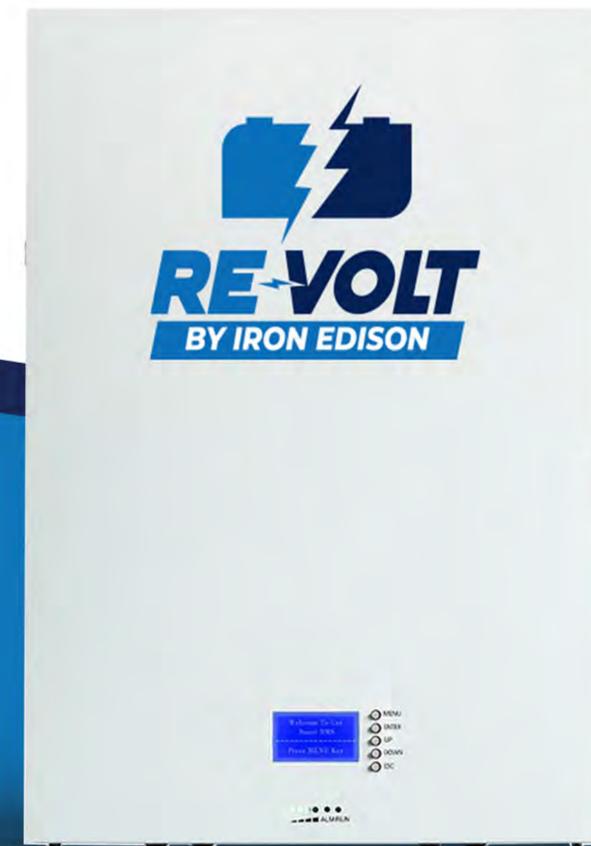




Owner's Manual

(Revised 12/01/2020)



720-432-6433

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1. Safety Precautions

It is important to read the entire user manual carefully before installing or using the RE-VOLT battery. Failure to follow any of the instructions or warnings in this manual may result in electrical shock or cause serious injury or death, and may damage the battery and system.

If the battery(ies) are stored for a prolonged period of time, they must be charged every three to six months, and the soc should never be less than 80% capacity.

- The battery needs to be recharged within 12 hours after fully discharging. Do not expose cable outside.
- All battery terminals must be disconnected prior to maintenance.
- Do not use cleaning solvents to clean the battery.
- Do not expose the battery to flammable or harsh chemicals or vapors.
- Do not paint any part of the battery, including any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Do not insert any foreign objects into the battery.

Damages caused directly or indirectly due to the aforementioned items may void your warranty.

1.1.Before Connecting

- Please inspect the battery and packing list. If the battery is damaged or spare parts are missing, please contact your support manager. Before installation, disconnect from grid/utility power and make sure the battery is turned off.
- The internal BMS in the battery is designed for 48VDC. DO NOT connect battery in series.
- Do not connect the battery with different types of batteries.
- Please ensure the electrical parameters of battery system are compatible to inverter.
- All setbacks should comply with local and National electric codes.

1.2.During Operation

If the battery system needs to be moved or repaired, grid power must be cut off prior to shutting the battery down.

- It is prohibited to connect the battery with a different type of battery. NEVER install battery(ies) with a faulty or incompatible inverter.
- In case of fire, use a foam extinguisher, CO2, ABC dry chemical, powdered graphite, copper powder or soda (sodium carbonate). Do not use liquid extinguishers.
- Do not open, repair or disassemble the battery. Iron Edison is not responsible for any damage or injuries due to a violation of safety precautions or a violation of design, production or equipment safety standards.

2. Introduction to the Battery

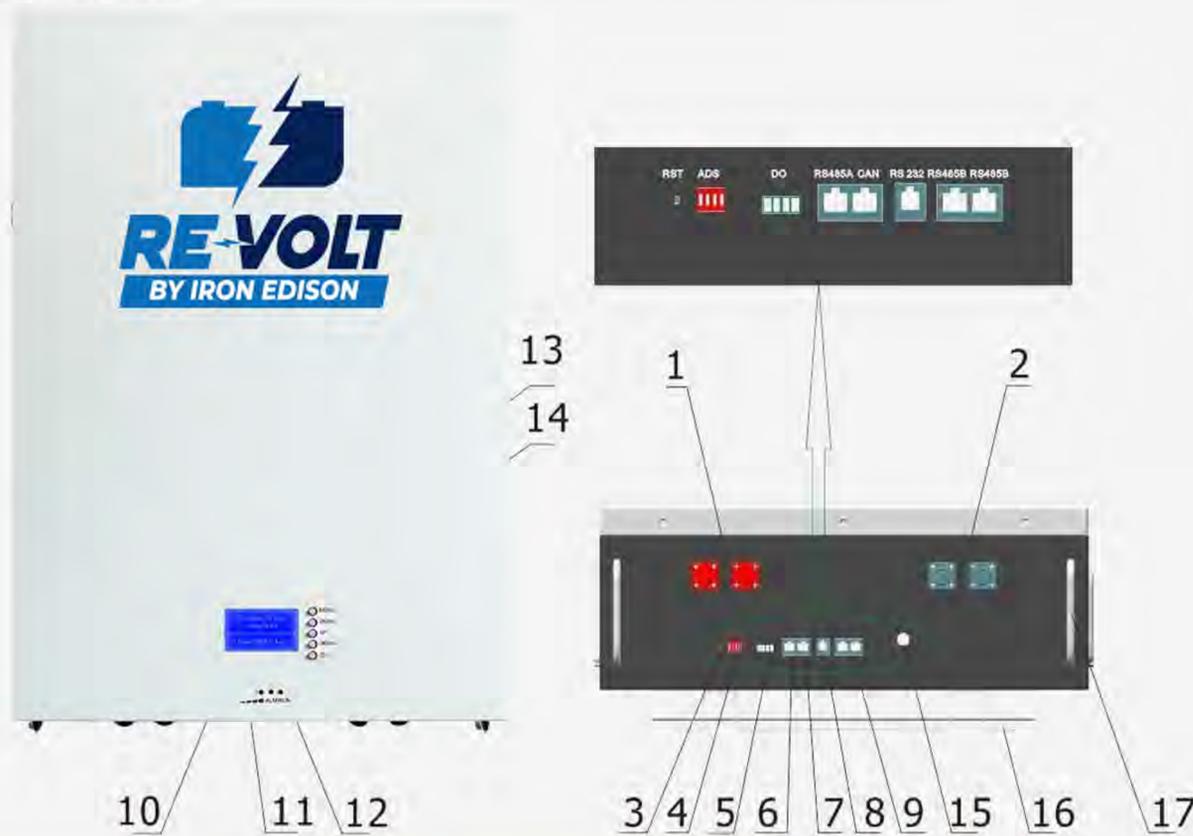
2.1.Key Features

- LiFePO4 composition - provides exceptional safety and longevity with 6,000 cycles and a 20 year service life
- Consistent performance over a wide temperature range
- Wall-mounted, convenient installation
- Integrated state-of-the-art BMS to manage and monitor battery information including voltage, current and temperature ,as well as balance cell charging/discharging rates
- 10-year warranty

2.2. Interface Introduction

This section details the interface functions of front and back panel.

Front interface:



No.	Description	Silk-screen	Remark
1	UES0600	P+ P+	Output terminal
2	UES0600	P- P-	Output terminal
3	Port Reset button	RST	RESET Battery
4	Dial switch	ADS	Set Address
5	Do		
6	CANbus Port	CANbus	CANbus and inverter connection port
7	RS485A Port	RS485	RS485 and inverter connection port
8	RS232 Port	RS232	RS232 communication port
9	RS485B port	RS485	RS485 parallel communication interface
10	LED	RUN	Operation indicator
11	LED	ALM	Alarm indicator
12	LED	CAPACITY	Capacity indicator
13	LCD		
14	LCD Key		
15	Switch		
16	Bracket		
17	Handle		

2.3. SOC Indicator & Status Indicator Guides

Chart 1: Battery Status

Status	Normal/ Warning/ Protection	RUN	ALM	Capacity (SOC) LED						Description	
Shut Down	Shut down	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	Flash	OFF	Based on capacity						Standby	
	Warning	Flash	Flash	Based on capacity							
Charge	Normal	ON	OFF	Based on capacity						ALM light does not flash when overcharge alarm	
	Warning	ON	Flash	Based on capacity							
	Over Charge Protection	ON	OFF	ON	ON	ON	ON	ON	ON	ON	Switch to standby when there is no charging
	Temperature, Current, Failure protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	Flash	OFF	Based on capacity							
	Warning	Flash	Flash	Based on capacity							
	Over discharge protection	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop Discharging
	Temperature, Over Current, Short Circuit, Reverse Connection, Failure Protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop Discharging
Fault	/		ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging or discharging

Chart 2: Battery Capacity

Status	Charging						Discharging					
Capacity LED Indicator												
Capacity	0 ~ 16.6%	OFF	OFF	OFF	OFF	Flash	OFF	OFF	OFF	OFF	OFF	OFF
	16.6 ~ 33.2%	OFF	OFF	OFF	Flash	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2 ~ 49.8%	OFF	OFF	Flash	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8 ~ 66.4%	OFF	Flash	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4 ~ 83.0%	OFF	Flash	ON	ON	ON	OFF	ON	ON	ON	ON	ON
83.0 ~ 100%	Flash	ON	ON	ON	ON	OFF	OFF	ON	ON	ON	ON	
RUN Status	ON						Flash					

2.4. Connectors

Charge / Discharge connectors: to connect the positive pole(+) and negative pole(-) from the battery to the inverter via DC isolator.

Canbus/ RS485: Active communication portal between battery and inverter.

USB To RS232: Provides dynamic monitoring data of battery via upper computer.

Address: Reserved Address portal for multiple parallel connections.

2.5. Wake Up button

Battery ON: When battery is shut down, press the RST button for 3 seconds. When activated, the LED lights shift from RUN light to the lowest capacity indicator.

Battery OFF: When battery is activated, press button for 3 seconds. System will shut down when the LED lights shift from the lowest capacity indicator to RUN light.

2.6. Display function instruction

2.6.1. Reference of Panel



2.6.2. Screen Display

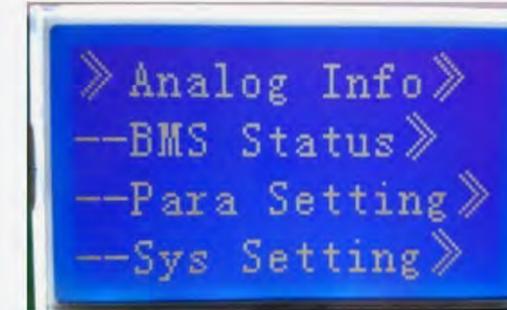


2.6.3. Functional Specifications

Interface Introduction

Main Menu Page

When electricity or dormancy is activated, page will display the welcome screen. Press the MENU button to enter the main menu page., as shown in the figure below:



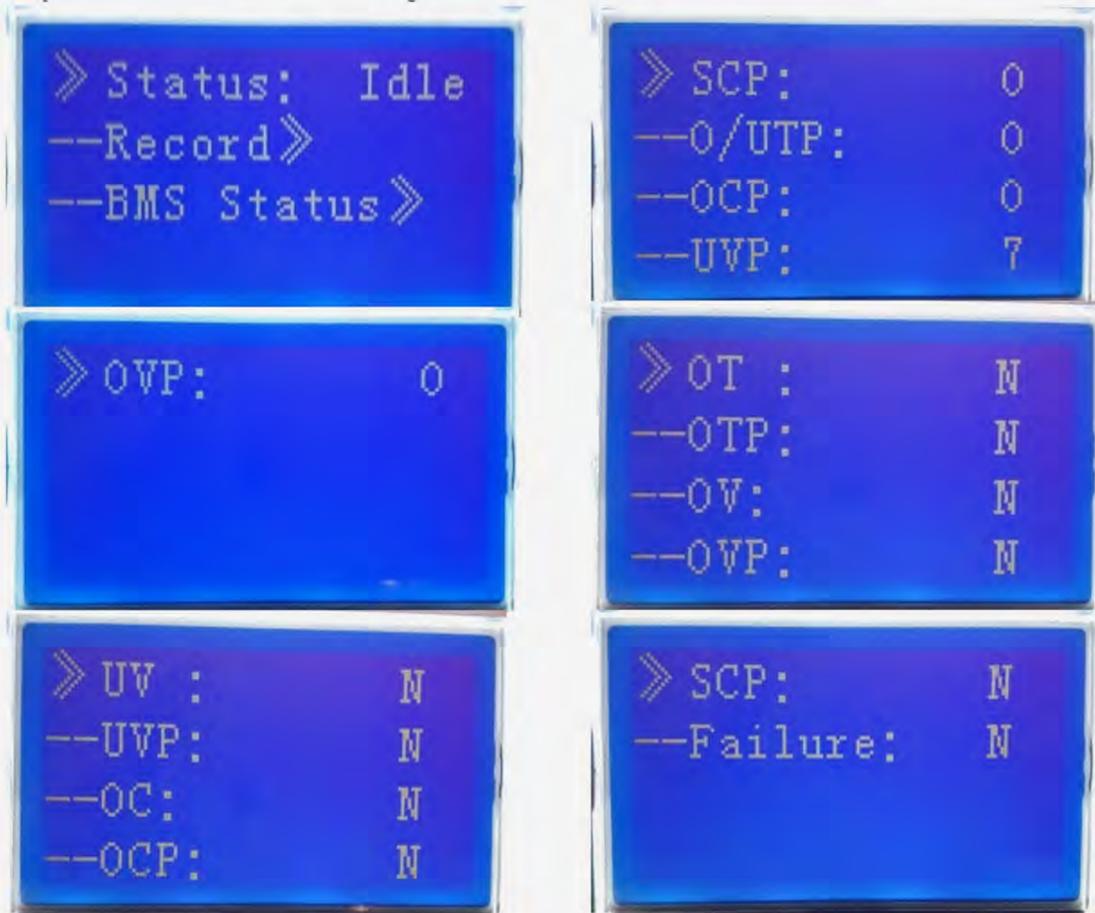
2.6.4 Battery Parameters Page

When the cursor">>" is pointing to "Battery Parameters Acquisition", press ENTER to access settings.



2.6.5. Battery Status Page

When the cursor ">>" is pointed to "Battery Status", press ENTER key to access the "Battery Status" page, as shown in the figure below:

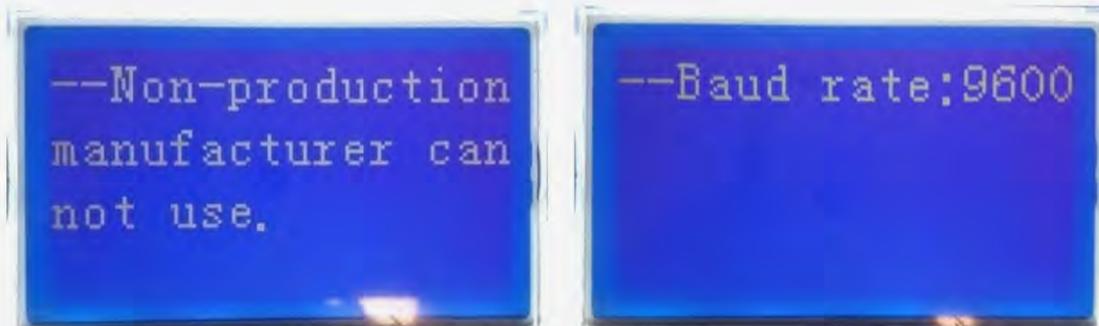


System Settings Page

Baud Rate: 9600. Do not change.

2.6.6. Parameter Settings

Screen can not set up parameters



2.6.7.Key Description

- 1) SW1---MENU ,SW2---ENTER ,SW3---UP ,SW4---DOWN , SW5---ESC.
- 2) Each item begins as ")" or "--", among them ")" shows the current cursor position. Press UP or DOWN key to move the cursor position ;with ")" end of the project ,the content of the said project has not shown, press ENTER key to enter the corresponding page.
- 3) Press ESC key to be returned to the next highest directory level ;In any position , press MENU key to return to the main menu page.
- 4) In a dormant state, press any key to activate screen.

Dormancy /Shutdown

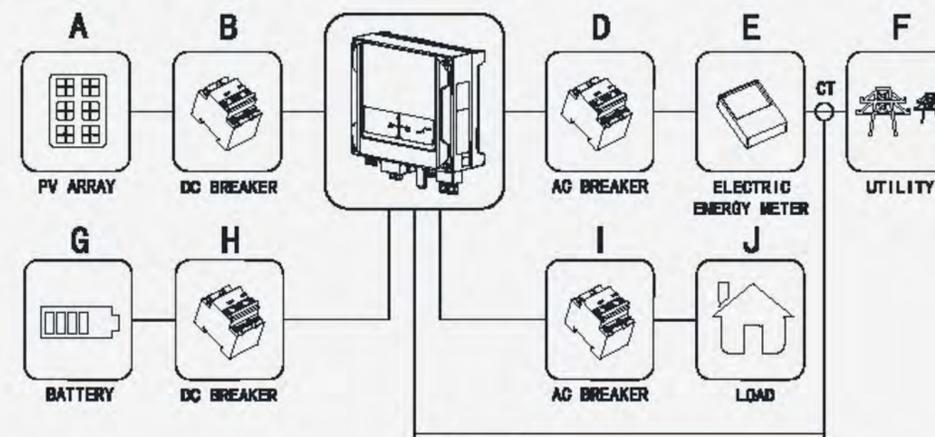
- Under normal operating conditions, system will enter a state of dormancy/shutdown if no keys are pressed for 1 minute.
- To activate screen from a shutdown/dormancy state, press any key.
- To completely reset the battery, press the RST button for 5 seconds.

2.6.8. Fault Code Definitions:

- OVP: Over Voltage Protection
- UV: Under Voltage
- UVP: Under Voltage Protection
- OC: Over Current
- OCP: Over Current Protection
- SCP: Short Circuit Protection
- O/UTP: Over/Under Temperature Protection
- OCP: Over Current Protection
- UVP: Under Voltage Protection
- OT: Over Temperature
- OTP: Over Temperature Protection

3.Safe Handling Guide

3.1.System Diagram



3.2. Tools

The following tools are required to install the battery pack:

- Lag bolts
- Impact Driver
- Hammer

NOTE :

Use properly insulated tools to prevent accidental electric shock or short circuits.

If insulated tools are not available, use electrical tape to cover the entirety of any exposed metal surfaces on tool.

3.3. Safety Gear

It is recommended to wear the following safety items when dealing with the battery pack:

- Insulated gloves
- Safety goggles
- Safety shoes

4. Installation

4.1. Inventory of items

Thoroughly inspect the package after receiving it. Upon opening, ensure there are no items missing. If there is any damage to the unit or external packaging, please contact us immediately.

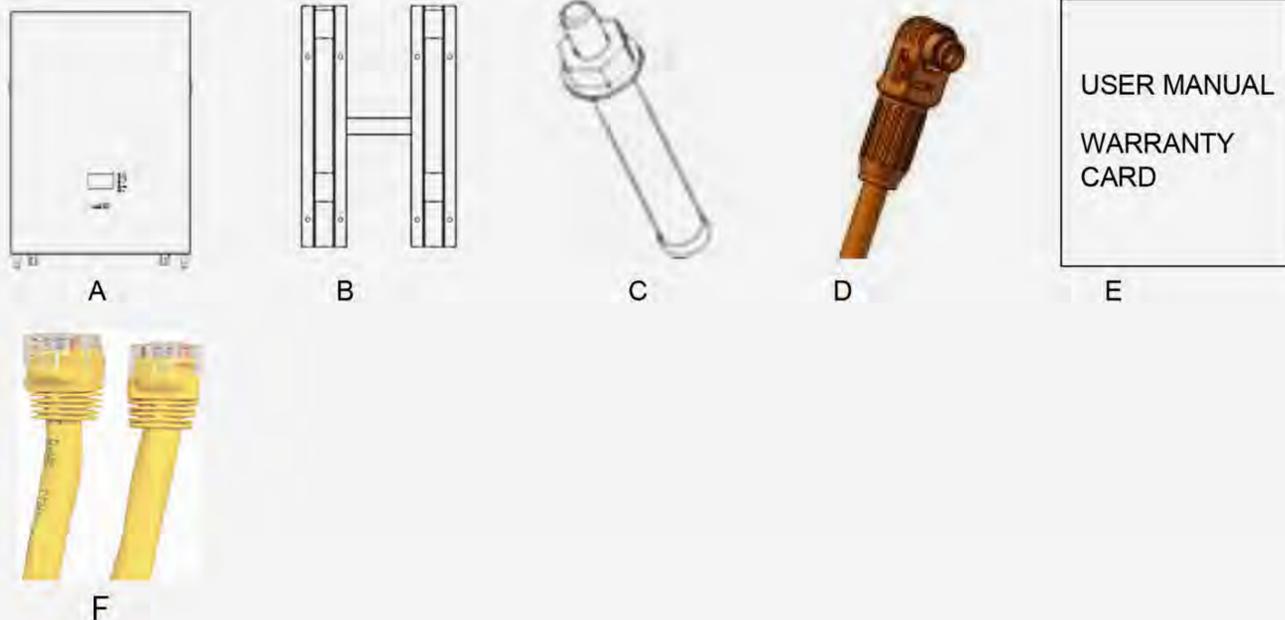
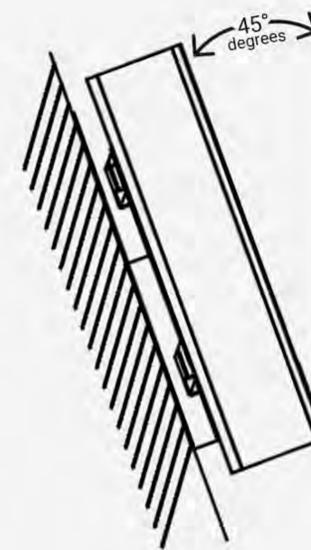


Fig.	Item	Quantity	Specification
A	Battery Pack	1	4.8/7.2 / 9.6 KWh
B	Mounting frame	1	SPCC
C	Mounting frame screw	12	M8*60mm
D	Power Cable(2.0 M)	2	25M2 Wire - M6/M8/M10 125A/1000V
E	Instruction manual/Warranty Card	1	This document
F	RJ45 Cable	1	3 ft

4.2. Installation Location

Make sure that the installation location meets the following conditions:

- The installation site must be suitable for the size and weight of the battery.
- Battery must be installed on a firm surface that can support its weight.
- The area is free of any water sources.
- There are no flammable or explosive materials in proximity.
- The ambient temperature is within the range of 0°C to 45°C (32°F, 113°F)
- There is minimal dust and dirt in the area.
- Battery should be installed upright or flat on its back.

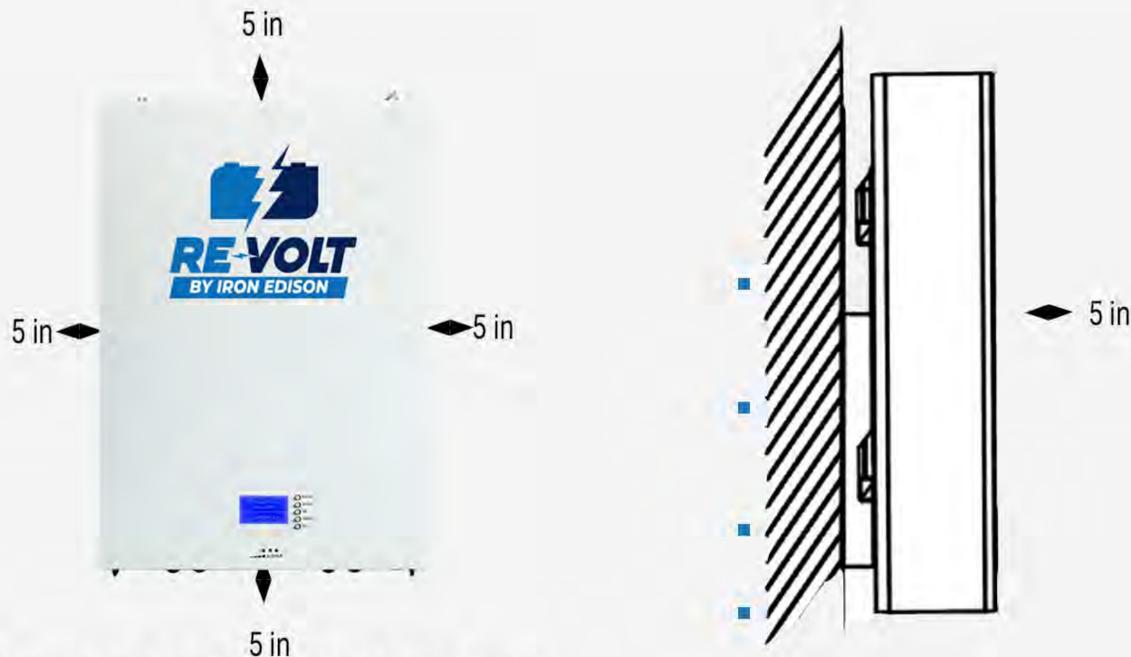


If ambient temperature is outside the recommended operating range, battery pack will stop running in order to protect itself. The optimal temperature range for the battery pack to operate is 0°C to 45°C (32°F, 113°F). Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

4.2.1. Minimum Clearances

Observe the minimum clearances to walls, other batteries, or objects shown in the diagram and picture below in order to guarantee sufficient heat dissipation:

Direction	Minimum clearance (inches)
Above	5 in
Below	5 in
Sides	5 in
Front	5 in



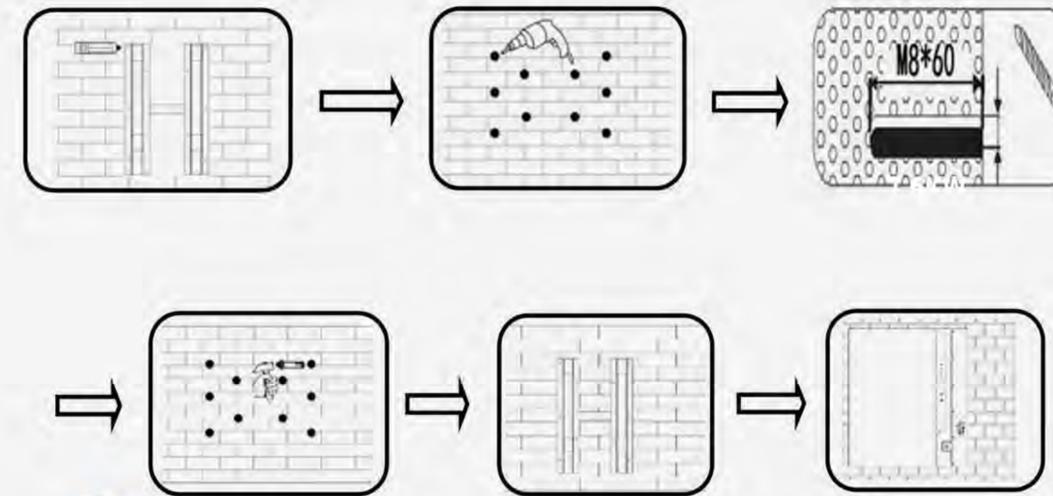
4.3. Installing the RE-VOLT Battery Pack

4.3.1. Mounting to a wall



In order to avoid electrical shock or other injury, please inspect existing electronic or plumbing installations before drilling holes. The battery is heavy. Please handle with care to avoid damage to yourself or to the battery.

1. Choose a suitable firm wall with a thickness greater than 80mm.
2. Use the mounting frame as a template to mark hole positions.
3. Drill 8 holes according to the hole position.
4. Hammer the MS screws to the above holes, and screw the nut. Note: Do not position screws flush to the wall - leave 1 to 20 mm exposed.
5. Fix and align the mounting frame to the 8 screws.
6. Raise the battery slightly above the mounting frame while maintaining the balance of the battery. Hang the battery on the frame through the match hooks.



Falling equipment can cause serious or even fatal injury. Never mount the battery on the bracket unless you are certain that the mounting frame is securely mounted on the wall.

5. Recommended System Settings

5.1.1.

Listed below are the recommended system settings as determined by Iron Edison. If your system is not compatible with the settings listed below, please consult with your Iron Edison Support Manager.

5.1.2. System Settings Table

Inverter Settings	Value
Absorb Voltage and Time	56 Vdc / 0.1 hr
Float Voltage and Time	53.4 Vdc / 0.0 hr
Re-float Voltage	52.0 Vdc
Re-bulk Voltage	52.8 Vdc
AC Charger Limit (A _{AC})	20.8 A _{ac}
Low Battery Cutout	48 Vdc
LBCO Delay	5 seconds
Low Battery Cut-in	51 Vdc
High Battery Cutout	57.6 Vdc
HBCO Delay	5 seconds
High Battery Cut-in	56.0 Vdc
Sell_RE Voltage	53.2 Vdc
Charge Controller Settings	
Absorb Voltage	56 Vdc / 0.1 hr
Float Voltage	53.4 Vdc
Re-bulk Voltage	52.8 Vdc
DC Current Limit	60/80/100 A _{dc} ^{2,3}
Absorb End Amps	0 A _{dc}
Battery Monitor Settings	
Battery Ah	100/200 Ah * # of units
Charged Voltage	54.8 Vdc
Charged Return Amps	5.0 A _{dc}
Battery Charge Efficiency	97.5%

6.Parallel use of Battery

Parallel use of Battery

- The RE-VOLT battery is a smart battery compatible with most off-grid and hybrid solar inverters (48VDC).
- The maximum number of parallel connections is 14 units without Canbus or RS485, and 15 units max with either com.
- Please consult with Iron Edison before configuring parallel units.
- When connecting with off-grid 48VDC solar inverters, it is not necessary to connect Canbus or RS-485 communication cables with inverter. If your inverter does not have either Canbus or RS485 ports, simply plug and play.

6.1.2. Parallel use of Battery (All off-grid inverters)

The RE-VOLT battery is a smart battery to match all off-grid and hybrid solar inverters (48VDC).

When the battery needs to be used in parallel, the maximum connection is 14 units without Canbus or RS485, and 15 units max with either comm. Iron Edison recommends 2-4 units according to application.

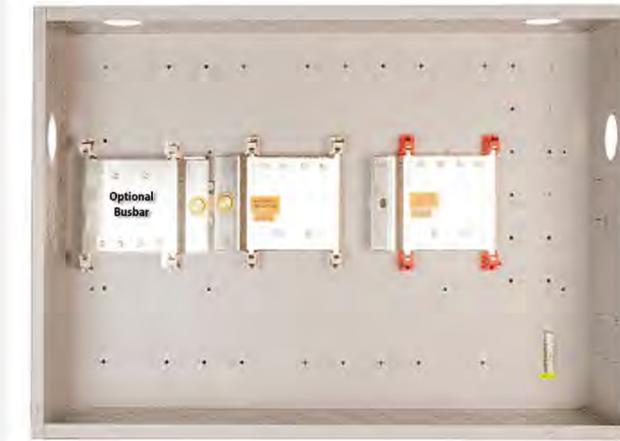
When connecting with off-grid 48VDC solar inverters, it does not need to add Canbus/RS485 communication cables with inverters.

If your inverter does not have either a Canbus or RS485 port, just plug and play.

NOTE: For parallel cable quantity needed, please consult with Iron Edison support manager for proper use, related length, and quantity.

6.1.3. Use of Combiner Box

When connecting multiple batteries, Iron Edison recommends the use of an external DC combiner box such as the Midnite Solar MNBCB 1000 (pictured) with a 100A disconnect, such as the Schneider 125VDC Single Pole PNL Breaker (also pictured).

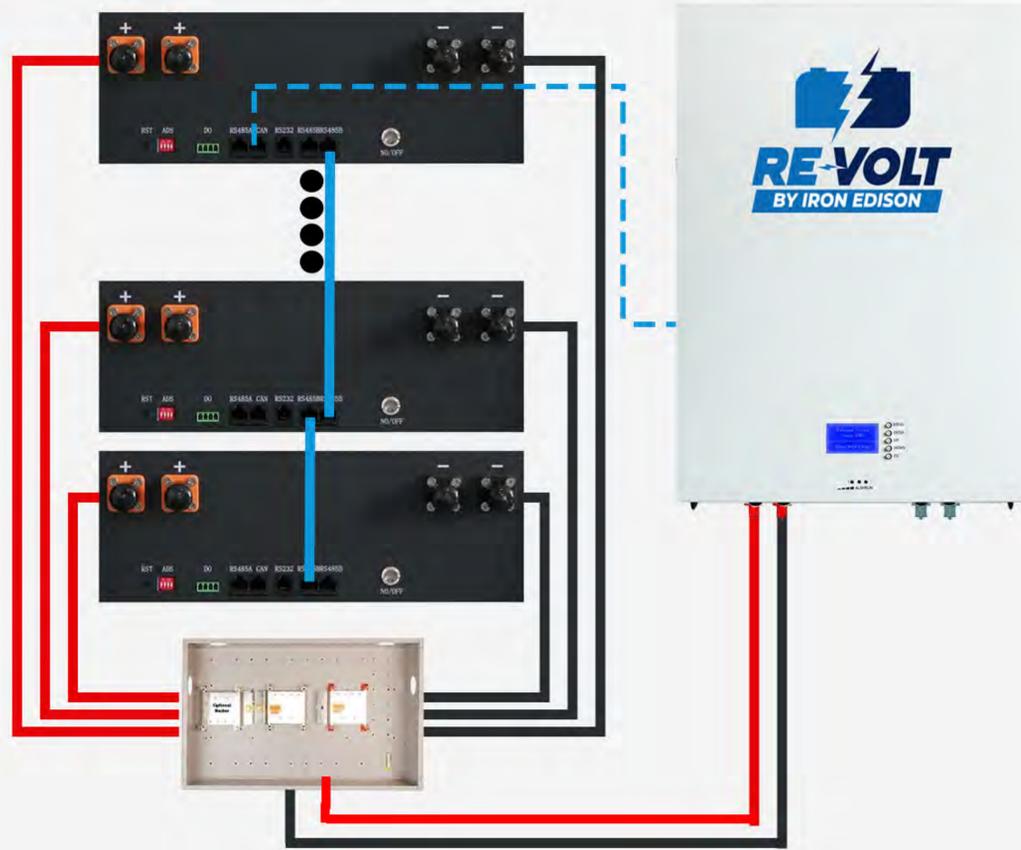


Midnite Solar MNBCB 1000



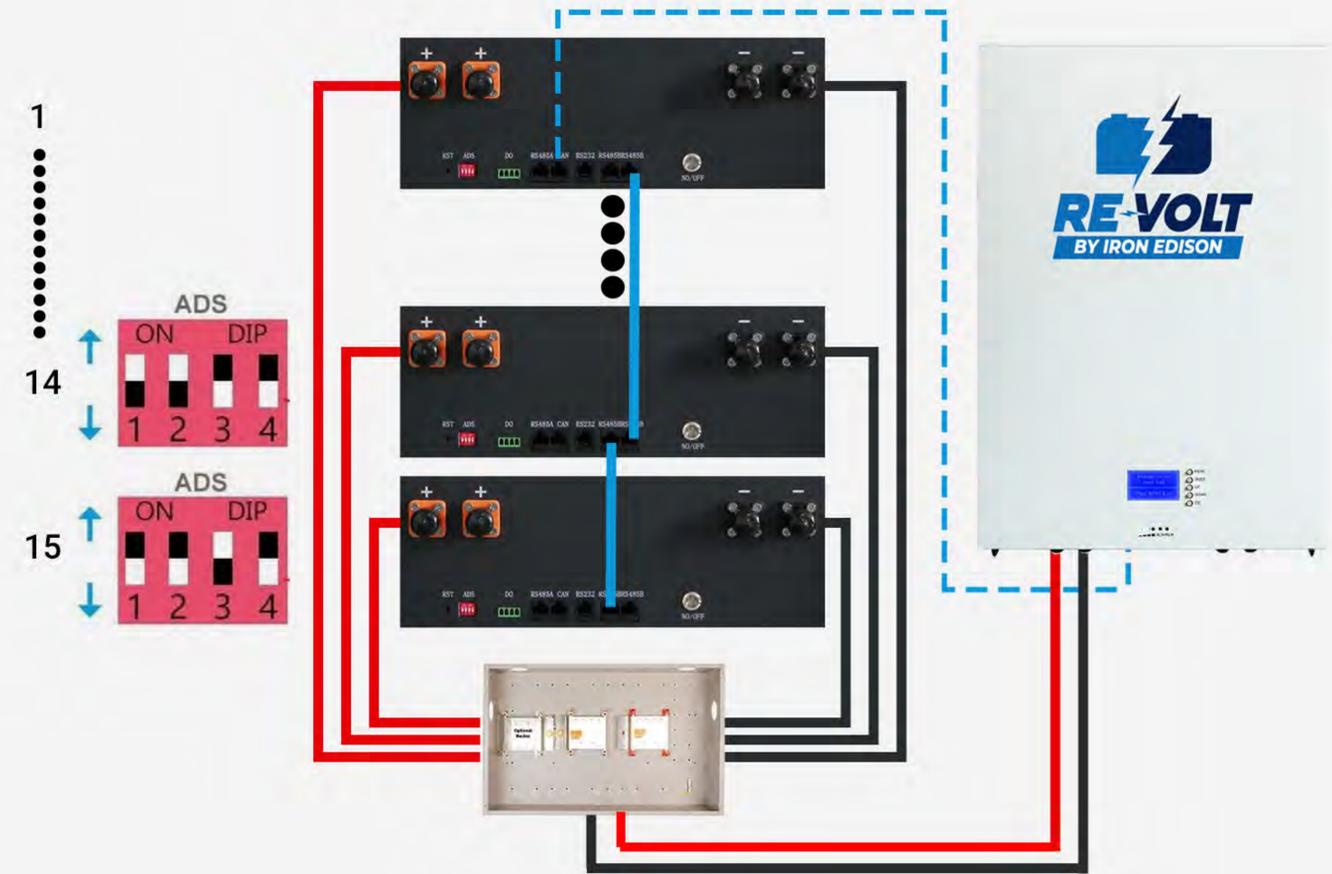
Schneider 125VDC

6.1.4. Parallel RE-VOLT Connect Diagram With External DC Combiner



NOTE: For parallel cable quantity needed, please consult with Iron Edison support manager for proper use, related length, and quantity.

6.1.5. Fifteen RE-VOLT Parallel Connect Diagram



6.1.6. Parallel use of Re-VOLT battery on Canbus /RS485(All hybrid on-off grid solar inverters)

When the battery needs to be used in parallel, the maximum connection is 15 units(Canbus), 14 units (RS485) with hybrid solar inverters, but we recommend to use 2-4 units according per application. The application needs power and communication connections as below, choose suitable parallel power cables and related connectors.

NOTE: For parallel cable quantity needed, please consult with Iron Edison sales manager for proper use and related quantity.

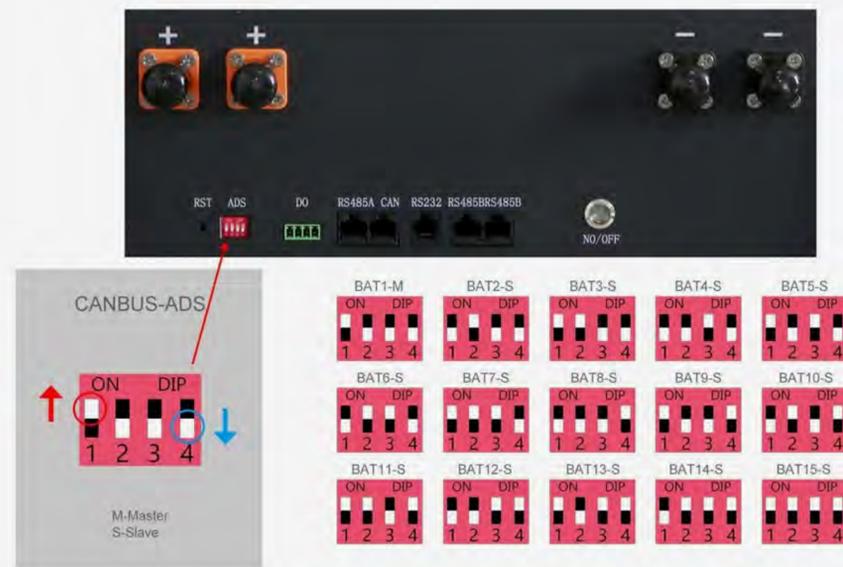
6.1.7. Canbus/RS485 compatible Hybrid Inverter brands

Model	Com/Port	Cable	Application
SMA	Sunny Island 4.5kW / 6.0 kW	CAN	On/Off-grid
Victron	Quattro 48	CAN	On/Off-grid

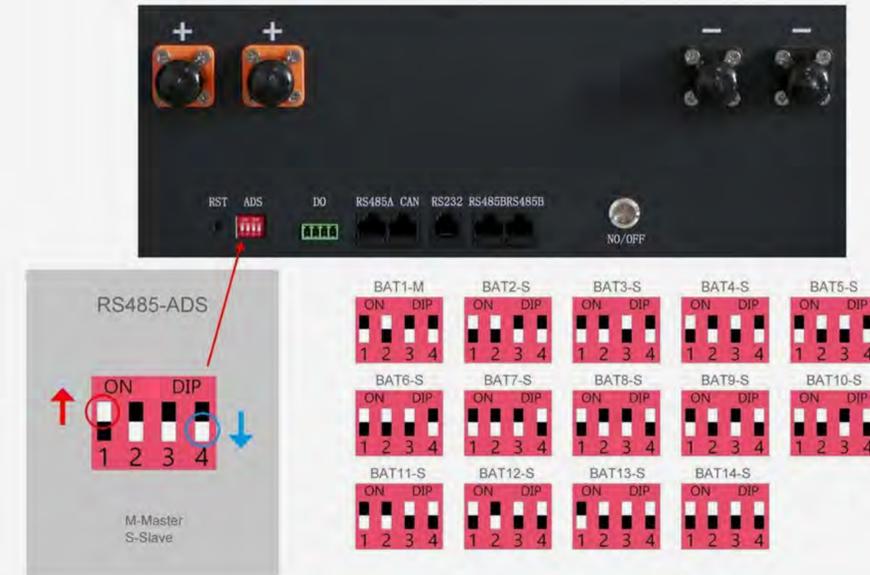
6.1.8. ADS Guideline

Consult with Iron Edison support prior to connecting and commissioning your RE-VOLT battery with a hybrid inverter. When contacting your support manager, please specify if your inverter is not manufactured by Iron Edison.

6.1.9. Canbus/RS485 Version –Max 15 PCS



6.1.10. RS485 Version –Max 14 pcs





LIMITED WARRANTY SCOPE

Iron Edison Battery Company warrants only to the original purchaser that any battery product which becomes unserviceable (not merely discharged) due to defect in material and/or workmanship within the free replacement period stated below will be replaced without charge. Any battery product which becomes unserviceable (not merely discharged) due to defect in material and/or workmanship within the pro-rated period stated below will receive a credit or refund as stated below. This warranty starts from the date delivered, applies to the original purchaser of the battery and is non-transferable. Purchaser is responsible for all shipping and testing costs for returned batteries, including any additional duties & taxes. If the battery is deemed to be defective under the terms stated below, replacement product of materials shall be shipped free of charge and testing costs shall be refunded. Iron Edison shall make all reasonable efforts to accomplish testing in a timely and efficient manner.

Lithium Iron Phosphate Batteries cannot be discharged more than 80% of nominal capacity. Battery shall not be charged or discharged at a rate greater than C/2 (50% of the battery's amperage rating). Charge controllers, inverters & generators must be configured using Iron Edison provided settings to be compliant with these requirements. This warranty does not include use in electric vehicle drive train, or other motive applications.

The battery owner will read warning labels on the battery and exercise due care in working on or around it. The battery is intended to be used by persons with training or experience with batteries. This warranty replaces all previous warranties, and may be updated in the future.

WARRANTY EXCLUSIONS

Iron Edison's exclusive liability for breach of any warranty on the battery shall be to repair or replace the battery or repay the pro-rated portion of the actual purchase price paid for the defective product within the warranty period in accordance with the terms of this limited warranty. In no event shall Iron Edison Battery Company or any of its affiliates be liable in contract, tort or otherwise for any loss, claim or damages of any other kind, whether direct, incidental, consequential, exemplary, special, punitive, remote or otherwise, including any lost profits, lost revenue or incentives, loss of equipment, cost of purchased power, cost of substitute product, facilities or services, claims of customers of owner, or removal, shipping, transportation or installation expenses.

The battery must be used in the application for which it was designed, and placed into service within 180 days of delivery. Warranty does not cover abuse or neglect, corroded hardware, improper maintenance, improper installation, cosmetic shortcomings which do not impact use or performance, breakage, force majeure (ie: fire, flood, earthquake, storm damage, overvoltage, lightning strikes, etc.), damage in transportation, exposure to fire, water, snow, moisture or liquid ingress, exposure to excessive heat (above 45C) or extreme cold (below -20C), charging at low temperatures (below 0C), the addition of any chemical or solution, damage from other electrical equipment or if the manufacturing codes have been destroyed or tampered with. Any changes made to the battery's hardware or software without prior approval shall immediately void this warranty. This warranty excludes any changes in appearance of the product that do not impact its performance, replacement of fuses, and replacement or resetting of circuit breakers. In a daily discharge application (≤1 discharge per 24 hours), the Lithium Iron Phosphate Battery shall not be discharged below 20% state of charge. In a battery backup application (≤1 discharge per week), the Lithium Iron Phosphate Battery shall not be discharged below 5% state of charge. Exceeding these values will void this warranty. Discharge history will be reviewed by Iron Edison using the battery's system logs.



WARRANTY PERIOD

Battery Type:	Free Replacement (months)	Pro-rated (months)
Lithium Iron Phosphate	1-24	25-120

To resolve problems covered by this warranty for renewable energy applications, contact Iron Edison Battery Company to confirm the defect. You will need to provide proof of purchase along with the serial number. Iron Edison Customer Service will work alongside the customer to diagnose the issue which includes the completion of a proprietary reconditioning procedure to determine if parts, service, or replacement is needed. If deemed necessary by Iron Edison Battery Company, customer must ship the defective product in an approved shipping container to Iron Edison Battery Company for testing before a warranty replacement or refund will be offered. Customer is responsible for all shipping and testing costs for returned batteries. Replacement materials or product will only be shipped following a complete examination of returned equipment.

PERFORMANCE REPLACEMENT REFUND

At the sole discretion of Iron Edison, if determined to be possible, and a single cell or group of cells within the battery qualifies for warranty replacement, only these cells shall be replaced. All serviceable parts and functioning cells will be incorporated in a returned battery. During the free replacement period, battery will be repaired or replaced with a battery equal to or better than the original

During the pro-ration period, the Performance Replacement Refund will be calculated using the formula below:

$$\text{Current Discounted Retail Price} \times \% \text{ Warranty Remaining} \times [0.7 \times (\text{Tested Ah Capacity} \div \text{New Ah Capacity})]$$

If the customer requires an Advanced Exchange on the suspected defective product(s), the customer must deposit into escrow funds equal to the replacement and shipping cost of the product(s) being replaced. Replacement product(s) will then be shipped to the customer as soon as possible. The customer will then return the suspected defective product(s) to Iron Edison for testing and evaluation. If the product(s) is deemed defective by Iron Edison and is within the free replacement period, the funds in escrow will be refunded to the customer. If the product(s) is deemed defective by Iron Edison and is within the pro-ration period, the Performance Replacement Refund formula below will be used to calculate the escrow refunded to the customer. If the product(s) is not deemed defective by Iron Edison, Iron Edison will retain the funds in escrow as payment for the advanced exchange product(s) shipped to the customer, and the original product(s) shipped to Iron Edison may be returned to the customer. The customer is responsible for ALL return shipping costs.

Revised 2/8/2021