QUINT4-PS/1AC/24DC/20/+

Power supply unit

Safety Manual ©PHOENIX CONTACT 2019-01-25

1 Description

QUINT POWER power supply with integrated decoupling MOSFET, SFB Technology, and preventive function monitoring ensures superior system availability.

Powerful

- SFB Technology: 6 times the nominal current for 15 ms
- Power reserves:
  Static boost of up to 125% for a sustained period
  Dynamic boost of up to 200% for 5 s

Robust

- Mains buffering ≥ 20 ms
- High degree of electrical immunity, thanks to integrated gas discharge tube
- ATEX/IECEx approval with protective coating

Secure

- Safety integrity level 3 (SIL 3) for Overvoltage Protection

Preventive

- Comprehensive signaling:
  Analog signal, digital signal, relay contact, LED bar graph

Can be ordered pre-configured

- Perform configuration online and order 1 or more units

Technical data (short form)	
Input voltage range	85 V AC ... 264 V AC 90 V DC ... 350 V DC
Mains buffering	typ. 36 ms (120 V AC) typ. 36 ms (230 V AC)
Nominal output voltage (U_N)	24 V DC
Setting range of the output voltage (U_{Set})	24 V DC ... 28 V DC
Residual ripple	< 30 mV_{PP}
Nominal output current (I_N) Static Boost ($I_{Stat.Boost}$) Dynamic Boost ($I_{Dyn.Boost}$) Selective Fuse Breaking (I_{SFB})	20 A 25 A (up to 40°C) 30 A (5 s) 120 A (15 ms)
Output power (P_N) Output power ($P_{Stat.Boost}$) Output power ($P_{Dyn.Boost}$)	480 W 600 W 720 W
Efficiency	typ. 92.7 % (120 V AC) typ. 94.2 % (230 V AC)
MTBF (IEC 61709, SN 29500)	> 524000 h (40°C)
Ambient temperature (operation)	-40 °C ... +75 °C > 60 °C Derating: 2,5 %/K
Dimensions W/H/D	70 mm / 130 mm / 125 mm
Weight	1.3 kg

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All technical specifications are nominal values and refer to a room temperature of 25 °C and 70 % relative humidity at 100 m above sea level.

2 Table of contents

3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Primary-switched QUINT POWER supply for DIN rail mounting, with selectable output characteristic curve and SFB Technology (selective fuse breaking) , protective coating and integrated decoupling MOSFET, input: 1-phase, output: 24 V DC / 20 A	QUINT4-PS/1AC/24DC/20/+	2904617	1
Preconfigured versions of the primary-switched QUINT POWER supply for DIN rail mounting, with selectable output characteristic curve and SFB Technology (selective fuse breaking) , protective coating and integrated decoupling MOSFET, input: 1-phase, output: 24 V DC / 20 A	QUINT4-PS/1AC/24DC/20/+/…	2908940	1

Starting from quantities of one piece or more, you can order online configured versions of the primary-switched power supply QUINT POWER with SFB Technology (selective fuse breaking) using the following web code: phoenixcontact.net/webcode/#0852.

Accessories	Type	Order No.	Pcs./Pkt.
Universal wall adapter for securely mounting the power supply in the event of strong vibrations. The power supply is screwed directly onto the mounting surface. The universal wall adapter is attached at the top/bottom.	UWA 182/52	2938235	1
Assembly adapter for QUINT-PS... power supply on S7-300 rail	QUINT-PS-ADAPTERS7/1	2938196	1

Prior to startup, read the installations notes and check the device for damage.
For additional information, please refer to the corresponding data sheet and package slip at phoenixcontact.net/products.

4 Safety Manual

The Phoenix Contact QUINT4-PS/1AC/24DC/20/+ power supply has been certified to the electrical safety in accordance to IEC 60950-1 and IEC 61010-1 and multiple EMC standards including EN61000-6-7. The power supply guarantees superior system availability with integrated decoupling MOSFET and an overvoltage protection circuitry with SIL 3, HFT = 1 certification in accordance with IEC 61508. With a protective coating and ATEX/IECEx approval in accordance with the standards IEC 60079-0, IEC 60079-7, IEC 60079-11, and IEC 60079-15, it can also be mounted within potentially explosive areas (zone 2).

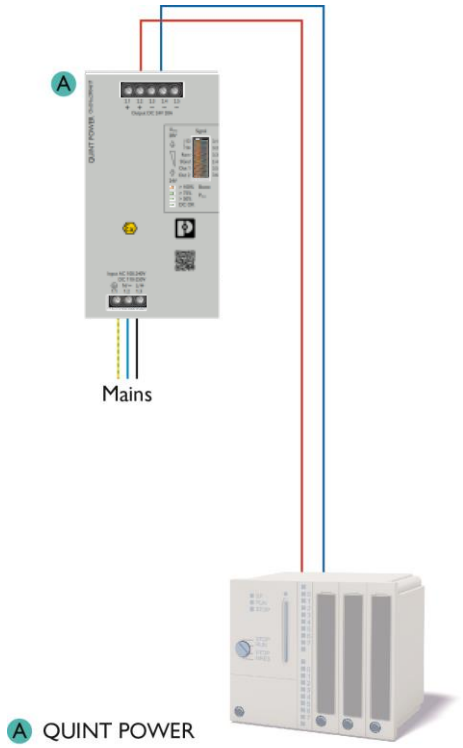
The fourth generation of the high-performance QUINT POWER power supplies ensures superior system availability by means of new functions. Signaling thresholds and characteristic curves can be individually adjusted via the NFC interface. The unique SFB technology and preventive function monitoring of the QUINT POWER power supply increase the availability of your application.

The overvoltage protection circuitry build in Phoenix Contact QUINT4-PS/1AC/24DC/20/+ (2904617) can be used to set up single or redundant bulk power system with proven Overvoltage Protection (OVP). The power supply can be used in applications up to SIL 3 according to IEC 61508 and IEC 61511.

The following application show how to use the Phoenix Contact QUINT4-PS/1AC/24DC/20/+ power supply to set up a:

- Single power application for 20 Amp with OVP for SIL 3
- Redundant power application for 20 Amp with OVP for SIL 3

4.1 Stand-alone application of QUINT4-PS/1AC/24DC/20/+



Safety Function and Failure behavior:

The overvoltage protection circuitry implemented in QUINT4-PS/1AC/24DC/20/+ power supply is considered to be operating as a Type A component, having Hardware Fault Tolerance (HFT) = 1. The safety function is to limit the output voltage to 30V and if higher to switch off within 20ms.

The safe state is no output voltage.

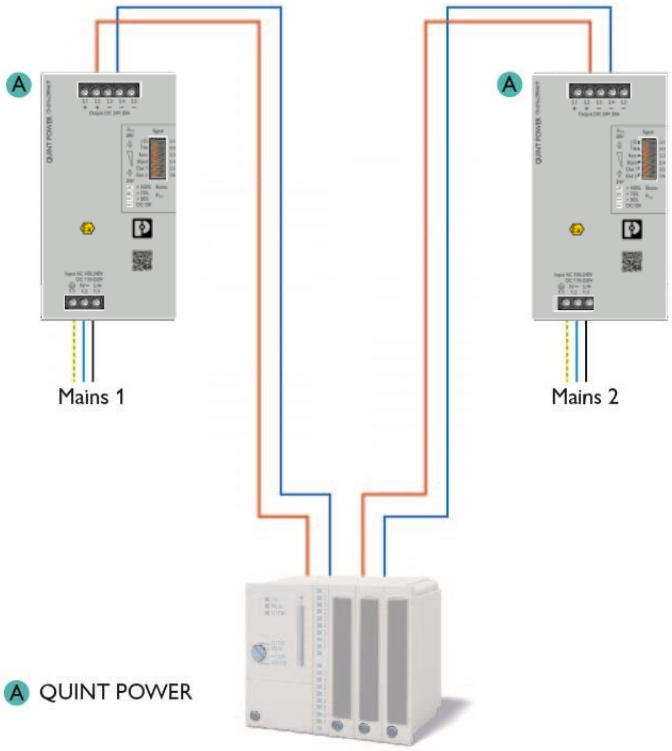
Failure rates of the electronic components are calculated according to Siemens SN 29500.

Safety parameter: Overvoltage protection circuitry implemented in Phoenix Contact QUINT4-PS/1AC/24DC/20/+ in a **stand-alone application.**

	Value	**Remark**
Safety Integrity Level	SIL 3	IEC 61508, IEC 61511
PFH [1/h]	9.1 E-10	corresponds to < 1% of SIL 3
PFD_{avg}	5.58 E-05	Corresponds to 5.6 % of SIL 3; this value is valid for the stated Proof Test Interval T_1
Proof Test Interval T_1	15 a	
SFF	> 60%	
HFT	1	

The overvoltage protection circuitry implemented in QUINT4-PS/1AC/24DC/20/+ power supply fulfils the requirement up to SIL 3 and can be used in applications up to SIL 3 according to IEC 61508 and IEC 61511.

4.2 Application of QUINT4-PS/1AC/24DC/20/+ in a 20 Amp redundant power system



Safety Function and Failure behavior:

The 1+1 redundant power system build up with path 1 and path 2 provides a symmetrical load sharing operation and increases the system availability. Use the same cable cross sections and the same cable lengths for wiring for the DC convergence point to avoid unbalanced load sharing. In the absence of path 1, path 2 will take over the output power and securely supply the load. In the absence of path 2, path 1 will take over the output power and securely supply the load. If both paths are missing, the output will be switched off and the power system will have a safe state.

The overvoltage protection circuitry implemented in QUINT4-PS/1AC/24DC/20/+ power supply is considered to be operating as Type A component, having Hardware Fault Tolerance (HFT) = 1. The safety function is to limit the output voltage to 30V and if higher to switch off within 20ms.

The safe state is no output voltage.

Failure rates of the electronic components are calculated according to Siemens SN 29500.

Safety parameter: Overvoltage protection circuitry implemented in QUINT4-PS/1AC/24DC/20/+ in a **20 Amp redundant power application**.

	Value	**Remark**
Safety Integrity Level	SIL 3	IEC 61508, IEC 61511
PFH [1/h]	1.8 E-09	corresponds to < 2% of SIL 3
PFD_{avg}	1.1 E-04	Corresponds to 11 % of SIL 3; this value is valid for the stated Proof Test Interval T_1
Proof Test Interval T_1	15 a	
SFF	> 60%	
HFT	1	

The overvoltage protection circuitry implemented in QUINT4-PS/1AC/24DC/20/+ power supply fulfils the requirement up to SIL 3 and can be used in redundant applications (1+1 and N+1) up to SIL 3 according to IEC 61508 and IEC 61511.