

# QUINT-PS/24DC/24DC/20 - DC/DC converter



2320102

<https://www.phoenixcontact.com/us/products/2320102>

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Primary-switched QUINT DC/DC converter for DIN rail mounting with SFB (Selective Fuse Breaking) Technology, input: 24 V DC, output: 24 V DC/20 A. Please use the following item for new projects: 2910121 QUINT4-PS/24DC/24DC/20/PT, 1046805 QUINT4-PS/24DC/24DC/20/SC

## Product description

QUINT DC/DC converter with maximum functionality

DC/DC converters alter the voltage level, regenerate the voltage at the end of long cables or enable the creation of independent supply systems by means of electrical isolation.

QUINT DC/DC converters magnetically and therefore quickly trip circuit breakers with six times the nominal current, for selective and therefore cost-effective system protection. The high level of system availability is additionally ensured, thanks to preventive function monitoring, as it reports critical operating states before errors occur.

## Your advantages

- Reliable starting of difficult loads, thanks to the static POWER BOOST power reserve with up to 125% nominal current permanently
- Preventive function monitoring indicates critical operating states before errors occur
- Constant voltage: output voltage regenerated even at the end of long cables
- Support conversion to various voltage levels
- Electrical isolation: for setting up independent supply systems

## Commercial data

Item number	2320102
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM05
Product key	CMDQ43
GTIN	4046356481892
Weight per piece (including packing)	2,086 g
Weight per piece (excluding packing)	1,700 g
Customs tariff number	85044095
Country of origin	IN

## Technical data

### Input data

#### DC operation

Nominal input voltage range	24 V DC
Input voltage range	18 V DC ... 32 V DC
Extended input voltage range in operation	14 V DC ... 18 V DC (Derating)
Wide-range input	no
Input voltage range DC	18 V DC ... 32 V DC 14 V DC ... 18 V DC (Consider derating during operation)
Voltage type of supply voltage	DC
Inrush current	< 26 A (typical)
Inrush current integral ( $I^2t$ )	< 11 A <sup>2</sup> s
Mains buffering time	typ. 10 ms (24 V DC)
Current consumption	28 A (24 V, $I_{BOOST}$ )
Reverse polarity protection	yes, $\leq$ 30 V DC
Protective circuit	Transient surge protection; Varistor
Recommended breaker for input protection	40 A ... 50 A (Characteristics B, C, D, K)

### Output data

Efficiency	> 93 %
Output characteristic	U/I
Nominal output voltage	24 V DC $\pm$ 1 %
Setting range of the output voltage ( $U_{Set}$ )	18 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)
Nominal output current ( $I_N$ )	20 A (-25 °C ... 60 °C)
POWER BOOST ( $I_{Boost}$ )	25 A (-25 °C ... 40 °C permanent, $U_{OUT} = 24$ V DC )
Selective Fuse Breaking ( $I_{SFB}$ )	120 A (12 ms)
Magnetic circuit breaker tripping	B2 / B4 / B6 / B10 / B16 / C2 / C4 / C6
Derating	60 °C ... 70 °C (2.5 %/K)
Protection against overvoltage at the output (OVP)	< 35 V DC
Max. capacitive load	unlimited
Active current limitation	approx. 29 A
Control deviation	< 1 % (change in load, static 10 % ... 90 %) < 2 % (change in load, dynamic 10 % ... 90 %) < 0.1 % (change in input voltage $\pm$ 10 %)
Residual ripple	< 20 mV <sub>PP</sub>
Output power	480 W
Peak switching voltages nominal load	< 10 mV <sub>PP</sub> (20 MHz)
Maximum no-load power dissipation	2.2 W
Power loss nominal load max.	39 W
Rise time	< 2 ms ( $U_{OUT}$ (10 % ... 90 %))
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes

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Signal: DC OK active

Output description	$U_{OUT} > 0.9 \times U_N$ : High signal
Switching voltage range	18 V DC ... 24 V DC
Maximum inrush current	< 20 mA (short-circuit-proof)

Signal: POWER BOOST, active

Output description	$I_{OUT} < I_N$ : High signal
Switching voltage range	18 V DC ... 24 V DC
Maximum inrush current	< 20 mA (short-circuit-proof)

Signal:  $U_{IN}$  OK, active

Output description	$U_{IN} > 19.2$ V: High signal
Switching voltage range	18 V DC ... 24 V DC
Maximum inrush current	$\leq 20$ mA (short-circuit-proof)

Signal: DC OK floating

Output description	Relay
Output voltage	$\leq 30$ V AC/DC
Maximum inrush current	$\leq 100$ mA

## Connection data

Input

Connection method	Screw connection
Conductor cross-section, rigid min.	0.5 mm <sup>2</sup>
Conductor cross-section, rigid max.	16 mm <sup>2</sup>
Conductor cross-section flexible min.	0.5 mm <sup>2</sup>
Conductor cross-section flexible max.	16 mm <sup>2</sup>
Conductor cross-section AWG min.	8
Conductor cross-section AWG max.	6
Stripping length	10 mm
Screw thread	M3
Tightening torque, min	1.2 Nm
Tightening torque max	1.5 Nm

Output

Connection method	Screw connection
Conductor cross-section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section, rigid max.	6 mm <sup>2</sup>
Conductor cross-section flexible min.	0.2 mm <sup>2</sup>
Conductor cross-section flexible max.	4 mm <sup>2</sup>
Conductor cross-section AWG min.	12
Conductor cross-section AWG max.	10
Stripping length	8 mm
Screw thread	M3
Tightening torque, min	0.5 Nm

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Tightening torque max	0.6 Nm
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## Signal

Conductor cross-section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section, rigid max.	2.5 mm <sup>2</sup>
Conductor cross-section flexible min.	0.2 mm <sup>2</sup>
Conductor cross-section flexible max.	2.5 mm <sup>2</sup>
Conductor cross-section AWG min.	24
Conductor cross-section AWG max.	12
Screw thread	M3
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

## Signaling

Types of signaling	LED
	Active switching output
	Relay contact

### Signal output: DC OK active

Status display	"DC OK" LED green
Note on status display	$U_{OUT} < 0.9 \times U_N$ : LED flashing
Color	green
Note on status display	LED flashing

### Signal output: POWER BOOST, active

Status display	"BOOST" LED yellow/ $I_{OUT} > I_N$ : LED on
Color	yellow
Note on status display	LED on

### Signal output: $U_{IN}$ OK, active

Status display	LED " $U_{IN} < 19.2$ V" yellow/ $U_{IN} < 19.2$ V DC: LED on
Color	yellow
Note on status display	LED on

### Signal output: DC OK floating

Note on status display	$U_{OUT} > 0.9 \times U_N$ : Contact closed
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## Electrical properties

Number of phases	1
Insulation voltage input/output	1.5 kV (type test)
	1 kV (routine test)
	1 kV (type test)

## Product properties

Product type	DC/DC converters
Product family	QUINT POWER
MTBF (IEC 61709, SN 29500)	> 554000 h (40 °C)

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## Insulation characteristics

Protection class	III
Degree of pollution	2

## Dimensions

Width	82 mm
Height	130 mm
Depth	125 mm

## Installation dimensions

Installation distance right/left	0 mm / 0 mm ( $\leq 70\text{ °C}$ )
Installation distance right/left (active)	15 mm / 15 mm ( $\leq 70\text{ °C}$ )
Installation distance top/bottom	50 mm / 50 mm ( $\leq 70\text{ °C}$ )
Installation distance top/bottom (active)	50 mm / 50 mm ( $\leq 70\text{ °C}$ )

## Alternative assembly

Width	122 mm
Height	130 mm
Depth	85 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	no

## Material specifications

Housing material	Metal
Type of housing	Aluminum (AlMg3)
Hood version	Galvanized sheet steel, free from chrome (VI)

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating, 2.5 %/K, startup at -40°C type-tested)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	$\leq 95\%$ (at 25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude $\pm 2.5$ mm (according to IEC 60068-2-6)

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	15 Hz ... 150 Hz, 2.3g, 90 min.
Temp code	T4 (-25 ... +70 °C; > 60 °C, Derating: 2,5 %/K)

## Standards and regulations

Rail applications	EN 50121-4
Standard – Electronic equipment for use in electrical power installations and their assembly into electrical power installations	EN 50178/VDE 0160 (PELV)
Standard - Electrical safety	EN 60950-1/VDE 0805 (SELV)
Standard – Safety extra-low voltage	EN 60950-1 (SELV)
	EN 60204 (PELV)
Standard - Safe isolation	DIN VDE 0100-410

## Approvals

Shipbuilding approval	DNV GL (EMC B)
UL approvals	UL/C-UL listed UL 508
	UL/C-UL Recognized UL 60950-1
	UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location)

## 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

### 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	10 V/m
Frequency range	1 GHz ... 2 GHz
Test field strength	10 V/m
Frequency range	2 GHz ... 3 GHz
Test field strength	10 V/m
Comments	Criterion A

### Fast transients (burst)

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

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

## Surge voltage load (surge)

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

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

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

Input/output/signal	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

## Emitted interference

Standards/regulations	EN 61000-6-3
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential

## 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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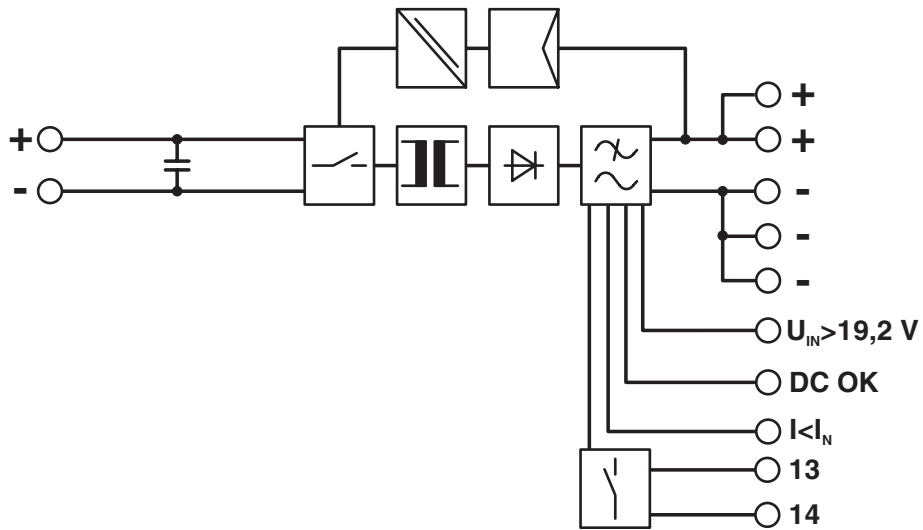


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## Drawings

Block diagram



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## Approvals

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**cUL Recognized**  
Approval ID: E211944



**UL Recognized**  
Approval ID: E211944



**IECEE CB Scheme**  
Approval ID: DK-5535-M1



**EAC**  
Approval ID: RU S-DE.BL08.W.00764



**NK**  
Approval ID: TA24091M



**BV**  
Approval ID: 27662/C0 BV



**UL Listed**  
Approval ID: E123528



**cUL Listed**  
Approval ID: E123528



**RINA**  
Approval ID: ELE333522XG



**ABS**  
Approval ID: 26-0442639-PDA



**LR**  
Approval ID: LR22301698TA-02

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**DNV**

Approval ID: TAA000030X



**IECEE CB Scheme**

Approval ID: DE/PTZ/0071



**NK**

Approval ID: TA22564M



**cUL Listed**

Approval ID: FILE E 199827



**UL Listed**

Approval ID: E199827

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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	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	3cf66bba-8679-479e-bbd0-1ce31ea74c36

### EF3.1 Climate Change

CO2e kg	60.372 kg CO2e
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