EFFEKTA®

UPS
Uninterruptible Power Supply
OFFICE 400-2000

Operating Manual V 1.23



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Translation of the original operating manual

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We reserve the right to make changes to the design and the system that will improve the system, the production process or the product.

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1. Introduction

1.1 Preface

Dear Operator,

This manual is required for the operation of the uninterruptible power supply described herein.
This operating manual should provide you with support for working responsibly and give basic information about the uninterruptible power supply, namely on how it works, its application and, in addition, what you should do in the event of malfunctioning. Furthermore, this operating manual contains instructions for the transport and storage as well as for the handling and installation of the uninterruptible power supply.

The planning guidelines in this operating manual only relate to special requirements and characteristics of the uninterruptible power supply. All national and local provisions and regulations for electrical installations have to be adhered to in the installation process. The same applies to the operation of the device.

The content of this operating manual may change due to technological progress. We have done our best to present the content correctly and clearly. If, however, we have made errors, we would be grateful if you would let us know.

We do not assume any liability for errors in this operating manual or any consequences resulting thereof.

The uninterruptible power supply is intended to protect sensitive electronic systems and equipment from interferences that could occur due to bad electric quality or network failures.

Please read this operating manual carefully and take note particular note of the safety instructions!

If you have questions about the device, the technical supervisor at your company or our employees will gladly assist you.

Your
EFFEKTA Regeltechnik GmbH

1.2 Validity

The descriptions in this operating manual relate solely to the uninterruptible power supply (UPS) defined in the technical data as a whole or as it refers to modules, components and individual parts that were developed and built by **EFFEKTA Regeltechnik GmbH** (⇨ Chapter 13. Technical Data).



Read this documentation carefully and familiarize yourself with the product before you start operating it.

1.3 Storage

The operating manual for the device must be stored in the vicinity of the device at all times so it is immediately available if need be.

Pass this manual on to any subsequent users of the product.

1.4 Abbreviations, Terms and Symbols

In this manual, the abbreviation **UPS** stands for: uninterruptible power supply.

Typically, **accumulators** are used as energy storage of the UPS-equipment. Colloquially these are referred to as batteries or rechargeable batteries. A **battery bank** is then the term for the centralization of several accumulators into a group that forms the energy storage.

Danger, Warning, and Attention references are explicitly marked by the respective symbols (pictograms) and must be adhered to without fail. See the following list and explanations:

Danger / Warning Levels / Notes:

DANGER!

Text that is marked with DANGER! provides a warning about dangers. If accident prevention measures are not taken, these dangers result in serious (irreversible) injuries or even death!

WARNING!

Text that is marked with WARNING! provides a warning about hazards. If accident prevention measures are not taken, these hazards **may result** in serious (irreversible) injuries or even death!

CAUTION!

Text that is marked with CAUTION! provides a warning about hazards. If accident prevention measures are not taken, these dangerous situations can lead to slight or medium reversible injuries.

ATTENTION!

Text that is marked with ATTENTION! contains very important instructions for situations that, if accident prevention measures are not taken, may result in damage to the product and / or its functions or an object in its vicinity.



This symbol indicates text that contains notices or instructions / comments or tips.

Warning about danger spots:



General warning about danger spots!

Specific warnings:



Warning about dangerous electrical voltage!



Warning about proper handling of accumulators!

Instruction Symbols:



Take note of the provided documentation and/or instructions!



Disconnect before working!

Environmental Symbols:



Identifies instructions for recycling.



Identifies components that are subject to the Electronic Scrap Regulation.



Identifies components or parts that must be disposed of properly. Do not throw these into the household waste.

Text Symbols:

- ● This dot marks descriptions of activities that you should carry out.
- ✓ Requirement that must be fulfilled, for example:
  ✓The DC circuit breaker is “OFF”.
- – This dash marks specification lists.
- ⇨ This arrow marks a cross reference.
  If a cross reference to another chapter is necessary in the text, this is shortened for clarity.

  Example: ⇨ OM, 2 Safety Instructions
  This means: see Operating Manual, Chapter 2 Safety Instructions.

  If the cross reference refers to a page, figure or position number, this information is added at the end of the cross reference.

  Example: ⇨ Fig. 4-4, Pos. 1
  This means: see (in this manual in Chapter 4) in Figure 4, the position number 1.
- **(3)** Numbers in brackets refer to the positions in the figures.
- ****** Annotations within the text are marked with ** and explained accordingly.

1.5 Information obligation

This operating manual must be read and understood by all persons and qualified personnel working with this device (this equipment).

This applies, in particular, to maintenance, operating and cleaning personnel including persons responsible for transportation and/or disposal.

EFFEKTA Regeltechnik GmbH is not liable for damage incurred or caused by staff who have not been trained or who have been insufficiently trained!

1.6 Warranty conditions

The receipt of delivery is considered as the record for the initial purchase and should be kept in a safe place. It will be necessary for making use of the warranty. If the product is passed on to another user, this user has the right to the warranty for the remainder of the warranty period. The purchase receipt as well as this declaration should also be given to the new owner if the device is passed on.

We guarantee that this device, upon delivery, is in a functional state and technically conforms to the descriptions in the enclosed documentation.

The warranty period for UPS devices corresponds to the minimum periods stipulated by law.

The warranty ceases to apply in the following cases:

- if the defect is caused by: freight damage, accident, natural disasters, misuse, vandalism;
- in case of improper use, defective maintenance or incorrect repair by third parties;
- in the event of changes, unauthorized intervention, improper operation, false installation or other modifications not approved by us;
- in the case of improper use such as the connection of the device to unsuitable energy sources or unsuitable loads, or in general use in an unsuitable environment, etc.;
- in the event of failure to follow instructions in the provided documentation;
- for any defects caused by a lack of due care, e.g. splash water, etc.;
- in the event that the product is incompatible due to possible technical innovations or regulations (policies) that occur after the purchase;
- in the case of malfunctions or damage caused by the connection to incompatible devices or accessories;
- in the event of developments that are related to the normal ageing process of the product (wear parts);
- in the event of defects that were caused by external fixtures, e.g. electrical outlets;
- in the event of failure to provide due maintenance and care for the product;

The warranty period for replaced and/or repaired parts as part of this warranty expires together with the original warranty for the product.

Devices that are supplied without accessories are replaced without accessories. The return of the device is only accepted if it is sent in the original packaging.

Incurred transport costs are generally not included in the warranty.

In general, you shall bear the cost of repair and exchange of the device.

We are not liable for damage or consequential damage, whether directly, unintentionally or caused by negligence.

EFFEKTA Regeltechnik GmbH does not provide either explicit or implicit warranties related to this device and its quality, performance, salability or suitability for a certain purpose. In some countries, the exclusion of implicit warranties is not permitted by law. In this case, the validity of all explicit and implicit warranties is limited to the warranty period. With the expiration of these periods, all warranties lose their validity. In some countries, a limitation of the validity period of implicit warranties is not permitted by law so that the aforementioned limitation does not take effect.

1.7 Limitation of Liability

Claims to damage compensation are excluded unless they involve intent or gross negligence by EFFEKTA Regeltechnik GmbH or its employees. This does not affect liability according to the Product Liability Act. Under no circumstances are we liable for:

- Claims that third parties make against you due to losses or damage.
- Loss or damage of your records or data or the costs of recovering this data.
- Subsequent economic damage (including lost profits or savings) or concomitant damage, even in the event that we were informed of the possibility of such damage.

Under no circumstances is EFFEKTA Regeltechnik GmbH responsible for any accidental, indirect, specific, consequential or other damage of any kind (including, without any limitation, damage related to a loss of profits, interruption of business, loss of business information, or any other losses) that result from the use of the device or are connected with the device whether they are based on the contract, damage compensation, negligence, strict liability or other claims, even if EFFEKTA Regeltechnik GmbH was informed about the possibility of such damage in advance. This exemption also includes any liability that can result from the claims of third parties against the initial purchaser.

In some countries, the exemption or the limitation of concomitant consequential damage is not permitted by law so that the aforementioned declaration does not enter into force

2. Safety Instructions

2.1 Introduction



The UPS is a device that has been produced according to the rules and regulations of technology for an uninterruptible power supply.

The device is safe when used properly and under consideration of the safety requirements and instructions provided in this operating manual.

2.2 Proper Use



The UPS and its related components may only be used for purposes in accordance with its design – to provide a primary energy source for electrical devices and a short-term supply from a secondary energy source for electrical devices which does not exceed the nominal power in its entirety. Any other use is considered **improper** and can lead to injury of person or property and/or damage to the device!

WARNING!

The device is not designed for use in

- explosive;
- dusty or humid;
- radioactive or;
- biologically or chemically contaminated atmospheres!

For information about the respective IP protection class of the device please contact our service centers.



In addition, the device class must be noted with regard to “electromagnetic compatibility” (EMC). Radio interference does not occur with Class 1 devices. However, Class 2 devices can cause radio interference in residential areas. In this case, the operating company may be requested to take appropriate measures!

For this reason, please note the information about the device class in the specifications provided (⇨13 Technical Dat).

2.3 Prevention of personal injury / property damage

- Please read this operating manual carefully to familiarize yourself with the device. Under no circumstances should you ignore the safety information.
- Pay particular attention during the installation and initial operation of the device.
- Operate this product only in the proper and appropriate manner and always within the mandated performance parameters (⇨13 Technical Data).
- Only perform maintenance and service work that is described in the documentation. Observe the required steps. Only use original replacement parts from EFFEKTA Regeltechnik GmbH.

2.4 Environmental protection

Send the product back to **EFFEKTA Regeltechnik GmbH** after the end of its service life. We will ensure its environmentally friendly disposal.

2.5 Transport and Storage



The UPS may only be transported to the intended location in the original packaging. The same applies to moves or returns.

The packaging has a very good device-specific protective function. However, all devices damaged during transport must be checked by EFFEKTA Regeltechnik GmbH before the initial operation. The same applies in general for any damages to the device.

Should the device be in storage for more than 4 months, the battery bank of the UPS device must be charged urgently. For more, see ⇨ **Fehler! Verweisquelle konnte nicht gefunden werden. Fehler! Verweisquelle konnte nicht gefunden werden.**.



WARNING!

Due to the possibility of existing energy storage (accumulators) within a UPS, devices must generally be inspected by EFFEKTA Regeltechnik GmbH or a



qualified service center after transportation damages. In the case of transportation damages, there is a high risk that the energy storage units and/or their electrical connections have been affected. As a result, short circuits and/or the leaking of electrolytes cannot be ruled out. For this reason, the unit must be isolated until an inspection has been performed.

In addition, the device should not be transported or stored upside-down.

2.6 Positioning

Only operate the UPS in well-ventilated rooms, ensuring the specified ambient temperature range (according to ⇨13 Technical Dat).

The UPS should not be placed in the vicinity of heat sources.

Always take the operating conditions into account when positioning the device.

Maintain the minimum distance to adjacent equipment and walls necessary for ventilation purposes (see ⇨13 Technical Dat and ⇨ 5 Installation and Connection of the UPS ensure that the necessary air circulation is provided.

Never place or operate the device in a moist environment. Liquids must, as a rule, be kept away from the device.



Due to major temperature differences, condensation or dew effects may occur after the positioning of the UPS. Therefore, an acclimatization period of at least two hours must be observed before any further steps are taken. Make sure the temperature adjustment has been completed and that any surfaces with condensation inside and outside the device have completely dried.

WARNING!

Never operate the UPS in a combustible and/or unventilated environment.

2.7 Connection

Always use the connection terminals provided for the purpose of connecting the UPS.

DANGER!



To avoid electrical hazards, the connection of the unit may only be made under de-energized conditions.

The PE (protective earth) conductor must be connected without fail. The UPS-device, as well as the connected loads, must not be used without the PE conductor under any circumstances!

The UPS output is supplied with power even in the event of a power outage; according to the provisions included in EN62040-1, the lines and power outlets supplied by the UPS must be clearly labeled!

In addition, the following points must always be followed when connecting the UPS:

- Install all connections appropriately and keep the cable length as short as possible;
- Only use suitable power cables when connection the UPS to the mains power supply and pay attention to the required current carrying capacity;
- Only use suitable power cables when connecting appliances to the UPS and pay attention to the required current carrying capacity;
- The safeguarding of any appliance must always be performed immediately in front of an appliance and may never be done centrally in front of the UPS;
- Never operate any household devices or tools such as e. g. fan heaters, vacuum cleaners, electric drills, hairdryers, toasters, etc. by means of the UPS;
- Do not connect any appliance to the UPS that could overload the device;
- In general, only use appropriate tools for the installation.

2.8 Operation

Only qualified personnel are allowed access to the unit and the operation of the equipment.

WARNING!

It must be kept in mind that the UPS includes an energy storage or is connected to an external energy storage unit. This means that the UPS outlet can be current-carrying even when the UPS has already been disconnected from the mains power supply.

Consequently, the UPS output is guaranteed to be de-energized only when the device has completely shut down and has been disconnected from the mains power supply.

2.9 Working with accumulators

When handling accumulators, there is always a risk of electric shock, burns and/or chemical burns.

This is why unauthorized personnel should not have access to accumulators.

DANGER!



Accumulators and their circuit points can cause electric shocks.

In the event of a short-circuit of the accumulators, touching the current-carrying parts can result in severe burns.



Do not place accumulators in the vicinity of heat sources and do not bring them into contact with open fire. Explosion hazard!

Accumulators should never be opened or destroyed. The electrolyte released presents a great danger to health and the environment. It could result in chemical burns to skin and eyes; electrolyte is very toxic.





WARNING!

Defective accumulators must be disposed of an environmentally friendly manner!

Never dispose of accumulators with regular household waste!

Local disposal regulations must be observed!

2.10 Maintenance, service and malfunctions



DANGER!

Attention – Risk of electric shock.

Even after switching off the supply with the power button or after disconnecting the accumulator feed, parts of the UPS can still carry high voltages.

ATTENTION!

The following precautions must be taken when working on the UPS and the accumulators:

- The UPS must first be switched off and disconnected from the mains power supply and the loads before work on it is begun.
- Remove wristwatches, jewelry and other metallic objects;
- Use only isolated tools;
- Work on live equipment must only be performed by specially trained personnel. These persons must wear the appropriate personal protective equipment (PPE) at all times;
- The UPS may not be disassembled;
- Work on the accumulators must only be carried out and supervised by personnel with the required expertise concerning safety regulations;
- Unauthorized persons must be kept away from the UPS and the accumulators.

3. UPS device description

Sensitive loads require comprehensive protection against supply disruption. This includes: temporary mains failure, mains voltage fluctuations, mains voltage peaks, frequency changes, etc. The uninterruptible power supply unit is intended to support mains-supplied, sensitive electronic devices such as: computers, workstations, cash registers, operation-critical instruments, telecommunication devices, process control systems, etc. against supply disruptions. In doing so, the UPS supervises the above mentioned network sizes and supports the loads in critical moments. The support time, or autonomous duration, is dependent on the size of the installed or adapted energy storage (accumulator).

3.1 Topology and operation modes

In the OFFICE series, there is a so-called “LINE INTERACTIVE” or “OFFLINE” setting. This is identified in that the load is directly supplied by the mains power supply in standard mode (**Mains operation**) (see Fig. 3-1). Light mains voltage fluctuations are then equalized by the AVR (AUTOMATIC VOLTAGE REGULATION) so that a load operation is ensured to always remain in the standard mains voltage range.

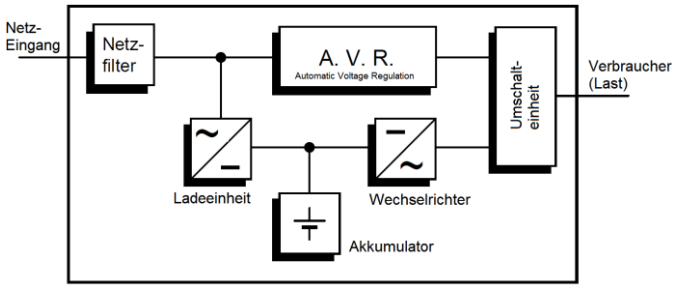


Fig. 3-1 Block diagram or setup of the OFFICE series.

In the event of a massive mains fault, the switching unit turns on in the **Inverter mode** (Inverter operation or autonomous mode). The loads will only be operated directly via the inverter for the duration of the fault. The inverter draws the necessary power from the accumulator during this autonomous period. Once the mains fault / mains failure has passed, the switching unit switches again to mains operation.

As long as the device it connected to the mains power supply, the charging unit of the accumulator is being charged (**Charging mode**). The maximal autonomous duration for the UPS is dependent on both the charging status and the capacity of the accumulator. Please see the section on technical data in this operating manual for details.

3.2 UPS device components

The entire device series is integrated in a plastic case. All components of the device for operation are located on the front panel of the device, and all components for the connection are distributed on the backside of the device (see the following figures). The front panels of the devices are the same for all versions. The front panel of the device also serves as an operation panel and is presented here as representative of all units:



Front panel of device (Operating panel):

(1) Device indicator (DISPLAY)

(2) Power switch On/Off

The backsides of the devices of the OFFICE device series differ in the respective version and power class according to the following figures. In summary, the power ranges (400 – 800 VA, 1000 – 2000 VA) are accommodated, each in a housing size. Only the design variants between the serial interfaces (RS variants) or the overvoltage protection (LSP variants) are possible within a device.

Illustration of the backside of the device: 400, 600, 800 VA

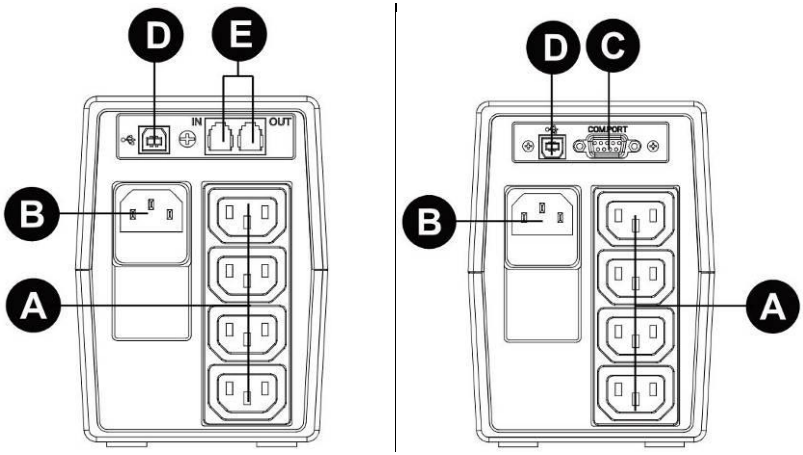
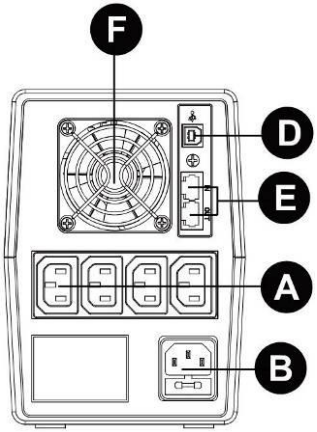


Illustration of the backside of the device: 1000, 1500 VA (1000VA without Fan)



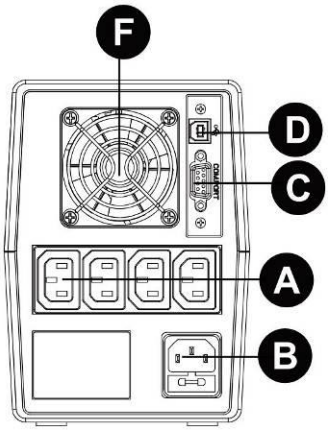
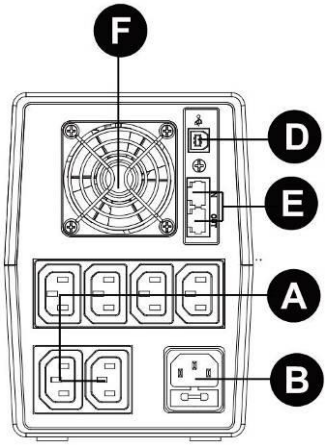
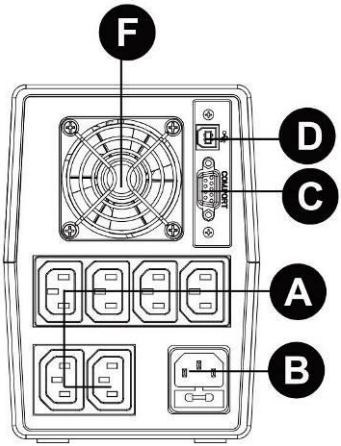


Illustration of the backside of the device: 2000 VA





Device model (LSP):

- (A) Device outlet port (C13);
- (B) Power input (C14);
- (D) USB port;
- (E) Overvoltage protection (LSP);
- (F) Unit fan (1500/2000VA);

Geräteausführung (RS):

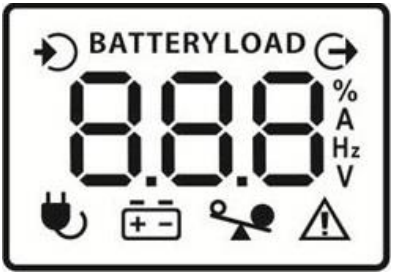
- (A) Device outlet port (C13);
- (B) Power input (C14);
- (C) Serial port (RS);
- (D) USB port;
- (F) Unit fan (1500/2000VA);

3.2.1 The operation panel (front panel of device)

In this device, the control panel is reduced to the power switch and the device display (TOUCH):



Power switch: for switching the UPS on and off. If the UPS is already connected to the mains power, the unit starts up automatically and initializes. Only the UPS device outlet port remains switched off.



Device display (TOUCH) for the clear presentation of all status data.

During operation, the operation parameters can be requested by touching the displays. Generally, the display remains on the information selected last.

Meaning of the individual display symbols:



Mains operation mode: appears when the device is connected to the mains supply.
The symbol turns off in the event of mains fault or failure. Should the voltage regulation (AVR) become active, the symbol blinks on the display.



Autonomous mode: appears when the device is in the inverter mode. If the battary capacity is low, this symbol blinks.



Overload display: appears and blinks when the unit is overloaded from the output side.



Device or system error: appears when a device error internally or a system error (e.g. overload in the output) occurs.



Display of the UPS input data (e.g. power supply in volts).



Display of the UPS output data (e.g. load voltage in volts or the load in %).

3.2.1 Auditory operation, warning and alarm signal

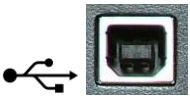


In addition to the information on the display, some operation, warning and alarm signals are provided acoustically via the integrated signaler (BUZZER).

3.2.2 The connection panel (back panel of device)



Device port: RS232 port for the exchange of device data and the signals for shutting down sensitive loads (PC, SHUT DOWN). If the serial port is used, the USB port remains inactive.
The serial port is only available in the RS device variants.



Device port: USB port for the exchange of device data and the signals for shutting down sensitive loads (PC, SHUT DOWN). If the USB port is used, the serial port remains inactive.



Overvoltage protection module: Data and telephone lines can be wired through here to safeguard against overvoltage (IN / OUT).



Power input (cold device plug C14) with integrated input fuse in the compartment.



UPS output (sockets C13). With these, up to six separate loads can be connected; mind the load values when connecting.

3.2.1 Name plate (Device identification)



exemplary fig.

UPS device identification. The following information is on the name plate:

- model name;
- data for connected load values;
- articel number;
- the CE and ROHS markings and the serial number for the device;
- manufacturer's address;

ATTENTION!

As a basic principle, compare the name plate on the device and the present operating manual for conformity. As a result, this bars improper use of the operation manual and the UPS.

4. Storage and Unpacking

4.1 Storage of the UPS

If the UPS is to be put in storage after delivery, it is imperative to observe the following instructions:

ATTENTION!

- Always leave the device and accessories in the original packaging;
- Never store the UPS upside-down;
- The recommended storage temperature should be between 10 – 25°C. The maximum temperature values may never be exceeded (see also ⇨ 13 Technical data);
- The delivered goods must also be protected against moisture. The device must therefore be stored in a dry area;
- If the storage period exceeds four months, the UPS must be connected with the mains power supply for approximately 24 hours to avoid a total discharge of the accumulators, which would result in irreversible damage to the accumulators.

4.2 Transport to the installation site

As the point of delivery is usually not the point of installation, the equipment has to be transported to the installation site. Please follow these instructions for the transport of the UPS:

ATTENTION!



- Always transport the delivery in the original packaging as close as possible to the installation site;
- Always transport the UPS in the specified transport position. Do not transport the device upside-down;
- Also mind the specified center of gravity when transporting the device;
- There is always a general risk of tipping or tilting with devices where the center of gravity is located in a high position;

4.3 Unpacking and positioning of the device

Remove the packaging at the installation site with the utmost care to avoid causing any possible damage to the device and the packaging material.

ATTENTION!

Check the scope of delivery (see ⇨ 14 Scope of delivery /).

Check all packaging materials to ensure that no items are missing.

Inspect the appearance of the UPS after unpacking to see if any visible damage incurred during transportation. Do not turn on the unit if you detect any damages or if any parts are missing, but rather notify the carrier and dealer immediately.



The shipping materials are recyclable. After unpacking, save them for later use or dispose of them appropriately.

5. Installation and Connection of the UPS

All critical values listed in the technical specifications concerning ambient and operating conditions must be met to ensure proper operation of the UPS.

ATTENTION!

The UPS must be installed in a well-ventilated area, far from water, flammable gases and corrosive agents.

In general, the following rules apply for the installation of the device:

- The device may only be mounted on a solid, weight bearing and horizontal surface;
- Ensure a proper vertical installation position, as specified;
- The UPS may only be installed in a clean, dry environment free of dust;
- In addition, air exchange according to EN62040-1, appendix M for devices with accumulators must be ensured;

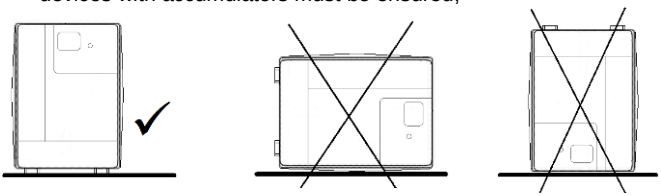


Fig. 5-1 Installation as standing device for the entire OFFICE series.

In addition, make sure that the ventilation channels of the UPS are not blocked and that there is sufficient clearance between the device and other equipment, furniture and walls to allow the device to cool. The following minimum distances are recommended as clearance space for the OFFICE series. If there is a forced ventilation, the clearance spaces can be reduced slightly:

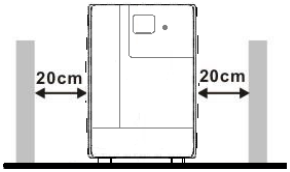


Fig. 5-2 Minimum distance and maintenance space surrounding the UPS.

5.1 Connection of the UPS device

The OFFICE model is equipped with plug connection. With this, the UPS can be connected with the standard wall socket (power supply) via the power cable provided (Schuko/C13).



ATTENTION!

Provided the UPS has been connected to the mains power supply, it will start up automatically and switch to the charging mode. An indication on the display follows. The UPS output is not active.

WARNING!

Ensure that the wall socket is properly secured and that the PE connection is available.

Additionally, the loads can, for example, be connected by means of an appropriate cable connection.



WARNING!

Attention here must also be paid that the PE connection and the proper fuse protection for the loads are available.

If a permanent connection of the UPS should be made, please pay attention to the following connection diagram.

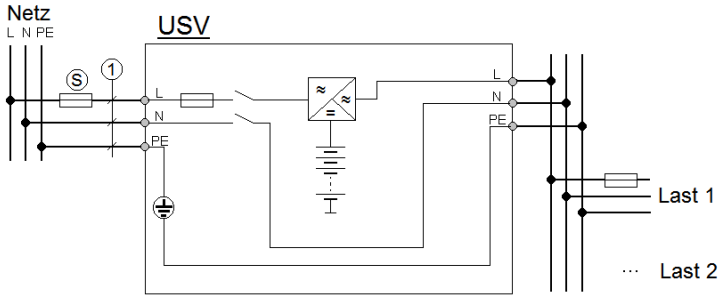


Fig. 5-3 Connection diagram of the UPS to the network and the loads.

(S)	Circuit breaker or fuse 10A;
(1)	Wire cross-section of the connection cable 0.75 mm²;
⏚	Grounding!

WARNING!

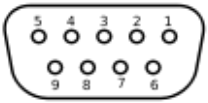
It is implicit to connect the protective conductor here and to maintain the loop resistance all the way to the last load.
It is likewise possible to secure the loads separately against over and fault currents and to directly ground them.
Always pay attention to the correct polarity between input and output for the UPS.

If the UPS is in the midst of an emergency stop circuit, it must be observed that the UPS output is not completely currentless after the emergency stop circuit operation. The loads will continue to be supplied by means of the duration of the UPS autonomy time.

5.1.1 Connection of the device port RS232 (Communication interface)

The serial port RS232 serves to connect the UPS with a PC or rather the application (software) installed on it

The connection is to be established by a standard serial cable. The configuration is as follows (not listed pins are not assigned):



PC RS232:	USV RS232:	Function:
Pin 2	Pin 2	Tx USV, Rx PC
Pin 3	Pin 3	Rx USV, Tx PC
Pin 5	Pin 5	GND

Fig. 5-4 RS232 Connecting a device to the UPS (SubD 9pole, female).

The serial port RS232 of the UPS works with the following interface parameters:

- Data rate: 2400 Baud;
- Data bits: 8;
- Stop bits: 1;
- Parity bit: none;

This interface supports the complete “Mega Tec Extended” protocol (version August 2000). Please use the accompanying software to check the connection.

5.1.2 Connection of the USB device port USB (Communication port)

Please use the USB cable provided or an alternative cable (Type A to type B) to connect the USB port and connect the UPS to a PC or hub with this.



The USB port is a plug and play connection. Additional actions are not necessary. Please use the accompanying software to check the connection.

5.1.3 Connection of the overvoltage module

A data or telephone line can be protected against overvoltage, e.g. against lightening, via the built-in overvoltage protection module (RJ11).



Fig. 5-5 Connection of the data and telephone line against overvoltage.

Using the telephone line as an example, insert the incoming telephone line into the “IN” jack and the continuative line of the telephone into the “OUT” jack. This loops and secures the telephone line through the overvoltage protection module. The same can be performed with a data line in order to protect it. Please take the level of protection from ⇨ 13 Technical Dat in this manual.

6. Operation of device and service

Due to the comprehensive protective functions which the device performs regarding the loads, the UPS runs completely automatically. This reduces the operation of the device to a few steps.

ATTENTION!

In general, the operating personnel should inform affected employees (keyword: consumer network) about any scheduled tasks concerning the UPS system.

Have the status and error messages listed in chapter 8 ready to facilitate the immediate interpretation of the operation display and possibly occurring errors.

6.1 Operation and operation modes of the UPS

As a rule, the switching on or starting up and shutting down of the system is done by the operating personnel.

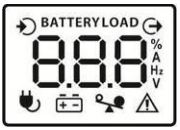
WARNING!

The operator of the UPS-system must always adhere to the instructions in this operating manual. Only the operator can perform the following actions and must always exercise particular care:

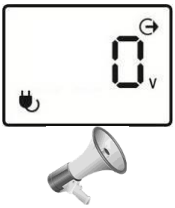
- Switching on and off the UPS;
- Reading the display messages and interpreting the acoustic warning signals;
- Switching from standard mode to autonomous mode and vice versa.

In addition, data can be exchanged with the UPS via the communication interface(s), but this data exchange is not imperative for general operation. Therefore, particular care and diligence are also required here as the UPS can, for example, by shut down by the software.

6.1.1 Switching on the UPS, Charging mode



If the UPS is connected to the network, the device switches on automatically and begins with the initialization. The display shown here occurs for 4-5 seconds.



Then the device automatically switches to the **charging mode**. The display shown here occurs when the UPS output is not switched on.

An acoustic message does not occur in this startup process of the UPS.

ATTENTION!

In any event, it is beneficial to keep the device in the charging mode for a few hours in order to reach the accumulator's complete loading status before the UPS is switched on and assumes its support function.

6.1.2 Changing the display informationen

As soon as the UPS is either operating on the network or generally switched on, additional device or load information can be accessed by touching the display. The selected information is preserved provided the device operating mode has not been changed

In the event that the background lighting of the display turns off, this can be reactivated by touching the display.



6.1.3 Switching the UPS on (network connection already available)



Switching on is performed with the on-off switch. The display changes to the screen pictured here. The UPS is now in **mains operation mode**.

The UPS output is switched on, the loads are now being supplied and supported. In addition, the charging unit continues to be active until the accumulator is completely charged.

6.1.4 Autonomous mode of the UPS

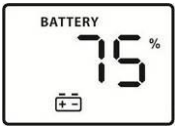


The UPS is forced into the **autonomous mode** by an interruption in the network connection. The display changes to the screen pictured here.



The autonomous mode is supported by an acoustic beeping of about a 1 second duration and an 8 second pause.

The UPS output remains switched on, the loads will continue to be supplied for the duration of the autonomy time.



The charging of the accumulator can be observed. For this, the appropriate display page must be selected (TOUCH) so the information shown here can appear.

Generally, a low battery level can also be recognized by a blinking battery symbol. An acoustic beeping of a roughly one second duration and 1 second pause signalizes when the autonomous mode is about to end.

6.1.5 Switching off the UPS



Switching off occurs by means of activating the on/off switch again. The device switches the UPS outlet on whereby the charging unit remains. The display changed to the image pictured here.

In the event of a complete shutdown of the device, the UPS must also be separated from the mains power supply.

6.1.6 Direct switching on of the autonomous mode (COLD START)



Without the power connection, the UPS is switched on and started by activating the on-off switch and changes directly to the **autonomous mode**. The display shows the screen pictured here.

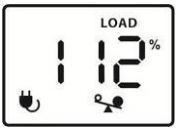


The starting process is supported here by a sustained beep (3-4 s).

The UPS output is switched on, and the loads are supplied for the duration of the autonomy time. After re-activating the on-off switch, the UPS shuts down completely again.

This operation mode is frequently used to determine the remaining autonomy duration.

6.1.7 Overload mode of the UPS



If the UPS is overloaded from the output side, the device displays its status with the blinking overload symbol ( ). The loads will be further supplied temporarily depending on the overload. The display shown here occurs (here, for example, 112 % load).



During the overload mode, a rapid beeping occurs (0.5 s interval).
In the event of a subsequent error, a continuous acoustic signal occurs.

6.1.8 Error mode of the UPS



When the UPS switches to the **error mode**, e.g. due to overload, the device switches the output off. The loads are no longer supplied; the display shown here occurs.

In the event of an error mode, a continuous acoustic signal occurs.

WARNING!

A return from the error mode is not automatically carried out by the UPS. It is necessary here to switch the device off or on again. However, this can only be carried out if the error source that occurred has first been removed.

7. Initial operation of the UPS

WARNING!

The initial operation generally requires that all previous chapters of this manual have already been successfully read or processed.



Additionally, check that all connected loads are switched off.

The initial operation of UPS devices is exclusively reserved for accredited personnel.

Please conduct the initial operation in the following order:

- Connect the UPS to the mains power supply;

Then the UPS starts up automatically and switches to the **charging mode**. The UPS output remains off. The corresponding image occurs in the display. Now switch the UPS on and, from here, the UPS switches to the standard mode; the UPS output is now active;

- Check all the status information on the display;
- Turn on the loads individually, under the observation of the indicated power levels;
- Briefly test the autonomous mode similarly under the observation of the power levels and status information;
- The UPS can be left in the mains operation (standard mode), the loads are secured via the UPS;
- Switching off the UPS occurs in the reverse order.

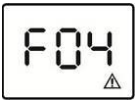
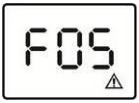
WARNING!

Should errors occur during the initial connection, these must first be analyzed and removed before the initial operation can be continued.

8. Error messages and support

In the event the UPS device is not working properly, please first check the operation information on the operation unit.

Please try to localize the problem with the aid of the following table:

Problem/Display:	Possible cause:	Corrective actions:
The UPS is not starting although it is connected to the network.	The power cord is not functional or not properly plugged in.	Check the power cord or network connection.
	Short circuit on the UPS output.	Remove the loads and restart the UPS.
	Overload on the UPS output.	Remove the loads and restart the UPS.
	Overcharging the internal battery bank.	Immediately contact the service hotline.
	Degenerated or completely discharged battery bank.	Have qualified personnel change the accumulator and check the charging unit.
	Output voltage error.	Immediately contact the service hotline.
	Device internal overtemperature.	Switch the UPS off for some time or reduce the load or see to a lower ambient temperature.
The autonomy time is shorter than indicated.	Either the accumulator was not completely loaded or the battery is degenerate.	Charge the accumulator for at least 12h and measure the autonomy time again. If this was unsuccessful, exchange the battery.

ATTENTION!

Never try to start up the UPS when there is an error status. Always remove the error source first and then switch the device on again.

9. Troubleshooting

Over the course of time, failures or malfunctions of the UPS, the accumulator or their surroundings can arise. In this event, please contact our customer service (service hotline) as soon as possible.
When contacting the service center, please provide the following information to ensure swift resolution:

- Model number, serial number and configuration of the device;
- Progress of the issue and date on which the it first occurred
- Control panel LCD/LED display information (status or warning or alarm messages);
- Condition of the mains power supply, load condition, environment conditions, temperature and moisture, ventilation conditions;
- Information of the condition, such as the age, of the accumulator;

Most importantly, name the respective qualified contact persons for the clarification of the issue and its resolution.

10. Service-Hotline

Should you encounter any general problems or require any information regarding safety, please contact our service hotline:

Phone: 0049 / (0) 741 – 17451-52
Fax: 0049 / (0) 741 – 17451-29

You can also reach us via email at:

kundendienst@effekta.com

In addition, you can contact the relevant department or branch office directly as listed on our website:

http://www.effekta.com

11. Software

The UPS management software runs as a client / server application for heterogeneous networks or on a local computer.

It works on any common platform (Win, Linux, UNIX).

Remote access to the UPS and its data is possible and recordable.

The software shows all relevant UPS data such as the accumulator condition, temperature, condition of the mains power supply, etc. in a clear graphic interface.

Malfunctioning of the system can be reported easily via e-mail, mobile phone or fax.

The range of services can roughly be summarized as follows:

- The availability for Windows 95/98/2000/NT/XP/Vista/Win7, Novell, Linux etc.;
- Local or network SHUTDOWN;
- The integrated SNMP-sub-agent;
- The graphic interface with all UPS information;
- Event-based sending of network news;
- Event-based sending of emails and text messages;
- Recording (LOGGING) all UPS status data and measurements;
- The timetable (SCHEDULER) for time controlled execution of functions such as REBOOT, SHUTDOWN, etc.;



A software package is included in the scope of delivery of the device. Please see the respective manual on the CD for additional information on the performance, installation, use, etc.

12. Maintenance and service

You can expect a long service life and interference-free operation from this product. The service life and reliability of the UPS is greatly dependent on the conditions of its environment. The ambient temperature and humidity in the vicinity of the device must remain within the specified range. In addition, the area around the UPS should preferably be kept clean and free of dust.

At an ideal ambient temperature of approximately 20-15°C, the service life of an accumulator is typically about 4 years. Through the use of special accumulators, the service life can be significantly increased (up to 8 years).

It should be regularly checked (6-12 months) if the remaining autonomy time (back-up time) is sufficient for the intended purposes. Should this no longer be the case, the accumulators will have to be replaced.

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12.1 Measuring the support time (autonomous time)

WARNING!

Before beginning with this procedure, it is obligatory that all open data files must be secured. Also, inform all concerned employees of your intentions.

There are essentially two methods to measure the support time.
Method A is suitable for measuring the actual back-up duration whereby the loads are required to be currentless at the end of the autonomy time. For this purpose, force the UPS into the autonomous mode and measure the time until it automatically shuts down.
Method B allows for the determination of the remaining capacity after a defined back-up period. Also for this method, first force the UPS into the autonomous mode for a specific duration. In returning to the mains operation mode, note the remaining capacity. Then calculate the autonomy duration through an estimation (linear).



Please remember that after measuring the autonomous period, the accumulator may be discharged. This means that the UPS device must remain in standard mode for several hours (min. 6 h) to recharge the accumulator bank accordingly, before this is again up to 70 % operational (capable of supporting).

If the backup-time is not measured due to local conditions or regulations, we recommend the prophylactic replacement of the accumulators every other year to avoid any risk of an insufficient autonomous period (back-up time) caused by degenerated accumulators.

If a defective accumulator is detected within the UPS, an acoustic signal is sent (Beeping at intervals of 2 s).

In addition, the fans and ventilation ducts of the device should be inspected regularly and cleaned, if needed, to ensure full output power. The frequency of the inspection and cleaning depends very much on the environment of the equipment. (Key word: dust).

12.2 Replacing components / accumulators

DANGER!

Only EFFEKTA Regeltechnik service personnel or personnel of other accredited service points is allowed to replace accumulators or other UPS components.

WARNING!

During the replacement of accumulators and other components, the loads are directly connected to the mains power supply via an external by-pass. Therefore, there is no protection or support function by the UPS during this period. Mains power failures or other grid problems are directly transferred to the load.

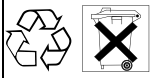
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12.3 Maintenance and service contracts

EFFEKTA Regeltechnik GmbH offers corresponding maintenance and service contracts to guarantee the best possible reliability and availability of your UPS equipment. Under a maintenance contract, our service personnel can, in addition, support and help you in the following areas:



Periodical inspection of the equipment, in particular, the accumulators, and their timely replacement.

	Inspection of the UPS installation and its functionality.
	Measuring the remaining back-up time or autonomous period.
	Professional cleaning, of particular importance for the ventilation areas.
	Proper disposal of defective or degenerate components.
	Environmentally sound disposal of accumulators.

Please contact our service hotline listed above for a complete list of our services or send us an email request.

Service Log

Please always enter all maintenance and service work performed on the UPS into the service log.

Date	Performed tasks	Performed by

13. Technical Data

	OFFICE:	**400** 400 VA, 240 W	**600** 600 VA, 360 W	**800** 800 VA, 480 W
UPS Input	Network	1 Phase, neutral conductor and PE conductor		
	Nominal Voltage	**230** VAC		
	Voltage Range	**170 - 280** VAC		
	Frequency Range	46 Hz – 54 Hz (**50** Hz)		
UPS Output	Network	1 Phases, neutral conductor and PE conductor		
	Nominal Voltage	**230** VAC		
	Voltage Accuracy	**±10 %** (Inverter mode)		
	AVR (Boost)	**+10%** (Mains operation mode)		
	AVR (Buck)	**-10%** (Mains operation mode)		
	Frequency	**50Hz ±1 %** (Inverter mode)		
	Wave Form	Sine		
	Switchover Time	typical **4-6** ms, maximal 10 ms		
Battery Bank	Voltage	**12** VDC		
	Capacity	1x **4.5 Ah**	1x **7 Ah**	1x **9 Ah**
	Charging Time	**12 h** (80 % of capacity reached)		
Device	Device Protection	Overload, Deep Discharge, Overcharge		
	Overvoltage Protection	Protection of a data line RJ11, (not with the RS variant)		
	Dimensions	**300 x 101 x 142** mm (D x W x H)		
	Weight	**3.7 kg**	**4.4 kg**	**5.0 kg**
	Device Class	**Class 2**		
	Communication	USB, RS232 (RS variant), MegaTec Protocol		
	Standards / Guidelines	Safety: EN 62040-1 EMC: EN 62040-2 Service: EN 62040-3		
Environment	Temperature Ranges	Operation: 0 ... 40 °C Recommended *: 15 … 25°C Storage: -25 ... 55 °C (without accumulators) Storage: 0 ... 40 °C (with accumulators)		
	Rel. Humidity	0 – 90 % (not condensing)		
	Noise Level	< 40 dB (without fan)		

	OFFICE:	**1000** 1000 VA, 600 W	**1500** 1500 VA, 900 W	**2000** 2000 VA, 1200 W
UPS Input	Network	1 Phase, neutral conductor and PE conductor		
	Nominal Voltage	**230** VAC		
	Voltage Range	**170 - 280** VAC		
	Frequency Range	46 Hz – 54 Hz (**50** Hz)		
UPS Output	Network	1 Phases, neutral conductor and PE conductor		
	Nominal Voltage	**230** VAC		
	Voltage Accuracy	**±10 %** (Inverter mode)		
	AVR (Boost)	**+10%** (Mains operation mode)		
	AVR (Buck)	**-10%** (Mains operation mode)		
	Frequency	**50Hz ±1 %** (Inverter mode)		
	Wave Form	Sine		
	Switchover Time	typical **4-6** ms, maximal 10 ms		
Battery Bank	Voltage	**24** VDC		
	Capacity	2x **7 Ah**	2x **9 Ah**	2x **9 Ah**
	Charging Time	**6 h** (90 % of capacity reached)		
Device	Device Protection	Overload, Deep Discharge, Overcharge		
	Overvoltage Protection	Protection of a data line RJ11, (not with the RS variant)		
	Dimensions	**320 x 130 x 182** mm (Dx W x H)		
	Weight	**8.2 kg**	**10.4 kg**	**11.0 kg**
	Device Class	**Class 2**		
	Communication	USB, RS232 (RS variant), MegaTec Protocol		
	Standards / Guidelines	Safety: EN 62040-1 EMC: EN 62040-2 Service: EN 62040-3		
Environment	Temperature Ranges	Operation: 0 ... 40 °C Recommended *: 15 … 25°C Storage: -25 ... 55 °C (without accumulators) Storage: 0 ... 40 °C (with accumulators)		
	Rel. Humidity	0 – 90 % (not condensing)		
	Noise Level	< 40 dB (without Fan)	< 45 dB	

* Outside the recommended temperature ranges, the Battery life is significantly reduced.

14. Scope of delivery / Accessories

The following is the list of the scope of delivery; please compare the list with the delivered goods. Should any items or components be missing in your delivery, please let us know immediately.

No.	Article no.	Function / View:	Description:
1 x	UPS		OFFICE series, according to your order;
1 x	Power cable		Network connection, cold-device cable (Schuko / C13);
1 x	Power cable		Load connection, cold-device cable (C13 / C14);
1 x	Operating Manual		Operating Manual - English V 1.22
Option	RS232 cable (M2505)		Port connection between UPS and PC (etc.);
1 x	USB Cable		Port connection between UPS and PC (etc.);
1 x	PowerShut Plus		Software package: PowerShut Plus CD-ROM network compatible shutdown, monitor and diagnosis software;

15. Optional accessories

The components, devices and/or equipment listed below are accessories that fit the OFFICE series and that have been tested and approved by EFFEKTA Regeltechnik GmbH.

15.1 Communication adapter SNMP

The SNMP adapter integrates the UPS into a network and communicates via TCP/IP, Telnet or FTP. After assigning an individual IP-address, the UPS can be accessed from any location, which is of particular interest for remote administration and maintenance of the equipment.



Fig. 15-1 SNMP adapter to connect the UPS to a network.

The SNMP adapter can easily be connected to the UPS as an external adapter via the serial port. A standard patch cable enables access to the network.

For additional information about this product and the accompanying software package, please contact our sales and service centers.

15.2 External Bypass

An external by-pass system allows the operation of the loads on two different paths. In the UPS operation mode (Fig. 15-2) the UPS system is integrated into the current path and the loads are protected in the usual manner. In the by-pass mode (Fig. 15-4), the loads are directly connected to the mains power supply, and the UPS input and output are isolated.

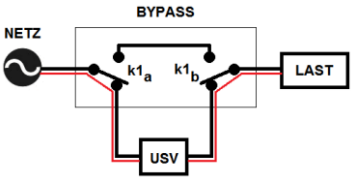


Fig. 15-2 UPS operation mode

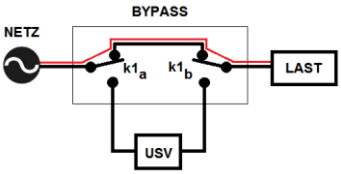


Fig. 15-3 Bypass mode

In this case, maintenance and service tasks on the UPS or the battery bank can be performed faster and safer.
On rare occasions, the UPS or its components can also be replaced without interrupting the loads.

Moreover, the application of an external bypass allows for a cost-efficient and clear installation of the UPS device.

16. Wear parts

The components listed below can show regular wear and are excluded from the warranty for this UPS:

Wear part	Function	Article nummer
XXXX XX XX ** accumulator (BATTERY) 12 V xx Ah	Energy storage	Dependent upon assemby!

** The name and identification of the accumulators can be found in the delivery documents or are available upon request.

17. Declaration of conformity

All units labeled with a CE sign fulfill the EU harmonized standards and regulations.

The EU declaration of conformity for this product is available upon request. Please contact our ⇨ 10 Service hotline.

You can also find the declaration of conformity for this product on our website:

http://www.effekta.com

EFFEKTA®

EFFEKTA Regeltechnik GmbH

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D – 78628 Rottweil