



EO-BAT9 USER GUIDE

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1 Introduction

1.1 EO-BAT9

The EO-BAT9 is a medical device accessory that increases the autonomy of the EO ventilators. The battery pack is intended to be used in home, institution, and portable environment. This User Guide is designed for a patient or caregiver.

1.1.1 Medical Indications

The EO-BAT9 battery pack has no medical indications. It is a MD accessory that increases the autonomy of the EO ventilators. These ventilators are themselves used to treat patients with acute or chronic respiratory failure (e.g., COPD, OHS, NMDs etc.).

1.1.2 Patient Population

The EO-BAT9 battery pack has no specific target population. It is a MD accessory that increases the autonomy of the EO ventilators. These ventilators are themselves designed to equip paediatric and adult patients weighing at least 3.5kg (8lbs) who require mechanical ventilation. These patients can be ventilator dependent or not, and can required invasive or non-invasive ventilation.

1.1.3 Contraindications

There are no known contraindications given the nature of the EO-BAT9 device.

1.1.4 Adverse Effects

There are no known adverse effects given the nature of the EO-BAT9 device.

1.2 Warnings and safety rules

1.2.1 Definitions

	WARNING	INDICATES A CONDITION THAT MAY ENDANGER THE PATIENT OR THE DEVICE OPERATES
	CAUTION	Indicates a condition that may damage the device or equipment
	Note	Advice that makes operation of the device more convenient or efficient

Read, understand, and follow these instructions before using the EO-BAT9. In addition, to use the battery pack correctly and efficiently and to help prevent incidents, review and adhere to all warnings and cautions contained in the User guide specific to the ventilator in use.

1.2.2 Warnings



FIRE HAZARD WARNINGS

- NEVER EXPOSE BATTERIES TO DIRECT FLAMES.



WARNINGS BEFORE USING EQUIPMENT

- ALWAYS VERIFY THE PROPER FUNCTIONING OF THE BATTERY PACK BEFORE USING.
- NEVER USE A BATTERY PACK OR ANY COMPONENTS OR ACCESSORIES THAT APPEAR TO BE DAMAGED. IF ANY SIGNS OF DAMAGE ARE EVIDENT, CONTACT YOUR EQUIPMENT SUPPLIER OR EOVE.
- INSTALL EO-BAT9 AND ITS ACCESSORIES WITH THE SUPPORT OF A TECHNICIAN TRAINED TO THE DEVICES INVOLVED.



WARNINGS REGARDING ENVIRONMENT OF USE

- DO NOT OPERATE IN DIRECT SUNLIGHT, NEAR HEAT SOURCES, OR NEAR INSTALLATION WHERE LIQUID MAY POSE A RISK WITHOUT FIRST PROVIDING ADEQUATE PROTECTION FOR THE DEVICE.
- TO ENSURE CORRECT AND LASTING OPERATION OF THE DEVICE, INSTALL AND OPERATE THE EQUIPMENT IN THE ENVIRONMENTAL CONDITIONS RECOMMENDED IN THIS MANUAL.
- HANDLE THE BATTERY PACK WITH CARE DURING AND AFTER USE, PARTICULARLY WHEN AMBIANT TEMPERATURES ARE HIGH. SOME BATTERY PACK SURFACES MAY BECOME HOT EVEN IF SAFETY SPECIFICATIONS ARE NOT EXCEEDED.
- IF THE BATTERY PACK HAS BEEN TRANSPORTED OR STORED AT A TEMPERATURE THAT DIFFERS MORE THAN +/- 20°C FROM THE TEMPERATURE IN WHICH IT WILL BE OPERATING, ALLOW THE BATTERY PACK TO STABILISE IN ITS OPERATING ENVIRONMENT FOR AT LEAST TWO HOURS PRIOR TO USE.
- DO NOT CHARGE OR DISCHARGE LI-ION BATTERIES OUTSIDE OF THE TEMPERATURE RANGE RECOMMENDED.



WARNINGS APPLICABLE DURING USE OF EQUIPMENT

- ALWAYS HANDLE THE EO-BAT9 WITH CARE.
- TO MINIMISE THE RISK OF DAMAGE, YOU MUST USE THE BATTERY PACK BAG TO TRANSPORT THE BATTERY PACK.
- NEVER IMMERSE THE DEVICE IN ANY LIQUID OR ALLOW LIQUID TO ENTER ANY DEVICE OPENING. NEVER PLACE A CONTAINER OF LIQUID ON TOP OF THE DEVICE. IMMEDIATELY WIPE AWAY ANY LIQUID ON THE SURFACE OF THE DEVICE.
- DISCONNECT AND MONITOR ANY CHARGER OR BATTERY THAT GETS TOO WARM (TOO HOT TO MAINTAIN HAND CONTACT) AS THIS MIGHT BE AN EARLY SIGN OF STRUCTURAL DAMAGE TO THE CELL
- FULL DEPLETION OF A LI-ION BATTERY IS NOT RECOMMENDED, AS EXCESSIVE DEPLETION MIGHT RESULT IN "HIBERNATION" OF SAFETY FEATURES.
- CHARGING LI-ION BATTERIES DURING FLIGHT IS NOT ALLOWED, IT IS RECOMMENDED TO USE MULTIPLE EO-BAT9 IF NECESSARY.
- IF A BATTERY IS DROPPED OR DAMAGE IS IDENTIFIED/SUSPECTED, IT SHOULD BE FORWARDED TO THE SERVICE EQUIPMENT OFFICER, QUARANTINED AND THEN DISPATCHED TO THE MANUFACTURER OR RELEVANT SERVICING AGENCY FOR CHECKING/SERVICING.



WARNINGS REGARDING ELECTRICAL POWER

- THE BATTERY PACK IS INTENDED TO FUNCTION WITH THE EXTERNAL SUPPLY 2541 FROM MASCOT. NEVER USE ANY OTHER POWER SUPPLY APPART WHEN USED WITH EXTERNAL BATTERY COUPLING (EO-EXTBATCBL) OR UNLESS RECOMMENDED BY EOVE.
- TO DISCONNECT THE DEVICE FROM THE MAINS, UNPLUG POWER SUPPLY.
- ENSURE THE BATTERY PACK AND THE VENTILATOR'S INTERNAL BATTERY ARE FULLY CHARGED BEFORE CONNECTING THE VENTILATOR TO THE BATTERY PACK.
- POWERING THE VENTILATOR USING THE BATTERY PACK DOES NOT ENABLES ITS INTERNAL BATTERY TO RECHARGE.
- WHEN RECHARGING THE BATTERY PACK, THE POWER SUPPLY TO WHICH THE EXTERNAL CHARGER IS CONNECTED MUST COMPLY WITH ALL APPLICABLE STANDARDS AND PROVIDE ELECTRICAL POWER CORRESPONDING TO THE AC VOLTAGE CHARACTERISTICS ON THE EXTERNAL CHARGER LABEL.
- TO ENSURE VENTILATION CONTINUES UNINTERRUPTED, ENSURE ALTERNATIVE POWER SOURCES ARE AVAILABLE (AC POWER SOURCE, SECOND BATTERY PACK OR AN AUXILIARY DC CAR ADAPTER). BE PREPARED FOR THE POSSIBILITY OF POWER FAILURE BY HAVING AN ALTERNATIVE MEANS OF VENTILATION READY FOR USE.
- TO AVOID DAMAGE TO THE BATTERY OR ELECTRICAL COMPONENTS, PREVENTS FLUID FROM ENTERING THE DEVICE.
- ENSURE THAT THE AC AND DC POWER CABLES ARE IN PERFECT CONDITION AND NOT COMPRESSED. THE DEVICE SHOULD NOT BE TURNED ON IF THE AC OR DC POWER CABLE IS DAMAGED.
- THE MAXIMUM RECOMMENDED SHELF LIFE OF THE BATTERY PACK IS THREE YEARS. DO NOT USE A BATTERY PACK THAT HAS BEEN STORED FOR THREE YEARS OR MORE. PERIODIC RECHARGING IS IMPORTANT TO HELP MAXIMISE USEFUL OF THE BATTERY. DO NOT STORE THE BATTERY PACK FOR EXTENDED PERIODS WITHOUT RECHARGING, AS THIS MAY REDUCE THE MAXIMUM LIFE.



WARNINGS REGARDING MAINTENANCE

- DO NOT ATTEMPT TO OPEN OR REPAIR THE BATTERY PACK. DOING SO MIGHT ENDANGER THE PATIENT, DAMAGE THE BATTERY AND VOID THE GUARANTEE.
- THE BATTERY PACK IS DISPOSABLE. THERE IS NO NEED FOR MAINTENANCE.
- REGULARLY CLEAN THE BATTERY PACK ACCORDING TO THE PROCEDURE DESCRIBED IN THIS MANUAL.
- REGULARLY CLEAN THE TRAVEL BAG ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.



WARNINGS TO PROTECT THE ENVIRONEMENT

- THE BATTERY PACK SHOULD BE CONSIDERED AS WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE). DISPOSE OF THE BATTERY PACK IN ACCORDANCE WITH LOCAL REQUIREMENTS AND REGULATIONS.

2 General information

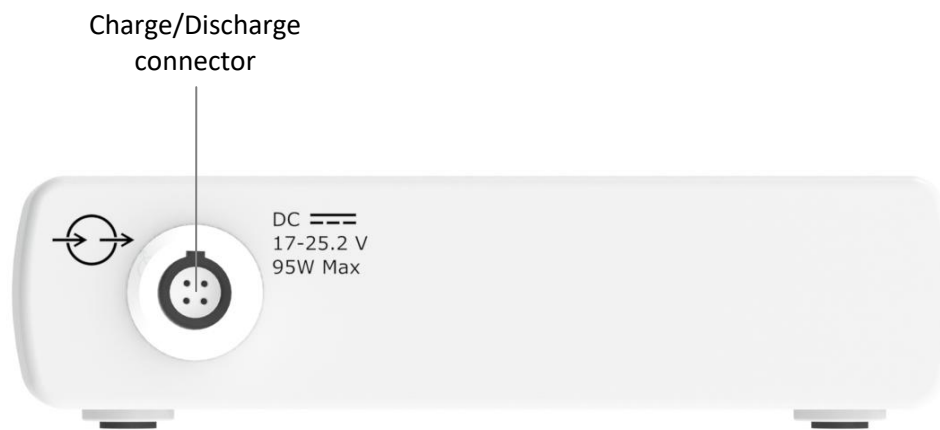
2.1 Description of the EO-BAT9



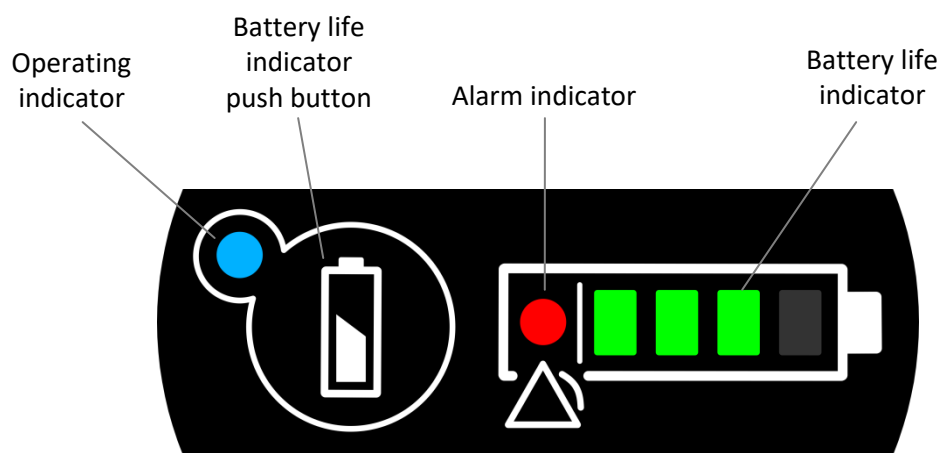
EO-BAT9



EO-BAT9 - Front view



EO-BAT9 - Rear view



Keyboard view

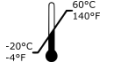
2.2 Discharge cable



Discharge cable

Note : The EO-BAT9 connector on the charger cable is the same as the one on the discharge cable.

2.3 Symbols table

Symbol	Description
	Connection port
	DC power inlet
	Consult operating instructions
	Operating indicator
	Alarm indicator
	Push button
	Battery life indicator
	Serial number
	Class II device
IP22	International Protection Marking, IEC standard 60529 Protection against ingress of water and foreign objects
	Should not be disposed of in household waste
	Complies with European legal requirements
	Manufacturer
	Keep dry
	This side up
	Fragile - Handle with care
	High and low temperature limitation
	High and low humidity limitation
	High and low atmospheric pressure limitation
	Recyclable
	Importer
	Inlet

	Outlet
	Inlet / Outlet
	Information

2.4 Indications for use

The EO-BAT9 battery pack is a medical device that increases the autonomy of EO ventilators. It is an external DC power source.

2.5 Environment of use

The EO-BAT9 battery pack device is intended to be used in home, institution, hospital, portable and mobility environments (i.e. Train, Car, Airplane, Wheelchair).

2.6 Users

The non-specialist operators of the EO-BAT9 battery pack, as defined by the IEC 60601-1, are:

- The patient;
- The patient's family;
- The caregivers.

The Clinical operators are:

- Doctors;
- Nurses;
- Physiotherapists.

The responsible organization operators are:

- The installation technician and;
- The maintenance technician.

2.7 Content of packaging

The Battery Pack for EO-Series Ventilators, ref **EO-BATPCK** includes:

- A battery pack: **EO-BAT9**
- A charger: **EO-BATCHRG**
- A discharge cable: **EO-BATCBL**

2.8 Serial number explanation



The serial number of EO-BAT9 can be found on the label just after the  symbol. It appears also after the application identifier (21) encoded in the barcode. The format is EO BAT9YYMMiii. It includes the manufacturing date at the format YYMM.

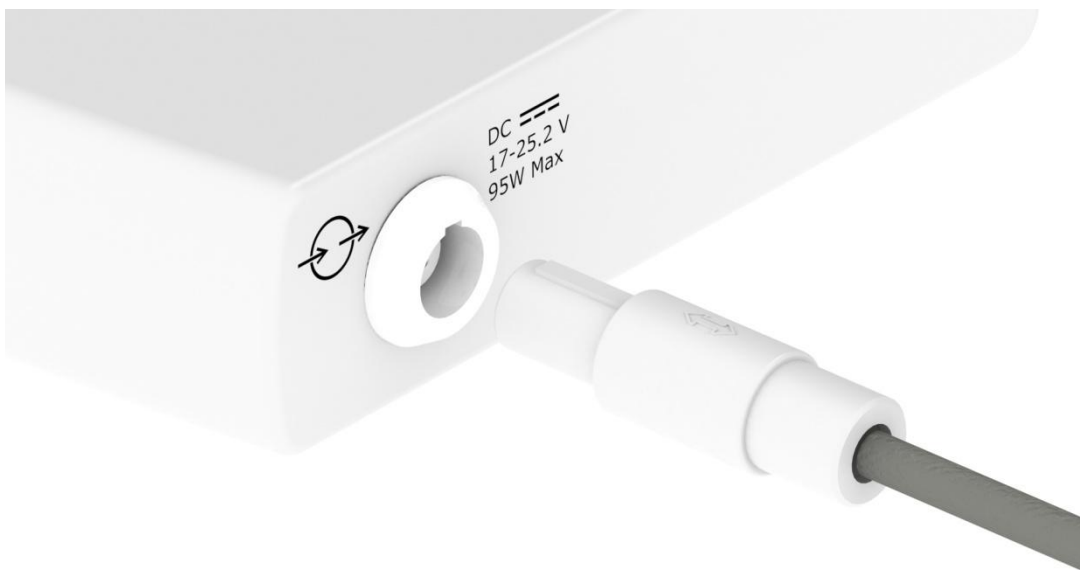
3 Operating instructions to connect the EO-BAT9

3.1 Connect the EO-BAT9 to the EO Ventilator



WARNING:

- ENSURE THE BATTERY PACK AND THE VENTILATOR'S INTERNAL BATTERY ARE FULLY CHARGED BEFORE CONNECTING THE VENTILATOR TO THE BATTERY PACK.
- IF THE BATTERY PACK HAS BEEN TRANSPORTED OR STORED AT A TEMPERATURE THAT DIFFERS MORE THAN +/- 20 °C FROM THE TEMPERATURE IN WHICH IT WILL BE OPERATING, ALLOW THE BATTERY PACK TO STABILISE IN ITS OPERATING ENVIRONMENT FOR AT LEAST TWO HOURS PRIOR TO USE.



Charge/Discharge Connector

- Line up the connector on the cable with the port on the battery pack.
- Push the connector onto the socket until an audible click occurs. The click indicates the connectors are locked together.

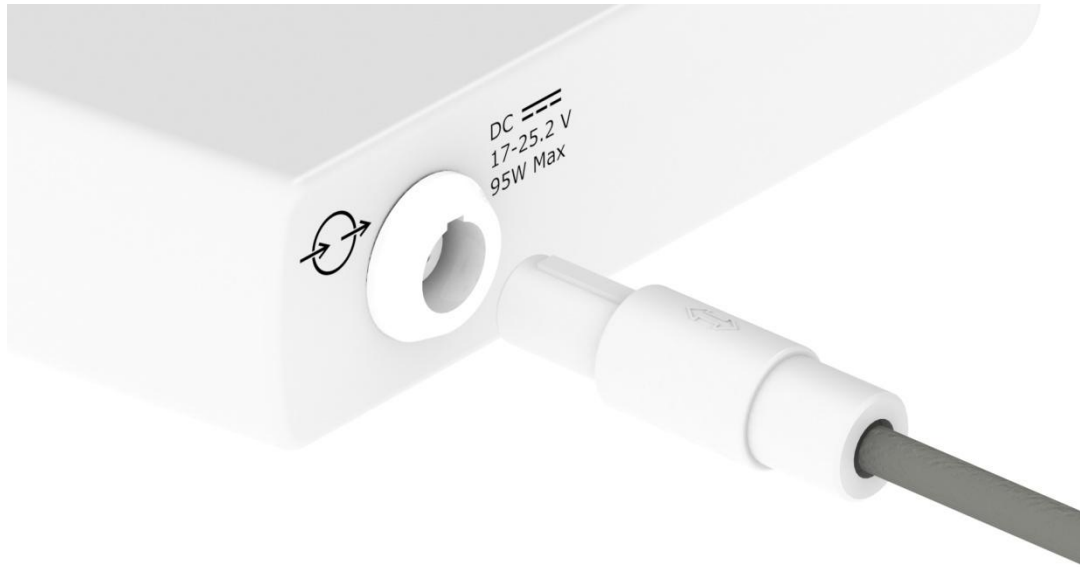


EO-150 Charge connector

- Plug the DC connector in the ventilator and screw the nut.

Note: The ignition of the DC power indicator on the ventilator's keyboard indicates a proper connection between the two devices.

3.2 Charge the EO-BAT9



Charge/Discharge Connector

- Line up the connector on the DC power cable with the port on the battery pack.
- Push the connector onto the socket until an audible click occurs. The click indicates the connectors are locked together.
- Connect the end of the AC power cable to the charger and the other end to a main power outlet.



WARNING:

- DO NOT ATTEMPT TO CONNECT THE EO-BAT9 CHARGER WITH THE EO VENTILATOR. DO NOT ATTEMPT TO CONNECT THE EO VENTILATOR CHARGER WITH THE EO-BAT9.

3.3 Disconnect the cables from the EO-BAT9

- Grasp the plug connected on the battery pack.
- Slide the locking ring back.
- Pull the plug away from the battery pack to disengage it.

Note: An "DC POWER LOSS" alarm on the ventilator signals the disconnection with the EO-BAT9 and an automatic switch to the ventilator internal battery.

The battery pack EO-BAT9 automatically turns off when the discharge cable is disconnected.

3.4 Connecting EO-BAT9 to EO150 with the Y Cable External Battery Coupling (EO-EXTBATCBL)

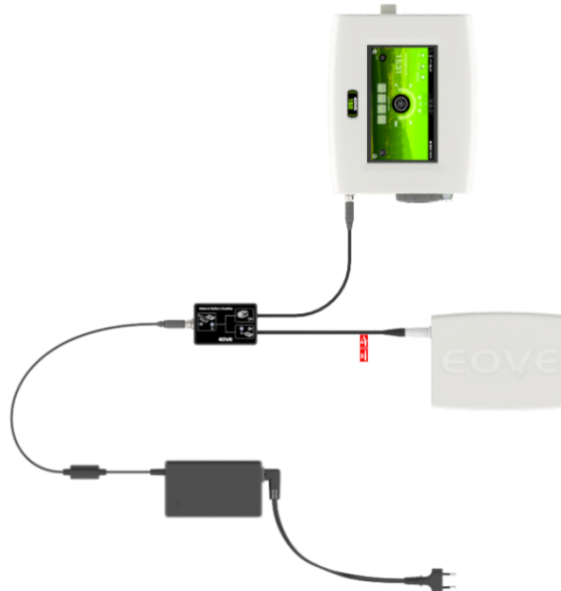
Connecting the EO-BAT9 and the EO-150 power supply

In this configuration, the AC/DC power supply is powering the EO-150 while it is connected to the mains and the EO-BAT9 is maintained charged. If the power supply is disconnected from the mains, the EO-BAT9 will then supply the EO-150 and will no longer be charged.

Note: The EO-EXTBATCBL was designed to maintain the EO-BAT9 charged (compensating self-discharge of the battery pack) and not for an optimal charge when the EO-BAT9 has been fully discharged. For a fast charge, we recommend using the EO-BAT9 charger separately from the EO-EXTBATCBL.

The full charge of the EO-BAT9 through EO-EXTBATCBL should typically vary from 9h to 15h depending on the ventilator power consumption (e.g. Internal battery charge in progress or not).

In extreme cases, if the ventilator maintains a very high power consumption, the charge could last up to 45 hours. In that case, contact your service provider since it is not a normal situation.



Connecting two EO-BAT9

In this configuration, the EO-150 will be powered successively by the two EO-BAT9. In this configuration no charge will occur. The pack connected to the first priority channel (using the discharge cable) will supply the EO-150 first.



WARNING:

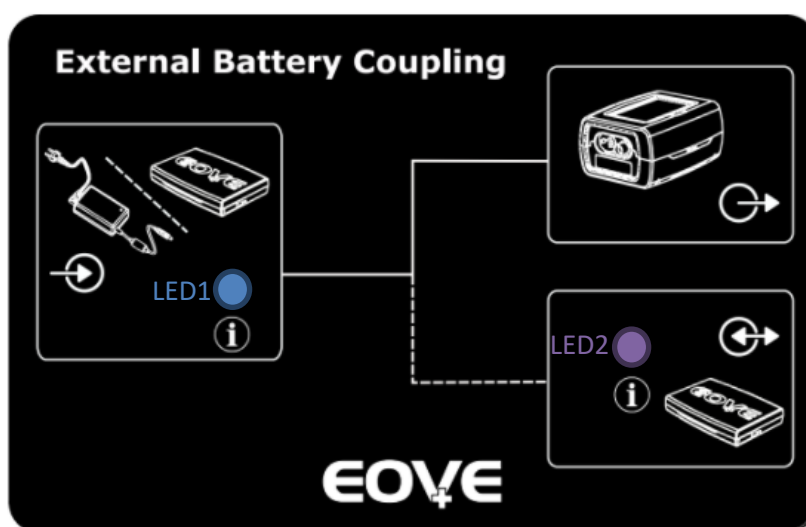
THE EO-EXTBACBL MUST BE USED IN ONE OF THE CONFIGURATIONS ABOVE. ANY ATTEMPT TO CONNECT OTHER DEVICES OR SAME DEVICES IN DIFFERENT CONFIGURATIONS WOULD LEAD TO A SIGNIFICANT RISK FOR THE VENTILATOR SAFETY AND FOR THE PATIENT. DO NOT CONNECT THE OUTLET PLUG (DEDICATED TO THE VENTILATOR) TO THE INLET, IT WILL RESULT IN AN NON-FUNCTIONNING OF THE OVERALL SYSTEM (NO POWERING OF THE EO-150 AND NO CHARGE OF THE EO-BAT9).

Connecting one EO-BAT9

In that case, the connection could be done through the EO-EXTBACBL but preferably using the second priority connection integrating the EO-BAT9 discharge cable. If placed in the wrong position the corresponding LED will blink in red.



EO-EXTBATCHBL visual indication



LED considered	Color	Description
LED1 First priority supply status	● Constant Blue	First priority Supply in use
	○ OFF	First priority supply not available
LED2 Second priority supply status	● Constant Purple	EO-BAT9 in use
	● Blinking Purple	EO-BAT9 is available (but charge is not maintained / no power supply connected)
	○ OFF	EO-BAT9 not available
	● Blinking Green	EO-BAT9 is available and charging (1)
	● Constant Green	EO-BAT9 is available and fully charged (2)

Troubleshooting EO-EXTBATCHBL Visual indication

LED considered	Color	
LED1 First priority supply status	○ OFF (while supply is connected)	Potential issue with the power supply or the EO-EXTBATCHBL, contact your technical assistance.
LED2 Second priority supply status	● Blinking Red OR ○ OFF (while EO-BAT9 is connected and charged)	Potential issue with the EO-EXTBATCHBL cable or the EO-BAT9, contact your technical assistance.

Notes:

- (1) If the green led is flashing (very brief blinking) more than a few seconds, it could mean the battery is not yet available for discharge (it requires a minimum charge to be available).
- (2) Fully charged indication could mean the charge is between 80% and 100% since the charge is not restarting above 80% (to preserve battery lifetime).

4 EO-BAT9 operation

4.1 Connection with the EO Ventilator

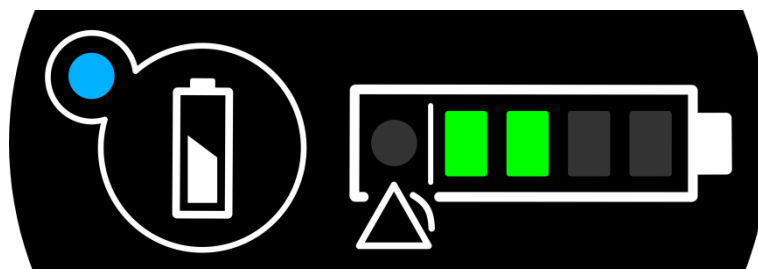
Any time the ventilator is not connected to a power main source but is connected to the EO-BAT9, the ventilator runs on the EO-BAT9 battery. The AC/DC power indicator LED on the ventilator's keyboard is also lit.



Ventilator's keyboard - EO-BAT9 powering the ventilator

4.2 Keyboard indicators

When the EO-BAT9 is connected to a ventilator or to the charger the keyboard is active. When it is not connected the keyboard is inactive. Pressing the push button active the keyboard and display the battery level.



Keyboard activated



Keyboard not activated

4.3 Indicators when the EO-BAT9 is charging

This applies only when the EO-BAT9 is directly connected to the external charger and not when it is charged through the EO-EXTBATCBL.

When the EO-BAT9 is charging, the battery life indicator on the keyboard switches battery level LEDs on.

The LED on the external charger also lights up whilst the battery pack is connected to.

LED colour	State of battery
Orange	Start of charge
Yellow	Medium level of charge
Green	Charge complete

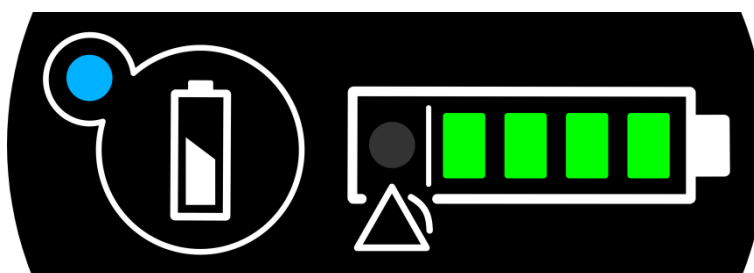
Charger LED colour code

Note: When the external charger is not connected to the EO-BAT9 the LED is green. Please refer to the 6.1 to know the specifications and the characteristics of the external charger.

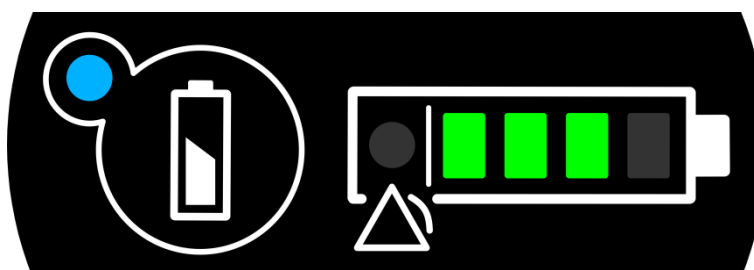
4.4 Indicators when the EO-BAT9 is powering the ventilator

4.4.1 Battery life indicator

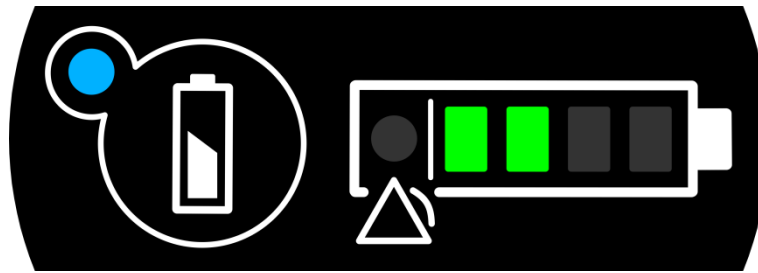
The battery life indicator displays the remaining battery power. If all the four LEDs are lit the battery is fully charged. Only the farthest-left LED remains lit when the battery is almost empty.



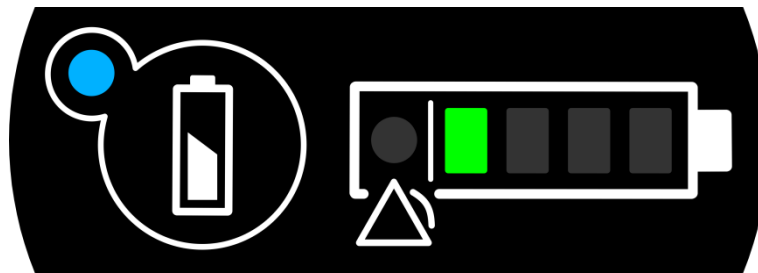
Battery level > 80%



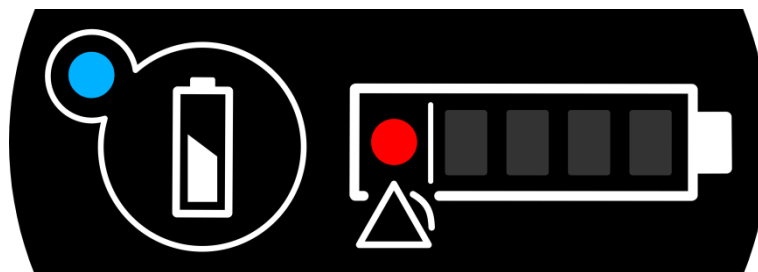
Battery level > 60%



Battery level > 40%



Battery level > 20%

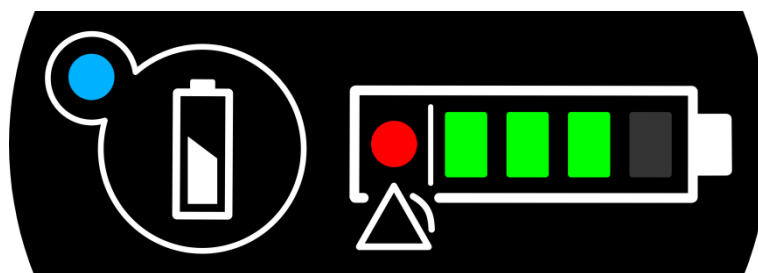


Battery level < 20% or depleted

Note: When the battery pack is fully depleted, the ventilator automatically switches to the ventilator's internal battery and an audible and visible "DC POWER LOSS" alarm triggers on the ventilator.

4.4.2 Charge temperature fail indicator

When the battery pack is operating outside recommended environmental conditions, the alarm indicator LED lights up and the battery life indicator LEDs remains lit when charge is in progress.



Temperature fail

4.5 Battery life indicator

The operator can check the level of charge of the battery when it is not connected to the ventilator or the charger by pressing continuously the charge indicator push button.

5 EO-BAT9 maintenance

5.1 EO-BAT9 cleaning



WARNING:

- USE ALL CLEANING SOLUTIONS AND PRODUCTS WITH CAUTION. READ AND FOLLOW THE INSTRUCTIONS ASSOCIATED WITH THE CLEANING SOLUTIONS YOU USE TO CLEAN THE BATTERY PACK.
- NEVER IMMERSE THE DEVICE IN ANY LIQUID OR ALLOW LIQUID TO ENTER ANY DEVICE OPENING. NEVER PLACE A CONTAINER OF LIQUID ON TOP OF THE DEVICE. IMMEDIATELY WIPE AWAY ANY LIQUID ON THE SURFACE OF THE DEVICE.
- TO AVOID DAMAGE TO THE BATTERY OR ELECTRICAL COMPONENTS, PREVENT FLUIDS FROM ENTERING THE DEVICE.
- ALWAYS UNPLUG THE BATTERY PACK BEFORE CLEANING AND VERIFY THAT IT IS DRY BEFORE PLUGGING IT BACK.
- CLEAN ONLY EXTERIOR SURFACES OF THE BATTERY PACK.
- DO NOT CLEAN A DAMAGED DEVICE, REPLACE IT OR HAVE IT REPAIRED BEFORE CLEANING

Wipe the exterior surfaces of the EO-BAT9 and EO-EXTBACBL with a damp cloth using a mild cleaning solution as often as necessary.

Clean the battery pack periodically whenever it is soiled or dirty and before storing.

5.2 Periodic safety checks

The user should perform some safety checks regularly:

- Checking of the proper appearance and cleanliness of the EO-BAT9 and EO-EXTBACBL.
- Checking of the clarity and legibility of the labels on the battery pack.
- Checking of the DC connector power cable proper appearance: ensure the DC connector power cable does not exhibit any signs of damage, such as kinks, breaks or damaged insulation.
- Checking of the autonomy in typical settings (autonomy will decrease overtime down to 70% of initial autonomy after three years with a full cycle of charge/discharge under 23°C once every two to three days, equivalent to 500 cycles of charge/discharge in total, when used according to this manual recommendations, please note the duration and number of cycles are indicative.)

Under a storage temperature from +20 °C to +30 °C, the EO-BAT9 should be charged every six months.

Under a storage temperature out of +20 °C to +30 °C, but within -20 °C to +55 °C, the EO-BAT9 should be charged every three months.

The EO-BAT9 should be replaced every three years or 500 cycles of charge/discharge, whichever condition reaches the first (When autonomy is lower than 70% of initial battery duration on similar ventilator settings).

5.3 Disposal instructions



WARNINGS:

- THE BATTERIES TO REJECT, MUST BE HANDLED WITH CARE.
- THE DISPOSAL OF DEFECTIVE BATTERIES SHOULD BE DONE IN COMPLIANCE WITH THE LAWS IN EFFECT IN YOUR COUNTRY. LITHIUM-ION BATTERY, WHEN DEFECTIVE, MIGHT PRESENT EXPLOSION OR COMBUSTION RISKS. USED BATTERIES MUST BE STORED IN CLOSED RATIFIED BOXES WITH APPROPRIATE PROTECTION (LIKE VERMICULITE) AGAINST IMPACTS AND OVERHEATING PROPAGATION. COLLECTION TOWARD A RECYCLING CENTER, MUST BE DONE BY ACCREDITED CHANNELS ABLE TO PROVIDE CERTIFICATE AND TRACEABILITY.
- ENVIRONMENTAL ACCIDENTS SUCH AS EARTHQUAKES, FLOODS, HURRICANES, TSUNAMIS, AND SAFETY RISKS THEY CAN CAUSE ONTO THE DEVICE ON THE MAINTENANCE CENTER, HAVE NO ENVIRONMENTAL IMPACT EXCEPT FIRE. INDEED, LITHIUM-ION BATTERY COMBINED WITH HEAT EXPOSURE MAY INCREASE FIRE AND EXPLOSION RISKS, AND RELEASE DANGEROUS AND TOXIC GAS FOR THE HUMANS, ANIMALS AND THE ENVIRONMENT. STORE THE BATTERIES AWAY FROM SUN EXPOSURE AND FLAMMABLE MATERIALS, ON A NON-COMBUSTIBLE SURFACE.



Lithium Ion Batteries	Electronic boards	Electronic waste	Plastic / shells

6 Product specifications

6.1 External charger electrical characteristics

Voltage	Frequency	Consumption
Input: 100 VAC to 240 VAC	50 Hz / 60 Hz	90 VA max
Output: 25.2 V	Continuous	1.4 A

LED colour	Voltage and current
Orange	25.2 V 1.4 A
Yellow	25.2 V < 0.6 A
Green	< 0.1 A Ready / Stand by

6.2 EO-BAT9 electrical characteristics

Characteristics	EO-BAT9 battery
DC Voltage output	21.6 VDC (nominal) 17 – 25.2 VDC
Max Power output	95 W
Max Current output	5.5 A
Full-load capacity	4.4 Ah
Battery recharge time	Full recharge (with EO-BATCHRG charger): < 4 h Full recharge (through EO-EXTBATCBL): From 9 h to 15 h
Charging current	With EO-BATCHRG charger: 1.4 A Through EO-EXTBATCBL: 0.1 A or 0.5 A

6.3 EO-BAT9 Physical characteristics

Characteristics	EO-BAT9 battery
Dimensions	190 x 138 x 32 mm
Weight	850 g

6.4 EO-BAT9 battery run time

The EO-BAT9 run time is determined by:

- Environmental conditions,
- The conditions and age of the battery,
- The ventilator settings,
- The current circuit in place and unintentional leak.

The EO-BAT9 battery pack will power the ventilation module during at least nine hours when the ventilator is used according to the following configurations at 21°C +/- 3°C:

- for an adult patient (Resistance: 20 cmH₂O/l/s, Compliance: 25 ml/cmH₂O): Inspiratory pressure: 20 cmH₂O, Ventilation Rate: 15 bpm, I/E ratio: 1/2, PEEP: OFF, VT=300ml.
- for an adult patient (Resistance: 5 cmH₂O/l/s, Compliance: 50 ml/cmH₂O): Inspiratory volume: 800 ml, Ventilation Rate: 20 bpm, I/E ratio: 1/2.

NOTE
• Always look at the device indication to know the real conditions expected autonomy.
• Those reference external 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 30% to 40%.
• Those reference external battery run time are given for a new external battery pack. When used with an external battery pack used for 3 years (500 charge/discharge cycles) , the residual operation time is reduced to 70%.
• Those reference external battery run time are given under ambient temperature. When used under extern temperature, the operation time is reduced to 80% at 5°C, and to 99% at 40 °C
• These ventilator parameters represent an average and representative use for ventilator-dependent patients

6.5 Environmental conditions

Operating:

Ambient Temperature range	From +5 °C to +40 °C (after conditioning for 20 min)
Relative humidity	From 10 % to 95 % (non-condensing)
Atmospheric pressure	From 600 hPa to 1100 hPa

Transport

Temperature	From -20 °C to +60 °C
Relative humidity	From 10 % to 95 % (non-condensing)
Atmospheric pressure	From 500 hPa to 1100 hPa

Storage (< 3 months):

Temperature	From -20 °C to +55 °C
Relative humidity	From 10 % to 85 % (non-condensing)

Atmospheric pressure	From 500 hPa to 1100 hPa
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Storage (< 6 months):

Temperature	From +20 °C to +30 °C
Relative humidity	From 10 % to 85 % (non-condensing)
Atmospheric pressure	From 500 hPa to 1100 hPa

Note: If stored outside the ambient temperature range, but within the storage range, the battery pack should be fully functional two hours after placement in +23 °C environment.

6.6 Product compliance

Protection type	Class II
Mode of operation	Continuous
Liquid ingress	IP22
Medical device directive	IIb
Classification	
Essential performance	Supply the ventilator or equipment attached to

6.7 Guidance and manufacturer's declaration electromagnetic emissions and immunity

All information below is issued from normative requirements applicable for medical-electrical devices according to IEC60601-1-2.

The device complies with applicable regulations, but the user should make sure that electromagnetic interferences are not creating additional risks, for example coming from radiofrequency emitters or other kind of electronic devices.

In this chapter, you will find all necessary information to ensure installation of the device in the best conditions regarding electromagnetic compatibility.

The various cables of the device should be distant one from another.

Some devices such as mobile phones are susceptible to interfere with this medical device. The separation distances recommended by this chapter must be strictly followed.

Using other accessories or spare parts than the one recommended or sold by EOVE could lead to increasing the emissions or decreasing the immunity of the device.



WARNING:

- THE VENTILATOR AND THE EO-BAT9 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 AND THE EO-BAT9 SHOULD BE CHECKED CAREFULLY AND OBSERVED TO ENSURE CORRECT FUNCTIONING OF THE DEVICE.
- ONLY ACCESSORIES RECOMMENDED FOR THE EO-BAT9 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: 

- EO-BAT9 IS DESIGNED FOR USE IN THE ELECTROMAGNETIC ENVIRONMENT DESCRIBED BELOW. THOSE USING THE DEVICE SHOULD ENSURE THAT THE EO-BAT9 IS USED IN SUCH AN ENVIRONMENT.

Cable length

Cables and accessories	Max length	Test type	Complies with
AC cable, Y cable and discharge cable	< 3 m	RF emissions	CISPR 11, Classe B
		Harmonic Emissions	IEC 61000-3-2
		Voltage Fluctuations/Flicker Emissions	IEC 61000-3-3
		Immunity to Electrostatic discharge (ESD)	IEC 61000-4-2
		Immunity to Magnetic field, radiated RF	IEC 61000-4-3
		Immunity to Electrical fast transient/burst	IEC 61000-4-4
		Immunity to Surge	IEC 61000-4-5
		Immunity to Conducted RF	IEC 61000-4-6
		Immunity to Power frequency (50/60 Hz) magnetic field	IEC 61000-4-8
		Immunity to Voltage dips, short interruptions and voltage variations on power supply input lines	IEC 61000-4-11

Recommended separation distance

EOBAT9 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 EOBA79, including specified cables. Not respecting this recommendation could lead to performance alteration.

Electromagnetic emissions

Emissions test	Level of compliance	Guidance for EM environment
RF emissions CISPR 11	Class B	EOBAT9 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	
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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 0% Ut for 1 cycles 70% Ut for 25&30 cycles	0% Ut for 0.5 cycle 0% Ut for 1 cycles 70% Ut for 25&30 cycles	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.
Voltage Interruption IEC 61000-4-11	0% Ut for 250 & 300 cycles	0% Ut for 250 & 300 cycles	
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	3 Vrms 150 kHz to 80 MHz	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
Proximity fields emitted by RF wireless communication devices IEC 61000-4-3 (provisional method)	3 V 80 MHz to 2.5 GHz 6 V in ISM Band	3 V 80 MHz to 2.5 GHz 6 V in ISM Band	for home health care environment and a professional health care establishment

6.8 Standards compliance

The EO-BAT9 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
- IP22 with respect to access to hazardous parts and ingress of moisture
- Not suitable for use in the presence of flammable anesthetic 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 60601-1-11: 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 62133-2: Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems

6.9 Training and support

Training and support are available on the EOVE website, www.eove.fr or by calling our helpline at +33 (0)5 59 21 86 84.

6.10 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 twelve month warranty period, covering the costs of defective parts. Such warranty shall be effective from the expiration of a fifteen 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 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:

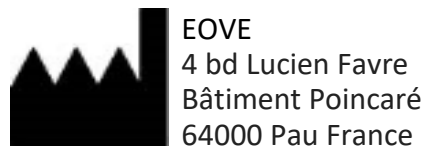
- Products have not been installed and operated in accordance with factory recommendations and user manual instructions;
- Products are no longer in their original packaging;
- Products are not accompanied by their instruction manuals and accessories;
- Products have been repaired by a non-Seller-accredited provider.

6.11 Revision history

Date	Revision	Change details from previous version
Oct. 2022	H New version of EO-BAT9 without USB port.	• Chapter 1: Addition of warnings. • Chapter 2: Intended use clarifications. Addition of serial number description. • Chapter 3: Addition of the EO-EXTBATCBL usage description • Chapter 5: Addition of disposal instructions and warnings • Chapter 6: Revision of technical characteristics. Revision of Guidance and manufacturer's declaration electromagnetic emissions and immunity. Revision of standard list.
Feb. 2025	I	• Chapter 1: Addition of §1.1.1 - 1.1.4 • Chapter 5: §5.2 Revision of periodic safty check. • Chapter 6: Revision of Battery run time and the operation environmental conditions.
Nov. 2025	J	• Chapter 6: Revision of Battery run time



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CH	REP		