

The Boldest, Baddest Charging Station on the Planet!

QuadZilla

QuadZilla™ Installation and Operation Guide

Software Version 2.0.1



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UL File # E473741

Product Description

- ◆ QuadZilla is an electric vehicle charging station (EVCS), a category of EVSE charging equipment that is available from LiquidSky Technologies, Inc.
- ◆ QuadZilla will charge any electronic device or vehicle that conforms to the J1772 charging standard, including electric cars, boats, motorcycles, snowmobiles, bicycles, campers, etc.
- ◆ Quadzilla is the world's first quad 80 Amp EVCS. With QuadZilla, you can simultaneously charge 4 electric vehicles (EVs) (e.g., the Tesla Model S) at the highest rate that the J1772 AC standard permits.
- ◆ QuadZilla is designed for tough, all-weather environments and is built inside a Type 4X 316 stainless steel outdoor rated enclosure.
- ◆ QuadZilla requires 208-240 VAC at 50/60 Hz, single phase and four independent, properly fused and/or breakered 100 Amp circuits.
- ◆ QuadZilla comes with four standard 25-foot cables complete with J1772 couplers.
- ◆ QuadZilla is easy to use, virtually plug and play. When plugged in and charging, each front LCD shows the amperage being delivered and duration of the charge by each side of QuadZilla.
- ◆ QuadZilla contains two enclosures that are each accessible through separate keyed doors. Each enclosure contains power cables that can provide power for two J1772 couplers and their attached 25-foot cables.
- ◆ QuadZilla offers optional Automatic Current Share (factory-activated) that automatically transfers available power between the attached devices.
- ◆ QuadZilla is warranted for both commercial and residential use.

About the QuadZilla LCD

On each enclosure door, there are two LCDs that display the operational status of each side of QuadZilla, including the charging duration and the total number of Amps being delivered to the EV at that moment in time. The LCD codes displayed inside the QuadZilla enclosure are visible through the viewing lenses on the cover of the enclosure. (See examples of the QuadZilla LCD codes in [Figure 1](#).) Information displayed on the LCD is color coded with the following meanings:

- ◆ **Green** — indicates the normal operational state.
- ◆ **Blue** — indicates a transitional state occurring when changing operational states.
- ◆ **Red** — indicates an error.



Figure 1. Examples of the QuadZilla LCD Codes

Automatic Current Share

QuadZilla features Automatic Current Share, a factory-activated feature that automatically transfers the power between devices being simultaneously charged. The maximum power that QuadZilla will provide to one or more vehicles at any one time is 80% of the total number of amps made available by connected circuit breakers. If more than one vehicle is being charged simultaneously, QuadZilla provides as much power as each device is able to draw up to a total maximum of available amps. As one vehicle draws less power, the additional available power is provided to other connected devices that are able to draw additional power. For example, if QuadZilla is connected to a 150 amp circuit breakers, 80% of the total power available from those breakers (or 120 amps) will be made available and shared by all connected devices.

The Automatic Current Share feature is available when ordering QuadZilla.

Enclosure Pole Mounting Instructions

The procedure in this section describes how to mount the QuadZilla enclosure to a QuadZilla Pole Mounting Kit. The pole is installed into a concrete base out of which comes enclosure wiring and a conduit (optional). This procedure also describes the installation of the cable management assembly and snow

shield options. The cable management assembly is also visible in [Figure 2](#).

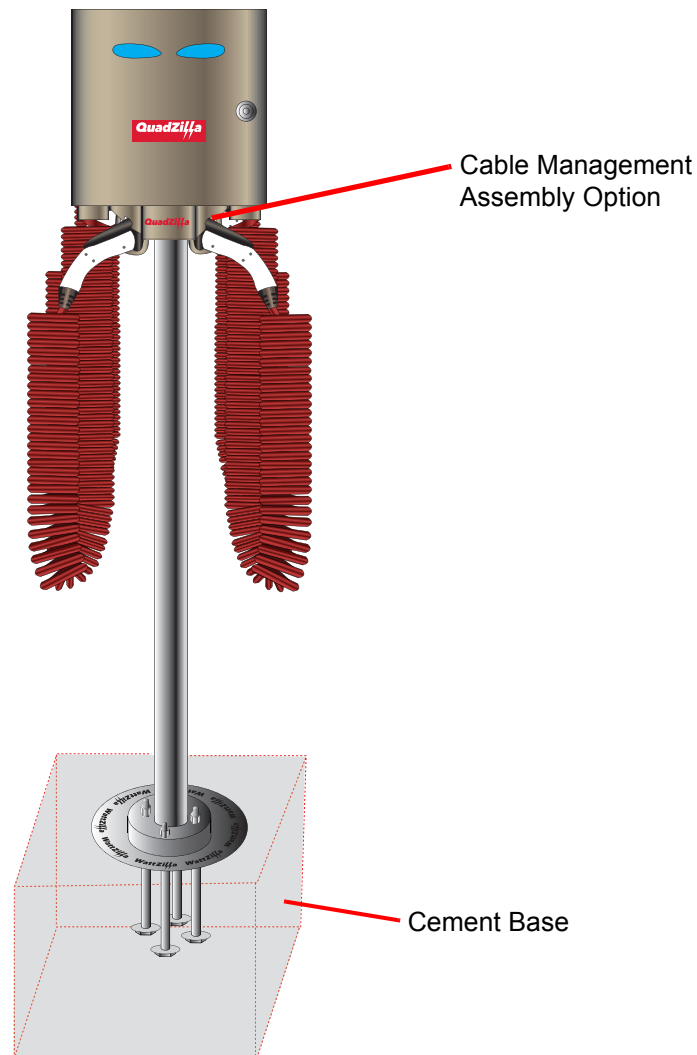


Figure 2. Pole-Mounted QuadZilla

Ensure that the enclosure is mounted in accordance with your local requirements. Consult with your local building inspector for more information.

PREREQUISITES:

- (4) stainless, corrosion-proof, hex anchor bolt (3/4 in.-10 x 7 in.)
- (1) stainless, corrosion-proof, bolt positioning plate
- (1) stainless, corrosion-proof, pole base mounting flange
- (4) stainless, corrosion-proof, 3/4 in. hex nut
- (4) stainless, corrosion-proof, 3/4 in. washer
- (1) 50 in. QuadZilla stainless pole with Myers™ Hub
- (1 tube) room temperature vulcanization (RTV) gasket gel (customer supplied)
- Conduit (2 in.) (e.g., Liquitite or as code requires) (customer-supplied)
- Adequate amount of concrete (or as required by code) to fill a hole at least 12 in. H x 12 in. W x 12 in. D (customer-supplied)

- Screwdriver (customer-supplied)

Procedure: To Pole Mount QuadZilla:

1. Dig a hole a minimum of 12 in. H x 12 in. W x 12 in. D in which to pour a concrete foundation for the pole. Optionally, prepare a concrete form in the hole to contain and form the concrete. Insert the conduit into the center of the hole and route a minimum of five feet of the necessary electrical wires through it ([Figure 3](#)). For more information about wiring, please see [“QuadZilla Electrical Wiring Instructions”](#) (page 10).

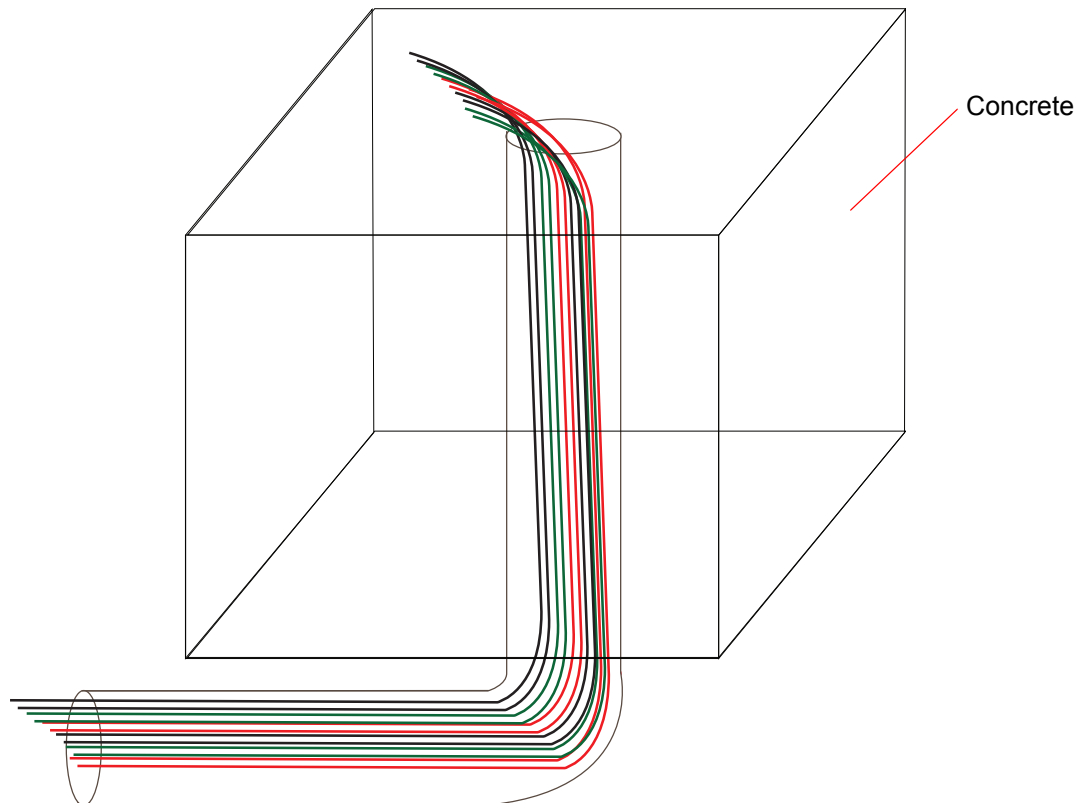


Figure 3. Concrete Base with Conduit and Wiring

2. Insert a washer onto each of the four hex anchor bolts ([Figure 4](#)).

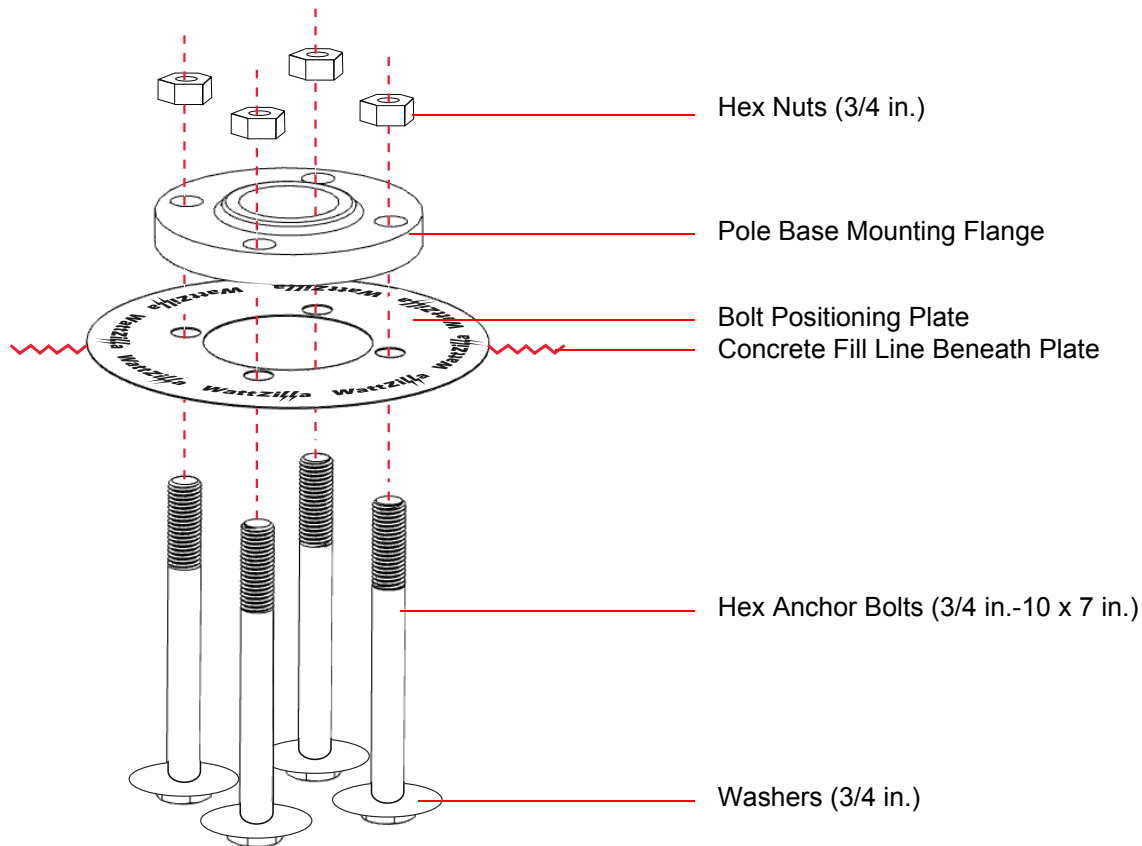


Figure 4. Pole Base Subassembly



Note: Do not remove the protective covering on the top of the bolt positioning plate (where the name *QuadZilla* appears) until the concrete is dry to ensure that no concrete or other debris soils the plate.

3. Insert and screw the hex anchor bolts (with the attached washers) to the bottom of the bolt positioning plate, leaving 1.5 inches of thread above the plate ([Figure 5](#)). (The name *WattZilla* appears on the top of the pole positioning plate, and the threaded ends of the hex anchor bolts are located above the top of the plate.)
4. Route the wiring through a conduit and up through the center of the bolt positioning plate ([Figure 5](#)). Starting from the top of the bolt positioning plate, a minimum five feet of electrical wiring should be available for wiring to the QuadZilla enclosure.

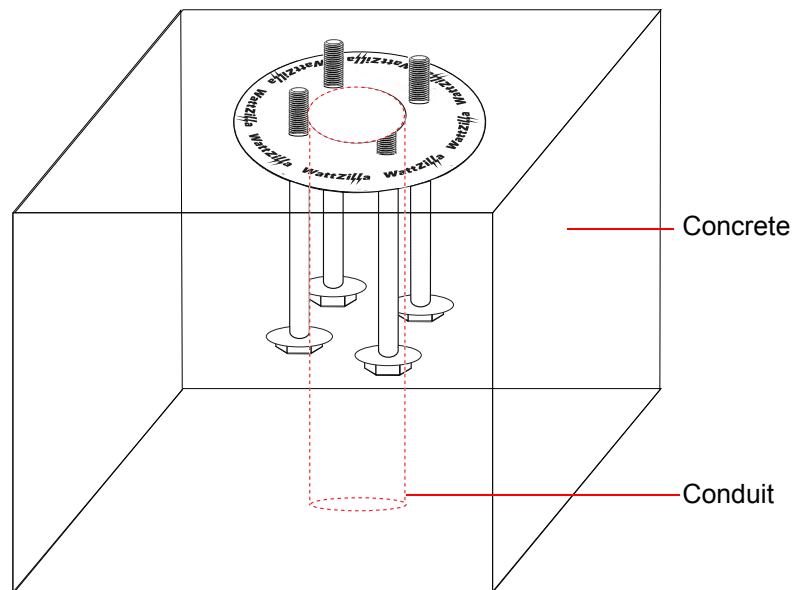


Figure 5. Pole Base Subassembly in Concrete Base



Note: Avoid getting any concrete inside the conduit!



Note: It may be necessary to use rebar to reinforce the concrete and to provide a support for the pole base subassembly to prevent it from sinking below the surface of the concrete.

5. Pour an adequate amount of concrete to fill the hole or use the amount required by local codes, making sure to route the concrete around the conduit ([Figure 5](#)).



Note: Avoid getting any concrete onto the bolt positioning plate! Leave the protective cover on the plate until the concrete is dry!

6. Immerse the bolts into the center of the concrete with the top side of the bolt positioning plate facing up, ensuring that the bolt positioning plate is located on the top surface of the concrete ([Figure 5](#)).
Ensure that no concrete covers the bolt positioning plate or the bolts above the plate, and ensure that the plate is level so that when the pole is installed later in this procedure, it stands straight. The washers should be located on top of the bolt heads as shown.
7. Allow enough time for the concrete to harden.

8. Slide the pole base mounting flange over the bolt positioning plate (reference [Figure 4](#)).
9. Using a wrench, attach and adequately tighten and torque a hex nut onto each of the threaded ends of the hex anchor bolts extending out of the flange (reference [Figure 4](#)).
10. Snake a minimum of five feet of wiring through the bottom end of the pole, exposing about 1 foot or more of wiring through the top of the pole. Since the wires will power both sides of QuadZilla, ensure that two red wires, two green wires, and two black wires are threaded through each side of the Y pipe as indicated in [Figure 6](#).
11. Place the threaded end of the pole (bottom of the pole) into the flange that is located at the top of the pole base subassembly that is embedded in the hardened concrete ([Figure 6](#)). Then wrap a piece of protective cloth or tape around the nut on the Myers hub (located at the top of the pole), and place the open end of a wrench over the covered nut. Carefully turn the nut clockwise to securely attach the pole to the flange. Be careful not to strip the threads when attaching the pole to the flange.

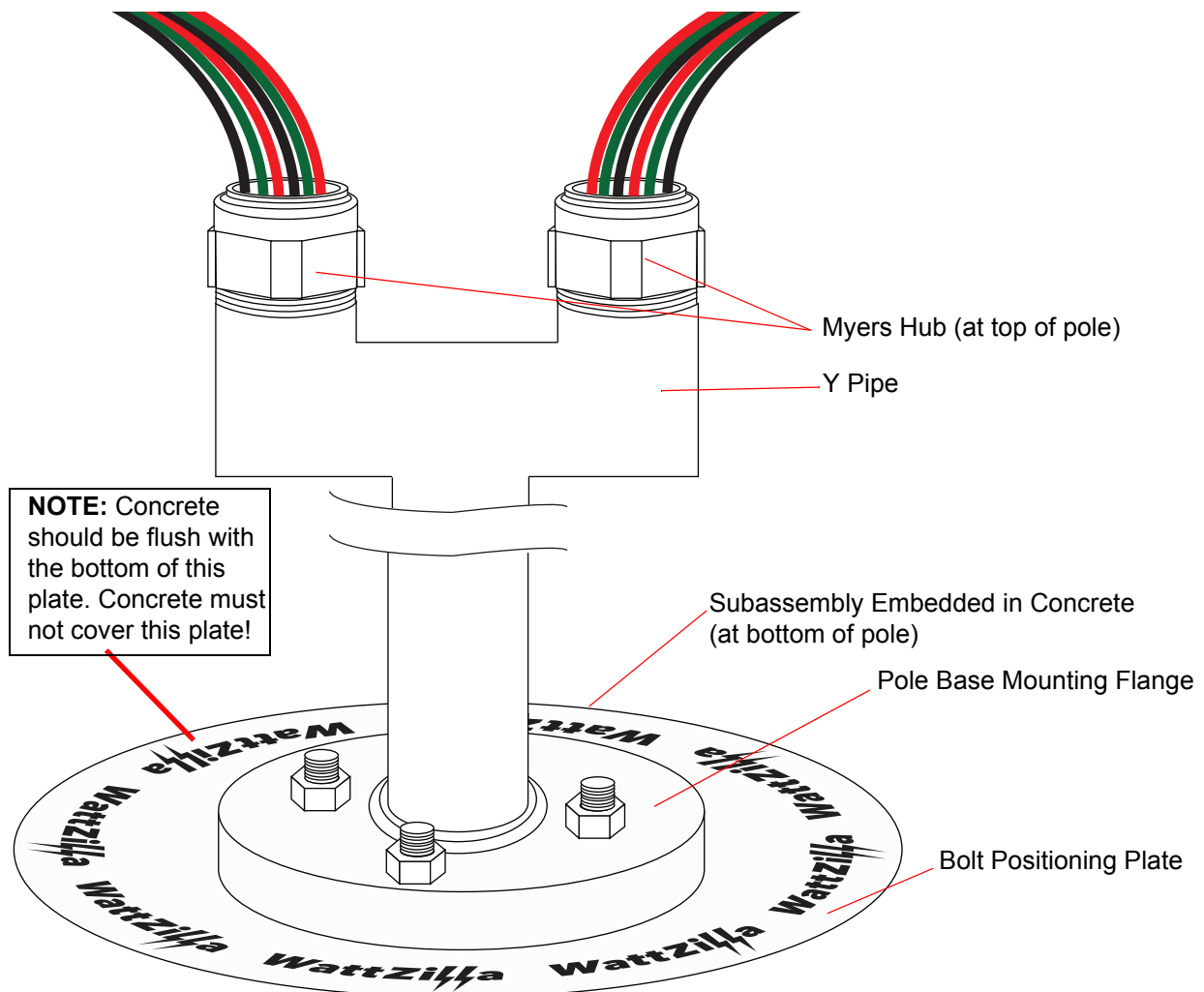


Figure 6. Attaching the Pole to the Base Subassembly

12. (Optional) Slide a cable management assembly onto each side of the Y pipe and rest it on top of the Myers hub ([Figure 7](#)).

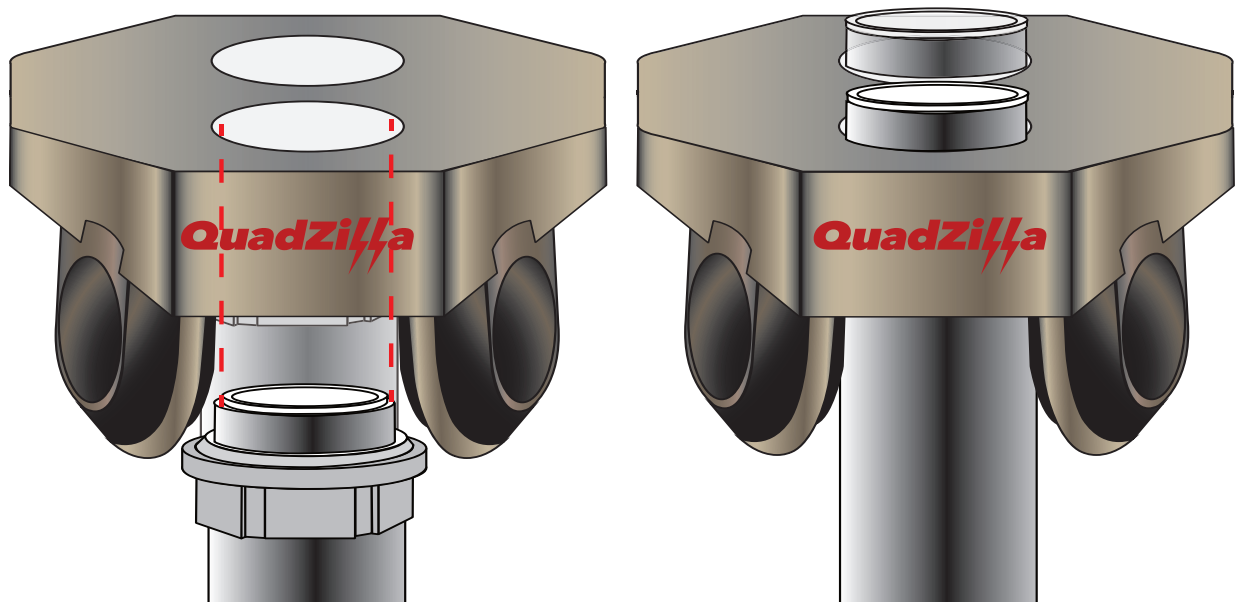


Figure 7. Attaching the QuadZilla Cable Management Assembly Onto the Pole

13. (Optional) In a similar manner, slide a snow shield assembly over each side of the Y pipe and rest it on top of the cable management assembly or hub (not shown).
14. Optionally, apply RTV gel to the blue gasket on the top of each Myers hub.
15. Lower the QuadZilla enclosure onto the top of the Myers hub ([Figure 8](#)).

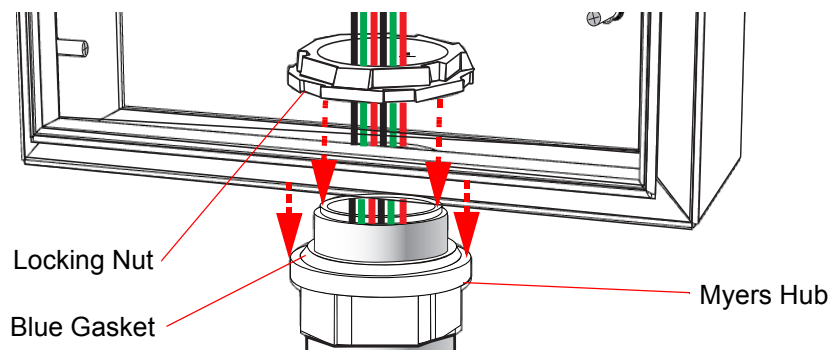


Figure 8. Attaching the QuadZilla Enclosure Onto the Pole

16. While one person holds the enclosure, inside the QuadZilla enclosure the other person should insert, tighten and torque a locking nut onto the top of each Myers hub to securely attach both sides of the enclosure to the pole.
17. Once mounted, maintain water tightness of the enclosure by applying RTV silicone on and around each mounting screw.
18. Proceed to [“QuadZilla Electrical Wiring Instructions”](#) (page 10).

QuadZilla Electrical Wiring Instructions

QuadZilla can be installed by any competent electrician using the following straightforward instructions. Either mount the QuadZilla enclosure onto a pole (using the optional pole mounting kit) or on a level plywood surface as described previously.



Warning: Use COPPER wire only for wiring this device! Do not use aluminum wire!
IF WIRING OF THIS DEVICE IS DONE WITH ANY MATERIAL OTHER THAN COPPER, THE WARRANTY IS VOID!

DO NOT USE ALUMINUM WIRE!

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Procedure: To Wire QuadZilla:

1. Insert a hex wrench into the door latch and turning the tool counter clockwise until it stops at the open position ([Figure 9](#)). Open the QuadZilla enclosure door.

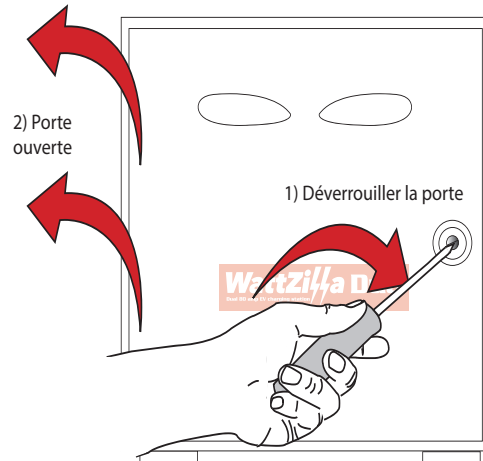


Figure 9. Opening the QuadZilla Enclosure

2. After the unit is mounted, route four hot lead number 2 copper wires and two number 6 copper ground wires through each end of the Y pipe and the two-inch metal liquid tight connectors located at the bottom of each QuadZilla enclosure.
3. (In this step, if your unit is equipped with Curtis Albright electrical contactors, refer to [Figure 10](#). If your unit is equipped with GE electrical contactors, refer to [Figure 11](#).) In each enclosure, connect the two hot leads from a 100 Amp breakered circuit to L1 and L2 on the left contactor. Then do the same with a second 100 Amp breakered circuit to L1 and L2 on the right contactor. To attach the power wire

to L1 and L2, insert the wire from beneath the contactor as shown in [Figure 10](#) and [Figure 11](#). Then use a hex wrench to torque each nut to secure each wire into place.

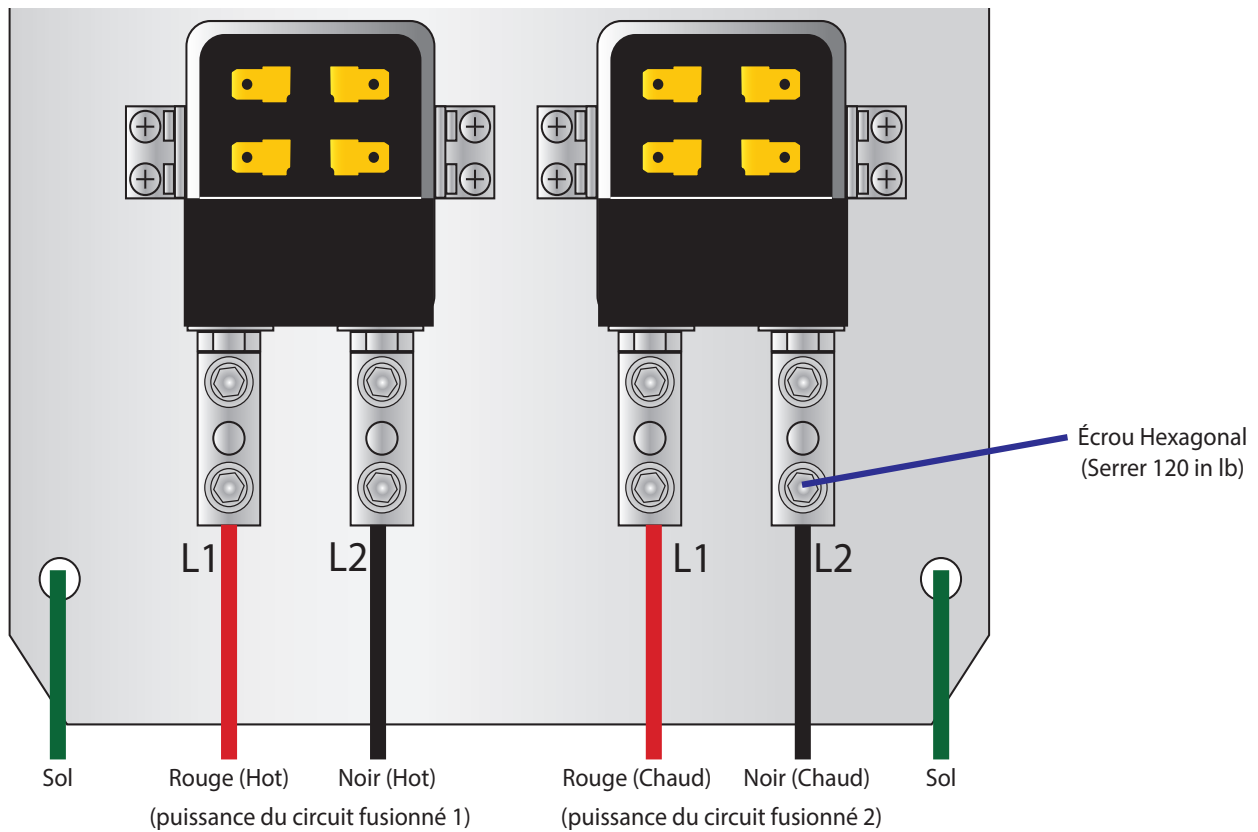


Figure 10. Wiring QuadZilla Equipped with Curtis Albright Contactors

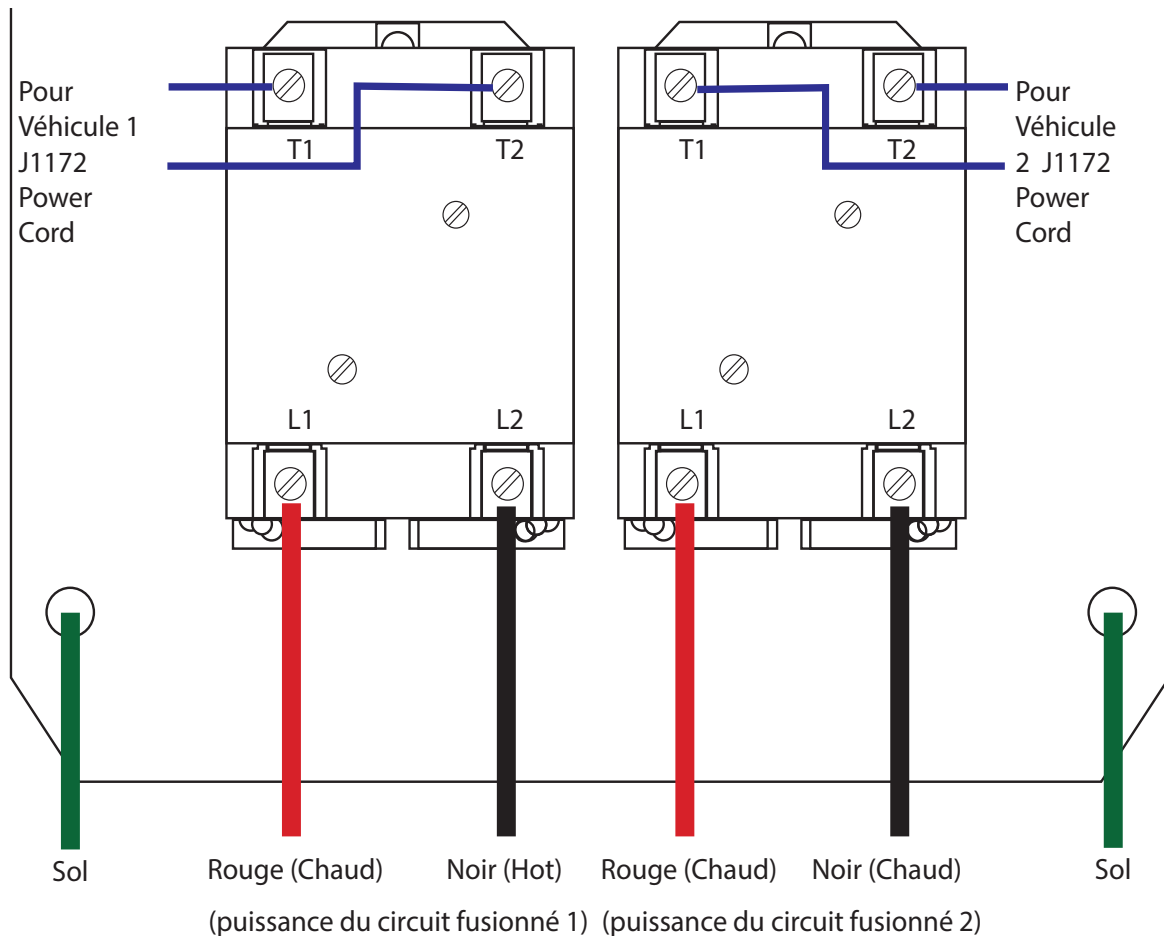


Figure 11. Wiring QuadZilla Equipped with GE Contactors (Alternate)

4. Connect the ground wires to the grounding studs located behind the electrical contactors (see [Figure 11](#)). The bolts connecting the QuadZilla enclosure to studs are the grounding studs.
5. After completing the internal power hook-up, close each QuadZilla enclosure door and lock them by inserting the wrench into each door latch and turning it counterclockwise until it stops at the closed position. Ensure that each enclosure door is secure.
6. Apply power to the electrical wires.
7. Upon application of power, “ready” should appear on each LCD display.

Operating QuadZilla

The following procedure explains how to use QuadZilla to charge an EV.



Warning: Before connecting QuadZilla to a vehicle, ensure that the vehicle is J1772 compatible, or the vehicle is supplied with an adapter (such as those provided by Tesla) to allow the unit to charge the vehicle.



Note: For information on codes or other information displayed on the LCD, please reference [“Interpreting LCD Codes” \(page 13\)](#) and [“Troubleshooting Error Codes” \(page 14\)](#).

Procedure: To Charge a Vehicle Using QuadZilla:

1. Plug the coupler into the vehicle’s charging port. An audible bang indicates that the GFI circuit test is completed and QuadZilla has uncoupled the electrical connector to allow for charging.
2. The QuadZilla LCD should display **charging**.



Warning: If there is a fault, the display will turn red and display the fault. Remove the coupler and correct the fault before reinserting the coupler.

3. To determine charging duration, please follow the charging times recommended by the manufacturer of your vehicle.

Interpreting LCD Codes

Please refer to the [Table 1](#) for interpreting the LCD information displayed on the QuadZilla LCD. For an understanding of error codes, please see the next section, [“Troubleshooting Error Codes” \(page 14\)](#).”

Table 1. LCD Codes and Meanings

LCD Display (Position)	Meaning
Ready (top line, left side)	QuadZilla is ready.
Charging (top line, left side)	QuadZilla is ready to charge or is charging.
Error (top line, left side)	QuadZilla has detected an error.
Stopped (top line, left side)	QuadZilla has been stopped.
Waiting (top line, left side)	QuadZilla is waiting for a timer.
Sleeping (top line, left side)	QuadZilla is sleeping.

Table 1. LCD Codes and Meanings (continued)

LCD Display (Position)	Meaning
L2:80A (top line, right side)	The meaning of these two default fields are defined here: <ul style="list-style-type: none"> • L2 — when in Ready state, this field indicates that there is 240V input voltage. • 80A — specifies the maximum allowed current by QuadZilla (e.g., 80A). Note: This information is displayed only when the state on the top line, left side of the LCD is Ready, Charging, Error, Stopped, Waiting or Sleeping .
EV State and Current Charging Session (bottom line)	Specifies one of the states of the EV and the current charging session: <ul style="list-style-type: none"> • EV Not Connected — the EV is not connected to QuadZilla. • EV Connected — the EV is connected to QuadZilla. Note: This information is displayed only when the state on the top line, left side of the LCD is Ready, Charging, Error, Stopped, Waiting or Sleeping .
Elapsed Time (bottom line, left side)	When QuadZilla is in the Charging state, the elapsed time since starting the charging session is displayed in the format hh:mm:ss (where hh is hours, mm is minutes and ss is seconds) (e.g., 00:03:08).

Troubleshooting Error Codes

Reference [Table 2](#) for a list and description of LCD error codes and corrective actions.

Table 2. Troubleshooting LCD Error Codes

LCD Error Code	Meaning	Corrective Action(s)
Errors During Power On Self Test		
Earth Ground Test Failed	QuadZilla could not detect a ground connection.	Check ground connections and AC_Test lines.
GFCI Self Test Failed	QuadZilla did not detect a ground fault circuit interrupt (GFCI) fault during test.	Check GFCI CT and self test coil.
Stuck Relay Test Failed	QuadZilla read AC voltage before relays were closed.	Check relay and AC_Test lines.
Operating-Time Errors		
GFCI Fault	QuadZilla detected a ground leakage of > 20ma.	QuadZilla will retry charging after 15 minutes up to 4 times.
No Diode	QuadZilla did not detect the J1772 vehicle diode.	N/A
No Ground	QuadZilla lost connection to ground.	Check grounds and AC_Test lines.

Safety Standards

QuadZilla complies with all the safety features required (and a few more) by standards documents for EV charging from standard SAE J1772, NEC and UL, including:

- ◆ UL2251 Standard for Plugs, Receptacles and Couplers for Electric Vehicles
- ◆ UL2231 Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits
- ◆ SAE J1772™ Electric Vehicle Conductive Charge Coupler Standard
- ◆ NEC Article 625 Electric Vehicle Charging System Equipment
- ◆ Others

Power Interlock

QuadZilla includes an interlock that de-energizes the EV connector and cable whenever the electrical connector is uncoupled from the EV (NEC 625.18).

Pilot Signal

QuadZilla supports the SAE J1772 pilot signal that automatically de-energizes the cable conductors and EV connector upon exposure to strain that could result in either cable rupture or separation of the cable from the electric connector and exposure of live parts (NEC 625.19) (SAE J1772).

Self-Test

QuadZilla performs a self-test during start up to ensure the unit is working properly and safely. Upon power-up and/or at the time of charging, QuadZilla performs some or all (depending on state) of these self-test checks:

- ◆ GFCI fault detection checks for missing ground by responding to a 20mA ground fault condition
- ◆ Test for missing ground
- ◆ Test of the welded relay contact monitor circuit
- ◆ Other tests

Ground Monitoring

QuadZilla checks ground upon power-up and constantly monitors for the presence of a proper safety ground. (SAE J1772)

Ground Fault Interrupt

QuadZilla includes mandatory ground fault interruption with a 20ma trip in all models available for protection against electric shock of personnel. (NEC 625.22) (SAE J1772) (UL 2231)

After each GFCI event, QuadZilla will retry charging up to 4 times after a 15-second delay per event. (UL 2231)

Stuck Relay Detection

QuadZilla checks relay contacts every time it starts to charge to ensure relays are functioning properly and providing proper power interlock.

EV Identification

QuadZilla verifies the pilot signal integrity by checking the EV diode. The pilot signal must be at BOTH the correct resistance AND pass the “diode check” to activate the circuit. (SAE J1772)



Note: This safety feature is commonly left out of many other commercial charging stations.

Ventilation Required

QuadZilla checks for the EV ventilation required request. QuadZilla will deny charging if ventilation is not available or allow charging if the charging station is equipped to activate ventilation. (SAE J1772)



Note: This safety feature is commonly left out of many other commercial charging stations or implemented with a warning label only.

Warnings and Notes

Please heed these warnings and notes.



Warning: Adult supervision is required when building, operating, servicing or inspecting.



Warning: Installation of an EV charging station requires wiring Alternating Current (AC) components that will be exposed to voltages from 100 to 250v. If you do not have the experience and knowledge required to safely work with AC voltages please consult with an experienced electrician for assistance and inspection of your work.



Warning: Do not install QuadZilla near flammable, explosive, or combustible materials. Do not locate or store flammable, explosive, or combustible materials near the charging station.



Warning: Do not operate the QuadZilla with a visibly damaged cable or if the enclosure or connector is broken, open, cracked, or shows any other signs of damage.



Note: Regularly inspect your QuadZilla. Pay special attention to excess heat.



Note: Important always disconnect your charging station from power before performing an inspection and/or maintenance.

About LiquidSky Technologies

LiquidSky Technologies, Inc. is a high technology company engaged in the design of state of the art products in the power industry.

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Published April 24, 2017. Printed in United States of America

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