

Laerdal® Suction Unit Questions & Answers

Laerdal® Suction Unit w/ Bemis™ Canister

Pump Unit

How is the noise level?

The level of noise changes with the vacuum setting. When the vacuum is low (i.e. 80 or 120 mmHg) the sound is very silent. This is a perfect solution for use in hospital and home care.

The noise level from the unit will not exceed 57 dBA.

Are there any risks for contamination of the pump?

There is a filter in the canister that acts as an overflow protection (Note: Some canisters also have a mechanical overflow protection device). This should help prevent decontamination of the pump by stopping droplets from entering the pump unit. However, should the protection fail or be otherwise defeated, the pump may be decontaminated. If overflow of liquid from the canister is suspected, the LSU must be returned for service.

Do not try to open the LSU, unless you are trained and qualified by Laerdal to service it.

Will heavy rain enter the unit and damage the pump?

No, the LSU is splashproof – IP34D, tested according to IEC 529:1989.

Cleaning

How should I clean the unit?

Disconnect the LSU from external power prior to cleaning. Use a minimum of water and other liquids. Use a cloth or sponge that is dampened with mild detergent to clean the surface of the LSU, then wipe it with a cloth or sponge dampened with water. Dry with clean cloth or paper towel.

Free Air Flow/Vacuum

Is the free air flow changing when the vacuum setting is changed?

Yes. See table below:

Setting mmHG:	80	120	200	350	500+
Free air flow l/min:	12	16	20	25	>30

Usage

Can we suction when the LSU is placed in a horizontal position?

No, it is not recommended to suction when the LSU is in a horizontal position. At least not when larger amount of material is suctioned. If the LSU tips over and you suspect suction material has passed through the filter, check the filter for contamination or replace the canister.

Why has Laerdal chosen to use mmHg on the vacuum selector instead of mBar or kPa?

Users are more familiar with mmHg than mBar, hence we considered using this measurement more user-friendly.

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How do we convert mmHg to kPa and mBar?

1 mmHg = 0,133 kPa = 1,33 mBar

MmHg	kPa	MBar
150	20	200
500	67	667
600	80	800

Battery

Should the battery be on continuous charge?

Yes. The LSU Battery should be placed on continuous charge when not in use. Alternatively, the battery should be fully charged after each use and at least once a month.

How long time does it take to fully charge the battery?

24 hours. Fast charging option: 3 hours (gives approx. 80% of battery capacity).

The fast charging option should only be used when absolutely needed, not on a regular basis.

What happens with the internal lead-acid battery if it is run all the way down?

The battery is protected by an automatic shut-off function that will prevent harmful discharge. Thus, you cannot run the battery so low that damage will occur.

Will there be any charging problems after discharging the battery completely?

No. There is a built-in protection that will prevent the battery from being completely discharged. However, a discharged battery should not be stored. Always **fully charge the battery before storage.** If the battery is stored discharged or partly charged the lifetime of the battery will be reduced. Perform Battery Quality Test (DFU section 5.5) to check if battery needs to be replaced.

Can I charge the battery while the LSU is switched on?

No. You have to switch it off before charging starts.

How long can the LSU be operated a fully charged battery?

Approximately 30 minutes at 500+ mmHg free air flow, longer at reduced suction levels (refer to DFU section 9.4).

How often should I replace the battery?

We recommend replacing the battery at least every third year if battery is used and maintained properly. If poor battery quality is suspected you may check Date of Manufacture stated on the Battery Label or perform a test as described both on the battery and in the Directions For Use, Section 5.5.

Is the LSU Battery the same as used in the Heartstart 4000?

No. You may use the Heartstart 4000 Battery in the LSU; however, the LSU Battery should not be used in the Heartstart 4000. The Heartstart Battery has some additional features developed for that particular application.

Can the battery be charged on an external charger?

Yes, you may use the External Charger Kit (part number 78044001).

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External Power Sources

What is the expected power consumption when operating the LSU from an external power source?

20 W to 60 W, depending on the actual flow/vacuum level. By maximum free air flow at 500+ mmHg setting the typical power consumption would be approx. 25 W.

What are the external power requirements?

- . AC mains: 100-240 VAC +/- 15% (50/60/400 Hz), connection through AC-power cord or AC wall Bracket.
- . DC mains: 12-28 VDC +/- 10%, connection through DC-power cord or DC Wall Bracket.

What is the minimum current required to be delivered from the external AC/DC-power source during operation?

- . 1 A for external AC-power
- . 6 A from external DC-power

What is the minimum current required from the DC power source to charge the LSU battery and/or maintain a fully charged battery? (Connected to DC power source with LSU turned off)

(During Charging of an Empty Battery)

TIME CURRENT

0 - 1.5 hours Approx. 1250 - 1300 mA (constant)

1. 1.5 - 2.0 hours Approx. 700 - 350 mA (decreasing)
2. 2.0 - 3.5 hours Approx. 350 - 190 mA (decreasing)
3. 3.5 - 24 hours Approx. 120 mA (constant)

Will the unit be damaged if connected to a DC external power source exceeding the specified voltage range?

No, the LSU has an internal over-voltage protection to avoid damage to the unit if the LSU is connected to a DC-power above 28 V. In addition, this over-voltage protection will tolerate short fluctuations in DC voltage which might happen inside an ambulance or a helicopter.

Safety

What is the purpose of the Device Test?

To facilitate regular testing of each pump in use, check:

- If there are any significant obstructions in the system which reduces the free air flow.
- If the pump works adequately in order to build up the vacuum quickly. We check the vacuum reached within 3 seconds.
- If the tested LSU is able to deliver maximum vacuum at 500 mmHg (within 10 seconds).
- If there is any air leakage in the system.

What is the purpose of the Failure Mode Indicator?

When the Failure Mode Indicator is continuously lit (see DFU, Section 3.2.2.3), it gives an indication that a malfunction of the LSU has been detected. (The Service Manual describes how to detect the error by performing a device test while the red LED is lit).

Can the LSU be used in helicopters?

Yes, when operated from the internal battery.

What is the classification of the Suction Unit?

Classification according to EC directive 93/42/EEC II b.

Please read through the Directions for Use for more detailed information on the Laerdal® Suction Unit.