

# TRIO-PS67/1AC/24DC/3.75/IPD - Power supply



1278301

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Primary-switched power supply unit TRIO POWER, IPD panel feed-through with Push-in spring connection, Panel mounting, input: 1-phase, output: 24 V DC / 3.75 A

## Product description

The robust power supplies with IP67 degree of protection are ideally suited for decentral supply in the field. The weather-resistant cast-aluminum housing protects the devices against dust and water. This enables the power supplies to ensure high system availability even in harsh ambient conditions. The different device connections provide flexibility during mounting.

## Your advantages

- Direct installation at the load in the field reduces cable lengths and saves space in the control cabinet
- The robust cast-aluminum housing ensures high system availability with resistance to extreme ambient conditions (temperature, dust, and water)
- High shock and vibration resistance, plus high electric strength
- Improved diagnostic options in the field with DC OK LED and AC OK LED
- NEC Class 2 (POUT <100 W)

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1278301       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CM08          |
| Product key                          | CMPF13        |
| GTIN                                 | 4063151474843 |
| Weight per piece (including packing) | 1,016 g       |
| Weight per piece (excluding packing) | 766 g         |
| Customs tariff number                | 85044095      |
| Country of origin                    | VN            |

## Technical data

### Input data

#### AC operation

|                                          |                                                                                                                     |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Supply system configuration              | Star network (TN, TT, IT (PE))                                                                                      |
| Nominal input voltage range              | 100 V AC ... 277 V AC                                                                                               |
| Input voltage range                      | 100 V AC ... 277 V AC -15 % ... +10 %<br>115 V AC ... 277 V AC $\pm 10$ % (UL)                                      |
| Derating                                 | < 100 V AC ... 85 V AC (1 %/V)                                                                                      |
| Switch-on voltage                        | $\geq 80$ V AC                                                                                                      |
| Shut-down voltage                        | < 75 V AC                                                                                                           |
| Typical national grid voltage            | 120 V AC<br>230 V AC                                                                                                |
| Voltage type of supply voltage           | AC                                                                                                                  |
| Inrush current                           | $\leq 35$ A (typical, 277 V AC)<br>17 A (typical, 120 V AC)                                                         |
| Inrush current integral ( $I^2t$ )       | < 0.45 A <sup>2</sup> s                                                                                             |
| AC frequency range                       | 50 Hz ... 60 Hz $\pm 10$ %                                                                                          |
| Frequency range ( $f_N$ )                | 50 Hz ... 60 Hz $\pm 10$ %                                                                                          |
| Mains buffering time                     | > 25 ms (120 V AC)<br>> 25 ms (230 V AC)                                                                            |
| Current consumption                      | 1 A (100 V AC)<br>0.4 A (277 V AC)                                                                                  |
| Protective circuit                       | Transient surge protection; Varistor                                                                                |
| Power factor (cos phi)                   | > 0.92                                                                                                              |
| Switch-on time                           | < 0.2 s                                                                                                             |
| Input fuse                               | 4 A (internal (device protection))                                                                                  |
| Recommended breaker for input protection | 6 A ... 16 A (US/CAN: branch circuit protection $\leq 1\frac{1}{4}$ A)<br>(Characteristic B, C, D, K or comparable) |
| Discharge current to PE                  | < 0.5 mA                                                                                                            |

#### DC operation

|                                |                                                                                |
|--------------------------------|--------------------------------------------------------------------------------|
| Nominal input voltage range    | 110 V DC ... 250 V DC                                                          |
| Input voltage range            | 110 V DC ... 250 V DC -20 % ... +10 %<br>120 V DC ... 250 V DC $\pm 10$ % (UL) |
| Derating                       | < 110 V DC ... 88 V DC (1 %/V)                                                 |
| Switch-on voltage              | $\geq 75$ V DC                                                                 |
| Shut-down voltage              | < 70 V DC                                                                      |
| Voltage type of supply voltage | DC                                                                             |
| Current consumption            | 0.88 A (110 V DC)<br>0.38 A (250 V DC)                                         |

### Output data

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|                                                    |                                                     |
|----------------------------------------------------|-----------------------------------------------------|
| Efficiency                                         | typ. 93 % (120 V AC)                                |
|                                                    | typ. 94 % (230 V AC)                                |
| Nominal output voltage                             | 24 V DC $\pm 2$ % (SELV)                            |
| Nominal output current ( $I_N$ )                   | 3.75 A (NEC Class 2 Output)                         |
| Derating                                           | > 60 °C ... 70 °C (2.0 %/K)                         |
| Feedback voltage resistance                        | $\leq 35$ V DC                                      |
| Protection against overvoltage at the output (OVP) | $\leq 35$ V DC                                      |
| Control deviation                                  | < 1 % (change in load, static 10 % ... 90 %)        |
|                                                    | < 3 % (Dynamic load change 10 % ... 90 %, 10 Hz)    |
|                                                    | < 0.1 % (change in input voltage $\pm 10$ %)        |
| Residual ripple                                    | $\leq 10$ mV <sub>PP</sub>                          |
| Short-circuit-proof                                | yes                                                 |
| No-load proof                                      | yes                                                 |
| Output power                                       | 90 W                                                |
| Peak switching voltages nominal load               | < 100 mV                                            |
| Maximum no-load power dissipation                  | < 0.25 W (120 V AC)                                 |
|                                                    | < 0.28 W (230 V AC)                                 |
| Power loss nominal load max.                       | < 7.4 W (120 V AC)                                  |
|                                                    | < 6 W (230 V AC)                                    |
| Rise time                                          | typ. 100 ms ( $U_{OUT}$ (10 % ... 90 %))            |
| Connection in parallel                             | yes, for increasing power and redundancy with diode |
| Connection in series                               | yes, for increased output voltage                   |
| Fuse protection (secondary side)                   | electronic                                          |

Signal: DC OK

|                         |        |
|-------------------------|--------|
| Continuous load current | 100 mA |
|-------------------------|--------|

## Connection data

### Input

|                                                               |                                                       |
|---------------------------------------------------------------|-------------------------------------------------------|
| Connection method                                             | IPD panel feed-through with Push-in spring connection |
| Conductor cross-section, rigid min.                           | 0.5 mm <sup>2</sup>                                   |
| Conductor cross-section, rigid max.                           | 2.5 mm <sup>2</sup>                                   |
| Conductor cross-section flexible min.                         | 0.5 mm <sup>2</sup>                                   |
| Conductor cross-section flexible max.                         | 2.5 mm <sup>2</sup>                                   |
| Single conductor/terminal point, stranded, with ferrule, min. | 0.5 mm <sup>2</sup>                                   |
| Single conductor/terminal point, stranded, with ferrule, max. | 2.5 mm <sup>2</sup>                                   |
| Conductor cross-section AWG max.                              | 14                                                    |
| Color-coded                                                   | gray                                                  |
| Type of locking                                               | Clip locking                                          |
| Number of positions                                           | 3                                                     |

### Output

|                                     |                                                       |
|-------------------------------------|-------------------------------------------------------|
| Connection method                   | IPD panel feed-through with Push-in spring connection |
| Conductor cross-section, rigid min. | 0.5 mm <sup>2</sup>                                   |

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|                                                               |                     |
|---------------------------------------------------------------|---------------------|
| Conductor cross-section, rigid max.                           | 2.5 mm <sup>2</sup> |
| Conductor cross-section flexible min.                         | 0.5 mm <sup>2</sup> |
| Conductor cross-section flexible max.                         | 2.5 mm <sup>2</sup> |
| Single conductor/terminal point, stranded, with ferrule, min. | 0.5 mm <sup>2</sup> |
| Single conductor/terminal point, stranded, with ferrule, max. | 2.5 mm <sup>2</sup> |
| Conductor cross-section AWG max.                              | 14                  |
| Color-coded                                                   | black               |
| Type of locking                                               | Clip locking        |
| Number of positions                                           | 3                   |

## Signaling

|                    |                 |
|--------------------|-----------------|
| Types of signaling | LED             |
| Status display     | 2 x LED (green) |

### Signal output: LED status indicator

|                           |                                                            |
|---------------------------|------------------------------------------------------------|
| Signalization designation | AC OK                                                      |
| Status display            | LED                                                        |
| Color                     | green                                                      |
| AC OK                     | $AC_{in} > 0.76 \times AC_N$ ( $AC_N = 100 \text{ V AC}$ ) |

### Signal output: LED status indicator

|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| Signalization designation | DC OK                                                  |
| Status display            | LED                                                    |
| Color                     | green                                                  |
| DC OK                     | $U_{OUT} > 0.9 \times U_N$ ( $U_N = 24 \text{ V DC}$ ) |

## Electrical properties

|                                 |                        |
|---------------------------------|------------------------|
| Number of phases                | 1                      |
| Insulation voltage input/output | 4 kV AC (type test)    |
|                                 | 3 kV AC (routine test) |

## Product properties

|                            |                     |
|----------------------------|---------------------|
| Product type               | Power supply        |
| Product family             | TRIO POWER          |
| MTBF (IEC 61709, SN 29500) | > 1475000 h (25 °C) |
|                            | > 1000000 h (40 °C) |
|                            | > 500000 h (60 °C)  |

### Insulation characteristics

|                  |                 |
|------------------|-----------------|
| Protection class | I               |
| Pollution degree | 2 (IEC 61010-1) |

## Dimensions

### Item dimensions

|       |        |
|-------|--------|
| Width | 100 mm |
|-------|--------|

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|        |        |
|--------|--------|
| Height | 222 mm |
| Depth  | 53 mm  |

## Drill hole

|          |        |
|----------|--------|
| Diameter | 4.2 mm |
|----------|--------|

## Installation dimensions

|                                  |                |
|----------------------------------|----------------|
| Installation distance right/left | 20 mm / 20 mm  |
| Installation distance top/bottom | 50 mm / 100 mm |

## Mounting

|                         |                |
|-------------------------|----------------|
| Mounting type           | Panel mounting |
| With protective coating | no             |

## Material specifications

|                                                                    |                  |
|--------------------------------------------------------------------|------------------|
| Flammability rating according to UL 94 (housing / terminal blocks) | V0               |
| Housing material                                                   | Metal            |
| Type of housing                                                    | Aluminum (AlMg3) |

## Environmental and real-life conditions

### Ambient conditions

|                                                |                                                                                                               |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Degree of protection                           | IP67                                                                                                          |
| Ambient temperature (operation)                | -25 °C ... 70 °C (Derating > 60 °C: 2 %/K)                                                                    |
| Ambient temperature (storage/transport)        | -40 °C ... 85 °C                                                                                              |
| Maximum altitude                               | ≤ 4000 m (> 2000 m, Derating: 10 %/1000 m)                                                                    |
| Climatic class                                 | 4K26 (EN 60721-3-4)                                                                                           |
| Max. permissible relative humidity (operation) | ≤ 100 % (at 25 °C, non-condensing)                                                                            |
| Permissible humidity (operation)               | ≤ 100 % (at 25 °C, non-condensing)                                                                            |
| Shock                                          | 18 ms, 30g, in each space direction (according to IEC 60068-2-27)                                             |
| Vibration (operation)                          | 10 Hz ... 59.6 Hz, amplitude ±0.35 mm (in accordance with IEC 60068-2-6)<br>59.6 Hz ... 150 Hz, 5g, 20 cycles |

## Standards and regulations

### Overvoltage category

|            |               |
|------------|---------------|
| EN 61010-1 | II (≤ 4000 m) |
|------------|---------------|

### Overvoltage category

|            |                |
|------------|----------------|
| EN 62477-1 | III (≤ 2000 m) |
|------------|----------------|

### Electrical safety

|                          |                   |
|--------------------------|-------------------|
| Standard designation     | Electrical safety |
| Standards/specifications | IEC 61010-1       |

### Protective extra-low voltage

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|                          |                              |
|--------------------------|------------------------------|
| Standard designation     | Protective extra-low voltage |
| Standards/specifications | IEC 61010-1                  |
|                          | IEC 61010-2-201 (SELV)       |

## 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                                                                               |

## Limit values for harmonic currents

|                          |                                    |
|--------------------------|------------------------------------|
| Standard designation     | Limit values for harmonic currents |
| Standards/specifications | EN 61000-3-2                       |

## Degrees of protection provided by enclosures (IP code)

|                          |                                                        |
|--------------------------|--------------------------------------------------------|
| Standard designation     | Degrees of protection provided by enclosures (IP code) |
| Standards/specifications | EN/IEC 60529                                           |

## Mains variation/undervoltage

|                          |                              |
|--------------------------|------------------------------|
| Standard designation     | Mains variation/undervoltage |
| Standards/specifications | SEMI F47 - 0706              |

## Approvals

### UL

|                |                                  |
|----------------|----------------------------------|
| Identification | NEC Class 2 according to UL 1310 |
|----------------|----------------------------------|

### UL

|                |                           |
|----------------|---------------------------|
| Identification | UL/C-UL Listed UL 61010-1 |
|----------------|---------------------------|

### UL

|                |                               |
|----------------|-------------------------------|
| Identification | UL/C-UL Listed UL 61010-2-201 |
|----------------|-------------------------------|

## 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                | Immunity in accordance with EN 61000-6-1 (residential), EN 61000-6-2 (industrial)                                |

## Conducted noise emission

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

## Noise emission

|                       |                     |
|-----------------------|---------------------|
| Standards/regulations | EN 55011 (EN 55022) |
|-----------------------|---------------------|

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## 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) |

## Electrostatic discharge

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-2 |
|-----------------------|--------------|

## Electrostatic discharge

|                   |                     |
|-------------------|---------------------|
| Contact discharge | 6 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 ... 2 GHz       |
| Test field strength | 10 V/m (Test Level 3) |
| Frequency range     | 2 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    | 4 kV (Test Level 3 - asymmetrical) |
| Output   | 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 4 - symmetrical)  |
|          | 4 kV (Test Level 4 - asymmetrical) |
| Output   | 1 kV (Test Level 3 - symmetrical)  |
|          | 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A                        |

## 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    |
| Comments              | Criterion A   |
| Voltage dip           | 40 %          |
| Number of periods     | 10 periods    |
| Comments              | Criterion B   |
| Voltage dip           | 0 %           |
| Number of periods     | 1 period      |
| Comments              | Criterion A   |

## Emitted interference

|                                                  |                                                                            |
|--------------------------------------------------|----------------------------------------------------------------------------|
| Standards/regulations                            | EN 61000-6-3                                                               |
| Radio interference voltage in acc. with EN 55011 | EN 55011 (EN 55022) Class B, area of application: Industry and residential |
| Emitted radio interference in acc. with EN 55011 | EN 55011 (EN 55022) Class B, area of application: Industry and residential |

## 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. |

# TRIO-PS67/1AC/24DC/3.75/IPD - Power supply

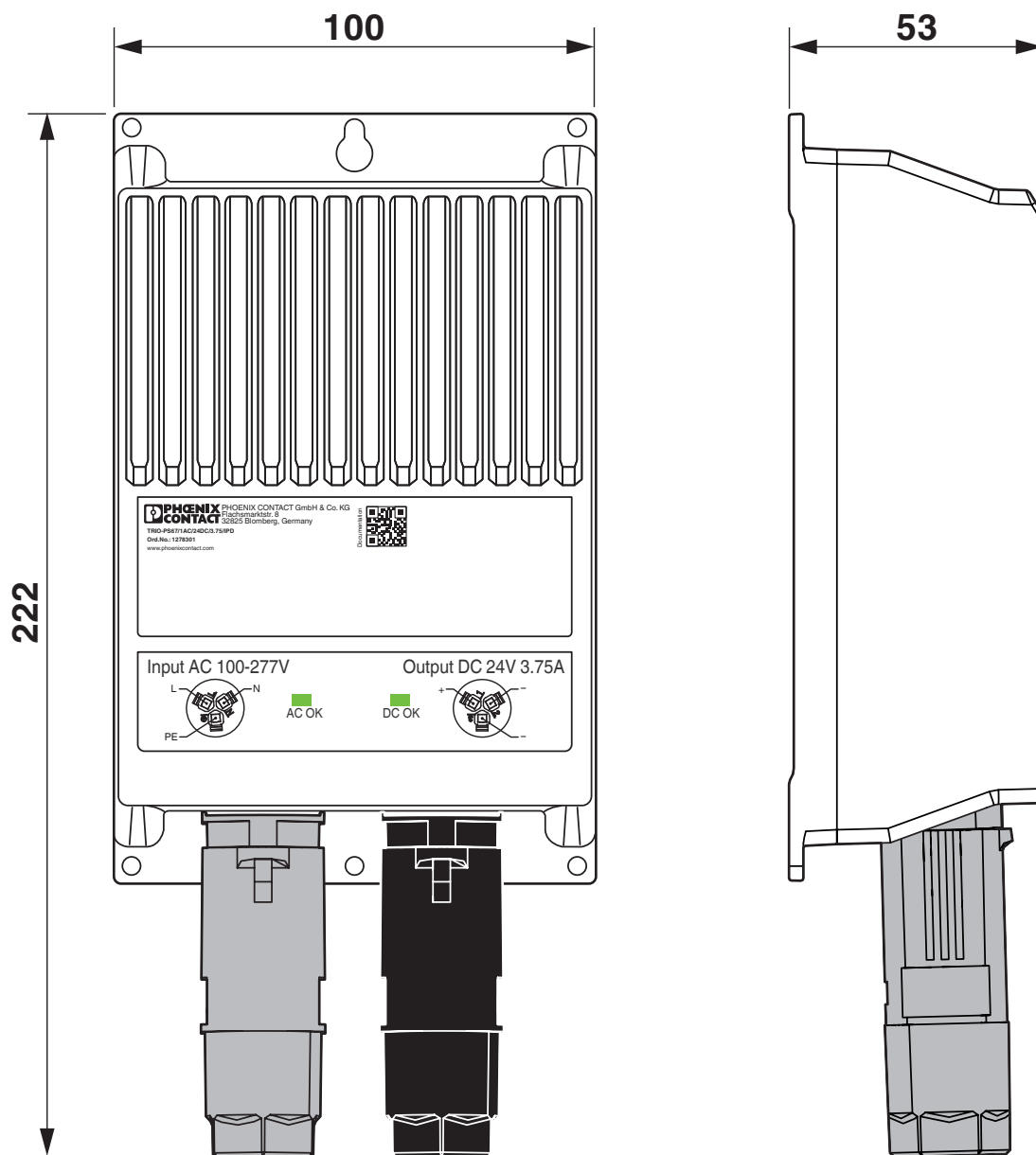
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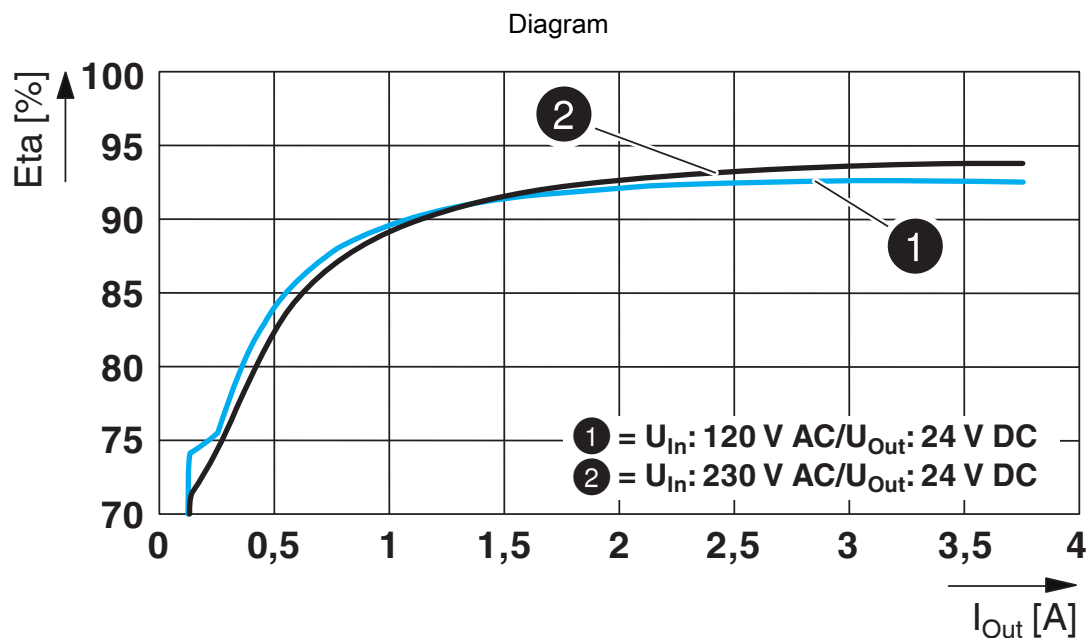


## Drawings

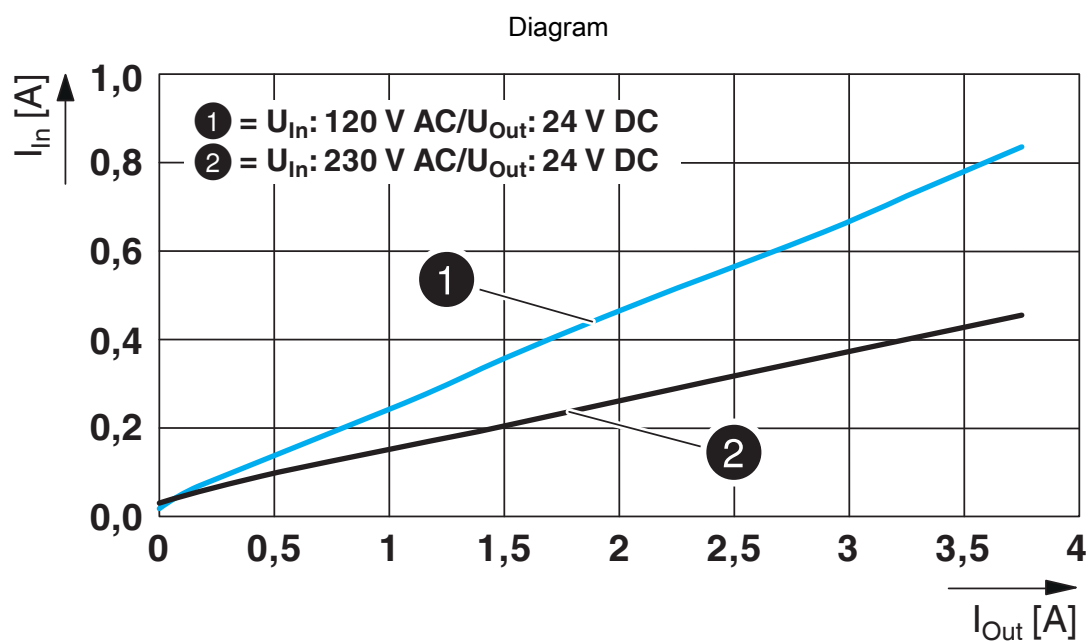
Dimensional drawing



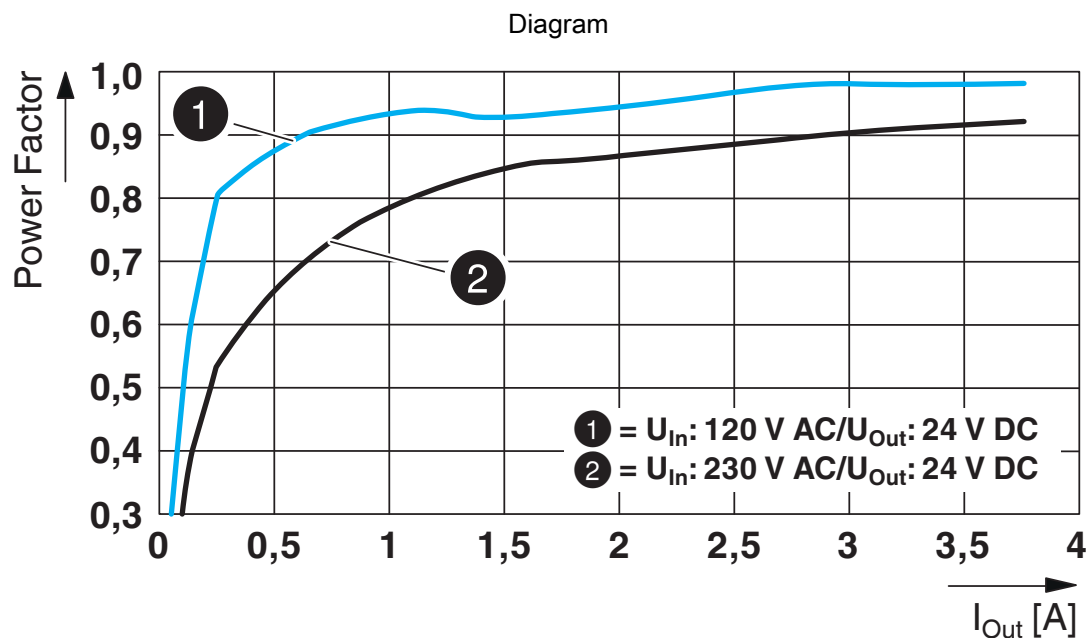
Device dimensions (dimensions in mm)



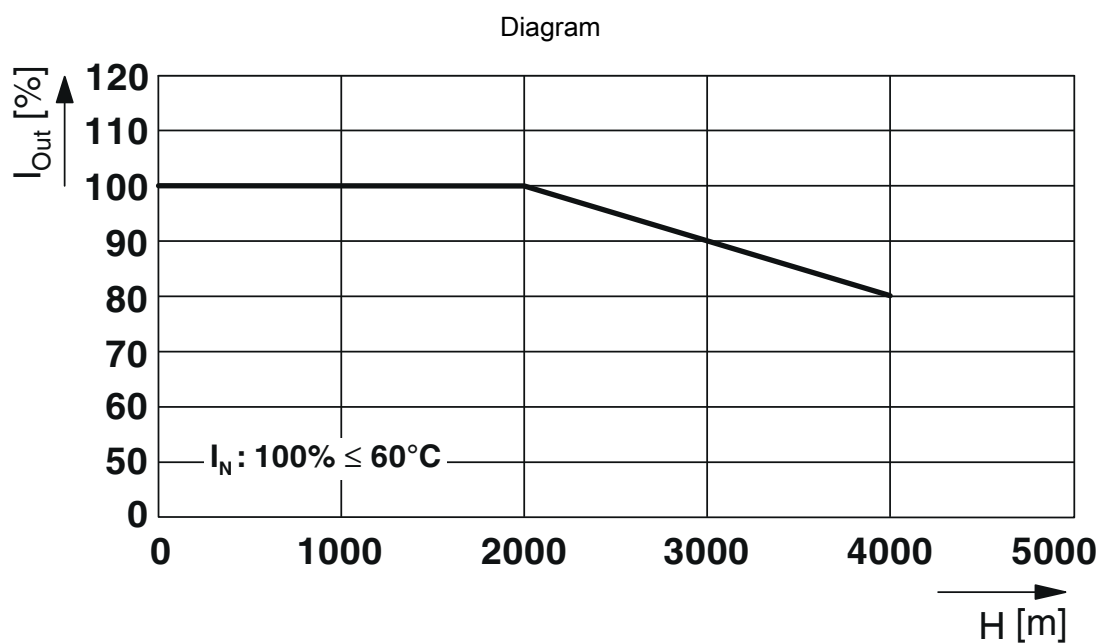
Efficiency



Input current/output current



Power factor

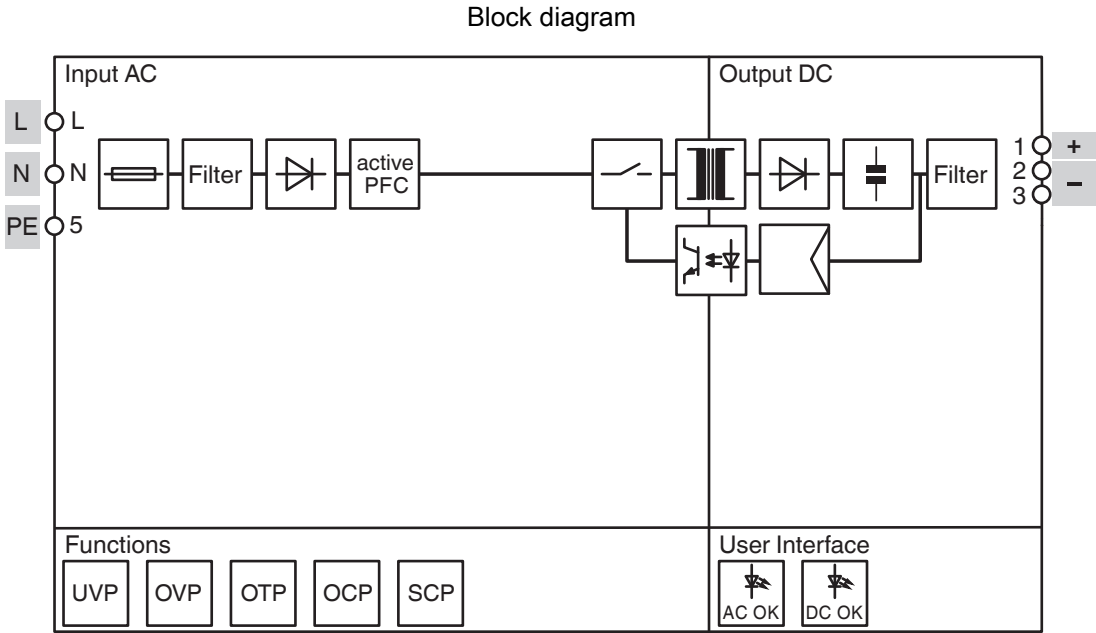


Output current/installation altitude

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Block diagram

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## Approvals

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**cULus Listed**

Approval ID: FILE E 123528

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC002540 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

## 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                                | 6db3951a-0b82-4b14-91a3-e26cbd796680 |