Heat Exchanger Replacement in a 60kW Bi-Directional Charger

Introduction

The Heat Exchanger in the 60 kW Bi-Directional Charger is a mounted backpack part that is bolted to the back of the charger and wired to charger inside the charger's doors.

To maintain the charger's listing, you must purchase replacement parts for this charger from Pii only and installers must be qualified and trained electricians who install the parts according to these instructions.

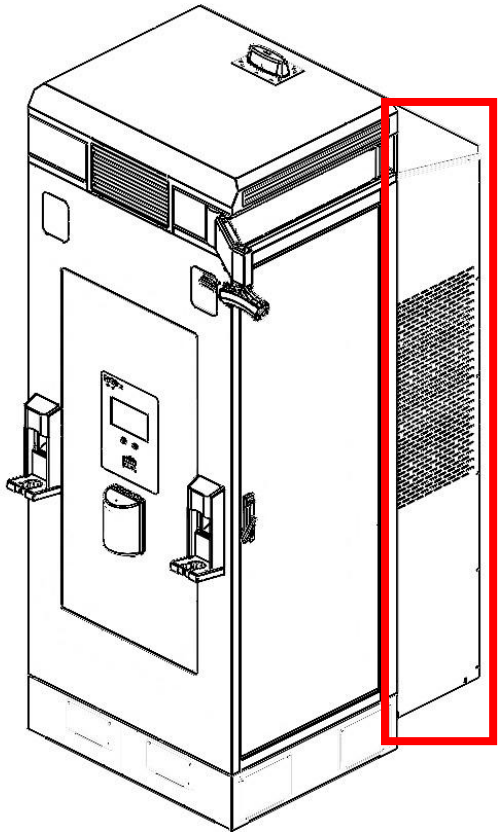

Figure 1: Heat Exchanger (HX) in the 60 kW Bi-Directional Charger is a mounted backpack that is wired inside the cabinet to the charger

CAUTION! Replacement parts used must be purchased from Power Innovations International to maintain the charger's listing.

Replacement Heat Exchanger Part Number

Heat Exchanger Part #	Description	Supported Pii Charger Models
Contact Pii	Heat Exchanger for use in 60 kW Bi-Directional Charger	EVBC6060 (60kW Bi-Direction)

Tools Needed

- PPE
- Headlamp
- Magnetic dish (for fasteners)
- Flathead screwdriver, no more than 5 mm wide
- Phillips screwdriver, 1 gauge
- Drill and Hex-head socket set for M6 hex-head bolts
- Caulk: 832 Dowsil RTV Sealant, Off-white

IMPORTANT SAFETY INSTRUCTIONS – SAVE THESE INSTRUCTIONS

ELECTRICAL WARNINGS – WARNING! RISK OF ELECTRIC SHOCK!

WARNING! RISK OF ELECTRIC SHOCK! ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED SHOULD ADJUST, MODIFY, AND SERVICE THIS EQUIPMENT, WHICH IS REQUIRED TO MAINTAIN THE CHARGER'S INTERTEK LISTING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! SHUT OFF POWER SUPPLY BEFORE BEGINNING INSTALLATION ACTIVITIES OR MAINTENANCE WORK. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! THIS EV QUICK CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

CAUTION! The installer is responsible for conforming to all local and national electrical codes and standards applicable in the jurisdiction this equipment is installed in, including providing suitable wire sizes per NEC for the input configuration.

Notice: Before Beginning Replacement

Note:

1. **Wire/cable count and placement vary, by model number**. Not all connections are specified here, so take note of positioning and be methodical when disassembling. Clear, lighted photographs, from varied angles, and labeling with tape and or Sharpie is recommended.
2. **Take care to keep track of fasteners**. If any fasteners are lost, they must be replaced--or else damage or liability may result.
3. **Avoid cross-threading.** Thread nuts and screws first by hand, then with power tools (if desired), to avoid cross-threading. This may seem minor, but it can have major ramifications if not observed.
4. **Recommissioning the unit is not necessary**, as that process will have been completed in the factory.

Replace Heat Exchanger in 60 kW Bi-Directional Charger

1. Open door, left of screen.

a. Remove padlock, turn key.

b. Pull bottom of handle toward you, then turn toward center of door.

Figure 2 – Main Switch and its removeable handle shown in a fully loaded 60kW Bi-Directional Charger (inside left-side door)

2. De-energize charger:

a. Still inside the left-side door, flip Main Switch at bottom to “Off” position (use extension handle if needed).

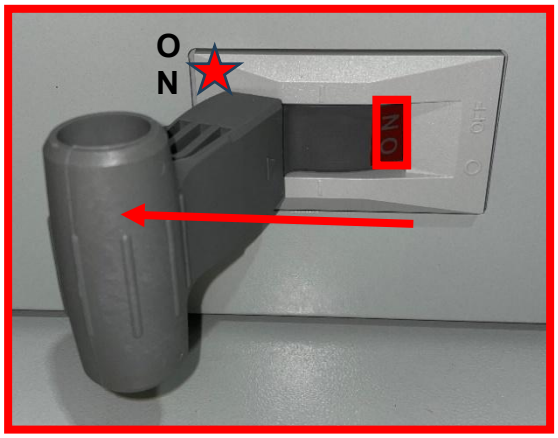

Figure 3 - Main Switch (shown with handle on) in the ON position

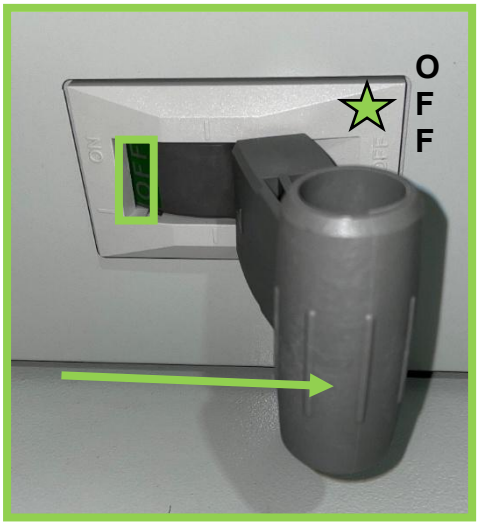

Figure 4 - Main Switch (shown with handle on) in the OFF position

WARNING! RISK OF ELECTRIC SHOCK! THIS EV QUICK CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

b. Open upstream disconnect, if possible. Lock-out-tag-out.

   If not possible, the **input** wires inside the right door coming up from the bottom remain **live**—Do not touch!

   The remainder of the system is without power and can be handled safely.

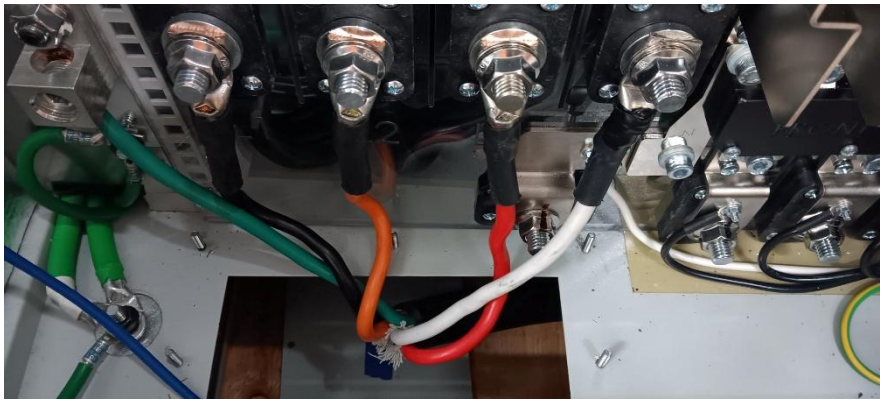

Figure 5 – WARNING! Don't touch Input wires inside right-side door if they are live live

3. Disconnect Heat Exchanger (HX) wires (Figures 6-7).

a. Open the right-side door (right of screen) to access the right side of back wall.
b. On the back wall, locate the 3-wire connector that holds Line (L), Neutral (N), & Ground (PE) wires together and that is screwed into HX or back wall's pass-through opening (Figure 7).
c. Using a short flathead screwdriver, no more than 5mm wide, disconnect the 3-wire connector from the HX or pass-through opening.
d. Close the right-side door.

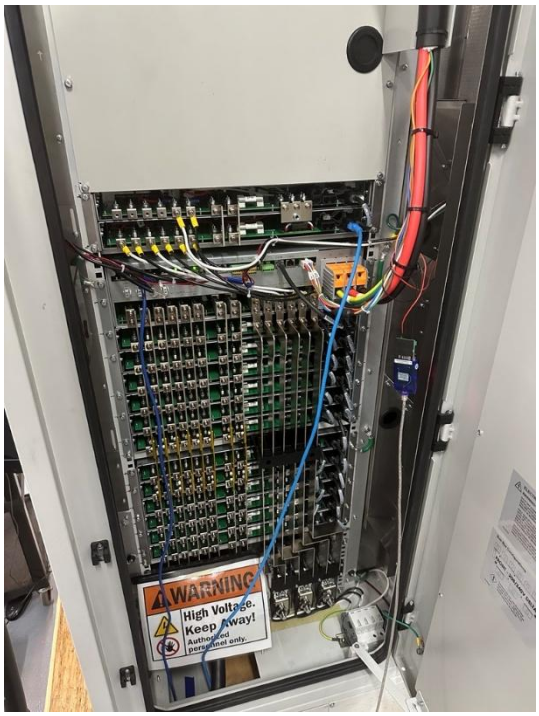

Figure 6: Inside right-side door of a 60 kW Bi-Directional Charger

Figure 7 –Disconnecting Line (L), Neutral (N), & Earth (PE) wires from screw terminal

4. Remove Heat Exchanger (HX).

a. Use a plastic caulk remover to avoid paint loss (and rusting) on charger (Figure 8).
b. Utilize an appropriate and safe lifting device to support the HX unit before removing first of 12 bolts.
c. Use Figure 9 to become familiar with the location of the 12 bolts securing HX to charger's back wall.
d. Open left-side door and use a socket and drill to remove 6 M6 bolts from the left-back wall (Figure 10).
e. Open right-side door and use a socket and drill to remove 6 M6 bolts from the right-back wall (Figure 11).
f. Note location of tapped holes in new HX for location of 12 bolts.
g. Lift away unloaded heat exchanger from charger, placing elsewhere safely.

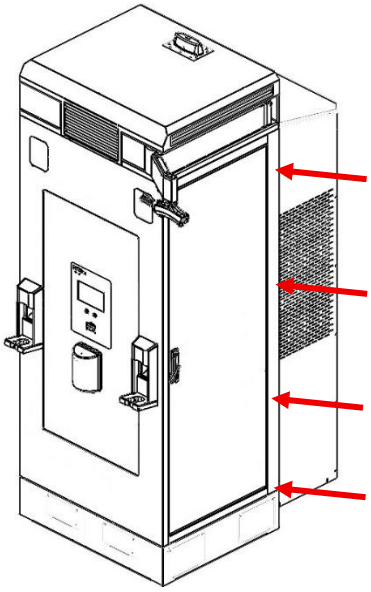

Figure 8 – Use caulk remover in between Charger's back wall and heat exchanger (HX)

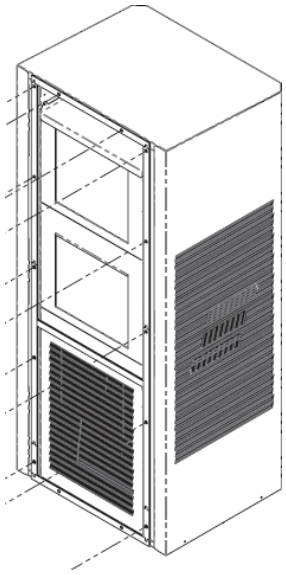

Figure 9 – Twelve Lines protruding from cut-away view of attached HX show location of the 12 M6 bolts securing HX to charger's back wall

Figure 10 – Left-side door grants access to 6 of the 12 M6 bolts that secure HX to charger's back wall

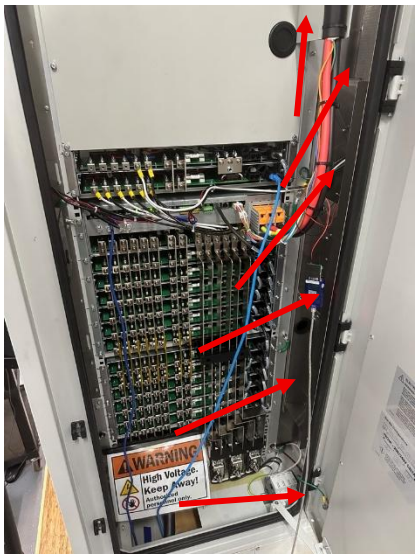

Figure 11 – Right-side door grants access to 6 of the 12 M6 bolts that secure HX to charger's back wall

Figure 12 – Remove heat exchanger from back of charger PLACEHOLDER

5. Install New Heat Exchanger (HX) and wires.

a. Utilize lifting device to move and hold the unit in place.
b. From inside the charger doors, use a socket and drill to install M6 bolts provided into back wall of charger to secure HX to back wall:
    i. Open left-side door and install 6 M6 bolts into left-back wall (Figure 10).
    ii. Open right-side door and install 6 M6 bolts into right-back wall (Figure 11).
c. Inside right-side door and using a short flathead screwdriver, no more than 5mm wide, reconnect the 3-wire connector onto the new HX or pass-through opening to reconnect the L, N, and PE wires (Figure 13) and Tug-test viability of terminations.
d. Close right and left doors.
e. Remove lifting device.
f. Using the following caulk, weather-seal the contact surface between HX and charger (Figure 14): *Caulk: 832 Dowsil RTV Sealant, Off-white*

g. Using the following caulk, weather-seal the contact surface between HX and charger: *Caulk: 832 Dowsil RTV Sealant, Off-white*

Figure 13 – Reconnecting Line (L), Neutral (N), & Earth (PE) wires into screw terminal

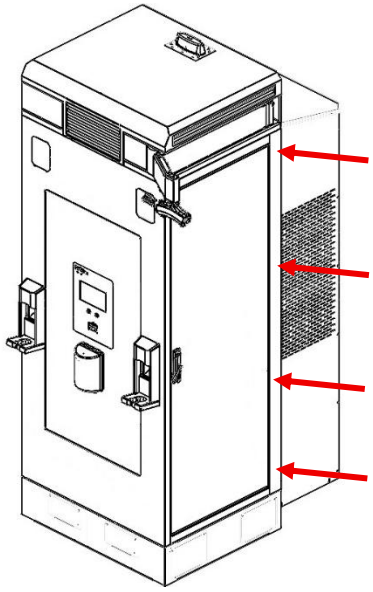

Figure 14 – Re-caulk in between Charger's back wall and heat exchanger (HX)

6. Energize Charger.

a. Restore upstream power (if applicable).
b. Inside left-side door, switch Main Switch to "On" position.
c. Close left-side door and lock both doors.