



## PC2000-series 1000 to 2000 W

### Input / Output

- Optimized inputs from 20 to 300 Vd.c.
- Single outputs from 24 to 48 Vd.c.
- Inrush current limit.
- Reverse input voltage protection.

### Features

- Alarm circuit with relay output.
- External voltage sense.
- Current sharing.
- Inhibit / Power down input.
- Over voltage protection OVP.
- Output voltage adjustable on frontpanel

### Operation

- High efficiency >89%.
- Operating temperature range -25 to +55°C.
- Convection cooled 1000W.
- Fan cooled up to 1400 to 2000W.

### EMC

- EN61000-6-2, Immunity.
- EN61000-6-3, Emission.
- EN/IEC61000-4-3, 20V/m
- EN/IEC61000-4-4, 4kV.
- EN/IEC61000-4-5 level 2&3.
- EN50121-3-2

## Input and output ratings

Nominal inputs	Input range	Stop level	Code
24 Vd.c.	20 to 32 V	<16.8 Vd.c.	24
48 Vd.c.	43 to 60 V	<33.6 Vd.c.	48
110, 127 Vd.c.	93 to 150 V	<77 Vd.c.	110
220, 250 Vd.c.	187 to 300 V	<154 Vd.c.	220

Output		
Voltage	Current	Power
24V	42 - 58A	1000 - 1400W
28V	36 - 50A	1000 - 1400W
36V*	28 - 39A	1000 - 1400W
48V	21 - 42A	1000 - 2000W

Other input ranges can be made on demand.

Input range, is the range we guarantee full output performance, Uout +10%, Iout +5%.

The converter works down to the stop levels.

The output voltage might decrease to approx -10% of nominal output at the stop level.

\* NRE might be charged

## Output ratings and type code

Voltage	Output		Input				Cooling
	Current	Power	20 - 32 V	43 - 60 V	93 - 150 V	187 - 300 V	
24 V	42 A	1000 W	PC1000 24/24	PC1000 48/24	PC1000 110/24	PC1000 220/24	Convection
24 V	58 A	1400 W		PC1400 48/24	PC1400 110/24	PC1400 220/24	Fan
28 V	36 A	1000 W	PC1000 24/48	PC1000 48/28	PC1000 110/28	PC1000 220/28	Convection
28 V	50 A	1400 W		PC1400 48/28	PC1400 110/28	PC1400 220/28	Fan
36 V	28 A*	1000 W	PC1000 24/36	PC1000 48/36	PC1000 110/36	PC1000 220/36	Convection
36 V	39 A*	1400 W		PC1400 48/36	PC1400 110/36	PC1400 220/36	Fan
48 V	21 A	1000 W	PC1000 24/48	PC1000 48/48	PC1000 110/48	PC1000 220/48	Convection
48 V	42 A	2000 W		PC2000 48/48	PC2000 110/48	PC2000 220/48	Fan

\* NRE might be charged

### How to read our product code:

Example **PC1000 24/48**

**PC1000** = Family code and power rating

**24** = Input voltage code 24

**48** = Output voltage 48V

## Features

- **Current Sharing**  
Current sharing is used to balance the load between up to 10 units working in parallel.
- **External output voltage sense**  
External sense is used when the voltage regulation at the load is critical.  
See output data page 3  
The sense can compensate voltage drops up to 5% of the nominal voltage.
- **Alarm circuit**  
The alarm relay switches to “ALARM” state if:
  - \* The output voltage is not within -10 to +15% of nominal output voltage.
  - \* The converter is overheated.
- **Over voltage protection OVP**  
A second regulation circuit takes over in case the main regulation fails. The output voltage is limited to approximately +15% over nominal output voltage.
- **Inhibit input / Power down**  
The converter will shutdown if the inhibit input is short-circuited by a relay or electrical switch. The current through the short-circuit is 20mA. Note that there is no electrical isolation between the inhibit and the output.
- **Inrush current limit and Reverse voltage protection**  
All models have an inrush current limit circuit. In case the input is connected in reverse voltage the converter will not start. The reverse voltage do not damage the input of the converter.
- **Electrical Safety Installation Class**  
The PC2000 series can be installed in different networks, see page 4.

## Optional Features

- **Series diode on output**  
Specify series diode output when the output is connected in parallel with other power supply to achieve redundancy.  
The output is derated 10% on 24V and 5% on 48V.
- **Conformally coating; tropical version**  
For use in weather protected area with high ambient humidity or large temperature gradients producing condensation.
- **Train input**  
Input voltage range according to train standard EN50155 and IEC60571. See T-input below.

## T-input ranges for Mobile applications

Code	Continuous range	Uin 0.1s-S2
24T	16.8 - 30 Vd.c.	14.4 - 33.6 Vd.c.
36T	25.2 - 45 Vd.c.	21.6 - 50.4 Vd.c.
48T	33.6 - 60 Vd.c.	28.8 - 67.2 Vd.c.
72T	50.4 - 90 Vd.c.	43.2 - 100.8 Vd.c.
110T	77 - 137.5 Vd.c.	66 - 154 Vd.c.

The total output power can be derated on a T-range compared to the output rating table, page 2.  
Input voltage range according to train standard EN50155:2001 and IEC60571:1998.

## General data / input data

Design topology	Push-Pul
Switching frequency	60 kHz
Emission / Immunity	See page 4
Safety EN/IEC60950-1:2001	See page 4
Max. accepted input ripple <sup>1</sup> 50-400Hz	2% of nominal voltage
Input power at no load Input code 24 Input code 48, 110 Input code 220	<8 W <17 W <21 W
Reverse input voltage protection	In start up sequence <sup>2</sup>
Inrush current limit	Yes <10 x Inom
Dimensions (D x W x H)	285 x 420 x 87 mm
Weight	8.5 kg

- Higher ripple affects the input, contact factory.
- The converter do not start at reverce voltage.
- Output ripple might increase to 0.5% RMS of Vout, when EN/IEC61000-4-3, 20V/m test is applied
- Lowest efficiency measured within the whole input voltage range at 100% load.
- Contact factory for derating as it depends on model. The alarm relay can not be used at +70°C.

## Output data

Source regulation	0.1%
Load regulation (0-100% load) with sense connected	0.2%
Load regulation (0-100% load)	0.5%
Transient recovery time for 10%-90% load step to within 3% of nominal output voltage.	<3 ms
Output ripple (120kHz) Vp-p <sup>3</sup>	Typ. 30 mV
Input ripple attenuation to output (50 to 400 Hz)	150:1
Emission / Immunity	See page 4
Temperature coefficient	0.02% / °C
Min output adjustment range adjustable with a 15 turn potentiometer	95% to 110%
Current limit, rectangular	105%
Remote sense	Yes
Soft start	Yes
Alarm relay rating (a.c. & d.c.)	30 V 300 mA
Start-up time	<3 s
Hold-up time, contact factory	2 - 25 ms
Efficiency <sup>4</sup>	89 - 93%
Operating temperature range at 100% load. (Convection cooling) with derating <sup>5</sup>	-25 to +55 °C -25 to +70 °C
Storage temperature range	-40 to +85 °C

## Mechanical drawing

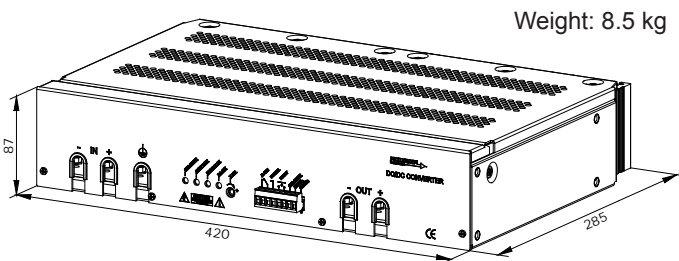


Figure 1. Dimensions and front panel for 24, 48 input code.

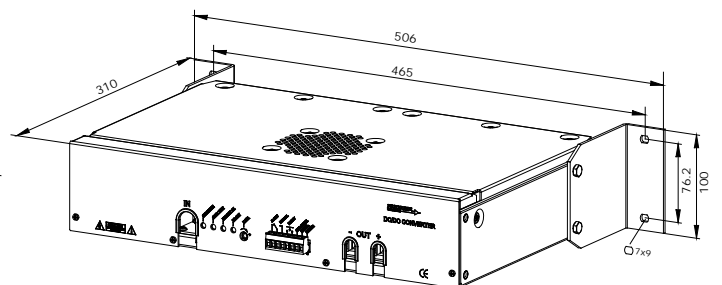


Figure 2. Wall mounting L100-1 and front panel for inputs >60V.

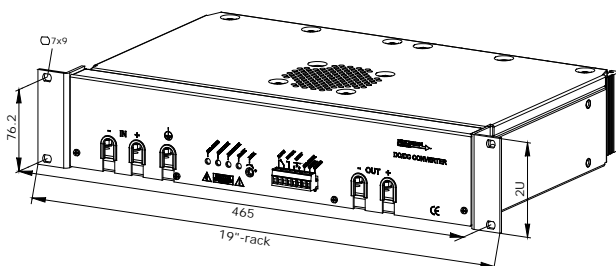


Figure 3. Dimensions and front panel for 24, 48 input code with standard brackets L89-3..

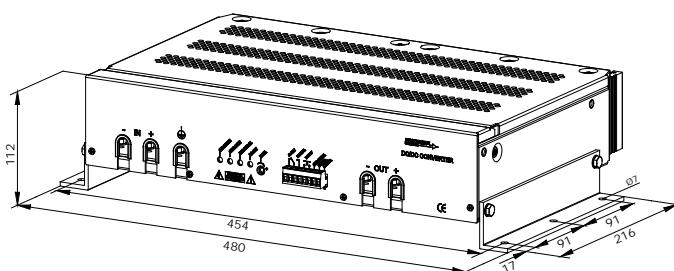


Figure 4. Wall mounting.  
Using mounting brackets L216-1 (Optional). Only for fan cooled types.

- 3x Single unit PC2000 mounted as one 2U 19" unit using standard brackets L89-3.
- 1x Single unit PC2000 mounted backwards as one 2U 19" unit using standard brackets L89-3.
- 4 units PC2000 mounted vertically using standard brackets L89-3 and L480-2 (Optional)

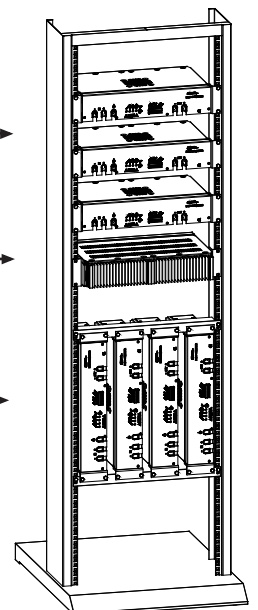


Figure 5. 19"-rack mounting.

## Safety and EMC



## Safety standard IEC60950

PC2000 meets the requirements defined by CE mark as an apparatus.

PC2000 meets requirements of EMC directive and low voltage directive (LVD).

Thus a PC2000 can be used as free standing unit or in installations as well as systems designed according to "The modular approach". PC2000 can be used in installation without further EMC tests, if our installation instructions are followed. Please note that product standards can demand different levels or other basic standard tests. We test according to levels below. For higher levels or other tests, please contact factory.

The PC2000 use the safety standard EN/IEC60950-1:2001 for electrical safety. For the EMC it meets the requirements of EN/IEC61204-3, EN50121-2-3:2000, IEC62236-2-3:2003.

and the generic EMC standards:

EN/IEC61000-6-2 (Immunity)

EN/IEC61000-6-3 (Emission)

Network	Installation class	Input code
Primary circuit max 250 Va.c.	class II (1)	110, 220
Primary circuit max 250 Va.c.	class I (2)	110, 220
Secondary circuit	class I (2)	all
SELV circuit	class I (2)	24, 48

1. Pollution degree 2.
2. Pollution degree 3.

Isolation testable levels	Test voltage
Input / Output: Input code: 24, 48, 72	2.5 kVd.c.
Input code: 110, 220	3 kVa.c. / 4.3 kVd.c.
Input / Alarm: Input code: 24, 48, 72	2.5 kVd.c.
Input code: 110, 220	3 kVa.c. / 4.3 kVd.c.
Input / Case: Input code: 24, 48, 72	2.5 kVd.c.
Input code: 110, 220	3 kVa.c. / 4.3 kVd.c.
Alarm / Case	2.5 kVd.c.
Output / Case on <75 Vd.c. output	2.5 kVd.c.
Output / Alarm	2.5 kVd.c.

## EMC

EMC-standards	EMC-performance		Remarks
Emission standards	Input	Output	
EN55011/EN55022 (0.15-30 MHz)	Level B	Level B	
EN55011/EN55022 (30-1000 MHz)	Level B		
Immunity standards	IEC/EN61000-6-2		
EN/IEC61000-4-2	8 kV / 15 kV		Contact / air, Enclosure test
EN/IEC61000-4-3, see note 3	20 V/m AM-Modulated		Output ripple can increase to 0.5% of Vout Enclosure test
EN/IEC61000-4-4	4 kV	4 kV	
EN/IEC61000-4-5, Input code 24, 48, 72 EN/IEC61000-4-5, Input code 110 <sup>4</sup> , 220 <sup>4</sup>	0.5 kV / 1 kV 1 kV / 2 kV	0.5 kV / 1 kV 0.5 kV / 1 kV	Line-line 2 Ω / Line-case 12 Ω see note 4
EN50155 Figure 4, 1.8 kV 1.5/50 μs	Yes		Line-line 100 Ω
EN/IEC61000-4-6	10 V <sub>RMS</sub>	10 V <sub>RMS</sub>	AM-Modulated
EN/IEC61000-4-8	30 A/m		Enclosure test
EN/IEC61000-4-10	Not sensitive		Enclosure test

3. 10 V/m do not show any influence.

4. Higher level 2 kV / 4 kV with external filters, contact factory.

## Contact

For updates on this datasheet we refer to [www.polyamp.com](http://www.polyamp.com)  
Specifications subject to change without notice.

Distributor



Polyamp AB Box 229 597 25 Åtvidaberg Sweden  
Telephone: +46 120 854 00 Telefax: +46 120 854 05  
<http://www.polyamp.se>, <http://www.polyamp.com>  
E-mail: [info@polyamp.se](mailto:info@polyamp.se)