# QUINT4-PS/12-24DC/24DC/1.3/SC - DC/DC converter

1066703

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Primary-switched DC/DC converter, QUINT POWER DIN rail mounting, input: 12 V DC - 24 V DC, output: 24 V DC / 1.3 A

## Product description

In the power range of up to 100 W, QUINT POWER provides superior system availability in the smallest size. Preventative function monitoring and exceptional power reserves are available for applications in the low-power range.

## 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

## Commercial data

| | |
|---|---|
| Item number | 1066703 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CM01 |
| Product key | CMDI43 |
| GTIN | 4055626733692 |
| Weight per piece (including packing) | 216 g |
| Weight per piece (excluding packing) | 169 g |
| Customs tariff number | 85044095 |
| Country of origin | CN |

## Technical data

### Input data

| | |
|---|---|
| Nominal input voltage range | 12 V DC ... 24 V DC |
| Input voltage range | 12 V DC ... 24 V DC -25 % ... +33 % (SELV) |
| Wide-range input | yes |
| Electric strength, max. | 35 V DC (60 s) |
| Inrush current | typ. 1.6 A |
| Inrush current integral ($I^2t$) | typ. 0.1 $A^2s$ |
| Inrush current limitation | typ. 1.6 A |
| Mains buffering time | typ. 19 ms (24 V DC) |
| Current consumption | typ. 3.75 A (12 V DC) |
| | typ. 1.85 A (24 V DC) |
| Typical response time | 700 ms (from SLEEP MODE) |
| Switch-on time | < 1 s |
| Input fuse | 15 A (fast blow, internal) |
| Recommended breaker for input protection | 10 A ... 16 A (Characteristic B, C, D, K or comparable) |

### Output data

| | |
|---|---|
| Efficiency | typ. 91.7 % (24 V DC) |
| Output characteristic | U/I Advanced |
| 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 ($I_N$) | 1.3 A |
| Static Boost ($I_{Stat.Boost}$) | 1.625 A (≤ 40 °C) |
| Dynamic Boost ($I_{Dyn.Boost}$) | 2.6 A (≤ 60 °C (4.9 s)) |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Derating | > 60 °C (2.5%/K of $P_{Out}$ nom.) |
| Output power ($P_N$) | 30 W |
| Output power ($P_{Stat. Boost}$) | 38 W |
| Output power ($P_{Dyn. Boost}$) | 60 W |
| Feedback voltage resistance | ≤ 35 V DC |
| Protection against overvoltage at the output (OVP) | < 32 V DC |
| Residual ripple | < 20 $mV_{PP}$ |
| 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 | < 1.3 W |
| Power loss nominal load max. | < 8 W |
| Connection in parallel | yes, for redundancy and increased capacity |

| | |
|---|---|
| Fuse protection (secondary side) | electronic |

## Connection data

### Input

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

Conductor connection

| | |
|---|---|
| Connection method | Screw connection |
| rigid | 0.5 mm² ... 2.5 mm² |
| flexible | 0.5 mm² ... 2.5 mm² |
| flexible with ferrule without plastic sleeve | 0.5 mm² ... 2.5 mm² |
| flexible with ferrule with plastic sleeve | 0.5 mm² ... 2.5 mm² |
| rigid (AWG) | 22 ... 14 |
| Stripping length | 8 mm |
| Tightening torque | 0.5 Nm ... 0.6 Nm |
| Drive form screw head | Slotted L |

### Output

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

Conductor connection

| | |
|---|---|
| Connection method | Screw connection |
| rigid | 0.2 mm² ... 2.5 mm² |
| flexible | 0.25 mm² ... 2.5 mm² |
| flexible with ferrule without plastic sleeve | 0.25 mm² ... 2.5 mm² |
| flexible with ferrule with plastic sleeve | 0.25 mm² ... 2.5 mm² |
| rigid (AWG) | 24 ... 14 |
| Stripping length | 8 mm |
| Tightening torque | 0.5 Nm ... 0.6 Nm |
| Drive form screw head | Slotted L |

### Signal

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

Conductor connection

| | |
|---|---|
| Connection method | Screw connection |
| rigid | 0.14 mm² ... 2.5 mm² |
| flexible | 0.14 mm² ... 2.5 mm² |
| flexible with ferrule without plastic sleeve | 0.25 mm² ... 2.5 mm² |
| flexible with ferrule with plastic sleeve | 0.25 mm² ... 2.5 mm² |
| rigid (AWG) | 26 ... 14 |
| Stripping length | 8 mm |
| Tightening torque | 0.5 Nm ... 0.6 Nm |
| Drive form screw head | Slotted L |

## Signaling

LED signaling

| | |
|---|---|
| Signal threshold | > $P_{Thr}$ (LED lights up yellow, output power > $P_{Thr}$, depending on the rotary selector switch setting) |
| | > 0.9 x $U_{Set}$ (LED lights up green) |
| | < 0.9 x $U_{Set}$ (LED flashes green) |

Signal output Configurable

| | |
|---|---|
| Digital | 0 V DC |
| | 24 V DC |
| | 22 mA |
| Default | 24 V DC |
| | 22 mA |
| | 24 V DC for $U_{Out}$ > 0.9 x $U_{Set}$ |

## Electrical properties

| | |
|---|---|
| Number of phases | 1.00 |
| Insulation voltage input/output | 2.6 kV DC (type test) |
| | 1.2 kV DC (routine test) |
| Switching frequency | 130.00 kHz ... 130.00 kHz (Auxiliary converter stage) |
| | 70.00 kHz ... 250.00 kHz (Main converter stage) |

## Product properties

| | |
|---|---|
| Product type | DC/DC converters |
| Product family | QUINT POWER |
| MTBF (IEC 61709, SN 29500) | > 1999348 h (25 °C) |
| | > 1120490 h (40 °C) |
| | > 471066 h (60 °C) |

Insulation characteristics

| | |
|---|---|
| Protection class | II |
| Overvoltage category (EN 61010-1) | II (≤ 5000 m) |
| Degree of pollution | 2 |

Life expectancy (electrolytic capacitors)

| | |
|---|---|
| Current | 0.65 A |
| Temperature | 40 °C |
| Time | 242000 h |
| Additional text | 24 V DC |

Life expectancy (electrolytic capacitors)

| | |
|---|---|
| Current | 1.3 A |
| Temperature | 40 °C |
| Time | 160000 h |
| Additional text | 24 V DC |

Life expectancy (electrolytic capacitors)

| | |
|---|---|
| Current | 1.3 A |
| Temperature | 30 °C |
| Time | 320000 h |
| Additional text | 24 V DC |

## Dimensions

Item dimensions

| | |
|---|---|
| Width | 22.5 mm |
| Height | 99 mm |
| Depth | 90 mm |

Installation dimensions

| | |
|---|---|
| Installation distance right/left (active) | 15 mm / 15 mm ($P_{Out}$ ≥50% ) |
| Installation distance right/left (passive) | 5 mm / 5 mm ($P_{Out}$ ≥50% ) |
| Installation distance right/left (active, passive) | 0 mm / 0 mm ($P_{Out}$ ≤50 %) |
| Installation distance top/bottom (active) | 30 mm / 30 mm ($P_{Out}$ ≥50% ) |
| Installation distance top/bottom (passive) | 30 mm / 30 mm ($P_{Out}$ ≥50% ) |
| Installation distance top/bottom (active, passive) | 30 mm / 30 mm ($P_{Out}$ ≤50 %) |

## 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 | Plastic |
| Type of housing | Polycarbonate (PC), UL 94 V0 |

## 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 | 3K3 (in acc. with EN 60721) |
| 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) | < 15 Hz, ±2.5 mm amplitude; 15 Hz ... 100 Hz: 2.3 g 90 Min. (in accordance with IEC 60068-2-6) |

| | |
|---|---|
| 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 | IEC 61010-1 (SELV) |

Mains voltage dips

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

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

Shipbuilding

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

## 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 |
| EMC requirements, power plant | EN 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 | 6 kV (Test Level 4) |
| Discharge in air | 8 kV (Test Level 3) |
| 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 4 - asymmetrical) |
| Output | 2 kV (Test Level 4 - asymmetrical) |
| Signal | 2 kV (Test Level 4 - asymmetrical) |
| Comments | Criterion B |

Surge voltage load (surge)

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

Surge voltage load (surge)

| | |
|---|---|
| Input | 1 kV (Test Level 4 - symmetrical) |
| | 2 kV (Test Level 4 - asymmetrical) |
| Output | 1 kV (Test Level 3 - symmetrical) |
| | 2 kV (Test Level 3 - asymmetrical) |
| Signal | 1 kV (Test Level 4 - symmetrical) |
| | 2 kV (Test Level 4 - 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 | 16.67 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 |
| Frequency | 0 Hz |
| Test field strength | 300 A/m |
| Additional text | DC, 60 s |

Voltage dips

| | |
|---|---|
| Standards/regulations | EN 61000-4-29 |
| Voltage | 24 V DC |
| Voltage dip | 70 % |
| Number of periods | 0.5 / 1 / 25 periods |
| Time | 100 ms |
| Additional text | Test Level 2 |
| Comments | Criterion A |
| Voltage dip | 40 % |
| Number of periods | 5 / 10 / 50 periods |
| Time | 100 ms |
| Additional text | Test Level 2 |

| | |
|---|---|
| Comments | Criterion A |
| Voltage dip | 0 % |
| Number of periods | 0.5 / 1 / 5 / 50 periods |
| 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 (Permanent) |
| 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 | 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) | 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Input, output (test level 2) | 1 MHz (Test Level 2 - asymmetrical) |
| Voltage | 1 kV |
| Signals (test level 1) | 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Signals (test level 2) | 1 MHz (Test Level 2 - asymmetrical) |

| | |
|---|---|
| Voltage | 1 kV |
| Comments | Criterion A |

Attenuated oscillating magnetic field

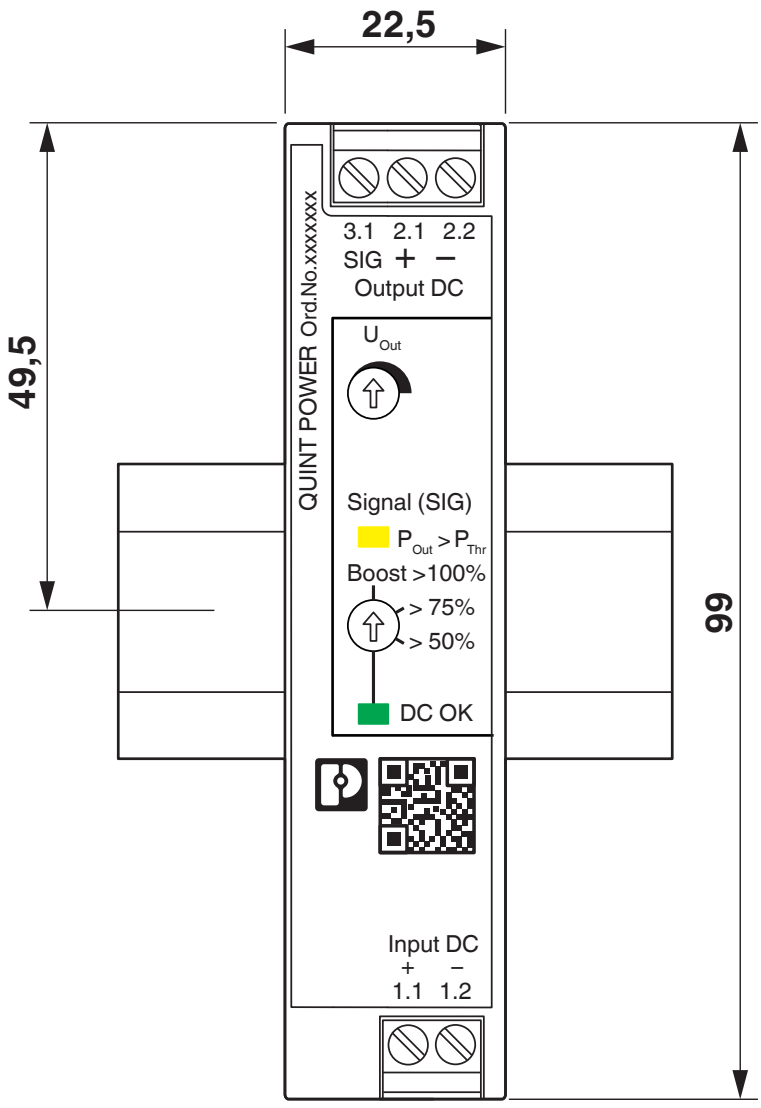
| | |
|---|---|
| Standards/regulations | EN 61000-4-10 |
| Test field strength | 100 A/m |
| Test level 1 | 100 kHz |
| Test field strength | 100 A/m |
| Test level 2 | 1 MHz |
| Comments | Criterion A |

Criteria

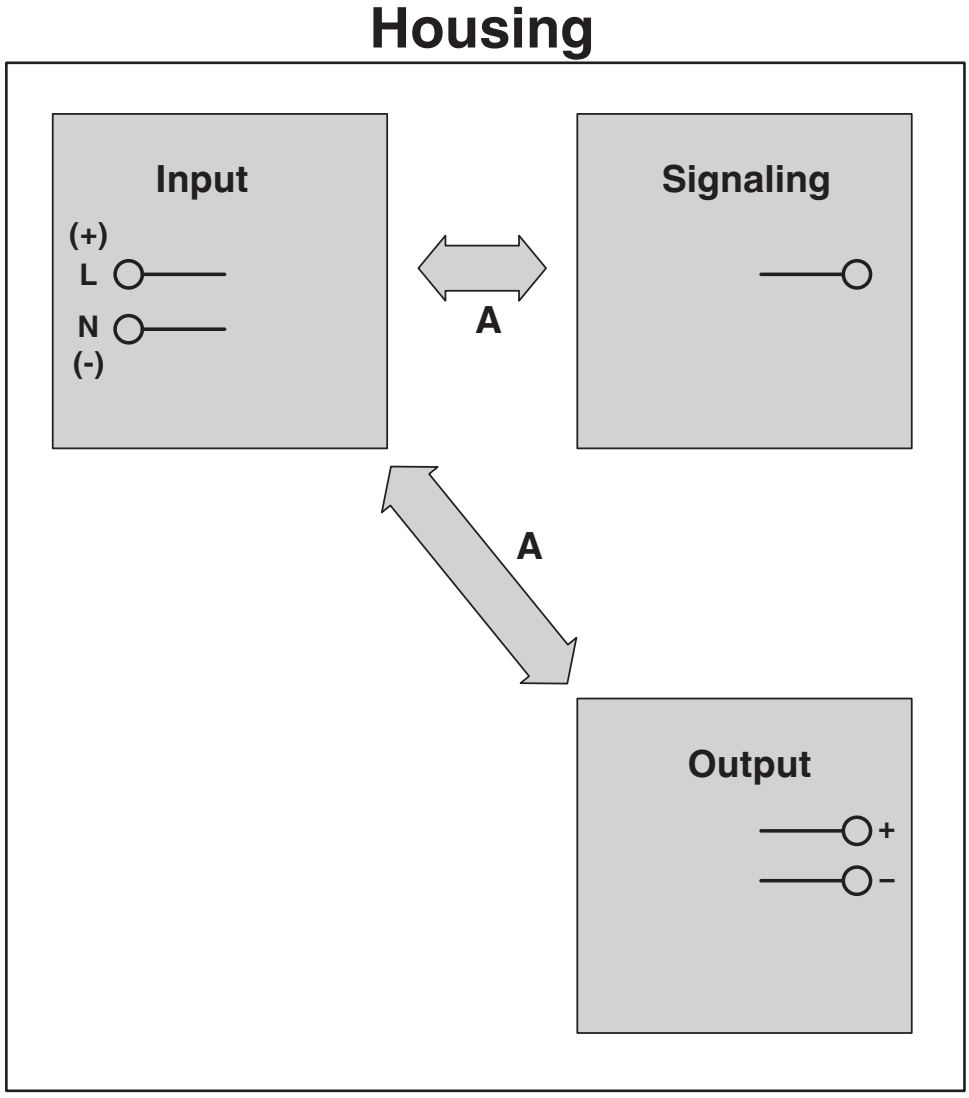
| | |
|---|---|
| Criterion A | Normal operating behavior within the specified limits. |
| Criterion B | Temporary impairment to operational behavior that is corrected by the device itself. |
| Criterion C | Temporary adverse effects on the operating behavior, which the device corrects automatically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

## Drawings

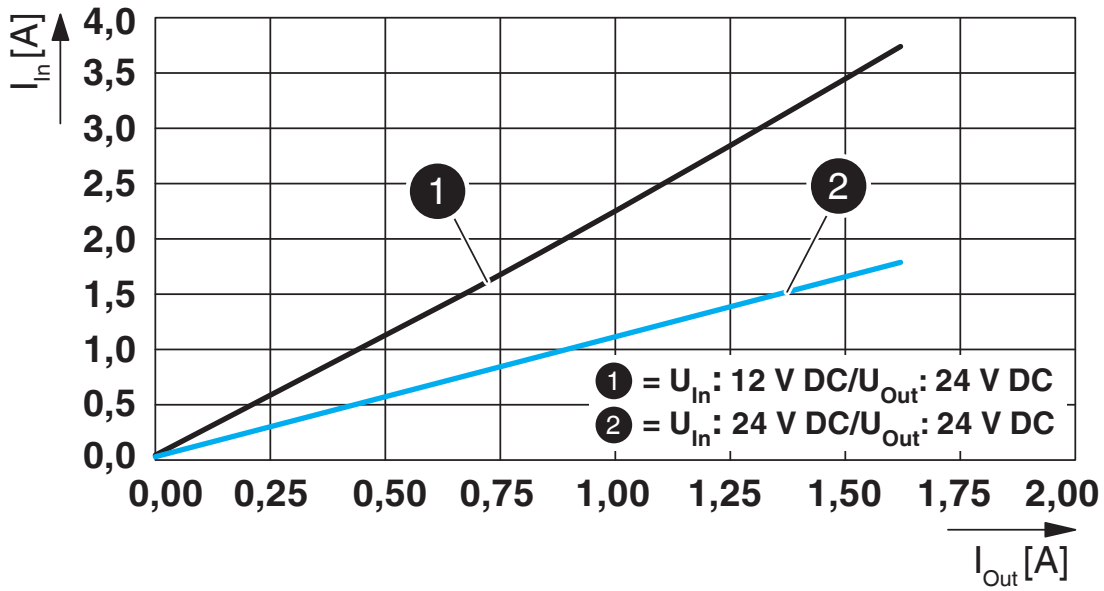
Dimensional drawing



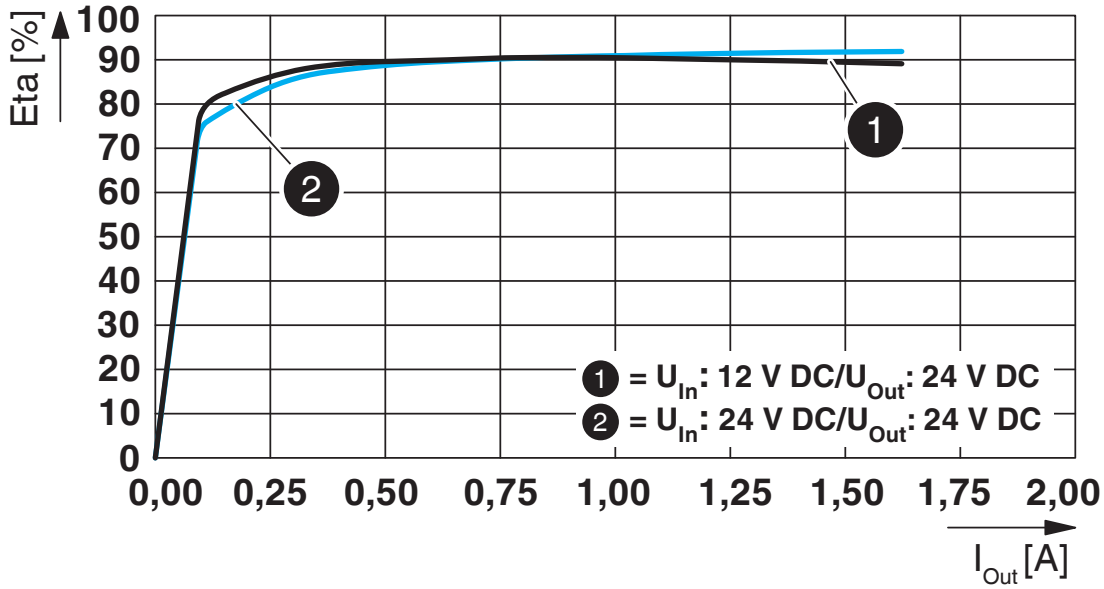
Schematic diagram



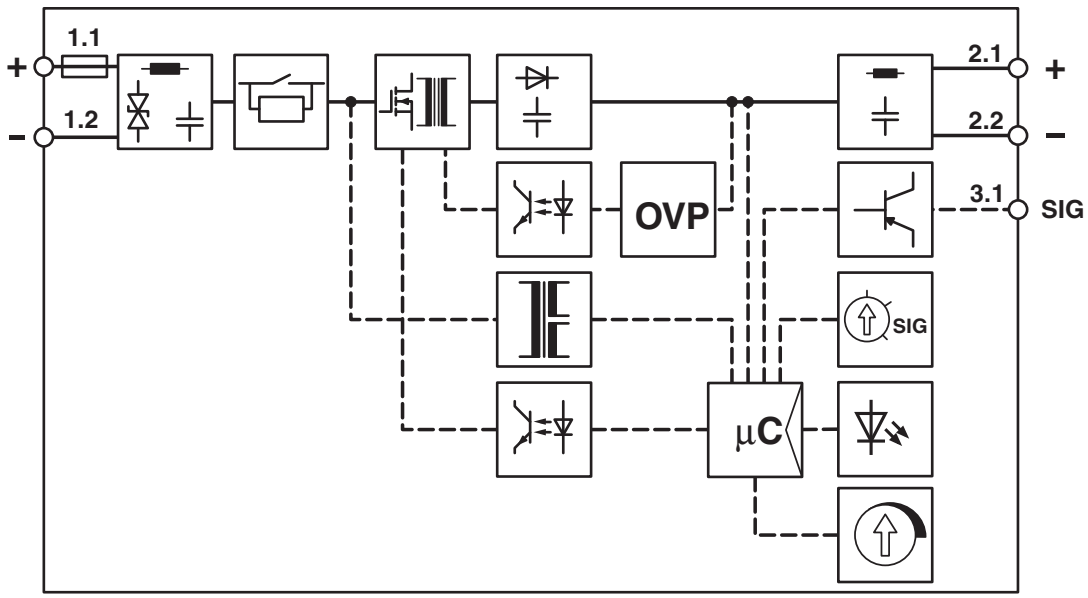
Diagram




Diagram



Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/1066703

**IECEE CB Scheme**
Approval ID: DK-97404-UL

**IECEE CB Scheme**
Approval ID: DE/PTZ/0122

**cULus Listed**
Approval ID: FILE E 123528

**DNV**
Approval ID: TAA00001YD

**cULus Listed**
Approval ID: FILE E 199827

## 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 | 6(c), 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 | c5e7fff1-8bf2-42c7-a0f9-d9d005d0147f |

EF3.1 Climate Change

| | |
|---|---|
| CO2e kg | 8.478 kg CO2e |

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