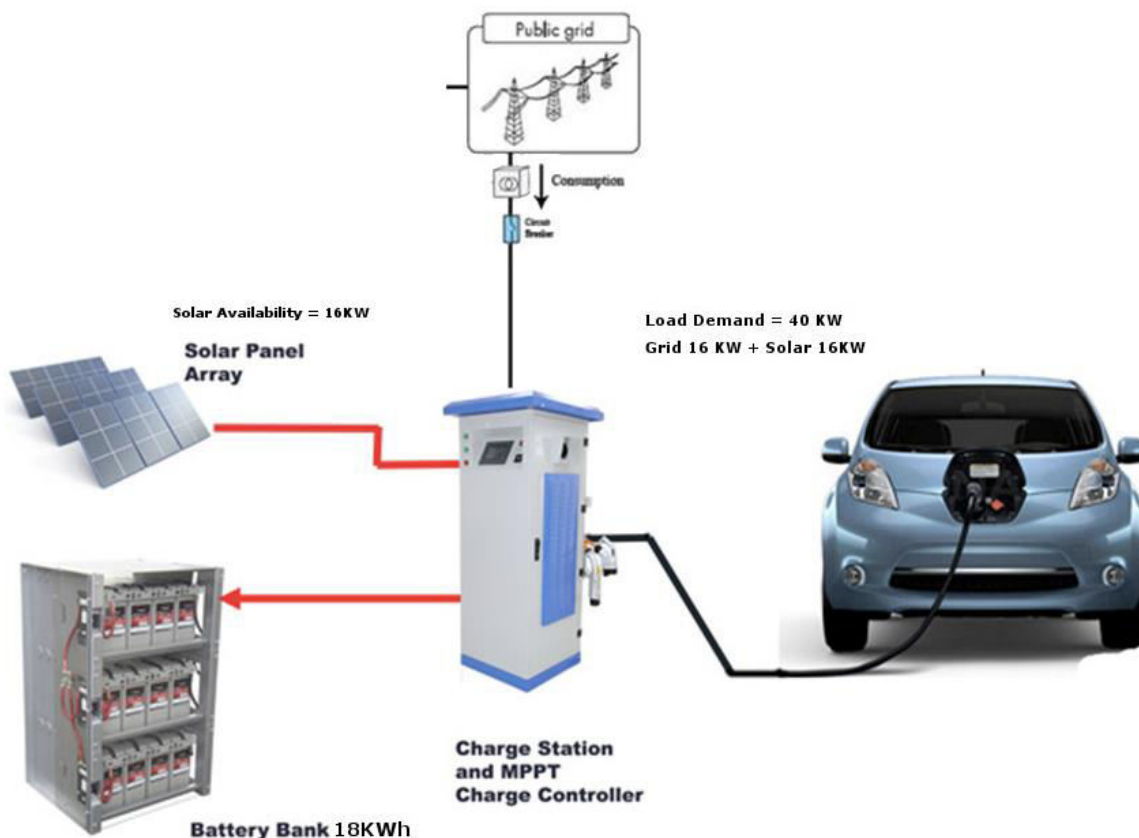




SOLAIRE INTRODUCES THE FIRST SOLAR EDGE'S 3 PHASE STOREDGE INVERTER WITH BATTERY FROM LG CHEM THE WORLD LEADER IN LITHIUM ION BATTERY INTEGRATED WITH 3 PHASE EV CHARGER FOR FAST CHARGING OF YOUR ELECTRIC VEHICLES

THIS UNIQUE CONFIGURATION offers users the ability to **charge electric vehicles up to six times faster than a standard Level 1 charger** through an innovative solar boost mode that utilizes grid, battery and PV charging simultaneously. This product is ONE OF the first PV inverter-integrated EV charger.

By installing the SolarEdge's 3NOS STOREDGE SINGLE PHASE INVERTERS IN EACH PHASE all 3 ac coupled -integrated WITH EV charger, customers benefit from the reduced hassle of installing a separate standalone EV charger with battery backup and a PV inverter. Furthermore, you benefit by eliminating the need for additional wiring, conduit and a breaker installation. By installing an EV charger that is integrated with an inverter, an additional dedicated circuit breaker is not needed, saving space and eliminating a potential main distribution panel upgrade. Load Shares the solar power and the grid power, thereby reducing the grid utilization IN ABSENCE OF SOLAR DURING NIGHT TIME LOAD SHARES BATTERY POWER WITH GRID





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KEY BENEFITS



Combines sun and grid power for charging up to six times faster than existing electrical infrastructure



Fully integrated with SolarEdge monitoring platform



Reduces workload and costs of installing a standalone EV charger and a PV inverter



Built-in meter enables separate tracking of EV power usage for visibility and control



12-year warranty⁽¹⁾, extendable to 20 or 25 years



Optional built-in Revenue Grade Meter (RGM)



Saves space on main distribution panel to avoid potential upgrade



Demand-Response ready



FULL VISIBILITY AND CONTROL

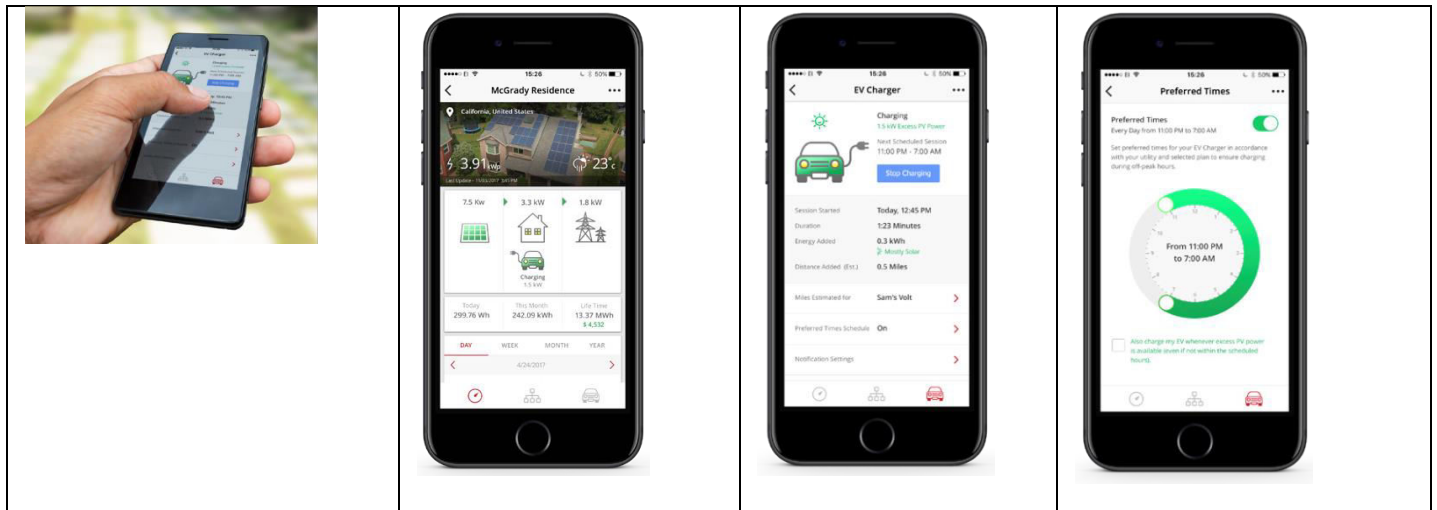
The SolarEdge EV charger supports full network connectivity and integrates seamlessly with the SolarEdge monitoring platform. Homeowners can track their charging status, control vehicle charging, and set charging schedules.

FEATURE HIGHLIGHTS

- Smart-scheduling for use with Time of Use (TOU) rates — charge from the grid during off peak hours or when grid rates are lower.
- Track PV, EV, and grid consumption for visibility and control of household energy usage.



- Remote operation via mobile app — turn charging on and off directly from your Smartphone.
- View charging duration, charge energy, and percent charge from PV EV CHARGING COMPARISON



EV CHARGING COMPARISON

	EV Charger Level 1 (1.44 kW 12A@120Vac)	SolarEdge EV Charger Level 2 with solar boost mode. Charging speed depends on PV produce on (Maximum 9.6 kW -12 KW PER PHASE 40A@ 240Vac)
Added miles per 1 hour of charging	5 miles	25 to 30 miles
.Charge me needed to meet average daily mileage.	6.5 hours	1.5 to 1 hour

Solar Edge’s Integrated Three Phase Storage Battery Inverter with EV Charger

OUTPUT — AC (LOADS / GRID)	
Rated AC Power Output	18 KW (6 KW PER PHASE)
Max. AC Power Output	18 KW (6 KW PER PHASE)



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Nominal (Voltage Output AC Line to Line/Line to Neutral)	415V /230 V @50c/s
Maximum Continuous Output Current @240 V AC	27 A per Phase
OUTPUT — AC (EV CHARGER)	
Charging Level	AC LEVEL 2,MODE 3
MAX AC Power Output: SOLAR + BATTERY	22 KW + GRID POWER 18 KW = 40 KW
Nominal AC Output Voltage PER Phase	240V @ 50c/s
Maximum Continuous Output Current @240V AC	42 A (27A from PV +15A from battery+ Grid Current =30.7 A) APPX
NOMINAL CONTINUOUS CURRENT @ 240 V AC	45 A IN ABSENCE OF SUN / 42 A IN ABSENCE OF GRID APPX
INPUT — DC	
Maximum DC Power	8100 watts per Phase = 24300 watts total
Transformer-less, Ungrounded	YES
Maximum Input Voltage PV & BATTERY PER PHASE	500 V DC
Nominal DC Input Voltage PER PHASE	400 V DC
Maximum Input Current PV @240VDC	23 A
Maximum Input Current BATTERY @240V	8.5 A
Max Input Short Circuit Current	45 A
Reverse-Polarity Protection	Yes
EV Charger Status LEDs, Fault Indicator	Yes
EV Charger Unplugging Detection	Yes, current termination according to SAE J1772
EV Charger Ground Connection Monitoring	Yes, continuous
EV Charger Connector TYPE	2 , 7 PIN L1,L2,L3,N,PE,CP,PP
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)
BATTERY	
Model	RESU 7H PER PHASE
Make	LG Chem
Type	Lithium Ion
Max Energy	7KWh per Phase
Usable Energy	6.6 KWh per Phase



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Voltage Range	350-450V
Communication	RS 485
Backup	1 Hr Per 6 KW Load Per Phase



ELECTRIC VEHICLE CHARGING SYSTEMS:

SOLAIRE INTRODUCES INTEGRATED ELECTRIC VEHICLE CHARGING SOLUTIONS

FOR CHARGING VARIOUS TYPES OF VEHICLES LIKE MAHINDRA'S E20, TOYOTA, TATA'S EV ETC , ELECTRIC BUSES OF BYD ETC , 2 WHEELERS & 3 WHEELERS , BASED ON THEIR BATTERY CONFIGURATION . THROUGH ANY PUBLIC METERED AC OUTLET HAVING TYPE II 7 PIN 3 PHASE AC 63 A CONNECTOR AS PER IEC 62196-2

CHOOSE FROM THE VARIOUS **ON BOARD CHARGER CONFIGURATION** WITH COMBINATION OF LIBAL'S FAST CHARGE INTERFACE WITH SWITCHING CONTROLS FROM DENMARK FOR CHARGING 4 WHEELERS WITHIN 1-2 HOURS & ELECTRIC BUSES WITHIN 4 TO 6 HRS DEPENDING ON THE BATTERY CAPACITY & STATE OF CHARGE. THE INTERFACE COMMUNICATES WITH THE ONBOARD BATTERY MANAGEMENT SYSTEM BMS USING A SEPARATE ISOLATED CAN BUS INTERFACE IN ORDER TO CONDUCT THE DC FAST CHARGING IN FULL COMPLIANCE WITH THE OPERATIONAL LIMITS SET BY THE BMS

THE HIGH VOLTAGE CHARGERS WITHOUT THE SWITCHING CONTROLS & FAST CHARGE INTERFACE CAN ALSO COMMUNICATE WITH THE BMS THROUGH CAN BUS & CHARGE THE BATTERIES . THE FAST CHARGE INTERFACE WITH SWITCHING CONTROLS SPEED UP THE NORMAL CHARGING PROCESS BY NEARLY 50 % TO 75 %.

VEHICLE MOUNTED ON BOARD AC CONVERTER & CHARGERS

1 HIGH VOLTAGE CHARGERS



SIZE : L357 X W254 X H377

WT : 28 KG



ADVANTAGES

Wide input voltage range (85Vac~265Vac), apply to worldwide requirements, high ability against electricity grid fluctuation, convenient for electric-network fluctuation and vehicles exportation.

Fully-sealed and water-proof, protection grade IP66. Shock resistance treatment inside makes vibration-proof level up to SAEJ1378, fully confirm to the standards of automobile appliance usage.

Internal integrated PFC, power factor can reach to 0.998, no pollution to electric grid. It can avoid high-current impact to the electric grid.

High with above 93% efficiency while the traditional chargers is only about 80% of the efficiency.

As for Lithium battery charger, equipped with CAN communication interface to realize real-time communication with BMS.

SUMMARY AND APPLICATION SCOPE

The charger is applicable for various lithium batteries like LiFePO₄, LiMn₂O₄ etc., It features light weight, small volume, stable performance, high efficiency and reliable security etc., It can be switched automatically between the floating and balancing charging and also has the protection functions of reverse connection, output short-circuit and overload and so on. The charger is widely used for battery-charging cycles in electric vehicles such as electric forklift, golf cars, electric trucks, electric tour bus, electric yacht, cleaning machines, or Uninterruptible Power Supply (UPS), solar energy, wind power dynamo and electric communication system on the railway etc.

TECHNICAL TARGET

Input Voltage Range	AC85V~AC265V
AC Input Frequency	45~65 Hz
AC Power Factor	=0.98
Full Load Efficiency	=93%
Mechanical Shock &	Conformance to SAEJ1378

Vibration Resistance Level	Standard
Environmental Enclosure	IP66
Operating Temperature	-40°C~+55°C (- 40°F~+131°F)
Storage Temperature	-40°C~+100°C (- 40°F~+212°F)
Charging Control	Via CAN bus or ENABLE

PROTECTION FEATURES

Thermal Self-Protection: When the internal temperature of the charger exceeds 75°C the charging current will reduce automatically. If it exceeds 85°C, the charger will shut down protectively. When the internal temperature drops, it will resume charging automatically.

Short-circuit Protection: When the charger encounters unexpected short-circuit, it will automatically stop to output. When fault removes, the charger will re-start in 10 seconds.

Reverse Connection Protection: When the battery is polarity reversed, the charger will cut off the connection between the internal circuit and the battery, and refuses to start. It can avoid any destroy.

Input Low-voltage & Over-voltage Protection: When the AC input Voltage is lower than 85V or higher than 265V, the charger will shutdown protectively and automatically resume working with the voltage is normal again.



Models Available	Output Voltage Max	Output Current Max
TCCH-H66-140	66V	140A
TCCH-H83-120	82.6V	120A for Type 2
TCCH-H96-100	96.2V	100A
TCCH-H112-84	112V	84A
TCCH-H130-72	130V	72A
TCCH-H145-64	144.7V	64A
TCCH-H168-60	168V	60A
TCCH-H192-48	192V	48A
TCCH-H208-44	208V	44A
TCCH-H234-40	233.3V	40A
TCCH-H243-36	243V	36A
TCCH-H258-36	258V	36A
TCCH-H290-32	289.5V	32A
TCCH-H337-28A8	337V	28.8A
TCCH-H389-24	389V	24A
TCCH-H417-22	417V	22A

FAST CHARGER INTERFACE FROM LIBAL





INTRODUCTION

The LiBAL Fast Charge Interface™ by Lithium Balance A/S enables vehicle side implementation to interface with GB/T/CHADEMO based fast charging system. The product has been designed to enable fast adaptation and integration to any battery pack.

The LiBAL Fast Charge Interface™ fully implements the physical and protocol level of the GB/T/CHADEMO standard. This includes all CAN frames required for the GB/T/CHADEMO fast charging as well as I/O ports for controlling high voltage contactors in full compliance with the GB/T standard for DC fast charging.

The LiBAL Fast Charge Interface™ communicates with the on board Battery Management System (BMS) using a separate isolated CAN bus interface in order to conduct the DC fast charging in full compliance with the operational limits set by the BMS

The LiBAL Fast Charge Interface™ is designed as an accessory to the Lithium Balance BMS product line, allowing fast, safe and simple addition of DC fast charging capabilities to any vehicle powered by a Lithium Balance BMS. This modular approach offers the capability to deploy DC fast charging simply and flexibly in a vehicle.

The functionality of the LiBAL Fast Charge Interface™ can be fully configured using Lithium Balance PC configuration tool via CAN Bus.

BENEFITS OF LIBAL FAST CHARGE INTERFACE™

Cost efficient and easy implementation of GB/T fast charging

Compact & installation friendly design

Safety rated (ASIL D) microcontroller

Real time operating system (optional ASIL D)

BENEFITS OF FAST CHARGING

Reduction in battery size (kWh) & weight

Reduction on Battery cost

Increased uptime of electric vehicles / applications

Elimination of battery swap operations

Improved total cost of ownership

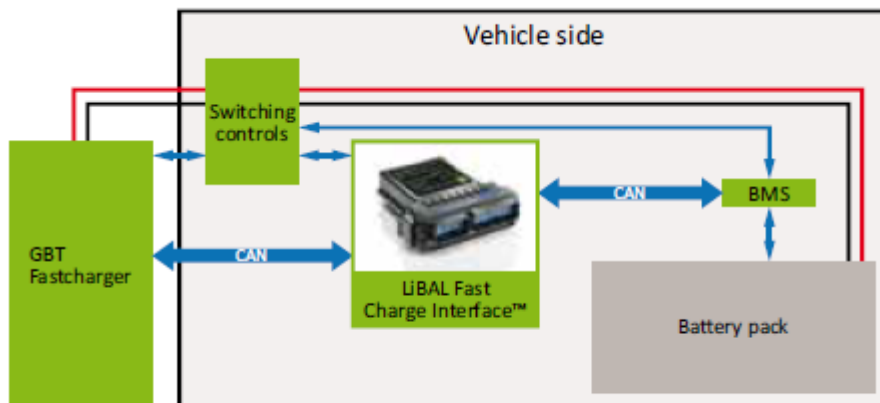
FUNCTIONALITY

GBT/CHADEMO control logic

Configurable relay drivers

Configurable IOs

Data logging





THE GBT / CHADEMO FAST CHARGER IS REPLACED WITH ON BOARD VEHICLE CHARGER WITH GBT PIN CONFIGURATION FOR AN PMAO AC OUTLET

PARAMETERS SPECIFICATIONS

Mechanical

Dimensions 103.5 mm X 101.6 mm X 42.3 mm

IP rating IP67

Operating Temperatures -40 Deg C to + 85 Deg C

Weight 300 g

Installation 2 X M6 Bolts

Electrical

Supply 6VDC to 16VDC (12V optimal)

Consumption 80 – 100 mA @ 12VDC

Hardware

Controller Automotive grade ASIL D

Controller Speed 80 MHz

CAN 1 CAN2.0 A/B - Galvanic Isolation - 125Kbps to 1Mbps

CAN 2 CAN2.0 A/B - Galvanic Isolation - 125Kbps to 1Mbps

IOs ChadeMO standard compliant 2 X Relay Drivers

RTC Yes

Data Logging SD card, high-end industrial grade; Suitable for automotive use

PC Software

Interface - USB Dongle

OS : Windows Vista , 7 , 8

Pro Version - Calibration Development capability

Service Version - Field Service &troubleshoot

Fast Charging Standard GBT/CHADEMO standard

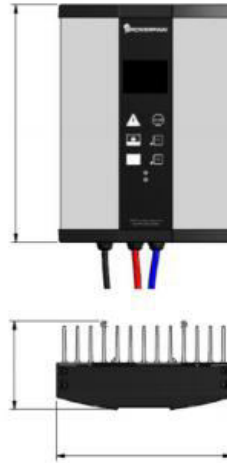
EMC Immunity Tested as per EN61000-4-3 (80MHz – 3000MHz) at 200 V/m, EN61000-4-4 (4kV)

Temperature Specifications Operational -40° to 85°C

Vibration Tolerance Tested as per EN60068-2-6 random vibration (10 – 1000Hz)



2 LIBAL ROBUST ON BOARD VEHICLE AC CHARGER



model	height	width	depth	weight kg
Robust 1100 passive	290	230	110	5.8
Robust 1100 fan	330	230	80	3.9
Robust 2300 passive	330	230	110	8.5
Robust 2300 fan	370	230	80	6.1
Robust 3000 fan	370	230	80	6.7

Dimensions in mm

The LiBAL Robust Chargers™ series is a cost effective and easy to use charging solutions for any lithium ion battery packs ranging from 24VDC to 48VDC with the following variants LiBAL Robust Charger 1100-3000W. The chargers can be connected in parallel to accommodate higher output current. The LiBAL Robust Charger™ is a rugged design with IP54, optionally 67 rating. The installation friendly charger is developed to suite any orientation and location. The unique fan design enables cooling of charger externally. The LiBAL Robust Chargers™ has a CAN interface which can be configured to delivery requested voltage and current by the BMS. LiBAL Robust Charger™ is fully compatible to LiBal BMS™ with one click integration using the pre-configured LiBal PC diagnostic tool.

HIGH LIGHTS

- The LiBAL Robust Chargers™ enables:
- Robust Design • Ease of integration to BMS via CAN
- Affordable
- Ease of installation
- Output power 1100W, 2300W and 3000W
- Output versions 24V, 36V and 48V • IP54 (optional 66)
- External LED • CAN controlled Voltage and Current



Rugged Lithium-ion BMS for LI-ION/LI-ION PHOS BATTERIES OF ELECTRIC VEHICLES

Hi,
Battery Management System



Rugged Lithium-ion BMS for

- Electric vehicles
- Industrial vehicles
- Hybrid vehicles
- Marine vessels
- Energy storage

INTRODUCTION

The housed s-BMS is an exceptionally flexible and cost effective Battery Management System for industrial, motive, and stationary battery packs ranging from 12VDC up to 1000VDC. It manages rechargeable lithium batteries of any chemistry and from any battery supplier allowing you maximum battery sourcing freedom.

The master Control Unit monitors up to 16 cells in series, and can be used stand alone as a 12-48VDC BMS. But it can also daisy chain up to 15 Monitoring Units, each of which can monitor another 16 cells. Both units are rated IP61 with casings designed to dissipate heat, and comes with a family of dedicated cables.

The PC Diagnostic Software provides displays for monitoring battery and BMS performance. It also allows you to configure all battery parameters such as limit voltages and temperatures, allowable charge and discharge rates or improve SoC estimation with your own battery model.

CAN frames can be constructed at "Bit level" to broadcast the parameters measured and calculated. A post processing module allows you to scale and manipulate values and broadcast them on the CAN bus with no custom development needed. This allows the s-BMS to work as a drop in replacement for many existing systems.

FLEXIBILITY

12 VDC to 1000 VDC



- Up to 256 cells in series
- All battery parameters easily configured
- User-definable event responses and warnings
- User configurable I/Os and CAN messages
- Battery model for intelligent rate control
- Embedded post processing of CAN values

SAFETY

- Detection of 27 error modes and 17 warning conditions
- Noise and vibration robust
- 40° to +85°C operational range

FUNCTIONALITY

- Cell voltages 0-5V, ±2mV accuracy
- SOC and SOH estimation
- LEAK detection
- Cell balancing up to 840mA/cell
- Cell and pack resistance estimation
- Thermal management
- Advanced charger control
- Data logging

System Voltage Range	12 - 1000VDC
Cells per Unit	16 cells max/unit
Cells per System	256 cells max/system
Capacity	2000Ah Max
Balancing Current	840mA @ 4.2VDC Max (Optional Heat Sink for boosted performance)
Input Voltage	Control Unit only: 12 VDC (9VDC - 14VDC)
Current Consumption:	Control Unit only – from 12V supply: <150mA operating Both Units - from cells: <20mA operating
Temperature Sensor	2 on the board + 2 for battery modules per LMU integration board NTC, 10KΩ @ 25 DegC, β Value: 3900
Measurement Specifications	Cell voltage: Range 0-5V, Accuracy ±2mV typical, <±10mV max., Sampling 1Hz Temperature accuracy ±1.5°C (dependent on sensor) Pack voltage 0-1000V, accuracy ±1V, Sampling 5 Hz Current measurement by Shunt (100 – 1000 μΩ), 400mV max, Sampling 5 Hz Control Unit: 268 x 125 x 56mm, 988g, Length with cables 500mm Monitoring Unit: 257 x 115 x 38mm, 718g, Length with cables 410mm
Dimensions	
Coating	3M™ Novec™ electronic coating EGC-1700
Control IOs	HV contactors, charge contactor, precharge contactor
User Defined IOs (max. 3)	Fan control, heater control, HV interlock, low SOC warning, mid pack relays, error LED, off board leak detect, low power charger mode (e.g. dual chargers)
Communication	CAN bus 2.0 A&B for system integration RS232 PC diagnostics interface
Charger Control Options	Analogue voltage control, PWM 1-5 KHz, CAN 2.0 A&B
Protection Modes	Capable to monitor and handle 27 safety critical error modes Capable to report 17 unique warnings conditions Capability to broadcast system status, errors and warnings over CAN
Diagnostic Tool	Supported operating systems: Windows Professional, XP, Vista, 7, 8.1 and 10 Pro version - calibration development capability Service version - field service & troubleshooting Requires USB to RS 232 converter cable or RS232 port on device
EMC Immunity	Tested as per EN61000-4-3 (80MHz – 1000MHz) at 200 V/m, EN61000-4-4 (4kV)
Temperature	-40° to 85°C
Vibration Tolerance	Tested as per EN60068-2-6 random vibration (10 – 1000Hz)
Certifications	CE marking