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Technical Data Sheet

# RACV22-24SW ◊ Constant Voltage LED Driver

## 22W ◊ Input: 176V-264VAC

RECOM AC/DC Converter

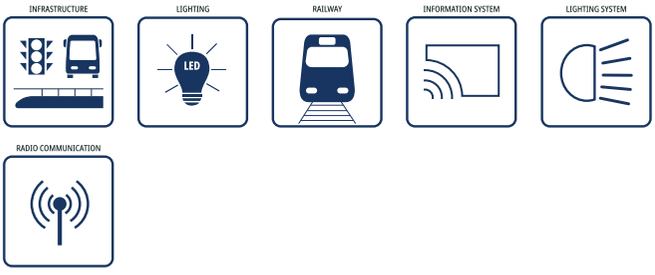
## FEATURES

- Power supply for stationary railroad systems
- LED driver for trackside railroad lighting
- Applicable for low trackside lighting (nGgB) DB InfraGO AG
- Housing with connection box in protection class IP65
- ENEC: DIN EN 61347-1 & -2-13 & EN IEC 62384
- EMV: DIN EN 61547, EN 50121-5
- Overvoltage category: EN 60664-1 OVC III
- Open- & short-circuit, overload & overtemperature protection
- Excellent efficiency, low power loss, full service life
- Full power up to +70° housing temperature
- 5 year warranty



Dimensions (LxWxH): 294.0 x 76.0 x 40.0mm (11.57 x 2.99 x 1.57 inch)
390g (0.85 lbs)

## APPLICATIONS




## SAFETY & EMC

CE · EN 61347-17 · Class 2 SELV Output · RoHS2 compliant 10 from 10 · Reach compliant

## DESCRIPTION

The chassis-mountable LED AC/DC power supply unit of the RACV22-24SW series is designed for fixed systems and devices in railroad and transportation applications. The robust mechanical design with IP65 protection offers all functions for use in stationary railroad environments for supplying small loads such as sensors, control units or lighting applications, in particular for the low-level track lighting (nGgB) of DB InfraGO AG. The input is designed for overvoltage category III and is also equipped with active power factor correction. The RACV22-24SW achieves a high and constant level of efficiency even in partial load operation. Together with the easily accessible connection box and simple installation, the RACV22-24SW is ideal for all types of stationary railroad and lighting applications with long service life requirements.

## SELECTION GUIDE

| Part Number | Input Voltage Range [VAC] | Output Voltage nom. [VDC] | Output Current Range [A] | Efficiency typ. @ full load [%] | Output Power [W] |
|---|---|---|---|---|---|
| RACV22-24SW | 176-264 | 24 | 0-0.92 | 87 | 22 |

## MODEL NUMBERING

RACV22-24 SW

- RACV22-24: rated. Output Power / nom. Output Voltage
- SW: **S**ingle

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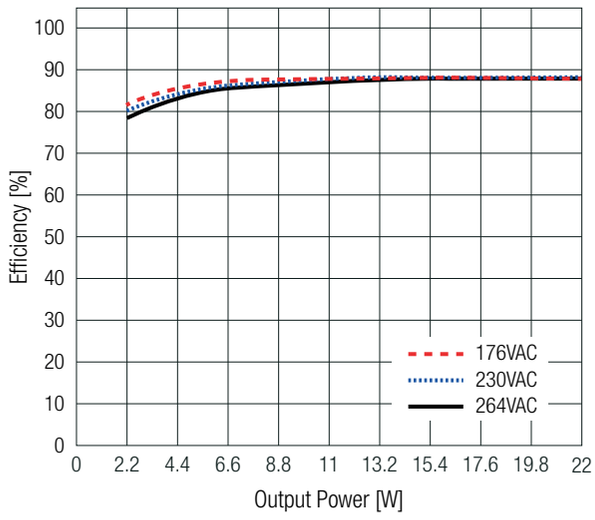
RECOM AC/DC Converter

**BASIC CHARACTERISTICS (measured @ $T_{AMB}$= 25°C, nom. $V_{IN}$, full load and after warm-up unless otherwise stated)**

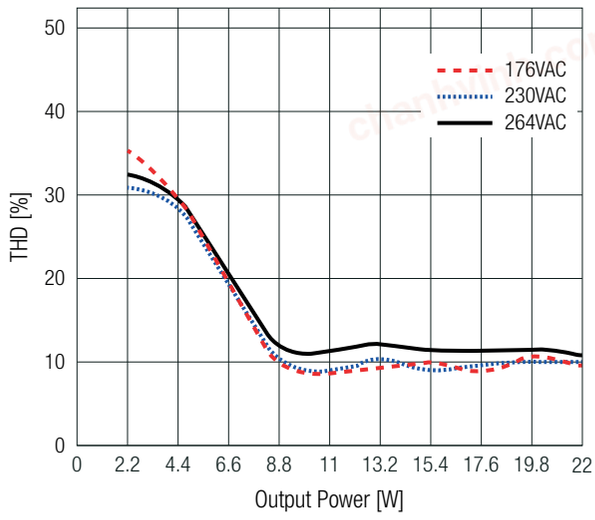
| Parameter | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|
| Nominal Input Voltage | | 220VAC | | 240VAC |
| Input Current | full load | | 150mA | |
| Inrush Current | | | 5A | |
| No Load Power Consumption | | | | 500mW |
| Input Frequency Range | | 50Hz | | 60Hz |
| Power Factor | $P_{OUT}$= 14-22W | | 0.95 | |
| | $P_{OUT}$= 10-14W | | 0.90 | |
| THD | | refer to **„Power Factor vs. Output Power“** | | |
| Start-up time | | | 500ms | |
| Internal Operating Frequency | | 60kHz | | 180kHz |
| Output Ripple and Noise (1) | | | | 480mVp-p |

Note1: Measured at 20MHz Bandwidth by using a 12” twisted pair-wire terminal with a 0.1µF & 47µF parallel capacitor

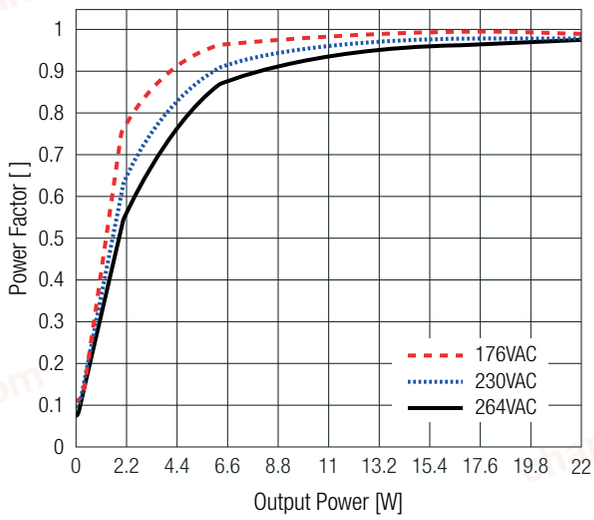
Efficiency vs. Output Power




THD vs. Output Power




Power Factor vs. Output Power




**REGULATIONS (measured @ $T_{AMB}$= 25°C, nom. $V_{IN}$, full load and after warm-up unless otherwise stated)**

| Parameter | Condition | Value |
|---|---|---|
| Output Accuracy (incl. Load and Line Regulation) | | ±2.0% max. |

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## PROTECTIONS (measured @ $T_{AMB}$= 25°C, nom. $V_{IN}$, full load and after warm-up unless otherwise stated)

| Parameter | Type | | Value |
|---|---|---|---|
| Short Circuit Protection (SCP) | | | auto recovery after fault condition is removed |
| Over Current Protection (OCP) | | | auto recovery after fault condition is removed |
| Open Circuit Protection | | | auto recovery after fault condition is removed |
| Over Temperature Protection (OTP) | @ tc point | | $T_{CASE}$ >110°C, latch off |
| Class of Equipment | Input | | Class II |
| | Output | | Class III |
| Over Voltage Category (OVC) | according to EN 60664-1 (4kV) | | OVC III |
| Isolation Voltage | I/P to O/P | 1 minute | 3.2kVAC |
| Insulation Grade | | | reinforced |

**Max. Number of RACV22-24SW in parallel**

| Circuit Breaker Type | B10 | C10 | B13 | C13 | B16 | C16 |
|---|---|---|---|---|---|---|
| Max. Number of LED-drivers | 66 | 66 | 86 | 66 | 106 | 106 |

## ENVIRONMENTAL (measured @ $T_{AMB}$= 25°C, nom. $V_{IN}$, full load and after warm-up unless otherwise stated)

| Parameter | Condition | Value |
|---|---|---|
| Operating Ambient Temperature Range | full load | -30°C to +50°C |
| Maximum Case Temperature | measured @ tc point | +70°C |
| IP Rating | according to DIN EN60529 | IP65 |
| Design Lifetime | $T_{CASE}$ = +60°C | 100 x $10^3$ hours |

## SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Report Number | Standard |
|---|---|---|
| Lamp controlgear Part 1: General and safety requirements (CB Scheme) | REP036564 | IEC61347-1:2015+A1:2017 3rd Ed. |
| Lamp controlgear Part 1: General and safety requirements | | EN61347-1:2015+A1:2021 |
| Lamp controlgear Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules (CB Scheme) | | IEC61347-2-13:2014+A1:2016 2nd Ed. |
| Lamp controlgear Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules (LVD) | | EN61347-2-13:2014+A1:2017 |
| DC or AC supplied electronic control gear for LED modules Performance requirements | REP037818 | EN IEC 62384:2020 |
| Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests | | DIN EN 60664 |
| Classification of environmental conditions - Part 3-2: Classification of groups of environmental parameters and their severities - Transportation and Handling | | IEC 60721-3-2 |
| RoHS2 | | RoHS-2011/65/EU + AM-2015/863 |

## SAFETY & CERTIFICATIONS APPLICABLE TO THE COMPLETE LIGHTING UNIT, PURELY INFORMATIVE

| Certificate Type (Safety) | Standard |
|---|---|
| Luminaires - Part 1: General requirements and tests | DIN EN 60598-1 |
| Luminaires - Part 2-3: Particular requirements - Luminaires for road and street lighting | DIN EN 60598-2-3 |
| Luminaires - Part 2-22: Particular requirements - Luminaires for emergency lighting | DIN EN 60598-2-22 |

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## SAFETY AND CERTIFICATIONS

| EMC Compliance | Condition | Standard / Criteria |
|---|---|---|
| Railway applications - Electromagnetic compatibility - Part 5: Emission and immunity of fixed power supply installations and apparatus | | DIN EN 50121-5 |
| Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment | | EN IEC 55015:2019+A11:2020 |
| Equipment for general lighting purposes - EMC immunity requirements | | EN IEC 61547:2023 |
| Assessment of lighting equipment related to human exposure to electromagnetic fields | | EN62493:2015+A1:2022 |
| ESD Electrostatic discharge immunity test | Air: ±2, 4, 8kV;<br>Contact: ±2, 4kV | IEC61000-4-2:2008 , Criteria B<br>EN61000-4-2:2009, Criteria B |
| Radiated, radio-frequency, electromagnetic field immunity test | 3 V/m (80-1000MHz) | EN IEC 61000-4-3:2020, Criteria A |
| Fast Transient and Burst Immunity | L, N, L-N: ±1kV<br>Output: ±1kV | IE/ENC61000-4-4:2012, Criteria A |
| Surge Immunity | L-N: ±1kV | IEC/EN61000-4-5:2014+A1:2017, Criteria A |
| Immunity to conducted disturbances, induced by radio-frequency fields | 3Vrms (0.15-80MHz) | IEC61000-4-6:2013, Criteria A<br>EN61000-4-6:2014, Criteria A |
| Voltage Dips and Interruptions | 100% (10ms);<br>30% (200ms) | EN IEC 61000-4-11:2020, Criteria B |
| Limits of Harmonic Current Emissions | | EN IEC 61000-3-2:2019+A1:2021 |
| Limits of Voltage Fluctuations & Flicker | | EN61000-3-3:2013 +A1:2019+A2:2021 |

## DIMENSION & PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|---|---|---|
| Materials | case | plastic (UL94 V-2) |
| Dimension (LxWxH) | | 294.0 x 76.0 x 40.0mm<br>11.57 x 2.99 x 1.57inch |
| Weight | | 390g typ.<br>0.85 lbs |

**Drawing with open connection box:**




**Cable Information**

| Function | Color | Type |
|---|---|---|
| VAC in (N) | blue | VDE H05RN-F 2 x 1.00mm² |
| VAC in (L) | brown | |
| -LED1 | blue | VDE H05RN-F 4 x 0.75mm² |
| +LED1 | brown | |
| -LED2 | black | |
| +LED2 | grey | |

Note2: The input cables are fitted with wire end ferrules.

Note3: The cover is screwed on with 4x M3 screws.
Maximum tightening torque = 1-1.2Nm with a PH2 screwdriver

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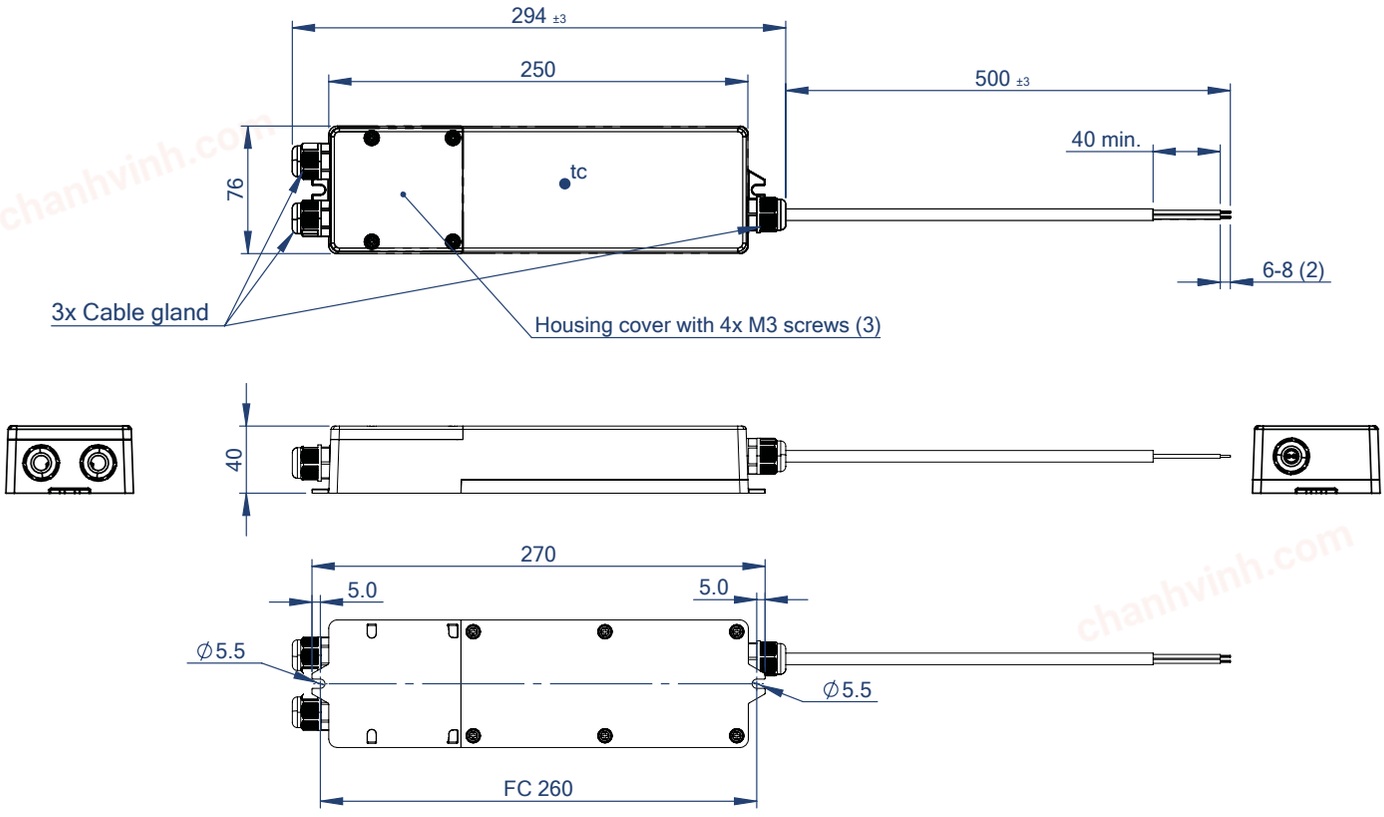
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## DIMENSION & PHYSICAL CHARACTERISTICS

### Dimension Drawing (mm)




## PACKAGING INFORMATION

| Parameter | Type | Value |
|---|---|---|
| Packaging Dimension (LxWxH) | cardboard box | 410 x 325 x 340mm |
| Packaging Quantity | | 30 pcs / box |
| Packaging Contents | RACV22-24SW LED-driver | 30 pcs |
| | 2x M5 Phillips screws L= 8mm | 2 pieces (included in the connection box) per device |
| Storage Temperature Range | | -25°C to +70°C |
| Storage Humidity | non-condensing | 5% to 85% RH |

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