

# QUINT-PS/48DC/24DC/ 5 - DC/DC converter



2320144

<https://www.phoenixcontact.com/au/products/2320144>

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Primary-switched QUINT DC/DC converter for DIN rail mounting with SFB (Selective Fuse Breaking) Technology, input: 48 V DC, output: 24 V DC/5 A

## 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                          | 2320144             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | CMDQ43              |
| Product key                          | CMDQ43              |
| Catalog page                         | Page 252 (C-4-2017) |
| GTIN                                 | 4046356482257       |
| Weight per piece (including packing) | 900.3 g             |
| Weight per piece (excluding packing) | 708 g               |
| Customs tariff number                | 85044095            |
| Country of origin                    | CN                  |

## Technical data

### Input data

#### DC operation

|                                          |                                            |
|------------------------------------------|--------------------------------------------|
| Nominal input voltage range              | 48 V DC                                    |
| Input voltage range                      | 30 V DC ... 60 V DC                        |
| Wide-range input                         | no                                         |
| Input voltage range DC                   | 30 V DC ... 60 V DC                        |
| Voltage type of supply voltage           | DC                                         |
| Inrush current                           | < 5 A (typical)                            |
| Inrush current integral ( $I^2t$ )       | < 0.2 A <sup>2</sup> s                     |
| Mains buffering time                     | > 14 ms (48 V DC)                          |
| Current consumption                      | 3.5 A (48 V DC)                            |
| Protective circuit                       | Transient surge protection; Varistor       |
| Input fuse                               | 10 A (slow-blow, internal)                 |
| Permissible backup fuse                  | B10 B16                                    |
| Recommended breaker for input protection | 10 A ... 16 A (Characteristics B, C, D, K) |

### Output data

|                                                    |                                                                 |
|----------------------------------------------------|-----------------------------------------------------------------|
| Efficiency                                         | > 91.5 %                                                        |
| 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 ( $I_N$ )                   | 5 A (-25 °C ... 60 °C)                                          |
| POWER BOOST ( $I_{Boost}$ )                        | 6.25 A (-25 °C ... 40 °C permanent, $U_{OUT} = 24$ V DC )       |
| Selective Fuse Breaking ( $I_{SFB}$ )              | 30 A (12 ms)                                                    |
| Magnetic circuit breaker tripping                  | B2 / B4 / C2                                                    |
| Derating                                           | 60 °C ... 70 °C (2.5 %/K)                                       |
| Feedback voltage resistance                        | 35 V DC                                                         |
| Protection against overvoltage at the output (OVP) | < 35 V DC                                                       |
| Max. capacitive load                               | unlimited                                                       |
| Active current limitation                          | Approximately 6.9 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                                    | < 25 mV <sub>PP</sub>                                           |
| Output power                                       | 120 W                                                           |
| Peak switching voltages nominal load               | < 5 mV <sub>PP</sub> (20 MHz)                                   |
| Maximum no-load power dissipation                  | 2.7 W                                                           |
| Power loss nominal load max.                       | 11 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      | $U_{IN} > 38.4$ V: high signal |
| Switching voltage range | 18 V DC ... 24 V DC            |
| Maximum inrush current  | < 20 mA (short-circuit-proof)  |

## Connection data

Input

|                                       |                            |
|---------------------------------------|----------------------------|
| Connection method                     | Pluggable screw connection |
| 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                         |
| Stripping length                      | 8 mm                       |
| Screw thread                          | M3                         |
| Tightening torque, min                | 0.5 Nm                     |
| Tightening torque max                 | 0.6 Nm                     |

Output

|                                       |                            |
|---------------------------------------|----------------------------|
| Connection method                     | Pluggable screw connection |
| 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                         |
| Stripping length                      | 7 mm                       |
| Screw thread                          | M3                         |
| Tightening torque, min                | 0.5 Nm                     |
| Tightening torque max                 | 0.6 Nm                     |

Signal

|                                     |                     |
|-------------------------------------|---------------------|
| Conductor cross section, rigid min. | 0.2 mm <sup>2</sup> |
| Conductor cross section, rigid max. | 2.5 mm <sup>2</sup> |

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|                                       |                     |
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| 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 |
| Color          | green             |

### 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 " $U_{IN} < 38.4$ V" yellow/ $U_{IN} < 38.4$ V DC: LED on |
| Color                  | yellow                                                        |
| Note on status display | LED on                                                        |

## Electrical properties

|                                 |                     |
|---------------------------------|---------------------|
| Number of phases                | 1.00                |
| Insulation voltage input/output | 1.5 kV (type test)  |
|                                 | 1 kV (routine test) |
|                                 | 1 kV (type test)    |

## Product properties

|                            |                    |
|----------------------------|--------------------|
| Product type               | DC/DC converters   |
| MTBF (IEC 61709, SN 29500) | > 995000 h (40 °C) |

### Insulation characteristics

|                     |     |
|---------------------|-----|
| Protection class    | III |
| Degree of pollution | 2   |

## Dimensions

|        |        |
|--------|--------|
| Width  | 32 mm  |
| Height | 130 mm |
| Depth  | 125 mm |

### Installation dimensions

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|                                           |                                       |
|-------------------------------------------|---------------------------------------|
| 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  | 35 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<br>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)                | $-25\text{ °C} \dots 70\text{ °C}$ ( $> 60\text{ °C}$ Derating: 2,5 %/K)                                                            |
| Ambient temperature (storage/transport)        | $-40\text{ °C} \dots 85\text{ °C}$                                                                                                  |
| Ambient temperature (start-up type tested)     | $-40\text{ °C}$                                                                                                                     |
| Climatic class                                 | 3K3 (in acc. with EN 60721)                                                                                                         |
| Max. permissible relative humidity (operation) | $\leq 95\%$ (at $25\text{ °C}$ , non-condensing)                                                                                    |
| Shock                                          | 18 ms, 30g, in each space direction (according to IEC 60068-2-27)                                                                   |
| Vibration (operation)                          | $< 15\text{ Hz}$ , amplitude $\pm 2.5\text{ mm}$ (according to IEC 60068-2-6)<br>$15\text{ Hz} \dots 150\text{ Hz}$ , 2.3g, 90 min. |
| Temp code                                      | T4 ( $-25 \dots +70\text{ °C}$ ; $> 60\text{ °C}$ , 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)<br>EN 60204-1 (PELV) |
| Standard - Safe isolation                                                                                                        | DIN VDE 0100-410                       |

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## Approvals

|              |                                                                                     |
|--------------|-------------------------------------------------------------------------------------|
| 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 |
|-----------------------|--------------|

### Electrostatic discharge

|                   |                      |
|-------------------|----------------------|
| Contact discharge | 8 kV (Test Level 4)  |
| Discharge in air  | 15 kV (Test Level 4) |
| Comments          | Criterion B          |

### 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 ... 2 GHz       |
| Test field strength | 10 V/m (Test Level 3) |
| Frequency range     | 2 GHz ... 3 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    | 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 |
|-----------------------|--------------|

### Surge voltage load (surge)

|       |                                     |
|-------|-------------------------------------|
| Input | 0.5 kV (Test Level 1 - symmetrical) |
|-------|-------------------------------------|

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|          |                                      |
|----------|--------------------------------------|
|          | 0.5 kV (Test Level 1 - asymmetrical) |
| Output   | 0.5 kV (Test Level 1 - symmetrical)  |
|          | 0.5 kV (Test Level 1 - asymmetrical) |
| Signal   | 1 kV (Test Level 2 - asymmetrical)   |
| Comments | Criterion B                          |

## Conducted interference

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-6 |
|-----------------------|--------------|

## 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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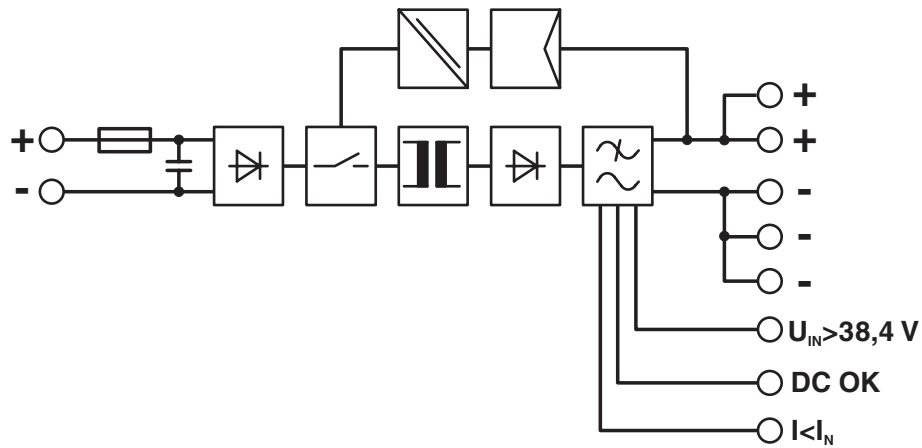


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## Drawings

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: EAC-Zulassung



**NK**  
Approval ID: TA24091M



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



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



**UL Listed**  
Approval ID: E123528



**cUL Listed**  
Approval ID: E123528



**RINA**  
Approval ID: ELE333522XG

**ABS**

Approval ID: 20-2022536-PDA

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



**LR**  
Approval ID: LR22301698TA-02

**DNV**  
Approval ID: TAA000030X



**IECEE CB Scheme**  
Approval ID: DE/PTZ/0071



**NK**  
Approval ID: TA22564M



**cUL Listed**  
Approval ID: E199827



**UL Listed**  
Approval ID: E199827

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC002540 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

## 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                                | 113b8663-356f-4da2-a55a-797fc34c8813 |