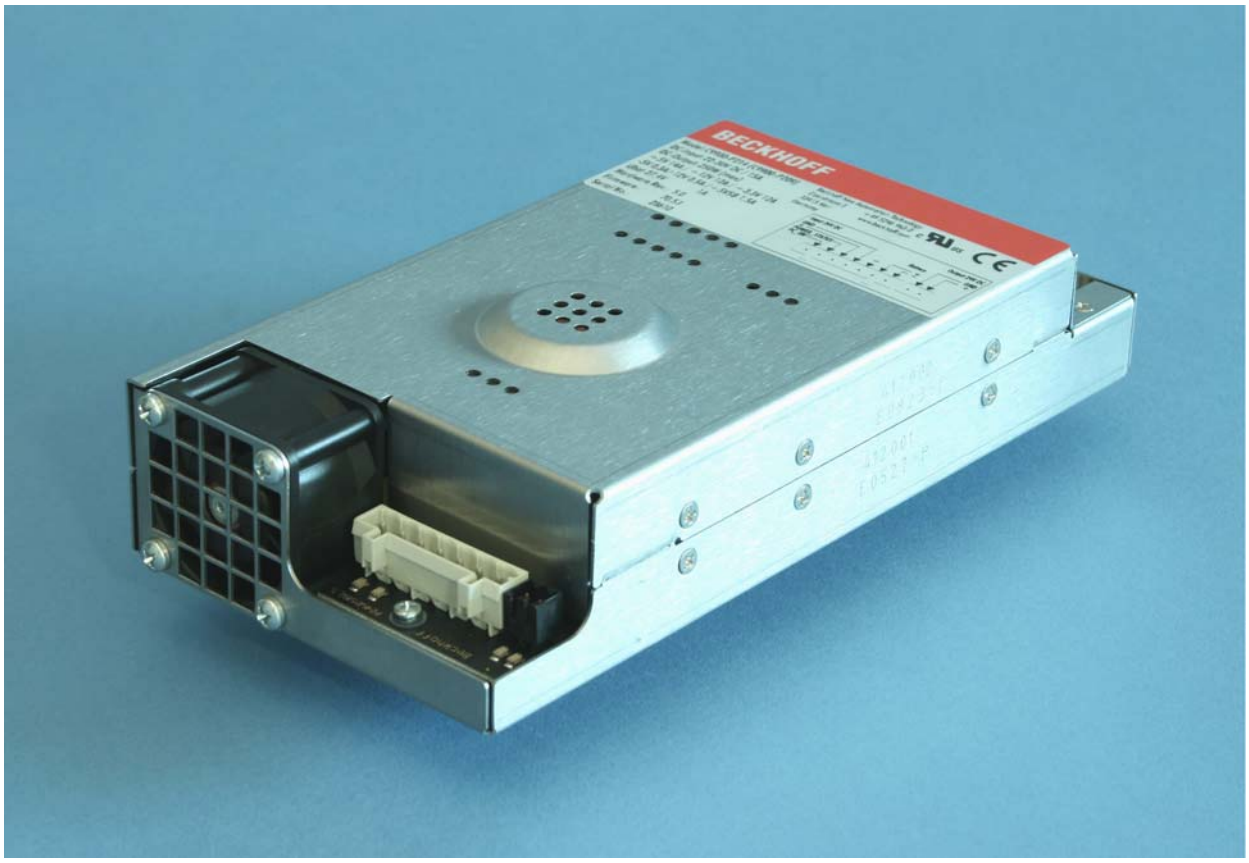

Installation and Operating instructions for

C9900-P208 and C9900-P209

Power Supply Units

Version: 1.5
Date: 2012-02-22

BECKHOFF

Table of contents

Foreword

Notes on the Documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.
The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

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Description of safety symbols

The following safety symbols are used in this operating manual. They are intended to alert the reader to the associated safety instructions.

 **DANGER**	**Acute risk of injury!!** If you **do not** adhere the safety advise adjoining this symbol, there is immediate danger to life and health of individuals!

 **WARNING**	**Risk of injury!** If you **do not** adhere the safety advise adjoining this symbol, there is danger to life and health of individuals!

 **CAUTION**	**Hazard to individuals!** If you **do not** adhere the safety advise adjoining this symbol, there is obvious hazard to individuals!

Attention	**Hazard to devices and environment** If you **do not** adhere the notice adjoining this symbol, there is obvious hazard to materials and environment.

 **Note**	**Note or pointer** This symbol indicates information that contributes to better understanding.

Basic safety measures

 **Note**	**Use only with Beckhoff Industrial PCs** The power supply unit must only be used in conjunction with Beckhoff Industrial PCs!

Attention	**Switch off the power supply of the system during installation!** During assembly, removal and electrical wiring of the power supply unit, the power supply of the system must be switched off in order to prevent damage on the power supply unit and the Industrial PC. Items of equipment that have been switched off must be secured against being switched on again.

 **WARNING**	**Do not open the power supply unit while voltage is applied!** The supply voltage must be switched off before the power supply unit housing is opened.

Operator's obligation to exercise diligence

 **CAUTION**	**Only appropriately trained staff may install the power supply unit!** The operator must ensure that only appropriately trained electricians deal with installation and wiring of the power supply unit.

Product Description

Appropriate Use

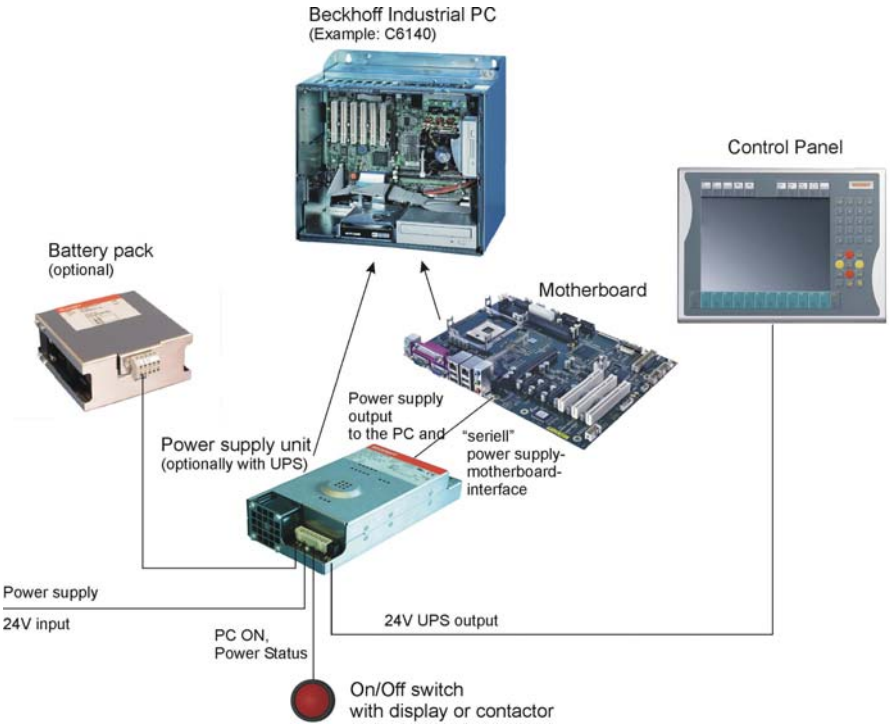
The C9900-P208 and C9900-P209 power supply unit provide the power supply for Beckhoff Industrial PCs.

The C9900-P209 power supply in conjunction with a C9900-U330 battery pack allows the construction of an uninterruptible power supply (UPS).

WARNING	**Risk of explosion!** Risk of explosion if other battery packs are used!

Beckhoff power supply technology

Schematic diagram of power supply unit wirings



Innovative solution for shutting down Industrial PCs

Industrial PCs equipped with a UPS are in actual use frequently switched off by simply turning off the supply voltage. In this case the PC shuts down via the battery. However, over time this reduces the service life of the battery.

The new Beckhoff power supply technology approach addresses this problem and now offers the user the option of switching the PC off without the need for using the battery, thereby reducing the load on the battery.

In addition to the main switch this innovative solution uses an ON/OFF switch for the machine. Basically, the main switch remains switched on and provides the power supply for the PC during shutdown. Via the PC ON-input of the power supply the PC gets the command to shut down the operating system.

Once the PC has shut down, the PC power supply unit sets the Power Status-output (P-S) to 0, what indicates that the process is complete and that the main voltage can be switched off. This can be done manually via a signal lamp connection or via a contactor. With this solution the main switch generally only has to be switched off if the control cabinet has to be opened. The battery will only be used in the event of a power failure.

In order to maintain a screen display for the Industrial PC in the event of a power failure, the C9900-P209 power supply unit is equipped with a UPS output 27 V / 1.4 A for connecting a Control Panel with a display dimension up to 19 inches. This enables a power failure to be visualized and displayed to the user. Once the PC has shut down, the UPS output is switched off.

For a detailed functional description please refer to section *External wiring*.

Electrical data

Input voltage:	22-30V DC/ 15A	
Power output:	250W (max.)	
Output voltages:	+ 5V	14A
	+ 12V	12A
	+ 3.3V	12A
	- 5V	0.3A
	- 12V	0.5A
	+ 5VSB	1.5A

Installation Instructions

Configuration and installation

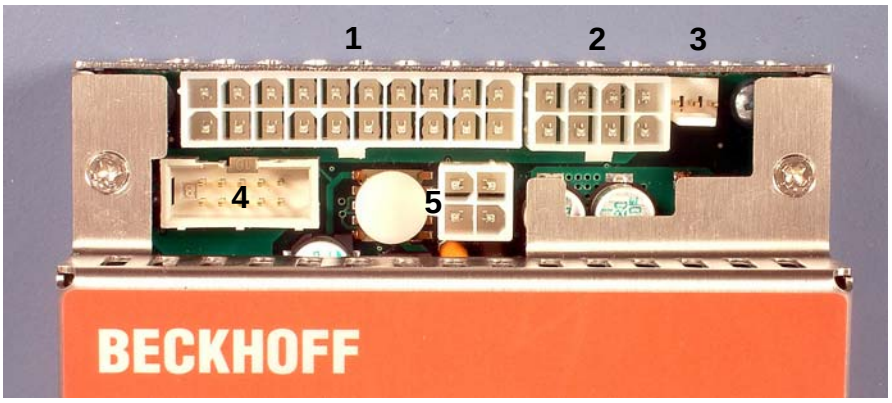
View of the power supply unit

The power supply unit is installed at the prescribed position in the Industrial PC.

The supply connections for the power supply unit are located next to the fan (**1**). The electrical connections for the motherboard are on the opposite side (**2**).

Connection with the motherboard

Pin strips
on the output side



Connection with the motherboard

The power supply unit is connected with the motherboard according to the installation instructions of the board.

Connection	Function
1	ATX interface
2	5V/12V supply
3	POWER ON
4	COM interface
5	12V supply

Pin assignment of the pin strips

ATX DC output

Pin	Function	Pin	Function
1	3.3V	11	3.3V
2	3.3V	12	- 12V
3	GND	13	GND
4	+ 5V	14	PS ON
5	GND	15	GND
6	+ 5V	16	GND
7	GND	17	GND
8	PWR OK	18	- 5V
9	5VSTB	19	+ 5V
10	12V	20	+ 5V

5V/ 12V supply for drives

Pin	Function	Pin	Function
1	+ 12V	5	+ 12V
2	GND	6	GND
3	GND	7	GND
4	+ 5V	8	+ 5V

POWER ON

Pin	Function
1	POWER-ON
2	POWER-ON

COM interface
(RS 232)

Pin	Function
3	TXD
5	RXD
9	GND

ATX 12V DC-Output

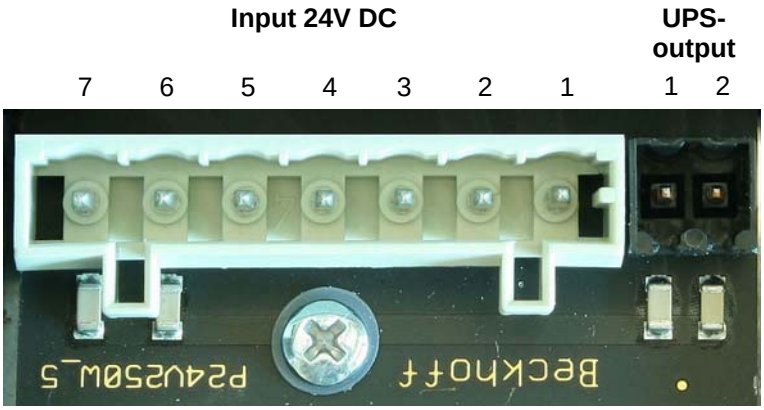
Pin	Function	Pin	Function
1	GND	3	+ 12V
2	GND	4	+ 12V

Connection with the Industrial PC

The power supply unit features an 8-pin contact strip for connecting the power supply unit inside the Industrial PCs with the respective connection sockets for power supply switch and battery pack (C9900-P209 only).

In addition, the C9900-P209 power supply unit features a UPS output for connecting a Control Panel.

Pin strips



Note	**Uninterruptible power supply (UPS)** With the C9900-P209 power supply you can realize an uninterruptible power supply (UPS) using the battery pack C9900-U330.

WARNING	**Risk of explosion!** Risk of explosion if other battery packs are used!

A Control Panel can be connected to the UPS output of the C9900-P224. The maximum current loading is 1.4 A.

Pin assignment of the connector

The power supply and the external circuit for switching the Industrial PC on and off are connected via the plug connector.

Pin assignment for connecting the switch, the power supply and the battery pack (optional)

Input 24V DC:

Pin	Function	
1	-	Battery Pack (C9900-P209 only)
2	+	
3	⏚	
4	-	24 V DC Power Supply
5	+	
6	Power-Status	
7	PC_ON	

Pin assignment for connecting a control panel (optional)

UPS-output (C9900-P209 only):

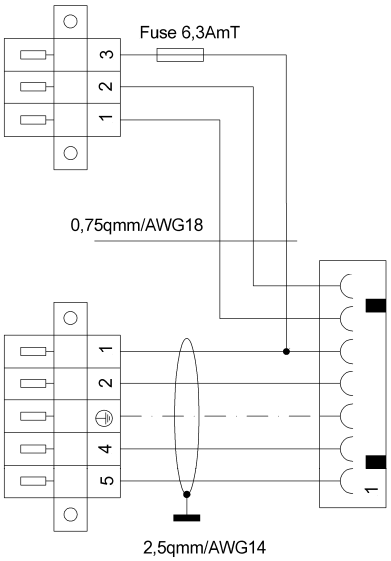
Pin	Function	
1	UPS-	UPS-output
2	UPS+	

Preparing the cable harness

A wiring harness is used for connecting the power supply unit with the connection sockets in the Industrial PC. Due to different cable lengths, the harness is produced individually for each type of computer.

The wiring diagram section shows the connection between the 7-pin power supply unit connector and the 3-pin and 5-pin pin strip at the PC case:

Cable harness wiring diagram



Attention	**Insert fuse** The power supply of the customized components for shutting down the PC must be protected with a fuse! To this end, a "flying" fuse (6.3A/ medium time-lag) is inserted in the line.

Note cable cross sections

The cable cross sections are 0.75 mm^2 / AWG18 for connecting the switch and 2.5 mm^2 / AWG14 (screened) for connecting the power supply.

External wiring

The external wiring consists of the connection of the power supply, the battery pack (only C9900-P209) and the connection of customized components for shutting down the PC.

The external wiring occurs according to the wiring diagram, see chapter *Wiring diagram*.

Cable Cross Sections

Note cable cross sections, avoid voltage drop!

For the connection of the power supply, wiring with a cable-cross-section of 1.5 mm^2 must be used.

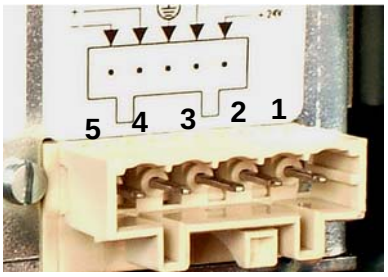
With bigger distances between voltage source and PC, you take the voltage drop as a function of the cable-cross-section as well as voltage fluctuations of your distribution voltage into account, so that is secured that the voltage doesn't fall under 22 V at the power supply.

Attention	**Insert fuse** The power supply must be protected with 16 A.

Power supply of the Industrial PC

The 5-pin pin strip with CAGE CLAMP connection and mounting flanges shown on the photograph is mounted on the PC case for connecting the power supply and the battery pack.

Pin assignment for connecting the power supply and the battery pack



Pin	Function	
1	+	24 V DC Power Supply
2	-	
3	⏚	
4	+	Battery Pack (C9900-P209 only)
5	-	

Configuration for shutting down the PC

The connections for shutting down the Industrial PCs are established via the **PC_ON** input and the **Power Status** output. The third contact is connected to 24 V. To this end, a 3-pin pin strip with CAGE CLAMP connection and mounting flanges is installed at the PC case.

Pin assignment for connecting the on/off switch

Pin	Function
1	Power-Status
2	PC_ON
3	+ 24 V

PC_ON and Power Status functions

- If the **PC_ON** input is connected to 24 V via a switch, the PC shuts down according to the rules. The PC_ON signal is inverted, i.e. the PC shuts down if the 24 V connection is live.
- If the **PC_ON** input is *NOT* connected by the user, the PC can be booted in the familiar way by connecting the supply voltage and shut down via the battery by switching off the supply voltage.

Attention	**Service life of the rechargeable battery** This procedure significantly reduces the service life of the rechargeable battery and should therefore not be used.

- Once the PC has shut down, the **Power Status** output is switched from 24 V to 0 V. Via this output a signal lamp can be connected or a contactor for de-energizing the whole system. The maximum load for the **Power Status** output is 0.5 A and a suitable fuse should be provided.

UPS output, C9900-P209 only

In order to maintain a screen display for the PC in the event of a power failure, the C9900-P209 power supply unit is equipped with a **UPS output** for connecting a Control Panel. The maximum load for the output is 1.4 A.

The UPS output is located on the power supply unit adjacent to the mains plug (see also section *Product Description*).

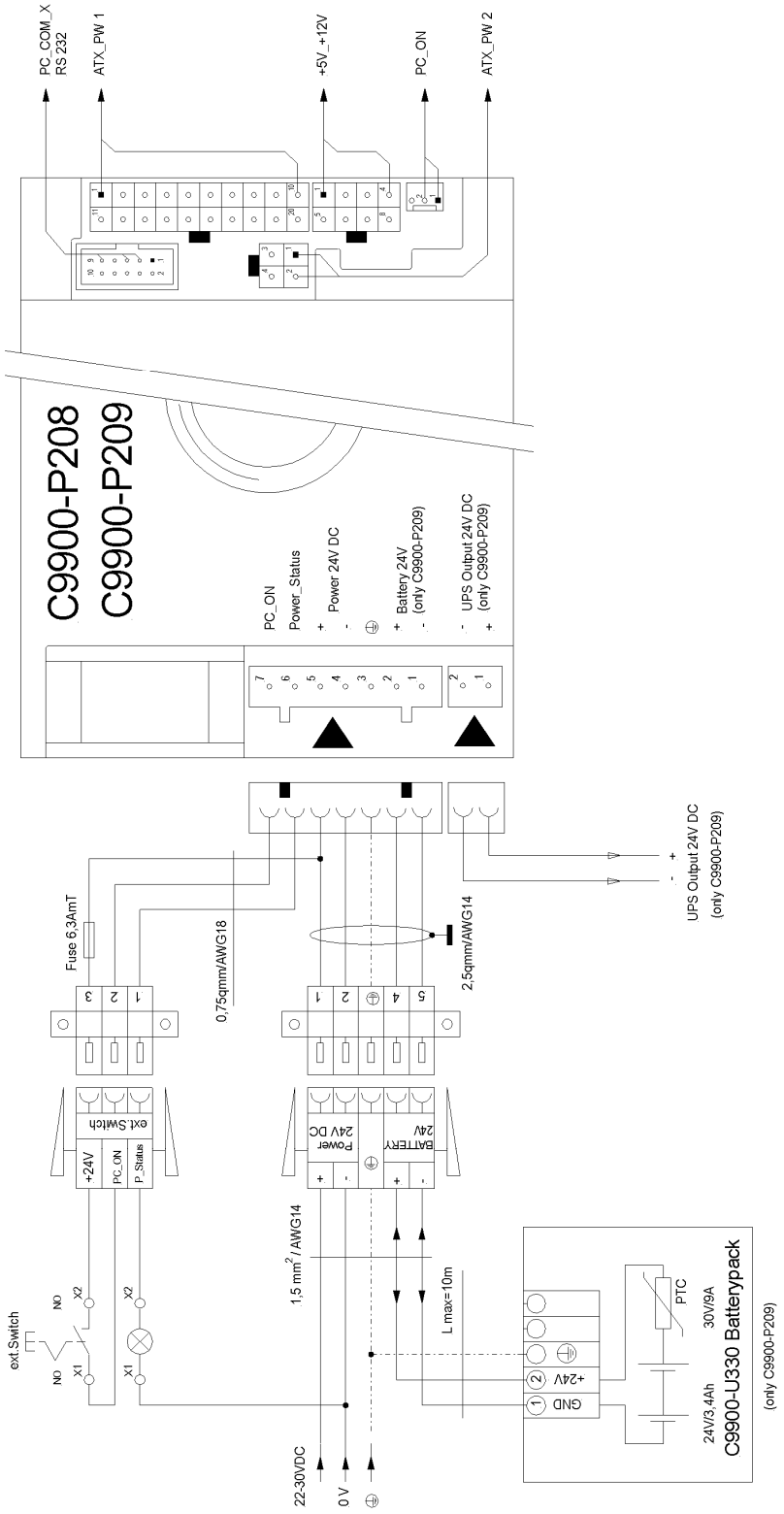
UPS output function

- The 27 V DC connection at the UPS output is live even after a power failure. The maximum load is 1.4 A (C9900-P209 only).

- Once the PC has been de-energized via the UPS software, the **UPS output** is switched to 0 V. Any connected panel is thus switched off, and total discharge of the rechargeable battery is prevented.

Wiring diagram

Wiring according to the wiring diagram.
The circuit of PC_ON and Power-Status is symbolical.



Note	**Connection of the Battery Pack and UPS Output** Connection of the Battery Pack and UPS Output only in combination with C9900-P209 power supply.

Installation of the supply cables

Wiring according to the wiring diagram

Install the cables for the power supply of the Industrial PC, the connection of the battery pack and the connection of the illuminated toggle switch according to the wiring diagram using the connector assembly material provided.

Connector assembly is described using the example of the 5-pole female plug connector:

Materials for assembly of the connector

Female plug connector, 5-pole

Strain relief housing

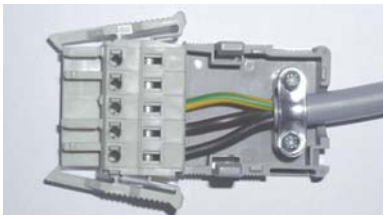
Connector installation

Fitting the connector to the cable

The plug is fitted to the cable as follows:

1. Remove the insulation from the cable ends (8 - 9 mm).
2. Push the cable into the holders, applying slight pressure according to the pin assignment label and the wiring diagram.
3. Push the lower part (part **A**) of the strain relief housing onto the top of the female plug connector until it snaps into place.
4. Relieve the strain on the supply cable by fixing it in place with the cable clamp (part **C**) and fixing screws (part **D**) (see photograph below).

Applying the strain relief



Fix the upper part (part **B**) of the strain relief housing by snapping it onto the lower part.

Operating Instructions

UPS Software Components (only C9900-P209)

Installing the UPS driver software

For operating the power supply unit as a UPS, the UPS driver software and the associated UPS driver must be installed on the Industrial PC.

On delivery of the Beckhoff Industrial PC with operating system the software is already installed. Should the software not be installed on your PC, the drivers can be installed from the driver CD provided.

Installation on the PC

Installation

To install the UPS driver software, execute file **Beckhoff_UPS_vx.xx.xx.exe** from the subdirectory of **UPS\…** from the CD provided on the Industrial PC (Driver-archive for the Industrial-PC, C9900-S700-xxxx).

The program is self-extracting and will guide the user through the installation routine.

Help files

Beckhoff Information System

The driver software comes with a detailed help function.
The help files can be called up either directly from the configuration register by clicking the Help button, or under via *Start* > *Programs* > *Beckhoff* > *UPS software components*.

Servicing

The power supply unit is maintenance-free.

Shutting down

Disposal

Dismantling the case

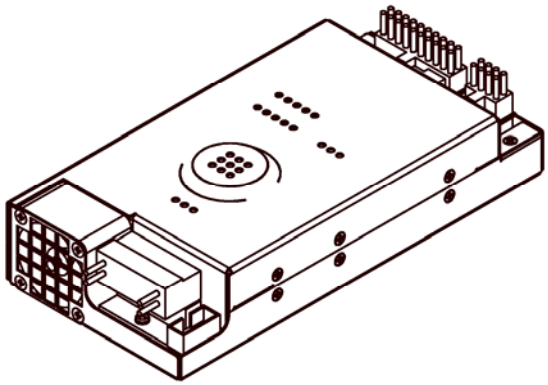
The device must be fully dismantled in order to dispose of it. The housing can be sent for metal recycling.

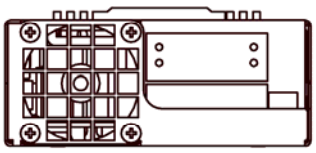
Observe national electronics scrap regulations

Electronic parts must be disposed of in accordance with national electronics scrap regulations.

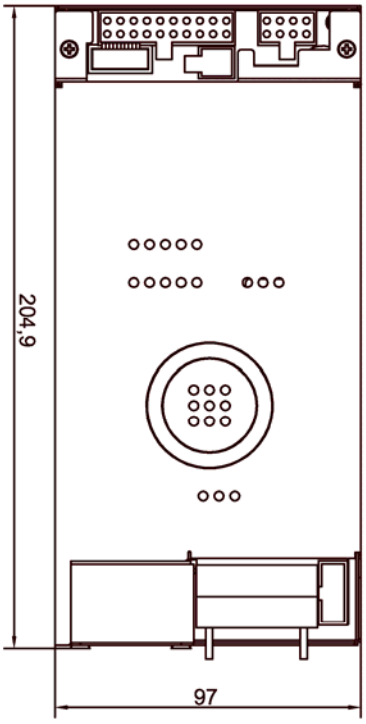
Assembly dimensions

Device dimensions and mounting points.
Dimensional notation in mm.



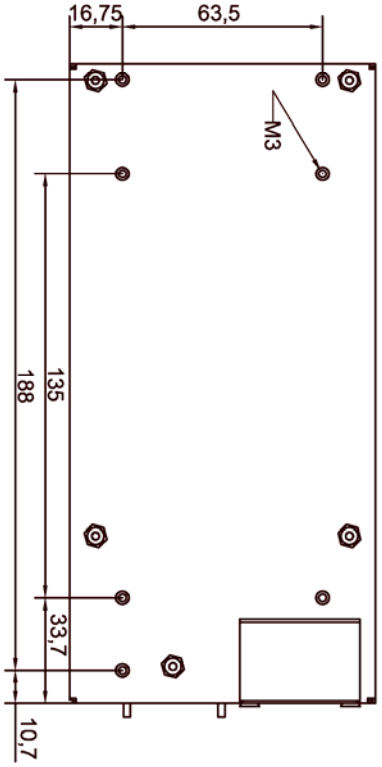


bottom view

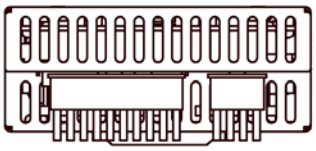


front view

left view



rear view



top view

Troubleshooting

In the event of a fault contact your Beckhoff Service.

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e-mail:	service@beckhoff.com

Quote the project number

If servicing is required, please quote the **project number** of your product.

Appendix

Technical data

Electrical data	**Input voltage:**	22-30V DC/ 15A
	Power output:	250W (max.)
	Output voltages:	see section *Electrical data*
Dimensions	**Dimensions (W x H x D):**	97.0 x 44.0 x 204.9 mm
	Weight:	0.85 kg
Do not use the power supply unit in areas of explosive hazard	**The power supply unit must not be used where there is a risk of explosion.**	
Environmental conditions	**The following conditions must be observed during operation:**	
	Ambient temperature:	0 to 55°C
	Atmospheric humidity:	Maximum 95%, non-condensing
Shock resistance	**Sinusoidal vibration (EN 60068-2-6):**	10 to 58 Hz: 0.035 mm 58 to 500 Hz: 0.5 G (~ 5 m/ s^2)
	Impact (EN 60068-2-27/ -29):	5 G (~ 50 m/ s^2), duration: 30 ms
EMC compatibility	**Resistance to interference:**	according to EN 61000-6-2
	Emission of interference:	according to EN 61000-6-4

Transport and storage

The same values for atmospheric humidity and shock resistance are to be observed during transport and storage as in operation. The shock resistance during transport can be improved by appropriate packaging of the power supply unit. The ambient temperature during storage and transport must be between -20°C and +65°C.

Approvals

FCC: Federal Communications Commission Radio Frequency Interference Statement

FCC Approval for USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC: Canadian Notice

FCC Approval for Canada

This equipment does not exceed the Class A limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.