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Operating Rules and Warranty terms and conditions for Lead-acid batteries (VRLA)

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NIP: PL 522-01-04-603 REGON: 012110050 BDO: 000012821

Dane rejestrowe:
Sąd Rejonowy dla m. st. Warszawy XIII Wydział Gospodarczy Krajowego Rejestru Sądowego. KRS: 0000179475; Kapitał zakładowy: 113 143,00 PLN

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WARRANTY TERMS AND CONDITIONS

1. For products offered by „Wamtechnik" [limited liability company] placed in Piaseczno, Techniczna 2, 05-500 Piaseczno (hereinafter referred to as the „Guarantor" or „Wamtechnik") warranty of quality is granted.
2. The exact conditions of granting the warranty are regulated by the following warranty points and rules related to the proper operation of the Product.
3. The warranty shall be granted to the Buyer, i.e. the first (direct) buyer of Wamtechnik Products. The Buyer can not transfer rights and obligations under the Warranty to the third parties without written consent of Wamtechnik..
4. The condition necessary to start the complaint procedure is to fill in the complaint form available on https://wamtechnik.pl/en/complaint/.
5. Claims are analyzed at the expense of the Producer only for Products which warranty period has not expired.
6. In case of delivery of claimed Product to Wamtechnik without a prior complaint or when data contained in complaint (such as possibility to identify the Buyer by the invoice number, reasons for the Products complaint) objectively preclude Wamtechnik from resolving the complaint despite the attempts made by Wamtechnik to determine them, Wamtechnik shall be entitled to reject the complaint within 14 days from the date of delivery of claimed Product to Wamtechnik.
7. The standard warranty period for lead-acid batteries, depending on the nature of work, is:

Manufacturer	Model	Type of operation	
		Standby use	Cyclic Use
SSB Battery	SB and SBH	12 months	6 months
	SBL SBL HR SBLFT SBCG OPzV	24 months	12 months
Nerbo	NB	12 months	6 months
	NBL NBLFT NBC NBCG	24 months	12 months
Panasonic	LC-R UP-VW and UP-RW	12 months	6 months
	LC-X LC-P LC-QA	24 months	12 months
B.B. Battery	BP, HR, SHR	12 months	6 months
	BPS	24 months	12 months
SUN Battery	SB up to 7 Ah capacity	12 months	6 months
	SB from 12 Ah capacity	24 months	12 months

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In case of a permanent increase in the operating temperature of the battery by every 8° C above the permissible level of 25° C, the warranty period will be reduced by half.

A non-standard warranty, i.e. for a period longer than mentioned above, is granted only with the agreement of the parties, and the information about the length of the non-standard period is included in the sales invoice.

8. The warranty period is counted from the date of issuing an invoice for the given Product.
9. The warranty is valid in the territory of the Republic of Poland. Polish law is the applicable law of the interpretation of this warranty and possible disputes that results from.
10. The warranty applies only to batteries stored, installed, charged, discharged, operated and maintained in accordance with the provisions of the Data Sheet and Operating Rules.
11. Warranty shall be covered only by material and workmanship defects disclosed in the period of warranty, in which the cause is in the sold item.
12. The battery will not be considered as defective, if in standard warranty period its capacity does not decrease below the 80% of its nominal capacity due to manufacturing defect. Simultaneously it must be remembered that gradual capacity loss of the battery is completely natural phenomenon associated with its operation and can not be subject to complaint.
13. Any noticed defects must be immediately reported to the Guarantor. It is unacceptable to use the product from the moment the defect was noticed.
14. The warranty does not cover:

a. Mechanical and thermal damage resulting from the Buyer's fault
b. Damage caused by lightning or other external causes (e.g. faulty electrical installation of the Buyer),
c. Damages caused by improper operation (e.g. incorrect connection of the battery to the electrical system),
d. The malfunction occurred as a result of launching the battery later than 3 months from the date of sale,
e. Batteries with unreadable serial number,
f. New batteries installed in an already operating battery string (connecting blocks of older manufacturing dates with new blocks) without the knowledge and consent of the guarantor,
g. Interference in the product, e.g. arbitrary repair, reworking.

15. The condition for exercising the warranty rights is to present to the guarantor:
    a. In case the batteries are connected to the emergency power supply system - a protocol of starting up the battery installation and a protocol of periodical service inspections with the results of measurements and tests as well as records of equalizing and maintenance charging described in the Operating Rules (periodic service inspections should be performed every 12 months).

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The basis for the complaint handling is the presentation of documented measurement results from each required periodic service.

b. For other applications, written information explaining the reason for the complaint and the operating conditions (voltage, current and duration for charging and discharging, number of cycles performed, temperature range) and, if applicable, the records of the equalizing and maintenance charging described in the Operating Rules.

16. The person, who is authorized under the warranty, delivers claimed battery to the address of the Guarantor indicated in point. 1, by his own efforts and at his own expense. In case the complaint is considered as justified, the guarantor returns the cost of transport to the entitled person.
17. Claimed Product sent to Wamtechnik should be properly protected to prevent short-circuits and its damaged during transport. Wamtechnik is not responsible for damage caused by inappropriate packaging and protection
18. The decision as to whether or not to consider a complaint as a reasonable, the guarantor shall make without undue delay, but no later than 14 days from the date of delivery of the battery, however, reserving himself adequate time to carry out tests or measurements.
19. The guarantor does not provide a replacement of the batteries or cover the cost of replacing them at the place of installation for the duration of the complaint.
20. The guarantor reserves the right to carry out an on-site inspection at the place of use of the batteries.
21. In case the complaint is considered justified, the defective battery will be regenerated or replaced with a new one. Product will be delivered to the address of the Buyer, indicated in the complaint form at the expense of the Guarantor.
22. After receiving a regenerated or replaced product, the packaging must be inspected. In the case of damage, a damage report should be drawn up with the courier delivering the package. The guarantor does not cover losses resulting from the transport of the product to the Buyer, which were not documented in the damage protocol.
23. The guarantor is not responsible for actual damage or lost profits resulting from product damage.
24. The use of the guarantee by the Buyer does not exclude, limit or suspend the rights resulting from the provisions on the warranty for defects of the sold item. Exercising the rights resulting from the warranty does not release the Guarantor from the liability under the warranty.
25. If the Terms and Conditions would contain, contrary to the intentions of Wamtechnik, provisions less favourable than those of the Civil Code and the Consumer Rights Act of 30 May 2014. (Journal of Laws 2020.287, as amended), then such provisions shall prove to be invalid, and the relevant provisions of the Civil Code and the Act shall apply.

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OPERATING RULES

These Operating Rules must be strictly complied with. The battery manual should be placed in a visible place near the battery. Only authorized persons can maintain the battery.

1. H&S RECOMMENDATIONS

RELOCATION

The batteries are delivered in a charged state. It is forbidden to short-circuit the battery poles due to high short-circuit currents, danger of shock, fire and equipment damage.

CAREFUL WITH THE FIRE

In the event of overcharging, flammable gas (hydrogen) may be released from the safety valve.
NOTE: Discharge a static electricity from clothes by touching a grounded item and do not use near an open fire source.

TOOLS

Use insulated tools designed for electrical work. Do not touch or drop on the battery terminals by metal objects. Before starting work, remove metal parts of clothing and other objects such as a watch, wedding ring, necklace, etc.

2. STORAGE

Store batteries in a dry, cool and clean place, not exposed to sunlight. Batteries must not be connected to any electrical circuit.
The permissible storage temperature range for a given battery model is specified in the data sheet, the recommended temperature range is from +15^{O}C to +20^{O}C.
The storage time is limited. Storage of batteries causes a self-acting loss of capacity, therefore do not store batteries in a discharged state.
In order to ensure a proper operation after the storage period, it is recommended to follow the following guidelines:

1. Always charge after the storage period if the 100% of battery capacity is required.

2. Charge the battery if the capacity decreases to 60-80% of rated capacity during storage - performed as early as possible will help to recover the lost capacity.

3. Leaving discharged batteries below 60% of their rated capacity may result in its irreversible loss.

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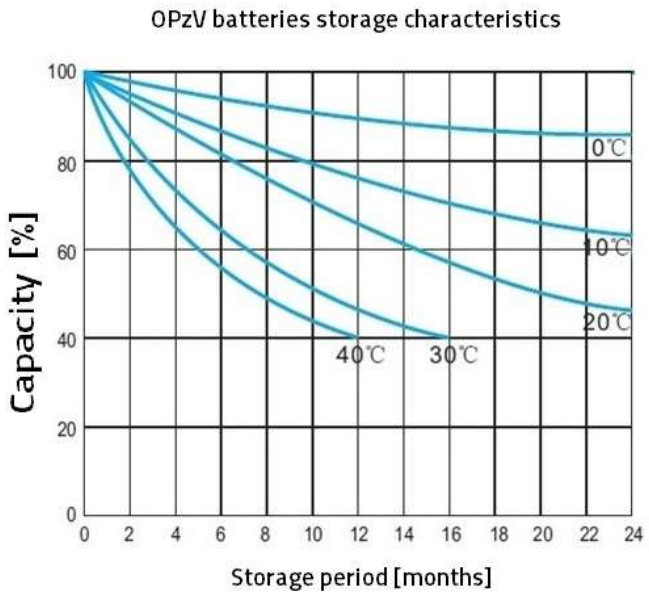

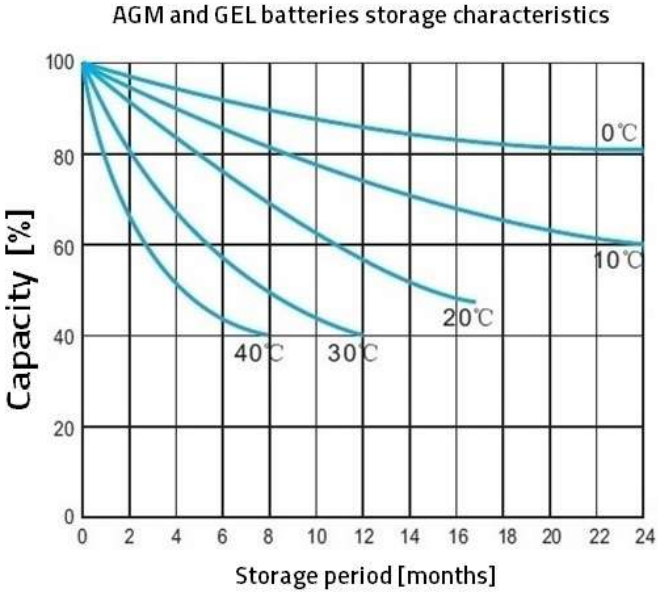

Taking into account the data from the above graphs, after a given period of time at a certain temperature, it is necessary to carry out a charge according to the CHARGING point in this manual. The measurement of the voltage in the open circuit of the battery can be information about the state of charge of the battery. Regenerative charging is recommended when voltage decreases below 2,07V/cell [i.e. 6,21V for 6V battery and 12,42V for 12V battery). Failure to comply with this condition may cause a significant decrease in capacity and durability of the stored battery. It is recommended to carry out and keep records containing information about date and duration of every regenerative charging. Such records should be presented in case of possible battery claim.

3. INSTALLATION OF THE BATTERY

The battery should be installed in dry and cool room. Under normal conditions of use, gas release is negligible, so it can work in rooms with other electrical devices.
VRLA AGM type batteries can be used in vertical (normal) position with connectors up (optimal operating position), and in the sidedown position, maximum angle of 90 degrees from the normal position. Upside position (connectors pointing down) is not allowed, as this may result in improper operation of the safety valves during charging.

TEMPERATURE
Avoid setting up and using the battery in areas with increased or extremely low temperature and direct sunlight. The temperature between the individual accumulators/blocks should not vary by more than $3^{O}C$. The best durability and performance is ensured for temperatures from $15^{O}C$ to $20^{O}C$.

For maximum life of the battery for standby use it is necessary to:

- place the battery away from equipment which is a source of heat (e.g. transformer, heat sink)
- a minimum distance of 1.5 cm around the battery and use devices with ventilation openings in the enclosure to provide free air circulation
- use effective natural or forced ventilation or air conditioning

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- use a power supply with temperature compensation of the charging voltage if the operating temperature will exceed 25^{O}C

High-temperature operation (above 40 ^{O}C) besides a significant reduction in battery life can also lead to its damage.

The increase in battery temperature causes a decrease in their internal resistance, which results in an increase in the charging current. Higher current raises the temperature of the batteries, so their resistance decreases. Then this cycle repeats itself, leading to the so-called thermal runaway, i.e. the lack of thermal stability of the batteries. When the temperature of the batteries exceeds 40°C, this process can become an avalanche reaction and lead to irreversible damage to the batteries (interruption or internal short circuit, in extreme cases deformation of the housing).

ATTENTION: Operation and storage of the battery at temperatures below 0°C in partially or fully discharged state may result in capacity loss of the battery and cause the electrolyte freezing and cracks of the housing.
Using at temperature below -20^{O}C, even if the battery is fully charged, may cause the electrolyte freezing and cracks of the housing.

VENTILATION
Under normal conditions the gas release is negligible and natural ventilation is sufficient to cool the cells and remove the effects of unforeseen overcharging. In case of installation the batteries in closed cabinets for accumulators, proper ventilation must be provided.

ASSEMBLY
Before launching, all accumulators must be checked in terms of mechanical damage, correct polarisation and correct connection. The screws of the electrical connections to the battery terminals must be tightened with a torque wrench by the torque specified in the data sheet for a given battery model.
When the charging device is switched off and the load is disconnected, connect the battery to the direct current installation, checking the correctness of the terminal connections. Switch on the charge device and adjust voltage in the installation as indicated below, point „CHARGING".

INSTALLATION OF PARALLEL BRANCHES
According to EURO-BAT (Association of European Battery Manufacturers) recommendations for VRLA batteries, the number of battery branches connected in parallel must not exceed four (4) branches due to the branch currents.

4. CHARGING

VRLA batteries should be charged using the constant voltage method with a limitation of the initial charging current, whose initial value should not exceed 0,3C (30% of nominal capacity expressed in [A]). Charging voltage values depending on the character of battery operation are given below:

Charging voltage of the battery at temperature 25°C		
Battery's technology:	Type of operation	
	standby use	cyclic
VRLA batteries - AGM	2,27 – 2,30 V/ cell	2,43 – 2,47 V/ cell
VRLA batteries - gel	2,27 – 2,30 V/ cell	2,37 – 2,40 V/ cell
VRLA batteries - OPzV	2,25 – 2,30 V/ cell	2,37 – 2,40 V/ cell

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The above charging voltage values are given for 25°C. If the ambient temperature varies by +/-5°C, it is recommended to select the voltage according to the characteristics of the charging voltage dependence on the temperature, which is given in the data sheet for each battery model. Due to the phenomenon of gas recombination, a +/-2% difference in the voltage of a single cell may occur. Nevertheless, the total battery voltage should be within the tolerance specified above.

ATTENTION: Do not charge the batteries at temperatures below 0 °C. Risk of battery or device damage, electric shock (does not apply to special batteries).

CHARGING CURRENT

VRLA batteries should be only operated in combination with a device providing a stabilized constant voltage and charging current limited to the value specified in data sheet of a given battery.

FAST CHARGING (EQUALIZING)

Equalizing charging is necessary after a deep discharge and/or insufficient charging. It can be carried out with a maximum voltage of 2,40 V/cell for up to 24 hours (no more than 4-5 times a year). Charging current should not exceed 10% of battery capacity. When the battery temperature exceeds 45°C, charging must be interrupted in order to decrease the temperature.

ALTERNATING COMPONENT OF THE CHARGING CURRENT

Impermissible alternating components of charging current can cause damage and reduce a durability. It is recommended to limit the alternating components of charging current to 0,1 C_{20} (10% of nominal capacity expressed in [A]) or ≤1% of rated voltage.

STATE OF CHARGE

The state of charge can be determined by measuring the voltage at the opened terminals of the battery after a period of relaxation and reaching a temperature about 25°C.

State of charge	OCV Voltage
100%	2,15 V/ cell
80%	2,09 V/ cell
60%	2,06 V/ cell
40%	2,02 V/ cell
20%	1,97 V/ cell

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5. DISCHARGING

CUT-OFF VOLTAGE

The cut-off voltage below which discharging of the battery is prohibited, should be limited to the values given below.

Cut-off voltage	Discharge time
1,65 V/cell	up to 1h
1,70 V/ cell	up to 5h
1,75 V/ cell	up to 8h
1,80 V/ cell	up to 10-20h

STATE OF CHARGE

The VRLA batteries must not remain in a discharged state, but must be immediately subjected to a maintenance charge. Failure to do so may result in loss of available capacity and shorten battery life.

ACCIDENTAL FULL DISCHARGE

If the battery is discharged too deeply, the phenomenon of sulphation of the battery plates occurs, which significantly increases the internal resistance and results in an irreversible loss of battery capacity. Operating or storing the battery in this condition at temperatures below $0^{O}C$ can cause the electrolyte to freeze and the housing to break. Deeply discharged battery should be subjected to a maintenance charge with 2.27 V/cell and with a current not greater than 0,1 C_{20} (mandatory condition) to avoid excessive heating. The minimum charging time should be 96 hours.

ATTENTION: Too deep discharge of the battery has a significant impact on its durability.

MAINTENANCE/CONTROL

VRLA batteries are sealed lead-acid batteries and do not require electrolyte refilling. The housing and cover should be dust-free and dry. Clean only with a cotton cloth.
During operation, it is recommended to take measurements of the voltage and current of the maintenance charge of each serial branch and the voltage and internal resistance of each battery in the installation. It is recommended to keep a book in which measured values, discharging tests, power cuts will be recorded. Records of measurements and tests should be presented in case of a possible battery complaint.

SPECIAL APPLICATIONS

In any situation where VRLA batteries are used for special applications, such as cycle operation or in extremely harsh environmental conditions, it is recommended to contact Wamtechnik service for advice.

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6. BATTERY DISPOSAL AND RECYCLING

Lead-acid batteries are subject to disposal and recycling regulations that vary across countries and regions. After use, batteries and accumulators are considered hazardous waste.

The most important measures to prevent or reduce the generation of VRLA battery waste include:

(1) selecting the correct battery type for the application, which will ensure the maximum possible battery life and service life, thereby limiting (slowing down) the generation of battery waste;

(2) being aware of the need to recycle VRLA batteries. Under no circumstances should they be disposed of in mixed municipal waste. Used batteries are recycled at lead refineries (secondary lead smelters). To simplify recycling and treatment, used lead-acid batteries should not be mixed with other types of batteries.

Before disposing of any battery, check and comply with applicable regulations. To dispose of the battery, contact your local battery recycling facility. Lead-acid batteries can be returned to the supplier (who placed the battery on the market in the EU country) who will accept them free of charge and forward them to a battery recycling facility.

Disposing of used electronic equipment, including accumulators and batteries, in standard waste bins is prohibited. Discharged accumulators and batteries should only be placed in collection containers for accumulators and batteries. To prevent short circuits, protect the leads/contacts/connection points of power cables, e.g., with insulating electrical tape or other approved protective material. A short circuit can cause ignition, damage to the housing, or leakage of harmful chemicals. Always handle used batteries with caution. Batteries are high-energy hazardous waste containing harmful, corrosive, and potentially flammable compounds, such as heavy metals (lead) and liquid electrolyte (sulfuric acid), gases (hydrogen and oxygen, which under certain conditions can form an explosive mixture), and other chemical compounds harmful to health and the environment. In the worst-case scenario, the battery may ignite or explode.

Improper disposal of used batteries and accumulators can have serious consequences, including:

• contamination of soil and groundwater by heavy metals and electrolytes.

• hazard to humans and animals – toxic substances can cause illness. Heavy metals present in batteries can cause a range of health problems, including damage to the nervous system, kidneys, and liver, and increase the risk of cancer.

• pollution of the natural environment and loss of the possibility of recovering valuable raw materials such as lithium, nickel, manganese, and cobalt.

SAFE HANDLING AND STORAGE OF USED BATTERIES

Storing and collecting used batteries and accumulators requires compliance with specific safety and protection measures, including occupational health and safety regulations. Appropriate storage conditions must be ensured, and mechanical damage to batteries and contact with hazardous substances must be prevented. It is also important that batteries are appropriately labeled.

Conditions for safe storage of wastes batteries and accumulators:

• Used batteries should be stored selectively in non-conductive containers, resistant to the substances contained in the batteries or accumulators, closed and labeled, and compliant with ADR regulations. Limit contact with other waste and flammable substances.

• Used batteries should be stored in a separate, weather-resistant area, away from sources of heat, fire, and moisture.

• Ensure adequate ventilation of rooms where used batteries are stored.

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• The battery container should be free of any metal elements that could cause a short circuit.

• Do not mix damaged and undamaged batteries – separate storage is required.

• Batteries must have their power cable terminals/contacts/connection points effectively protected, e.g., with electrical tape or other approved protective material, to prevent short circuits.

• Access by unauthorized persons must be restricted.

LEGAL NOTICE

Wamtechnik Limited Liability Company (hereinafter referred to as the „Company") shall not be liable for damages that may result from the use of the offered batteries contrary to their intended use and these Operating Rules of lead-acid batteries (hereinafter referred to as the "Manual").

The purchase of lead-acid batteries offered by the Company is connected with getting acquainted with and accepting the above mentioned Manual. The Company's Counterparty, purchasing the batteries in question from the Company, declares that he has familiarized himself with this Manual and is aware of the risks and threats that may result from using, storing and transporting the batteries in a manner inconsistent with this Manual.

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