

STEP3-PS/1AC/24DC/4/PT - Power supply



1140066

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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 / 4 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 | 1140066 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CM09 |
| Product key | CMPH13 |
| GTIN | 4063151089115 |
| Weight per piece (including packing) | 307 g |
| Weight per piece (excluding packing) | 255 g |
| Customs tariff number | 85044095 |
| Country of origin | VN |

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. 37 A |
| Inrush current integral (I^2t) | typ. 0.4 A ² s |
| Frequency range (f_N) | 50 Hz ... 60 Hz \pm 10 % |
| Mains buffering time | typ. 20 ms (120 V AC) |
| | typ. 20 ms (230 V AC) |
| Current consumption | 1.07 A (100 V AC) |
| | 0.47 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 | 0.97 A (110 V DC) |
| | 0.41 A (250 V DC) |

Output data

| | |
|---|---|
| Efficiency | > 93 % (120 V AC) |
| | > 94 % (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) | 4 A |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Derating | > 50 °C ... 70 °C (2 % / K) |
| Crest factor | typ. 1.74 |
| | typ. 2.08 |
| Output power (P_N) | 96 W |

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| | |
|--|---|
| 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. 150 mV _{pp} |
| 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 _{Out} = 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 | < 7 W (120 V AC) |
| Power loss nominal load max. | < 5.7 W (230 V AC) |
| Integrated fuse protection | no |
| Fuse protection (secondary side) | electronic |

Connection data

Input

| | |
|----------|-----|
| Position | 1.x |
|----------|-----|

Connection technology: Positions

| | |
|------------------|----------------------------|
| Position marking | 1.1, 1.2 (L), 1.3, 1.4 (N) |
|------------------|----------------------------|

Conductor connection

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

Output

| | |
|----------|-----|
| Position | 2.x |
|----------|-----|

Connection technology: Positions

| | |
|------------------|--|
| Position marking | 2.1, 2.2, 2.3, 2.4 (+), 2.5, 2.6, 2.7, 2.8 (-) |
|------------------|--|

Conductor connection

| | |
|-------------------|--------------------|
| Connection method | Push-in connection |
|-------------------|--------------------|

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| | |
|--|---|
| rigid | 0.2 mm ² ... 2.5 mm ² |
| | 1 mm ² (recommended) |
| flexible | 0.2 mm ² ... 2.5 mm ² |
| | 1 mm ² (recommended) |
| flexible with ferrule without plastic sleeve | 0.5 mm ² ... 1.5 mm ² |
| | 1 mm ² (recommended) |
| flexible with ferrule with plastic sleeve | 0.2 mm ² ... 1 mm ² |
| | 1 mm ² (recommended) |
| AWG | 17 |
| | 24 ... 14 (Cu) |
| Stripping length | 10 mm |

Signaling

LED signaling

| | |
|--------------------|---|
| Types of signaling | LED |
| Signal threshold | > 0,9 x U _N (U _N = 24 V DC) (LED lights up green) |
| | < 0,9 x U _N (U _N = 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) | > 1350000 h (25 °C) |
| | > 750000 h (40 °C) |
| | > 488000 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 | 72 mm |
| Height | 90 mm |
| Depth | 61 mm |

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| | |
|--|--|
| Depth (Device depth (DIN rail mounting)) | 55 mm (Device depth (DIN rail mounting)) |
| Dimensional drawing | |
| Horizontal pitch | 4 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

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 |

Electric vehicle conductive charging system - Part 21-2: EMC requirements for off board electric vehicle charging systems

| | |
|--------------------------|---|
| Standard designation | Electric vehicle conductive charging system - Part 21-2: EMC requirements for off board electric vehicle charging systems |
| Standards/specifications | IEC 61851-21-2 |
| Note | Class B |

Approvals

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 |

Conducted noise emission

| | |
|-----------------------|----------|
| Standards/regulations | EN 55016 |
|-----------------------|----------|

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| | |
|----------------------------|----------------------------------|
| | 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 |
| 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 |
| 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 |
| 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 |
| Surge voltage load (surge) | |
| Input | symmetrical 2 kV (Test Level 4) |
| | asymmetrical 4 kV (Test Level 4) |
| Output | symmetrical 1 kV (Test Level 3) |
| | asymmetrical 2 kV (Test Level 3) |
| Comments | Criterion A |

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Conducted interference

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-6 |
|-----------------------|--------------|

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 B |
| 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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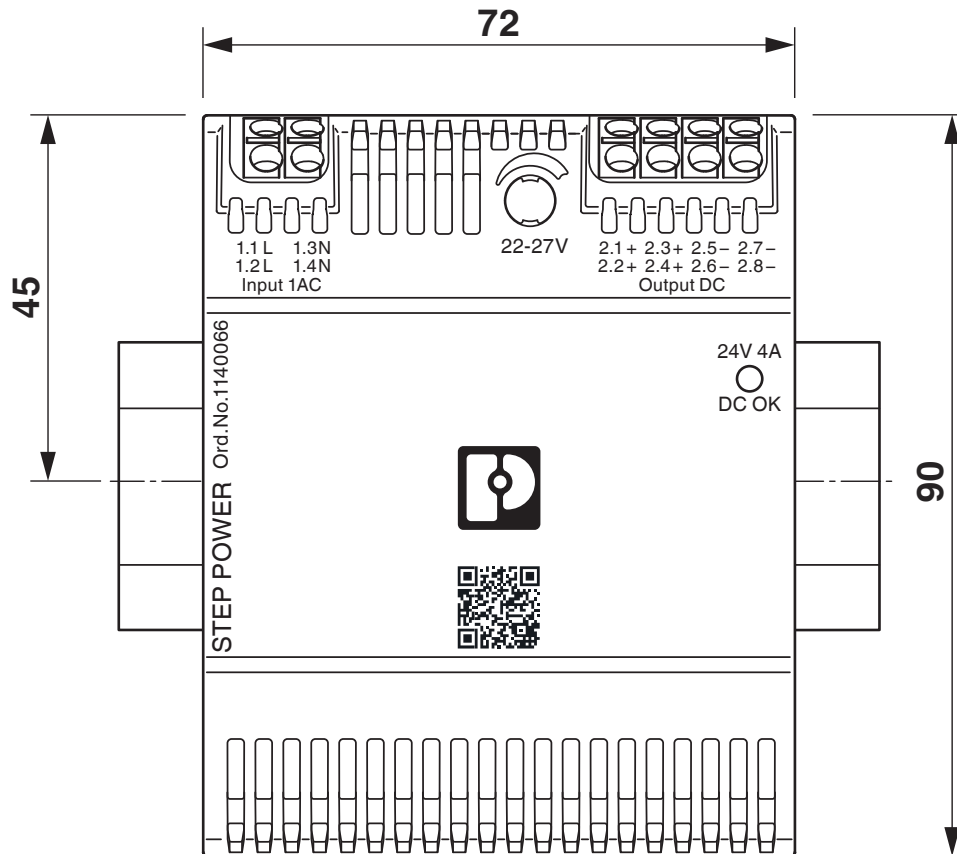


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Drawings

Dimensional drawing

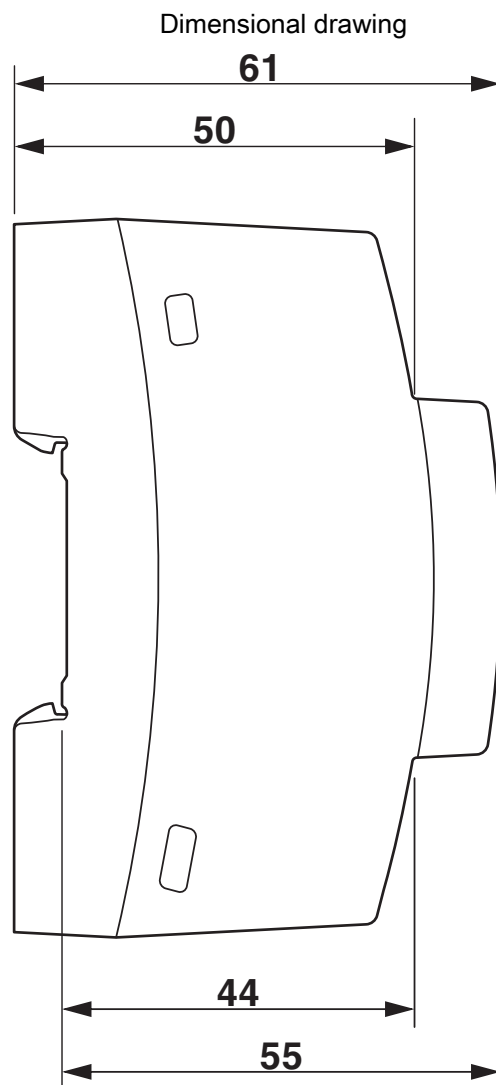


Device dimensions (dimensions in mm)

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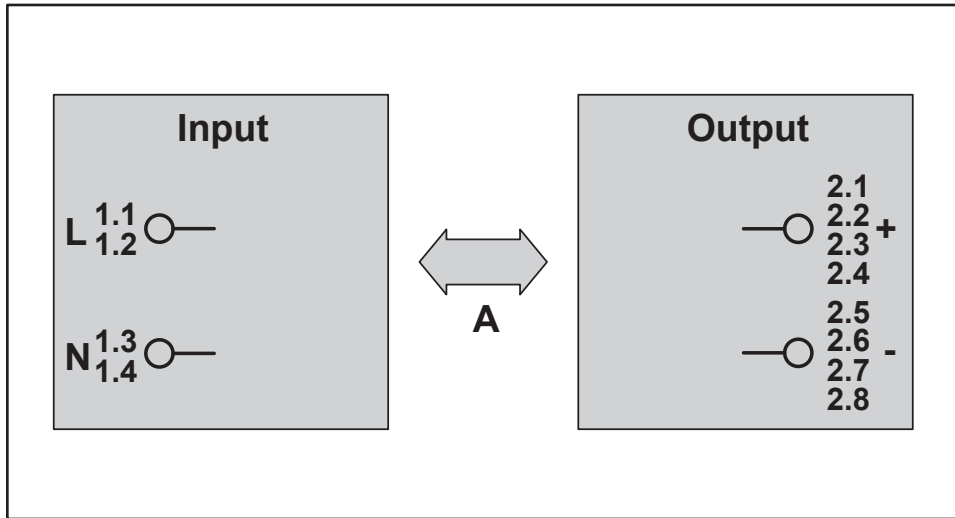
<https://www.phoenixcontact.com/us/products/1140066>



Device dimensions (dimensions in mm)

Schematic diagram

Housing

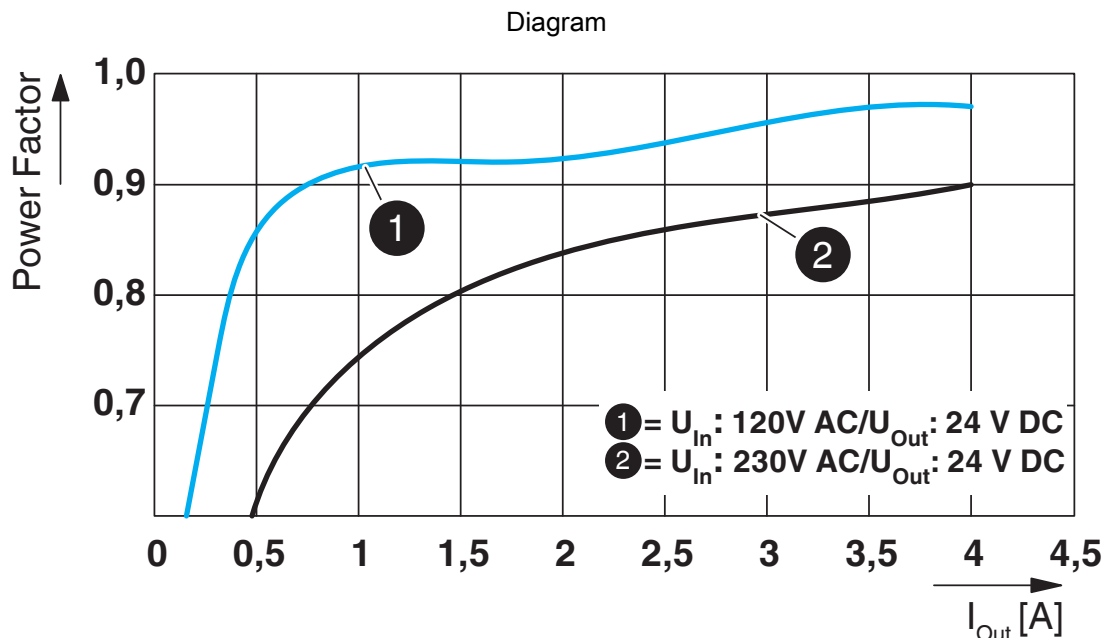


Test sections, insulation voltage

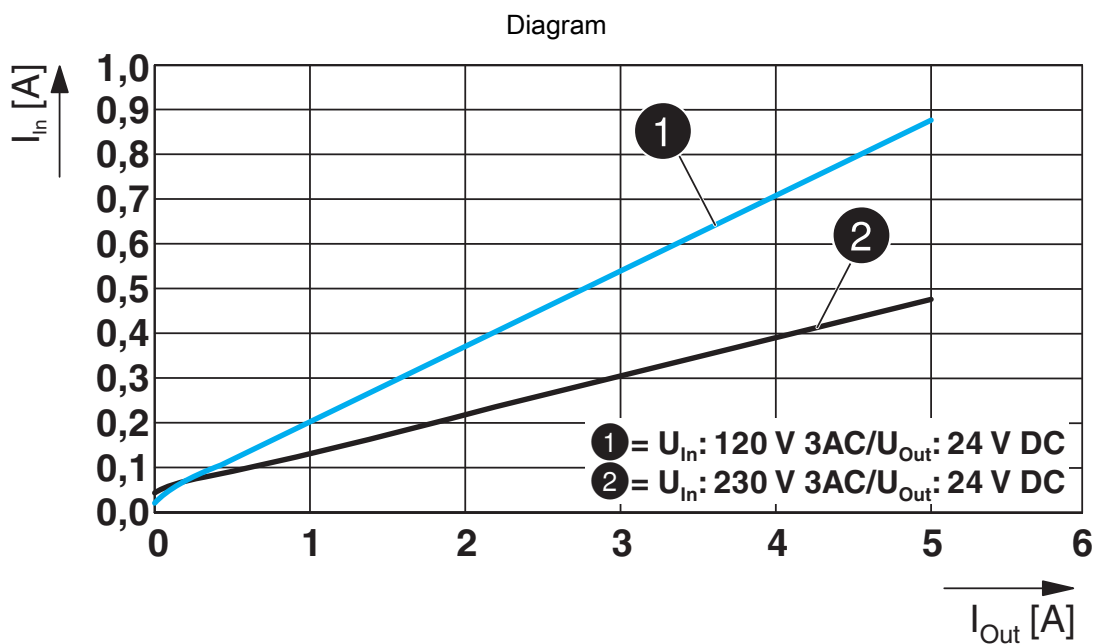
Schematic diagram



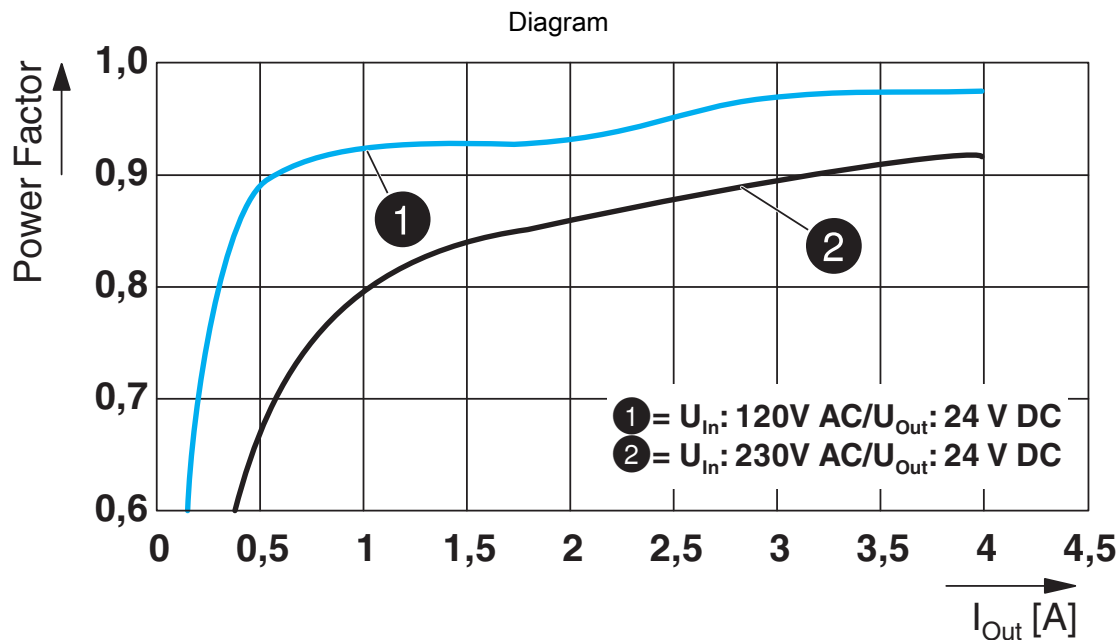
Mounting option



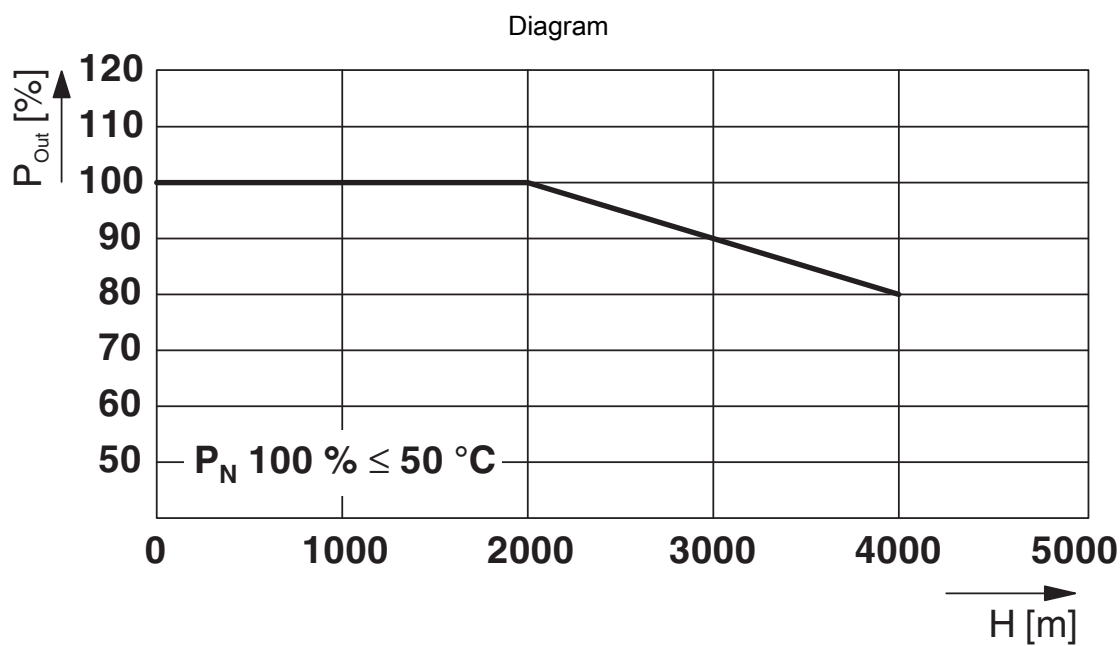
Efficiency



Input current/output current



Power factor



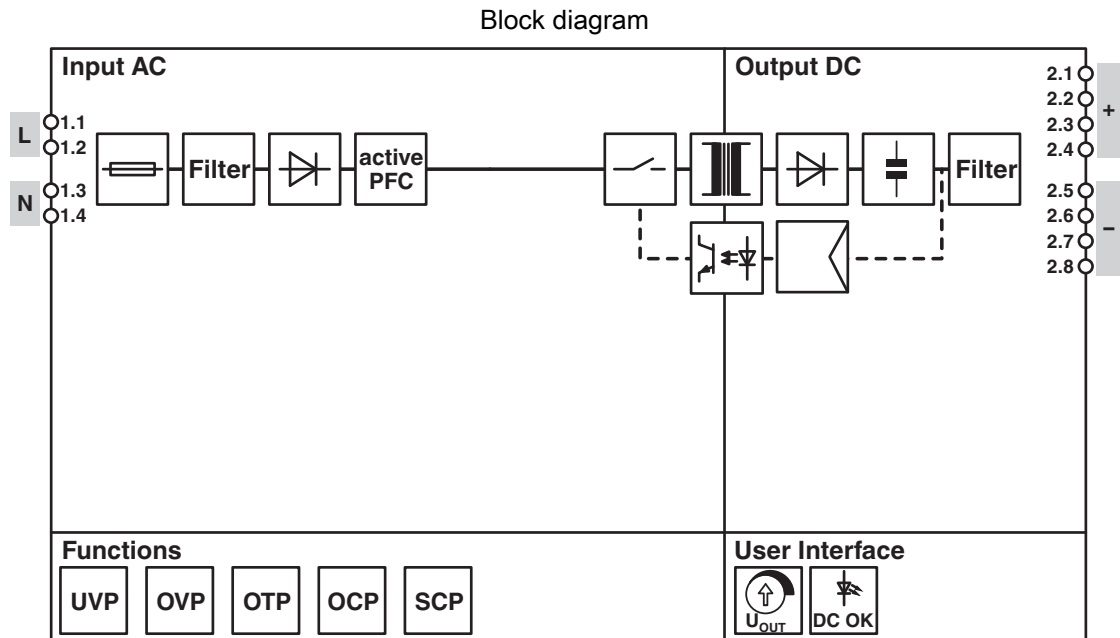
Output power/installation altitude

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Block diagram

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Approvals

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cULus Listed

Approval ID: FILE E 123528



EAC

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



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

BIS Licence Document

Approval ID: R-41259195



VDE Zeichengenehmigung

Approval ID: 40058061



cULus Listed

Approval ID: FILE E 199827

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27040701 |
| ECLASS-15.0 | 27040701 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC002540 |
|-----------|----------|

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 | 8121862f-e241-49c5-be69-a4fb63c14514 |

EF3.1 Climate Change

| | |
|---------|---------------|
| CO2e kg | 8.907 kg CO2e |
|---------|---------------|

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