electrical Systems
The ventilator is classified according to Chapter 5 of the norm CEI 60601-1, as follows:

Class II Equipment
Internally Powered Equipment
Type BF Applied Parts
IP22 with respect to access to hazardous parts and ingress of moisture
Not suitable for use in the presence of flammable anaesthetic mixtures
Not suitable for sterilisation
Suitable for continuous operation
Detachable power supply cable

IEC 60601-1-2: Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirements and tests
IEC 60601-1-6: Medical Electrical Equipment – Part 1-6: General requirements for basic safety and essential performance – Collateral Standard – Usability
IEC 60601-1-8: Medical Electrical Equipment -Part 1-8: General requirements for basic safety and essential performance : Tests and guidance for alarm systems in medical electrical equipment and medical electrical systems.
CEI 60601-1-11: General requirements for basic safety and essential performance -- Collateral standard: Requirements for medical electrical equipment and medical electrical systems used in the home healthcare environment.
EN ISO 10651-2: Lung ventilators for medical use -- Particular requirements for basic safety and essential performance -- Part 2: Home care ventilators for ventilator-dependent patients
ISO 80601-2-72: Medical electrical equipment -- Part 2-72: Particular requirements for basic safety and essential performance of home healthcare environment ventilators for ventilator-dependent patients

Training and support

Training and support are available on the EOVE website, www.eove.fr or by calling our helpline at +33 05 59 21 86 84

Limited warranty

The seller guarantees that the Product delivered complies with the use for which it is intended and guarantees the Purchaser in this respect from defects in materials and workmanship.

Subject to the extended warranty that the Seller may offer to the Purchaser, depending on the Product, the Seller offers to the Purchaser a TWELVE (12) month warranty period, covering the costs of defective parts. Such warranty shall be effective from the expiration of a FIFTEEN (15) day period following the invoice date.

This warranty is only applicable when Products are installed and operated in accordance with factory recommendations and user manual instructions. This warranty specifically excludes damage or wear to Products caused by misuse, abrasion, corrosion, negligence, accidents, faulty installation or by using material incompatible with the Product. Also, this warranty does not cover associated consumables or disposables relative to the use of the Product.

Whatever the claim on the quality of the Product made by the Purchaser, the latter remains liable for paying the corresponding amounts, on their due date.

The condition of the supplied Products must be verified by the Purchaser upon receipt. As such, any claim from the Purchaser based on the quality of the Product must be made by written notice within THREE (3) days from the discovery of the relevant defect. The Purchaser shall be responsible for providing all necessary proofs showing evidence of defects or non-conformity.

Once defects or non-conformity are duly recorded by the Seller, the Purchaser may return the relevant Product if the Seller believes that it can be repaired in whole or in part. Otherwise, the Seller shall substitute the non-repairable dysfunctional equipment with equivalent new equipment.

In any case, any return of Products requested by the Purchaser must be agreed in writing by the Seller. In particular, no returns will be accepted if:

- Products have not been installed and operated in accordance with factory recommendations and user manual instructions;

- Products are no longer in their original packaging;

- Products are not accompanied by their instruction manuals and accessories;

- Products have been repaired by a non-Seller-accredited provider.

Appendix A: Definitions

Ventilation Setting Definitions

(A)PCV	Pressure Assisted Controlled (with expiration valve)
(A)VCV	Volume Assisted Controlled (with expiration valve)
Backup I Time	Sets the Inspiratory Time (in sec) during the backup rate ventilation
C-FLOW	Continuous Flow
Circuit Type	Sets the type of circuit configuration and interface in use with Valve (Non Vented) or No Valve (Vented)
CPAP (mb)	Continuous positive airway pressure maintained during a spontaneous breath cycle. (with leak)
c/min	Count per minute
E Trig (%)	The threshold mechanism to switch from inspiration to exhalation.
EPAP (Expiratory Positive Airway Pressure - mb)	Sets the positive airway pressure delivered to the patient during expiration.
Flow Ramp	Sets the shape of inspiratory flow delivered during mandatory controlled volume breaths: Square or Decelerating.
IPAP (Inspiratory Positive Airway Pressure - mb)	Sets the positive airway pressure delivered to the patient during inspiration.
Breath (Manual Breath)	Triggers a manual breath according to the current ventilation mode in use.
MPV	Mouth Piece Volume Ventilation
MPP	Mouth Piece Pressure Ventilation
PAC	Pressure Assisted/ Controlled (with leak)
Patient type	Sets either Adult or Paediatric patient. This configures the default values and ranges available for ventilation settings and determines circuit resistance acceptance criteria applied to the Calibration.
Leak (l/min)	The average unintentional leak monitoring above the set intentional Leak Level. It is reported as a flow for Single limb circuits with intentional leak. The measured Leak is displayed as a monitored parameter during ventilation.
PEEP (Positive End Expiratory Pressure - mb)	Sets the positive airway pressure delivered to the patient during expiration.
Pressure Ramp (ms)	Sets the time needed to reach inspiratory pressure during pressure breaths.
Pres. Support (mb)	Sets the inspiratory pressure support above PEEP delivered during Pressure Support Ventilation mode (spontaneous breaths).
Pres. Sup. Max (mb)	Sets the maximum pressure support above PEEP allowed to achieve safe tidal volume in PSV VT mode.

Pres. Control. (Pressure Controlled - mb)	Sets the pressure control above PEEP delivered during inspiration for pressure-controlled breaths (with constant I Time).
P. Contr. Max (Pressure Controlled max - mb)	Sets the maximum pressure control above PEEP delivered during inspiration for pressure-controlled breaths (with constant I Time).
PSV	Pressure support Ventilation (with expiration valve)
PSV VT	Pressure support ventilation Volume regulated (with expiratory valve)
P-SIMV	Pressure Synchronous intermittent Mandatory Ventilation (with expiratory valve)
Rate (C/min)	Sets the breaths per minute (bpm) to be delivered by the ventilator to the patient. The measured respiratory rate may be greater due to manual breaths.
ST	Synchronized Timed (with leak)
I Time (s)	Sets the duration of the inspiratory phase of a breath.
I Time Max (Maximum inspiratory time - s)	Sets the maximum duration of the inspiratory phase of a breath. AUTO / 0.3-2.5
I Time Min (Minimum Inspiratory Time - s)	Sets the minimum duration of the inspiratory phase of a breath.
Inspiration Trigger (I Trigger)	Sets the trigger threshold to be detected to deliver a new breath. The trigger is blocked for the first 300 ms (Pediatric) or 500 ms (Adult) following the beginning of expiration phase.
V-SIMV	Volume Synchronous intermittent Mandatory Ventilation (with expiratory Valve)
VT (Tidal Volume - ml)	Sets the volume of gas, to be delivered to the patient in during the inspiratory phase of controlled volume breath in (A)VCV, MPV, PSV VT or VTS modes.
VTS	Volume Target Synchronised (with leak)

Measured and calculated parameter definitions

These measured and calculated parameters are displayed during configuration or during ventilation. Each ventilation mode sets out the parameters displayed.

FiO2 %	Fraction of inspired Oxygen delivered to Patient circuit.
I / E	The time ratio of the inspiratory period to the expiratory period. The measured I / E ratio is displayed as a monitored parameter during ventilation. Relative I / E ratio value is calculated and displayed during settings of time variables like Respiratory rate or Ti.
Leak Level (l/min)	Level of intentional leak set in the patient configuration menu. Leak monitoring displays leak above this set level.
MV (Delivered Minute Volume)	The measured volume averaged over the last breath. The measured MV is displayed as a monitored parameter during ventilation

Pressure	The measured airway pressure at the patient inlet port. The measured Pressure is displayed in the monitoring menu during ventilation
PEEP (Positive End Expiratory pressure -mb)	The airway pressure measured 100 ms at the end of the last expiration. The measured PEEP is displayed in the monitoring menu during ventilation.
Pmean	Mean airway pressure in the Patient circuit computed over the last breath.
PIP (Peak Inspiratory Pressure -mb)	The maximum airway pressure reached over the last inspiration. The measured PIP is displayed in the monitoring menu during ventilation
Heart rate	When a pulse oximeter is connected on the ventilator Pulse rate is displayed in the monitoring menu during ventilation.
Total Breath Rate (RR) (Res. Rate - c/min)	Breath rate is computed over the last breath according to (60/inspiratory time + Expiratory time). The measured **Rtot** is displayed in the monitoring menu during ventilation.
SpO2 (**Measured Oxygen Saturation %**)	When a pulse oximeter is connected on the ventilator, SpO2 is displayed in the monitoring menu during ventilation.
Te (Expiratory time -s)	The duration in seconds of the last expiratory phase. The measured Te is displayed in the monitoring menu during ventilation.
Ti (Inspiratory time -s)	The duration in seconds of the last inspiratory phase. The measured Ti is displayed in the monitoring menu during ventilation.
Exhalation Tidal Volume (VTE -ml)	The expired volume measured over the last breath. Vte is displayed in the monitoring menu during ventilation.
Inspiratory Tidal Volume (VTI- ml)	The inspired volume measured over the last breath. Vti is displayed in the monitoring menu during ventilation.

Other Definitions

IP22	Ingress protection level
IP2X	protects against the ingress of solid objects with >12.5 mm diameter.(e.g. fingers)
IPX2	protects against the ingress of water droplets (at 15° angle tilt)

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