

Galvanic Pulse – battery removal and replacement by an independent professional



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1. What this document is, and who it is for

The Galvanic Pulse bracelet GW-GP-2000 contains one built-in rechargeable lithium-polymer cell. This document states how that cell is removed and replaced, and it is addressed to an **independent professional**, not to the owner of the bracelet.

It is published because the law requires the instructions and safety information for the removal and replacement of the battery to accompany the product and to be available permanently online.

Nothing here is a warranty commitment. Opening a bracelet ends the warranty on that bracelet.

2. The legal requirements

Regulation (EU) 2023/1542, Article 11. Paragraph 1 is the default: a portable battery must be “readily removable and replaceable by the end-user at any time during the lifetime of the product”, and the product must be “accompanied with instructions and safety information on the use, removal and replacement of the batteries”, which “shall be made available permanently online, on a publicly available website, in an easily understandable way for end-users”.

Paragraph 2 gives the derogation the Galvanic Pulse relies on:

“By way of derogation from paragraph 1, the following products incorporating portable batteries may be designed in such a way as to make the battery removable and replaceable only by independent professionals: (a) appliances specifically designed to operate primarily in an environment that is regularly subject to splashing water, water streams or water immersion, and that are intended to be washable or rinseable [...] The derogation set out in point (a) of this paragraph shall only be applicable where such derogation is required to ensure the safety of the user and the appliance.”

The bracelet is worn on deck and in the water, and it is sealed for that reason, so it is an appliance under point (a). Its battery can be removed and replaced by an independent professional with commercially available tools, without damaging the housing or the battery. Article 11 does not require the original ingress-protection rating to be restored after the battery is replaced.

United Kingdom – The Batteries and Accumulators (Placing on the Market) Regulations 2008, regulation 7(1):

“No person shall place on the market an appliance into which a battery is or may be incorporated unless that appliance is – (a) designed in such a way that a waste battery can be readily removed from that appliance; and (b) accompanied by instructions showing how the battery can be removed safely and, where appropriate, informing the end-user of the type of the incorporated battery.”

This document provides both the removal instructions and the battery type.

3. The bracelet

Item	Value
Product	Galvanic Pulse, GW-GP-2000
Radio	Bluetooth 5.0 Low Energy, 2402–2480 MHz, 0 dBm EIRP
Body	40 × 18 × 9.5 mm, ABS housing
Band	Silicone, 260 mm
Weight	33 g
Charging	Built-in USB-A plug, 5 V / 1 A maximum; 2–3 hours from empty
Construction	Two housing halves – main body and back plate – bonded by an adhesive bead laid in a channel around the rim. No screws
Internals	One circuit board with a Nordic nRF52 Bluetooth 5.0 chipset, accelerometer, temperature sensor, LED indicator, audible buzzer and a single button; a coin-type vibration motor wired to the board; one pouch cell connected to the board by a plug
Wristband	Detachable; held on the beacon body by a friction fit. Detaching it exposes the built-in USB-A plug
Battery life	About 2 months of normal use, broadcasting once per second

4. The cell

Item	Value
Cell model	HW 501220 (IEC 11NP5/12/20)

Chemistry	Lithium-ion polymer pouch cell, gel polymer electrolyte, single cell
Nominal voltage	3.7 V
Rated capacity	90 mAh
Energy	0.333 Wh
Charge limit	4.2 V
Discharge cut-off	2.7 V
Dimensions	about 26 × 16 × 8 mm
Connection	2-pin plug connector – no soldering
Mercury, cadmium, lead	None present
Transport test	UN 38.3, report LA2025B1243001U
Safety test	IEC 62133-2, report LA2025B1357001
Safety data sheet	LA2026B0531002M

A replacement cell must match the chemistry, the nominal voltage, the charge limit and the dimensions above, must fit the 2-pin connector, and must itself carry a UN 38.3 test summary and an IEC 62133-2 report.

5. Safety before the bracelet is opened

- A lithium-polymer pouch cell is damaged by pressure, puncture and heat. Do not bend, cut, pierce or crush it, and do not use a metal tool between the cell and the housing.
- Work on a bracelet that is **not on charge** and not connected to any USB port.
- Do not attempt the procedure on a cell that is swollen, discoloured, hot or leaking. Place it in a non-combustible container and take it to a battery collection point (§9).
- Have a way to smother a cell fire at hand. Water is not a suitable extinguishing agent for a lithium cell.
- The bracelet must be dry, inside and out, before it is opened and before it is re-closed.
- Apply only low heat to the housing: the cell is inside it.

6. Tools and materials

All of the following are commercially available and none is proprietary, which is the test Article 11(1) sets (“commercially available tools, without requiring the use of specialised tools [...] proprietary tools, thermal energy, or solvents”).

Item	Purpose
Stainless opening shim, about 0.3 mm	Starting the seam between the two housing halves
Two or three plastic opening picks	Walking the seam around the rim without marking the housing
Plastic spudger	Lifting the circuit board and cell assembly out of the body
Plastic tweezers	Handling the cell and its leads
Isopropanol 99 % and a lint-free cloth	Cleaning the cured adhesive out of the glue channel
Heat pad or hot air on a low setting, optional	Softening the old adhesive before the seam is started
Neutral-cure (alkoxy) silicone adhesive sealant	Resealing the glue channel
Replacement cell to the specification of §4	—

The adhesive must be neutral-cure. LOCTITE SI 5140 is the reference product: an alkoxy silicone, described by its manufacturer as “non-corrosive”, for “potting, coating and sealing of [...] electronic [...] components”, whose “full performance properties will develop over 72 hours” and which must have the parts “mated within a few minutes after the product is dispensed” (Henkel technical data sheet). An equivalent neutral alkoxy or oxime silicone may be substituted; its own data-sheet figures then replace these.

Do not use an acetoxysilicone — the common blue and clear RTV sealants, such as LOCTITE SI 5926. They release acetic acid as they cure, which corrodes the circuit board, the cell tabs and the USB contacts sealed inside with it. Cyanoacrylate is also unsuitable: it is brittle, and it leaves a white bloom on surfaces near the joint.

7. Removal and replacement

7.1 Preparation

1. **Take the bracelet out of service.** A bracelet registered to a boat that stops broadcasting while the boat is under way triggers a man-overboard alarm on the Galvanic Voice. Service it ashore, or with the boat not under way.
2. **Rinse and dry.** If the bracelet has been in salt water, rinse it in fresh water, dry the body and the USB-A contacts with a soft cloth, and let it air-dry completely.
3. **Detach the wristband.** The wristband is held to the beacon body by friction; there are no tabs. Find the small square button symbol on the transparent face of the wristband and pull the wristband away from the beacon on that side. The beacon body and its USB-A plug are now free. Set the wristband aside: it is not part of the procedure.
4. **Prepare the work surface.** A clean, dry, non-conductive mat, the tools of §6 laid out, and the replacement cell checked against §4 before anything is opened.

7.2 Opening

5. **Soften the adhesive, if needed.** Warm the rim with the heat pad or hot air on a low setting, moving continuously. The housing should become warm to the touch, never hot: the cell is inside.
6. **Start the seam.** Insert the 0.3 mm shim into the seam between the back plate and the main body, at a corner, keeping the blade flat and shallow so that it does not reach the cell.
7. **Walk the seam.** Slide a plastic pick into the gap opened by the shim and work it along the rim. Leave it in place and continue with a second pick, then a third, until the adhesive has released all the way round.
8. **Separate the halves.** Lift the back plate away from the main body. The housing opens without structural damage to either half.



Figure 1: The housing opened: main body (top) and back plate (bottom). Both halves are intact, and the adhesive residue along both rims is visible.

7.3 Removing the cell

9. **Lift the assembly.** Slide the plastic spudger under the circuit board and lift the board and cell together out of the main body. Do not lever on the cell itself.

10. **Mind the motor wires.** The coin-type vibration motor is connected to the board by two thin wires. Do not pull or pinch them while the assembly is out.
11. **Unplug the cell.** Hold the connector body with the plastic tweezers and pull it straight out of its socket. Do not pull on the leads. Nothing is cut and nothing is desoldered.
12. **Free the cell.** Lift the pouch cell off the board. Do not bend it or peel it off with a metal tool. Tape its terminals at once and put it aside for recycling (§9).

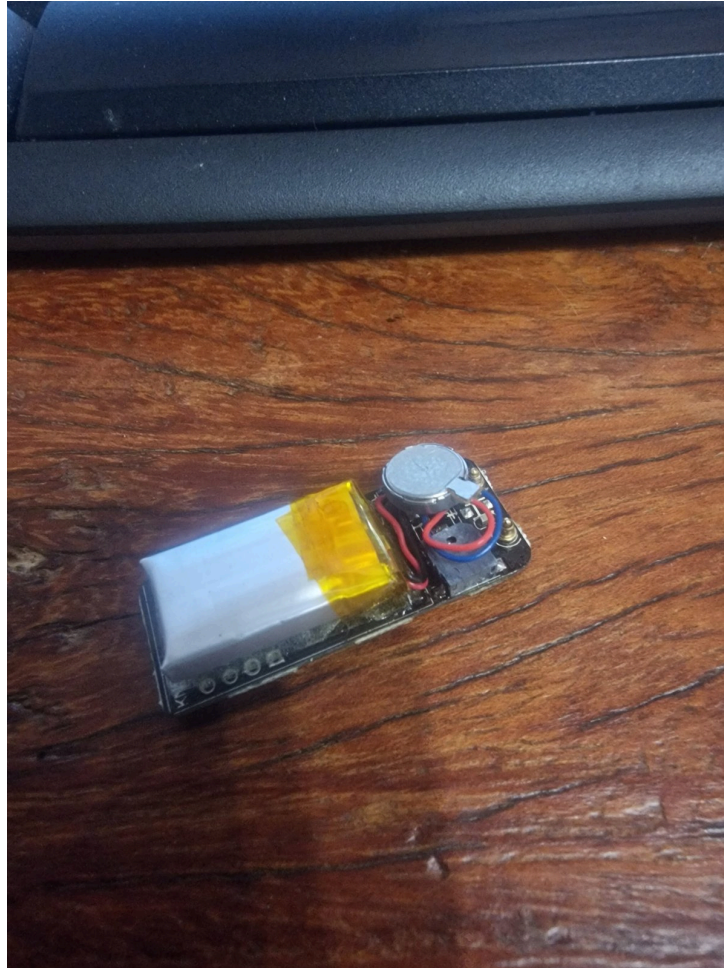


Figure 2: The assembly out of the housing: the circuit board with the coin-type vibration motor and its wires (right), and the lithium-polymer pouch cell (left).

7.4 Fitting the new cell

13. **Check the new cell.** Same model or equivalent to §4; no swelling, no damage to the pouch or the leads; leads long enough to reach the socket without tension.
14. **Plug it in.** Push the connector straight into the socket until it is fully seated.
15. **Position the cell** in its pocket, in the same orientation as the old one, without folding or tensioning its leads, and with the motor wires clear of the cell and the rim.
16. **Refit the assembly** in the main body, seated flat.

7.5 Cleaning the channel

17. **Remove the old adhesive** from the glue channel around the rim of the main body and from the mating edge of the back plate, first mechanically with a plastic pick, then with isopropanol on the lint-free cloth.
18. **Let it dry completely.** New adhesive does not seal against old adhesive, and does not cure properly on a wet surface.



Figure 3: The empty main body. The glue channel around the rim is intact and takes a new bead of adhesive.

7.6 Resealing

19. **Lay the bead.** Apply a continuous bead of the neutral-cure silicone of §6 along the channel: no gaps, no overlaps that leave voids, and no excess that can be squeezed onto the board, the cell or the USB contacts.
20. **Close the housing** within a few minutes of dispensing. Align the back plate with the main body and press it evenly into place until the halves sit flush all round.
21. **Clamp and clean.** Hold the halves together with light, even pressure while the surface skins, and wipe off any adhesive squeezed out of the seam.
22. **Leave it to cure** (§8, check 1) before anything else is done to the bracelet.

8. After the replacement

Work through these checks in order. The bracelet is not handed back until all of them pass.

1. **Cure.** Leave the bracelet for the full cure of the adhesive used – 72 hours for LOCTITE SI 5140 (§6). Do not charge it and do not wear it before then.
2. **Seal.** Check by eye that the bead is continuous the whole way round, that the two halves are seated flush, and that there is no adhesive on the USB-A contacts.
3. **Charge.** Plug the built-in USB-A plug into a 5 V USB port. The LED must go red while charging and green when full. Charge fully: 2–3 hours from empty.
4. **Wake.** Press the button once: a single press wakes the radio.
5. **Vibration and LED.** From the Galvanic App, send a buzz command to the bracelet: it must vibrate for about two seconds while the LED flashes blue. This confirms that the motor wires were not disturbed.
6. **Button.** Triple-press the button (three quick presses) and confirm that it is recognised.
7. **Radio.** Confirm that the bracelet is detected by a Galvanic Voice and can be registered to it.
8. **Wristband.** Refit the wristband: align it with the beacon body and press firmly until it bottoms out. Confirm it is secure with a gentle pull from the button-symbol side.

No water test is prescribed. Article 11 does not require the original ingress-protection rating to be restored, and a pass on one serviced bracelet would not support a rating for it.

Water ingress. The original factory seal cannot be reproduced outside the factory process. Galvanic Works does not declare an ingress-protection rating for a bracelet that has been opened and resealed by a third party.

9. The removed cell

The removed cell is a waste portable battery. It does not go in household waste and it does not go back in the bracelet's packaging. It goes to a portable-battery collection point, or back to Galvanic Works S.L.

Tape the terminals of the removed cell before transport, and do not transport a damaged or swollen cell by air.

The waste-battery information required by Regulation (EU) 2023/1542, Article 74, is published at [galvanicworks.com/compliance/galvanic-pulse/battery](https://www.galvanicworks.com/compliance/galvanic-pulse/battery), which is also the target of the battery QR code on the packaging.

10. References

- Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries – Articles 11 and 74.
- The Batteries and Accumulators (Placing on the Market) Regulations 2008 (SI 2008/2164), regulation 7.
- Henkel, technical data sheets LOCTITE SI 5140 and LOCTITE SI 5926.

11. Manufacturer

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