10kW Bidirectional Charger module

Based on years of experience PRE has developed a standard 10kW bidirectional Power concept for EV chargers with 3 phase AC Input. The charger has active PFC and is based on the latest SiC semiconductors and quasi-resonant technology which results in high efficiency and excellent overall performance. The Charger module meets today's safety and grid connectivity requirements and is compatible with the CCS and CHAdeMO Charging standards. The charger module can be fully controlled and monitored by CAN-bus Interface.

Features

- Bidirectional (V2G) operation
- CAN/BMS Control Interface
- CCS & CHAdeMO compatible
- VDE & G99 compliant Grid connectivity
- Optional Solar Input with MPP-Tracker

Applications

- EV (Fast) Charger
- V2G Home Charger
- Smart Grid and Peak Shaving
- Power Supply / DC Load

CHAdeMO

Key Specifications

Model		V2G500V30A (Bidirectional)
Output (Battery)	Voltage Range	50 .. 500Vdc
	Current Range	-28 .. +28A @ 125-360Vdc (-30 .. +30A without internal fuse - optional)
	Rated Power (5)	10.000W @ 400Vac
	Voltage Ripple + Noise (2)	500mVp-p
	Voltage & Current Tolerance (3)	<1%
	Line / Load Regulation	<2%
	Current Ripple	<1Arms @ Rated Power (measured on a resistive Load)
Input (Mains)	AC Voltage & Current Range (5)	400Vac +/-10%, 0-16A, 50Hz (11kVA max.) 3L + N + PE
	Power Factor (Control)	>0,98 @ 400Vac & Rated Power (-0.90 .. +0.90 Reactive Power Control in V2G Mode)
	Total Harmonic Current	<5% @ 400Vac & Rated Power
	Efficiency (max.)	>95% @ 400Vac
	Stand-by consumption	<2.5W @ Main Relay Off (St-by mode pin:Low) /<18W @ Main Relay On (St-by mode pin:High)
	Inrush Current (max.)	50A Cold Start @ 400Vac
	Leakage Current	<3.5mA @ 400Vac
Protection	Input UVP & OVP	Voltage & Frequency Window, Phase error, DC Injection (external fuse)
	Output OVP & OCP	550V (30A 600Vdc Midget Fuse)
	Over Temperature	84°C at main Heatsink. Output Power derating at higher Tamb.
Control	Control	CAN-bus with h/w Interlock (Charge Enable) and Standby mode (CANopen protocol / 500kbps)
	Auxiliary supply (Input)	9V - 32V 100mA max.
General	Protection Class	Class I ⏚
	Isolation	>100MΩ (In-Output: reinforced / PE-Input, PE-Output: Basic / CAN Interface: reinforced)
	Overvoltage category	Category II (internal SPD for Overvoltage cat. III for fixed installations optional)
	Leakage Current detection (opt.)	AC/DC(30mA/6mA) RCD according to IEC62752-2016 and internal 20A/440V fuses optional
	Cooling	Fan cooled (Temperature controlled)
	IP protection class	IP00
	Working (Storage) Temp. & RH.(5)	-20 .. 50°C (-20 .. 70°C) / 10 .. 90% Non Condensing
	Dimension & Weight	Approx. 500x300x110mm / 15kg (excl. fans)
	Lifetime (MTBF)	>100.000 hours @ 25 °C (Designed to meet <0.1% / Year)
Safety & EMC(4) CE	Safety (LVD)	IEC 62368-1 (Low-Voltage Directive 2014/35/EU)
	EMC / Applicable Standards (6)	IEC 61851-23, EN 55011 Class A, IEC 61000-3.2, IEC 61000-4.2,3,4,5,6,8,11 (criteria: B)
	Grid connectivity (7)	G98/1, G99/1:2019-4(UK), VDE-AR-N-4105:2018-11(D)

1. All parameters NOT specially mentioned are measured at 400VAC input, rated load and 20°C ambient temperature.
2. Ripple & noise are measured at 20MHz bandwidth by using a standard probe.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. This product is considered a component which will be installed into the end product. The end product must be re-confirmed that it still meets EMC directives.
5. Derating may be needed ad lower and higher Output Voltages and higher ambient temperature. Please check the derating curve for more details.
6. Residential EMC standards (EN 55032 Class B) optional.
7. This product is intended for European Mains connections. Grid connectivity settings can differentiate depending on country codes. (G98/99 & VDE-AR-N-4105:2018-11 pending)
8. This is a preliminary datasheet. Specifications are subjected to change without notice.

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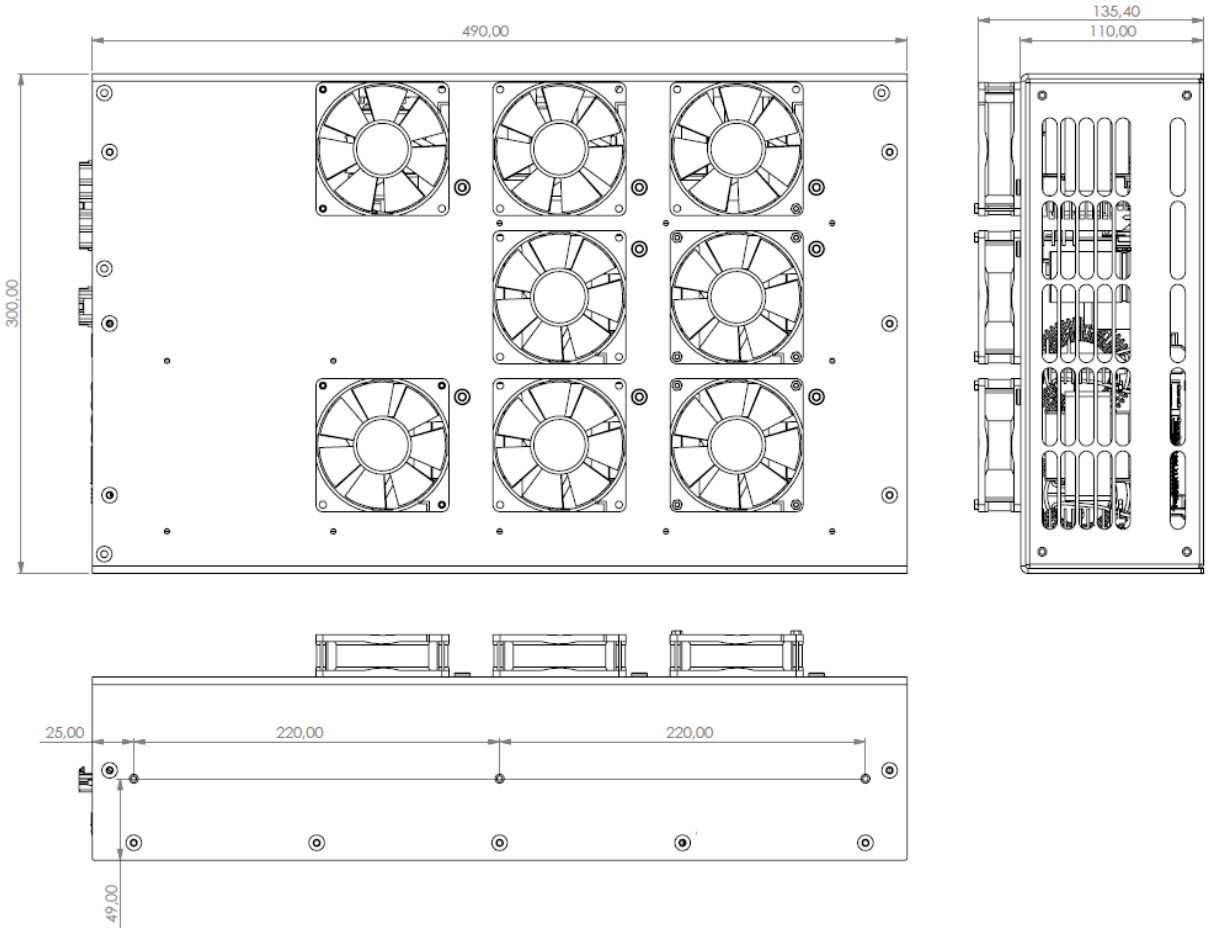
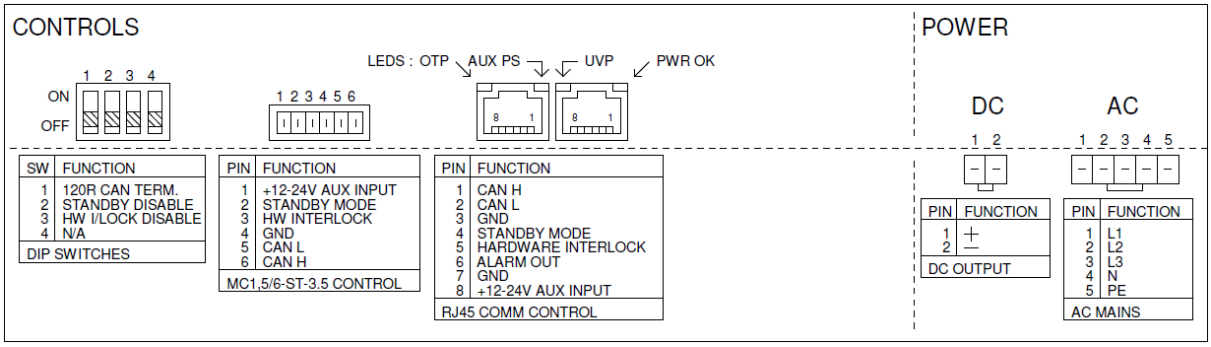
Mechanical Dimensions



Side mounting holes : M4 press nuts. Maximum of 5mm thread inside enclosure.

Electrical Connections



AC Connector : Molex Mini-Fit Sr 5 Way Housing: 42816-0512 / Crimp Terminal : 42815-0012 (12-10 AWG/4-6mm²)
DC Connector : Molex Mini-Fit Sr 2 Way Housing: 42816-0212 / Crimp Terminal : 42815-0012 (12-10 AWG/4-6mm²)
Control Interface : RJ45 Ethernet cable or Phoenix Contact MC1,5/6-ST-3,5 connector.

Hardware I/O functions

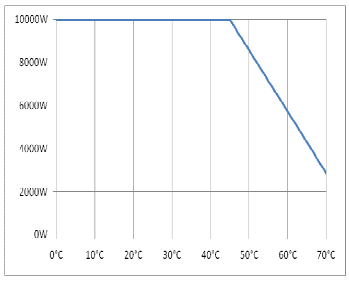
Dipswitch pos. 1 : 120Ω CAN bus terminator resistor.

Standby Mode : Switch between Off state (Input Low <1V) and Standby mode (Input High >3V). (Can be disabled by dipswitch pos. 2)

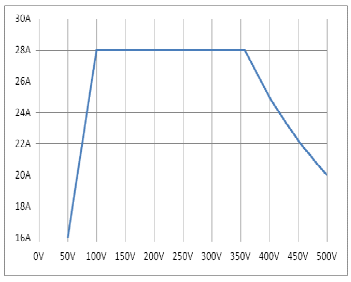
Hardware Interlock : External Hardware Interlock disable (Input Low <1V) and Enable. (Input High >3V) (Can be disabled by dipswitch pos. 3)

Alarm Out : Open collector alarm Output. (32V /5mA max.)

Ambient temp. derating.



Output Current derating.



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