

MANUAL

LiFePO₄ BATTERY

JARO-BT SERIE



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- > JARO-BT100.36

SPECIFICATIONS JARO-BT BATTERIES

Parameter	BT9.12	BT12.12	BT20.12	BT60.12	BT90.12
Battery chemistry	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄
Capacity Ah	9Ah	12Ah	20Ah	60Ah	90Ah
Capacity Wh	115Wh	154Wh	256Wh	768Wh	1.152Wh
Voltage nominal	12,8V				
Internal resistance	<50mΩ		<20mΩ		
Temperature during charging	0 – +45°C				
Voltage during charging	14,5V±0,2V				
Maximum charge current	9A	12A	20A	50A	75A
Recommended charge current	≤6A	≤6A	≤10A	≤25A	≤40A
Temperature during discharge	-20 – +50°C				
Output voltage range	11,0 – 14,6V				
Maximum discharge current	15A	30A	30A	50A	75A
Maximum power per battery	192W	384W	384W	640W	960W
Maximum discharge (3 sec.)	n.v.t.		55A	150A	200A
Battery disconnects at	9,0V	8,0V	8,0V	10,0V	10,0V
Length	151mm	151mm	181mm	196mm	318mm
Width	65mm	98,5mm	76mm	165mm	165mm
Height	95mm	95mm	165mm	174mm	215mm
Weight	1,15kg	1,6kg	2,9kg	7,1kg	10,5kg
Recommended storage temperature	-10 – +30°C				
Self discharge rate	< 20% per year		< 3% per month		
When not in use	Charge the battery at least every 3 months until the charger stops when the battery is not in use				



BT9.12



BT12.12



BT20.12



BT60.12


 BT90.12
 BT120.12

SPECIFICATIONS JARO-BT BATTERIES

Parameter	BT120.12	BT150.12	BT60.24	BT100.24	BT30.36	BT100.36
Battery chemistry	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄
Capacity Ah	120Ah	150Ah	60Ah	100Ah	30Ah	100Ah
Capacity Wh	1.536Wh	1.920Wh	1.536Wh	2.560Wh	1.152Wh	3.840Wh
Voltage nominal	12,8V		25,6V		38,4V	
Internal resistance	<20mΩ		<40mΩ	<30mΩ	<40mΩ	
Temperature during charging	0 - +45°C					
Voltage during charging	14,5V±0,2V		29,0V±0,2V		43,6V±0,2V	
Maximum charge current	100A		50A	80A	25A	100A
Recommended charge current	<50A		<25A	<50A	<15A	<50A
Temperature during discharge	-20 - +50°C					
Output voltage range	11,0 - 14,6V		20,0 - 29,2V		33,0 - 43,8V	
Maximum discharge current	100A		50A	150A	25A	100A
Maximum power per battery	1280W			3840W	960W	3840W
Maximum discharge (3 sec.)	500A	600A	140A	300A	50A	200A
Battery disconnects at	10,0V		20,0V		30,0V	
Length	318mm	318mm	318mm	485mm	318mm	520mm
Width	165mm	165mm	165mm	170mm	165mm	269mm
Height	215mm	215mm	215mm	245mm	215mm	220mm
Weight	13,4kg	15,9kg	13,5kg	24,2kg	10,6kg	37,7kg
Recommended storage temperature	-10 - +30°C					
Self discharge rate	< 3% per month		< 5% per month		< 7% per month	
When not in use	Charge the battery at least every 3 months until the charger stops when the battery is not in use					



BT150.12
BT60.24
BT30.36



BT100.24



BT100.36

SAFETY GUIDELINES

General safety

Attention should be paid to all safety instructions in this manual. Keep the manual located close to the battery for future reference. Maintenance or repair work should only be carried out by qualified personnel. A damaged or abnormal functioning battery should not be used. Keep the battery away from children. The battery should be used for general purpose, small drive trains and source for static electrical equipment. The batteries should not be used for critical equipment like medical equipment unless a thorough risk analysis has been conducted. Furthermore, the battery can be used for light drive systems as well as for power supply of static equipment.

Explosion and fire

- > The battery terminals have a different polarity. For this reason, you should not place any conductive materials on the battery. When working close to the battery it is advised not to wear any jewelry or watches to prevent short circuits.
- > The battery should not come in contact with fire or be placed close to a heat source.
- > Use and store the battery on a non-flammable, heat resistance and non-conductive surface.
- > Contact with very humid air and water should be avoided as much as possible. Store the battery on a dry and safe place.
- > Use a type D, foam or CO₂ type fire extinguisher in case of fire.

Safety and protection

- > Never try to open the battery or dismantle the battery. The battery contains electrolyte. Under normal operational conditions contact with the electrolyte is impossible. If the battery casing is damaged do not touch the electrolyte or other materials released from the battery. In case of contact with the electrolyte: rinse thoroughly with water and consult a doctor.
- > Prevent damaging of the battery. A damaged battery should not be used anymore.
- > A damaged or deformed battery has to be disposed according local guidelines as small chemical waste.
- > Prevent mechanical shock and extreme vibrations as the batteries can get damaged. Never cut or drill in the casing.
- > Prevent contact with the connections of the battery.
- > Use only special LiFePO₄ chargers or standard chargers programmed to be used within the specifications of the batteries.

Instructions for connecting battery packs

- > Use cables of sufficient thickness. Pay attention to the required current load and length of the cables.
- > Putting batteries in series is only allowed for 12V batteries and up to a maximum of three of the same type. Make sure that the batteries are fully charged separately, before connecting them in series.
- > Batteries may be connected in parallel up to eight. However, when connecting in parallel, it is important that each battery has a fuse that has a value equal to the maximum current specification of one battery.

Charging and discharging

- > Check the mains on the right voltage before connecting your battery charger to the mains.
- > The battery may only be charged with the cables supplied with the battery charger. Extending the charger cables can cause slow or not completely charging of your battery, because the charger can no longer properly detect the battery voltage.
- > The battery may only be placed in a dry environment, in a non-flammable environment and on a non-conductive surface be charged.
- > Only a charger suitable for LiFePO₄ may be used to charge the battery.
- > The battery must not be charged with damaged cables. Check this before charging the batteries.
- > Use the charger in a dry environment. The charger should not come into contact with moisture unless it is a waterproof charger.
- > Rapid temperature changes can lead to condensation. If this happens, wait until the charger is dry and has assumed the correct temperature of its environment (this does not apply to waterproof chargers).

- > A JARO BT battery cannot be overcharged, is protected against over-discharging and will not be damaged when completely discharged.
- > JARO BT batteries connected in series may only be charged if they have the same charge (equally full) +/-10%. Otherwise, charge them separately with a charger suitable for one battery and then place them back in series.
- > When discharging, ensure that the maximum current remains within specifications. It is important that sufficient battery capacity is installed to prevent operating outside specifications at maximum consumption. Although the battery switches off at high current, this only happens after a certain time to be able to absorb peak currents. Working outside the normal current range regularly will shorten the life of the battery.
- > The battery has a self-discharge of 3 to 5% per month. This is of course faster with connected equipment and depending on the type of battery, this can be less or much more. Check the battery voltage regularly. Charge the battery if the voltage is lower than 12.8V (25.6V for a 24V battery or 38.4V for a 36V battery). Keep the battery connected to the charger until the charger shuts down.

NOTE: The SOC (State of Charge) meter in the App is based on the Coulomb principle. This means that the measurement is accurate, but must be calibrated before use after a period of more than 14 days when the battery has not been used. This is because the readout slowly loses its precision. For the battery pack this is not important because it is just a calculation. So charge the battery before use after a longer standstill. The App will calibrate to 100% at this point and will be accurate again in the next 14 days.

- > In case the battery is not used for a longer period of time it is recommended to disconnect all the equipment from the battery to prevent discharge by e.g. monitoring instruments.
- > The battery should not be charged when the temperature of the battery is below 0°C. Discharging the battery up to -20°C is allowed. Since the battery temperature will increase during discharge, charging can be done directly after discharge when the temperature of the battery is over 0°C.
- > A fully discharged battery should be recharged within 24 hours. The loads will be disconnected automatically when the battery is fully discharged but the remaining energy is minimal. Self-discharge can lead to damage of the battery when the battery is left in fully discharged state for a longer period.
- > Even if the battery is not completely discharged, it is recommended to fully charge the battery at least every 3 months to recalibrate the internal measurements to ensure that the reading remains reliable.

Warning when used in parallel or series

- > When used in parallel or series, the batteries must be in the same State of Charge (SOC). Charge the batteries completely separately and then connect them in parallel or in series.
- > If batteries connected in parallel are partially or completely discharged, not one of the batteries may be replaced by a full battery. This is harmful to the batteries. In this case, charge all batteries individually to full and then connect them in parallel again.
- > When connecting batteries in series, the same conditions apply as when connecting batteries in parallel (only 12V batteries and not more than three in series). First charge the batteries separately and then connect them.
- > The batteries in series may be charged simultaneously by several separate battery chargers when connected. The condition is that the chargers do not share the negative pole with each other. Consult an electrician of your supplier in case of doubt.
- > No more than three 12V batteries may be connected in series. With 24V batteries the maximum is two in series (48V); provided they are charged separately by 24V chargers. The 36V batteries may not be connected in series.

Warnings for transportation

- > Transportation of the batteries should be done packed in the original packaging or a packaging suitable to protect the battery against shock of falling on the ground.
- > Make sure the batteries are fixed properly during transport to prevent shifting of the load.
- > Avoid mechanical shocks such as knocks and falls.

THE JAROCELLS APP

General

All information that is available within the battery about the degree of charge, power consumption, voltage, temperature, etcetera is made available via a wireless bluetooth connection to be read via our JAROCELLS App on an Android or Apple device.

To download and install the JAROCELLS App

- > The JAROCELLS App is available for Android (from version 4.3) and Apple (from iOS version 7.2) devices.
- > Download and install the JAROCELLS App from the Google Playstore or the App store.



Connect to the JAROCELLS battery

- > Open the JAROCELLS App on your device.
 - NOTE:** The battery must be within a range of <6 meters from your device.
- > When the App is activated, it will search for JAROCELLS batteries in the area. The names of the found batteries will be listed on the screen.
- > Click on the battery you want to connect to. You will see the message "Connecting".
- > The App connects to the chosen battery and will display the data from this battery.

Available information

- > When you have established a connection with your battery, the basic information appears the screen. In the center you see the degree of charge of the battery (the percentage, also known as the State of Charge) and below the voltage, the capacity of the battery and the status. At "Estimated duration" you can see the time it takes for the loading to complete, if the battery is being charged or the time remaining until the battery is empty when it becomes empty and the load does not change.
- > If you swipe left (swiping motion) the following screen appears with actual information: the voltage, the current (when charging / discharging), the temperature of the battery and the number of charging cycles. The latter is the number of times the battery is complete discharged and recharged (for the full capacity).
- > After swiping left again, the System info screen will appear. This screen shows notifications of possible particularities.



Change the name of the battery

- > Give each battery a unique name.
- > Connect your device to the battery and click on the three dots next to each other in the upper right corner. Then tap the field with the current name.
- > Enter the password **5678** and confirm with "Confirm".
- > Rename the battery (**max. 18 characters**) and confirm.
- > The connection will now be disconnected and the battery will now run with the new one name can be found.

NOTE: For Apple devices the above instruction must be performed twice.

Troubleshooting if the connection is lost

> What to do if the connection to the battery is lost?

“Kill” the JAROCELLS App and restart the App. **NOTE:** By “Kill the App” we mean that the App must be completely turned off and not just closed. You do this as follows:

Apple: Double-click on the home button or (from iPhone 11) slowly swipe up from the bottom of the screen and stop halfway down the screen. The App Chooser is activated; then swipe up the App previews to close it completely.

Android: Click the Overview button so that all running Apps are visible and swipe the JAROCELLS App up from its screen.

Make sure you are within a radius of <6 meters from the battery. The battery's Bluetooth transmitter has a range of up to about 6 meters.

> With my Android device I do not see any batteries in the App?

When installing the JAROCELLS App on an Android device, you will be asked to access your location. This one function must be allowed, otherwise the App will not function properly. Location (GPS) must also be on with an Android device if you use the App.

> I try to connect to another device but cannot establish a connection?

The battery can only be connected to one device at a time. First disconnect and / or “kill” the App before connecting to another device.

WARRANTY



- > The warranty period is five years for the battery with attachments.

Warranty provision

- > The warranty applies to normal use according to recommendations and within specifications of the product.
- > Warranty is only given if the purchase invoice can be submitted.
- > The warranty does not go beyond repair or replacement of the delivered goods. Consequential damage is expressly stated excluded.
- > In all cases where the warranty conditions are not clear, an attempt will be made to resolve the complaints within reason and cost. This within the provisions of liability.

Liability

- > Besides the warranty provisions on the delivered goods, JAROCELLS B.V. will not accept any liability. JAROCELLS B.V. shall not be liable for any direct, incidental or consequential damages of any nature, or losses or consequential damages or losses or expenses resulting from the use of this product.
- > The user of the product should take all precautions, required to prevent damage.
- > In case JAROCELLS B.V. will be held responsible for damage or losses caused by the product, the compensation paid by JAROCELLS B.V. will not exceed the payments of the assurance company. When the damage is not covered by the insurance, the maximum payment will be equal to the total of the invoice.
- > Liability and right to warranty is in any case excluded with:
 - Damage due to external disasters such as lightning strike
 - The use of an unsuitable charger
 - Incorrect installation or use
 - Repairs have been carried out by third parties or changes have been made to the product
 - Using the battery if water or possible water has entered the housing of the equipment
 - Using the battery when defects are visible or signaled (such as heat distortion, smelling scorching air, loosening of parts, etc.)

We've got the power



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NEXT GENERATION BATTERY PACKS