

## 6kW V2G Charger Module

Based on years of experience PRE has developed a standard 6kW bidirectional Power Concept for EV chargers with EU Single Phase or US Split Phase AC Input. The charger has active PFC and is based on the latest techniques of HF power electronics based on SiC semiconductors and quasi-resonant technology which results in high efficiency and excellent overall performance. The Power Module can be configured as bidirectional V2G operation. Output Voltage and Current can be controlled and monitored by CAN bus Interface.



## Key Specifications

### Features

- Bidirectional V2G operation
- CAN bus/BMS Control Interface
- CCS & CHAdeMO compatible
- Optional PV Input with MPP-Tracker

### Applications

- V2G Home/Office Charger
- Industrial Battery Charger
- Smart-Grid and Peak-Shaving



Model		V2G500V1 5A (Bidirectional)
DC Output (Battery)	Voltage Range	50 – 500Vdc
	Current Range	-15 – +15A (bidirectional)
	Rated Power (5)	6.000W
	Voltage Ripple + Noise (2)	500mVp-p
	Voltage & Current Tolerance (3)	±1%
	Line / Load Regulation (typ.)	±2%
	Current Ripple	<1Arms @ Rated Power (measured on a resistive Load)
	Hold up Time (typ.)	10mSec. (TBD)
AC Input (Mains)	AC Voltage Range (5)	230Vac ±10% 50Hz ±2% (6.5kVA max.) L-N-PE
	Total Harmonic Current	<5% @ 230Vac & Rated Power
	Power Factor	>0,95 @ 230Vac & Rated Power (-0.95 .. +0.95 Reactive Power Control)
	Efficiency (max.)	95% @ 230Vac
	Stand-by consumption	<1W @ Mains Relay Off /8W @ Mains Relay On (Standby)
	AC Current (max.)	26A @ Rated Power
	Inrush Current (typ.)	<50A Cold Start @ 230Vac
	Leakage Current	<3.5mA @ 230Vac
Protection	Input UVP & OVP (OCP)	Voltage & Frequency Window (30A 250Vac Fuse 6.3x32mm )
	Output OVP (OCP)	550V (20A 600Vdc Fuse 14x38mm)
	Over Temperature	70°C at main Heatsink. Output Power derating at >50 °C temperature
Control	Control	CAN bus with hardware Interlock (Charge Enable) (CANopen protocol / 500kbps)
	Auxiliary supply (Input)	9V – 32V 100mA max. (TBD)
General	Protection Class (Isolation)	Class 1 ⚡ (4kV In-Output/2kV PE-Input, PE-Output/4kV CAN/Interface)
	Cooling @ IP protection class	Air cooled, IP20
	Working (Storage) Temp. & Humi.	-20 .. 50°C (-20 .. 70°C) / 20 .. 90% Non Condensing
	Dimension & Weight	Approx. 400x300x150mm / 12kg
	Lifetime (MTBF)	>100.000 hours @ 25 °C (Designed to meet <0.1% / Year)
Safety & EMC(4)	Safety (LVD)	low-voltage directive 2006/95/EC (EN60950)
	EMC	EMC directive 2004/108/EC
	Grid connectivity	IEC62116 (EU), G59/3 (UK), DIN V VDE V 0126-1-1, VDE-AR-N-4105 (D)

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 20°C ambient temperature.

(TBD: To be determined)

2. Ripple & noise are measured at 20MHz bandwidth by using a standard probe.

3. Tolerance : includes set up tolerance, line regulation and load regulation.

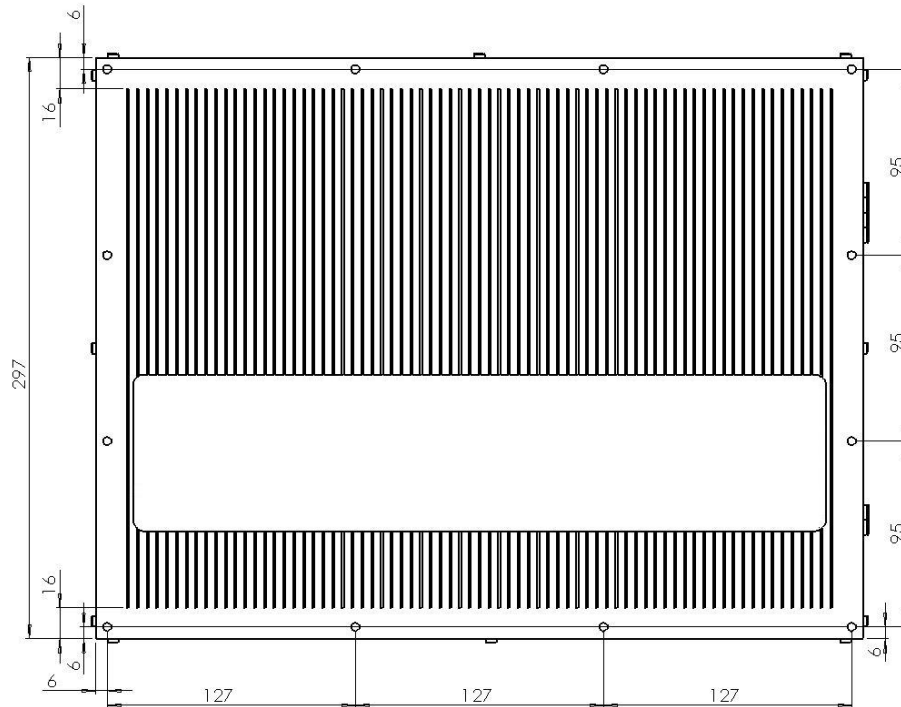
4. The Charger Module is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.

5. Derating may be needed under low input voltage and higher ambient temperature.

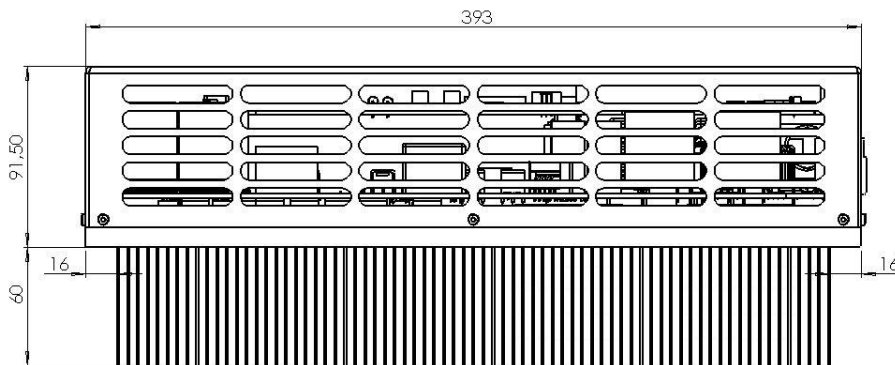
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## Mechanical Dimensions

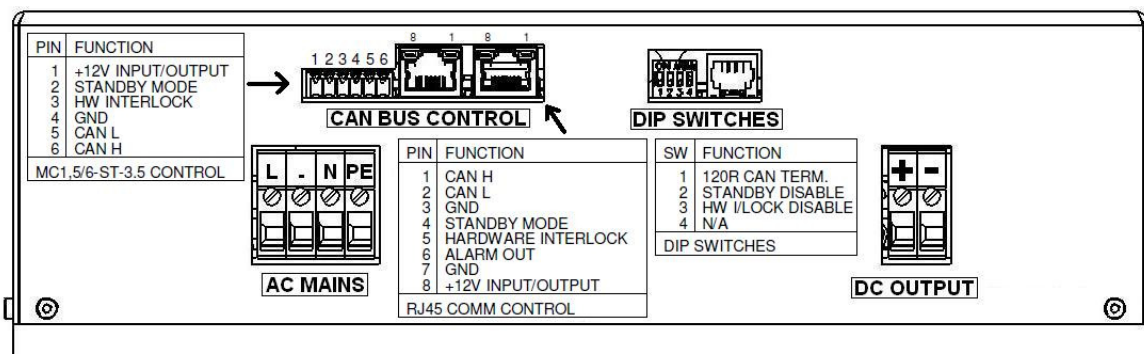
### Bottom View



### Side View



## Electrical Connections



\*) Pin 6 : Optional Alarm pull-down (open collector, 24V /5mA max. Default : OVP function)

AC Mains Connector : 4mm<sup>2</sup> / 11 AWG (26Arms max.)

DC Output Connector : 2.5 – 4mm<sup>2</sup> / 11 – 13 AWG (15Adc max)

Control Connector : Phoenix Contact MC1,5/6–ST–3,5 or RJ45 Ethernet cable.

## 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 techniques of HF power electronics based on SiC semiconductors and quasi-resonant technology which results in high efficiency and excellent overall performance. The Power Module can be configured as 'bidirectional' or 'Charger only' operation. Output Voltage and Current can be controlled and monitored by a CAN bus Interface.



### Features

- Bidirectional (V2G) operation
- CAN/BMS Control Interface
- Combo/CCS & CHAdeMO compatible
- Optional Solar Input with MPP-Tracker
- Parallel operation for EV Fast Chargers

### Applications

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



### Key Specifications

Model		EVC500V30A (Charger only)	V2G500V30A (Bidirectional)
Output (Battery)	Voltage Range	50 – 500Vdc	50 – 500Vdc
	Current Range	0 .. 30A (0 .. 28A with internal fuse)	-30 .. +30A (-28 .. +28A with internal fuse)
	Rated Power (5)	10.000W	10.000W
	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)	
	Hold up Time	10mSec.	
Input (Mains)	AC Voltage & Current Range (5)	400Vac +/-10%, 0-16Aac, 47-63Hz (11kVA max.) 3L + N + PE	
	Power Factor (Control)	>0,99 @ 400Vac & Rated Power (-0.8 .. +0.8 Reactive Power Control)	
	Total Harmonic Current	<3% @ 400Vac & Rated Power	
	Efficiency	>95% @ 400Vac & Rated Power	
	Stand-by consumption	<1W @ Mains Relay Off / 15W @ Mains Relay On (Stand-by)	
	Inrush Current (typ.)	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 Fuse)	
	Over Temperature	80°C at main Heatsink. Output Power derating at Tamb. >50 °C	
Control	Control	CAN bus with hardware Interlock (Charge Enable) (CANopen protocol / 500kbps)	
	Auxiliary supply (Input)	9V – 32V 100mA max.	
General	Protection Class (Isolation)	Class 1 (⊕) (4kV In-Output/2kV PE-Input, PE-Output/4kV CAN/Interface)	
	Cooling	Fan cooled.	
	IP protection class	IP20	
	Working (Storage) Temp. & Humi.	-20 .. 50°C (-20 .. 70°C) / 20 .. 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)	Safety (LVDD)	low-voltage directive 2006/95/EC (EN60950)	
	EMC	EMC directive 2004/108/EC	
	Grid connectivity	IEC62116 (EU), G83/2, G59/3 (UK), DIN V VDE V 0126-1-1, VDE-AR-N-4105 (D)	

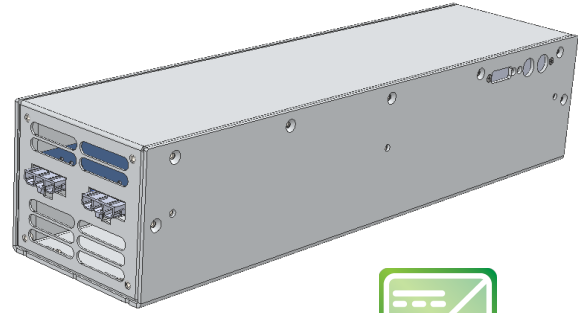


1. All parameters NOT specially mentioned are measured at 400VAC input, rated load and 20°C ambient temperature.  
 2. Ripple & noise are measured at 20MHz bandwidth by using a standard probe.  
 3. Tolerance : includes set up tolerance, line regulation and load regulation.  
 4. The Charger Module is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.  
 5. Derating may be needed under low input voltage and higher ambient temperature. Please check the derating curve for more details.  
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## 10kWp Solar Input Module

### Features

- Up to 10kWp PV systems.
- Triple 10A Input. (1 dynamic MPPT)
- 99% Efficiency.
- Direct PV to EV DC Charging.
- PV Fuses & Surge protection inside.  
(Only external DC Isolation switch needed)



### Key Specifications

Model	PV750V30A	
Input (Solar)	Voltage Range (Vstart - Voc max)	275 - 750Vdc
	MPPT Voltage Range	300 - 650Vdc
	Power Range	3 - 10kWp (72 Cells 10 - 18 Solar panels in series per Input.)
	Number of MPP Trackers	1x Dynamic MPPT
	Number of Inputs	3x 10A max.
	Efficiency (max.)	99% (System efficiency : PV → Grid : 97% / PV → EV : 96%)
Output (DC Bus)	Voltage	700 - 760Vdc
	Current Range	0 - 14A
Protection	Input OCP	3x 12A / 1000V Midget Fuse
	Output OVP	800V
	Over Temperature	80°C at main Heatsink. Output Power derating at Tamb. >50 °C
	Isolation Monitor Device	Disconnect @ <800kΩ (in combination with V2G Charger Module)
General	Protection Class (Isolation)	Class 1 Ⓧ Transformer less design
	Cooling	Fan cooled.
	IP protection class	IP20
	Working (Storage) Temp. & Humi.	-20 .. 50°C (-20 .. 70°C) / 20 .. 90% Non Condensing
	Dimension & Weight	Approx. 500x140x110mm / 5kg (excl. fans)
	Lifetime (MTBF)	>100.000 hours @ 25 °C (Designed to meet <0.1% / Year)
Safety & EMC(4)	Safety (LVD)	low-voltage directive 2006/95/EC (EN60950)
	EMC	EMC directive 2004/108/EC
	Solar connectivity	IEC 61727:2004, IEC 62109-2:2011

1. All parameters NOT specially mentioned are measured at nominal 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. The Charger Module is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. Derating may be needed under low input voltage and higher ambient temperature. Please check the derating curve for more details.
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### Connections

