Rectiverter 1U, 3kVA

Integrated / Standalone 48 V_{DC} System



High Efficiency Industrial Power Solutions

The Rectiverter integration/standalone system can be used in applications where a 230/115 V_{AC} backup is needed in parallel with the 48 V_{DC} backup.

The system can be integrated into a Delta DC system and connected to the same controller as the 48 V_{DC} system. It can also be used as a standalone system connected to any available 48 V_{DC} source.

The total output power for both AC and DC output is limited to max 4 kW. AC and DC output limits can be set according to the attached load, where the limitation for AC load is set to max 3 kVA.



Rectiverter module

Key features

- Single phase 230 or 115 V_{AC} input/output
- 2x Front mounted IEC sockets
- Built in transfer technology
- Can operate in parallel with Flatpack2 rectifiers
- Can be integrated into DC system connected to the same controller

Applications

- Power Utilities
- Marine and Offshore
- Railway / Metro Infrastructure
- Telecom-mobile/Wireless

Rectiverter 1U, 3kVA

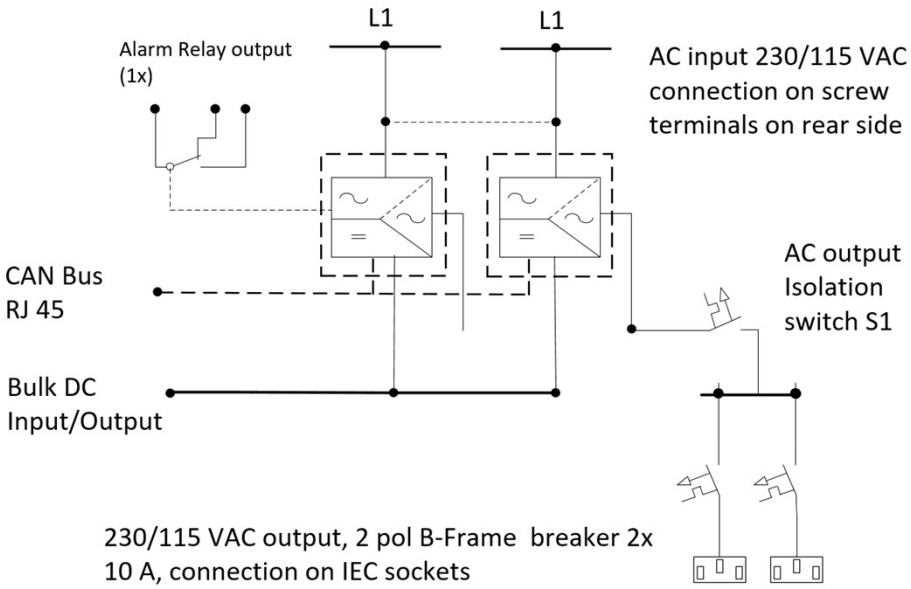
48 V_{DC}

Model	4 kW / 2 kW
Product number	PSPHTx02RC30y.y
Input Data	
Voltage range AC	185 – 275 / 95 – 140 V
Voltage range DC	40 – 58 V
Maximum current AC	14 - 24 A
Frequency	47 - 53 / 57 - 63 Hz
Power factor	>0.99
Output Data	
Adjustable range AC	200 - 240 / 100 – 127 V
Adjustable range DC	43 - 58 V
Max output power AC	3.0 / 1.5 kVA
Max output power DC	2.4 / 1.2 kW
Power factor	0 Ind. To 0 Cap.
Frequency	50 Hz / 60 Hz
Other Specifications	
2- pole AC distribution	2x 10 A
2x IEC sockets (IEC320-C13)	Front mounted

Front View – Rectiverter 1U Integrated



Single Line Diagram: 3 kVA with 2- pole AC distribution



Delta Electronics (Netherlands) B.V.,
Zandsteen 15 2132 MZ Hoofddorp, The Netherlands
Phone: +31 20 800 3900
www.delta-emea.com

Doc: PEDM0001323480 00.2

Rectiverter 1U, 3kVA

48 V_{DC}

Model	4 kW, 230 V_{AC}	2 kW, 115 V_{AC}
Product number	PSPHT402RC301.1	PSPHT202RC301.0

AC Output Data		
Voltage (default) I (adjustable range) [1]	230 V_{AC} / 200 – 240 V_{AC}	115 V_{AC} / 100 – 127 V_{AC}
Frequency (default inverter mode)	50 Hz (adaptive)	60 Hz (adaptive)
Frequency (set-able inverter mode)	50 Hz, 60 Hz or last synced 50/60Hz (adaptive)	
Power maximum (continuous / overload (<15s))	2400 W (3000 VA) / 4000 VA	1200 W (1500 VA) / 2000 VA
Current maximum (continuous / overload (<15s))	13 A_{RMS} / 17.4 A_{RMS}	
Current (maximum) Quick trip (20ms)	64 A (6 x nominal)	
Hold up (Voltage dips) (before switching to battery)	5 ms	
THD	<1.5 % at resistive load	
Protection	Module: Fuse in L and N , Hot pluggable	

DC Output Data		
Voltage (default) / (adjustable range)	53.5 V_{DC} / 43 – 58 V_{DC}	
Power (maximum @nominal input)	2400 W [2]	1200 W [2]
Current (maximum @nominal output V_{DC})	50 A [2]	25 A [2]
Hold up time, maximum output power	>10ms; V_{OUT} > 41 V_{DC}	
Output features	Short circuit proof, Over voltage Shutdown, Bulk DC output connection to M6 bolt	

Input Data		
AC Mains Input Voltage (range / LV disconnect)	185 – 275 V_{AC} / 170 V_{AC}	95 – 140 V_{AC} / 85 V_{AC}
AC Current (at nominal output voltage) (depending on module type)	14 - 24 A_{RMS} [4]	
Frequency (default: sync range)	47 - 53 & 57 - 63 Hz	57 - 63 & 47 - 53 Hz
Frequency (set-able: sync range)	47 - 53 Hz, 57 - 63 Hz or both (adaptive)	
Power Factor / THD	> 0.99 at 70% load or more / <3.5%	
DC Voltage nominal I extended range (no overload) [3]	45 - 58 / 40 - 45 V_{DC}	
DC Current (maximum)	64 A / 90 A during overload (15s)	32 A / 45 A during overload (15s)
Input features	Module : Fuse in L and N, Hot pluggable, Varistor AC input individual screw terminals 6 mm^2 for L, N & PE Bulk DC input connection to M6 bolt	

Delta Electronics (Netherlands) B.V.,
Zandsteen 15 2132 MZ Hoofddorp, The Netherlands
Phone: +31 20 800 3900
www.delta-emea.com

Doc: PEDM0001323480 00.2

Rectiverter 1U, 3kVA

48 V_{DC}

Other Specifications	
Support for connection to following controller (RJ45)	Smartpack2, Smartpack S & Compack controllers
Efficiency	>96% (mains mode (AC/AC and AC/DC)), >94% (inverter mode (DC/AC))
2 pole AC distribution (connection IEC 320-C13 sockets)	2pc, 10A, Output characteristics (optional 8 A breaker with CS characteristics available)
Protection Class	IP 20
Operating temperature	-40 to +55°C (-40 to +131°F), humidity 5 - 95% RH non-condensing
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing
Dimensions[W x D x H] / Weight	482 x 395 x 44 mm (1U) (19 x 17 x 1.8 inch) / 6 kg (13 lbs)

Design Standards	
Electrical safety	EN IEC62368-1:2020+A11:2020, EN 62040-1 UPS safety
EMC	ETSI EN 300 386 V.1.6.1, FCC CFR 47 Part 15 EN 61000-6-1/-2/-4/-5 EN62040-2 (Cat C1 emissions, cat C2/C3 immunity)
Environment	ETSI EN 300 019: 2-1 (Class 1.2), 2-2 (Class 2.3) Normal operating conditions as per IEC 62040-3:2011 clause 4.2. Other operating conditions as per IEC 62040-3:2011 clause 4.3, must be advised RoHS 3 (2015/863/EU) and WEEE (2008/98/EC) compliant

1) Output voltage ranges configured in factory and have individual keying in top chassis
2) AC load has priority. Maximum available DC output power and current is dependent on instant AC load and AC input voltage; i.e. maximum 1600 W at full AC power and nominal input for 230 V_{AC}
3) Reduced performance - no power boost and increased voltage THD on AC output.
4) If DC port is overloaded pulling the voltage below 43 V the input current may increase above this level.

Specifications are subject to change without notice and errors and omissions excepted

Delta Electronics (Netherlands) B.V.,
Zandsteen 15 2132 MZ Hoofddorp, The Netherlands
Phone: +31 20 800 3900
www.delta-emea.com
Doc: PEDM0001323480 00.2

Rectifier & Inverter in one box

Built on HE technology from the Flatpack2 HE rectifier family the Rectiverter 230/1500 48/1200 provides backed up power for 230 V_{AC} loads with minimum losses and footprint.

It is a 3 port device capable of charging the 48V battery and simultaneously provides power for the AC and DC loads. During mains outage the Rectiverter feeds AC loads using energy stored in the battery.



Rectiverter 48V

230/1500 48/1200 & 115/750 48/600

Doc 241123.100.DS3 – v4

APPLICATIONS

TELECOM
- LTE/4G/WiMAX
- Distributed antenna system
- Broadband

POWER UTILITIES
- Switch tripping and SCADA
- Low & High voltage switchgear
- Transformer & SUB stations
- Power Generation & Distribution
- Control & protection
- SCADA system

RAILWAY & METRO INFRASTRUCTURE
- Signaling and communications
- Control centers

MARINE
- Communication onboard ships

OTHER
- Rural electrification

KEY FEATURES

- UNIQUE 3-IN-1 OPERATION….
  - INVERTER
  - RECTIFIER
  - POWER SOURCE TRANSFER

  ….IN ONE BOX
- MODULAR DESIGN
- HIGH EFFICIENCY
- GLOBAL COMPLIANCE
- PATENTED TECHNOLOGY
- HOT PLUG-ABLE
- AC & DC PORT VOLTAGE KEYING

Rectiverter 48V

Doc 241123.100.DS3 – v4

Models / ordering information	230/1500 48/1200	230/1500 48/150	230/1500 48/0	115/750 48/600	115/750 48/75	115/750 48/0
Part number	241123.100	241123.101	241123.102	241123.100L	241123.101L	241123.102L
AC OUTPUT DATA						
Voltage (default) / (adjustable range)	230 V_{AC} / 200 - 240 V_{AC}			115 V_{AC} / 100 - 127 V_{AC}		
Frequency (default inverter mode)	50 Hz (adaptive)			60 Hz (adaptive)		
Frequency (set-able inverter mode)	50Hz, 60Hz or last synced 50/60Hz (adaptive), 94-106Hz[5], 74-76Hz[5]					
Power maximum (continuous / overload (<15s))	1200 W (1500 VA) / 2000 VA			600 W (750 VA) / 1000 VA		
Load sharing	±5% of active power from 10 to 100% load					
Current maximum (continuous / overload (<15s))	6.5 A_{RMS} / 8.7 A_{RMS}					
Current (maximum) Quick trip (20ms)	32 A (6 x nominal)					
THD	< 1.5 % at resistive load					
Protection	Fuse in L, Hot pluggable, Varistor					
DC OUTPUT DATA						
Voltage (default) / (adjustable range)	53.5 V_{DC} / 43 - 58 V_{DC}					
Power (maximum @nominal input)	1200 W [1]	150 W	0 W [2]	600 W [1]	75 W	0 W [2]
Current (maximum @V_{OUT} ≤ 48 V_{DC})	25 A [1]	3.13 A	- [2]	12.5 A [1]	1.56 A	- [2]
Current sharing (10 - 100% load)	±5% of maximum current from 10 to 100% load					
Static Voltage regulation (10 - 100% load)	±0.5%					
Dynamic Voltage regulation	±5.0% for 10-90% or 90-10% load variation, regulation time < 50ms					
Ripple	< 200 mV_{PP}, 30 MHz bandwidth					
Protection	Short circuit proof, Over voltage shutdown, Reversed polarity, Reversed polarity and Fuse					
INPUT DATA						
AC Mains Input Voltage (range / LV disconnect)	185 - 275 V_{AC} / 170 V_{AC}			95 - 140 V_{AC} / 85 V_{AC}		
AC Current (maximum)	11.5 A_{RMS}	9.1 A_{RMS} [3]	8.2 A_{RMS} [3]	11.3 A_{RMS}	10.1 A_{RMS} [3]	9.2 A_{RMS} [3]
Frequency (default: sync range)	47-53 & 57-63 Hz			47-53 & 57-63 Hz		
Frequency (set-able: sync range)	47-53 Hz, 57-63 Hz or both (adaptive)					
Power Factor / THD	> 0.985 at 50% load or more / < 3.5%					
AC Input Protection	Fuse in L and N, Hot pluggable, Varistor					
DC Voltage nominal / extended range[4]	45 - 58 V_{DC} / 40 - 45 V_{DC}					
DC Current (maximum)	32 A / 45A during overload (15s)			16 A / 22.5A during overload (15s)		
OTHER SPECIFICATION						
Efficiency	>96% (mains mode), >94% (inverter mode)			>92% (mains mode), >91% (inverter mode)		
Isolation	3.6 kV_{DC} - AC_{Ports} to PE, 3 kV_{AC} - AC_{Ports} to DC_{Port}/CAN, 710 V_{DC} - DC_{Port} to PE, 60 V_{DC} - DC_{Port} to CAN					
Alarms: Red LED Alarm relay [NO max 75 V_{DC} / 100 mA] (AC output **OR** DC output alarms)	Low and high mains input voltage shutdown, High and low temperature shutdown, Rectiverter Failure, Overvoltage shutdown on output, Fan failure, Low output voltage alarm, CAN bus failure, Sync bus lost and Sync fail					
Warnings: Yellow LED	Rectiverter in power de-rate mode or in power or current limit mode on DC or AC port, Remote output current limit activated, Loss of CAN communication with controller					
Normal operation: Green LED	AC output and/or DC output on and ok					
MTBF (Telcordia SR-332 Iss.I method III (a))	260 000 hours (@ Tambient : 25 °C)					
Operating temperature	-40 to +75°C (-40 to +167°F), humidity 5 - 95% RH non-condensing					
Temperature de-rating above 55°C (131°F)	1200W to 480W @ 75°C (167°F) for each, AC and DC, outputs (total power 2000W to 800W)					
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing					
Dimensions[WxHxD] / Weight	109 x 41.5 x 327mm (4.25 x 1.69 x 13") / 1.95 kg (4.3 lbs)					
DESIGN STANDARDS						
Electrical safety	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013, IEC/EN 62040-1:2008+A1:2013 UL 60950-1:2014, UL1778:2014, C22.2 No. 107.3-14					
EMC	EN 61000-6-1:2019, -6-2:2019, - 6-3:2007 + A1:2011, - 6-4:2019, IEC 61000-6-5:2015 EN 62040-2:2006, EN50121-4:2016+A1:2019, -5:2017+A1:2019 ETSI EN 300 386 V.2.1.1, FCC CFR 47 Part 15					
Environment	EU 2015/863 (RoHS) & 2012/19/EU (WEEE) / ETSI EN 300 019: 2-1 (Class 1.2) & 2-2 (Class 2.3) Normal operating conditions as per IEC 62040-5-3:2016 clause 4.2. Other operating conditions as per IEC 62040-5-3:2016 clause 4.3, must be advised					

1) AC load has priority. Maximum **available** DC output power and current is dependent on instant AC load and AC input voltage; i.e maximum 800W/16.6A at full AC power and nominal input for 230V_{AC}.
2) DC port must still be considered a bi-directional port; voltage will present if mains powered
3) If DC port is overloaded pulling the voltage below 43V the input current may increase above this level.
4) Reduced performance - no over load support, and for 200 - 240 VAC output THD will increased and maximum output power de-rates (to 970W for 230 VAC @ 40 VDC)
5) Implemented since product release, please check with Sales Support for required HW/FW revisions

Specifications are subject to change without notice

Eltek © 2019 – www.eltek.com

powerbox
Powering Progress

Authorised, valued-added distributor

Australia & New Zealand



Powerbox Australia Pty Ltd
Sydney Head Office
4 Beaumont Road,
Mt Kuring-Gai, NSW 2080
Australia

1800 251 380

sales@powerbox.com.au

powerbox.com.au

Powerbox Pacific Ltd
New Zealand Sales Office
1a Henry Rose Place,
Albany, Auckland
New Zealand 0632

09 4158 320

sales@powerbox.co.nz

powerbox.co.nz