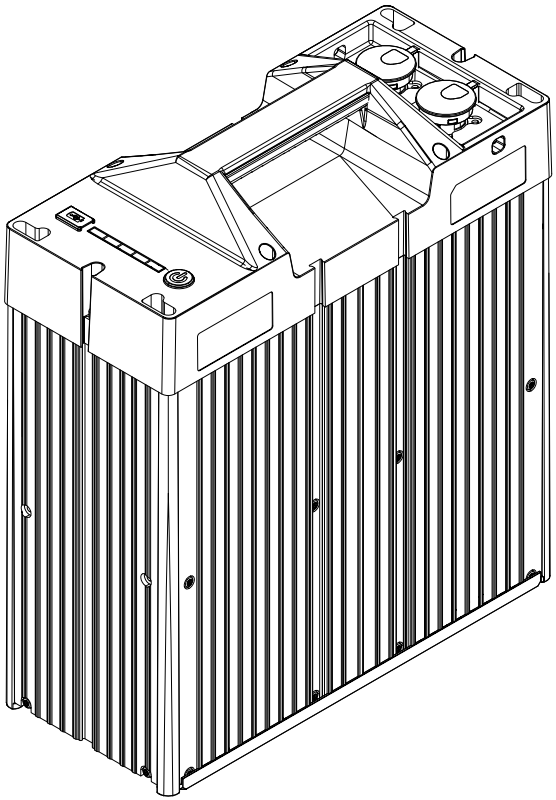
VIPOWER™

Owner's Manual

56V DC Battery Pack



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Support

Phone: 1-800-864-1649
Email: sales@valleyind.com
Website: www.valleyind.com

Introduction

Thank you for purchasing a VIPower™ 56V DC battery pack. We want to help you to get the best results from your new 56V DC battery pack and to operate it safely. This manual contains information on how to do that; please read it carefully before operating.

Safety Messages

Your safety and the safety of others are very important. We have provided important safety messages in this manual and on the 56V DC battery pack. Please read these messages carefully.

⚠ DANGER ⚠

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING ⚠

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION ⚠

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Important Safety Information

For your safety and the safety of others, always follow the instructions below.

- Before utilizing battery pack, review and understand these instructions that have been provided along with the manual for the VIPower™ electric motor and 56V DC battery charger. Save instructions for future reference.
- Make sure operator receives adequate instruction before utilizing battery pack with VIPower™ electric motors and 56V DC battery charger.
- Use only VIPower™ elector motor, 56V DC battery charger and power cables with 56V DC battery pack.
- Do not allow children or persons of physical, sensory or mental limitations or lack of experience or knowledge use battery pack. Do not allow children to play with this battery pack.
- When charging a VIPower™ 56V DC battery pack, always place in a well-ventilated area and avoid exposure to outdoor elements such as rain. Never charge a frozen battery pack.
- **Warning** – Do not use a battery pack or equipment that is damaged or modified. Damaged or modified battery packs may exhibit unpredictable behavior resulting in fire, explosion or risk of injury.
- **Warning** – Do not expose battery pack or equipment to fire or excessive temperature. Exposure to fire or temperature above 265° F (130° C) may cause explosion.
- **Warning** – Follow all charging instructions and do not charge the battery pack or equipment outside of the temperature range specified in the instructions. Charging improperly or at temperatures outside of the specified temperature range may damage the battery and increase the risk of fire.
- Do not leave the battery pack unattended while it is on.
- Always perform a pre-operation inspection before each operation and correct any problems.
- Always wear safety glasses, hearing protection and other appropriate PPE during use.
- Do not modify or attempt to repair the battery pack or equipment except as indicated in the instructions for use and care.
- Do not store, transport, or operate battery upside down.

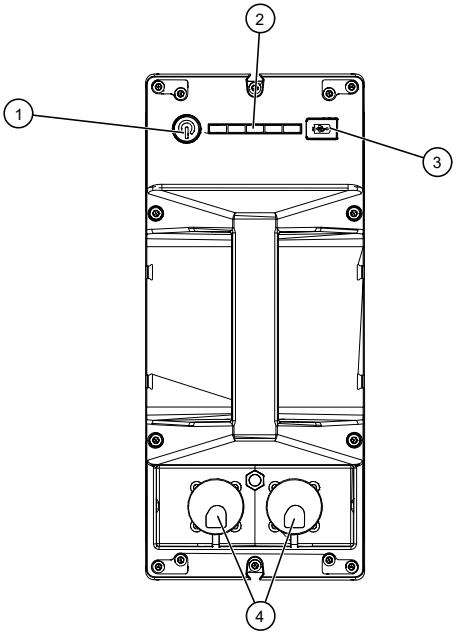
Safety Label Location

The label below is affixed to your battery pack and warns of a potential hazard that could cause damage to the battery pack. Please read carefully.

Battery Pack Specifications

General	
Part #	33-103428
Charging Cycles	2500+
Charge Time	2.5 Hours*
Length, Width, Height	14.21" x 6.14" x 16.73"
Weight (lbs)	60.4
Voltage (V DC)	56
Battery Chemistry	Lithium Iron Phosphate (LiFePO4)
Rating (kW)	2.7
AMP Hour Rating (Ah)	54
Rated Discharge (A)	80
Peak Discharge (A)	150
Cell Grade	A
Cell Format	Prismatic
Discharge Temp.	-4° to 122° F (-20° to 50° C)
IP Code	IP67
Casing Material	Aluminum
Certifications	CE CB RECOGNIZED COMPONENT ETL Intertek 5031912 Conforms to UL Std.2595 Certified to CSA Std C22.2 No.0.23
*Charge time is from 0%-100%. Charging time is approximate. Charge time will differ if charging multiple batteries.	

Machine Component ID



#	Description	Function
1	Power Button	Powers battery pack on and off.
2	LED Indicator Lights	Provides charge level of battery pack.
3	Weatherproof Plug	Protects battery pack from outdoor elements.
4	Weatherproof Port Caps	Protects ports from outdoor elements when not in use.

Connecting Battery Pack

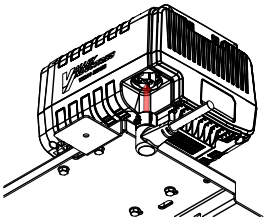
Here are the proper installation steps for your VIPower™ 56V DC battery pack with VIPower™ electric motor. VIPower™ power cables are required and sold separately.

1. Connecting Power Cable Connector to Motor

On backside of electric motor, install a connector plug end of power cable to the electric motor port.

You will hear an audible click when properly installed.

Verify connection is secured by light tugging on connection.

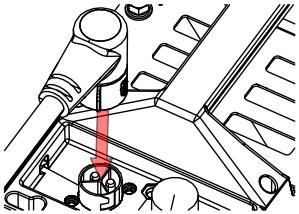


2. Connecting Power Cable Connector from Motor to Battery Pack

Connect the remaining connector plug end of power cable to a port on the battery pack.

You will hear an audible click when properly installed.

Verify connection is secured by light tugging on power cable connector.



Connecting Multiple Battery Packs

Here are the proper steps in connecting multiple VIPower™ 56V DC battery packs together. VIPower™ power cables are required and sold separately.

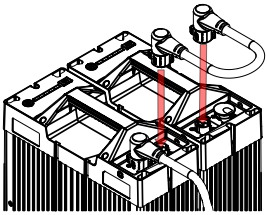
1. Connect VIPower™ Power Cable to Each Battery

Connect plug ends of power cable, to an open port on each battery.You will hear an audible click when properly installed.

Verify connection is secure by lightly tugging on power cable ends.

For disconnecting, please see the next section.

NOTE: If charging multiple batteries at once, charge time will increase.

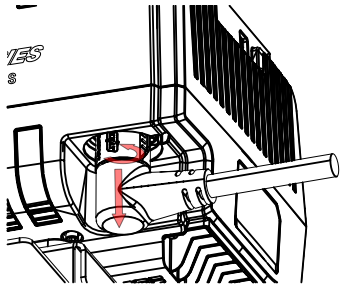


Disconnecting Battery Pack

Here are the proper steps for disconnecting power cable between your VIPower™ electric motor and battery pack.

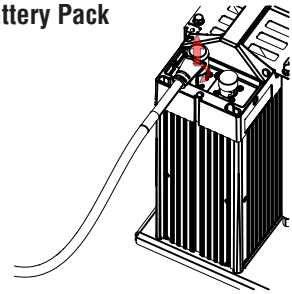
1. Disconnecting Power Cable From Motor

Turn the winged connector plug clockwise by a quarter turn and then pull out from motor port.



2. Disconnecting Power Cable Connector from Battery Pack

Turn the winged connector plug counter-clockwise by a quarter turn and then pull out from battery pack port.

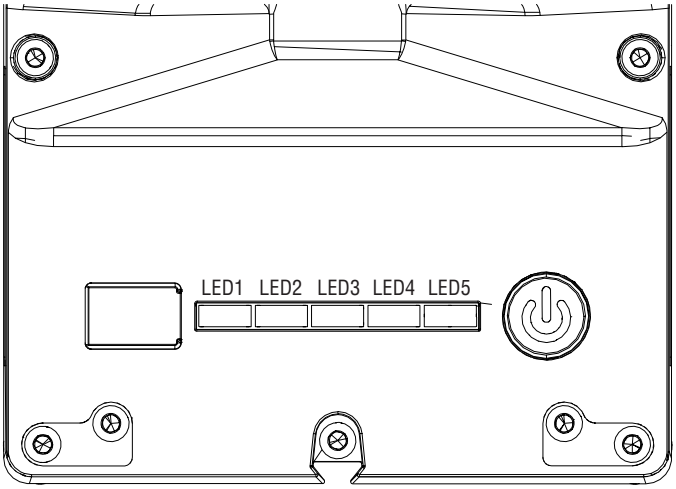


Charging Battery Pack

For how to charge your 56V DC battery pack, refer to manual for the 56V DC battery charger. Reference section Battery Indicator Status on page 9 on identifying the charge level of battery pack.

Battery Indicator Status

On your VIPower™ 56V DC battery pack, there will be LED battery indicator lights. See below for status.



LED Indicator Status	LED1 flashes yellow	<42±0.3V
	LED1 flashes green	<20%SOC
	LED1 is solid green	20-39%SOC
	LED1, LED2 are solid green	40-59%SOC
	LED1, LED2, LED3 are solid green	60-79%SOC
	LED1, LED2, LED3, LED4 are solid green	80-89%SOC
	LED1, LED2, LED3, LED4, LED5 are solid green	>90%SOC
SOC = State of Charge		

Pre-Operation

Before utilizing your VIPower™ 56V DC battery pack, it is very important to take few moments before you utilize the battery pack to check its condition. Be sure to take of any problem you find before operating.

⚠ DANGER ⚠

Improperly maintaining this battery pack, or failure to correct a problem before operation, can cause a malfunction which you can be seriously hurt or killed.

Always perform pre-operation inspection before each operation and correct any problem.

⚠ WARNING ⚠

Before beginning your pre-operation checks, be sure that the power switch is not illuminating a green light.

Always check the following items before starting your battery pack:

1. Look for signs of damage on the battery pack and power cable.
2. Verify that the battery pack is properly installed and fastened to equipment.
3. Check the electric motor that is powered by the battery pack.

Operation

1. Turning On Battery Pack

1. Press the POWER button. It will illuminate green when powered on.
2. Make sure each port on the battery pack is in-use. If port not in-use, cover port with cap.
   NOTE: Battery pack will not operate if cap is not covering unused port.

2. Turning Off the Battery Pack

1. Press & hold the POWER button, it will no longer illuminate green when powered off. If they battery pack is not connected to anything and does not operate for a period of time, it will automatically shut down.

Maintenance & Handling

Transporting

- Hold the grip at the top of the battery pack and grasp firmly so your fingers do not slip from the grip.
- Do not swing the battery pack or throw it.
- Always use proper lifting technique when transporting battery pack by hand. Use a team lift when available.
- Always make sure battery pack is secured to a mounting surface that is flat. **Never place battery upside down.**
- Do not vertically stack more than seven batteries.
- Do not immerse the battery pack in water or expose to moisture.
- Do not mix battery pack with other cargo.
- During storage or transportation, do not exceed 149° F (65° C)

Transporting - By Ship or Aircraft

- When shipping by third parties (e.g.: by air transport or forwarding agency), special requirements on packaging and labeling must be observed. For preparation of the item being shipped, consulting an expert for hazardous material is required.
- Ship battery packs only when undamaged. Please also observe the possibility of more detailed national regulations.

Cleaning

- After use, wipe down with a dry cloth.
- DO NOT use water from a garden hose or a pressure washer to spray down battery pack.
- DO NOT submerge battery pack in water.

Maintenance & Handling

Storage

- Inappropriate long-term storage can cause the battery pack to deteriorate quickly and possibly become unusable.
- Store in a cool, dry, and well-ventilated area avoiding exposure to heat and high temperatures. Do not place battery in direct sunlight or heat.
- The recommended storage temperature is as followed based on time in storage:
    1. Less than 1 month = -4° F to 113° F (-20° to 45° C)
    2. Less than 3 months = 14° F to 86° F (-10° to 30° C)
    3. Less than 1 year = 32° F to 86° F (0° to 30° C)
- Battery pack should be stored within recommended room temperatures with a charge of 40% - 60% of rated capacity.
- In order to avoid over-discharge, always charge and discharge battery pack every three months, then charge to 40% - 60% rated capacity.

Disposal

To protect the environment, do not dispose of this product using standard waste collection. Observe the local laws and regulations.

Contact Valley Industries for shipping instructions.

Troubleshooting

Troubleshooting is required when the LED indicator lights are all flashing red on the battery pack, indicating an error. Sequential flashing will not repeat unless battery pack is turned off then turned back on.

If error still exists after trying solution, please contact our support team at 1-800-864-1649.

Sequential Flashing	Problem	Solution
Twice (Short), Once (Long)	Total voltage is overvoltage	Disconnect all external parts and then connect again.
Twice (Short), Twice (Long)	Total voltage is undervoltage	Disconnect all external parts and then connect again.
Twice (Short), Three (Long)	Battery is overvoltage	Disconnect all external parts and then connect again.
Twice (Short), Four (Long)	Battery is undervoltage	Disconnect all external parts and then connect again.
Twice (Short), Five (Long)	Cell differential pressure protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Twice (Short), Six (Long)	DC-DC undervoltage	Disconnect all external parts and then connect again.
Twice (Short), Seven (Long)	DC-DC overvoltage	Disconnect all external parts and then connect again.
Three (Short), One (Long)	Charge overcurrent level 1 protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Three (Short), Two (Long)	Discharge overcurrent level 1 protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Three (Short), Three (Long)	Discharge overcurrent level 2 protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Three (Short), Four (Long)	Charge overtemperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Three (Short), Five (Long)	Charge low temperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Three (Short), Six (Long)	Discharge overcurrent level 3 protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Three (Short), Seven (Long)	Charge overcurrent level 2 protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Three (Short), Eight (Long)	DC-DC overcurrent protection	Check connected parts have short circuit phenomenon, repair and reconnect.
Four (Short), One (Long)	Discharge overtemperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Four (Short), Two (Long)	Discharge low temperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Four (Short), Three (Long)	mos overtemperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.

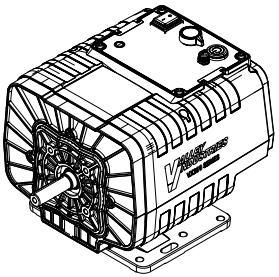
Troubleshooting
(Continued)

Sequential Flashing	Problem	Solution
Four (Short), Four (Long)	Simulated front-end overtemperature	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Four (Short), Five (Long)	Cell temperature difference too large	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Four (Short), Six (Long)	Abnormal charging current	Disconnect all external parts and then connect again.
Four (Short), Seven (Long)	Pressure difference between P+ and B+ is too large	Disconnect all external parts and then connect again.
Five (Short), One (Long)	Cell temperature rises rapidly	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Five (Short), Two (Long)	Sampling resistance is overheated	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Five (Short), Three (Long)	Voltage inconsistency	Disconnect all external parts and then connect again.
Five (Short), Four (Long)	High feedback current	Disconnect all external parts and then connect again.
Five (Short), Five (Long)	Charge communication timeout	Check if power connector is properly connected.
Five (Short), Six (Long)	Heating Plate Anomaly	Internal Sensor Failure. Contact Customer Support
Five (Short), Seven (Long)	LDO Overheating	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Five (Short), Eight (Long)	Isostatic resistance overheating	Disconnect all external parts, place in room temp. for 1 hour. Reconnect.
Six (Short), One (Long)	Discharge communication timeout	Check if power connector is properly connected.
Six (Short), Two (Long)	Internal communication failure	Internal Sensor Failure. Contact Customer Support
Six (Short), Three (Long)	Precharge timeout	Check connected parts have short circuit phenomenon, repair and reconnect.
Six (Short), Four (Long)	Precharge overcurrent	Check connected parts have short circuit phenomenon, repair and reconnect.
Six (Short), Five (Long)	Discharge short circuit	Check connected parts have short circuit phenomenon, repair and reconnect.
Seven (Short), One (Long)	Temperature sensor fault	Contact Customer Support.
Seven (Short), Two (Long)	Voltage sensor fault	Contact Customer Support.
Seven (Short), Three (Long)	Current sensor fault	Contact Customer Support.
Seven (Short), Four (Long)	Low pressure prohibition	Battery is completely overdischarged. Contact Customer Support.
Seven (Short), Five (Long)	Low soc	Battery is low. Recharge.
Seven (Short), Six (Long)	Secondary overvoltage	Internal Sensor Failure. Contact Customer Support
Seven (Short), Seven (Long)	The voltage at point cd is abnormal	Disconnect all external parts and then connect again.

Additional System Components

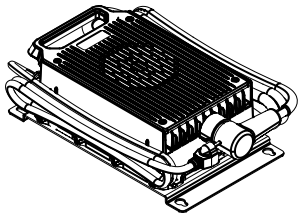
(Sold Separately)

Electric Motor



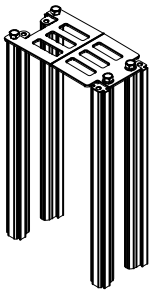
VX-120 or VX-200 Series

56V DC Battery Charger



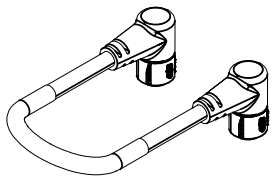
Part# 33-103430

Battery Rack (Holds 1 Battery)



Part# 34-100024

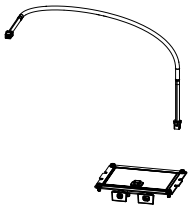
Power Cables (M x M)



Part#
33-103427 (10")*
33-103427-3 (3ft)
33-103427-6 (6ft)
33-103427-9 (9ft)
33-103427-12 (12ft)
33-103427-15 (15ft)

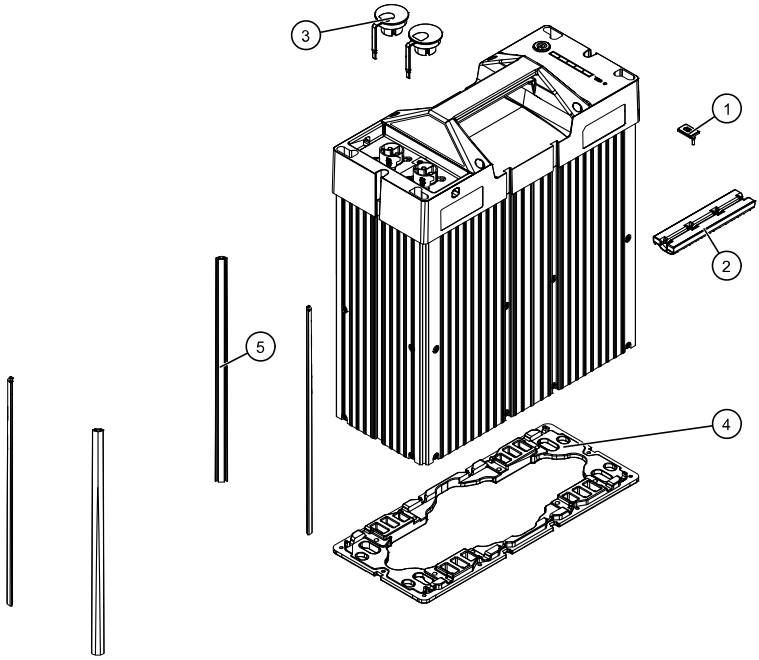
*Used only for connecting batteries together

Remote Mount Panel Kit



Part# 34-100023

Exploded View Diagram



#	Part #	Description
1	33-103439	Weatherproof Plug
2	33-103434	Handle Cushion
3	33-103432	Weatherproof Cap
4	33-103433	Rubber Foot
5	34-100030	Guard Kit

Manufacturer Warranty

Valley Industries shall warranty any battery pack manufactured, or parts of battery packs manufactured, to be free from defects in material or workmanship for a period of 3 years from the date of purchase by the original owner. This warranty applies to the original purchaser of the battery pack and is non-transferable. Verification of purchase is the responsibility of the buyer.

This warranty specifically covers manufacturer defects only. If a defect is found Valley Industries will replace the battery pack. The user must contact our support team (phone: 1-800-864-1649 / email: sales@valleyind.com) to initiate the return process for a replacement battery pack. Shipping costs to return the battery pack to Valley Industries are the responsibility of the customer, while the shipping of the replacement unit will be covered by Valley Industries.

Any misuse, abuse, alteration, improper installation or operation will void the warranty. Any services performed by parties other than Valley Industries will void the warranty.

This warranty specifically excludes the following: failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by Valley Industries in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability or fitness for a specific use.

Warranty does not cover items subject to normal wear caused by direct physical contact by the public.

This warranty is in lieu of any other warranty, expressed or implied, and Valley Industries assumes no other responsibility or liability outside that expressed within this warranty.

Valley Industries reserves the right to modify the terms and conditions of this warranty at any time and without prior notice. Please refer to the most current warranty terms available at the time of purchase.

To activate your 3-year warranty and streamline any future support, please scan the QR code below or visit: **www.valleyind.com/vipower-warranty-registration**.

Please have your purchase receipt handy during registration.