

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
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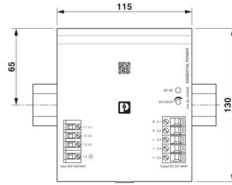
Product properties

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 note	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
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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
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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
Surge voltage load (surge)	
Input	1 kV (Test Level 2 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical)
	0.5 kV (Test Level 1 - asymmetrical)
Comments	Criterion B
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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