



Quantum Charger Installation Manual

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Chapter 1: QUANTUM CHARGER SERIES

The Quantum Charger Series is part of ACTintelligent products and solutions. Featuring a modular and flexible design, reducing electrical infrastructure requirements to achieve greater energy savings.

1.1 Key Features

- Modular design featuring:
 - Plug-n-Play installation
 - Built-in redundancy
 - Fault tolerance
 - Simplified service
 - Scalability through field expansion
- Wi-Fi and PLC communications
- CEC Compliant

1.2 Remote Monitoring Capabilities

- Chargers enabled with **ACTview** integration will provide remote monitoring and fleet operation optimization.
 - Key performance parameters are monitored
 - Service issues pinpointed remotely
 - Service dispatched seamlessly

Chapter 2: SAFETY PRECAUTIONS

While every care has been taken to ensure the completeness and accuracy of this manual, Advanced Charging Technologies Inc. assumes no responsibility or liability for losses or damages resulting from the use of the information contained in this document. Due to technical improvements, some information contained in this manual may change without notice.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS.

**THIS MANUAL CONTAINS IMPORTANT SAFETY AND
OPERATING INSTRUCTIONS**

- WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF THE UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ AND FOLLOW THE INSTRUCTIONS PROVIDED EXACTLY.
- TO REDUCE RISK OF BATTERY EXPLOSION, FOLLOW THESE INSTRUCTIONS AND THOSE MARKED ON THE BATTERY.
- NEVER SMOKE OR ALLOW AN OPEN SPARK OR FLAME IN THE VICINITY OF THE BATTERY.
- USE CHARGER FOR CHARGING A LEAD-ACID BATTERY **AND LITHIUM ION** ONLY. IT IS NOT INTENDED TO SUPPLY POWER TO AN EXTRA-LOW-VOLTAGE ELECTRICAL SYSTEM OR TO CHARGE DRY-CELL BATTERIES. CHARGING DRY-CELL BATTERIES MAY CAUSE THEM TO BURST AND CAUSE INJURY TO PERSONS AND DAMAGE TO PROPERTY.
- NEVER CHARGE A FROZEN BATTERY.
- STUDY ALL BATTERY MANUFACTURER'S SPECIFIC PRECAUTIONS SUCH AS REMOVING OR NOT REMOVING CELL CAPS WHILE CHARGING AND RECOMMENDED RATES OF CHARGE.
- NEVER PLACE THE CHARGER DIRECTLY ABOVE OR BELOW THE BATTERY BEING CHARGED; GASES OR FLUIDS FROM THE BATTERY WILL CORRODE AND DAMAGE THE CHARGER.
- LOCATE THE CHARGER AS FAR AWAY FROM THE BATTERY AS DC CABLES PERMIT.
- DO NOT OPERATE CHARGER IN A CLOSED-IN AREA OR RESTRICT VENTILATION IN ANY WAY.

WARNING:

*BEFORE INSTALLING, USING OR MAINTAINING
QUANTUM CHARGERS, READ AND UNDERSTAND THE
ABOVE AND THE FOLLOWING INSTRUCTIONS. ONLY
QUALIFIED PERSONNEL SHOULD INSTALL, OPERATE OR
SERVICE THIS EQUIPMENT*





DANGER:

Risk of High Voltages – Lethal voltages are present within the charger enclosure whenever the AC mains supply is energized and/or the battery or load is connected. The bus bars and other internal components present the risk of electric shock

**WARNING:**

Risk of Explosive Gases – Working near lead-acid batteries is dangerous. Batteries generate explosive gases during charging and discharging. To reduce the risk of battery explosion, ensure adequate ventilation and follow these instructions as well as those published by the battery manufacturer.

**WARNING:**

Risk of Improper Grounding – The charger must be connected to an AC mains supply incorporating an earth/ground. The grounding conductor must be of a size equal or larger than the line (phase) conductors.

**WARNING:**

Protect Eyes and Skin – Wear safety goggles and skin protection when installing or servicing the battery charging system or working near lead-acid batteries.

**WARNING:**

To reduce the risk of injury, only charge rechargeable lead-acid batteries. Charging or trying to charge other types of batteries may cause damage or result in personal injury.

**WARNING:**

Risk of Fire - To reduce the risk of fire, install battery charger on a floor of non-combustible material, such as stone, brick, concrete, or metal. Do not install on or over combustible surfaces.

**CAUTION:**

Risk of Fire – Use only on circuits provided with appropriate branch circuit protection in accordance with the National Electrical Code, NFPA 70.

**DANGER:**

Risk of Electric Shock from Stored Energy – Wait at least five minutes after de-energizing the AC power supply and disconnecting the battery or load before opening the charger enclosure or touching any of the de-energized AC supply parts.



DANGER:

Risk of Electric Shock and/or Electric Energy from High Current Levels – Do not touch un-insulated battery, connectors, bus bars or terminals. All tools used should be adequately insulated to avoid the possibility of shorting connections. Inspect cables often for damage to the insulation. Replace cracked, worn or otherwise damaged cables immediately.

CAUTION:

Risk of Fire or Explosion from Gases Vented by Batteries – Discharge static electricity from tools and technician by touching a grounded surface when working in the vicinity of batteries

CAUTION:

Improper Connection - Damage to the charging system or battery, or personal injury may occur if the charger is incorrectly wired to AC supply or its output devices. Always observe local safety codes and standards.

**CAUTION:**

Quantum Chargers are for Indoor Use Only – This charger is for INDOOR use only. Do NOT expose the charging system to rain or snow.



Quantum GSE Series Chargers are for outdoor use. Enclosure rated NEMA 3R.

**CAUTION:**

Air Filter Maintenance – To prevent damage from overheating or internal contamination, check air filters regularly (at least every two weeks), and clean or replace as necessary.

**WARNING:**

Charger top surfaces should not be used as support surfaces for other structures or as shelves and must be kept free of flammable materials, liquid containers and other foreign objects.

**WARNING:**

Personnel must not stand on, climb on or hang from chargers.

Chapter 3: INSTALLATION

3.1 Charger Unpacking and Inspection

Upon receipt of a Quantum charger, ensure that there is no physical damage to the chassis, the display, or the DC cables. If any damage is apparent, contact the shipping carrier.



WARNING:

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

3.2 Needed Tools (NOT SUPPLIED)



Note:

The hardware for wall, stand, or floor installation is not provided. Use appropriate hardware based on the surface you have.

- Phillips head screwdriver
- To program the Charger:
 - Option I: Using USB cable (recommended)
 - Type A Male USB cable
 - ACT Windows tablet or Windows laptop with ACTlink software installed
 - Option II: Through Wi-Fi connection
 - ACT Mobile Router
 - ACT Windows tablet or Windows laptop with ACTlink software installed



3.3 Charger Mounting Options

The charging area should be well ventilated, dry and adequately clean before the charger is mounted.

There must be at least 5.5 inches of spacing between the front, back, and sides of the charger and any adjacent walls or barriers to allow for proper cooling.



CAUTION:

Do not restrict airflow to the air filter at the front of the charger or to the vents at the back of the charger.



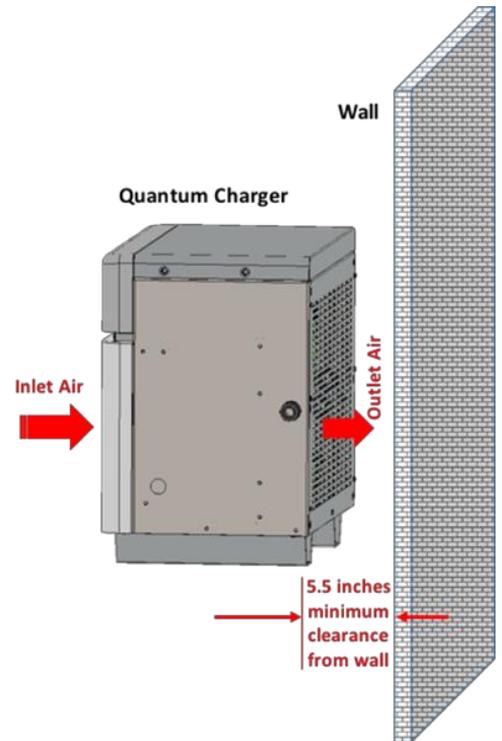
WARNING:

Charger top surfaces should not be used as support surfaces for other structures or as shelves and must be kept free of flammable materials, liquid containers, and other foreign objects.



WARNING:

Personnel must not stand on, climb on or hang from chargers.



Quantum chargers offer a wide variety of mounting options such as floor mount, wall mount, or stacked mounting. Refer to Appendix A for mounting bolt patterns.

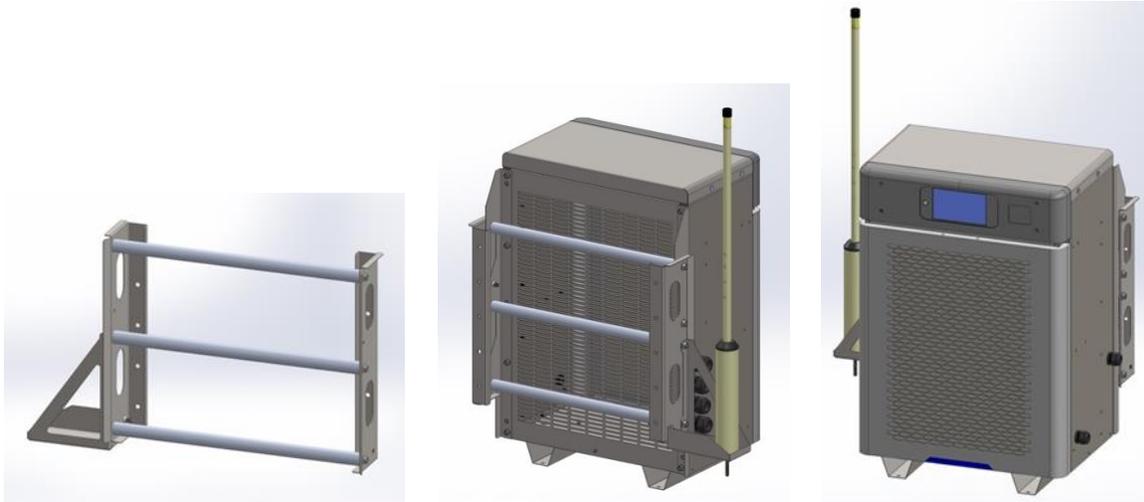
	WARNING
No pressure washing near the Outdoor/GSE Charger	

	WARNING
No sprinklers should be turned on near the Outdoor/GSE Charger	

3.3.1 Wall Mounting

For wall mounting, only use mounting brackets especially designed for the Quantum Charger Series, available from your local ACT Dealer. The wall mount is also available with a pogo stick

cable management system. Follow the installation instructions included in the Wall Mounting Kit for proper installation.



3.3.2 Post Stand

The post stand provides a convenient floor-mount option. The charger mounts to the stand using the provided hardware in the Post Stand Kit. It is also available with a pogo stick cable management system, providing easy connection to the battery and keeping cables off the floor when not connected.

The four mounting holes in the bottom of the indoor Quantum charger stand are 9/16" (14.3mm) diameter for use with 1/2" (12.7mm) anchor bolts. The four mounting holes in the bottom of the outdoor GSE charger stand are 0.725" (18.4mm) diameter for use with 5/8" (15.9mm) anchor bolts.



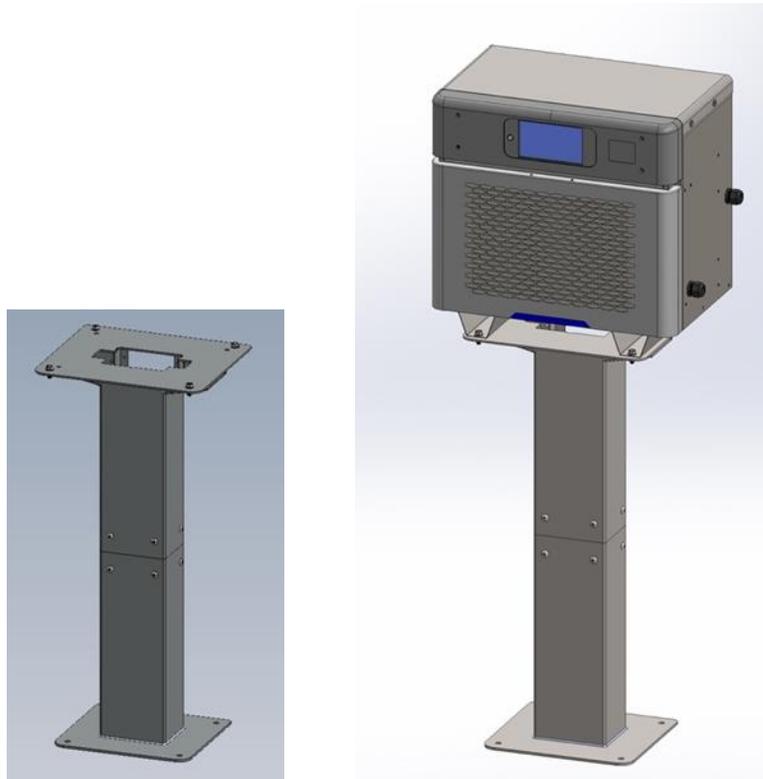
WARNING:

Always install indoor Quantum charger stands with 4 ea. 1/2" x 4" anchor bolts or longer that are suitable for use with the installation surface in accordance with anchor manufacturer instructions. Install stand directly to a floor or foundation surface. Concrete floors must be 4" thickness minimum. Anchor bolts must be a minimum of 4" from nearest expansion joint or cracks through concrete.

**WARNING:**

Always install outdoor GSE charger stands with 4 ea. 5/8" x 4" anchor bolts or larger that are suitable for use with the installation surface in accordance with anchor manufacturer instructions. Install stand directly to a floor or foundation surface. Anchor bolts used must be corrosion resistant and rated for outdoor use. Concrete mounting surfaces must be 4" thickness minimum.

Anchor bolts must be a minimum of 4" from nearest expansion joint or cracks through concrete.



3.3.3 Floor or Shelf Mounting

If the charger is mounted on the floor, or a suitable load bearing structure or shelf, make sure the charger is mounted on non-combustible material, such as concrete.

The four mounting holes in the bottom of the indoor Quantum charger are 3/8" (10mm) diameter. Use 5/16" or larger bolts and hardware that are suitable for use with the installation surface. The four mounting holes in the bottom of the outdoor GSE charger are 0.484" (12.3mm) diameter. Use 3/8" or larger bolts and hardware that are suitable for use with the installation surface.



WARNING:

Ensure structures or shelves used for elevated charger mounting above floors and foundations are load rated for supporting the

weight of installed charger(s), are free of combustible materials and not subject to deterioration during the life of the charger that would create unsafe conditions.



WARNING:

Always mount indoor Quantum chargers installed in elevated locations securely to surfaces using 4 ea. 5/16" bolts or larger that are suitable for use with the installation surface.

Always mount outdoor GSE chargers installed in elevated locations so as to prevent immersion of the unit under expected service conditions. Mount to concrete pad or surface securely using 4 ea. 3/8" bolts or larger that are suitable for use with the installation surface, corrosion resistant and rated for outdoor use. Pads or surfaces on which GSE chargers are mounted should not be made of wood or any material that retains moisture, and should completely cover the ground beneath the charger without openings and extend out 6" in all four directions from the outer faces of the charger

3.3.4 Stacking

For floor mounting, chargers can be stacked to maximize area utilization. For Stacking, only use mounting brackets especially designed for the Quantum or GSE Charger Series, available from your local ACT Dealer.



NOTE:

When Stacking units follow the Maximum number of stacked units provided in the following table

	Q4	Q6	Q12
Maximum Number of Stacked units	3	2	2



WARNING:

Do not exceed recommended stacking limits for chargers. Post stands count as one unit for stacking purposes, do not stack post mounted Q6, Q12 or GSE chargers. Stacked chargers must all be secured together using ACT supplied Stacking Kits.



WARNING:

Lowest unit of stacked chargers must always be anchored directly to a floor or foundation surface, or suitable load bearing structure or shelf as detailed in Section 3.3.3.

For stacked indoor Quantum chargers anchored directly to a floor or foundation, install lowest charger with 4 ea. 5/16" x 4" anchor bolts or larger that are suitable for use with the installation surface in accordance with anchor manufacturer instructions. Concrete floors must be 4" thickness minimum. Anchor bolts must be a minimum of 4" from nearest expansion joint or cracks through concrete.

For stacked outdoor GSE chargers anchored directly to a floor or foundation, install lowest charger with 4 ea. 3/8" x 4" anchor bolts or larger that are suitable for use with the installation surface in accordance with anchor manufacturer instructions. Anchor bolts used must be corrosion resistant and rated for outdoor use. Concrete floors must be 4" thickness minimum. Anchor bolts must be a minimum of 4" from nearest expansion joint or cracks through concrete.



3.4 Charger Electrical Installation

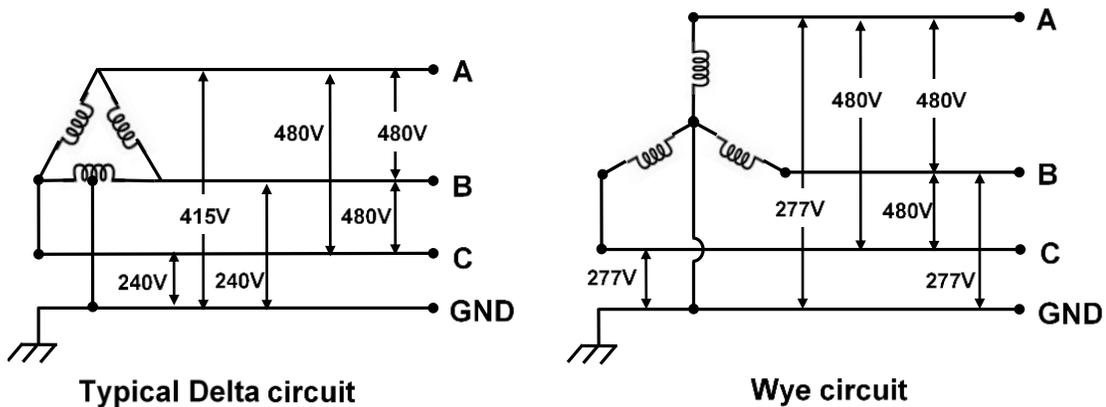


WARNING:

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

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

- The Quantum charger requires 600/480/380/208 VAC 3Ø (3-Phase) service. Check the nameplate rating on the charger to verify AC Voltage.
- The Quantum charger has a variety of configurations. Check the nameplate rating on the charger to verify the current draw requirement.
- The Quantum charger requires four-wire Wye or Delta electrical supply with a separate ground. Check the Technical Specification section for the AC current draw; circuit disconnect should be sized at 125% of the current draw.

**WARNING:**

AC power connection should be made by a licensed electrician only.

1. Verify that the source circuit is locked and tagged out before connecting power to the charger.
2. Take off the back cover by loosening the mounting screws on the sides of the cover and lift the cover off.



NOTE:

For the Outdoor/GSE Charger remove the labyrinth

that is behind the front and back cover to access the charger backplanes. The screws are located on the side.

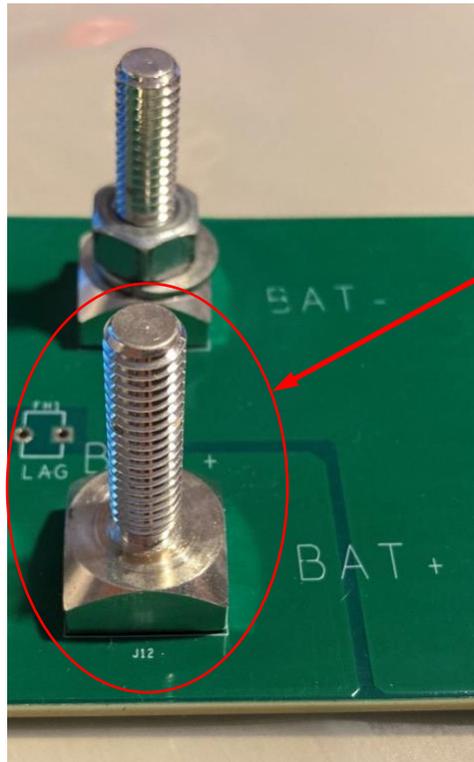


Outdoor/GSE Charger back Labyrinth

3. Inspect the DC fuse and battery cables, make sure the torque lines are straight. If a torque line is not straight, set torque on the DC connection.

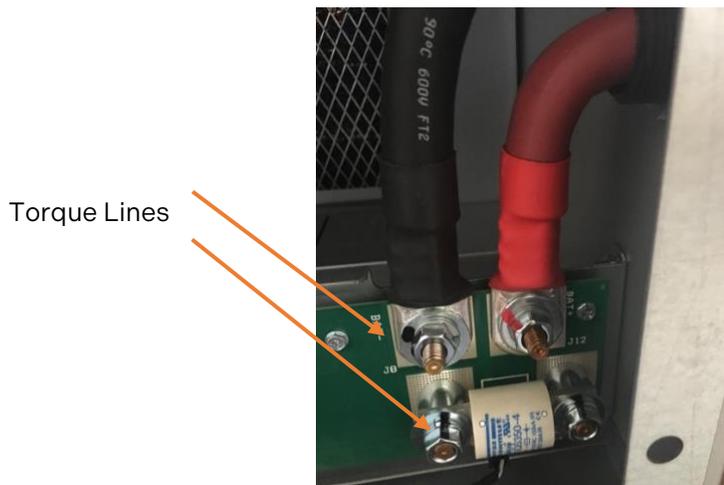
Torque nuts on external threaded Power Elements on DC Backplanes to a maximum of 79 lbf*inch +0/-10% (6.6 lbf*ft) (9.0N*m). See next image for an example of an external threaded Power Element. CAUTION, DO NOT OVERTIGHTEN AS THIS MAY DAMAGE THE PCB.

Torque all other fasteners for DC main fuses or DC output cables to 120 lbf*inch +0/-10% (10 lbf*ft) (13.5N*m).



**EXTERNAL THREADED
POWER ELEMENT**

Reapply torque lines after torquing fasteners as necessary using a suitable indelible marker.



Torque Lines

4. Push out the knockout on the left side of the charger and pass the AC input power wires through, using the appropriate conduit or strain relief fittings per local and national codes.



WARNING:

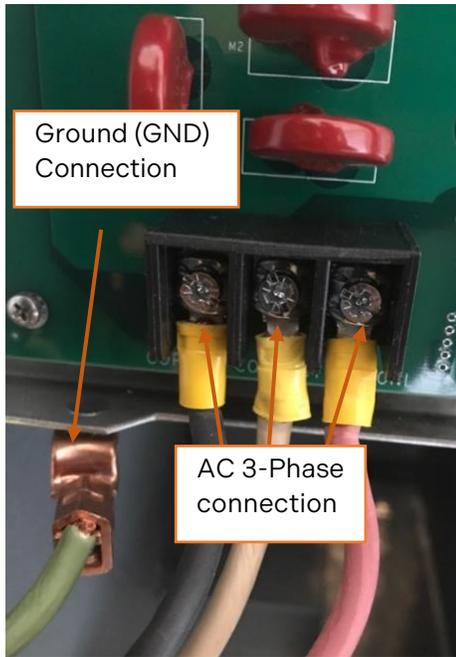
For the Outdoor/GSE Chargers, the AC input power cable and cable strain relief need to have minimum rating of type 3R and designated for outdoor use.



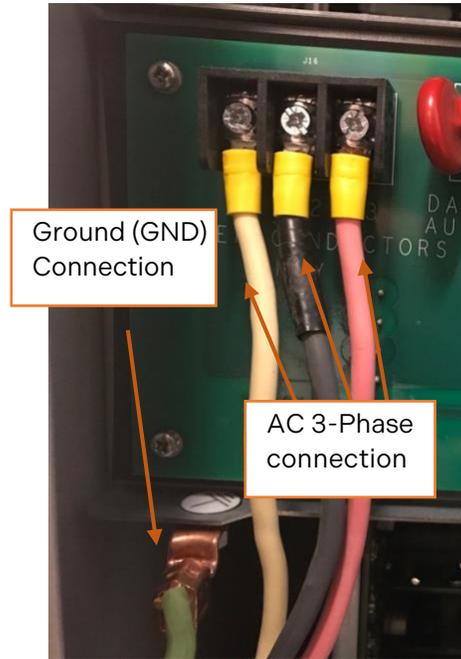
NOTE:

The Q4 charger has an alternative knockout at the bottom for AC connection

5. Connect the AC input power wires to the AC terminal block
6. The ground connection should be made to the charger to the compression lug provided under the AC terminal block. The charger must be grounded in accordance with the Facilities Utility grounding method.



Q6 and Q12 Chassis

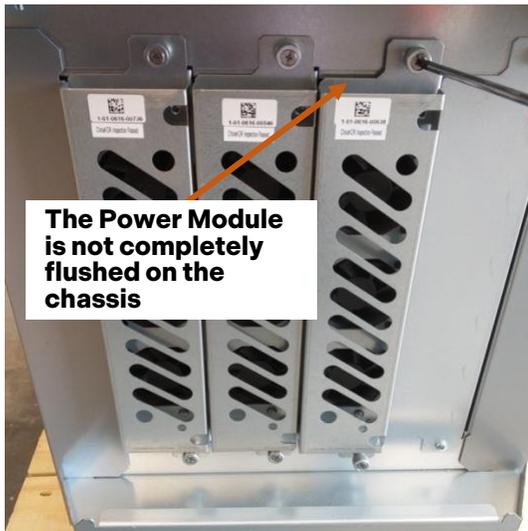


Q4 Chassis

7. Verify the line and ground connections of the outlet or junction box/disconnect.
8. Open the front cover to expose the Power Modules and check to ensure that all the Power Modules are tightened and completely flushed on the chassis. Close the front cover after inspection.



Outdoor/GSE Charger front Labyrinth



9. With no battery connected to the charger, energize the source circuit and verify proper AC voltage at the line side of the charger switch. All line-to-line voltages should be within $\pm 10\%$ of rated values and matched within 10 VAC. De-energize the source circuit.
10. Verify that the source circuit is locked and tagged out. Reinstall the back cover on the charger, securing it with the six mounting screws.
11. Energize the source circuit and verify the charge screen started as shown below.



12.Ensure that the LCD on the charger is calibrated by clicking the home button and verify you can navigate the menu.



NOTE:

Outdoor/GSE Chargers do not have a touch screen.

NOTE:

If the LCD is not responding to touch, please follow the procedure "**710-00027 Quantum Charger LCD Screen Calibration Procedure**".



NOTE:

The LCD can be calibrated by holding **down** the Stop Button on the charger for **10 seconds or more**, then release. This will initiate the calibration procedure



NOTE:

- Use THHN or similar type, 600V, suitable for conduit use.
- Use copper conductors only.
- All connections must comply with all local codes and ordinances

**DANGER:**

RISK OF ELECTRIC SHOCK - After turning off AC power for servicing, allow 5 minutes for the system to bleed down before touching the AC connections.

**CAUTION:**

POTENTIAL SYSTEM DAMAGE – Disconnect the battery from the charger before applying AC power. Use external circuit breaker to turn on AC power.

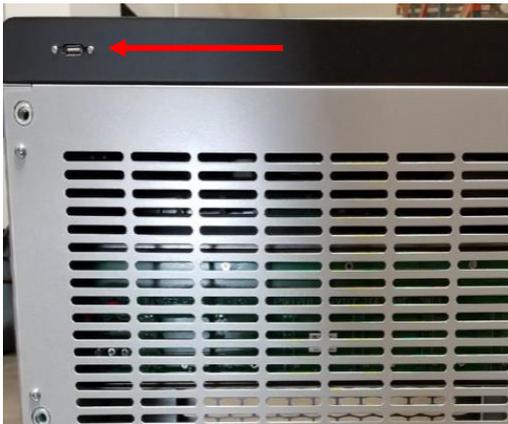
THE CHARGER IS NOW READY FOR OPERATION

Chapter 4: CHARGER SETTINGS

Follow the steps below to launch ACTlink Software, program Battview settings, and upload the settings to ACT-view.com cloud server. There are two options to program the charger settings, use a direct connection to the computer or tabled through USB cable, or using Wi-Fi connection

4.1 Option I: Using USB cable (recommended)

1. After installing the charger Section, connect the USB port on the back of the charger, if the charger is an Outdoor/GSE charger connect the USB port on the front of the charger to a Windows laptop or tablet.



Quantum Charger



Outdoor/GSE Charger



NOTE:

There is also a micro USB connection available in the front of the charger behind the plastic cover. Loosen the 4 screws holding the black bezel to uncover the connector.

2. Launch ACTlink Software from Windows tablet or laptop



NOTE:

The latest version of ACTlink Software can be downloaded from www.act-view.com

3. Log in using your Assigned Email and Password

Email

Password

Keep me logged in



NOTE:

Users can obtain ACTview User Name and Password by registering at www.act-view.com

IMPORTANT:

ACTlink users need to log in once every 2 weeks with internet connection to keep their credential active. Please log in before you visit the customer site with internet connection.

4. Choose USB Mode from list of connectivity options

About demo dealer

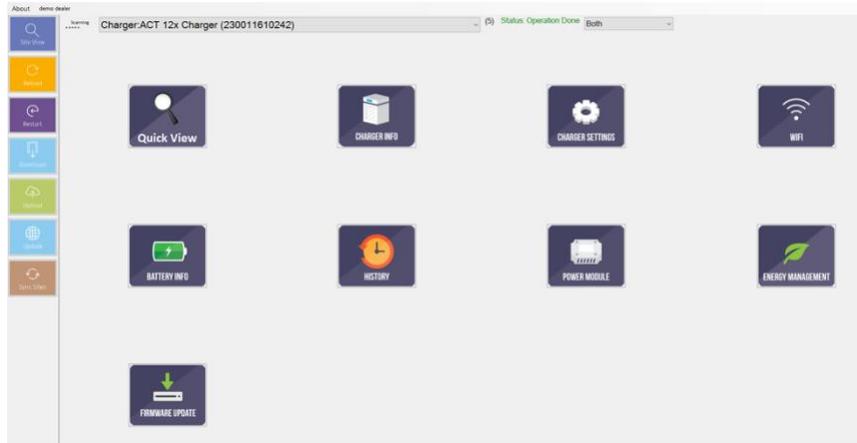
USB

Mobile Mode

Mobile Router Mode

Stationary Router (ACT Access)

5. The charger will connect with the following main menu

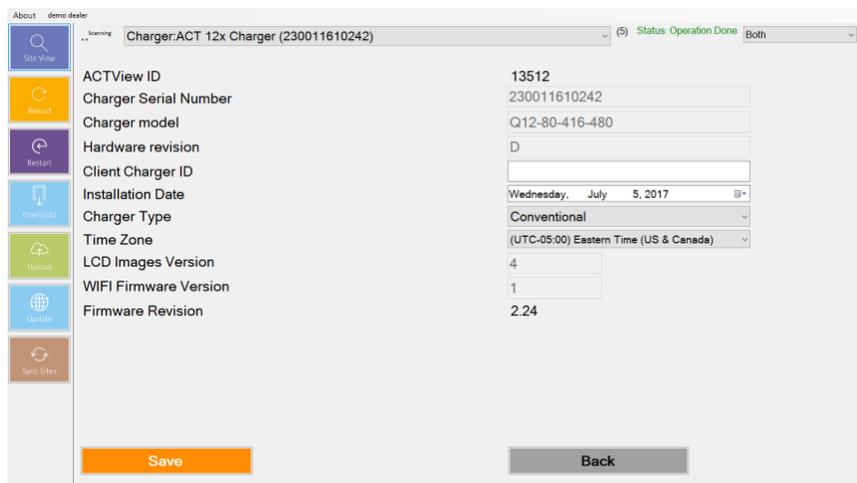


6. Click on Charger Info. Enter the Client Charger ID, if any, this will help identify the charger on ACTview without needing the full serial number. Also enter the Installation Date, Charger Type, and Time Zone, then click on Save and when the screen updates, you will see on the top right corner “Status Operation Done” indicating that the modification was programmed. Click back to go to the Main Menu.

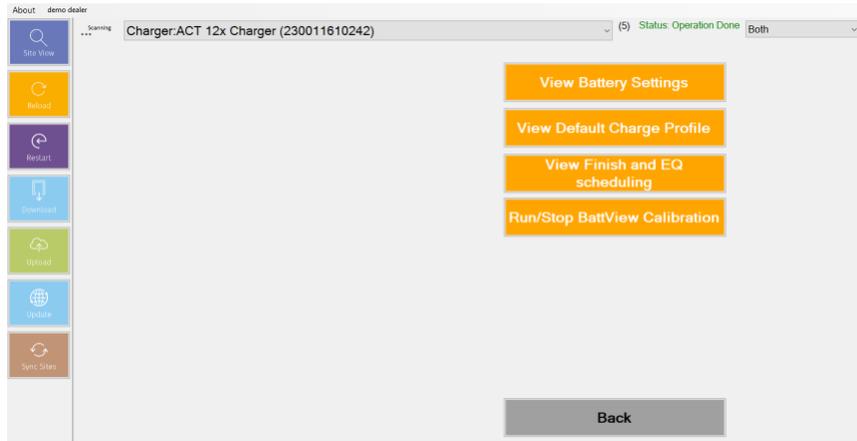


NOTE:

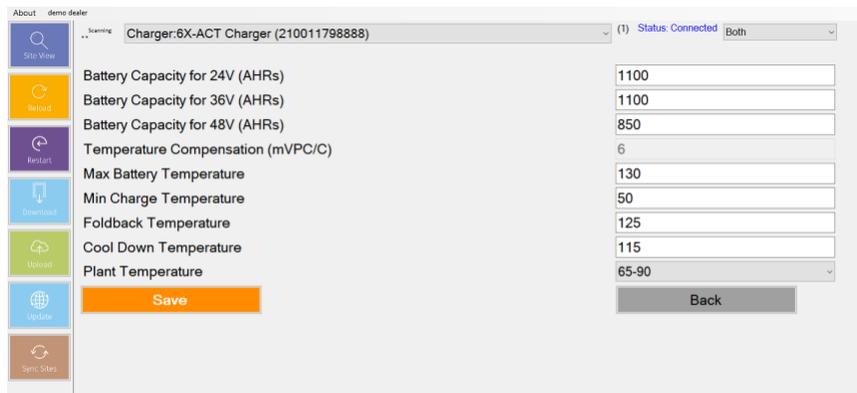
Charger Type could be: Conventional, Opportunity, or Fast. Based on the Charger Type the software will load the Default Charging Profile.



7. Click on Battery Info, then click on View Battery Settings



8. Enter the Battery Capacity. When the charger is setup for multi-voltage operation, there will be a battery capacity associated with every Voltage. The other fields will have Default Values. Click on Save after all of the information is updated, then click on Back.



NOTE:

Charging Type (Conventional, Opportunity, or Fast) will be applied for all voltages. Based on the Charging Type the software will load the Default Charging Profile.

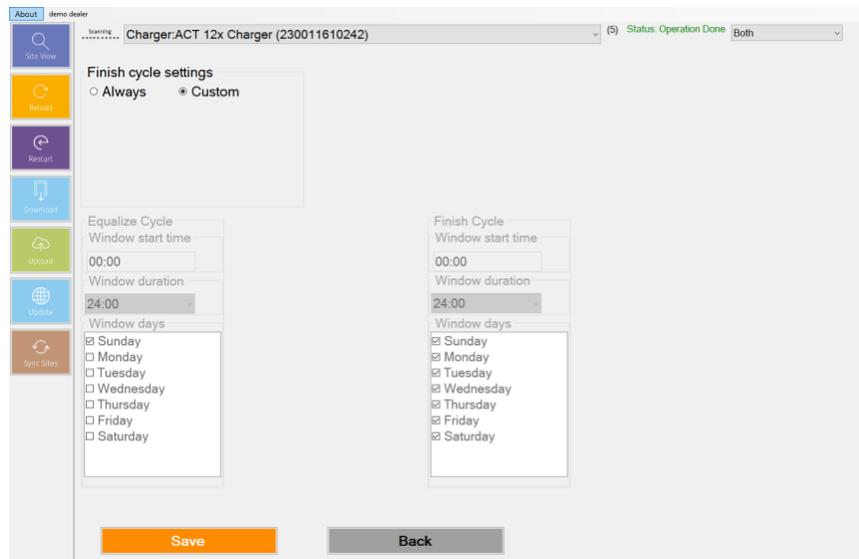
9. To view the Default Charging Profile, click on View Default Charge Profile. The default charging profile follows the recommended settings by East Penn. Click on Back to go back to the Battery Info Menu.
10. Click on View Finish and EQ Scheduling. Setup the Finish and Equalize Cycle windows by entering the Start Time, Window Duration, and selecting the Days. The default for Conventional chargers will be to finish always (daily), while the default value for Opportunity and Fast charging will be Custom Finish Schedules. Click **Save** once the values are updated, then click Back.



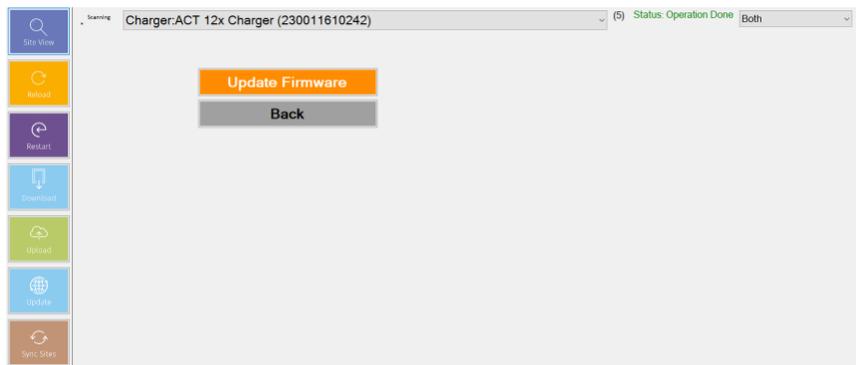
NOTE:

The Finish and Equalize Window Start Time uses military time format. The window start time plus the window duration will dictate the overall window duration.

For the selected days, the Finish or EQ cycles will be enabled at the window start time for the number of hours specified in the window duration.



11. Click Back to go to the Main Menu, and click on Update Firmware.



12. Click on Update Firmware to ensure the latest firmware is installed on the charger (if any). Wait for the firmware to update and the charger to restart.

13. Close ACTlink software and connect to a network with Internet access.

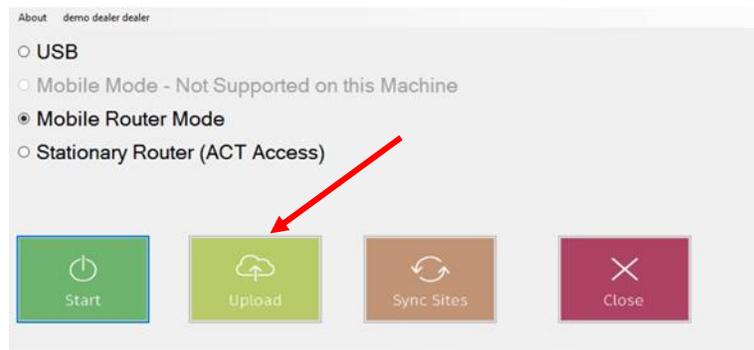


NOTE:

If there is no internet connection available at the

site, this step and the following step can be performed off-site when internet connection is available.

14. Reopen ACTlink software, click on the Upload button. This will insure that the settings are updated in ACTview. This step could be done after leaving the customer site if there is no internet connection at the site.



NOTE:

ACT Mobile Router is not internet based. It will not connect to the cloud, it will just form a local area network for ACT devices. To upload the data, you need to be connected to a different network with internet connectivity



Important:

All settings need to be uploaded to ACT-view.com to insure future Replacements and Alerts are accurate. The upload needs to be done with Internet connection and can be done off-site. The upload can be done when all device settings are completed for the entire site. Skipping the upload step will cause data discrepancy in ACTview records, which could prevent the ACT Support Team from providing future support.

4.2 Option II: Using Wi-Fi

Follow the steps below to launch the ACTlink software, program the charger settings, and upload the settings.

1. Turn on ACT Mobile Router

**NOTE:**

ACT Mobile Router is a hand-held router that can be purchased from ACT. It comes preconfigured with ACT network credentials and can be used for configuring or downloading data from Battviews and Quantum Chargers. ACT Mobile Router is not internet based. It will not connect to the cloud, it will just form a local area network.



2. Launch ACTlink Software from Windows tablet or laptop

**NOTE:**

The latest version of ACTlink Software can be downloaded from www.act-view.com

3. Log in using your Assigned Email and Password

Email

Password

Keep me logged in

**NOTE:**

Users can obtain ACTview User Name and Password by registering at www.act-view.com

4. Choose Mobile Router Mode from list of connectivity options

About demo dealer dealer

USB

Mobile Mode - Not Supported on this Machine

Mobile Router Mode

Stationary Router (ACT Access)

5. Follow the same step from Option I above starting at Step 5 Section 4.1

Chapter 5: OPERATION

Users operate the Quantum charger through the front LCD touch screen. The LCD screen is the main user interface for viewing and displaying operation and fault messages. It also allows limited charger programming options.

5.1 Powering the Charger

1. Energize the AC mains (turn the main AC disconnect switch to the ON position if one exists).
2. Verify that the LCD display is lit and Quantum logo is displayed indicating that the unit is in Start Up Mode.



3. After Start Up, the charger will display the following screen as shown below.



NOTE:

If the LCD is not lit, or if the message is not displayed, cycle the Main AC disconnect switch to the OFF

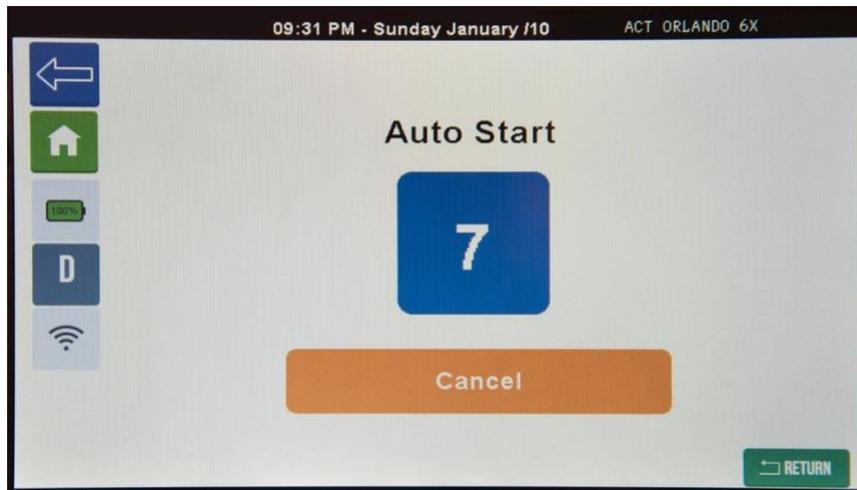
position and then to the ON position to restart the charger.

If the charger still does not power up, carefully verify the source circuit and wiring to the charger and correct any problems. Check that the fuses in the AC mains junction box on the wall are intact and check the supply voltage for all three phases (AC mains line-to-line) to ensure it is within $\pm 10\%$, and matches to 10 VAC or better.

If the problem persists, contact the Dealer or ACT Service.

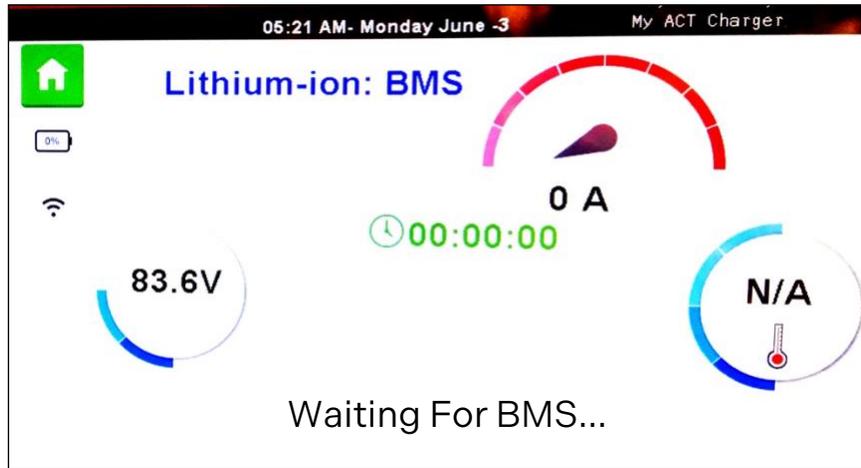
5.2 Starting a Charge Cycle

1. Connect the battery to the charger. Once the battery is detected, the charger Auto Start countdown will appear on the screen.

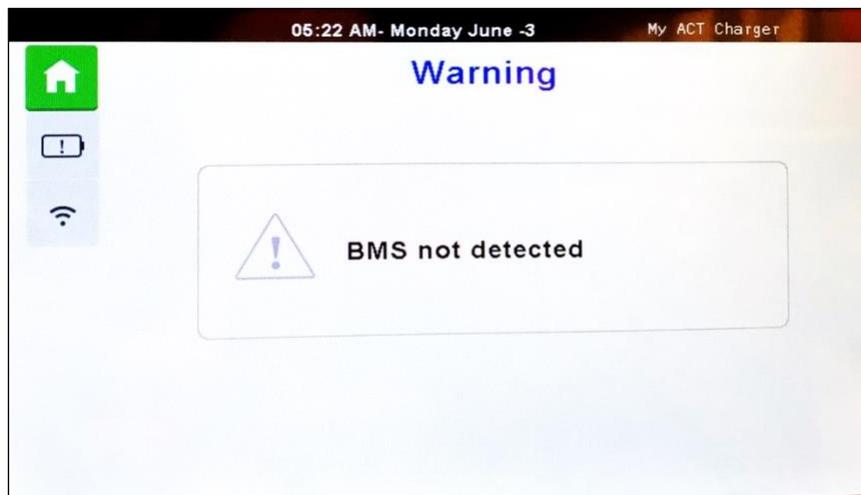


NOTE:

If the charger is setup to communicate with battery BMS (most Li-Ion Batteries), the following screen will be displayed instead of the count down.



If the charger doesn't detect the BMS on the battery the following screen will be displayed after 45 seconds.



If the following screen appears, it indicates an error on the communication board, restart the charger to clear the error.



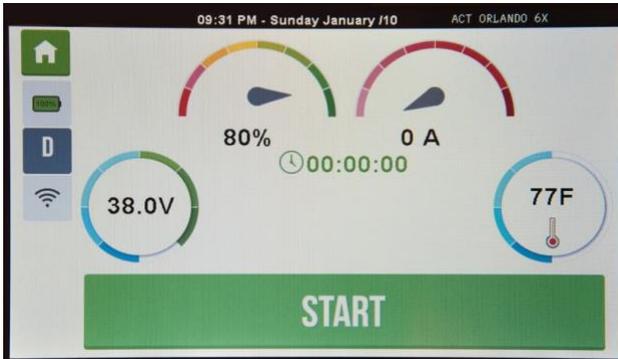


NOTE:

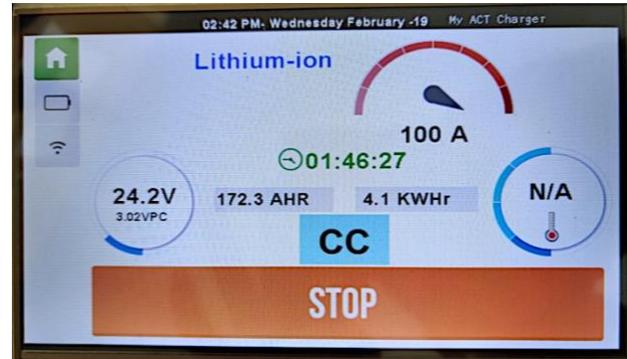
If the problem persists, contact the Dealer or ACT Service. If the charger is not set to start automatically, start the charge cycle by pushing the Green **START** button on the screen.

**NOTE:**

All Outdoor/GSE chargers have to be set for auto start since the touch screen is disabled.



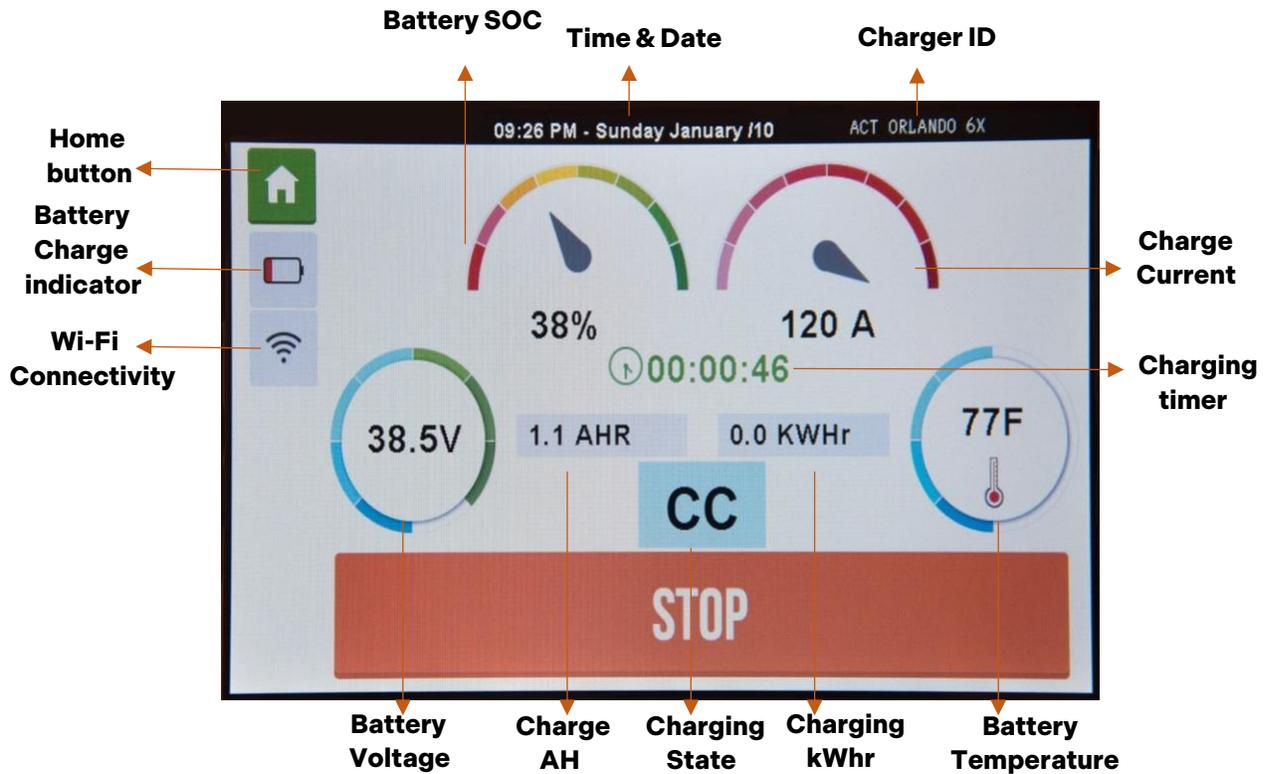
Quantum Charger LCD Screen



Outdoor/ GSE LCD Screen

If either this screen or this message is not displayed, the battery has not been detected. Make sure that the battery cables are connected properly and verify that the auxiliary contacts are properly connected.

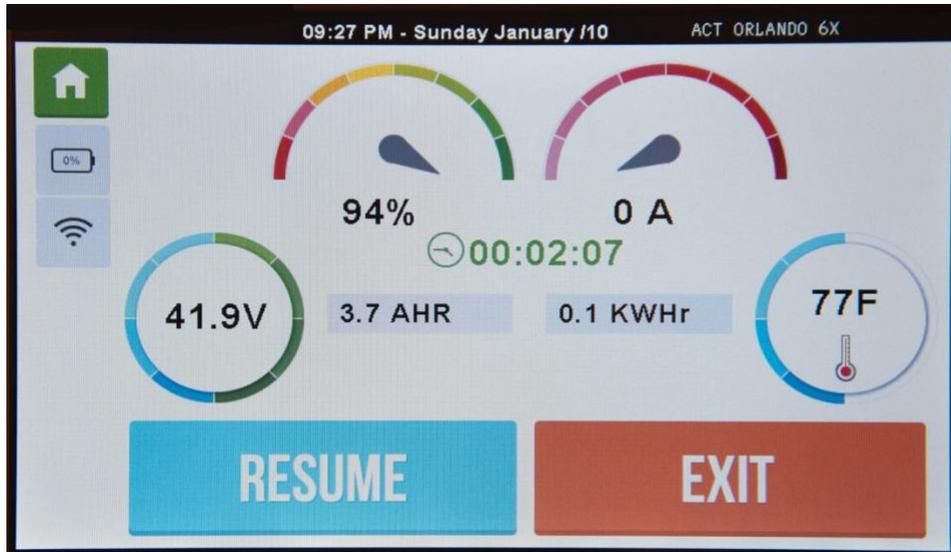
2. The Charge Cycle begins and the following screen showing the Charging Status display appears.



3. If the charger is set up for Li-Ion batteries the following screen will appear instead.



- The Charging State indicates the active charging mode (TR for trickle, CC for constant current, CV for constant voltage, FI for finish, or EQ for equalize). The screen also displays the Charging Timer, % State of Charge gauge along with actual readings of Charging Amps (A), Charging Amp-hours (AH), Battery Voltage (V), and Battery Temperature (T).
- To stop the Charge Cycle, select the **STOP** button. The options to **RESUME** or **EXIT** will appear on the screen.



6. Selecting **EXIT** stops the charger completely and defaults to the **START** screen. Selecting **RESUME** from the screen resumes the Charge Cycle and the screen will again display the charging operation display.
7. Once the Charge Cycle has completed, the charger will display "Completed" on the screen.

5.3 Charger LED Color Indication

The LED strip attached under the charger front bezel, has a color indication to allow the user to identify the Charging Cycle and identify any issue with the charger.

Quantum Charger LED Strip Color Code



Charging Cycle



Constant Current (CC)/ Constant Voltage (CV)/ Finish / EQ / Desulfate
(BLUE)



Charge Cycle Completed (GREEN)

Charge Cycle Interrupted or Charger Idle with Fault



(RED)

Charger Idle (no battery connected/with no auto start)

NO LIGHTS when no service is needed

Chapter 6: QUANTUM CHARGER PREVENTIVE MAINTENANCE

The Quantum charger streamlined design emphasizes ease of maintenance. **Preventive Maintenance is mandatory annually to maintain warranty – twice a year is recommended.** The maintenance Below is the list of the maintenance procedures:

1) Air Filter

Regularly inspect air filter and clean or replace as necessary. Location and environmental conditions must be taken into account when determining the frequency that the filter is cleaned or replaced. The air filter can be blown out or washed in warm soapy water (the filter must be completely dried prior to reinstall).

The following are general guidelines in regard to cleaning or replacing the air filter:

Environmental Condition	Application Example	Recommended Filter Replacement Cycle
Normal	A normal daily operation Conventional Charging basic material handling of clean product in dry environments.	Annually
Severe	Extended operating hours or constant use when Fast or Opportunity charging in dusty, hot but dry environments.	Bi-Annually
Extreme	All dusty or sandy conditions such as in cement plants, lumber or flour mills, coal dust or stone-crushing areas. Corrosive atmosphere such as in chlorine or salt-sea air environments.	Quarterly

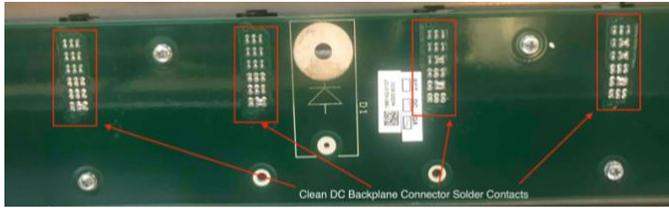
2) Power modules Inspection

Pull out the power module and Inspect DC connector for any discoloration or deformation. Reinstall the PMs and ensure that the PMs are fully seated, and the tabs are flushed. Tighten the bolts all the way by hand and make sure they are secured.

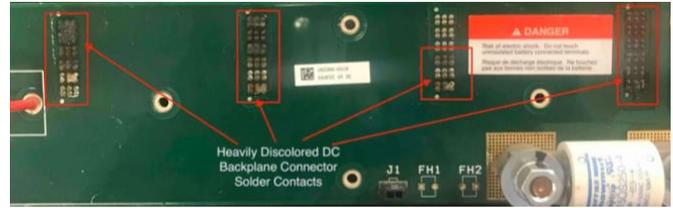


3) DC Backplane Inspection

Remove the charger back cover and inspect the DC backplane for any discoloration. Report any discoloration to



Clean DC connector contacts



Slight discoloration of DC connector contacts

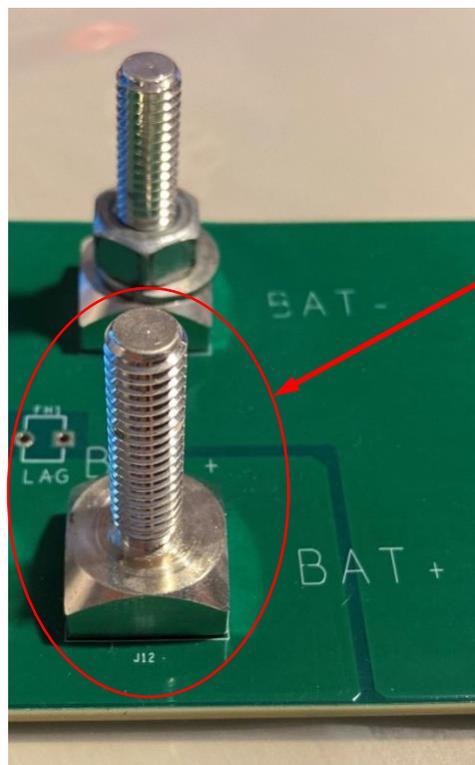
4) Battery Cables Inspection

Regularly inspect the DC cables for wear. If the DC cables or connectors become worn or damaged, they should be immediately replaced with a cable of the same rating by qualified personnel. Inspect the connector housing and make sure there is no damage. Inspect the tips of the battery connector for signs of pitting due to arcing. Replace the tips as needed.

Inspect the DC fuse and battery cables, make sure the torque lines are straight. If a torque line is not straight, set torque on the DC connection.

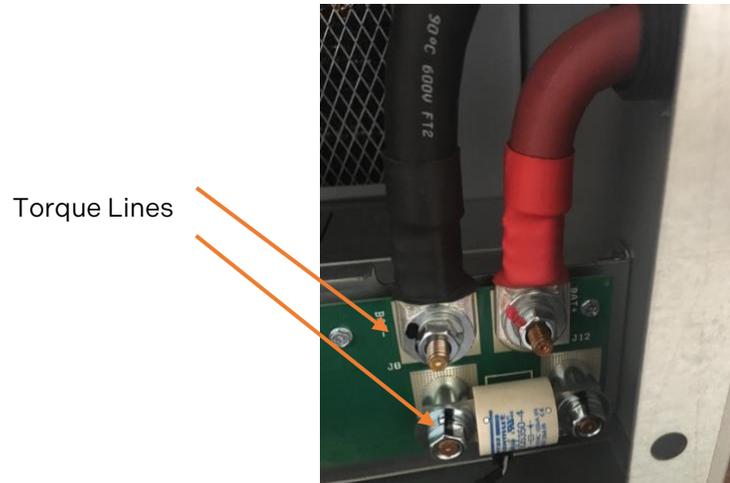
Torque nuts on external threaded Power Elements on DC Backplanes to a maximum of 79 lbf*inch +0/-10% (6.6 lbf*ft) (9.0N*m). See next image for an example of an external threaded Power Element. CAUTION, DO NOT OVERTIGHTEN AS THIS MAY DAMAGE THE PCB.

Torque all other fasteners for DC main fuses or DC output cables to 120 lbf*inch +0/-10% (10 lbf*ft) (13.5N*m).



**EXTERNAL THREADED
POWER ELEMENT**

Reapply torque lines after torquing fasteners as necessary using a suitable indelible marker.



IMPORTANT NOTE:

Please Refer to doc 710-00037 Quantum GSE Maintenance Manual for more instructions on the Maintenance of the GSE chargers

Chapter 7: TECHNICAL SPECIFICATIONS

7.1 Nameplate Rating

The Nameplate Rating Label is attached to the side of the charger; an example is shown below:



QUANTUM CHARGER Model #: Q4-24/36-50-480

INPUT		OUTPUT	
Voltage	480 VAC	Voltage	50 VDC max
Phase	3 ϕ (3-wire & ground)	Current	50A max
Frequency	50/60 Hz	Power	2 kW
Current	2.75 A nominal	Maximum # of Cells	12/18
Battery Type: Flooded Lead Acid, AGM, Gel			
Manufacturer: Advanced Charging Technologies Inc – La Mirada, CA DESIGN & FINAL ASSEMBLY IN THE USA 		 LISTED INDUSTRIAL BATTERY CHARGER E-file # E476468	

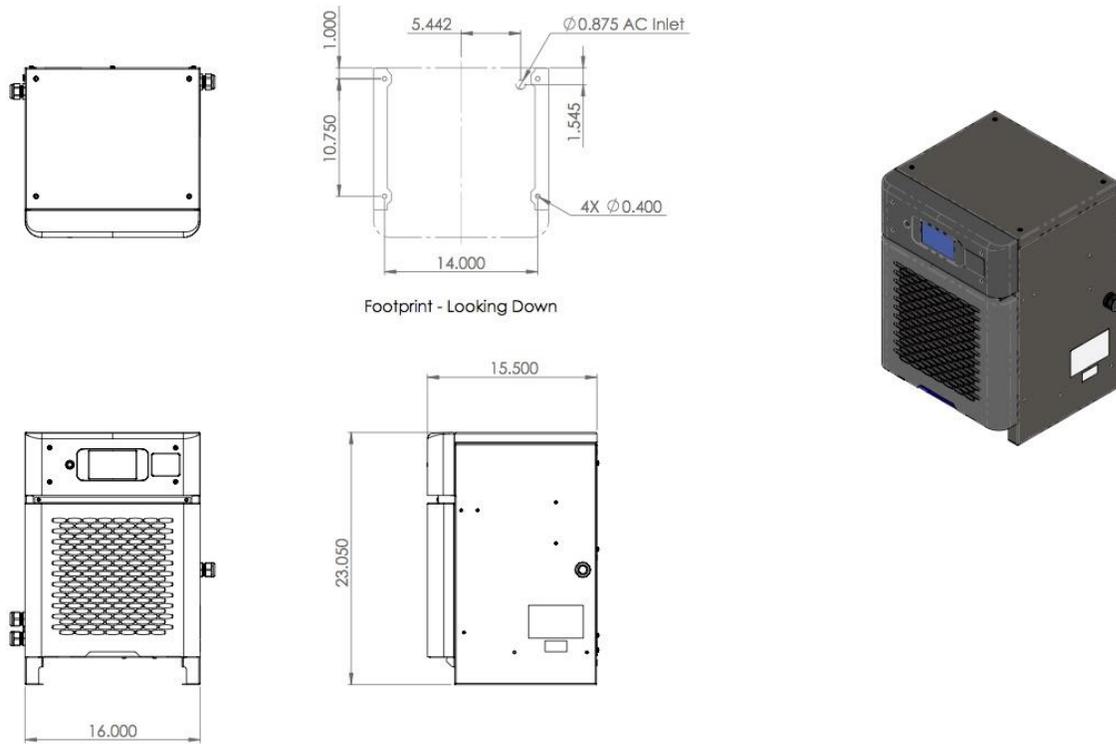
The label specifies the Input Voltage and Current Rating for the charger, as well as the Output Rating. It also contains the UL Listing and File Number.

7.2 Charger Operating Conditions

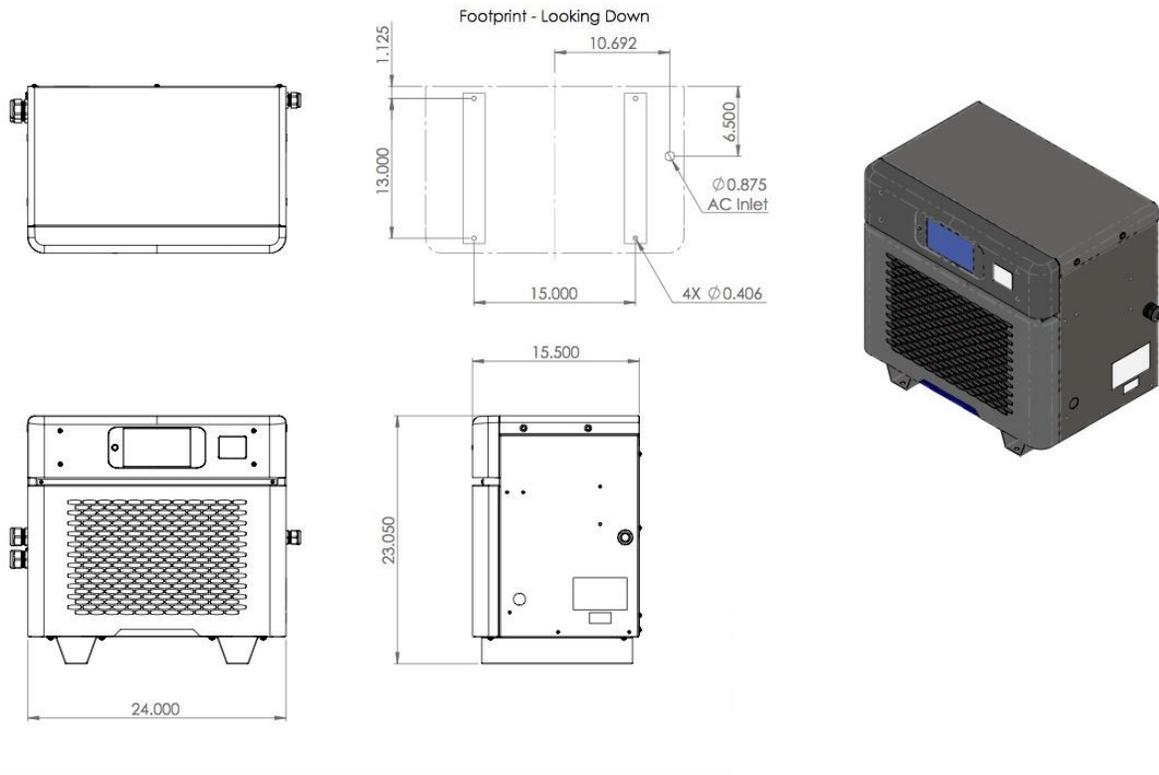
The charger operating conditions are listed in the table below, please ensure that the site operation conditions match the charger operation limits before installing the charger.

Operating Conditions	
Ambient Temperature	0-50°C
Humidity	10-90% RH noncondensing
Cooling	Forced air (fans)

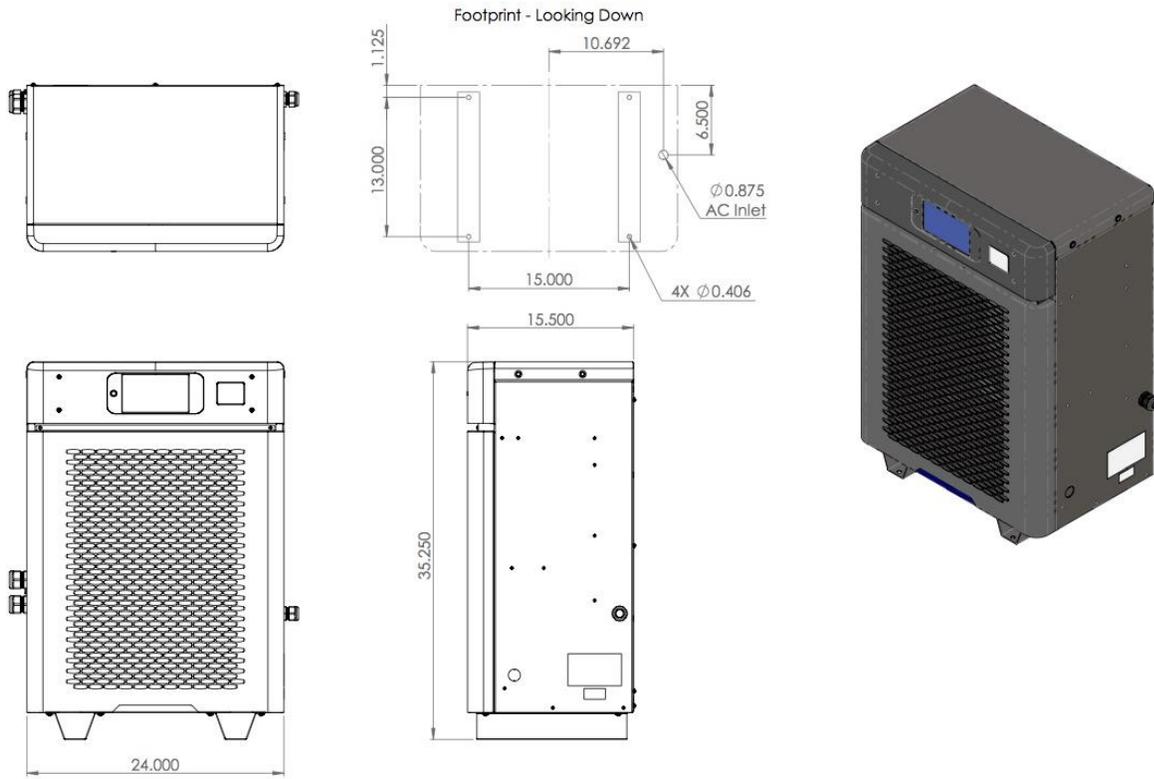
APPENDIX A: FLOOR MOUNTING PATTERN



Quantum Q4 Charger



Quantum Q6 Charger

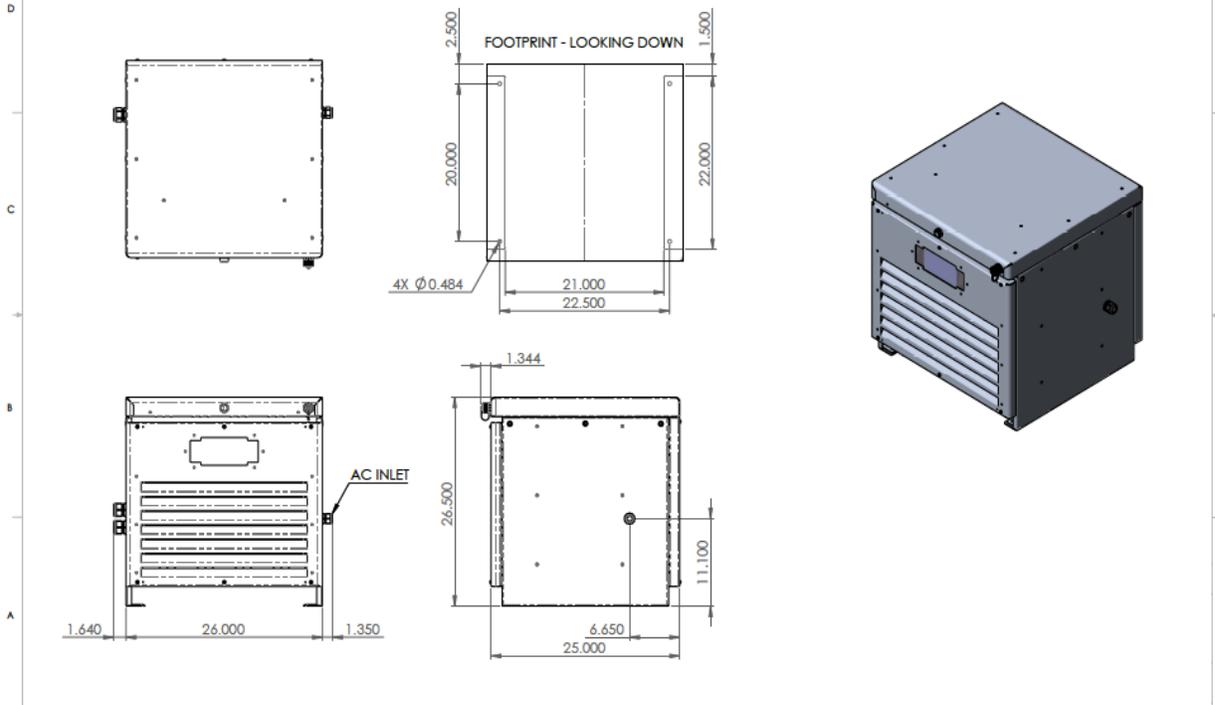


Quantum Q12 Charger

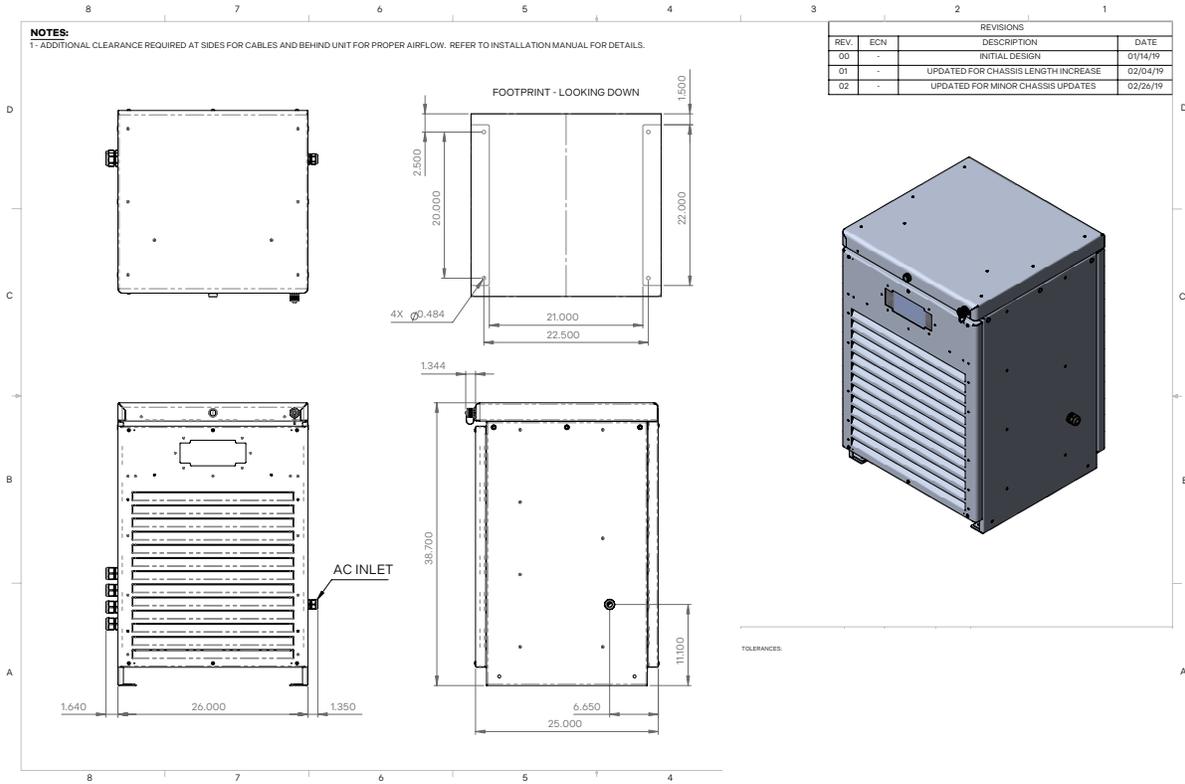
NOTES:

1 - ADDITIONAL CLEARANCE REQUIRED AT SIDES FOR CABLES AND BEHIND UNIT FOR PROPER AIRFLOW. REFER TO INSTALLATION MANUAL FOR DETAILS.

REV.	ECH	DESCRIPTION	DATE
00	-	INITIAL DESIGN	10/27/17
01	-	UPDATED FOR CHASSIS LENGTH INCREASE	02/26/19



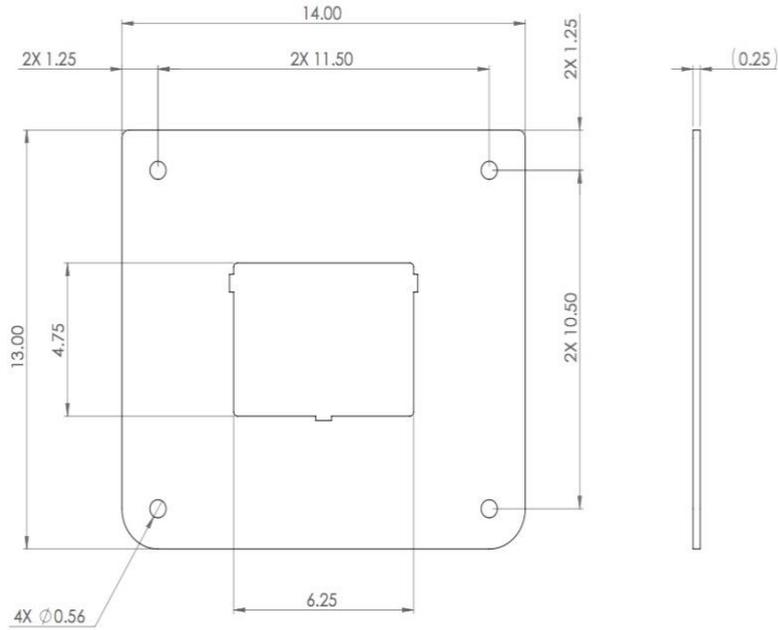
Outdoor/GSE Q6 Charger



Outdoor/GSE Q12 Charger

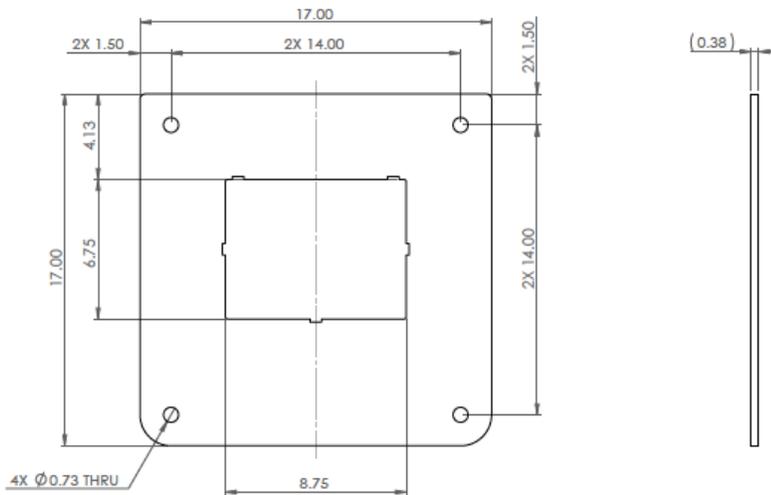
APPENDIX B: FLOOR STAND MOUNTING PATTERN

NOTES:
1 - VIEWS SHOW BASE FOOTPRINT OF STAND.



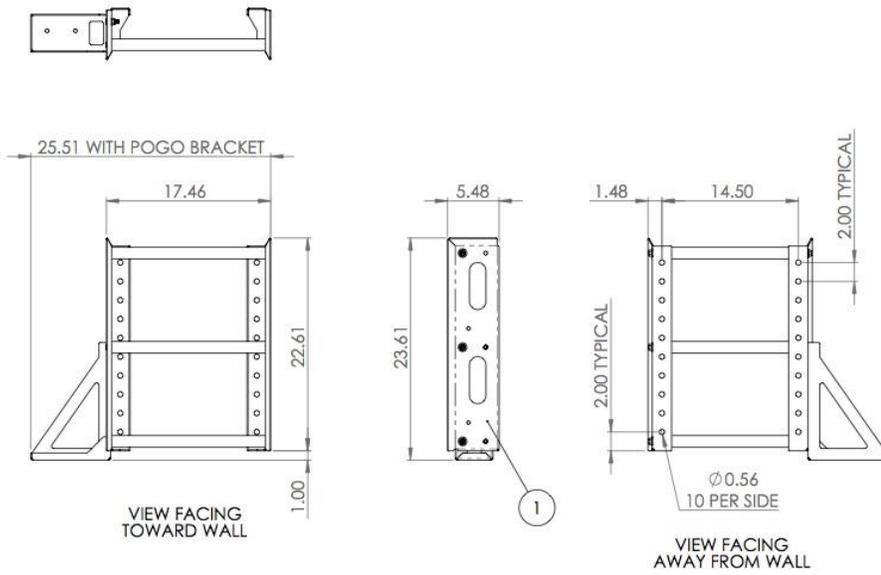
Quantum Charger Floor Stand Mounting Pattern

NOTES:
1 - VIEWS SHOW BASE FOOTPRINT OF STAND.



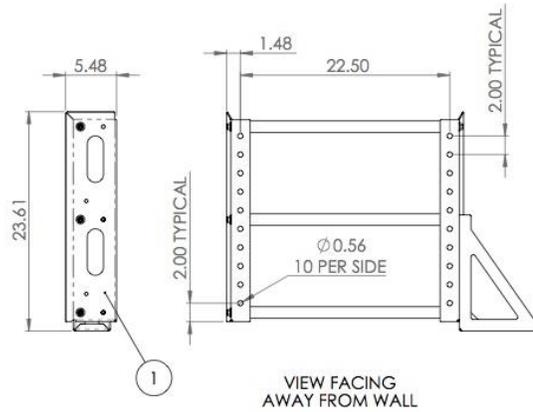
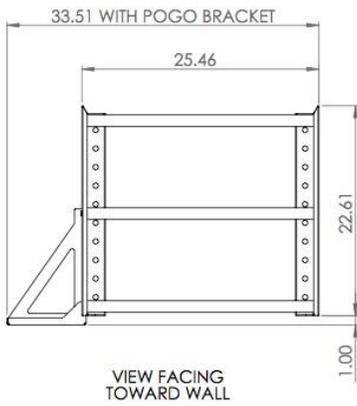
Quantum GSE Charger Floor Stand Mounting Pattern

APPENDIX C: WALL MOUNTING PATTERN



ITEM NO.	PART NUMBER	QTY.
1	ASM 860-00009	1

Quantum Q4 Wall Mount



ITEM NO.	PART NUMBER	QTY.
1	ASM 860-00007	1

Quantum Q6 & Q12 Wall Mount