Features

Regulated Converters

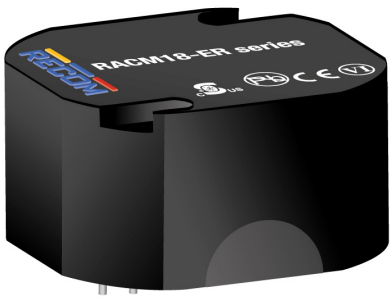
- Medical certified 2MOPP Module, type BF
- Class II installations (without FG)
- IP68 waterproof encapsulation
- Operation altitude up to 5000m
- No external components necessary
- Energy Efficiency Level IV

RECOM
AC/DC Converter

RACM18-ER

18 Watt Round Shape Single Output

3 YEAR warranty



Description

The RACM18-SER series comprises highly reliable power conversion modules in a potted IP68 waterproof encapsulation to withstand harsh operating conditions. With a certified operation up to 5000m altitude and a temperatures ranging from -20°C up to +80°C these modules are designed to power medical healthcare, household, sanitary, smart building and automation process appliances. The product family is covered by medical, household, and ITE safety standards. A 6dB margin to conducted emissions class B limits eases integration without the need for any external components.

Selection Guide

Part Number	Input Voltage Range (VAC)	Output Voltage (1) (VDC)	Output Current (A)	Efficiency typ. (2) (%)
RACM18-05SER (3)	90-264	5	2.5	81
RACM18-12SER (3)	90-264	12	1.5	86
RACM18-24SER (3)	90-264	24	0.75	86

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

RACM18-__ SER(3)

- Output Power + Output Voltage
- Single

Notes:

Note3: Other connection types on reqeuest

2MOPP
280VAC

IEC/EN60950-1 (pending)
UL60950-1 (pending)
IEC/EN60601-1 (pending)
UL60601-1 (pending)
IEC/EN60335-1 (pending)
IEC/EN61558-2-16 (pending)

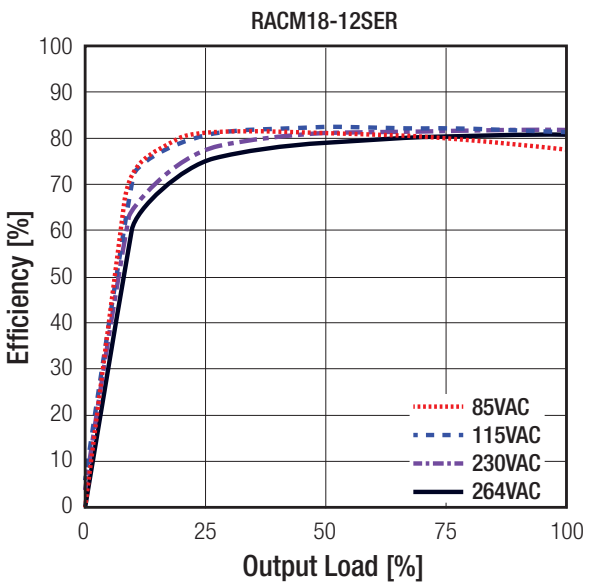
RACM18-ER Series

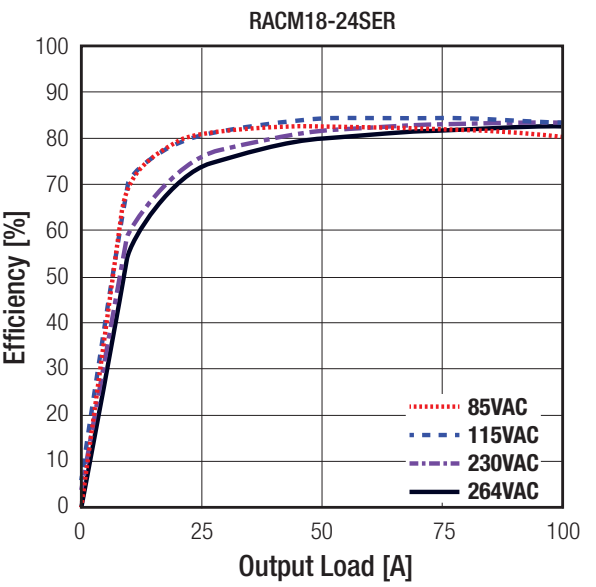
Specifications (measured @ ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				Pi type
Input Voltage Range		90VAC	230VAC	264VAC
Input Current	115VAC 230VAC			500mA 150mA
Inrush Current	115VAC 230VAC		24A 46A	
No load Power Consumption			40mW	75mW
Input Frequency Range		47Hz		63Hz
Minimum Load		0%		
Power Factor			0.46	
Start-up Time	115VAC 230VAC		180ms 200ms	
Rise Time	115VAC/230VAC		15ms	
Hold-up Time	115VAC 230VAC		15ms 65ms	
Internal Operating Frequency	100% load at nominal Vin		100kHz	
Output Ripple and Noise				140mVp-p

Efficiency vs. Load





REGULATIONS

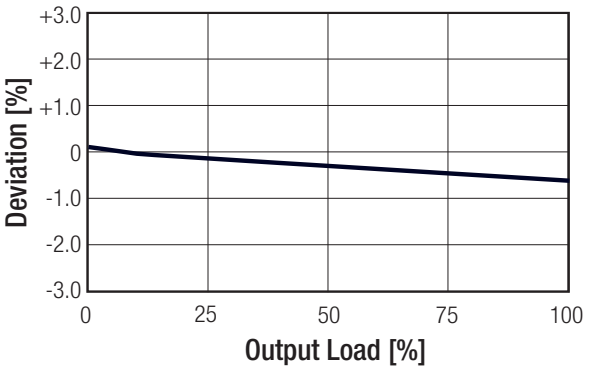
Parameter	Condition	Value
Output Accuracy		±3.0% max.
Line Regulation	low line to high line, full load	1.0% max.
Load Regulation	0% to 100% load	1.0% max.
Transient Response	100% load step change	±3.0% max.

continued on next page

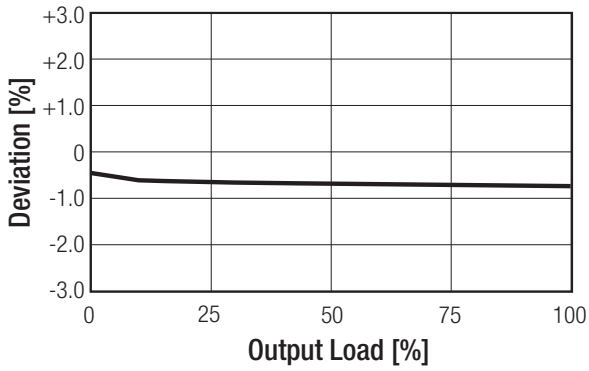
Specifications (measured @ ta= 25°C, nom. Vin (115/230VAC), full load after warm-up unless otherwise stated)

Accuracy vs. Load
(@ min Vin to max. Vin)

RACM18-12SER



RACM18-24SER



PROTECTIONS

Parameter	Type		Value	
Input Fuse	internal (line & neutral)		T2A, slow blow	
Short Circuit Protection (SCP)			continuous, auto recovery	
Over Voltage Protection (OVP)	5Vout, 12Vout 24Vout		16VDC, Latch OFF 24VDC, Latch OFF	
Over Voltage Category (OVC)			OVCII	
Over Current Protection (OCP)	< 1 minute	90VAC 160VAC 264VAC	145% of nominal Output Current, auto recovery 180% of nominal Output Current, auto recovery 165% 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	4.6kVAC	
Insulation Grade			reinforced	
Leakage Current			100µA max.	
Means of Protection	280VAC 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 +80°C
Maximum Case Temperature			+85°C
Operating Altitude			5000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +50°C	563 x 10^3 hours 112 x 10^3 hours
Design Lifetime			130 x 10^3 hours

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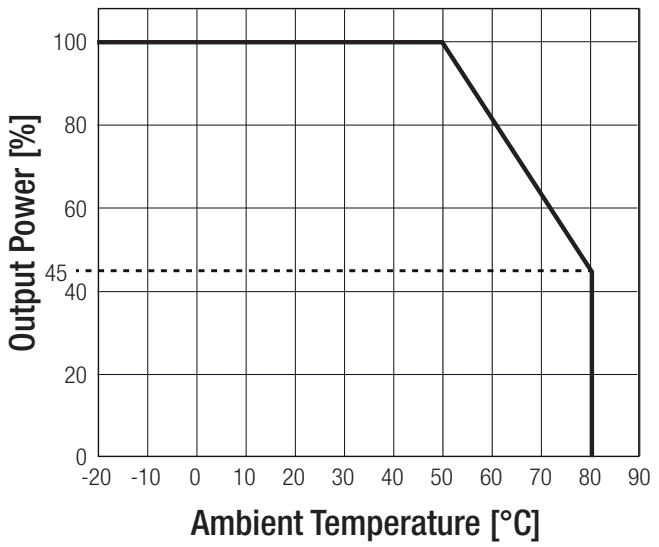
RACM18-ER Series

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)		IEC60950-1:2005, 2nd Edition +Am2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety		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)		IEC60601-1:2005, AM1:2012 EN60601-1:2006 + A12:2014
Medical Electric Equipment, General Requirements for Safety and Essential Performance		CAN/CSA-C22.2 No. 60601-1:14, 3rd Edition 2014
Household and similar electrical appliances - Safety Part 1: General requirements (CB Scheme)		IEC60335-1:2010 EN60335-1:2012 + A11:2014
RoHs 2 (2+)		RoHs 10/10, AM2015

EMC Compliance	**Condition**	**Standard / Criterion**
Electromagnetic compatibility of multimedia equipment - Emission requirements		EN55022: 2010, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024: 2010
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission		EN55014-1: 2006 + A2:2011 EN55014-2: 1997 + A2:2008
Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests		EN60601-1-2, 2007
ESD Electrostatic discharge immunity test	±8kV Air; ±6kV Contact	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m, 80-2500MHz	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	±2kV	EN61000-4-4, Criteria A
Surge Immunity	L-N ±1kV	EN61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	3V r.m.s.	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	3A/m	EN61000-4-8, Criteria A
Voltage Dips and Interruption	100/230VAC	EN61000-4-11
Voltage Fluctuations and Flicker in Public Low-Voltage Systems		EN61000-3-3

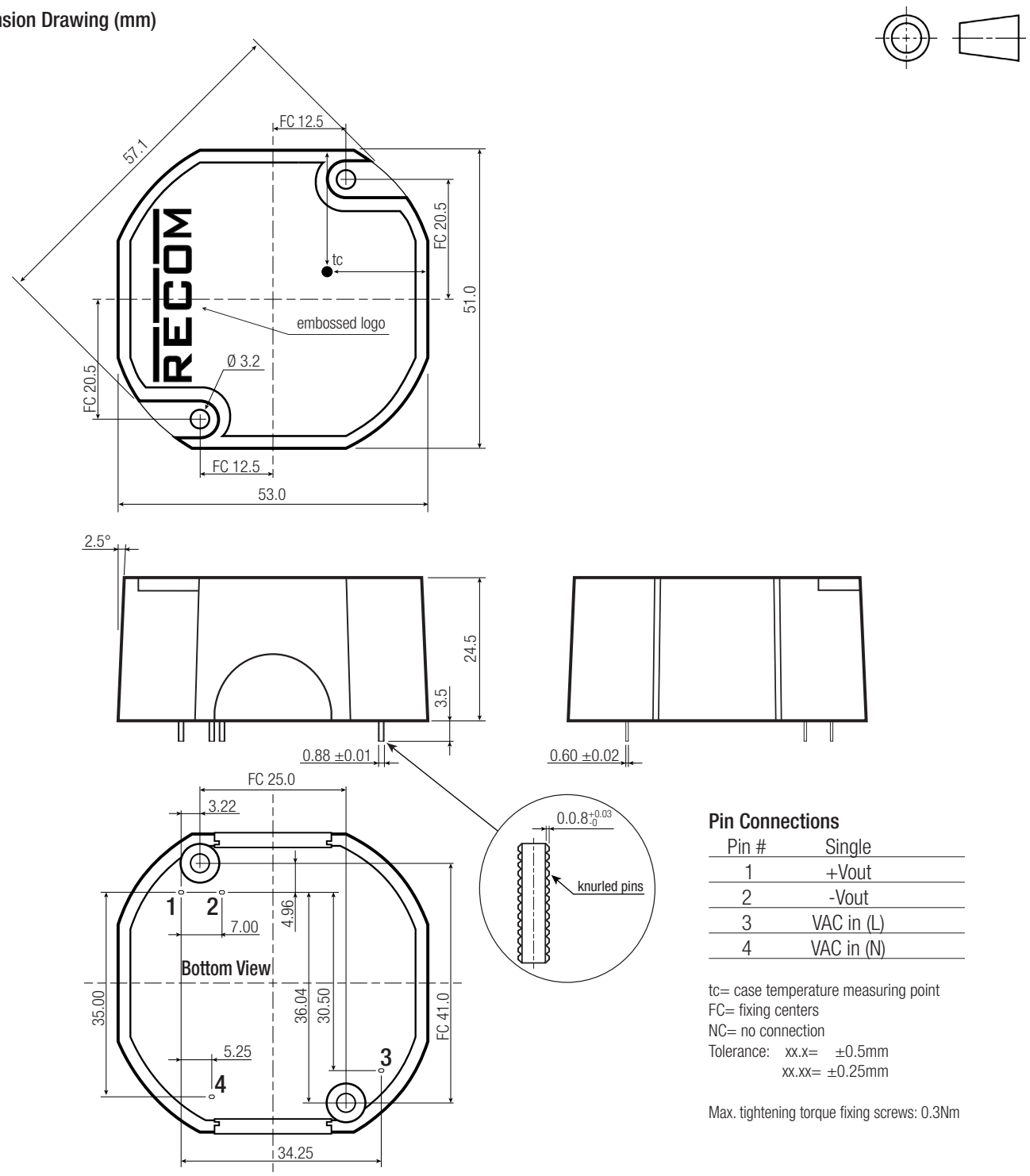
RACM18-ER Series

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

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 51.0 x 24.5mm
Package Weight		88g max.

Dimension Drawing (mm)



Pin Connections

Pin #	Single
1	+Vout
2	-Vout
3	VAC in (L)
4	VAC in (N)

tc= case temperature measuring point
FC= fixing centers
NC= no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

Max. tightening torque fixing screws: 0.3Nm

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

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.