

QUINT4-PS/1AC/24DC/40/+ - Power supply



2904618

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Primary-switched QUINT POWER supply for DIN rail mounting, with selectable output characteristic curve and SFB (Selective Fuse Breaking) Technology, protective coating and integrated decoupling MOSFET, input: 1-phase, output: 24 V DC / 40 A

Product description

The fourth generation of the high-performance QUINT POWER power supplies ensures superior system availability by means of new functions. Signaling thresholds and characteristic curves can be individually adjusted via the NFC interface. The unique SFB technology and preventive function monitoring of the QUINT POWER power supply increase the availability of your application.

Your advantages

- Integrated decoupling MOSFET maximizes system availability and operational safety
- Double overvoltage protection (OVP) switches the output off in the event of an error to reliably protect the loads against overvoltages.
- Protective coating offers protection against dust, corrosive gases, and humidity
- ATEX/IECEx approval in accordance with IEC 60079-0, -7, -11, and -15
- Wide temperature range allows use under extreme ambient conditions of -40°C to +75°C

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Technical data

Input data

Control input (configurable) Rem	Output power ON/OFF (SLEEP MODE)
Default	Output power ON (>40 k Ω /24 V DC/open bridge between Rem and SGnd)

AC operation

Network type	Star network
Input voltage	min. 77 V DC
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	100 V AC ... 240 V AC -15 % ... +10 %
Derating	< 100 V AC (1 %/V)
Electric strength, max.	300 V AC 60 s
Typical national grid voltage	120 V AC 230 V AC
Voltage type of supply voltage	AC
Inrush current	typ. 12 A (at 25 °C)
Inrush current integral (I^2t)	< 0.3 A ² s
Inrush current limitation	12 A (after 1 ms)
AC frequency range	50 Hz ... 60 Hz -10 % ... +10 %
Frequency range (f_N)	50 Hz ... 60 Hz -10 % ... +10 % 16.7 Hz (acc. to EN 50163)
Mains buffering time	typ. 27 ms (120 V AC) typ. 27 ms (230 V AC)
Current consumption	13.6 A (100 V AC) 9.9 A (120 V AC) 5.4 A (230 V AC) 5.4 A (240 V AC)
Nominal power consumption	1072 VA
Protective circuit	Transient surge protection; Varistor, gas-filled surge arrester
Switch-on time	< 1 s
Typical response time	300 ms (from SLEEP MODE)
Input fuse	16 A (slow-blow, internal)
Recommended breaker for input protection	16 A ... 20 A (Characteristic B, C, D, K or comparable)
Discharge current to PE	< 3.5 mA 1.7 mA (264 V AC, 60 Hz)

DC operation

Nominal input voltage range	110 V DC ... 250 V DC
Input voltage range	110 V DC ... 250 V DC -18 % ... +40 %
Derating	< 110 V DC (1 %/V)
Voltage type of supply voltage	DC
Current consumption	12 A (110 V DC)

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	5 A (250 V DC)
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Output data

Efficiency	typ. 94.7 % (120 V AC)
	typ. 95.7 % (230 V AC)
Output characteristic	U/I Advanced
	Smart HICCU
	FUSE MODE
Nominal output voltage	24 V DC
Setting range of the output voltage (U_{Set})	24 V DC ... 28 V DC (constant capacity)
Nominal output current (I_N)	40 A
Static Boost ($I_{Stat.Boost}$)	45 A
Dynamic Boost ($I_{Dyn.Boost}$)	60 A (5 s)
Selective Fuse Breaking (I_{SFB})	215 A (15 ms)
Magnetic circuit breaker tripping	A1...A40 / B2...B25 / C1...C13 / Z1...Z16
Derating	> 60 °C ... 70 °C (2.5 %/K)
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	< 30 V DC (double protection with shut off within 20 ms)
Control deviation	< 0.5 % (Static load change 10 % ... 90 %)
	< 2 % (Dynamic load change 10 % ... 90 %, (10 Hz))
	< 0.25 % (change in input voltage ±10 %)
Residual ripple	< 40 mV _{PP} (with nominal values)
Short-circuit-proof	yes
No-load proof	yes
Output power	960 W
	1080 W
	1440 W
Maximum no-load power dissipation	< 5 W (120 V AC)
	< 5 W (230 V AC)
Power loss nominal load max.	< 55 W (120 V AC)
	< 44 W (230 V AC)
Power dissipation SLEEP MODE	< 3 W (120 V AC)
	< 3 W (230 V AC)
Crest factor	typ. 1.7 (120 V AC)
	typ. 1.65 (230 V AC)
Rise time	< 60 ms (U_{Out} = 10 % ... 90 %)
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes
Fuse protection (secondary side)	electronic
	thermal-magnetic
	thermal

Signal

Signal ground SGnd	Reference potential for Out1, Out2, and Rem
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Signal Out 1 (configurable)

Digital	24 V DC 20 mA
Default	24 V DC 20 mA 24 V DC for $U_{Out} > 0.9 \times U_{Set}$

Signal Out 2 (configurable)

Digital	24 V DC 20 mA
Analog	4 mA ... 20 mA $\pm 5\%$ (Load $\leq 400\ \Omega$)
Default	24 V DC 20 mA 24 V DC for $P_{Out} < P_N$

Signal relay 13/14 (configurable)

Default	closed ($U_{out} > 0.9 U_{Set}$)
Digital	24 V DC 1 A
	30 V AC/DC 0.5 A

Connection data

Input

Connection method	Screw connection
Conductor cross-section, rigid min.	0.2 mm ²
Conductor cross-section, rigid max.	6 mm ²
Conductor cross-section flexible min.	0.2 mm ²
Conductor cross-section flexible max.	4 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.25 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	4 mm ²
Single conductor/flexible terminal point with ferrule without plastic sleeve, min.	0.25 mm ²
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	4 mm ²
Conductor cross-section AWG min.	24
Conductor cross-section AWG max.	10
Stripping length	8 mm
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Output

Connection method	Screw connection
Conductor cross-section, rigid min.	0.5 mm ²
Conductor cross-section, rigid max.	16 mm ²
Conductor cross-section flexible min.	0.5 mm ²
Conductor cross-section flexible max.	16 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.5 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	16 mm ²
Single conductor/flexible terminal point with ferrule without plastic	0.5 mm ²

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sleeve, min.	
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	16 mm ²
Conductor cross-section AWG min.	20
Conductor cross-section AWG max.	6
Stripping length	10 mm
Tightening torque, min	1.2 Nm
Tightening torque max	1.5 Nm

Signal

Connection method	Push-in connection
Conductor cross-section, rigid min.	0.2 mm ²
Conductor cross-section, rigid max.	1.5 mm ²
Conductor cross-section flexible min.	0.2 mm ²
Conductor cross-section flexible max.	1.5 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.2 mm ²
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	0.75 mm ²
Single conductor/flexible terminal point with ferrule without plastic sleeve, min.	0.2 mm ²
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	1.5 mm ²
Conductor cross-section AWG min.	24
Conductor cross-section AWG max.	16
Stripping length	8 mm

Signaling

Types of signaling	LED
	Floating signal contact
	Active signal output Out1 (digital, configurable)
	Active signal output Out2 (analog, configurable)
	Remote contact
	Signal ground SGnd

Signal output

Signal option	Output current
	Output voltage
	Output power
	U _{IN} input voltage OK
	Operating hours
	Early warning of high temperatures
	OVP voltage limitation active
P _{Out}	> 100 % (LED lights up yellow, output power > 960 W)
	> 75 % (LED lights up green, output power > 720 W)
	> 50 % (LED lights up green, output power > 480 W)

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U _{Out}	> 0.9 x U _{Set} (LED lights up green)
	< 0.9 x U _{Set} (LED flashes green)

Electrical properties

Number of phases	1
Insulation voltage input/output	4 kV AC (type test)
	2 kV AC (routine test)
Switching frequency	85.00 kHz ... 107.00 kHz (Auxiliary converter stage)
	45.00 kHz ... 200.00 kHz (Main converter stage)
	50.00 kHz ... 500.00 kHz (PFC stage)

Product properties

Product type	Power supply
Product family	QUINT POWER
MTBF (IEC 61709, SN 29500)	> 908000 h (25 °C)
	> 539000 h (40 °C)
	> 243000 h (60 °C)

Insulation characteristics

Protection class	I
Degree of pollution	2

Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	40 °C
Time	360000 h
Additional text	120 V AC

Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	40 °C
Time	455000 h
Additional text	230 V AC

Life expectancy (electrolytic capacitors)

Current	40 A
Temperature	25 °C
Time	389000 h
Additional text	120 V AC

Life expectancy (electrolytic capacitors)

Current	40 A
Temperature	25 °C
Time	460000 h
Additional text	230 V AC

Life expectancy (electrolytic capacitors)

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Current	40 A
Temperature	40 °C
Time	137000 h
Additional text	120 V AC

Life expectancy (electrolytic capacitors)

Current	40 A
Temperature	40 °C
Time	162000 h
Additional text	230 V AC

Dimensions

Width	120 mm
Height	130 mm
Depth	140 mm

Installation dimensions

Installation distance right/left	5 mm / 5 mm
Installation distance top/bottom	50 mm / 50 mm

Mounting

Mounting type	DIN rail mounting
Assembly note	alignable: $P_N \geq 50\%$, 5 mm horizontally, 15 mm next to active components, 50 mm vertically alignable: $P_N < 50\%$, 0 mm horizontally, 40 mm vertically top, 20 mm vertically bottom
Mounting position	horizontal DIN rail NS 35, EN 60715
With protective coating	yes

Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Metal
Hood version	Stainless steel X6Cr17
Side element version	Aluminum

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 75 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Maximum altitude	≤ 5000 m (> 2000 m, observe derating)
Climatic class	3K22 (in accordance with EN 60721-3-3)
Max. permissible relative humidity (operation)	≤ 100 % (at 25 °C, non-condensing)
Shock	11 ms, 15 g, in each space direction (according to IEC 60068-2-27)

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Vibration (operation)	5 Hz ... 100 Hz resonance search 0.7g, 90 min., resonance frequency 0.7g, 90 min. (in accordance with DNV GL Class A) 5 Hz ... 100 Hz resonance search 2.3g, 90 min., resonance frequency 2.3g, 90 min. (according to DNV GL Class C) mounted with UWA 130 - 2901664
Temp code	T4 (-40 ... +75 °C; > 60 °C, Derating: 2,5 %/K)

Standards and regulations

Rail applications	EN 50121-3-2
	EN 50121-4
	EN 50121-5
	EN 50163
	IEC 62236-3-2
	IEC 62236-4
	IEC 62236-5
	EN 50155
	EN 45545-2 (HL3)
	EN 61373 (Class 1B)
HART FSK Physical Layer Test Specification Compliance	Output voltage U_{Out} compliant
Standard – Limitation of mains harmonic currents	EN 61000-3-2
Standard - Electrical safety	IEC 61010-2-201 (SELV)
Explosive atmosphere	IEC 60079-0
	IEC 60079-7
	IEC 60079-11
	IEC 60079-15
Standard – Safety extra-low voltage	IEC 61010-1 (SELV)
	IEC 61010-2-201 (PELV)
Standard - Safe isolation	IEC 61558-2-16
	IEC 61010-2-201
Standard - safety for equipment for measurement, control, and laboratory use	IEC 61010-1
Battery charging	DIN 41773-1
Noxious gas test	ANSI/ISA 71.04-2013 G3 Harsh Group A
Approval - requirement of the semiconductor industry with regard to mains voltage dips	SEMI F47-0706, EN 61000-4-11

Fire protection in rail vehicles

Standard designation	Fire protection in rail vehicles
Standards/specifications	EN 45545-2 (HL3)

Approvals

CSA	CAN/CSA-C22.2 No. 61010-2-201
	CSA-C22.2 No. 107.1-16
Shipbuilding approval	DNV, BV
SIQ	CB-Scheme (IEC 61010-1, IEC 61010-2-201)
UL approvals	UL Listed UL 508

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	UL 121201 & CSA C22.2 No. 213-17 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location)
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Conformity/Approvals

ATEX	SIQ 23 ATEX 161 X
	Ex II 3 G Ex ec ic nC IIC T4 Gc
INMETRO	DNV 19.0187 X
IECEX	IECEX SIQ 23.0001X
	Ex ec ic nC IIC T4 Gc
Functional Safety in accordance with IEC 61508	SIL 3 (from device revision 01)

EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
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
EMC requirements for power supply	IEC 61850-3 (G,H)
	EN 61000-6-5 (switching devices)

Conducted noise emission

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

Noise emission

Standards/regulations	Additional basic standard EN 61000-6-5 (immunity in switching devices), IEC/EN 61850-3 (power supply)
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Noise emission

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

DNV GL conducted noise emissions

DNV	Class A
Additional text	Area power distribution

DNV GL noise radiation

DNV	Class A
Additional text	Area power distribution

Harmonic currents

Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)
Frequency range	0 kHz ... 2 kHz

Flicker

Standards/regulations	EN 61000-3-3
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	EN 61000-3-3
Frequency range	0 kHz ... 2 kHz
Electrostatic discharge	
Standards/regulations	EN 61000-4-2
Electrostatic discharge	
Contact discharge	8 kV (Test Level 4)
Discharge in air	15 kV (Test Level 4)
Comments	Criterion A
Electromagnetic HF field	
Standards/regulations	EN 61000-4-3
Electromagnetic HF field	
Frequency range	80 MHz ... 1 GHz
Test field strength	20 V/m (Test Level 3)
Frequency range	1 GHz ... 6 GHz
Test field strength	10 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	4 kV (Test Level 4 - asymmetrical)
Signal	4 kV (Test Level 4 - asymmetrical)
Comments	Criterion A
Surge voltage load (surge)	
Standards/regulations	EN 61000-4-5
Surge voltage load (surge)	
Input	typ. 3 kV (Test Level 4 - symmetrical)
	typ. 6 kV (Test Level 4 - asymmetrical)
Output	1 kV (Test Level 3 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Signal	4 kV (Test Level 4 - asymmetrical)
Comments	Criterion A
Conducted interference	
Standards/regulations	EN 61000-4-6
Conducted interference	
Input/output/signal	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A

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Voltage	10 V (Test Level 3)
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Power frequency magnetic field

Standards/regulations	EN 61000-4-8
Frequency	16.7 Hz
	50 Hz
	60 Hz
Test field strength	100 A/m
Additional text	60 s
Comments	Criterion A
Frequency	50 Hz
	60 Hz
Frequency range	50 Hz ... 60 Hz
Test field strength	1 kA/m
Additional text	3 s
Frequency	0 Hz
Test field strength	300 A/m
Additional text	DC, 60 s

Voltage dips

Standards/regulations	EN 61000-4-11
Voltage	230 V AC
Frequency	50 Hz
Voltage dip	70 %
Number of periods	0.5 / 1 / 25 / 30 periods
Additional text	Test Level 2
Comments	Criterion A: 0.5 / 1 / 25 / 30 periods
Voltage dip	40 %
Number of periods	5 / 10 / 50 periods
Additional text	Test Level 2
Comments	Criterion A
Voltage dip	0 %
Number of periods	0.5 / 1 / 5 / 50 / 250 periods
Additional text	Test Level 2
Comments	Criterion A: 0.5 / 1 period Criterion B: 5 / 50 / 250 periods

Pulse-shape magnetic field

Standards/regulations	EN 61000-4-9
Test field strength	1000 A/m
Comments	Criterion A

Attenuated sinusoidal oscillations (ring wave)

Standards/regulations	EN 61000-4-12
Input	2 kV (Test Level 4 - symmetrical)
	4 kV (Test Level 4 - asymmetrical)

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Comments	Criterion A
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Asymmetrical conducted disturbance variables

Standards/regulations	EN 61000-4-16
Test level 1	15 Hz 150 Hz (Test Level 4)
Voltage	30 V 3 V
Test level 2	150 Hz 1.5 kHz (Test Level 4)
Voltage	3 V
Test level 3	1.5 kHz 15 kHz (Test Level 4)
Voltage	3 V 30 V
Test level 4	15 kHz 150 kHz (Test Level 4)
Voltage	30 V
Test level 5	16.7 Hz 50 Hz 60 Hz (Test Level 4)
Voltage	30 V (10 s)
Test level 6	150 Hz 180 Hz (Test Level 4)
Voltage	30 V (10 s)
Test level 7	16.7 Hz 50 Hz 60 Hz (Test Level 4)
Voltage	300 V (3 s)
Comments	Criterion A

Attenuated oscillating wave

Standards/regulations	EN 61000-4-18
Input, output (test level 1)	100 kHz 1 MHz (Test Level 3 - symmetrical)
Voltage	1 kV
Input, output (test level 2)	10 MHz (Test Level 3 - asymmetrical)
Voltage	2 kV
Input, output (test level 3)	100 kHz 1 MHz (Test Level 3 - asymmetrical)
Voltage	2.5 kV
Signals (test level 1)	100 kHz 1 MHz (Test Level 3 - symmetrical)
Voltage	1 kV
Signals (test level 2)	100 kHz 1 MHz (Test Level 3 - asymmetrical)
Voltage	2.5 kV
Comments	Criterion A

Attenuated oscillating magnetic field

Standards/regulations	EN 61000-4-10
Test field strength	100 A/m
Test level 1	100 kHz
Test field strength	100 A/m
Test level 2	1 MHz
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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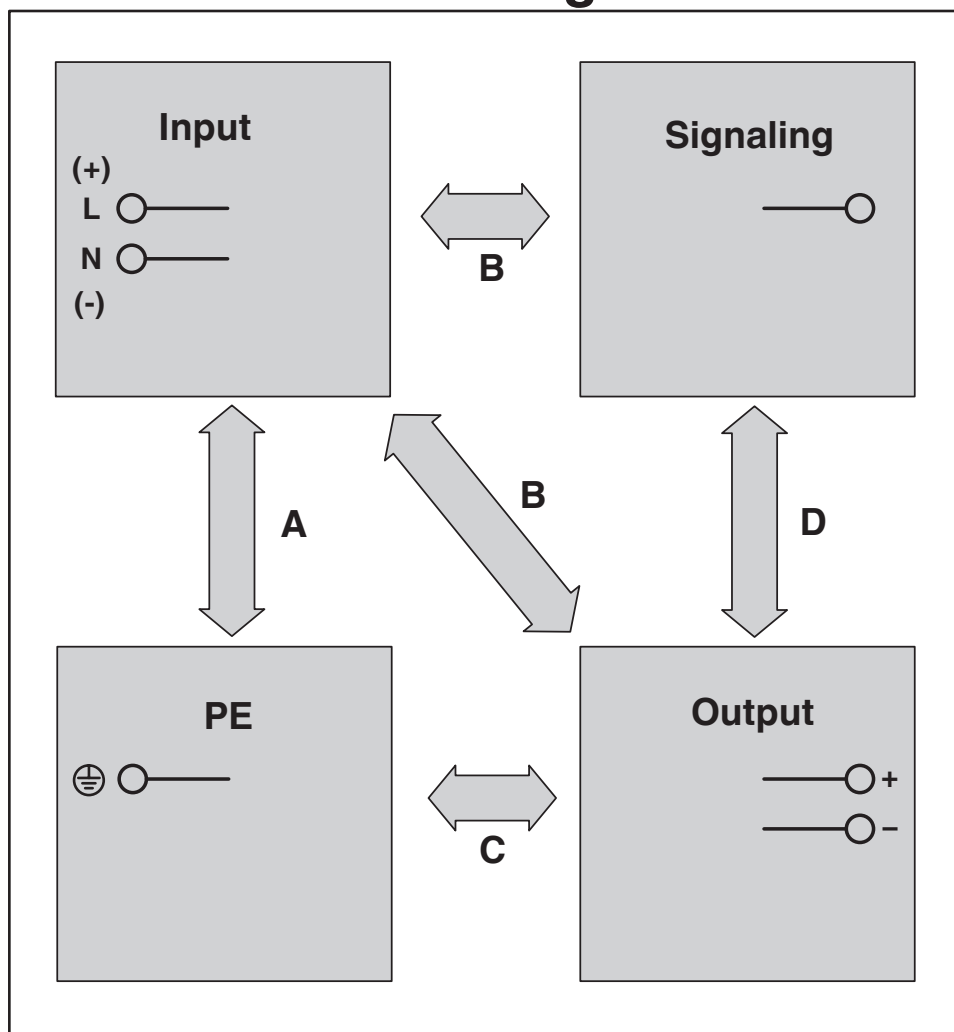
<https://www.phoenixcontact.com/gb/products/2904618>

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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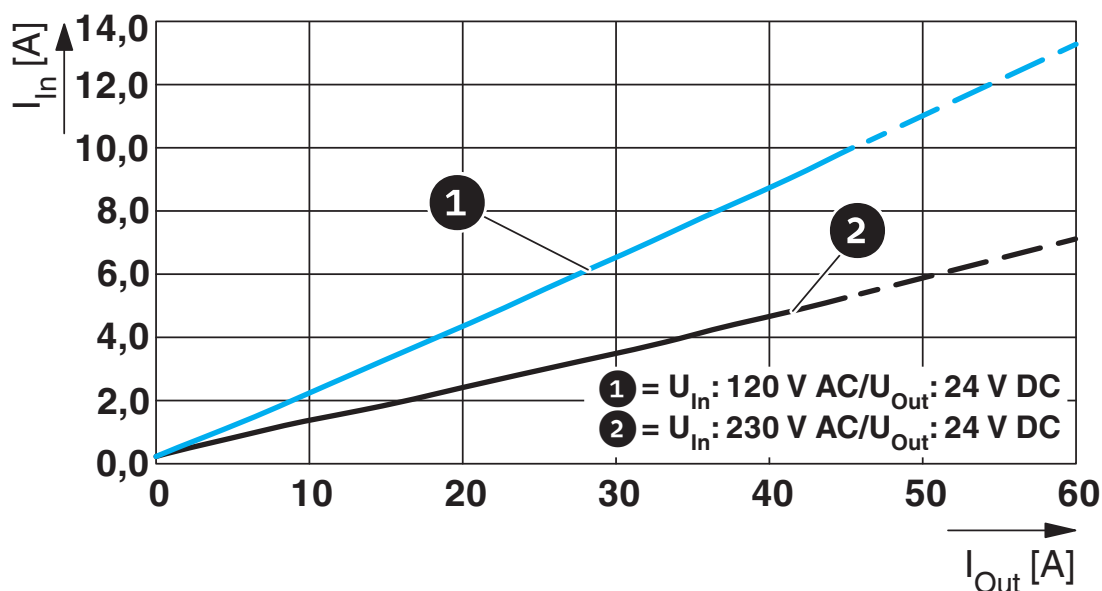
Drawings

Schematic diagram

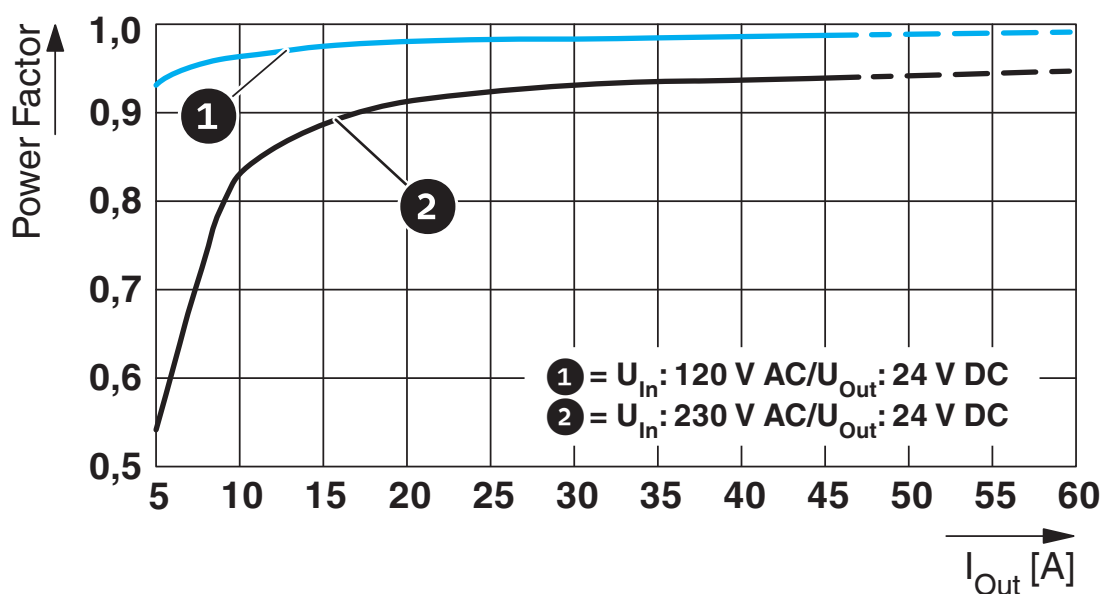
Housing



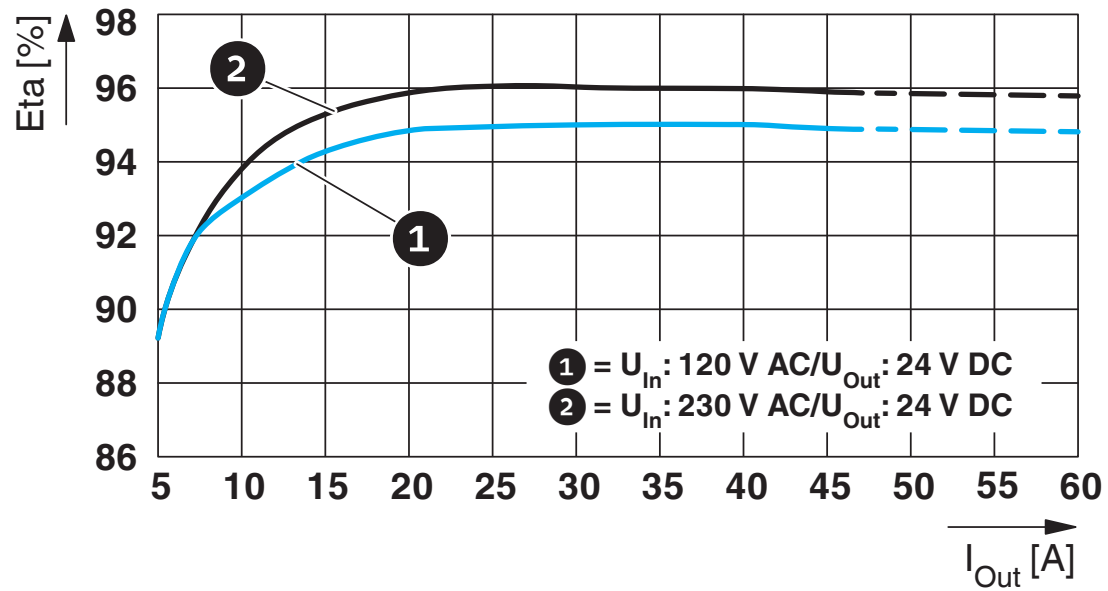
Diagram



Diagram



Diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/gb/products/2904618>



IECEE CB Scheme

Approval ID: SI-10371



cULus Listed

Approval ID: E123528-20230713

DNV

Approval ID: TAA00001YD



BV

Approval ID: 44621/B1 BV



Type approved

Approval ID: SI-SIQ BG 005/111

SEMI F47

Approval ID: SEMI F47

CoC / Compliance Statement

Approval ID: 24PP124-01_0

ABS

Approval ID: 26-0442641-PDA



IECEx

Approval ID: IECEx SIQ 23.0001X



ATEX

Approval ID: SIQ 23 ATEX 161 X



UKCA-EX

Approval ID: 23UKEX1677X

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CCC

Approval ID: 2023322303005406



NEPSI-EX

Approval ID: GYJ23.1281X

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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	39121000
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	6(c), 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	f4056b4b-5ea3-42a9-978c-864fcec62c5c

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