PFC1600 SERIES / Converter
1600W / Wide Range

AC/DC Battery Charger

FEATURES

- Modular Power Factor Correction
- Mobile or Stationary use
- Excellent Performance
- Compact Design, High Efficiency
- Easy to Integrate



Dimensions 186.0 x 158.0 x 44.0 mm (7.32 x 6.22 x 1.73 inch)

APPLICATION



SAFETY & EMC

RoHS² compliant 10 from 10

Reach compliant

- The converter follows LVD Directive 2014/35/EU and EMC Directive 2014/30/EU.
- The converter is CE compliant. EMC radiation must be evaluated and tested in the complete system since mounting and wiring have a large influence on radiation behaviour.

DESCRIPTION

Our active PFCs achieve excellent power factor values of more than 0.95. An additional on-board controller such as a buck-boost converter can load the intermediate output circuit to a voltage above or below the peak value of the mains voltage supply, typically 350 to 400V, to balance out spikes in the mains power supply as well as power factor correction. Extended features such as measurement and readout (via interface) on any input phase voltage and phase current as well as the DC output side (intermediate circuit) to supply the actual load can be realized. In mechanical terms, the solutions are available for 19” rack, open frame or chassis assembly and can be modified to customer specification, application or power range.

MODELS

Part Number	Input Voltage nom. [VAC]	Input Current Max. [A]	Output Voltage nom. [VDC]	Output Current Max. [A]	Output Power Max [W]
PFC1609-X-1F-V2	230	9	365	4.5	1720
PFC1619-X-1F-V2*	230	4.1	385	2.3	800
PFC1619-X-1F-WIR-V2*	230	4.1	385	2.3	800

*Coming soon. Contact Recom Power Systems for further information.

PFC1609-X-1F-V2

Nominal power
Nominal Input
Version
Input type

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BASIC CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.
INPUT				
Rated Input Voltage			230VAC	
Input Voltage Range	±15% of rated input	196VAC		264VAC
Rated Input Frequency		50Hz		60Hz
Input Frequency		48Hz		63Hz
Max. Input Current	PFC1609-X-1F-V2			9A
	PFC1619-X-1F-V2*			4.1A
	PFC1619-X-1F-WIR-V2*			4.1A
Max. Input Power	PFC1609-X-1F-V2			1720W
	PFC1619-X-1F-V2*			800W
	PFC1619-X-1F-WIR-V2*			800W
Power Factor	At Vin and Pin nominal	0.95		
Efficiency			96%	
Inrush Current				40A
OUTPUT				
Rated Output Voltage	PFC1609-X-1F-V2		365VDC	
	PFC1619-X-1F-V2*		385VDC	
	PFC1619-X-1F-WIR-V2*		385VDC	
Output Voltage Range	PFC1609-X-1F-V2	360VDC		370VDC
	PFC1619-X-1F-V2*	380VDC		390VDC
	PFC1619-X-1F-WIR-V2*	380VDC		390VDC
Output Current Range	PFC1609-X-1F-V2			4.50A
	PFC1619-X-1F-V2*			2.30A
	PFC1619-X-1F-WIR-V2*			2.30A
Rated Output Power	PFC1609-X-1F-V2		1600W	
	PFC1619-X-1F-V2*		760W	
	PFC1619-X-1F-WIR-V2*		760W	
Max. Output Power	PFC1609-X-1F-V2			1643W
	PFC1619-X-1F-V2*			935W
	PFC1619-X-1F-WIR-V2*			935W
Output Voltage Accuracy		-5V		+5V
Output Ripple & Noise	100Hz			20V

PFC Compensation

Active PFC implemented.

ENVIROMENTAL CONDITIONS

Parameter	Conditions	Min.	Typ.	Max.
Operating temperature range		-25°C		+60°C
Storage temperature range		-25°C		+85°C
Operating humidity range		5% RH		95% RH
Storage humidity range		5% RH		95% RH
Operating altitude				2000m
Cooling	Natural Convection			
Temperature drift			0.01%/K	
Operating cycle (60s)	Full Power		3s	
	20% load		57s	

SAFETY AND PROTECTIVE FUNCTIONS

Parameter	Conditions	Min.	Typ.	Max.
Dielectrics withstand voltage	Input – P.E.		1500VAC	
Isolation	Input – P.E.		1500VAC	
Input Fuses			2x10A	
Inrush current limitation				40A
Over-temperature protection (OTP)		+80°C		+85°C

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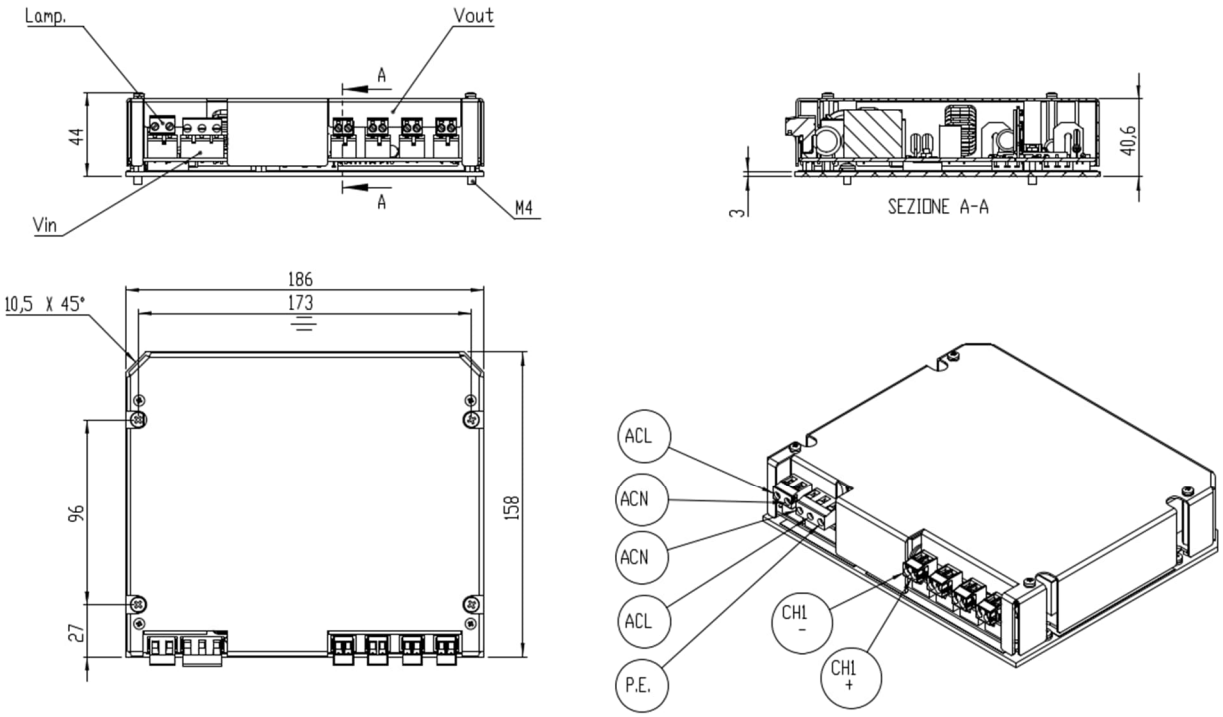
CERTIFICATIONS	
Environmental	
Compliance	**Standard / Criterion**
CE marking	CE
RoHS2	RoHS 2011/65/EU + AM2015/863

CERTIFICATIONS	
Safety	
Compliance	**Standard / Criterion**
Low Voltage Directive (LVD)	Directive 2014/35/EU
Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN 62368-1: 2020

CERTIFICATIONS	
EMC Compliance	
Compliance	**Standard / Criterion**
Directive 2014/30/UE Electromagnetic Compatibility (EMC)	Directive 2014/30/EU
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN 61000-6-2: 2019
Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4: 2019
Electromagnetic compatibility (EMC) Part 3: Limits Section 2: Limits for harmonic current emissions (equipment with input current <= 16 A per phase)	EN 61000-3-2/A14

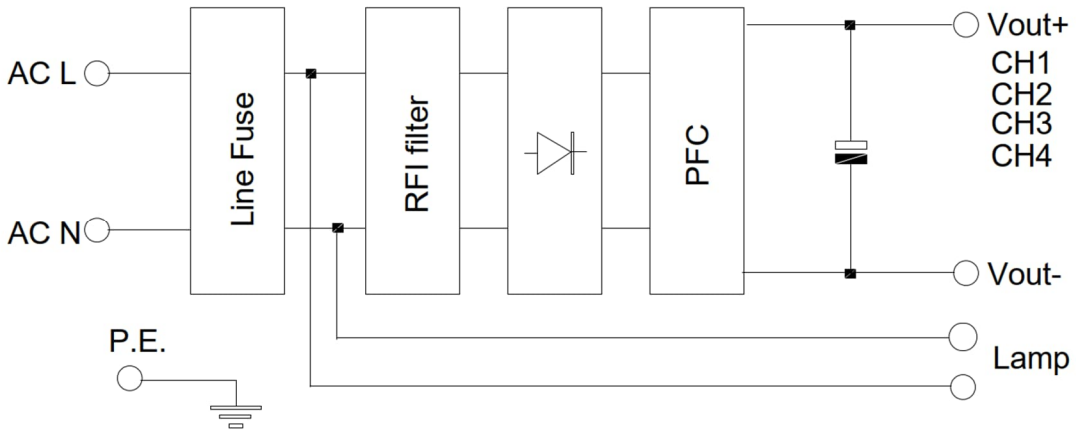
MECHANICAL DATA				
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**
Weight			0.95kg	
Enclosure Material	Aluminum Casting		---	
Height			186.0mm 7.32inch	
Width			158.0mm 6.22inch	
Length			44.0mm 1.73inch	

DIMENSIONS



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BLOCK DIAGRAM



DIMENSIONS AND INSTALLATION INFORMATION

For the installation of charger, the following must be adhered to:

- The converter must be installed at a secure location out of reach of the user of the vehicle. This is to prevent dangers such as accidental touching of HV components or skin burns on the hot housing.
- When selecting the installation location, it must be ensured that the charger is situated above the wading depth of the respective vehicle.
- The converter should be installed at a dry location, safe from splashing water, dirt and stone chipping.
- The tightness of the converter can only be guaranteed if all signal wires to the signal connectors are assembled and connected to a tight unit on both sides. If this is not the case for a cable or wire, it must be sealed separately.
- The mechanical fixture is to be designed in such a way that the device is installed in a fixed position and with as little vibrations as possible.
- All cable connections must be secured with strain relief elements near the device (not included in the scope of delivery).
- Cable connections must have sufficient play and must not meet sharp-edged components.
- The enclosure should be sufficiently ventilated (no heat accumulation).

WARRANTY AND GUARANTEE

The warranty corresponds to the regulations in our currently valid general terms and conditions.

INSTRUCTIONS REGARDING DISPOSAL

A basic requirement for the re-use and recycling of used electronic devices is the correct disposal. With the implementation of the electric and electronic device regulation, electronic devices may no longer be disposed of along with ordinary household waste but must be separately collected and recorded by a specialist service.
Disposal through a specialist service significantly helps to avoid dangers to people and nature. Therefore, in the case of disposal, we recommend contacting a recognized specialist disposal service.

GENERALLY APPLICABLE SAFETY MEASURES

The following safety measures have been developed based on the knowledge of the manufacturer. They are incomplete as they can be supplemented by local and/or country-specific safety instructions and guidelines for accident prevention.
The distributor of the device must therefore supplement the present general safety instructions with country-specific and local guidelines.

SAFETY INSTALLATIONS – POWER LIMITATIONS

MAINS OVERVOLTAGE PROTECTION

Overvoltage protection is integrated in the charger to provide permanent protection against overloading. Mains overvoltage is detected by the quick sensor system and leads to immediate shutdown of the charger. Highly energetic overvoltage (e.g. due to lightning) is absorbed by protective elements.
Also, on the output side, overvoltage protection is integrated. The quick sensor system detects overvoltage on the HV battery side (e.g. load drop or fluctuations) and the charger is immediately shut down.

MAINS PROTECTION INPUT CURRENT

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On the converter, each phase is protected by fuse to protect the device and electric systems from damage due to overcurrent. If one of these fuses is blown, the charger must be returned to charger supplier! Do not open the device – no user-serviceable parts inside.

OVERCURRENT PROTECTION

Overcurrent protection is integrated in the charger to avoid overload damage. The quick sensor system detects any overcurrent and either reduces the current by regulation or shuts the charger down.

REQUIREMENTS ON THE OPERATION PERSONNEL

All courses of action described in this manual may only be carried out by a qualified electrician! Specialist staff are defined as electricians who have had

- specific professional training
- have knowledge and experience in the field of electronics
- as well as knowledge of relevant provisions and dangers

for which they can provide proof. Furthermore, they must be able to assess the work assigned to them independently, identify possible dangers, and establish necessary protection measures.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.

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