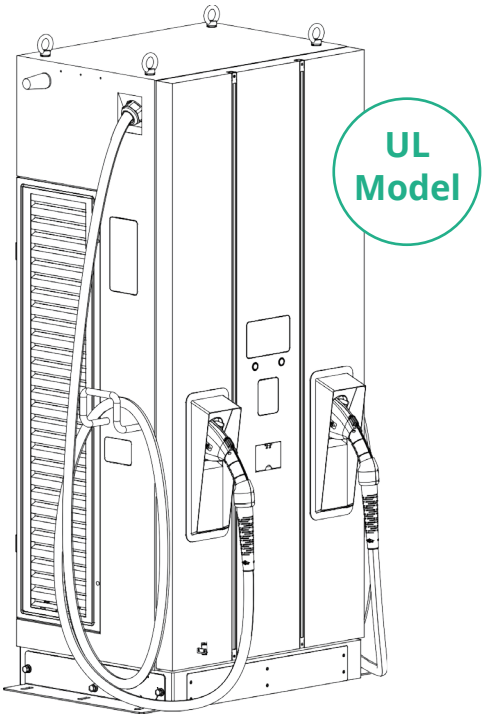
eSolutions
Free2move

DC Series

DC EVSE 180kW Standalone Fast Charger

Troubleshooting/Maintenance Manual



Contents

Revision History				
Version	Date	Description	Author	
			Writer	Editor
V1.0	2024/01/09	First Issue	Clara	
V2.0	2024/05/15	• Free2Move customized first issue	Natalie	Julie

Introduction

The intent of this manual is to provide a guide for the troubleshooting and maintenance of the Standalone DC Fast Charger.

Compliance with the information in this manual does NOT relieve the owner/operator of their responsibility to comply with all applicable codes and safety standards.

To provide feedback on the contents of this manual or request additional information please contact your supplier.

Standards and References

- NFPA-70 - Article 625 - Electrical Vehicle Power Transfer System
- NFPA-70E - Article 110 - General Requirements for Electrical Safety - Related Work Practices
- NFPA-70E - Article 120 - Establish an Electrically Safe Work Condition
- NFPA-70E - Article 130 - Work Involving Electrical Hazards
- Electric Vehicle (EV) Charging System Equipment [UL 2202:2009 Ed.2+R:09Feb2018]
- Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4]
- FCC CFR Title 47 Part 15 Subpart B: 2018 Class A
- ICES-003: 2020 Issue 7
- Energy Star
- California Type Evaluation Program / National Type Evaluation Program (NIST Handbook 44)
- ISO 15118 -2
- OCPP 1.6 JSON / OCPP 2.0

1. Specifications and Features

1.1 Device User Interface

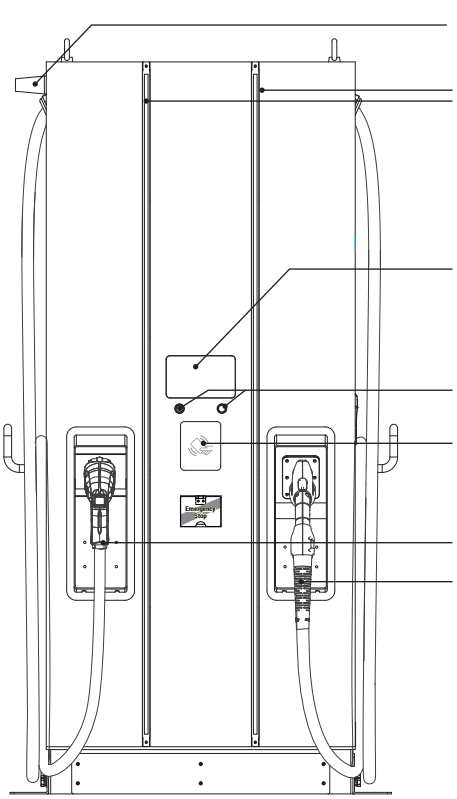


Figure 1. User Interface

2. Troubleshooting

Follow the troubleshooting guide when errors occur during the charging process.Make sure the EVSE is connected to the Internet, then contact the EVSE owner/operator for further instructions.

Note:
The EVSE must be connect to the Internet for remote diagnostics and upgrades.

You will need to provide the following information:

- Serial Number
- Model Name
- Status Code
- Failure Behavior
- Failure Time

Note:
If an emergency occurs, push the Emergency Stop Button immediately.

2.1 Troubleshooting - No Status Code

When a fault occurs, follow this troubleshooting guide. See Table 1.

Conditions	Troubleshooting Guide
Black screen	Please contact your dealer.
Stuck on boot or service screen.	Please contact your dealer.
Card tapping or QR code scanning failed.	1. Invalid RFID card or insufficient balance. 2. Contact management staff to check Internet connection between charger and Back-End server. 3. Code scanning or Back-End authorization failed; please contact management staff. 4. Card reader failure or other faults; please contact your dealer.

The Indication page returns from cable plugging to selection.	1. Please make sure the correct charging cable is selected. 2. Please make sure the charging cable has been plugged in completely with a “clicking” sound, and the charging plug button cannot be pressed. 3. Please check the charge port indicator or meter whether the charge function has failed. 4. Please try again with other chargers. If the EV won't charge at other charges, the EV may have a fault. Send the EV for service. 5. Charging cable or control guide is invalid, please contact your dealer.
The Indication page transfers from charging preparation directly to settlement.	1. Please unplug the charging cable and try again. 2. Please check the EV charge port indicator or meter to see if the target charging limit has been reached, or was stopped before the default charging time.* 3. Drive the EV a small distance away and return, then try again. 4. Please contact your dealer.
Stuck on SOC 100% or 0% settlement page without charging.	1. Please check the EV charge port indicator or meter to see if the target charging limit has been reached, or was stopped before the default charging time.* 2. Please unplug the charging cable and try again. 3. Please contact your dealer.
Charging complete but the charger did not release EV.	1. Please unlock the EV, press the button of HV charging port cover, and try to unplug again*. 2. Turn the startup switch on and off, then try to unplug again. 3. Lock the EV doors and release, then try to unplug again. 4. Turn the EV air conditioner off, then try to unplug again. 5. Please release by EV manual unlock switch. 6. If there is no manual unlock, please turn off or reset the charger. 7. Contact your EV company or dealer.

Table 1. Troubleshooting - No Status Code

*Different models of EV have different charging conditions and charge plug release methods. Refer to the EV User Manual.

2.2 Troubleshooting - (011-XXX) Error Codes

011-XXX codes are related to EVSE parts or connector faults.

1. Unplug the DC plug.
2. Turn the power off.
3. Install the issued part.
4. Turn the power on.

If the same error code is displayed, the EVSE must be serviced by a qualified technician. Contact the Owner/Operator.

2.3 Troubleshooting - (012-XXX) Warning Codes

Status Code	Conditions	Troubleshooting Methods
012200 ↓ 012214	Abnormal Input Voltage.	1. Charging can be enabled after the electrical grid supply is corrected. 2. Check the input power or turn off and restart the charger. 3. Contact your dealer.
012223 ↓ 012232	Abnormal environment or device temperature.	1. Keep the air flow inlet and outlet clear or remove heat sources, charging will be enabled after cooling down. 2. Mal-operation of over-temperature protection or devices over temperature. Please contact your dealer.
012241 ↓ 012244	External network disconnected.	1. Code scanning or app authorize application are unavailable for the moment, please change to RFID or other authorizations. 2. Contact network management staff for network inspection.
012251	Emergency switch is pressed.	1. Release the emergency switch by rotating, charging will be enabled after warning code is removed. (Meanwhile, if it shows service page, rotate the switch back, turn off and restart the charger). 2. Contact your dealer or turn off and restart the charger.
012252	Cabinet door open indication.	1. Close the cabinet door, charging will be enabled after warning code is removed. 2. The door open sensor is misaligned. Screw the sensor back into the correct position. 3. Broken door open sensor, contact your dealer for further instruction.

012304	Communication error between power and charging plug cabinet.	1. Make sure the Ethernet cable connection between cabinets is reliable. 2. If there is no green light solid on the power cabinet, please reset it. 3. Please contact your dealer for further instruction.

Table 2. Troubleshooting - (012-XX) Warning Codes

2.4 Troubleshooting - (013-XXX) Codes

013-XXX codes are related to setup, maintenance, and reference diagnostics. There is generally no impact on charging. Continue use of the charger and contact your dealer.

2.5Troubleshooting - (023-XXX) Codes

023-XXX codes are related to communication or charging error messages coming from the EV. These errors prevent charging and require the charging cable to be unplugged. Refer to the EV manual for setup and backup charging procedures. If needed, use the steps that follow or contact the Owner/Operator:

1. Unplug the charging cable and wait for 5 more seconds. Plug the charging cable in completely until you hear a clicking sound and try the charging procedure again.
2. Unplug the charging cable, try charging with the other plug or another charger.
3. Unplug the charging cable, drive the EV a small distance away and return, stop the EV, unplug the key, and try again.
4. After unplugging the charging cable, check in the EV whether the charging mode and time limit have been enabled.
5. If the charging process cannot be started and the EV meter or charging indicator shows abnormal status or error messages, follow your EV user manual for troubleshooting.
6. After unplugging the charging cable, contact management staff to turn off the charger, restart, and try again.
7. If charging terminated but the charging cable cannot be unplugged, please follow the EV user manual, press release button (on EV or remote controller) or manual unlock switch. If all these methods are unavailable, please contact management staff to turn off and restart the charger.

Status Code	Conditions	Troubleshooting Methods
023758	Procedure Error.	1. Unplug the charging cable, release the EV side charging limit, and try again. 2. Follow steps 1~7 for troubleshooting.
023809	The charger missed the first message from the EV.	1. Charging cable is not locked by EV side, please unplug, and plug the charging cable in completely until you hear a clicking sound. 2. Follow steps 1~7 for troubleshooting.
023814	Hand shake feedback incorrect.	1. Unplug the charging cable, restart BMS on EV side, and try again. 2. Follow steps 1~7 for troubleshooting.
023844	V2G communication time-out.	3. Unplug the charging cable, restart BMS on EV side, and try again. 4. Follow steps 1~7 for troubleshooting.
023847	Charging cable insulation test time-out.	1. Unplug the charging cable and try again. 2. Unplug the charging cable, restart the charger, and try again.
023889	Noise interference (or) Charging being terminated by the EV caused a control guide status error.	1. Unplug the charging cable, restart BMS on EV side, and try again. 2. Follow step 1~7 for troubleshooting.
023891	The charger was not ready.	1. Unplug the charging cable, wait for 5 more seconds, and try again. 2. Unplug the charging cable, restart the charger, and try again.
023983	Charging terminated by unknown request.	1. Check whether charging target or time is limited. 2. Follow the EV operating indication for troubleshooting. 3. Unplug the charging cable, restart BMS on EV side, and try again.

Table 3. Troubleshooting (023-XXX) Codes

2.6 Troubleshooting - (033-XXX) Codes

033-XXX codes are related to the charger control server. The charger control server is running intelligent remote control. Use the troubleshooting methods that follow or contact the Owner/Operator.

Status Code	Conditions	Troubleshooting Methods
033900 033901 033902	The Back-End disconnected for the moment.	1. Code scanning and app authorization are unavailable for the moment, change to RFID or other authorization. 2. Contact management staff to check Back-End server connectivity. 3. If the connection cannot be restored after router or AP restart, please restart the main/sub cabinets. 4. If the connection cannot be restored after main/sub cabinet restart, please turn off the whole charger and restart. 5. Please contact your dealer.
033903	Charging was started by the remote control.	1. Remote authorization passed, please plug in the charging cable for charging. 2. Contact management staff for further instructions.
033904	Charging was stopped by the remote control.	1. Charging meets setup time, Watt-Hour or amount, charging terminated by the remote control. 2. Contact management staff for further instructions.
033905	Restarted by the remote control	1. Charger reset and maintain process by the remote control, charging terminated. 2. Contact management staff for further instructions.

Table 4. Troubleshooting (033-XXX) Codes

2.7 Status Codes

Status Code	Description
11001	CHAdeMO output fuse blew
11002	CCS output fuse blew
11003	GB output fuse blew
11004	RCD/CCID self-test fail
11005	AC input contactor 1 welding
11006	AC input contactor 1 driving fault
11007	AC input contactor 2 welding
11008	AC input contactor 2 driving fault
11009	AC output relay welding
11010	AC output relay driving fault
11011	CHAdeMO output relay welding
11012	CHAdeMO output relay driving fault
11013	CCS output relay welding
11014	CCS output relay driving fault
11015	GB output relay welding
11016	GB output relay driving fault
11017	AC connector temperature sensor broken
11018	CHAdeMO connector temperature sensor broken
11019	CCS connector temperature sensor broken
11020	GB connector temperature sensor broken
11021	WiFi module broken
11022	3G/4G module broken
11023	Auxiliary power module broken
11024	Relay control module /smart box broken
11025	CHAdeMO connector lock fail
11026	GB connector lock fail
11027	AC connector lock fail
11028	CHAdeMO module broken
11029	CCS module broken
11030	GBT module broken

Status Code	Description
11031	PSU module broken
11032	RCD/CCID module broken
11033	Maximum Output Current setup error
11034	Shutter fault
11035	Ble module broken
11036	Rotary switch fault
11037	CCS liquid chiller water level fault
11038	Chiller temperature sensor broken
11039	Parallel relay welding
11040	Parallel output relay driving fault
12200	System L1 input OVP
12201	System L2 input OVP
12202	System L3 input OVP
12203	System L1 input UVP
12204	System L2 input UVP
12205	System L3 input UVP
12206	PSU L1 input OVP
12207	PSU L2 input OVP
12208	PSU L3 input OVP
12209	PSU L1 input UVP
12210	PSU L2 input UVP
12211	PSU L3 input UVP
12212	System L1 input drop
12213	System L2 input drop
12214	System L3 input drop
12215	System AC output OVP
12216	System AC L1 output OCP
12217	System CHAdeMO output OVP
12218	System CHAdeMO output OCP
12219	System CCS output OVP
12220	System CCS output OCP
12221	System GB output OVP

Status Code	Description
12222	System GB output OCP
12223	System ambient/inlet OTP
12224	System critical point OTP
12225	PSU ambient/inlet OTP
12226	PSU critical point OTP
12227	Aux. power module OTP
12228	Relay board/smart box OTP
12229	CHAdeMO connector OTP
12230	CCS connector OTP
12231	GB connector OTP
12232	AC connector OTP
12233	RCD/CCID trip
12234	CHAdeMO GFD trip
12235	CCS GFD trip
12236	GB GFD trip
12237	SPD trip
12238	Main power breaker trip
12239	Auxiliary power breaker trip
12240	PSU communication fail
12241	WiFi module communication fail
12242	3G/4G module communication fail
12243	RFID module communication fail
12244	Bluetooth module communication fail
12245	LCM module communication fail
12246	Auxiliary power module communication fail
12247	Relay control boaed/smart box communication fail
12248	CCS module communication fail
12249	CHAdeMO module communication fail
12250	GBT module communication fail
12251	Emergency stop
12252	Door open
12253	System fan decay

Status Code	Description
12254	Fail to create share memory
12255	CSU initialization failed
12256	AC Ground Fault
12257	MCU self-test Fault
12258	Relay self-test Fault
12259	CHAdeMO groundfault detection timeout (GFD)
12260	CCS groundfault detection timeout (GFD)
12261	GB groundfault detection timeout (GFD)
12262	System AC L1 output Circuit Short
12263	PSU Duplicate ID
12264	PSU Output Short Circuit
12265	PSU Discharge Abnormal
12266	PSU DC Side ShutDown
12267	PSU Failure Alarm
12268	PSU Protection Alarm
12269	PSU FanFailure Alarm
12270	PSU Input UVP
12271	PSU Input OVP
12272	PSU WalkIn State
12273	PSU Power Limited State
12274	PSU Id Repeat
12275	PSU Severe Uneven Current
12276	PSU Three Phase Input Inadequate
12277	PSU Three Phase Onput Imbalance
12278	PSU Ffc Side ShutDown
12279	NO PSU Resource
12280	Self test Failed due to communication of Relayboard failure
12281	Self test Failed due to communication of Fanboard failure
12282	Self test Failed due to communication of Primary failure
12283	Self test Failed due to communication of Chademoboard failure
12284	Self test Failed due to communication of CCSboard failure
12285	Self test Failed due to AC Contact failure

Status Code	Description
12286	Self test Failed due to communication of PSU failure
12287	Self test Failed due to Model name is none match
12288	CCS output UVP
12289	Chademo output UVP
12290	GBT output UVP
12291	Self test Failed due to communication of GBTboard failure
12292	Self test Failed due to communication of AC failure
12293	Self test Failed due to communication of Ledboard failure
12294	AC input ovp
12295	AC input uvp
12296	CHAdeMO groundfault detection - warning
12297	CCS groundfault detection - warning
12298	GB groundfault detection - warning
12299	System AC L2 output OCP
12300	System AC L3 output OCP
12301	System AC L2 output Circuit Short
12302	System AC L3 output Circuit Short
12303	CCS liquid chiller water level warning
12304	Disconnected from power cabinet
12305	Meter communication timeout
12306	The dip switch of the PSU may be incorrect
12307	PSU Fault : Fuse Burn-Out
12308	PSU Fault : Pfc And Dcdc Communication Fault
12309	PSU Fault : Bus Voltage Unbalance
12310	PSU Fault : Bus Over Voltage
12311	PSU Fault : Bus Voltage Abnormal
12312	PSU Fault : Bus Under Voltage
12313	PSU Fault : Input Phase Loss
12314	PSU Fault : Fan Full Speed
12315	PSU Fault : Temperature Power Limit
12316	PSU Fault : Ac Power Limit
12317	PSU Fault : Dcdc Eeprom Fault

Status Code	Description
12318	PSU Fault : Pfc Eeprom Fault
12319	PSU Dcdc Over Voltage
12320	System CHAdeMO output UCP
12321	System CCS output UCP
12322	System GBT output UCP
12323	System Chiller output OTP
12324	Connector 1 detects abnormal voltage on the output line
12325	Connector 2 detects abnormal voltage on the output line
12326	System task is lost
12327	System DC input ovp
12328	System DC input uvp
12329	PSU Fault : Psu Can Communication Fault
12330	PSU Fault : Psu Dc to Dc OTP
12331	PSU Fault : Psu Dc to Dc OVP
12332	Chiller Tube OTP
12333	PSU Fault : DC input ovp (Phase OVP)
12343	Tilt sensor self-test failed
12344	Meter IC communication timeout
12345	Pilot negative error
12346	PSU Communication error with CSU
12347	AC: Local power sharing communication error (Slave disconnect from Master)
12348	Chiller Alarm Failure
12352	Payment system communication timeout
12353	Meter Slave Los Link
12354	Meter Sync Time Error
12355	Meter Start Transaction Error
12356	Meter Stop Transaction Error
12357	Meter Get Transaction Ocmf Error
13600	Normal stop charging by user
13601	Charging Time's up
13602	Replace system air filter

Status Code	Description
13603	Reach to CHAdeMO max. plugging times.
13604	Reach to CCS max. plugging times.
13605	Reach to GB max. plugging times.
13606	Reach to AC max. plugging times.
13607	CSU fimrware update fail
13608	CHAdeMO Module fimrware update fail
13609	CCS Module fimrware update fail
13610	GB Module fimrware update fail
13611	Auxiliary power module fimrware update fail
13612	Relay control module fimrware update fail
13613	LCM module fimrware update fail
13614	Bluetooth module fimrware update fail
13615	WiFi module fimrware update fail
13616	3G/4G module fimrware update fail
13617	SMR fimrware update fail
13618	RFID module fimrware update fail
13619	Configured by USB flash drive
13620	Configured by backend
13621	Configured by webage
13622	Disconnected from Internet through Ethernet
13623	Disconnected from Internet through WiFi
13624	Disconnected from Internet through 3G/4G
13625	Disconnected from AP through WiFi
13626	Disconnected from APN through 3G/4G
13627	WiFi disabled (separated charger only)
13628	4G disabled (separated charger only)
13629	PSU quantity not match
23700	CHAdeMO EV communication Fail
23701	CCS EV communication Fail
23702	GB EV communication Fail
23703	AC: pilot fault
23704	CHAdeMO: battery malfunction

Status Code	Description
23705	CHAdeMO: no charging permission
23706	CHAdeMO: battery incompatibility
23707	CHAdeMO: battery OVP
23708	CHAdeMO: battery UVP
23709	CHAdeMO: battery OTP
23710	CHAdeMO: battery current difference
23711	CHAdeMO: battery voltage difference
23712	CHAdeMO: shift position
23713	CHAdeMO: battery other fault
23714	CHAdeMO: charging system error
23715	CHAdeMO: ev normal stop
23716	CHAdeMO: connector temperature sensor broken
23717	CHAdeMO: connector lock fail
23718	CHAdeMO: d1 on no receive
23719	CHAdeMO: bms k to j on timeout
23720	CHAdeMO: bms charge allow timeout
23721	CHAdeMO: wait groundfault timeout (Output short circuit)
23722	CHAdeMO: bms ev relay on timeout
23723	CHAdeMO: bms req current timeout
23724	CHAdeMO: bms k to j off timeout
23725	CHAdeMO: bms ev relay off timeout
23726	CHAdeMO: adc more than 10v
23727	CHAdeMO: adc more than 20v
23728	CHAdeMO: bms charge before stop
23729	CHAdeMO: charger get normal stop cmd
23730	CHAdeMO: charger get emergency stop cmd
23731	CHAdeMO: isolation result fail
23732	CHAdeMO: mother board miss link
23733	CHAdeMO: output voltage more than limit
23734	CHAdeMO: req current more than limit
23735	CHAdeMO: re capability bms eqr current exceed
23736	CHAdeMO: charge remaining count done

Status Code	Description
23737	CCS_EVCC_EVErrorCode_FAILED_RESSTemperatureInhibit
23738	CCS_EVCC_EVErrorCode_FAILED_EVShiftPosition
23739	CCS_EVCC_EVErrorCode_FAILED_ChargerConnectorLockFault
23740	CCS_EVCC_EVErrorCode_FAILED_EVRESSMalfunction
23741	CCS_EVCC_EVErrorCode_FAILED_ChargingCurrentdifferential
23742	CCS_EVCC_EVErrorCode_FAILED_ChargingVoltageOutOfRange
23743	CCS_EVCC_EVErrorCode_FAILED_ChargingSystemIncompatibility
23744	CCS_EVCC_EVErrorCode_FAILED_EmergencyEvent
23745	CCS_EVCC_EVErrorCode_FAILED_Breaker
23746	CCS_EVCC_EVErrorCode_FAILED_NoData
23747	CCS_EVCC_EVErrorCode_FAILED_reserved_by_DIN_A
23748	CCS_EVCC_EVErrorCode_FAILED_reserved_by_DIN_B
23749	CCS_EVCC_EVErrorCode_FAILED_reserved_by_DIN_C
23750	CCS_EVCC_EVErrorCode_FAILED_reserved_by_ISO_1
23751	CCS_EVCC_EVErrorCode_FAILED_reserved_by_ISO_2
23752	CCS_EVCC_EVErrorCode_FAILED_reserved_by_ISO_3
23753	CCS_EVCC_EVErrorCode_FAILED_reserved_by_OEM_1
23754	CCS_EVCC_EVErrorCode_FAILED_reserved_by_OEM_2
23755	CCS_EVCC_EVErrorCode_FAILED_reserved_by_OEM_3
23756	CCS_EVCC_EVErrorCode_FAILED_reserved_by_OEM_4
23757	CCS_EVCC_EVErrorCode_FAILED_reserved_by_OEM_5
23758	CCS_SECC_ResponseCode_FAILED_SequenceError
23759	CCS_SECC_ResponseCode_FAILED_SignatureError
23760	CCS_SECC_ResponseCode_FAILED_UnknownSession
23761	CCS_SECC_ResponseCode_FAILED_ServiceIDInvalid
23762	CCS_SECC_ResponseCode_FAILED_Payment SelectionInvalid
23763	CCS_SECC_ResponseCode_FAILED_IdentificationSelectionInvalid
23764	CCS_SECC_ResponseCode_FAILED_ServiceSelectionInvalid
23765	CCS_SECC_ResponseCode_FAILED_CertificateExpired
23766	CCS_SECC_ResponseCode_FAILED_CertificateNotYetValid
23767	CCS_SECC_ResponseCode_FAILED_CertificateRevoked
23768	CCS_SECC_ResponseCode_FAILED_NoCertificateAvailable

Status Code	Description
23769	CCS_SECC_ResponseCode_FAILED_CertChainError
23770	CCS_SECC_ResponseCode_FAILED_CertValidationError
23771	CCS_SECC_ResponseCode_FAILED_CertVerificationError
23772	CCS_SECC_ResponseCode_FAILED_ContractCanceled
23773	CCS_SECC_ResponseCode_FAILED_ChallengeInvalid
23774	CCS_SECC_ResponseCode_FAILED_WrongEnergyTransferMode
23775	CCS_SECC_ResponseCode_FAILED_WrongChargeParameter
23776	CCS_SECC_ResponseCode_FAILED_ChargingProfileInvalid
23777	CCS_SECC_ResponseCode_FAILED_TariffSelectionInvalid
23778	CCS_SECC_ResponseCode_FAILED_EVSEPresentVoltageToLow
23779	CCS_SECC_ResponseCode_FAILED_PowerDeliveryNotApplied
23780	CCS_SECC_ResponseCode_FAILED_MeteringSignatureNotValid
23781	CCS_SECC_ResponseCode_FAILED_NoChargeServiceSelected
23782	CCS_SECC_ResponseCode_FAILED_ContactorError
23783	CCS_SECC_ResponseCode_FAILED_ CertificateNotAllowedAtThisEVSE
23784	CCS_SECC_ResponseCode_FAILED_GAChargeStop
23785	CCS_SECC_ResponseCode_FAILED_AlignmentError
23786	CCS_SECC_ResponseCode_FAILED_ACDError
23787	CCS_SECC_ResponseCode_FAILED_AssociationError
23788	CCS_SECC_ResponseCode_FAILED_EVSEChargeAbort
23789	CCS_SECC_ResponseCode_FAILED_NoSupportedApp-Protocol
23790	CCS_SECC_ResponseCode_FAILED_ContractNotAccepted
23791	CCS_SECC_ResponseCode_FAILED_MOUnknown
23792	CCS_SECC_ResponseCode_FAILED_OEM_Prov_CertificateRevoke
23793	CCS_SECC_ResponseCode_FAILED_OEM_SubCA1_ CertificateRevoked
23794	CCS_SECC_ResponseCode_FAILED_OEM_SubCA2_ CertificateRevoked
23795	CCS_SECC_ResponseCode_FAILED_OEM_RootCA_ CertificateRevoked
23796	CCS_SECC_ResponseCode_FAILED_MO_Prov_CertificateRevoked

Status Code	Description
23797	CCS_SECC_ResponseCode_FAILED_MO_SubCA1_ CertificateRevoked
23798	CCS_SECC_ResponseCode_FAILED_MO_SubCA2_ CertificateRevoked
23799	CCS_SECC_ResponseCode_FAILED_MO_RootCA_ CertificateRevoked
23800	CCS_SECC_ResponseCode_FAILED_CPS_Prov_CertificateRevoked
23801	CCS_SECC_ResponseCode_FAILED_CPS_SubCA1_ CertificateRevoked
23802	CCS_SECC_ResponseCode_FAILED_CPS_SubCA2_ CertificateRevoked
23803	CCS_SECC_ResponseCode_FAILED_CPS_RootCA_ CertificateRevoked
23804	CCS_SECC_ResponseCode_FAILED_reserved_1
23805	CCS_SECC_ResponseCode_FAILED_reserved_2
23806	CCS_SECC_ResponseCode_FAILED_reserved_3
23807	CCS_SECC_ResponseCode_FAILED_reserved_4
23808	CCS_SECC_ResponseCode_FAILED_reserved_5
23809	CCS_SECC_TIMEOUT_SLAC_TT_EVSE_SLAC_init
23810	CCS_SECC_TIMEOUT_SLAC_TP_match_response
23811	CCS_SECC_TIMEOUT_CM_START_ATTEN_CHAR_IND
23812	CCS_SECC_TIMEOUT_SLAC_TT_EVSE_match_MNBC
23813	CCS_SECC_TIMEOUT_SLAC_TP_EVSE_avg_atten_calc
23814	CCS_SECC_TIMEOUT_SLAC_CM_ATTEN_CHAR_RSP
23815	CCS_SECC_TIMEOUT_SLAC_CM_VALIDATE_REQ_1ST CM_SLAC_ MATCH_REQ
23816	CCS_SECC_TIMEOUT_SLAC_TT_EVSE_assoc_session
23817	CCS_SECC_TIMEOUT_SLAC_TT_EVSE_vald_toggle
23818	CCS_SECC_TIMEOUT_SLAC_CM_MNBC_SOUND_IND
23819	CCS_SECC_TIMEOUT_SLAC_CM_VALIDATE_REQ_2ND CM_SLAC_ MATCH_REQ
23820	CCS_SECC_TIMEOUT_SLAC_reserved_3
23821	CCS_SECC_TIMEOUT_SLAC_reserved_4
23822	CCS_SECC_TIMEOUT_SLAC_reserved_5

Status Code	Description
23823	CCS_SECC_TIMEOUT_SLACC_SDP_UDP_TT_match_join
23824	CCS_SECC_TIMEOUT_SLACC_SDP_TCP_TT_match_join
23825	CCS_SECC_TIMEOUT_SLACC_SDP_TP_amp_map_exchange
23826	CCS_SECC_TIMEOUT_SLACC_SDP_TP_link_ready_notification
23827	CCS_SECC_TIMEOUT_SLACC_SDP_reserved_1
23828	CCS_SECC_TIMEOUT_SLACC_SDP_reserved_2
23829	CCS_SECC_TIMEOUT_SLACC_SDP_reserved_3
23830	CCS_SECC_TIMEOUT_SLACC_SDP_reserved_4
23831	CCS_SECC_TIMEOUT_SLACC_SDP_reserved_5
23832	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ SupportedAppProtocolRes
23833	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ SessionSetupRes
23834	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ ServiceDiscoveryRes
23835	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ ServicePaymentSelectionRes
23836	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ ContractAuthenticationRes
23837	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ ChargeParameterDiscoveryRes
23838	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ PowerDeliveryRes
23839	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ CableCheckRes
23840	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ PreChargeRes
23841	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ CurrentDemandRes
23842	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ WeldingDetectionRes
23843	CCS_SECC_TIMEOUT_V2G_Msg_Performance_Time_ SessionStopRes
23844	CCS_SECC_TIMEOUT_V2G_Sequence_Time
23845	CCS_SECC_TIMEOUT_V2G_ReadyToCharge_Performance_Time

Status Code	Description
23846	CCS_SECC_TIMEOUT_V2G_CommunicationSetup_Performance_Time
23847	CCS_SECC_TIMEOUT_V2G_CableCheck_Performance_Time (Output short circuit)
23848	CCS_SECC_TIMEOUT_V2G_CPState_Detection_Time
23849	CCS_SECC_TIMEOUT_V2G_CPOscillator_Retain_Time
23850	CCS_SECC_TIMEOUT_V2G_PreCharge_Performace_Time
23851	CCS_SECC_TIMEOUT_V2G_reserved_2
23852	CCS_SECC_TIMEOUT_V2G_reserved_3
23853	CCS_SECC_TIMEOUT_V2G_reserved_4
23854	CCS_SECC_TIMEOUT_V2G_reserved_5
23855	CCS_CAN_TIMEOUT_TP_GET_EV_TARGET_INFO
23856	CCS_CAN_TIMEOUT_TT_GET_EV_TARGET_INFO
23857	CCS_CAN_TIMEOUT_TP_GET_EV_BATTERY_INFO
23858	CCS_CAN_TIMEOUT_TT_GET_EV_BATTERY_INFO
23859	CCS_CAN_TIMEOUT_TP_EV_STOP_EVENT
23860	CCS_CAN_TIMEOUT_TT_EV_STOP_EVENT
23861	CCS_CAN_TIMEOUT_TP_EVSE_STOP_EVENT
23862	CCS_CAN_TIMEOUT_TT_EVSE_STOP_EVENT
23863	CCS_CAN_TIMEOUT_TP_GET_MISC_INFO
23864	CCS_CAN_TIMEOUT_TT_GET_MISC_INFO
23865	CCS_CAN_TIMEOUT_TP_DOWNLOAD_REQUEST
23866	CCS_CAN_TIMEOUT_TT_DOWNLOAD_REQUEST
23867	CCS_CAN_TIMEOUT_TP_START_BLOCK_TRANSFER
23868	CCS_CAN_TIMEOUT_TT_START_BLOCK_TRANSFER
23869	CCS_CAN_TIMEOUT_TP_DATA_TRANSFER
23870	CCS_CAN_TIMEOUT_TT_DATA_TRANSFER
23871	CCS_CAN_TIMEOUT_TP_DOWNLOAD_FINISH
23872	CCS_CAN_TIMEOUT_TT_DOWNLOAD_FINISH
23873	CCS_CAN_TIMEOUT_TP_ISOLATION_STATUS
23874	CCS_CAN_TIMEOUT_TT_ISOLATION_STATUS
23875	CCS_CAN_TIMEOUT_TP_CONNECTOR_INFO

Status Code	Description
23876	CCS_CAN_TIMEOUT_TT_CONNECTOR_INFO
23877	CCS_CAN_TIMEOUT_TT_RTC_INFO
23878	CCS_CAN_TIMEOUT_TP_RTC_INFO
23879	CCS_CAN_TIMEOUT_TP_EVSE_PRECHARGE_INFO
23880	CCS_CAN_TIMEOUT_TT_EVSE_PRECHARGE_INFO
23881	CCS_CAN_TIMEOUT_MSG_Sequence
23882	CCS_CAN_MSG_Unrecognized_CMD_ID
23883	CCS_SECC_DIN_Msg_Decode_Error
23884	CCS_SECC_DIN_Msg_Encode_Error
23885	CCS_SECC_ISO1_Msg_Decode_Error
23886	CCS_SECC_ISO1_Msg_Encode_Error
23887	CCS_SECC_ISO2_Msg_Decode_Error
23888	CCS_SECC_ISO2_Msg_Encode_Error
23889	CCS_SECC_CP_State_Error
23890	CCS_SECC_Unexpected_60V_Before_Charing_Error
23891	CCS_SECC_Not_Ready_For_Charging
23892	CCS_SECC_TIMEOUT_QCA7000_COMM (The firmware code of QCA7000 may not be installed, yet).
23893	CCS_SECC_FAIL_QCA7000_SETKEY
23900	GBT_LOS_CC1
23901	GBT_CONNECTOR_LOCK_FAIL
23902	GBT_BATTERY_INCOMPATIBLE
23903	GBT_BMS_BROAA_TIMEOUT
23904	GBT_CSU_PRECHARGE_TIMEOUT
23905	GBT_BMS_PRESENT_VOLTAGE_FAULT
23906	GBT_BMS_VOLTAGE_OVER_RANGE
23907	GBT_BSM_CHARGE_ALLOW_00_10MIN_COUUNTDONE
23908	GBT_WAIT_GROUNDFAULT_TIMEOUT
23909	GBT_ADC_MORE_THAN_10V
23910	GBT_ADC_MORE_THAN_60V
23911	GBT_CHARGER_GET_NORMAL_STOP_CMD
23912	GBT_CHARGER_GET_EMERGENCY_STOP_CMD

Status Code	Description
23913	GBT_ISOLATION_RESULT_FAIL
23914	GBT_MOTHER_BOARD_MISS_LINK
23915	GBT_OUTPUT_VOLTAGE_MORE_THAN_LIMIT
23916	GBT_REQ_CURRENT_MORE_THAN_LIMIT
23917	GBT_OUTPUT_VOLTAGE_MORE_THAN_10_PERCENT
23918	GBT_OUTPUT_VOLTAGE_DIFF_BCS_5_PERCENT
23919	GBT_STOP_ADC_MORE_THAN_10V
23920	ERROR_CODE_GBT_BMS_BROAA_NO_VOLTAGE_TIMEOUT
23921	ERROR_CODE_GBT_BMS_BROAA_TO_BRO00_ERROR
23930	GBT_CEM_BHM_TIMEOUT
23931	GBT_CEM_BRM_TIMEOUT
23932	GBT_CEM_BCP_TIMEOUT
23933	GBT_CEM_BRO_TIMEOUT
23934	GBT_CEM_BCL_TIMEOUT
23935	GBT_CEM_BCS_TIMEOUT
23936	GBT_CEM_BSM_TIMEOUT
23937	GBT_CEM_BST_TIMEOUT
23938	GBT_CEM_BSD_TIMEOUT
23939	GBT_CEM_BEM_OTHER_TIMEOUT
23940	GBT_BEM_CRM_TIMEOUT
23941	GBT_BEM_CRMAA_TIMEOUT
23942	GBT_BEM_CTS_CML_TIMEOUT
23943	GBT_BEM_CRO_TIMEOUT
23944	GBT_BEM_CCS_TIMEOUT
23945	GBT_BEM_CST_TIMEOUT
23946	GBT_BEM_CSD_TIMEOUT
23947	GBT_BEM_BEM_OTHER_TIMEOUT
23950	GBT_BST_SOC_GOAL
23951	GBT_BST_TOTAL_VOLTAGE_GOAL
23952	GBT_BST_CELL_VOLTAGE_GOAL
23953	GBT_BST_GET_CST
23954	GBT_BST_ISOLATION

Status Code	Description
23955	GBT_BST_OUTPUT_CONNECTOR_OTP
23956	GBT_BST_COMPONEN
23957	GBT_BST_CHARGE_CONNECTOR
23958	GBT_BST_OTP
23959	GBT_BST_OTHER
23960	GBT_BST_HIGH_V
23961	GBT_BST_CC2
23962	GBT_BST_CURRENT
23963	GBT_BST_VOLTAGE
23964	GBT_GET_BST_NO_REASON
23970	GBT_BSM_CELL_OVER_VOLTAGE
23971	GBT_BSM_CELL_UNDER_VOLTAGE
23972	GBT_BSM_OVER_SOC
23973	GBT_BSM_UNDER_SOC
23974	GBT_BSM_CURRENT
23975	GBT_BSM_TEMPERATURE
23976	GBT_BSM_ISOLATE
23977	GBT_BSM_OUTPUT_CONNECTOR
23979	CCS_EV full charging
23980	ERROR_CODE_CHADEMO_BMS_CHARGE_ALLOW_ERROR
23981	ERROR_CODE_CHADEMO_OUTPUT_VOLTAGE_MORE_THAN_10_PERCENT
23982	ERROR_CODE_CHADEMO_ADC_LESS_THAN_10V
23983	CCS_ STOP by EV with unknow reason
23984	STOP by EVSE condition (Config or OCPP)
33900	Disconnected from backend through Ethernet
33901	Disconnected from backend through WiFi
33902	Disconnected from backend through 3G/4G
33903	Remote start charging by backend
33904	Remote stop charging by backend
33905	Remote reset by backend
41004	RCD/CCID self-test fail

Status Code	Description
41005	AC input contactor 1 welding
41006	AC input contactor 1 driving fault
41007	AC input contactor 2 welding
41008	AC input contactor 2 driving fault
41009	AC output relay welding
41010	AC output relay driving fault
41017	AC connector temperature sensor broken
41021	WiFi module broken
41022	3G/4G module broken
41023	Auxiliary power module broken
41024	Relay control module /smart box broken
41031	PSU module broken
41032	RCD/CCID module broken
41033	Maximum Output Current setup error
41034	Shutter fault
41035	Ble module broken
41036	Rotary switch fault
42200	System L1 input OVP
42201	System L2 input OVP
42202	System L3 input OVP
42203	System L1 input UVP
42204	System L2 input UVP
42205	System L3 input UVP
42206	PSU L1 input OVP
42207	PSU L2 input OVP
42208	PSU L3 input OVP
42209	PSU L1 input UVP
42210	PSU L2 input UVP
42211	PSU L3 input UVP
42212	System L1 input drop
42213	System L2 input drop
42214	System L3 input drop

Status Code	Description
42223	System ambient/inlet OTP
42224	System critical point OTP
42225	PSU ambient/inlet OTP
42226	PSU critical point OTP
42227	Auxiliary power module OTP
42228	Relay board/smart box OTP
42232	AC connector OTP
42233	RCD/CCID trip
42237	SPD trip
42238	Main power breaker trip
42239	Auxiliary power breaker trip
42240	PSU communication fail
42241	WiFi module communication fail
42242	3G/4G module communication fail
42244	Bluetooth module communication fail
42246	Auxiliary power module communication fail
42247	Relay control boaed/smart box communication fail
42251	Emergency stop
42252	Door open
42253	System fan decay
42254	Fail to create share memory
42255	CSU initialization failed
42257	MCU self-test Fault
42258	Relay self-test Fault
42262	System AC L1 output Circuit Short
42263	PSU Duplicate ID
42264	PSU Fault : Output Short Circuit
42265	PSU Discharge Abnormal
42266	PSU Dc Side ShutDown
42267	PSU Failure Alarm
42268	PSU Protection Alarm
42269	PSU Fault : Fan Fault

Status Code	Description
42270	PSU Input UVP
42271	PSU Input OVP
42272	PSU WalkIn State
42273	PSU Fault : Power Limited State
42274	PSU Fault : Id Repeat
42275	PSU Fault : Severe Uneven Current
42276	PSU Three Phase Input Inadequate
42277	PSU Three Phase Onput Imbalance
42278	PSU Ffc Side ShutDown
42279	NO PSU Resource
42280	Self test Failed due to communication of Relayboard failure
42281	Self test Failed due to communication of Fanboard failure
42282	Self test Failed due to communication of Primary failure
42283	Self test Failed due to communication of Chademoboard failure
42284	Self test Failed due to communication of CCSboard failure
42285	Self test Failed due to AC Contact failure
42286	Self test Failed due to communication of PSU failure
42287	Self test Failed due to Model name is none match
42291	Self test Failed due to communication of GBTboard failure
42292	Self test Failed due to communication of AC failure
42293	Self test Failed due to communication of Ledboard failure
42294	AC input ovp
42295	AC input uvp
42299	System AC L2 output OCP
42300	System AC L3 output OCP
42301	System AC L2 output Circuit Short
42302	System AC L3 output Circuit Short
42304	Disconnected from dispenser
42305	Meter communication timeout
42306	The dip switch of the PSU may be incorrect
42307	PSU Fuse Burn-Out
42308	PSU Pfc And Dcdc Communication Fault

Status Code	Description
42309	PSU Bus Voltage Unbalance
42310	PSU Bus Over Voltage
42311	PSU Bus Voltage Abnormal
42312	PSU Bus Under Voltage
42313	PSU Input Phase Loss
42314	PSU Fan Full Speed
42315	PSU Temperature Power Limit
42316	PSU Ac Power Limit
42317	PSU Dcdc Eeprom Fault
42318	PSU Pfc Eeprom Fault
42319	PSU Dcdc Over Voltage
42326	System task is lost
42327	DC input ovp
42328	DC input uvp
43600	Normal stop charging by user
43601	Charging Time's up
43602	Replace system air filter
43607	CSU fimrware update fail
43611	Auxiliary power module fimrware update fail
43612	Relay control module fimrware update fail
43614	Bluetooth module fimrware update fail
43615	WiFi module fimrware update fail
43616	3G/4G module fimrware update fail
43617	SMR fimrware update fail
43618	RFID module fimrware update fail
43619	Configured by USB flash drive
43620	Configured by backend
43621	Configured by webage
43622	Disconnected from Internet through Ethernet
43623	Disconnected from Internet through WiFi
43624	Disconnected from Internet through 3G/4G
43625	Disconnected from AP through WiFi

Status Code	Description
43626	Disconnected from APN through 3G/4G
43627	WiFi disabled (separated charger only)
43628	4G disabled (separated charger only)
43629	PSU quantity not match

Table 5. Status Codes

3. Maintenance

3.1 Before Maintenance

To meet NFPA-70E, OSHA 1910.333 and other Health/safety/security codes, adhwere to the notice and get the permit needed in advance as below:

- Turn off power (Work de-energized whenever possible)
- Lockout/Tagout (LOTO)
- Live work permit (Input terminals with High Voltage after door is open)
- Plan the Work/Permit To Work
- Use Personal Protective Equipment (PPE)
- Safe workplace condition and space

3.1.1 Preventative Maintenance Checklist

Refer to Appendix A for more details.

3.2 General Maintenance

When reporting faults, defects, or damage, you will need to provide the serial number, model name, status code, failure behavior, and date/time. The charger must be connected to the Internet for remote diagnostics and upgrades.

WARNING

Danger of electrical shock or injury. Disconnect power to the charger before performing any maintenance. Failure to do so may cause physical injury or damage to the charger.

WARNING

After power to the charger has been removed and the maintenance door is open, the charger is still hazardous. Only a visual inspection can be performed at this point.

WARNING

After opening the front door of the charger, secure the main and auxiliary breakers before performing maintenance.

CAUTION

Do not twist, swing, bend, drop, or crush the charging cable. Never drive over it with a vehicle.

CAUTION

After power to the charger has been removed and the maintenance door is open, the charger is still hazardous. Only a visual inspection can be performed at this point.

Note:

Before removing power to the charger to begin maintenance, record the status code on the display.

Note:

Maintenance of the charger shall only be conducted by a qualified technician.

3.2.2 Exterior Inspection

Inspect the exterior housing. The housing is made of welded metal with a painted surface. Slight rust will not affect the performance of the charger. However, if the charger develops major rust during or after the warranty period, contact the Owner/Operator for instructions.

Inspect the charging connector, charging cable, and the connector holder. There should not be bends or twists in the charging cable. The metal contacts of the connector should not fade or be rusty. If there is damage, contact the Owner/Operator.

If the cabinet or screen is broken, cracked, open, or shows other signs of damage, contact the Owner/Operator.

3.2.3 Interior Inspection

Tighten the main power junctions every month. A loose connection can result in damage to the charger or electrical fire. Make sure the screw is torqued properly. See Appendix C - Torque Requirements Table in the installation manual.

Test the cables for continuity.

Look for evidence of water intrusion and damage. If there is evidence of water intrusion or damage, contact the Owner/Operator.

3.2.4 Cleaning

Keep the exterior clean at all times. Clean the cabinet exterior with a damp cloth or wet cotton towel. Use light pressure and tap water or cleaning agents with a PH level between 6 to 8.

Do not apply high-pressure water jets.

Do not use abrasive cleaning agents or tools. Abrasive cleaning agents can damage the coating, paint, finish, and durability of the exterior parts.

Clean the cabinet interior at least three times a year.

3.2.5 Cooling

The charger is cooled by forced air. Keep the charger in a ventilated location and do not block the air vents.

Clean the air filters regularly.

Replace the air filters every 6 to 12 months.

The following limited warranty covers all Zerova EV Chargers sold to authorized Zerova Reseller Partners.

4. Zerova Limited Warranty Agreement (Parts Only)

Warranty Coverage:

- The warranty period for all Zerova EV chargers is two years (parts only) from the invoice date. A two- month grace period is provided for all shipments direct from Asia to the location designated by the reseller.
- After the warranty period, if no extended warranty has been purchased, any replacement parts ordered will be covered for one year from the invoice date.
- During the warranty period, Zerova will provide ongoing technical support to help troubleshoot any technical issues. Our support team is available Monday thru Friday from 9 am to 5 pm Pacific Standard Time. Please report the issues to: EVSE.Customer.Service@ZerovaTech.com.

Warranty Exclusions:

- Inability to provide valid proof of purchase.
- The product is out of warranty.
- Damage caused by improper use, maintenance, and/or storage.
- Damage or malfunction caused by a foreign object entering the unit.
- Unauthorized repair, disassembly, or modification.
- Malfunction and damage caused by other unavoidable external factors. Malfunction and damage caused by improper use of equipment, such as water or other solutions entering the equipment.
- Mechanical damage caused by an accident.
- Damage or rendered non-functional because of power surges, lighting, earthquake, fire, flood, pest damage, abuse, accident, misuse, negligence, or failure to maintain the product or other event beyond Supplier's reasonable control or not arising from normal operating condition.
- Cosmetic or superficial defect, dents, marks, or scratches after use.
- Components which are separate from the product, ancillary equipment, and consumables, such as door key, RFID card, air filter, fuse, cable, wires, and connectors.
- Damage as a result of modifications, alterations or disassembling which were not pre-authorized in writing by Supplier.
- Damage due to the failure to observe the applicable safety regulations governing the proper use of the product.
- Installed or operated equipment not in strict conformance with the documentation, including without limitation, not ensuring sufficient

ventilation for the product as described in Supplier installation instruction.

If a defect occurs during the warranty period, the product or parts must be returned in accordance with the terms in our return policy. A copy of the original invoice or other proof of purchase must accompany the returned unit(s) or parts. Zerova reserves the right to repair or replace any defective EV charger within the warranty period. Zerova is under no obligation to repair or replace EV chargers that have components damaged by using excessive loads or input conditions beyond the stated range of the EV charger specification.

Except as expressly stated in this warranty or in the written sales agreement between Zerova and its direct customer, no other warranties, expressed or implied will be applicable. In no event shall Zerova be liable for loss of profit or benefits, indirect, special, consequential, or other similar damages arising out of any breach of warranty or otherwise.

When service is required for a Zerova EV charger, a defect report is required to obtain a Return Merchandise Authorization number (RMA) before returning the EV charger(s). Zerova will not accept returns that do not have an RMA number included with the shipment.

Defective units or parts must be returned freight prepaid; Zerova will only pay for the shipping back to the customer for valid warranty claims.

EV chargers within the warranty period will be repaired or replaced free of charge, if the warranty and return policy conditions have been met. EV chargers that are repaired after the warranty has expired will be subject to charges for parts and labor. We will only start the repair process after we have received acceptance by the customer of the repair costs.

Any damage occurring to the EV charger during shipping should be reported to the carrier immediately. Zerova is not responsible for damage during transit. Keep original shipping containers and packaging material. The carrier will not be honor a claim if shipping material is missing.

To return EV chargers or parts to Zerova, please phone us between our business hours (9:00 am to 5:00 pm PST). If you cannot call, send a detailed explanation of the problem by fax or email. You will be issued an RMA number and instructed on how to return the EV charger. A detailed description of the problem(s) with each EV charger and a list of the serial numbers should be included with the shipment.

Returned EV chargers are sugject to following conditions:

1. EV chargers or parts must be packed in a manner that will prevent incidental damage during shipping.

2. A copy of the original purchase order or other proof of purchase and defect report must accompany the return.

3. EV chargers or parts returned to Zerova that are determined to be misused, altered, or modified from the original manufactured release will be returned to the client freight collect.

4. Retesting fee per unit and return freight charges will be incurred for unit(s) with no defects.

5. Route Cause Analysis and failure report for products out of Warranty will be charged depending on the condition of the product.

5. Appendix A - Replacement Kit List

No.	Item	Description	0.5 year	1st year	2nd year	3rd year	4th year	5th year
1	Preventive maintenance		I	I	I	I	I	I
2	Appearance inspection	Appearance visual inspection	I	I	I	I	I	I
3	System fan	Fan clean and spinning smoothly check	I	I	I	R	I	I
4	Air filter	Air filter, air inlet and outlet clean	I	I	R	I	R	I
5	Charging cable	Appearance clean	I	I	I	R	I	I
6	PCBA	Visible section clean	--	I	I	I	I	R
7	SPD	SPD status indication check	I	I	I	I	I	R
8	DC output bolts torque	Bolts torque check	--	I	I	I	I	I
9	AC input bolts torque	Bolts torque check	--	I	I	I	I	I
10	LCD display	Display sharpness and backlight check	--	I	I	I	I	R
11	Selection button	Indication light and function check	--	I	I	I	I	R
12	RFID reader	Function check	--	I	I	I	I	R
13	Emergency stop button	Function check	--	I	I	I	I	R
14	Breaker and RCD	Function check	--	I	I	I	I	R
15	Aux power supply	No maintenance requirement	--	--	--	--	--	R
16	PSU module	No maintenance requirement	--	--	--	--	--	R

Note:

Depending on the environment, user may decide the timing of filter replacement.

I: Inspection recommended

R: Replacement recommended

--: No maintenance needed or depend on the situation

6. Appendix B - Preventative Maintenance Worksheet

Note: Tear out this page and make copies before use.

Item	Status	Remark
Appearance inspection		Appearance visual inspection
System fan		Fan clean and spinning smoothly check
Air filter		Air filter, air inlet and outlet clean
Charging cable		Appearance clean
PCBA		Visible section clean
SPD		SPD status indication check
DC output bolts torque		Bolts torque check
AC input bolts torque		Bolts torque check
LCD display		Display sharpness and back-light check
Selection button		Indication light and function check
RFID reader		Function check
Emergency stop button		Function check
Breaker and RCD		Function check
Aux power supply		No maintenance requirement
PSU module		No maintenance requirement

7. Appendix C - Torque Requirements Table

Metric Size	Type	Steel lbf-in	Steel Kg-cm	Steel N-m	Aluminum Kgf-cm	Aluminum N-m
M2*0.4	Machine	3~4.77	3.5~5.5	0.34~0.54	3~4.5	0.34~0.44
M2.5*0.45	Machine	3~4.77	3.5~5.5	0.34~0.54	3~4.5	0.34~0.44
M3*0.5	Machine	5.5~9	6.5~10.5	0.64~1.04	5.2~8.4	0.51~0.82
M3.5*0.6	Machine	8.5~13	10~15	0.98~1.47	8~12	0.78~1.18
M4*0.7	Machine	13~18	15~21	1.47~2.06	12~17	1.18~1.66
M5*0.8	Machine	25~34	29~39	2.84~3.82	23~32	2.26~3.14
M6*1.0	Machine	45·55	52~63.5	5.1~6.22	42~51	4.11~5
M6*1.0	Hex cap	85~112	98~129	9.6~12.65	78~103	7.65~10.1
M8*1.25	Machine	106~141	122~163	11.96~15.98	98~130	9.61~12.75
M8*1.25	Hex cap	205~274	237~316	23.24~30.98	190~253	18.63~24.8
M10*1.5	Hex cap	212~382	245~440	24.02~43.15	196~351	19.22~34.42
M12*1.75	Hex cap	372~668	430~770	42.17~75.49	343~615	33.63~60.3
Imperial Size	Type	Steel lbf-in	Steel Kg-cm	Steel N-m	Aluminum Kgf-cm	Aluminum N-m
2-56	Machine	1.5~2	1.7~2.3	0.17~0.22	1.4~1.8	0.14~0.18
4-40	Machine	3~4	3.5~4.5	0.34~0.44	2.8~3.6	0.27~0.35
6-32	Machine	6~10	7~11.5	0.68~1.13	5.6~9.2	0.55~0.9
8-32	Machine	10~15	11.5~17	1.13~1.66	9.2~14	0.9~1.37
10-32	Machine	16~24	18.5~28	1.81~2.74	15~22	1.47~2.16
1/4-20	Machine	35~46	40~53	3.92~5.2	32~42	3.14~4.11
1/4-20	Hex cap	57~77	66~89	6.47~8.73	53~71	5.2~6.96
5/16-18	Hex cap	119~158	137~182	13.43~17.85	110~145	10.77~14.21
3/8-16	Hex cap	205~274	237~316	23.24~30.99	190~253	18.63~24.82
7/16-14	Hex cap	338~451	390~521	38.24~51.09	312~416	30.59~40.79
1/2-13	Hex cap	515~686	595~792	58.35~77.66	476~634	46.68~62.17

NOTE

NOTE

NOTE

Manufacturer Contact Info Sticker