

ESSENTIAL-PS/3AC/24DC/480W/EE - Power supply unit



1018299

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Primary-switched ESSENTIAL edition power supply for DIN rail mounting, input: 3-phase, output: 24 V DC / 480 W

Your advantages

- Worldwide use thanks to the wide range input and international approval package
- Fast installation, thanks to easy DIN rail mounting
- Greater availability, thanks to fanless convection cooling

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Technical data

Input data

AC operation

| | |
|---|---|
| Nominal input voltage range | 3x 400 V AC ... 500 V AC |
| Input voltage range | 3x 320 V AC ... 575 V AC (Derating < 360 V AC: 1,5 %/V) |
| Extended input voltage range in operation | 3x 320 V AC ... 575 V AC (Derating < 360 V AC: 1,5 %/V) |
| Input voltage range AC | 3x 320 V AC ... 575 V AC (Derating < 360 V AC: 1,5 %/V) 2x 360 V AC ... 575 V AC (for 2-phase operation) |
| Voltage type of supply voltage | AC |
| Inrush current | < 15 A |
| Inrush current integral (I^2t) | 0.5 A ² s |
| AC frequency range | 45 Hz ... 65 Hz |
| Mains buffering time | > 17 ms (3x 400 V AC) |
| Current consumption | 3x 1.1 A (400 V AC) 3x 0.8 A (480 V AC) |
| Nominal power consumption | 666.33 VA |
| Protective circuit | Transient surge protection; Varistor |
| Power factor (cos phi) | 0.67 |
| Typical response time | < 1 s |
| Permissible backup fuse | B6 B10 B16 |
| Recommended breaker for input protection | 6 A ... 16 A |
| Discharge current to PE | < 3.5 mA |

Output data

| | |
|--|---|
| Efficiency | 91 % (at 400 V AC and nominal values) |
| Output characteristic | U/I |
| Nominal output voltage | 24 V DC \pm 1 % |
| Setting range of the output voltage (U_{Set}) | 22.5 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted) |
| Nominal output current (I_N) | 20 A ($U_{OUT} = 24$ V DC) |
| Derating | 55 °C ... 70 °C (2.5 %/K) |
| Feedback voltage resistance | 35 V DC |
| Protection against overvoltage at the output (OVP) | < 35 V DC |
| Max. capacitive load | unlimited |
| Active current limitation | Approx. 25 A |
| Control deviation | < 1 % (change in load, static 10 % ... 90 %) < 2 % (change in load, dynamic 10 % ... 90 %) < 0.1 % (change in input voltage \pm 10 %) |
| Residual ripple | < 10 mV _{PP} |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Output power | 480 W |
| Peak switching voltages nominal load | < 30 mV _{PP} |

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| | |
|-----------------------------------|--|
| Maximum no-load power dissipation | < 6 W |
| Power loss nominal load max. | < 48 W |
| Rise time | < 2 ms (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 ² |
| Conductor cross section, rigid max. | 2.5 mm ² |
| Conductor cross section flexible min. | 0.2 mm ² |
| Conductor cross section flexible max. | 2.5 mm ² |
| Conductor cross section AWG min. | 24 |
| Conductor cross section AWG max. | 14 |
| Stripping length | 9 mm |
| Screw thread | M2,5 |
| Tightening torque, min | 0.4 Nm |
| Tightening torque max | 0.5 Nm |

Output

| | |
|---------------------------------------|---------------------|
| Connection method | Screw connection |
| Conductor cross section, rigid min. | 0.5 mm ² |
| Conductor cross section, rigid max. | 6 mm ² |
| Conductor cross section flexible min. | 0.5 mm ² |
| Conductor cross section flexible max. | 4 mm ² |
| Conductor cross section AWG min. | 12 |
| Conductor cross section AWG max. | 10 |
| Stripping length | 14 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

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

Electrical properties

| | |
|---------------------------------|---|
| Number of phases | 3.00 |
| Insulation voltage input/output | 3 kV AC (type test) 1.5 kV AC (routine test) |

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| | |
|--------------------------------|----------|
| Insulation voltage output / PE | 500 V DC |
|--------------------------------|----------|

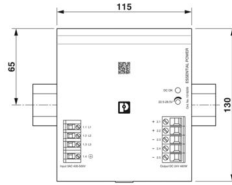
Product properties

| | |
|----------------------------|-----------------|
| Product type | Power supply |
| Product family | ESSENTIAL POWER |
| MTBF (IEC 61709, SN 29500) | > 700000 h |

Insulation characteristics

| | |
|----------------------|------------------------|
| Protection class | I (with PE connection) |
| Overvoltage category | III |
| Degree of pollution | 2 |

Dimensions

| | |
|---------------------|---|
| Dimensional drawing |  |
| Width | 115 mm |
| Height | 130 mm |
| Depth | 152.5 mm |

Installation dimensions

| | |
|----------------------------------|---------------|
| Installation distance right/left | 0 mm / 0 mm |
| Installation distance top/bottom | 50 mm / 50 mm |

Mounting

| | |
|-------------------------|--|
| Mounting type | DIN rail mounting |
| Assembly instructions | alignable: horizontally 0 mm, vertically 50 mm |
| Mounting position | horizontal DIN rail NS 35, EN 60715 |
| With protective coating | No |

Material specifications

| | |
|----------------------|--------------------------|
| Housing material | Metal |
| Type of housing | Steel sheet, zinc-plated |
| Side element version | Aluminum |

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 |
| 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 ± 2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min. |

Standards and regulations

| | |
|--|----------------------------|
| Standard - Electrical safety | EN 60950-1 |
| Standard – Safety extra-low voltage | EN 60950-1 (SELV) |
| Approval - requirement of the semiconductor industry with regard to mains voltage dips | SEMI F47 - 0706 (200 V AC) |

Approvals

| | |
|--------------|------------------------|
| CSA | CSA-C22.2 Nr. 107.1-01 |
| | CSA-C22.2 Nr. 60950-01 |
| UL approvals | UL/C-UL listed UL 508 |

Conformity/Approvals

| | |
|--|---------|
| SIL in accordance with IEC 61508 | 0 |
| Performance level according to ISO 13849 | without |

EMC data

| | |
|-------------------------------------|---|
| Low Voltage Directive | Conformance with Low Voltage Directive 2014/35/EC |
| EMC requirements for noise emission | EN 61000-6-3 |
| | EN 61000-6-4 |
| EMC requirements for noise immunity | EN 61000-6-1 |
| | EN 61000-6-2 |
| Electromagnetic compatibility | Conformance with EMC Directive 2014/30/EU |
| Noise emission | EN 55011 (EN 55022) Class B |

Electrostatic discharge

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

Electrostatic discharge

| | |
|-------------------|---------------------|
| Contact discharge | 8 kV (Test Level 4) |
| 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 |
| Frequency range | 1 GHz ... 2 GHz |
| Test field strength | 10 V/m |
| Frequency range | 2 GHz ... 3 GHz |
| Test field strength | 10 V/m |

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| | |
|--|--|
| Comments | Criterion A |
| Fast transients (burst) | |
| Standards/regulations | EN 61000-4-4 |
| Fast transients (burst) | |
| Input | 4 kV (Test Level 4 - asymmetrical) |
| Output | 4 kV (Test Level 4 - asymmetrical) |
| Signal | 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A |
| Surge voltage load (surge) | |
| Standards/regulations | EN 61000-4-5 |
| Input | 2 kV (Test Level 3 - symmetrical) |
| | 4 kV (Test Level 4 - asymmetrical) |
| Output | 1 kV (Test Level 2 - symmetrical) |
| | 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A |
| Conducted interference | |
| Standards/regulations | EN 61000-4-6 |
| Conducted interference | |
| Frequency range | 0.15 MHz ... 80 MHz |
| Comments | Criterion A |
| Voltage | 10 V (Test Level 3) |
| 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, 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. |

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