



TESLA MOTORS

## Installation Manual

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## HIGH POWER CONNECTOR

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## SAVE THESE IMPORTANT SAFETY INSTRUCTIONS


This manual contains important instructions that must be followed during installation of the Tesla Motors High Power Connector.

## Grounding instructions


The High Power Connector must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor is to be run with circuit conductors and connected to equipment-grounding terminal or lead on battery charger. Connections to battery charger shall comply with all local codes and ordinances.


| Temperature rating of wire that is used to connect the unit  | Copper conductors only        |
|--|-------------------------------|
| 75°C   | Use (a) AWG, 75°C copper wire |
| 90°C   | Use (a) AWG, 90°C copper wire |
| (a) The conductor size shall be no smaller than the 75° C wire size based on the ampacities given in Table 310-16 of the National Electrical Code, ANSI/NFPA 70. |                               |


## Warnings and cautions


 Warning: The High Power Connector must be installed by a Tesla-recommended installer or a licensed electrician of your choice. The installer will test the unit to ensure that it is operating correctly. Installation performed by installers


who are not electricians, or who are not Tesla-recommended installers may result in fire, serious injury, or death.▲


 Warning: The High Power Connector must be grounded through a permanent wiring system or an equipment grounding conductor. Failure to properly ground the High Power Connector could result in fire, serious injury or death.▲


 Warning: Do not install the High Power Connector near flammable, explosive, or combustible materials.▲

 Caution: Do not expose the High Power Connector to temperatures outside its operating range of -22°F to 122°F (-30°C to +50°C).

 Caution: Incorrect installation and testing of the High Power Connector could result in damage to the vehicle's Battery and to the High Power Connector itself.

 Caution: Store the High Power Connector in temperatures between -58°F and +176°F (-50°C and +80°C) to protect it from damages that may be caused by storing it at temperatures outside of this range.

 Caution: When transporting the High Power Connector, handle with care to prevent its internal components from being damaged.

 Caution: Do not use cleaning solvents to clean any of the High Power Connector's components. The outside of the High Power Connector, the charge cable, and the connector end of the charge cable should

be regularly cleaned with a clean dry or damp cloth to remove any accumulation of dust and dirt.

## Communications regulations

### FCC declaration of conformity

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. See instructions if interference to radio or television reception is suspected.

### Radio and television interference

The equipment described in this manual generates, uses, and can radiate radio-frequency energy. If it is not installed and used properly - that is, in strict accordance with Tesla Motors' instructions - it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If necessary, consult a Tesla Motors authorized service technician.

# Safety and regulatory information

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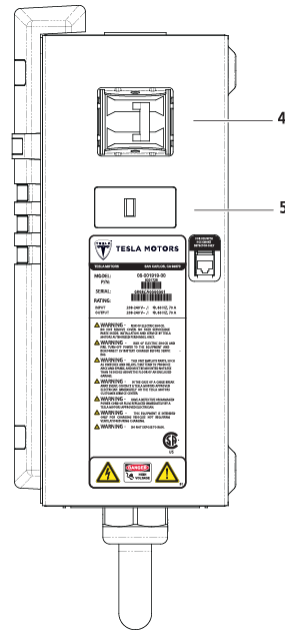
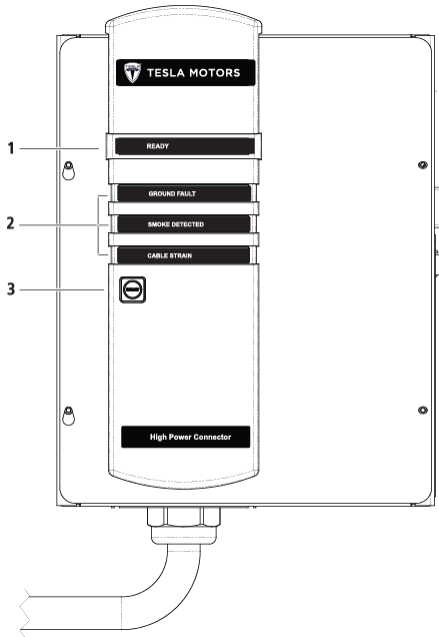
## **Important!**

Changes or modifications to this product not authorized by Tesla Motors could void the FCC certification and negate your authority to operate the product.

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# The High Power Connector at a glance



- 1 READY light
- 2 Fault indicators (includes GROUND FAULT, CABLE STRAIN, and SMOKE DETECTION)
- 3 Fault RESET button
- 4 DISCONNECT switch
- 5 GFCI: red RESET button and black TEST button

## Specifications

|                       |  |
|-----------------------|--|
| Voltage               | 208-240VAC   |
| Frequency             | 60Hz   |
| Distribution          | Single phase protected by an over-current circuit breaker. Also supports three phase by using any two of the three phases. |
| Cable length          | 25'  |
| Dimensions            | 12" wide<br>15" high<br>6" deep  |
| Operating Temperature | -22°F to 122°F<br>-30°C to 50°C  |

## About the installation

As the owner of a Tesla vehicle, you are responsible for installing and operating the High Power Connector. You are also responsible for any wiring upgrades that may be required to accommodate correct installation and operation of the High Power Connector.

# Planning your installation

## Five simple steps

Complete these planning steps before installing the High Power Connector:

- Contact your utility company
- Find a Tesla recommended electrician, or licensed electrician of your choice
- Determine your home's electrical capacity and your charging requirements
- Choose the best location
- Obtain building permits

These planning steps are detailed next.

## Contact your utility company

Check with your local utility company about special time-of-use rates, metering, and electrical service requirements. Some utility companies have mandatory time-of-use rates that encourage charging electric vehicles during night-time, off-peak hours when the demand for electricity is lower. In some cases, discounted rates for charging electric vehicles may require that you install an alternate or additional meter and dedicated charging outlet.

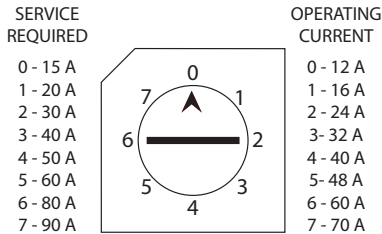
## Find an electrician

The High Power Connector must be installed by a Tesla-recommended installer or a licensed electrician of your choice. For a list of Tesla recommended electricians in your area, contact Tesla Motors at 1-877-TESLAEV (1-877-837-5238).

## Determine electrical capacity and charge requirements

A quick survey by an electrician can determine whether your existing electrical configuration has sufficient capacity for the High Power Connector, or if you need to upgrade your electrical service panel.

For maximum charging performance, a 240 Volt 90A circuit is required. Although it is possible to use a lower rated power supply, this will increase charging time for the vehicle. If a 90A circuit is unavailable, you'll need to de-rate the High Power Connector's charging current using the rotary switch as illustrated here.



If you de-rate the charging current, the National Electric Code (NEC) 625.21 specifies that you should install a proper circuit breaker device according to the maximum charge current you decide to use.

| Switch position | Dedicated Service Circuit Breaker Requirement |
|-----------------|---|
| 7               | 90A   |
| 6               | 80A   |
| 5               | 60A   |
| 4               | 50A   |
| 3               | 40A   |
| 2               | 30A   |
| 1               | 20A   |
| 0               | 15A   |

## How long does it take to charge?

The amount of time it takes to fully charge the vehicle will vary depending on the amount of current and voltage provided by the charging system. It also depends on the charge setting you are using. For example, a full charge at Max Range or Max Performance takes approximately 15% longer.

Use the following table as a guideline when estimating how long it will take to charge your vehicle. This table assumes you are charging a fully depleted Battery to a full charge using the standard setting. Charge times are shown in hours. These times are estimates only.

| Charge Current | Charge Time<br>(at 240 Volts) |
|----------------|-------------------------------|
| 70 amps        | 4 hours                       |
| 60 amps        | 5 hours                       |
| 48 amps        | 6 hours                       |
| 40 amps        | 7 hours                       |
| 32 amps        | 10 hours                      |
| 24 amps        | 15 hours                      |
| 16 amps        | 18 hours                      |
| 12 amps        | 20 hours                      |

## Choose the best location

Carefully consider these factors to determine the best location for the High Power Connector:

- Choose an indoor, wall mounted location, typically in an enclosed garage, that allows unobstructed access to the High Power Connector control panel. Consider the High Power Connector's dimensions.
- The High Power Connector must be located in a clean and dry environment away from flammable vapors, liquids and gases or other combustible materials.
- The High Power Connector should be mounted so that its charge cable easily reaches the charging port on the vehicle without straining the connections at either end, and without obstructing entry and exit routes. Typically, the High Power Connector is mounted towards the front of the vehicle or on the driver's side.

- The High Power Connector should be mounted at a height so that the connector used to connect the charge cable to the vehicle is stored between 18" and 48" from the ground. Also provide a minimum clearance of 12" between the bottom of the unit and any obstructions.
- An appropriate electrical supply must be available at the location. The High Power Connector accepts the electrical conduit in either the top surface or the left side of the housing.
- Do not expose the High Power Connector to extreme temperatures outside of its operating range of -22°F to 122°F (-30°C to +50°C).

## Obtain building permits

Depending on local regulations, installing the High Power Connector may require a building permit. Consult your local authorities to determine if this is the case in your area. If so, follow their process to obtain the appropriate building permits before you begin. When the installation is complete, an inspection by your local building inspector may be required.

# Step-by-step installation instructions

## Summary of steps

Installing the High Power Connector involves these steps:

- Review the parts
- Remove the front cover
- Mount the High Power Connector
- Run service wiring into the High Power Connector
- Connect the wiring
- Install the smoke detector
- Mount the cable hanger
- Inspect the cable connection
- Re-install the front cover
- Test the High Power Connector

Each step is detailed next, followed by a wiring diagram.

**Note:** Before you begin, note that the following special tools are required:

- #8 Drilled Spanner or Snake-Eyes® driver
- Tesla Motors Power Up Fixture
- Amp Modular Plug Hand Tool (231652-1) with 8-position die set (853400)

## Review the parts

Your High Power Connector comes pre-assembled and ready to install in a package that includes three main components:

- main High Power Connector unit
- smoke detector
- cable hanger

If any parts are missing or damaged, contact Tesla Motors immediately at 1-877-TESLAEV (1-877-837-5238).

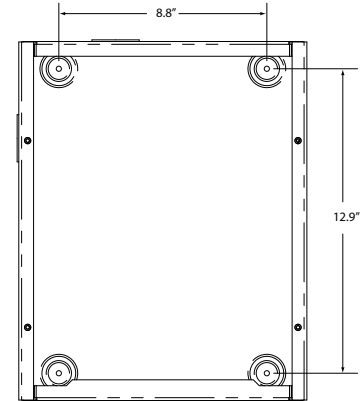
## Remove the front cover

1. Remove the 2 screws that secure the right-hand side of the front cover to the main housing. Then loosen the 2 screws that secure the left-hand side of the front cover to the main housing.
2. Lift and withdraw the front cover from the main housing by passing the screws through the larger cutouts in the front cover while ensuring that the warning light wire is not strained. Then mount the front panel backwards on the 2 left-hand screws.
3. Disconnect the two wiring harnesses and the RJ45 connection from the PCBA mounted to the back of the front cover.
4. Disconnect the ground strap between the front cover and the main housing by removing the nut from the stud on the inside of the front cover, and then remove the front cover.

## Mount the High Power Connector

The High Power Connector must be mounted so that the top of the main housing is no higher than 48" from the ground and the

bottom of the main housing is no lower than 18" from the ground and is free of obstructions.

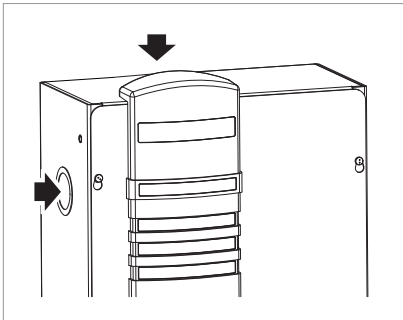


Mount the housing using four #10 x 2 1/2" lag screws for masonry walls or Rugged Structural Screws (RSSTM) for stud walls. At a minimum, two of the fixings must be mounted to studs. If studs are not available, use a suitable plywood spreader plate.



## Run service wiring into the housing


**!** Warning: Ensure that the main power supply is disconnected at the distribution panel before running service wiring into the High Power Connector.▲



1. Punch out the appropriate knock-out for the wiring to enter the main housing and de-burr the edges. You can pass wiring into the main housing through either the top or the left side.
2. Route suitable gauge wiring through the main housing using 1" or larger conduit.
3. Select a suitable sized conduit connector and fit to the housing.
4. Connect the electrical conduit to the High Power Connector and tighten the conduit connector.
5. Pass the wiring into the main housing.
6. Remove any debris that may have accumulated inside the housing.

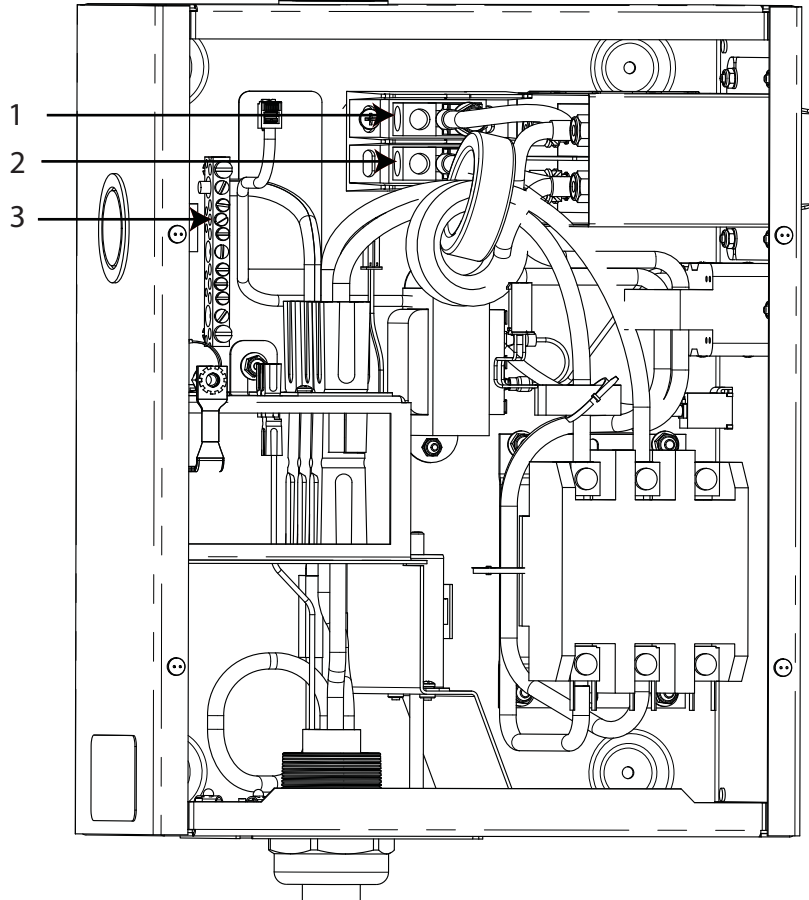
# Step-by-step installation instructions

## Connect the wiring

 Warning: Ensure that the main power supply is disconnected at the distribution panel before connecting wiring.▲

1. Connect LINE 1 to the terminal as illustrated (1).
2. Connect LINE 2 to the terminal as illustrated (2).
3. Connect GROUND to the ground bar as illustrated (3).

**Note:** Do not allow the wiring to make contact with the housing unit or any of its internal components, other than the connection points.

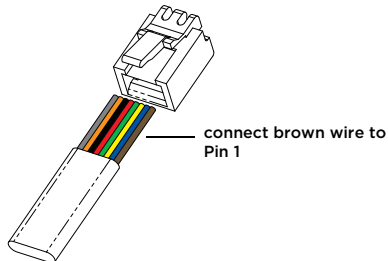


# Step-by-step installation instructions

## Install the smoke detector

**Warning:** Ensure that the main power supply is disconnected at the distribution panel before installing the smoke detector.▲

1. Unclip the base plate from the detector.
2. Using suitable fasteners, mount the base plate on the wall or ceiling within 10' of the High Power Connector. For a wall mounted installation, the smoke detector should be mounted so the top of the detector is 4 to 12 inches from the ceiling. For a ceiling mounted installation, the smoke detector should be mounted at least 4 inches from the nearest wall.
3. Clip the detector to the base plate.
4. Route the wiring to the RJ45 jack on the right side of the High Power Connector.
5. Cut the cable to the appropriate length and terminate using the RJ45 connector, ensuring that the brown wire is connected to Pin 1 as illustrated here.

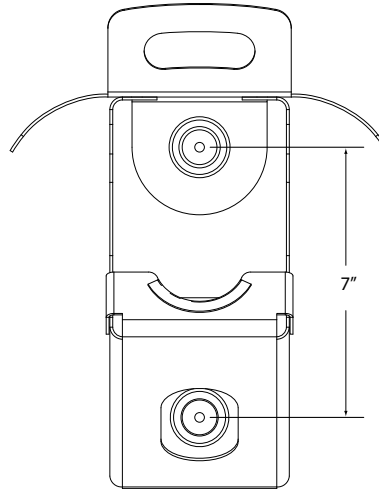


6. Plug the smoke detector cable into the RJ45 jack on the right side of the High Power Connector.

7. Using suitable fasteners, secure the wiring to the wall.

## Mount the cable hanger

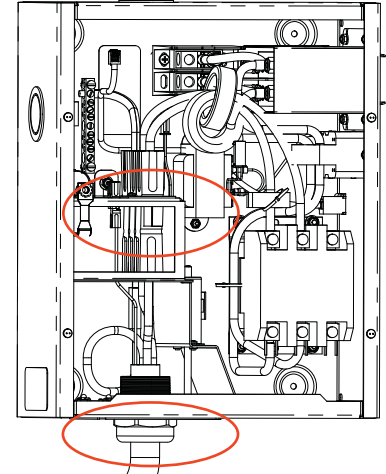
The cable hanger must be mounted so that the connector used to connect the High Power Connector to the vehicle is stored between 18" and 48" from the ground and free of obstructions.



Mount the cable hanger using two #10 2 1/2" lag screws for masonry walls, or two RSSTM (Rugged Structural Screws) for stud walls.

## Inspect the cable connection

Check to ensure the charge cable connection wasn't detached during installation.



1. Ensure the connections to the disconnect mechanism are fully seated.
2. Ensure that the lower mounting plate is flush with the bottom of the unit.

## Re-install the front cover

1. Mount the front panel backwards on the two left-hand screws.
2. Connect the ground strap between the main housing and the front cover.

# Step-by-step installation instructions

3. Connect the two wiring harness connections and the RJ45 connection to the PCBA mounted to the back of the front cover.
4. Fit the front cover by passing the securing screws through the large cut-outs in the front panel and sliding the front cover down. Tighten the screws to secure the front cover.

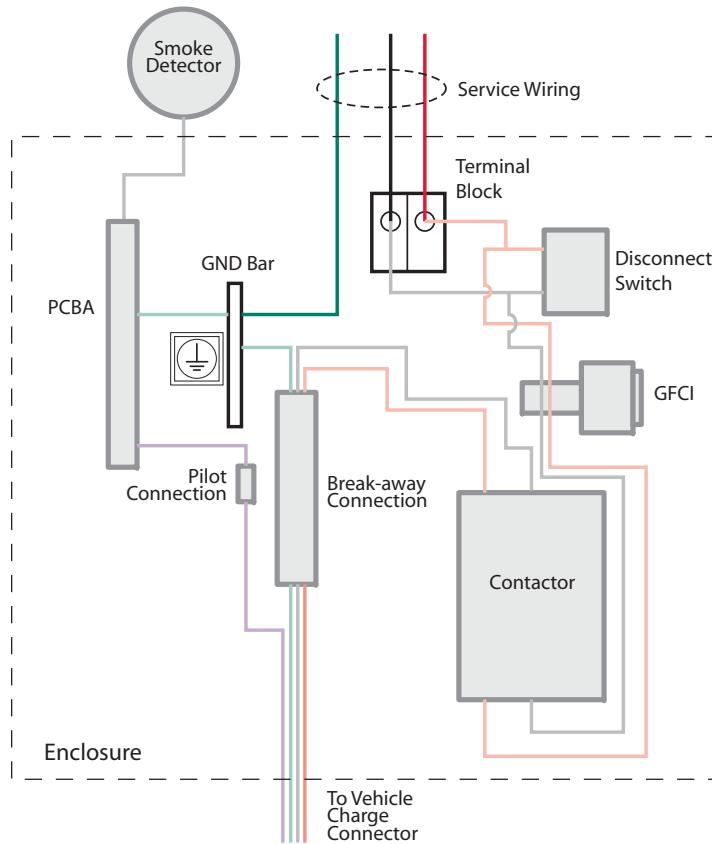
## Test the High Power Connector

The High Power Connector, including the smoke detector, must be fully installed before testing or using it. Follow these steps to test the High Power Connector using the Tesla Motors Power Up Fixture. If a step fails, do not continue—this indicates a possible wiring or hardware problem.

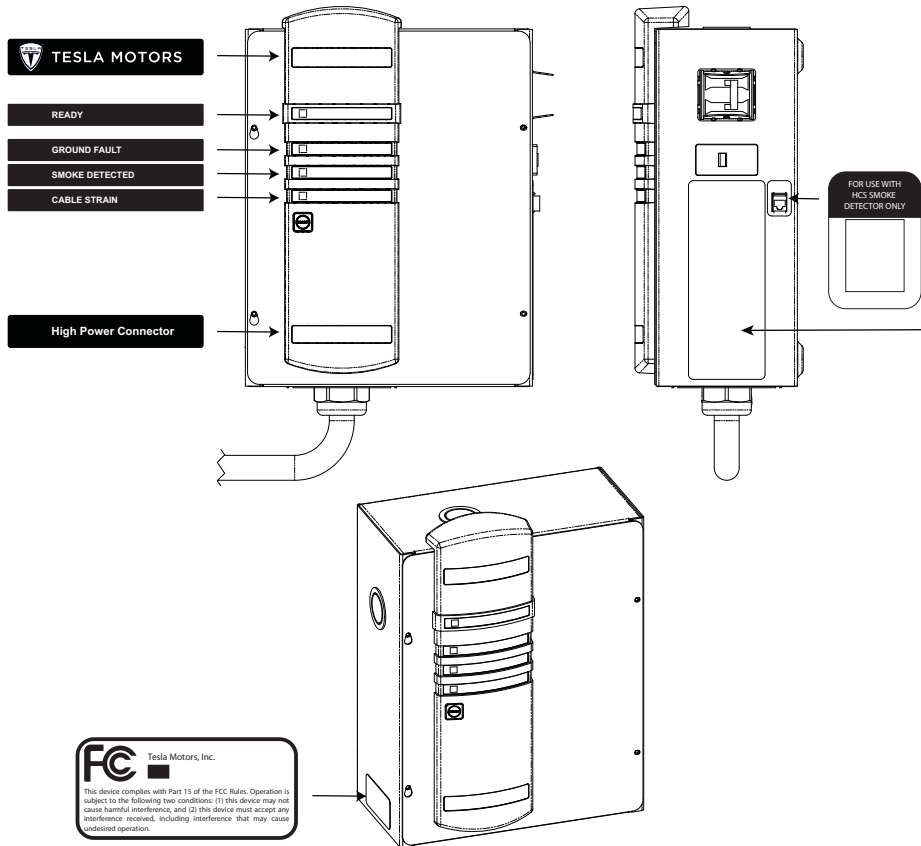
1. Switch the High Power Connector OFF and make sure that the GFI is not tripped.
2. Flip both switches on the Power Up Fixture downwards (which is the OFF position),
3. Attach the Power Up Fixture to the charge cable, locking the connector to the Power Up Fixture via the thumb lock on the connector.
4. Switch the High Power Connector ON and wait until the READY light illuminates a steady green.
5. Flip the CONNECT switch on the Power Up Fixture upwards.
6. Flip the CHARGE switch on the Power Up Fixture upwards. The red light on the Power Up Fixture illuminates (indicating that power is available at the charge connector) and the READY light on the High Power Connector illuminates amber.
7. Trip the GFI circuit by momentarily pressing the GFI button on the Power Up Fixture. The contactor in the High Power Connector should open, disconnecting power from the charge cable. The red light on the Power Up Fixture will extinguish.
8. Verify that the High Power Connector's GROUND FAULT light is steady red and the READY light is flashing red. All other lights should be off.
9. Turn the CURRENT switch on the Power Up Fixture OFF.
10. Press the red RESET button in the middle of the GFCI located on the right side of the High Power Connector's housing. The switch should latch into place. Then, momentarily press the RESET button located on the High Power Connector's front panel. The GROUND FAULT light extinguishes and the READY light illuminates green.
11. Flip the CHARGE switch on the Power Up Fixture upwards. The High Power Connector's contactor closes. The Power Up Fixture's RED light should illuminate and the High Power Connector's READY light should illuminate solid amber.
12. Flip the CHARGE switch on the Power Up Fixture downwards. The power light on the Power Up Fixture extinguishes.
13. Turn the CONNECT switch on the Power Up Fixture downwards and disconnect the Power Up Fixture from the charge cable.


If all of the steps above were completely successfully, the High Power Connector is ready to charge the vehicle.

# Wiring diagram




# Labels






|   |                                    |
|---|------------------------------------|
|  <b>TESLA MOTORS</b> |                                    |
| TESLA MOTORS  | SAN CARLOS, CA 94070               |
| MODEL:  | 06-001919-00                       |
| P/N:  | 6001729                            |
| SERIAL:   | 0808CA0000001                      |
| RATING:   |                                    |
| INPUT   | 208-240 V~, 1 $\Phi$ , 60 HZ, 70 A |
| OUTPUT  | 208-240 V~, 1 $\Phi$ , 60 HZ, 70 A |

- WARNING** - RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. INSTALLATION AND SERVICE BY TESLA MOTORS AUTHORIZED PERSONNEL ONLY.
- WARNING** - RISK OF ELECTRIC SHOCK AND FIRE. TURN-OFF POWER TO THE EQUIPMENT AND DISCONNECT EV BATTERY CHARGER BEFORE SERVICING.
- WARNING** - THIS UNIT EMPLOYS PARTS, SUCH AS SWITCHES AND RELAYS, THAT TEND TO PRODUCE ARCS AND SPARKS, AND MUST BE MOUNTED NOT LESS THAN 18 INCHES ABOVE THE FLOOR OF AN ENCLOSED GARAGE.
- WARNING** - IN THE CASE OF A CABLE BREAK AWAY EVENT, CONTACT A TESLA MOTORS APPROVED ELECTRICIAN IMMEDIATELY OR THE TESLA MOTORS CUSTOMER SERVICE CENTER.
- WARNING** - HAVE A DEFECTIVE OR DAMAGED POWER CORD OR PLUG REPLACED IMMEDIATELY BY A TESLA MOTORS APPROVED ELECTRICIAN.
- WARNING** - THIS EQUIPMENT IS INTENDED ONLY FOR CHARGING VEHICLES NOT REQUIRING VENTILATION DURING CHARGING.
- WARNING** - DO NOT EXPOSE TO RAIN.

  
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