REVOLUTIONX

RVX05, RVX08 and RVX12
RVH05, RVH08 and RVH12
Installation & Operation Manual

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power designers sibeX

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REVOLUTION X SERIES

The **REVOLUTION X** Series features very high charge cycle efficiencies and state-of-the-art MOSFET soft-switching technology resulting in lower energy costs, smaller sizes, and lighter weight units. The **REVOLUTION X** chargers maintain the charging efficiency greater than 90% over the entire charge cycle. This results in true energy savings of 6% or greater as compared to leading HF chargers. For a typical 36V/850Ahr battery, these savings will translate into approximately 1.5kWhr per charge cycle. In a typical application, the savings can be greater than 400kWhr per battery per year.

The REVOLUTION Series is a combination of cutting edge charging and energy management technologies, with a smaller footprint, lower acquisition costs, easy maintenance, and flexible configurations.

The **REVOLUTION X** chargers can support conventional, opportunity, and fast charge cycles. The **REVOLUTION X** chargers also offer programmability. All charger settings and features can be easily customized to match workloads and schedules. Finish and equalize cycles may be programmed to automatically run on certain days of the week. Additionally, the **REVOLUTION X** chargers may be tailored to meet the needs of any battery chemistry, including lithium, flooded, gel, and Absorbed Glass Mat (AGM), Thin Plate Pure Lead (TPPL) batteries.

The REVOLUTION RVX05/RVH05, RVX08/RVH08 and RVX12/RVH12 Battery Charger

SAFETY PRECAUTIONS

BEFORE ATTEMPTING TO INSTALL AND OPERATE THE CHARGER, READ THIS MANUAL CAREFULLY

This manual contains important instructions for the **REVOLUTION X** series product line that shall be followed during installation and operation of the charger. Only qualified personnel should install, operate, or service this equipment.

SAVE THESE INSTRUCTIONS

WARNING

- **High Voltages.** Lethal voltages are present within the charger enclosure whenever the AC line is energized and/or the battery/load is connected. The heat sinks and other internal components present the risk of electric shock.
- **Stored Energy.** To avoid the risk of electric shock, wait at least two minutes after de-energizing the AC line and disconnecting the battery/load before removing the cover.
- **High Current Levels.** Do not touch uninsulated battery connectors or terminals. All tools should be adequately insulated to avoid the possibility of shorting connections. Inspect cables often for damage to the insulation. Replace cracked or worn cables immediately.
- **Improper Connections.** If the charger is incorrectly wired to input or output devices or wiring is not in accordance with local safety codes and standards, the **REVOLUTION X** charger and/or its components are at risk of being damaged.
- **Grounding.** The charger must be connected to an AC power supply incorporating an earth ground. The grounding conductor must be of a size equal to or larger than the line (phase) conductors.
- **Explosive Gases**. Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during charge and discharge. To reduce the risk of ignition, follow these safety instructions as well as those published by the battery manufacturer. To minimize the potential for arcing and to reduce the risk of damage to the connector contacts, it is recommended to connect and disconnect a battery when the charger output is **OFF**.

WARNING

- **Chemical Hazard.** Working with lead-acid batteries may result in exposure to highly corrosive acid. To protect eyes and skin, use the required **P**ersonal **P**rotective **E**quipment (**PPE**) as mandated by your employer and local regulations. At a minimum, wear safety goggles and skin protection while connecting the battery charger or working in the vicinity of lead-acid batteries.
- **Follow the battery manufacturer's published instructions when installing, charging, and servicing batteries.**
- **Use only with rechargeable batteries**. Do not attempt to charge other battery types; doing so may cause equipment damage and result in serious personal injury.
- **Do not expose the charger to rain or snow**. The charger is **NOT** designed for outdoor use.

CAUTION

- **Adequate Cooling Required**. To prevent damage from overheating, proper airflow must be ensured. Do not restrict fan inlets or exhaust outlets. Do not mount the charger in a confined space or where the exhaust air will recirculate.
- **No User Serviceable Parts**. If service is required, contact Power Designers Sibex or its service representative.
- **These instructions assume a certain level of competence by the installer and/or user**. The following practices and codes contain relevant information, and should be consulted for safe installation, testing, handling, and maintenance of batteries. All applicable state and local codes must be followed.

  - **N**ational **E**lectrical **S**afety **C**ode (**NESC**), ANSI/IEEE C2-2007 (or latest revision). Copies may be obtained by contacting: The **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers, Inc. (**IEEE**), Publications Office, 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720

    www.ieee.org

  - **N**ational **E**lectrical **C**ode (**NEC**) NFPA-70 (or latest version) available from: National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269

    www.nfpa.org

  - **Federal Codes**

    29CFR1926.441 Batteries and Battery Chargers

    29CFR1910.305 (j) Wiring Methods, Components and Equipment for General Use

    OSHA Directive STD 01-08-002, including 29CFR1910.151(c) Medical Services and First Aid; 29CFR1926.50 and 29CFR1926.51, Medical Service and First Aid, and Sanitation, respectively; applicable to electric storage battery charging and maintenance areas.

  - **EMC Compliance**

    This device complies with Part 15 section 103 of FCC Rules as a digital device used exclusively as a power system in public utilities or industrial plants.

    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.

Specifications for the REVOLUTION RVX05 480VAC UL models

36V REVOLUTION X Chargers

SPECIFICATIONS	X05-90A-36V	X05-135A-36V	X05-175A-36V	X05-90A-36V-2/0	X05-135A-36V-2/0	X05-180A-36V-2/0	X05-225A-36V-2/0
UL Model Number	RVX-7.9-175-36			RVX-10.2-225-36			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 175A	36V / 90A	36V / 135A	36V / 180A	36V / 225A
Input Specifications							
Voltage	480 VAC, ± 10%, 3-phase						
Current	5.6A rms/ph	8.4A rms/ph	10.9 rms/ph	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94						
Breaker Rating	15A			20A			
Output Specifications							
Voltage	36V nom. / 50V max.						
Current	90A max.	135A max.	175A max.	90A max.	135A max.	180A max.	225A max.
Power	4.1kw max.	6.1kw max.	7.9kw	4.1kw max.	6.1kw max.	8.2kw	10.2kw max.
Output Cables	1/0:10’			2/0:10”			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350						
# of Battery Cells	12/18						
Peak-to-Peak Voltage Ripple	< 1%						
EFFICIENCY	Total charge cycle efficiency > 90%						
	Peak charging efficiency > 93%						
Protection							
Input	• Under voltage • Over voltage transients						
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity						
Operating Conditions							
Temperature	0–40°C						
Humidity	10-90% RH noncondensing						
Interface							
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface						
Mechanical							
W x D x H	12.5” x10” x 20.25”						
Weight	~57lbs.	~61 lbs.	~65 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)						
Certifications	UL Listed; CEC Certified						

+ PT Link sold separately

48V REVOLUTION X Chargers

SPECIFICATIONS	X05-68A-48V	X05-102A-48V	X05-136A-48V	X05-170A-48V	X05-68A-48V-2/0	X05-102A-48V-2/0	X05-136A-48V-2/0	X05-170A-48V-2/0
UL Model Number	RVX-10.2-170-48							
Nominal Volt (V) /	48V / 68A	48V / 102A	48V / 136A	48V / 170A	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph	5.6A rms/ph	8.4A rms/ph	11.3 rms/ph	14.1A rms/ph
Power Factor	>0.94							
Breaker Rating	20A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	68A max.	102A max.	136A max.	170A max.	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10’				2/0:10”			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350							
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

80V REVOLUTION X Chargers

SPECIFICATIONS	X05-40A-80V	X05-60A-80V	X05-80A-80V	X05-100A-80V
UL Model Number	RVX-10.2-100-80			
Nominal Volt (V) / Maximum Current (A)	80V /40A	80V /60A	80V / 80A	80V /100A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94			
Breaker Rating	20A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10' or 2/0:10"			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5" x 10" x 20.25"			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X Chargers

SPECIFICATIONS	X05-40A-96V	X05-60A-96V	X05-80A-96V	X05-100A-96V
UL Model Number	RVX-10.2-100-96			
Nominal Volt (V) / Maximum Current (A)	96V /40A	96V /60A	96V / 80A	96V /100A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94			
Breaker Rating	20A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0: 10'			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350 4/0: A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SY350, SYX350			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5" x 10" x 20.25"			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION RVX08 480VAC UL models

36V REVOLUTION X Chargers

SPECIFICATIONS	X08-225A-36V	X08-270A-36V	X08-315A-36V	X08-350A-36V
UL Model Number	RVX-15.9-350-36			
Nominal Volt (V) / Maximum Current (A)	36V / 225A	36V / 270A	36V / 315A	36V / 350A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	21.9A rms/ph
Power Factor	>0.94			
Breaker Rating	30A			
OUTPUT SPECIFICATIONS				
Voltage	36V nom. / 50V max.			
Current	225A max.	270A max.	315A max.	350A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	15.9kw max.
Output Cables	4/0: 10’			
Output Connectors	4/0: A320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SYX350			
# of Battery Cells	12 / 18			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 9.5” x 20.25”			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

48V REVOLUTION X Chargers

SPECIFICATIONS	X08-170A-48V-2/0	X08-204A-48V-2/0	X08-238A-48V-2/0	X08-260A-48V-2/0	X08-170A-48V	X08-204A-48V	X08-238A-48V	X08-272A-48V-
UL Model Number	RVX-15.6-260-48				RVX-16.3-272-48			
Nominal Volt (V) / Maximum Current (A)	48V / 170A	48V / 204A	48V / 238A	48V / 260A	48V / 170A	48V / 204A	48V / 238A	48V / 272A
INPUT SPECIFICATIONS								
Voltage	480 VAC, 3-phase±10%							
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	21.5A rms/ph	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94							
Breaker Rating	30A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.				48V nom. / 65V max.			
Current	170A max.	204A max.	238A max.	260A max.	170A max.	204A max.	238A max.	272A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	15.6kw max.	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	2/0: 10’				4/0: 10’			
Output Connectors	2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SYX350 4/0: A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SY350, SYX350							
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	18.5” x 9.5” x 20.25”							
Weight	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

80V REVOLUTION X Chargers

SPECIFICATIONS	X08-100A-80V	X08-120A-80V	X08-140A-80V	X08-160A-80V
UL Model Number	RVX-16.3-160-80			
Nominal Volt (V) / Maximum Current (A)	80V /100A	80V /120A	80V /140A	80V /160A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94			
Breaker Rating	30A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10' or 2/0:10"			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5" x 9.5" x 20.25"			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X Chargers

SPECIFICATIONS	X08-100A-96V	X08-120A-96V	X08-140A-96V	X08-160A-96V
UL Model Number	**RVX-16.3-160-96**			
Nominal Volt (V) / Maximum Current	96V /100A	96V /120A	96V /140A	96V /160A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94			
Breaker Rating	30A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10', 2/0:10", 4/0: 10'			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SB350, SBX175; EAX: DIN320A; REM: SR175, SR350; TVH: SY175, SY350 2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SY350, SYX350 4/0: A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SY350, SYX350			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5" x 9.5" x 20.25"			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION RVX12 480VAC UL models

36V REVOLUTION X Single Cable Chargers

SPECIFICATIONS	X12-360A-36V-SC	X12-400A-36V-SC	X12-360A-36V-SC0	X12-405A-36V-SC0	X12-425A-36V-SC0	X12-405A-36V-SC2	X12-450A-36V-SC2	X12-495A-36V-SC2
UL Model Number	RVX-18.1-400-36-SC		RVX-19.3-425-36-SC0			RVX-22.4-495-36-SC2		
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V / 400A	36V / 360A	36V / 405A	36V / 425A	36V / 405A	36V / 450A	36V / 495A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	22.5A rms/ph	24.9A rms/ph	22.5A rms/ph	25.3A rms/ph	26.6A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph
Power Factor	>0.94							
Breaker Rating	35A					40A		
OUTPUT SPECIFICATIONS								
Voltage	36V nom. / 50V max.							
Current	360A Max	400A Max	360A Max	405A Max	425A Max	405A Max	450A Max	495A Max
Power	16.3kw Max	18.1kw Max	16.3kw Max	18.4kw Max	19.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max
Output Cables	4/0: 10’					250mcm: 10’		
Output Connectors	A320, SB350, SBE320; EAX: DIN430A; REM: DIN640; SCH: LV320, LV500		A320, SB350, SBE320; EAX: DIN430A; SCH: LV320, LV500			REM: DIN640		
# of Battery Cells	12/18							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	26.5” x 9.5” x 20.25”							
Weight	~120 lb	~124 lb	~120 lb	~124 lb	~128 lb	~128 lb	~132 lb	~136 lb
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

36V REVOLUTION X Dual Cable Chargers

SPECIFICATIONS	X12-360A-36V-DC	X12-405A-36V-DC	X12-450A-36V-DC	X12-495A-36V-DC	X12-540A-36V-DC
UL Model Number	RVX-24.5-540-36-DC				
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V /405A	36V / 450A	36V / 495A	36V /540A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	36V nom. / 50V max.				
Current	360A Max	405A Max	450A Max	495A Max	540A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual A320				
# of Battery Cells	12/18				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X Single Cable Chargers

SPECIFICATIONS	X12-272A-48V	X12-306A-48V	X12-340A-48V	X12-374A-48V-SC	X12-400A-48V-SC	X12-374A-48V-SC0	X12-408A-48V-SC0	X12-374A-48V-SC2	X12-408A-48V-SC2
UL Model Number	RVX-20.4-340-48			RVX-24.0-400-48-SC		RVX-24.5-408-48-SC0		RVX-24.5-408-48-SC2	
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V / 374A	48V / 400A	48V / 374A	48V / 408A	48V / 374A	48V / 408A
INPUT SPECIFICATIONS									
Voltage	480 VAC, 3-phase±10%								
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.1A rms/ph	30.9A rms/ph	33.7A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94								
Breaker Rating	40A			45A					
OUTPUT SPECIFICATIONS									
Voltage	48V nom. / 65V max.								
Current	272A Max	306A Max	340A Max	374A Max	400A Max	374A Max	408A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.0kw Max	22.4kw Max	24.5kw Max	22.4kw Max	24.5kw Max
Output Cables	4/0: 10’							10’, 250mcm	
Output Connectors	A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SYX350			A320, SB350, SBE320; EAX: DIN430A; REM: DIN640; SCH: LV320, LV500		A320, SB350, SBE320; EAX: DIN430A; SCH: LV320, LV500		DIN640	
# of Battery Cells	12/18/24								
Peak-to-Peak Voltage Ripple	< 1%								
EFFICIENCY	Total charge cycle efficiency > 90%								
	Peak charging efficiency > 93%								
PROTECTION									
Input	• Under voltage • Over voltage transients								
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity								
OPERATING CONDITIONS									
Temperature	0–40°C								
Humidity	10-90% RH noncondensing								
INTERFACE									
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface								
MECHANICAL									
W x D x H	26.5” x 9.5” x 20.25”								
Weight	~118 lb	~122 lb	~126 lb	~132 lb	~136 lb	~132 lb	~136 lb	~136 lb	~139 lb
Cooling	Forced air (fans)								
Certifications	UL Listed; CEC Certified								

+ PT Link sold separately

48V REVOLUTION X Dual Cable Chargers

SPECIFICATIONS	X12-340A-48V-DC	X12-374A-48V-DC	X12-400A-48V-DC
UL Model Number	RVX-24.0-400-48-DC		
Nominal Volt (V) / Maximum Current (A)	48V / 340A	48V /374A	48V / 400A
INPUT SPECIFICATIONS			
Voltage	480 VAC, 3-phase ± 10%		
Current	28.1A rms/ph	30.9A rms/ph	33.1A rms/ph
Power Factor	>0.94		
Breaker Rating	45A		
OUTPUT SPECIFICATIONS			
Voltage	48V nom. / 65V max.		
Current	340A Max	374A Max	400A Max
Power	20.4kw Max	22.4kw Max	24.0kw Max
Output Cables	Dual 2/0, 10’		
Output Connectors	Dual Euro A320		
# of Battery Cells	12/18/24		
Peak-to-Peak Voltage Ripple	< 1%		
EFFICIENCY	Total charge cycle efficiency > 90%		
	Peak charging efficiency > 93%		
PROTECTION			
Input	• Under voltage • Over voltage transients		
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity		
OPERATING CONDITIONS			
Temperature	0–40°C		
Humidity	10-90% RH noncondensing		
INTERFACE			
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface		
MECHANICAL			
W x D x H	26.5” x 9.5” x 20.25”		
Weight	~133 lb	~137 lb	~141 lb
Cooling	Forced air (fans)		
Certifications	UL Listed; CEC Certified		

80V REVOLUTION X Chargers

SPECIFICATIONS	X12-160A-80V	X12-180A-80V	X12-200A-80V	X12-220A-80V	X12-240A-80V
UL Model Number	RVX-24.5-240-80				
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /200A	80V /220A	80V /240A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	80V nom. / 110V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	2/0; 10’				
Output Connectors	A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SYX350				
# of Battery Cells	18 / 24 / 36 / 40				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

96V REVOLUTION X Chargers

SPECIFICATIONS	X12-160A-96V	X12-180A-96V	X12-200A-96V	X12-220A-96V	X12-240A-96V
UL Model Number	RVX-24.5-240-96				
Nominal Volt (V) / Maximum Current (A)	96V /160A	96V /180A	96V /200A	96V /220A	96V /240A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	2/0:10' or 4/0: 10'				
Output Connectors	2/0: A320, EBC320, SB175 2/0, SB350, SBE320, SBX350; EAX: DIN320A; REM: SR350; TVH: SYX350 4/0: 320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; REM: DIN640, SR350; SCH: LV320, LV500; TVH: SY350, SYX350				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5" x 9.5" x 20.25"				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

Specifications for the REVOLUTION RVX05 480VAC cUL models

36V REVOLUTION X Chargers

SPECIFICATIONS	X05-90A-36V-CN	X05-135A-36V-CN	X05-160A-36V-CN	X05-90A-36V-2/0-CN	X05-135A-36V-2/0-CN	X05-180A-36V-2/0-CN	X05-200A-36V-2/0-CN
UL Model Number	RVX-7.3-160-36-CN			RVX-9.1-200-36-CN			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 160A	36V / 90A	36V / 135A	36V / 180A	36V / 200A
Input Specifications							
Voltage	480 VAC, ± 10%, 3-phase						
Current	5.6A rms/ph	8.4A rms/ph	10.1 rms/ph	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	12.5A rms/ph
Power Factor	>0.94						
Breaker Rating	15A			20A			
Output Specifications							
Voltage	36V nom. / 50V max.						
Current	90A max.	135A max.	160A max.	90A max.	135A max.	180A max.	200A max.
Power	4.1kw max.	6.1kw max.	7.3kw	4.1kw max.	6.1kw max.	8.2kw	9.1kw max.
Output Cables	1/0, 10’			2/0, 10’			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SBX175; EAX: DIN320A 2/0: A320, EBC320, SB175 2/0; EAX: DIN320A						
# of Battery Cells	12/18						
Peak-to-Peak Voltage Ripple	< 1%						
EFFICIENCY	Total charge cycle efficiency > 90%						
	Peak charging efficiency > 93%						
Protection							
Input	• Under voltage • Over voltage transients						
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity						
Operating Conditions							
Temperature	0–40°C						
Humidity	10-90% RH noncondensing						
Interface							
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface						
Mechanical							
W x D x H	12.5” x 10” x 20.25”						
Weight	~57lbs.	~61 lbs.	~65 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)						
Certifications	cUL Listed; CEC Certified						

+ PT Link sold separately

48V REVOLUTION X Chargers

SPECIFICATIONS	X05-68A-48V-CN	X05-102A-48V-CN	X05-136A-48V-CN	X05-170A-48V-CN
UL Model Number	RVX-10.2-170-48-CN			
Nominal Volt (V) /	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94			
Breaker Rating	20A			
OUTPUT SPECIFICATIONS				
Voltage	48V nom. / 65V max.			
Current	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	2/0, 10’			
Output Connectors	2/0: A320, EBC320, SB175 2/0, SBE320, SBX350; EAX: DIN320A			
# of Battery Cells	12/18/24			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5” x 10” x 20.25”			
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

80V REVOLUTION X Chargers

SPECIFICATIONS	X05-40A-80V-1/0-CN	X05-60A-80V-1/0-CN	X05-80A-80V-1/0-CN	X05-100A-80V-1/0-CN	X05-40A-80V-2/0-CN	X05-60A-80V-2/0-CN	X05-80A-80V-2/0-CN	X05-100A-80V-2/0-CN
UL Model Number	RVX-10.2-100-80-CN							
Nominal Volt (V) / Maximum Current (A)	80V /40A	80V /60A	80V / 80A	80V /100A	80V /40A	80V /60A	80V / 80A	80V /100A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94							
Breaker Rating	20A							
OUTPUT SPECIFICATIONS								
Voltage	80V nom. / 110V max.							
Current	40A max.	60A max.	80A max.	100A max.	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0, 10’				2/0, 10’			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SBX175; EAX: DIN320A 2/0: A320, EBC320, SB175 2/0, SBE320, SBX350; EAX: DIN320A							
# of Battery Cells	18 / 24 / 36 / 40							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

96V REVOLUTION X Chargers

SPECIFICATIONS	X05-40A-96V-1/0-CN	X05-60A-96V-1/0-CN	X05-80A-96V-1/0-CN	X05-100A-96V-1/0-CN	X05-40A-96V-2/0-CN	X05-60A-96V-2/0-CN	X05-80A-96V-2/0-CN	X05-100A-96V-2/0-CN
UL Model Number	RVX-10.2-100-96-CN							
Nominal Volt (V) / Maximum Current (A)	96V /40A	96V /60A	96V / 80A	96V /100A	96V /40A	96V /60A	96V / 80A	96V /100A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	5.6A rms/ph	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph	5.6A rms/p	8.4A rms/ph	11.3A rms/ph	14.1A rms/ph
Power Factor	>0.94							
Breaker Rating	20A							
OUTPUT SPECIFICATIONS								
Voltage	96V nom. / 130V max.							
Current	40A max.	60A max.	80A max.	100A max.	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10’				2/0:10”			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SBX175; EAX: DIN320A 2/0: A320, EBC320, SB175 2/0, SBE320, SBX350; EAX: DIN320A							
# of Battery Cells	18 / 24 / 36 / 40 / 48							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10” x 20.25”							
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

Specifications for the REVOLUTION RVX08 480VAC cUL models

36V REVOLUTION X Chargers

SPECIFICATIONS	X08-225A-36V-CN	X08-245A-36V-CN
UL Model Number	RVX-11.1-245-36-CN	
Nominal Volt (V) / Maximum Current (A)	36V / 225A	36V / 245A
INPUT SPECIFICATIONS		
Voltage	480 VAC, ± 10%, 3-phase	
Current	14.1A rms/ph	15.3A rms/ph
Power Factor	>0.94	
Breaker Rating	20A	
OUTPUT SPECIFICATIONS		
Voltage	36V nom. / 50V max.	
Current	225A max.	245A max.
Power	10.2kw max.	11.1kw max.
Output Cables	4/0: 10’	
Output Connectors	4/0: A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; SCH: LV320, LV500	
# of Battery Cells	12 / 18	
Peak-to-Peak Voltage Ripple	< 1%	
EFFICIENCY	Total charge cycle efficiency > 90%	
	Peak charging efficiency > 93%	
PROTECTION		
Input	• Under voltage • Over voltage transients	
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity	
OPERATING CONDITIONS		
Temperature	0–40°C	
Humidity	10-90% RH noncondensing	
INTERFACE		
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface	
MECHANICAL		
W x D x H	18.5” x 9.5” x 20.25”	
Weight	~57 lbs.	~61 lbs.
Cooling	Forced air (fans)	
Certifications	cUL Listed; CEC Certified	

+ PT Link sold separately

48V REVOLUTION X Chargers

SPECIFICATIONS	X08-170A-48V-CN	X08-204A-48V-CN	X08-238A-48V-CN	X08-245A-48V-CN
UL Model Number	RVX-14.7-245-48-CN			
Nominal Volt (V) / Maximum Current (A)	48V / 170A	48V / 204A	48V / 238A	48V / 245A
INPUT SPECIFICATIONS				
Voltage	480 VAC, 3-phase±10%			
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	20.2A rms/ph
Power Factor	>0.94			
Breaker Rating	30A			
OUTPUT SPECIFICATIONS				
Voltage	48V nom. / 65V max.			
Current	170A max.	204A max.	238A max.	245A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	14.7kw max.
Output Cables	4/0: 10’			
Output Connectors	4/0: A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; SCH: LV320, LV500			
# of Battery Cells	12/18/24			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 9.5” x 20.25”			
Weight	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

80V REVOLUTION X Chargers

SPECIFICATIONS	X08-100A-80V-1/0-CN	X08-120A-80V-1/0-CN	X08-140A-80V-1/0-CN	X08-160A-80V-1/0-CN	X08-100A-80V-2/0-CN	X08-120A-80V-2/0-CN	X08-140A-80V-2/0-CN	X08-160A-80V-2/0-CN
UL Model Number	RVX-16.3-160-80-CN							
Nominal Volt (V) / Maximum Current (A)	80V /100A	80V /120A	80V /140A	80V /160A	80V /100A	80V /120A	80V /140A	80V /160A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94							
Breaker Rating	30A							
OUTPUT SPECIFICATIONS								
Voltage	80V nom. / 110V max.							
Current	100A max.	120A max.	140A max.	160A max.	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0, 10’				2/0, 10’			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SBX175; EAX: DIN320A 2/0: A320, EBC320, SB175 2/0, SBE320, SBX350; EAX: DIN320A							
# of Battery Cells	18 / 24 / 36 / 40							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	18.5” x 9.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

96V REVOLUTION X Chargers

SPECIFICATIONS	X08-100A-96V-1/0-CN	X08-120A-96V-1/0-CN	X08-140A-96V-1/0-CN	X08-160A-96V-1/0-CN	X08-100A-96V-2/0-CN	X08-120A-96V-2/0-CN	X08-140A-96V-2/0-CN	X08-160A-96V-2/0-CN
UL Model Number	RVX-16.3-160-96-CN							
Nominal Volt (V) / Maximum Current (A)	96V /100A	96V /120A	96V /140A	96V /160A	96V /100A	96V /120A	96V /140A	96V /160A
INPUT SPECIFICATIONS								
Voltage	480 VAC, ± 10%, 3-phase							
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94							
Breaker Rating	30A							
OUTPUT SPECIFICATIONS								
Voltage	96V nom. / 130V max.							
Current	100A max.	120A max.	140A max.	160A max.	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0, 10’				2/0, 10’			
Output Connectors	1/0: A160, A320, E160, EBC320, SB175, SBX175; EAX: DIN320A 2/0: A320, EBC320, SB175 2/0, SBE320, SBX350; EAX: DIN320A							
# of Battery Cells	18 / 24 / 36 / 40/ 48							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	18.5” x 9.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

96V REVOLUTION X Chargers (continued from previous page)

SPECIFICATIONS	X08-100A-96V-4/0-CN	X08-120A-96V-4/0-CN	X08-140A-96V-4/0-CN	X08-160A-96V-4/0-CN
UL Model Number	RVX-16.3-160-96-CN			
Nominal Volt (V) / Maximum Current (A)	96V /100A	96V /120A	96V /140A	96V /160A
INPUT SPECIFICATIONS				
Voltage	480 VAC, ± 10%, 3-phase			
Current	14.1A rms/ph	16.8A rms/ph	19.7A rms/ph	22.5A rms/ph
Power Factor	>0.94			
Breaker Rating	30A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	4/0			
Output Connectors	A320, EBC320, SB350, SBE320, SBX350; EAX: DIN320A, DIN430A; SCH: LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 9.5” x 20.25”			
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION RVX12 480VAC cUL models

36V REVOLUTION X Dual Cable Chargers

SPECIFICATIONS	X12-360A-36V-DC-CN	X12-405A-36V-DC-CN	X12-450A-36V-DC-CN	X12-470A-36V-DC-CN	X12-490A-36V-DC-CN
UL Model Number	RVX-22.2-490-36-DC-CN				
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V /405A	36V / 450A	36V / 470A	36V /490A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	29.3A rms/ph	30.6A rms/ph
Power Factor	>0.94				
Breaker Rating	40A				
OUTPUT SPECIFICATIONS					
Voltage	36V nom. / 50V max.				
Current	360A Max	405A Max	450A Max	470A Max	490A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	21.3kw Max	22.2kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual A320				
# of Battery Cells	12/18				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X Single Cable Chargers

SPECIFICATIONS	X12-272A-48V-CN	X12-306A-48V-CN	X12-340A-48V-CN
UL Model Number	RVX-20.4-340-48-CN		
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A
INPUT SPECIFICATIONS			
Voltage	480 VAC, 3-phase±10%		
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph
Power Factor	>0.94		
Breaker Rating	40A		
OUTPUT SPECIFICATIONS			
Voltage	48V nom. / 65V max.		
Current	272A Max	306A Max	340A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max
Output Cables	4/0: 10’		
Output Connectors	SB 350		
# of Battery Cells	12/18/24		
Peak-to-Peak Voltage Ripple	< 1%		
EFFICIENCY	Total charge cycle efficiency > 90%		
	Peak charging efficiency > 93%		
PROTECTION			
Input	• Under voltage • Over voltage transients		
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity		
OPERATING CONDITIONS			
Temperature	0–40°C		
Humidity	10-90% RH noncondensing		
INTERFACE			
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface		
MECHANICAL			
W x D x H	26.5” x 9.5” x 20.25”		
Weight	~112 lb	~116 lb	~120 lb
Cooling	Forced air (fans)		
Certifications	cUL Listed; CEC Certified		

+ PT Link sold separately

48V REVOLUTION X Dual Cable Chargers

SPECIFICATIONS	X12-272A-48V-DC-CN	X12-306A-48V-DC-CN	X12-340A-48V-DC-CN	X12-370A-48V-DC-CN	X12-400A-48V-DC-CN
UL Model Number	RVX-24.0-400-48-DC-CN				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /370A	48V / 400A
INPUT SPECIFICATIONS					
Voltage	480 VAC, 3-phase ± 10%				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.6A rms/ph	33.1A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	370A Max	400A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.2kw Max	24.0kw Max
Output Cables	Dual 2/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~133 lb	~137 lb	~141 lb	~145 lb	~149 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X Dual Cable Chargers

SPECIFICATIONS	X12-272A-48V-DC-CN	X12-306A-48V-DC-CN	X12-340A-48V-DC-CN	X12-374A-48V-DC-CN	X12-408A-48V-DC-CN
UL Model Number	RVX-24.5-408-48-DC-CN				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /374A	48V / 408A
INPUT SPECIFICATIONS					
Voltage	480 VAC, 3-phase ± 10%				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

80V REVOLUTION X Chargers

SPECIFICATIONS	X12-160A-80V-CN0	X12-180A-80V-CN0	X12-195A-80V-CN0	X12-160A-80V-CN	X12-180A-80V-CN	X12-200A-80V-CN
UL Model Number	RVX-19.9-195-80-CN			RVX-20.4-200-80-CN		
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /195A	80V /160A	80V /180A	80V /200A
INPUT SPECIFICATIONS						
Voltage	480 VAC, ± 10%, 3-phase					
Current	22.5A rms/ph	25.3A rms/ph	27.4A rms/ph	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph
Power Factor	>0.94					
Breaker Rating	35A			40A		
OUTPUT SPECIFICATIONS						
Voltage	80V nom. / 110V max.					
Current	160A max.	180A max.	195A max.	160A max.	180A max.	200A max.
Power	16.3kw max.	18.4kw max.	19.9kw max.	16.3kw max.	18.4kw max.	20.4kw max.
Output Cables	2/0; 10’					
Output Connectors	SBX 350			A320, SB175 2/0		
# of Battery Cells	18 / 24 / 36 / 40					
Peak-to-Peak Voltage Ripple	< 1%					
EFFICIENCY	Total charge cycle efficiency > 90%					
	Peak charging efficiency > 93%					
PROTECTION						
Input	• Under voltage • Over voltage transients					
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity					
OPERATING CONDITIONS						
Temperature	0–40°C					
Humidity	10-90% RH noncondensing					
INTERFACE						
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface					
MECHANICAL						
W x D x H	26.5” x 9.5” x 20.25”					
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb	~131 lb
Cooling	Forced air (fans)					
Certifications	cUL Listed; CEC Certified					

+ PT Link sold separately

80V REVOLUTION X Chargers (continued from previous page)

SPECIFICATIONS	X12-160A-80V-CN-4/0	X12-180A-80V-CN-4/0	X12-200A-80V-CN-4/0	X12-220A-80V-CN-4/0	X12-240A-80V-CN-4/0
UL Model Number	RVX-24.5-240-80-CN				
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /200A	80V /220A	80V /240A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	80V nom. / 110V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	4/0; 10’				
Output Connectors	A320, SB350, SBX350, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

96V REVOLUTION X Chargers

SPECIFICATIONS	X12-160A-96V-CN-2/0	X12-180A-96V-CN-2/0	X12-195A-96V-CN-2/0	X12-160A-96V-CN-2/0	X12-180A-96V-CN-2/0	X12-200A-96V-CN-2/0
UL Model Number	RVX-19.9-195-96-CN			RVX-20.4-200-96-CN		
Nominal Volt (V) / Maximum Current (A)	96V /160A	96V /180A	96V /200A	96V /160A	96V /180A	96V /200A
INPUT SPECIFICATIONS						
Voltage	480 VAC, ± 10%, 3-phase					
Current	22.5A rms/ph	25.3A rms/ph	27.4A rms/ph	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph
Power Factor	>0.94					
Breaker Rating	35A			40A		
OUTPUT SPECIFICATIONS						
Voltage	96V nom. / 130V max.					
Current	160A max.	180A max.	200A max.	160A max.	180A max.	200A max.
Power	16.3kw max.	18.4kw max.	19.9kw max.	16.3kw max.	18.4kw max.	20.4kw max.
Output Cables	2/0: 10’					
Output Connectors	SBX 350			A320, SB175 2/0		
# of Battery Cells	18 / 24 / 36 / 40 /48					
Peak-to-Peak Voltage Ripple	< 1%					
EFFICIENCY	Total charge cycle efficiency > 90%					
	Peak charging efficiency > 93%					
PROTECTION						
Input	• Under voltage • Over voltage transients					
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity					
OPERATING CONDITIONS						
Temperature	0–40°C					
Humidity	10-90% RH noncondensing					
INTERFACE						
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface					
MECHANICAL						
W x D x H	26.5” x 9.5” x 20.25”					
Weight	~112 lb	~116 lb	~120 lb	~112 lb	~116 lb	~120 lb
Cooling	Forced air (fans)					
Certifications	cUL Listed; CEC Certified					

+ PT Link sold separately

96V REVOLUTION X Chargers (continued from previous page)

SPECIFICATIONS	X12-160A-96V-CN-4/0	X12-180A-96V-CN-4/0	X12-200A-96V-CN-4/0	X12-220A-96V-CN-4/0	X12-240A-96V-CN-4/0
UL Model Number	RVX-24.5-240-96-CN				
Nominal Volt (V) / Maximum Current (A)	96V /160A	96V /180A	96V /200A	96V /220A	96V /240A
INPUT SPECIFICATIONS					
Voltage	480 VAC, ± 10%, 3-phase				
Current	22.5A rms/ph	25.3A rms/ph	28.1A rms/ph	30.9A rms/ph	33.7A rms/ph
Power Factor	>0.94				
Breaker Rating	45A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	4/0: 10’				
Output Connectors	A320, SB350, SBX350, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 9.5” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

Specifications for the REVOLUTION X RVH05 600VAC UL Models

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-90A-36V-1/0	RVH05-135A-36V 1/0	RVH05-175A-36V 1/0	RVH05-90A-36V-2/0	RVH05-135A-36V-2/0	RVH05-180A-36V-2/0	RVH05-225A-36V-2/0
UL Model Number	RVH-7.9-175-36			RVH-10.2-225-36			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 175A	36V / 90A	36V / 135A	36V / 180A	36V / 225A
Input Specifications							
Voltage	600 VAC, ± 10%, 3-phase						
Current	4.5A rms/ph	6.7A rms/ph	8.7A rms/ph	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94						
Breaker Rating	15A						
Output Specifications							
Voltage	36V nom. / 50V max.						
Current	90A max.	135A max.	175A max.	90A max.	135A max.	180A max.	225A max.
Power	4.1kw max.	6.1kw max.	7.9kw	4.1kw max.	6.1kw max.	8.2kw	10.2kw max.
Output Cables	1/0, 10’			2/0, 10’			
Output Connectors	1/0: A160, A320, SB175, SB350, SBX175 2/0: A320, SB175 2/0, SB350, SBX350						
# of Battery Cells	12/18						
Peak-to-Peak Voltage Ripple	< 1%						
EFFICIENCY	Total charge cycle efficiency > 90%						
	Peak charging efficiency > 93%						
Protection							
Input	• Under voltage • Over voltage transients						
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity						
Operating Conditions							
Temperature	0–40°C						
Humidity	10-90% RH noncondensing						
Interface							
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface						
Mechanical							
W x D x H	12.5” x 10.5” x 20.25”						
Weight	~57lbs.	~61 lbs.	~65 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)						
Certifications	UL Listed; CEC Certified						

+ PT Link sold separately

36V REVOLUTION X RVH 600V Chargers (continued from previous page)

SPECIFICATIONS	RVH05-90A-36V-4/0	RVH05-135A-36V-4/0	RVH05-180A-36V-4/0	RVH05-225A-36V-4/0
UL Model Number	RVH-10.2-225-36			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 180A	36V / 225A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	36V nom. / 50V max.			
Current	90A max.	135A max.	180A max.	225A max.
Power	4.1kw max.	6.1kw max.	8.2kw	10.2kw max.
Output Cables	4/0, 10’			
Output Connectors	4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	12 / 18			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5” x 10.5” x 20.25”			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

48V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-68A-48V-1/0	RVH05-102A-48V-1/0	RVH05-136A-48V-1/0	RVH05-170A-48V48V-1/0	RVH05-68A-48V-2/0	RVH05-102A-48V-2/0	RVH05-136A-48V-2/0	RVH05-170A-48V-2/0
UL Model Number	RVH-10.2-170-48							
Nominal Volt (V) /	48V / 68A	48V / 102A	48V / 136A	48V / 170A	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94							
Breaker Rating	15A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	68A max.	102A max.	136A max.	170A max.	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0, 10’				2/0, 10’			
Output Connectors	1/0: A160, A320, SB175, SB350, SBX175 2/0: A320, SB175 2/0, SB350, SBX350							
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

48V REVOLUTION X RVH 600V Chargers (continued from previous page)

SPECIFICATIONS	RVH05-68A-48V-4/0	RVH05-102A-48V-4/0	RVH05-136A-48V-4/0	RVH05-170A-48V-4/0
UL Model Number	RVH-10.2-170-48			
Nominal Volt (V) / Maximum Current (A)	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	48V nom. / 65V max			
Current	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	4/0, 10’			
Output Connectors	4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	12 / 18 / 24			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5” x 10.5” x 20.25”			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-40A-80V	RVH05-60A-80V	RVH05-80A-80V	RVH05-100A-80V
UL Model Number	RVH-10.2-100-80			
Nominal Volt (V) / Maximum Current (A)	80V /40A	80V /60A	80V / 80A	80V /100A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0: 10'			
Output Connectors	1/0: A160, A320, SB175, SBX175, SB350 2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5" x 10.5" x 20.25"			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-34A-96V	RVH05-51A-96V	RVH05-68A-96V	RVH05-85A-96V
UL Model Number	RVX-10.2-100-96			
Nominal Volt (V) / Maximum Current (A)	96V /34A	96V /51A	96V / 68A	96V /85A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	34A max.	51A max.	68A max.	85A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10’ or 2/0:10” or 4/0: 10’			
Output Connectors	1/0: A160, A320, SB175, SB350, SBX175 2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5” x 10.5” x 20.25”			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION X RVH08 600VAC UL Models

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-225A-36V-4/0	RVH08-270A-36V-4/0	RVH08-315A-36V-4/0	RVH08-350A-36V-4/0
UL Model Number	RVH-15.9-350-36			
Nominal Volt (V) / Maximum Current (A)	36V / 225A	36V / 270A	36V / 315A	36V / 350A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	17.5A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	36V nom. / 50V max.			
Current	225A max.	270A max.	315A max.	350A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	15.9kw max.
Output Cables	4/0: 10’			
Output Connectors	4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	12 / 18			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5” x 10” x 20.25”			
Weight	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

48V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	X08-170A-48V-2/0	X08-204A-48V-2/0	X08-238A-48V-2/0	X08-260A-48V-2/0	X08-170A-48V-4/0	X08-204A-48V-4/0	X08-238A-48V-4/0	X08-272A-48V-4/0
UL Model Number	RVH-15.6-260-48				RVH-16.3-272-48			
Nominal Volt (V) / Maximum Current (A)	48V / 170A	48V / 204A	48V / 238A	48V / 260A	48V / 170A	48V / 204A	48V / 238A	48V / 272A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	17.2A rms/ph	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	18.0A rms/ph
Power Factor	>0.94							
Breaker Rating	25A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	170A max.	204A max.	238A max.	260A max.	170A max.	204A max.	238A max.	272A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	15.6kw max.	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	2/0: 10’				4/0: 10’			
Output Connectors	2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500							
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	18.5” x 10” x 20.25”							
Weight	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-100A-80V	RVH08-120A-80V	RVH08-140A-80V	RVH08-160A-80V
UL Model Number	RVH-16.3-160-80			
Nominal Volt (V) / Maximum Current (A)	80V /100A	80V /120A	80V /140A	80V /160A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	18.0A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10’ or 2/0:10” or 4/0: 10’			
Output Connectors	1/0: A160, A320, SB175, SB350, SBX175 2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 10” x 20.25”			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-85A-96V	RVH08-102A-96V	RVH08-119A-96V	RVH08-136A-96V
UL Model Number	**RVH-16.3-136-96**			
Nominal Volt (V) / Maximum Current	96V /85A	96V /102A	96V /119A	96V /136A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	18.0A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	85A max.	102A max.	119A max.	136A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10’ or 2/0:10” or 4/0: 10’			
Output Connectors	1/0: A160, A320, SB175, SBX175, SB350 2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 10” x 20.25”			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	UL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION X RVH12 600VAC UL Models

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-360A-36V-SC-4/0	RVH12-400A-36V-SC-4/0	RVH12-360A-36V-SC0-4/0	RVH12-405A-36V-SC0-4/0	RVH12-425A-36V-SC0-4/0	RVH12-405A-36V-SC2	RVH12-450A-36V-SC2	X12-495A-36V-SC2
UL Model Number	RVH-18.1-400-36-SC		RVH-19.3-425-36-SC0			RVH-22.4-495-36-SC2		
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V / 400A	36V / 360A	36V / 405A	36V / 425A	36V / 405A	36V / 450A	36V / 495A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	18.0A rms/ph	19.9A rms/ph	18.0A rms/ph	20.3A rms/ph	21.3A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph
Power Factor	>0.94							
Breaker Rating	25A		30A			35A		
OUTPUT SPECIFICATIONS								
Voltage	36V nom. / 50V max.							
Current	360A Max	400A Max	360A Max	405A Max	425A Max	405A Max	450A Max	495A Max
Power	16.3kw Max	18.1kw Max	16.3kw Max	18.4kw Max	19.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max
Output Cables	4/0: 10’					250mcm: 10’		
Output Connectors	DIN640		A320, SB350			DIN640		
# of Battery Cells	12/18							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	26.5” x 10” x 20.25”							
Weight	~120 lb	~124 lb	~120 lb	~124 lb	~128 lb	~128 lb	~132 lb	~136 lb
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

36V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-360A-36V-DC-2/0	RVH12-405A-36V-DC-2/0	RVH12-450A-36V-DC-2/0	RVH12-485A-36V-DC-2/0	RVH12-520A-36V-DC-2/0
UL Model Number	RVH-23.6-520-36-DC				
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V /405A	36V / 450A	36V / 485A	36V /520A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.2A rms/ph	26.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	36V nom. / 50V max.				
Current	360A Max	405A Max	450A Max	485A Max	520A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.0kw Max	23.6kw Max
Output Cables	Dual 2/0: 10’				
Output Connectors	Dual A320				
# of Battery Cells	12/18				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

36V REVOLUTION X RVH 600V Dual Cable Chargers (continued from previous page)

SPECIFICATIONS	RVH12-360A-36V-DC-4/0	RVH12-405A-36V-DC-4/0	RVH12-450A-36V-DC-4/0	RVH12-495A-36V-DC-4/0	RVH12-540A-36V-DC-4/0
UL Model Number	RVH-24.5-540-36-DC				
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V /405A	36V / 450A	36V / 495A	36V /540A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	36V nom. / 50V max.				
Current	360A Max	405A Max	450A Max	495A Max	540A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual A320				
# of Battery Cells	12/18				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X RVH 600V Single Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-4/0	RVH12-306A-48V-4/0	RVH12-340A-48V-4/0	RVH12-272A-48V-SC-4/0	RVH12-306A-48V-SC-4/0	RVH12-340A-48V- SC-4/0	RVH12-374A-48V- SC-4/0	RVH12-400A-48V- SC-4/0
UL Model Number	RVH-20.4-340-48			RVH-24.0-400-48-SC				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V / 272A	48V /306A	48V / 340A	48V / 374A	48V / 400A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	26.4A rms/ph
Power Factor	>0.94							
Breaker Rating	30A			35A				
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	272A Max	306A Max	340A Max	272A Max	306A Max	340A Max	374A Max	400A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.0kw Max
Output Cables	4/0: 10’							
Output Connectors	A320, SB350, SBX350, DIN640, LV320, LV500			DIN640				
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	26.5” x 10” x 20.25”							
Weight	~118 lb	~122 lb	~126 lb	~132 lb	~136 lb	~132 lb	~136 lb	~136 lb	~139 lb
Cooling	Forced air (fans)							
Certifications	UL Listed; CEC Certified							

+ PT Link sold separately

48V REVOLUTION X RVH 600V Single Cable Chargers (continued from previous page)

SPECIFICATIONS	RVH12-272A-48V-SC0-4/0	RVH12-306A-48V- SC0-4/0	RVH12-340A-48V- SC0-4/0	RVH12-374A-48V- SC0-4/0	RVH12-408A-48V- SC0-4/0	RVH12-374A-48V- SC2	RVH12-408A-48V- SC2
UL Model Number	RVH-24.5-408-48-SC0					RVH-24.5-408-48-SC2	
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V / 374A	48V /408A	48V / 374A	48V / 408A
INPUT SPECIFICATIONS							
Voltage	600 VAC, ± 10%, 3-phase						
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94						
Breaker Rating	35A						
OUTPUT SPECIFICATIONS							
Voltage	48V nom. / 65V max.						
Current	272A Max	306A Max	340A Max	374A Max	408A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max	22.4kw Max	24.5kw Max
Output Cables	4/0: 10’					250mcm: 10’	
Output Connectors	A320, SB350, LV320, LV500					DIN640	
# of Battery Cells	12/18/24						
Peak-to-Peak Voltage Ripple	< 1%						
EFFICIENCY	Total charge cycle efficiency > 90%						
	Peak charging efficiency > 93%						
PROTECTION							
Input	• Under voltage • Over voltage transients						
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity						
OPERATING CONDITIONS							
Temperature	0–40°C						
Humidity	10-90% RH noncondensing						
INTERFACE							
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface						
MECHANICAL							
W x D x H	26.5” x 10” x 20.25”						
Weight	~118 lb	~122 lb	~126 lb	~132 lb	~136 lb	~136 lb	~139 lb
Cooling	Forced air (fans)						
Certifications	UL Listed; CEC Certified						

+ PT Link sold separately

48V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-DC-2/0	RVH12-306A-48V-DC-2/0	RVH12-340A-48V-DC-2/0	RVH12-374A-48V-DC-2/0	RVH12-408A-48V-DC-2/0
UL Model Number	RVH-24.5-408-48-DC				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /374A	48V / 408A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 2/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~133 lb	~137 lb	~141 lb	~145 lb	~149 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-DC-4/0	RVH12-306A-48V-DC-4/0	RVH12-340A-48V-DC-4/0	RVH12-374A-48V-DC-4/0	RVH12-408A-48V-DC-4/0
UL Model Number	RVH-24.5-408-48-DC				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /374A	48V / 408A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~133 lb	~137 lb	~141 lb	~145 lb	~149 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-160A-80V	RVH12-180A-80V	RVH12-200A-80V	RVH12-220A-80V	RVH12-240A-80V
UL Model Number	RVH-24.5-240-80				
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /200A	80V /220A	80V /240A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	80V nom. / 110V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	2/0; 10’ or 4/0; 10’				
Output Connectors	2/0; A320, SB350, SBX350, SB175 2/0 4/0; A320, SB350, SBX350, DIN640, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-136A-96V	RVH12-153A-96V	RVH12-170A-96V	RVH12-187A-96V	RVH12-204A-96V
UL Model Number	RVH-24.5-204-96				
Nominal Volt (V) / Maximum Current (A)	96V /136A	96V /153A	96V /170A	96V /187A	96V /204A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	136A max.	153A max.	170A max.	187A max.	204A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	2/0:10" or 4/0:10'				
Output Connectors	2/0: A320, SB350, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, DIN640, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5" x 10" x 20.25"				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	UL Listed; CEC Certified				

+ PT Link sold separately

Specifications for the REVOLUTION X RVH05 600 cUL VAC models

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-90A-36V-CN0-1/0	RVH05-135A-36V-CN0-1/0	RVH05-160A-36V-CN0-1/0	RVH05-90A-36V-CN-1/0	RVH05-135A-36V-CN-1/0	RVH05-175A-36V-CN-1/0
UL Model Number	RVH-7.3-160-36-CN			RVH-7.9-175-36-CN		
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 160A	36V / 90A	36V / 135A	36V / 175A
Input Specifications						
Voltage	600 VAC, ± 10%, 3-phase					
Current	4.5A rms/ph	6.7A rms/ph	8.0A rms/ph	4.5A rms/ph	6.7A rms/ph	8.7A rms/ph
Power Factor	>0.94					
Breaker Rating	15A					
Output Specifications						
Voltage	36V nom. / 50V max.					
Current	90A max.	135A max.	160A max.	90A max.	135A max.	175A max.
Power	4.1kw max.	6.1kw max.	7.3kw max.	4.1kw max.	6.1kw max.	7.9kw max.
Output Cables	1/0: 10’					
Output Connectors	A160, A320			SB175, SBX175		
# of Battery Cells	12/18					
Peak-to-Peak Voltage Ripple	< 1%					
EFFICIENCY	Total charge cycle efficiency > 90%					
	Peak charging efficiency > 93%					
Protection						
Input	• Under voltage • Over voltage transients					
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity					
Operating Conditions						
Temperature	0–40°C					
Humidity	10-90% RH noncondensing					
Interface						
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface					
Mechanical						
W x D x H	12.5” x 10.5” x 20.25”					
Weight	~57lbs.	~61 lbs.	~65 lbs.	~57lbs.	~61 lbs.	~65 lbs.
Cooling	Forced air (fans)					
Certifications	cUL Listed; CEC Certified					

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-90A-36V-CN0-2/0	RVH05-135A-36V-CN0-2/0	RVH05-180A-36V-CN0-2/0	RVH05-195A-36V-CN0-2/0	RVH05-90A-36V-CN-2/0	RVH05-135A-36V-CN-2/0	RVH05-180A-36V-CN-2/0	RVH05-200A-36V-CN-2/0
UL Model Number	RVH-8.8-195-36-CN				RVH-9.1-200-36-CN			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 180A	36V / 195A	36V / 90A	36V / 135A	36V / 180A	36V / 200A
Input Specifications								
Voltage	600 VAC, ± 10%, 3-phase							
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	9.7A rms/ph	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	10A rms/ph
Power Factor	>0.94							
Breaker Rating	15A							
Output Specifications								
Voltage	36V nom. / 50V max.							
Current	90A max.	135A max.	180A max.	195A max.	90A max.	135A max.	180A max.	200A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	8.8kw max.	4.1kw max.	6.1kw max.	8.2kw max.	9.1kw max.
Output Cables	2/0:10”							
Output Connectors	SBX350				A320, SB175 2/0			
# of Battery Cells	12/18							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
Protection								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
Operating Conditions								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
Interface								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
Mechanical								
W x D x H	12.5” x 10.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-90A-36V-CN-4/0	RVH05-135A-36V-CN-4/0	RVH05-180A-36V-CN-4/0	RVH05-225A-36V-CN-4/0
UL Model Number	RVH-10.2-225-36-CN			
Nominal Volt (V) / Maximum Current (A)	36V / 90A	36V / 135A	36V / 180A	36V / 225A
Input Specifications				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
Output Specifications				
Voltage	36V nom. / 50V max.			
Current	90A max.	135A max.	180A max.	225A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	4/0:10'			
Output Connectors	A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	12/18			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
Protection				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
Operating Conditions				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
Interface				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
Mechanical				
W x D x H	12.5” x 10.5” x 20.25”			
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

48V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-68A-48V-CN0-1/0	RVH05-102A-48V-CN0-1/0	RVH05-136A-48V-CN0-1/0	RVH05-160A-48V-CN0-1/0	RVH05-68A-48V-CN-1/0	RVH05-102A-48V-CN-1/0	RVH05-136A-48V-CN-1/0	RVH05-170A-48V-CN-1/0
UL Model Number	RVH-9.6-160-48-CN				RVH-10.2-170-48-CN			
Nominal Volt (V) /	48V / 68A	48V / 102A	48V / 136A	48V / 160A	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	10.6A rms/ph	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94							
Breaker Rating	15A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	68A max.	102A max.	136A max.	160A max.	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	9.6kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0: 10’							
Output Connectors	A160, A320				SB175, SBX175			
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

48V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-68A-48V-CN-2/0	RVH05-102A-48V-CN-2/0	RVH05-136A-48V-CN-2/0	RVH05-170A-48V-CN-2/0	RVH05-68A-48V-CN-4/0	RVH05-102A-48V-CN-4/0	RVH05-136A-48V-CN-4/0	RVH05-170A-48V-CN-4/0
UL Model Number	RVH-10.2-170-48-CN							
Nominal Volt (V) /	48V / 68A	48V / 102A	48V / 136A	48V / 170A	48V / 68A	48V / 102A	48V / 136A	48V / 170A
INPUT SPECIFICATIONS								
Voltage	600 VAC, ± 10%, 3-phase							
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94							
Breaker Rating	15A							
OUTPUT SPECIFICATIONS								
Voltage	48V nom. / 65V max.							
Current	68A max.	102A max.	136A max.	170A max.	68A max.	102A max.	136A max.	170A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	2/0:10”				4/0:10’			
Output Connectors	A320, SB175 2/0, SBX350				A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	12/18/24							
Peak-to-Peak Voltage Ripple	< 1%							
EFFICIENCY	Total charge cycle efficiency > 90%							
	Peak charging efficiency > 93%							
PROTECTION								
Input	• Under voltage • Over voltage transients							
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity							
OPERATING CONDITIONS								
Temperature	0–40°C							
Humidity	10-90% RH noncondensing							
INTERFACE								
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface							
MECHANICAL								
W x D x H	12.5” x 10.5” x 20.25”							
Weight	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.	~57lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)							
Certifications	cUL Listed; CEC Certified							

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-40A-80V-CN	RVH05-60A-80V-CN	RVH05-80A-80V-CN	RVH05-100A-80V-CN
UL Model Number	RVH-10.2-100-80-CN			
Nominal Volt (V) / Maximum Current (A)	80V /40A	80V /60A	80V / 80A	80V /100A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	40A max.	60A max.	80A max.	100A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0:10'			
Output Connectors	1/0: A160, A320, SB175, SBX175 2/0: A320, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5" x 10.5" x 20.25"			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH05-34A-96V-CN	RVH05-51A-96V-CN	RVH05-68A-96V-CN	RVH05-85A-96V-CN
UL Model Number	RVH-10.2-85-96-CN			
Nominal Volt (V) / Maximum Current (A)	96V /34A	96V /51A	96V / 68A	96V /85A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	4.5A rms/ph	6.7A rms/ph	9.0A rms/ph	11.2A rms/ph
Power Factor	>0.94			
Breaker Rating	15A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	34A max.	51A max.	68A max.	85A max.
Power	4.1kw max.	6.1kw max.	8.2kw max.	10.2kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0:10'			
Output Connectors	1/0: A160, A320, SB175, SBX175 2/0: A320, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40 / 48			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	12.5" x 10.5" x 20.25"			
Weight	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION X RVH08 600 cUL VAC models

36V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-225A-36V-CN-4/0	RVH08-245A-36V-CN-4/0	RVH08-225A-36V-CN1-4/0	RVH08-270A-36V- CN1-4/0	RVH08-315A-36V- CN1-4/0	RVH08-350A-36V- CN1-4/0
UL Model Number	RVH-11.1-245-36-CN		RVH-15.9-350-36-CN			
Nominal Volt (V) / Maximum Current (A)	36V / 225A	36V / 245A	36V / 225A	36V / 270A	36V / 315A	36V / 350A
INPUT SPECIFICATIONS						
Voltage	600 VAC, ± 10%, 3-phase					
Current	11.2A rms/ph	12.2A rms/ph	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	17.5A rms/ph
Power Factor	>0.94					
Breaker Rating	20A		25A			
OUTPUT SPECIFICATIONS						
Voltage	36V nom. / 50V max.					
Current	225A max.	245A max.	225A max.	270A max.	315A max.	350A max.
Power	10.2kw max.	11.1kw max.	10.2kw max.	12.2kw max.	14.3kw max.	15.9kw max.
Output Cables	4/0: 10’					
Output Connectors	A320, SB350, SBX350, LV320, LV500		SB350			
# of Battery Cells	12 / 18					
Peak-to-Peak Voltage Ripple	< 1%					
EFFICIENCY	Total charge cycle efficiency > 90%					
	Peak charging efficiency > 93%					
PROTECTION						
Input	• Under voltage • Over voltage transients					
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity					
OPERATING CONDITIONS						
Temperature	0–40°C					
Humidity	10-90% RH noncondensing					
INTERFACE						
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface					
MECHANICAL						
W x D x H	12.5” x 10” x 20.25”					
Weight	~57 lbs.	~61 lbs.	~57 lbs.	~61 lbs.	~65 lbs.	~68 lbs.
Cooling	Forced air (fans)					
Certifications	cUL Listed; CEC Certified					

48V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-170A-48V-CN-4/0	RVH08-204A-48V-CN-4/0	RVH08-238A-48V-CN-4/0	RVH08-245A-48V-CN-4/0
UL Model Number	RVH-14.7-245-48-CN			
Nominal Volt (V) / Maximum Current (A)	48V / 170A	48V / 204A	48V / 238A	48V / 245A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	16.2A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	48V nom. / 65V max.			
Current	170A max.	204A max.	238A max.	245A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	14.7kw max.
Output Cables	4/0: 10’			
Output Connectors	A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	12/18/24			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5” x 10” x 20.25”			
Weight	~77 lbs.	~81 lbs.	~85 lbs.	~89 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-100A-80V-CN	RVH08-120A-80V-CN	RVH08-140A-80V-CN	RVH08-160A-80V-CN
UL Model Number	RVH-16.3-160-80-CN			
Nominal Volt (V) / Maximum Current (A)	80V /100A	80V /120A	80V /140A	80V /160A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	18.0A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	80V nom. / 110V max.			
Current	100A max.	120A max.	140A max.	160A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0:10'			
Output Connectors	1/0: A160, A320, SB175, SBX175 2/0: A320, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5" x 10" x 20.25"			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH08-85A-96V-CN	RVH08-102A-96V-CN	RVH08-119A-96V-CN	RVH08-136A-96V-CN
UL Model Number	RVH-16.3-136-96-CN			
Nominal Volt (V) / Maximum Current (A)	96V /85A	96V/102A	96V/119A	96V/136A
INPUT SPECIFICATIONS				
Voltage	600 VAC, ± 10%, 3-phase			
Current	11.2A rms/ph	13.4A rms/ph	15.8A rms/ph	18.0A rms/ph
Power Factor	>0.94			
Breaker Rating	25A			
OUTPUT SPECIFICATIONS				
Voltage	96V nom. / 130V max.			
Current	85A max.	102A max.	119A max.	136A max.
Power	10.2kw max.	12.2kw max.	14.3kw max.	16.3kw max.
Output Cables	1/0:10' or 2/0:10" or 4/0:10'			
Output Connectors	1/0: A160, A320, SB175, SBX175 2/0: A320, SBX350, SB175 2/0 4/0: A320, SB350, SBX350, LV320, LV500			
# of Battery Cells	18 / 24 / 36 / 40			
Peak-to-Peak Voltage Ripple	< 1%			
EFFICIENCY	Total charge cycle efficiency > 90%			
	Peak charging efficiency > 93%			
PROTECTION				
Input	• Under voltage • Over voltage transients			
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity			
OPERATING CONDITIONS				
Temperature	0–40°C			
Humidity	10-90% RH noncondensing			
INTERFACE				
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface			
MECHANICAL				
W x D x H	18.5" x 10" x 20.25"			
Weight	~75 lbs.	~79 lbs.	~83 lbs.	~86 lbs.
Cooling	Forced air (fans)			
Certifications	cUL Listed; CEC Certified			

+ PT Link sold separately

Specifications for the REVOLUTION X RVH12 600 cUL VAC models

36V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-360A-36V-DC-CN	RVH12-405A-36V-DC-CN	RVH12-450A-36V-DC-CN	RVH12-470A-36V-DC-CN	RVH12-490A-36V-DC-CN
UL Model Number	RVH-22.2-490-36-DC-CN				
Nominal Volt (V) / Maximum Current (A)	36V / 360A	36V /405A	36V / 450A	36V / 470A	36V /490A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	23.5A rms/ph	24.5A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	36V nom. / 50V max.				
Current	360A Max	405A Max	450A Max	470A Max	490A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	21.3kw Max	22.2kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual A320				
# of Battery Cells	12/18				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~138 lb	~142 lb	~146 lb	~150 lb	~154 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X RVH 600V Single Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-4/0	RVH12-306A-48V-4/0	RVH12-340A-48V-4/0
UL Model Number	RVH-20.4-340-48		
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A
INPUT SPECIFICATIONS			
Voltage	600 VAC, ± 10%, 3-phase		
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph
Power Factor	>0.94		
Breaker Rating	30A		
OUTPUT SPECIFICATIONS			
Voltage	48V nom. / 65V max.		
Current	272A Max	306A Max	340A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max
Output Cables	4/0: 10’		
Output Connectors	SB350		
# of Battery Cells	12/18/24		
Peak-to-Peak Voltage Ripple	< 1%		
EFFICIENCY	Total charge cycle efficiency > 90%		
	Peak charging efficiency > 93%		
PROTECTION			
Input	• Under voltage • Over voltage transients		
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity		
OPERATING CONDITIONS			
Temperature	0–40°C		
Humidity	10-90% RH noncondensing		
INTERFACE			
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface		
MECHANICAL			
W x D x H	26.5” x 10” x 20.25”		
Weight	~118 lb	~122 lb	~126 lb
Cooling	Forced air (fans)		
Certifications	cUL Listed; CEC Certified		

+ PT Link sold separately

48V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-DC-CN-2/0	RVH12-306A-48V-DC-CN-2/0	RVH12-340A-48V-DC-CN-2/0	RVH12-374A-48V-DC-CN-2/0	RVH12-400A-48V-DC-CN-2/0
UL Model Number	RVH-24.0-400-48-DC-CN				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /374A	48V / 400A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	26.4A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	374A Max	400A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.0kw Max
Output Cables	Dual 2/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~133 lb	~137 lb	~141 lb	~145 lb	~149 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

48V REVOLUTION X RVH 600V Dual Cable Chargers

SPECIFICATIONS	RVH12-272A-48V-DC-CN-4/0	RVH12-306A-48V-DC-CN-4/0	RVH12-340A-48V-DC-CN-4/0	RVH12-374A-48V-DC-CN-4/0	RVH12-408A-48V-DC-CN-4/0
UL Model Number	RVH-24.5-408-48-DC-CN				
Nominal Volt (V) / Maximum Current (A)	48V / 272A	48V /306A	48V / 340A	48V /374A	48V / 408A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	48V nom. / 65V max.				
Current	272A Max	306A Max	340A Max	374A Max	408A Max
Power	16.3kw Max	18.4kw Max	20.4kw Max	22.4kw Max	24.5kw Max
Output Cables	Dual 4/0: 10’				
Output Connectors	Dual Euro A320				
# of Battery Cells	12/18/24				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PT Link+ Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~133 lb	~137 lb	~141 lb	~145 lb	~149 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-160A-80V-CN0-2/0	RVH12-180A-80V-CN0-2/0	RVH12-195A-80V-CN0-2/0	RVH12-160A-80V	RVH12-180A-80V	RVH12-200A-80V
UL Model Number	RVH-19.9-195-80-CN			RVH-20.4-200-80-CN		
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /195A	80V /160A	80V /180A	80V /200A
INPUT SPECIFICATIONS						
Voltage	600 VAC, ± 10%, 3-phase					
Current	18.0A rms/ph	20.3A rms/ph	21.9A rms/ph	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph
Power Factor	>0.94					
Breaker Rating	30A					
OUTPUT SPECIFICATIONS						
Voltage	80V nom. / 110V max.					
Current	160A max.	180A max.	195A max.	160A max.	180A max.	200A max.
Power	16.3kw max.	18.4kw max.	19.9kw max.	16.3kw max.	18.4kw max.	20.4kw max.
Output Cables	2/0:10”					
Output Connectors	SBX350			A320, SB175 2/0		
# of Battery Cells	18 / 24 / 36 / 40					
Peak-to-Peak Voltage Ripple	< 1%					
EFFICIENCY	Total charge cycle efficiency > 90%					
	Peak charging efficiency > 93%					
PROTECTION						
Input	• Under voltage • Over voltage transients					
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity					
OPERATING CONDITIONS						
Temperature	0–40°C					
Humidity	10-90% RH noncondensing					
INTERFACE						
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface					
MECHANICAL						
W x D x H	26.5” x 10” x 20.25”					
Weight	~112 lb	~116 lb	~120 lb	~112 lb	~116 lb	~120 lb
Cooling	Forced air (fans)					
Certifications	cUL Listed; CEC Certified					

+ PT Link sold separately

80V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-160A-80V-CN-4/0	RVH12-180A-80V-CN-4/0	RVH12-200A-80V-CN-4/0	RVH12-220A-80V-CN-4/0	RVH12-240A-80V-CN-4/0
UL Model Number	RVH-24.5-240-80-CN				
Nominal Volt (V) / Maximum Current (A)	80V /160A	80V /180A	80V /200A	80V /220A	80V /240A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	80V nom. / 110V max.				
Current	160A max.	180A max.	200A max.	220A max.	240A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	4/0; 10’				
Output Connectors	A320, SB350, SBX350, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-136A-96V-CN0-2/0	RVH12-153A-96V-CN0-2/0	RVH12-170A-96V-CN0-2/0	RVH12-187A-96V-CN0-2/0	RVH12-195A-96V-CN0-2/0
UL Model Number	RVH-23.4-195-96-CN				
Nominal Volt (V) / Maximum Current (A)	96V /136A	96V /153A	96V /170A	96V /187A	96V /195A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	25.8A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	136A max.	153A max.	170A max.	187A max.	195A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	23.4kw max.
Output Cables	2/0:10’				
Output Connectors	SBX350				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-136A-96V-CN-2/0	RVH12-153A-96V-CN-2/0	RVH12-170A-96V-CN-2/0	RVH12-187A-96V-CN-2/0	RVH12-200A-96V-CN-2/0
UL Model Number	RVH-24.0-200-96-CN				
Nominal Volt (V) / Maximum Current (A)	96V /136A	96V /153A	96V /170A	96V /187A	96V /200A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.7A rms/ph	26.4A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	136A max.	153A max.	170A max.	187A max.	200A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.0kw max.
Output Cables	2/0:10’				
Output Connectors	A320, SB175 2/0				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transient0				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

96V REVOLUTION X RVH 600V Chargers

SPECIFICATIONS	RVH12-136A-96V-CN-4/0	RVH12-153A-96V-CN-4/0	RVH12-170A-96V-CN-4/0	RVH12-187A-96V-CN-4/0	RVH12-204A-96V-CN-4/0
UL Model Number	RVH-24.5-204-96-CN				
Nominal Volt (V) / Maximum Current (A)	96V /136A	96V /153A	96V /170A	96V /187A	96V /204A
INPUT SPECIFICATIONS					
Voltage	600 VAC, ± 10%, 3-phase				
Current	18.0A rms/ph	20.3A rms/ph	22.5A rms/ph	24.74A rms/ph	27.0A rms/ph
Power Factor	>0.94				
Breaker Rating	35A				
OUTPUT SPECIFICATIONS					
Voltage	96V nom. / 130V max.				
Current	136A max.	153A max.	170A max.	187A max.	204A max.
Power	16.3kw max.	18.4kw max.	20.4kw max.	22.4kw max.	24.5kw max.
Output Cables	4/0:10’				
Output Connectors	A320, SB350, SBX350, LV320, LV500				
# of Battery Cells	18 / 24 / 36 / 40 /48				
Peak-to-Peak Voltage Ripple	< 1%				
EFFICIENCY	Total charge cycle efficiency > 90%				
	Peak charging efficiency > 93%				
PROTECTION					
Input	• Under voltage • Over voltage transients				
Output	• Over current • Over voltage • Charger Over temperature; Battery Over temperature • Battery reverse polarity				
OPERATING CONDITIONS					
Temperature	0–40°C				
Humidity	10-90% RH noncondensing				
INTERFACE					
User Interface	LCD & keypad, USB, wireless communication with PowerTrac and PT Link+ . Optional: Ethernet or CAN Interface				
MECHANICAL					
W x D x H	26.5” x 10” x 20.25”				
Weight	~112 lb	~116 lb	~120 lb	~124 lb	~127 lb
Cooling	Forced air (fans)				
Certifications	cUL Listed; CEC Certified				

+ PT Link sold separately

INSTALLATION PROCEDURE

Charger Installation

The following procedure describes proper installation of the **REVOLUTION** series of chargers.

Charger Unpacking and Inspection

Upon receipt of a **REVOLUTION** charger, ensure that there is no physical damage to the chassis, the **L**iquid **C**rystal **D**isplay (**LCD**)/keypad, or the DC cables. If any damage is apparent, contact the shipping carrier.

Do not install or operate the charger if it has any visible damage.

Failure to meet these minimum requirements
May result in a voided warranty.

- **Adequate Cooling Required –** To prevent damage from overheating, proper airflow must be ensured. Do not restrict fan inlets or exhaust outlets. Do not mount the charger in a confined space or where the exhaust air will recirculate.

Continue on page 75 for RVX05/RVH05 Installation Procedure
Continue on page 80 for RVX08/RVH08 Installation Procedure
Continue on page 85 for RVX12/RVH12 Installation Procedure

RVX05/RVH05 Models Installation

- Mount the charger vertically, observing the minimum spacing shown below:

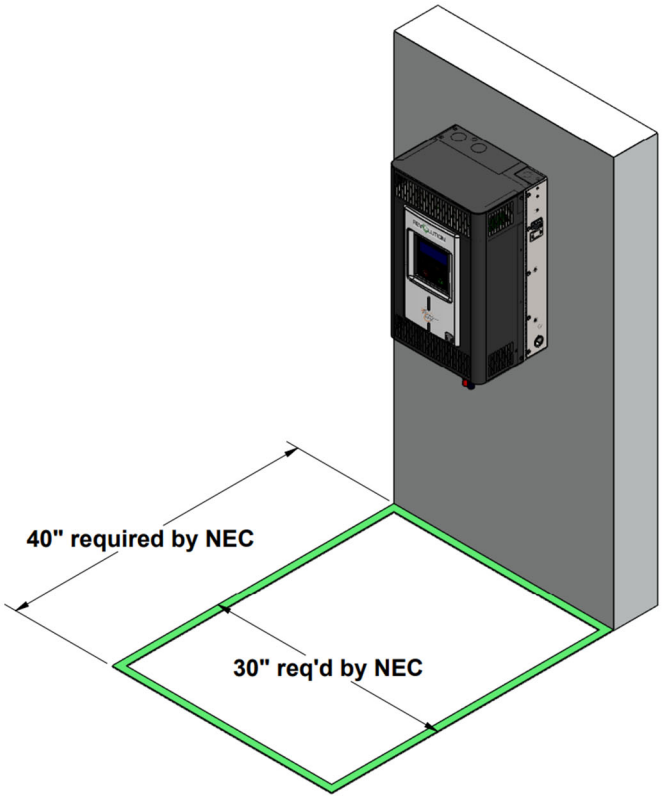


Figure 1: RVX05/RVH05 NEC minimum spacing

- Ensure that the charging area is well ventilated, dry, and clean.

- **Do not expose the charger to rain or snow.**

  The charger is NOT designed for outdoor use.

- There must be at least 12” of spacing between the sides of the charger and any adjacent walls or barriers, and 12” of spacing between the bottom of the charger and the floor or any other obstruction.

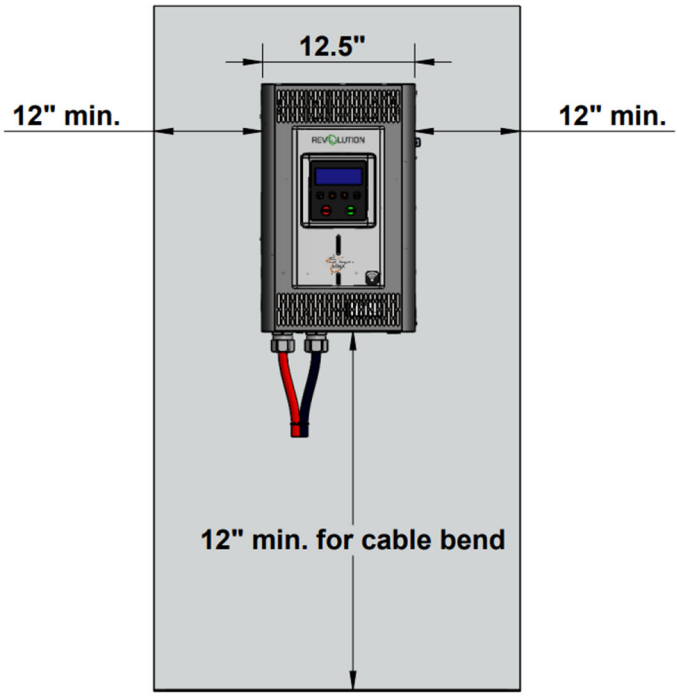


Figure 2: RVX05/RVH05 minimum spacing

- Ambient Temperature Range 0 – 40° C
- Ambient Humidity Range 10-90% RH non-condensing

1. **Preparing the Mounting Area:**

   The Charger must be mounted vertically as illustrated, using 1/4” or 5/16” hardware (user provided). The Charger may be directly mounted to masonry or concrete, structural framing channels, or onto the Floor or Shelf Stand (purchased separately; see Appendix B or C).

- Unpack the RVX05/RVH05 Mounting Bracket and use it as a template to position the mounting holes.

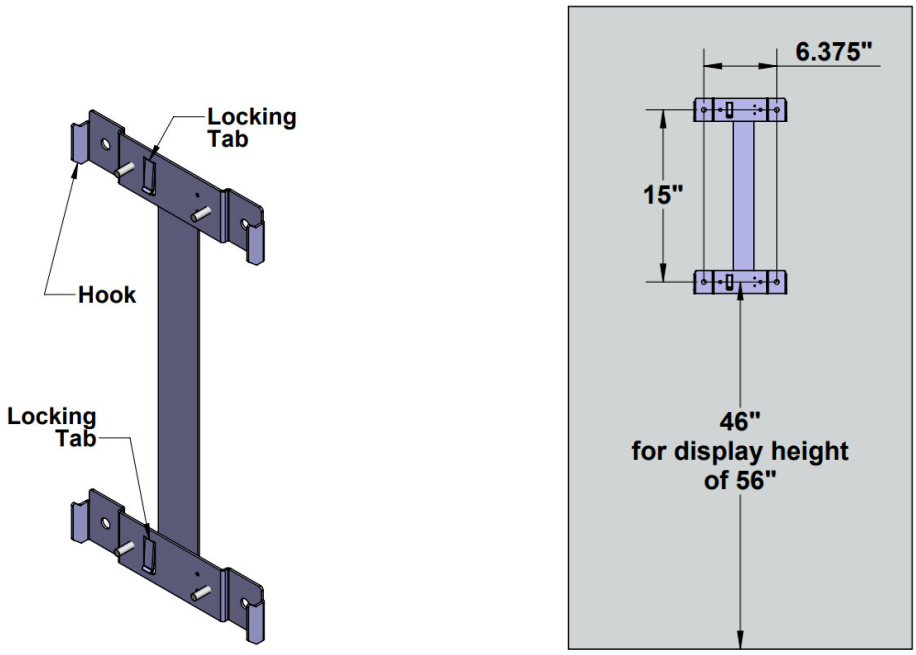


Figure 3: RVX05/RVH05 mounting bracket and mounting height

- The charger mounting bracket should be fastened to the mounting surface using ¼” or 5/16” hardware (User provided).

IMPORTANT

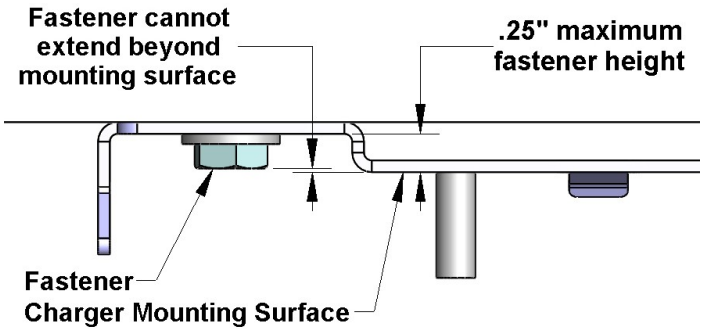


Figure 4: Fastener Height Restriction

- Note that the mounting bracket fasteners cannot extend beyond the Charger mounting surface on the mounting brackets.
- **Charger Weight: 56 lbs. Maximum**

2. Mounting the Charger:

- The hooks, studs, and locking tabs of the mounting bracket mate to matching slots in the Charger:

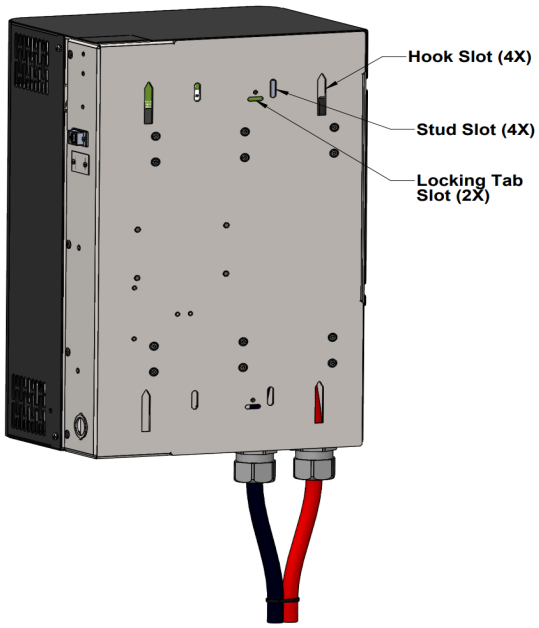


Figure 5: RVX05/RVH05 Rear View

- Lift the charger (2 people, 1 on each side) onto the 4 hooks of the mounting bracket. Be sure all 4 hooks and studs are mated to their respective slots, and allow the charger to drop onto the hooks. The locking tabs will engage in their slots, and will lock the charger temporarily to the charger mounting bracket. Verify the charger is locked down by attempting to lift the charger.

Fastening the Charger

- On the left side of the Charger, remove the 2 (10-32) screws securing the Charger door:

Figure 6: RVX05/RVH05 Cover Removal

- Swing the Charger open to expose the studs of the Mounting Bracket, and the plastic bag containing the mounting nuts:

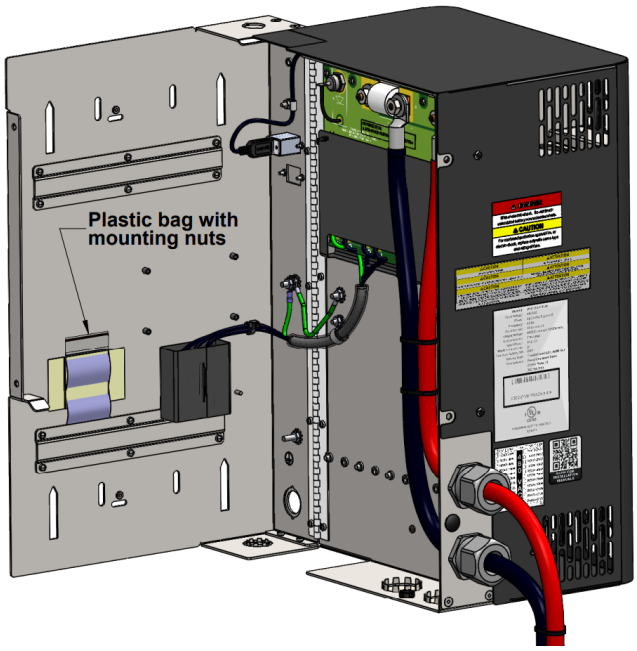


Figure 7: RVX05/RVH05 Cover open

- Remove the nuts from the bag and use them to secure the Charger. Tighten to 60 in-lb +/- 2 in-lb:

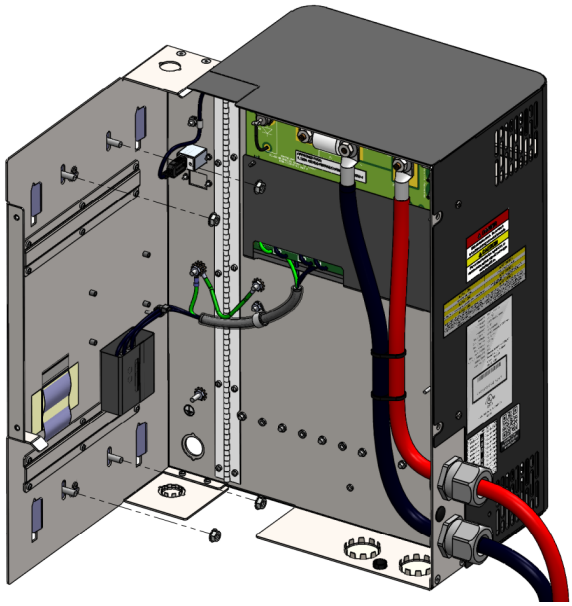


Figure 8: RVX05/RVH05 Permanent Attachment

- Once the Charger has been securely mounted, electrical installation can proceed.

CAUTION: Do not allow debris to fall inside the Charger during the mounting and installation process!

Continue to page 92 for Charger Electrical Installation

RVX08/RVH08 Models Installation

- The Charger must be mounted vertically as illustrated, using 5/16” hardware (user provided). The Charger may be directly mounted to masonry or concrete, structural framing channels, or onto the Floor or Shelf Stand (purchased separately; see Appendix B or C).

- Mount the charger vertically, observing the minimum spacing shown below:

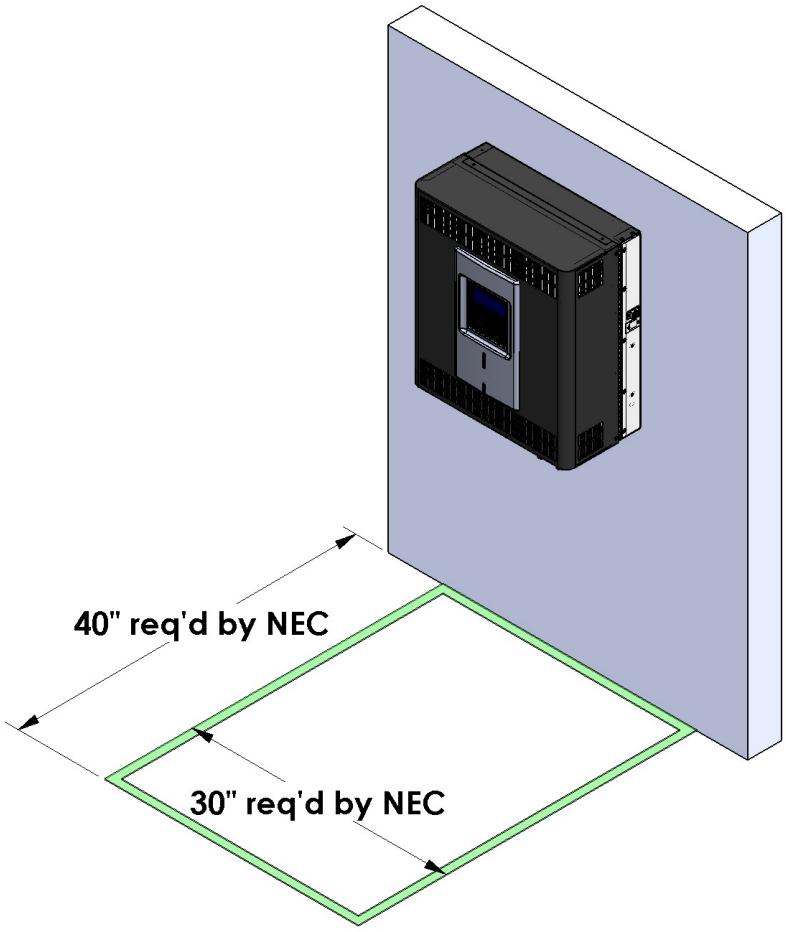


Figure 9: RVX08/RVH08 NEC minimum spacing

- Ensure that the charging area is well ventilated, dry, and clean.

- **Do not expose the charger to rain or snow.**

  The charger is NOT designed for outdoor use.

- There must be at least 12” of spacing between the sides of the charger and any adjacent walls or barriers, and 12” of spacing between the bottom of the charger and the floor or any other obstruction. This is to allow for service and tool access to the Charger.

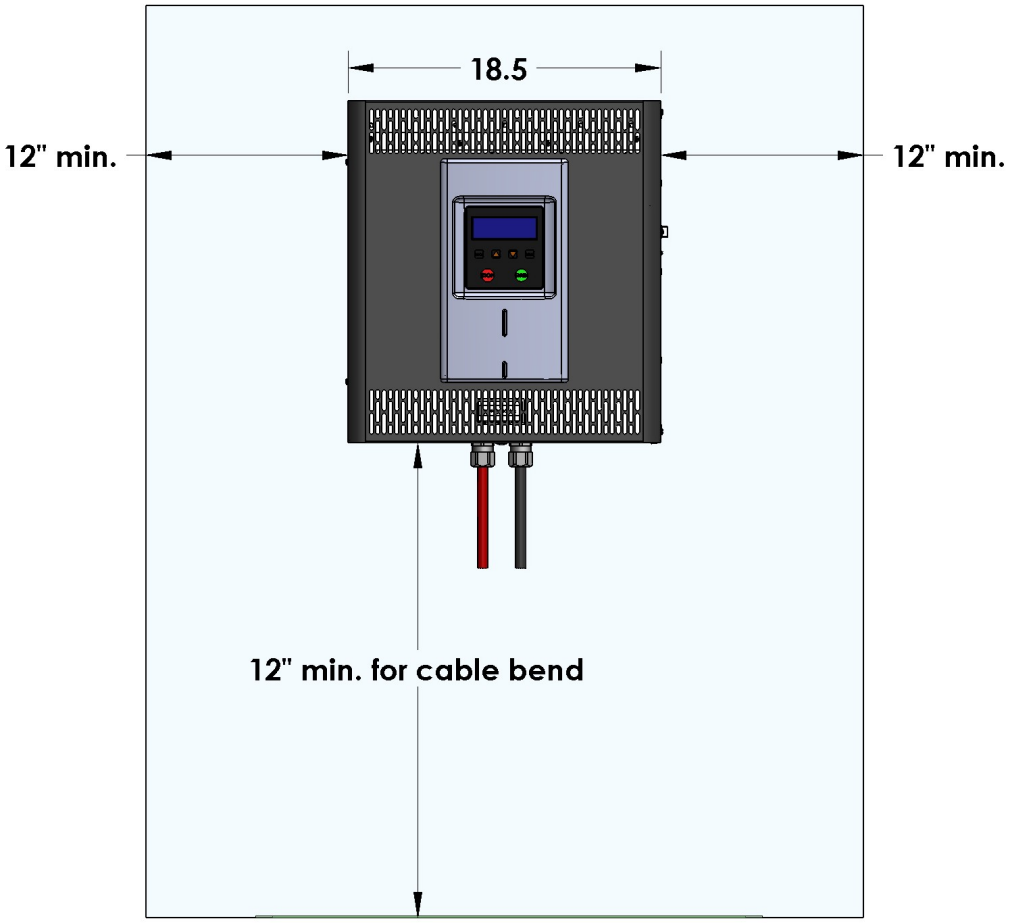


Figure 10: RVX08/RVH08 minimum spacing

- Ambient Temperature Range 0 – 40° C
- Ambient Humidity Range 10-90% RH non-condensing

1. **Preparing the Mounting Area:**

   The Charger must be mounted vertically as illustrated, using 5/16” hardware (user provided). The Charger may be directly mounted to masonry or concrete, structural framing channels, or onto the Floor or Shelf Stand (purchased separately; see Appendix B or C).

- Unpack the RVX08/RVH08 Mounting Bracket, and use it as a template to position the mounting holes.

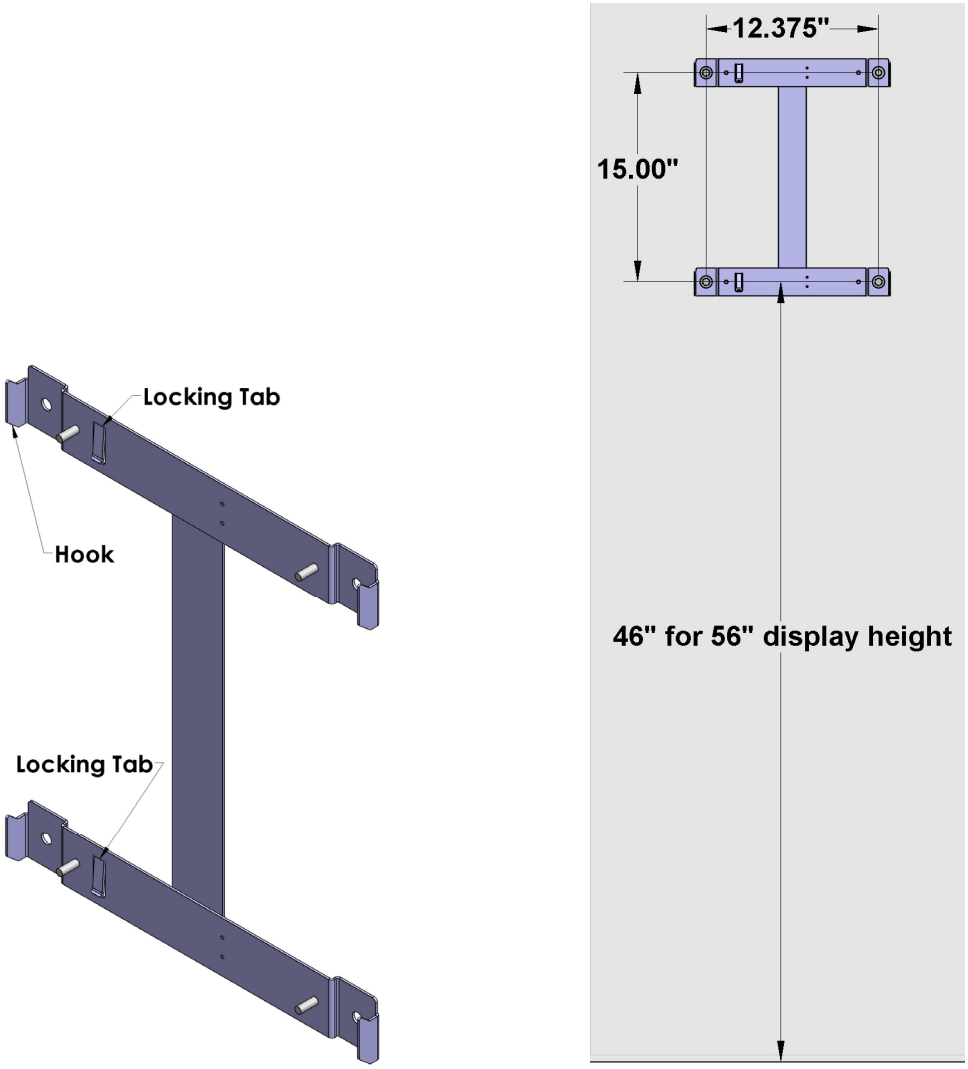


Figure 11: RVX08/RVH08 mounting bracket and mounting height

- The charger mounting bracket should be fastened to the mounting surface using 5/16” hardware (User provided).

IMPORTANT

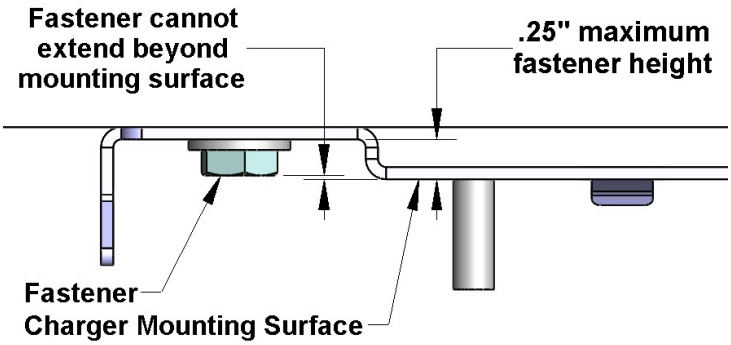


Figure 12: Fastener Height Restriction

- Note that the mounting bracket fasteners cannot extend beyond the Charger mounting surface on the mounting brackets.
- **Charger Weight: 85 lbs. Maximum**

2. Mounting the Charger:

- The hooks, studs, and locking tabs of the mounting bracket mate to matching slots in the Charger:

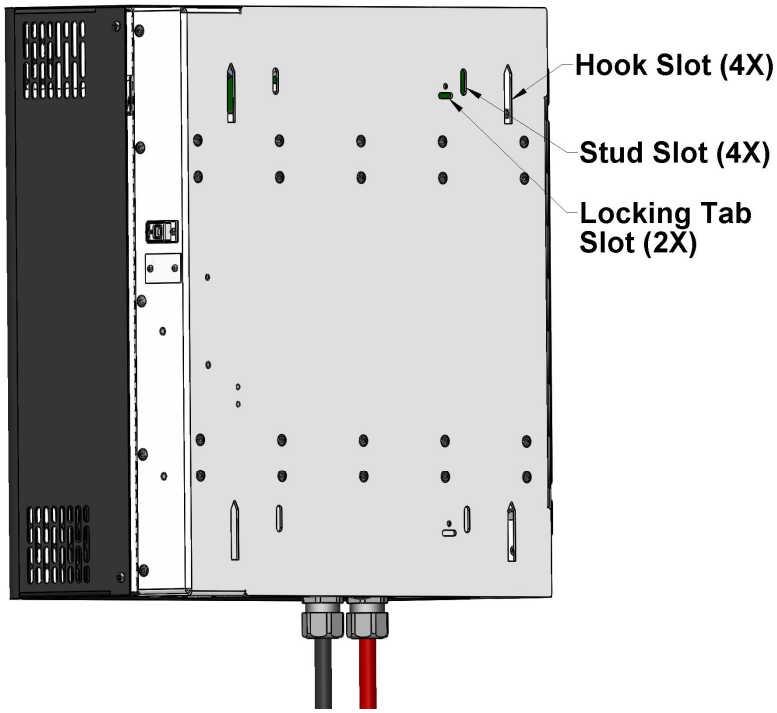


Figure 13: RVX08/RVH08 Rear View

- Lift the charger (2 people, 1 on each side) onto the 4 hooks of the mounting bracket. Be sure all 4 hooks and studs are mated to their respective slots, and allow the charger to drop onto the hooks. The locking tabs will engage in their slots, and will lock the charger temporarily to the charger mounting bracket. Verify the charger is locked down by attempting to lift the charger.

3. Fastening the Charger

- On the left side of the Charger, remove the 2 (10-32) screws securing the Charger door:

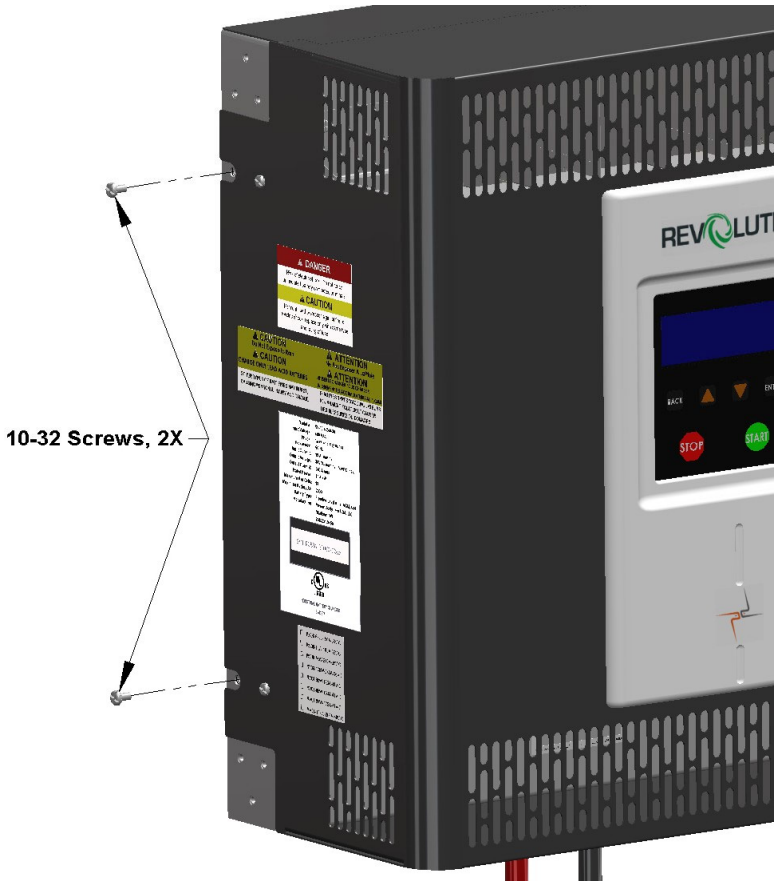


Figure 14: RVX08/RVH08 Cover Removal

- Swing the Charger open to expose the studs of the Mounting Bracket, and the plastic bag containing the mounting nuts:

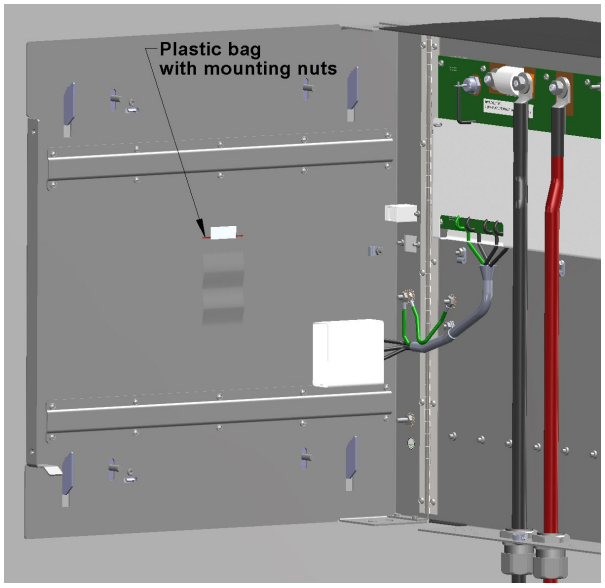


Figure 15: RVX08/RVH08 Cover open

- Remove the nuts from the bag and use them to secure the Charger. Tighten to 60 in-lb +/- 2 in-lb:

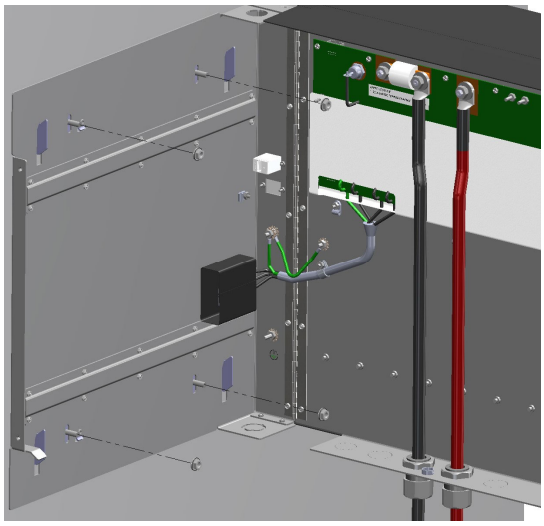


Figure 16: RVX08/RVH08 Permanent Attachment

- Once the Charger has been securely mounted, electrical installation can proceed.

CAUTION: Do not allow debris to fall inside the Charger during the mounting and installation process!

Continue to page 92 for Charger Electrical Installation

RVX12/RVH12 Models Installation

- Mount the charger vertically, observing the minimum spacing shown below:

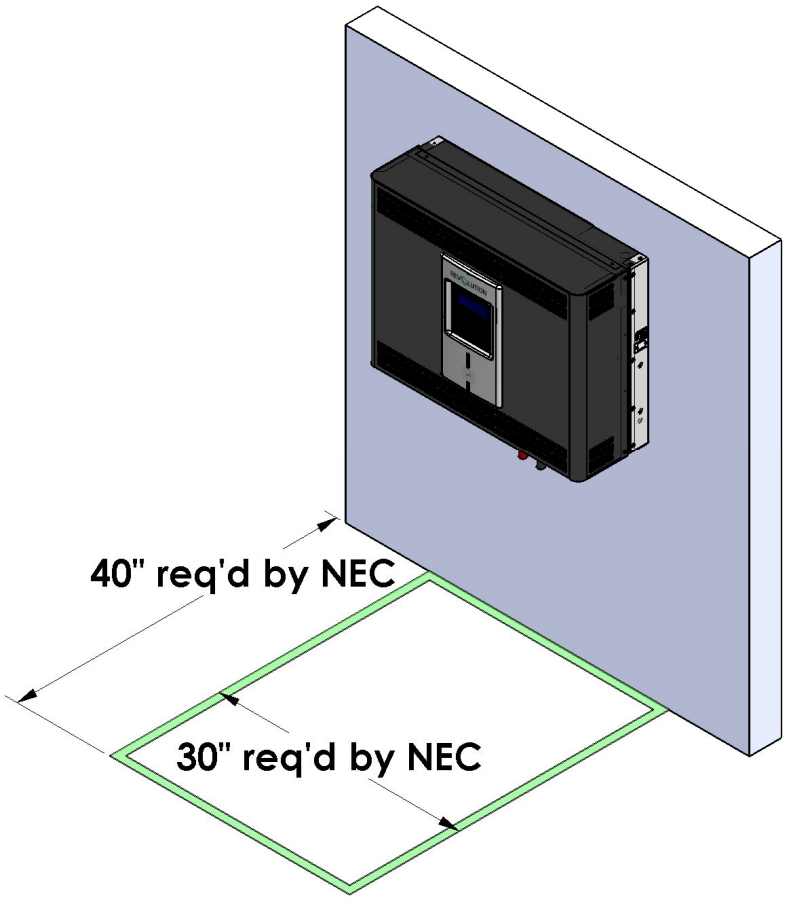


Figure 17: RVX12/RVH12 NEC minimum spacing

- Ensure that the charging area is well ventilated, dry, and clean.

- **Do not expose the charger to rain or snow.**

  The charger is NOT designed for outdoor use.

- There must be at least 12” of spacing between the sides of the charger and any adjacent walls or barriers, and 12” of spacing between the bottom of the charger and the floor or any other obstruction. This is to allow for service and tool access to the Charger.

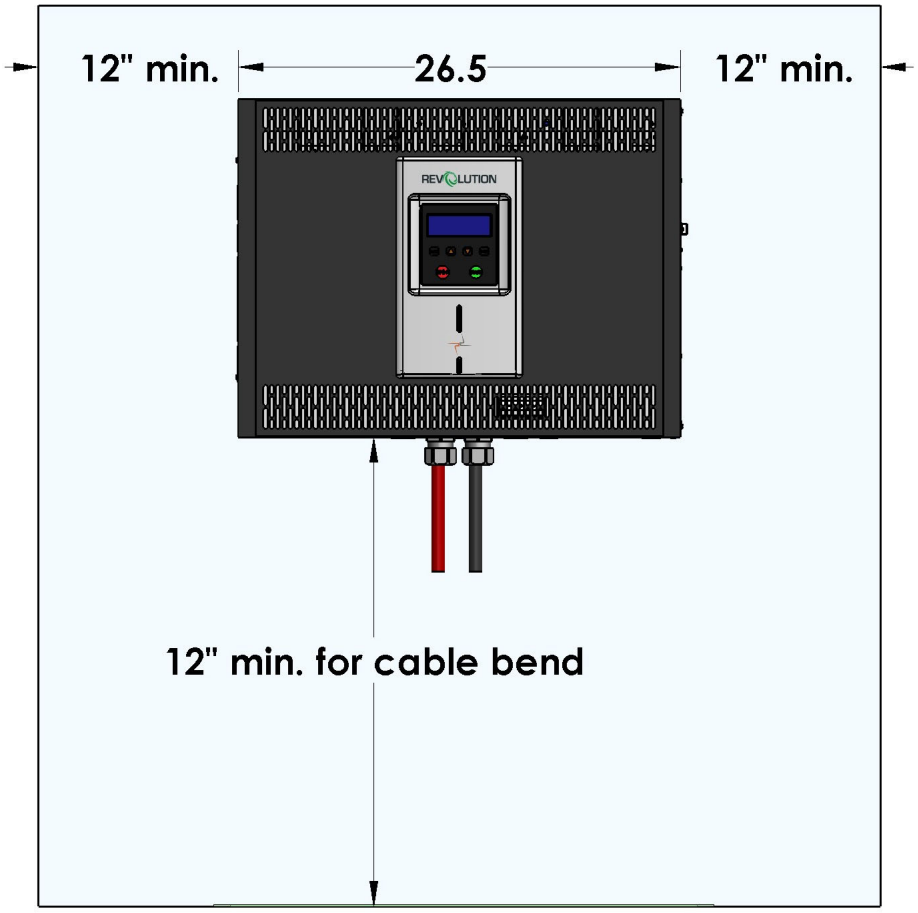


Figure 18: RVX12/RVH12 minimum spacing

- Ambient Temperature Range 0 – 40° C
- Ambient Humidity Range 10-90% RH non-condensing

1. Preparing the Mounting Area:

- The Charger must be mounted vertically as illustrated, using 5/16” hardware (user provided). The Charger may be directly mounted to masonry or concrete, structural framing channels, or onto the Floor Stand (purchased separately; see Appendix B).

- Unpack the RVX12/RVH12 Mounting Bracket, and use it as a template to position the mounting holes.

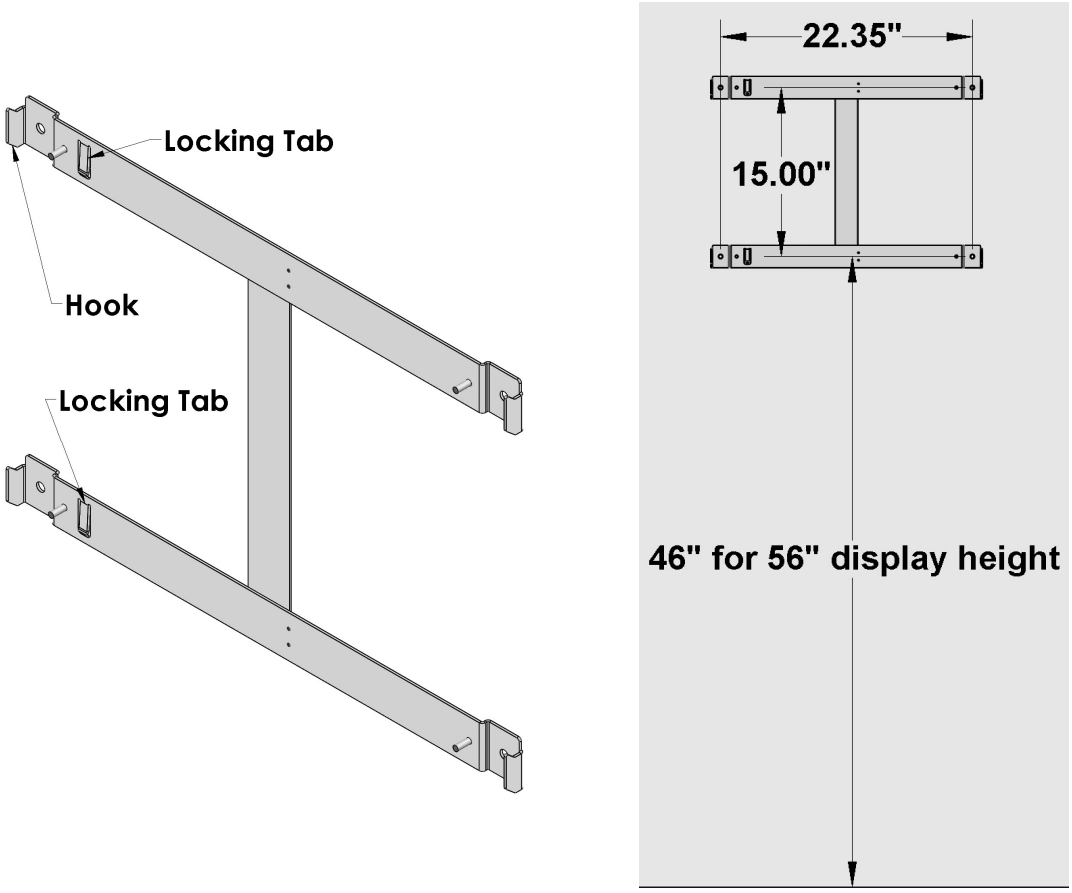


Figure 19: RVX12/RVH12 mounting bracket and mounting height

- The charger mounting bracket should be fastened to the mounting surface using 5/16” hardware (User provided).

IMPORTANT

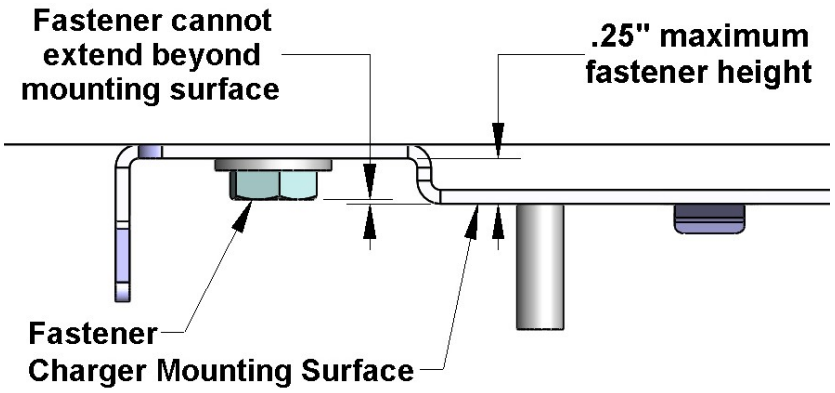


Figure 20: Fastener Height Restriction

- Note that the mounting bracket fasteners cannot extend beyond the Charger mounting surface on the mounting brackets.
- **Charger Weight: 120 lbs. Maximum**

2. Mounting the Charger:

- The hooks, studs, and locking tabs of the mounting bracket mate to matching slots in the Charger:

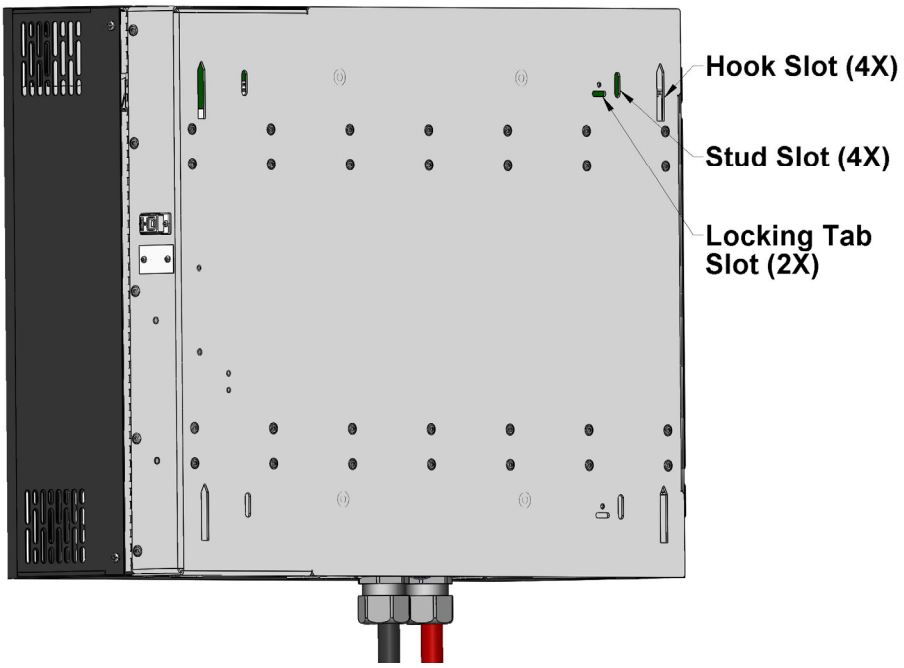


Figure 21: RVX12/RVH12 Rear View

- Lift the charger (2 people, 1 on each side) onto the 4 hooks of the mounting bracket. Be sure all 4 hooks and studs are mated to their respective slots and allow the charger to drop onto the hooks. The locking tabs will engage in their slots and will lock the charger temporarily to the charger mounting bracket. Verify the charger is locked down by attempting to lift the charger.

3. Fastening the Charger

- On the left side of the Charger, remove the 2 (10-32) screws securing the Charger door:

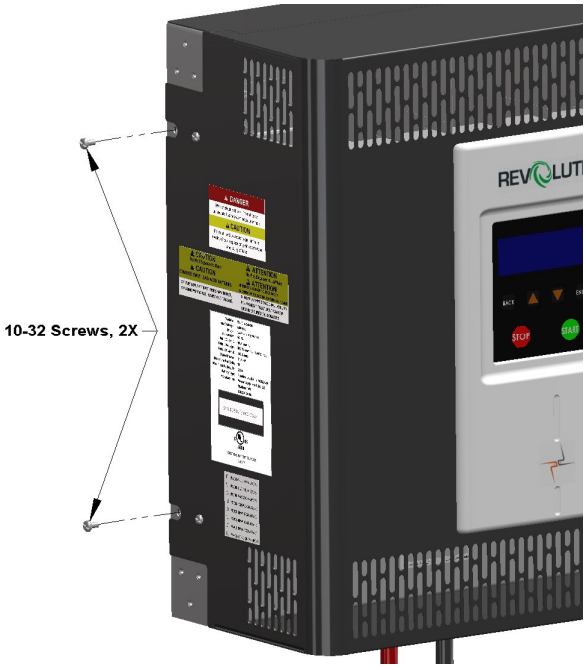


Figure 22: RVX12/RVH12 Cover Removal

- Swing the Charger open to expose the studs of the Mounting Bracket, and the plastic bag containing the mounting nuts:

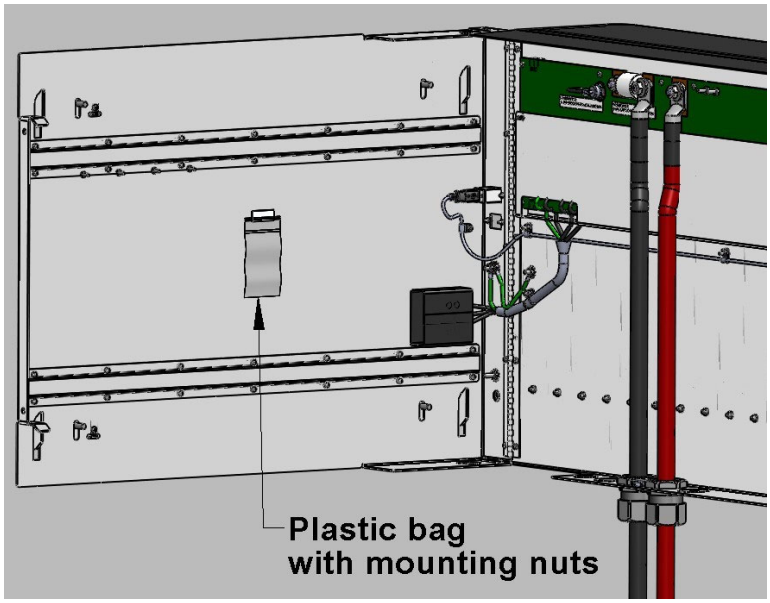


Figure 23: RVX12/RVH12 Cover open

- Remove the nuts from the bag and use them to secure the Charger. Tighten to 60 in-lb +/- 2 in-lb:

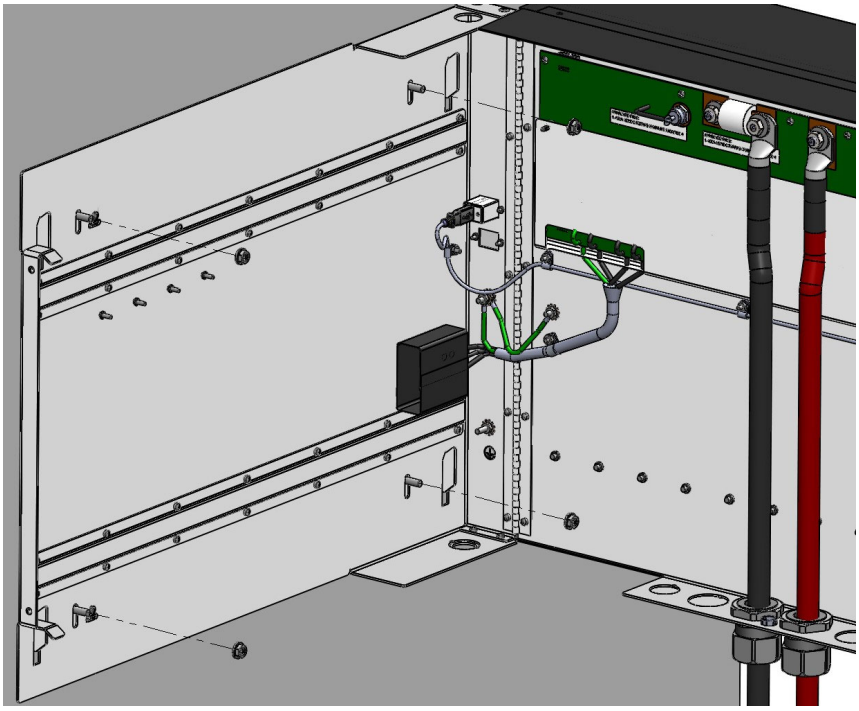


Figure 24: RVX12/RVH12 Permanent Attachment

- Once the Charger has been securely mounted, electrical installation can proceed.

CAUTION: Do not allow debris to fall inside the Charger during the mounting and installation process!

Continue to page 92 for Charger Electrical Installation.

WARNING

DANGEROUS VOLTAGES AND CURRENTS ARE PRESENT IN THE AC MAINS WHEN ENERGIZED. ONLY TRAINED PERSONNEL SHOULD PERFORM THE INSTALLATION, USING PROPER EQUIPMENT AND PROCEDURES.

VERIFY THAT INPUT AND OUTPUT WIRING ADHERES TO ALL LOCAL SAFETY CODES AND STANDARDS.

1. **The REVOLUTION chargers require a 480 VAC 3∅, three-wire Wye or Delta electrical supply with a separate ground (Figure 25).**

480V REVOLUTION X Model	Current Draw	Circuit Protection at 125%
RVX05	14.1 A	20 A
RVX08	22.5 A	30 A
RVX12	33.7 A	45 A
600V REVOLUTION X Model	**Current Draw**	**Circuit Protection at 125%**
RVH05	11.2 A	15 A
RVH08	18.0 A	25 A
RVH12	27.0 A	40 A

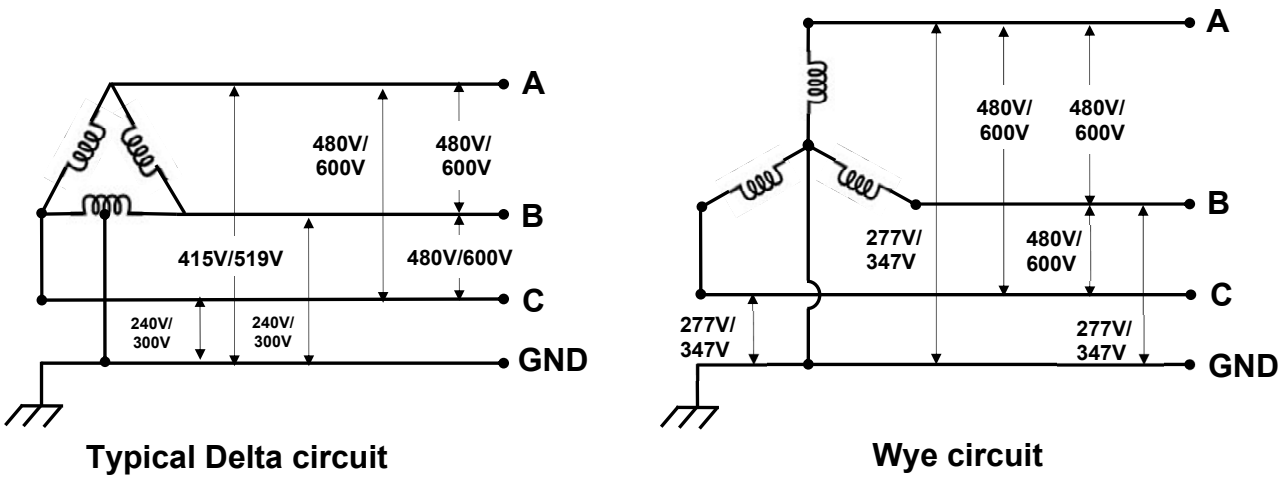


Figure 25: AC input wiring diagrams

2. Verify that the source circuit is locked and tagged out before connecting power to the charger.

Electrical Instructions

3. Determine whether the ½” or ¾” conduit hole will be utilized (3/4” or 1” on RVX12/RVH12), if the larger KO is desired, punch out the outer ring from the knockout (KO) provided (Figures 26, 27):

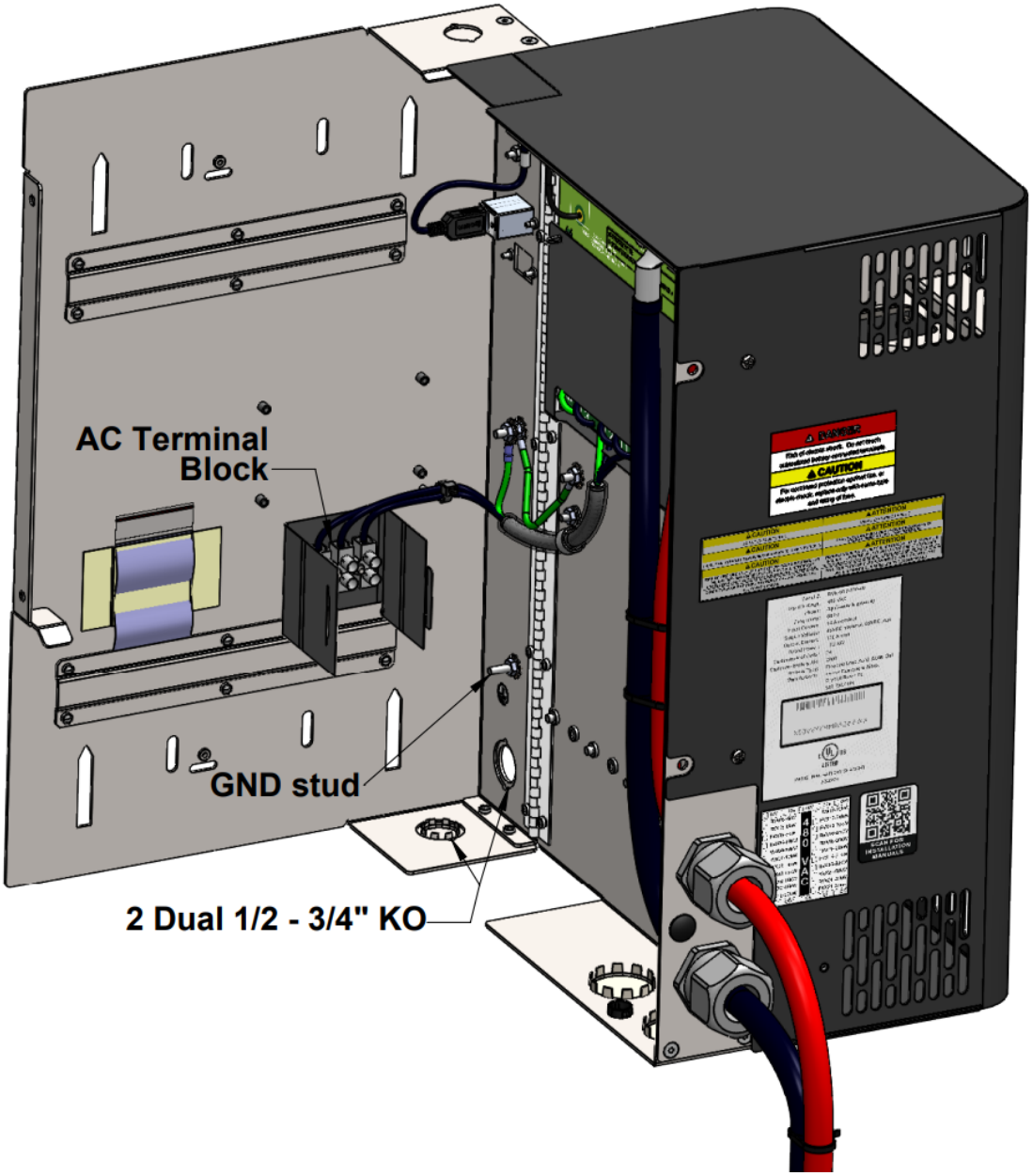


Figure 26: RVX05/RVH05 KO locations

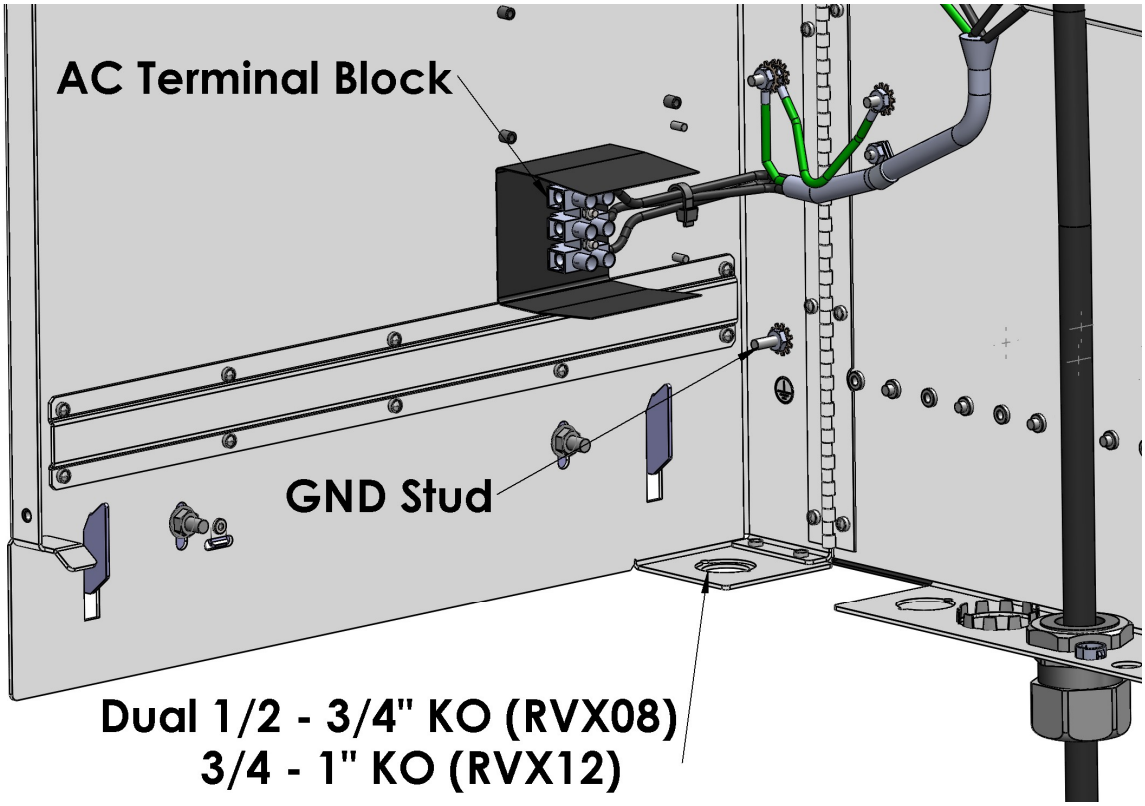


Figure 27: RVX08/RVH08, RVX12/RVH12 KO location

4. Pass the 480VAC/600VAC input power wires through, using the appropriate conduit or strain relief fittings per local and national codes.
5. Crimp a #10 ring tongue terminal to the ground (**GND**) wire and connect it to the GND stud (Figure 27). **Tighten the nut to 15 in-lb +/- 2 in-lb.**
6. Strip the conductors back 0.5 inch (12 mm) and connect them to the AC Terminal Block. **Tighten the terminal screws to 12 in-lb +/- 2 in-lb. NOTE:** The charger is not phase-rotation sensitive. Be sure any excess wire does not get pinched when the Charger door is closed.
7. Once the electrical connections have been made, the Charger door should be closed, and secured with the 10-32 screws previously removed. **Tighten the 10-32 screws to 12 in-lb +/- 2 in-lb.**
8. Verify the line and ground connections of the outlet or junction box/disconnect.
9. Energize the source circuit and verify proper AC voltage to the Charger. All line-to-line voltages should be 480 VAC ± 10% or 600 VAC ± 10% and matched within 10 VAC.

THE CHARGER IS NOW READY FOR OPERATION

OPERATION PROCEDURE

Charger Controls and User Interface

Users operate the **REVOLUTION** series of chargers through each charger's front panel LCD/keypad (Figure 28).

This is the main user interface for viewing operation and fault messages. It also allows limited charger programming options. (For programming information, see **Charger Main Menu**, page 46 of this manual.)

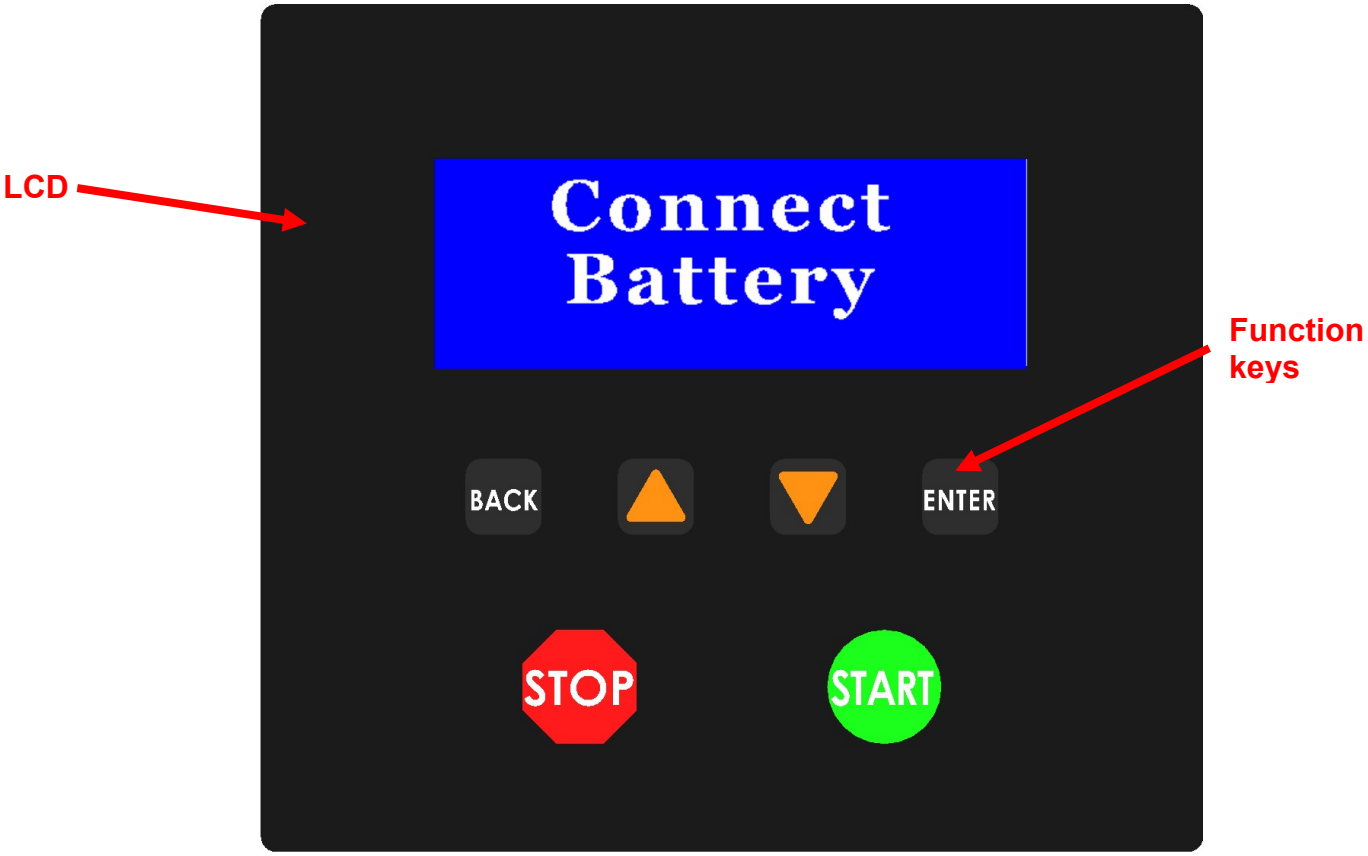


Figure 28: User interface LCD/keypad

Basic Charge Cycle Operation

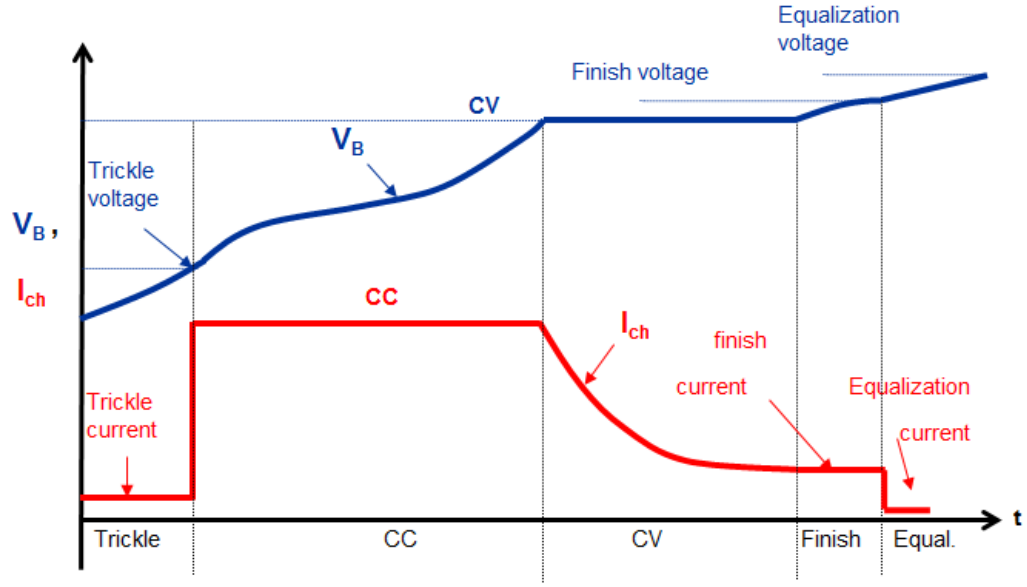


Figure 29: Typical charge cycle – charge modes

The typical charge cycle for conventional and opportunity chargers consists of the first four modes (TR, CC, CV, FI) on a daily basis, with all five modes (TR, CC, CV, FI, EQ) occurring on a weekly basis. The typical charge cycle for fast chargers consists of the first three modes (TR, CC, CV)on a daily basis, with all five modes (TR, CC, CV, FI, EQ) occurring on a weekly basis. A brief description of the various modes is listed below and all modes are shown above in Figure 29.

Trickle: Trickle mode is rarely used, as it is typically only encountered when a battery is extremely discharged (average cell voltage of <1.85 volts). This mode charges the battery at a very low current (typically ~3% of Ahr capacity) until the battery voltage rises above the trickle voltage setting.

CC: CC mode is where the bulk of the battery charging occurs. This mode is the Constant Current mode where the current is held steady at ~15%-50% of the battery capacity. This mode continues until the battery voltage rises to an average cell voltage of ~2.4 volts (CV voltage), and the charge cycle then transitions into the CV mode. This voltage is partially inflated above the true battery voltage due to the fact that current is being pushed into the battery and the internal battery resistance causes the battery voltage to artificially rise above the resting battery voltage.

CV: CV mode ensures the battery rises to ~95% charged. This mode holds the voltage of the charge steady at approximately 2.4 volts per cell and allows the current into the battery to taper off as the battery voltage gets closer to holding itself at the set voltage. The current will continue to taper off until it reaches the CV Finish Current, at which time the charge cycle will terminate, unless finish is enabled. If Finish is enabled, the current will continue to decrease until it reaches the Finish Current, at which time the charger will transition into Finish mode.

Finish: Finish mode will hold the current into the battery constant, and the battery voltage will slowly rise. The charge cycle will terminate when one of three conditions exists: The charger has been in the finish mode for the full duration of the finish timer, the Finish dv/dt is reached, or the Finish Voltage is achieved. The Finish dv/dt is reached when the battery voltage rises less than the Finish dv (typically ~5mv/cell) over the length of time defined by the Finish dt (typically ~20 minutes). (Figure 30)

Equalize: The equalize mode ensures that all cells of the battery are equally charged. During charge/discharge, the inner and outer cells of the battery will tend to be at slightly different voltage. The equalize mode charges at a low fixed current (~3% of Ahr capacity) for a fixed amount of time (Typically ~3-6 hr), and ensures that all cells are fully and equally charged.

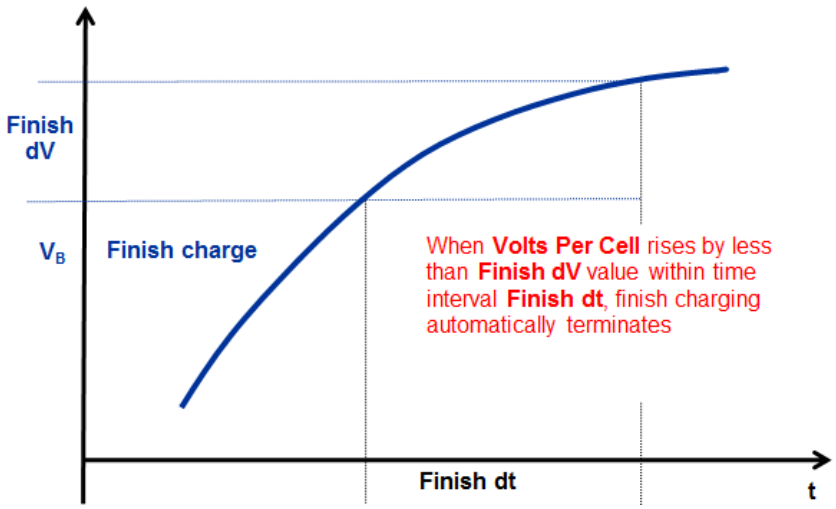


Figure 30: Finish charge termination criteria

Opportunity and Fast Charging: Opportunity and fast charging typically utilize a temperature sensor (thermistor) on the battery to allow more rapid recharge of the battery, without the risk of damage to the battery. The thermistor may be mounted to an intercell strap or post (external type), or mounted through the cover of the cell to monitor the electrolyte temperature directly (internal type). The thermistor is connected to the charger through the auxiliary contacts of the battery connector. The charger uses the temperature that is calculated from the thermistor to adjust the voltages at which the charger transitions to the CV and Finish/Equalize modes of operation, and to limit the temperature rise of the battery to a safe level. See Appendix D for further details. Installation instructions for the thermistor can be obtained at http://powerdesignerssibex.com/.

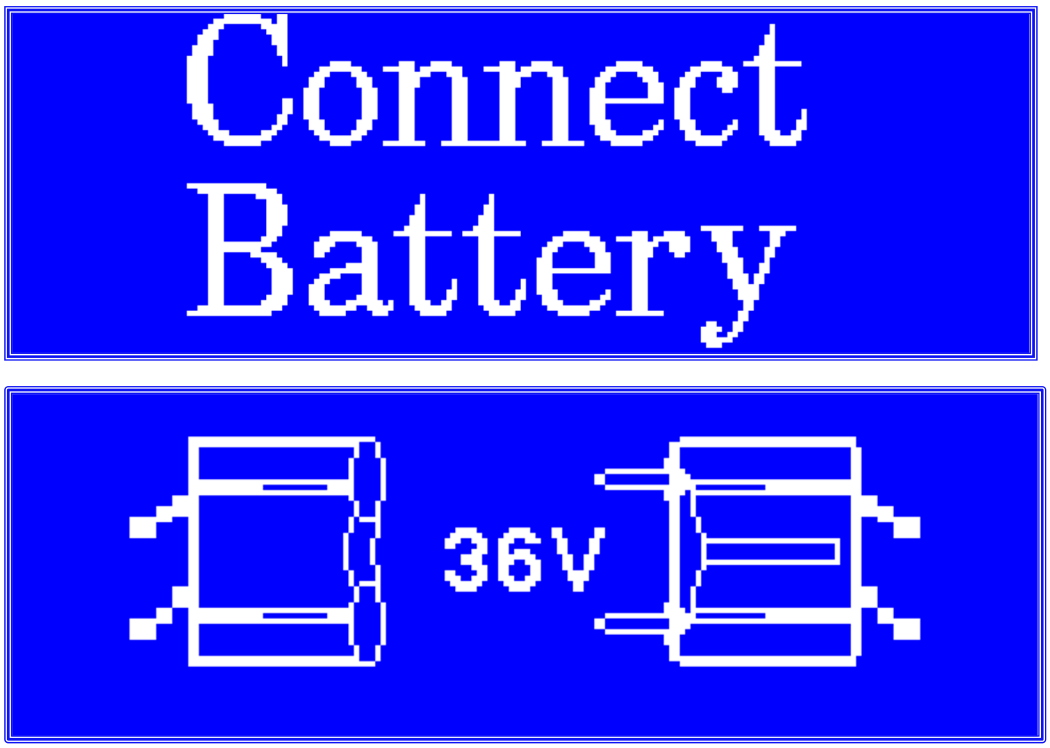
REVOLUTION X Chargers include the interface to communicate with the PowerTrac Battery monitoring devices. The PowerTrac, battery data logger option allows the charger to have multi-voltage (24/36/48)* capabilities, giving the charger the ability to automatically adapt to the battery voltage and Ahr capacity.

*48V chargers are capable of charging 24/36/48 batteries
36V chargers are capable of charging 24/36 batteries.

The LCD display on **REVOLUTION** series presents various screens and **SCREEN MESSAGES**.

1. Powering the Charger

- Energize the AC mains at the main panel (turn the local AC disconnect switch to the **ON** position, if one exists).
- Verify that the LCD display is lit and displays the **CONNECT BATTERY** screens, alternating between the animation and message as shown below.



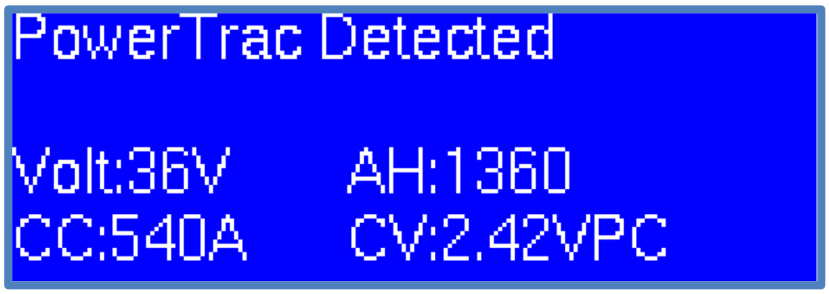
WARNING

DANGEROUS VOLTAGES AND CURRENTS ARE PRESENT IN THE AC MAINS WHEN ENERGIZED. ONLY TRAINED PERSONNEL SHOULD PERFORM THESE CHECKS, USING PROPER EQUIPMENT AND PROCEDURES.

- If the charger does not power up, carefully verify the source circuit and wiring to the charger and correct any problems. If appropriate, check that all fuses in the local disconnect switch box on the wall are intact, and for the supply voltage for all three phases (AC mains line-to-line) ± 10%, and matches to within 10 VAC or better between phases.
- Restart the charger; if the problem persists, contact the Dealer or Power Designers Sibex.

2. Starting a Charge Cycle

- Connect the battery to the charger. **REVOLUTION** Chargers can incorporate a detection circuit that distinguishes between a PowerTrac Battery Monitor and a thermistor. If a PowerTrac is detected when the battery is connected, the LCD will momentarily display a screen similar to this:



If the Charger has been set up to accept the PowerTrac battery charge parameters, charging of the battery will proceed using the displayed values. Following this display, one of two messages appears on the LCD:

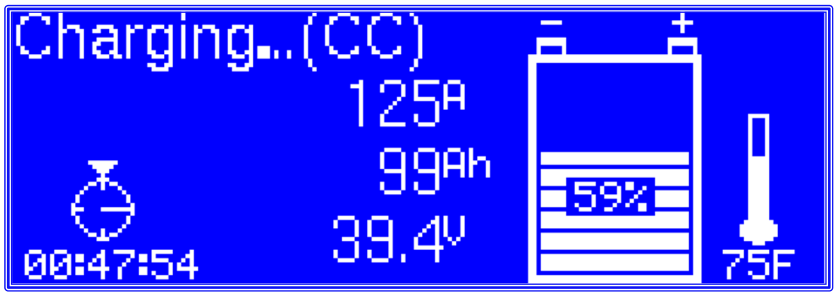
The LCD displays the **PUSH START** screen.

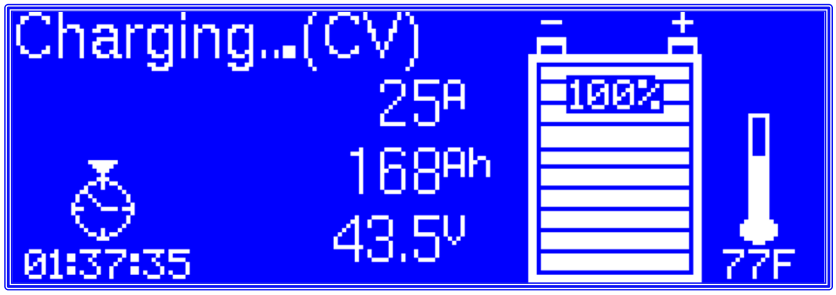
Or, if **Charge Autostart** is enabled, the charger automatically starts the charge cycle, and briefly displays an **AUTO START** with a timer count-down message as shown below. The timer will count down from 5 to 1 before the charge cycle starts.

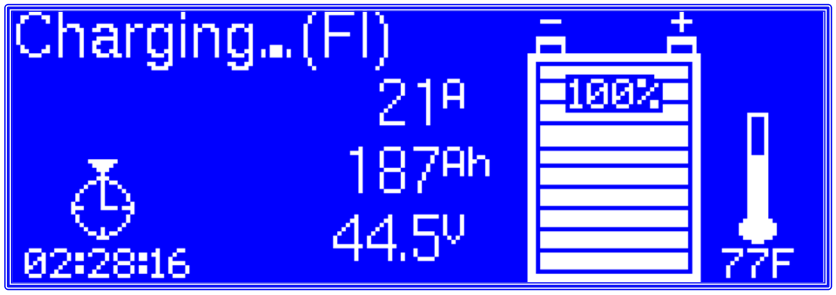
If either the “Start” or “Auto Start” screens are not displayed, the battery has not been detected. Make sure that the battery cables are connected properly.

- If the charger is not set to start automatically, start the charge cycle by pushing the green **START** button on the keypad.

- The charge cycle begins and a screen similar to one of the following, showing the charging operation, appears:

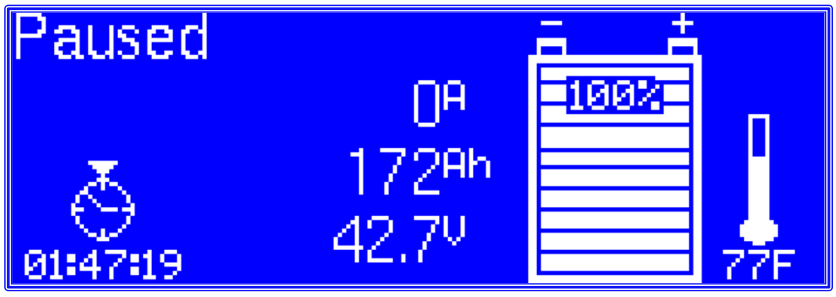






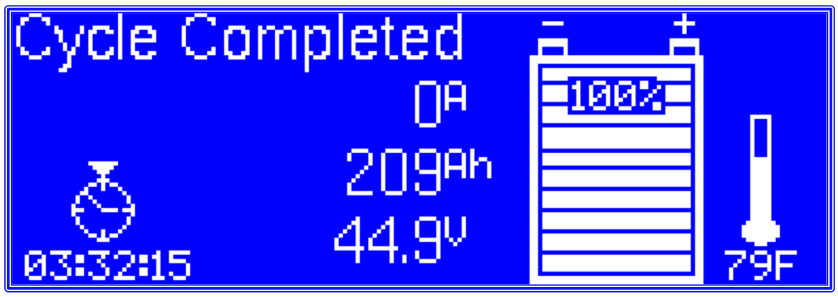
The **Charging … (XX)** field in the upper left corner indicates the active charging mode, the **XX** will indicate **TR** for trickle, **CC** for constant current, **CV** for constant voltage, **FI** for finish, or **EQ** for equalize. The screen also displays a charge timer (lower left), a battery icon with % state of charge gauge along with actual readings of charging amps (**A**), returned amp hours (**Ah**), and battery voltage (**V**). The right side of the screen has a thermometer icon which gives the current battery temperature (°F or °C).

- To stop the charge cycle, select the **STOP** button. A **PAUSED** message appears.



Selecting **STOP** for the second time stops the charger completely and defaults to the **PUSH START** screen. Selecting **START** from the **CHARGING STOPPED** screen starts a new charge cycle and the screen will again display the charging operation display.

- Once the charge cycle has completed, the charger displays the **CYCLE COMPLETED** screen.



On this screen appears the total charging time and total returned amp hours along with the final state of charge of the battery.

Charger Main Menu

From the charger **MAIN MENU** screen, access is provided to the following list of screens:

- Manual Equalize
- Desulfation Cycle
- Charge History
- Lifetime Summary
- Model & SN
- Network Settings

These screens may only be accessed when the charger is in idle mode (i.e., when either the **CONNECT BATTERY** or the **PUSH START** screens are displayed).

Pushing the **ENTER** key selects the charger **MAIN MENU** screens.
The up/down arrow (**▲/▼)** keys scroll between the various screens.
The **BACK** button is used to return to the previous screen and/or back to the main menu.
Selecting the **ENTER** button within a main menu will select a setting, go to the next screen, or toggle between two screens.

1. Manual Equalize

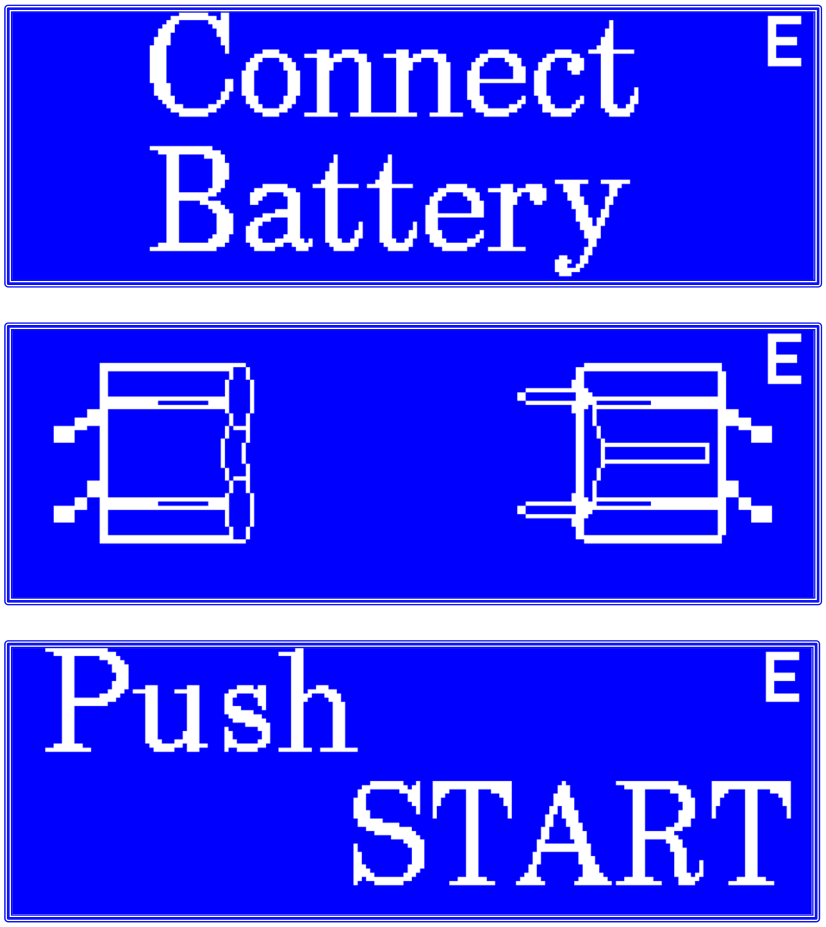
A. While in **MAIN MENU**, press **▲/▼** until the **MANUAL EQUALIZE** screen appears.

B. Press **ENTER** to access screen.

C. Press **▲/▼** to select **YES** or **NO**.

NOTE: Once an Equalization is activated, it remains active only for the next charge cycle.

D. Press **ENTER** key to save selection and return to the main menu. The LCD display now indicates the Equalization charge is activated with an “E” in the upper right corner of the display, and one of the following displays will be observed, depending on the setup of the Charger.



2. Desulfation Cycle

One of the unique features of this charger is the ability to run a safe, tailored recovery cycle for sulfated batteries. This can easily be done through the **DESULFATION CYCLE** screen.

The operator enters the battery nominal voltage, Ahr capacity, and the cycle duration. The charger will output a constant current of 5% of the Ahr capacity (.05*C) for the defined duration (in the time range of 6:00 hours to 18:00 hours). Any battery capacity above 1200 Ahr will have the desulfation current limited to 60A.

A. Connect the battery to be recovered. If the charger is set to auto-start the charge cycle, press the stop button until you are back on the “Push Start” screen.

NOTE: Do not attempt to recover a battery with a capacity of less than 250 amp hours.

B. While in **MAIN MENU**, press ▲/▼ until the **DESULFATION CYCLE** screen appears.

C. Press **ENTER** to access the recovery cycle set-up screens. The first screen selects the appropriate battery voltage.

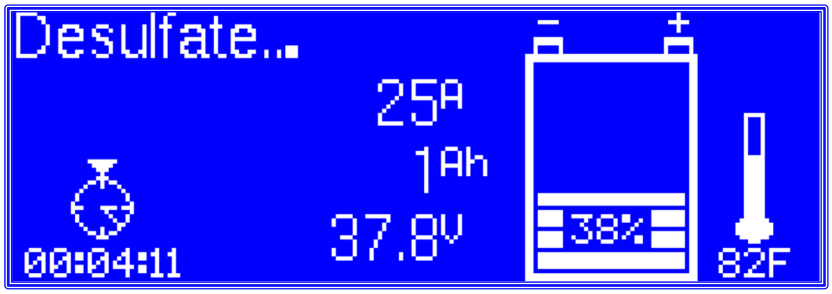
Pressing ▲/▼ toggles the battery voltage setting. Select the correct voltage and select **ENTER**. The **Battery Capacity** screen appears.

Pressing ▲/▼ allows the user to enter the correct battery amp hour capacity. The recovery charge current is fixed at 5A /100 Ahrs (5% of rated capacity).

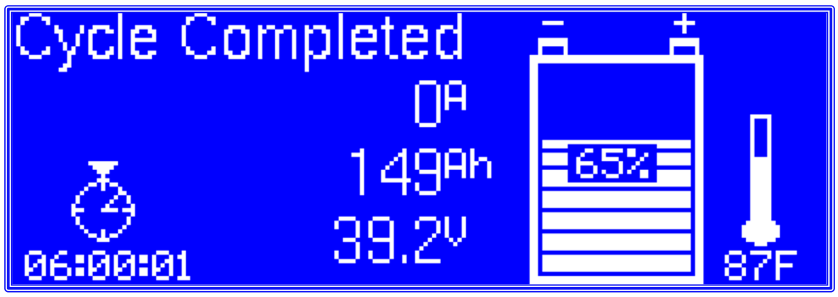
D. Press the **ENTER** key once the correct value is selected. The **Cycle Duration** timer screen appears.

Pressing ▲/▼ allows adjustment of the charge timer setting in 15-minute increments. The charge timer setting can be set up to 18 hours. Select the desired value, then select **ENTER**. Next, the **START DESULFATION CYCLE** screen appears.

E. Push **START** to initiate the desulfation cycle.



Once the cycle is complete, a **CYCLE COMPLETED** message appears.



NOTE: The desulfation cycle is a separate cycle; activating it does not affect other charger settings.

3. Charge Cycle History

a. While in **MAIN MENU**, press ▲/▼ until the **CHARGE HISTORY** screen appears.

Press **ENTER** to access the **Charge History** screens.

b. The first screen that appears is the Charge Cycle history screen as shown below. Users can access the charge history for up to 400 charge cycles, beginning with the most recent charge cycle. Pressing ▲/▼ allows scrolling through the saved charge cycles, from the most recent cycle to the earliest (Charge 0), in descending order.

The first screen of the charge history displays the charge number, the date and time when the charge was started, the charge duration, end battery voltage, the total amp hours returned to the battery, and the Charger status.

STATUS indicates whether the cycle was completed successfully (**COMPLETED**), interrupted by the user (**STOPPED**), interrupted due to a power outage or disconnection (**TURNED OFF**), or interrupted due to a fault (e.g., **OV FAULT** for an overvoltage fault)**.**

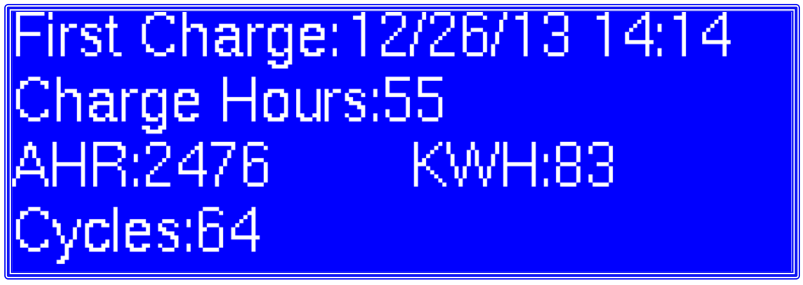
Press **ENTER** to access the second screen of the charge history which shows the profiles that were activated in the charge cycle, and any Charger faults. Pressing **ENTER** again will return to the first screen. Pressing the **BACK** key returns to the **CHARGE HISTORY** screen from the first screen only.

PROFILES lists the profiles activated during the charge cycle. Trickle charge appears as **TR**, constant current as **CC**, constant voltage as **CV**, finish as **FI**, and equalize as **EQ**.

4. Lifetime Summary

a. While in **MAIN MENU**, press ▲/▼ until the **LIFETIME SUMMARY** screen appears.

B. Pressing the **ENTER** key will display a screen summarizing charger lifetime summary stats since installation.



This screen allows verification of charger usage: First charge date and time, total charge hours, amp hours, and kw-hours, and the total number of cycles completed since installation. This information may be used to compare usage on different chargers.

5. Charger Model

A. While in **MAIN MENU**, press ▲/▼ until the **MODEL & SN** screen appears.

B. Pressing the **ENTER** key displays the charger model number, manufacturing ID, and firmware revision for reference.

6. **Network Settings (Ethernet Option Only)**

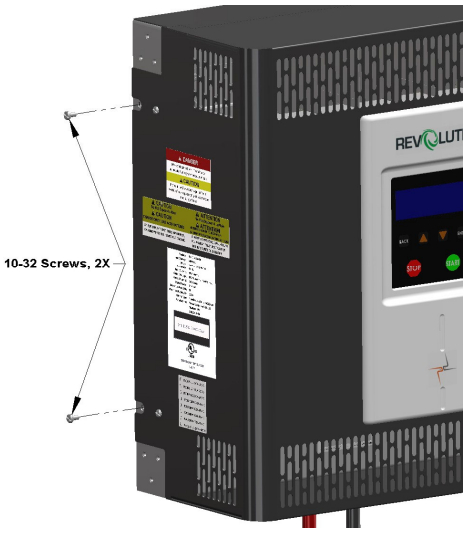
   A. While in **MAIN MENU**, press ▲/▼ until the **Network Settings** screen appears.

   B. Pressing the **ENTER** key displays the IP Configuration Screen:

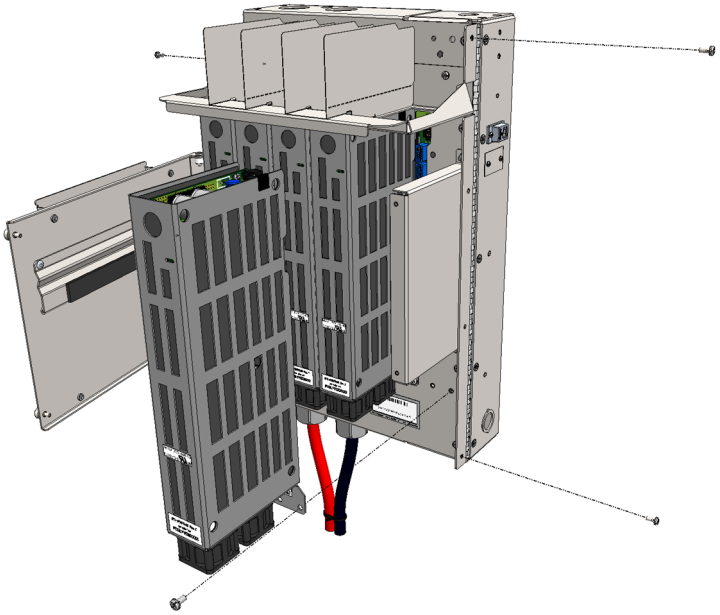
   For further information on network setup, see the PowerCharge datalink User Software, P/N 014-000324-00. (Downloadable from www.powerdesignerssibex.com)

MODULE REPLACEMENT

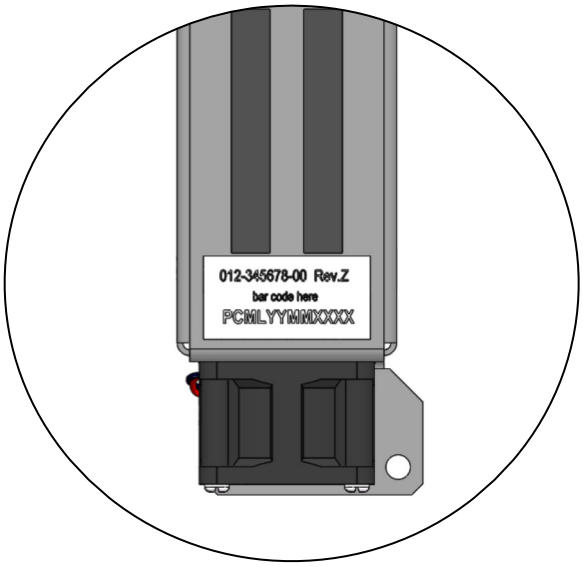
In the event a module needs to be replaced follow the instructions below.



1. Note the serial number of the module that needs to be replaced from the Main Screen under the Charge History.
2. De-energize and lock out the incoming AC line from the charger. Follow all local safety procedures and PPE guidelines.
3. Remove the cover of the charger
    a. RVX05/RVH05, RVX08/RVH08 and RVX12/RVH12
        i. Remove the (4) 8-32 screws (2 on each side) securing the cover on the sides of the charger. Do not remove the (2) 10-32 screws on the left side of the charger.
        ii. Pull the cover out and away from the charger.
        iii. Loosen the (2) captive screws securing the door closed and swing open the door.



4. Locate the module being removed by the serial number label on the lower front of the module.
5. Remove the (1) 10-32 screw from the bottom tab of the module.
6. Carefully pull the module straight out of the socket. Use your thumb or forefinger to grab the round hole at the top of the module. Grab the fan at the bottom of the module with your other hand.
7. Re-assemble the charger in reverse order. Slide the module in the slot and install the (1) 10-32 screw in the bottom tab of the new module.
   Note: Tighten the captive screws to 10 in-lbs., the (1) 10-32 module screw and (2) 8-32 cover screws to 12 in-lbs.
8. Enumerate the modules to allow the charger to recognize the new module.



ENUMERATING INSTALLED MODULES

After a new module is installed into the charger, the charger must be programmed (enumerated) to communicate properly.

1. From the Idle screen, press the Enter key to enter the menu.
2. While in **Main Menu**, press ▲/▼ until the **Model & SN** screen appears.

3. Pressing the **ENTER** key displays the charger model number, manufacturing ID, and firmware revision.

4. Press the **ENTER** key again. The serial numbers of the installed modules will be displayed. There will be an "!" next to the module(s) that is not enumerated.

5. Press the green **START** button on the keypad. The display will show "Save Installed Modules?" with "NO" as the default selection.

6. Press the Up Arrow to select “Yes”

7. Press the **ENTER** key to enumerate the modules. The serial numbers of the modules will be displayed; verify the correct number of serial numbers are listed per installed modules.

8. Press the **STOP** key to exit the menu.

TROUBLESHOOTING

Occasional faults may occur in certain conditions. Please follow the suggested steps.

A. Charger Does Not Power Up

When the charger is first turned on, the LCD should illuminate and display one of the idle mode messages, typically the **CONNECT BATTERY** screen.

If the LCD is not illuminated after power is applied, perform the following checks:

a. Verify that the service disconnect switch (if provided) and the main panel breaker is in the **ON** position.

b. Cycle the switch to the **OFF** position, wait 30 seconds, and then return it to the **ON** position.

c. If the charger display still does not illuminate, carefully verify the source circuit and wiring to the charger and correct any problems. If appropriate, check that all fuses in the service disconnect switch box on the wall are intact, and also that the supply voltage for all three phases (AC mains line-to-line) is 480 V ± 10% or 600 V ± 10% and matches to 10 VAC or better.

d. If the fault persists, contact the Dealer or Power Designers Sibex.

WARNING

DANGEROUS VOLTAGES AND CURRENTS ARE PRESENT IN THE AC MAINS WHEN ENERGIZED. ONLY TRAINED PERSONNEL SHOULD PERFORM THESE CHECKS, USING PROPER EQUIPMENT AND PROCEDURES.

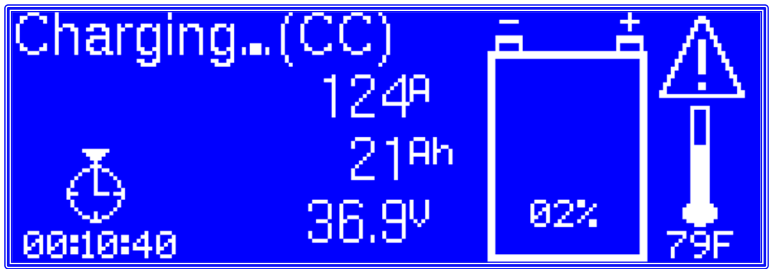
CAUTION

DO NOT ATTEMPT TO SERVICE THE CHARGER!

B. Charger Fault During Operation

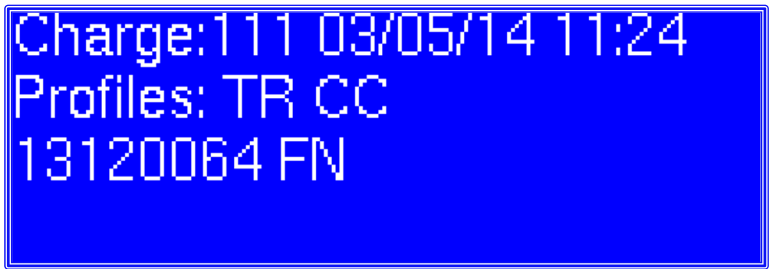
The **REVOLUTION** Series features a modular and fault-tolerant design that allows the Charger to continue operation despite the loss of a portion of the modules through temporary or permanent fault conditions. If a module faults during the charging cycle, the fault is recorded, and the charge cycle continues. The Charger will continue to operate, so long as 60% of the installed modules are operational.

If the Serial Numbers of the operating modules do not match the expected numbers, either because they are missing (faulted), or a module has been replaced or added improperly, a Warning Symbol will be displayed on the upper right of the display while the charge cycle is under way.



The Warning Symbol is not displayed once the charge cycle is complete.

The appearance of the Charge History screen under these circumstances may be similar to:



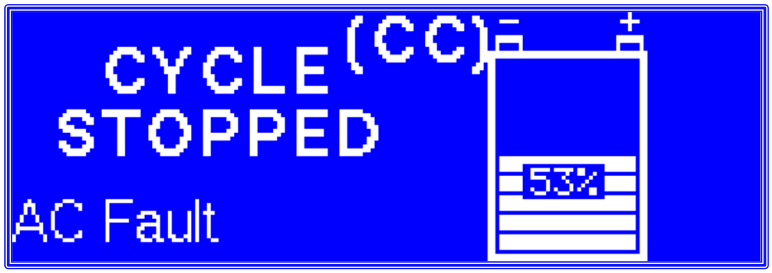
The Serial Number of the faulted module is displayed, along with a fault code.

When contacting your dealer or Power Designers Sibex, make sure to note the specific fault message that is displayed. This will aid in quick identification of the cause and the appropriate fix for the fault.

If the Warning Symbol is displayed while charging, but no faulted modules are listed in the Charge History screen, the problem is that the Serial Numbers of the modules that are found to be available do not match the stored list of "Installed Modules". This may have occurred either through complete loss of power to a module, or by the improper addition of spare or replacement modules. Please contact your dealer or Power Designers Sibex to arrange repair.

If the number of faulted modules results in the Charger having less than 60% of the "Installed Modules" operational, the charge cycle will be interrupted, and a fault message is displayed. Examples of possible faults follow:

1. **AC Fault**



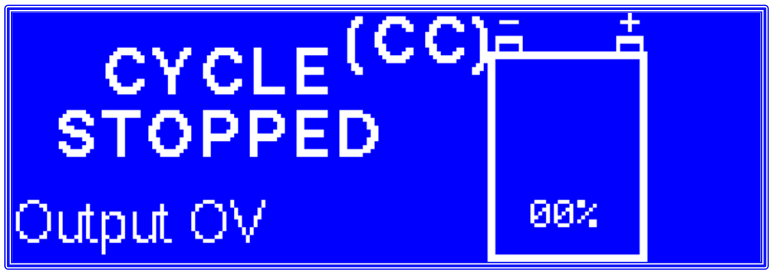
Possible Causes

- AC line voltage outside of allowable limits. (432 VAC-528 VAC or 540 VAC-660 VAC, phases matched within 10V)
- Fuse blown in AC service.

Troubleshooting

a. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.
b. Remove power, disconnect the battery, and verify the AC supply and connections to the charger.
c. Restart the charge cycle by connecting the battery and selecting **START**.
d. If the fault persists, contact your dealer or Power Designers Sibex.

2. **Output Over-Voltage Fault**



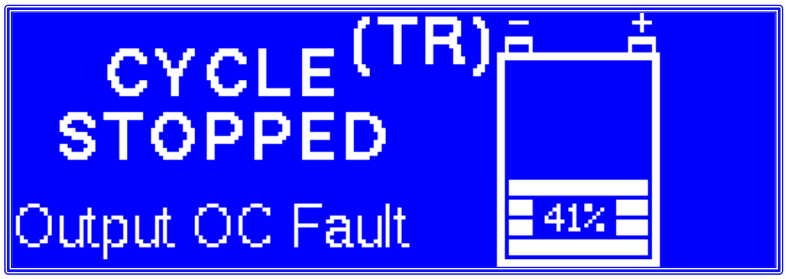
Possible Causes

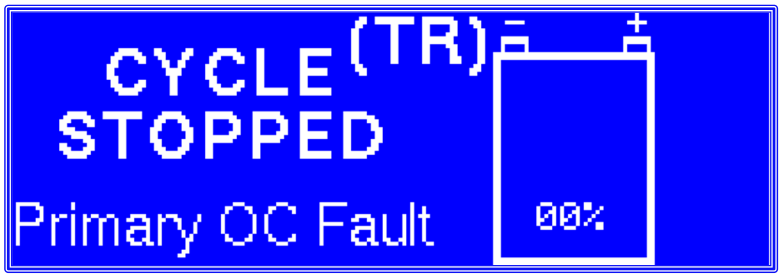
- Battery disconnected while charging.

Troubleshooting

a. The **CYCLE STOPPED** screen automatically reverts to the **Connect Battery** or **Push START** screens in 30 seconds.
b. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.
c. Restart the charge cycle by selecting **START**.
d. If the fault persists, contact the Dealer or Power Designers Sibex.

3. **Over-Current / Primary Over-Current Fault**





Possible Causes

- Damaged DC (output) cables. (short)

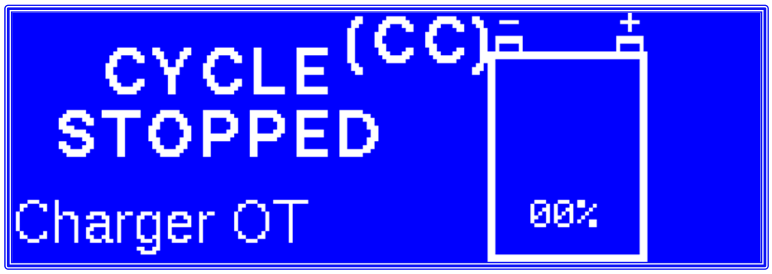
Troubleshooting

a. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.
b. Verify that the output cables are in good working condition and are properly connected to the battery.

c. Restart the charge cycle by selecting **START**.

d. If the fault persists, contact your dealer or Power Designers Sibex.

4. Charger Over-Temperature



Possible Causes

- Blocked air flow to the charger.
- Failed cooling fan.
- Room temperature above 104˚F.

Troubleshooting

a. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.

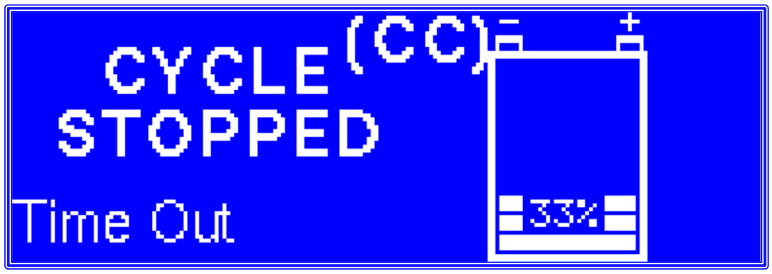
b. Allow the charger to cool down.

c. Make sure there are no airflow restrictions to the intake or exhaust of the charger.

d. Restart the charge cycle by selecting **START**.

e. If the fault persists, contact the Dealer or Power Designers Sibex.

5. Charger Timeout Faults



The screen indicates which timer has caused the problem: **TRICKLE CHARGE**, **CC CHARGE**, or **CV CHARGE**.

Possible Causes

- Programmed charge timers are set incorrectly.
- Programmed charge parameters are set incorrectly.
- Battery has shorted cell(s).

Troubleshooting

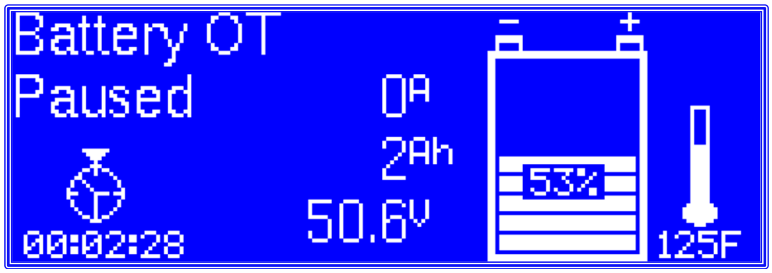
a. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.

b. Verify that the battery is in good working condition (i.e., no shorted cells).

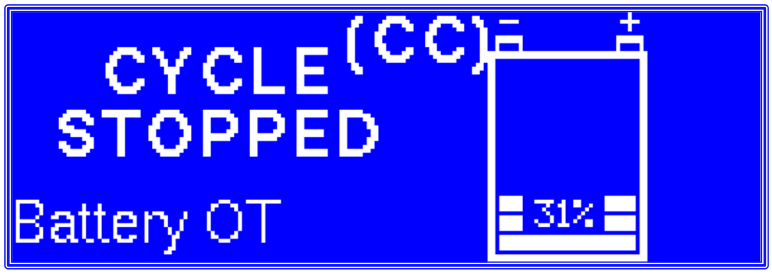
c. If the fault persists, contact the Dealer or Power Designers Sibex.

6. Battery Over-Temperature

The following screen will appear the first 5 times the battery over-temperature limit is exceeded during any charge cycle. On the first instance of detecting a battery over-temperature, the Charger will wait until the battery temperature drops approximately 7°C (13°F) and then re-start the charge cycle automatically. If another over-temperature fault is the encountered, the charger waits for an 8°C (14°F) drop before re-starting the charge cycle. The Charger increments the delay until an 11°C (20°F) drop is required before restart.



If the battery temperature limit is exceeded once again, the Charger will stop the charge cycle and display the following screen:



Possible Causes

- Charge and/ or discharge rates too high.
- CV and Finish modes running too often.
- Room temperature excessive.

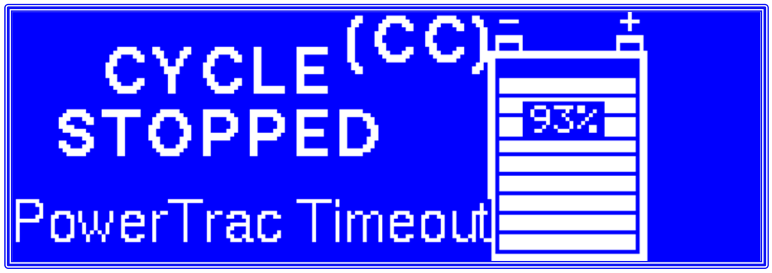
Troubleshooting

a. Select **STOP** to revert to the **Connect Battery** or **Push START** screens.
b. Allow the battery to cool down.
c. Restart the charge cycle by selecting **START**.
d. If the fault persists, contact the Dealer or Power Designers Sibex.

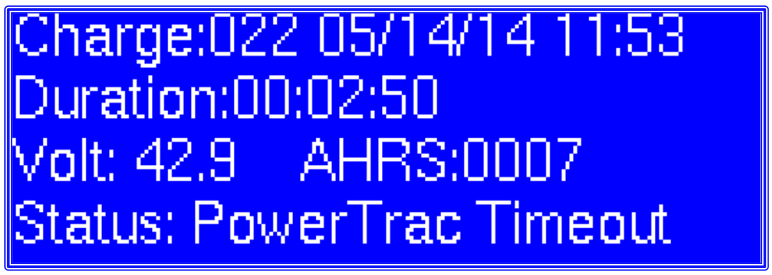
7. PowerTrac Communication Faults

The following screen will appear when the battery is connected and the charger detects the presence of a PowerTrac, but is unable to establish a link. This may be due to a poor or reversed connection of the auxiliary wires.

If the connection to the PowerTrac is lost while a charge cycle is underway, a screen similar to the following will be displayed:



Examining the Charge History will reveal a screen similar to this:



Possible Causes

- Worn or broken auxiliary wires or auxiliary contacts
- Failure of the PowerTrac

Troubleshooting

a. Inspect connections on both charger and battery sides of the battery connector. Verify auxiliary Wire #1 is connected on the positive (red) side of the battery connector.

b. If the fault persists, contact the Dealer or Power Designers Sibex.

RETURN MATERIAL PROCESS

In the event that the troubleshooting steps included in this manual do not resolve the problem,

a. Record the charger serial number;

B. Call or Email Power Designers Sibex with a description of the problem.

Power Designers Sibex will attempt to resolve the problem over the phone. If the issue cannot be resolved in this manner, a Return Material Authorization (RMA) form must be completed and submitted to Power Designers Sibex.

Upon receipt of the completed RMA form, Power Designers Sibex will issue an RMA number for the return. Based on the serial number of the specific charger(s) and the particular problem encountered, Power Designers Sibex will either repair or replace the defective components under warranty.

For chargers out of warranty, Power Designers Sibex, upon receipt of the charger and in consideration of a diagnostic fee, will provide a repair estimate.

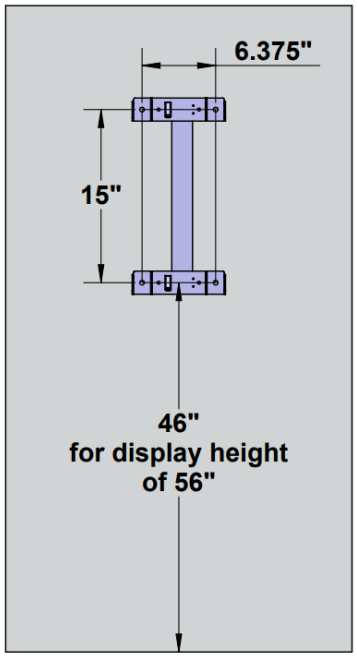
Power Designers Sibex
RMA Return #
430 N. Suncoast Blvd
Crystal River, FL 34429

Phone: 352.795.0101
Fax: 352.564.0772
Email: service@powerdesigners.com

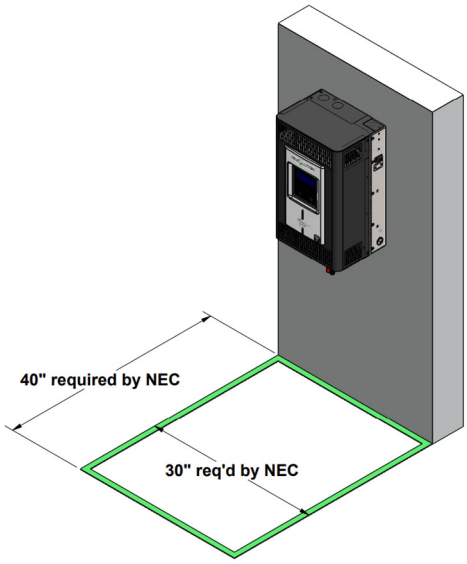
www.powerdesigners.com

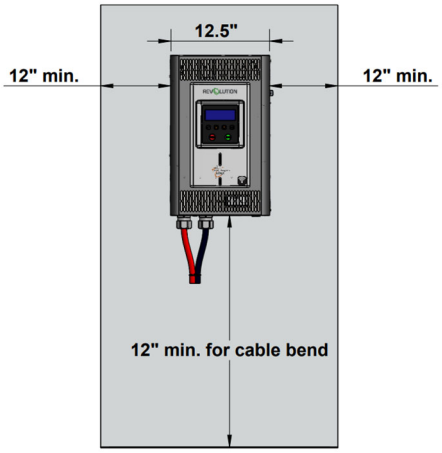
Appendix A – Wall Mount Dimensions and Clearances

RVX05/RVH05 Models

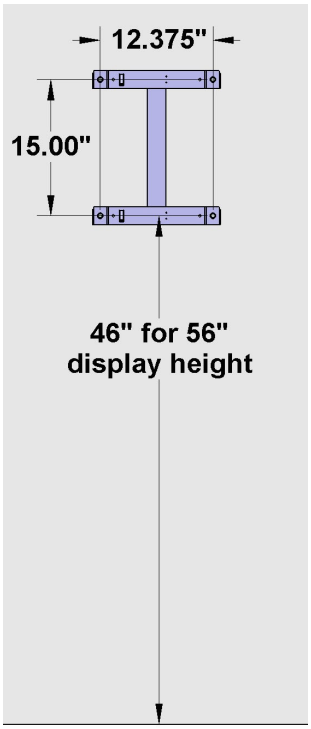


Recommended mounting hardware: ¼” or 5/16”.

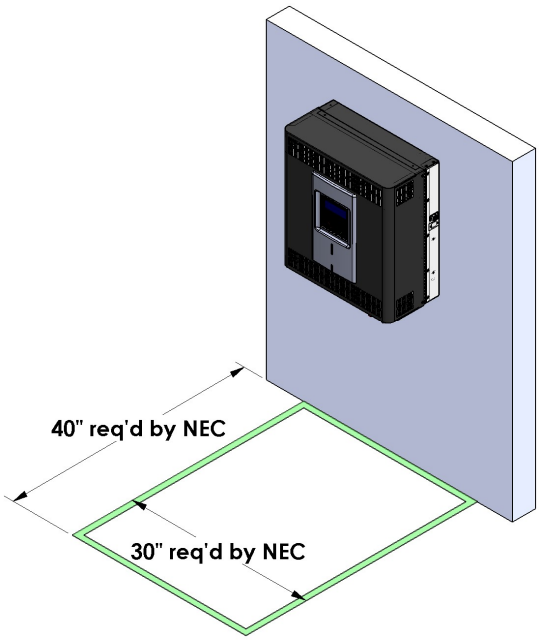


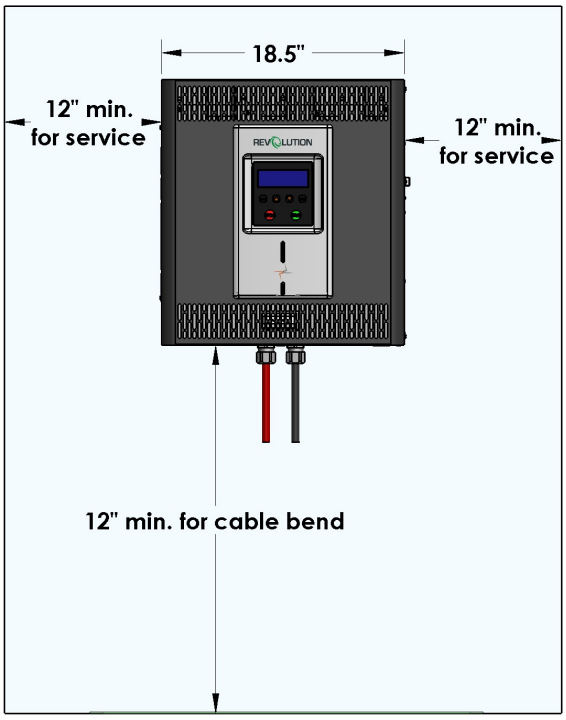


RVX08/RVH08 Models

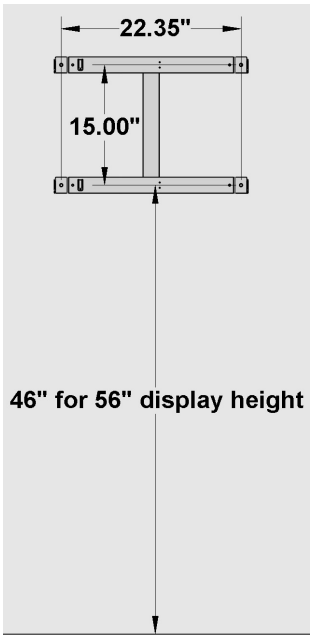


Recommended mounting hardware: 5/16”.

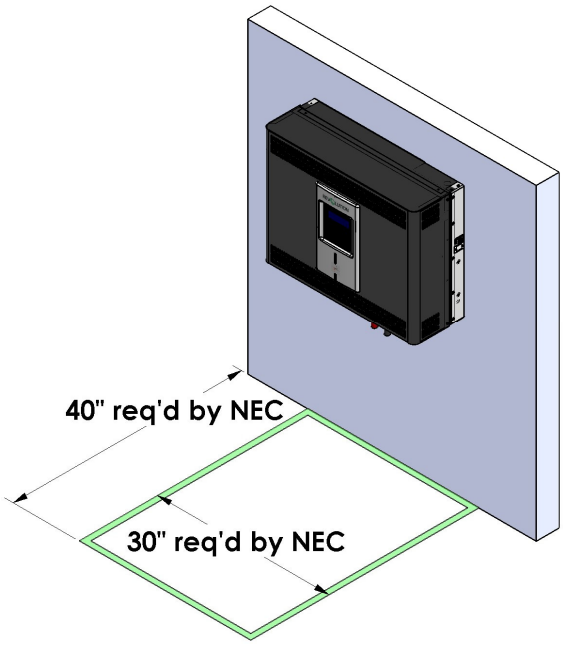


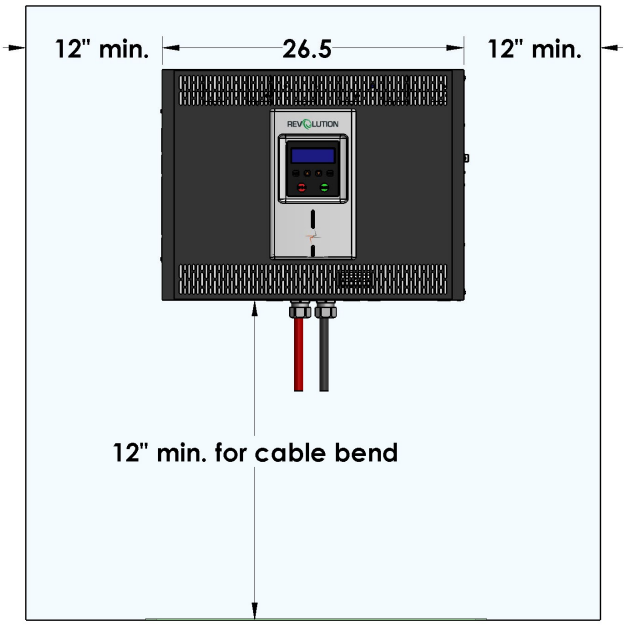


RVX12/RVH12 Models



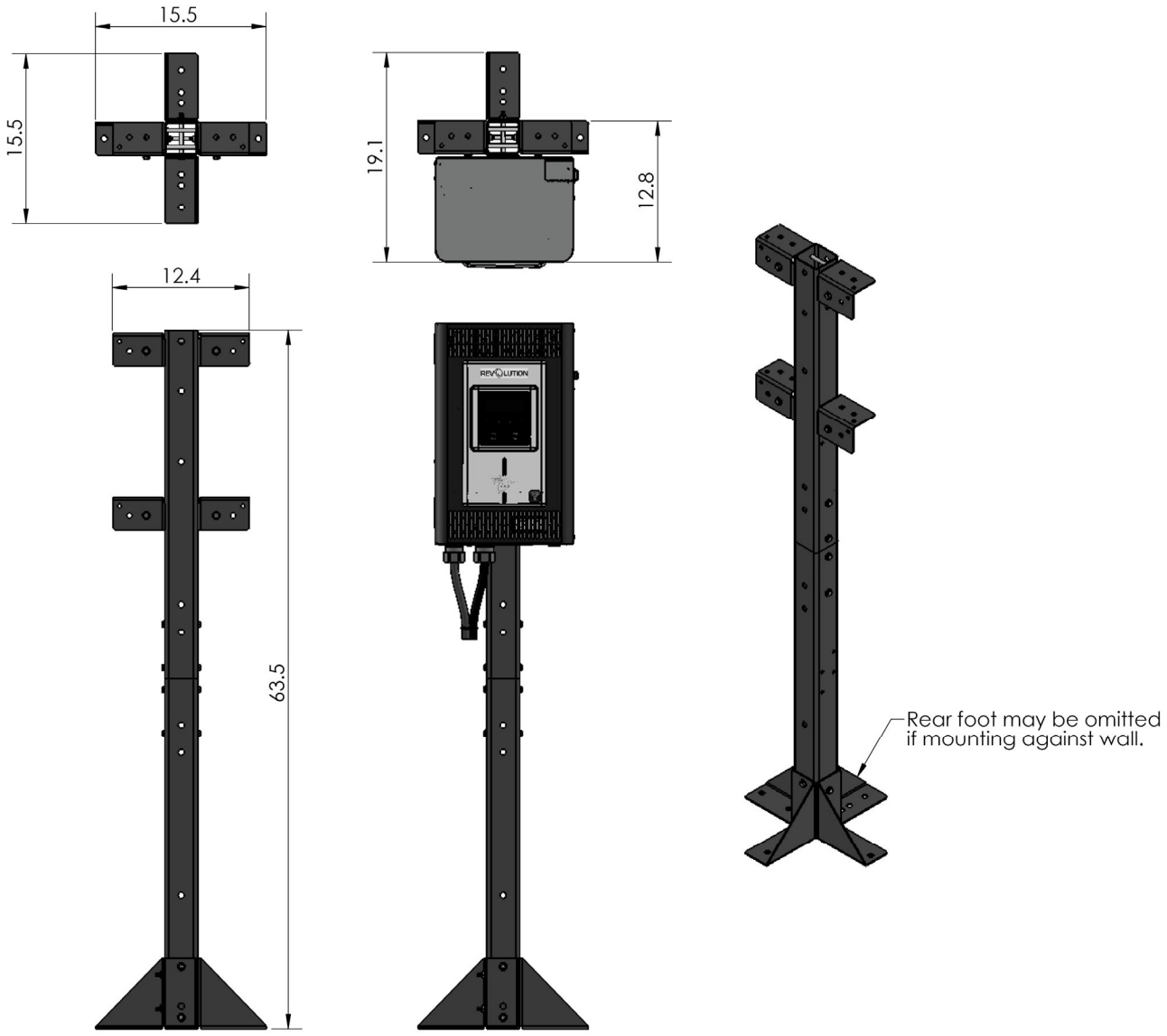
Recommended mounting hardware: 5/16”.



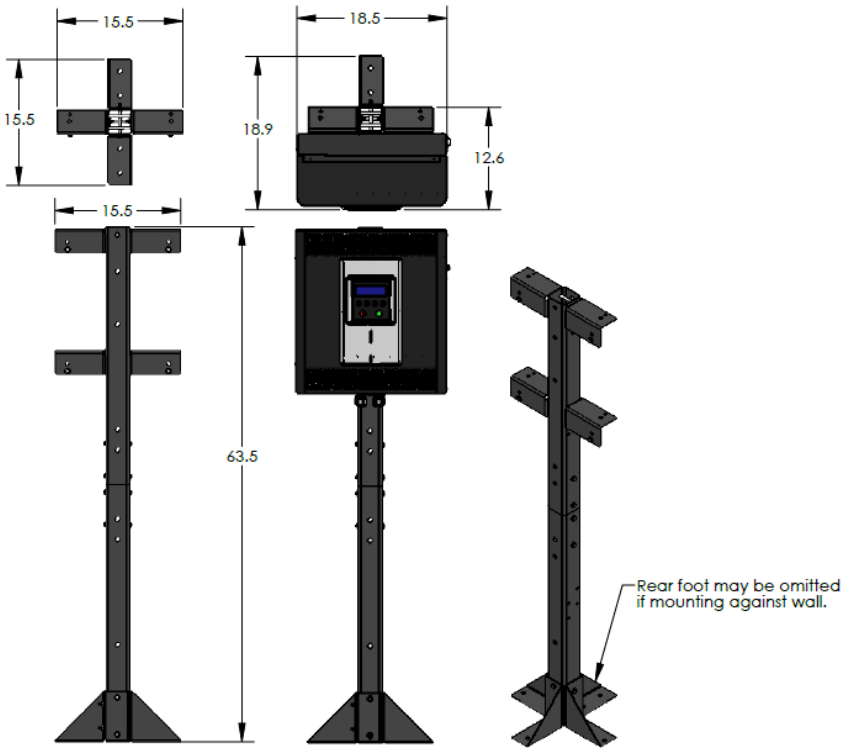


Appendix B – Post Stand Dimensions and Assembly instructions

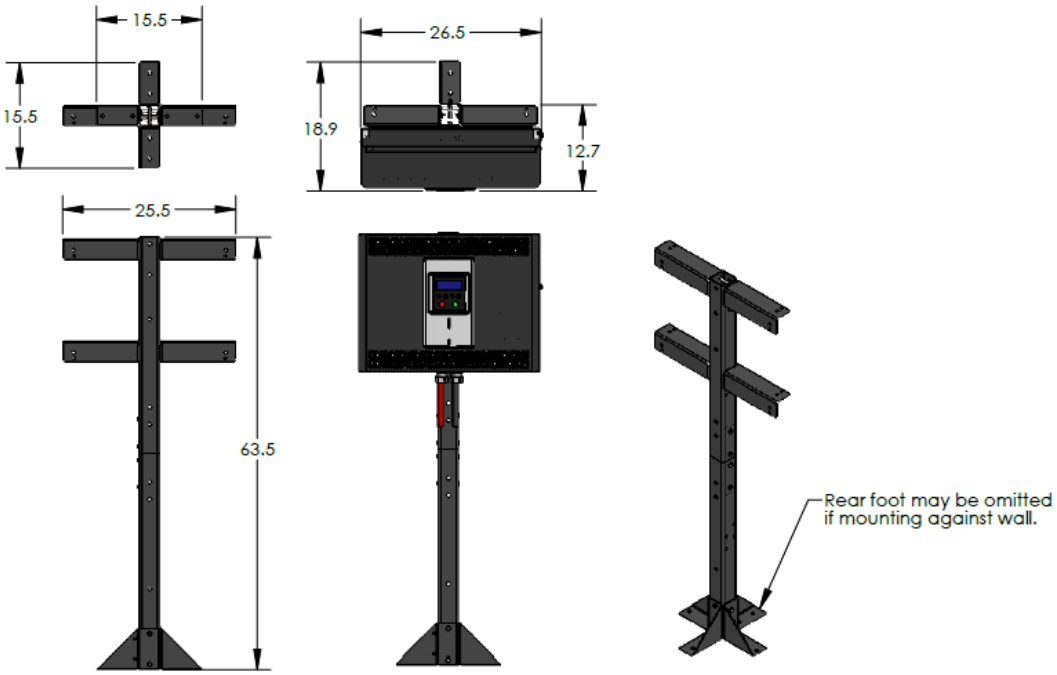
RVX05/RVH05 Models



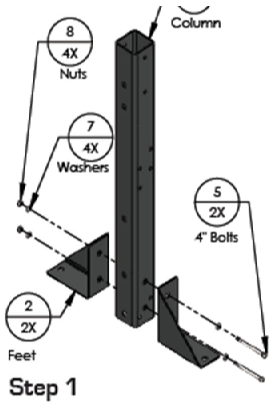
RVX08/RVH08 Models



RVX12/RVH12 Models

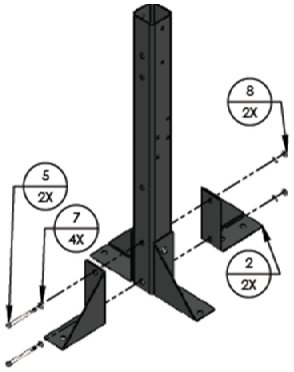


Floor Stand Assembly Instructions



Step 1

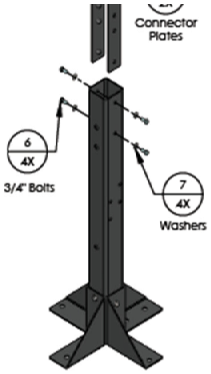
Assemble left and right feet to column as shown.
Note orientation of holes on column.
Hand tighten only.



Step 2

Assemble front and back feet to column as shown.
Hand tighten only.

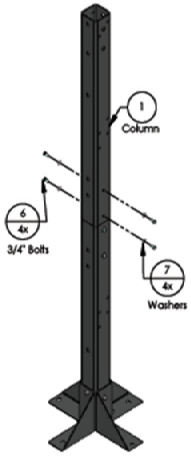
Once this step is complete, it is recommended that the stand be placed in the intended mounting location and anchored to the floor. The column should be adjusted to vertical prior to tightening the fasteners to 10 ft-lbs.



Step 3

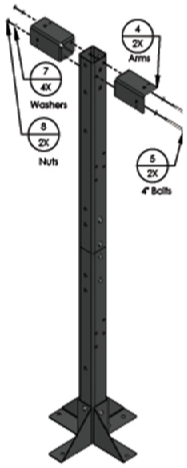
Assemble connector plates to lower column as shown.
Hand tighten only.

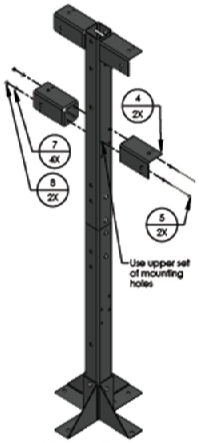
Item #	Description	Qty
1	Column	2
2	Foot	4
3	Connector Plate	2
4	Arm	4
5	Hex Cap Screw 5/16" - 18, 4"	8
6	Hex Cap Screw 5/16" - 18, 3/4"	12
7	Washer, 5/16"	32
8	Nut 5/16 - 18	12



Step 4

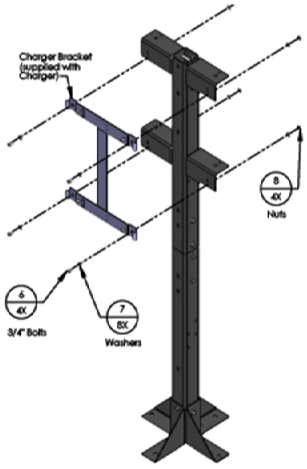
Assemble connector plates to lower column. Hand tighten only.
Verify upper column is vertical and flush with lower column.
Tighten all fasteners to 10 ft-lbs.





Step 5 **Step 6**

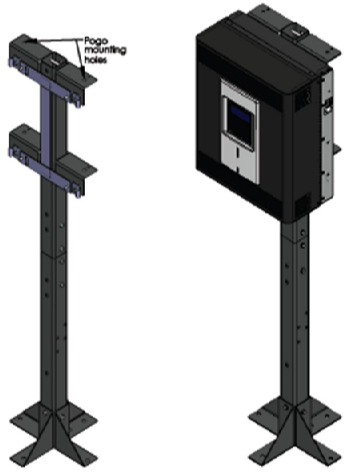
Assemble arms to upper column as shown.
Tighten all fasteners to 10 ft-lbs.



Step 7

Assemble Fasteners to mount charger bracket as shown.
Tighten all fasteners to 10 ft-lbs.

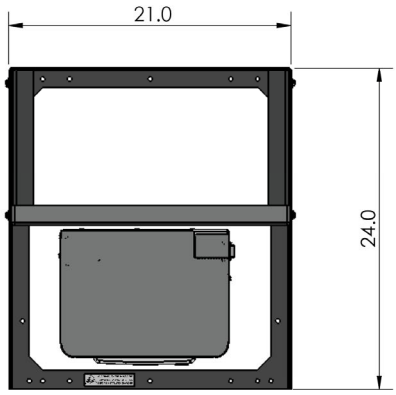
DO NOT MOUNT THE CHARGER UNLESS THE FEET HAVE BEEN PROPERLY ANCHORED.

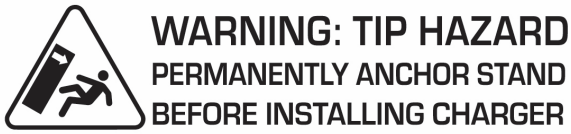


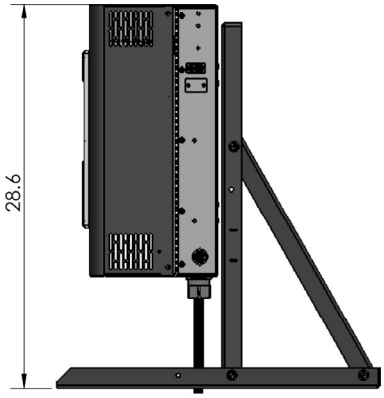
Step 8

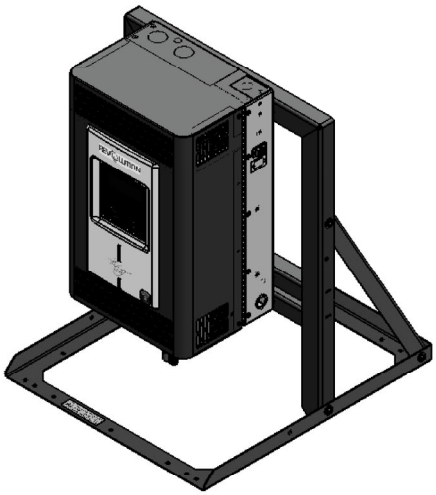
Mount charger to charger brackets.
Follow charger mounting installation found in charger manual (page 12).

RVX05/RVH05 Models

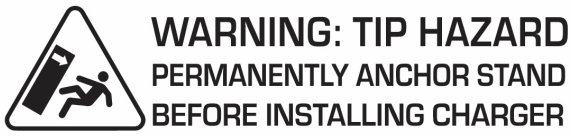


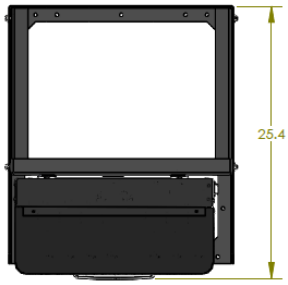


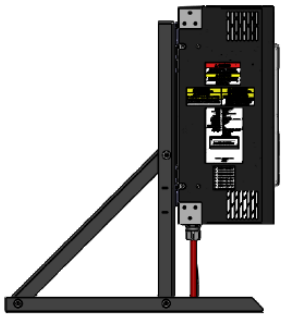


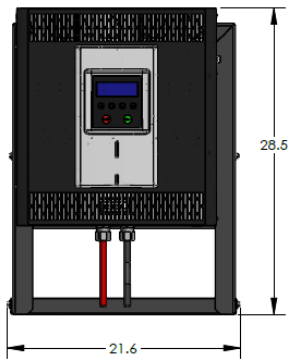


RVX08/RVH08 Models









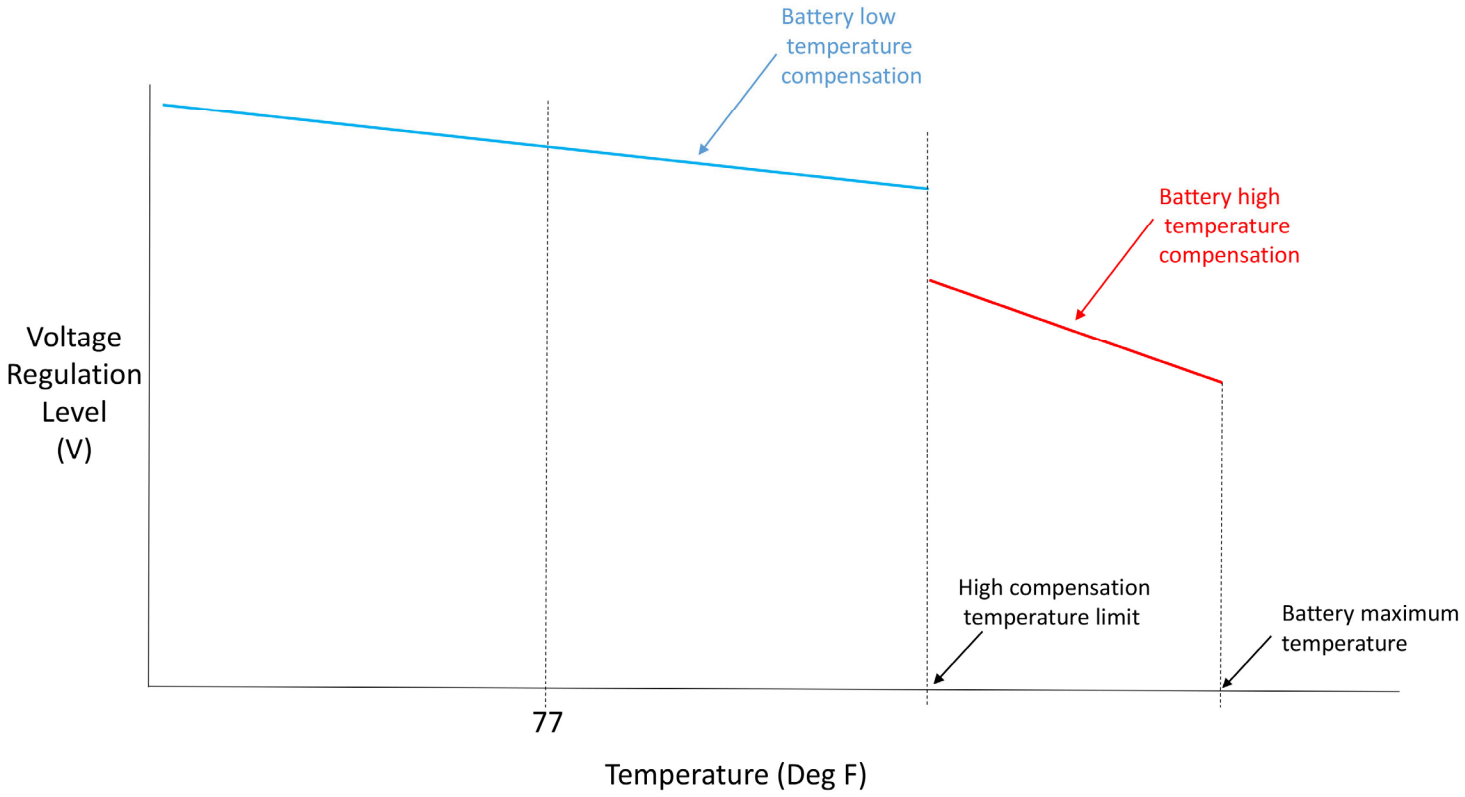
Appendix D – Note on Temperature Compensation

Temperature compensation is critical to maintaining battery life and performance. If the battery temperature deviates from 77 deg. F during normal operation, the charger voltage regulation levels can be automatically adjusted to compensate for temperature variations.

The REVOLUTION charger (when used with an optional thermistor) implements two temperature compensation factors expressed in mv/ deg C/cell.

1. The Battery Low Compensation factor (Batt Low Temp Comp) is activated when the battery temperature varies from 77 deg F, but is lower than the high compensation temperature limit (High Comp Temp). The default value is 2 mv/deg. C/cell.

2. The Battery High Compensation factor (Batt High Temp Comp) is activated when the battery temperature is higher than the high compensation temperature limit (High Comp Temp). The default value is 4 mv/deg. C/cell.



These parameters can be factory or dealer adjusted.

CONTACT INFORMATION

Power Designers Sibex

430 N. Suncoast Blvd
Crystal River, FL 34429
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Fax: 352.564.0772

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sales@powerdesigners.com

service@powerdesigners.com

Phones are answered between 8 a.m. and 4 p.m., Monday through Friday Eastern Time. After-hours calls are answered by voice mail and returned on the next business day. Questions and comments can also be submitted via fax or email.