Technical Data Sheet

RACV22-24SW ◊ Constant Voltage LED Driver

22W ◊ Input: 176V-264VAC

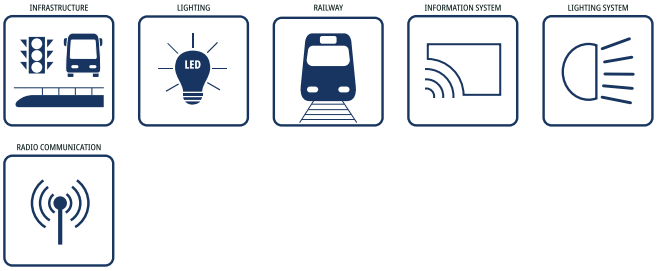
RECOM
AC/DC Converter

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

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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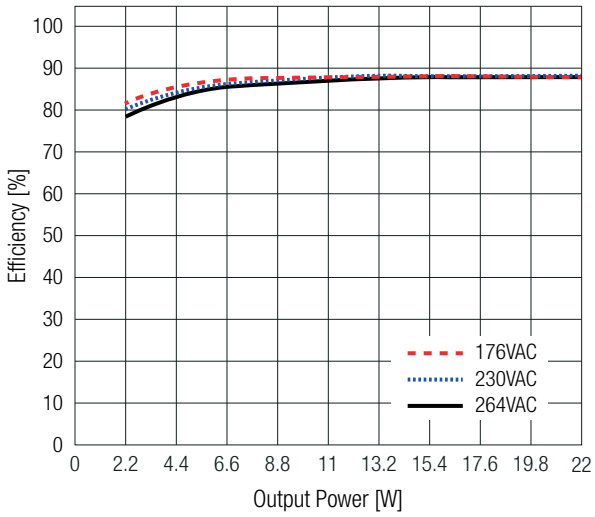
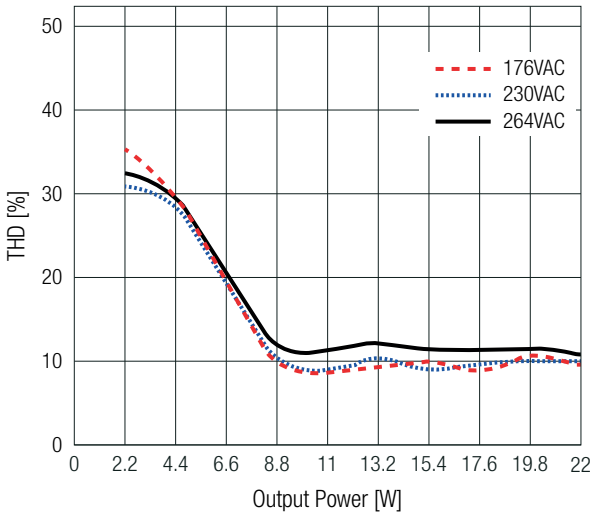
BASIC CHARACTERISTICS (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Nominal Input Voltage		220VAC		240VAC
Input Current	full load		150mA	
Inrush Current			5A	
No Load Power Consumption				500mW
Input 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

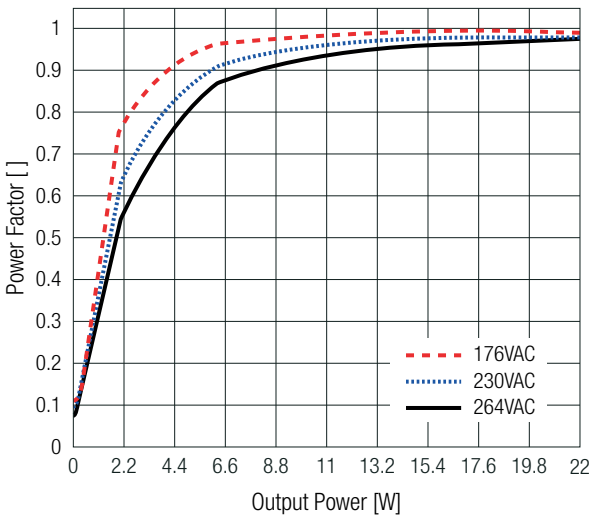
Efficiency vs. Output Power



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

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; Contact: ±2, 4kV	IEC61000-4-2:2008 , Criteria B 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 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 EN61000-4-6:2014, Criteria A
Voltage Dips and Interruptions	100% (10ms); 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 11.57 x 2.99 x 1.57inch
Weight		390g typ. 0.85 lbs

Drawing with open connection box:

Cable Information

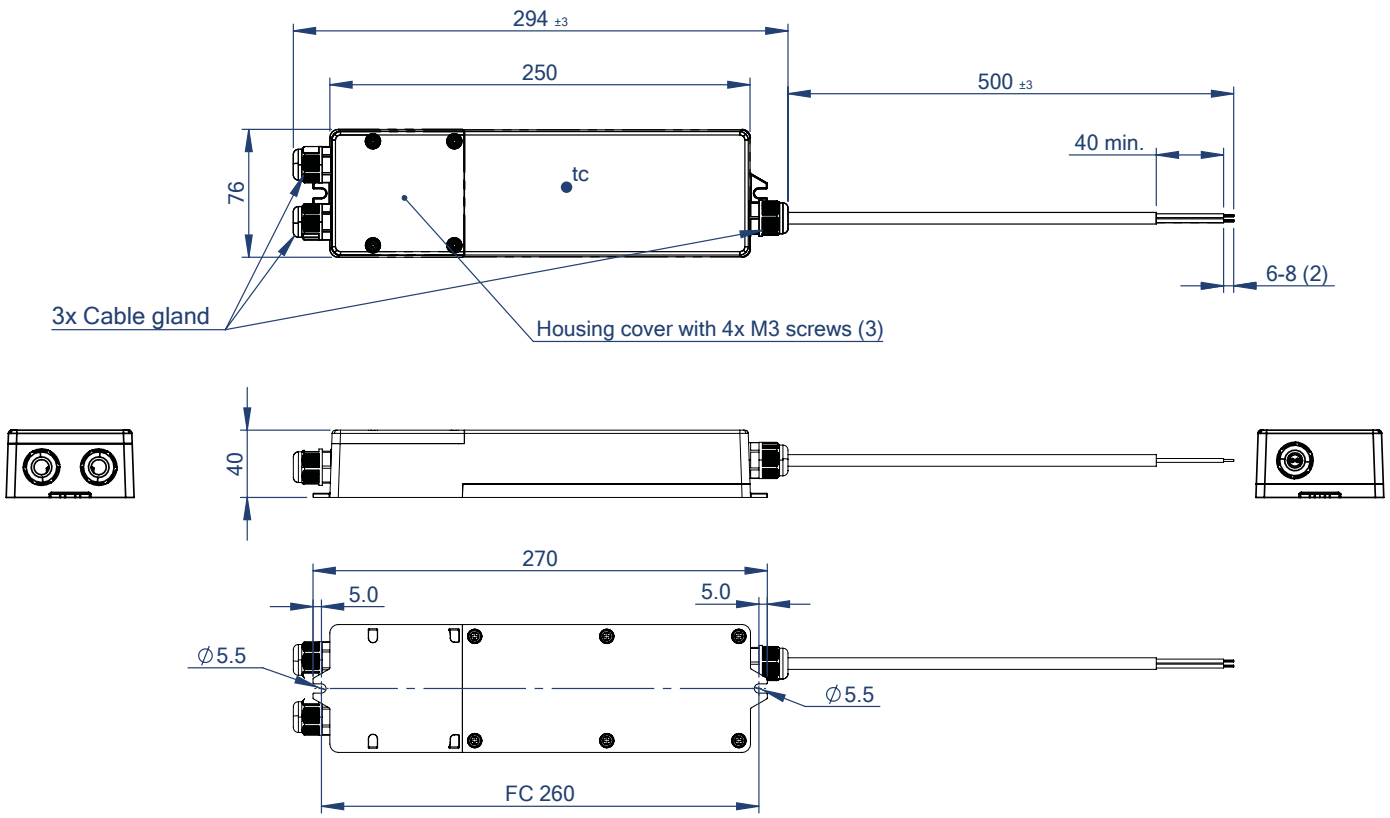
Function	Color	Type
VAC in (N)	blue	VDE H05RN-F 2 x 1.00mm²
VAC in (L)	brown	
-LED1	blue	VDE H05RN-F 4 x 0.75mm²
+LED1	brown	
-LED2	black	
+LED2	grey	

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

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