Features

Regulated Converter

- Household, medically and ITE certified
- Class II installations (without FG)
- IP68 waterproof encapsulation
- Long life components, rugged module
- Energy Efficiency Level VI
- Cable and connector modifications on request

RECOM
AC/DC Converter

RACM30-ER/W

30 Watt Wired Round Shape Single Output

Description

The RACM30-ER/W series comprises reliable and highly efficient power conversion modules in a potted IP68 certified, waterproof encapsulation to fit into flush mount wall installations. All versions are covered by multiple certifications for household, medical and ITE safety standards as well. With a certified operation up to 5000m altitude and an ambient temperature range from -20°C up to +70°C, the compact modules are designed to power sanitary, healthcare, smart building, automation, and household applications. Since these modules do not require any external components, they are ready to connect and forget.

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage (1) [VDC]	Output Current [A]	Efficiency typ. (3) [%]
RACM30-12SER (2)	90-264	12	2.5	88
RACM30-24SER (2)	90-264	24	1.25	89.5

Notes:

Note1: Other output voltages on request

Note2: Efficiency is tested at nominal input (115/230VAC) and full load at +25°C ambient

Model Numbering

RACM30-__ SER/W

- Output Power
- Output Voltage
- Connection (3)
- Single

Notes:

Note3: Other connection types on reqeuest

2MOPP
250VAC

IEC/EN60950-1 certified
UL60950-1 certified
ANSI/AAMI ES60601-1 certified
IEC/EN60601-1 certified
IEC/EN60335-1 certified
IEC/EN61558-1 certified
IEC/EN61558-2-16 certified
IEC/EN60601-1-2 certified
EN55024/32 certified
EN55014-1 (-2) certified
IEC60529 certified

RACM30-ER/W Series

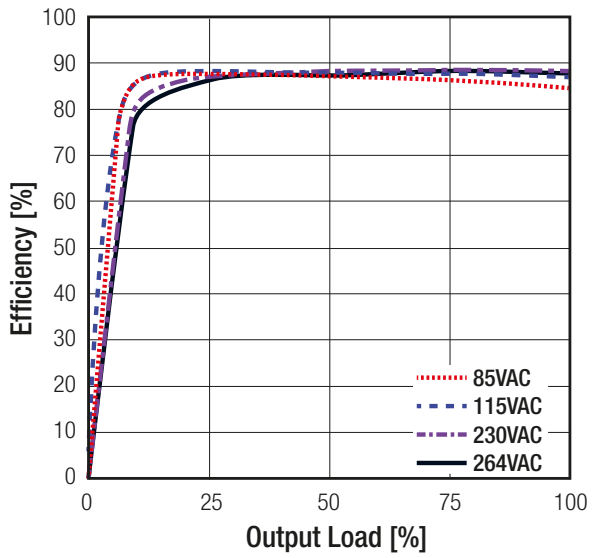
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

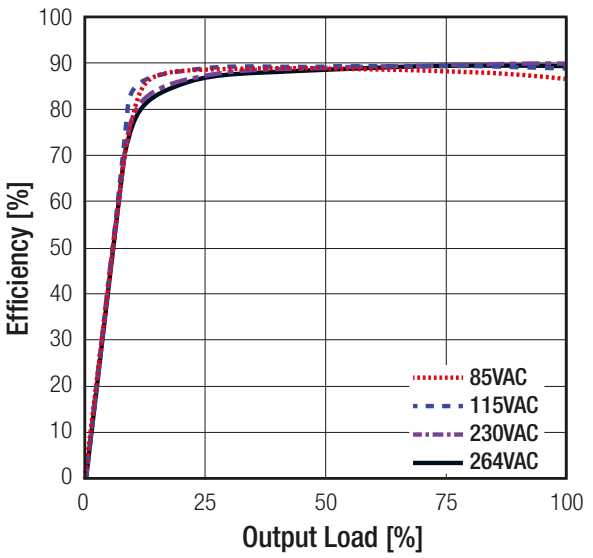
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				Pi type
Input Voltage Range		90VAC	230VAC	264VAC
Input Current	115VAC 230VAC			1000mA 290mA
Inrush Current	115VAC 230VAC		60A 95A	
No load Power Consumption				75mW
Input Frequency Range		47Hz		63Hz
Minimum Load		0%		
Power Factor			0.55	
Start-up Time	115VAC 230VAC		75ms 150ms	
Rise Time	115VAC / 230VAC		10ms	
Hold-up Time	115VAC 230VAC		15ms 55ms	
Internal Operating Frequency	100% load at nominal Vin		100kHz	
Output Ripple and Noise				75mVp-p

Efficiency vs. Load

RACM30-12SER/W



RACM30-24SER/W



REGULATIONS

Parameter	Condition	Value
Output Accuracy		±3.0% max.
Line Regulation	low line to high line	±1.0% max.
Load Regulation	0% to 100% load	±1.0% max.
Transient Response	100% load step change	±3.0% max.

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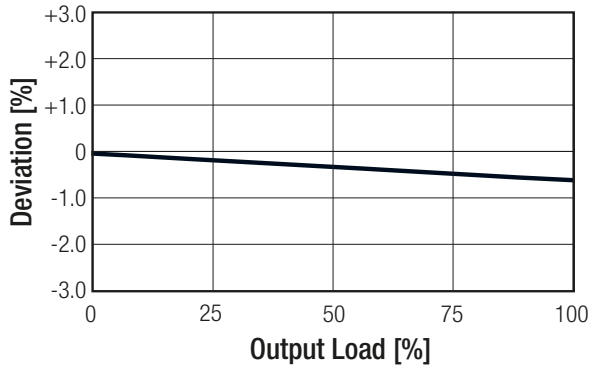
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

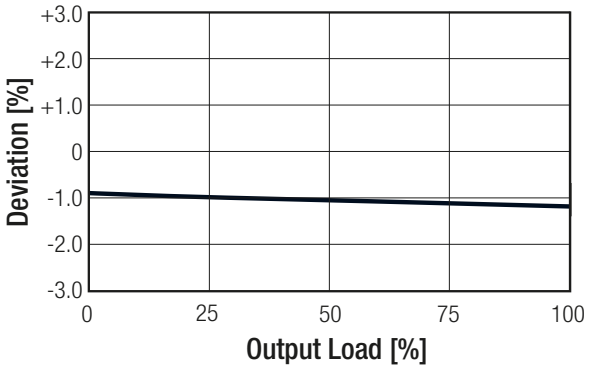
Accuracy vs. Load

(@ min Vin to max. Vin)

RACM30-12SER/W



RACM30-24SER/W



PROTECTIONS

Parameter	Type		Value	
Input Fuse	internal (line & neutral)		T2A, slow blow	
Short Circuit Protection (SCP)			continuous, auto recovery	
Over Voltage Protection (OVP)	12Vout 24Vout		17VDC, Latch OFF 35VDC, Latch OFF	
Over Voltage Category (OVC)			OVCII	
Over Current Protection (OCP)	< 1 minute	90VAC 264VAC	140% of nominal output current, auto recovery 170% of nominal output current, auto recovery	Hiccup Mode
Over Temperature Protection (OTP)	95°C ambient		thermal shutdown, auto recovery	
Class of Equipment			Class II	
Isolation Voltage [3]	I/P to O/P	tested for 1 minute	4.4kVAC	
Insulation Grade			reinforced	
Leakage Current			100µA max.	
Means of Protection	260VAC working voltage		2MOPP	
Medical Device Classification			Type BF	

Notes:

Note3: For repeat Hi-Pot testing, reduce the time and/or the test voltage

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	natural convection 0.1m/s	without derating with derating	-20°C to +50°C -20°C to +70°C
Maximum Case Temperature			+85°C
Operating Altitude			5000m
Operating Humidity	non-condensing		95% RH max.
IP Rating			IP68
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +50°C	538 x 10^3 hours 107 x 10^3 hours
Design Lifetime	E-Cap limitation		130 x 10^3 hours

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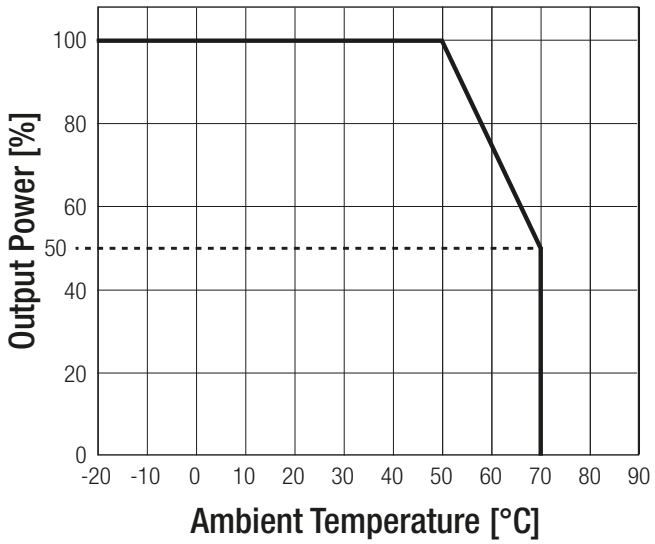
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

Derating Graph
(@ Chamber and natural convection 0.1m/s)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (CB Scheme)	T223-0255/17	IEC60950-1:2005, 2nd Edition + Am2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	T223-0255/17	UL60950-1, 2nd Edition:2014 CAN/CSA C22.2 No. 60950-1, 2nd Edition:2014
Medical Electric Equipment, General Requirements for Safety and Essential Performance (CB Scheme)	T223-0254/17	IEC60601-1:2005, AM1:2012 EN60601-1:2006 + A12:2014
Medical Electric Equipment, General Requirements for Safety and Essential Performance	T223-0254/17	CAN/CSA-C22.2 No. 60601-1:14, 3rd Edition 2014 ANSI/AAMI ES60601-1:2005
Household and similar electrical appliances - Safety Part 1: General requirements (CB Scheme)	T211-0759/17	IEC60335-1:2010, 5th Edition + A1:2013 EN60335-1:2012 + A11:2014
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100V	T211-0760/17	IEC61558-1:2005, 2nd Edition + A1:2009 EN61558-1:2005 + A1:2009
Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1100 V - Part 2-16: Particular requirements and tests for switch mode power supply units		IEC61558-2-16:2009, 1st Edition + A1:2013 EN61558-2-16:2009 + A1:2013
Degrees of protection provided by enclosures (IP Code)	T211-0584/17	IEC60529-1989,2nd-Edition+A1:1999+A2:2013
EAC	RU-AT.49.09571	TP TC 004/2011 TP TC 004/2011
RoHs 2 (2+)		RoHs 10/10, AM2015

EMC Compliance (Medical)	Condition	Standard / Criterion
Medical electrical equipment Part 1-2: Electromagnetic disturbances – Requirements and tests		EN60601-1-2:2015
ESD Electrostatic discharge immunity test	Air ±2, 4, 8, 15kV; Contact ±8kV	IEC61000-4-2:2008
Radiated, radio-frequency, electromagnetic field immunity test	10V/m (80 - 2700MHz)	IEC61000-4-3:2006 + A2:2010
Radiated, radio-frequency, electromagnetic field immunity test (table 9)	27V/m (385MHz), 28V/m (450MHz), 9V/m (710, 745, 780MHz), 28V/m 1720, 1845, 1970, 2450MHz), 9V/m (5240, 5500, 5785MHz)	IEC61000-4-3:2006 + A2:2010, Criteria A
	28V/m (800-960MHz)	IEC61000-4-3:2006 + A2:2010, Criteria B (4)
Fast Transient and Burst Immunity	AC Power Port ±2.0kV DC Output Port ±1.0kV	IEC61000-4-4:2012
Surge Immunity	AC Power Port: L-N ±0.5, 1.0kV	IEC61000-4-5:2005

Notes:

Note4: Output voltage doesn´t meet specified output accuracy

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Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

EMC Compliance (Medical)	Condition	Standard / Criterion
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 6V DC Output Port 6V	IEC61000-4-6:2013
Power Magnetic Field Immunity	50Hz, 60Hz, 30A/m	IEC61000-4-8:2009
Voltage Dips and Interruptions		IEC61000-4-11:2004

EMC Compliance (Household)	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55014-1:2006 + A1:2009 + A2:2011
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55014-2:1997 + A1:2001 + A2:2008
ESD Electrostatic discharge immunity test	Air ±8kV; Contact ±4kV	EN61000-4-2:1995 + A2:2001, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m (80 - 1000MHz)	EN61000-4-3:2006 + A1:2008, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV DC Power Port ±0.5kV	EN61000-4-4:2004, Criteria A
Surge Immunity	AC Power Port: L-N ±0.5, 1.0kV	EN61000-4-5:2006, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3V DC Power Port 3V	EN61000-4-6:2007, Criteria A
Voltage Dips and Interruptions		EN61000-4-11:2004

EMC Compliance (Multimedia)	Condition	Standard / Criterion
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010
ESD Electrostatic discharge immunity test	Air ±2, 4, 8kV; Contact ±4kV	EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m (80 - 1000MHz)	EN61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV DC Power Port ±0.5kV	EN61000-4-4:2004, Criteria A
Surge Immunity	AC Power Port: L-N ±0.5, 1.0kV	EN61000-4-5:2006, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3V DC Power Port 3V	EN61000-6-2:2009, Criteria A
Power Magnetic Field Immunity	50Hz, 60Hz, 1A/m	EN61000-4-8:2010, Criteria A
Voltage Dips and Interruptions		EN61000-4-11:2004, Criteria A
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

EMC Compliance (Generic Standards)	Condition	Standard / Criterion
Generic standards – Immunity standard for residential, commercial and light-industrial environments		EN61000-6-1:2007
Generic standards – Immunity standard for industrial environments		EN61000-6-2:2005
Generic standards – Emission standard for residential, commercial and light-industrial environments		EN61000-6-3:2007 + A1:2011

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	Case Potting PCB	non-conductive black plastic, (UL94V-0) polyurethane, (UL94V-0) FR4, (UL94V-0)
Package Dimension (LxWxH)		53.0 x 378.0 x 33.5mm
Package Weight		132g max.

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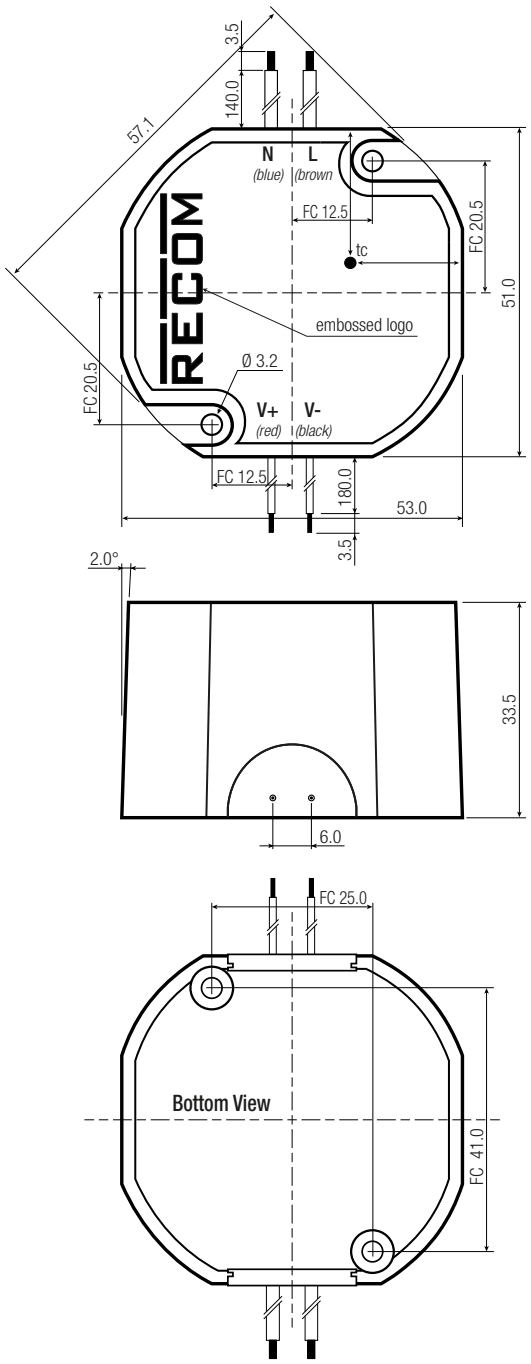
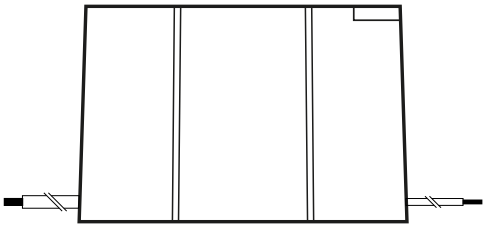
RACM30-ER/W Series

Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

Dimension Drawing (mm)





Wired Connection

#	Function	Wire Color	Type
1	VAC in (N)	white	UL-1007, AWG20
2	VAC in (L)	white	UL-1007, AWG20
3	V+	red	UL-1007, AWG22
4	V-	black	UL-1007, AWG22

tc= case temperature measuring point
FC= fixing centers
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm
Max. tightening torque fixing screws: 0.3Nm

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	carton	310.0 x 220.0 x 100.0mm
Packaging Quantity		10pcs
Storage Temperature Range		-30°C to +80°C
Storage Humidtiy	non-condensing	95% RH max.