# QUINT4-PS/24DC/24DC/10/SC - DC/DC converter

1046803

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CRA-READY



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. The product is being prepared for compliance with the Cyber Resilience Act (CRA).

## 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 miniature 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

ELEKTROGERÄTE RÜCKNAHME

## Commercial data

| | |
|---|---|
| Item number | 1046803 |

| | |
|---|---|
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CM01 |
| Product key | CMDI43 |
| GTIN | 4055626643748 |
| Weight per piece (including packing) | 1,033.26 g |
| Weight per piece (excluding packing) | 910 g |
| Customs tariff number | 85044095 |
| Country of origin | TH |

# Technical data

## Notes

Note on application

| | |
|---|---|
| Note on application | As things stand now, we are preparing the product so that, as of December 11, 2027, it will comply with the requirements of the EU Cyber Resilience Act (CRA) based on the information currently available regarding the CRA. |

## 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 $A^2s$ |
| 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 ... 20 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 ... 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 |
| 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) | ≤ 32 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 | < 100 ms ($U_{OUT}$ (10 % ... 90 %)) |
| Connection in series | yes |
| Maximum no-load power dissipation | < 5 W |
| Power loss nominal load max. | < 16 W |
| Power dissipation SLEEP MODE | < 2 W |
| Connection in parallel | yes, for redundancy and increased capacity |
| Fuse protection (secondary side) | electronic |
| | thermal-magnetic |
| | thermal |

## Connection data

### Input

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

### Conductor connection

| | |
|---|---|
| Connection method | Screw connection |
| rigid | 0.2 mm² ... 6 mm² |
| flexible | 0.2 mm² ... 6 mm² |
| flexible with ferrule without plastic sleeve | 0.2 mm² ... 4 mm² |
| flexible with ferrule with plastic sleeve | 0.2 mm² ... 4 mm² |
| rigid (AWG) | 24 ... 10 |
| Stripping length | 10 mm |
| Tightening torque (EU) | 0.6 Nm ... 0.8 Nm |
| Drive form screw head | Slotted L |

### Output

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

### Conductor connection

| | |
|---|---|
| Connection method | Screw connection |
| rigid | 0.2 mm² ... 6 mm² |
| flexible | 0.2 mm² ... 6 mm² |
| flexible with ferrule without plastic sleeve | 0.2 mm² ... 4 mm² |
| flexible with ferrule with plastic sleeve | 0.2 mm² ... 4 mm² |
| rigid (AWG) | 24 ... 10 |
| Stripping length | 10 mm |
| Tightening torque (EU) | 0.6 Nm ... 0.8 Nm |
| Drive form screw head | Slotted L |

### Signal

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

### Conductor connection

| | |
|---|---|
| Connection method | Push-in connection |
| rigid | 0.2 mm² ... 1 mm² |
| flexible | 0.2 mm² ... 1.5 mm² |
| flexible with ferrule without plastic sleeve | 0.2 mm² ... 1.5 mm² |
| flexible with ferrule with plastic sleeve | 0.2 mm² ... 0.75 mm² |
| 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 |
| | 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 | for 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 |
| | > 1380000 h (25 °C) |

| | |
|---|---|
| MTBF (IEC 61709, SN 29500) | > 800000 h (40 °C) |
| | > 340000 h (60 °C) |
| Special properties | The product is being prepared for compliance with the Cyber Resilience Act (CRA) |

Insulation characteristics

| | |
|---|---|
| Protection class | Special with SELV input and output |
| Overvoltage category (EN 61010-1) | II (≤ 5000 m) |
| Overvoltage category (EN 62477-1) | III (≤ 5000 m) |
| 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: $P_N$ ≥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 |
| With protective coating | no |

## 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 |
| 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 | 3K22 (in accordance with EN 60721-3-3) |
| 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) | 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 (-25 ... +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 |

Protective extra-low voltage

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

Mains voltage dips

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

Railway applications

| | |
|---|---|
| Standard designation | Railway applications |
| Standards/specifications | EN 50121-3-2 |

| | |
|---|---|
| | IEC 62236-3-2 |

## Approvals

UL

| | |
|---|---|
| Identification | UL Listed UL 61010-1 |

UL

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

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 C22.2 No. 61010-2-201:18 |

SIQ

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

SIQ

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

Shipbuilding

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

Shipbuilding

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

Shipbuilding

| | |
|---|---|
| Identification | BV |

Shipbuilding

| | |
|---|---|
| Identification | NK |

Shipbuilding

| | |
|---|---|
| Identification | LR |

## 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

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

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 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 direct voltage

| | |
|---|---|
| Standards/regulations | EN 61000-4-17 |
| Alternating component | 15 % ($U_N$) |
| Frequency | 50 Hz |
| | 100 Hz |
| | 150 Hz |
| Comments | Criterion A |
| Alternating component | 14 % ($U_N$) |
| Frequency | 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 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 |

Attenuated oscillating magnetic field

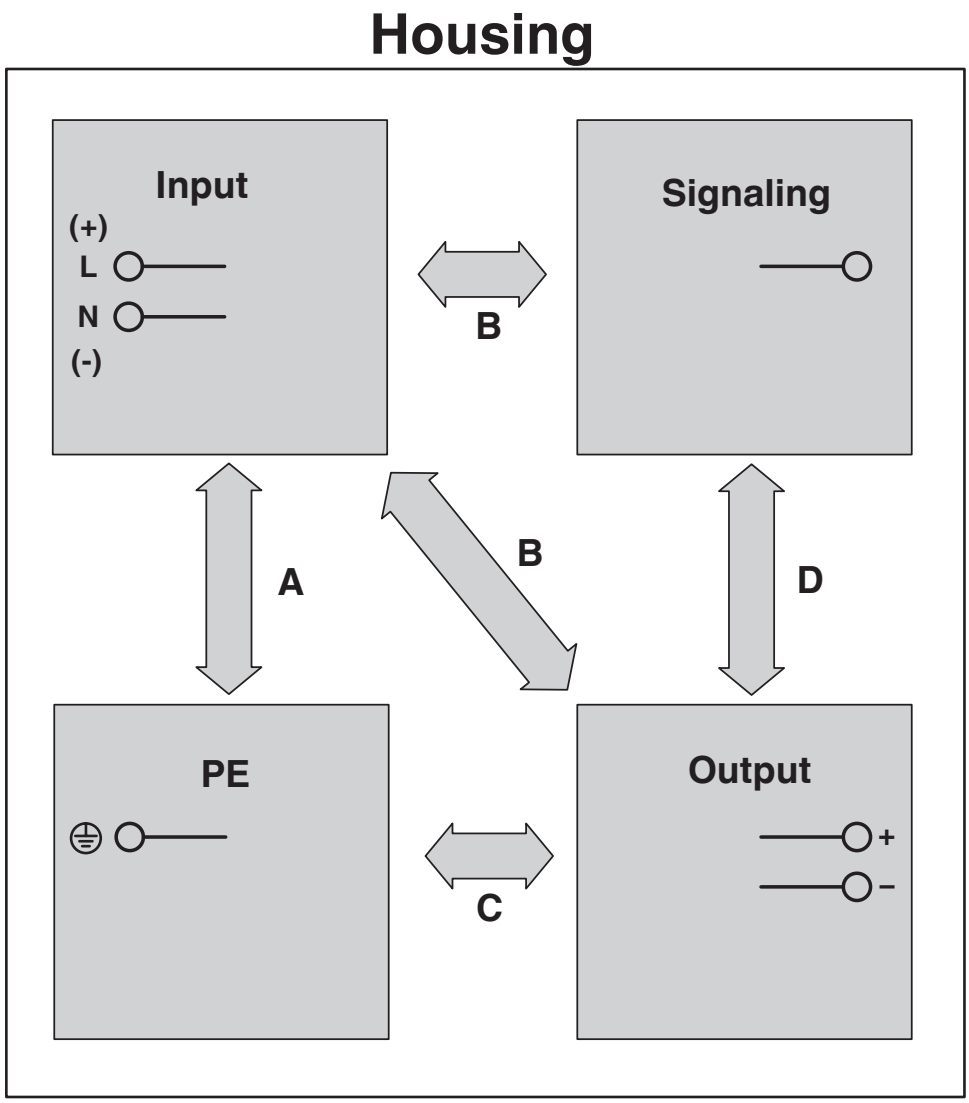
| | |
|---|---|
| Standards/regulations | EN 61000-4-10 |
| Test field strength | 100 A/m |
| Test level 1 | 100 kHz |
| Test field strength | 100 A/m |
| Test level 2 | 1 MHz |
| Comments | Criterion A |

Criteria

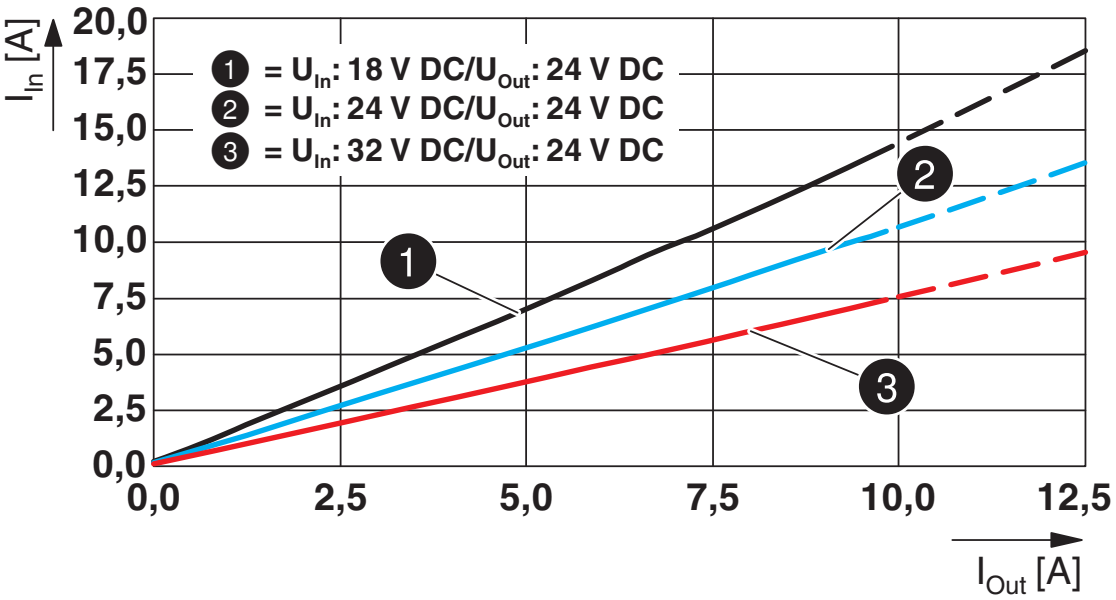
| | |
|---|---|
| Criterion A | Normal operating behavior within the specified limits. |
| Criterion B | Temporary impairment to operational behavior that is corrected by the device itself. |
| Criterion C | Temporary adverse effects on the operating behavior, which the device corrects automatically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

## Drawings

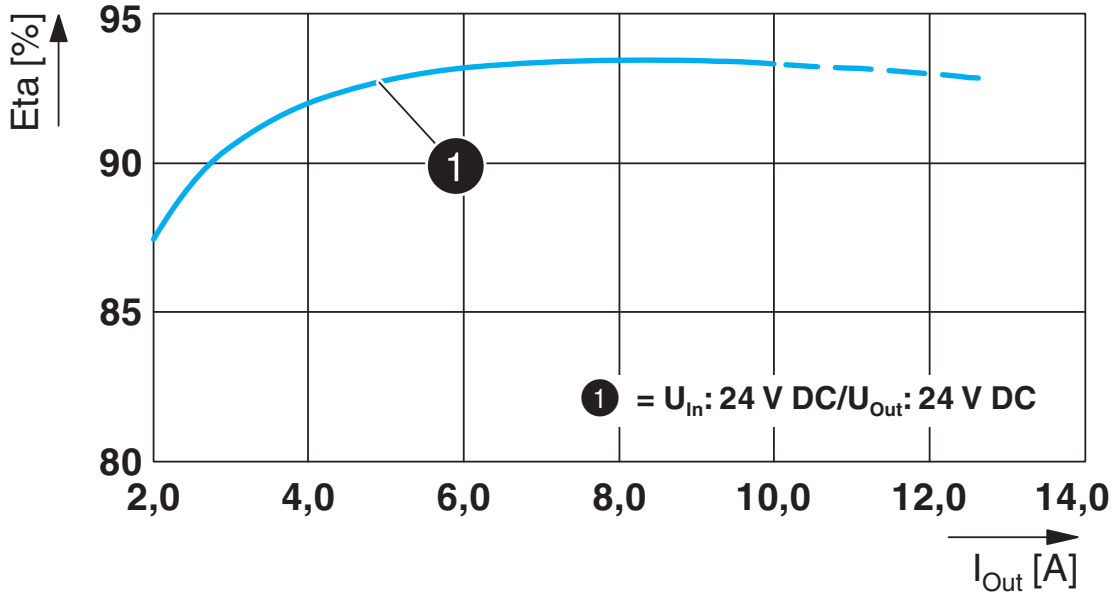
Schematic diagram



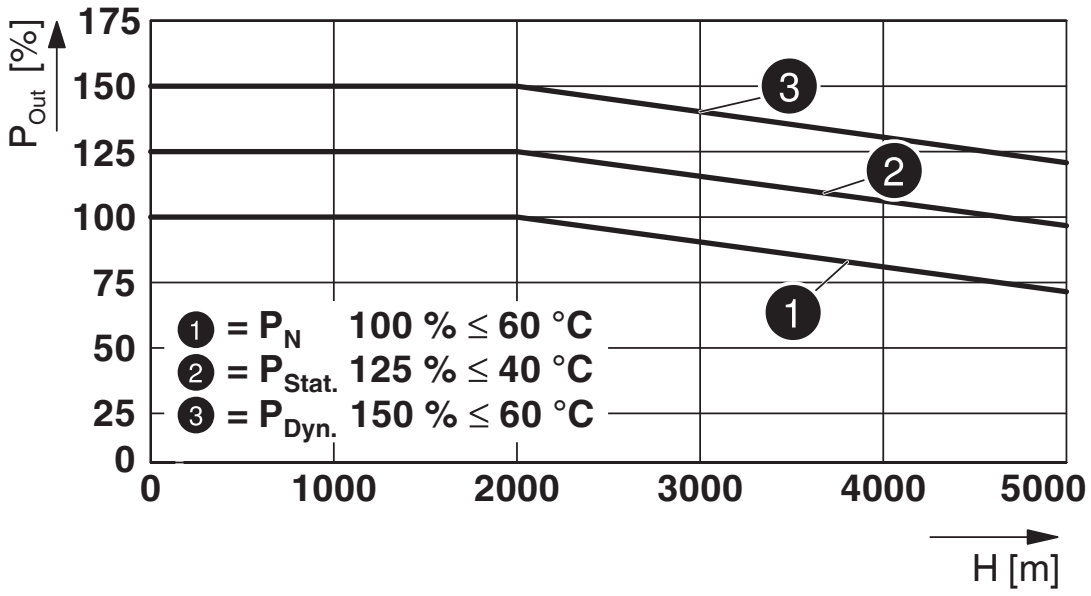
Diagram



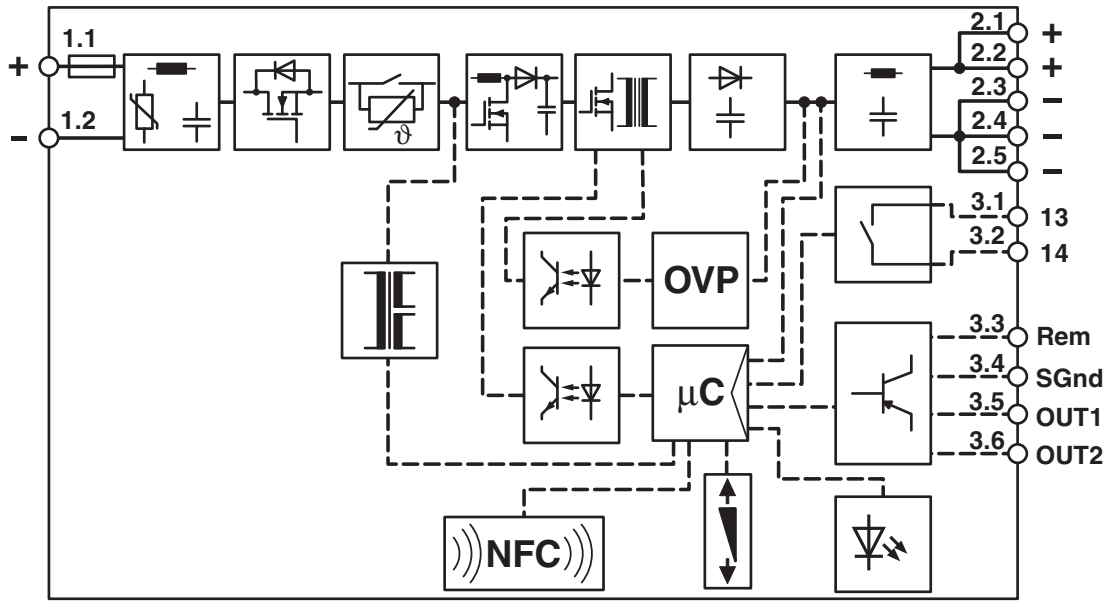

Diagram



Diagram




Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/1046803

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

**LR**
Approval ID: LR22472797TA

**BV**
Approval ID: 57060/B0 BV

**ABS**
Approval ID: 26-0442641-PDA

**Type approved**
Approval ID: SI-SIQ BG 005/058

**DNV**
Approval ID: TAA00001YD

**cCSAus**
Approval ID: 70212082

**NK**
Approval ID: TA21182M

**EAC**
Approval ID: KZ7500651 0101 12535

**IECEE CB Scheme**
Approval ID: SI-8406

**cULus Listed**
Approval ID: E123528-20190222

**cULus Listed**
Approval ID: E199827-20190329

## Classifications

### ECLASS

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

### ETIM

| | |
|---|---|
| ETIM 10.0 | 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 | 1bcb2815-8214-4da2-b271-5091b9cba01b |

EF3.1 Climate Change

| | |
|---|---|
| CO2e kg | 20.085 kg CO2e |

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