



**VANAIR**<sup>®</sup>  
MOBILE POWER SOLUTIONS<sup>®</sup>



Product Name: Commercial Storage Batteries  
Model: SK-48V100Ah-16S, E-48V-5K  
FCC ID: 2BK65-SK  
Battery Normal Voltage: 51.2V  
Rated Capacity: 100Ah, 5120Wh



# USER GUIDE

## OPERATION MANUAL AND SERVICE PARTS LIST KEEP THE MANUAL WITH THE VEHICLE

**NOTE:** Read this manual before installing, operating or servicing this equipment. Failure to comply with the operation and maintenance instructions in this manual will VOID THE EQUIPMENT WARRANTY.

This publication contains the latest information available at the time of preparation. Every effort has been made to ensure accuracy. Vanair<sup>®</sup> Manufacturing, Inc. reserves the right to make design change modifications or improvements without prior notification.

Making unauthorized modification to the system components WILL VOID THE WARRANTY! Always contact Vanair<sup>®</sup> before beginning any changes to the ELiMENT<sup>™</sup> Battery.

## **FCC Statement**

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirements. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.



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## GENERAL INFORMATION

For parts, service or technical assistance, make sure you have the Serial Number and Model Number of the unit. Please record the information in the spaces below for future reference. *(For location of this information, See Figure 1-1)*

Serial Number:	
Model Number	

Model and serial numbers are listed on the information label found on the connector side of the battery. *(See Figures 1-1 and 1-2 for reference.)*

<b>GENERAL INFORMATION</b>	
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*Figure 1-1: ELiMENT™ 100 Information Label*

## OVERVIEW

**This manual applies only to ELiMENT™ 100 batteries using LiFePO<sub>4</sub> battery chemistry and may not apply to other types of Lithium based batteries**

The ELiMENT™ LiFePO<sub>4</sub> battery is a multi-cell, compact, heavy duty 48V DC battery pack, which provides up to 100Ah. It is designed as a rechargeable electrical source to power other EPEQ® equipment.

## SAFETY



- Do not use if the battery is wet or has become immersed in water. Contact customer support for instructions.

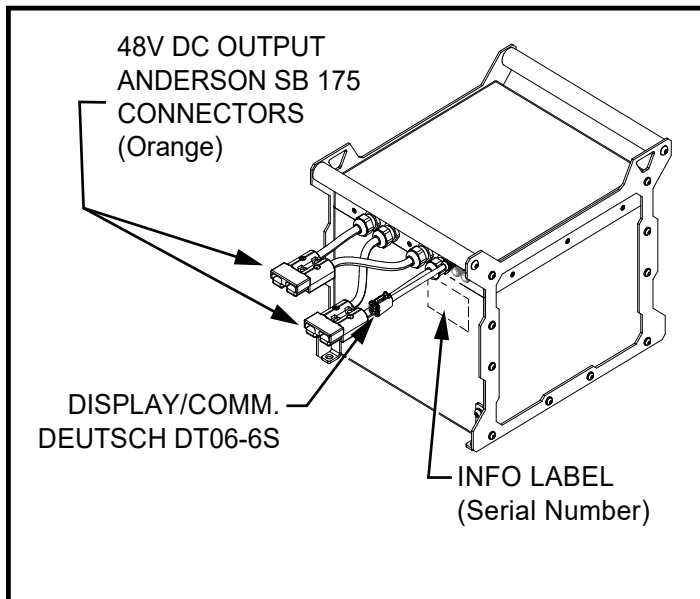


- Never connect or touch both the positive and negative terminals simultaneously with any metal, or electrically conductive object or material at any time – including hands and fingers. This can cause

personal injury, and result in a short circuit, which can ruin or cause serious damage to the battery.



- Do not use if battery, case, or cables show signs of damage or unusual appearance such as swelling, cracks, or leaking.
- Leaked electrolyte is flammable. Keep away from open flame. If leaked electrolyte contacts water it may generate hydrogen fluoride. Hydrogen fluoride is both corrosive and toxic. *The gas is harmful and is foul smelling. Avoid breathing.*
- *Wear protective gloves and eye protection if a battery leak is present - avoid contact with skin.*
- Turn off any connected equipment and disconnect battery if you hear unusual noises, see smoke or smell unusual odors coming from the battery.
- Do not bump, drop, hit the battery, or store anything on top of the battery. This can cause a short circuit or permanent damage to the battery.
- We recommend using only EPEQ® chargers designed for charging ELiMENT™ batteries. Unapproved chargers could result in battery failure, damage to the battery, or unexpected conditions including fire or explosion.
- Exercise safe handling and usage when working with electric batteries and electrical equipment.
- Batteries have a high short circuit current. To reduce chance of accidents we recommend removing watches, rings, or other metal objects.
- Use tools with insulated handles.
- Disconnect charging source before you connect or disconnect cables at the battery terminals.
- ELiMENT™ batteries come pre-wired with DC power cables using Anderson-type connectors.
- Battery weighs approximately 95 lbs. Two people are recommended when carrying battery by hand.



**Figure 1-2:** ELiMENT™ 100 battery connectors.



- **FIRE SAFETY:** When using electrical equipment it is a good idea to keep a Class C fire extinguisher nearby. In case of fire, use a Class C fire extinguisher designed for electrical fires. Whenever possible, avoid using water on electrical fires. Water conducts electricity and may cause electrical short circuits and fire concerns to spread to other components and electrical equipment.

## SETUP

The ELiMENT™ Battery is self-contained and arrives wired with DC power cables and connectors, and ready to be charged. The ELiMENT™ Battery has 2 main orange power connectors which are factory installed for DC power in and DC power out.

The orange DC cables from the battery connect to the corresponding output connectors found on the EPEQ® Shore Power charger, or 12V-48V DC-DC converter. (Or may be connected to another matched input source.) Mate the orange DC connector from the battery to the matching connector on the charging source, and push together until it is secured.

The battery also comes with a smaller connectors: (see *Figure 1-2*)

1. A square Deutsch DT06-6S connector used to connect an optional display.
2. NOTE: Battery must be connected to an EPEQ® controller, with display turned on, to charge battery.

## OPERATION

1. Before its **first** use, charge the battery fully to activate all cells to avoid possible deep battery level depletion.
2. If battery requires charging, charge the battery using matched charging equipment such as the EPEQ® *Shore Power* 120V AC charger or the EPEQ® 12V-48V DC-DC Converter.
3. Safely charge the battery at temperatures between 0°C to 45°C (32°F - 114°F). These batteries can also be charged automatically by a vehicle using an EPEQ™ alternator and regulator option, or planned solar option.
4. LiFePO4 batteries can safely operate between -4°F to 140°F (-20°C to 60°C).
5. ELiMENT™ batteries feature 2 orange colored quick connect Anderson-type plugs for ease of connecting power to other equipment, disconnecting and relocation.
6. Plug in the cable from the EPEQ® charging device using the orange battery connectors. Press connectors together to make sure the connection is secure, then power on the charging unit to begin charging.
7. The orange DC connectors are also used to connect power output from the battery to other EPEQ™ equipment (such as EPEQ® air compressors and AC power inverters).

## KEY INFORMATION

- Battery output is rated at 48V DC and 100Ah.
- ELiMENT™ battery can be fully cycled 5,000+ times. (1 cycle consists of 80% Depth of Discharge, or D.O.D.)
- Battery weight is approximately 95 lbs. (43 kg)
- Dimensions: 16.75"L x 13.38"H x 12.87"W (42.6cm L x 34cm H x 32.7cm W)
- Life span between 5-7 years

- Output is not reduced with remaining battery life. ELiMENT™ Batteries can output at nearly full amperage even with only 10% battery charge remaining.
- The ELiMENT™ battery can provide available power even while being charged.
- Contains built-in BMS (Battery Management System) that protects and monitors over current, over/under voltage and over temperature, It also monitors the state of each individual cell in the battery case.

- » Balancing the charge between cells in a multi-cell battery is another BMS function, This evenly distributed among all of the cells - contributing to the overall health of the battery pack.
- » Communication from the battery's BMS can provide useful data to other compatible attached equipment, providing such information as the amount of run-time left for that piece of equipment, temperature warnings, and errors. It can also communicate with the battery when the equipment is not being used or is on standby, saving battery life when not in use, among other benefits.

## **BMS - (BATTERY MANAGEMENT SYSTEM)**

- ELiMENT™ (LiFePO4) batteries come with built-in battery management system (BMS) designed to protect against under and over charging, extreme operating temperatures, short-circuits, and incorrect voltage for added protection.
- Every ELiMENT™ battery utilizes a BMS, allowing the user to monitor the state of individual battery cells within a battery pack.
- (V2 battery only) Data signals are sent and received by the ELiMENT™ battery and can be monitored and controlled by means of monitoring devices connected to the small gray CAN (controller area network) bus connector of the battery.
- How does BMS benefit the user?
  - » The BMS monitors and manages a battery pack to keep the battery operating within safe limits (including temperature and voltage levels), which can prolong the life of the battery, improve efficiency and protect it from damage.
  - » The BMS typically measures key information such as current, voltage, temperature. (An example of BMS which most of us use in our daily lives is the battery charge level on a cell phone display.)
  - » The BMS can also provide information when one or more cells are not operating properly or to call attention to potential conditions that need attention.

## **ADDITIONAL BATTERY SAFETY & FEATURES**

- Batteries are a source of stored electricity. Always exercise safe handling and operation to avoid injury and damage to equipment.
- Visually check the battery's case, cables and connectors to ensure they are not damaged and in good condition before each use.
- Lithium Iron Phosphate is a very stable chemical battery composition, making them among the safest batteries available today.
- LiFePO4 batteries are naturally non-combustible and will not overheat - unlike other battery types.
- LiFePO4 batteries are non toxic, and do not give off toxic, harmful fumes during normal use, are safe to use indoors and out, and are also safe for the environment. LiFePO4 batteries are recyclable.
- Each battery cell is in a hermetically sealed can, constructed to withstand pressures and temperatures generated during normal use.
- During normal use, there is no physical danger of ignition, explosion or danger of chemical or hazardous materials leakage.
  - If exposed to fire, physical impacts, misuse causing excess electrical



stress, or decomposition - the cell container may be breached and hazardous materials may be released. Additionally, if exposed to excess heat or fire - an unpleasant smelling gas may be emitted.

- Abnormal conditions may occur that require special attention and the use of personal protective equipment (PPE), as listed elsewhere in this manual.
- While PPE may be required or recommended for the work being done using tools or appliances powered by the ELiMENT™ 100 battery, under normal operating conditions, the use of the ELiMENT™ 100 (LiFePO<sub>4</sub>) battery alone requires no special respiratory protection, special ventilation, protective gloves, eye protection, special clothing or equipment

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**ELiMENT™ LITHIUM IRON  
PHOSPHATE BATTERY****VANAIR® VANTAGE  
WARRANTY****ALL WARRANTY OR  
RETURNS MUST BE  
PRE-AUTHORIZED PRIOR  
TO PERFORMING  
ANY WARRANTY WORK.****(844) VAN - SERV****SERVICE@VANAIR.COM****PARTS@VANAIR.COM****10896 W. 300 N.  
MICHIGAN CITY, IN 46360****(800) 526-8817****EPEQ.COM****EFFECTIVE: JULY 15, 2022**

This limited warranty supersedes all previous Vanair® warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY—Subject to the expressed terms and conditions set forth below, Vanair® Mfg., Inc. ("Vanair"), of Michigan City, Indiana (USA), warrants to the original retail purchaser of new Vanair® equipment that such equipment is free from defects in materials and workmanship when shipped by Vanair®.

For warranty claims received by Vanair® within the applicable warranty periods described below, Vanair® will repair or replace any warranted equipment, parts, or components that fail due to defects in material or workmanship or refund the purchase price for the equipment at Vanair®'s discretion. Vanair® is not responsible for time or labor to gain access to the machine to perform work.

TO BE ELIGIBLE FOR WARRANTY, THE CUSTOMER MUST REGISTER THE PRODUCT ONLINE AT <https://vanair.com/support/registration.html> AND RETAIN PROOF OF PURCHASE RECEIPT. All returns must receive a Return Material Authorization (RMA) number from the factory and be returned directly postage or freight prepaid. See RMA for instructions regarding the shipping of products containing Lithium Batteries. DO NOT SHIP LITHIUM BATTERIES VIA AIR.

Warranty will commence upon receipt of the Warranty Registration online. If the Warranty Registration is not received within sixty (6) days of shipment from Vanair®, the warranty commencement date shall be thirty (30) days from the date of shipment from Vanair®. Records of warranty adherence are the responsibility of the end user.

Vanair® must be notified in writing within thirty (30) days of any such defect or failure. All warranty or returns must be pre-authorized in writing prior to performing warranty work. Call Vanair® for process and forms. Vanair® will provide instructions on the warranty claim procedures to be followed.

**STANDARD WARRANTY TERMS**

ELiMENT™ 48V Lithium Iron Phosphate Battery Pack: thirty-six (36) Months, or 3.0 Adjusted Discharge Megawatt-hours (whichever comes first)

This Limited Warranty shall not apply to:

1. Items furnished by Vanair®, but manufactured by others, such as engines and trade accessories (these items are covered by the manufacturer's warranty, if any).
2. Equipment that has been modified by any party other than Vanair® or equipment which has not been used and maintained in accordance with Vanair®'s specifications.
3. Equipment which has been improperly installed and/or improperly operated, based upon Vanair®'s specifications for the equipment or industry standards.
4. Equipment installed by a non-authorized or third-party personnel. Vanair® products are intended for purchase and use by commercial/industrial users and persons.

In the event of a warranty claim covered by this Limited Warranty, the exclusive remedies shall be, at Vanair®'s sole discretion: (i) repair; or (ii) replacement; (iii) where authorized in writing by Vanair® in appropriate cases, the reasonable cost of repair or replacement at an authorized Vanair® service facility; or (iv) payment of (or credit for) the purchase price (less reasonable depreciation based upon actual use) upon return of the equipment at the warranty claimant's risk and expense. Vanair® will pay standard ground freight for any warranty item shipped to and from Vanair® or (Vanair® designated facility) within the first year of the applicable warranty period. Any additional expedited freight cost is the responsibility of the purchaser.

TO THE GREAT EXTENT PERMITTED BY APPLICABLE LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES APPLICABLE TO THE VANAIR® EQUIPMENT. IN NO EVENT SHALL VANAIR® BECOME LIABLE FOR DIRECT, INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT OR LOST BUSINESS OPPORTUNITY), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY. IN NO EVENT SHALL VANAIR® BECOME OBLIGATED TO PAY MORE ON ANY WARRANTY CLAIM THAN THE PURCHASE PRICE ACTUALLY PAID BY THE ORIGINAL RETAIL PURCHASER.

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Some states in the United States of America do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, and as such, the above limitations and exclusions may not apply to you. This warranty provides specific legal rights. Other rights may be available to you, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be saved, the limitations and exclusions set out forth above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

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