QUINT4-CHARGER/1AC/24DC/10

Battery charger



Data sheet
107808_en_00

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1 Description

The QUINT4 CHARGER is a charging rectifier for charging AGM lead and lithium batteries and is used as an additional battery charger for devices in the QUINT4 UPS family. This battery charger enables you to increase the charging current and reduce the charging time.
The QUINT4 CHARGER with integrated power supply communicates with the QUINT4 UPS via a data cable. The QUINT4 CHARGER can also be used as a universal charger for charging batteries from other manufacturers. The battery parameters are configured via the USB interface.

- Power supply and rectifier in a device
- Configuration of charging parameters via USB interface
- Communication to the UPS via battery control

Technical data (short form)	
Input voltage range	100 V AC ... 240 V AC (-15 % ... +10 %)
	110 V DC ... 250 V DC
Frequency range (f_N)	50 Hz ... 60 Hz ±10 %
Nominal output voltage (U_N)	24 V DC
Nominal output current (I_N)	10 A
Output power (P_N)	240 W
Efficiency (for nominal values)	89 % ... 91 %
Residual ripple	< 20 mV_{PP}
MTBF (IEC 61709, SN 29500)	> 500000 h (230 V AC, at 40 °C)
Maximum no-load power dissipation	< 4 W (for 230 V AC)
Power loss nominal load max.	< 35 W (for 230 V AC)
Ambient temperature (operation)	-40 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Dimensions W/H/D	60 mm / 130 mm / 126 mm
Weight	0.87 kg

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

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3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
Battery charger, QUINT CHARGER, Screw connection, DIN rail mounting, input: 1-phase, output: 24 V DC / 10 A	QUINT4-CHARGER/1AC/ 24DC/10	2907990	1

Accessories	Type	Item no.	Pcs./Pkt.
Used for communication between an industrial PC and Phoenix Contact devices with USB-Mini-B connection.	MINI-SCREW-USB-DATACABLE	2908217	1
2-piece universal wall adapter for securely mounting the device in the event of strong vibrations. The profiles that are screwed onto the side of the device 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 device in the event of strong vibrations. The device is screwed directly onto the mounting surface. The universal wall adapter is attached on the top/bottom.	UWA 182/52	2938235	1
Energy storage, VRLA-AGM, 24 V DC, 7 Ah, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/PB/24DC/7AH	1274118	1
Energy storage, VRLA-AGM, 24 V DC, 12 Ah, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/PB/24DC/12AH	1274119	1
Energy storage, VRLA-AGM, 24 V DC, 20 Ah, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/PB/24DC/20AH	1348516	1
Energy storage, VRLA-AGM, 24 V DC, 40 Ah, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/PB/24DC/40AH	1354641	1
Energy storage device, lead AGM, VRLA technology, 24 V DC, 13 Ah, tool-free battery replacement, automatic detection, and communication with QUINT UPS-IQ	UPS-BAT/VRLA-WTR/24DC/ 13AH	2320416	1
Energy storage device, lead AGM, VRLA technology, 24 V DC, 26 Ah, tool-free battery replacement, automatic detection, and communication with QUINT UPS-IQ	UPS-BAT/VRLA-WTR/24DC/ 26AH	2320429	1
Energy storage device, LI-ION technology, 24 V DC, 120 Wh, for ambient temperatures of -20°C ... 60°C, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/LI-ION/24DC/ 120WH	2320351	1
Energy storage device, LI-ION technology, 24 V DC, 924 Wh, for ambient temperatures of -25 °C ... 60 °C, automatic detection and communication with QUINT UPS-IQ	UPS-BAT/LI-ION/24DC/ 924WH	2908232	1

Accessories	Type	Item no.	Pcs./Pkt.
Relay base RIF-1..., for miniature power relay with 1 or 2 changeover contacts or solid-state relays of the same design, Push-in connection, plug-in option for input/ interference suppression modules, for mounting on NS 35/7,5	RIF-1-BPT/2X21	2900931	10
Plug-in miniature power relay, with power contact for high continuous currents, 1 changeover contact, input voltage 24 V DC	REL-MR- 24DC/21HC	2961312	10



You will find the latest accessories for the item at phoenixcontact.net/products.

4 Technical data

Input data	
Input voltage range	100 V AC ... 240 V AC (-15 % ... +10 %) 110 V DC ... 250 V DC
Derating	< 90 V AC (2.5 %/V)
Frequency range (f_N)	50 Hz ... 60 Hz ±10 %
Current consumption (for nominal values) typical	2.7 A (100 V AC) / 1.2 A (240 V AC)
	2.4 A (110 V DC) / 1.1 A (250 V DC)
Input fuse internal (device protection), slow-blow	6.3 A
Recommended breaker for input protection	10 A ... 16 A (AC: Characteristic B, C, D, K, or comparable)
Input connection data	
Connection method	Screw connection
Conductor cross section, rigid	0.2 mm² ... 2.5 mm²
Conductor cross section, flexible	0.2 mm² ... 2.5 mm²
Conductor cross section flexible, with ferrule with plastic sleeve	0.2 mm² ... 2.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.2 mm² ... 2.5 mm²
Conductor cross section AWG/kcmil	24 ... 14
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm
Output data	
Nominal output voltage (U_N)	24 V DC
Setting range of the output voltage	19.2 V DC ... 28.6 V DC
Nominal output current (I_N)	10 A
Output power (P_N)	240 W
Short-circuit-proof	yes
No-load proof	yes
Residual ripple	< 20 mV_{PP}
Output connection data	
Connection method	Screw connection
Conductor cross section, rigid	0.2 mm² ... 2.5 mm²
Conductor cross section, flexible	0.2 mm² ... 2.5 mm²
Conductor cross section flexible, with ferrule with plastic sleeve	0.2 mm² ... 2.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.2 mm² ... 2.5 mm²
Conductor cross section AWG/kcmil	24 ... 14
Stripping length	6.5 mm
Tightening torque	0.5 Nm ... 0.6 Nm

Charging process	
Battery technology	VRLA, VRLA-WTR, LI-ION ($LiFePO_4$)
Charge characteristic curve	IU
Nominal voltage	24 V DC
Nominal capacity range	7 Ah ... 300 Ah
Charging voltage maximum	32 V DC
Charge current typical	10 A

Status and diagnostic indicator / signal output U_{In} OK	
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
Status display	Green LED

Status and diagnostic indicator / signal output Alarm	
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
Status display	LED red

Status and diagnostic indicator / signal output Bat.-Voltage OK	
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
Status display	Green LED

Remote control / Remote	Digital control input (configurable)
Low signal	Remote active
High signal	Remote inactive

Signal ground SGnd

Reference potential for the signal inputs and outputs

Signal connection data	
Connection method	Push-in connection
Conductor cross section, rigid	0.2 mm^2 ... 1.5 mm^2
Conductor cross section, flexible	0.2 mm^2 ... 1.5 mm^2
Conductor cross section flexible, with ferrule with plastic sleeve	0.2 mm^2 ... 1.5 mm^2
Conductor cross section flexible, with ferrule without plastic sleeve	0.2 mm^2 ... 1.5 mm^2
Conductor cross section AWG/kcmil	24 ... 16
Stripping length	8 mm

Interface	
USB classification	MINI-USB type B

Device combinations	
Connection in parallel	no
Connection in series	no
Power consumption	
Maximum no-load power dissipation	< 4 W (for 230 V AC)
Power loss nominal load max.	< 35 W (for 230 V AC)
General data	
Overvoltage category EN 61010-1	II
Efficiency (for nominal values)	89 % ... 91 %
MTBF (IEC 61709, SN 29500)	> 500000 h (230 V AC, at 40 °C)
Degree of protection	IP20
Protection class	I
Side element version	Aluminum
Hood version	High-grade steel plate
Dimensions (W/H/D)	60 mm / 130 mm / 126 mm
Weight	0.87 kg
Ambient conditions	
Ambient temperature (operation)	-40 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	≤ 95 % (At +25°C, non-condensing)
Installation height	≤ 4000 m (> 2000 m, observe derating)
Degree of pollution	2
Vibration (operation)	2 Hz ... 15 Hz, ±2.5 mm amplitude; 15 Hz ... 150 Hz, 2.3g
Shock	30g, 18 ms in accordance with IEC 60068-2-27
Climatic class	3K3 (EN 60721)
Standards	
Safety for measurement, control, and laboratory equipment	IEC 61010-1
Protective extra-low voltage	IEC 61010 (SELV) / (PELV)
Safe isolation	DIN VDE 0100-410
Approvals	
UL approvals	UL Listed UL 61010-1 UL/C-UL Listed ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C



You will find the latest approvals for the item at phoenixcontact.net/products.

Electromagnetic compatibility		
Noise emission according to EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)		
CE basic standard	**Minimum normative requirements**	**Higher requirements in practice (covered)**
Noise emission	EN 61000-6-4 (Class A)	EN 61000-6-3 (Class B)
Conducted noise emission	EN 61000-6-4 (Class A)	EN 61000-6-3 (Class B)
Harmonic currents	EN 61000-3-2 (Class B)	0 kHz ... 2 kHz

Immunity according to EN 61000-6-2 (industrial)		
CE basic standard	**Minimum normative requirements of EN 61000-6-2 (CE)**	**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 ... 1 GHz
Test field strength	10 V/m (Test Level 3)	10 V/m (Test Level 3)
Comments	Criterion B	Criterion A
Fast transients (burst) EN 61000-4-4		
Input	2 kV (Test Level 3 - asymmetrical)	2 kV (Test Level 3 - asymmetrical)
Output	1 kV (Test Level 3 - asymmetrical)	1 kV (Test Level 2 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B	Criterion B
Surge voltage load (surge) EN 61000-4-5		
Input	1 kV (Test Level 2 - symmetrical) 2 kV (Test Level 3 - asymmetrical)	2 kV (Test Level 4 - symmetrical) 4 kV (Test Level 4 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical) 1 kV (Test Level 1 - asymmetrical)	1 kV (Test Level 1 - symmetrical) 2 kV (Test Level 3 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B	Criterion B
Conducted interference EN 61000-4-6		
Input/Output/Signal	asymmetrical	asymmetrical

Immunity according to EN 61000-6-2 (industrial)		
CE basic standard	**Minimum normative requirements of EN 61000-6-2 (CE)**	**Higher requirements in practice (covered)**
Frequency range	0.15 MHz ... 80 MHz	0.15 MHz ... 80 MHz
Voltage	10 V (Test Level 3)	10 V (Test Level 3)
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.

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.



This indicates that the device can be hot and should not be touched without taking care.



This symbol and the accompanying text provide additional information on the correct disposal of used batteries.



This symbol and the accompanying text provide additional information on recycling.

5.2 Safety and warning notes



WARNING: Danger to life by electric shock!

- Only skilled persons may install, start up, and operate the device.
- For indoor use only.
- Never carry out work when voltage is present.
- Establish connection correctly and ensure protection against electric shock.
- Connect the protective conductor device terminal block ⏚ with ground.
- 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.
- When connecting the external batteries, observe the polarity and do not short circuit the pole terminals.
- Provide a switch/circuit breaker close to the device at the AC input, DC output and at the battery terminals, which are labeled as the disconnecting device for this device.
- Do not disconnect the battery fuse and / or battery connection under hazardous location conditions.



WARNING: Explosion hazard

Do not disconnect equipment unless power has been removed or the area is known to be free of ignitable concentrations.



WARNING: Explosion hazard

Substitution of components may impair suitability for use in potentially explosive areas (CLASS 1; DIVISION 2).



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 battery charger 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.
- Observe mechanical and thermal limits.
- Horizontal mounting position (normal mounting position)
- 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.
- For the connection parameters, such as the required stripping length for wiring with and without ferrule, refer to the technical data.
- The battery charger is approved for the connection to TN, TT and IT power grids (star networks) with a maximum phase-to-phase voltage of 240 V AC
- Protect the device against foreign bodies penetrating it, e.g., paper clips or metal parts.
- To reduce the risk of fire, replace only with same type and rating of fuse.
- The battery charger does not require maintenance. Repairs may only be carried out by the manufacturer. Opening the housing invalidates the warranty.
- The battery charger may only be used for its intended use.
- Improper use invalidates the device protection.

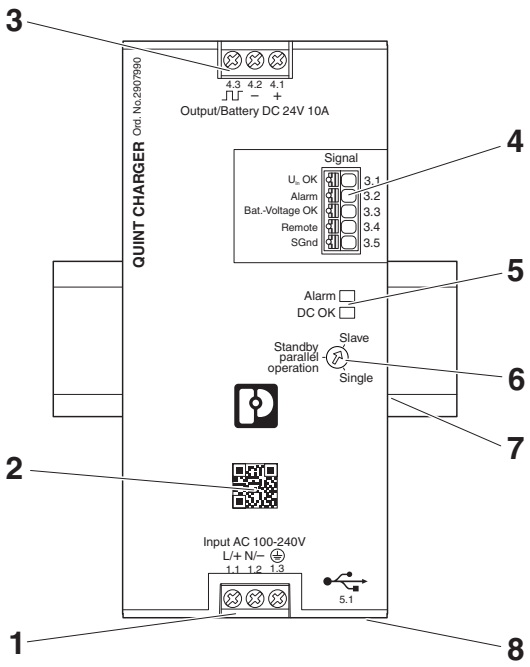
More follows

- The switching outputs are active outputs according to SELV. These may only be operated on permitted SELV circuits.
- 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 and batteries.

6 Structure

6.1 Function elements

Figure 1 Function elements



Key

No.	Designation
1	Connection terminal blocks input voltage: input L/N/⏚
2	QR code web link
3	Output voltage connection terminal blocks: Output / Battery DC LIN/-/+
4	Signaling connection terminal blocks
5	Status and diagnostics indicators
6	Rotary selector switch
7	Universal DIN rail adapter (rear of housing)
8	USB interface MINI type B (bottom of device)

6.2 Device dimensions and keep-out areas

Figure 2 Keep-out areas

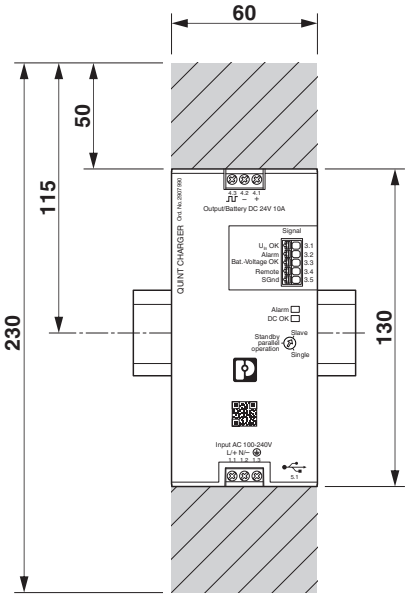
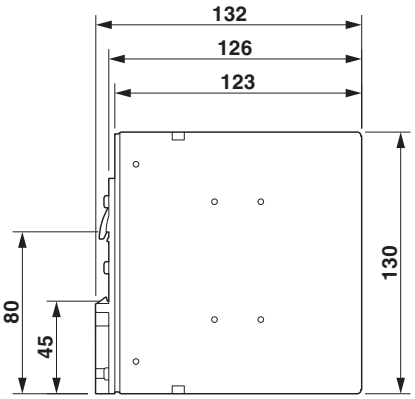
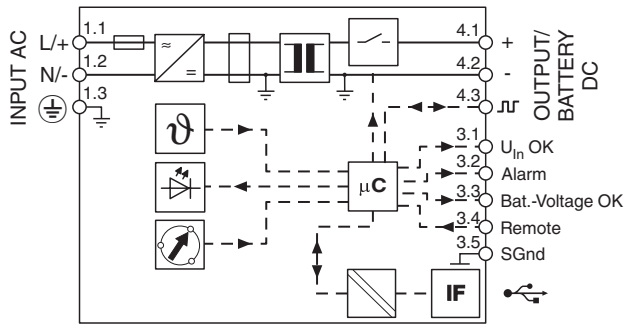


Figure 3 Device dimensions



6.3 Block diagram

Figure 4 Block diagram



Key

Element	Meaning
	Fuse
	Rectifier
	Transformer
	Switch
µC	Microcontroller
	Electrically isolated signal transmission
IF	Communication interface (device underside)
	Temperature sensor
	LED
	Selector switch

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

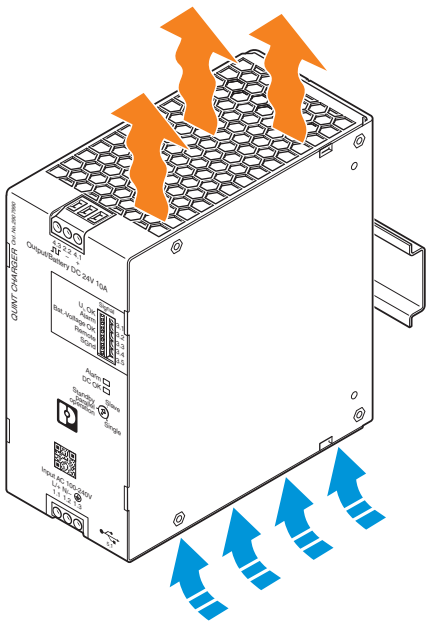
CAUTION: Hot surface

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

NOTE: enable convection

In order to ensure sufficient convection, we recommend a minimum vertical distance of 50 mm to the other devices.

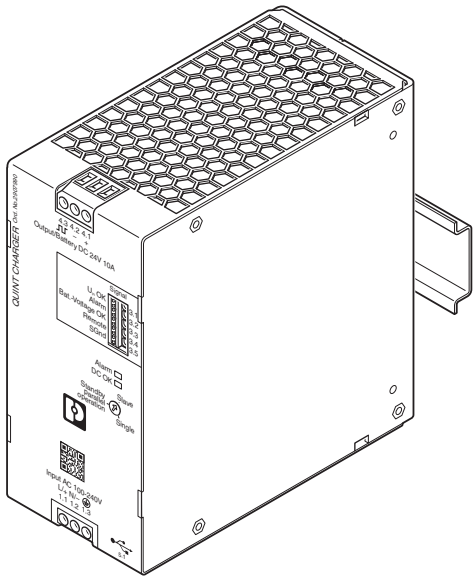
Figure 5 Convection



7.2 Normal mounting position

The device can be snapped onto all DIN rails in accordance with EN 60715 and should be mounted in the normal mounting position (connection terminal blocks on top and bottom).

Figure 6 Normal mounting position

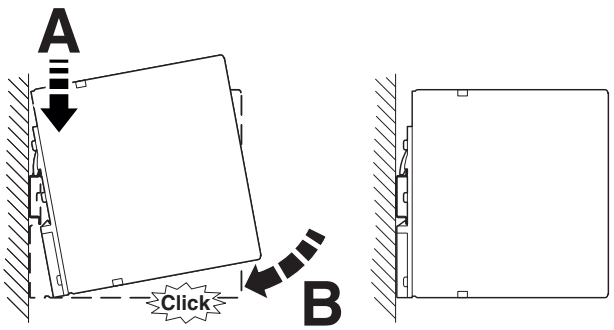


7.3 Mounting the battery charger

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 base latch engages properly behind the DIN rail (A).
2. Push the front of the device toward the mounting surface until the base latch audibly snaps 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 battery charger

WARNING:Never carry out work when voltage is present!

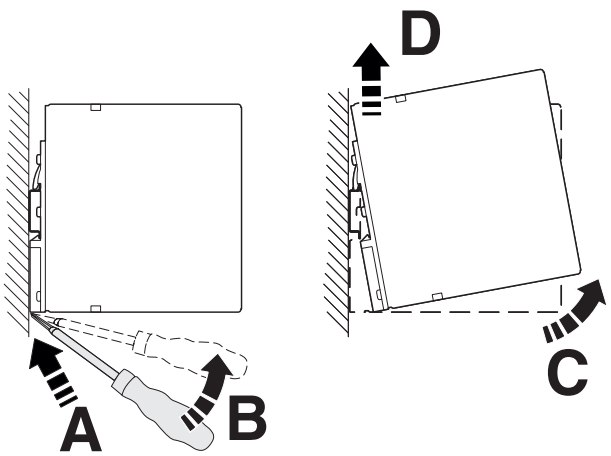
Switch off the supply voltage and ensure it cannot be switched on again!

Disconnect the connecting cables before you remove the device.

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 Rotated mounting position (270° Y-axis)

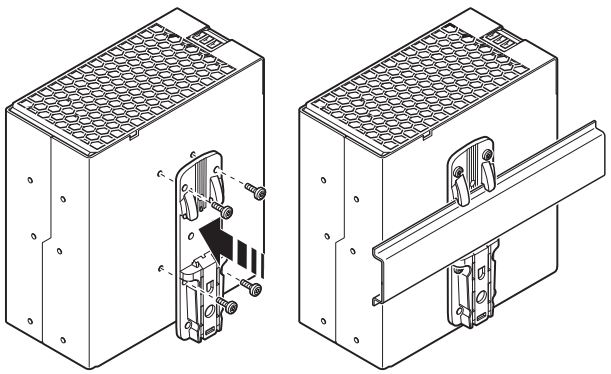
For rotated installation, use the existing universal DIN rail adapter and the Torx screws available.

The maximum tightening torque of the Torx screw (Torx® T10) is 0.7 Nm.

To mount the battery charger in a rotated mounting position, attach the universal DIN rail adapter to the left side of the housing as follows:

1. Remove the screws for the factory-installed 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 DIN rail adapter so that the mounting holes match the hole pattern on the left side of the housing.
4. Insert the Torx screws that were removed earlier into the appropriate hole pattern on the universal DIN rail adapter, so that the necessary drill holes on the battery charger module can be accessed.
5. Screw the universal DIN rail adapter onto the device.

Figure 9 Mounting the universal DIN rail adapter



7.6 Wall mounting

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

The use of the universal wall adapter is recommended for extreme ambient conditions, e.g., strong vibrations. An extremely high level of mechanical stability is ensured thanks to the tight screw connection between the battery charger and universal wall adapter or the actual mounting surface.

The UWA 182 or UWA 130 universal wall adapter is attached to the device by means of the Torx screws of the universal DIN rail adapter.

The maximum tightening torque of the Torx screw (Torx® T10) is 0.7 Nm.

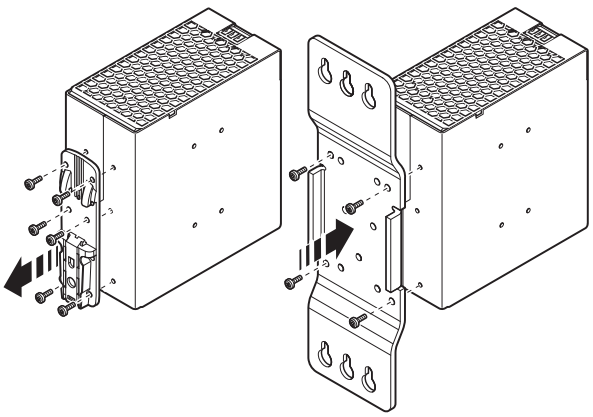
Make sure you use suitable mounting material when attaching to the mounting surface.

7.6.1 Mounting the UWA 182/52 universal wall 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 10 Mounting the UWA 182/52 universal wall adapter

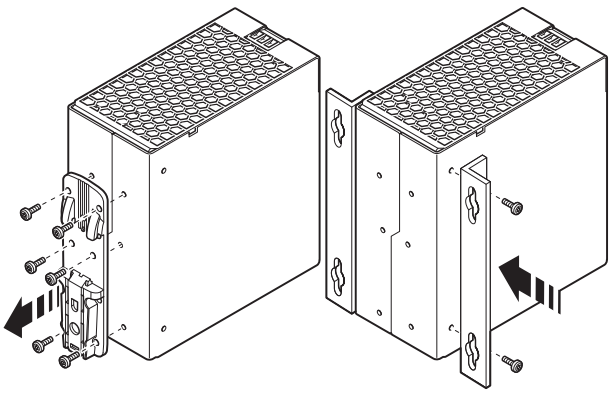


7.6.2 Mounting the UWA 130 2-piece universal wall adapter

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 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 universal wall adapter onto the device.

Figure 11 Mounting the UWA 130 universal wall adapter

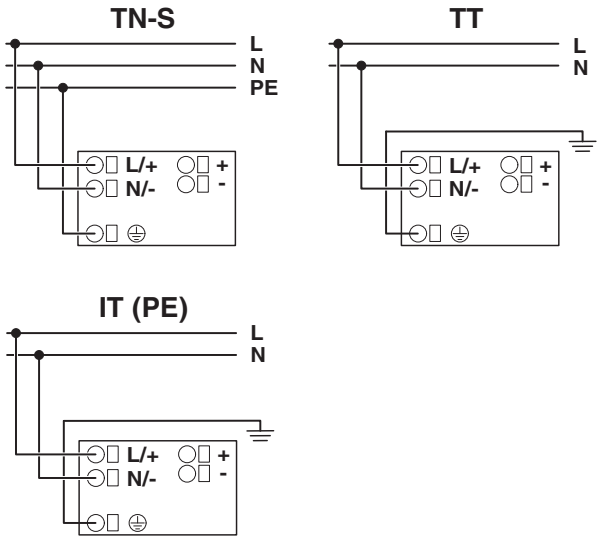


8 Device connection

8.1 Mains connection

The device can be operated on single-phase AC or DC power grids in accordance with the nominal input voltage. Connection is via the INPUT L+/N-/⏚ connection terminal blocks.

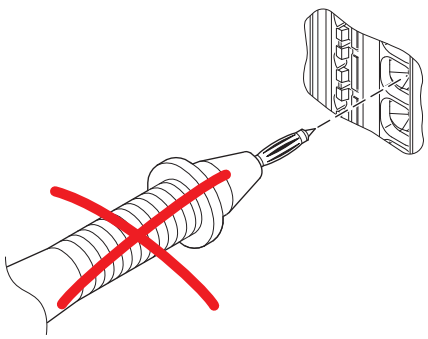
Figure 12 Network types



9 Device connection terminal blocks

NOTE: Damage to the Push-in connection terminal blocks is possible

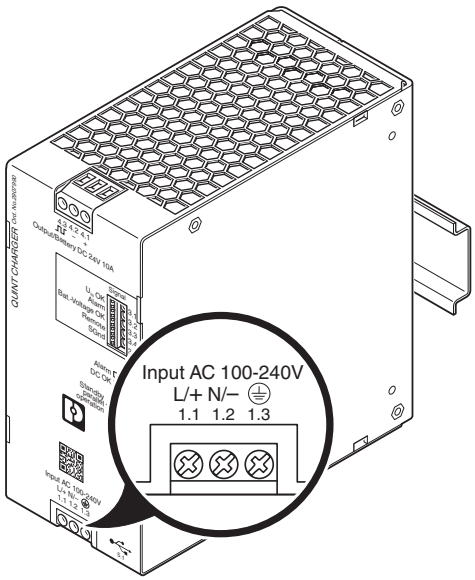
Do not plug test pins into the Push-in connection terminal blocks. The maximum pluggable depth of the Push-in connection terminal blocks is limited. In addition, when the test pin is plugged in, the unlocking button (pusher) is covered to such an extent that unlocking is not possible or only possible to an insufficient extent. If you do not push the unlocking button (pusher) down completely when you are pulling the test pin out, then the Push-in connection terminal block will become damaged.



9.1 AC input

The supply voltage is connected via "Input AC" connection terminal blocks.

Figure 13 Input voltage connection terminal blocks: Input L/N/⏚ (1.1...1.3)



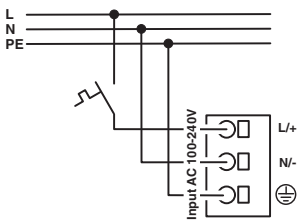
9.1.1 Protection of the primary side

It must be possible to switch the device off using a suitable disconnection device outside the power supply. The protection on the primary side, for example, is suitable for this (see section: Technical data).

An internal, approved AC/DC fuse is available as device protection. Additional device protection is not required.

If an internal fuse trips, this is due to a device fault. In this case, the device must be inspected in the factory. Opening the device or repairing it yourself is prohibited.

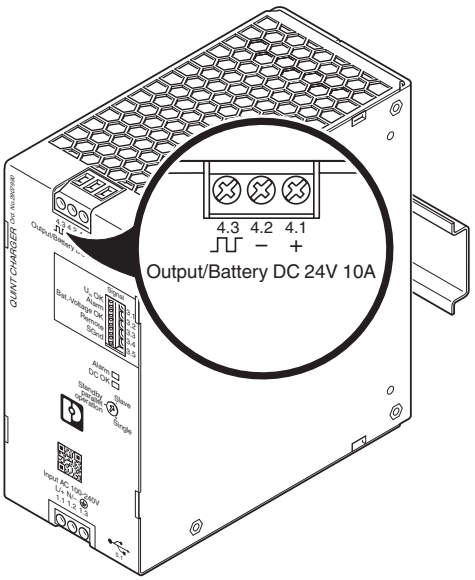
Figure 14 Schematic diagram, switching the input terminals



9.2 Output/battery DC

The output voltage/battery is connected via the “Output/ Battery DC” connection terminal blocks.

Figure 15 Output/battery DC connection terminal blocks: Output/battery DC LIN/-/+ (4.3 ... 4.1)



9.2.1 Protection of the secondary side

The battery charger is electronically short-circuit-proof and idling-proof. In the event of a fault, the output voltage is limited.

Ensure that all output cables are dimensioned appropriately for the maximum output current or have separate fuse protection.

The connecting cables on the secondary side should have large cross-sections to keep the voltage drops in the cables as low as possible.

9.3 Connection terminal block signaling

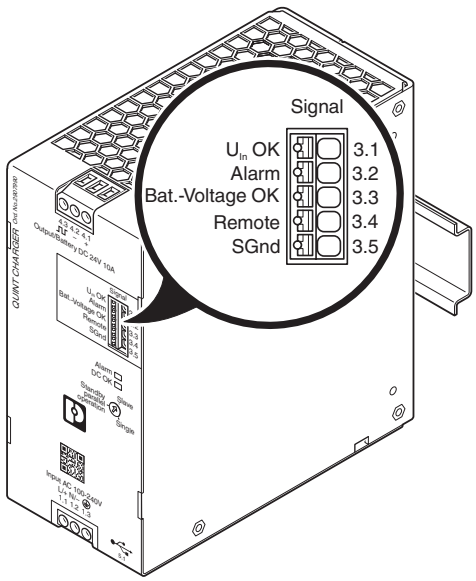
The battery charger has the following signal outputs:

– U_{In} OK
– Alarm
– Bat.-Voltage OK

The battery charger also offers the following signal input:

– Remote

Figure 16 Signaling connection terminal block (3.1 ... 3.5)



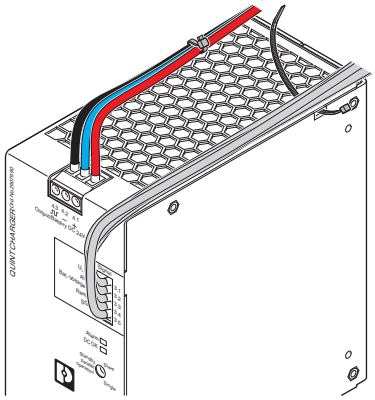
9.4 Securing the connection wiring

Two images for bundled fixing of the connection wiring are integrated into the left and right housing wall. If required, secure the connection wiring with cable binders (optional WT-HF 3,6X140 - Item No. 3240744).

Proceed as follows to secure the connection wiring:

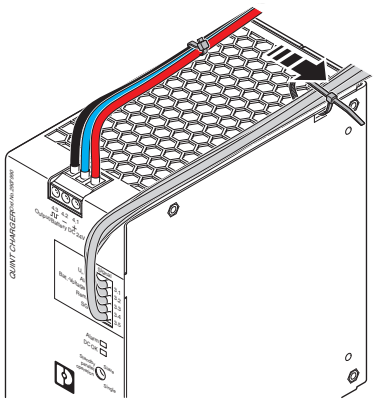
– Wire the charger with sufficient connection reserves (input terminal blocks, output terminal blocks/ battery terminal blocks)
– Bundle and lay out the connection wiring such that the ventilation slots on the top of the housing are covered as little as possible
– Thread the cable tie through the opening provided on the top of the housing

Figure 17 Lay and align connection wiring



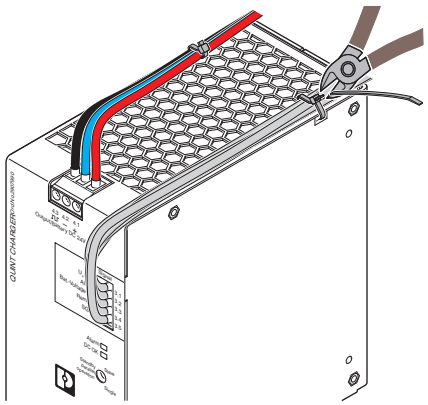
– Tighten the cable tie
– When doing so, ensure that the connection wiring is attached safely and securely without damaging the connection wiring

Figure 18 Secure connection wiring with cable binder



– Shorten the excess length of the cable ties.

Figure 19 Shorten protruding ends of the cable binder



10 Device operation

Basic settings for commissioning can be made directly on the device using the rotary selection switch. Advanced settings can be made via the POWER MANAGEMENT SUITE software.

The latest software version is to be found in the product download area.

POWER MANAGEMENT SUITE software (Item No. 1252232)

Using battery types from another manufacturer:

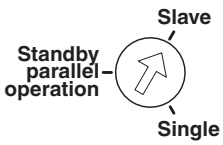
To ensure optimum charging of the batteries used, transfer all parameters via the USB interface in line with the recommendations of the battery manufacturer.

10.1 Setting the operating mode

Set the relevant operating mode via the rotary selector switch on the device front:

– Slave mode
– Single mode
– Standby parallel operation

Figure 20 Rotary selector switch

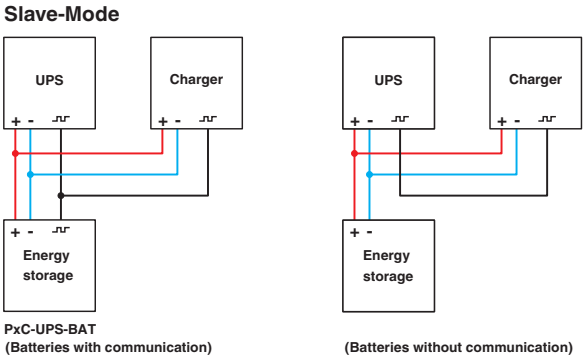


Use a suitable screwdriver to set the rotary selector switch.

10.2 Slave mode

Slave mode is the basic setting for the battery charger. In this mode, the battery charger communicates directly with the QUINT4 UPS. USB communication is deactivated. Parameterization is performed via the POWER MANAGEMENT SUITE software. The UPS controls all functions.

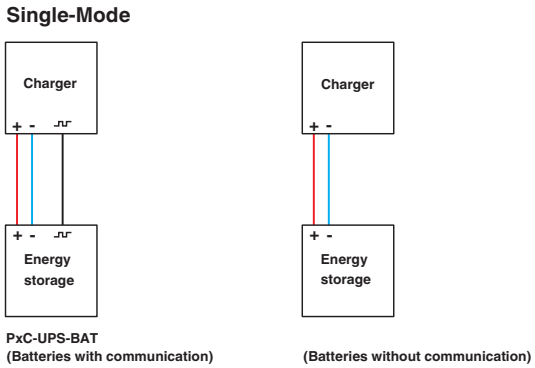
Figure 21



10.3 Single mode

In single mode, a battery is connected directly to the QUINT4 CHARGER. The device acts solely as a battery charger. When using Phoenix Contact batteries, the battery charger communicates with the battery. Parameterization is performed via the POWER MANAGEMENT SUITE software of the battery charger.

Figure 22

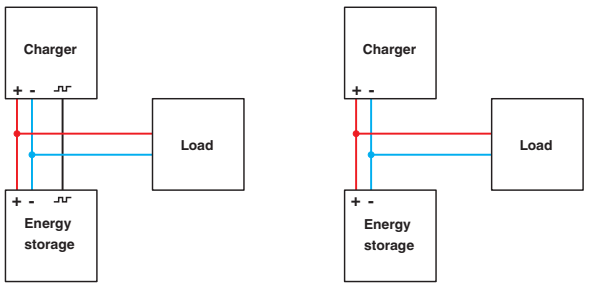


10.4 Standby parallel operation

Standby parallel operation is an extension of single mode. In addition to acting solely as a battery charger, the device can also be used to supply a load connected in parallel.

Figure 23

Standby parallel operation

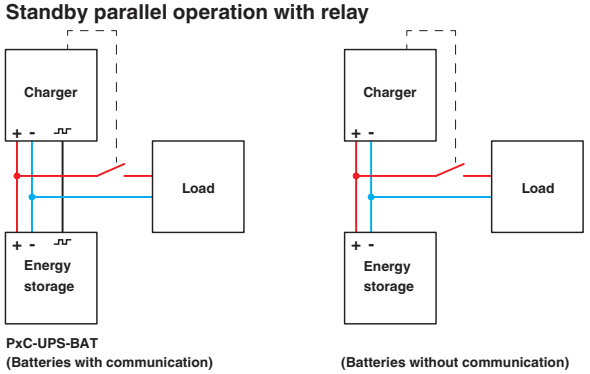


10.4.1 Standby parallel operation with relais

In this mode, a relay is installed between the battery charger and the load. This means that the load is supplied even in the event of mains failure. To trigger the relay, enter a defined battery voltage via the POWER MANAGEMENT SUITE software. The battery charger will then supply the load with power. The energy storage system will be charged.

Figure 24

Standby parallel operation with relay



10.5 Software configuration

You can request the current device status via the POWER MANAGEMENT SUITE software. Furthermore, you can change the settings of certain parameters within a defined value range and reset them to the default settings. Please refer to the respective setting options in the following table:

Parameter	Value range	Default setting
Field of application		/
Battery capacity that can be connected	7,0 ... 300 Ah	38 Ah
Charging current	0,3...10 A	10 A
Compensation end-of-charge voltage	25 ... 32 V	28 V
Conservation end-of-charge voltage	25 ... 32 V	27,6 V
Temperature compensation	-200 ... 0 mV/K	-42 mV/K
End-of-discharge voltage	18...24 V DC	19.2 V DC
Signaling threshold of alarm - maximum charging time exceeded	4 ... 200 h	18 h
Signaling threshold of alarm - battery voltage	18 ... 30 V	20,4 V

In addition to parameter setting options, the software also features setting options for signaling and communication.

11 Battery management

The battery management for the battery charger comprises the following tests:

– Battery presence test
– Battery quality test

11.1 Battery presence test

The battery presence test is performed once when the battery charger is started up. The test is used to detect whether a correctly installed battery is present. If the battery is installed incorrectly, the test is failed and the red LED lights up. The green LED indicates a correctly connected battery.

The battery presence test is performed by testing the voltage of the battery:

Battery voltage test

Before the output is switched on, the battery charger tests the voltage at the output.

– If the voltage is greater than 22.4 V, the device detects a connected battery. The output is switched on. The charger is ready to operate.
– If the battery voltage is less than 22.4 V, the battery charger recognizes that the battery is in the deep discharge state and could be damaged. An alarm is generated. The output remains switched off.

11.2 Quality check of battery

The battery quality test is a life cycle test.
When the maximum charging time has been exceeded, conclusions can be drawn regarding the maximum service life of the battery, for example. If an event arises, the green and red LED control lamps come on and stay on.

11.3 System prerequisites for the use of Phoenix Contact batteries

The CHARGER recognizes and supports the following Phoenix Contact batteries. Observe the minimum required V/C level (V/C: xx) of the battery here. The actual V/C level of the battery is printed on the side of the battery housing.

For the minimum required V/C level, refer to the table below:

Product designation	Item No.	From V/C level
UPS-BAT/PB/24DC/7AH	1274118	00
UPS-BAT/PB/24DC/12AH	1274119	00
UPS-BAT/PB/24DC/20AH	1348516	00
UPS-BAT/PB/24DC/40AH	1354641	00
UPS-BAT/VRLA-WTR/24DC/13AH	2320416	06
UPS-BAT/VRLA-WTR/24DC/26AH	2320429	06
UPS-BAT/LI-ION/24DC/120WH	2320351	10
UPS-BAT/LI-ION/24DC/924WH	2908232	01

11.4 Connecting the battery

WARNING

When connecting the batteries take note of the polarity.

Do not short circuit the pole terminals.

The batteries are maintenance free and may not be opened.

NOTE

When replacing batteries, always use new batteries from the same production batch.

When storing the battery modules, observe the latest startup date and recharge the batteries if necessary.

To connect the battery, proceed as follows:

1. Connect the remote contact (3.4) to ground, e.g.,SGnd (3.5).
2. Prepare the batteries that are to be charged.
3. Connect the cabling of the battery blocks.
   Connect the positive terminal (+) of the battery to the positive terminal (+) of the charger.
   Connect the negative terminal (-) of the battery to the negative terminal (-) of the charger.
4. Connect the battery control cable of the UPS-BAT from Phoenix Contact to the charger. (Skip this step if using batteries from another manufacturer).
5. When using batteries from another manufacturer, you must enter the manufacturer's recommended charging parameters via the software.
6. Remove the connection between the remote contact (3.4) and ground, e.g., SGnd (3.5).

11.5 Service mode

When the remote contact (3.4) is open, the battery charger operates in the operating mode set with the rotary selector switch.

If the battery charger detects a defective battery, it indicates this with an alarm. The battery charger output switches off. The battery needs to be changed. Use service mode for this. Connect the remote contact (3.4) to ground, e.g., SGnd (3.5).

For service mode, the operating state is as follows:

1. The battery charger output is switched off.
2. The green LED flashes with D = 10%.
3. All rotary selector switch modes are disabled.

11.6 Charging process

The performance capability of the battery charger limits the charging current with which a battery can be charged. The maximum charging current is 10 A.

The charging current adjusts itself based on the battery's state of charge. The charging current is reduced to 0 A when a battery is fully charged. A fully discharged battery is initially charged with the maximum charging current.

The charging time of the energy storage device depends on the capacity and energy supplied by the uninterruptible energy supply unit. The maximum charging time can last up to several hours.

11.7 Notes on disposal

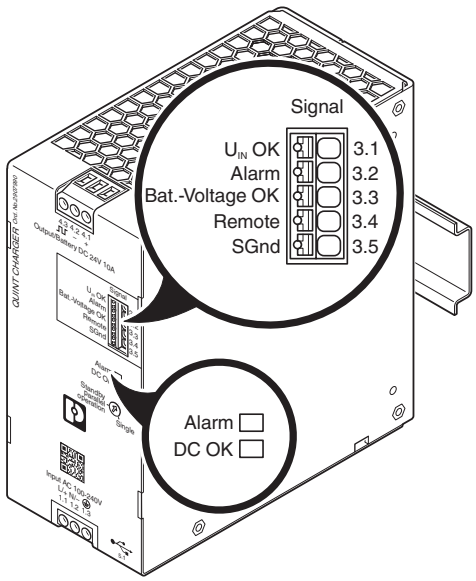
Do not dispose of used batteries and accumulators in the household waste. They should be disposed of in accordance with the currently applicable national regulations.

You can return used batteries and accumulators to Phoenix Contact or the manufacturer.

12 Signaling

Various LED indicators are available for visual function monitoring of the device. 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



12.1 LED indicators and signal states

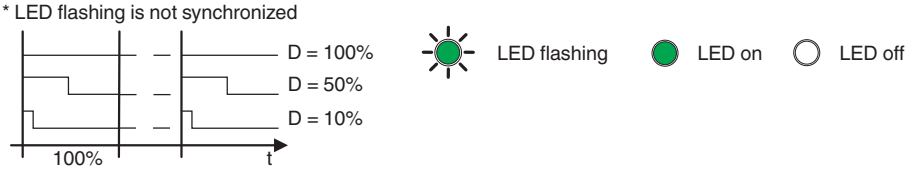
Refer to the tables below for the signaling that corresponds to the relevant operating mode.

12.1.1 Signaling for slave mode

Figure 26

Signaling Slave-Mode						
Status LED		Digital output			Digital input	Note
Green	Red	Battery Voltage OK (Active high)	Main AC Fail (Active low)	Alarm (Active low)	Remote (Active,when connected to Gnd)	
●	○	high	high	high	deactive	Battery fully charged.
☀ D = 50%	○	low	high	high	deactive	LIN communication with UPS established. Battery not fully charged. Charger ON or OFF based on the command from UPS.
○	●	low	low	high	deactive	Charger Main AC fail. Charger running from battery.
☀ D = 50% / 100%	●	low	high	low	deactive	Alarm from UPS and charger remains ON.
☀ D = 10%	●	low / high	high	low	deactive	Alarm from UPS and charger remains OFF.
○	☀ D = 10%				deactive	Master UPS not found / disconnected.

* LED flashing is not synchronized



12.1.2 Signaling for single mode

Figure 27

Signaling Single-Mode						
Status LED		Digital output			Digital input	Note
Green	Red	Battery Voltage OK (Active high)	Main AC Fail (Active low)	Alarm (Active low)	Remote (Active,when connected to Gnd)	
●	○	high	high	high	deactive	Battery fully charged.
☀ D = 50%	○	low	high	high	deactive	Battery not fully charged.
○	●	low	low	high	deactive	Main AC fail, battery voltage above setBatAlarmVoltage.
○	☀ D = 50%	low	low	high	deactive	Main AC fail, battery voltage below setBatAlarmVoltage.
○	●	low	high	low	deactive	Normal alarm: 1) Battery not present or 2) Battery voltage below 14 V or 3) Battery voltage not above 19.2 V in five minutes of charging or 4) Battery charging duration exceeded.
☀ D = 50%*/ 100%	☀ D = 10%	low / high	high	high	deactive	LIN communication was active. LIN fail now. Warning Bit 2 high.

* LED flashing is not synchronized



12.1.3 Signaling standby parallel operation

Figure 28

Signaling Standby parallel operation						
Status LED		Digital output			Digital input	Note
Green	Red	Battery Voltage OK (Active high)	Main AC Fail (Active low)	Alarm (Active low)	Remote (Active,when connected to Gnd)	
●	○	high	high	high	deactive	Battery presence check PASS, charger output is ON.
○	●	high	low	high	deactive	BAT-Mode. Battery voltage above setBatAlarmVoltage.
○	☀ D = 50%	high	low	low	deactive	BAT-Mode. Battery voltage below setBatAlarmVoltage.
○	●	low	high	low	deactive	Battery presence check FAIL, charger remains OFF.
☀ D = 10%*/ 100%	☀ D = 10%	low / high	high	high	deactive	LIN communication was active. LIN fail now. Warning Bit 2 high.
○	☀ D = 50%	high	high	low	deactive	Load current higher than set charger capacity. Battery discharging. Battery voltage below setBatAlarmVoltage.
○	☀ D = 50%	low	high	low	deactive	Load current higher than set charger capacity. Battery discharging. Battery voltage below setDisBatEndVoltage. Battery voltage OK is RESET, load is connected, because there is no load relay.

* LED flashing is not synchronized

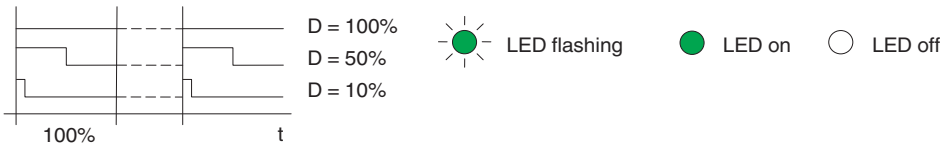


12.1.4 Signaling for standby parallel operation with relay

Figure 29

Signaling Standby parallel operation (with relay)						
Status LED		Digital output			Digital input	Note
Green	Red	Battery Voltage OK (Active high)	Main AC Fail (Active low)	Alarm (Active low)	Remote (Active, when connected to Gnd)	
●	●	low	high	low	deactive	Charger startup process ongoing.
●	○	high	high	high	deactive	Battery voltage above setChargerBatVoltageOK. Load relay connected to BatVoltageOK is ON or load connected and load current is higher than max. charger current. Battery discharging and battery voltage is over setBatAlarmSocVoltage.
✳ D = 10%	○	low / high	high	low / high	active	Remote active. Output turned OFF.
✳ D = 50%	○	low	high	high	deactive	Battery voltage not above BatteryVoltageOK value.
○	●	high	low	high	deactive	Bat.-Mode, Battery voltage above setBatAlarmSocVoltage.
○	✳ D = 50%	high	low	low	deactive	Bat.-Mode, Battery voltage below setBatAlarmSocVoltage.
○	●	low	high	low	deactive	Battery presence check FAIL. Charger remains OFF.
✳ D = 50%*/ 100%	✳ D = 10%	low / high	high	high	deactive	LIN communication was active. LIN fail now. Warning Bit 2 high.
○	✳ D = 50%	high	high	low	deactive	Load current more than charger capacity. Battery discharging. Battery voltage below setBatAlarmSocVoltage.
○	✳ D = 50%	low	high	low	deactive	Load current more than charger capacity. Battery discharging. Battery voltage below setDisBatEndVoltage. Battery voltage OK is RESET and load is disconnected.

* LED flashing is not synchronized



12.2 Signal outputs

U_{In} OK

A digital transistor output is available as a signal contact.

This signal is indicated visually by a green LED.

Alarm

When an alarm is present, the signal output is active (low level).

A digital transistor output is available as a signal contact.

This signal is indicated visually by a red LED.

The possible alarms depend on the set operating mode:

Slave mode:

- Mains failure
- UPS out of operation
- UPS not found
- General UPS alarm: charger is switched off

Single mode:

- Mains failure
- Battery not detected
- Battery voltage too low (< set voltage value), LED flashes with 50%
- LIN communication aborted, LED flashes with 10%
- Battery charging process aborted (charging process too long)

Standby parallel operation

- Battery mode
- Charging current is too high
- Battery not detected
- Battery voltage too low (< set voltage value), LED flashes with 50%
- LIN communication aborted, LED flashes with 10%

Bat.-Voltage OK

A digital transistor output is available as a signal contact.

12.3 Signal input

Remote

This signal is indicated visually by a green LED.

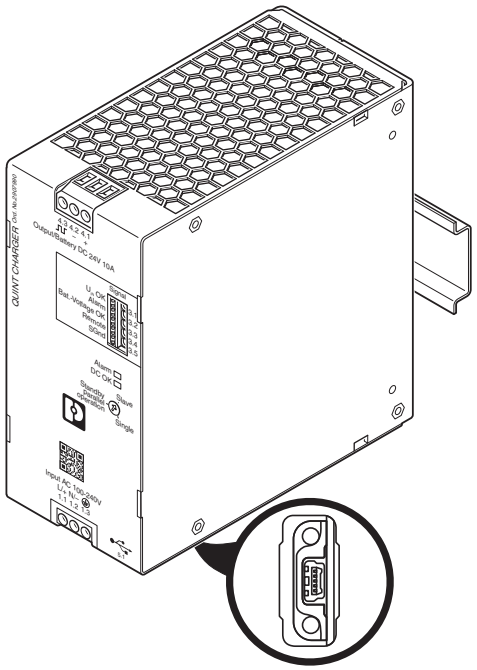
For further information on the remote contact, please refer to section: Battery management.

13 Communication interface

The device 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.

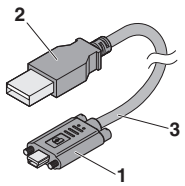
Figure 30 USB interface MINI type B (bottom of device)



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 (Item No. 2908217).

Figure 31 MINI-SCREW-USB-DATACABLE



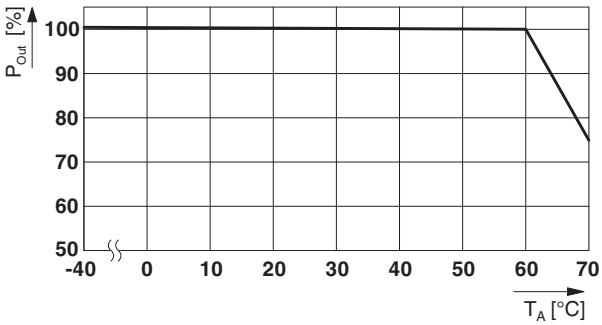
No.	Designation
1	Mini type B USB connector with screw connection
2	USB plug type A
3	Cable length: 3 m

14 Derating

14.1 Ambient temperature

At an ambient temperature of up to 60°C, the battery charger supplies continuous nominal power. When operating the battery charger at an ambient temperature of >60°C, a power derating of 2.5%/K should be ensured.

Figure 32 Temperature-dependent derating



14.2 Installation height

The battery charger can be operated at an installation altitude of up to 2000 m without any limitations. Different data applies for installation locations above 2000 m due to the differing air pressure and the reduced convection cooling associated with this.

Figure 33 Altitude-dependent derating

