# Features

# Regulated Converter

- Unique, patent-pending design
- Isolated power supply with integrated mains filter
- Packaged inside of line filter case
- Safe, touchable DC outputs
- Easy installation
- Worldwide standard IEC input
- 85-264VAC universal input voltage

RECOM
AC/DC Converter

# RAC05-K/C14

## 5 Watt Single Output




## Description

The RAC05-K/C14 is a unique design that combines a mains filter and isolated power supply in the same case as a mains input filter alone, at a cost lower than many mains filters. It fits into a standard IEC "kettle connector" mounting hole, so installation time is only a few seconds. The touchable output spade terminals are safe extra-low voltage (SELV) available in 3.3V, 5V, 12V, 15V and 24V DC output voltages and are protected against short circuits, overload and overvoltage. The metal case offers secure fixing and enhances thermal dissipation allowing an operating temperature from -40°C to +70°C. The RAC05-K/C14 is ideal for powering single board computers such as the Raspberry Pi (including touchscreen), Arduino, BBC Micro:bit, etc.

## Selection Guide

| Part Number | Input Voltage Range [VAC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ (1) [%] | Max. Capacitive Load (2) [µF] |
|---|---|---|---|---|---|
| RAC05-3.3SK/C14 | 85-264 | 3.3 | 1510 | 76 | 6000 |
| RAC05-05SK/C14 | 85-264 | 5 | 1000 | 80 | 6000 |
| RAC05-12SK/C14 | 85-264 | 12 | 420 | 81 | 1500 |
| RAC05-15SK/C14 | 85-264 | 15 | 333 | 81 | 1000 |
| RAC05-24SK/C14 | 85-264 | 24 | 210 | 84 | 330 |

**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

E224736

UL/IEC/EN62368-1 pending
IEC60950-1 pending
FCC Part 15 certified
ANSI C63.4 certified
IEC/EN61204-3 compliant
EN55032 compliant
EN55024 compliant
CB Report

## Model Numbering

RAC05-__ SK/C14

- nom. Output Power
- Output Voltage
- **S**ingle
- C14 input plug (male)

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

| BASIC CHARACTERISTICS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Condition** | | **Min.** | **Typ.** | **Max.** |
| Internal Input Filter | | | | | Pi type |
| Input Voltage Range (3,4) | nom. Vin= 230VAC | | 85VAC<br>120VDC | 230VAC | 264VAC<br>370VDC |
| Input Current | 115VAC<br>230VAC | | | | 250mA<br>100mA |
| Inrush Current | cold start at 25°C | 115VAC<br>230VAC | | | 15A<br>30A |
| No Load Power Consumption | | | | 75mW | |
| ErP Standby Mode Conformity<br>(Output Load Capability) | Input Power= | 0.5W<br>1.0W<br>2.0W | | | 0.3W<br>0.7W<br>1.5W |
| Input Frequency Range | AC Input | | 47Hz | | 63Hz |
| Minimum Load | | | 0% | | |
| Power Factor | 115VAC<br>230VAC | | 0.6<br>0.45 | | |
| Start-up Time | | | | 20ms | |
| Rise Time | | | | | 8ms |
| Hold-up Time | 115VAC<br>230VAC | | | 12ms<br>60ms | |
| Internal Operating Frequency | | | | | 130kHz |
| Output Ripple and Noise | 20MHz BW | 3.3Vout, 5Vout<br>others | | 60mVp-p | <br>1% of Vout |

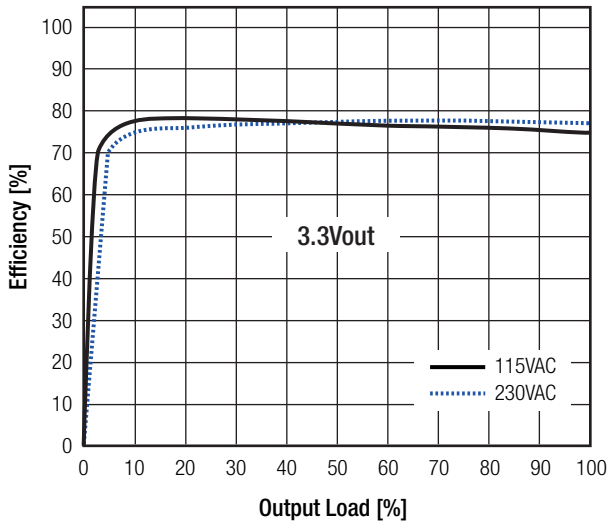
**Notes:**

Note3: The products were submitted for safety files at AC-Input operation

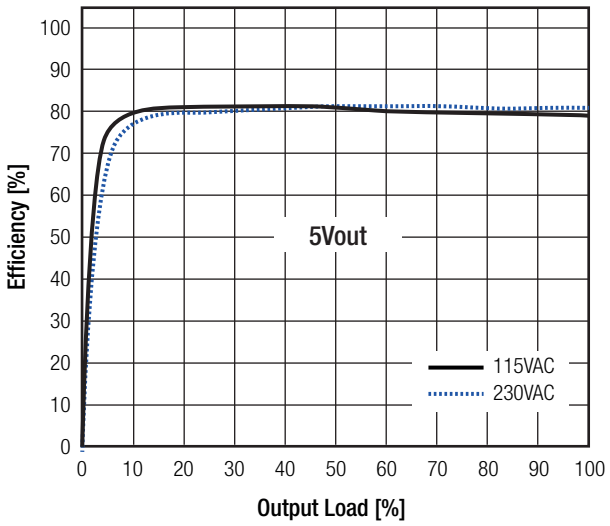
Note4: Refer to line derating graph on page PA-4

### Efficiency vs. Load

RAC05-3.3SK/C14




RAC05-05SK/C14

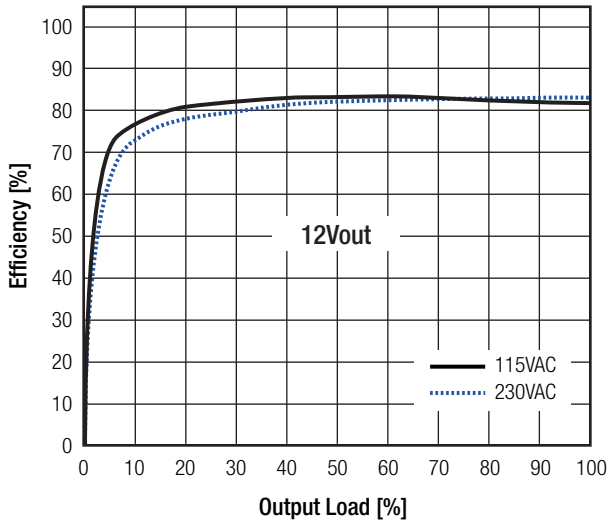



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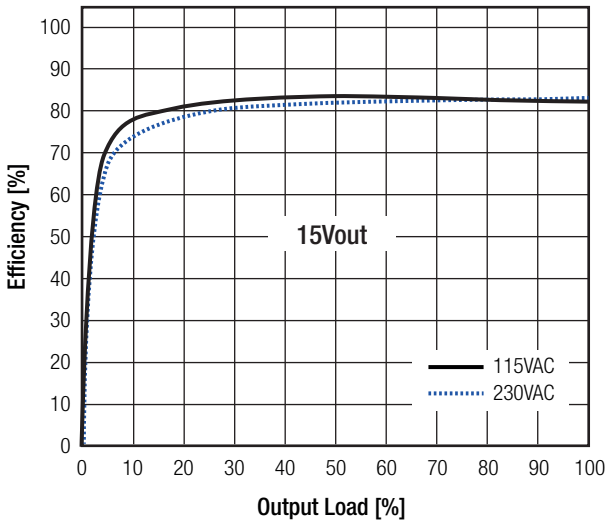
## Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### Efficiency vs. Load

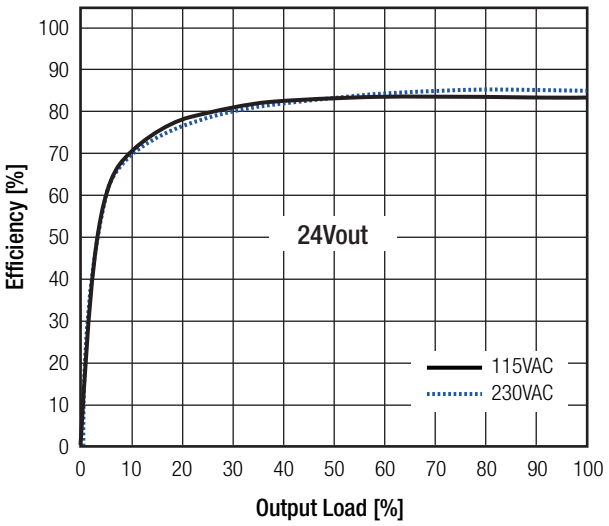
RAC05-12SK/C14




RAC05-15SK/C14




RAC05-24SK/C14




| REGULATIONS | | |
|---|---|---|
| **Parameter** | **Condition** | **Value** |
| Output Accuracy | | ±2.0% typ. |
| Line Regulation | low line to high line, full load | ±0.5% typ. |
| Load Regulation | 10% to 100% load | ±1.0% typ. |
| Transient Response | 25% load step change<br>recovery time | 4.0% max.<br>500µs typ. |

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

### PROTECTIONS

| Parameter | Type | | Value |
|---|---|---|---|
| Input Fuse [5] | internal | | T1A, slow blow |
| Short Circuit Protection (SCP) | below 100mΩ | | Hiccup, automatic restart |
| Over Voltage Protection (OVP) | | | 125% - 195%, Latch-off |
| Over Voltage Category | | | OVCII |
| Over Current Protection (OCP) | | | 125% - 195%, Hiccup auto recovery |
| Class of Equipment | | | Class I |
| Isolation Voltage [6] | I/P to O/P; I/P to Case (GND) | rated for 1 minute | 3kVAC |
| Isolation Resistance | | | 1GΩ min. |
| Isolation Capacitance | | | 100pF max. |
| Insulation Grade | | | reinforced |
| Leakage Current | | | 0.25mA max. |

**Notes:**

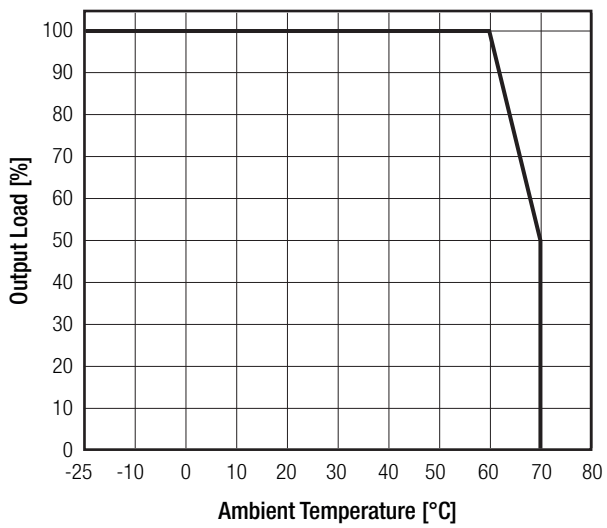
Note5: Refer to local safety regulations if input over-current protection is also required

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

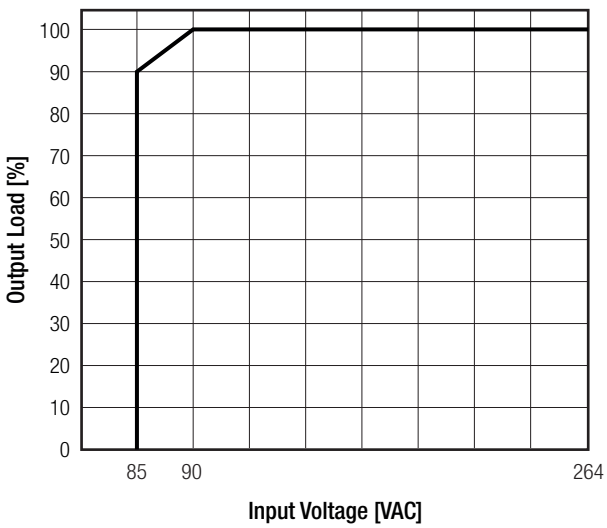
### ENVIRONMENTAL

| Parameter | Condition | | Value |
|---|---|---|---|
| Operating Temperature Range | @ natural convection 0.1m/s | full load | -25°C to +60°C |
| | | refer to derating graph | -25°C to +70°C |
| Maximum Case Temperature | | | +90°C |
| Temperature Coefficient | | | ±0.05%/K |
| Operating Altitude | | | 3000m |
| Operating Humidity | non-condensing | | % - % RH max. |
| Pollution Degree | | | PD2 |
| Vibration | 10-500Hz, 2G 10min./ 1 cycle, period o 60min. each along X,Y and Z axes | | |
| MTBF | according to MIL-HDBK-217F, G.B. | +25°C<br>+50°C | 450 x $10^3$ hours<br>250 x $10^3$ hours |
| Design Lifetime | | | 136 x $10^3$ hours |

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




**Line Derating**



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

| SAFETY AND CERTIFICATIONS | | |
|---|---|---|
| **Certificate Type (Safety)** | **Report / File Number** | **Standard** |
| Audio/video, information and communication technology equipment - Safety requirements (CB) | pending | IEC62368-1:2014 2nd Edition |
| Audio/video, information and communication technology equipment - Safety requirements (LVD) | | EN62368-1:2014 + A11:2017 |
| Audio/video, information and communication technology equipment - Safety requirements | | UL62368-1, 2nd Edition, 2014<br>CAN/CSA-C22.2 No. 62368-1-14, 2nd Ed. |
| Information Technology Equipment, General Requirements for Safety (CB) | | IEC60950-1 |
| RoHS2 | | RoHS 2011/65/EU + AM2015/863 |

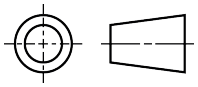
| EMC Compliance | Condition | Standard / Criterion |
|---|---|---|
| Low-voltage power supplies DC output - Part 3: Electromagnetic compatibility | | EN IEC61204-3:2018 |
| Electromagnetic compatibility of multimedia equipment - Emission requirements | | EN55032:2015, Class B |
| Information technology equipment - Immunity characteristics - Limits and methods of measurement | | EN55024:2010 + A1:2015 |
| Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity | | EN55014-2:2015 |
| Limitations on the amount of electromagnetic intererence allowed from digital and electronic devices | | FCC 47 CFR Part15, Supbart B |
| ESD Electrostatic Discharge Immunity Test | Air: ±8,4,2kV<br>Conatact: ±4, 2kV | EN61000-4-2 :2009, Criteria B |
| Radiated, Radio-Frequency, Electromagnetic Field Immunity Test | 10V/m, 80MHz-1GHz<br>3V/m, 1.4GHz-2GHz<br>1V/m, 2GHz-2.7GHz | EN61000-4-3:2006 +A1:2008, Cirteria A |
| Fast Transient and Burst Immunity | AC In Port: ±2kV<br>DC out Port: ±2kV | EN61000-4-4:2012, Criteria B |
| Surge Immunity | AC In Port (L-N): ±1kV<br>DC Output Port: ±0.5kV | EN61000-4-5:2014+A1:2017, Criteria B |
| Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields | AC+DC Power Port: 10V | EN61000-4-6:2014, Criteria A |
| Power Magnetic Field Immunity | 50Hz, 30A/m | EN61000-4-8:2010, Criteria A |
| Voltage Dips and Interuptions | Voltage Dips 20%<br>Voltage Dips 30%<br>Voltage Dips 60%<br>Voltage Dips 100%<br>Voltage Interruptions > 95% | EN61000-4-11:2004+A1:2017, Criteria C<br>EN61000-4-11:2004+A1:2017, Criteria C<br>EN61000-4-11:2004+A1:2017, Criteria C<br>EN61000-4-11:2004+A1:2017, Criteria B<br>EN61000-4-11:2004+A1:2017, Criteria C |
| Voltage Fluctuations and Flicker in Public Low-Voltage Systems <=16A per phase | | EN61000-3-3:2013 |

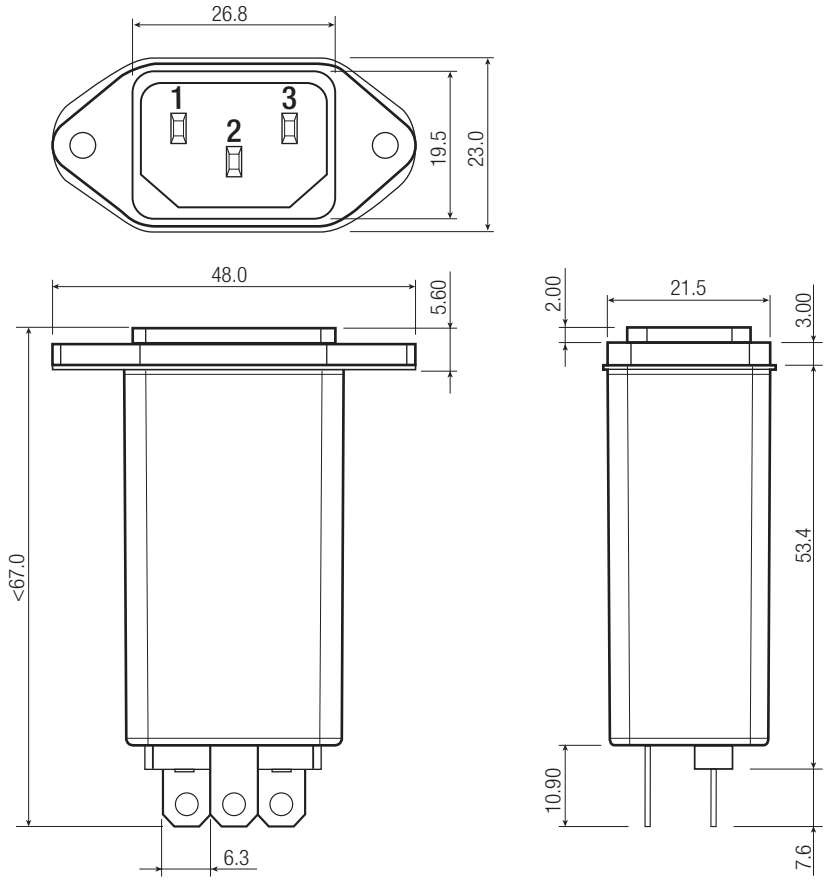
| DIMENSION AND PHYSICAL CHARACTERISTICS | | |
|---|---|---|
| **Parameter** | **Type** | **Value** |
| Material | case<br>inner case<br>potting | nickel-plated steel<br>plastic (UL94 V-0)<br>silicone rubber (UL96V-0) |
| Dimension (LxWxH) | | 67.0 x 48.0 x 23.0mm |
| Weight | | 56g typ. |

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

### Dimension Drawing (mm)



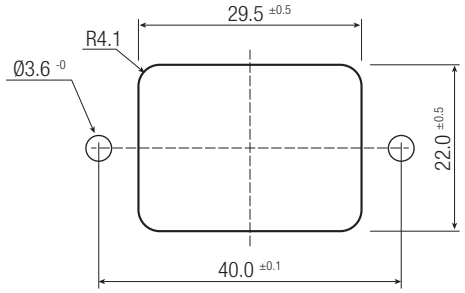



### Pinning information

| Pin # | Single |
|---|---|
| 1 | VAC in (L) |
| 2 | Earth |
| 3 | VAC in (N) |
| 4 | +Vout |
| 5 | Earth |
| 6 | -Vout |

FC= fixing centers
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

### Mounting hole dimensions




| PACKAGING INFORMATION | | |
|---|---|---|
| **Parameter** | **Type** | **Value** |
| Packaging Dimension (LxWxH) | cardboard box | 166.0 x 123.0 x 91.0mm |
| Packaging Quantity | | 10pcs |
| Storage Temperature Range | | -40°C to +85°C |
| Storage Humidity | non-condensing | 95% RH max. |

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