



INSTRUCTION MANUAL

SafeHeat

ANTIFREEZE SYSTEM FOR MONOBLOCK
HEAT PUMPS

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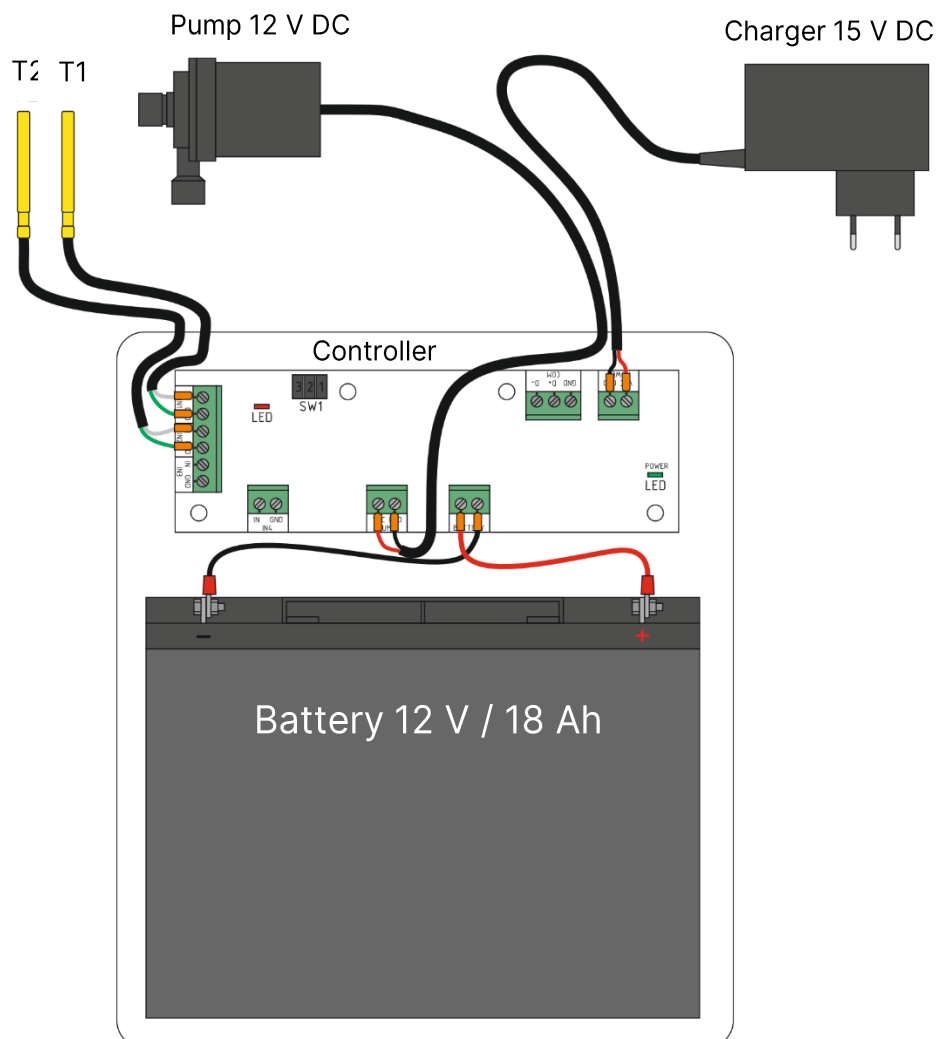


1 General information and safety

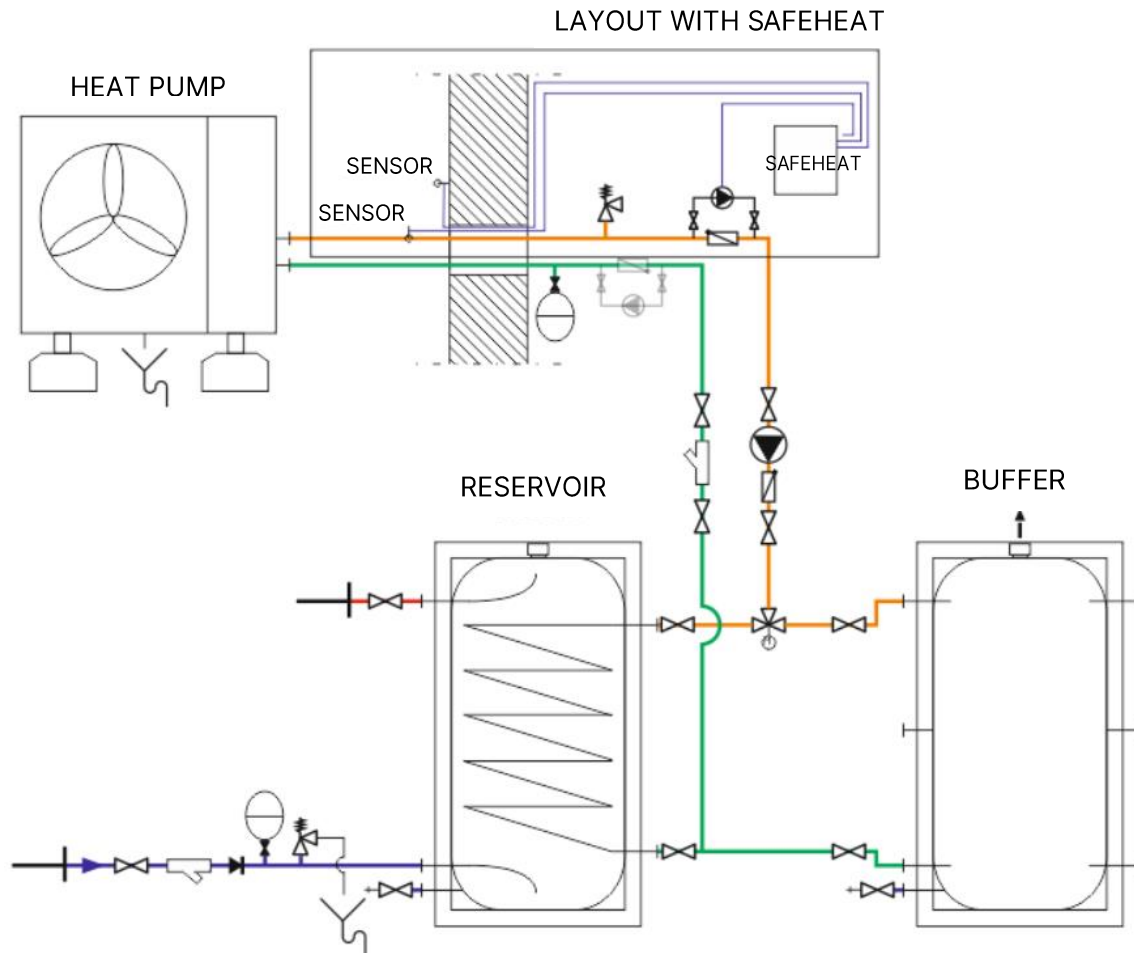
The SafeHeat anti-freeze system is used to reduce the possibility of freezing of the monoblock heat pump system. Correct installation and operation are prerequisites for the correct operation of the device.

- The kit must be installed only by a qualified person.
- Live electrical device. Before carrying out any power supply operations (connecting cables, installing the device, etc.), ensure that the device is not connected to the mains.
- The device is not intended to be operated by children.
- The device must not be misused.
- Lightning discharges may damage the controller; therefore, during a thunderstorm, the controller must be disconnected from the mains by removing the mains plug from the socket.
- Given the nature of the device and the safety of its use, its technical condition must be checked regularly.
- It is forbidden to operate the device if its housing is damaged or if the battery or any of its components are found to be damaged.

2 Power supply module

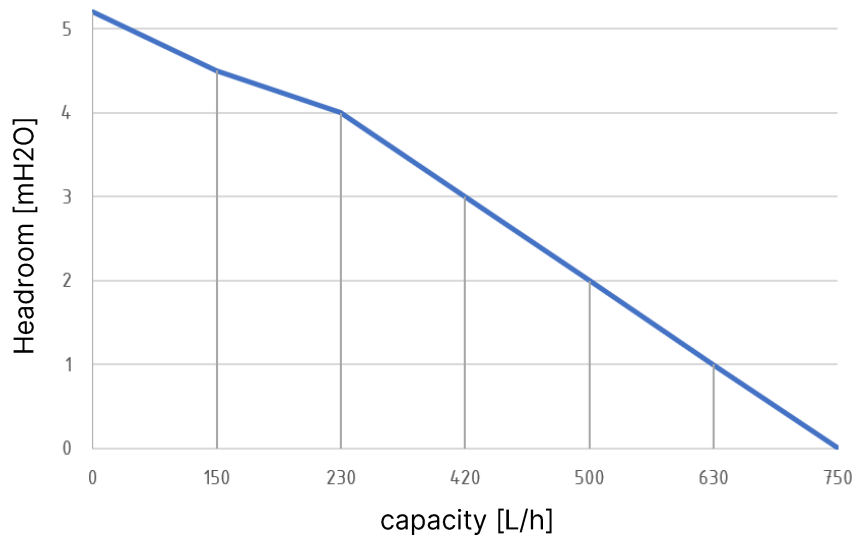


3 Examples of hydraulic diagrams using SafeHeat



When building a system, we need to ensure that the flow is possible irrespective of the position of the zone valve at the time of power failure. Therefore, in the case of systems with or without a buffer connected in series, we can ensure that the heat is taken from, for example, short loops of underfloor heating not controlled by an actuator, or we can make a bypass for the hot water cylinder with a potential-free open solenoid valve, which will open after a power failure.

4 Circulation pump characteristics



5 Installation of the bypass

The bypass included in the kit must be installed in the supply or return on the pipe section between the buffer and the heat pump, taking into account correct flow direction. Both the non-return valve and the pump, for proper operation, must be installed so that the non-return valve flap is in the vertical position and the axis of the pump impeller is in the horizontal position. It is also advisable to install the system so that the pump connection hose is below the level of the main pipe, so that the system can vent itself without any problems.

Careful and effective insulation of the pipework to the outside will greatly extend the system's operating time on battery backup. Where possible, it is also worth insulating the condenser.

Ensure that the bypass is well vented and that there are no components in the circuit that can generate insurmountable resistance for the connected circulation pump!

5.1 Example of correct bypass installation



5.2 Examples of incorrect bypass installation



*Pump impeller vertical,
difficult venting.*



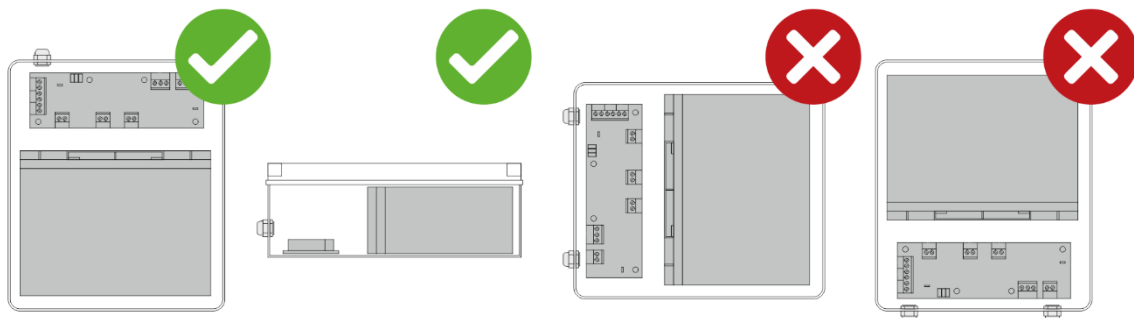
Difficult hose venting.



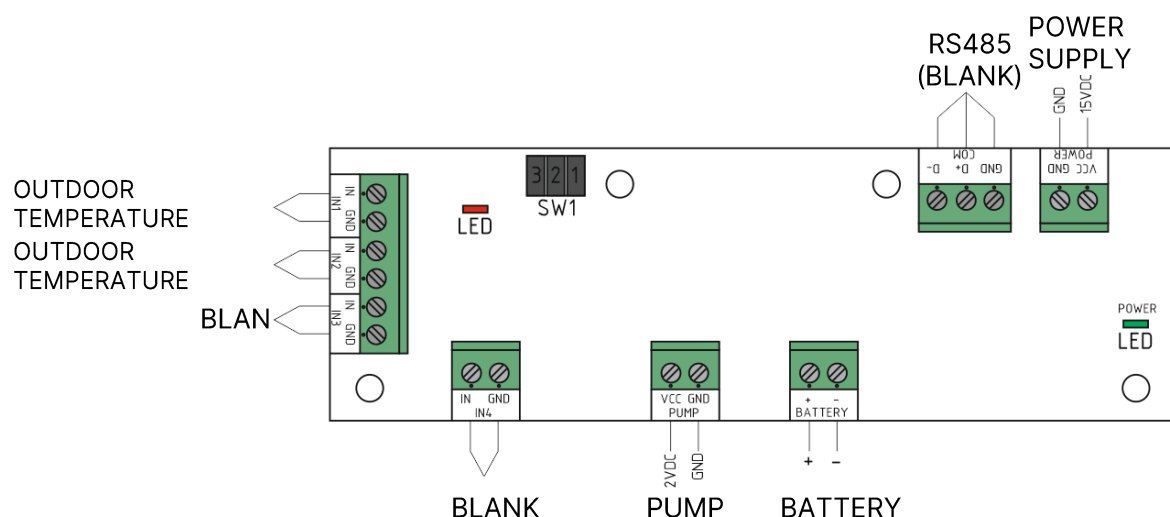
Risk of check valve noise.

6 Power supply module installation

Hang the pump supply module on the wall using rawplugs with screws paying attention to correct mounting orientation, i.e., the battery pack at the bottom and the controller at the top. At the controller, verify and, if necessary, connect the pump supply (PUMP) and temperature sensors T1 and T2 (IN1 and IN2). **Next, connect the battery plug (BATTERY) of the battery** and insert the charger into the socket.



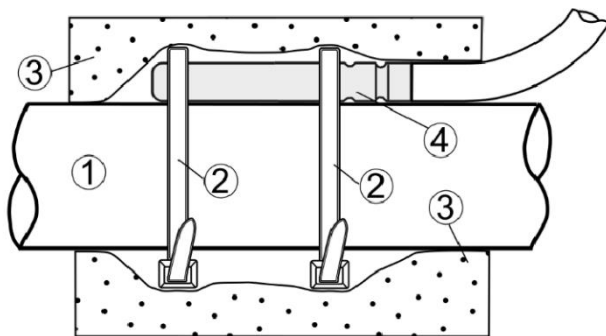
The module may only be installed indoors, in a dry and clean place, and the room temperature should not exceed 25 °C or be lower than 15 °C. Operation outside this range will reduce the life of the battery and decrease its capacity. The device must not be installed near heat sources, and must be protected from fire and falling sparks.



7 Installation of temperature sensors

The probe of outdoor temperature sensor T1 should be placed outside away from sunlight in such a way that the ambient temperature can be accurately identified (e.g., on an external wall or on the external part of an insulated pipeline).

The probe of heating water temperature sensor T2 should be placed as close as possible to the heat pump on the outlet pipe, directly on the pipe, under the insulation layer or in a suitable capillary. In the case of pipes made of poorly thermally conductive material, e.g., PP-R, it is advisable to find another location for the sensor, e.g., on a metal fitting, and to insulate it effectively. Each probe can be extended up to 15 mb in total length using a 2x0.75 mm² cable. When routing with the power cable harness, use a shielded cable.



Installation of a circulating water temperature sensor:

- 1 – Pipe
- 2 – Clamp
- 3 – Thermal insulation (insulating lagging)
- 4 – Temperature sensor

CT10 (NTC 10K)	
Ambient temperature [°C]	Resistance [Ω]
-30	175200
-20	96358
-10	55046
0	32554
10	19872
20	12488
30	8059
40	5330
50	3605
60	2490
70	1753
80	1256
90	915.4
100	677.3
110	508.30
120	386.60

It is essential to ensure that sensors T1 and T2 are correctly identified. Incorrect connection of the sensors can result in malfunction of the system and lack of antifreeze protection of the heat pump!

8 Operation and diagnostics

Check mode – when the temperature measured by outdoor temperature sensor T1 drops below 10 °C, the check mode is activated in which the temperature is checked hourly while the circulation pump starts. As the outside temperature falls below 3 °C, the pump's standstill periods shorten in order to check the water system temperature more reliably.

Anti-freeze mode – when the measured temperature at water temperature sensor T2 falls below the critical value of 6 °C, the circulation pump operates according to the hysteresis.

Summer mode – once a day, the circulation pump is activated as part of the anti-impeller blockage function.

The correct operation of the device is signalled by the lighting of the green LED indicating the

presence of the mains supply and the blinking of the red LED (LED on time 1 second, off time 3 seconds).

Alarm states are signalled by an audible tone and by a sequence of red LED flashes corresponding to the given alarm state number. In the case of more than one active alarm, the first in the sequence is signalled first, followed by the others. Alarms are signalled until the alarm is cleared or the cause of the alarm is eliminated (e.g., repair of a faulty cable to the sensor). In the event of a mains power failure (battery backup operation), the audible signalling is switched off in order to ensure that the system operates on backup power for as long as possible.

No.	Sequence	Description	Action
1	1 short flash, 5-second pause (no beep)	lack of power	in the case of a power failure, the message is informative, otherwise check the power supply
2	2 short flashes, 5-second pause (beep)	short circuit detected on the pump	check that the connection of the circulating pump cable to the controller is correct, otherwise there is a possible failure of the circulating pump – contact the service department
3	3 short flashes, 5-second pause (beep)	hole detected on the pump	check that the connection of the circulating pump cable to the controller is correct, otherwise there is a possible failure of the circulating pump – contact the service department
4	4 short flashes, 5-second pause (beep)	charging voltage is too high	possible controller failure – contact the service department
5	5 short flashes, 5-second pause (beep)	battery discharged below the critical value	possible battery damage due to deep discharge, capacity check and possible replacement are recommended Alarm reset possible by removing jumper no. 2 on SW1 connector
6	6 short flashes, 5-second pause (beep)	failure of outdoor temperature sensor T1	check the continuity of the sensor wires, alternatively verify resistance for NTC 10k
7	7 short flashes, 5-second pause (beep)	failure of water temperature sensor T2	check the continuity of the sensor wires, alternatively verify resistance for NTC 10k

If the acoustic signal needs to be silenced (e.g., until the technician arrives), the buzzer can be deactivated by removing jumper no. 3 on connector SW1.

Errors can be reset by removing jumper no. 2 on connector SW1 for 30 seconds (provided the cause has been eliminated).

8.1 Storage

The devices should be stored in a dry, cool (above 0 °C) and clean place. Depending on the

storage temperature, the batteries will self-discharge (up to 3 % per month at 25 °C – the higher the temperature, the faster the discharge). The rate of self-discharge increases at higher temperatures, and a refresher charge should be carried out after more than three months of storage.

8.2 Maintenance, technical condition monitoring and battery handling

Before the start of the heating season, it is advisable to observe the operation of the system, i.e., the operation of the circulation pump, verify that the system is properly vented, and have a specialist carry out a battery capacity test.

If the battery needs to be replaced, the following guidelines must be followed:

- The battery must be replaced by an authorised service centre or qualified electrician.
- When working on batteries, remove metal personal items such as rings, bracelets, necklaces and watches.
- The charging voltage compensation algorithm is designed for 12 V VRLA batteries in AGM technology with a capacity of 18-20 Ah – lithium-ion and other types of batteries must not be used as a substitute!
- Before replacing the battery, remove the charger from the mains socket and the plug (BATTERY) from the socket on the controller.
- When connecting a new battery, pay particular attention to the correct polarity (+ and - markings) – short-circuiting is strictly prohibited!
- The used battery must not be disposed of in the rubbish and must be taken to a dedicated disposal centre.
- Under normal operating conditions, there is no possibility of contact with the electrolyte; however, due to damage, leakage may run out via safety valves – in such cases, if there is contact with skin, the affected area should be flushed with a large amount of water, and the damaged battery should be disposed of, remembering to wear protective gloves and goggles.

9 Disposal and waste handling

Caring for the environment is of paramount importance to us. Knowing that we manufacture electronic devices obliges us to dispose of used electronic components and devices in a manner that is safe for the environment.

Households play a very important role in contributing to reuse and recovery, including the recycling of spent equipment.

The symbol of a crossed-out rubbish bin on the product means that the product must not be disposed of in normal waste bins with other waste. This applies to both the device itself and to accessories marked with this symbol. Such devices may contain harmful substances that were necessary for their proper functioning and safety. Appropriate handling of used equipment prevents potential negative consequences for the environment and human health resulting from the presence of hazardous components as well as improper storage and processing of such equipment. It is the user's responsibility to take used equipment to a designated collection point for the recycling of waste from electrical and electronic equipment. Packaging materials must be disposed of in accordance with their labelling and municipal guidelines. Penalties may



be imposed in accordance with national legislation if waste is disposed of incorrectly.

When disposing of the battery, it should be removed from the device and delivered separately to a suitable waste collection point or the manufacturer, or to a store when buying a new battery (on a one-for-one basis). Prior to disposal, it is advisable to discharge the battery and protect the terminals against short circuits (e.g., insulate with adhesive tape).

10 Warranty and complaint procedure for SafeHeat

1. The warranty for the device is 24 months from the date of sale, but no longer than 30 months from the date of manufacture, excluding the battery.
2. The warranty conditions for the battery installed in the device are in accordance with the manufacturer's warranty conditions and are described in detail in the battery warranty paragraph.
3. Free warranty repairs on devices are carried out exclusively at Nord HT's service headquarters.
4. The claimed device is to be delivered to Nord HT by the Recipient – it is possible to order a paid courier service to collect the prepared package.
5. Nord HT does not provide field intervention services, including travel, device replacements or other maintenance activities necessary to rectify a failure.

10.1 A prerequisite for the start of warranty repair discussions is

- the sending of the completed complaint protocol to the address of Nord HT by the reporting person,
- the sending of a copy of the proof of purchase,
- the sending of photographic documentation of the claimed device.

10.2 Handling of the complaint process

- Sending data related to the complaint to Nord HT.
- Contacting Nord HT's service department with the installation company or the Distributor in order to establish the validity of the complaint, costs, method and date of warranty replacement, and the place of delivery of the device components sent from Nord HT's warehouse.
- Shipment of new device components to an agreed address and the issuing of a VAT invoice for the shipped part – if the part is shipped before an expert examination of the claimed component is carried out.
- Information from the installation company or the Distributor about the warranty replacement performed.
- Sending the replaced parts from the installation company or the Distributor back to Nord HT.
- Verification of the validity of the complaint by Nord HT.

REASONABLE COMPLAINT – information for the complainant:

- Correction of the VAT invoice for the replaced part (the condition for issuing the correction is to send back the damaged part).

- Shipment of a new part – if this did not occur sooner.
- Closure of the claim.

COMPLAINT NOT JUSTIFIED – information to the complainant, and:

- If the complaint is not justified, Nord HT will invoice the company/person who made the complaint, in accordance with the pricing for the delivered items, as well as shipping costs and the cost of the expert opinion.
- Closure of the claim.

10.3 The warranty does not cover

- Damage resulting from installation not in line with the manufacturer's recommendations.
- Damage resulting from improper transport.
- Damage caused by the user, mechanical damage, overvoltage.

10.4 Warranty coverage

This warranty applies to sealed, maintenance-free lead-acid (VRLA) batteries. Nord HT assures that the batteries supplied will be of good quality, and without defects in material or workmanship. Batteries against which a complaint is made during the warranty period will, at Nord HT discretion, be reconditioned or replaced at no extra charge. This warranty only covers defects arising in the battery during the manufacturing process.

10.5 Battery warranty

Warranty conditions:

1. The battery shall not be deemed defective if its capacity does not drop to **80 [%]** of its rated capacity within the warranty period.
2. The warranty applies only to batteries intended for **buffer operation** (emergency power supply). Batteries for cyclic operation are not covered by this warranty.
3. The warranty period will be reduced by **50 [%]** for every **8 [°C]** permanent increase in operating temperature of the battery above the rated operating temperature of **25 [°C]**.
4. Each battery must be stored, charged, discharged, operated and handled in accordance with the instructions on the **data sheet** and the Quick Start Guide for Batteries.
5. Periodic servicing of all batteries should be carried out at least every **12** months after installation as recommended in the **Quick Start Guide**.
6. **Nord HT AS is not responsible for:**
 - a. batteries with an illegible serial number;
 - b. damage caused by incorrect charging or installation;
 - c. mechanical damage to the container, cover and terminal blocks (clamps) caused during transport, storage, installation, commissioning and operation of the batteries;
 - d. damage caused by fire, elevated temperature (overheating), explosion or

- freezing;
 - e. damage caused by improper use or negligence;
 - f. damage caused by force majeure.
7. The basis for recognition of a complaint is the presentation of the purchase invoice and the delivery of the claimed battery bearing the original serial number designation and a description of the defect.

Warranty period from date of sale: **2 years.**

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