

1234308
<https://www.phoenixcontact.com/us/products/1234308>

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Primary-switched power supply unit ESSENTIAL POWER, Screw connection, DIN rail mounting, input: 1-phase, output: 24 V DC / 20 A, adjustable from 24 V DC ... 28 V DC



Commercial data

Item number	1234308
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM07
Product key	CMB313
GTIN	4063151338602
Weight per piece (including packing)	1,578 g
Weight per piece (excluding packing)	1,410 g
Customs tariff number	85044095
Country of origin	CN

PS-EE-2G/1AC/24DC/480W/SC - Power supply



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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 $\pm 10\%$ ($P_N = 480\text{ W}$) 100 V AC ... 109 V AC -15% ... $+10\%$ ($P_N = 400\text{ W}$)
Typical national grid voltage	120 V AC 230 V AC
Voltage type of supply voltage	AC
Inrush current	typ. 16 A (at 25 °C)
Inrush current integral (I^2t)	typ. 0.25 A ² s
Frequency range (f_N)	50 Hz ... 60 Hz $\pm 10\%$
Mains buffering time	typ. 15 ms (120 V AC) typ. 35 ms (230 V AC)
Current consumption	max. 6 A (480 W) max. 5 A (400 W) typ. 5 A (110 V AC (480 W)) typ. 2.3 A (240 V AC (480 W)) typ. 4.5 A (100 V AC (400 W)) typ. 4.3 A (109 V AC (400 W))
Protective circuit	Transient protection; Varistor
Switch-on time	typ. 1 s
Device mains fuse	10 A internal (device protection), fast-blow
Recommended breaker for input protection	6 A ... 16 A (Characteristic B, C, D, K or comparable)
Discharge current to PE	< 3.5 mA

Output data

Efficiency	typ. 91 % (120 V AC) typ. 93 % (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) (I_{N_PMax})	max. 20 A ($P_N = 480\text{ W}$)
Nominal output current (I_N) (I_{N_PMin})	max. 16.66 A ($P_N = 400\text{ W}$)
Short-circuit-proof	yes
No-load proof	yes
Crest factor	typ. 1,7 (120 V AC) typ. 1.8 (230 V AC)
Output power (P_N)	480 W (240 V AC) 400 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 _{PP} (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	< 100 ms (U _{Out} = 10 % ... 90 %)
Minimum no-load power dissipation	< 4 W (120 V AC)
Maximum no-load power dissipation	< 3 W (230 V AC)
Minimum nominal load power dissipation	< 43 W (120 V AC)
Power loss nominal load max.	< 33 W (230 V AC)
Integrated fuse protection	no

Connection data

Input

Position	1.x
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Connection technology: Positions

Position marking	1.1 (L1), 1.2 (N), 1.3 (⊕, ⊖)
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Conductor connection

Connection method	Screw connection
rigid (Terminal block)	0.75 mm² ... 6 mm²
rigid (recommended)	2.5 mm² (recommended)
flexible (Klemme)	0.75 mm² ... 4 mm²
flexible (empfohlen)	2.5 mm² (recommended)
flexible with ferrule without plastic sleeve (Terminal block)	0.75 mm² ... 4 mm²
flexible with ferrule without plastic sleeve (recommended)	2.5 mm² (recommended)
flexible with ferrule with plastic sleeve (Terminal block)	0.75 mm² ... 4 mm²
flexible with ferrule with plastic sleeve (recommended)	2.5 mm² (recommended)
AWG (Terminal block)	18 ... 10 (Cu)
AWG (recommended)	14 (recommended)
Stripping length (starr/flexibel)	8 mm (Rigid/flexible/ferrule)
Tightening torque (EU)	0.5 Nm ... 0.6 Nm
Tightening torque ()	5 lb _F -in. ... 7 lb _F -in.
Drive form screw head	Slotted L
Screwdriver blade	1 x 4 mm

Output

Position	2.x
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Connection technology: Positions

Position marking	2.1, 2.2 (+), 2.3, 2.4 (-)
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Conductor connection

Connection method	Screw connection
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rigid (Terminal block)	2.5 mm ² ... 6 mm ²
rigid (recommended)	4 mm ² (recommended)
flexible	2.5 mm ² ... 4 mm ²
flexible (empfohlen)	4 mm ² (recommended)
flexible with ferrule without plastic sleeve (Terminal block)	0.75 mm ² ... 4 mm ²
flexible with ferrule without plastic sleeve (recommended)	4 mm ² (recommended)
flexible with ferrule with plastic sleeve (Terminal block)	2.5 mm ² ... 4 mm ²
flexible with ferrule with plastic sleeve (recommended)	4 mm ² (recommended)
AWG (Terminal block)	14 ... 10 (Cu)
AWG (recommended)	12 (recommended)
Stripping length (starr/flexibel)	8 mm (Rigid/flexible/ferrule)
Tightening torque (EU)	0.5 Nm ... 0.6 Nm
Tightening torque ()	5 lb _f -in. ... 7 lb _f -in.
Drive form screw head	Slotted L
Screwdriver blade	1 x 4 mm

Signaling

LED signaling

Types of signaling	LED DC OK - signal state operation ($U_N = 24 \text{ V DC}$, $I_{\text{Out}} = I_N$)
Function	Visual operating state display
Color	green
LED off	Supply voltage input AC not present (Off)
LED on (green), DC OK	$U_{\text{OUT}} > 11 \text{ V}$ (On (green), DC OK)

Electrical properties

Number of phases	1
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)	> 860000 h (25 °C)
	> 640000 h (40 °C)
	> 570000 h (45 °C)

Insulation characteristics

Protection class	I
Overvoltage category (EN 61010-1)	II ($\leq 3000 \text{ m}$)
Degree of pollution	2

Life expectancy (electrolytic capacitors)

Current	20 A
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Temperature	40 °C
Time	25000 h
Additional text	120 V AC

Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	30 °C
Time	50000 h
Additional text	120 V AC

Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	40 °C
Time	37000 h
Additional text	230 V AC

Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	30 °C
Time	74000 h
Additional text	230 V AC

Dimensions

Item dimensions

Width	86 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: 10 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

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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	≤ 3000 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, 15g, 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.
Temp code	T4 (-20 ... +70 °C; > 45 °C, Derating: 2,5 %/K)

Standards and regulations

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)

Safe isolation

Standard designation	Safe isolation
Standards/specifications	IEC 61558-2-16
Note	Transformer

Approvals

UL

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

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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

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)
EMC requirements for noise immunity	EN 61000-6-2

Conducted noise emission

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

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)
Frequency range	0 kHz ... 2 kHz

Electrostatic discharge

Standards/regulations	EN 61000-4-2
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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
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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
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Fast transients (burst)

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Input	asymmetrical 4 kV (Test Level 4)
Output	asymmetrical 2 kV (Test Level 3)
Comments	Criterion A

Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
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Surge voltage load (surge)

Input	symmetrical 2 kV (Test Level 4)
	asymmetrical 4 kV (Test Level 4)
Output	symmetrical 0.5 kV (Test Level 2)
	asymmetrical 1 kV (Test Level 3)
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	40 %
Number of periods	10 periods
Comments	Criterion A
Voltage dip	0 %
Number of periods	1 period
Comments	Criterion B
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.
Criterion C	Temporary adverse effects on the operating behavior, which the device corrects automatically or which can be restored by actuating the operating elements.

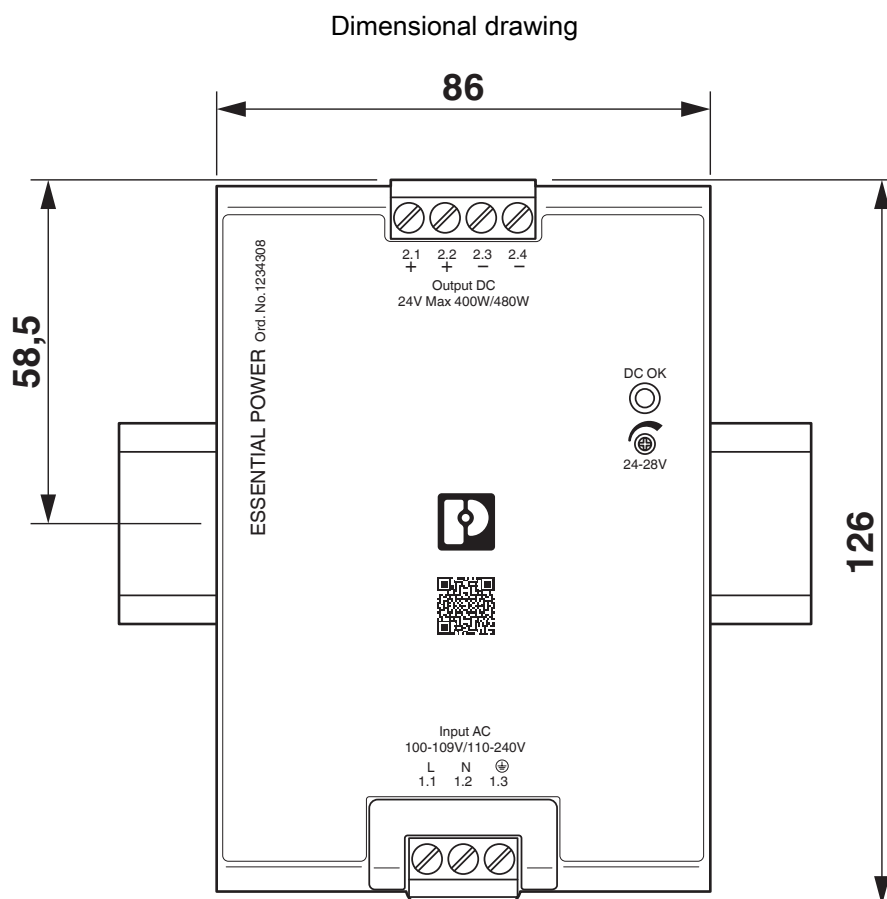
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Drawings



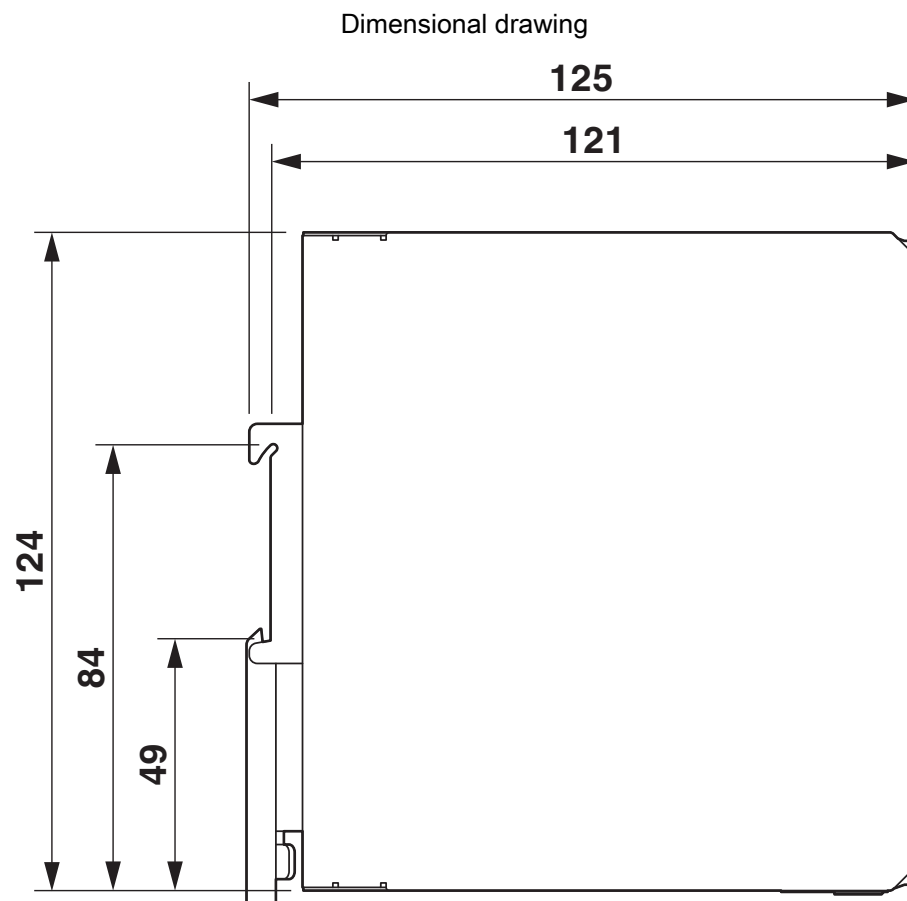
Device dimensions (dimensions in mm)

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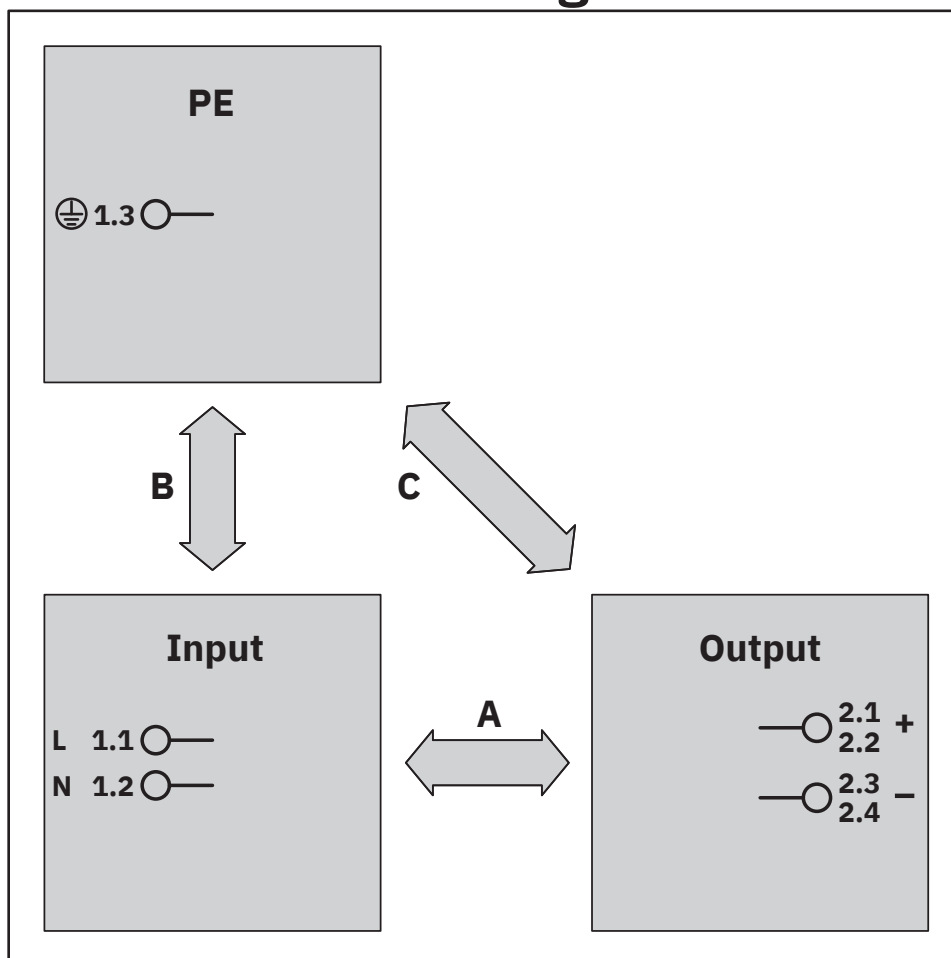
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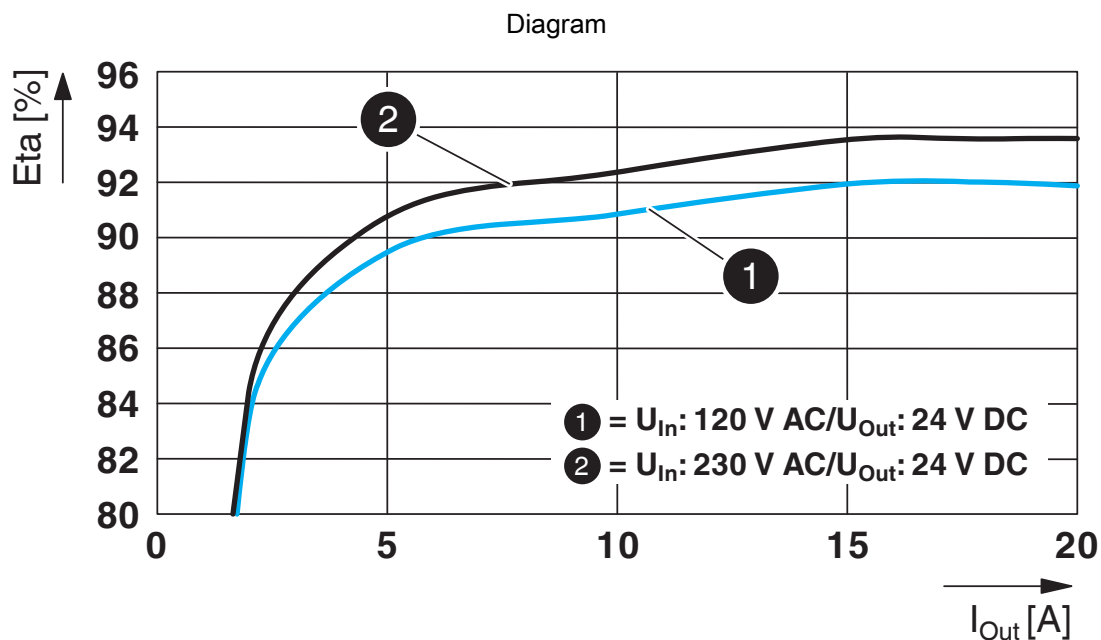
Device dimensions (dimensions in mm)

Schematic diagram

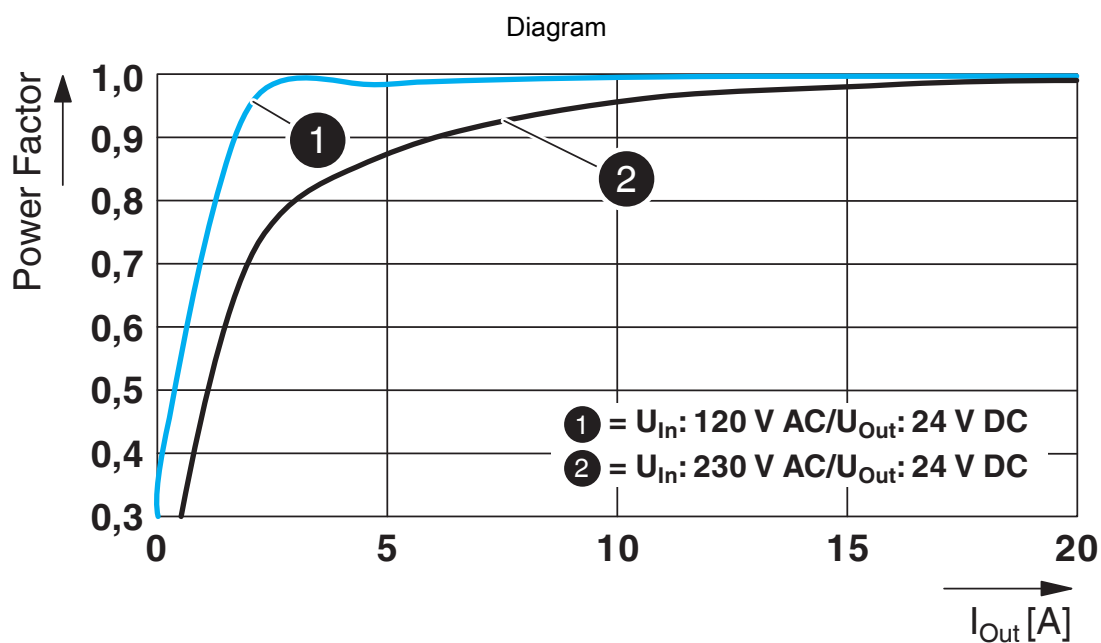
Housing



Test sections, insulation voltage



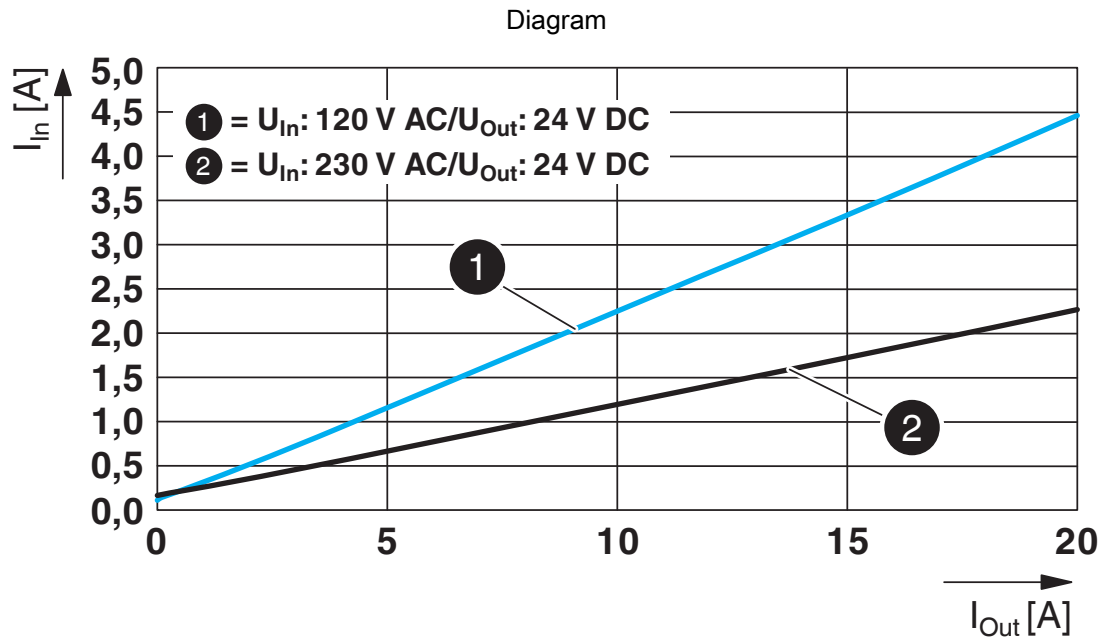
Efficiency



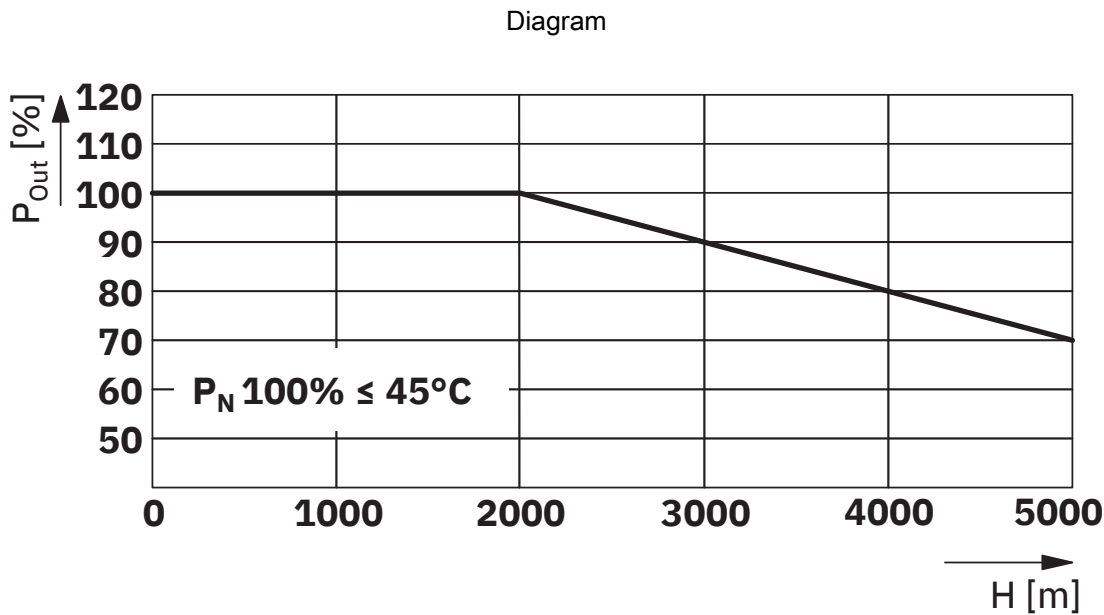
Power factor

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Input current/output current



Output power Installation altitude

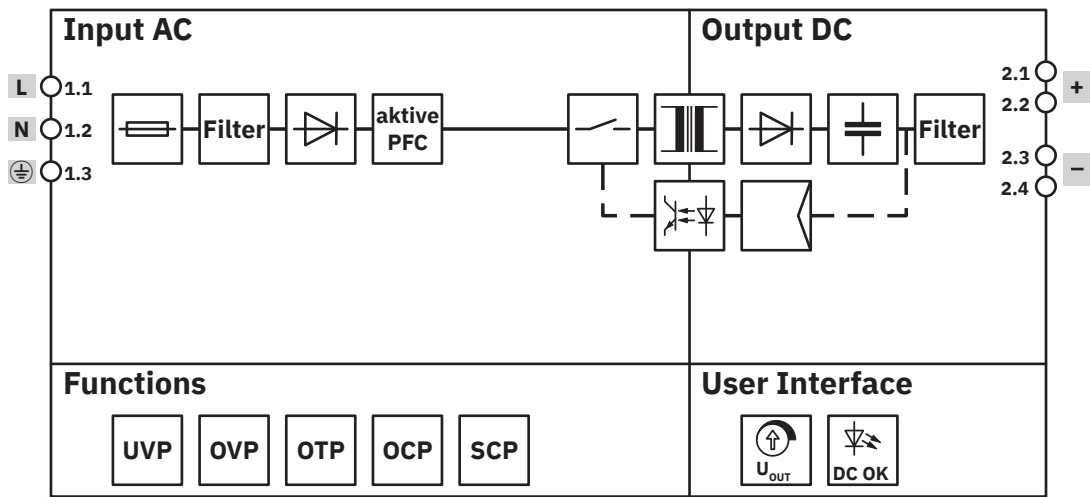
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Block diagram



Block diagram

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1234308>

	IECEE CB Scheme Approval ID: DE 2-039140
	cULus Listed Approval ID: E123528-20230614
	IECEE CB Scheme Approval ID: DE 2-039140
	BIS Licence Document Approval ID: R-41287490
	cULus Listed Approval ID: E123528-20230614
	IECEE CB Scheme Approval ID: JPTUV-148103-M1
	IECEE CB Scheme Approval ID: JPTUV-148103-M1
	BIS Licence Document Approval ID: R-41287490

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Classifications

ECLASS

ECLASS-13.0	27040701
ECLASS-15.0	27040701

ETIM

ETIM 10.0	EC002540
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UNSPSC

UNSPSC 21.0	26111700
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 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	7ca01468-b67a-4efa-b359-a91ba8d89713

EF3.1 Climate Change

CO2e kg	33.975 kg CO2e
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