

The Boldest, Baddest Charging Stations on the Planet!

WattZilla

WallWattz

UL-Listed EVSE for Home

WallWattz™ Installation and Operation Guide

Software Version 2.0.1 and higher



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UL File # E473741

Product Description

- ◆ WallWattz is a Level 2 electric vehicle charging station (EVCS), a category of EVSE charging equipment that is available from LiquidSky Technologies, Inc.
- ◆ WallWattz will charge any electronic device or vehicle that conforms to the J1772 charging standard, including electric cars, boats, motorcycles, snowmobiles, bicycles, campers, etc.
- ◆ WallWattz is a wall-mounted J1772 charger available in three models:
 - ❖ WallWattz Model 40 requires one independent, properly fused and/or breakered 50 Amp circuit that can be plugged into a 240 VAC outlet 14-50R.
 - ❖ WallWattz Model 48 requires one independent, properly fused and/or breakered 60 Amp circuit that can be plugged into a 240 VAC outlet 14-60R.
 - ❖ WallWattz Model 75 requires one independent, properly fused and/or breakered 100 Amp circuit that features a six-foot wire (whip) that can be directly wired directly into an electrical panel.
- ◆ WallWattz requires 208-240 VAC at 50/60 Hz, single phase. It requires a single independent, properly fused and/or breakered circuit.



Figure 1. WallWattz (Pictured with Cable Management System)

- ◆ WallWattz comes with a J1772 coupler as well as a standard 25-foot black (or an optional red coiled cable) charging cable and a 6-foot power cable.
- ◆ WallWattz is easy to use, virtually plug and play. When plugged in and charging, the front LCD shows the amperage being delivered, the duration of the charge and other information.
- ◆ WallWattz offers an optional cable management assembly to organize the cables and protect the J1772 coupler.

- ◆ WallWattz has a small yet elegant footprint that makes it ideal for use in a crowded space like a garage.
- ◆ WallWattz is designed for tough, all-weather indoor/outdoor (optional) environments, enclosed inside a Type 4X 316 Stainless Steel (optional) outdoor rated enclosure or a Type 1 indoor rated enclosure (standard).
- ◆ WallWattz can be quickly and easily installed securely to any wall.
- ◆ WallWattz is warrantied for residential use only.

About the WallWattz LCD

The multi-color LCD displays the operational status of WallWattz, 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 WallWattz enclosure are visible through the scratch-resistant viewing lens on the cover of the enclosure. (See examples of the WallWattz LCD codes in [Figure 2](#).) 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 2. Examples of the WallWattz LCD Codes

Enclosure Wall Mounting Instructions

The procedure in this section describes how to wall mount either the WallWattz enclosure. You can either wall mount the enclosure directly to a single wall stud or to plywood that attaches to at least two wall studs.



Note: When installing onto a single stud, two people are needed to install the enclosure.

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

PREREQUISITES:

- WallWattz wall mounting template

- Plywood (customer supplied), 18 in. W x 16 in. H, 1/2 in. thick (or larger)
- (6) 2-4 SS corrosion-proof Phillips lag screws
- Stud finder (as necessary), screwdriver, level, plaster and paint (customer supplied)



Note: Two people are necessary to perform this procedure.

1. Choose the appropriate installation method, and then proceed to the next step for detailed instructions (reference [Figure 3](#)):
 - a. **Plywood Wall Mounting** — (Preferred Method) Attach plywood to at least two wall studs, and then mount the enclosure onto the plywood.
 - b. **Single Stud Wall Mounting** — Using the two center holes of the enclosure, mount the enclosure directly to a single wall stud.

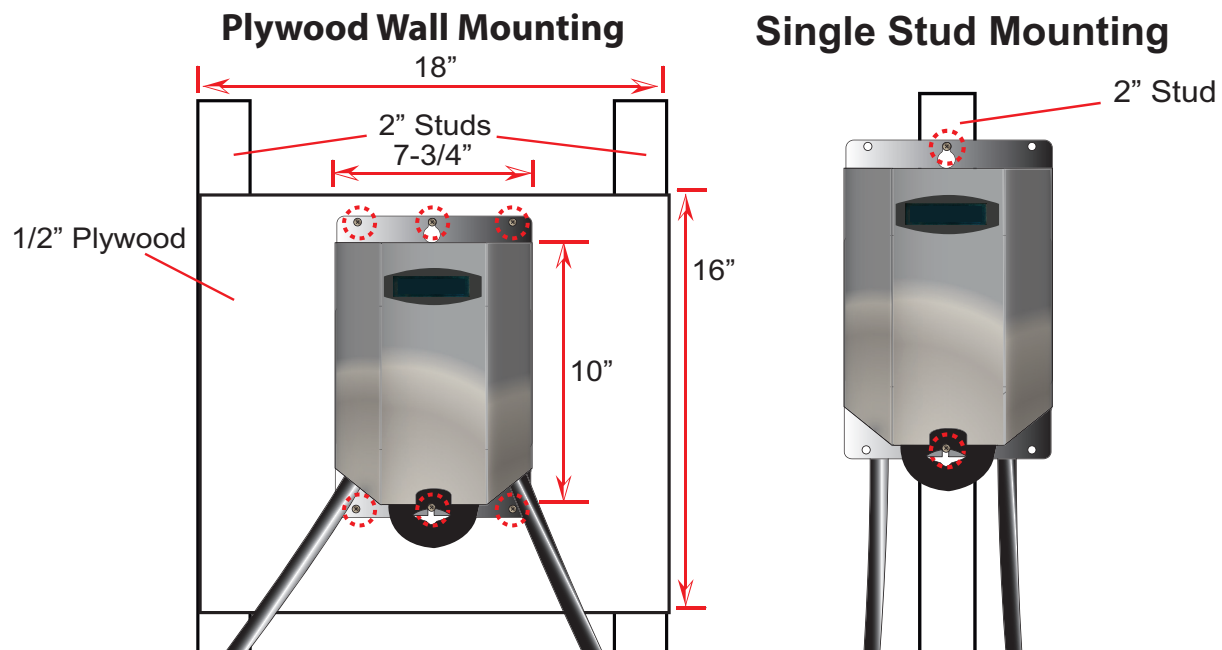


Figure 3. WallWattz Wall Mounting Options

2. For plywood wall mounting, follow these steps:
 - a. Locate two studs into which to install the plywood.

- b. Identify and mark an installation area on the drywall between the outer edge of each stud that matches the size of the plywood (at least 18 in. W x 16 in. H) ([Figure 4](#)). Then cut out that area of the drywall.

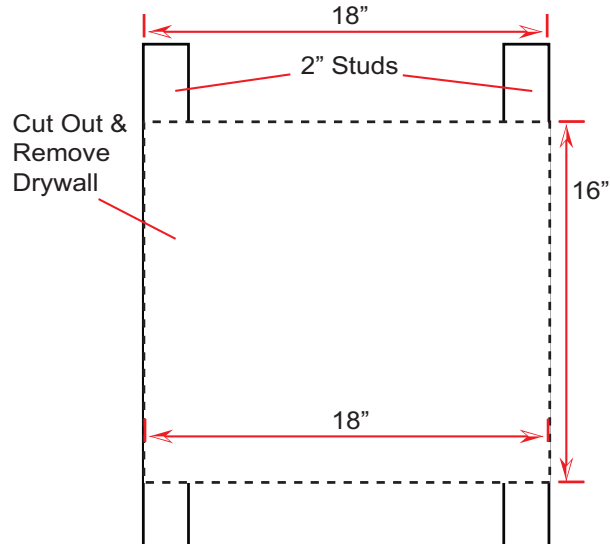


Figure 4. Preparing Mounting Surface for Plywood Wall Mounting

- c. Securely attach the plywood to the mounting surface, ensuring that the plywood is attached to at least two wall studs.
- d. As necessary, refinish the plywood with plaster, and when dry, paint the finished surface.
3. Tape the wall mounting template ([Figure 5](#)) against the mounting surface location (either the plywood or a wall stud) at a height that complies with local requirements. Each hole for a screw is marked with a red crosshair in the illustration. Mark the center of each crosshair on the wall as directed in the following instructions in the steps below.

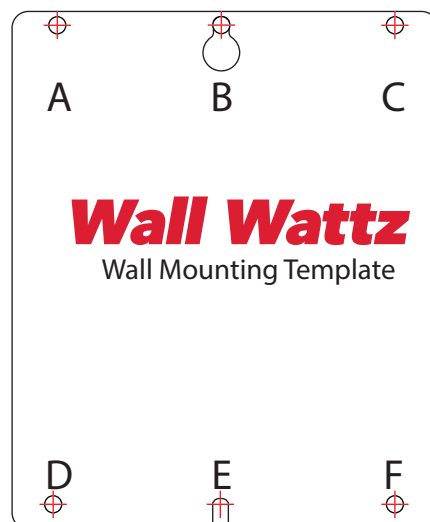


Figure 5. WallWattz Wall Mounting Template - Enclosure Mounting Holes

4. In each location where there is a crosshair, mark the hole on the wall mounting surface ([Figure 5](#)).
5. For single stud wall mounting, only mark the crosshairs for holes B and E. When marking hole locations on the plywood, ensure that marked holes A, B and C are level.
6. Remove the mounting template.
7. Proceed to either step 8 (plywood wall mounting) or step 9 (single stud wall mounting).
8. **For plywood wall mounting:**
 - a. Use a screwdriver to install a lag screw into the pear-shaped B hole, leaving 1/8 in. of the screw exposed.
 - b. While one person lifts and places the WallWattz enclosure against the plywood surface over the exposed screw in hole B, the other person should use a screwdriver to hand tighten the screw in hole B.
 - c. Make sure that holes A, B and C on the enclosure are level.
 - d. Install and tighten a lag screw into the top of the slotted E hole as marked on the template guide.
 - e. Make sure that holes A, B and C on the enclosure are level.
 - f. Install and tighten a lag screw into holes A, C, D and F.
 - g. Tighten all screws fully as necessary to secure the installation.
9. **For single stud wall mounting:**
 - a. Use a screwdriver to install a lag screw into the pear-shaped B hole, leaving 1/8 in. of the screw exposed.
 - b. One person must lift and place the WallWattz enclosure against the wall stud over crosshair marks for holes B and E of the enclosure ([Figure 5](#)).
 - c. Make sure that holes A, B and C on the enclosure are level.
 - d. Using a screwdriver, the other person should hand tighten the screw in hole B.
 - e. Make sure that holes A, B and C on the enclosure are level.
 - f. Install and tighten a lag screw into the top of the slotted E hole as marked on the template guide.
 - g. Tighten all screws fully as necessary to secure the installation.
10. Plug the WallWattz into a properly grounded 240v 14-50R (Model WallWattz 40) or 14-60R electrical wall outlet (Model WallWattz 48).

Operating WallWattz

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



Warning: Before connecting WallWattz 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” \(page 7\)](#) and [“Troubleshooting Error Codes” \(page 8\)](#).

To Charge a Vehicle Using WallWattz:

1. Plug the J1772 coupler into the vehicle’s charging port. An audible bang indicates that the GFI circuit test is completed and WallWattz has uncoupled the electrical connector to allow for charging.
2. The WallWattz 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 WallWattz LCD. For an understanding of error codes, please see the next section, [“Troubleshooting Error Codes” \(page 8\)](#).”

Table 1. LCD Codes and Meanings

LCD Display (Position)	Meaning
Ready (top line, left side)	WallWattz is ready.
Charging (top line, left side)	WallWattz is ready to charge or is charging.
Error (top line, left side)	WallWattz has detected an error.
Stopped (top line, left side)	WallWattz has been stopped.
Waiting (top line, left side)	WallWattz is waiting for a timer.
Sleeping (top line, left side)	WallWattz 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 WallWattz (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 WallWattz. • EV Connected — the EV is connected to WallWattz. 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 WallWattz 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	WallWattz could not detect a ground connection.	Check ground connections and AC_Test lines.
GFCI Self Test Failed	WallWattz did not detect a ground fault circuit interrupt (GFCI) fault during test.	Check GFCI CT and self test coil.
Stuck Relay Test Failed	WallWattz read AC voltage before relays were closed.	Check relay and AC_Test lines.
Operating-Time Errors		
GFCI Fault	WallWattz detected a ground leakage of > 20ma.	WallWattz will retry charging after 15 minutes up to 4 times.
No Diode	WallWattz did not detect the J1772 vehicle diode.	N/A
No Ground	WallWattz lost connection to ground.	Check grounds and AC_Test lines.

Safety Features

WallWattz supports 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

Power Interlock

WallWattz 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

WallWattz 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

WallWattz 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, WallWattz 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

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

Ground Fault Interrupt

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

Stuck Relay Detection

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

EV Identification

WallWattz 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

WallWattz checks for the EV ventilation required request. WallWattz 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 WallWattz 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 WallWattz 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 WallWattz. 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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