

Let's talk!

# AC-DC Converter REC15k-400-110-K2-K6

## Battery Charger for Railway Applications

- 3 rectifier modules, each providing 5 kW
- Active load sharing
- 1 rectifier module (3 kW) for 230 V<sub>AC</sub> off-board power supply in workshop operation
- Intelligent battery management system with temperature-controlled charging curve
- Adjustment and monitoring via web interface
- Internal CAN bus control
- Efficiency > 93 % at full load
- Overload and short circuit proof



Picture may differ from actual device

## Technical Data

### General information

Isolation	according to EN 50124
Electrical safety	overload and short circuit proof
Efficiency	> 93 % at full load (with 3-phase supply)
Galvanic isolation (primary/secondary)	3.75 kV <sub>AC</sub>
Protection class	1
EMC	EN 50121-3-2:2017
Redundant decoupling of the modules	by means of active diode function
Decoupling of the load output	by means of active diode function

### Input AC (3~)

Input voltage	U <sub>N</sub> = 400/480 V <sub>AC</sub> , 3-phase, without N
Voltage range	304 – 495 V <sub>AC</sub>
Frequency	50 Hz/60 Hz (40–60 Hz)
Power factor	0.8 from 50 % load upwards
Number of inputs	3 inputs (1 three-phase input per rectifier module)

### Input AC (1~)

Input voltage	U <sub>N</sub> = 230 V <sub>AC</sub> , 1-phase
Voltage range	195.5 – 253 V <sub>AC</sub>
Frequency	50 Hz (±1 Hz)
Power factor	0.98 from 50% load upwards
Number of inputs	1 input

### Output DC

Output voltage	U <sub>N</sub> = 110 V <sub>DC</sub>
Voltage range	90 – 136 V <sub>DC</sub>
Voltage tolerance	±1 % (of U <sub>N</sub> )
Voltage ripple	< 400 mV <sub>pp</sub> (with 3~)
Output current	with 3~ supply max. 100 A; with 1~ supply max. 25 A
Battery current tolerance	±2 % (reference: 40 A)
Power	with 3~ supply max. 15 kW; with 1~ supply max. 3 kW
OVP	< 137.5 V <sub>DC</sub> within 100 ms
Load range	0 – 100 %
Short circuit current	with 3~ supply 35 A per module; with 1~ supply 25 A
Number of outputs	2 outputs for load supply and battery charging

Subject to change without notice.

© Power Innovation GmbH

Version 1.1

Let's talk!

# AC-DC Converter REC15k-400-110-K2-K6

## Battery Charger for Railway Applications

### Environmental conditions

Operation temperature	-40 °C to +70 °C (+ 15 °C overtemperature for 10 min.)
Relative humidity	15 % – 100 % (with coating)
Max. operation altitude	2000 meters
Shock and vibration	acc. to EN 61373:2011 Category 1B

### Signalling

Electrical	3 x potential-free relay contacts for „3~ AC OK“, „1~ AC OK“ and „battery high-temperature“, 3- pole led out (NC-C-NO), max. contact rating: 0.5 A at 125 V <sub>AC</sub> , 1 A at 30 V <sub>DC</sub> ; remote on/off
Optical	each rectifier module: two green LEDs for “AC o.k.” and “DC o.k.”; connection module: green LED for “OK” and red LED for “Alarm” (controller); two green LEDs for “AC OK” and “DC OK” (3 kw converter); two green LEDs for “Link” and “Active” (LAN interface for commu- nication with TCMS); green LED for “Link” and yellow LED for “Active” (LAN interface for service)
LAN interface (X8)	display of device status and error messages, parameter setting (web interface)  specification: IEEE 802.3™ compatible Ethernet Controller, 10/100 Base-T Port, supported network protocols: IPv4, HTTP, DHCP, ICMP, TCMS
LAN interface (X9)	communication with train control (TCMS)

### Mechanical data

Construction	for mounting in 19" racks
Housing material	galvanized sheet steel
Dimensions of the sub- rack (W x H x D)	19", 6 U, 465 mm (from flanges to back side)
Weight	sub-rack (fully equipped): approx. 70 kg; single rectifier module: approx. 15 kg

Protection class	IP 20
Cabling	front side
Cooling	2 temperature-controlled fans per each rectifier module; 1 temperature-controlled fan in the connection module

### Operation

Control	via web interface
---------	-------------------

### Connection technique

Input AC (3~): X1 – X3	3 x Phoenix GMSTBV 2,5/4-GF- 7,62
Output DC load: X4	Phoenix IPC 35HC/2-GF-15,00
Output DC battery: X5	Phoenix IPC 35HC/2-GF-15,00
Connection battery temperature sensors: X6	Phoenix MC1,5/6-GF-3,81
Signal connector: X7	Phoenix MCD1,5/6-G1F-3,81
Service port (LAN): X8	RJ45, 8-pole, shielded
Communication interface (LAN): X9	M12 circular connector, Harting M12-PCB-THT-2PC-4P-D-COD- F-ANG
Input AC (1~): X10	Phoenix PC4/3-GF-7,62
Grounding bolt	M8

### Warranty

**24 months**

### Order codes

**REC15k-400-110-K2**  
**REC15k-400-110-K3**  
**REC15k-400-110-k4**  
**REC15k-400-110-K5**  
**REC15k-400-110-K6**

The versions K2 to K6 differ in terms of their preset temperature-controlled charging characteristics and supported types of sensors for battery temperature measurement.

**K2\***: for lead acid batteries, U<sub>NOM</sub> = 104 V  
**K3\***: for lead acid batteries, U<sub>NOM</sub> = 108 V  
**K4\***: for nickel-cadmium batteries, U<sub>NOM</sub> = 100.8 V  
**K5\***: for nickel-cadmium batteries, U<sub>NOM</sub> = 105.6 V  
**K6\*\***: for nickel-cadmium batteries, U<sub>NOM</sub> = 96 V

Supported sensors for battery temperature measurement:  
\*NTC 10 KΩ \*\*PT 100B (100 Ω)

The factory-preset charging characteristics can be easily adjusted to other types of battery via web interface.