Features

Regulated Converter

- 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

RECOM
AC/DC Converter

RAC03-SER/277

3 Watt Single Output

3 YEAR Warranty

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 (1) [%]	Max. Capacitive Load (2) [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 resisitive load

Model Numbering

RAC03-__ SER/277-__

- nom. Output Power
- Output Voltage
- Packaging (3)
- Single

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

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

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

BASIC CHARACTERISTICS

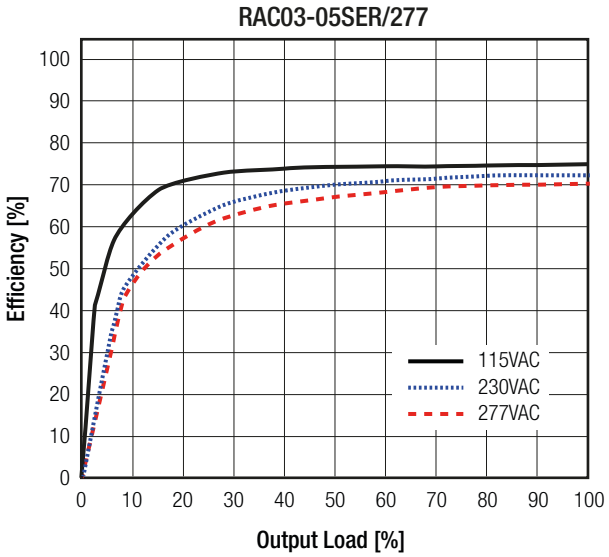
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range [4]	nom. Vin= 230VAC		85VAC 120VDC	277VAC	305VAC 430VDC
Input Current	115VAC 230VAC			70mA 45mA	
Inrush Current	cold start at +25°C	115VAC 230VAC			15A 30A
No load Power Consumption	85-305VAC/ 47-440Hz				40mW
Input Frequency Range	AC Input		47Hz		440Hz
Minimum Load [7]				10%	
Hold-up Time	115VAC		18ms		
Internal Operating Frequency	100% load at nominal Vin			55kHz	
Output Ripple and Noise [5]	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 [6]	3.3Vout 5Vout 12, 24Vout		±4.0% typ. / ±8.0% max. ±3.5% typ. / ±5.0% max. ±3.0% typ. / ±4.0% max.
Line Regulation	low line to high line, full load		±0.7% typ. / ±1.0% max.
Load Regulation [7]	10% to 100% load	3.3Vout 5Vout 12, 24Vout	5.5% typ. / 9.0% max. 5.0% typ. / 7.5% max. 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

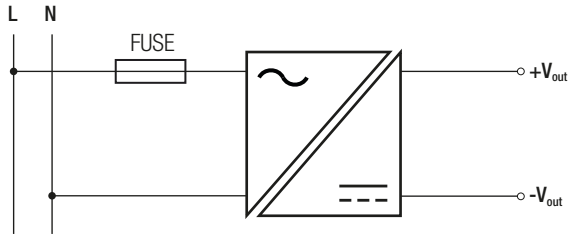
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

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

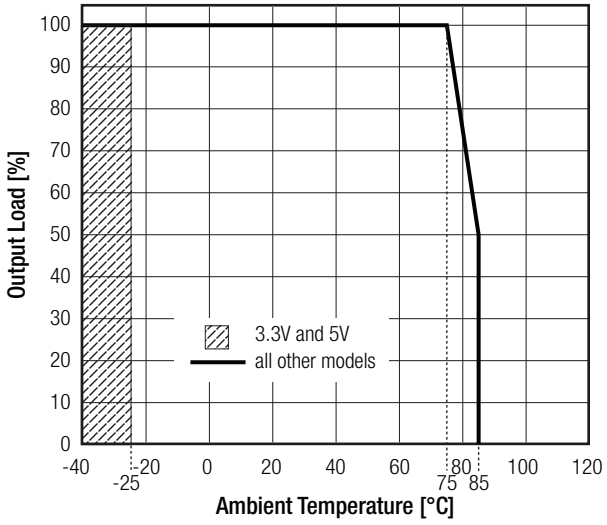
Parameter	Condition		Value
Operating Temperature Range [9]	full load		-40°C to +75°C
	refer to derating graph		-40°C to +85°C
Maximum Case Temperature			+105°C
Thermal Impedance			9.5K/W typ.
Operating Humidity	non-condensing		5% - 95% RH max.
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	3554 x 10^3 hours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

Notes:

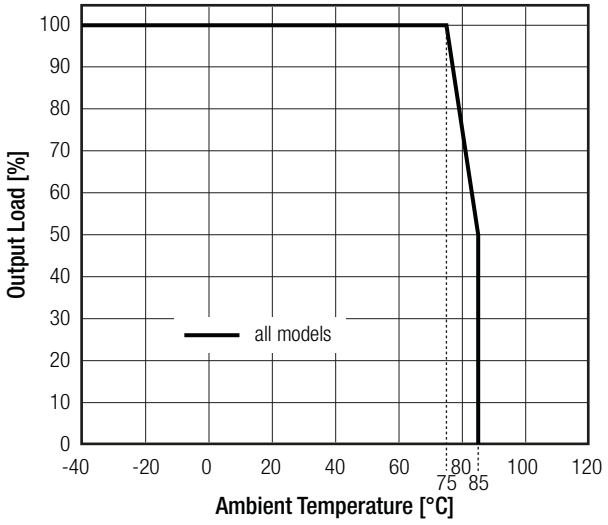
Note9: At low input voltage (85-140VAC) and temperature below -25°C the RAC03-3.3SER/277 and RAC03-05SER/277, will not start

Derating Graph

@ 85-140VAC



@ 140-305VAC



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

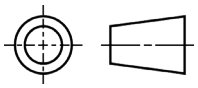
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety (CB Scheme)	L0339L26-CB-1-B4	IEC60950-1:2005 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements 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
EMC Compliance (Industrial)	**Condition**	**Standard / Criterion**
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
EMC Compliance (Household)	**Condition**	**Standard / Criterion**
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

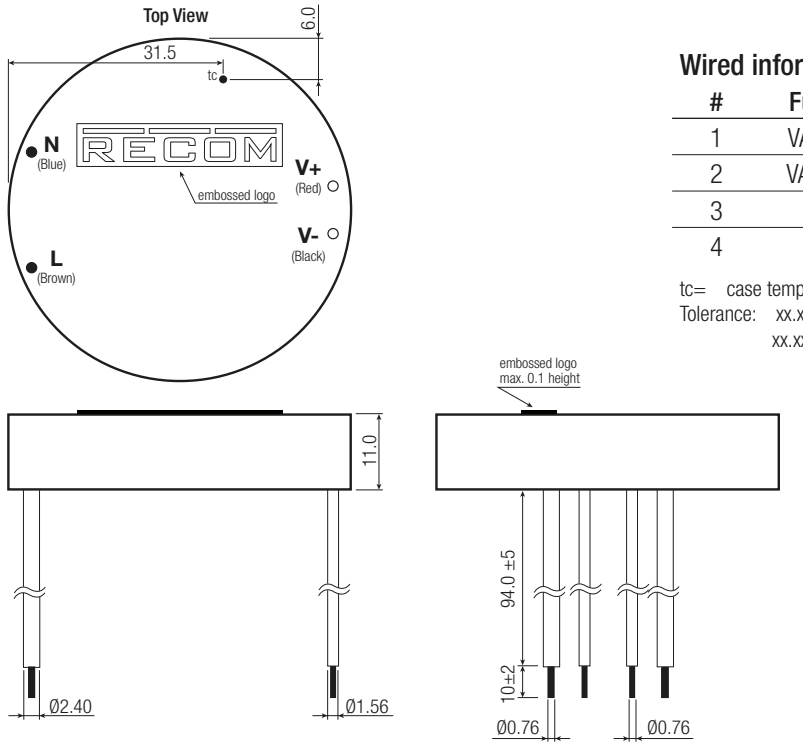
DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	case potting	black plastic, (UL94V-0) epoxy, (UL94V-0)
Dimension (LxWxH)		50.3 x 50.3 x 11.0mm
Weight		41g typ.

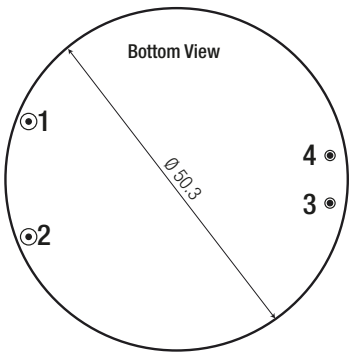
continued on next page

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 tray	195.0 x 170.0 x 140.0mm 462.0 x 292.0 x 49.0mm
Packaging Quantity	cardboard box tray	12pcs 72pcs
Storage Temperature Range		-40°C to +85°C