

Features

- Universal Input 90-264VAC
- Efficiency Up To 86%
- Short Circuit And Over Voltage/Current Protected
- UL/EN60950 Certified, CE Marked
- RECOM Connector Set Available

Regulated Converters

RAC45-G/OF

45 Watt

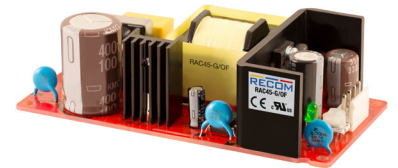
4" x 2"

Open Frame



Description

The RAC45-xxG/OF series are low cost, 4"x2" AC/DC power supplies with universal inputs (90-264VAC) and fully protected and isolated DC outputs in the range of 12V up to 48V. The converters are offered in open frame (/OF) version. The outputs are trimmable to compensate for cable losses and are short circuit and overload protected. The converters work over a wide temperature range of -25°C to +60°C (with derating), are UL60950, EN60950 and CE certified and comply with Class B EMC limits. The RAC45-G series come with a three year warranty.



UL60950 Certified
 CAN/CSA C22.2 N.60950-1-07
 Certified
 EN60950-1 Certified
 EN55022/55024 compliant

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	max. Output Current [mA]	typ. Efficiency ⁽¹⁾ [%]
RAC45-12SG/OF	90-264	12	3700	84
RAC45-24SG/OF	90-264	24	1900	85
RAC45-48SG/OF	90-264	48	1000	86

Notes:

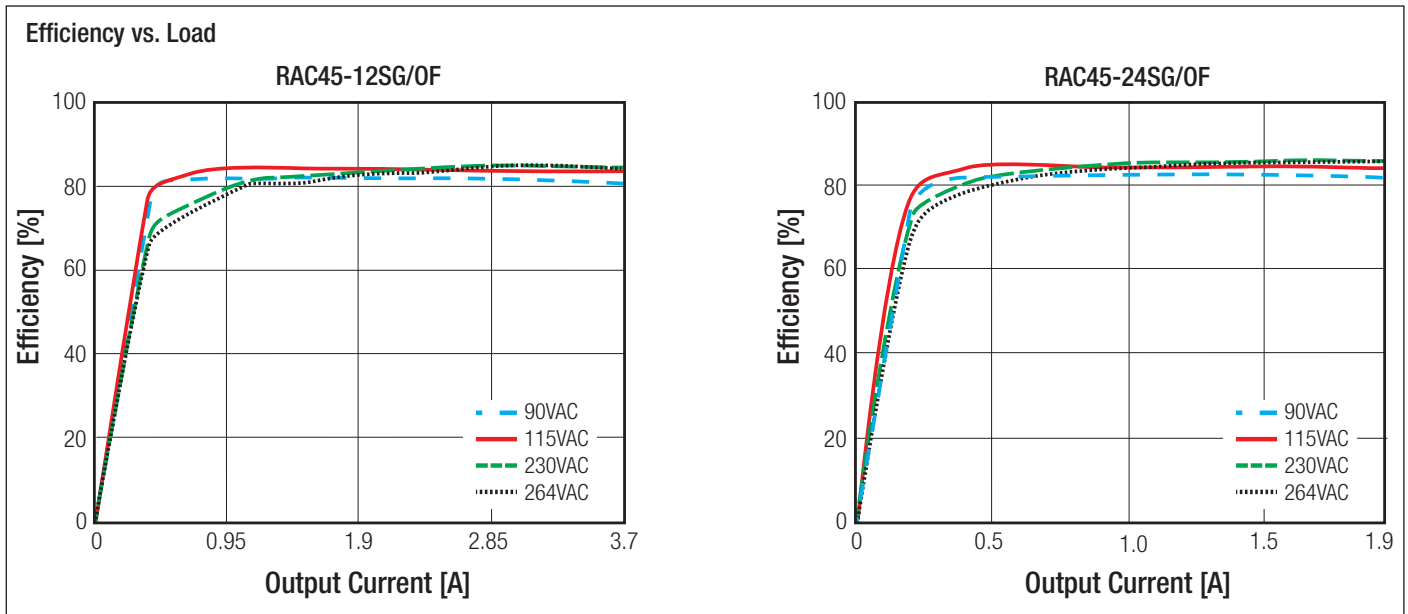
Note1: Typ. efficiency is tested @ 230VAC and full load

Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

BASIC CHARACTERISTICS					
Parameter	Condition	Min.	Typ.	Max.	
Output Power					48W
Input Voltage Range		90VAC	230VAC		264VAC
Input Current	115VAC 230VAC				1A 0.6A
Inrush Current	cold start, 115VAC cold start, 230VAC				20A 45A
No Load Power Consumption	230VAC		0.5W		
Input Frequency Range		47Hz			63Hz
Output Voltage Trimming	12Vout 24Vout 48Vout	11.4VDC 22.8VDC 45.6VDC	12VDC 24VDC 48VDC		13.2VDC 26.4VDC 52.8VDC
Minimum Load		0%			
Power Factor	115VAC 230VAC		0.6 0.5		
Start-up Time	115VAC 230VAC				2s 0.8s
Rise Time	115VAC 230VAC		10ms 8ms		
Hold-up Time	115VAC 230VAC		16ms 80ms		
Internal Operating Frequency		65kHz			100kHz
Ripple and Noise ⁽²⁾	20Mhz BW		50mVp-p		120mVp-p

Notes:
 Note2: Measured with a 0.1µF & 10µF parallel capacitor.
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Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted)



REGULATIONS		
Parameter	Condition	Value
Output Accuracy		$\pm 1.0\%$ typ. / $\pm 3.0\%$ max.
Load Regulation	10%-100% load	$\pm 0.5\%$ typ. / $\pm 3.0\%$ max.
Line Regulation		$\pm 0.2\%$ typ. / $\pm 1.0\%$ max.

PROTECTIONS			
Parameter	Condition		Value
Input Fuse	internal		T3.15A / 250V slow blow
Short Circuit Protection			continuous, auto recovery
Over Voltage Protection (OVP)	115-135% of V_{out} nominal		Latch OFF
Over Current Protection (OCP)	12VDC		3.9 - 6.2A
	nom. V_{out} = 24VDC		2.0 - 3.2A
	48VDC		1.1 - 1.56A
Isolation Voltage	tested for 1 minute	I/P to O/P	3kVAC
		I/P to FG	1.5kVAC
		O/P to FG	0.5kVDC
Isolation Capacitance			2200pF max.
Isolation Resistance	I/P to O/P		100M Ω min.
Leakage Current	I/P to O/P		0.25mA max.
	O/P to FG		3.5mA max.
Insulation Grade			reinforced

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	with derating (see graph)	-25°C to $+60^\circ\text{C}$
Temperature Coefficient		$\pm 0.05\%/^\circ\text{C}$ typ.

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Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted)

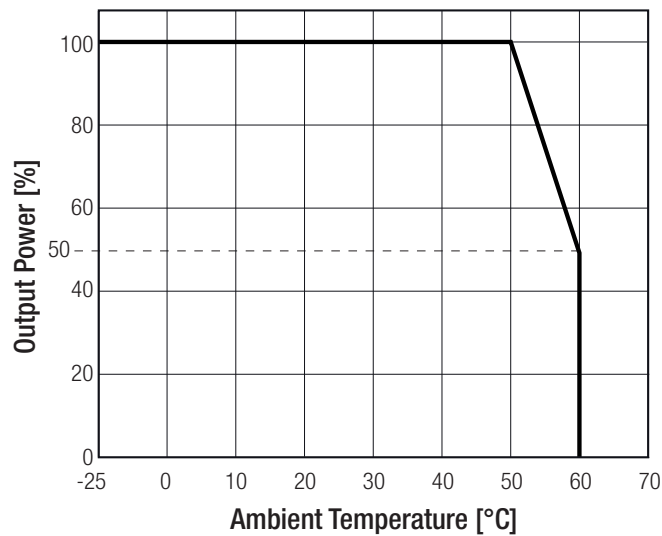
Parameter	Condition	Value
Operating Humidity	non-condensing	20% - 90% RH
Operating Altitude ⁽³⁾		5000m
Pollution Degree		PD2
Shock		20G, 11ms, 3 times for X,Y and Z axis
MTBF	MIL-HDBK-217F G.B. +25°C	200 x 10 ³ hours

Notes:

Note2: Recognized by UL for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Contact RECOM tech support for advice

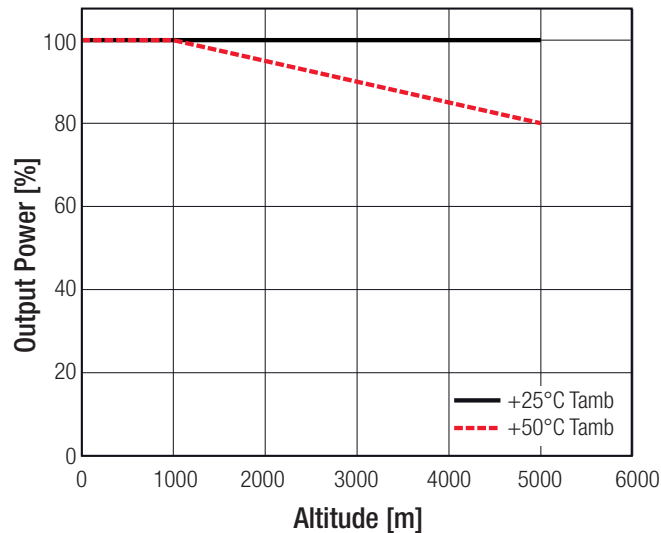
Derating Graph

(@ Chamber and natural convection 0.1m/s)



Operating Altitude

(limitation E-Cap heatsink)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Information Technology Equipment, General Requirements for Safety (LVD)	16BAS07018 11	EN60950-1, 2nd Edition, 2013
RoHS2		RoHS 2011/65/EU + AM2015/863

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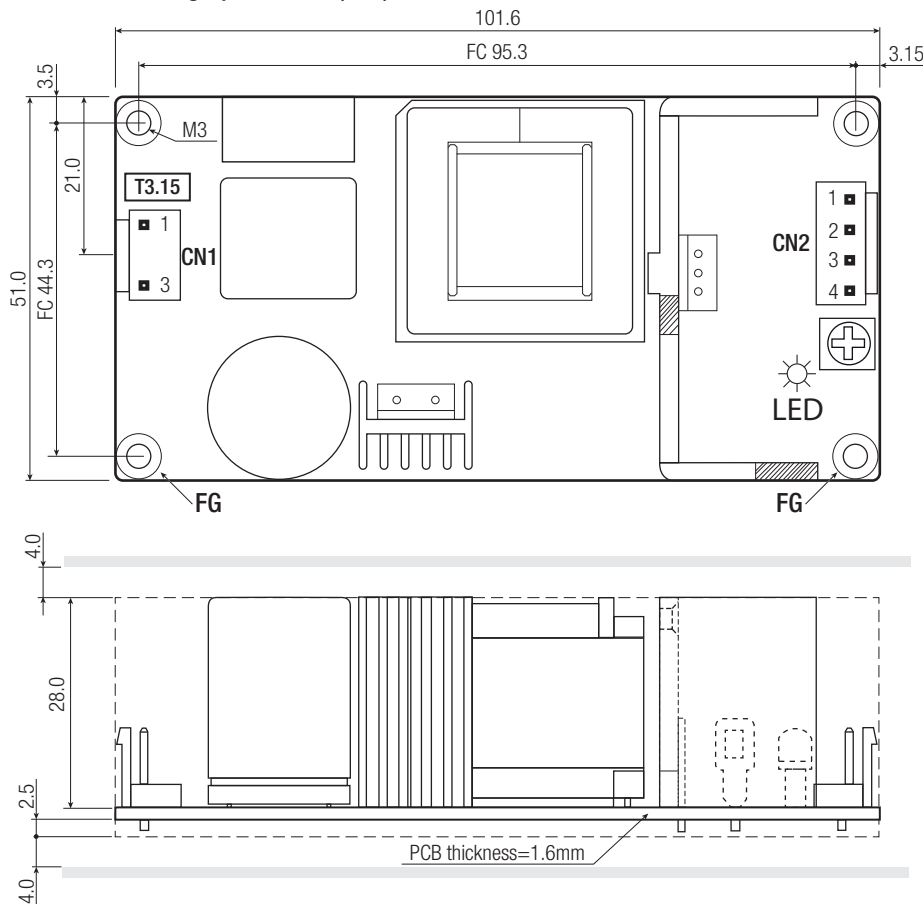
Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted)

EMC Compliance	Conditions	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	without external filter	EN55022, A2:2011, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2010
ESD Electrostatic discharge immunity test	$\pm 8\text{kV}$ Air; $\pm 4\text{kV}$ Contact	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	AC Power Port: $\pm 1\text{kV}$	EN61000-4-4, Criteria A
Surge Immunity	AC Power Port: L-L $\pm 1\text{kV}$ L-PE $\pm 2\text{kV}$ N-PE $\pm 2\text{kV}$	EN61000-4-5, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8, Criteria A
Voltage Dips and Interruptions	Dips: >95% reduction Interruption: >95%	EN61000-4-11, Criteria A EN61000-4-11, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2, Criteria A
Voltage Fluctuations and Flicker in Public Low-Voltage Systems $\leq 16\text{A}$ per phase		EN61000-3-3

DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	PCB	FR4 (UL94-V0)
Package Dimension (LxWxH)		101.6 x 51.0 x 28.0mm
Package Weight		126g typ.

Dimension Drawing Open Frame (mm)



Connection via Connector

Suggested Plug: RECOM Connector SET OF

AC Input (CN1)

Pin #	Pin Header
1 AC/N	LANDWIN 3961P0300TN2
3 AC/L	

DC Output Connector (CN2)

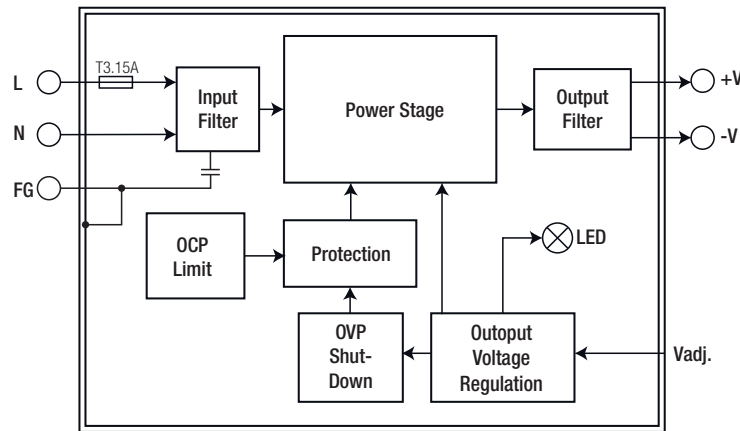
Pin #	Pin Header
1,2 V+	LANDWIN 3962P0400T
3,4 V-	

FC= fixing centers
Crimp Terminal AWG Range: 18-22AWG
Tolerance: xx.x= $\pm 1.0\text{mm}$
xx.xx= $\pm 0.5\text{mm}$

Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted)

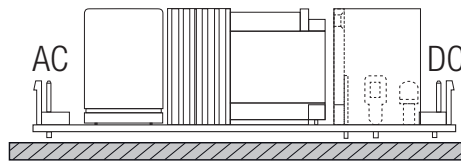
APPLICATION and INSTALLATION

Functional diagram



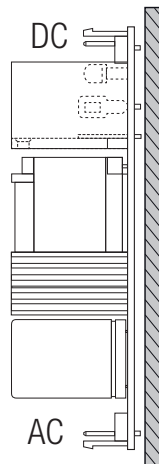
Mounting

horizontal (standard)

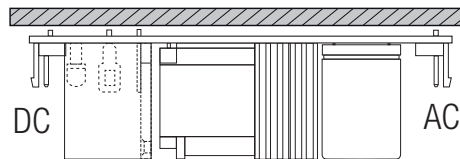


If module is mounted vertical or upside-down with natural convection cooling, the power must be derated $\geq 10\%$.

vertical



upside-down



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	174.0 x 125.0 x 266.0mm
Packaging Quantity		10pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	10% - 95% RH

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.