

QUINT4-CAP/24DC/5/4KJ

Capacity module

Data sheet
107575_en_00

© PHOENIX CONTACT 2018-02-07



1 Description

The QUINT capacity module combines an electronic switch-over unit and energy storage in the same housing. The capacity module stores the energy required to bridge mains failures in maintenance-free double-layer capacitors. Long mains buffering is possible depending on the required load current.

- High level of system availability due to high capacitor service life
- Maintenance-free, thanks to double-layer capacitors
- Space savings, thanks to the compact design
- Electronic switchover unit and energy storage device in one housing
- Maximum energy efficiency
- Large temperature range
- Thanks to soft start, can be used with power supplies in the low power range
- USB interface for connection to higher-level controllers

Technical data (short form)


Input voltage range	22.5 V DC ... 30 V DC
Current consumption (idling/ charging process/max.)	0.1 A / 0.8 A / 7 A
Activation threshold	< 22 V DC
Buffer period	30 s / 5 A ; 3 min. / 1 A
Charging time (for completely discharged capacitors)	approx. 18 min.
Recharging time	approx. 12 min.
Nominal output voltage (U_N) (depending on the input voltage)	24 V DC
Nominal output current I_N / $I_{Stat. Boost}$	5 A / 6.25 A
Max. Power dissipation	< 3 W
Efficiency with charged energy storage device	> 97 %
MTBF (IEC 61709, SN 29500)	1301923 h (40 °C)
Ambient temperature (operation)	-25 °C ... 60 °C (> 40 °C Derating: 1 %/K)
Dimensions W/H/D	94 mm / 130 mm / 125 mm
Weight	1.3 kg



Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

2	Table of contents	
1	Description	1
2	Table of contents	2
3	Ordering data	3
4	Technical data	4
5	Safety regulations and installation notes.....	8
	5.1 Symbols used	8
	5.2 Safety and warning notes	8
6	Structure	10
	6.1 Function elements	10
	6.2 Device dimensions and keep-out areas	10
	6.3 Block diagram.....	11
7	Mounting and removing	11
	7.1 Convection.....	11
	7.2 Normal mounting position	12
	7.3 Mounting the capacity module	12
	7.4 Removing the capacity module	12
	7.5 Wall mounting	13
8	Device connection	14
	8.1 DC input	14
	8.2 DC output	14
	8.3 Connection terminal block signaling	14
	8.4 Conductor cross sections	14
9	Device operation	15
	9.1 Setting the buffer time	15
	9.2 PC mode	15
	9.3 Remote	16
	9.4 Switch-on delay.....	18
	9.5 Service life	18
10	Signaling.....	18
	10.1 Signal outputs	20
	10.2 Signal input	20
11	Interface	20
	11.1 MINI-SCREW-USB-DATACABLE	20
12	Derating.....	21
	12.1 Ambient temperature	21
	12.2 Installation height.....	21
13	Switch-on and switching behavior	21
	13.1 Switch-on behavior	21
	13.2 Switching behavior.....	21

3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
QUINT capacity module with maintenance-free double-layer capacitor-based energy storage for DIN rail mounting, input: 24 V DC, output: 24 V DC/5 A/4 KJ including mounted UTA 107 universal DIN rail adapter.	QUINT4-CAP/24DC/5/4KJ	2320539	1
Accessories	Type	Order No.	Pcs./Pkt.
2-piece universal wall adapter for securely mounting the power supply in the event of strong vibrations. The profiles that are screwed onto the side of the power supply are screwed directly onto the mounting surface. The universal wall adapter is attached on the left/right.	UWA 130	2901664	1
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
Used for communication between an industrial PC and Phoenix Contact devices with USB-Mini-B connection.	MINI-SCREW-USB-DATACABLE	2908217	1
 Our range of accessories is being continually extended, our current range can be found in the download area.			

4 Technical data

Input data	
Nominal input voltage	24 V DC SELV
Input voltage range	22.5 V DC ... 30 V DC
Buffer period	30 s / 5 A ; 3 min. / 1 A
Charging time (for completely discharged capacitors)	approx. 18 min.
Recharging time	approx. 12 min.
Activation threshold	< 22 V DC
Current consumption	0.1 A (No-load) 0.8 A (charging process) 7 A (max.)
Input connection data	
Connection method	Screw connection
Conductor cross section, solid	0.2 mm ² ... 2.5 mm ²
Conductor cross section, flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross section AWG	30 ... 12
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm
General output data	
Nominal output voltage U_N (depending on the input voltage)	24 V DC
Connection in parallel	No
Connection in series	No
Output data (mains operation)	
Nominal output voltage U_N (depending on the input voltage)	24 V DC
Nominal output current $I_N / I_{Stat. Boost}$	5 A / 6.25 A
Power loss nominal load max.	< 3 W
Efficiency (with charged energy storage device)	> 97 %
Output data (battery operation)	
Nominal output voltage U_N (typical)	22 V DC
Nominal output current $I_N / I_{Stat. Boost}$	5 A / 6.25 A
Output connection data	
Connection method	Screw connection
Conductor cross section, solid	0.2 mm ² ... 2.5 mm ²
Conductor cross section, flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross section AWG	30 ... 12
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm

Status and diagnostic indicators/signal outputs U_{IN} OK

Switching output , floating 13/14	Electronic relay (photorelay)
Switching voltage	30 V DC
Continuous load current	200 mA
Status display	LED (green)
Signal threshold	Input voltage in the valid range

Status and diagnostic indicators/signal outputs Ready

Switching output	Transistor output, active
Output voltage	24 V (U _N - 1 V (typical))
Continuous load current	20 mA
Status display	LED (green)
Signal threshold	Charging state = 100% or buffer mode

Status and diagnostic indicators/signal outputs Alarm

Switching output	Transistor output, active
Output voltage	24 V (U _N - 1 V (typical))
Continuous load current	20 mA
Status display	LED (red)
Signal threshold	An alarm has occurred

Status and diagnostics indicators/signal inputs Remote

Switching input active	< 3 kΩ to SGnd
Switching input not active	> 100 kΩ to SGnd

Status and diagnostic indicators/signal outputs SGnd

Reference potential for Ready, alarm and remote

Signal connection data

Connection method	Screw connection
Conductor cross section, solid	0.2 mm ² ... 1.5 mm ²
Conductor cross section, flexible	0.2 mm ² ... 1.5 mm ²
Conductor cross section AWG/kcmil	24 ... 16
Stripping length	8 mm

General data

Memory medium	Dual layer capacitor
Insulation voltage input, output / housing	500 V
Degree of protection	IP20
Protection class	Special application (SELV input voltage, hazardous voltages are generated in the device).
MTBF (EN 29500, 40°C)	1301923 h (40 °C)
Mounting position	horizontal DIN rail NS 35, EN 60715
Dimensions W / H / D (state of delivery)	94 mm / 130 mm / 125 mm
Weight	1.3 kg

Ambient conditions

Ambient temperature (operation)	-25 °C ... 60 °C (> 40 °C Derating: 1 %/K)
Ambient temperature (start-up type tested)	-40 °C
Ambient temperature (storage/transport)	-40 °C ... 60 °C
Max. permissible relative humidity (operation)	≤ 95 %
Degree of pollution	2
Climatic class	3K3 (in acc. with EN 60721)

Approvals

UL	UL Listed UL 508 UL/C-UL Recognized UL 60950-1
----	---



Current approvals/permissions for the product can be found in the download area under phoenixcontact.net/products

Electromagnetic compatibility

Noise emission

CE basic standard	Minimum normative requirements	Higher requirements in practice (covered)
-------------------	--------------------------------	---

Noise emission EN 55016	EN 61000-6-4	EN 61000-6-3
-------------------------	--------------	--------------

Noise immunity according to EN 61000-6-2

CE basic standard	Minimum normative requirements	Higher requirements in practice (covered)
-------------------	--------------------------------	---

Electrostatic discharge EN 61000-4-2		
--------------------------------------	--	--

Housing contact discharge	4 kV (Test Level 2)	6 kV (Test Level 3)
---------------------------	---------------------	---------------------

Housing air discharge	8 kV (Test Level 3)	8 kV (Test Level 3)
-----------------------	---------------------	---------------------

Comments	Criterion B	Criterion A
----------	-------------	-------------

Electromagnetic HF field EN 61000-4-3		
---------------------------------------	--	--

Frequency range	80 MHz ... 1 GHz	80 MHz ... 6 GHz
-----------------	------------------	------------------

Test field strength	10 V/m	10 V/m
---------------------	--------	--------

Comments	Criterion A	Criterion A
----------	-------------	-------------

Conducted interference EN 61000-4-6		
-------------------------------------	--	--

Frequency range	0.15 MHz ... 80 MHz	0.15 MHz ... 80 MHz
-----------------	---------------------	---------------------

Voltage	10 V	10 V
---------	------	------

Comments	Criterion A	Criterion A
----------	-------------	-------------

Key

Criterion A	Normal operating behavior within the specified limits.
-------------	--

Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.
-------------	--



All technical specifications are nominal and refer to a room temperature of 25 °C and 70% relative humidity at 2000 m above sea level.

5 Safety regulations and installation notes

5.1 Symbols used

Instructions and possible hazards are indicated by corresponding symbols in this document.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible personal injuries.

There are different categories of personal injury that are indicated by a signal word.



WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The following symbols are used to indicate potential damage, malfunctions, or more detailed sources of information.



NOTE

This symbol together with the signal word NOTE and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.



This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

5.2 Safety and warning notes



WARNING: Danger to life by electric shock!

- Only skilled persons may install, start up, and operate the device.
- Never carry out work when voltage is present.
- Only remove equipment when it is disconnected and not in the potentially explosive area.
- Establish connection correctly and ensure protection against electric shock.
- Cover termination area after installation in order to avoid accidental contact with live parts (e. g., installation in control cabinet).
- Keep flames, embers or sparks away from the module.
- Use copper cables for operating temperatures of >75 °C.
- If the capacity module is disconnected from the power supply, there may still be a residual charge/voltage.



CAUTION: Hot surface

The housing can become hot, depending on the ambient temperature and device load.

**NOTE**

- Observe the national safety and accident prevention regulations.
- Assembly and electrical installation must correspond to the state of the art.
- The capacity module is a built-in device. The IP20 degree of protection of the device is intended for use in a clean and dry environment.
- The device must be installed in a control cabinet that can be locked and only opened by specialist staff.
- Horizontal mounting position (normal mounting position)
- Observe mechanical and thermal limits.
- Ensure sufficient convection (minimum gap above/below: 50 mm). Housing can become hot.
- Ensure that the primary-side wiring and secondary-side wiring are the correct size and have sufficient fuse protection.
- Refer to the corresponding table for the connection parameters, such as the necessary stripping length for wiring with and without ferrule (see section Device connection).
- Protect the device against foreign bodies penetrating it, e.g., paper clips or metal parts.
- The device may only be used for its intended use.
- Improper use invalidates the device protection.
- The capacity module is maintenance free and may not be opened.
- Before transport, the capacity module must be completely discharged.
- Use ferrules for flexible cables.
- A suitable fire and electrical enclosure must be provided in the end application.

**More follows**

- Do not exceed max. input/output current of 8 A. Use current-limited source, e. g., QUINT POWER or suitable fuse.
- Keep these instructions in a safe place – this data sheet contains important safety notes which must be observed during installation and maintenance of the device.

6 Structure

6.1 Function elements

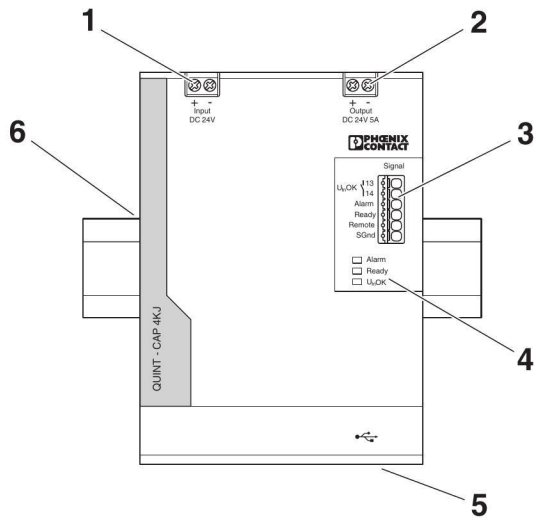


Figure 1 Position of the function elements

Key

No.	Designation
1	Connection terminal blocks for DC input (Input + / -)
2	Connection terminal blocks for DC output (Output + / -)
3	Signaling connection terminal blocks
4	Status and diagnostics indicators
5	USB interface MINI type B (bottom of device)
6	Universal DIN rail adapter (rear of housing)

6.2 Device dimensions and keep-out areas

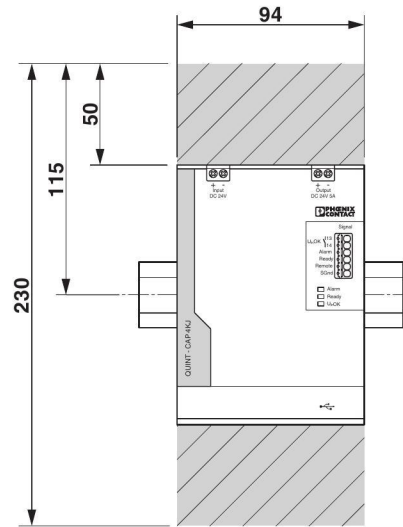


Figure 2 Keep-out areas

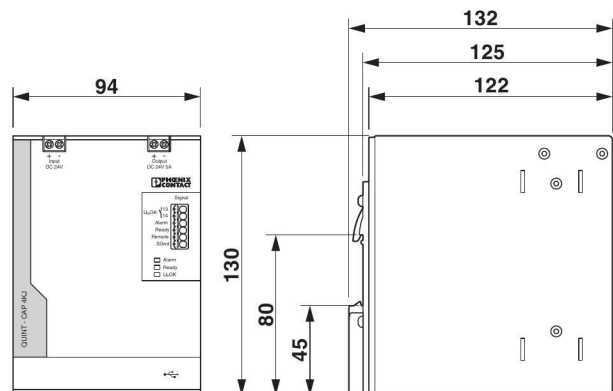


Figure 3 Device dimensions

6.3 Block diagram

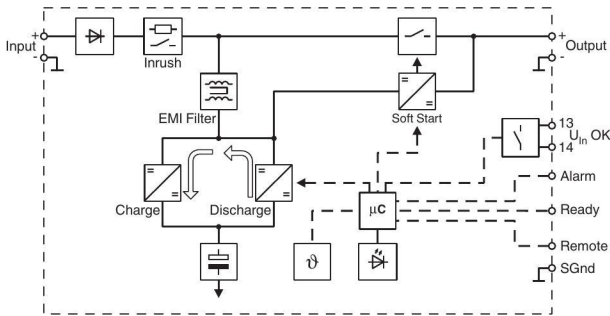


Figure 4 Block diagram

Key

Symbol	Meaning
	Reverse polarity protection
	Inrush current limitation
	Switch
	EMI filter
	Electrolytic capacitor
	DC/DC converter
	Microprocessor
	Temperature sensor
	LED

7 Mounting and removing



The device must be installed in a control cabinet that can be locked and only opened by specialist staff.

7.1 Convection



NOTE: enable convection

The housing can become hot, depending on the ambient temperature and device load. In order to ensure sufficient convection, we recommend a minimum vertical distance of 50 mm to the other devices.

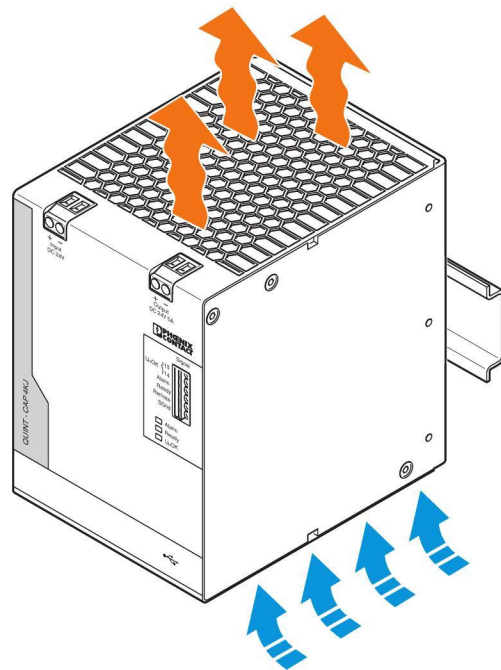


Figure 5 Convection

7.2 Normal mounting position



The device can be snapped onto all DIN rails according to EN 60715 and should only be mounted in the normal mounting position.

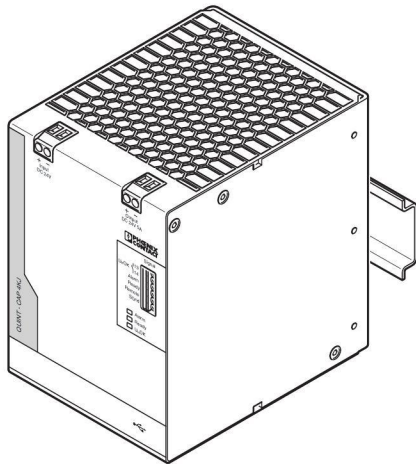


Figure 6 Normal mounting position

7.3 Mounting the capacity module

Proceed as follows to mount the device:

1. In the normal mounting position the device is mounted on the DIN rail from above. Make sure that the universal DIN rail adapter is in the correct position behind the DIN rail (A).
2. Then press the device down until the universal DIN rail adapter audibly latches into place (B).
3. Check that the device is securely attached to the DIN rail.

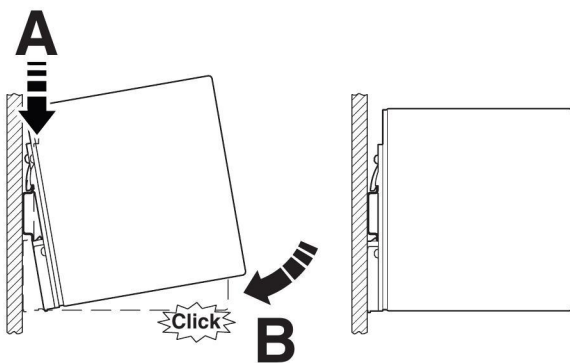


Figure 7 Snapping onto the DIN rail

7.4 Removing the capacity module

Proceed as follows to remove the device:

1. Take a suitable screwdriver and insert this into the lock hole on the universal DIN rail adapter (A).
2. Release the lock by lifting the screwdriver (B).
3. Carefully swivel the device forward (C) so that the lock slides back into the starting position.
4. Then separate the device from the DIN rail (D).

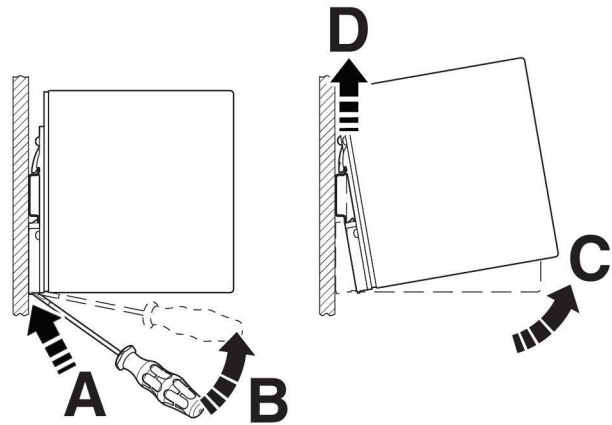


Figure 8 Removing from the DIN rail

7.5 Wall mounting

The UWA 182/52 universal wall adapter (Order No. 2938235) or UWA 130 universal wall adapter (Order No. 2901664) is used to attach the device directly to the mounting surface.

The use of the universal wall adapter is recommended under extreme ambient conditions, e.g., strong vibrations. Thanks to the tight screw connection between the device and the universal wall adapter or the actual mounting surface, an extremely high level of mechanical stability is ensured.



The maximum tightening torque of the Torx screw (Torx® T10) is 0.9 Nm.
Make sure you use suitable mounting material when attaching to the mounting surface.

7.5.1 Mounting the UWA 182/52 universal wall adapter



The UWA 182/52 universal wall adapter (Order No. 2938235) is attached to the device by means of the Torx screws of the universal DIN rail adapter.

Proceed as follows to disassemble the universal DIN rail adapter that comes pre-mounted:

1. Remove the screws for the universal DIN rail adapter using a suitable screwdriver (Torx 10).
2. Remove the universal DIN rail adapter from the rear of the device.
3. Position the universal wall adapter in such a way that the keyholes or oval tapers face up. The mounting surface for the device is the raised section of the universal wall adapter.
4. Insert the Torx screws into the appropriate hole pattern on the universal wall adapter so that the necessary mounting holes of the device can be accessed.
5. Screw the universal wall adapter onto the device.

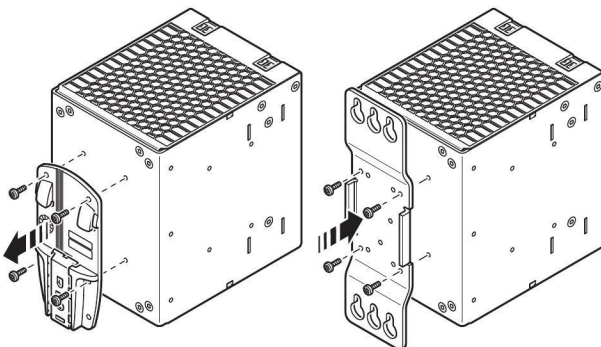


Figure 9 Mounting the UWA 182/52 universal wall adapter

7.5.2 Mounting the UWA 130 2-piece universal wall adapter



The UWA 130 universal wall adapter (Order No. 2901664) is attached to the device using the Torx screws provided.

Proceed as follows to disassemble the universal DIN rail adapter that comes pre-mounted:

1. Remove the screws for the universal DIN rail adapter using a suitable screwdriver (Torx 10).
2. Remove the universal DIN rail adapter from the rear of the device.
3. Position the two-piece universal wall adapter on the right and left side of the housing.
4. Insert the Torx screws into the appropriate hole pattern on the universal wall adapter so that the necessary mounting holes of the device can be accessed.
5. Screw the two-piece universal wall adapter onto the device.

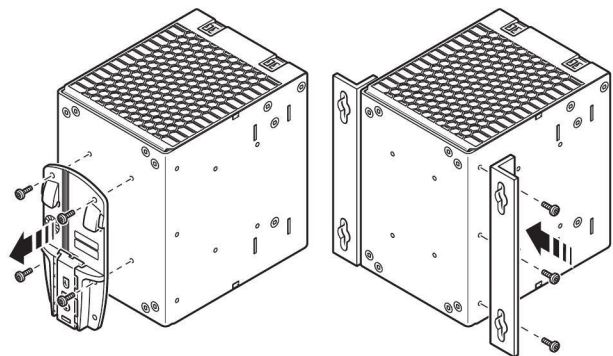


Figure 10 Mounting the UWA 130 universal wall adapter

8 Device connection

8.1 DC input

The supply voltage is connected via the Input + / - connection terminal blocks.

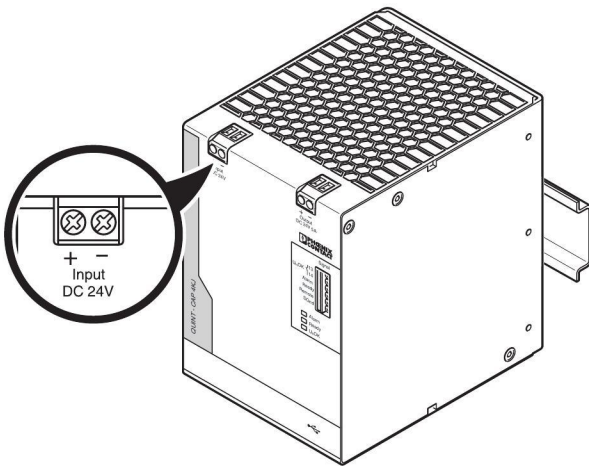


Figure 11 Connection terminal blocks input voltage: Input +/-

Protection of the input side



Do not exceed max. input/output current of 8 A. Use current-limited source, e. g., QUINT POWER or suitable fuse.

8.2 DC output

The output voltage is connected via the "Output" connection terminal blocks.

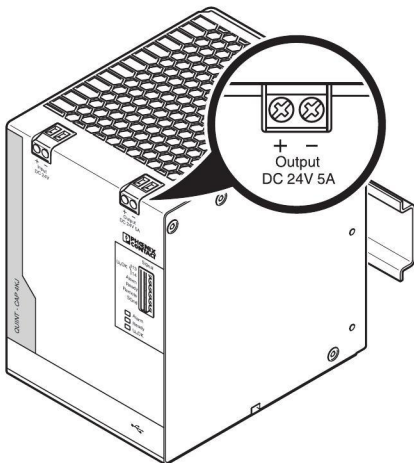


Figure 12 Connection terminal blocks output voltage: Output +/-

8.3 Connection terminal block signaling

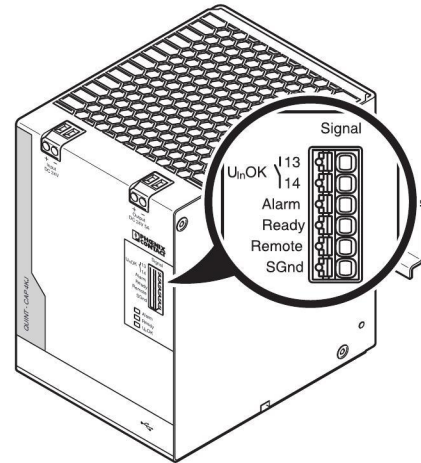


Figure 13 Signal inputs and outputs

8.4 Conductor cross sections

		[mm ²]	[mm ²]	AWG	L [mm]	[Nm]	[lb in]
Input DC	Screw	0.2-2.5	0.2-2.5	30-12	6.5	0.5-0.6	5-7
	Push-In	0.2-2.5	0.2-2.5	30-12	6.5	0.5-0.6	5-7
Signal	Push-In	0.2-1.5	0.2-1.5	24-16	8	—	—

Figure 14 Conductor cross sections

9 Device operation

9.1 Setting the buffer time

You can set the required buffer time in the UPS-CONF configuration software. To do this, activate the "Buffer time Custom" control field. In this configuration, buffer mode is ended after the entered amount of time. If the configuration is 0 (mm:ss), all available power from the capacity module is supplied.



Particularly with respect to cyclical applications, the recharging time is reduced when configuring the buffer time because a corresponding level of power remains in the storage capacitors (depending on the buffer time).

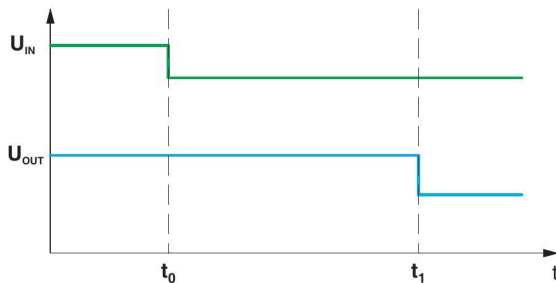


Figure 15

t_0 : mains power failure

t_1 : after the preset buffer time has expired, the output is switched off

Refer to the following diagram for possible buffer times for varying discharge currents.

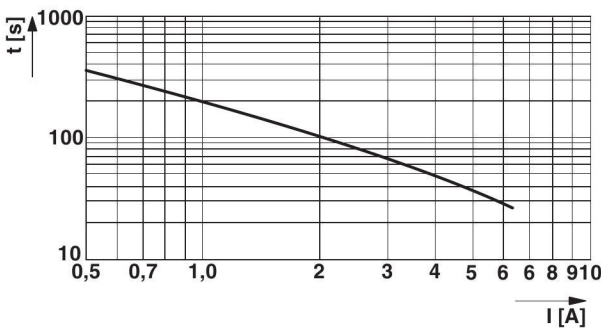


Figure 16 Buffer time/discharge current diagram

9.2 PC mode

In the UPS-CONF configuration software, you can customize configuration of the chronological sequence of buffer mode in PC mode.

Activate the "PC mode" control field to switch to the PC mode of the capacity module:



The following components are required for the PC mode function:

Data cable MINI-SCREW-USB-DATACABLE (Order No. 2908217)

Configuration software UPS-CONF (Order No. 2320403)

In the event of a mains failure, one PC can continue to work, perform a controlled shutdown, and restart automatically.

You can configure the following times in the UPS-CONF configuration software:

1: Delay time

If the mains supply is not restored during the delay time, the PC is shut down.

2: Program runtime

After the delay time has expired, it is possible to start a program.

3: PC shut-down

The time required for PC shutdown is set here.

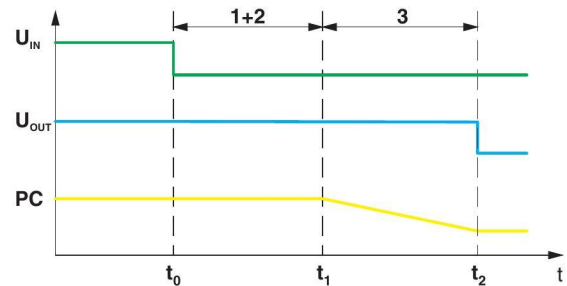


Figure 17

t_0 : mains power failure

t_1 : delay time and program runtime have expired, PC will be shut down

t_2 : the PC has shut down, the output will be switched off

4: PC idle time

Only if the PC is shut down and the mains supply is restored in the meantime is the output voltage interrupted for the PC standby time and the PC then started automatically.

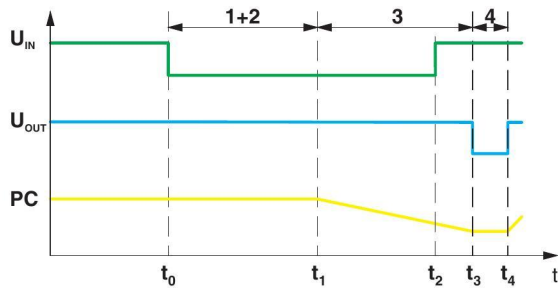


Figure 18

t_0 : mains power failure

t_1 : delay time and program runtime have expired, PC will be shut down

t_2 : mains restored while PC is shutting down

t_3 : the PC has shut down and the output will be switched off, PC idle time starts

t_4 : the PC idle time has expired, PC is starting back up

9.3 Remote

You can use the Remote signal terminal to:

1. Deactivate buffer mode
2. Shut down the PC immediately
3. Shut down the PC immediately in buffer mode
4. Switch on/off the output of the capacity module

To perform these steps, you must connect the Remote signal terminal to the SGnd signal terminal.

You can configure the various functions in the UPS-CONF configuration software. To do this, activate the corresponding radio buttons.

1. Remote disables buffer mode

You can deactivate buffer mode using this function. This function is always active when a buffer time has been preset.

This function is the default setting in PC mode.

In mains operation, the Remote signal is indicated by the flashing green LED (see Signaling section).

In the event of mains failure, buffer mode is not started.

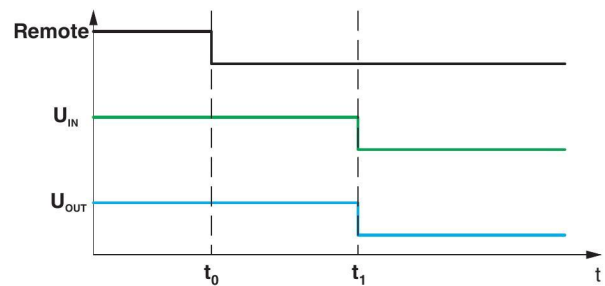


Figure 19

t_0 : remote signal is set in mains operation

t_1 : no input voltage, output will be switched off

If the remote signal is set in buffer mode, then buffer mode is exited immediately. The output of the capacity module is switched off. This procedure cannot be reversed. The capacity module is only activated once the input voltage is applied.

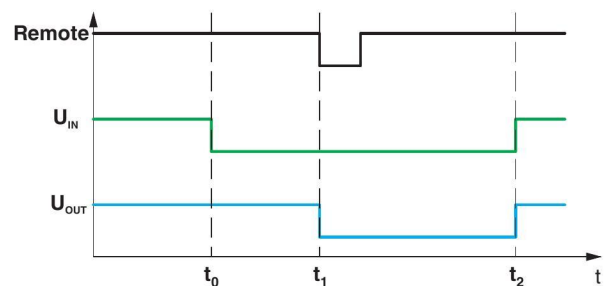


Figure 20

t_0 : mains power failure

t_1 : remote signal is set in buffer mode, the output is switched off

t_2 : input voltage restored, output will be switched on

2. Remote starts undelayed PC-Shutdown

You can shut down the PC immediately via the UPS-CONF configuration software.

This setting only applies in PC mode.

The Remote signal is indicated by the flashing green LED (see Signaling section).

The PC shuts down, and the delay time under Item 1 is skipped (see PC mode section).

Once the PC has shut down, the capacity module output is switched off. When input voltage is present, the capacity module remains charged and the system is ready to use. When you reset the remote signal, the capacity module output is switched on again.

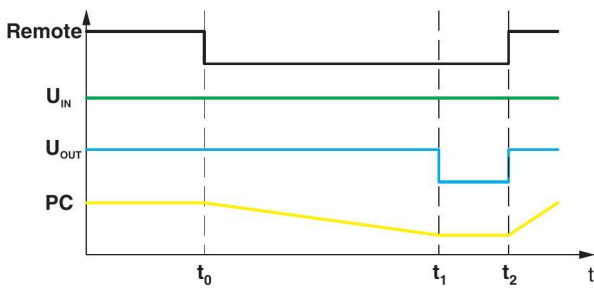


Figure 21

t_0 : remote signal is set during mains operation, PC will be shut down
 t_1 : PC has shut down, output will be switched off
 t_2 : remote signal will be reset, output will be switched back on



Once the PC has shut down in buffer mode, the capacity module output is switched off. This procedure cannot be reversed. The capacity module is only activated once the input voltage is applied.

3. Remote starts undelayed PC-Shutdown only in buffer mode

You can perform immediate shutdown of the PC when buffer mode is entered via the UPS-CONF configuration software. This setting only applies in PC mode.

The Remote signal is indicated by the flashing green LED (see Signaling section).

If the remote signal is set in mains operation, the PC is shut down when buffer mode is entered. The delay time under Item 1 is skipped (see PC mode section).



Once the PC has shut down in buffer mode, the capacity module output is switched off. This procedure cannot be reversed. The capacity module is only activated once the input voltage is applied.

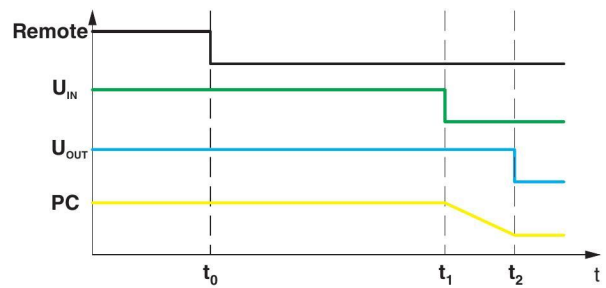


Figure 22

t_0 : remote signal is set in mains operation
 t_1 : no input voltage, PC shutdown begins immediately
 t_2 : the PC has shut down, the output will be switched off

4. Remote switches the output

You can use this function to switch on/off the output of the capacity module. This function is only available when a buffer time has been set.

The Remote signal is indicated by the flashing green LED (see Signaling section).

If the remote signal is set in buffer mode, then buffer mode is exited immediately. The output of the capacity module is switched off. This procedure cannot be reversed. The capacity module is only activated once the input voltage is applied.

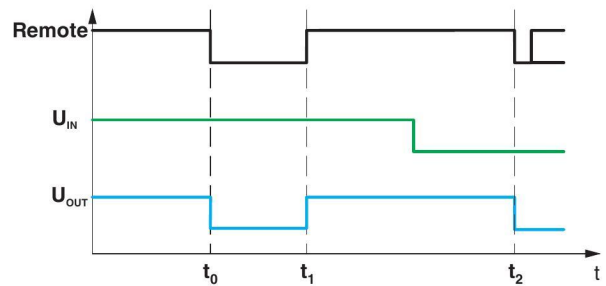


Figure 23

t_0 : remote signal is set in mains operation, output will be switched off
 t_1 : the remote signal will be reset, output will be switched back on
 t_2 : remote signal is set in buffer mode, the output is switched off

9.4 Switch-on delay

You can use this function to switch on the capacity module output based on the charging state of the storage capacitors.

The "buffer-ready threshold value" refers to the charging state of the storage capacitors and also has an effect on signaling.

You can use the corresponding selection fields in the UPS-CONF configuration software to activate and configure parameters for this function.



The switch-on delay ensures that a system does not switch on until a certain level of power is available in the storage capacitors. As a result, a mains failure can be bypassed for a specific amount of time.

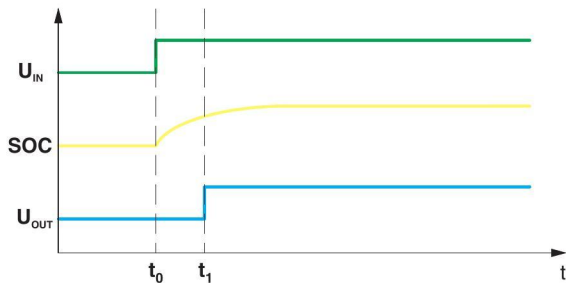


Figure 24

t_0 : the input voltage is present, the storage capacitors are charged

t_1 : the configured support bar has been reached, the output is switched off

9.5 Service life

You can affect the service life of the capacity modules by configuring the charging voltage of the storage capacitors. You can use the corresponding selection fields in the UPS-CONF configuration software to activate and configure parameters for this function.

Reducing the charging voltage leads to an increase in the service life and simultaneous reduction of the possible buffer time.

Charging voltage of buffer capacitors	Buffer time (at 5 A)	Service life
13.5 V	> 30 s	~ 10 years
13.0 V	~ 30 s	~ 14 years
12.5 V	~ 25 s	~ 20 years



The values in the table are based on an ambient temperature $T_A = 40\text{ °C}$.

10 Signaling

Various LED indicators are available for visual function monitoring of the module. Active signal outputs can be used to forward this data to a higher-level control system.

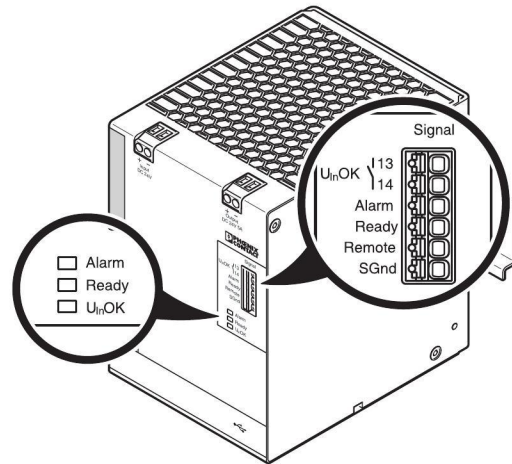


Figure 25 LED displays and signal inputs and outputs

For module signaling and the corresponding states, please refer to the table below.

Status LED			Switching output			Note
U _{in} OK	Ready	Alarm	U _{in} OK	Ready	Alarm	
			open	low	low	Device off
			open	low	high	Initialization, LED test (~3 sec.)
			closed	high	high	Mains operation, buffer is ready
			closed	low	high	Mains operation, charging in process
			closed	low	low	Mains operation, Alarm
			open	high	high	Buffer mode
			closed	high	high	Mains operation, remote contact shorted to SGnd, buffer is ready
			closed	low	high	Mains operation, remote contact shorted to SGnd, charging in process
			closed	low	low	Mains operation, remote contact shorted to SGnd, Alarm
			closed	high	high	Mains operation, remote contact shorted to SGnd, (Output is off), buffer is ready
			closed	low	high	Mains operation, remote contact shorted to SGnd, (Output is off), charging in process
			closed	low	low	Mains operation, remote contact shorted to SGnd, (Output is off), Alarm
			open	low	low	Signaling time after switch off

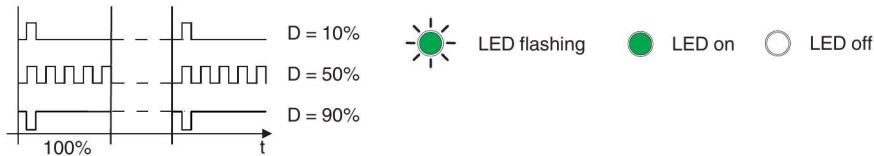


Figure 26 LED indicators and signal outputs

10.1 Signal outputs

U_{in} OK (13/14)

If the input voltage is in the valid range, the signal output is active (closed). The signal status can be inverted via the UPS-CONF configuration software.

A floating N/O contact (implemented with a photorelay) is available as a signal contact.

This signal is indicated visually by a green LED.

You can assign other additional information to this signal output using the UPS-CONF configuration software.

Ready

When the storage capacitors are fully charged or the device is in buffer mode, the signal output is active (High level). The signal status can be inverted via the UPS-CONF configuration software.

A digital transistor output is available as a signal contact.

This signal is indicated visually by a green LED.

You can assign other additional information to this signal output using the UPS-CONF configuration software.

Alarm

In the event of an alarm, the signal output is active (low level). The signal status can be inverted via the UPS-CONF configuration software.

A digital transistor output is available as a signal contact.

This signal is indicated visually by a red LED.

Possible alarms include:

- Device overheated
- Error in the storage capacitor
- Disconnection in the event of overload in buffer mode

10.2 Signal input

Remote

You can activate and trigger various functions using the remote signal input. For additional information, please refer to the "Remote device operation" section.

The signal status can be inverted using the UPS-CONF configuration software.



A change made to the remote function using the UPS-CONF configuration software is not applied until a corresponding status change of the remote signal input or device restart has been carried out.

11 Interface

The capacity module is equipped with a USB Mini type B interface for data transmission.

A data cable is required for communicating with a PC or a higher-level controller.

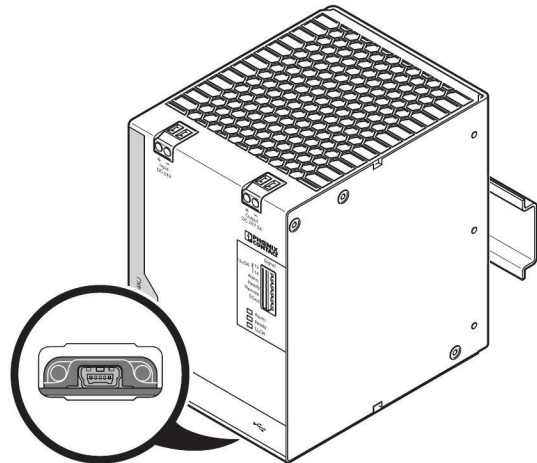


Figure 27 USB interface MINI type B (bottom of device)

11.1 MINI-SCREW-USB-DATACABLE

The device is connected to the USB interface on the PC via the USB Mini type B interface with data cable MINI-SCREW-USB-DATACABLE (order number 2908217).

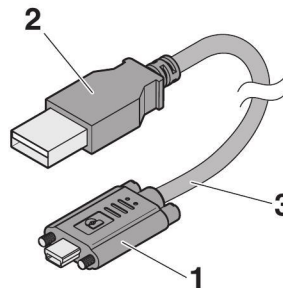


Figure 28 MINI-SCREW-USB-DATACABLE

No.	Designation
1	Mini type B USB connector with screw connection
2	USB plug type A
3	Cable length: 3 m

12 Derating

12.1 Ambient temperature

At an ambient temperature of up to +40°C, the device supplies the output current $I_{Stat. Boost}$

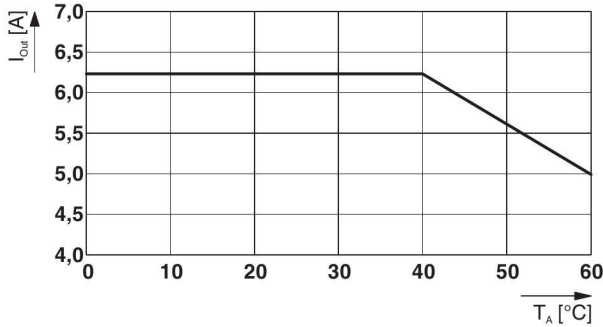


Figure 29 Temperature-dependent derating

12.2 Installation height

The device can be operated at an installation height of up to 4000 m without any limitations.

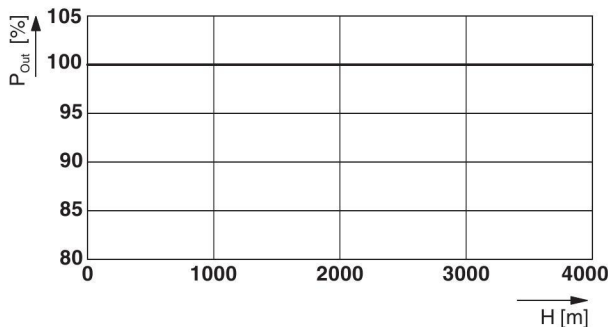


Figure 30 Altitude-dependent derating

13 Switch-on and switching behavior

13.1 Switch-on behavior

The QUINT capacity module features a soft startup. The output is switched on by ramping up instead of abruptly. This makes the QUINT capacity module also suitable for use in power supplies in the low power range.



How to adjust the switch-on behavior is described in the section Switch-on delay.

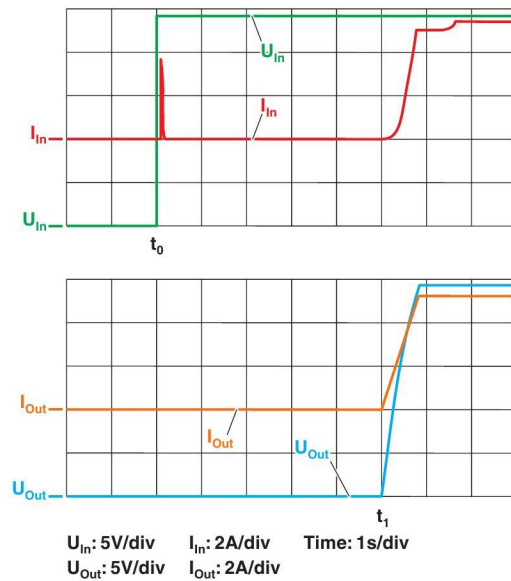


Figure 31 Switch-on behavior

t_0 : input voltage is present

t_1 : the output is switched on approximately 5 seconds later

13.2 Switching behavior

The output voltage remains present without interruption when switching over from grid to buffer mode.

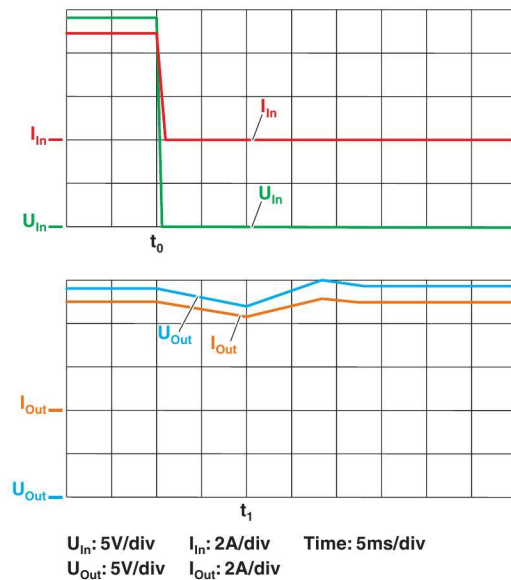


Figure 32 Switching behavior

t_0 : mains power failure

t_1 : the output voltage does not drop below 20 V in the switchover phase