

# ESSENTIAL-PS/3AC/24DC/240W/EE - Power supply unit



1018291

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Primary-switched ESSENTIAL edition power supply for DIN rail mounting, input: 3-phase, output: 24 V DC / 240 W

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## 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	2x / 3x 400 V AC ... 500 V AC
Input voltage range	3x 320 V AC ... 575 V AC
Input voltage range AC	3x 320 V AC ... 575 V AC 2x 360 V AC ... 575 V AC (for 2-phase operation)
Voltage type of supply voltage	AC
Inrush current	< 15 A
Inrush current integral ( $I^2t$ )	0.2 A <sup>2</sup> s
AC frequency range	45 Hz ... 65 Hz
Mains buffering time	> 20 ms (3x 400 V AC)
Current consumption	3x 0.6 A (400 V AC) 3x 0.5 A (480 V AC)
Nominal power consumption	284.4 VA
Protective circuit	Transient surge protection; Varistor
Power factor (cos phi)	0.59
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	88.5 % (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 ( $I_N$ )	10 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. 15 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 <sub>PP</sub>
Short-circuit-proof	yes
Output power	240 W
Peak switching voltages nominal load	< 30 mV <sub>PP</sub>
Maximum no-load power dissipation	7.5 W
Power loss nominal load max.	34 W

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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 <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.	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.	0.2 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.	16
Conductor cross section AWG max.	12
Stripping length	9 mm
Screw thread	M2,5
Tightening torque, min	0.4 Nm
Tightening torque max	0.5 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)
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	60 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
With protective coating	No

## Material specifications

Housing material	Metal
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## 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)
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.

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## 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
Comments	Criterion A

## Fast transients (burst)

Standards/regulations	EN 61000-4-4
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## 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
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## 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
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## 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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