

# Features

- 40mW max. no load power consumption
- High efficiency up to 76%
- Isolated output 3kVAC / 1 min
- SCP, OVP protection
- Wide operating temperature range: -40°C to +85°C
- Universal input 85-305VAC

# Regulated Converter

# RECOM AC/DC Converter

## RAC03-SER/277

### 3 Watt Single Output



UL60950-1 certified  
 CAN/CSA-22.2 No. 60950 certified  
 EN60335-1 certified  
 IEC/EN60950-1 certified  
 CB Report  
 EN55032 certified  
 EN55024 certified  
 EN55014 certified

### Description

The modules of the RAC03-SER/277 series are regulated AC/DC converters with 3kVAC isolation and a round, flat shape. This series has been designed to offer low stand-by consumption and an ultra-wide input voltage range. Uses include a variety of applications in building automation, security systems and communication systems.

### Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2)</sup> [µF]
RAC03-3.3SER/277	100-277	3.3	900	68	22000
RAC03-05SER/277	100-277	5	600	70	7500
RAC03-12SER/277	100-277	12	250	74	1000
RAC03-24SER/277	100-277	24	125	76	200

#### Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load

### Model Numbering



#### Notes:

Note3: add suffix "-TRAY" for Tray packaging, without suffix standard cardboard box packaging

#### Ordering Examples:

RAC03-05SER/277	3 Watt	5Vout	Single Output	cardboard box
RAC03-12SER/277	3 Watt	12Vout	Single Output	cardboard box
RAC03-05SER/277-TRAY	3 Watt	5Vout	Single Output	tray packaging

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

### BASIC CHARACTERISTICS

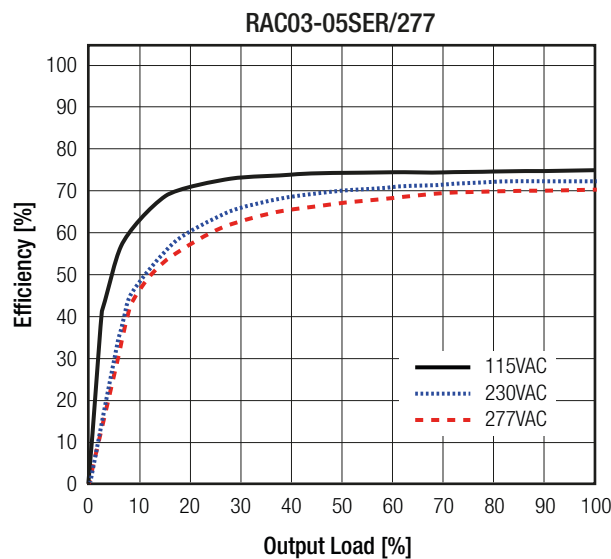
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range <sup>(4)</sup>	nom. Vin= 230VAC	85VAC 120VDC	277VAC	305VAC 430VDC
Input Current	115VAC 230VAC		70mA 45mA	
Inrush Current	cold start at +25°C	115VAC 230VAC		15A 30A
No load Power Consumption	85-305VAC/ 47-440Hz			40mW
Input Frequency Range	AC Input	47Hz		440Hz
Minimum Load <sup>(7)</sup>			10%	
Hold-up Time	115VAC	18ms		
Internal Operating Frequency	100% load at nominal Vin		55kHz	
Output Ripple and Noise <sup>(5)</sup>	3.3Vout all others		250mVp-p 200mVp-p	

**Notes:**

Note4: No line derating required

Note5: Ripple and Noise is the maximum peak-to-peak voltage value measured at the output with a 20MHz bandwidth, at rated line voltage at full load. And with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output

### Efficiency vs. Load



### REGULATIONS

Parameter	Condition	Value
Output Voltage Tolerance <sup>(6)</sup>	3.3Vout	±4.0% typ. / ±8.0% max.
	5Vout	±3.5% typ. / ±5.0% max.
	12, 24Vout	±3.0% typ. / ±4.0% max.
Line Regulation	low line to high line, full load	±0.7% typ. / ±1.0% max.
Load Regulation <sup>(7)</sup>	3.3Vout	5.5% typ. / 9.0% max.
	5Vout	5.0% typ. / 7.5% max.
	12, 24Vout	4.0% typ. / 5.5% max.

**Notes:**

Note6: Includes initial voltage accuracy, thermal drift, line regulation and load regulation at rated input voltage and load conditions

Note7: Operation below 10% load will not harm the converter, but specifications may not be met

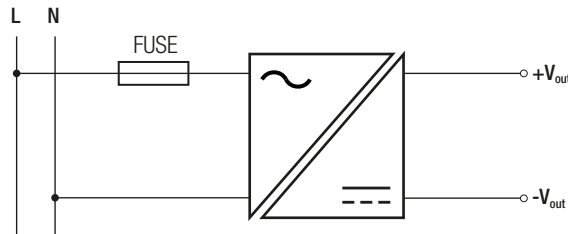
**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

**PROTECTIONS**

Parameter	Type		Value
Short Circuit Protection (SCP)			continuous, automatic recovery
Over Voltage Protection (OVP)	zener diode clamp		105% - 150%
Over Current Limit			120% - 190%
Over Voltage Category			OVCII
Isolation Voltage	I/P to O/P	tested for 1 minute	3kVAC
Isolation Resistance			1GΩ min.
Leakage Current	85-305VAC, 47-440Hz		10μA max.

**Notes:**

Note8: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: slow blow type



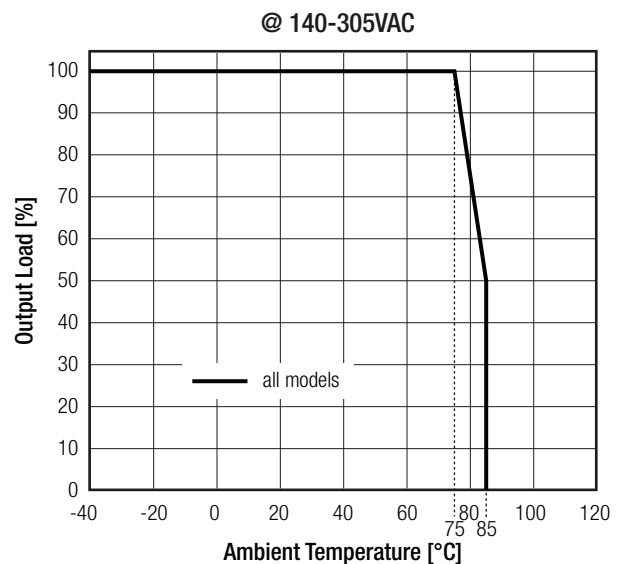
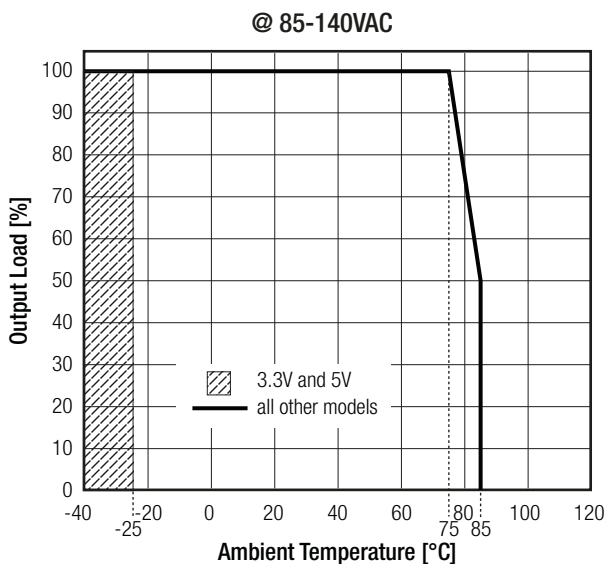
**ENVIRONMENTAL**

Parameter	Condition		Value
Operating Temperature Range <sup>(9)</sup>	full load		-40°C to +75°C
	refer to derating graph		-40°C to +85°C
Maximum Case Temperature			+105°C
Thermal Impedance			9.5K/W typ.
Operating Humidity	non-condensing		5% - 95% RH max.
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	3554 x 10 <sup>3</sup> hours
			3219 x 10 <sup>3</sup> hours

**Notes:**

Note9: At low input voltage (85-140VAC) and temperature below -25°C the RAC03-3.3SER/277 and RAC03-05SER/277, will not start

**Derating Graph**



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

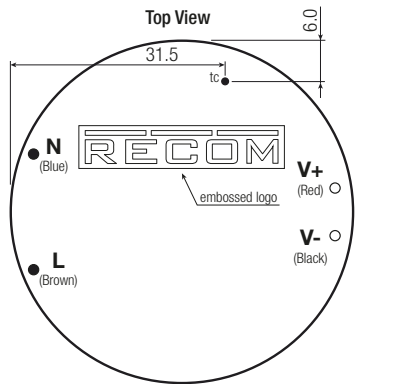
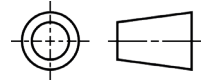
<b>SAFETY AND CERTIFICATIONS</b>		
<b>Certificate Type (Safety)</b>	<b>Report / File Number</b>	<b>Standard</b>
Information Technology Equipment, General Requirements for Safety (CB Scheme)	L0339L26-CB-1-B4	IEC60950-1:2005 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	E224736-A24-UL	UL No. 60950-1, 2nd Edition, 2014 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2014
Household and similar electrical appliances, General requirements	L0339L26-B2-L	EN60335-1:2012+A11:2014
EAC Safety of Low Voltage Equipment	RU-AT.37.02367	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863
<b>EMC Compliance (Industrial)</b>		
	<b>Condition</b>	<b>Standard / Criterion</b>
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement		EN55032:2015, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010
ESD Electrostatic discharge immunity test	±8kV air, ±4kV contact	EN61000-4-2:2009, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1kV	EN61000-4-4:2012, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8:2010, Criteria A
Voltage Dips and Interruption	Voltage Dips: >95% reduction >30% reduction Interruption: >95%	EN61000-4-11:2004, Criteria A EN61000-4-11:2004, Criteria A EN61000-4-11:2004, Criteria B
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013
<b>EMC Compliance (Household)</b>		
	<b>Condition</b>	<b>Standard / Criterion</b>
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55014-1:2006+A2:2011
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55014-2:2015
ESD Electrostatic discharge immunity test	±8kV Air, ±4kV Contact	IEC61000-4-2:2008, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port +/-1.0kV DC Output +/-0.5kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port L-N +/-2kV DC Output L-N +/-1kV	IEC61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3V, DC Output 3V	IEC61000-4-6:2013, Criteria A
Voltage Dips and Interruption	Voltage Dips: >95% reduction >30% reduction Interruption: >95%	IEC61000-4-11:2004, Criteria B IEC61000-4-11:2004, Criteria C IEC61000-4-11:2004, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2:2014
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

<b>DIMENSION AND PHYSICAL CHARACTERISTICS</b>		
<b>Parameter</b>	<b>Type</b>	<b>Value</b>
Material	case potting	black plastic, (UL94V-0) epoxy, (UL94V-0)
Dimension (LxWxH)		50.3 x 50.3 x 11.0mm
Weight		41g typ.

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

Dimension Drawing (mm)



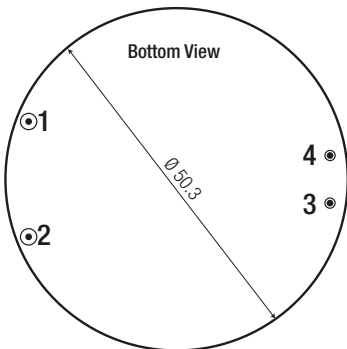
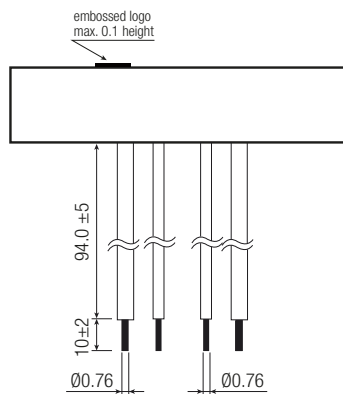
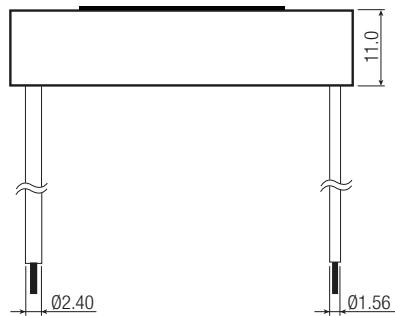
Wired information

#	Function	Wire color	Type	AWG
1	VAC in (L)	brown	UL-1015	22
2	VAC in (N)	blue	UL-1015	22
3	+Vout	red	UL-1430	22
4	-Vout	black	UL-1430	22

tc= case temperature measuring point

Tolerance: xx.x= ±0.5mm

xx.xx= ±0.35mm



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	195.0 x 170.0 x 140.0mm
	tray	462.0 x 292.0 x 49.0mm
Packaging Quantity	cardboard box	12pcs
	tray	72pcs
Storage Temperature Range		-40°C to +85°C

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant 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.

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