let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## Modular Battery Charger for Telecom and Industry Applications

### General description

Picture may differ from actual device

Thanks to a variety of available modules, the RECE3200 system offers the perfect solution for all areas of application requiring a power output of up to 3.2 kW.
Starting up from a minimum equipment for 800 watts, the system can be expanded with additional modules for higher performance or redundancy growing in line with the requirements of your application.
With the easily integratable controller monitoring and remote control functions, the RECE3200 system allows the design and setup of appropriate system solutions, e.g. for outdoor telecommunication systems.
Further features:

- 19“, 3U subrack, also suitable for installation in ETSI racks or cabinets
- Redundant rectifier modules (800 W each)
- Battery module for UPS function ($I_{MAX}$ = 50 A)
- Short-term UPS module based on Super-Cap capacitors (available on request)
- Inverter module for a secured, uninterruptable supply of AC loads
- Bidirectional, universal DCDC converter (48 V / 60 V)
- Solar converter module for feeding solar energy into the rectifier system
- Integrated electronic distribution with adjustable shutdown function (8 DC outputs on front panel)
- Optional distribution module providing additional electronically protected DC outputs (available on request)
- Comprehensive controller functions such as alarm contacts, LAN ports, SNMP and a web interface

### Electrical data – input

| | |
|---|---|
| Mains voltage | $U_N$ = 3 x 230 $V_{AC}$, 50/60 Hz |
| Voltage range | +/-20 % (184 – 276 $V_{AC}$) |
| Frequency range | 47 – 63 Hz, sine wave |
| Mains connection | 1–3 phase |
| Commercial power line | TT and TN net (EN 60950) |
| Power factor | 0.99 at nominal load |

### Electrical data – output

| | |
|---|---|
| Output voltage | 48 $V_{DC}$, potential-free |
| Output power | 800 W – 3200 W, depending on expansion stage, without derating up to 60°C ambient temperature |
| Output voltage tolerance | temperature-controlled battery charging characteristic |
| Output characteristic | UI characteristic |
| Output ripple | < 100 mVpp |
| Efficiency | > 93 % at nominal load |

### Mechanical data

| | |
|---|---|
| Version | Suitable for mounting in 19“ and ETSI racks (flanges for ETSI optionally available) |
| Dimensions (W x D x H) | 19“ x 240.5 mm x 3U |
| Weight | Sub-rack with distribution panel and controller: approx. 5.4 kg<br>Single rectifier module: approx. 1.7 kg<br>Single battery module: approx. 0.8 kg |



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## Modular Battery Charger for Telecom and Industry Applications

### Cooling

| | |
|---|---|
| Rectifier module | Forced ventilation with fan failure detection |

### Protective functions

| | |
|---|---|
| DC output | Overvoltage protection, repetitive trace function, tripping value ≤ 60 $V_{DC}$ |
| DC output short-circuit current | $I_{sc}$ = 16 A per rectifier module (without battery), short-circuit-proof |
| Leakage current | A fixed protective earth (PE) connection is obligatory |

### Connector terminals

| | |
|---|---|
| AC input | Connection cable 2.5 m, 5 x 1.5 mm² (L1, L2, L3, N, PE) |
| DC outputs 1 – 5 | D-SUB 3W3, socket |
| DC outputs 6 – 8 | Phoenix MCV 1,5/3-GF-3,81 |
| Battery terminal | Phoenix HDFK10 |
| Signals | 2 x Phoenix FK-MC 0,5/10-ST-2,5, each 10-pole |
| LAN interfaces | 2 x RJ45 connector |

### Distribution panel

| | |
|---|---|
| DC output 1 | max. 25 A, 1-pole electronic fuse |
| DC outputs 2–3 | max. 16 A each, 1-pole electronic fuses |
| DC outputs 4–5 | max. 10 A each, 1-pole electronic fuses |
| DC outputs 6–8 | max. 6 A each, 1-pole electronic fuses |

Permanent load max. 75 % of $I_{MAX}$ each.
Sum current of the distribution panel max. 45 A.

### Signalling

| | |
|---|---|
| Optical: controller module | LED green: OK<br>LED red: alarm (common alarm) |
| Optical: rectifier module | LED green: AC OK<br>LED green: DC OK |
| Electrical: controller module | 3 external alarm inputs |
| | 3 programmable, potential-free relay contacts, each 3-pole led out (COM-NC-NO), contact load max. 80 $V_{DC}$, 500 mA via signal connector |
| | 2 inputs for PT1000 sensors |
| Electrical: battery connection module | 1 input for PT1000 sensor |

### EMC, safety

| | |
|---|---|
| EMC emission | EN 61000-6-3 |
| EMC immunity | EN 61000-6-2 (industrial areas) |
| Electrical safety | EN 60950 |
| Protection class | 1 |
| Isolation group | Pollution degree 2 |

### Environmental conditions

| | |
|---|---|
| Ambient temperature during operation | -25°C to +60°C |
| Maximum ambient temperature | +70°C, from +60°C upwards derating 2.5 % / K |
| Relative air humidity | Up to 100 %, start-up after drying |
| Protection | IP 20 |

**Warranty** **24 months**

**Order code** **RECE3200-230-48-z-K30**
(z = number of rectifier modules included)



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## 800 W Rectifier Module for the RECE3200

### General description

**The rectifier modules of the type MREC800-230-48-K30-HE for installation in the RECE3200 sub-rack are hot pluggable, i.e. they can be mounted in the sub-rack or extracted during operation.**

**The decoupling of the single rectifier modules realized via a diode function (MOSFET transistors) and the active load sharing of the modules with the resulting module redundancy provide a system with a very high availability.**


Picture may differ from actual device

### Electrical data – output

| | |
|---|---|
| Nominal voltage | 48 $V_{DC}$ (40 – 60 $V_{DC}$), CAN bus controlled |
| Output power | Max. 800 W |
| Output current | Max. 16 A |
| Efficiency | 93,5 % at nominal load |
| Output characteristic | UI characteristic |
| Output ripple | < 100 mVpp |
| Parallel operation | Redundant decoupling of the modules via diode function |
| Load sharing | Active, accuracy ±10 % |

### Signalling

| | |
|---|---|
| LED green | AC OK |
| LED green | DC OK |

**Order code** **MREC800-230-48-K30-HE**



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

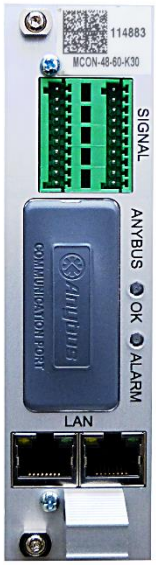
## Controller Module for the RECE3200

### General description

**The controller module is used for controlling and monitoring of the RECE3200 system via the internal CAN bus. The module is equipped with two LAN interfaces for connection with a local PC or network. A clear and easy-to-operate user interface facilitates control, programming and monitoring of all relevant system parameters.**

**Further features:**

- **Hot-plug capability**
- **No AC/DC power supply interruption in case of controller failure**
- **Output voltage control by means of temperature dependent charging characteristic**
- **External alarm inputs**
- **Freely programmable alarm relays**
- **PCBs protected against humidity**
- **Web interface and SNMP functionality integrated**
- **Slot for Anybus module M30**




Picture may differ from actual device

### Signals

| | |
|---|---|
| External alarm inputs | 3 x (e.g. door contacts, relays of other devices) |
| Alarm outputs | 3 x (potential-free, freely programmable) |
| External temperature monitoring | 2 x PT1000 |

### Connector terminals

| | |
|---|---|
| Signals | 2 x Phoenix FK-MC 0,5/10-ST-2,5, each 10-pole |
| LAN interfaces | 2 x RJ45 connector |

### Optical signalling

| | |
|---|---|
| LED green | OK |
| LED red | alarm (common alarm) |

### LAN interfaces

| | |
|---|---|
| Specifications | IEEE 802.3™ compatible Ethernet Controller, 10/100Base-T Port |
| Supported network protocols | IPv4, HTTP, SNMPv1 and v2c, DHCP, NTP, ICMP |

| | |
|---|---|
| **Order code** | **MCON-48-60-K30** |



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## Battery Connection Module for the RECE3200

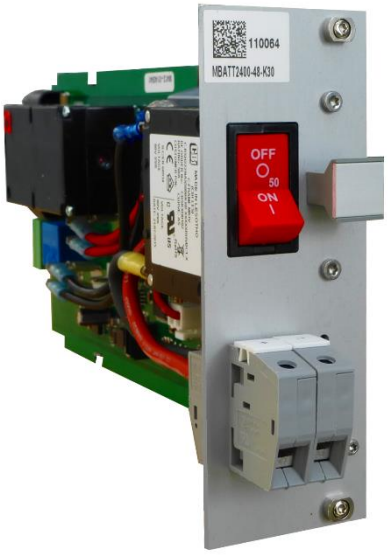
### General description

**The battery connection module enables the implementation of a UPS function by connecting a battery to the rectifier system.**

**The module includes the battery connector, battery fuse and LVD relay as well as the connectors for symmetry measuring lines and temperature monitoring (PT1000 sensor). The integrated control electronics for battery management enables functions such as symmetry monitoring, current measurement and temperature-controlled charging characteristics.**

**Further features:**

- **CAN bus controlled**
- **Programmable charging characteristics**
- **Programmable LVD relay**
- **Battery temperature detection**
- **Automatic battery tests**




Picture may differ from actual device

### Battery connection

| | |
|---|---|
| Nominal voltage | 48 $V_{DC}$ |
| Max. output current | 50 A |
| Fuse | 2-pole, magneto-hydraulic |
| Max. battery power | 2400 W |
| Deep-discharge protection | Via LVD relay (Low Voltage Disconnect) |
| Battery connection | Phoenix HDFK10 |
| Symmetry measurement | Phoenix MC1,5/6-G-3,5-RN (10 kΩ required in the measuring lines) |
| Temperature sensor | PT1000 |
| Recommended power reserve for battery charging | 500 W |

### Signalling

| | |
|---|---|
| LED green | OK |
| LED red | Failure |

**Order code** **MBATT3200-48-K30**



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## Inverter Module for the RECE3200

### General description

**Inverter module for a secure and uninterrupted supply of AC loads. The plug-in module provides a 230$V_{AC}$/50Hz sine-wave output signal supplied by the DC bus system. The load connection is carried out at the module's front panel.**

**Further features:**

- **CAN bus controlled**
- **Hot-plug capability**
- **Temperature range -25°C to +70°C**
- **Controlled and monitored fan**
- **PCBs protected against humidity**
- **Real SINE output**
- **Short-circuit protected**


Picture may differ from actual device

### Electrical data – output

| | |
|---|---|
| Output voltage | 230 $V_{AC}$ |
| Frequency | 50 Hz, sine-wave processor-controlled |
| Output power | 500 VA / 400 W |
| Power factor | 0.8 |
| Crest factor | > 2.5 % |
| Harmonic distortion | < 5 % |
| Load range | 0 % - 100 % |
| Overload range | 101 % - 150 %, tolerated for 30 s to 3 s |
| Efficiency | > 88 % at nominal load |

### Connector terminals

| | |
|---|---|
| Output | Phoenix MC1,5/3-GF-5,08 |

### Signalling

| | |
|---|---|
| LED green | Output OK |
| LED yellow | Warning (excessive temperature, fan failure) |
| LED red | Alarm, output switched off (overload, short-circuit, excessive temperature, AC UVP/OVP) |

**Order code** **MINV500-48-230-K30**



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## DCDC Module for the RECE3200

### General description

**The bidirectional DCDC converter is powered by the DC bus system. It provides a 60 $V_{DC}$ output voltage at its front panel. Thus, a 60 $V_{DC}$ load can be supplied in a 48 $V_{DC}$ system. Alternatively, an external voltage (38 – 72 $V_{DC}$) can be fed into the system via the converter.**

**Further features:**

- **CAN bus controlled**
- **Hot-plug capability**
- **High efficiency of 97 %**
- **Controlled and monitored fan**
- **Output voltage adjustable**
- **Operation mode „feeding-in“**
- **$U_{IN}$ = 38 – 72 $V_{DC}$**

MDCDC1500-48-60-K30

(in development)

### Electrical data – output

| | |
|---|---|
| Output voltage | 20 - 68 $V_{DC}$ |
| Max. output current | 30 A |
| Output power | 1500 W |
| Efficiency | > 97 % at nominal load |

### Connector terminals

| | |
|---|---|
| Output | Phoenix PC5/2-GF-7,62 |

### Signalling

| | |
|---|---|
| LED green | Output OK |
| LED yellow | Warning, overload within the range of tolerance |
| LED red | Alarm, output switched off |

**Order code MDCDC1500-48-60-K30**



Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden

let's talk!

Power Innovation
Stromversorgungstechnik GmbH

# AC-DC Converter RECE3200-230-48-K30

## DCDC Module for feeding solar energy into the RECE3200

### General description

**The solar converter module is equipped with three inputs, each of them feeding the energy from a pair of series-connected solar panels into a 48 $V_{DC}$ system. Each input has a separate control, so that different irradiation or even partial shade do not have any significant impact on the overall system. An effective MPP tracking ensures optimal efficiency in every situation. The evaluation of the power supplied by the solar panels can be done via the controller of the RECE3200 system.**


Picture may differ from actual device

### Electrical data – Input

| | |
|---|---|
| Input voltage | $U_N$ = 2 x $U_{solar\ panel}$ |
| Voltage range | 55 – 95 $V_{DC}$ |
| Max. power | 3 x 2 x 240 $W_{pp}$ |

### Electrical data – Output

| | |
|---|---|
| Output voltage | $U_N$ = 48 $V_{DC}$<br>(system voltage)<br>adjustable via controller MCON-48-60-K30 |
| Current | max. 26 A |

### Connector terminals

| | |
|---|---|
| Input IN 1 – 3 | Phoenix CCDN 2,5/6<br>(2 x 3 pole, pitch 5 mm) |

### Signalling

| | |
|---|---|
| LED green | operation |
| LED red | error |

**Order code** **MDCDC1500-80-48-K30**




Power Innovation GmbH
Rehland 2
28832 Achim

Telefon: +49 (0) 4202 5117-0
Fax: +49 (0) 4202 5117-70
eMail: Info@powerinnovation.com
Internet: www.powerinnovation.com

Amtsgericht Walsrode
HRB 121695
Steuer Nr. 48-201-24705
UST-ID DE 114 426 732

Geschäftsführer:
Dipl.-Ing. Bernhard Böden