

# DC/DC converters - QUINT4-PS/12-24DC/24DC/2.5/SC



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

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## 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

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## Commercial Data

Order Key	1066718
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	CMDI43
Product Key	CMDI43
GTIN	4055626734507
Weight per Piece (including packing)	321 g
Weight per Piece (excluding packing)	246 g
Customs tariff number	85044030
Country of origin	CN

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## Technical Data

### Input data

Nominal input voltage range	12 V DC ... 24 V DC -25 % ... +33 %
Input voltage range	9 V DC ... 24 V DC -25 % (SELV)
Electric strength, max.	35 V DC (60 s)
Inrush current	typ. 8.6 A
Inrush current integral ( $I^2t$ )	typ. 0.1 A <sup>2</sup> s
Inrush current limitation	8.6 A
Mains buffering time	typ. 16 ms (24 V DC)
Current consumption	typ. 7.2 A (12 V DC)
	typ. 3.5 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. 92.1 % (24 V DC)
Output characteristic	U/I Advanced
	Smart HICCUP
	FUSE MODE
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)
Nominal output current ( $I_N$ )	2.5 A
Static Boost ( $I_{Stat.Boost}$ )	3.125 A ( $\leq 40$ °C)
Dynamic Boost ( $I_{Dyn.Boost}$ )	5 A ( $\leq 60$ °C (4,9 s))
Short-circuit-proof	yes
No-load proof	yes
Derating	> 60 °C (2.5%/K of $P_{Out}$ nom.)
Output power ( $P_N$ )	60 W
	75 W
	120 W
Feedback voltage resistance	$\leq 35$ V DC
Protection against overvoltage at the output (OVP)	$\leq 32$ V DC
Residual ripple	< 20 mV <sub>PP</sub>
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	< 1.3 W
Power loss nominal load max.	< 8 W
Connection in parallel	yes, for redundancy and increased capacity

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## Signal (configurable)

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

## Connection data

### Input

Connection method	Screw connection
Conductor cross section solid	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section (ferrule with plastic sleeve)	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section AWG	18 ... 14
Stripping length	8 mm
Torque	0.5 Nm ... 0.6 Nm

### Output

Connection method	Screw connection
Conductor cross section solid	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section (ferrule with plastic sleeve)	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.5 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section AWG	20 ... 14
Stripping length	8 mm
Torque	0.5 Nm ... 0.6 Nm

### Signal

Connection method	Screw connection
Conductor cross section solid	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section (ferrule with plastic sleeve)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section AWG	26 ... 14
Stripping length	8 mm
Torque	0.5 Nm ... 0.6 Nm

## LED signaling

$P_{Out}$	> $P_{Thr}$ (LED lights up yellow, output power > $P_{Thr}$ , depending on the rotary selector switch setting)
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$U_{Out}$	> 0.9 x $U_{Set}$ (LED lights up green)
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## 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	130 kHz ... 130 kHz (Auxiliary converter stage)
	70 kHz ... 250 kHz (Main converter stage)

## Product properties

MTBF (IEC 61709, SN 29500)	> 1999348 h (25 °C)
	> 1120490 h (40 °C)
	> 471066 h (60 °C)

## Insulation characteristics

Protection class	II
Degree of pollution	2

## Life expectancy (electrolytic capacitors)

Current	1.25 A
Temperature	40 °C
Time	242000 h
Additional text	24 V DC

## Life expectancy (electrolytic capacitors)

Current	2.5 A
Temperature	40 °C
Time	160000 h
Additional text	24 V DC

## Life expectancy (electrolytic capacitors)

Current	2.5 A
Temperature	30 °C
Time	320000 h
Additional text	24 V DC

## Dimensions

Dimensional drawing	
Width	32 mm

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Height	99 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 ( $P_{Out} \leq 50\%$ )

## Alternative assembly

Width	90 mm
Height	99 mm
Depth	32 mm

## Mounting

Mounting type	DIN rail mounting
Assembly instructions	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

## Material specifications

Inflammability class in acc. with 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

Standards/specifications	IEC 61010-1
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## Protective extra-low voltage

Standards/specifications	IEC 61010-1 (SELV)
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## Mains voltage dips

Standards/specifications	EN 61000-4-29
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## Approval data

SIQ	CB-Scheme (IEC 61010-1, IEC 61010-2-201)
UL approvals	UL Listed UL 61010-1
	UL Listed UL 61010-2-201
	UL 1310 Class 2 Power Units
	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

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
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, power plant	EN 61850-3

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	EN 61000-6-5
Conducted noise emission	EN 55016
	EN 61000-6-3 (Class B)
Interference emission	Noise emission according to EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)
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)
Noise immunity	Immunity according to EN 61000-6-1 (residential), EN 61000-6-2 (industrial), and EN 61000-6-5 (power station equipment zone), IEC/EN 61850-3 (energy supply)
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	6 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	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
Input	1 kV (Test Level 4 - symmetrical)
	2 kV (Test Level 4 - asymmetrical)

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Output	1 kV (Test Level 3 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Signal	1 kV (Test Level 4 - symmetrical)
	2 kV (Test Level 4 - asymmetrical)
Comments	Criterion A

## 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 %

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Number of periods	0.5 / 1 / 5 / 50 periods
Time	50 ms
Additional text	Test Level 2
Comments	Criterion B

## 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

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## 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
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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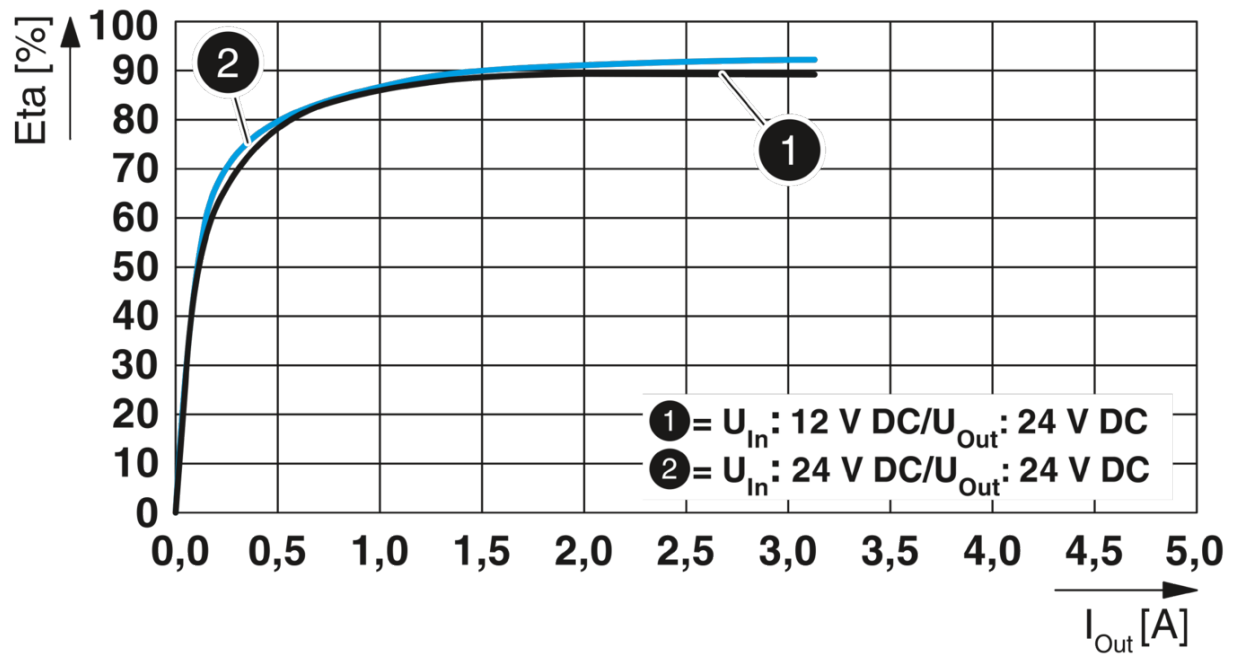


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## Drawings

Diagram



# DC/DC converters - QUINT4-PS/12-24DC/24DC/2.5/SC

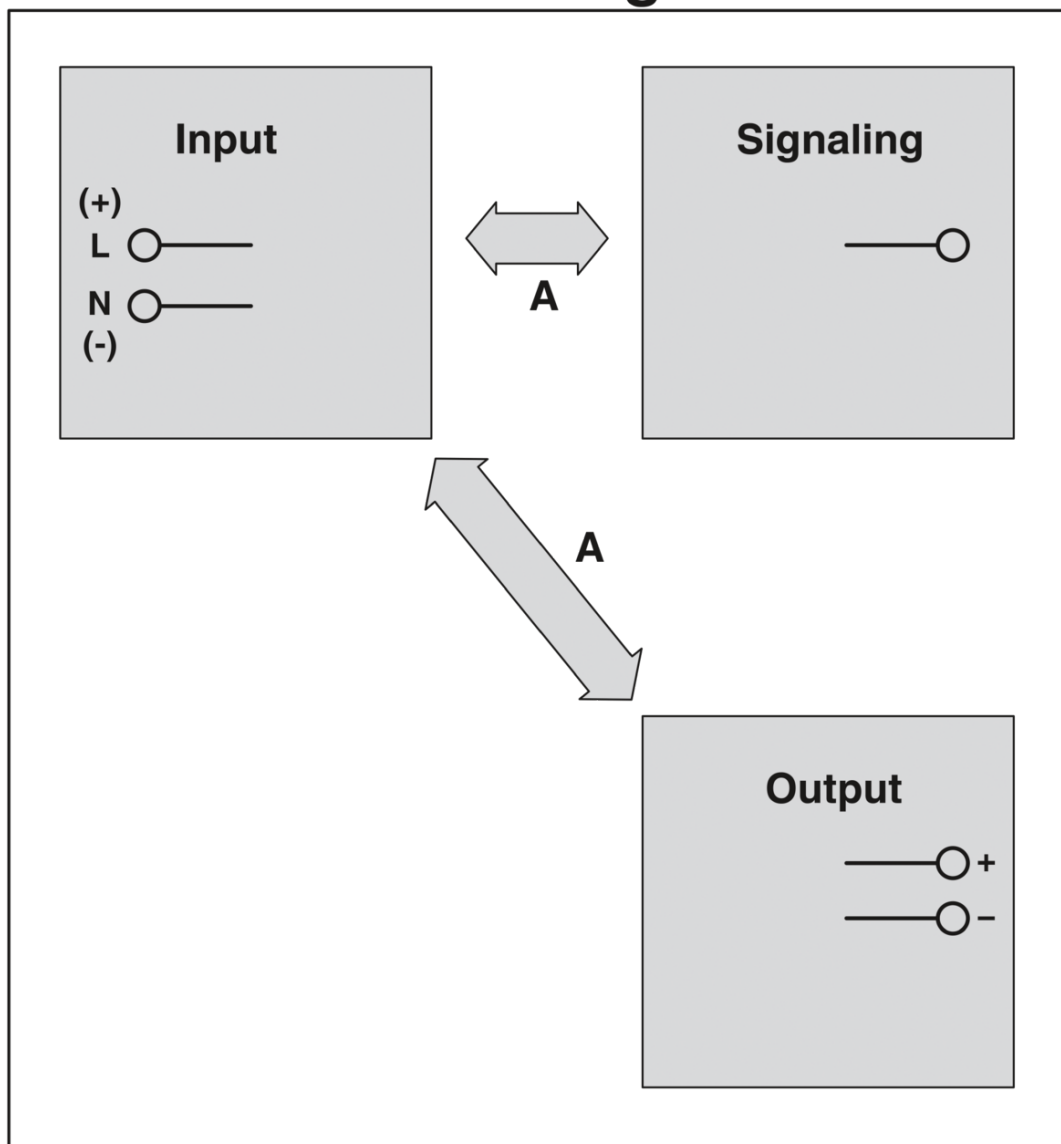


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Schematic diagram

## Housing



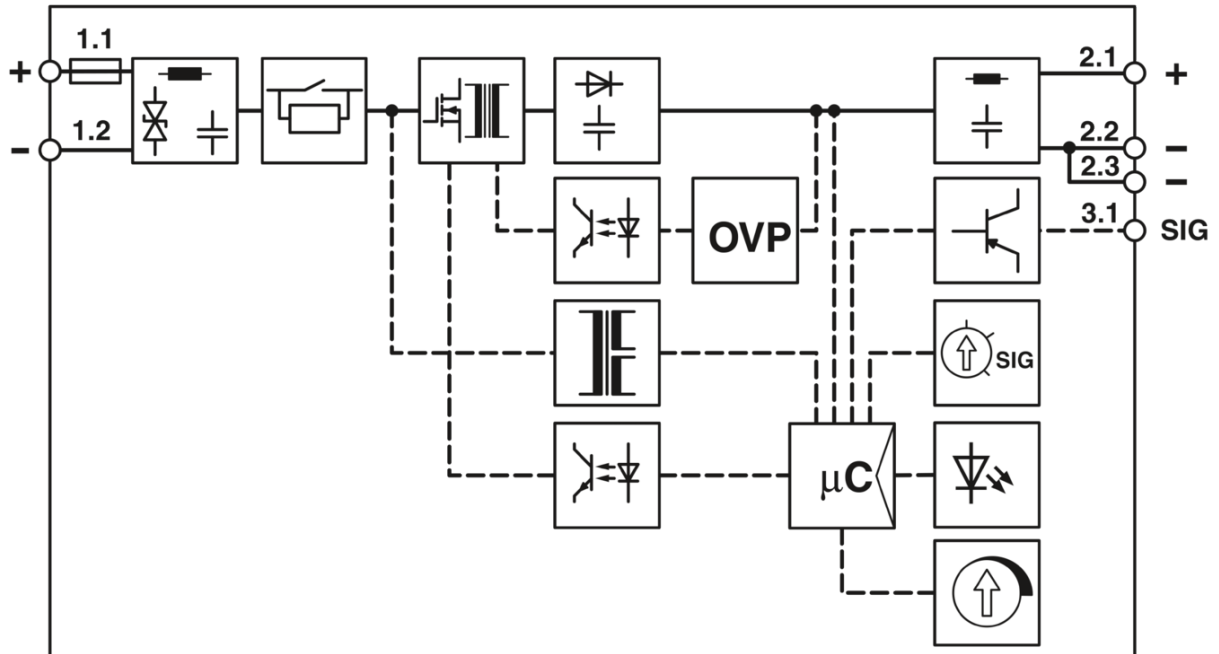
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Block diagram



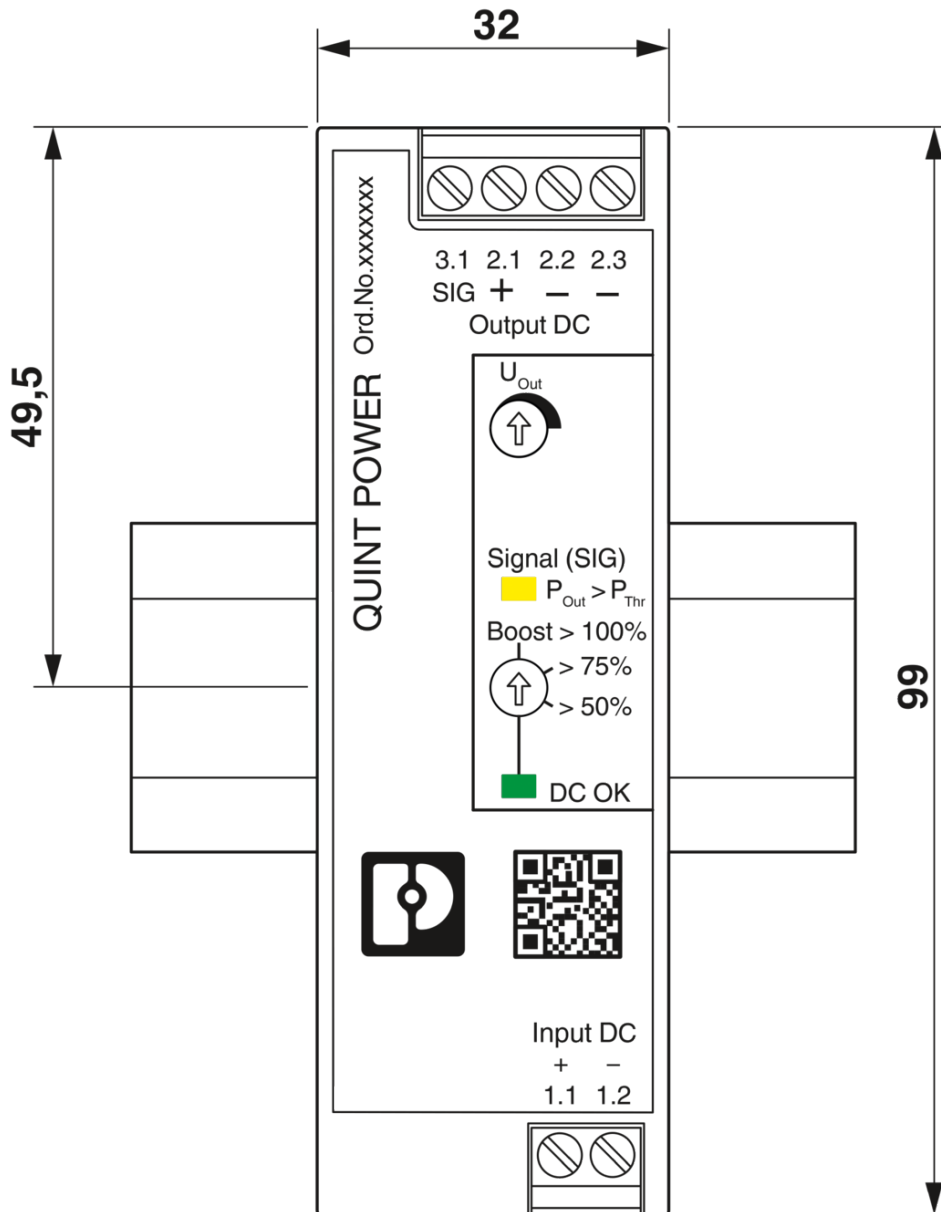
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Dimensional drawing



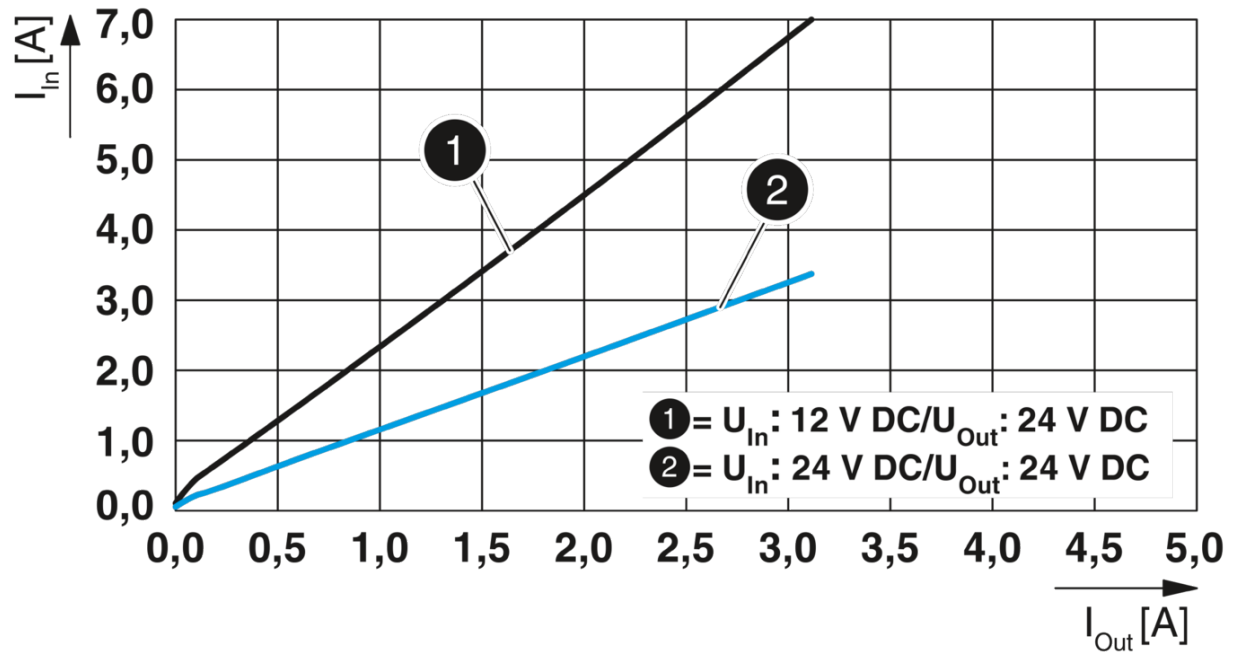
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Diagram




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## Approvals

IECEE CB Scheme  


IECEE CB Scheme  


cULus Listed 

DNV

cULus Listed 

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## Classifications

### ECLASS

ECLASS-9.0	27210901
ECLASS-11.0	27210901

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## Environmental Product Compliance

REACH SVHC

Lead 7439-92-1

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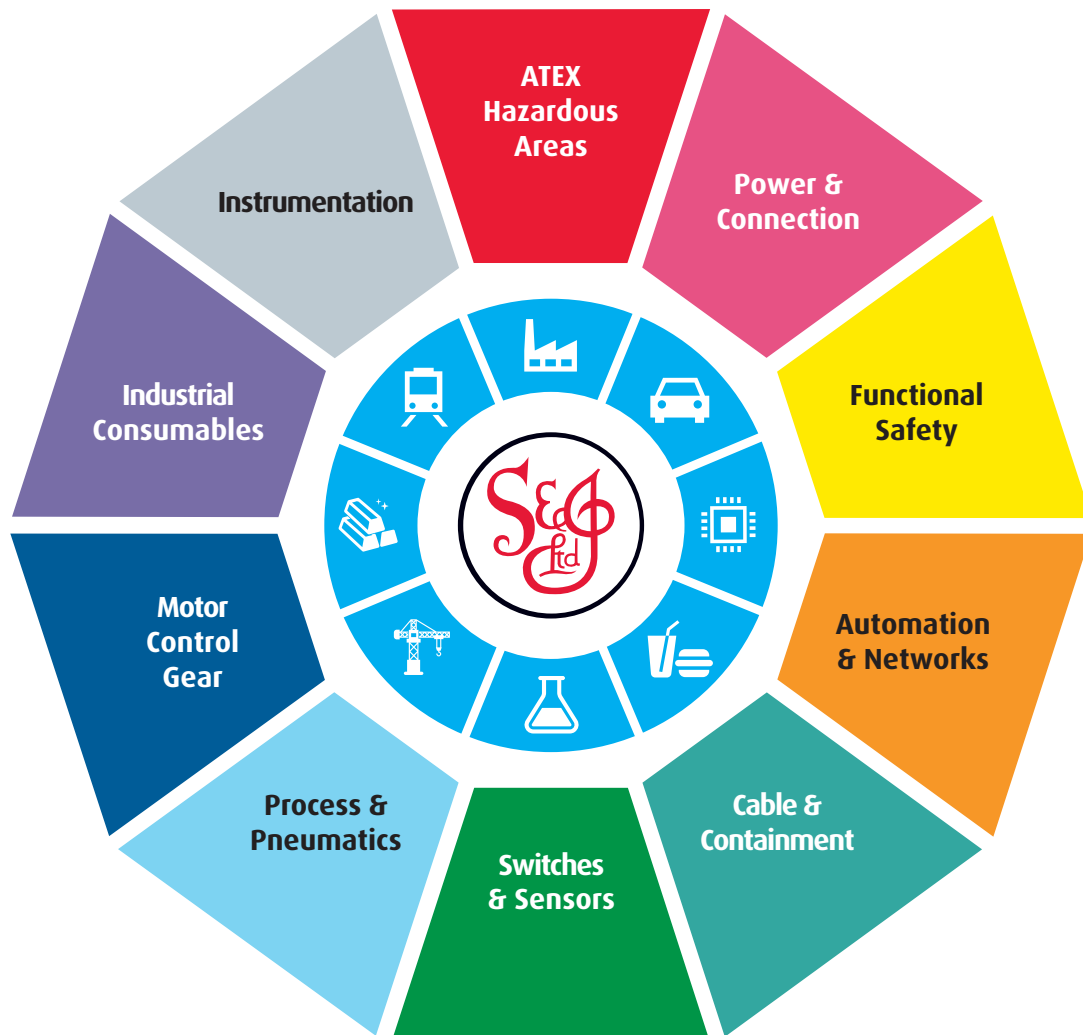
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