

# QUINT-PS/1AC/24DC/10 - Power supply unit



2866763

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Primary-switched power supply unit QUINT POWER, Screw connection, DIN rail mounting, SFB Technology (Selective Fuse Breaking), input: 1-phase, output: 24 V DC / 10 A

## Product description

QUINT POWER power supplies with maximum functionality

QUINT POWER circuit breakers magnetically and therefore quickly trip at 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.

Reliable starting of heavy loads takes place via the static power reserve POWER BOOST. Thanks to the adjustable voltage, all ranges between 5 V DC ... 56 V DC are covered.

## Your advantages

- Reliable starting of difficult loads with the static POWER BOOST power reserve with up to 1.5 times the nominal current permanently
- Fast tripping of standard circuit breakers with dynamic power reserve SFB (selective fuse breaking) technology with up to 6 times the nominal current for 12 ms
- For superior system availability
- Preventive function monitoring

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2866763             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Product key                          | CMPQ13              |
| Catalog page                         | Page 159 (C-6-2015) |
| GTIN                                 | 4046356113793       |
| Weight per piece (including packing) | 1,508 g             |
| Weight per piece (excluding packing) | 1,145 g             |
| Customs tariff number                | 85044095            |
| Country of origin                    | TH                  |

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## Technical data

### Input data

#### AC operation

|                                          |                                                                 |
|------------------------------------------|-----------------------------------------------------------------|
| Nominal input voltage range              | 100 V AC ... 240 V AC -15 % / +10 %                             |
| Input voltage range                      | 85 V AC ... 264 V AC                                            |
| Derating $I_{Stat. Boost}$               | < 100 V AC (1 %/V)                                              |
| Input voltage range DC                   | 110 V DC ... 350 V DC (typ. 90 V DC (UL 508: $\leq 300$ V DC))  |
| Electric strength, max.                  | 300 V AC                                                        |
| Typical national grid voltage            | 120 V AC                                                        |
|                                          | 230 V AC                                                        |
| Voltage type of supply voltage           | AC                                                              |
| Inrush current                           | < 15 A                                                          |
| Inrush current integral ( $I^2t$ )       | < 1.5 A <sup>2</sup> s                                          |
| Inrush current limitation                | 15 A                                                            |
| AC frequency range                       | 45 Hz ... 65 Hz                                                 |
| Frequency range DC                       | 0 Hz                                                            |
| Mains buffering time                     | > 36 ms (120 V AC)                                              |
|                                          | > 36 ms (230 V AC)                                              |
| Current consumption                      | 4 A (100 V AC)                                                  |
|                                          | 1.7 A (240 V AC)                                                |
| Nominal power consumption                | 302 VA                                                          |
| Protective circuit                       | Transient surge protection; Varistor, gas-filled surge arrester |
| Power factor (cos phi)                   | 0.85                                                            |
| Typical response time                    | < 0.15 s                                                        |
| Input fuse                               | 10 A (slow-blow, internal)                                      |
| Permissible backup fuse                  | B10 B16 AC:                                                     |
| Permissible DC backup fuse               | DC: Connect a suitable fuse upstream                            |
| Recommended breaker for input protection | 10 A ... 20 A (Characteristics B, C, D, K)                      |
| Discharge current to PE                  | < 3.5 mA                                                        |

#### DC operation

|                             |                                                                 |
|-----------------------------|-----------------------------------------------------------------|
| Nominal input voltage range | 110 V DC ... 250 V DC -10 % ... +40 % (UL 508: $\leq 300$ V DC) |
| Input voltage range         | 110 V DC ... 350 V DC                                           |
| Derating $I_{Stat. Boost}$  | < 110 V DC (1 %/V)                                              |
| Current consumption         | 3.4 A (110 V DC)                                                |
|                             | 1.5 A (250 V DC)                                                |

### Output data

|                        |                        |
|------------------------|------------------------|
| Efficiency             | typ. 92 % (120 V AC)   |
|                        | typ. 93.2 % (230 V AC) |
| Output characteristic  | U/I                    |
| Nominal output voltage | 24 V DC $\pm 1$ %      |

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|                                                    |                                                                 |
|----------------------------------------------------|-----------------------------------------------------------------|
| Setting range of the output voltage ( $U_{Set}$ )  | 18 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted) |
| Nominal output current ( $I_N$ )                   | 10 A                                                            |
| POWER BOOST ( $I_{Boost}$ )                        | 15 A (-25 °C ... 40 °C permanent, $U_{OUT} = 24$ V DC )         |
| Static Boost ( $I_{Stat.Boost}$ )                  | 15 A                                                            |
| Selective Fuse Breaking ( $I_{SFB}$ )              | 60 A (12 ms)                                                    |
| Magnetic circuit breaker tripping                  | B2 / B4 / B6 / C2 / C4                                          |
| Derating                                           | 60 °C ... 70 °C (2.5 %/K)                                       |
| Feedback voltage resistance                        | $\leq 35$ V DC                                                  |
| Protection against overvoltage at the output (OVP) | $\leq 35$ V DC                                                  |
| 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                                    | < 50 mV <sub>PP</sub> (with nominal values)                     |
| Short-circuit-proof                                | yes                                                             |
| Output power                                       | 240 W                                                           |
|                                                    | 360 W                                                           |
| Maximum no-load power dissipation                  | 9.1 W                                                           |
| Power loss nominal load max.                       | 22 W                                                            |
| Rise time                                          | < 0.05 s ( $U_{OUT}$ (10 % ... 90 %))                           |
| Connection in parallel                             | yes, for redundancy and increased capacity                      |
| Connection in series                               | yes                                                             |

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  | $\leq 20$ mA (short-circuit-proof)       |
| Continuous load current | $\leq 20$ mA                             |

Signal: DC OK floating

|                           |                                                            |
|---------------------------|------------------------------------------------------------|
| Output description        | Relay contact, $U_{OUT} > 0.9 \times U_N$ : Contact closed |
| Maximum switching voltage | 30 V AC                                                    |
|                           | 24 V DC                                                    |
| Maximum inrush current    | 0.5 A                                                      |
|                           | 1 A                                                        |
| Continuous load current   | $\leq 1$ A                                                 |

Signal: POWER BOOST, active

|                         |                               |
|-------------------------|-------------------------------|
| Output description      | $I_{OUT} < I_N$ : High signal |
| Switching voltage range | 18 V DC ... 24 V DC           |
| Output voltage          | + 24 V DC                     |
| Maximum inrush current  | 20 mA (short-circuit-proof)   |
| Continuous load current | $\leq 20$ mA                  |

## Connection data

Input

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|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | 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.      | 16                  |
| 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              |

## Output

|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | 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.      | 16                  |
| 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

|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | 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.      | 16                  |
| 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         | $U_{OUT} > 0.9 \times U_N$ : "DC OK" LED green    |
| Note on status display | $U_{OUT} < 0.9 \times U_N$ : Flashing "DC OK" LED |

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|                                    |                                                   |
|------------------------------------|---------------------------------------------------|
|                                    | $I_{OUT} < I_N$ : LED ON                          |
| Signal output: DC OK floating      |                                                   |
| Status display                     | $U_{OUT} > 0.9 \times U_N$ : "DC OK" LED green    |
| Note on status display             | $U_{OUT} < 0.9 \times U_N$ : Flashing "DC OK" LED |
| Signal output: POWER BOOST, active |                                                   |
| Status display                     | $I_{OUT} > I_N$ : LED "BOOST" yellow              |

## Electrical properties

|                                 |                         |
|---------------------------------|-------------------------|
| Number of phases                | 1.00                    |
| Insulation voltage input/output | 4 kV AC (type test)     |
|                                 | 2 kV AC (routine test)  |
| Insulation voltage output / PE  | 500 V DC (routine test) |
| Insulation voltage input / PE   | 3.5 kV AC (type test)   |
|                                 | 2 kV AC (routine test)  |

## Product properties

|                            |                    |
|----------------------------|--------------------|
| Product type               | Power supply       |
| Product family             | QUINT POWER        |
| MTBF (IEC 61709, SN 29500) | > 940000 h (25 °C) |
|                            | > 530000 h (40 °C) |
|                            | > 230000 h (60 °C) |

## Insulation characteristics

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

## Dimensions

|        |        |
|--------|--------|
| Width  | 60 mm  |
| Height | 130 mm |
| Depth  | 125 mm |

## Installation dimensions

|                                  |               |
|----------------------------------|---------------|
| Installation distance right/left | 5 mm / 5 mm   |
| Installation distance top/bottom | 50 mm / 50 mm |

## Alternative assembly

|        |        |
|--------|--------|
| Width  | 122 mm |
| Height | 130 mm |
| Depth  | 63 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 |

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|                         |                                     |
|-------------------------|-------------------------------------|
| Mounting position       | horizontal DIN rail NS 35, EN 60715 |
| With protective coating | no                                  |

## Material specifications

|                      |                                               |
|----------------------|-----------------------------------------------|
| Housing material     | Metal                                         |
| Hood version         | Galvanized sheet steel, free from chrome (VI) |
| 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                                 | 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, amplitude ±2.5 mm (according to IEC 60068-2-6)<br>15 Hz ... 150 Hz, 2.3g, 90 min. |
| Temp code                                      | T4 (-25 ... +60 °C)                                                                        |

## Standards and regulations

|                                                                                        |                                            |
|----------------------------------------------------------------------------------------|--------------------------------------------|
| Rail applications                                                                      | EN 50121-4                                 |
|                                                                                        | EN 50121-3-2                               |
| HART FSK Physical Layer Test Specification Compliance                                  | Output voltage $U_{Out}$ compliant         |
| Standard – Limitation of mains harmonic currents                                       | EN 61000-3-2                               |
| Standard - Electrical safety                                                           | IEC 61010-2-201 (SELV)                     |
| Standard - Equipment safety                                                            | BG (design tested)                         |
| Standard - Approval for medical use                                                    | IEC 60601-1, 2 x MOOP                      |
| Standard – Safety extra-low voltage                                                    | IEC 61010-1 (SELV)                         |
|                                                                                        | IEC 61010-2-201 (PELV)                     |
| Standard - Safe isolation                                                              | IEC 61010-2-201                            |
| Standard - safety for equipment for measurement, control, and laboratory use           | IEC 61010-1                                |
| Approval - requirement of the semiconductor industry with regard to mains voltage dips | SEMI F47-0706 Compliance Certificate       |
| DeviceNet approval                                                                     | DeviceNet™ Power Supply Conformance Tested |

### Overvoltage category

|            |               |
|------------|---------------|
| EN 61010-1 | II (≤ 5000 m) |
|------------|---------------|

## Approvals

|     |                              |
|-----|------------------------------|
| CSA | CAN/CSA-C22.2 No. 60950-1-07 |
|-----|------------------------------|

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|                       |                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------|
|                       | CSA-C22.2 No. 107.1-01                                                                          |
| Shipbuilding approval | DNV GL (EMC B), ABS, LR, RINA, NK, BV                                                           |
| SIQ                   | BG (type approved)                                                                              |
| UL approvals          | UL Listed UL 508                                                                                |
|                       | UL/C-UL Recognized UL 60950-1                                                                   |
|                       | UL 121201 & CSA C22.2 No. 213-17 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location) |
| DeviceNet approval    | DeviceNet™ Power Supply Conformance Tested                                                      |

## 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                                      |

### 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 ... 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    | 4 kV (Test Level 4 - 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 |
|-----------------------|--------------|

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## Surge voltage load (surge)

|          |                                      |
|----------|--------------------------------------|
| Input    | 1 kV (Test Level 2 - symmetrical)    |
|          | 2 kV (Test Level 3 - 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. |