

# QUINT4-PS/1AC/110DC/4 - Power supply unit



2904613

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Primary-switched power supply unit QUINT POWER, Screw connection, DIN rail mounting, input: 1-phase, output: 110 V DC / 4 A

## Commercial Data

Item number	2904613
Packing unit	1 pc
Minimum order quantity	1 pc
Product Key	CMPI14
GTIN	4063151023461
Weight per Piece (including packing)	1,619 g
Weight per Piece (excluding packing)	1,265 g
Customs tariff number	85044083
Country of origin	TH

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## Technical Data

### Input data

Control input (configurable) Rem	Output power ON/OFF (SLEEP MODE)
Default	Output power ON (>40 k $\Omega$ /24 V DC/open bridge between Rem and SGnd)

### AC operation

Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	100 V AC ... 240 V AC -10 % ... +10 %
Derating	< 100 V AC (1 %/V)
Electric strength, max.	300 V AC 60 s
Typical national grid voltage	120 V AC
	230 V AC
Voltage type of supply voltage	AC
Inrush current	typ. 11 A (at 25 °C)
Inrush current integral ( $I^2t$ )	< 0.3 A <sup>2</sup> s
Inrush current limitation	11 A
AC frequency range	50 Hz ... 60 Hz -10 % ... +10 %
Frequency range ( $f_N$ )	50 Hz ... 60 Hz -10 % ... +10 %
Mains buffering time	typ. 37 ms (120 V AC)
	typ. 38 ms (230 V AC)
Current consumption	6.3 A (100 V AC)
	5 A (120 V AC)
	2.6 A (230 V AC)
	2.5 A (240 V AC)
Nominal power consumption	474 VA
Protective circuit	Transient surge protection; Varistor, gas-filled surge arrester
Power factor (cos phi)	0.94
Switch-on time	< 1 s
Typical response time	300 ms (from SLEEP MODE)
Input fuse	12 A (slow-blow, internal)
Recommended breaker for input protection	10 A ... 16 A (Characteristic B, C or comparable)
Discharge current to PE	< 3.5 mA
	0.7 mA (264 V AC, 60 Hz)

### DC operation

Nominal input voltage range	110 V DC ... 250 V DC
Input voltage range	110 V DC ... 250 V DC -18 % ... +40 %
Derating	< 110 V DC (1 %/V)
Voltage type of supply voltage	DC
Current consumption	5.6 A (110 V DC)
	2.3 A (250 V DC)

## Output data

Efficiency	typ. 93.5 % (120 V AC)
	typ. 94.7 % (230 V AC)
Output characteristic	U/I Advanced
	Smart HICCUP
	FUSE MODE
Nominal output voltage	110 V DC
Setting range of the output voltage ( $U_{Set}$ )	110 V DC ... 135 V DC (constant capacity)
Nominal output current ( $I_N$ )	4 A
Static Boost ( $I_{Stat.Boost}$ )	5 A
Dynamic Boost ( $I_{Dyn.Boost}$ )	6 A (5 s)
Selective Fuse Breaking ( $I_{SFB}$ )	24 A (15 ms)
Magnetic circuit breaker tripping	A1 ... A4 / B2 ... B4 / C1 ... C2 / Z1 ... Z4
Derating	> 60 °C ... 70 °C (2.5%/K)
Feedback voltage resistance	≤ 160 V DC
Protection against overvoltage at the output (OVP)	< 150 V DC
Control deviation	< 0.5 % (Static load change 10 % ... 90 %)
	< 4 % (Dynamic load change 10 % ... 90 %, (10 Hz))
	< 0.25 % (change in input voltage ±10 %)
Residual ripple	< 600 mV <sub>PP</sub> (with nominal values)
Short-circuit-proof	yes
No-load proof	yes
Output power	440 W
	550 W
	660 W
Apparent power	336 VA (120 V, $U_{OUT} = 24$ V, $I_{OUT} = \text{stat. Boost}$ )
	345 VA (230 V, $U_{OUT} = 24$ V, $I_{OUT} = \text{stat. Boost}$ )
Maximum no-load power dissipation	< 7 W (120 V AC)
	< 7 W (230 V AC)
Power loss nominal load max.	< 31 W (120 V AC)
	< 25 W (230 V AC)
Power dissipation SLEEP MODE	< 7 W (120 V AC)
	< 7 W (230 V AC)
Crest factor	typ. 1.54 (120 V AC)
	typ. 1.57 (230 V AC)
Rise time	< 1 s ( $U_{Out} = 10$ % ... 90 %)
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes

## Signal

Signal ground SGnd	Reference potential for Out1, Out2, and Rem
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## Signal Out 1 (configurable)

Digital	24 V DC 20 mA
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Default	24 V DC 20 mA 24 V DC for $U_{Out} > 0.9 \times U_{Set}$
Signal Out 2 (configurable)	
Digital	24 V DC 20 mA
Analog	4 mA ... 20 mA $\pm 5\%$ (Load $\leq 400 \Omega$ )
Default	24 V DC 20 mA 24 V DC for $P_{Out} < P_N$
Signal relay 13/14 (configurable)	
Default	closed ( $U_{out} > 0.9 U_{Set}$ )
Digital	24 V DC 1 A
	30 V AC/DC 0.5 A

## Connection data

### Input

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>
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.25 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	2.5 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, min.	0.25 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Stripping length	6.5 mm
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>
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.25 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	2.5 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, min.	0.25 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	2.5 mm <sup>2</sup>

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Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Stripping length	6.5 mm
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

## Signal

Connection method	Push-in connection
Conductor cross section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross section, rigid max.	1 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	1.5 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule with plastic sleeve, min.	0.2 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule with plastic sleeve, max.	0.75 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, min.	0.2 mm <sup>2</sup>
Single conductor/flexible terminal point with ferrule without plastic sleeve, max.	1.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	8 mm

## 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 output

P <sub>Out</sub>	> 100 % (LED lights up yellow, output power > 440 W)
	> 75 % (LED lights up green, output power > 330 W)
	> 50 % (LED lights up green, output power > 220 W)
U <sub>Out</sub>	> 0.9 × U <sub>Set</sub> (LED lights up green)
	< 0.9 × U <sub>Set</sub> (LED flashes green)

## 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	0.5 kV DC (type test)
	0.5 kV DC (routine test)
Insulation voltage input / PE	3.5 kV AC (type test)

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Switching frequency	2.4 kV AC (routine test)
	90 kHz ... 110 kHz (Auxiliary converter stage)
	80 kHz ... 340 kHz (Main converter stage)
	50 kHz ... 70 kHz (PFC stage)

## Product properties

Product type	Power supply
Product family	QUINT POWER
MTBF (IEC 61709, SN 29500)	> 1169000 h (25 °C)
	> 688000 h (40 °C)
	> 308000 h (60 °C)
Environmental protection directive	RoHS Directive 2011/65/EU
	WEEE
	Reach

## Insulation characteristics

Protection class	I
Degree of pollution	2

## Life expectancy (electrolytic capacitors)

Current	2 A
Temperature	40 °C
Time	218000 h
Additional text	120 V AC

## Life expectancy (electrolytic capacitors)

Current	2 A
Temperature	40 °C
Time	322000 h
Additional text	230 V AC

## Life expectancy (electrolytic capacitors)

Current	4 A
Temperature	25 °C
Time	528000 h
Additional text	120 V AC

## Life expectancy (electrolytic capacitors)

Current	4 A
Temperature	25 °C
Time	817000 h
Additional text	230 V AC

## Life expectancy (electrolytic capacitors)

Current	4 A
Temperature	40 °C
Time	176000 h

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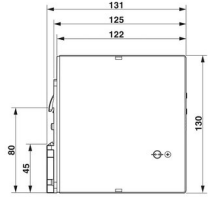


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Additional text	120 V AC
Life expectancy (electrolytic capacitors)	
Current	4 A
Temperature	40 °C
Time	272000 h
Additional text	230 V AC

## Dimensions

Dimensional drawing	
Width	70 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

## Mounting

Mounting type	DIN rail mounting
With protective coating	No

## Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Metal

## 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	≤ 4000 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)	5 Hz ... 100 Hz resonance search 2.3g, 90 min., resonance frequency 2.3g, 90 min. (according to DNV GL Class C)

## Standards and regulations

Rail applications	EN 50121-3-2
	EN 50121-5
	EN 50163
	IEC 62236-3-2
	IEC 62236-5
Standard – Limitation of mains harmonic currents	EN 61000-3-2
Standard - Electrical safety	IEC 61010-2-201
Standard - Safe isolation	IEC 61010-2-201
Standard - safety for equipment for measurement, control, and laboratory use	IEC 61010-1
Battery charging	DIN 41773-1
Approval - requirement of the semiconductor industry with regard to mains voltage dips	SEMI F47-0706, EN 61000-4-11

## Overvoltage category

EN 61010-1	II ( $\leq 4000$ m)
EN 62477-1	III ( $\leq 2000$ m)

## Approvals

CSA	CAN/CSA-C22.2 No. 61010-1-1
	CAN/CSA-C22.2 No. 61010-1-12
Shipbuilding approval	DNV GL applied for
SIQ	BG (type approved)
	CB-Scheme (IEC 61010-1, IEC 61010-2-201, IEC 60950-1)
UL approvals	UL Listed UL 61010-1
	UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) applied for

## EMC data

Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
Interference emission	Interference emission in accordance with EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)
EMC requirements for noise immunity	EN 61000-6-1
	EN 61000-6-2
Noise immunity	Immunity in accordance with EN 61000-6-1 (residential), EN 61000-6-2 (industrial), and EN 61000-6-5 (power station equipment zone), IEC/EN 61850-3 (power supply)
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
EMC requirements, power plant	IEC 61850-3
	EN 61000-6-5
Conducted noise emission	EN 55016
	EN 61000-6-3 (Class B)
Noise emission	Additional basic standard EN 61000-6-5 (immunity in power station), IEC/EN 61850-3 (energy supply)
Noise emission	EN 55016



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	EN 61000-6-3 (Class B)
DNV GL conducted interference	Class A
Additional text	Area power distribution
DNV GL noise radiation	Class B
Additional text	Bridge and deck area

## Harmonic currents

Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)
Frequency range	0 kHz ... 2 kHz

## Flicker

Standards/regulations	EN 61000-3-3
	EN 61000-3-3
Frequency range	0 kHz ... 2 kHz

## Electrostatic discharge

Standards/regulations	EN 61000-4-2
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## 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
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## 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
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## Fast transients (burst)

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

## Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
Input	typ. 3 kV (Test Level 4 - symmetrical)
	typ. 6 kV (Test Level 4 - asymmetrical)
Output	1 kV (Test Level 3 - symmetrical)

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	2 kV (Test Level 3 - asymmetrical)
Signal	4 kV (Test Level 4 - asymmetrical)
Comments	Criterion A

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

I/O/S	asymmetrical
Frequency range	10 kHz ... 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
Frequency	0 Hz
Test field strength	300 A/m
Additional text	DC, 60 s

## Voltage dips

Standards/regulations	EN 61000-4-11
Voltage	230 V AC
Frequency	50 Hz
Voltage dip	70 %
Number of periods	0.5 / 1 / 25 / 30 periods
Additional text	Test Level 2
Comments	Criterion A: 0.5 / 1 / 25 / 30 periods
Voltage dip	40 %
Number of periods	5 / 10 / 50 periods
Additional text	Test Level 2
Comments	Criterion A
Voltage dip	0 %
Number of periods	0,5 / 1 / 5 / 50 / 250 periods
Additional text	Test Level 2