

QUINT4-PS/12-24DC/5-15DC/2.5/PT - DC/DC converter



1066704

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Primary-switched DC/DC converter, QUINT POWER, DIN rail mounting, input: 12 V DC - 24 V DC, output: 12 V DC / 2.5 A

Product description

In the power range of up to 100 W, QUINT POWER provides superior system availability in the smallest size. Preventative function monitoring and exceptional power reserves are available for applications in the low-power range.

Your advantages

- Most powerful output side: easy system expansion, reliable heavy load startup and miniature circuit breaker tripping
- Most comprehensive signaling: preventive function monitoring reports critical operating states before errors occur
- Free selection between Push-in and screw connection

Commercial data

Item number	1066704
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM01
Product key	CMDI43
GTIN	4055626734255
Weight per piece (including packing)	225.9 g
Weight per piece (excluding packing)	172 g
Customs tariff number	85044095
Country of origin	CN

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Technical data

Input data

Nominal input voltage range	12 V DC ... 24 V DC
Input voltage range	12 V DC ... 24 V DC -25 % ... +33 % (SELV)
Wide-range input	yes
Electric strength, max.	35 V DC (60 s)
Inrush current	typ. 1.5 A
Inrush current integral (I^2t)	typ. 0.05 A ² s
Inrush current limitation	typ. 1.5 A
Mains buffering time	typ. 20 ms (24 V DC)
Current consumption	typ. 3.55 A (12 V DC) typ. 1.75 A (24 V DC)
Switch-on time	< 1 s
Input fuse	15 A (fast blow, internal)
Recommended breaker for input protection	10 A ... 16 A (Characteristic B, C, D, K or comparable)

Output data

Efficiency	typ. 92.2 % (12 V DC)
Output characteristic	U/I Advanced
Nominal output voltage	12 V DC
Setting range of the output voltage (U_{Set})	5 V DC ... 15 V DC (> 12 V DC, constant capacity)
Nominal output current (I_N)	2.5 A
Static Boost ($I_{Stat.Boost}$)	3.125 A (≤ 40 °C)
Dynamic Boost ($I_{Dyn.Boost}$)	5 A (≤ 60 °C (4.9 s))
Short-circuit-proof	yes
No-load proof	yes
Derating	> 60 °C (2.5%/K of P_{Out} nom.)
Output power (P_N)	30 W
Output power ($P_{Stat. Boost}$)	37.5 W
Output power ($P_{Dyn. Boost}$)	60 W
Feedback voltage resistance	≤ 25 V DC
Protection against overvoltage at the output (OVP)	≤ 18 V DC
Residual ripple	< 20 mV _{PP}
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
Rise time	< 1 s (U_{OUT} (10 % ... 90 %))
Connection in series	yes
Maximum no-load power dissipation	< 0.5 W
Power loss nominal load max.	< 2.7 W
Connection in parallel	yes, for redundancy and increased capacity

Signal (configurable)

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Digital	0 V DC
	24 V DC
	22 mA
Default	24 V DC
	22 mA
	24 V DC for $U_{\text{Out}} > 0.9 \times U_{\text{Set}}$

Connection data

Input

Position	1.x
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Conductor connection

Connection method	Push-in connection
rigid	0.5 mm ² ... 2.5 mm ²
flexible	0.5 mm ² ... 2.5 mm ²
flexible with ferrule without plastic sleeve	0.5 mm ² ... 2.5 mm ²
flexible with ferrule with plastic sleeve	0.5 mm ² ... 2.5 mm ²
rigid (AWG)	22 ... 14
Stripping length	10 mm

Output

Position	2.x
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 2.5 mm ²
flexible	0.25 mm ² ... 2.5 mm ²
flexible with ferrule without plastic sleeve	0.25 mm ² ... 2.5 mm ²
flexible with ferrule with plastic sleeve	0.25 mm ² ... 2.5 mm ²
rigid (AWG)	20 ... 14
Stripping length	10 mm

Signal

Position	3.x
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 2.5 mm ²
flexible	0.25 mm ² ... 2.5 mm ²
flexible with ferrule without plastic sleeve	0.25 mm ² ... 2.5 mm ²
flexible with ferrule with plastic sleeve	0.25 mm ² ... 2.5 mm ²
rigid (AWG)	24 ... 14
Stripping length	10 mm

Signaling

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LED signaling

Signal threshold	> P_{Thr} (LED lights up yellow, output power > P_{Thr} , depending on the rotary selector switch setting)
	> $0.9 \times U_{Set}$ (LED lights up green)
	< $0.9 \times U_{Set}$ (LED flashes green)

Electrical properties

Number of phases	1.00
Insulation voltage input/output	2.6 kV DC (type test)
	1.2 kV DC (routine test)
Switching frequency	4.00 kHz ... 70.00 kHz (Auxiliary converter stage)
	70.00 kHz ... 150.00 kHz (Main converter stage)

Product properties

Product family	QUINT POWER
MTBF (IEC 61709, SN 29500)	> 2804000 h (25 °C)
	> 1590000 h (40 °C)
	> 687000 h (60 °C)

Data management status

Article revision	01
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Insulation characteristics

Protection class	II
Degree of pollution	2

Life expectancy (electrolytic capacitors)

Current	1.25 A
Temperature	40 °C
Time	422000 h
Additional text	12 V DC

Life expectancy (electrolytic capacitors)

Current	2.5 A
Temperature	40 °C
Time	226000 h
Additional text	12 V DC

Life expectancy (electrolytic capacitors)

Current	2.5 A
Temperature	30 °C
Time	452000 h
Additional text	12 V DC

Dimensions

Item dimensions

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Width	22.5 mm
Height	106 mm
Depth	90 mm

Installation dimensions

Installation distance right/left (active)	15 mm / 15 mm ($P_{Out} \geq 50\%$)
Installation distance right/left (passive)	5 mm / 5 mm ($P_{Out} \geq 50\%$)
Installation distance right/left (active, passive)	0 mm / 0 mm ($P_{Out} \leq 50\%$)
Installation distance top/bottom (active)	30 mm / 30 mm ($P_{Out} \geq 50\%$)
Installation distance top/bottom (passive)	30 mm / 30 mm ($P_{Out} \geq 50\%$)
Installation distance top/bottom (active, passive)	30 mm / 30 mm ($P_{Out} \leq 50\%$)

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
With protective coating	no

Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Plastic
Type of housing	Polycarbonate (PC), UL 94 V0

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Maximum altitude	≤ 5000 m (> 2000 m, observe derating)
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, ±2.5 mm amplitude; 15 Hz ... 100 Hz: 2.3 g 90 Min. (in accordance with IEC 60068-2-6)

Standards and regulations

Overvoltage category

EN 61010-1	II (≤ 5000 m)
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Safety for measurement, control, and laboratory equipment

Standard designation	Electrical safety (of control and regulation devices)
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Standards/specifications	IEC 61010-1
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Protective extra-low voltage

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

Mains voltage dips

Standard designation	Mains variation/undervoltage
Standards/specifications	EN 61000-4-29

Approvals

SIQ	CB-Scheme (IEC 61010-1, IEC 61010-2-201)
UL approvals	UL Listed UL 61010-1
	UL Listed UL 61010-2-201
	ANSI/UL 121201 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

UL

Identification	UL Listed UL 61010-1
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UL

Identification	CAN/CSA C22.2 No. 61010-1-12
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UL

Identification	UL Listed UL 61010-2-201
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UL

Identification	CAN/CSA C22.2 No. 61010-2-201:18
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UL

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

Identification	IEC 61010-1
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CB scheme

Identification	IEC 61010-2-201
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Shipbuilding

Identification	DNV GL
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EMC data

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
EMC requirements, power plant	EN 61850-3

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	EN 61000-6-5
Conducted noise emission	EN 55016
	EN 61000-6-3 (Class B)
Noise emission	Additional basic standard EN 61000-6-5 (immunity in power station), IEC/EN 61850-3 (energy supply)
Noise emission	EN 55016
	EN 61000-6-3 (Class B)
DNV GL conducted interference	Class B
Additional text	Bridge and deck area
DNV GL noise radiation	Class B
Additional text	Bridge and deck area

Electrostatic discharge

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

Input	2 kV (Test Level 4 - asymmetrical)
Output	2 kV (Test Level 4 - asymmetrical)
Signal	2 kV (Test Level 4 - asymmetrical)
Comments	Criterion B

Surge voltage load (surge)

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

Input	0.5 kV (Test Level 3 - symmetrical)
	1 kV (Test Level 3 - asymmetrical)
Output	0.5 kV (Test Level 2 - symmetrical)
	1 kV (Test Level 1 - asymmetrical)
Signal	0.5 kV (Test Level 2 - symmetrical)

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	1 kV (Test Level 1 - asymmetrical)
Comments	Criterion B

Conducted interference

Standards/regulations	EN 61000-4-6
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Conducted interference

I/O/S	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

Power frequency magnetic field

Standards/regulations	EN 61000-4-8
Frequency	16.67 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 61000-4-29
Voltage	24 V DC
Voltage dip	70 %
Number of periods	0.5 / 1 / 25 periods
Time	100 ms
Additional text	Test Level 2
Comments	Criterion A
Voltage dip	40 %
Number of periods	5 / 10 / 50 periods
Time	100 ms
Additional text	Test Level 2
Comments	Criterion A
Voltage dip	0 %
Number of periods	0.5 / 1 / 5 / 50 periods
Time	50 ms
Additional text	Test Level 2

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Comments	Criterion B
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Pulse-shape magnetic field

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

Asymmetrical conducted disturbance variables

Standards/regulations	EN 61000-4-16
Test level 1	15 Hz 150 Hz (Test Level 3)
Voltage	10 V 1 V (Permanent)
Test level 2	150 Hz 1.5 kHz (Test Level 3)
Voltage	1 V
Test level 3	1.5 kHz 15 kHz (Test Level 3)
Voltage	1 V 10 V
Test level 4	15 kHz 150 kHz (Test Level 3)
Voltage	10 V
Test level 5	16.7 Hz 50 Hz 60 Hz 150 Hz 180 Hz (Test Level 3)
Voltage	10 V (Permanent)
Test level 6	0 Hz 16.7 Hz 50 Hz 60 Hz (Test Level 3)
Voltage	100 V (1 s)
Comments	Criterion A

Alternating component of direct voltage

Standards/regulations	EN 61000-4-17
Alternating component	10 % (U_N)
Frequency	50 Hz
	100 Hz
	150 Hz
	300 Hz
Comments	Criterion A

Attenuated oscillating wave

Standards/regulations	EN 61000-4-18
Input, output (test level 1)	1 MHz (Test Level 2 - symmetrical)
Voltage	0.5 kV
Input, output (test level 2)	1 MHz (Test Level 2 - asymmetrical)
Voltage	1 kV
Signals (test level 1)	1 MHz (Test Level 2 - symmetrical)
Voltage	0.5 kV
Signals (test level 2)	1 MHz (Test Level 2 - asymmetrical)
Voltage	1 kV
Comments	Criterion A

Attenuated oscillating magnetic field

Standards/regulations	EN 61000-4-10
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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.
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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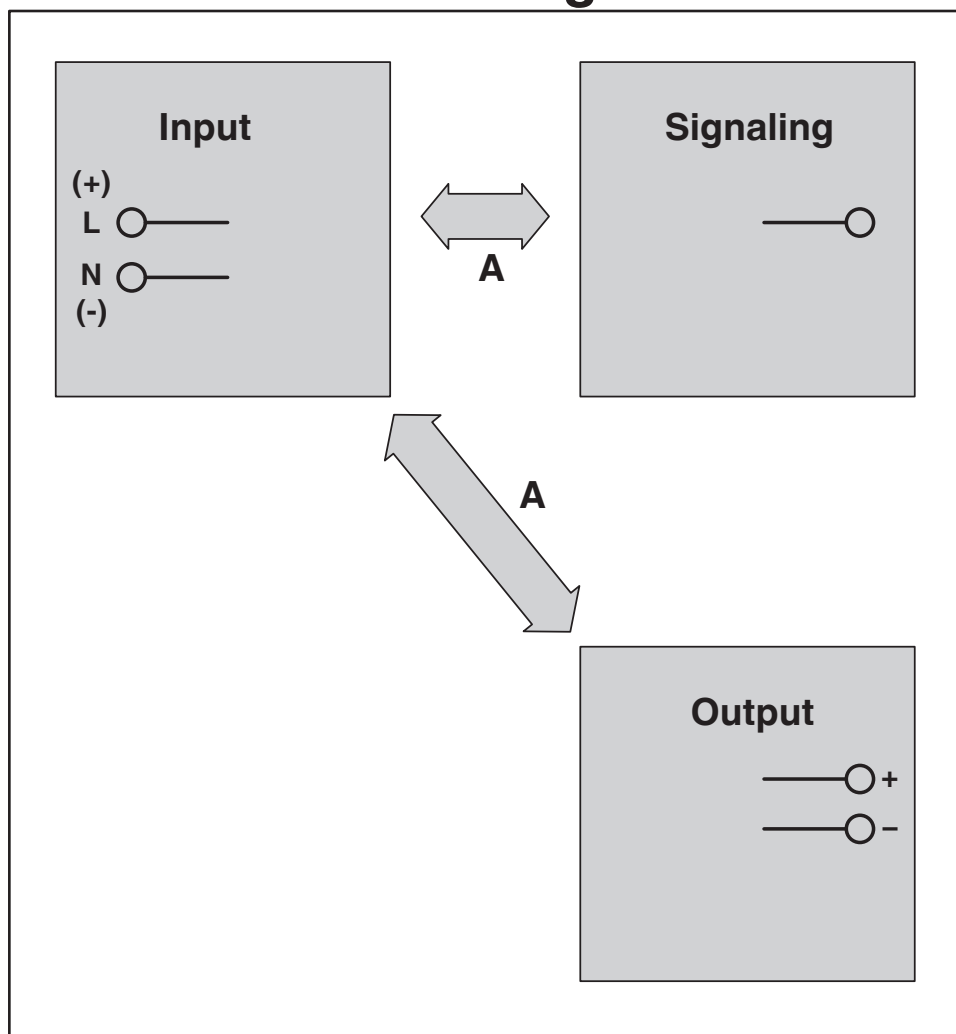
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Drawings

Schematic diagram

Housing



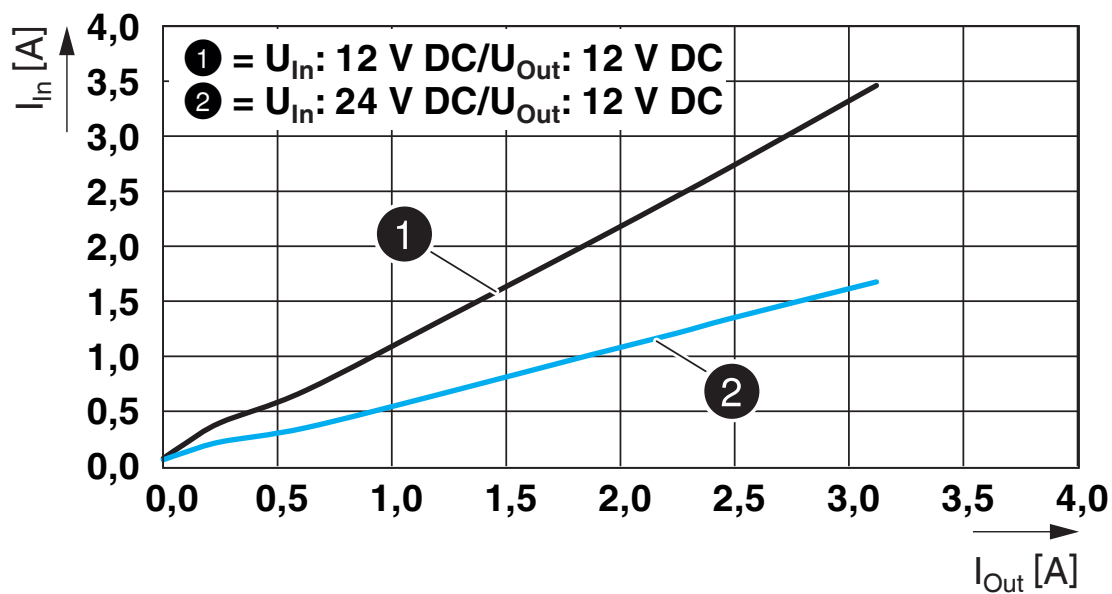
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Diagram



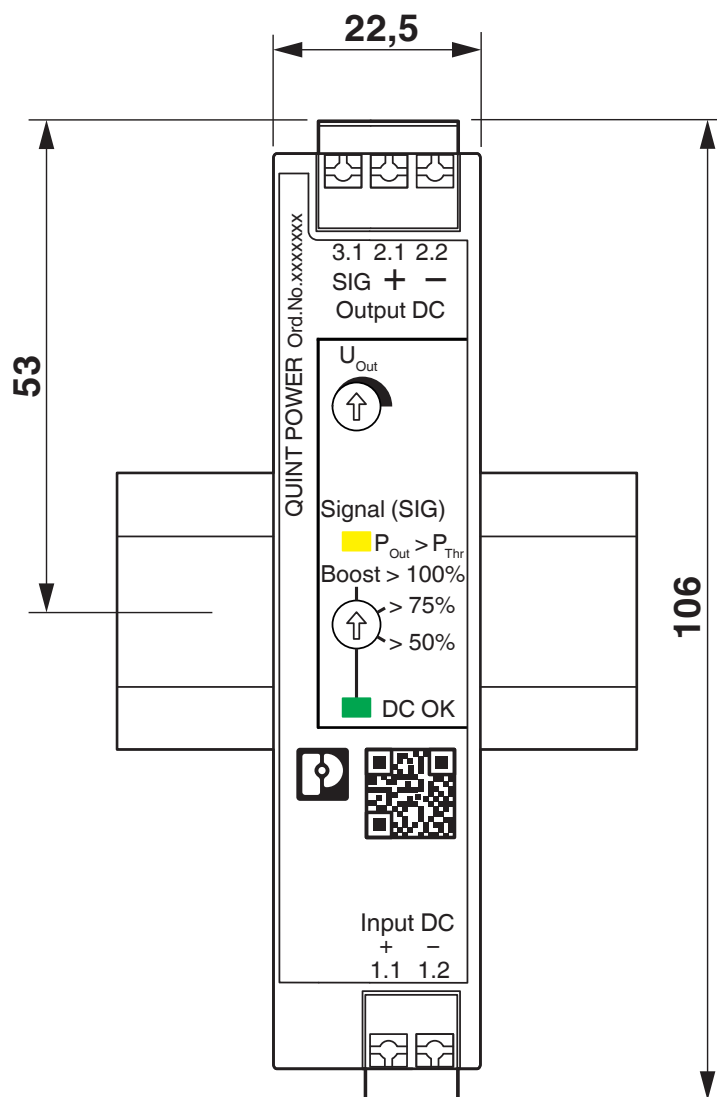
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Dimensional drawing



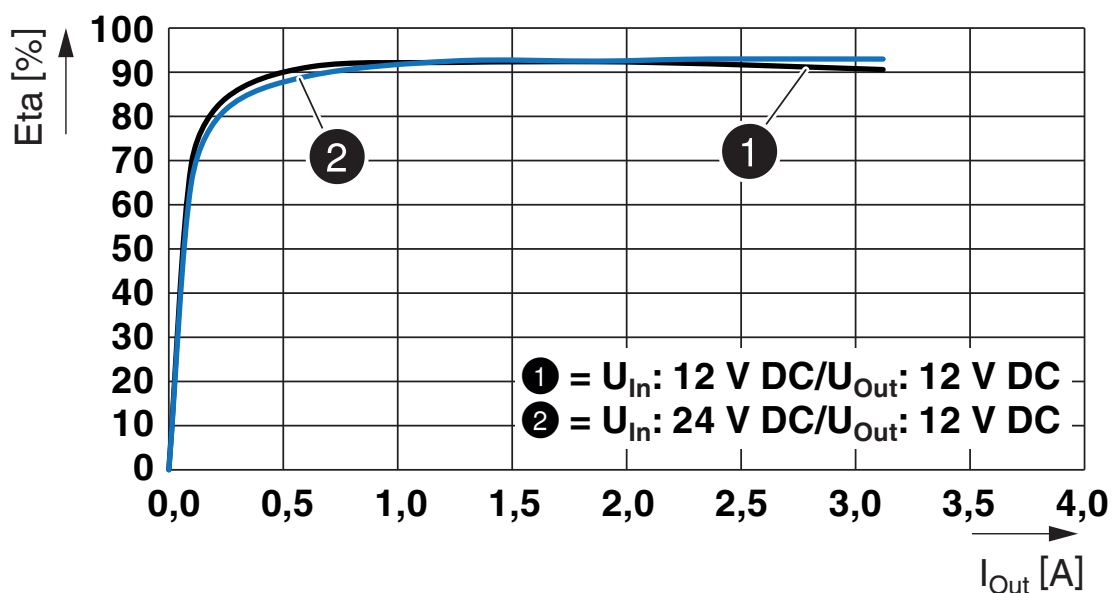
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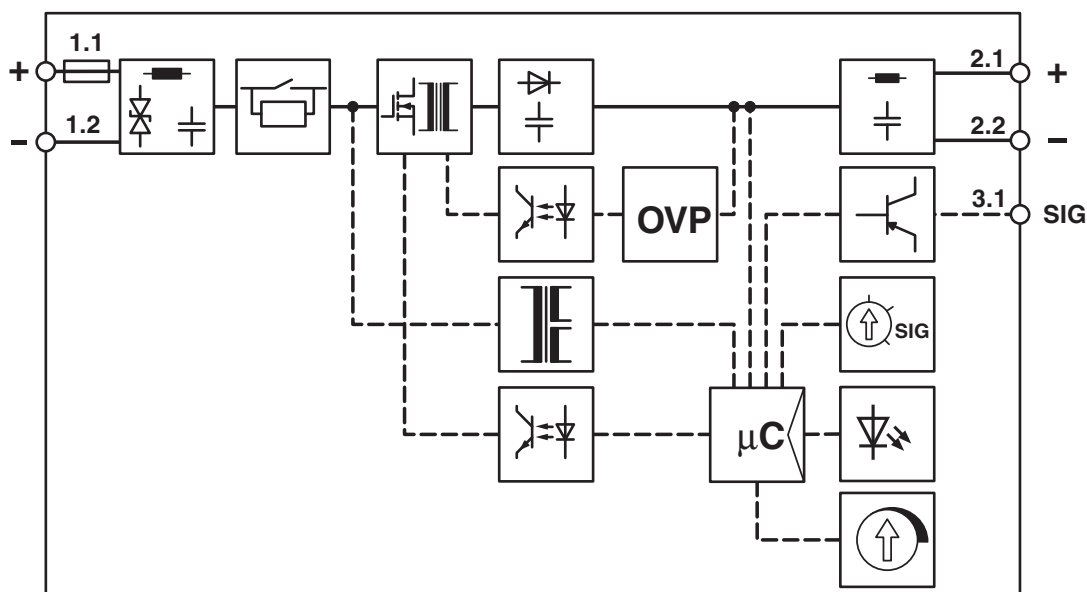
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Diagram



Block diagram



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Approvals

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IECEE CB Scheme
Approval ID: DK-97404-UL



IECEE CB Scheme
Approval ID: DE/PTZ/0122



cULus Listed
Approval ID: FILE E 123528

DNV
Approval ID: TAA00000BV



cULus Listed
Approval ID: FILE E 199827

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Classifications

ECLASS

ECLASS-11.0	27040701
ECLASS-12.0	27040701
ECLASS-13.0	27040701

ETIM

ETIM 9.0	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	9c878f7f-4d9b-480d-8667-aa365ab106a2

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Accessories

SF-SL 0,4X2,0-60 - Screwdriver

1212546

<https://www.phoenixcontact.com/us/products/1212546>



Screwdriver, flat bladed, size: 0.4 x 2.0 x 60 mm, 2-component grip, with non-slip grip

PLT-SEC-T3-24-FM-UT - Type 3 surge protection device

2907916

<https://www.phoenixcontact.com/us/products/2907916>



Type 3 surge protection, consisting of protective plug and base element, with integrated status indicator and remote signaling for single-phase power supply networks. Nominal voltage: 24 V AC/DC

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