

User Manual

Rittal PMC UPS 6kVA

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Contents

1. Introduction	29
2. Safety Instructions	30
3. Indicators and Operating Controls	33
3.1 Front Panel	33
3.2 Back Panel.....	35
4. Installation and Start Up	36
4.2 Permanently connected unit RITTAL PMC UPS 6KVA	36
4.3 Battery extension.....	40
5. Troubleshooting	42
6. Maintenance	45
6.1 Operation.....	45
6.2 Storage.....	45
7. Technical data	46
7.1 Electrical specifications.....	46
7.2 Typical stored energy time (Battery mode).....	47
7.3 Dimensions and weights.....	47
7.4 Operating environment.....	47
7.5 Port connectors.....	48
7.5.1 RS232 interface	48
7.5.2 Relay interface (Option).....	48
8. Appendix	26

List of Figures

Figure 1: Operating and display panel.....	33
Figure 2: Slide buttons to select output voltage.	35
Figure 3: Attaching the stabiliser to RITTAL PMC UPS 6KVA.....	37
Figure 4: Connection diagram for RITTAL PMC UPS 6KVA	38
Figure 5: Connection of battery extensions to RITTAL PMC UPS 6kVA	40
Figure 6: Circuit diagram of relay interface	49
Figure 7: Front and back view of RITTAL PMC UPS 6KVA	51
Figure 8: Back view of battery extension for RITTAL PMC UPS 6KVA	52

1. Introduction

The Rittal PMC UPS 6kVA Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for Novell, Windows NT and UNIX servers.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sinusoidal AC voltage which permanently supplies the loads.

Computers and periphery are thus powered entirely independently of the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter. This means an end to the switchover times from mains to battery operation which cannot be avoided on other systems.

2. Safety Instructions

PLEASE READ THROUGH AND FOLLOW THE USER MANUAL AND THE SAFETY INSTRUCTIONS BEFORE INSTALLING THE UNIT AND STARTING IT UP!

Transport

- Please transport the UPS system only in the original packaging (to protect against shock and impact).

Set-up

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow an acclimatisation time of at least two hours.
- Do not install the UPS system near water or in damp environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heat.
- Do not block off ventilation openings in the UPS system's housing.

Installation

- Please note the special installation aspects for the permanently connected units Rittal PMC UPS 6kVA in Chapter 4 „Installation and Start Up“.
- The building wiring socket outlet (shockproof socket outlet) must be easily accessible and close to the UPS system.

- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- Do not connect appliances or items of equipment which would overload the UPS system (e.g. laser printers) to the UPS outlet socket.
- Place cables in such a way that no one can step on or trip over them.

Operation

- Do not disconnect the mains cable on the UPS system or the building wiring socket outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets may be electrically live even if the UPS system is not connected to the building wiring socket outlet.
- In order to fully disconnect the UPS system, first press the Standby switch then disconnect the mains lead or, on the permanently connected unit Rittal PMC UPS 6kVA, isolate the incoming feeder.
- Ensure that no fluids or other foreign objects can enter the UPS system.

Maintenance, servicing and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.

- **Caution** - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket outlet), components inside the UPS system are still connected to the battery and are still electrically live and dangerous. Before carrying out any kind of servicing and/or maintenance, disconnect the batteries and verify that no current is present.
- Only persons adequately familiar with batteries and with the required precautionary measures may exchange batteries and supervise operations. Unauthorised persons must be kept well away from the batteries.
- **Caution** - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - remove wristwatches, rings and other metal objects
 - use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

3. Indicators and Operating Controls

3.1 Front Panel

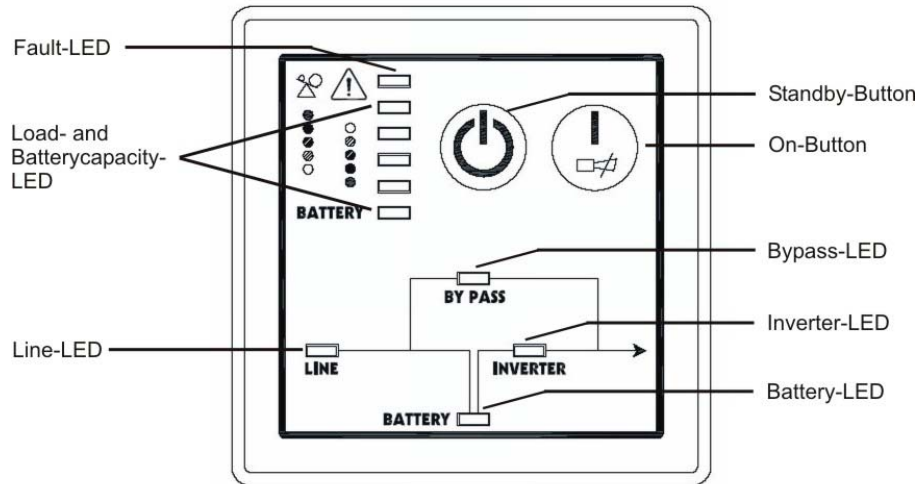


Figure 1: Operating and display panel

<i>Switch</i>	<i>Function</i>
ON - Switch	<ol style="list-style-type: none"> 1. Turn on UPS system: By pressing the ON-Switch „I“ the UPS system is turned on. 2. Deactivate acoustic alarm: By pressing this switch an acoustic alarm can be deactivated.

Standby-Switch	The UPS system switches to Standby mode when the Standby button „⏻“ is pressed. It is then switched to Bypass and the inverter is off. The output sockets are supplied with voltage via the bypass if the mains power supply is available.
<i>Display</i>	<i>Function</i>
LINE LED	<ol style="list-style-type: none"> 1. The green LINE LED lights up if mains voltage is applied to the UPS input. 2. LINE_LED blinks when the phase and neutral conductor have been reversed at the input of the UPS system. 3. If LINE-LED and BATTERY-LED light up, the mains power supply is out of tolerance.
BATTERY-LED	The orange-coloured BATTERY-LED lights up when the mains power supply has failed and the inverter is being powered by the batteries.
BYPASS-LED	The orange-coloured BYPASS LED lights up when the UPS system is supplying voltage provided by the mains power supply system via the bypass.
INVERTER-LED	The green INVERTER LED lights up if the inverter of the UPS is operating and supplying the UPS output with energy.
FAULT-LED	<p>The red FAULT-LED lights up and an acoustic warning signal is issued every second when the UPS is overloaded (load exceeds the maximum power of the UPS).</p> <p>The red FAULT LED lights up and an acoustic warning signal is issued when the UPS system is in fault condition. Press the Standby switch in order to turn off the warning tone.</p>

<p>Load and battery capacity LED</p>	<p>1. These LEDs signal the UPS system load if the mains power is available (normal operation):</p> <p style="padding-left: 40px;">1st LED 1-35 % 2nd LED 35-55 % 3rd LED 55-75 % 4th LED 75-95 % 5th LED 95-100 %.</p> <p>2. In the case of battery operation, the LEDs indicate the capacity of the batteries:</p> <p style="padding-left: 40px;">1st LED 1-35 % 2nd LED 35-55 % 3rd LED 55-75 % 4th LED 75-95 % 5th LED 95-100 %.</p>
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3.2 Back Panel

Slide buttons on the back panel allow selection of the outgoing voltage of the UPS system. This can be changed only when the UPS system is switched off.

2 1



2	1	
↑	↓	208
↑	↑	220
↓	↓	230
↓	↑	240

Figure 2: Slide buttons to select output voltage.

4. Installation and Start Up

4.1 Permanently connected unit RITTAL PMC UPS 6kVA

The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations!

When installing the electrical wiring, please note the nominal amperage of your incoming feeder. UPS \geq 6000 VA are not suitable for 16 A sub-distribution boards!

- 1) Inspect the packaging carton and its contents for damage. Please inform the transport agency immediately should you find signs of damage.
Please keep the packaging in a safe place for future use.
- 2) Fit the supplied stabiliser, as shown in the illustration below, before installation:

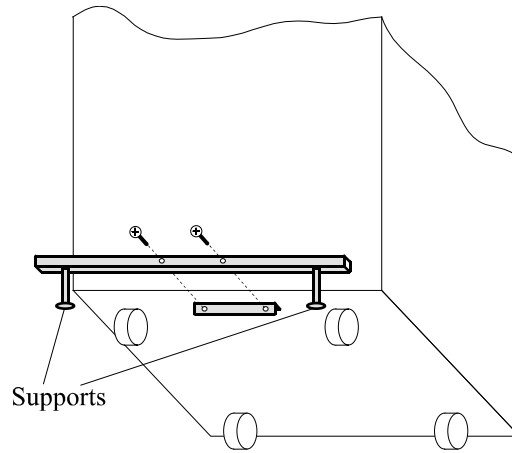


Figure 3: Attaching the stabiliser to RITTAL PMC UPS 6KVA.

The supports must be unscrewed adequately on both sides so that the castors are not contacting the ground!

- 3) Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again. Set the I/P and the O/P switch on the back panel to position „OFF“.
- 4) Connect the UPS system to the mains at the screw terminals as shown in the diagram below:

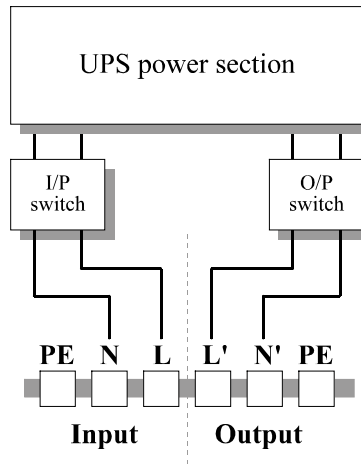


Figure 4: Connection diagram for RITTAL PMC UPS 6KVA

- 5) Connect your computer to the screw-type terminals of the UPS system as shown in the above diagram.

Caution!
Do not connect equipment which would overload the UPS system (e.g. laser printers). Do not connect domestic appliances to the UPS system.

- 6) Set the I/P switch on the back panel to position „ON“.

Note:

Load capacity LEDs first light up simultaneously, then one after the other. After a few seconds the INVERTER-LED lights up and the BYPASS-LED turns off.

- 7) Fully charge the batteries of the UPS system by leaving the UPS system connected to the mains for 1-2 hours. You can also use the

UPS system directly without charging it but the stored energy time may then be shorter than the nominal value specified.

8) Set the O/P switch on the back panel to position „ON“.

9) Press the On button „I“ on the front panel.

Note:

The INVERTER LED lights up after 10 seconds. The BYPASS LED then goes out and the ventilation system switches on. The UPS system is now operating correctly.

10) Test the function of the UPS system by either pressing the On button „I“ or disconnecting the input of the UPS system from the power supply.

Caution!

The output sockets of the UPS system may still be electrically live even if the power supply system has been disconnected or if the I/P switch is in position OFF.

4.2 Battery extension

External battery extensions are available for the UPS model. In order to connect them to the UPS system, proceed as shown below:

1. Disconnect the UPS system from the mains power supply and the load from the UPS system.
2. Connect the battery extensions to the UPS system with the included cables according to the following instructions:

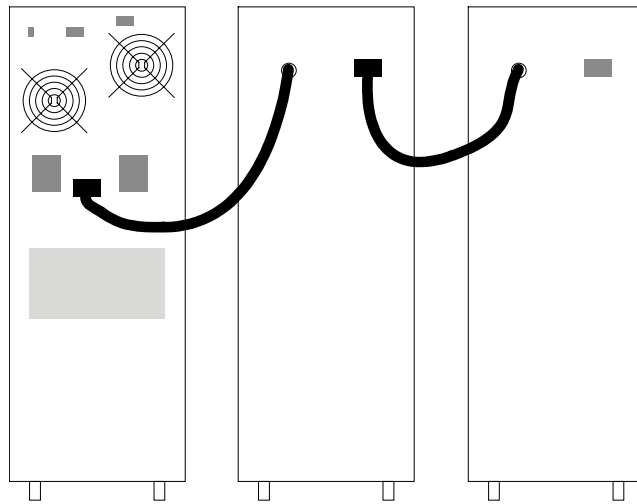


Figure 5: Connection of battery extensions to RITTAL PMC UPS 6KVA.

3. The UPS system can now operate normally.

Note:

Operating the system with external battery extensions prolongs charging to 24 hours with one battery extension and to 48 hours with two battery extensions after total discharge.

5. Troubleshooting

If the UPS system does not operate correctly, please attempt to solve the problem using the table below.

<i>Problem</i>	<i>Possible cause</i>	<i>Remedy</i>
No indication, no warning tone even though system is connected to mains power supply	No input voltage	Check building wiring socket outlet, check input cable
	I/P switch has been disconnected	Set the I/P switch to „ON“
BATTERY-LED blinks	Battery voltage < 12VDC per unit.	When battery voltage > 12VDC per unit then clear warning signal.
LINE-LED blinks and BATTERY-LED lights up	Input power and/or frequency are out of tolerance	Check input power source and inform dealer if necessary
LINE-LED and BYPASS-LED light up even though the power supply is available	Inverter not switched on	Press On button “I”

INVERTER-LED lights up, warning tone at intervals (every 1 or 4 seconds)	Mains power supply has failed	Not necessary, battery operation; warning tone at intervals of 1 second means battery is almost empty
INVERTER-LED lights up, warning tone in intervals (1 to 4 seconds), mains power supply available	I/P switch disconnected	Set the I/P switch to „ON“. If the problem persists, please inform your dealer.
FAULT-LED lights up, warning tone once a second	Overload	Reduce number of users at UPS output
FAULT-LED lights up, permanent warning tone	UPS-mistake	Notify dealer!!
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defective	Charge the batteries for at least 1 - 2 hours. Check capacity. If the problem still persists, consult your dealer.

Please have the following information at hand before calling the After-Sales Service Department:

1. Model number, serial number
2. Date on which the problem occurred
3. Detailed description of the problem

6. Maintenance

6.1 Operation

The UPS system contains no user-serviceable parts.

If the battery service life (3 - 5 years at 25 °C ambient temperature) has been exceeded, the batteries must be exchanged. In this case please contact your dealer.

6.2 Storage

If the batteries are to be stored in temperate climatic zones, they should be charged every three months for 1-2 hours (see Chapter "Installation and Start Up"). You should shorten the charging intervals to two months at locations subject to high temperatures.

7. Technical data

7.1 Electrical specifications

Model number	6kVA
INPUT	
Voltage	230 VAC (160 – 276 VAC) \pm 3%
Frequency	50/60 Hz \pm 5 % automatic detection
Current (maximum)	29,6 A
OUTPUT	
Power rating	6000VA 4200 W
Voltage	220/230/240 VAC \pm 0,5% (synchronized)
Frequency	50/60 Hz \pm 0,5 % (free-wheeling)
Wave form	Sinusoidal
BATTERIES	
Number and type	20 x12V 7Ah

The units bear the CE mark and comply with the following standards

(limit value class B):

EN 60950 (1992.8),

EN 50091-1 (1994.4),

prEN 50091-3 (1994.4),

EN 50081-1 (1992.2),

EN 50082-1 (1992.2),

IEC 801-2 Level 4,

IEC 801-3 Level 3,

IEC 801-4 Level 4,

IEC 801-5 Level 2.

7.2 Typical stored energy time (Battery mode)

Typical values at 25°C in minutes:

<i>Model</i>	<i>100 % Load</i>	<i>50 % Load</i>
RITTAL PMC UPS 6KVA	8	23
RITTAL PMC UPS 6KVA + 1 battery extension	38	88
RITTAL PMC UPS 6KVA + 2 battery extensions	60	141

7.3 Dimensions and weights

<i>Model</i>	<i>Dimensions W x H x D (mm)</i>	<i>Net Weight, kg</i>	<i>Gross Weight, kg</i>
RITTAL PMC UPS 6KVA	260 x 710 x 555	91	107
Battery extension for RITTAL PMC UPS 6KVA	260 x 710 x 555	125	145

7.4 Operating environment

Temperature: 10 °C to 40 °C, Installation height < 1500 m
0 °C to 35 °C, Installation height 1500 m to
3000 m
Relative humidity: 20 to 90 %, no condensation

7.5 Port connectors

A computer can be connected to the port connectors RS232 interface on the back panel of the UPS system. This allows

- the UPS system to be monitored,
- the mains system to be monitored,
- data to be backed up,
- the computer to be switched off and
- the UPS system to be switched off.

There are various software packages for implementing these functions. Please consult your dealer for further details.

7.5.1 RS232 interface

The 9-pin Sub-D connector (socket) makes an RS232 interface available.

Description of the PIN assignment:

Pin		
2	RXD	received data
3	TXD	transmitted data
5	GND	ground

7.5.2 Relay interface (Option)

The 9-pin Sub-D connector (socket) makes a relay interface available.

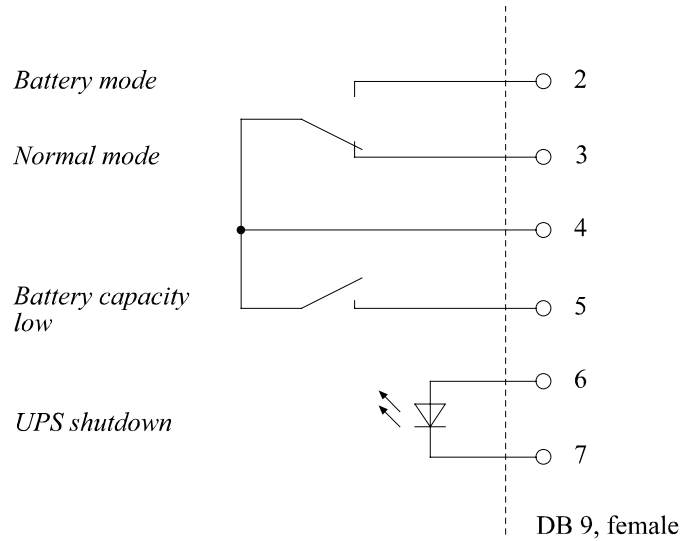


Figure 6: Circuit diagram of relay interface

Description of the PIN assignment:

	Pin No.		
Battery mode	2	normally open	PIN 2 is shorted to PIN 4 (ground) if the mains power supply fails or is out of tolerance.
UPS shut-down in case of battery operation	6, 7		If, in the case of battery operation, a positive signal level (+5 V to + 12 VDC) is applied for 500 ms, the UPS system shuts down.
Battery capacity low	5	normally open	PIN 5 is shorted with respect to PIN 4 if batteries have become discharged to such

			an extent that the remaining emergency supply period at full load is less than 2 minutes.
Normal mode	3	normally closed	PIN 3 is shorted to PIN 4 during normal operation and opened, if the mains power supply fails or is out of tolerance

8. Appendix

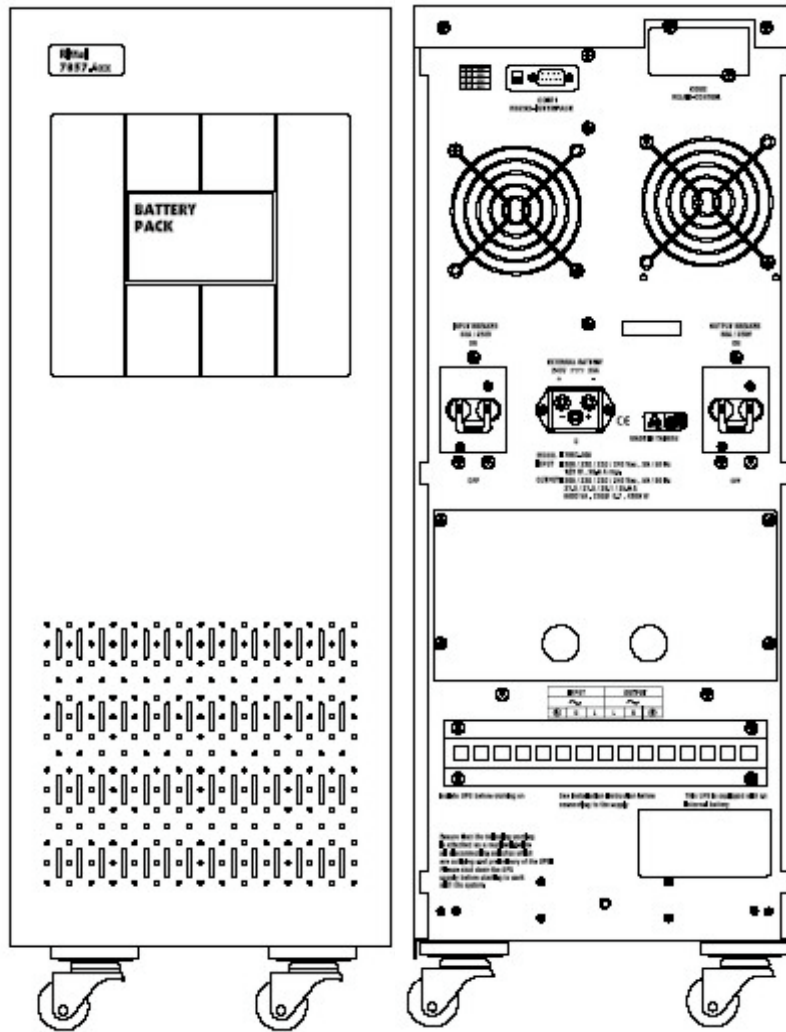


Figure 7: Front and back view of RITTAL PMC UPS 6KVA

