

SWITCHBOARD SYSTEM

UPS 10 - 240 kVA

Instruction Manual

SYS
SWITCH
BOARD
TEM



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1. SAFETY

Important safety standards - Keep these instructions in a safe place. There are dangers inside the UPS due to the voltage and high temperatures. During installation, commissioning and maintenance, we therefore ask you to observe the locally applicable safety regulations and the relevant laws. Failure to do so could result in personal injury or damage to the appliance. The safety instructions contained in this manual serve as a supplement to the locally applicable safety regulations. Our company is not liable for damage caused by non-compliance with safety regulations.

1.1 Sicherheitshinweise

1. Even without connection to the mains, a voltage of 220/230/240 VAC could still be present at the output of the UPS!
2. For your personal safety, we ask you to connect the UPS to an earth connection before starting.
3. Do not open or damage the battery, as the liquid escaping from it is highly toxic and harmful!
4. Try to avoid short circuits between the positive and negative terminals of the battery, otherwise sparks or fire could occur!
5. Do not remove the cover of the UPS. There is a risk of electric shock!
6. Check that voltage is present before touching the battery.
7. The service life and reliability of the UPS depend on the working environment and its location. Avoid using the UPS for long periods under the following conditions:
 - ◆ Areas in which humidity and temperature values are not within the specified range (temperature from 0 to 40°C, relative humidity 5%-95%).
 - ◆ Direct sunlight or positioning near heat sources.
 - ◆ Areas with vibrations that can damage the UPS.
 - ◆ Areas with corrosive or flammable gases, excessive dust formation, etc..
8. Always ensure good ventilation, otherwise the components inside the UPS will heat up too much, which could affect their service life.

1.2 Symbols used in the instructions



ATTENTION! Risk of electric shock!



ATTENTION! Read this information to avoid damage to the device

**The system may only be operated by a certified electrician or qualified personnel.
Read this manual carefully before installation.**

Always switch off the UPS as described in chapter 4.2. Never disconnect the UPS from the power supply and leave it running until deep discharge (e.g. during weekend shutdown or shutdown).



2. MAIN FEATURES

2.1. Content

This is a series of high-frequency online UPSs with three-phase input and output. The UPS can eliminate most of the power supply problems such as power failure, overvoltage, undervoltage, sudden voltage drop, voltage spike, voltage fluctuation, overcurrent, current spike, total harmonic distortion (THD), interference noise, frequency fluctuation, etc. The UPS discussed here can be used in various areas, from computer equipment, vending machines and communication systems to industrial equipment.

2.2. Functions and properties

- ◆ **UPS with three-phase input and three-phase output**
This is a high-intensity UPS system with three-phase input and output whose input current is maintained constant. There can be no imbalances.
- ◆ **Digital Control**
This UPS series is controlled by a Digital Signal Processor (DSP), which enhances and increases its reliability, performance, self-protection, self-diagnosis, etc..
- ◆ **Configurable battery**
10 - 30 kVA: From 2x8 or up to 2x10 units, the battery voltage of this UPS series can be configured with 16, 18 or 20 units according to your requirements. 40 - 60 kVA: From 2x16 to 2x20 units, the battery voltage of this UPS series can be configured with 32, 34, 36, 38 or 40 units according to your requirements.
- ◆ **The charging current can be configured**
Using a configuration tool, the operator can set the capacity of the batteries as well as the normal charging current and the maximum charging current. The operating modes with constant voltage, constant current and holding current can be alternated automatically and effortlessly.
- ◆ **Intelligent charging method**
The UPS series uses a state-of-the-art charging method with three stages:
1st stage: high constant charging current to guarantee a 90% charge;
2nd stage: constant voltage to supply the battery and ensure that the batteries are fully charged.
3rd stage: maintenance mode
The option of charging in three different stages ensures a longer battery life and fast charging.
- ◆ **LCD-Display**
With LCD display and LEDs, the operator can easily see the status of the UPS and its operating parameters such as input/output voltage, frequency, % of load, % of battery charge, ambient temperature, etc.
- ◆ **Intelligente Überwachungsfunktion**
Über die SNMP-Kartenoption können Sie die UPS aus der Ferne steuern und überwachen.
- ◆ **EPO-Funktion**
Diese UPS-Serie kann durch Betätigen des Notaus (EPO) vollständig ausgeschaltet werden. Für diese UPS-Serie steht auch die REPO-Funktion zur Verfügung (Fern-Notaus).

3. INSTALLATION

3.1 Packaging control

1. Do not tilt the UPS when removing it from the packaging.
2. Check the appearance to determine whether the UPS has been damaged during transportation. Do not switch on the UPS if you notice any damage. In this case, contact the supplier immediately.
3. Check that the accessories are present in accordance with Appendix 8. If any parts are missing, contact the supplier.

3.2 View of UPS housing

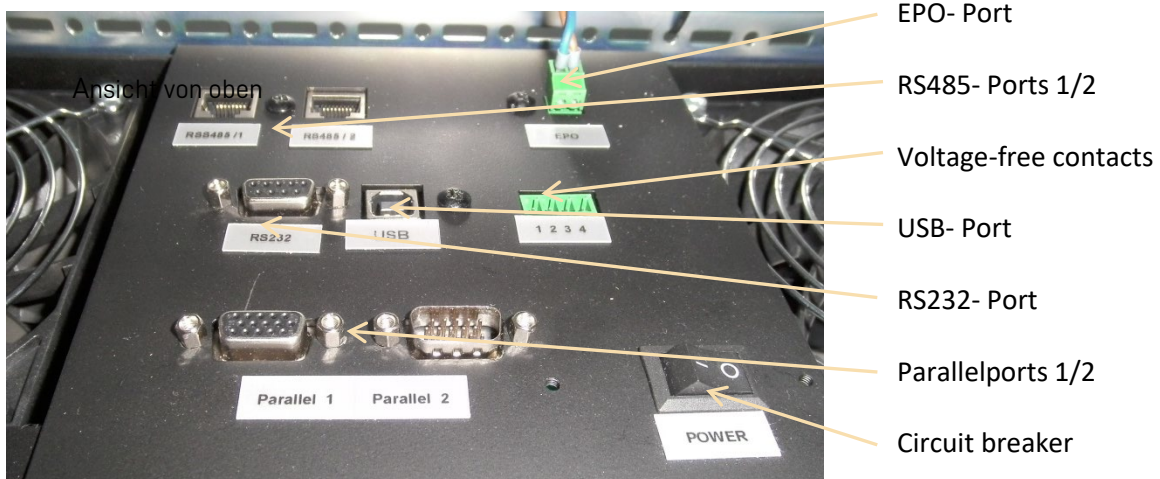
The UPS and batteries are installed in a Rittal housing. The display is accessible after opening the door. The batteries are installed in the lower part of the housing and can be accessed from the front. For longer autonomy times, the batteries are installed in another housing.



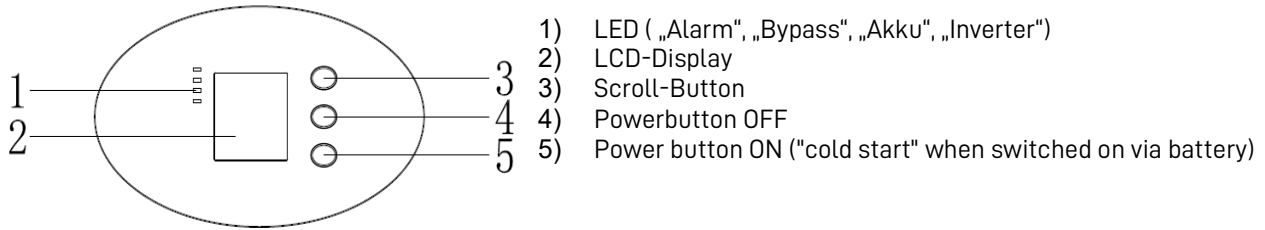
Front view up to 40 KVA



Front view from 60 KVA



3.3 LCD control panel



3.4 Installation instructions

- ◆ Set up the UPS in a clean environment, away from vibrations, dust, moisture and flammable or corrosive gases and liquids.
- ◆ The ambient temperature around the UPS (without batteries) should be kept between 0°C and 40°C. If the ambient temperature exceeds 40°C, the calculated load must be reduced by an additional 12% every 5°C. The maximum temperature must not exceed 50°C.
- ◆ If the UPS is unpacked in environments with low temperatures, condensation may form. The UPS must not be installed until the device is completely dry both inside and outside, otherwise there is a risk of electrical discharge and electric shocks.
- ◆ The batteries should be installed in an environment with a temperature within the specified data. Temperature is one of the most important factors affecting battery life and performance. In a normal installation, the battery temperature is kept between 18°C and 25°C. Keep the batteries away from heat sources or ventilation shafts, etc..



ATTENTION!

The normal performance of the battery is calculated depending on the operating temperature between 20°C and 25°C. If the battery is used above this interval, the service life of the battery is reduced, while operation below this interval reduces its capacity.

- ◆ The appliance must not be installed immediately, but must be set up in a suitable room where it is protected from excessive moisture and heat sources.

ATTENTION!

An unused battery must be recharged every 6 months. Temporarily connect the UPS to a suitable AC power supply and switch it on for the time required to recharge the batteries.

- ◆ The maximum altitude at which the UPS can be operated normally at full load is 1500 meters. The load capacity shall be reduced when the UPS is installed at an altitude higher than 1500 meters as shown in the following table. (The load coefficient corresponds to the maximum load at the high altitude location divided by the rated capacity of the UPS)

Height (m)	1500	2000	2500	3000	3500	4000	4500	5000
Load coefficient:	100 %	95%	90%	85%	80%	75%	70%	65%

- ◆ The cooling of the UPS depends on the fan, so it must be installed in a well-ventilated area. There are various ventilation openings on the front panel and on the rear panel, which must not be blocked by any foreign objects.
- ◆ The transport locks on the batteries must be removed before commissioning.

3.5 External protective devices

For safety reasons, an external switch must be installed on the supply network and between the battery housing and the UPS. This chapter provides guidelines for specialist installers who must be familiar with the local regulations regarding the electrical connections of the devices to be installed.

◆ **External battery**

The UPS and their respective batteries are protected from overcurrent conditions by means of a DC circuit breaker (direct current) or by a series of fuses installed near the battery.

◆ **Output UPS**

Jede Schalttafel, die für die Verteilung der Last verwendet wird, muss mit Schutzvorrichtungen ausgestattet werden, um die Gefahr der Überlastung der UPS zu vermeiden.

◆ **Overcurrent**

The UPS input switch on the supply panel must have a capacity that guarantees both the protection of the electrical cables and the overload capacity of the UPS.



ATTENTION!

For the AC input/output, select a circuit breaker with an IEC 60947-2 intervention curve C (normal) for 125% of the current.

3.6 Electric cable

- ◆ The cable type must take into account the voltage and current present in this section. You are requested to observe the locally applicable regulations on electrical installations and to take into account the ambient conditions (temperature and material supports).

ATTENTION!

Before starting, make sure you know the position and operation of the circuit breakers connected to the input/bypass for supplying the UPS in the distribution board. Check that these devices are electrically isolated and install warning signals to prevent any accidental switching on.

- ◆ For the purpose of later extensions, it is economically advantageous to install electrical cables that can withstand the maximum rated capacity immediately. The cable diameter is specified here in the connection:

UPS	CABLE DIAMETER (mm ²)			
	AC input	AC output	DC input	Grounding
30 KVA	4 x 50	4 x 16	3 x 35	16
40 KVA	4 x 50	4 x 16	3 x 16	16
60 KVA	4 x 50	4 x 35	3 x 50	35
80 KVA	4 x 50	4 x 35	3 x 35	35
90 KVA	4 x 70	4 x 50	3 x 70	50
120 KVA	4 x 95	4 x 50	3 x 50	50
160 KVA	4 x 150	4 x 70	3 x 70	50



ATTENTION!

Protective ground cable: Connect each enclosure to the main grounding system. Select the shortest possible route for grounding.



ATTENTION!

If the appropriate grounding procedures are not observed, electromagnetic interference or the risk of electric shock or fire may occur.

TABLE OF THE UPS SWITCHES

UPS-MODEL	10 KVA	20 KVA	30 KVA	40 KVA	60 KVA
INPUT switch	3P 20A / 400Vac	3P 40A / 400Vac	3P 63A / 400Vac	3P 80A / 400Vac	3P 125A / 400Vac
OUTPUT switch	3P 20A / 400Vac	3P 40A / 400Vac	3P 63A / 400Vac	3P 100A / 400Vac	3P 125A / 400Vac
BYPASS switch	3P 63A / 400Vac	3P 63A / 400Vac	3P 63A / 400Vac	3P 100A / 400Vac	3P 125A / 400Vac
Fuse inside the battery	63A / 500Vdc	120A / 500Vdc	200A / 500Vdc	200A / 500Vdc	2x 200A / 500Vdc

UPS-MODEL	80 KVA (2 x 40 KVA)	120 KVA (3 x 40 KVA)	160 KVA (4 x 40 KVA)	180 KVA (3 x 60 KVA)	240 KVA (4 x 60 KVA)
INPUT switch	2x 3P 80A / 400Vac	3x 3P 80A / 400Vac	4x 3P 80A / 400Vac	3x 3P 125A / 400Vac	4x 3P 125A / 400Vac
OUTPUT switch	2x 3P 100A / 400Vac	3x 3P 100A / 400Vac	4x 3P 100A / 400Vac	3x 3P 125A / 400Vac	4x 3P 125A / 400Vac
BYPASS switch	2x 3P 100A / 400Vac	3x 3P 100A / 400Vac	4x 3P 100A / 400Vac	3x 3P 125A / 400Vac	4x 3P 125A / 400Vac
Fuse inside the battery	2x 200A / 500Vdc	3x 200A / 500Vdc	4x 200A / 500Vdc	3x 200A / 500Vdc	4x 200A / 500Vdc

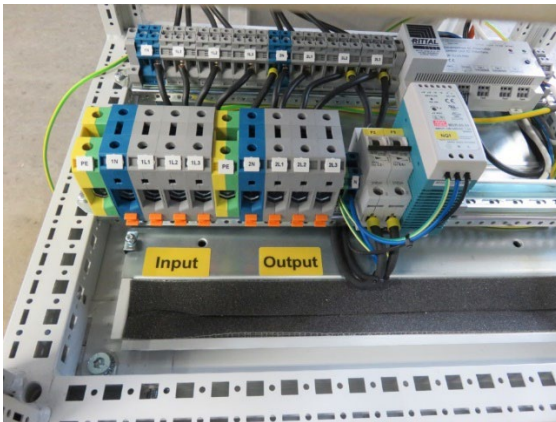
TABLE OF THE BATTERY HOUSING CIRCUIT

UPS-MODEL	10 KVA	20 KVA	30 KVA	40 KVA	60 KVA (2 x 30 KVA)
Battery switch			4P 63A / 400Vac (2P BAT+ / 2P BAT-)	4P 80A / 400Vac (2P BAT+ / 2P BAT-)	2x 4P 125A / 400Vac (2P BAT+ / 2P BAT-)
Fuse inside the battery			200A / 500Vdc (BAT+ / BAT-)	200A / 500Vdc (BAT+ / BAT-)	2x 200A / 500Vdc (BAT+ / BAT-)

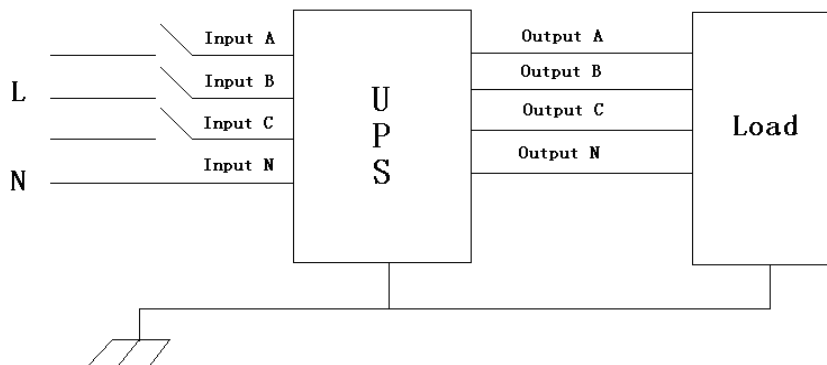
UPS-MODEL	80 KVA (2 x 40 KVA)	120 KVA (3 x 40 KVA)	160 KVA (4 x 40 KVA)	180 KVA (3 x 60 KVA)	240 KVA (4 x 60 KVA)
Battery switch	2x 4P 80A / 400Vac (2P BAT+ / 2P BAT-)	3x 4P 80A / 400Vac (2P BAT+ / 2P BAT-)	4x 4P 80A / 400Vac (2P BAT+ / 2P BAT-)	3x 4P 125A / 400Vac (2P BAT+ / 2P BAT-)	4x 4P 125A / 400Vac (2P BAT+ / 2P BAT-)
Fuse inside the battery	2x 200A / 500Vdc (BAT+ / BAT-)	3x 200A / 500Vdc (BAT+ / BAT-)	4x 200A / 500Vdc (BAT+ / BAT-)	3x 200A / 500Vdc (BAT+ / BAT-)	4x 200A / 500Vdc (BAT+ / BAT-)

3.7 Connection of electrical cables

Once the device has been positioned and attached, connect the electrical cables as described in the connection. Check that the UPS is completely isolated from the external power source and that all electrical disconnectors of the UPS are open. Check that everything is electrically isolated and labeled with all warning signals to prevent accidental activation of the disconnect switches. Remove the terminal block cover to make wiring easier.



Select suitable electrical cables (refer to the table above) and pay attention to the diameter of the cable's connection terminal, which should be larger or the same size as that of the connection poles.



ATTENTION!

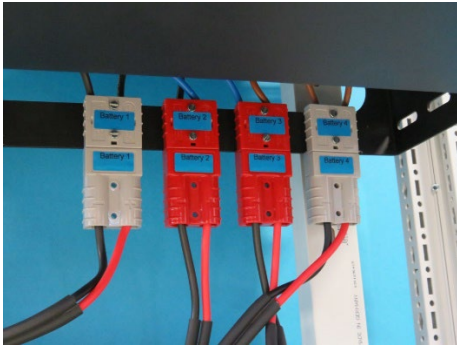
If the load at the output of the UPS is not ready for supply during commissioning by the technician, it must be ensured that the cables at the output are insulated at the ends and that safe conditions exist. Connect the earthing under safe conditions. All earthing cables must be connected to the copper earthing screws on the bottom of the device under the electrical connections. All UPS enclosures must be correctly connected to earth.

ATTENTION!

The earthing and connection of the neutral conductor must comply with local and national regulations.

3.8 Battery connections

There are 4 battery plugs between the battery trays and the UPS on models before 2023 and with a transformer. These must be connected together as shown in the picture.



View models before 2023 or with transformer



View model up to 40 KVA



View models from 60 KVA



ATTENTION!

Do not mix batteries with different capacities or different brands, or new batteries with old ones.

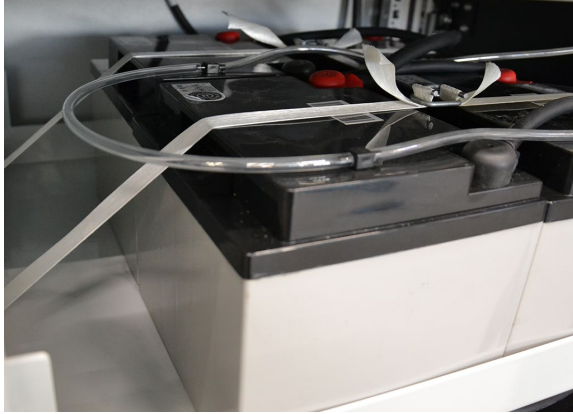


ATTENTION!

Ensure the correct polarity of the sequence of connections to the battery switch and from the battery switch to the UPS terminals, e.g. (+) to (+) / (-) to (-), disconnect one or more units from each group of batteries. Do not reconnect these connections and do not close the battery switch unless you have been authorized to do so by the technical support service carrying out commissioning.

3.9 UPS with air conditioning

This UPS has a ventilation system with hoses. These are fully connected. Models from 60 KVA use a hose system that is connected directly to the batteries to vent the batteries. Models up to 40 KVA are vented via a hose directly at the integrated battery cabinet.



For older models before 2023 and with transformer:

Please note during maintenance work: To achieve protection classes IP 68 / 67 / 66 / 65 in accordance with EN 60529 IEC 60529 and IP 69K* in accordance with DIN 40050 T.9, please observe the following: Protective conduit separation: Separate the ROHRflex® corrugated conduit in the corrugation trough. Please ensure that an unevenness of max. one corrugation is not exceeded.



Simply attach

Assembly

Fit the screw fitting with hose connection mount onto the separate hose side. Push the fitting onto the corrugated hose until it stops engaging and the fitting can only be turned with force. The relieved corrugated conduit presses the claws of the locking sleeve into the corrugated conduit valleys. This ensures that the screw connection is properly locked.



Press the collar of the locking sleeve onto the base body and pull off

Dismantling

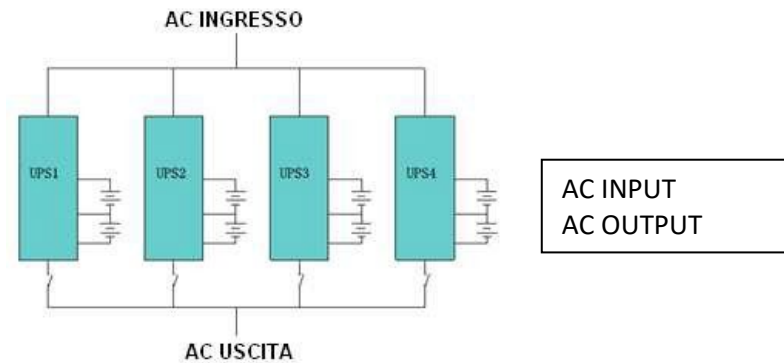
The corrugated conduit is removed by pressing the collar of the locking sleeve onto the fitting body, then pulling the conduit out of the fitting or pulling the fitting off the corrugated conduit. The fitting is ready for use again.

3.10 Parallel installation of the UPS

In den folgenden Abschnitten werden die für das parallele System spezifischen Installationsvorgänge erläutert.

3.10.1 Installing the UPS enclosure

All UPSs to be installed in the parallel-connected system must be connected as shown in the figure below.



Make sure that the UPS switch is in the "OFF" position and that none of the UPS outputs are connected. The battery groups can be connected separately or in parallel, which means that the system itself supplies both a battery for each UPS and a single battery for all UPSs.

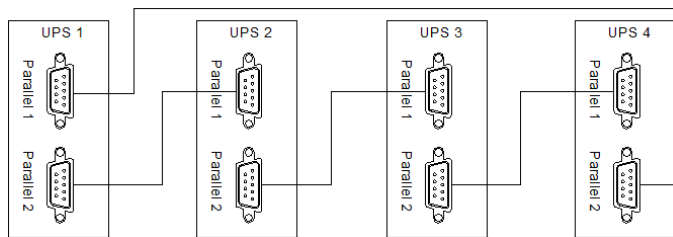


ATTENTION!

Make sure that the cables N, A(1L1), B(1L2), C(1L3) are correct and that the earthing is firmly connected.

3.10.2 Installing the parallel cable (optional)

The cables supplied with the UPS are shielded and double insulated and are to be connected in a ring configuration between the UPS groups as shown in the illustration below. The ring configuration ensures high reliability control.



3.10.3 Requirements for the system connected in parallel

A UPS group connected in parallel has the function of a single large UPS, but with the advantage of offering greater reliability. To guarantee that all UPSs are used in the same way and comply with the cabling regulations, you must fulfill the requirements listed below.

- 1) All UPSs must have the same power and be connected to the same bypass power line.
- 2) The outputs of all UPSs must be connected in parallel at the same point on the distribution board.
- 3) The electrical cables, which include the input cables of the bypass and the output cables of the UPS, should have the same length and the same technical data. This makes it easier to split the load in bypass mode.

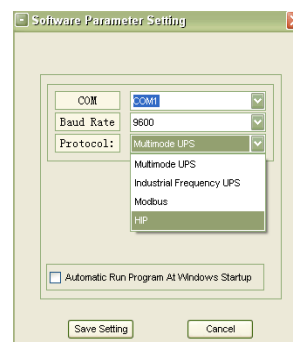
3.11 Access via computer (Option CD MUSER4000)

One end of the USB cable is connected to the computer, the other to the USB port of the UPS.

- ◆ Open the Muser4000 software and click on the "System" button."



- ◆ A "Software Parameter Setting" window appears, as shown in the illustration.
- ◆ Select COM depending on the UPS, select 9600 as the baud rate (transmission speed) and "HIP" as the protocol. Then save the settings.



- ◆ On the main page of Muser4000 click on "Append" ("Add") klicken. The "Append equipment" window is displayed.
- ◆ Enter the UPS name in the "Equipment name" field and the number of the UPS in the "Equipment address" field."
- ◆ Clicking on "Append" completes the process of connecting the UPS to the computer.



ATTENTION!

If the load of the UPS is on the inverter and the PC is to be used to enter the output voltage and frequency, the inverter must first be switched off.



Download Software MUSER 4000

<https://www.thiele-kg.de/downloads.html>

or scan the QR code



4. COMMISSIONING

4.1 Type of commissioning

The UPS is of the double online conversion type, which can be used in the operating modes listed below.

◆ **Normal operation**

The rectifier/battery charger, which is supplied from the mains, supplies DC voltage and current to the inverter and charges the battery. The inverter converts the direct current and direct voltage into alternating current and voltage and supplies the load.

◆ **Battery operation (operation with stored energy)**

If there is no power supply at the input of the UPS, the inverter is supplied by the battery and delivers the supply to the critical load. The supply to the critical load is not interrupted. The UPS automatically returns to normal operation when the power supply returns to its input.

◆ **Bypass-operation**

If the inverter is not working or there are overloads, the static converter is activated to transfer the load from the inverter to the bypass without interrupting the current to the critical load. If the output of the inverter is not synchronized with the electrical current of the bypass, the static switch performs a transfer of the load from the inverter to the bypass with a current interruption to the critical load. This is done to avoid the parallelization of non-synchronized AC sources. This interruption can be programmed, but is generally entered so that it is less than one cycle, e.g. less than 15 ms (50 Hz) or less than 13.33 ms (60 Hz).

◆ **ECO-operation**

If the UPS is in normal operation and the load is not critical, the UPS can be set to ECO mode to increase the efficiency of the power supply. In ECO mode, the UPS is line-interactive, so it switches to bypass mode. If the mains supply does not correspond to the entered parameters, the UPS transfers the load from bypass to the inverter, which is supplied by the battery. All information is shown on the LCD display.

◆ **Operation with parallel redundancy (system expansion)**

In order to achieve a higher capacity or increase reliability, up to four UPS can be connected in parallel and the parallel card in each UPS automatically ensures load sharing on each individual UPS.

◆ **Maintenance mode (Manual bypass)**

A manual bypass switch is available to supply the critical load when the UPS is not working, being repaired or being serviced. This manual bypass switch is suitable for a load that corresponds to the rated load of the UPS.

4.2 Switching the UPS

4.2.1 Starting procedure with existing power grid



ATTENTION!
Make sure that there is adequate grounding

The power switch on the top of the UPS is in the (I).



ACHTUNG!
Check whether the load is correctly connected to the UPS at the output. If the load is not ready to be supplied by the UPS, ensure that it is not connected to the output terminals of the UPS.

- ◆ Close the UPS output switch.
- ◆ Close the UPS input switch.

If the mains at the rectifier input corresponds to the specified tolerance values, the rectifier is switched on in 30 seconds and then the inverter also starts. If the rectifier does not start, the bypass LED switches on. When the inverter starts, the UPS switches from bypass mode to inverter mode. The bypass LED therefore switches off and the inverter LED switches on. The various states of the UPS are shown on the LCD display.



4.2.2 Testing



ATTENTION!
The UPS is in normal operation. It may take 60 seconds to complete the start-up process and run the self-diagnosis of the UPS.

- ◆ Interrupt the power supply at the input of the UPS to simulate a power failure. The rectifier switches off and the battery should supply the inverter without voltage interruption at the output of the UPS. The battery LED should now switch on.
- ◆ Switch the voltage back on at the input of the UPS. The rectifier switches back on automatically after 20 seconds and the inverter supplies the load. It is advisable to use replacement loads for this test. The UPS can be loaded up to its maximum capacity during the test.

4.2.3 Manual Bypass

To supply the load directly from the mains, simply close the manual bypass isolator switch on the UPS.



ATTENTION!

If the manual bypass is active and the current is not suitable, the load is not protected by the UPS.

Switch to manual bypass.

- ◆ Open the cover of the manual bypass.
The UPS automatically switches to bypass mode and the bypass LED lights up.
- ◆ Activate the manual bypass switch.
- ◆ Open the UPS input switch.
- ◆ Open the UPS output switch.

The mains now supplies the load via the manual bypass switch.

Return to normal operation (from manual bypass)



ATTENTION!

Never attempt to switch the UPS back to normal operation until you have checked that there are no faults on the UPS.

- ◆ Close the UPS output switch.
- ◆ Close the UPS input switch.
The UPS supplies the load via the static bypass instead of the manual bypass, which is why the bypass LED lights up.
- ◆ Open the manual bypass switch. The output voltage is then supplied by the static bypass of the UPS. Replace the cover of the manual bypass switch. The rectifier will function normally after 30 seconds. During normal operation of the inverter, the UPS switches from bypass operation to normal operation. The green LED lights up.

4.2.4 Start process via the battery (cold start)



ATTENTION!

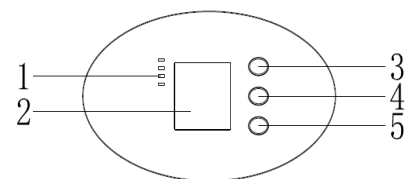
Carry out this procedure if the AC voltage is not present at the input of the UPS but the battery is working.

- ◆ Close the circuit breaker
(it supplies the "Auxiliary power board" card).
- ◆ Close the UPS output switch.



- ◆ Press the "Cold start" button (button 5 in the adjacent image)

If the battery is in normal operation, the inverter is started within 30 s and the battery LED switches on.



4.2.5 Switch-off device



ATTENTION!

This procedure must be carried out to completely switch off the UPS and the load. After all switches and disconnectors have been opened, there is no longer any output voltage.

- ◆ Press the OFF button on the front panel (4) for a few seconds. The green LED of the inverter switches off and the yellow LED of the static bypass switches on.
- ◆ Open the UPS input switch, open the UPS output switch. The UPS is now completely switched off.
- ◆ To completely isolate the UPS from the AC mains, all switches supplying the input of the UPS and the bypass mains must be fully opened on the distribution panel.
- ◆ A sign should be placed on the distribution panel that supplies the UPS and is often located away from the UPS area, indicating that maintenance work is being carried out on the UPS.



ATTENTION!

The internal capacitors may not be fully discharged.

4.2.6 Configuration of the parallel switching (Option Software Muser4000)

- ◆ See chapter 4.4.10 - 4.4.11 - 4.4.12. Connect the UPS to the computer. Switch on the UPS.
- ◆ Open the Muser4000 software. After the UPS has been successfully connected, click on "System"-> and select "User Set" ("User settings").
- ◆ Click on "Set" in the "User Set" window.
- ◆ In the "Data Set" window, click "Work Mode" and select the "Parallel" option, then click "Set" as shown in the figure below. If the UPS emits a beep, it means that the setting is correct.
- ◆ In the "Data Set" window, click on "Ups ID", enter "1" for the value for the parallel UPS on the right-hand side, then click on "Set" as shown in the figure below. If the UPS emits a beep, this means that the setting has been made correctly.



ATTENTION!

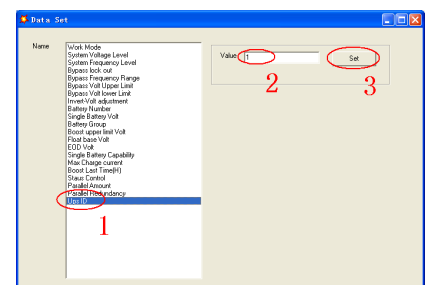
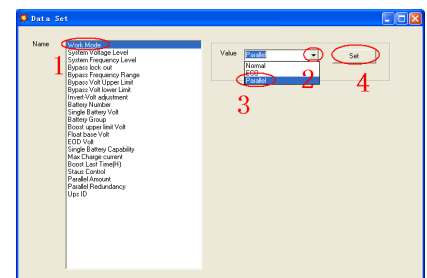
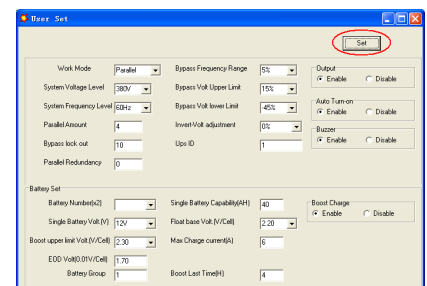
After the ID of the UPS connected in parallel has been changed, the connection between the Muser4000 and the UPS could be interrupted. If this is the case, restore it according to the instructions described above.



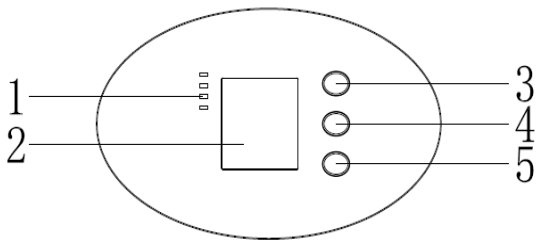
ATTENTION!

The parallel connection cable must not be connected when the parameters for the parallel connection are entered.

- ◆ After setting the UPSs that need to be connected in parallel, switch off all UPSs. Connect all UPSs according to the procedure "Installing the parallel cable" and then restart the UPSs.



4.3 LCD-Display

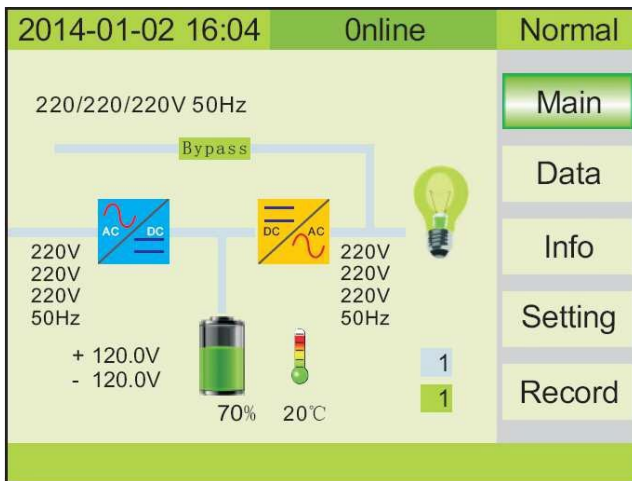


- 1) LED-Lights
- 2) LCD-Display
- 3) Scroll-Button: button to move on to the next item
- 4) Power OFF Button
- 5) Power ON Button

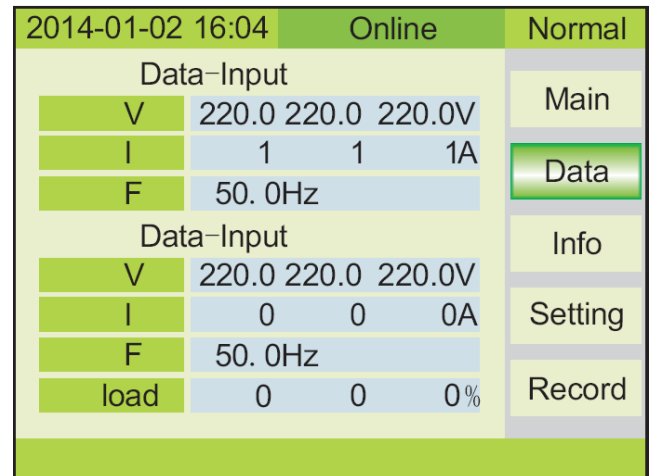
View of the UPS control panel



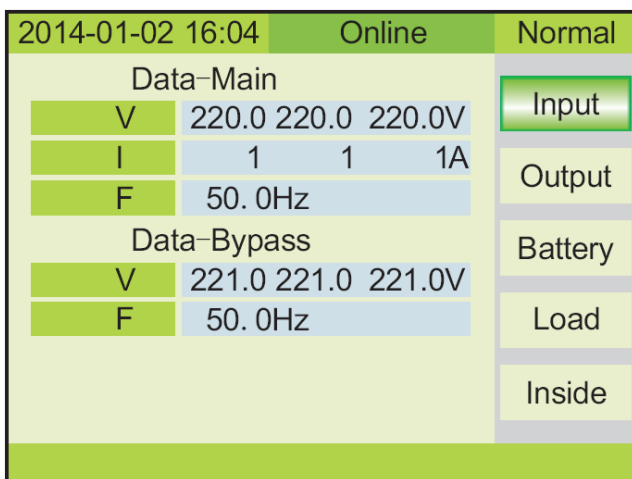
ATTENTION!
The display shows more functions than those described in these instructions.



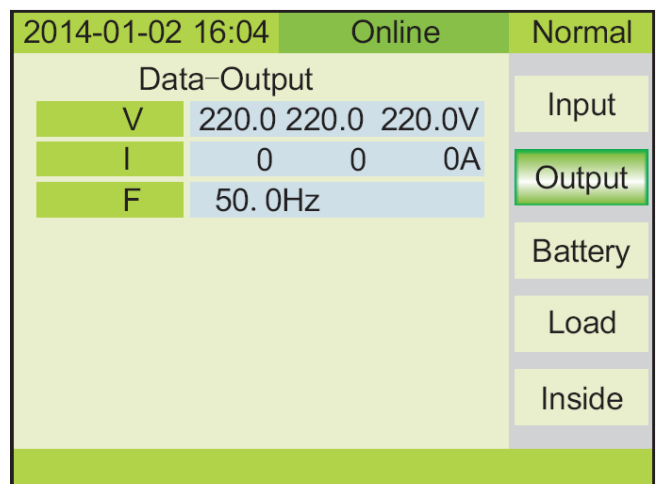
1 – Main view



2 – Data view



3 – Data input view



4 – Data output view

2014-01-02 16:04	Online	Normal
Data-Battery		
V	+120.0 -120.0V	Input
I	2 2A	Output
Time	120 120min	Battery
CaP.	70 70%	Load
Inside		

5 - Battery data view

2014-01-02 16:04	Online	Normal
Data-Load		
%	0 0 0%	Input
P	0 0 0kW	Output
S	0 0 0kVA	Battery
Load		
Inside		

6 - Load data view

2014-01-02 16:04	Online	Normal
Data-Inside		
V-Bus	+370 -370V	Input
T1/T2	PFC:42 INV:46°C	Output
V-Inv	220 220 220V	Battery
F-Inv	50Hz	Load
Inside		

7 - Internal data view

2014-01-02 16:04	Online	Normal
Information		
LCD Ver.	V004B001D000	Main
PFC Ver.	V001B345D000	Data
INV Ver.	V001B345D000	Info
Setting		
Record		

8 - Info view

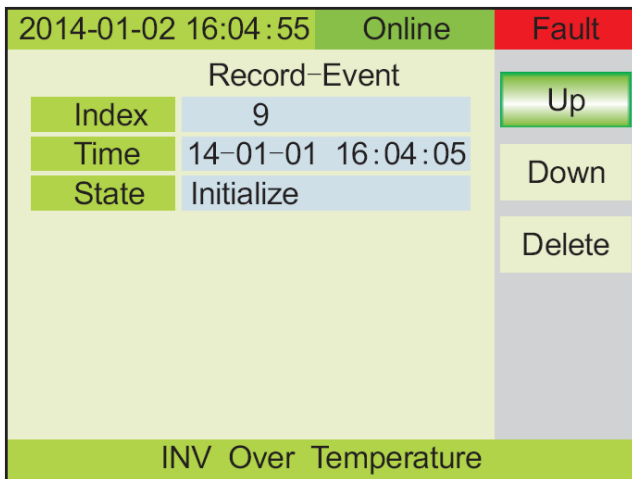
2014-01-02 16:04	Online	Normal
Setting-User		
Lang.	English	Main
Date	2014-01-02	Data
Time	16:04	Info
Backlight	60s	Setting
Buzzer	Disable	Record
Test Now	OFF	

9 - User settings view

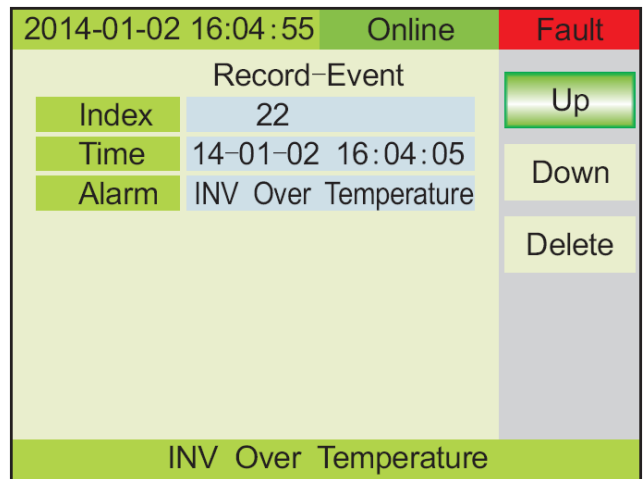
2014-01-02 16:04:55	Online	Fault
Record-Event		
Time	14-01-01 16:04:05	Main
State	Initialize	Data
Record-Fault		
Time	14-01-02 16:04:05	Info
Alarm	INV Over Temperature	Setting
Record		
INV Over Temperature		

10 - Recording view

The ABT function (Automatic Battery Test) can be selected as follows:
 1) 10 s every 30 days, 2) 10 min every 30 days, 3) EOD* every 30 days.
 (*End of discharge). The selection can be made at the factory or by an authorized technician.



11 – Recording - Event view



12 – Recording Error view
(Max. 2000 event records)

4.4 Parameter settings and display

The functions of the buttons for setting the views and parameters of the UPS are described below:

Button	Function	Access	
SELECT	Short press to select, long press to log out	USER	AUTHORIZED TECHNICIANS
OFF	Press briefly to confirm, press and hold to switch off (OFF)		
ON	ON - Press the button		
SELECT + OFF	Press this key combination on the settings page to access the maintenance password input interface. (reserved for authorized technicians only)		

USER INTERFACE:

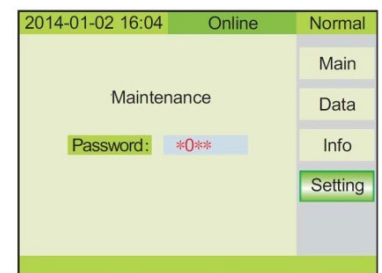
The views to which the user has access are those from Section 4.3 (Figures 1 to 12). The settings are those shown in Figure 9.

INTERFACE OF THE AUTHORIZED TECHNICIANS:

Access is granted to authorized technicians and service points who have the password. You can access the maintenance and advanced settings interface (Figure 13) by pressing the "SELECT + OFF" key combination in the screen shown in Figure 9.

Options:

- SYSTEM (Operating mode-SINGLE-PARALLEL-ECO, output, frequency, etc.)
- BYPASS (Lower/upper limit value, range)
- BATTERY (Number, capacity, max. charge, etc.)
- PARALLEL (ID, number of units, redundancy, etc.)



4.5 Messages/troubleshooting on the display

This section lists the events and alarm messages that the UPS could display. The messages are listed in alphabetical order. This section lists the alarm messages to help you solve any problems that may arise.

Messages on the display - operating status and operating mode

Nr.	STATUS of the UPS	LED			
		DEFEKT	BYPASS	AKKU	INVERTER
1	Started	OFF	OFF	OFF	OFF
2	Standby mode	OFF	OFF	X	OFF
3	No output	OFF	OFF	X	OFF
4	Bypass mode	OFF	OFF	X	OFF
5	On Grid mode	OFF	OFF	X	ON
6	Battery mode	OFF	OFF	OFF	OFF
7	Battery self-diagnosis	OFF	OFF	OFF	OFF
8	Inverter is started	OFF	X	X	OFF
9	ECO-mode	OFF	X	X	X
10	EPO-mode	ON	OFF	X	OFF
11	Manual bypass operation	OFF	OFF	OFF	OFF
12	Defective operation	ON	X	X	X

ATTENTION: "X" means that other conditions are the reasons

Alarminformation

CODE (Err)	INDICATES THE DEFECT ON THE UPS	STONE	LED
1	Rectifier defect	Continuous whistling tone	Defekt-LED leuchtet
2	Inverter defect (including inverter pole bridge short circuit)	Continuous whistling tone	Defekt-LED leuchtet
3	Inverter thyristor in short circuit	Continuous whistling tone	Defekt-LED leuchtet
4	Inverter thyristor open	Continuous whistling tone	Defekt-LED leuchtet
5	Bypass thyristor in short circuit	Continuous whistling tone	Defekt-LED leuchtet
6	Bypass thyristor open	Continuous whistling tone	Defekt-LED leuchtet
7	Fuse blown	Continuous whistling tone	Defekt-LED leuchtet
8	Defective parallel relay	Continuous whistling tone	Defekt-LED leuchtet
9	Blower defect	Continuous whistling tone	Defekt-LED leuchtet
10	Reserve	Continuous whistling tone	Defekt-LED leuchtet
11	Auxiliary current defect	Continuous whistling tone	Defekt-LED leuchtet
12	Initialization defect	Continuous whistling tone	Defekt-LED leuchtet
13	Defective battery charger branch P-battery	Continuous whistling tone	Defekt-LED leuchtet
14	Defective battery charger branch N-battery	Durchgehender Pfeifton	Defekt-LED leuchtet
15	Overvoltage DC voltage	Durchgehender Pfeifton	Defekt-LED leuchtet
16	Undervoltage DC voltage	Durchgehender Pfeifton	Defekt-LED leuchtet
17	DC voltage unbalanced	Durchgehender Pfeifton	Defekt-LED leuchtet
18	Soft start failed	Durchgehender Pfeifton	Defekt-LED leuchtet
19	Overtemperature rectifier	Zweimal pro Sekunde	Defekt-LED leuchtet
20	Inverter overtemperature	Zweimal pro Sekunde	Defekt-LED leuchtet
21	Reserve	Zweimal pro Sekunde	Defekt-LED leuchtet
22	Battery poles swapped	Zweimal pro Sekunde	Defekt-LED leuchtet
23	Cable connection error	Zweimal pro Sekunde	Defekt-LED leuchtet
24	Defective CAN bus communication	Zweimal pro Sekunde	Defekt-LED leuchtet
25	Defect Splitting parallel load	Zweimal pro Sekunde	Defekt-LED leuchtet
26	Battery overvoltage	Einmal pro Sekunde	Defekt-LED blinkt
27	Supply connection error	Einmal pro Sekunde	Defekt-LED blinkt
28	Bypass line connection error	Einmal pro Sekunde	Defekt-LED blinkt
29	Short circuit at the output	Einmal pro Sekunde	Defekt-LED blinkt
30	Overcurrent rectifier	Einmal pro Sekunde	Defekt-LED blinkt
31	Overcurrent bypass	Einmal pro Sekunde	LED BPS (Bypass) blinkt
32	Overload	Einmal pro Sekunde	LED BPS oder INV blinkt
33	No battery	Einmal pro Sekunde	Akku-LED blinkt
34	Battery undervoltage	Einmal pro Sekunde	Akku-LED blinkt
35	Pre-alarm Battery discharged	Einmal pro Sekunde	Akku-LED blinkt
36	Internal communication error	Einmal alle zwei Sekunden	Defekt-LED blinkt
37	Direct current component above limit value	Einmal alle zwei Sekunden	INV-LED blinkt
38	Overload parallel connection	Einmal alle zwei Sekunden	INV-LED blinkt
39	Abnormal mains voltage	Einmal alle zwei Sekunden	Akku-LED eingeschaltet
40	Abnormal mains frequency	Einmal alle zwei Sekunden	Akku-LED eingeschaltet
41	Bypass not available		BPS-LED blinkt
42	Bypass cannot be traced		BPS-LED blinkt
43	Inverter not available		
44	Reserve		
45	Inverter not switched on		

4.6 Options

SNMP Card: Option SNMP internal/external

- ◆ Loosen the two pairs of screws (on all sides of the card).
- ◆ Carefully remove the card. Carry out the reinsertion procedure in reverse order.

The slot named SNMP supports the MegaTec protocol. It should be noted that the NetAgent II-3 card for ports is also a tool for remote monitoring and management of any UPS. NetAgent II-3 for Ports supports the Modem Dial-in (PPP) function to allow remote control via the Internet when the network is not available.

In addition to the standard features of the NetAgent Mini, the NetAgent II has the ability to add the NetFeeler Lite to detect temperature, humidity, smoke and the security sensors of the UPS room. This makes NetAgent II a versatile management tool. NetAgent II also supports numerous languages to automatically capture the web language.

RELAY-Card

The RELAY card provides voltage-free contacts for external monitoring of the UPS and indicates the status it is in.

The RELAY card offers 10 voltage-free contacts available to the user: / at the output indicate the status of the UPS, 1 for earthing and 2 at the input for remote shutdown of the UPS.



SNMP Card



RELAY Card

5. Scheduled maintenance

5.1 Annual maintenance (every six months for critical applications))

The UPS requires scheduled maintenance cycles during its service life in order to maintain operational safety and efficiency. Scheduled maintenance must be carried out by the company that supplied the device or by a company that has been trained on the system by the seller and specializes in the device.

**The system may only be serviced by a certified electrician or by qualified personnel.
Read this manual carefully before carrying out maintenance.
Inadequate maintenance will invalidate the warranty!**

**Always switch off the UPS as described in chapter 4.2.
Never disconnect the UPS from the power supply and leave it running until it is completely discharged (e.g. during a weekend shutdown or when the system is not in operation).**

The following actions and tests are carried out during maintenance work:

- Cleaning the machine
- Cleaning the control logic and interface cards
- Check all screws, bolts and electrical connections (UPS and battery)
- Check ventilation efficiency, replace / clean dirty filter mats
- Check inverter output waveform
- Check output voltage / frequency
- Test synchronization
- Test signals, alarms and EPA triggering
- Display calibration with suitable instrument
- Function test of manual switches and automatic machines
- Function test of circuits
- Power failure test of UPS line, battery efficiency test and test of correct battery charger operation

5.2 Operating instructions for valve-regulated lead-acid battery

Sealed lead-acid batteries consist of cells that cannot be topped up with water for the entire service life. Pressure relief valves that cannot be opened without destroying them are used as sealing plugs.

Commissioning. Before commissioning, all blocks must be checked for mechanical damage, correct polarity and tight fit of the connectors. The following torques apply to screw connections: M5-2-3Nm; M6-4-5.5Nm; M8 5-6Nm; M10 14-22Nm


If necessary, apply the pole covers.

Operation. DIN VDE 0510 applies to the installation and operation of these batteries. The battery must be installed in such a way that an ambient temperature difference of $>3K$ cannot occur between the individual blocks.

Ventilation. According to DIN VDE 0510 Part 2 Section 9.4.3...natural ventilation is permissible when using lead batteries with a charging capacity of up to 3 kW and NiCd batteries with a charging capacity of up to 2 kW. In addition, artificial (technical) ventilation must be provided.

Unloading. The final discharge voltage of the battery assigned to the discharge current must not be undercut. Unless otherwise specified by the manufacturer, no more than the nominal capacity may be discharged. Charge immediately after discharging, even partial discharges.

Charging. All charging methods with their limit values in accordance with DIN 41773 (IU characteristic curve) are applicable. Depending on the charger design and charger characteristic, alternating currents flow through the battery during the charging process, which are superimposed on the direct charging current ($<0.1C(A)$ effective ripple). These superimposed alternating currents and the feedback from consumers lead to additional heating of the battery and stress on the electrodes with possible consequential damage. The load is only supplied from the battery. The charging method depends on the user and must be agreed with the battery manufacturer.



Supplementary and equalizing charge. To achieve optimum battery life, a top-up charge is recommended before putting the batteries into operation, provided that the batteries have been stored for more than 6 months, are not older than 9 months in relation to the production date and that the batteries have an open terminal voltage of less than 2.1 V/cell. Batteries that are retrofitted into a battery pack as a replacement do not require equalization charging at normal float charge voltage in order to match the terminal voltage level of other batteries.

Superimposed alternating currents. During recharging up to 2.4 V/cell, the effective value of the alternating current may briefly be 0.1 C(A). After recharging and further charging (trickle charging) in standby parallel operation or buffer operation, the effective value of the alternating current must not exceed 5 A/100 Ah nominal capacity.

Temperature. The recommended operating temperature range for lead batteries is 10°C to 30°C. The ideal operating temperature range is 20°C±5K. Higher temperatures shorten the service life. The technical data apply to a nominal temperature of 20°C. Lower temperatures reduce the available capacity. Exceeding the limit temperature of 50°C is not permitted. Continuous operating temperatures above 40°C must be avoided.

Electrolyte. The electrolyte is diluted sulphuric acid and bound in fleece.

Battery care and control. The battery must always be kept clean and dry to prevent leakage currents. The battery should be cleaned in accordance with the ZVEI data sheet "Cleaning batteries". Plastic parts of the battery may only be cleaned with water without additives; the use of organic cleaning agents is not recommended.

Measure and record at least every 6 months:

- Battery voltage
- Voltage of individual block batteries
- Surface temperature of individual block batteries
- Battery room temperature. If the cell voltage deviates from the average float charge voltage deviates by ± 0.1 V/cell or if the surface temperature of different battery blocks deviates by more than 5 K, customer service must be requested.

The following must be measured and recorded annually:

- Voltages of all block batteries
- Surface temperature of all block batteries
- Battery room temperature
- Insulation resistance according to DIN 43539 T 1

Annual visual inspection

- Screw connections, unsecured screw connections must be checked for tightness
- Battery installation and accommodation
- Ventilation and aeration

Tests. Tests must be carried out in accordance with DIN 43539 Parts 1 and 100 (draft). Special test instructions, e.g. in accordance with DIN VDE 0107 and DIN VDE 0108, must also be observed. To ensure a reliable power supply, the entire battery should be replaced after the expected service life, taking into account the operating conditions and temperatures.

Errors. If faults are detected on the battery or the charging system, customer service must be called immediately. Measurement data simplifies troubleshooting and fault rectification. A service contract with us makes it easier to detect faults in good time.

Storage and decommissioning. If cells/batteries are stored for a longer period of time or taken out of service, they must be stored fully charged in a dry, frost-free room. To avoid damage, trickle charging should be carried out.

Transportation: Undamaged VRLA batteries are not treated as dangerous according to the Dangerous Goods Ordinance Road (ADR) or the Ordinance Railway (GGVE) if they are protected against short-circuiting, slipping, falling over and damage (GGVS, No. 2801a). No dangerous traces of acid are permitted on the outside of the packaging. The following applies to air transport: The batteries are leak-proof and protected against short circuits at the terminals during transportation. They comply with IATA regulations, packaging regulation 806 and the provisions of IATA Resolution 618 A67.

5.3 Air conditioning maintenance (Option)



Danger of electric shock! The device is live. Before opening, switch off the power supply and secure it against accidental reactivation!

The refrigeration circuit is a maintenance-free and hermetically sealed system. The cooling unit is filled with the required amount of refrigerant at the factory, checked for leaks and subjected to a functional test run. The built-in maintenance-free fans are mounted on ball bearings, protected against moisture and dust and equipped with a temperature monitor. The life expectancy is at least 30,000 operating hours. The cooling unit is therefore largely maintenance-free. Only the components of the external air circuit can be cleaned from time to time using a vacuum cleaner or compressed air if they are visibly dirty. Stubborn, oil-soaked dirt can be removed with a non-flammable cleaner, e.g. cold cleaner. Maintenance interval: 2,000 operating hours. Depending on the degree of pollution of the ambient air, the maintenance interval is reduced according to the intensity of the air pollution.



Attention! Fire hazard! Do not use flammable liquids for cleaning!

Sequence of maintenance measures:

- Checking the degree of soilings
- Filter contamination? Clean / Change filter if necessary
- Cooling fins dirty? Cleaning possible
- Testmode;Cooling function in order?
- Check noise development of compressor and fans

See also the installation and operating instructions for the cooling unit.



ATTENTION !!! The temperature setting on the air conditioner must not be changed, otherwise the warranty will be invalidated.

APPENDIX 1: TECHNICAL DATA

MODELL		SWS 30	SWS 40	SWS 60
Inputs	Power	30 KVA 27 KW	40 KVA 36 KW	60 KVA 54 KW
	Phases	3 phases, 4 cables and earthing		
	Nominal voltage	380/400/415Vac		
	Voltage interval	208~478Vac		
	Frequency interval	45-55 Hz bis 50Hz / 56-66Hz bis 60Hz (selbsttätige Messung)		
	Power factor	≥0,99		
	THDi-Strom	≤2% (100 %non-linear load)		
	Bypass-Voltage interval	Max. Tension: 220 Vac: +25% (Option +5%,+10%,+15%) 230 Vac: +20% (Option+10%,+15%) 240 Vac: +15% (Option +10%) Min. Tension: -45% (Option -20%、 -30%) Frequency protection interval: ±10%		
	Generator input	Supported		
Output	Phases	3 phases, 4 cables and earthing		
	Nominal voltage	380/400/415Vac		
	Power factor	0.9		
	Voltage regulation	±1%		
	Frequenz	With net	±1%、±2%、±4%、±5%、±10% of the nominal frequency (option)	
		In battery mode	(50/60±0,1 %) Hz	
	Crest-Faktor	3:1		
THD	≤1 % with linear load ≤3 % with non-linear load			
Efficiency (in normal operation)		≥97,5%		
Battery	Spannung	Standard-UPS: ±240 Vdc (20+20) 12V 7/9AH UPS mit langer Dauer: ±192/±204/±216/ ±228/±240 Vdc (32/34/36/38/40 Elemente Option)	Standard-UPS: ±120Vdc (10+10) 12V 7/9AH UPS mit langer Dauer ±96V/±108V/±12 0 Vdc (16/18/20 Elemente Option)	
	Charging current (A)	The charging current is entered automatically depending on the capacity, number and dynamics of the batteries used Standard-UPS (20 EL.): 1,35A Standard-UPS (2X20 EL.): 2,7 A Standard-UPS (3X20 EL.): 4,5 A UPS with long duration: max. 10A		
	Battery test	Unterstützt		
Transmission time		from mains to battery: 0 ms from mains to bypass: 0 ms		

MODEL		SWS 30	SWS 40	SWS 60
Protection	Overload	Normal operation	Load ≤ 110 %: Duration 60 min, ≤ 125%: Duration 10 min, ≤ 150%: Duration 1 min, ≥ 150% switches immediately to bypass	
		Battery operation	Load ≤ 110%: Duration 10 min, ≤ 125%: Duration 1 min, ≤ 150%: Duration 10 s, ≥ 150% switches the UPS off immediately	
		Bypass operation	63 A-Switches	80 A-Switches
	Short circuit	Concerns the whole UPS		
	Overheating	Normal operation: Switches to bypass, battery operation: Switches the UPS off immediately		
	Battery discharged	Alarm and switching off the UPS		
	Self-diagnosis	When switching on the UPS and via software command		
	EPO (Option)	Switches the UPS off immediately		
	Battery	Advanced battery management		
Noise suppression	Compliant with EN62040-2			
Alarms	Audiovisual	Power failure, battery discharged, overload, defective UPS		
Display	Status LED and LCD	Line operation, bypass operation, battery discharged, battery with low charge, overload and UPS fault		
	Shown on the LCD display	Input voltage, input frequency, output voltage, output frequency, charge level in percent, battery voltage and internal temperature		
Communication interface		USB, RS485, parallel card (option), voltage-free contacts, intelligent slot, SNMP card (option), relay card (option)		
Surroundings	Operating temperature	0°C ~ 40°C		
	Storage temperature	-25°C ~ 55°C		
	Moisture	0 ~ 95% without condensation		
	Height	< 1500 m If > 1500 m, the rated power is reduced		
	Noise level	< 55dB	< 58dB	< 55dB
Misc.	Dimensions of the group (D×L×H) in mm	500x600x2000 (+200 Base)		2x500x600x2000 (+200 Base)
	Unit	1		2
Compliant with safety standards		CE, EN/IEC 62040-3, EN/IEC 62040-1-1		
Frequency converter function		YES		

MODELL		SWS 80	SWS 90	SWS 120	SWS 160	
Input	Power	80 KVA 72 KW	90 KVA 81 KW	120 KVA 108 KW	160 KVA 144 KW	
	Phases	3 phases, 4 cables and earthing				
	Nominal voltage	380/400/415Vac				
	Voltage interval	208~478Vac				
	Frequency interval	45-55 Hz bis 50Hz / 56-66Hz bis 60Hz (selbsttätige Messung)				
	Power factor	≥0.99				
	THDi-Electricity	≤2% (100 % nicht-lineare Last)				
	Bypass voltage interval	Max. Tension: 220 Vac: +25% (Option +5%,+10%,+15%) 230 Vac: +20% (Option +10%,+15%) 240 Vac: +15% (Option +10%) Min. Tension: -45% (Option -20%、 -30%) Frequency protection interval: ±10%				
	Generator input	Supported				
Output	Phases	3 phases, 4 cables and earthing				
	Nominal voltage	380/400/415Vac				
	Power factor	0.9	0.8	0.9	0.9	
	Voltage regulation	±1%				
	Frequency	With net	±1%、 ±2%、 ±4%、 ±5%、 ±10%of the nominal frequency (option)			
		In battery mode	(50/60±0,1 %) Hz			
	Crest-Faktor	3:1				
THD	≤1 % with linear load ≤3 % with non-linear load					
Efficiency (in normal operation)		≥97,5%				
Battery	Tension	Standard-UPS: ±240 Vdc (20+20) 12V 7/9AH UPS with a long duration: ±192/±204/±216/ ±228/±240 Vdc (32/34/36/38/40 Elements Option)	Standard-UPS: ±120Vdc (10+10) 12V 7/9AH UPS with long duration ±96V/±108V/±12 0 Vdc (16/18/20 Elements Option)	Standard-UPS: ±240 Vdc (20+20) 12V 7/9AH UPS with long duration: ±192/±204/±216/±228/±240Vdc (32/34/36/38/40 Elements Option)		
	Charging current (A)	The charging current is entered automatically depending on the capacity, number and dynamics of the batteries used Standard UPS (20 EL.): 1.35A Standard UPS (2X20 EL.): 2.7 A Standard UPS (3X20 EL.): 4.5 A UPS with long duration: max. 10A				
	Battery test	Ja				
Transmission time		from mains to battery: 0 ms from mains to bypass: 0 ms				

MODEL		SWS 80	SWS 90	SWS 120	SWS 160	
Protection	Overload	Normal operation	Load ≤ 110 %: Duration 60 min, ≤ 125%: Duration 10 min, ≤ 150%: Duration 1 min, ≥ 150% switches immediately to bypass			
		Battery operation	Load ≤ 110%: Duration 10 min, ≤ 125%: Duration 1 min, ≤ 150%: Duration 10 s, ≥ 150% switches the UPS off immediately			
		Bypass operation	2x80 A-Switches	3x63 A-Switches	3x80 A-Switches	4x80 A-Switches
	Short circuit		Concerns the whole UPS			
	Overheating		Normal operation: Switches to bypass, battery operation: Switches the UPS off immediately			
	Battery discharged		Alarm and switching off the UPS			
	Self-diagnosis		When switching on the UPS and via software command			
	EPO (Option)		Switches the UPS off immediately			
	Battery		Advanced battery management			
	Noise suppression		Compliant with EN62040-2			
Alarms	Audiovisuell	Power failure, battery discharged, overload, defective UPS				
Display	Status LED and LCD	Line operation, bypass operation, battery discharged, battery with low charge, overload and UPS fault				
	Shown on the LCD display	Input voltage, input frequency, output voltage, output frequency, charge level in percent, battery voltage and internal temperature				
Communication interface		USB, RS485, parallel card (option), voltage-free contacts, intelligent slot, SNMP card (option), relay card (option)				
Surroundings	Operating temperature	0°C ~ 40°C				
	Storage temperature	-25°C ~ 55°C				
	Moisture	0 ~ 95% without condensation				
	Height	< 1500 m If > 1500 m, the rated power is reduced				
	Noise level	< 58dB	< 55dB	< 58dB		
Misc.	Dimensions of the group (D×L×H) in mm	2x 500x600x2000	3x 500x600x2000		4x 500x600x2000	
	Einheit	2	3		4	
Compliant with safety standards		CE, EN/IEC 62040-3, EN/IEC 62040-1-1				
Frequency converter function		Yes				

APPENDIX 2: PROBLEMS AND SOLUTIONS

If the UPS does not function normally, the installation, cabling or commissioning may not have been carried out correctly. Check these aspects in particular. If no problems are found when checking these aspects, contact customer service and provide the following information:

- 1) UPS model, power of the USS and serial number.
- 2) Try to describe the defect in as much detail as possible, e.g. stating the indications on the LCD display, the status of the LEDs, etc.

Read the operating instructions carefully. This can be very helpful for the correct use of this UPS. Here are some FAQs that can help you to resolve the problem quickly.

No.	PROBLEM	POSSIBLE REASON	SOLUTION
1	The power supply is available, but the UPS cannot be switched on.	The power supply at the input is not connected; low input voltage; the switch at the input of the UPS is not closed.	Measure whether the voltage/frequency at the input of the UPS is within the permissible limit values. Check whether all switches at the input of the UPS are closed.
2	Power grid normal, but the power grid LED does not switch on and the UPS is in battery mode.	The switch at the input of the UPS is not closed; the supply cable at the input is not connected.	Close the switch on the input; make sure that the supply cable is correctly connected to the input.
3	The UPS does not indicate a fault, but there is no voltage at the output.	The output cable is not connected correctly. The switch on the output is not closed.	Make sure that the output cable is connected correctly. Close the output switch.
4	The power supply LED flashes.	The voltage at the input of the UPS exceeds the permissible values.	If the UPS is in battery mode, check the remaining operating time of the UPS.
5	The battery LED flashes, but the batteries are not charged.	The battery switch is not closed, the batteries are damaged, the battery is connected the wrong way round or the number and capacity of the battery have not been entered correctly.	Close the battery switch. If the batteries are damaged, all batteries must be replaced. Connect the battery cables correctly. Go to the LCD display settings and enter the correct data for the number and capacity of the battery.
6	The buzzer sounds every 0.5 seconds and "Overload output" appears on the LCD display".	Overload	Remove some load
7	The buzzer sounds for a long time and the defect code "29" appears on the LCD display.	There is a short circuit on the UPS.	Make sure that there is no short circuit on the load, then restart the UPS.
8	The UPS only works in bypass mode.	The UPS is set to ECO mode or the times for switching to bypass mode are limited.	Enter the operating mode of the UPS as a single UPS (not connected in parallel) or reset the changeover times to bypass or restart the UPS.
9	The UPS does not start in "cold start" mode.	The battery switch is not closed correctly. The battery fuse is open. The batteries are discharged. The number of batteries has not been set correctly. The circuit breaker on the rear panel is not closed.	Close the battery switch. Replace the fuse. Charge the battery. Switch on the UPS in normal mode to enter the number of batteries or the capacity. Close the circuit breaker.
10	The buzzer does not stop sounding and the LCD display shows the error codes 1, 3, 5, 9, 15, etc.	The UPS is defective.	Contact customer service for repair.

APPENDIX 3: DEFINITION OF THE USB COMMUNICATION PORTS

Portdefinition: Connection between the USB port of the PC and the USB port of the UPS.

USB-PORT PC	USB-PORT UPS	SIGNAL DESCRIPTION
Pin 1	Pin 1	PC: +5V
Pin 2	Pin 2	PC: Signal DPLUS
Pin 3	Pin 3	PC: Signal DMINUS
Pin 4	Pin 4	Grounding

UPS functions available

- ◆ Monitoring the voltages and currents of the UPS.
- ◆ Monitoring and information on UPS alarms.
- ◆ Monitoring the operating parameters of the UPS.
- ◆ Setting automatic switching on/off of the UPS.

Communicationparameter:

Transmission speed	9600 bps
Byte-Length	8 Bit
Stopp-Bit	1 Bit
Parity check	None

ATTENTION!

The USB, RS232 and RS485 ports cannot be used simultaneously.

APPENDIX 4: DEFINITION OF THE RS232 COMMUNICATION PORTS

Port definition: Connection between the RS232 port of the PC and the RS232 port of the UPS

PORT RS232 PC	PORT RS232 UPS	SIGNAL DESCRIPTION
Pin 2	Pin 2	UPS sends - PC receives
Pin 3	Pin 3	PC sends - UPS receives
Pin 5	Pin 5	Grounding

Functions of the RS232 port available

- ◆ Monitoring the voltages and currents of the UPS.
- ◆ Monitoring and information on UPS alarms.
- ◆ Monitoring the operating parameters of the UPS.
- ◆ Setting automatic switching on/off of the UPS.

Communication parameters RS232:

Transmission speed	9600 bps
Byte-Length	8 Bit
Stopp-Bit	1 Bit
Parity check	none

ATTENTION!

The USB, RS232 and RS485 ports cannot be used simultaneously. Only one can be used at a time.

APPENDIX 5: DEFINITION OF THE RS485 COMMUNICATION PORTS

Port definition: Connection between the RS485 port of the communication device and the S485 port of the UPS.

DIRECTION (RJ45)	UPS (RJ45)	SIGNAL DESCRIPTION
Pin 1/5	Pin 1/5	485 + "A"
Pin 2/4	Pin 2/4	485 - "B"
Pin 7	Pin 7	+12Vdc
Pin 8	Pin 8	GND

RS485-Functions available

- ◆ Monitoring the voltages and currents of the UPS.
- ◆ Monitoring and information on UPS alarms.
- ◆ Monitoring the operating parameters of the UPS.
- ◆ Setting automatic switching on/off of the UPS.
- ◆ Monitoring the ambient temperature of the battery.
- ◆ Charging voltage modulated depending on the battery temperature.



ATTENTION!
The USB, RS232 and RS485 ports cannot be used simultaneously.

APPENDIX 6: DEFINITION OF COMMUNICATION PORT WITH VOLTAGE-FREE CONTACTS (with optocouplers)

Definition of the plug - instructions:

UPS	SIGNAL	STATUS
Pin 1	Low battery charge	Closer
Pin 2	No source	Closer
Pin 3	Switch off UPS	Closer
Pin 4	Common grounding	Closer

Functional description:

- ◆ Monitoring UPS status
- ◆ Monitoring the status of the UPS battery
- ◆ Switch off UPS

Vdc	I
0-25V (max)	6 mA (max)

ANNEX 7: REPO INSTRUCTIONS

Definition of the port and connection diagram: Connection between the button and the REPO port of the UPS.

BUTTON	REPO UPS	SIGNAL DESCRIPTION
Pin 1	Pin 1	EPO
Pin 2	Pin 2	GND

- ◆ A remote switch for switching off the UPS in an emergency (voltage-free contact and "normally open contact" - not included) can be installed in a remote position and simply connected to the REPO connector with wires.
- ◆ The remote switch can be connected to many UPSs in a parallel configuration so that the operator can switch off all devices simultaneously.

APPENDIX 8: ACCESSORIES

Check whether the following accessories are present:

TYP	SWB System 10 - 240
Operating instructions	●
Software MUSER4000 (CD)	○
USB-cabel	●
EPO-Connector	●

● vorhanden

○ optional



Download Software MUSER

<https://www.thiele-kg.de/downloads.html>

oder QR-Code scannen



Video Battery replacement

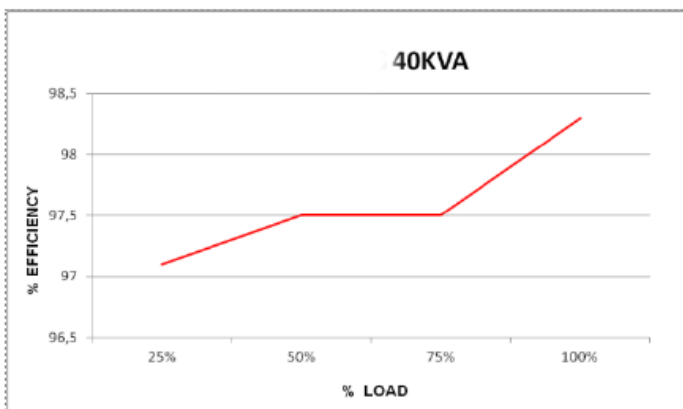
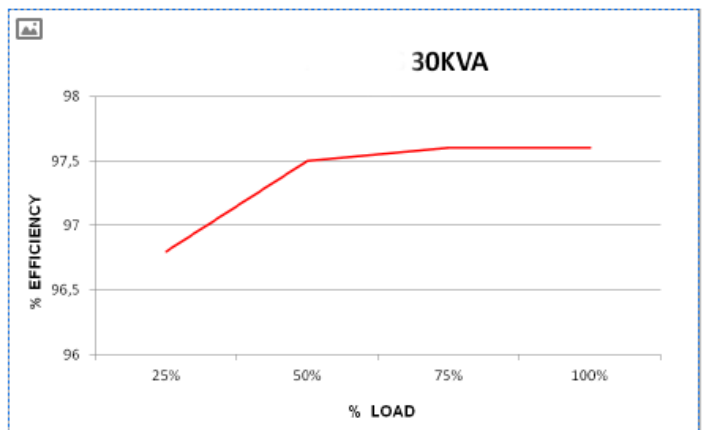
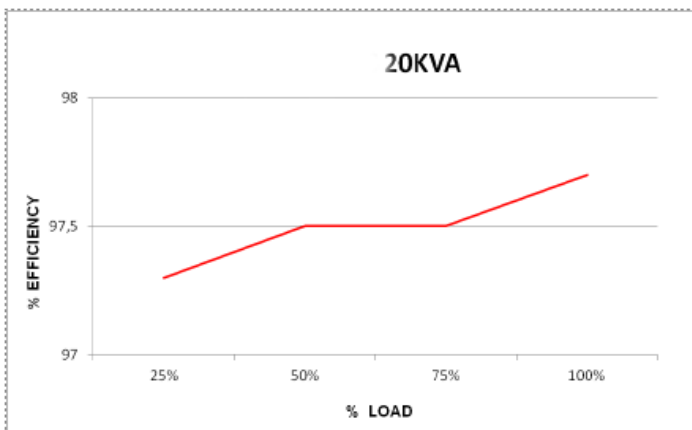
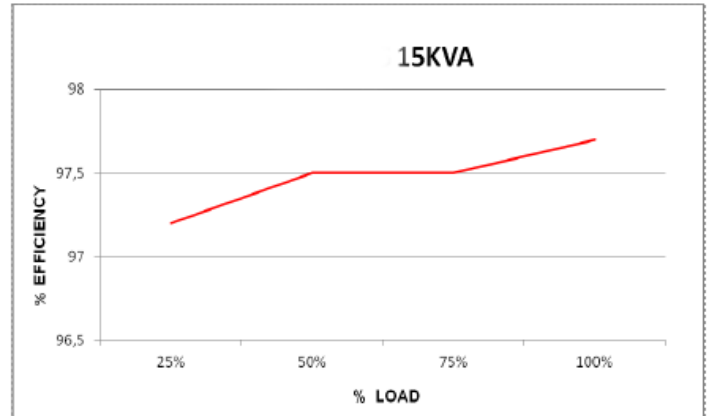
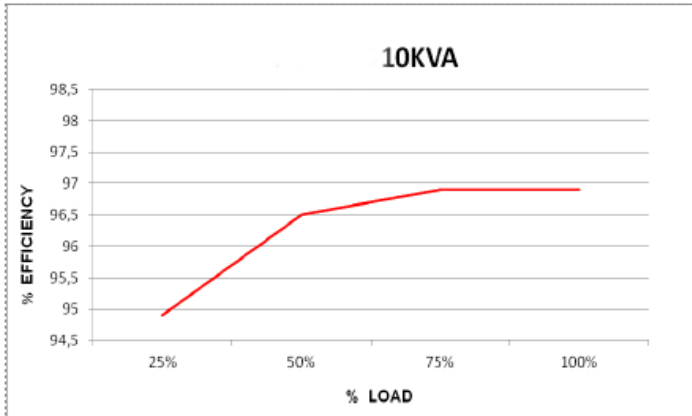
<https://www.thiele-kg.de/downloads.html>

oder QR-Code scannen

APPENDIX 9: EFFICIENCY TABLE

Unten Tabelle und Grafiken der Wirkungsgradaten:

Model	Load	30kVA	40kVA
	25%	96,8	97,1
	50%	97,5	97,5
	75%	97,6	97,5
	100%	97,6	98,3



USV-Anlagen

Minimieren Sie Ausfallrisiken mit zuverlässigen USV-Systemen.

#VERSORGTBESSER

Stromversorgungen

Versorgen Sie Ihre Verbaucher mit der exakt passenden Spannung.

#WECHSELTBESSER

Netzersatzanlagen

Ihre sichere Stromversorgung bei Blackout mit Notstromsystemen.

#ERSETZTBESSER

Energiespeicherung

Schalten und trennen Sie Ihre Lasten stabil und sicher.

#SPEICHERTBESSER

Schaltung & Schutz

Schalten und trennen Sie Ihre Lasten stabil und sicher.

#SCHALTETBESSER

Prüftechnik

Simulieren, analysieren und prüfen Sie mit verlässlichen Komponenten.

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Service & Support

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Vorderer Weinberg 26
DE - 71522 Backnang

Tel.: +49 (0) 71 91 35 60 - 0
Fax: +49 (0) 71 91 35 60 - 19

E-Mail: info@thiele-kg.de
Internet: www.thiele-kg.de