

DC/DC converters - QUINT4-PS/24DC/24DC/10/SC - 1046803

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Primary-switched QUINT DC/DC converter for DIN rail mounting with SFB (Selective Fuse Breaking) Technology, screw connection, input: 24 V DC, output: 24 V DC / 10 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

- ✓ 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



Key Commercial Data

| | |
|--------------|---------------|
| Packing unit | 1 pc |
| GTIN | |
| GTIN | 4055626643748 |

Technical data

Input data

| | |
|--|--------------------------|
| Input voltage range | 18 V DC ... 32 V AC |
| Electric strength, max. | 35 V DC (60 s) |
| Typical current consumption | 13.8 A (24 V DC) |
| Mains buffering | typ. 11 ms (24 V DC) |
| Switch-on time | < 1 s |
| Typical response time | 300 ms (from SLEEP MODE) |
| Inrush current limitation typical | 1.5 A (after 1 ms) |
| Inrush current integral (I ² t) | < 0.02 A ² s |

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Technical data

Input data

| | |
|------------|----------------------------|
| Input fuse | 30 A (slow-blow, internal) |
|------------|----------------------------|

Insulation electric strength

| | |
|---------------------------------|------------------------|
| Insulation voltage input/output | 4 kV DC (type test) |
| | 2 kV DC (routine test) |
| Type test (IEC/EN 60950-1) A | 2 kV DC |
| Type test (IEC/EN 60950-1) B | 4 kV DC |
| Type test (IEC/EN 60950-1) C | 0.5 kV DC |
| Type test (IEC/EN 60950-1) D | 0.5 kV DC |
| Production test A | 2 kV DC |
| Production test B | 2 kV DC |
| Production test C | 0.5 kV DC |
| Production test D | 0.5 kV DC |

Input connection data

| | |
|---|---|
| Connection method | Screw connection |
| Stripping length | 10 mm |
| Conductor cross section solid | 0.2 mm ² ... 6 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 6 mm ² |
| Flexible conductor cross section (ferrule with plastic sleeve) | 0.2 mm ² ... 4 mm ² |
| Flexible conductor cross section flexible (ferrule, w/o plastic sleeve) | 0.2 mm ² ... 4 mm ² |
| Conductor cross section AWG | 24 ... 10 |

Output data

| | |
|--|--|
| Nominal output voltage (U_N) | 24 V DC |
| Setting range of the output voltage (U_{Set}) | 24 V DC ... 29.5 V DC (> 24 V DC, constant capacity) |
| Nominal output current (I_N) | 10 A |
| Static Boost ($I_{Stat.Boost}$) | 12.5 A |
| Dynamic Boost ($I_{Dyn.Boost}$) | 20 A (5 s) |
| Selective Fuse Breaking (I_{SFB}) | 60 A (15 ms) |
| Magnetic circuit breaker tripping | A1...A6 / B2...B6 / C1...C3 / Z1...Z6 |
| System deviation, static | < 1 % (change in load, static 10 % ... 90 %) |
| System deviation, dynamic | < 3 % (Dynamic load change 10 % ... 90 %, 10 Hz) |
| System deviation, input voltage change | < 0.1 % (change in input voltage ± 10 %) |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Residual ripple | < 50 mV _{PP} |
| Connection in parallel | Yes, for redundancy and increased capacity |
| Connection in series | yes |
| Feedback voltage resistance | ≤ 35 V DC |
| Protection against overvoltage at the output (OVP) | ≤ 32 V DC |
| Rise time | < 1 s (U_{OUT} (10 % ... 90 %)) |

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Technical data

Output connection data

| | |
|---|---|
| Connection method | Screw connection |
| Stripping length | 10 mm |
| Conductor cross section solid | 0.2 mm ² ... 6 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 6 mm ² |
| Flexible conductor cross section (ferrule with plastic sleeve) | 0.2 mm ² ... 4 mm ² |
| Flexible conductor cross section flexible (ferrule, w/o plastic sleeve) | 0.2 mm ² ... 4 mm ² |
| Conductor cross section AWG | 24 ... 10 |

LED 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 |
| P _{Out} | > 100% (LED lights up yellow, output power > 240 W) |
| | > 75% (LED lights up green, output power > 180 W) |
| | > 50% (LED lights up green, output power > 120 W) |
| U _{Out} | > 0.9 x U _{Set} (LED lights up green) |
| | < 0.9 x U _{Set} (LED flashes green) |
| U _{In} | > 0.8 x U _{InNom} (LED off) |
| | < 0.8 x U _{InNom} (LED lights up yellow) |

Signal contacts – signal output Out 1 (configurable)

| | |
|---------------------|------------------------------------|
| Connection labeling | 3.5 + |
| Digital | 0 V DC |
| | 24 V DC |
| | 20 mA |
| Default | U _{IN} input voltage OK |
| Signal option | Output voltage |
| | Output current |
| | Output power |
| | Operating hours |
| | Early warning of high temperatures |
| | OVP voltage limitation active |

Signal contacts – signal output Out 2 (configurable)

| | |
|---------------------|--------------|
| Connection labeling | 3.6 + |
| Digital | 0 V DC |
| | 24 V DC |
| | 20 mA |
| Default | Output power |

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Technical data

Signal contacts – signal output Out 2 (configurable)

| | |
|---------------|---|
| Signal option | Output voltage |
| | Output current |
| | Operating hours |
| | Early warning of high temperatures |
| | OVP voltage limitation active |
| Analog | 4 mA ... 20 mA $\pm 5\%$ (Load $\leq 400\ \Omega$) |
| Signal option | Output voltage |
| | Output current |
| | Output power |

Signal contacts – signal output relay 13/14 (configurable)

| | |
|----------------------|------------------------------------|
| Connection labeling | 3.1, 3.2 |
| Switch contact | floating |
| Maximum contact load | 24 V DC |
| | 1 A |
| | 30 V AC |
| | 0.5 A |
| Default | Output voltage |
| Signal option | Output current |
| | Output power |
| | Operating hours |
| | Early warning of high temperatures |
| | OVP voltage limitation active |
| | U_{IN} input voltage OK |

Signal contacts – remote signal input (configurable)

| | |
|---------------------|---|
| Connection labeling | 3.3 + |
| Function | Output power ON/OFF (remote) |
| Default | Output power ON ($>40\ k\Omega/24\ V\ DC$ /open bridge between REM and SGnd) |

Signal contacts – signal ground SGnd

| | |
|---------------------|--------------------|
| Connection labeling | 3.4 + |
| Function | Signal ground |
| Reference potential | to OUT1, OUT2, REM |

Signal connection data

| | |
|---|--|
| Connection method | Push-in connection |
| Conductor cross section solid | 0.2 mm ² ... 1 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 1.5 mm ² |
| Flexible conductor cross section (ferrule with plastic sleeve) | 0.2 mm ² ... 0.75 mm ² |
| Flexible conductor cross section flexible (ferrule, w/o plastic sleeve) | 0.2 mm ² ... 1.5 mm ² |
| Conductor cross section AWG | 24 ... 16 |

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Technical data

Signal connection data

| | |
|------------------|------|
| Stripping length | 8 mm |
|------------------|------|

Reliability

| | |
|----------------------------|---------------------|
| MTBF (IEC 61709, SN 29500) | > 1380000 h (25 °C) |
| | > 800000 h (40 °C) |
| | > 340000 h (60 °C) |

Life expectancy (electrolytic capacitors)

| | |
|----------------|----------|
| Output current | 5 A |
| Temperature | 40 °C |
| Time | 367721 h |
| Voltage | 24 V DC |
| Output current | 10 A |
| Temperature | 40 °C |
| Time | 183860 h |
| Voltage | 24 V DC |
| Output current | 10 A |
| Temperature | 30 °C |
| Time | 422400 h |
| Voltage | 24 V DC |

Switching frequency

| | |
|---------------------------|---------------------|
| Auxiliary converter stage | 190 kHz ... 220 kHz |
| Main converter stage | 67 kHz ... 135 kHz |

General data

| | |
|---|------------------------------------|
| Degree of protection | IP20 |
| Protection class | Special with SELV input and output |
| Inflammability class in acc. with UL 94 (housing / terminal blocks) | V0 |
| Side element version | Aluminum |
| Hood version | Stainless steel X6Cr17 |
| Width | 50 mm |
| Height | 130 mm |
| Depth | 125 mm |
| Width with alternative assembly | 122 mm |
| Height with alternative assembly | 130 mm |
| Depth with alternative assembly | 53 mm |
| Weight | 0.8 kg |
| Efficiency | typ. 93.3 % (24 V DC) |

Power dissipation

| | |
|--|-------|
| Maximum power dissipation in no-load condition | < 5 W |
| Power dissipation SLEEP MODE | < 2 W |

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Power dissipation

| | |
|------------------------------|--------|
| Power loss nominal load max. | < 16 W |
|------------------------------|--------|

Ambient conditions

| | |
|--|---|
| Ambient temperature (operation) | -25 °C ... 70 °C (> 60 °C Derating: 2.5 %/K) |
| Ambient temperature (start-up type tested) | -40 °C |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Max. permissible relative humidity (operation) | ≤ 95 % (at 25 °C, non-condensing) |
| Maximum altitude | ≤ 5000 m (> 2000 m, observe derating) |
| Vibration (operation) | 5 Hz ... 100 Hz resonance search 2.3g, 90 min., resonance frequency 2.3g, 90 min. (according to DNV GL Class C) |
| Shock | 18 ms, 30g, in each space direction (according to IEC 60068-2-27) |
| Degree of pollution | 2 |
| Climatic class | 3K3 (EN 60721) |
| Overvoltage category EN 61010-1 | II |
| Overvoltage category EN 62477-1 | III |

Standards

| | |
|-------------------------------------|---|
| EMC requirements for noise immunity | EN 61000-6-1 |
| | EN 61000-6-2 |
| EMC requirements for noise emission | EN 61000-6-3 |
| | EN 61000-6-4 |
| EMC requirements, power plant | IEC 61850-3 |
| | EN 61000-6-5 |
| Standard designation | Electrical safety (of control and regulation devices) |
| Standards/regulations | IEC 61010-1 |
| Standard designation | Safety extra-low voltage |
| Standards/regulations | EN 61010-1 (SELV) |
| | IEC 61010-2-201 (PELV) |
| Standard designation | Explosive atmospheres |
| Standards/regulations | IEC 60079-0 |
| | IEC 60079-7 |
| | IEC 60079-11 |
| | IEC 60079-15 |
| Standard designation | Mains variation/undervoltage |
| Standards/regulations | EN 61000-4-29 |

Conformance/approvals

| | |
|----------------|--------------------------|
| Designation | UL |
| Identification | UL Listed UL 61010-1 |
| Designation | UL |
| Identification | UL Listed UL 61010-2-201 |
| Designation | UL |

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Technical data

Conformance/approvals

| | |
|----------------|---|
| Identification | UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location) |
| Designation | CSA |
| Identification | CAN/CSA-C22.2 No. 61010-1-12 |
| Designation | CSA |
| Identification | CAN/CSA-IEC 61010-2-201:14 |
| Designation | SIQ |
| Identification | Type tested (type approved) |
| Designation | SIQ |
| Identification | CB scheme (IEC 61010-1, IEC 61010-2-201) |
| Designation | Shipbuilding |
| Identification | DNV GL |
| Designation | Shipbuilding |
| Identification | ABS |
| Designation | ATEX |
| Identification | # II 3 G Ex ec ic nC IIC T4 Gc X |
| Designation | IECEX |
| Identification | IECEX SIQ 19.0001X |
| | Ex ec ic nC IIC T4 Gc |

EMC data

| | |
|-------------------------------|---|
| Electromagnetic compatibility | Conformance with EMC Directive 2014/30/EU |
| Low Voltage Directive | Conformance with Low Voltage Directive 2014/35/EC |
| Conducted noise emission | EN 55016 |
| | EN 61000-6-3 (Class B) |
| 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 | EN 61000-4-2 |
| Contact discharge | 8 kV (Test Level 4) |
| Discharge in air | 15 kV (Test Level 4) |
| Electromagnetic HF field | EN 61000-4-3 |
| 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) |
| Frequency range | 1 GHz ... 6 GHz |
| Test field strength | 10 V/m (Test Level 3) |

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Technical data

EMC data

| | |
|----------------------------|------------------------------------|
| Comments | Criterion A |
| Fast transients (burst) | EN 61000-4-4 |
| 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) | EN 61000-4-5 |
| Input | 1 kV (Test Level 3 - symmetrical) |
| | 2 kV (Test Level 3 - asymmetrical) |
| Output | 1 kV (Test Level 3 - symmetrical) |
| | 2 kV (Test Level 3 - asymmetrical) |
| Signal | 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A |
| I/O/S | asymmetrical |
| Frequency range | 0.15 MHz ... 80 MHz |
| Voltage | 10 V (Test Level 3) |
| Comments | Criterion A |
| 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 |
| Test field strength | 1 kA/m |
| Additional text | 3 s |
| Comments | Criterion A |
| Frequency | 0 Hz |
| Test field strength | 300 A/m |
| Additional text | DC, 60 s |
| Comments | Criterion A |
| Voltage dips | EN 61000-4-29 |
| Voltage | 24 V DC |
| Voltage dip | 70 % |
| Additional text | Test Level 2 |
| Comments | Criterion A |
| Voltage dip | 40 % |
| Additional text | Test Level 2 |
| Comments | Criterion B |

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Technical data

EMC data

| | |
|--|--|
| Voltage dip | 0 % |
| Additional text | Test Level 2 |
| Comments | Criterion B |
| Pulse-shape magnetic field | EN 61000-4-9 |
| Test field strength | 1000 A/m |
| Comments | Criterion A |
| Damped oscillating magnetic field | 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 |
| Asymmetrical conducted disturbance variables | EN 61000-4-16 |
| Test level 1 | 15 Hz 150 Hz (Test Level 3) |
| Voltage | 10 V 1 V |
| 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 DC voltage | EN 61000-4-17 |
| Attenuated oscillating wave | EN 61000-4-18 |
| Input, output (test level 1) | 100 kHz 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Input, output (test level 2) | 100 kHz 1 MHz (Test Level 2 - asymmetrical) |
| Voltage | 1 kV |
| Input, output (test level 3) | 10 MHz (Test Level 2 - asymmetrical) |
| Voltage | 0.5 kV |
| Signals (test level 1) | 100 kHz 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Signals (test level 2) | 100 kHz 1 MHz (Test Level 2 - asymmetrical) |
| Voltage | 1 kV |
| Comments | Criterion A |
| Criterion A | Normal operating behavior within the specified limits. |

DC/DC converters - QUINT4-PS/24DC/24DC/10/SC - 1046803

Technical data

EMC data

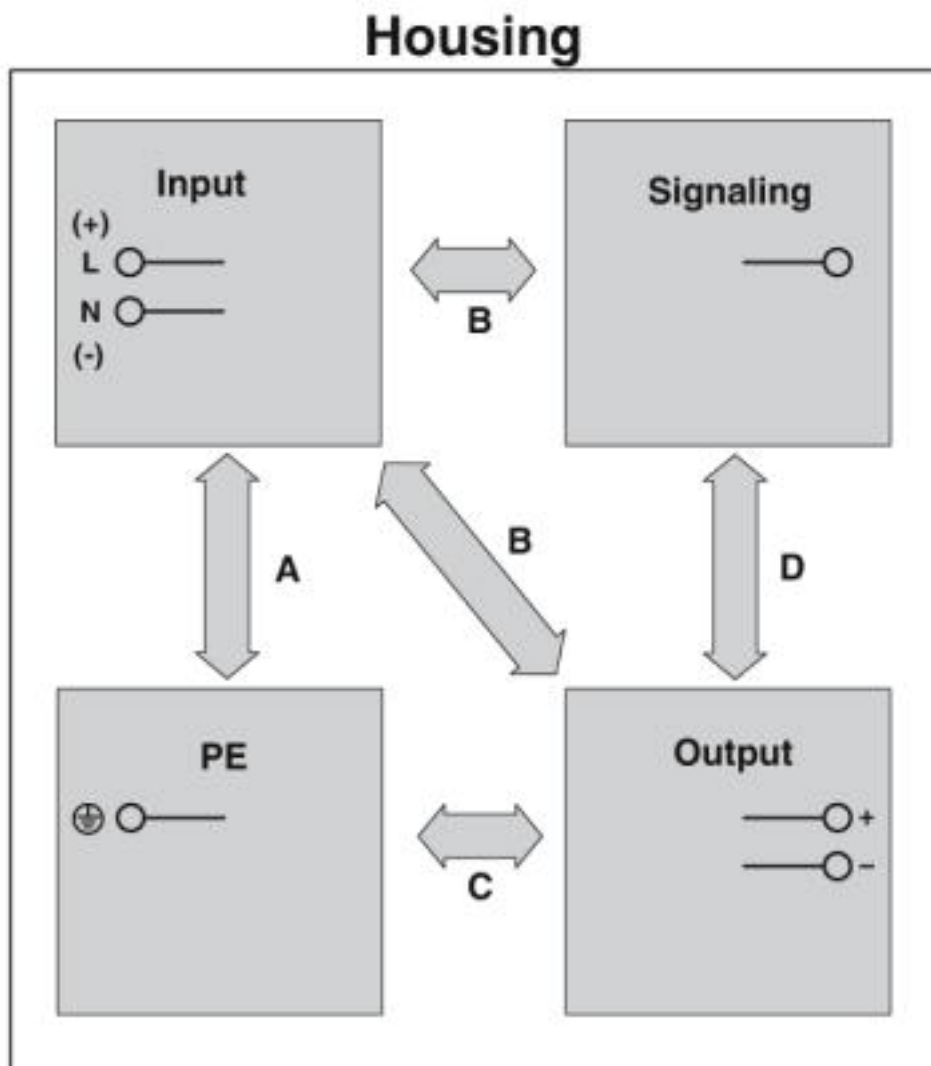
| | |
|-------------|--|
| Criterion B | Temporary impairment to operational behavior that is corrected by the device itself. |
| Criterion C | Temporary adverse effects on the operating behavior, which the device corrects automatically or which can be restored by actuating the operating elements. |

Environmental Product Compliance

| | |
|------------|----------------|
| REACH SVHC | Lead 7439-92-1 |
|------------|----------------|

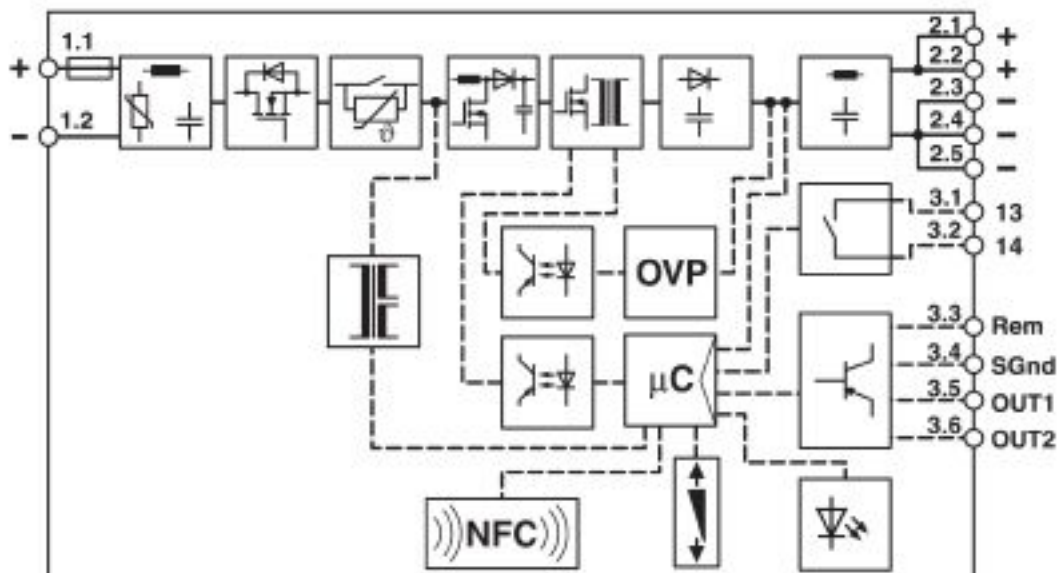
Drawings

Schematic diagram

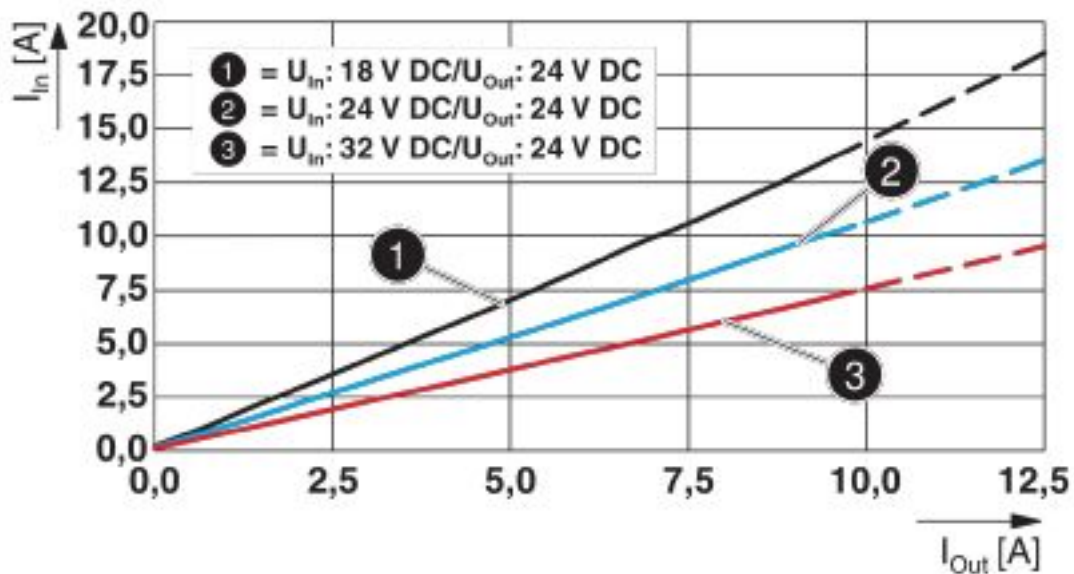


DC/DC converters - QUINT4-PS/24DC/24DC/10/SC - 1046803

Block diagram

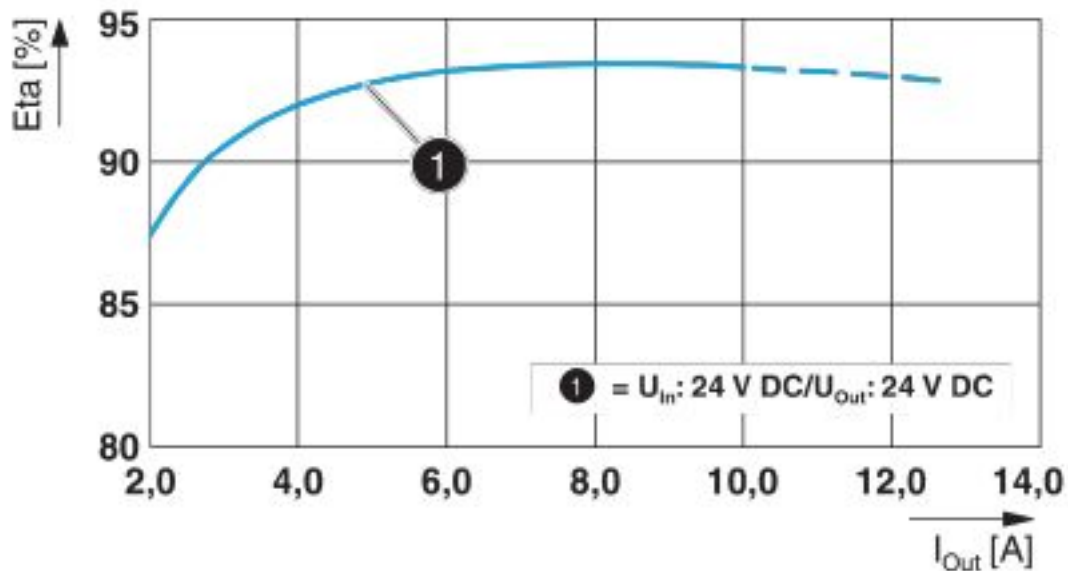


Diagram

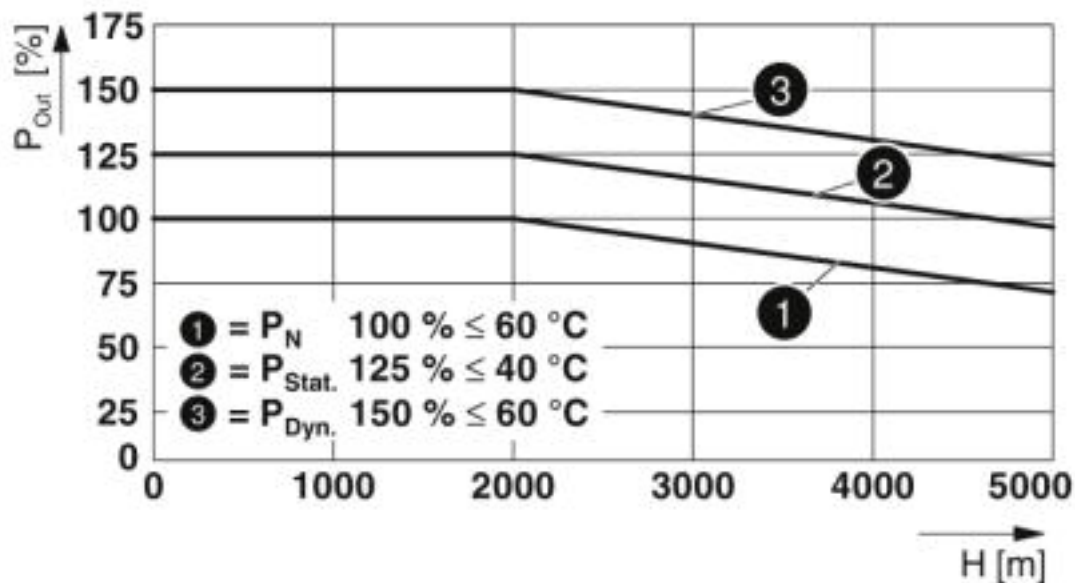


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Diagram



Diagram



Classifications

eCl@ss

| | |
|------------|----------|
| eCl@ss 8.0 | 27210901 |
| eCl@ss 9.0 | 27210901 |

ETIM

| | |
|----------|----------|
| ETIM 5.0 | EC002046 |
| ETIM 6.0 | EC002046 |

DC/DC converters - QUINT4-PS/24DC/24DC/10/SC - 1046803

Classifications

ETIM

| | |
|----------|----------|
| ETIM 7.0 | EC002046 |
|----------|----------|

Approvals

Approvals

Approvals

CSA / CSAus / ABS / DNV GL / UL Listed / cUL Listed / Type approved / LR / cCSAus / cULus Listed

Ex Approvals

EAC Ex

Approval details

| | | | |
|---------------|--|---|-------------------|
| CSA | | http://www.csagroup.org/services-industries/product-listing/ | 70212082 |
| CSAus | | http://www.csagroup.org/services-industries/product-listing/ | 70212082 |
| ABS | | http://www.eagle.org/eagleExternalPortalWEB/ | 19-HG1860348-PDA |
| DNV GL | | https://approvalfinder.dnvgl.com/ | TAA000027S |
| UL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 123528 |
| cUL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 123528 |
| Type approved | | | SI-SIQ BG 005/058 |

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Approvals

| | | | |
|----|--|---|-------------|
| LR | | http://www.lr.org/en | 17-20107-02 |
|----|--|---|-------------|

| | | | |
|--------|--|--|--|
| cCSAus | | | |
|--------|--|--|--|

| | | | |
|--------------|--|--|--|
| cULus Listed | | | |
|--------------|--|--|--|

Accessories

Accessories

Assembly adapter

Assembly adapters - UWA 182/52 - 2938235



Universal wall adapter for securely mounting the device in the event of strong vibrations. The device is screwed directly onto the mounting surface. The universal wall adapter is attached on the top/bottom.

Assembly adapters - UWA 130 - 2901664



2-piece universal wall adapter for securely mounting the device in the event of strong vibrations. The profiles that are screwed onto the side of the device are screwed directly onto the mounting surface. The universal wall adapter is attached on the left/right.

Assembly adapters - QUINT-PS-ADAPTERS7/1 - 2938196



Assembly adapter for QUINT-PS... power supply on S7-300 rail

Device circuit breakers

DC/DC converters - QUINT4-PS/24DC/24DC/10/SC - 1046803

Accessories

Electronic device circuit breaker - CBMC E4 24DC/1-4A NO - 2906031



Multi-channel electronic device circuit breaker for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

Electronic device circuit breaker - CBMC E4 24DC/1-10A NO - 2906032



Multi-channel electronic device circuit breaker for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

Electronic device circuit breaker - CBMC E4 24DC/1-4A+ IOL - 2910410



Multi-channel electronic circuit breaker with IO-Link interface for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

Electronic device circuit breaker - CBMC E4 24DC/1-10A IOL - 2910411



Multi-channel electronic circuit breaker with IO-Link interface for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

Electronic device circuit breaker - CBM E4 24DC/0.5-10A NO-R - 2905743



Multi-channel, electronic device circuit breaker with active current limitation for protecting four loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.

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Accessories

Electronic device circuit breaker - CBM E8 24DC/0.5-10A NO-R - 2905744



Multi-channel, electronic device circuit breaker with active current limitation for protecting eight loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.

Programming adapter

Programming adapter - TWN4 MIFARE NFC USB ADAPTER - 2909681



Near Field Communication (NFC) programming adapter with USB interface for the wireless configuration of NFC-capable products from PHOENIX CONTACT with software. No separate USB driver is required.

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