

QUINT4-PS/24DC/24DC/10/PT/CO - DC/DC converter



2910133

<https://www.phoenixcontact.com/us/products/2910133>

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Primary-switched DC/DC converter, QUINT POWER, DIN rail mounting, SFB Technology (Selective Fuse Breaking), 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
- Protective coating and ATEX/IECEx approval

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 2910133 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CM01 |
| Product key | CMDI43 |
| GTIN | 4055626537429 |
| Weight per piece (including packing) | 1,043 g |
| Weight per piece (excluding packing) | 910 g |
| Customs tariff number | 85044095 |
| Country of origin | TH |

Technical data

Input data

| | |
|--|---|
| Nominal input voltage range | 24 V DC |
| Input voltage range | 24 V DC -25 % ... +40 % |
| Wide-range input | no |
| Electric strength, max. | 35 V DC (60 s) |
| Inrush current | typ. 1.5 A |
| Inrush current integral (I^2t) | < 0.02 A ² s |
| Inrush current limitation | 1.5 A (after 1 ms) |
| Mains buffering time | typ. 11 ms (24 V DC) |
| Current consumption | 13.8 A (24 V DC) |
| Typical response time | 300 ms (from SLEEP MODE) |
| Switch-on time | < 1 s |
| Input fuse | 30 A (slow-blow, internal) |
| Recommended breaker for input protection | 16 A ... 32 A (Characteristic B, C, D, K or comparable) |

Output data

| | |
|--|--|
| Efficiency | typ. 93.3 % (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) | 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 |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Output power (P_N) | 240 W |
| Output power ($P_{Stat. Boost}$) | 300 W |
| Output power ($P_{Dyn. Boost}$) | 480 W (5 s) |
| Feedback voltage resistance | ≤ 35 V DC |
| Protection against overvoltage at the output (OVP) | ≤ 30 V DC |
| Residual ripple | < 50 mV _{PP} |
| Control deviation static | < 1 % (change in load, static 10 % ... 90 %) |
| Control deviation dynamic | < 1 % (change in load, static 10 % ... 90 %) |
| Control deviation Input voltage change | < 1 % (change in load, static 10 % ... 90 %) |
| Rise time | < 1 s (U_{OUT} (10 % ... 90 %)) |
| Connection in series | yes |
| Maximum no-load power dissipation | < 5 W |

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| | |
|------------------------------|--|
| Power loss nominal load max. | < 16 W |
| Power dissipation SLEEP MODE | < 2 W |
| Connection in parallel | yes, for redundancy and increased capacity |

Connection data

Input

| | |
|----------|-----|
| Position | 1.x |
|----------|-----|

Conductor connection

| | |
|--|---|
| Connection method | Push-in connection |
| rigid | 0.2 mm ² ... 6 mm ² |
| flexible | 0.2 mm ² ... 6 mm ² |
| flexible with ferrule without plastic sleeve | 0.2 mm ² ... 4 mm ² |
| flexible with ferrule with plastic sleeve | 0.2 mm ² ... 4 mm ² |
| rigid (AWG) | 24 ... 10 |
| Stripping length | 10 mm |

Output

| | |
|----------|-----|
| Position | 2.x |
|----------|-----|

Conductor connection

| | |
|--|---|
| Connection method | Push-in connection |
| rigid | 0.2 mm ² ... 6 mm ² |
| flexible | 0.2 mm ² ... 6 mm ² |
| flexible with ferrule without plastic sleeve | 0.2 mm ² ... 4 mm ² |
| flexible with ferrule with plastic sleeve | 0.2 mm ² ... 4 mm ² |
| rigid (AWG) | 24 ... 10 |
| Stripping length | 10 mm |

Signal

| | |
|----------|-----|
| Position | 3.x |
|----------|-----|

Conductor connection

| | |
|--|--|
| Connection method | Push-in connection |
| rigid | 0.2 mm ² ... 1 mm ² |
| flexible | 0.2 mm ² ... 1.5 mm ² |
| flexible with ferrule without plastic sleeve | 0.2 mm ² ... 1.5 mm ² |
| flexible with ferrule with plastic sleeve | 0.2 mm ² ... 0.75 mm ² |
| rigid (AWG) | 24 ... 16 |
| Stripping length | 8 mm |

Signaling

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 |
| Signal threshold | > 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) |
| | > 0.9 x U _{Set} (LED lights up green) |
| | < 0.9 x U _{Set} (LED flashes green) |
| | > 0.8 x U _{InNom} (LED off) |
| | < 0.8 x U _{InNom} (LED lights up yellow) |

Signal input Remote (configurable)

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

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 output Out 2 (configurable)

| | |
|---------------------|------------------------------------|
| Connection labeling | 3.6 + |
| Digital | 0 V DC |
| | 24 V DC |
| | 20 mA |
| Default | Output power |
| Signal option | Output voltage |
| | Output current |
| | Operating hours |
| | Early warning of high temperatures |
| | OVP voltage limitation active |
| Analog | 4 mA ... 20 mA ±5 % (Load ≤400 Ω) |
| Signal option | Output voltage |
| | Output current |

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| | |
|--|------------------------------------|
| | Output power |
| Signal output Relay 13/14 (configurable) | |
| Connection labeling | 3.1, 3.2 |
| Switch contact (floating) | floating |
| Digital | 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 ground SGnd | |
| Connection labeling | 3.4 + |
| Function | Signal ground |
| Reference potential | to OUT1, OUT2, REM |

Electrical properties

| | |
|---------------------------------|---|
| Number of phases | 1.00 |
| Insulation voltage input/output | 4 kV DC (type test) |
| | 2 kV DC (routine test) |
| Switching frequency | 190.00 kHz ... 220.00 kHz (Auxiliary converter stage) |
| | 67.00 kHz ... 135.00 kHz (Main converter stage) |

Product properties

| | |
|----------------------------|---------------------|
| Product type | DC/DC converters |
| Product family | QUINT POWER |
| MTBF (IEC 61709, SN 29500) | > 1380000 h (25 °C) |
| | > 800000 h (40 °C) |
| | > 340000 h (60 °C) |

Insulation characteristics

| | |
|-----------------------------------|------------------------------------|
| Protection class | Special with SELV input and output |
| Overvoltage category (EN 61010-1) | II |
| Overvoltage category (EN 62477-1) | III |
| Degree of pollution | 2 |

Life expectancy (electrolytic capacitors)

| | |
|-------------|----------|
| Current | 5 A |
| Temperature | 40 °C |
| Time | 367721 h |

| | |
|-----------------|---------|
| Additional text | 24 V DC |
|-----------------|---------|

Life expectancy (electrolytic capacitors)

| | |
|-----------------|----------|
| Current | 10 A |
| Temperature | 40 °C |
| Time | 183860 h |
| Additional text | 24 V DC |

Life expectancy (electrolytic capacitors)

| | |
|-----------------|----------|
| Current | 10 A |
| Temperature | 30 °C |
| Time | 422400 h |
| Additional text | 24 V DC |

Dimensions

Item dimensions

| | |
|--------|--------|
| Width | 50 mm |
| Height | 130 mm |
| Depth | 125 mm |

Item dimensions with alternative mounting

| | |
|--------|--------|
| Width | 122 mm |
| Height | 130 mm |
| Depth | 53 mm |

Installation dimensions

| | |
|--|-------------------------------|
| Installation distance right/left (active) | 15 mm / 15 mm (≤ 70 °C) |
| Installation distance right/left (passive) | 0 mm / 0 mm (≤ 70 °C) |
| Installation distance top/bottom (active) | 50 mm / 50 mm (≤ 70 °C) |
| Installation distance top/bottom (passive) | 50 mm / 50 mm (≤ 70 °C) |

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 | yes |

Material specifications

| | |
|--|------------------------|
| Flammability rating according to UL 94 (housing / terminal blocks) | V0 |
| Housing material | Metal |
| Hood version | Stainless steel X6Cr17 |
| Side element version | Aluminum |

Environmental and real-life conditions

Ambient conditions

| | |
|--|---|
| Degree of protection | IP20 |
| | IP20 |
| Ambient temperature (operation) | -40 °C ... 70 °C (> 60 °C Derating: 2,5 %/K) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Maximum altitude | ≤ 5000 m (> 2000 m, observe derating) |
| Climatic class | 3K3 (EN 60721) |
| Max. permissible relative humidity (operation) | ≤ 100 % (at 25 °C, non-condensing) |
| Shock | 18 ms, 30g, in each space direction (according to IEC 60068-2-27) |
| Vibration (operation) | 5 Hz ... 100 Hz resonance search 2.3g, 90 min., resonance frequency 2.3g, 90 min. (according to DNV GL Class C) |
| Temp code | T4 (-40 ... +70 °C; > 60 °C, Derating: 2,5 %/K) |

Standards and regulations

Safety for measurement, control, and laboratory equipment

| | |
|--------------------------|---|
| Standard designation | Electrical safety (of control and regulation devices) |
| Standards/specifications | IEC 61010-1 |

Railway applications

| | |
|----------------------|----------------------|
| Standard designation | Railway applications |
|----------------------|----------------------|

Protective extra-low voltage

| | |
|--------------------------|------------------------------|
| Standard designation | Protective extra-low voltage |
| Standards/specifications | EN 61010-1 (SELV) |
| | IEC 61010-2-201 (PELV) |

Explosive atmospheres

| | |
|--------------------------|-----------------------|
| Standard designation | Explosive atmospheres |
| Standards/specifications | IEC 60079-0 |
| | IEC 60079-7 |
| | IEC 60079-11 |
| | IEC 60079-15 |

Mains voltage dips

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

Approvals

UL

| | |
|----------------|--------------------------------|
| Identification | UL Listed UL 61010-1 |
| | Ⓢ II 3 G Ex ec ic nC IIC T4 Gc |

UL

| | |
|----------------|--------------------------|
| Identification | UL Listed UL 61010-2-201 |
| | Ex ec ic nC IIC T4 Gc |

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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) |
|----------------|---|

CSA

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

CSA

| | |
|----------------|----------------------------|
| Identification | CAN/CSA-IEC 61010-2-201:14 |
|----------------|----------------------------|

SIQ

| | |
|----------------|-----------------------------|
| Identification | Type tested (type approved) |
|----------------|-----------------------------|

SIQ

| | |
|----------------|--|
| Identification | CB scheme (IEC 61010-1, IEC 61010-2-201) |
|----------------|--|

Shipbuilding

| | |
|----------------|--------|
| Identification | DNV GL |
|----------------|--------|

Shipbuilding

| | |
|----------------|-----|
| Identification | ABS |
|----------------|-----|

ATEX

| | |
|----------------|--------------------------------|
| Identification | SIQ 21 ATEX 025 X |
| | ⊕ II 3 G Ex ec ic nC IIC T4 Gc |

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 |
| 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 | IEC 61850-3 |
| | EN 61000-6-5 |

Conducted noise emission

| | |
|-----------------------|------------------------|
| Standards/regulations | EN 55016 |
| | EN 61000-6-3 (Class B) |

Noise emission

| | |
|-----------------------|---|
| Standards/regulations | Additional basic standard EN 61000-6-5 (immunity in switching devices), IEC/EN 61850-3 (power supply) |
|-----------------------|---|

Noise emission

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| | |
|-----------------------|------------------------|
| Standards/regulations | EN 55016 |
| | EN 61000-6-3 (Class B) |

DNV GL conducted noise emissions

| | |
|-----------------|----------------------|
| DNV | Class B |
| Additional text | Bridge and deck area |

DNV GL noise radiation

| | |
|-----------------|----------------------|
| DNV | Class B |
| Additional text | Bridge and deck area |

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 A |

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 ... 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) |
| Comments | Criterion A |

Fast transients (burst)

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

Fast transients (burst)

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

Surge voltage load (surge)

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-5 |
|-----------------------|--------------|

Surge voltage load (surge)

| | |
|--------|------------------------------------|
| 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) |

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| | |
|----------|------------------------------------|
| Signal | 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion A |

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) |

Power frequency magnetic field

| | |
|-----------------------|-----------------|
| Standards/regulations | EN 61000-4-8 |
| 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 |
| Frequency range | 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

| | |
|-----------------------|---------------|
| Standards/regulations | EN 61000-4-29 |
| Voltage | 24 V DC |
| Voltage dip | 70 % |
| Time | 100 ms |
| Additional text | Test Level 2 |
| Comments | Criterion A |
| Voltage dip | 40 % |
| Time | 100 ms |
| Additional text | Test Level 2 |
| Comments | Criterion B |
| Voltage dip | 0 % |
| 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 4) |
| Voltage | 30 V 3 V |
| Test level 2 | 150 Hz 1.5 kHz (Test Level 4) |
| Voltage | 3 V |
| Test level 3 | 1.5 kHz 15 kHz (Test Level 4) |
| Voltage | 0 V 3 V |
| Test level 4 | 15 kHz 150 kHz (Test Level 4) |
| Voltage | 30 V |
| Test level 5 | 16.7 Hz 50 Hz 60 Hz 150 Hz 180 Hz (Test Level 4) |
| Voltage | 30 V (Permanent) |
| Test level 6 | 0 Hz 16.7 Hz 50 Hz 60 Hz (Test Level 4) |
| Voltage | 300 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) | 100 kHz 1 MHz (Test Level 3 - symmetrical) |
| Voltage | 1 kV |
| Input, output (test level 2) | 100 kHz 1 MHz (Test Level 3 - asymmetrical) |
| Voltage | 2.5 kV |
| Input, output (test level 3) | 10 MHz (Test Level 3 - asymmetrical) |
| Voltage | 2 kV |
| Signals (test level 1) | 100 kHz 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 1 kV |
| Signals (test level 2) | 100 kHz 1 MHz (Test Level 3 - asymmetrical) |
| Voltage | 2.5 kV |
| Comments | Criterion A |

Attenuated oscillating magnetic field

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

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. |

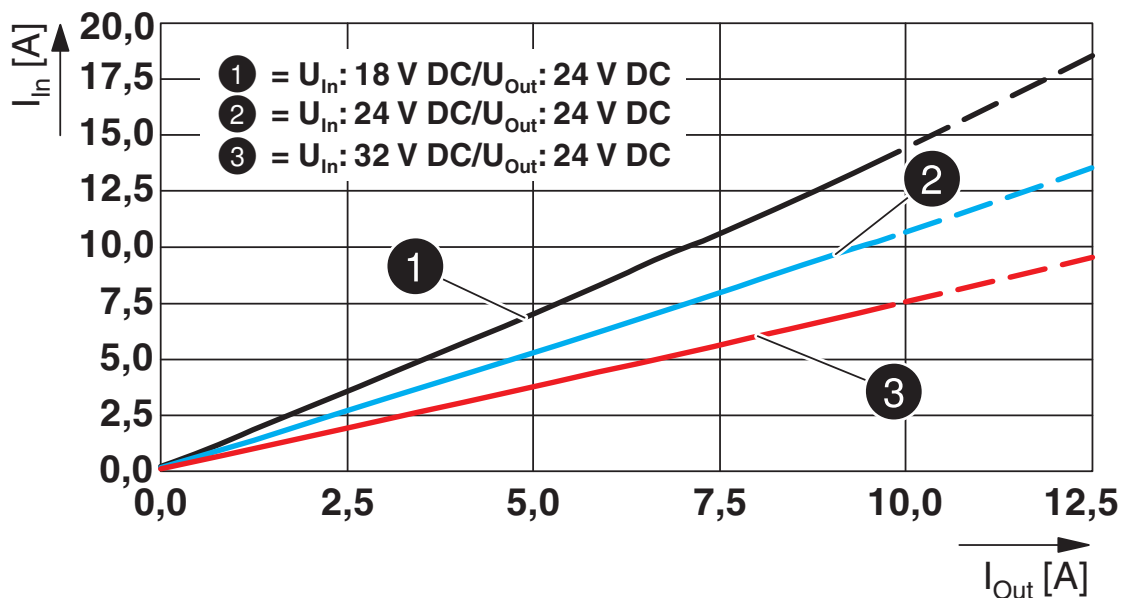
Drawings

Schematic diagram

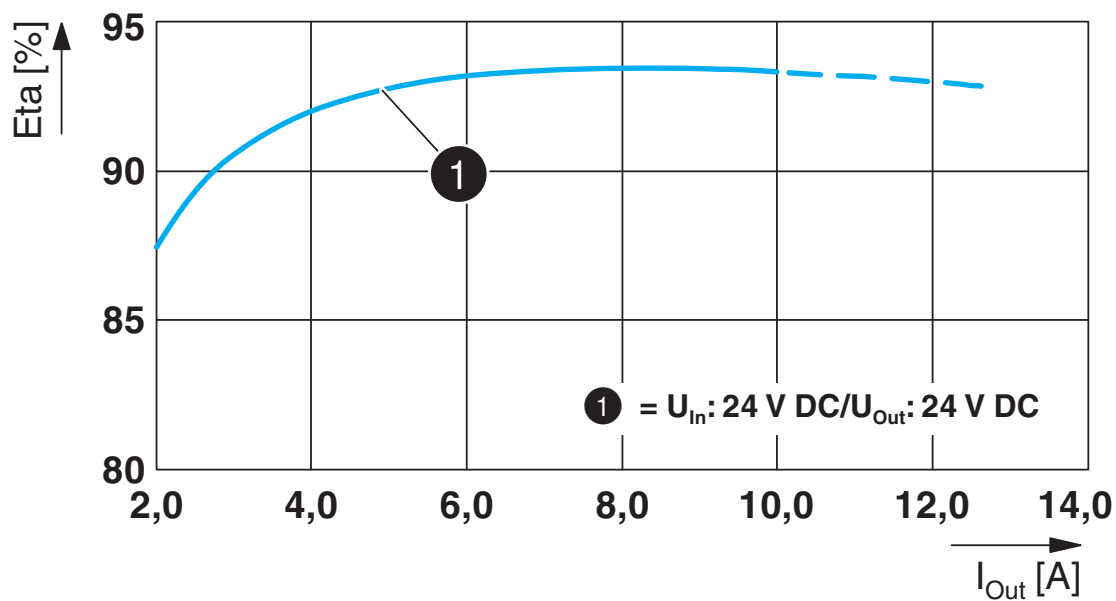
Housing



Diagram



Diagram



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Approvals

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IECEE CB Scheme

Approval ID: SI-8406



EAC

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



LR

Approval ID: LR22472797TA



NK

Approval ID: TA21182M



cULus Listed

Approval ID: FILE E 123528



BV

Approval ID: 57060/B0 BV

DNV

Approval ID: TAA00001YD



IECEx

Approval ID: IECEx SIQ 19.0001X



cULus Listed

Approval ID: FILE E 199827



ATEX

Approval ID: SIQ 21 ATEX 025 X



CCC

Approval ID: 2021122303114610

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27040701 |
| ECLASS-15.0 | 27040701 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC002540 |
|-----------|----------|

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 | 60bbbed1-90c9-4ac4-8806-25d8d1977e7d |

EF3.1 Climate Change

| | |
|---------|----------------|
| CO2e kg | 20.275 kg CO2e |
|---------|----------------|

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Phoenix Contact USA
 586 Fulling Mill Road
 Middletown, PA 17057, United States
 (+717) 944-1300
info@phoenixcon.com