

QUINT-BUFFER/24DC/20

Buffer module with maintenance-free capacitor-based power storage device



INTERFACE

Data sheet
102035_03_en

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Description

Short-term mains interruptions are bridged by QUINT BUFFER, a maintenance-free buffer module on a capacitor basis. Systems can therefore also run in unstable networks or are, in the event of failures of a longer duration, correctly shut down after all relevant process data is saved. The bridging time is 200 ms at 20 A and 4 s at 1 A. The buffer module also acts as a power storage device for peak loads and for triggering fuses. For function monitoring, an active switching output and a control lamp are used. With the integrated diode, loads can be divided into buffered and unbuffered loads. Thus, the buffer period is extended and the buffered consumers are protected against errors in the internal network.

- Maintenance-free due to capacitor-based power buffer
- The slim design saves space on the DIN rail
- High system availability due to clear signaling
- Extended buffer period for critical loads through decoupled input



Danger!

Components with dangerously high voltage and high stored energy are located in the device!
Never carry out work on live parts!
Depending on the ambient temperature and the load, the housing can become very hot!



Make sure you always use the the latest documentation.
It can be downloaded at www.download.phoenixcontact.com.
A conversion table is available on the Internet at
www.download.phoenixcontact.com/general/7000_en_00.pdf.

Order data

Description	Type	Order No.	Pcs./Pkt.
Buffer module with maintenance-free capacitor-based power storage device	QUINT-BUFFER/24DC/20	2866213	1
Accessories	Type	Order No.	Pcs./Pkt.
Universal wall adapter	UWA 182/52	2938235	1

Technical data

Input data	
Nominal input voltage	24 V DC
DC input voltage range	22.5 V DC ... 30 V DC
Buffer period	0.2 s (20 A) 4 s (1 A)
Charging time	< 27 s
Current consumption	0.1 A (idling) 0.6 A (charging process) 20.6 A (max.)
Protection against polarity reversal	Yes
Charging delay	No
Connect threshold	< 22 V DC (fixed) ($U_{IN} - 1 V$)/0.1 s (variable)
Protective circuitry	Transient surge protection Suppressor diode, 35 V DC
Input fuse, integrated	(slow-blow, internal)

Output data	
Nominal output voltage	24 V DC (depending on the input voltage)
Setting range of the output voltage	22 V AC ... 28.5 V AC
Buffer voltage	$U_{IN} - 0.8 V$ and $> 22.0 V$
Output current	20 A
Output current limit	27 A (buffer mode)
Max. transit current	27 A (at 40°C) 20 A (at 70°C)
Disconnect	> 4.5 s (buffer mode)
Power loss	2.5 W (ready at 27 A) 9.8 W (buffer mode at 27 A)
Efficiency	> 95 % (at 27 A)
Residual ripple	< 100 mV _{SS} (buffer mode)
Peak switching voltages	< 100 mV _{SS} (20 MHz)
Connection in parallel	Yes, for increasing the buffer time and for redundancy
Surge protection against internal surge voltages	Yes, limited to approx. 35 V DC
Resistance to reverse feed	< 35 V DC (buffer mode)

Status indication	
Status display	LED "Power Good", green Buffer module is loaded: LED ON

Signal output



Active (high = buffer module is loaded)

Output description	Power Good
Continuous current	+20 mA
Output voltage	+24 V

Standards

Electrical Equipment for Machinery	EN 60204
Safety transformers for power supply units	EN 61558-2-17
Electrical safety (of information technology equipment)	EN 60950/VDE 0805 (SELV) EN 61558-2-17 UL/C-UL recognized UL 60950
Industrial control equipment	UL/C-UL Listed UL 508
Shipbuilding	German Lloyd, ABS
Electronic equipment for use in electrical power installations	EN 50178/VDE 0160
SELV	EN 60950 (SELV) and EN 60204 (PELV)
Safe isolation	DIN VDE 0106-101

Approvals

Granted approvals	
Granted approvals for potentially explosive areas	

General data

Insulation voltage input/output	1 kV (routine test) 1 kV (type test)
Installation position	Horizontal DIN rail NS 35, EN 60715
Degree of protection	IP20
Class of protection	III, without PE connection
MTBF	> 500 000 h in acc. with IEC 61709 (SN 29500)
Housing version	AluNox (AlMg1)
Width	64 mm
Height	130 mm
Depth	125 mm
Width with alternative assembly	122 mm
Height with alternative assembly	130 mm
Depth with alternative assembly	67 mm
Weight	1 kg

Climatic data

Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible. relative humidity (operation)	95 % (at 25°C, no condensation)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm in acc. with IEC 60068-2-6 15 Hz ... 150 Hz, 2.3g, 90 min.
Shock	30g in all directions in acc. with IEC 60068-2-27
Pollution degree in acc. with EN 50178	2
Climatic class	3K3 (in acc. with EN 60721)

Conformance with EMC directive 89/336/EEC

Immunity to interference in acc. with EN 61000-6-2

Discharge of static electricity in acc. with EN 61000-4-2

Housing	Level 4
Contact discharge	8 kV
Discharge in air	15 kV
Comments	Criterion B

Electromagnetic HF field in acc. with EN 61000-4-3

Housing	Level 3
Frequency range	80 MHz ... 1 GHz
Field intensity	10 V/m
Comments	Criterion A

Fast transients (burst) in acc. with EN 61000-4-4

Input	2 kV (level 3 - asymmetrical: conductor to ground)
Output	2 kV (level 3 - asymmetrical: conductor to ground)
Signal	1 kV (level 2 - asymmetrical: conductor to ground)
Comments	Criterion B

Surge voltage capacities (surge) in acc. with EN 61000-4-5

Input/Output/Signal	0.5 kV (level 1 - asymmetrical: conductor to ground)
	0.5 kV (level 1 - symmetrical: conductor to conductor)
Comments	Criterion B

Conducted disturbance in acc. with EN 61000-4-6

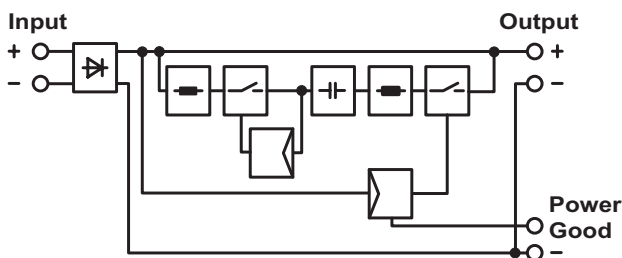
Input/Output/Signal	Level 3
Frequency range	0.15 MHz ... 80 MHz
Voltage	10 V
Comments	Criterion A

Emitted interference in acc. with EN 61000-6-3

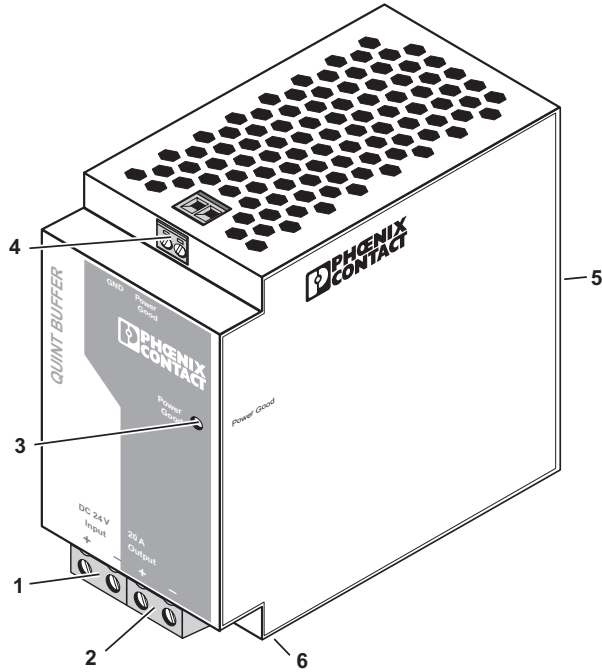
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential

Note:
 Criterion A: Normal operating behavior within the defined limits.
 Criterion B: Temporary impairment to operational behavior that is corrected by the device itself
 EN 55011 corresponds to CISPR11 / EN 55022 corresponds to CISPR22
 EN 61000 corresponds to IEC 1000

Block diagram



Structure



- 1 - DC input
- 2 - DC output
- 3 - Control lamp "Power Good"
- 4 - Switching output active
- 5 - DIN rail adapter
- 6 - Switch DYNAMIC ON/OFF

	[mm ²]		AWG	[Nm] Torque
	solid	stranded		
Input	0.5 - 16	0.5 - 10	20 - 6	1.2 - 1.5
Output	0.5 - 16	0.5 - 10	20 - 6	1.2 - 1.5
signal	0.2 - 2.5	0.2 - 2.5	24 - 12	0.5 - 0.6

Input data

Nominal input voltage	24 V DC
DC input voltage range	22.5 V DC ... 30 V DC
Input fuse, integrated	(slow-blow, internal)
Type of connection	Screw connection
Stripping length	10 mm

Output data

Nominal output voltage	24 V DC (depending on the input voltage)
Setting range of the output voltage	22 V AC ... 28.5 V AC
Output current	20 A
Type of connection	Screw connection
Stripping length	10 mm

Safety and warning notes



The power supply units are built-in devices. The device may only be installed and put into operation by qualified personnel. The corresponding national regulations (e.g. VDE, DIN) must be observed.



Danger!

**Components with dangerously high voltage and high stored energy are located in the device!
Never carry out work on live parts!
Depending on the ambient temperature and the load, the housing can become very hot!**



Before startup please ensure:

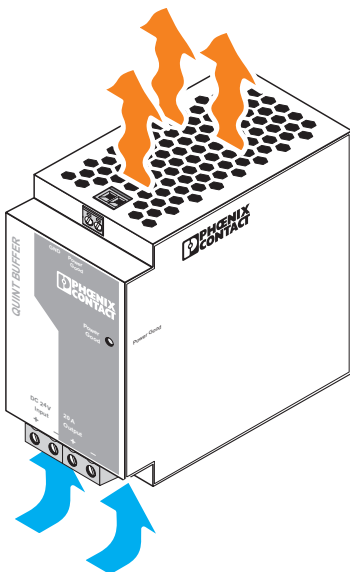
The mains connection has been carried out by a competent person and protection against electric shock is guaranteed!

All feed lines are sufficiently protected and dimensioned!

All output lines are dimensioned according to the maximum output current of the device or separately protected!

Sufficient convection is guaranteed!

Installation

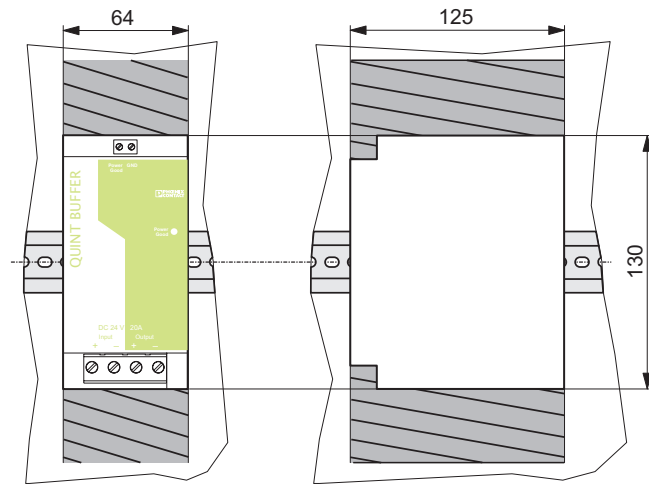


In order for the device to function in the manner intended, it is not necessary to observe any minimum spacing to other devices.



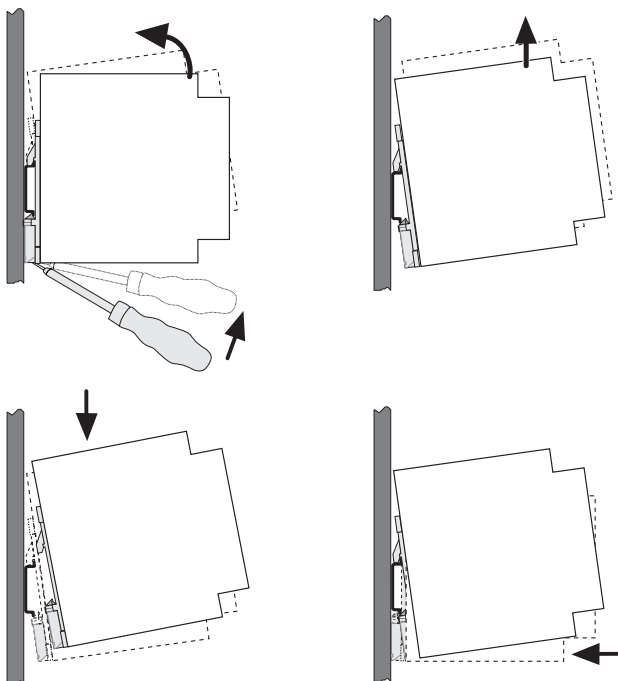
The power supply unit can be snapped onto all DIN rails in acc. with EN 60715. They must be horizontal (connecting terminal blocks below).

Installation position



Slim-style installation: Installation depth 125 mm (+ DIN rail)
(state at delivery)

Low-profile installation: Installation depth 67 mm (+ DIN rail)



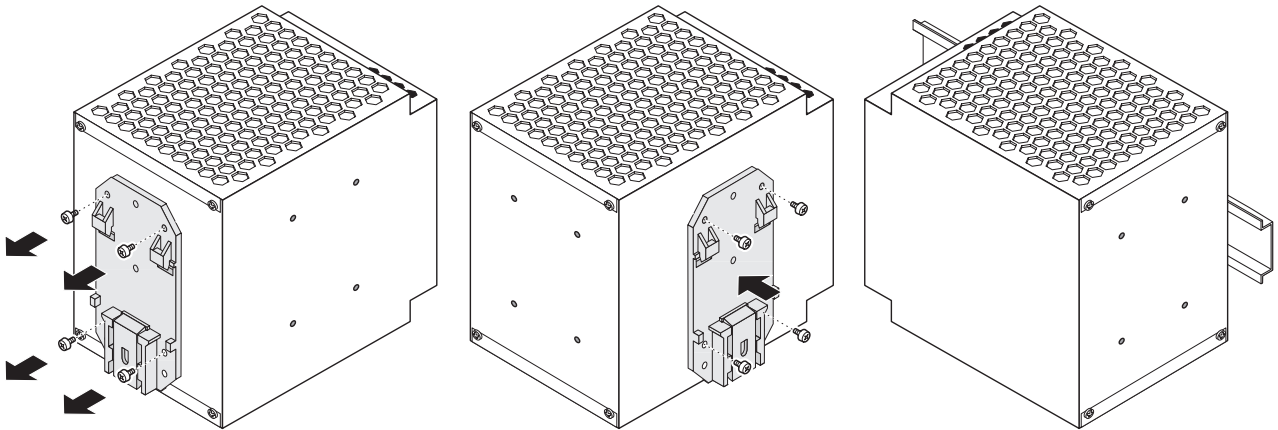
Slim-style installation:

Assembly

Position the module with the DIN rail guide on the upper edge of the DIN rail, and snap it in with a downward motion.

Dismantling

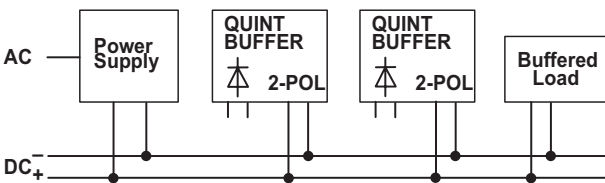
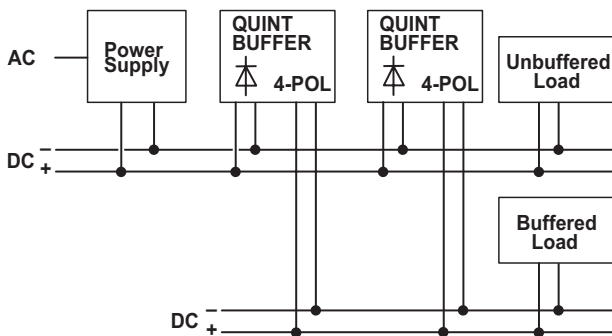
Pull the snap lever open with the aid of a screwdriver and slide the module out at the lower edge of the DIN rail.



Low-profile installation:

Low-profile installation can be achieved by mounting the device at right-angles to the DIN rail. Mount the DIN rail adapter (UTA 107) as described in the figure. No additional mounting material is required. Fixing screws: Torx T10 (torque 0.8 Nm ... 0.9 Nm).

Input



The buffer module is connected at the output of the power supply via the "+" and "-" screw connections of the 24 V DC input (connection as 4-pos.). The output is decoupled from the input by means of the internal diode. The stored power is only delivered at the output (see figure).

If no decoupling is required, the buffer module can also be connected to the power supply as a 2-pos. connection via the "+" and "-" connections of the DC output (see figure).

Protection of the primary side

Device installation must be carried out according to the regulations in EN 60950.

For device protection, there is an internal fuse. Additional device protection is not necessary.



If an internal fuse is triggered, there is most probably a malfunction in the device. In this case, the device must be inspected in the factory!

Output

All loads that, in the event of a failure of the supply voltage, are to be supplied with power stored in the buffer module, ("Buffered Load"), are connected to the "+" and "-" of the DC output.

We recommend that all other loads not requiring buffering in the event of a failure of the supply voltage ("Unbuffered Load") should be connected parallel to the power supply unit. This extends the buffer time, as it depends on the output current (see figure).

The internal diode guarantees that the buffered loads are decoupled from the unbuffered loads.

Output voltage

The output voltage of the buffer module is equal to the supply voltage connected. If the input voltage falls within 0.1 s by more than 1 V, the buffer is connected and the output voltage is regulated to this value. This dynamic detection can be disabled with switch "DYNAMIC ON/OFF". The minimum connect threshold is 22 V.

The device is electronically protected against short circuit and idling. In the event of a malfunction, the output voltage is limited to 35 V DC.

Signaling

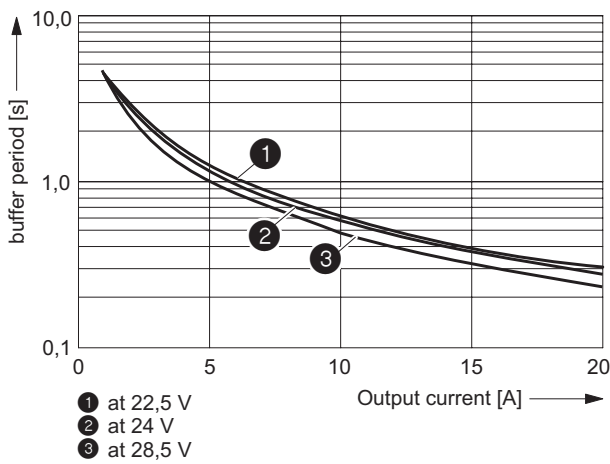
For function monitoring, there is the active signal output and an LED "Power Good".

The signal output is connected via the "Power Good" and "GND" screw connections. The 24 V DC signal can carry up to 20 mA.

	State 1	State 2
LED "Power Good"	ON	Flashing
Active signal output "Power Good"	U = +24 V (in reference to "-")	U = 0 V (in reference to "-")
Meaning	1. Supply voltage is present 2. Buffer module is charged 3. Buffer module is ready	1. There is supply voltage, buffer module is being charged Or 2. There is no supply voltage, the power store in the buffer module will be provided at the output (as long as is available)

Function

For all connected loads, QUINT-BUFFER provides a regulated and uninterrupted 24 V DC voltage at the output for a load current of 20 A. Once the 24 V supply voltage has been applied, the integrated capacitor-based power storage device is charged. If the supply voltage fails, uninterrupted operation of up to 4 seconds for all connected loads is guaranteed with the stored power.



Buffer time extension

With the decoupled input, the connected consumers can be divided into buffered and non-buffered loads. Thus, the buffer time, which is dependent on the output current, is extended. If only the critical consumers are protected, the buffer time is markedly extended. In addition, the decoupled input of the connected consumers protects against errors in the internal network.