

# STEP3-PS/1AC/24DC/2.5/PT - Power supply



1088491

<https://www.phoenixcontact.com/us/products/1088491>

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Primary-switched power supply unit STEP POWER, Push-in connection, DIN rail or direct mounting, input: 1-phase, output: 24 V DC / 2.5 A, adjustable from 22 V DC ... 27 V DC

## Product description

STEP POWER power supplies for distribution boards. The STEP POWER power supplies with Push-in connection technology are the professional solution for intelligent building automation. The compact devices are economical, space-saving, and flexible in application.

## Your advantages

- Energy savings with the highest level of efficiency in no-load and part-load operation (Efficiency Level VI)
- Space savings in the control cabinet due to the narrow design combined with increased performance (up to 100%)
- Approval for household purposes (EN 60335) allows use in domestic applications
- Quick and easy startup with tool-free Push-in connection technology at a 45° angle with double terminal points
- Flexible mounting: Snap onto a DIN rail or screw onto a level surface

## Commercial data

Item number	1088491
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM09
Product key	CMPH13
GTIN	4055626890227
Weight per piece (including packing)	261 g
Weight per piece (excluding packing)	200 g
Customs tariff number	85044095
Country of origin	VN

1088491

<https://www.phoenixcontact.com/us/products/1088491>

## Technical data

### Input data

#### AC operation

Supply system configuration	Star network (TN, TT, IT (PE))
Input voltage range	100 V AC ... 240 V AC -15 % ... +10 %
Derating	< 100 V AC ... 85 V AC (1 %/V)
Typical national grid voltage	120 V AC
	230 V AC
Voltage type of supply voltage	AC
Inrush current	typ. 28 A (25 °C)
Inrush current integral ( $I^2t$ )	typ. 0.9 A <sup>2</sup> s
Frequency range ( $f_N$ )	50 Hz ... 60 Hz $\pm$ 10 %
Mains buffering time	typ. 25 ms (120 V AC)
	typ. 130 ms (230 V AC)
Current consumption	1.2 A (100 V AC)
	0.64 A (240 V AC)
Protective circuit	Transient surge protection; Varistor
Switch-on time	typ. 2 s
Device mains fuse	4 A internal (device protection), slow-blow
Recommended breaker for input protection	6 A ... 16 A (Characteristics B, C, D, K)
Discharge current to PE	< 0.25 mA

#### DC operation

Input voltage range	110 V DC ... 250 V DC -20 % ... +40 %
Derating	< 110 V DC ... 88 V DC (1 %/V)
Voltage type of supply voltage	DC
Current consumption	0.61 A (110 V DC)
	0.26 A (250 V DC)

### Output data

Efficiency	> 89 % (120 V AC)
	> 90 % (230 V AC)
Efficiency Level	VI
Nominal output voltage	24 V DC
Setting range of the output voltage ( $U_{Set}$ )	22 V DC ... 27 V DC (> 24 V DC, constant capacity restricted)
Nominal output current ( $I_N$ )	2.5 A
Short-circuit-proof	yes
No-load proof	yes
Derating	> 50 °C ... 70 °C (2 % / K)
Crest factor	typ. 3.4
	typ. 4.08
Output power ( $P_N$ )	60 W

# STEP3-PS/1AC/24DC/2.5/PT - Power supply



1088491

<https://www.phoenixcontact.com/us/products/1088491>

Connection in parallel	yes, for increasing power and redundancy with diode
Connection in series	yes, for increased output voltage
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	< 35 V DC
Residual ripple	typ. 100 mV <sub>pp</sub>
Control deviation	< 0.5 % (Static load change 10 % ... 90 %)
	< 3 % (Dynamic load change 10 % ... 90 %, (10 Hz))
	< 0.1 % (change in input voltage ±10 %)
Rise time	typ. 100 ms (U <sub>Out</sub> = 10 % ... 90 %)
Minimum no-load power dissipation	< 0.21 W (120 V AC)
Maximum no-load power dissipation	< 0.21 W (230 V AC)
Minimum nominal load power dissipation	< 6.8 W (120 V AC)
Power loss nominal load max.	< 6.2 W (230 V AC)
Integrated fuse protection	no
Fuse protection (secondary side)	electronic

## Connection data

### Input

Position	1.x
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### Connection technology: Positions

Position marking	1.1, 1.2 (L), 1.3, 1.4 (N)
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### Conductor connection

Connection method	Push-in connection
rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible with ferrule without plastic sleeve	0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible with ferrule with plastic sleeve	0.2 mm <sup>2</sup> ... 1 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
AWG	17
	24 ... 14 (Cu)
Stripping length	10 mm (rigid/flexible)
	10 mm (Ferrule)

### Output

Position	2.x
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### Connection technology: Positions

Position marking	2.1, 2.2 (+), 2.3, 2.4 (-)
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### Conductor connection

Connection method	Push-in connection
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1088491

<https://www.phoenixcontact.com/us/products/1088491>

rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible with ferrule without plastic sleeve	0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
flexible with ferrule with plastic sleeve	0.2 mm <sup>2</sup> ... 1 mm <sup>2</sup>
	1 mm <sup>2</sup> (recommended)
AWG	17
	24 ... 14 (Cu)
Stripping length	10 mm (rigid/flexible)
	10 mm (Ferrule)

## Signaling

### LED signaling

Types of signaling	LED
Signal threshold	> 0,9 x U <sub>N</sub> (U <sub>N</sub> = 24 V DC) (LED lights up green)
	< 0,9 x U <sub>N</sub> (U <sub>N</sub> = 24 V DC) (LED off)

## Electrical properties

Number of phases	1
Insulation voltage input/output	4 kV AC (type test)
	3.75 kV AC (routine test)

## Product properties

Product type	Power supply
Product family	STEP POWER
MTBF (IEC 61709, SN 29500)	> 3440000 h (25 °C)
	> 2000000 h (40 °C)
	> 1370000 h (50 °C)
Environmental protection directive	RoHS Directive 2011/65/EU
	WEEE
	Reach

### Insulation characteristics

Protection class	II (in closed control cabinet)
Overvoltage category (EN 61010-1)	II (≤ 4000 m)
Overvoltage category (EN 62477-1)	III (≤ 2000 m)
Degree of pollution	2

## Dimensions

### Item dimensions

Width	54 mm
Height	90 mm

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1088491

<https://www.phoenixcontact.com/us/products/1088491>

Depth	61 mm
Depth (Device depth (DIN rail mounting))	55 mm (Device depth (DIN rail mounting))
Dimensional drawing	
Horizontal pitch	3 Div. (DIN 43880)

## Installation dimensions

Installation distance right/left	0 mm / 0 mm
Installation distance top/bottom	30 mm / 30 mm

## Mounting

Mounting type	DIN rail or direct mounting
Assembly note	alignable: 0 mm horizontally, 30 mm vertically
Mounting position	horizontal DIN rail NS 35, EN 60715
With protective coating	no

## Material specifications

Flammability rating according to UL 94	V0 (Housing, terminal blocks, base latches)
Housing material	Plastic
Housing material	PC
Foot latch material	Polyamid

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 70 °C (Derating: > 50 °C; 2 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-25 °C
Maximum altitude	≤ 4000 m (> 2000 m, Derating: 10 %/1000 m)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Shock (operation)	18 ms, 30g, per spatial direction (IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min.
Temp code	T4 (-10 ... +70 °C; > 50 °C, Derating: 2 %/K)

## Standards and regulations

### Fire protection in rail vehicles

Standard designation	Fire protection in rail vehicles
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1088491

<https://www.phoenixcontact.com/us/products/1088491>

Standards/specifications	EN 45545-2 (HL3)
Safety extra-low voltage	
Standard designation	Safety extra-low voltage
Standards/specifications	IEC 61010-1 (SELV)
Protective extra-low voltage	
Standard designation	Protective extra-low voltage
Standards/specifications	IEC 61010-2-201 (PELV)
Safe isolation	
Standard designation	Safe isolation
Standards/specifications	IEC 61558-2-16
Low-voltage power supplies, DC output	
Standard designation	Low-voltage power supplies, DC output
Standards/specifications	EN 61204-3
Safety requirements for electrical equipment for measurement, control, and laboratory use	
Standard designation	Safety requirements for electrical equipment for measurement, control, and laboratory use
Standards/specifications	IEC 61010-1
Household and similar electrical appliances - Safety	
Standard designation	Safety of electrical devices for household use and similar purposes
Standards/specifications	DIN EN 60335-1

## Approvals

UL	
Identification	UL 1310 Class 2 Power Units
UL	
Identification	UL/C-UL Listed UL 61010-1
UL	
Identification	UL/C-UL Listed UL 61010-2-201
UL	
Identification	UL/C-UL Listed ANSI/UL 121201 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

## EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
Interference emission	Interference emission in accordance with EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)
Noise immunity	EN 61000-6-2:2005

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1088491

<https://www.phoenixcontact.com/us/products/1088491>

## Conducted noise emission

Standards/regulations	EN 55016
	EN 61000-6-3 (Class B)

## Noise emission

Standards/regulations	EN 55016
	EN 61000-6-3 (Class B)

## Harmonic currents

Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)

## Flicker

Standards/regulations	EN 61000-3-3
Frequency range	0 kHz ... 2 kHz

## Electrostatic discharge

Standards/regulations	EN 61000-4-2
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## Electrostatic discharge

Contact discharge	6 kV (Test Level 3)
Discharge in air	8 kV (Test Level 3)
Comments	Criterion A

## Electromagnetic HF field

Standards/regulations	EN 61000-4-3
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## Electromagnetic HF field

Frequency range	80 MHz ... 1 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	1 GHz ... 6 GHz
Test field strength	10 V/m (Test Level 3)
Comments	Criterion A

## Fast transients (burst)

Standards/regulations	EN 61000-4-4
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## Fast transients (burst)

Input	asymmetrical 4 kV (Test Level 4)
Output	asymmetrical 2 kV (Test Level 3)
Comments	Criterion A

## Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
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## Surge voltage load (surge)

Input	symmetrical 2 kV (Test Level 4)
	asymmetrical 4 kV (Test Level 4)

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1088491

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Output	symmetrical 1 kV (Test Level 3)
	asymmetrical 2 kV (Test Level 3)
Comments	Criterion B

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

Input/Output	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

## Voltage dips

Standards/regulations	EN 61000-4-11
Voltage	230 V AC
Frequency	50 Hz
Voltage dip	70 %
Number of periods	25 periods
Additional text	Class 3
Comments	Criterion A
Voltage dip	40 %
Number of periods	10 periods
Additional text	Class 3
Comments	Criterion A
Voltage dip	0 %
Number of periods	1 period
Additional text	Class 3
Comments	Criterion A

## Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.
Criterion C	Temporary adverse effects on the operating behavior, which the device corrects automatically or which can be restored by actuating the operating elements.

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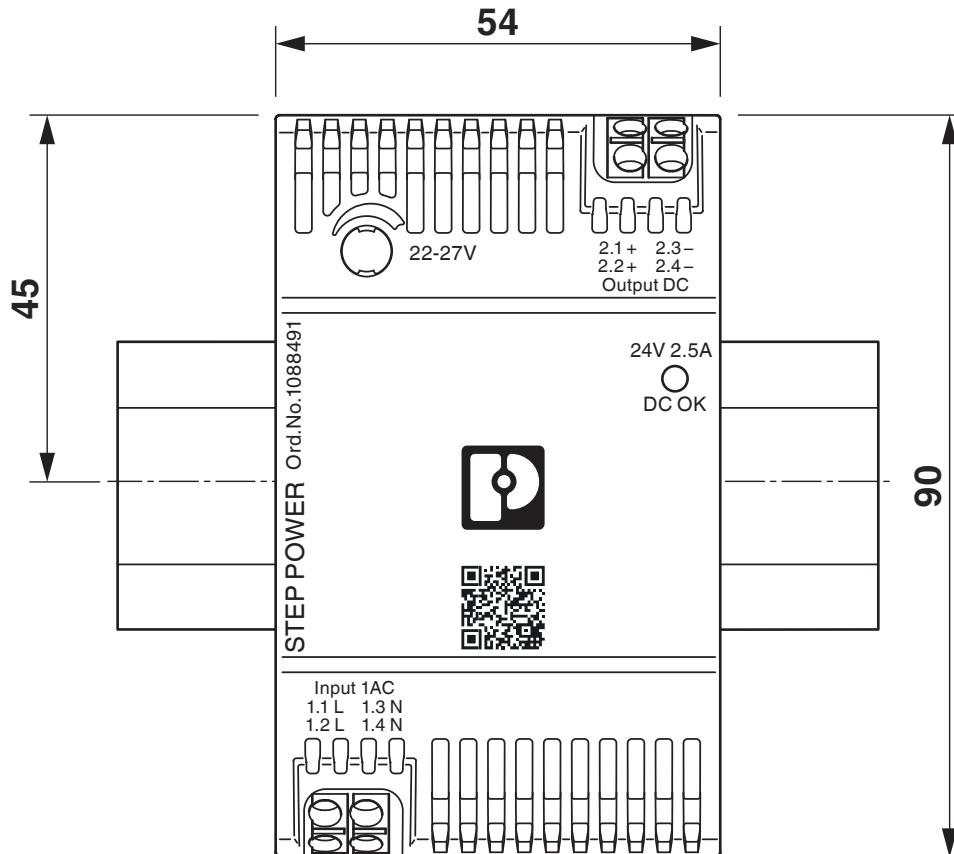


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## Drawings

Dimensional drawing

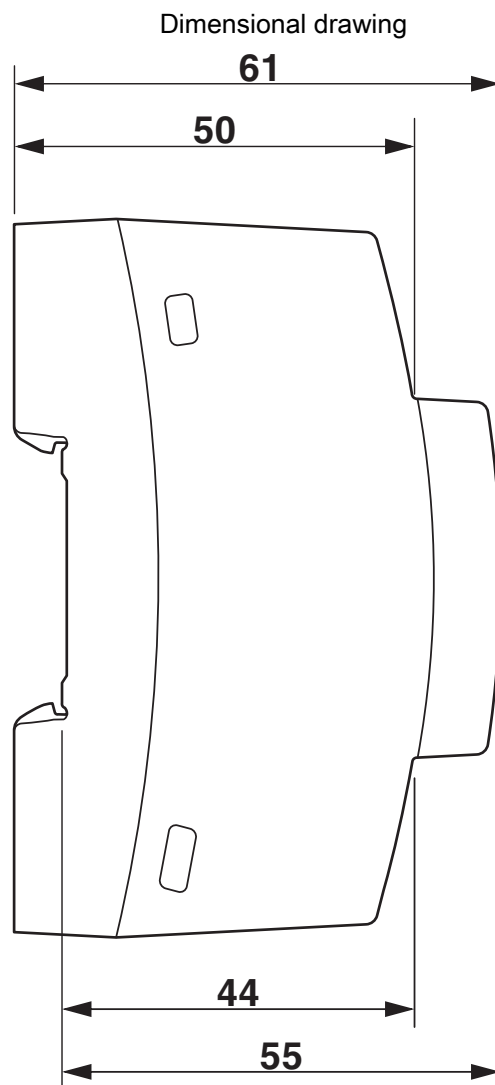


Device dimensions (dimensions in mm)

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Device dimensions (dimensions in mm)

Schematic diagram

## Housing

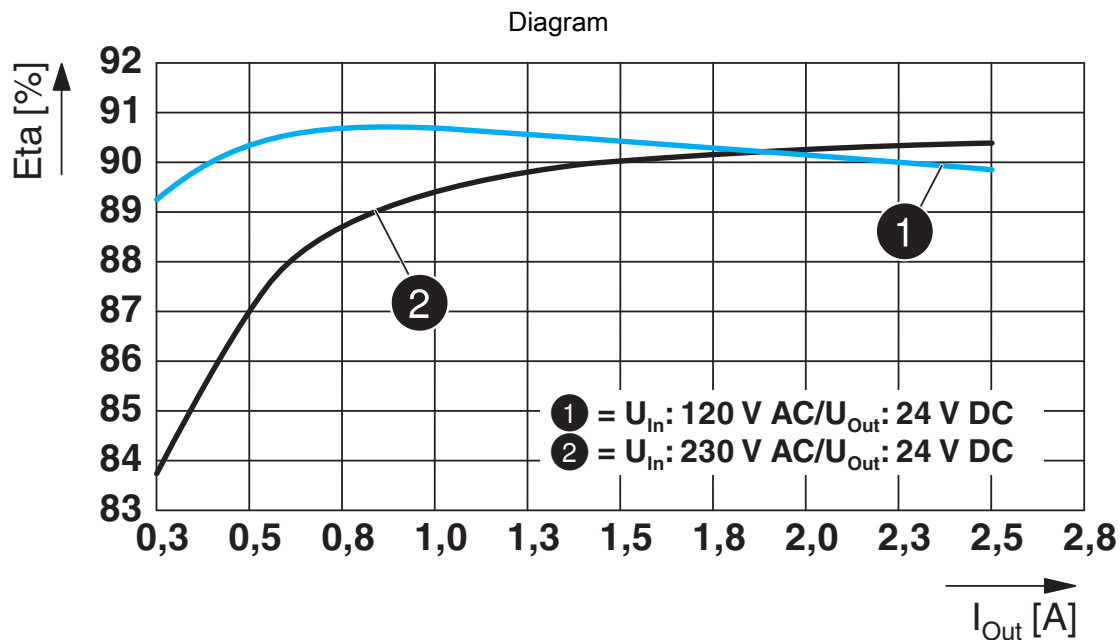


Test sections, insulation voltage

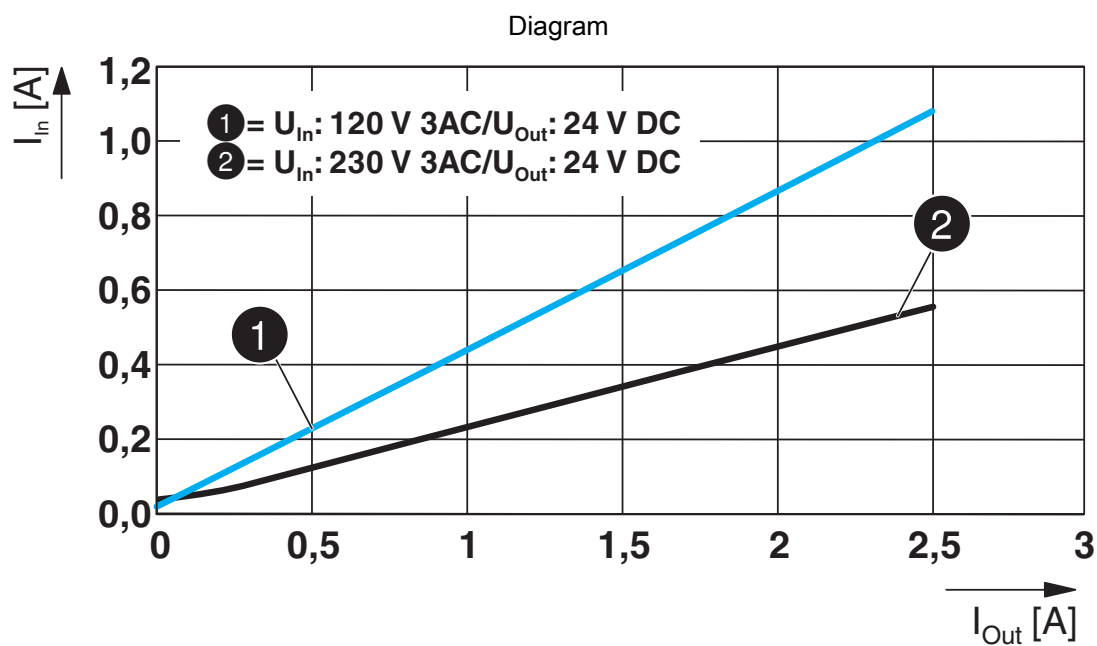
Schematic diagram



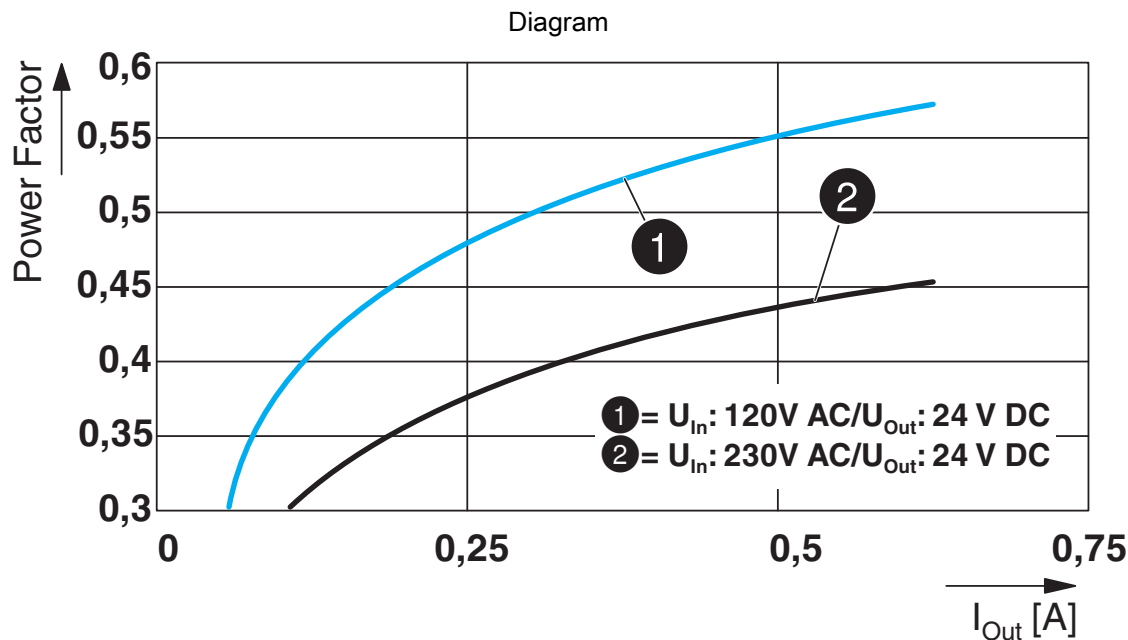
Mounting option



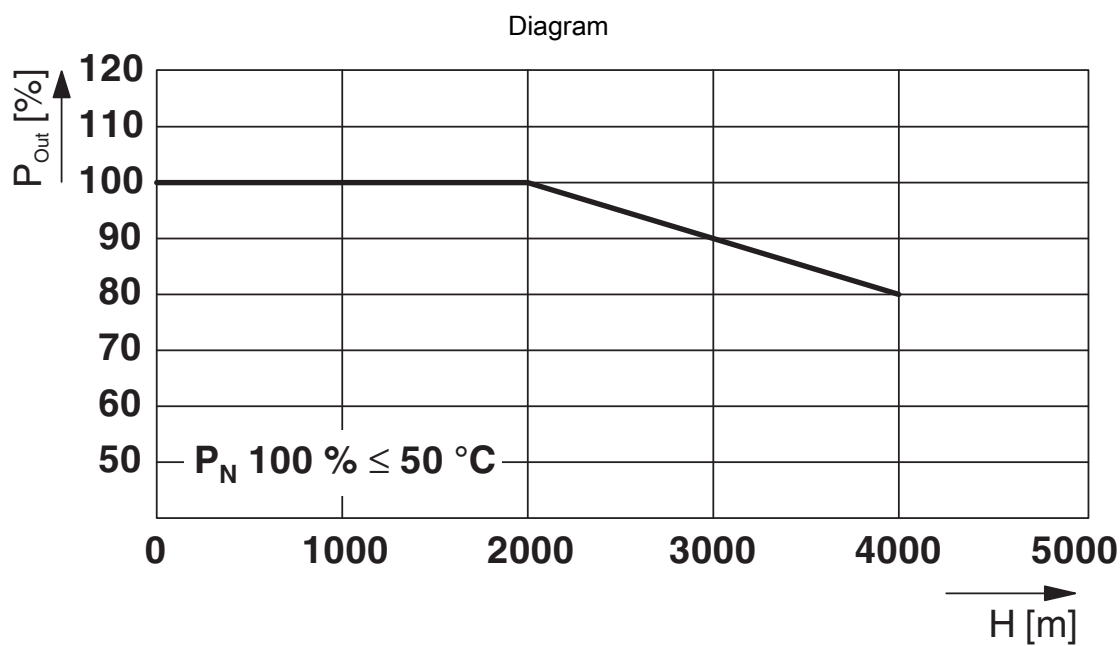
Efficiency



Input current/output current



Power factor



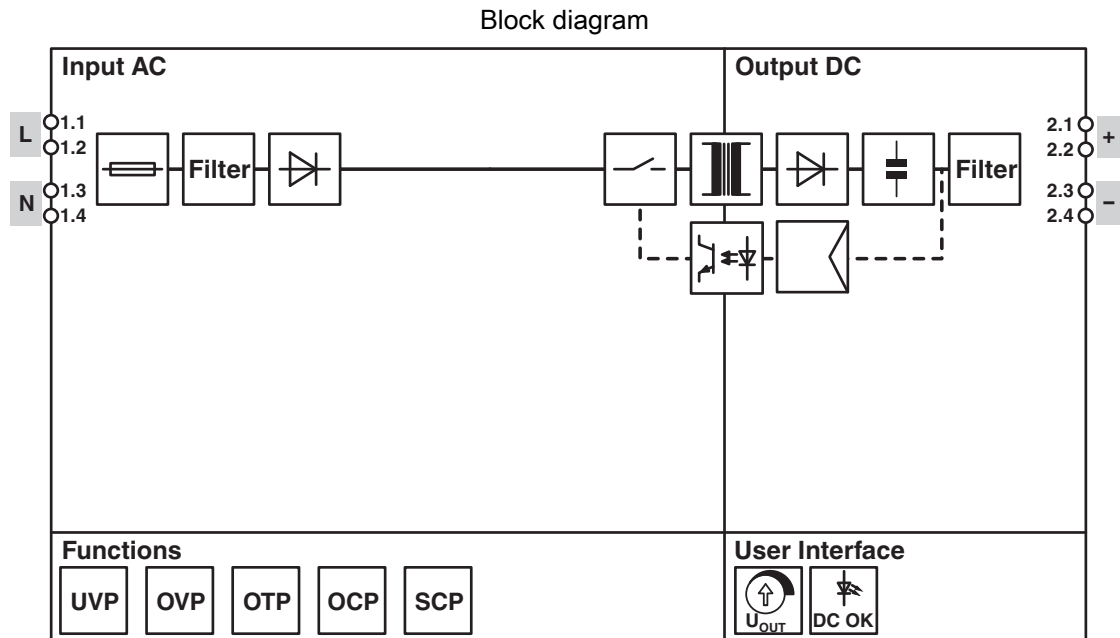
Output power/installation altitude

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Block diagram

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## Approvals

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**cULus Listed**

Approval ID: E123528-20191031



**EAC**

Approval ID: RU S-DE.BL08.W.00764



**EAC**

Approval ID: RU S-DE.BL08.W.00764

**BIS Licence Document**

Approval ID: R.41259195



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Approval ID: FILE E 199827

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## Classifications

### ECLASS

ECLASS-13.0	27040701
ECLASS-15.0	27040701

### ETIM

ETIM 10.0	EC002540
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	6(c), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-25
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	4a429ebf-4c92-40bf-80de-12fd9d73431b

### EF3.1 Climate Change

CO2e kg	7.572 kg CO2e
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