

# STEP-PS/ 1AC/24DC/2.5 - Power supply



2868651

<https://www.phoenixcontact.com/us/products/2868651>

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Primary-switched STEP POWER power supply for DIN rail mounting, input: 1-phase, output: 24 V DC/2.5 A

## Product description

STEP POWER power supplies for distribution boards

The STEP POWER power supply range was developed especially for building automation. The low idling losses and high degree of efficiency ensure maximum energy efficiency. They allow flexible use and can be snapped onto the DIN rail or screwed onto an even surface.

## Your advantages

- Flexible mounting by simply snapping onto the DIN rail or screwing onto a level surface
- Reliable power supply thanks to high MTBF (mean time between failures) of more than 500,000 hours and U/I characteristic curve
- Energy savings thanks to maximum energy efficiency and incredibly low idling losses

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2868651       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CM13          |
| Product key                          | CMPS13        |
| GTIN                                 | 4046356163224 |
| Weight per piece (including packing) | 330.88 g      |
| Weight per piece (excluding packing) | 277 g         |
| Customs tariff number                | 85044095      |
| Country of origin                    | VN            |

## Technical data

### Input data

#### AC operation

|  |   |
|--|---|
| Nominal input voltage range              | 100 V AC ... 240 V AC                           |
| Input voltage range                      | 85 V AC ... 264 V AC                            |
| Voltage type of supply voltage           | AC  |
| Inrush current                           | < 15 A (typical)                                |
| Inrush current integral ( $I^2t$ )       | < 0.6 A <sup>2</sup> s                          |
| AC frequency range                       | 45 Hz ... 65 Hz                                 |
| Frequency range DC                       | 0 Hz  |
| Mains buffering time                     | typ. 20 ms (120 V AC)<br>typ. 100 ms (230 V AC) |
| Current consumption                      | 0.8 A (120 V AC)<br>0.4 A (230 V AC)            |
| Nominal power consumption                | 124.3 VA  |
| Protective circuit                       | Transient surge protection; Varistor            |
| Power factor (cos phi)                   | 0.56  |
| Typical response time                    | < 0.5 s   |
| Input fuse                               | 3.15 A (slow-blow, internal)                    |
| Recommended breaker for input protection | 6 A ... 16 A (Characteristics B, C, D, K)       |

#### DC operation

|                                |                      |
|--------------------------------|----------------------|
| Input voltage range            | 95 V DC ... 250 V DC |
| Voltage type of supply voltage | DC                   |

### Output data

|  |   |
|--|---|
| Efficiency   | > 86 % (for 230 V AC and nominal values)  |
| Output characteristic                              | U/I   |
| Nominal output voltage                             | 24 V DC   |
| Setting range of the output voltage ( $U_{Set}$ )  | 22.5 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)   |
| Output current $I_{max}$                           | 4.4 A   |
| Nominal output current ( $I_N$ )                   | 2.5 A (-25 °C ... 55 °C)<br>2.75 A (-25 °C ... 40 °C permanent)   |
| Derating   | 55 °C ... 70 °C (2.5 %/K)   |
| Feedback voltage resistance                        | ≤ 35 V DC   |
| Protection against overvoltage at the output (OVP) | ≤ 35 V DC   |
| Control deviation                                  | < 1 % (change in load, static 10 % ... 90 %)<br>< 2 % (change in load, dynamic 10 % ... 90 %)<br>< 0.1 % (change in input voltage ± 10 %) |
| Residual ripple                                    | < 80 mV <sub>PP</sub> (20 MHz)  |
| Output power                                       | 60 W  |
| Peak switching voltages nominal load               | < 40 mV <sub>PP</sub> (20 MHz)  |

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|                                   |  |
|-----------------------------------|--|
| Maximum no-load power dissipation | < 0.7 W                                    |
| Power loss nominal load max.      | 9.9 W                                      |
| Rise time                         | < 0.5 s ( $U_{OUT}$ (10 % ... 90 %))       |
| Connection in parallel            | yes, for redundancy and increased capacity |
| Connection in series              | yes  |

## Connection data

### Input

|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | Screw connection    |
| Conductor cross-section, rigid min.   | 0.2 mm <sup>2</sup> |
| Conductor cross-section, rigid max.   | 2.5 mm <sup>2</sup> |
| Conductor cross-section flexible min. | 0.2 mm <sup>2</sup> |
| Conductor cross-section flexible max. | 2.5 mm <sup>2</sup> |
| Conductor cross-section AWG min.      | 24                  |
| Conductor cross-section AWG max.      | 12                  |
| Stripping length                      | 6.5 mm              |
| Screw thread                          | M3                  |
| Tightening torque, min                | 0.5 Nm              |
| Tightening torque max                 | 0.6 Nm              |

### Output

|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | Screw connection    |
| Conductor cross-section, rigid min.   | 0.2 mm <sup>2</sup> |
| Conductor cross-section, rigid max.   | 2.5 mm <sup>2</sup> |
| Conductor cross-section flexible min. | 0.2 mm <sup>2</sup> |
| Conductor cross-section flexible max. | 2.5 mm <sup>2</sup> |
| Conductor cross-section AWG min.      | 24                  |
| Conductor cross-section AWG max.      | 12                  |
| Stripping length                      | 6.5 mm              |
| Screw thread                          | M3                  |
| Tightening torque, min                | 0.5 Nm              |
| Tightening torque max                 | 0.6 Nm              |

## Signaling

|                           |           |
|---------------------------|-----------|
| Types of signaling        | LED       |
| Operating voltage display | Green LED |

### Signal output: LED status indicator

|                        |                                   |
|------------------------|-----------------------------------|
| Status display         | "DC OK" LED green                 |
| Note on status display | $U_{OUT} > 21.5$ V: LED lights up |

## Electrical properties

|                                 |  |
|---------------------------------|--|
| Number of phases                | 1  |
| Insulation voltage input/output | 4 kV AC (type test)<br>3.75 kV AC (routine test) |

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|                                 |                           |
|---------------------------------|---------------------------|
| Insulation voltage output / PE  | 500 V DC (routine test)   |
| Insulation voltage input/output | 3.75 kV AC (routine test) |
|                                 | 4 kV AC (type test)       |
| Insulation voltage input / PE   | 3.5 kV AC (type test)     |
|                                 | 2 kV AC (routine test)    |

## Product properties

|                            |                     |
|----------------------------|---------------------|
| Product type               | Power supply        |
| Product family             | STEP POWER          |
| MTBF (IEC 61709, SN 29500) | > 1061000 h (40 °C) |

## Insulation characteristics

|                      |                                |
|----------------------|--------------------------------|
| Protection class     | II (in closed control cabinet) |
| Overvoltage category | III                            |
| Degree of pollution  | 2                              |

## Dimensions

|  |  |
|--|--|
| Width                                  | 72 mm                                    |
| Height                                 | 90 mm                                    |
| Depth Device depth (DIN rail mounting) | 55 mm (Device depth (DIN rail mounting)) |
| Horizontal pitch                       | 4 Div.                                   |

## Installation dimensions

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

## Mounting

|                         |  |
|-------------------------|--|
| Mounting type           | DIN rail 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

|                     |                        |
|---------------------|------------------------|
| Housing material    | Plastic                |
| Housing material    | PC                     |
| Foot latch material | POM (Polyoxymethylene) |

## Environmental and real-life conditions

### Ambient conditions

|  |  |
|--|--|
| Degree of protection                           | IP20   |
| Ambient temperature (operation)                | -25 °C ... 70 °C (> 55° C derating : 2.5%/K) |
| Ambient temperature (storage/transport)        | -40 °C ... 85 °C                             |
| Ambient temperature (start-up type tested)     | -40 °C                                       |
| Climatic class                                 | 3K3 (in acc. with EN 60721)                  |
| Max. permissible relative humidity (operation) | ≤ 95 % (at 25 °C, non-condensing)            |

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|                       |   |
|-----------------------|---|
| Shock                 | 18 ms, 30g, in each space direction (according to IEC 60068-2-27)                               |
| Vibration (operation) | < 15 Hz, amplitude $\pm 2.5$ mm (according to IEC 60068-2-6)<br>15 Hz ... 150 Hz, 2.3g, 90 min. |
| Temp code             | T3C (70 °C)   |

## Standards and regulations

|  |  |
|--|--|
| Rail applications  | EN 50121-4                               |
| Standard – Electronic equipment for use in electrical power installations and their assembly into electrical power installations | EN 50178/VDE 0160 (PELV)                 |
| Standard – Limitation of mains harmonic currents   | EN 61000-3-2                             |
| Standard - Electrical safety   | IEC 62368-1 (SELV)                       |
| Standard – Protection against shock currents, basic requirements for protective separation in electrical equipment               | EN 50178                                 |
| Standard – Safety extra-low voltage  | IEC 62368-1 (SELV) und EN 60204-1 (PELV) |
| Standard - Safe isolation  | DIN VDE 0100-410                         |
| Standard - Safety of transformers  | EN 61558-2-16                            |

## Approvals

|                       |  |
|-----------------------|--|
| CSA                   | CSA-C22.2 No. 107.1-01   |
| Shipbuilding approval | DNV GL (EMC B), ABS, LR, RINA, NK, BV  |
| UL approvals          | UL/C-UL listed UL 508<br>UL/C-UL Recognized UL 60950-1<br>UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D T3C (Hazardous Location)<br>NEC Class 2 as per UL 1310 |

## Conformity/Approvals

|                                  |   |
|----------------------------------|---|
| SIL in accordance with IEC 61508 | 0 |
|----------------------------------|---|

## EMC data

|                                     |   |
|-------------------------------------|---|
| Electromagnetic compatibility       | Conformance with EMC Directive 2014/30/EU         |
| Low Voltage Directive               | Conformance with Low Voltage Directive 2014/35/EC |
| EMC requirements for noise emission | EN 61000-6-3<br>EN 61000-6-4                      |
| EMC requirements for noise immunity | EN 61000-6-1<br>EN 61000-6-2                      |

## 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

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|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-3 |
|-----------------------|--------------|

## Electromagnetic HF field

|                     |                  |
|---------------------|------------------|
| Frequency range     | 80 MHz ... 1 GHz |
| Test field strength | 10 V/m           |
| Frequency range     | 1 GHz ... 2 GHz  |
| Test field strength | 10 V/m           |
| Frequency range     | 2 GHz ... 3 GHz  |
| Test field strength | 10 V/m           |
| Comments            | Criterion A      |

## Fast transients (burst)

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

## Fast transients (burst)

|          |                                      |
|----------|--------------------------------------|
| Input    | 4 kV (Test Level 4 - asymmetrical)   |
| Output   | 2.2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A                          |

## Surge voltage load (surge)

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-5 |
|-----------------------|--------------|

## Surge voltage load (surge)

|          |                                      |
|----------|--------------------------------------|
| Input    | 2 kV (Test Level 3 - symmetrical)    |
|          | 4 kV (Test Level 4 - asymmetrical)   |
| Output   | 1 kV (Test Level 2 - symmetrical)    |
|          | 0.5 kV (Test Level 1 - asymmetrical) |
| Comments | Criterion A                          |

## Conducted interference

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

## Conducted interference

|                 |                    |
|-----------------|--------------------|
| Frequency range | 10 kHz ... 15 kHz  |
|                 | 10 kHz ... 15 kHz  |
| Comments        | Criterion A        |
|                 | Criterion A        |
| Voltage         | 3 V (Test Level 2) |
|                 | 3 V (Test Level 2) |

## Conducted interference

|                 |                    |
|-----------------|--------------------|
| Frequency range | 10 kHz ... 15 kHz  |
|                 | 10 kHz ... 15 kHz  |
| Comments        | Criterion A        |
|                 | Criterion A        |
| Voltage         | 3 V (Test Level 2) |
|                 | 3 V (Test Level 2) |

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## Voltage dips

|                       |               |
|-----------------------|---------------|
| Standards/regulations | EN 61000-4-11 |
|-----------------------|---------------|

## Emitted interference

|  |   |
|--|---|
| Standards/regulations                            | EN 61000-6-3  |
| Radio interference voltage in acc. with EN 55011 | EN 55011 (EN 55022) class B used in industry and residential area / EMC 1 |
| Emitted radio interference in acc. with EN 55011 | EN 55011 (EN 55022) class B used in industry and residential area / EMC 1 |

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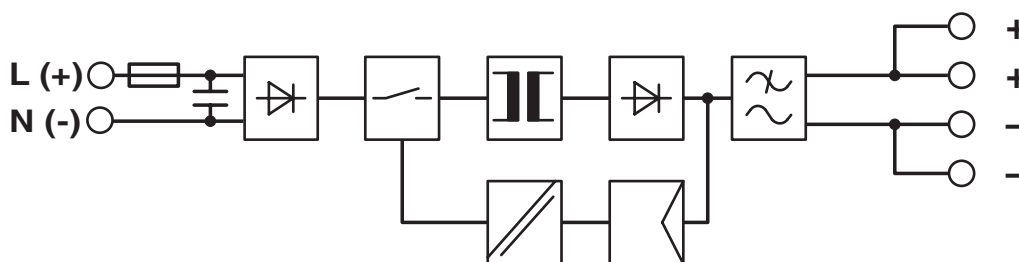


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## Drawings

Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2868651>



**cUL Recognized**  
Approval ID: FILE E 214596



**UL Recognized**  
Approval ID: FILE E 214596



**IECEE CB Scheme**  
Approval ID: DK-11098-M1



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



**LR**  
Approval ID: LR22301698TA-02



**NK**  
Approval ID: TA24454M



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



**UL Listed**  
Approval ID: E123528



**cUL Listed**  
Approval ID: E123528



**BSH**  
Approval ID: 581



**RINA**  
Approval ID: ELE038319XG

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## ABS

Approval ID: 23-2446587-PDA



## IECEE CB Scheme

Approval ID: DE/PTZ/0105



## BV

Approval ID: 21005-D0 BV



## cUL Listed

Approval ID: E199827



## UL Listed

Approval ID: E199827

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | 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                                | bedca7ed-5603-45e3-b61e-01a08eac3ae4 |

### EF3.0 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 5.577 kg CO2e |
|---------|---------------|

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