

# PS-EE-2G/1AC/24DC/120W/SC - Power supply unit



1234302

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Primary-switched power supply unit, ESSENTIAL POWER, Screw connection, DIN rail mounting, input: 1-phase, output: 24 V DC / 5 A, adjustable from 24 V DC ... 28 V DC

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## Technical data

### Input data

#### AC operation

Supply system configuration	TN, TT, IT (PE)
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	110 V AC ... 240 V AC $\pm 10\%$ ( $P_N = 120\text{ W}$ )
	100 V AC ... 109 V AC $-15\%$ ... $+10\%$ ( $P_N = 100\text{ W}$ )
Typical national grid voltage	120 V AC
	230 V AC
Voltage type of supply voltage	AC
Inrush current	typ. 43 A (at 25 °C)
Inrush current integral ( $I^2t$ )	typ. 0.7 A <sup>2</sup> s
Frequency range ( $f_N$ )	50 Hz ... 60 Hz $\pm 10\%$
Mains buffering time	typ. 15 ms (120 V AC)
	typ. 42 ms (230 V AC)
Current consumption	max. 2 A (120 W)
	max. 1.5 A (100 W)
	typ. 1.3 A (110 V AC (120 W))
	typ. 0.6 A (240 V AC (120 W))
	typ. 1.2 A (100 V AC (100 W))
	typ. 1.1 A (109 V AC (100 W))
Protective circuit	Transient protection; Varistor
Switch-on time	typ. 1 s
Device mains fuse	3.15 A internal (device protection), fast-blow
Recommended breaker for input protection	10 A ... 16 A (Characteristic B, C, D, K or comparable)
Discharge current to PE	< 3.5 mA

### Output data

Efficiency	typ. 87 % (120 V AC)
	typ. 88 % (230 V AC)
Nominal output voltage	24 V DC
Setting range of the output voltage ( $U_{Set}$ )	24 V DC ... 28 V DC (> 24 V DC, constant capacity restricted)
Nominal output current ( $I_N$ )	max. 5 A ( $P_N = 120\text{ W}$ )
	max. 4.16 A ( $P_N = 100\text{ W}$ )
Short-circuit-proof	yes
No-load proof	yes
Crest factor	typ. 1.5 (120 V AC)
	typ. 1.5 (230 V AC)
Output power ( $P_N$ )	120 W (240 V AC)
	100 W (100 V AC)
Connection in parallel	yes, for increasing power and redundancy with diode
Connection in series	yes, for increased output voltage

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Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	≤ 35 V DC
Residual ripple	typ. 70 mV <sub>PP</sub> (with nominal values)
Control deviation	< 2 % (change in load, static 10 % ... 90 %)
	< 4 % (change in load, dynamic 10 % ... 90 %)
	< 0.1 % (change in input voltage ±10 %)
Rise time	< 2 s (U <sub>Out</sub> = 10 % ... 90 %)
Minimum no-load power dissipation	< 1 W (120 V AC)
Maximum no-load power dissipation	< 1 W (230 V AC)
Minimum nominal load power dissipation	< 20 W (120 V AC)
Power loss nominal load max.	< 16 W (230 V AC)
Integrated fuse protection	no

## Connection data

### Input

Position	1.x
Identification	1.1 (        FS L), 1.3 (N)

### Conductor connection

Connection method	Screw connection
rigid	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
rigid (AWG)	20 ... 14 (Cu)
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm
	5 lb <sub>F</sub> -in. ... 7 lb <sub>F</sub> -in.
Drive form screw head	Slotted L

### Output

Position	2.x
Identification	2.1, 2.2 (+), 2.3, 2.4 (-)

### Conductor connection

Connection method	Screw connection
rigid	1 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible	1 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	1 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	1 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
rigid (AWG)	17 ... 14 (Cu)
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm
	5 lb <sub>F</sub> -in. ... 7 lb <sub>F</sub> -in.
Drive form screw head	Slotted L

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## Signaling

### LED signaling

Types of signaling	LED DC OK – signal state operation ( $U_N = 24 \text{ V DC}$ , $I_{Out} = I_N$ )
Function	Visual operating state display
Color	green
LED off	Supply voltage input AC not present (Off)
LED on (green), DC OK	$U_{OUT} > 15 \text{ V}$ (On (green), DC OK)

## Electrical properties

Number of phases	1.00
Insulation voltage input/output	4 kV AC (type test)
	3 kV AC (routine test)
Insulation voltage input / PE	3.5 kV AC (type test)
	2.4 kV AC (routine test)

## Product properties

Product type	Power supply
Product family	ESSENTIAL POWER
MTBF (Telcordia SR-332)	> 2470000 h (25 °C)
	> 2000000 h (40 °C)
	> 1840000 h (45°C)

### Insulation characteristics

Protection class	I
Degree of pollution	2

### Life expectancy (electrolytic capacitors)

Current	5 A
Temperature	40 °C
Time	24000 h
Additional text	120 V AC

### Life expectancy (electrolytic capacitors)

Current	5 A
Temperature	30 °C
Time	48000 h
Additional text	120 V AC

### Life expectancy (electrolytic capacitors)

Current	5 A
Temperature	40 °C
Time	32000 h
Additional text	230 V AC

### Life expectancy (electrolytic capacitors)

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Current	5 A
Temperature	30 °C
Time	64000 h
Additional text	230 V AC

## Dimensions

### Item dimensions

Width	40 mm
Height	124 mm
Depth	125 mm

### Installation dimensions

Installation distance right/left	10 mm / 10 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	Metal
Housing material	Aluminum (AlMg3) / sheet steel, zinc-plated
Hood version	Stainless steel
Side element version	Aluminum
Foot latch material	Sheet steel, zinc-plated

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-20 °C ... 70 °C (Derating >45°C: 2.5%/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Maximum altitude	≤ 5000 m (> 2000 m, Derating: 10 %/1000 m)
Climatic class	3K22 (in accordance with EN 60721-3-3)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Shock (operation)	15 ms, 15 g, per spatial direction (IEC 60068-2-27)
Vibration (operation)	10 Hz ... 50 Hz, amplitude ±0.2 mm 50 Hz ... 150 Hz, 2.3g, 90 min.

## Standards and regulations

### Overvoltage category

EN 61010-1	II (≤ 3000 m)
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## Electrical safety

Standard designation	Electrical safety
Standards/specifications	IEC 61010-2-201 (SELV)

## Safety for measurement, control, and laboratory equipment

Standard designation	Safety for equipment for measurement, control, and laboratory use
Standards/specifications	IEC 61010-1

## Protective extra-low voltage

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

## Limitation of harmonic line currents

Standard designation	Limitation of harmonic line currents
Standards/specifications	EN 61000-3-2

## Mains voltage dips

Standard designation	Requirement of the semiconductor industry with regard to mains voltage dips
Standards/specifications	SEMI F47 - 0706 (120 V AC)

## Approvals

### UL

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

Identification	UL/C-UL Listed UL 61010-2-201
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### CB scheme

Identification	CB scheme (IEC 61010-1, IEC 61010-2-201)
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## EMC data

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)
EMC requirements for noise immunity	EN 61000-6-2
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Conducted noise emission	EN 55016
	EN 61000-6-3 (Class B)
Noise emission	EN 55016
	EN 61000-6-3 (Class B)

## Harmonic currents

Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)

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Frequency range	0 kHz ... 2 kHz
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	
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 ... 6 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	2 GHz ... 3 GHz
Test field strength	1 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 4 - 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	1 kV (Test Level 2 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical)
	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B
Conducted interference	
Standards/regulations	EN 61000-4-6
Conducted interference	
Input/Output	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

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## 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	12 periods
Comments	Criterion A
Voltage dip	0 %
Number of periods	1 period
Comments	Criterion A

## 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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