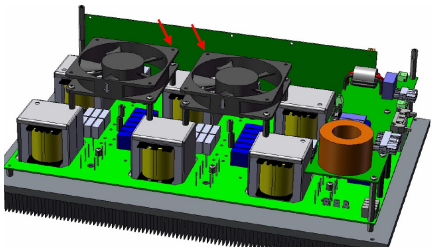
Power Supply 10kW / 750V / 20A DC



For more than 10 years, PRE's Universal Power Module is one of the most competitive AC/DC products in the market for industrial power supplies. It has a 3 phase input and can work in constant voltage mode or in constant current mode. The UPM features active PFC and is based on the latest techniques of HF power electronics design, which results in a high efficiency and excellent overall performance. The power rating is 10kW continuous. The UPM output can be controlled through a voltage- or current set point. Other control methods and/or configurations are available on request.
Industrial charging using 10kW UPM: The 10kW power module from PRE was originally designed for commercial car charging. It meets all the requirements from both ChaDeMo and Combo. To use the power module for industrial charging applications, it is important to specify the following matters:
*AC plug or DC plug
*Battery BMS system and protocol (e.g. CAN)
*User interface (enable charging by key or other function, charge time indication, etc.)

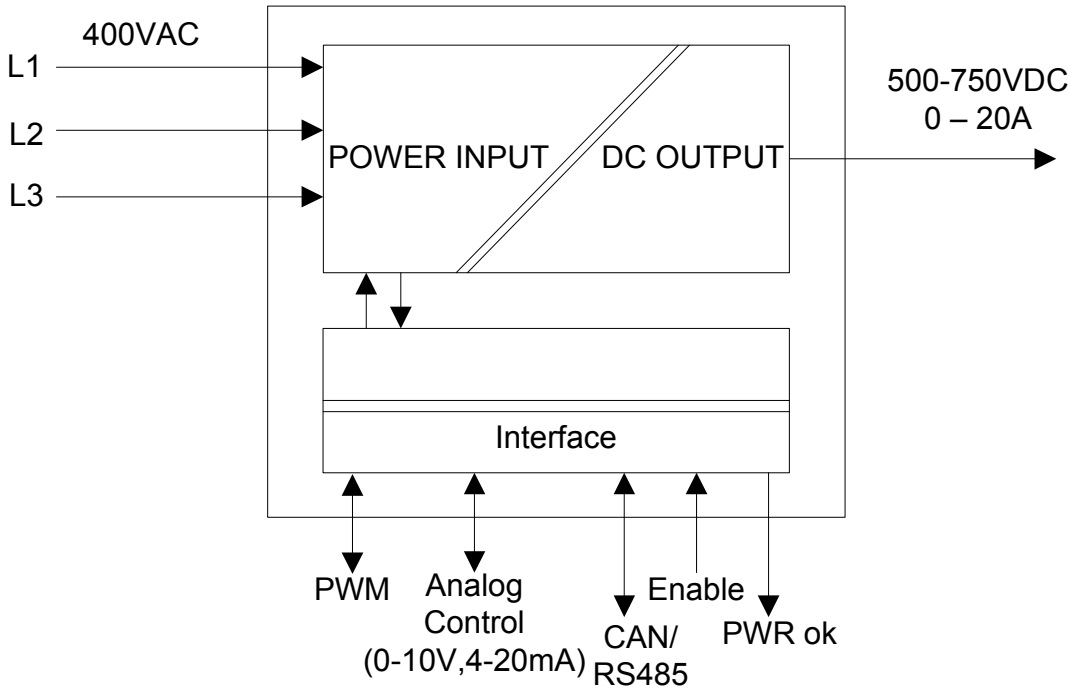
Features

- True 3 phase input, active PFC, inrush limit
- Output: voltage or current control
- Complies with EV car charging standards (Chademo, Combo)
- Standard industrial controls for PLC and microcontrollers
- Competitive price/performance ratio
- Robust, durable and light weight design
- For indoor and outdoor cabinets.
- Up to 10 units in parallel

Applications

- Industrial battery (fast) charging
- Industrial processes
- Public charger

Block Diagram



Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl

Specification

(all specifications below are rated/nominal values, measured at rated conditions, unless mentioned otherwise)

Model		750V 20A
Output (DC)	Nominal Voltage	500-750VDC
	Output Current	0-20ADC
	Output Power	10.000W
	Application	Industrial processes
	Response/rise time	App. 1000ms typical (10-90%)
	Control	Output current
	Regulation	2% (line, load: 10-90%), ambient temperature
	Voltage Ripple	±8V
	Current Ripple	1 Ap-p
	Short-circuit protected	Yes, CC mode
	Overload protection	Yes
	Output OVP	800V DC
	Over temperature	70 ºC @ main heat sink
Input (AC)	Nominal Voltage	3x 400VAC (optional 3x 480VAC US), Cat II
	Voltage Range	3 x (340 – 530) VAC ph-ph, 50/60 Hz, 690V optional
	Input frequency	47-63 Hz
	No load input power	<10W
	Input protection	With external fuse (3x) (rating 20A, B-kar.)
	Input UVP & OVP	±20% @ 400Vac
	Hold-up time	App.10ms
	Power factor	>0.99
	Inrush current limit	Yes (50Apk - 100us @ 400Vac)
	Bursts (EFT)	Acc. To EN 61000-4-4 (level 2)
	High energy pulses (surge)	Acc. To EN 61000-4-5 (level 2)
Control	Control	Output current
	Type	PWM, 1kHz, 10 bit resolution
	Insulation to input / output	Reinforced insulation, acc. To EN 60950
	Optional	RS485, RS232, CAN, MODBUS, 4-20mA (on request)
General	Operating temperature	-20ºC - 50ºC
	Derating	50ºC - 70 ºC
	Storage Temperature	-40 - 70ºC (PCB temperature)
	Cooling	Forced Air cooling, 300m3 per hour
	Switching frequency	App.40-90kHz
	Efficiency	App.94% @ 400V/25A
	Isolation resistance	>10MOhm @ 500VDC
	Isolation (input-ground)	2000V AC
	Isolation (output-ground)	500V DC
	Isolation (input-output)	3750V AC
	Isolation Voltage	Reinforced insulation, acc. To EN 60950
	Creepage distance	Acc. To EN 60950
	Clearance distance	Acc. To EN 60950
	Earth leakage	<3.5mA (Acc.to EN 60950)
	Working Humidity	20% to 95% RH, non-condensing
	Lifetime , MTBF	>100.000 hours @ 25 ºC (Designed to meet <0.1% / Year)
	Connectors	Plug-in terminal block (molex)
Safety & EMC	Safety	Class I, acc.EN60950:2006,
CE	EMC Emission	EN55022 class A (class B optional)
	EMC Immunity	EN61000-6-2:2005 EN61000-6-4:2007
	Approvals	CE certificate by Notified Body

Guidelines for enclosure design and cooling

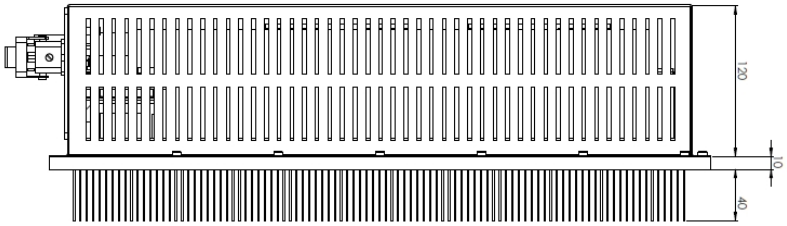
The 10 - 100kW system design using Parallel operation. The 10kW power module can operate in parallel, using the a main control board. In this way systems up to 100kW and more can be realized. When the power module is installed in a standard cabinet, one should consider the cooling capacity of the enclosure. Each 10kW power module has a efficiency of 95%. Therefore the power loss of each module is around 500W. It is recommended to design the cooling system such that the temperature rise of the inlet air is 10C or less. In this way the power modules experience a ambient temperature of 50C at 40C ambient and will therefore not de-rate. Consult PRE for a tailored advice.

Active cooling for the heatsink at the bottom is required. Consult PRE for different implementation methods for both indoor as outdoor cabinets. Consider cool fin direction for external airflow (drawing below). A minimum airflow is recommended for proper operation (depends on chosen industrial cabinet/rack). Active fan control is optional. For an example of an industrial rack see picture below.

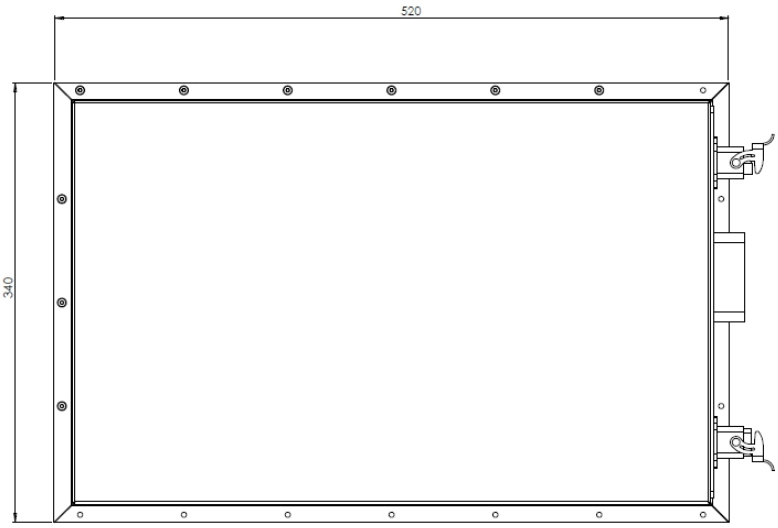
Example industrial rack

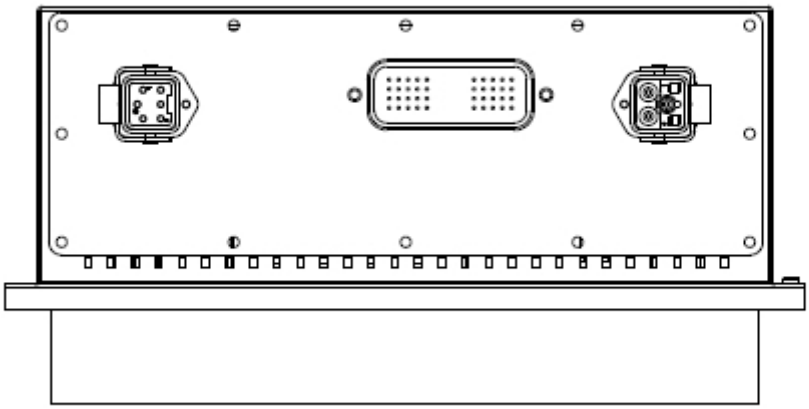
Mechanical Specification

Overall dimensions: [H x W x D] = 150 x 340 x 520
Weight: approx.20kg



Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl





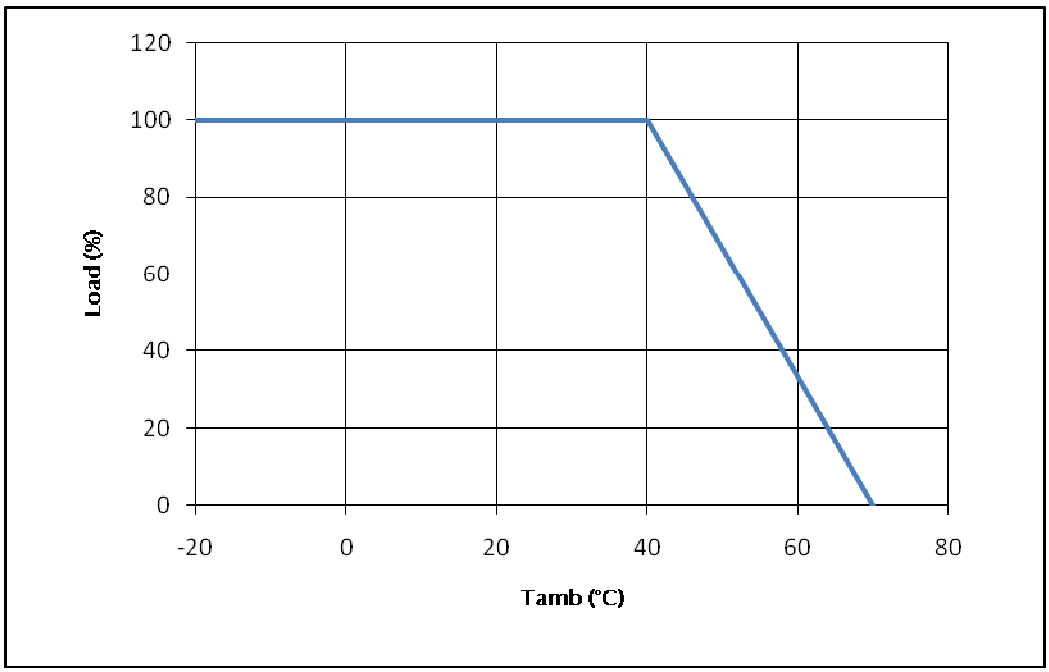
All dimensions are in mm.

The shown connectors are optional.

On request a step file can be provided.

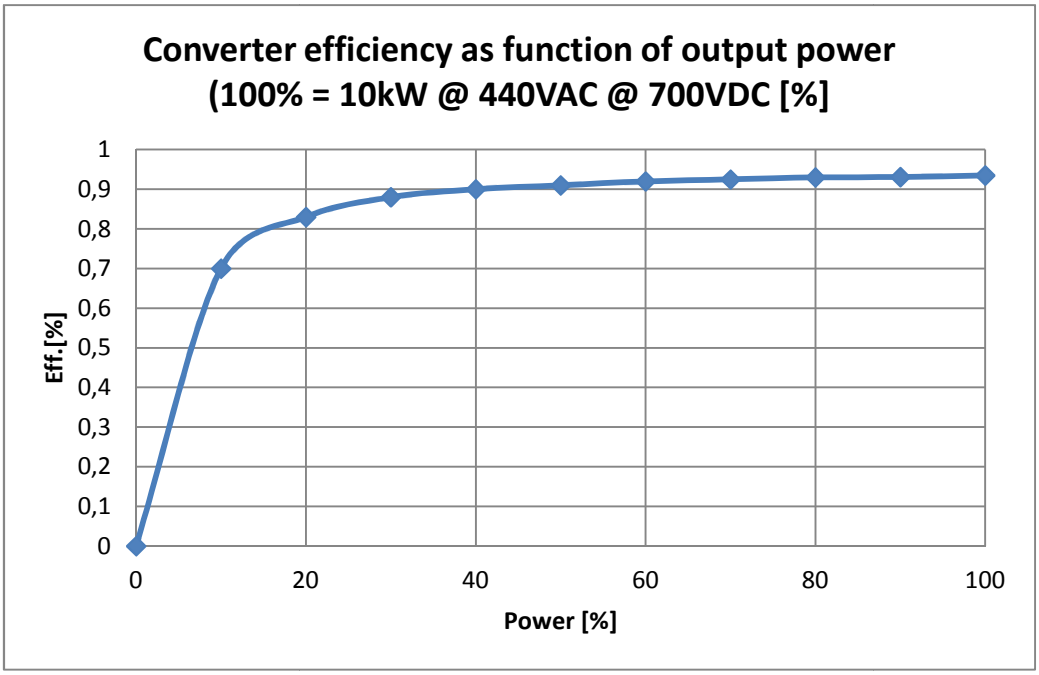
Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl

Temperature Derating Curve



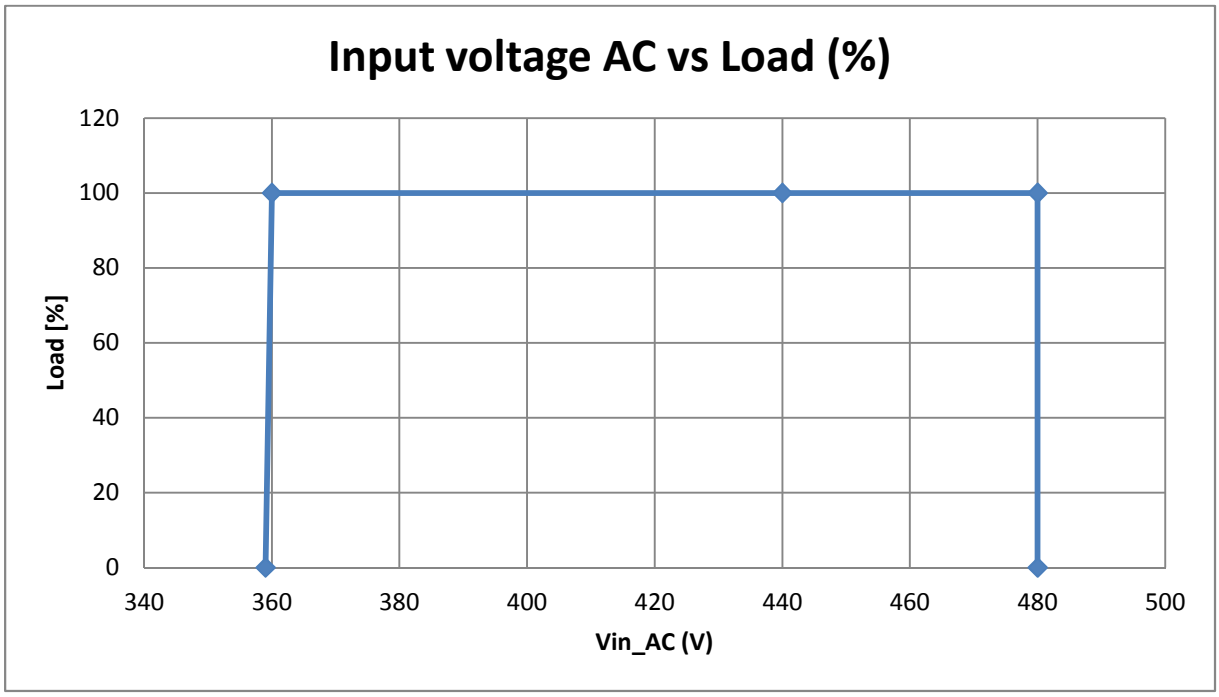
Values have been measured under full load conditions (At an external air-flow of 5 m/s)

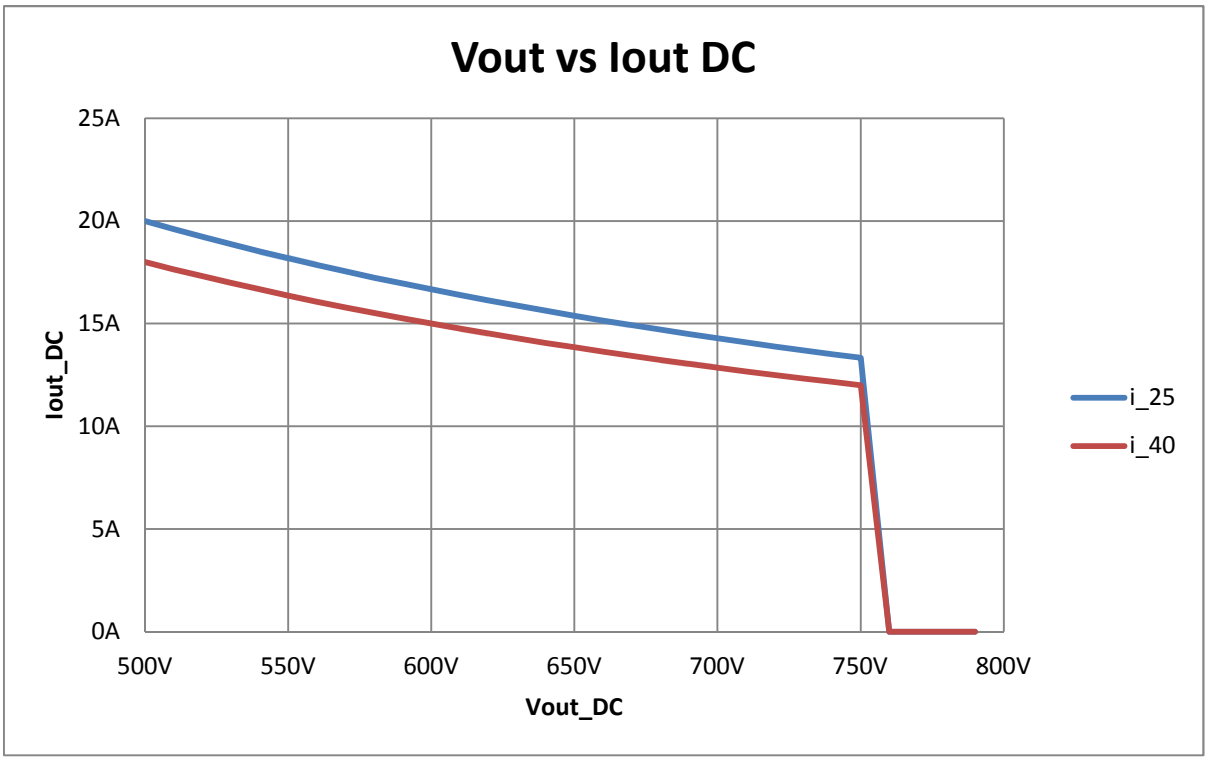
Converter efficiency



Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl

Output power vs Input voltage

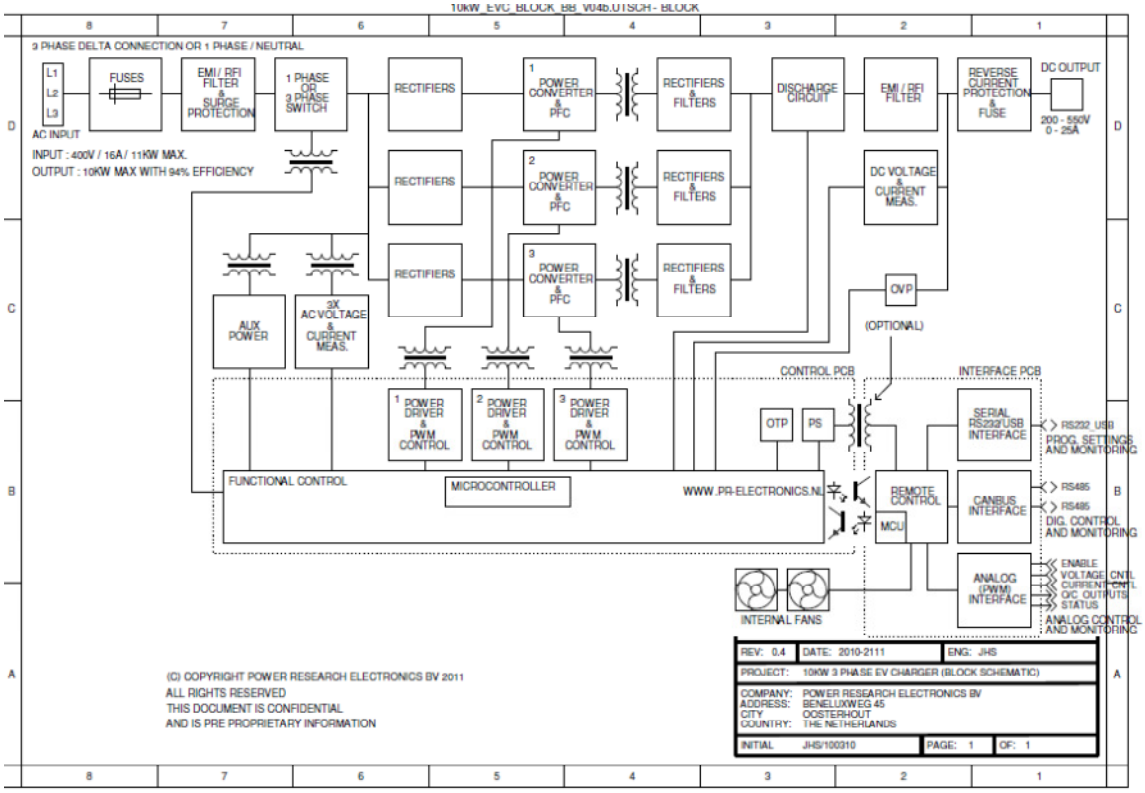




The shown curves are for the DC output current at 25 and 40 degrees Celsius.

Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl

Block diagram specified



Power Research Electronics B.V.
Minervum 7073 NL-4817 ZK Breda
T: 0162 - 422 111
F: 0162 - 431 350
info@pr-electronics.nl
www.pr-electronics.nl

Contact & ordering information

PRE
Minervum 7071
4817 ZK Breda

T: +31 (0) 76 58.11.077
F: +31 (0) 76 58.11.237
E: info@pr-electronics.nl

Article numbers

Article no.	Short code	Description	Produced in
360	UPM-750-20	UPM 10kW 750V 20A PS	Netherlands
361	UPM-750-20-AS	UPM 10kW 750V 20A PS	Asia (MOQ 500pcs)