Features

Regulated Converters

- Long 5 Year Warranty
- 2MOPP/250VAC
- Suitable for built in Class II Applications
- Wide Input Voltage Range (85-264VAC)
- Low Leakage Current (<75µA)
- 5000m Operation
- -40°C to +85°C Operating Temperature

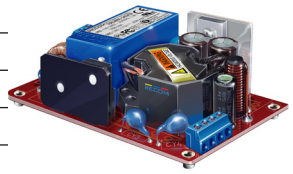
RECOM

AC/DC Converter

RACM65

65 Watt Enclosed & Open Frame Case Style Single Output





2MOPP
250VAC

Description

The RACM65 is a compact 3.6"x2.38" high efficiency AC/DC power supply with 2xMOPP safety approval for medical applications. These space saving enclosed power supplies have an universal input voltage range (85-264VAC), 4kVAC isolation, require no minimum load and can be used at ambient temperatures of between -40°C and +85°C. The 5V, 12V, 15V, 24V or 48V output voltages are fully protected and have tolerances of less than ±0.2% over the entire input voltage range and less than ±0.5% over the entire load range. The output voltage can be trimmed over a ±10% range. The RACM65 series is certified to medical safety standard IEC/ES/EN-60601-1 3rd Edition and feature BF rated outputs with less than 75µA leakage current. It has a built-in Class B EMI filter and comes with a 5 year warranty.

Selection Guide

Part Number	Input Voltage Range (VAC)	Output Voltage (VDC)	Output Current (A)	Efficiency typ. (%)
RACM65-05S (1,2)	85-264	5	10	90
RACM65-12S (1,2)	85-264	12	5.42	92.5
RACM65-15S (1,2)	85-264	15	4.34	93.5
RACM65-24S (1,2)	85-264	24	2.71	93.5
RACM65-48S (1,2)	85-264	48	1.36	93

Model Numbering

RACM65- __ S / __ -

- Output Power
- Output Voltage
- Single
- Connections (2)
- Case Style (1)

Notes:

Note1: Case Style: without suffix, standard enclosed case
add suffix "/OF" for open frame style

Note2: Connections: without suffix, standard connection with connector
with suffix "-ST" connection with screw terminals

Examples:

RACM65-12S = 12Vout, standard enclosed case
RACM65-48S/OF = 24Vout, open frame style
RACD65-15S/OF-ST = 15Vout, open frame style with screw terminal connection

IEC/EN-60601 Certified
ANSI/AAMI ES-60601 Certified
EN-55011 (Pending)
EN-55022 (Pending)

Refer to Applications Notes

Specifications (measured at T_a= 25°C, 250VAC, full load and after warm-up)

BASIC CHARACTERISTICS

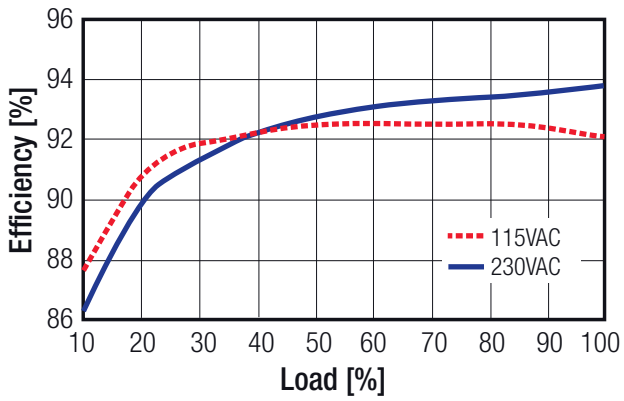
Parameter	Condition	Min.	Typ.	Max.
Input Voltage		85VAC 100VDC (3)	230VAC	264VAC 370VDC
Input Current	115VAC, fulll load 230VAC, full load			1.6A 0.9A
Inrush Current	cold start, 230VAC			60A
Input Power @ No Load				0.11W
Input Frequency Range	AC Input		50/60Hz	440Hz (3)
Start-up Time				1 Second
Rise Time			20ms	
Hold up Time	115VAC, full load		16ms	
Minimum Load				0%
Operating Frequency Range	5VDC, 230VAC others, 230VAC		60kHz 120kHz	
Output Ripple and Noise (measured @ 20MHz BW)	5VDC, 12VDC and 15VDC with 10µF/25V MLCC 24VDC, with 1µF/50V MLCC 48VDC, with 0.1µF/100V MLCC		75mVp-p 75mVp-p 150mVp-p	

Notes:

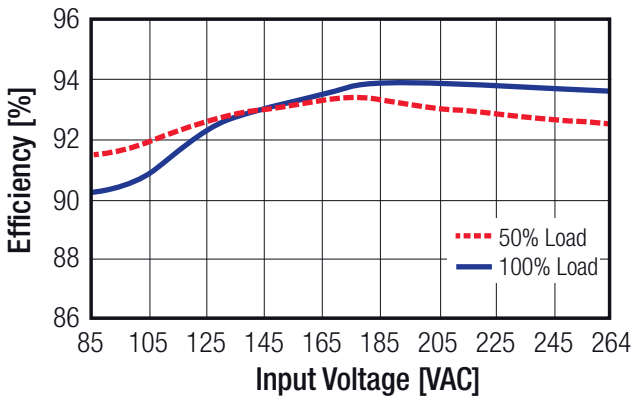
Note3: Confirmed performance, but not covered in certificates. 100V inpult voltage with derating.

RACM65-24

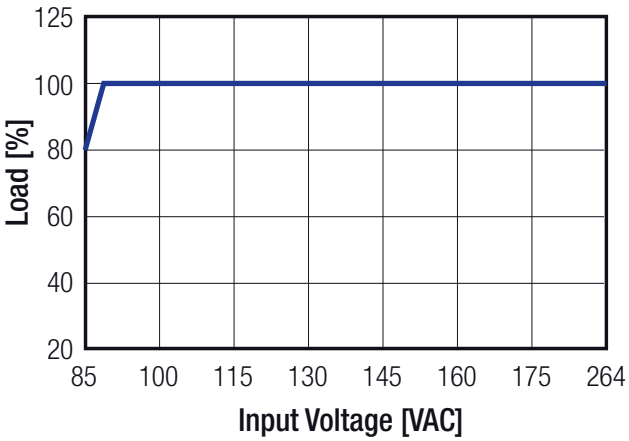
Efficiency vs. Load



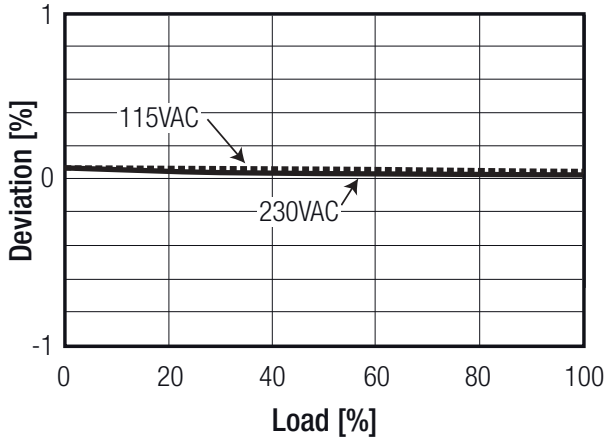
Efficiency vs. Input Voltage



Load vs. Input Voltage



Vout Deviation vs. Load



Specifications (measured at T_a= 25°C, 250VAC, full load and after warm-up)

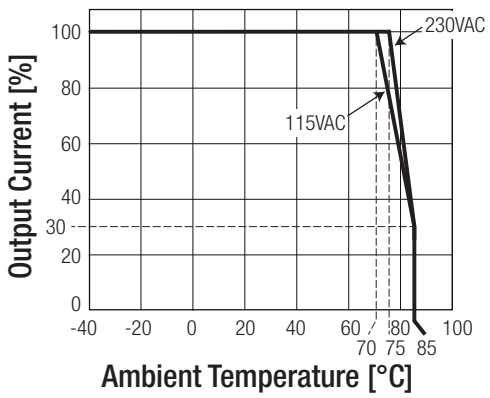
REGULATIONS		
Parameter	**Condition**	**Value**
Set Voltage Accuracy	230VAC, full load	±1%
Line Voltage Regulation	low line to high line, full load	±0.2%
Load Voltage Regulation	0% to 100% load 5VDC others 10% to 90% load 5VDC others	±0.7% ±0.5% ±0.6% ±0.4%
Output Voltage Trim	on-board trimpot.	±10%
Transient Peak Deviation	load step from 50% - 75% change at 2.5A/µs	3% Vout max.
Transient Recovery Time	load step from 50% - 75% change at 2.5A/µs	600µs typ.

PROTECTIONS		
Parameter	**Condition**	**Value**
Input Fuse	internal line neutral	T3.15A / 250VAC, slow blow type T3.15A / 250VAC, slow blow type
Short Circuit Protection (SCP)		continuous, auto-recovery
Over Load Protection (OLP)	% of Iout rated (Hiccup)	145% typ.
Over Voltage Protection (OVP)	% of Vout nominal (Latch off)	125% min / 140% max.
Isolation Voltgage (2MOPP insulation)	I/P to O/P I/P to Chassis, O/P to Chassis working voltage	4kVAC / 1 minunte 2.5kVAC / 1 minute 250VAC / continuous
Means of Protection		2MOPP
Leakage Current	264VAC	75µA max.
Medical Device Classification		Type BF applied device
Internal Clearance Creepage	I/P to O/P I/P to O/P	8mm min. 8mm min.
Isolation Resistance	500VDC	100MΩ min.
Insulation Grade		Reinforced Insulation

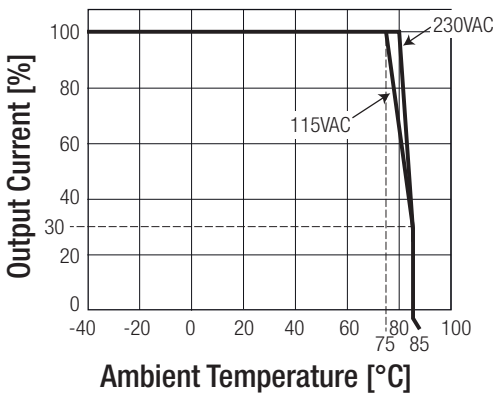
ENVIRONMENTAL		
Parameter	**Condition**	**Value**
Operating Humidity	non-condensing	5% to 95% RH
Temperature Coefficient		±0.02% / °C
Operating Temperature Range	with derating	-40°C to +85°C
Operating Altitude		5000m max.
MTBF	according to MIL-HDBK-217F, full load, +25°C	1494 x 10^3 hours

Derating Graph

RACM65-05,12,48S(/OF)



RACM65-15,24S(/OF)



Specifications (measured at T_a= 25°C, 250VAC, full load and after warm-up)

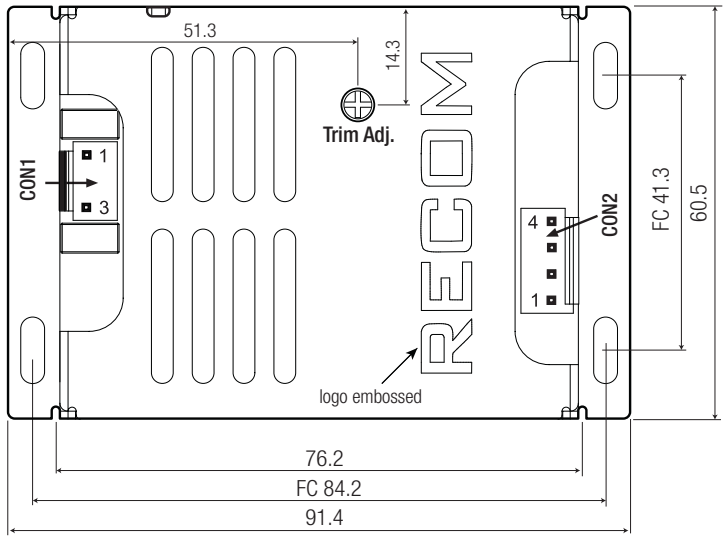
SAFETY AND CERTIFICATIONS		
Certificate Type	**Report / File Number**	**Standard**
IEC/EN Medical Safety (CB Scheme)	151101302	IEC60601-1, 3rd Edition, 2012 EN60601-1, 3rd Edition, 2014
ANSI/AAMI Medical Safety		ES60601-1, 2012
Risk Managment	151101301_2037	ISO 14971:2007 EN ISO 14971:2012

EMC Compliance	Condition	Standard / Criterion
EMI Standard		EN55011 + EN55022 + FCC18, Class B
ESD	Air ±8kV; Contact ±6kV	EN61000-4-2, Criteria A
Radiated Immunity	20V/m	EN61000-4-3, Criteria A
Fast Transient	±2kV	EN61000-4-4, Criteria A
Surge	L-N ±1kV and L-GND/N-GND ±2kV	EN61000-4-5, Criteria A
Conducted Immunity	20Vr.m.s	EN61000-4-6, Criteria A
Power Frequency Magnetic Field	10A/m	EN61000-4-8, Criteria A
Harmonic Current	full load	EN61000-3-2, Class A
Voltage Flicker		EN61000-3-3
Shock		IEC60068-2-27
Vibration		IEC60068-2-6
Dip and Interruptions, 230VAC 50Hz	30% 500ms 60% 100ms >95% 10ms >95% 5000ms	EN60601-1-2, Criteria A EN60601-1-2, Criteria A EN60601-1-2, Criteria A EN60601-1-2, Criteria B

DIMENSION and PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Package Dimension (LxWxH)	Enclosed Case Open Frame	91.4 x 60.5 x 33.3mm 76.2 x 50.8 x 26.5mm
Package Weight	Enclosed Case Open Frame + "-ST" Version	172g 137g
Case Material	enclosed case	Aluminum

Dimension Drawing Enclosed Case (mm)

Top View



AC Input Connector CON1

Pin1 Line
Pin3 Neutral

Pin Connector: Molex KK156

DC Output Connector CON2

Pin1,2 -Vout
Pin3,4 +Vout

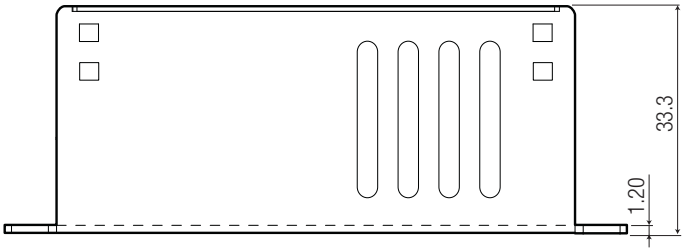
Pin Connector: Molex KK156

Tolerance: ±0.5mm
FC: fixing center

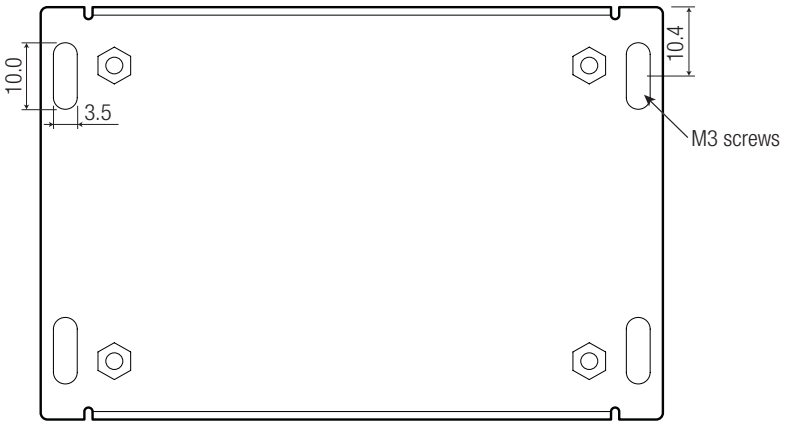
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Specifications (measured at T_a= 25°C, 250VAC, full load and after warm-up)

Side View

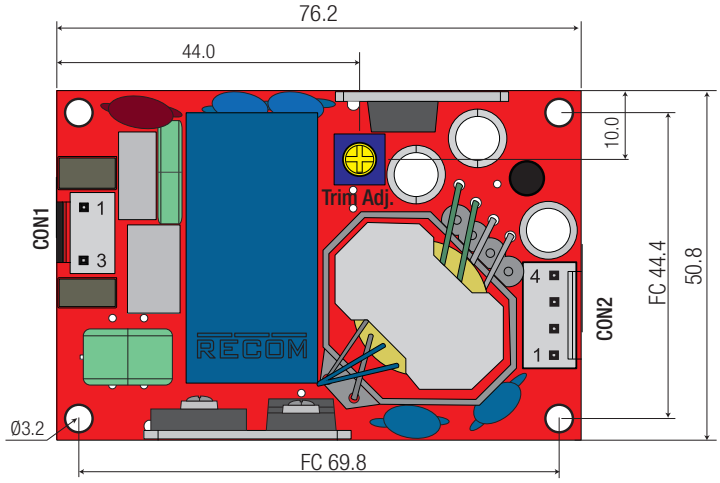


Bottom View

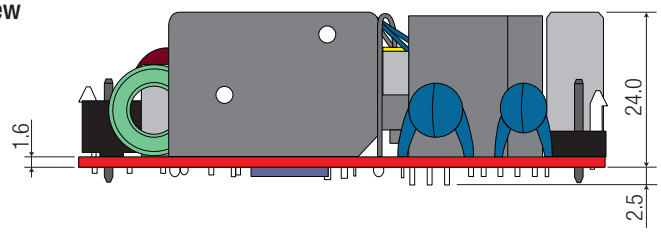


Dimension Drawing Open Frame (/OF) (mm)

Top View



Side View



AC Input Connector CON1

Pin1 Line
Pin3 Neutral

Pin Connector: Molex KK156

DC Output Connector CON2

Pin1,2 -Vout
Pin3,4 +Vout

Pin Connector: Molex KK156

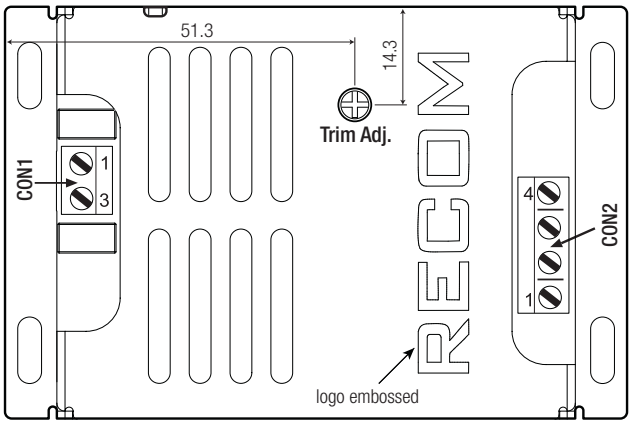
Tolerance: ±0.5mm
FC: fixing center

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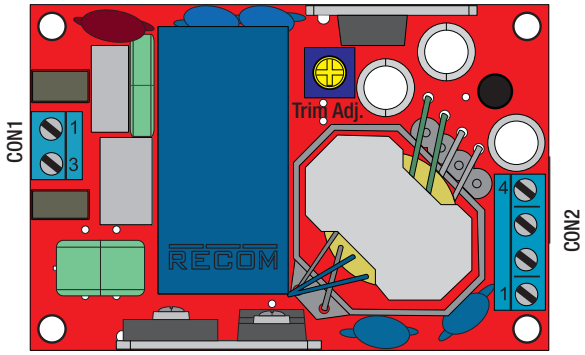
Specifications (measured at T_a= 25°C, 250VAC, full load and after warm-up)

Screw Terminal Connection "-ST"

Enclosed Version



Open Frame Version



AC Input Connector CON1

Pin1 Line
Pin3 Neutral

Screw Terminal: ETB30

DC Output Connector CON2

Pin1,2 -Vout
Pin3,4 +Vout

Screw Terminal: ETB30

Tolerance: ±0.5mm
FC: fixing center

PACKAGING INFORMATION			
Parameter	**Type**		**Value**
Packaging Dimension (LxWxH)	cardboard box	enclosed case	111.0 x 94.0 x 51.0mm
		open frame	120.0 x 80.0 x 85.0mm
Packaging Quantity			1pcs
Storage Temperature Range			-40°C to +85°C

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