RSV RUHSTRAT
STROMVERSORGUNGEN

PRODUCT INFORMATION

R-BSV Ultimate Kombi

BATTERY BACKUP CENTRAL POWER SUPPLY SYSTEM

BSV according to DIN VDE 0100-710 / DIN VDE 0558-507 for:

- surgical lights (24 V)
- A/C powered devices (230 V) and Schuko sockets
- space-saving and easy to use
- uninterrupted power supply

Specifically for medical practices and medical care centers

Expert Advice You Can Trust

RSV RUHSTRAT STROMVERSORGUNGEN GMBH:
A MODERN, MEDIUM-SIZED COMPANY WITH A LONG-STANDING TRADITION.

Since our foundation in 1888, our high-quality products in the fields of electrical engineering and plant engineering have established themselves internationally.

We can look back on over 90 years of experience in the field of 'emergency power supply'. As early as 1916, Ruhstrat built the first emergency lighting system for public assembly venues. As a specialist supplier of battery-backed power supplies, we specialise not only in modern safety lighting systems but also in DC power supplies, battery-backed central power supply systems (BSV – previously ZSV) and uninterruptible power supplies (UPS). Ruhstrat's BSV/ZSV systems are used for surgical lighting and life-supporting medical equipment in hospitals. Our UPS systems ensure a reliable power supply in industrial facilities and computer networks.

As a provider of complete solutions, we assist with everything from planning through to installation. We supply everything from a single source, ensure replacements are provided at the earliest opportunity and, on request, undertake the maintenance of the systems. We are happy to meet customer requirements and the most challenging technical specifications on an individual basis. A wide range of standards and regulations, which are interlinked by cross-references, apply to the installation, maintenance and condition of emergency lighting systems. This applies to both lighting and electrical engineering aspects. Many German standards and regulations that have proven their worth in practice have been replaced by European ones in recent years or are currently being revised.

The most important installation regulations for emergency lighting systems with regard to electrical requirements are DIN EN 50172 (VDE 0108-100), draft DIN VDE 0108-100 and DIN VDE 0100-718. These electrical regulations are supplemented by a set of photometric parameters, described in the standards DIN EN 1838 and DIN 4844 (or ISO 3864). The regulations in accordance with EN 60598 Part 1 and EN 60598 Part 2-22 contain the general requirements for luminaires as well as the regulations for luminaires used in emergency lighting. They are authoritative for the manufacturer with regard to the electrical, thermal and mechanical safety of the luminaires.

Product Overview

Emergency lighting systems and central power supply systems

Battery backup central power supply systems (BSV)
according to DIN VDE 0100-710 / VDE 0558-507

Decentralized power supply systems
with limited power capacity

DC power supply
for stationary battery systems

Emergency exit signs and safety lights for

- Central battery systems
- Single-battery systems

Uninterruptible Power Supply (UPS) Systems

R-BSV Ultimate Kombi

BATTERY BACKUP CENTRAL POWER SUPPLY SYSTEM

Safety Power Supply

A reliable power supply can be a matter of life and death—especially in medical offices, the same level of safety must be ensured as in hospitals if the same medical tasks are to be performed.

Vital medical equipment must continue to operate even in the event of a power outage. This requirement is specified in both DIN VDE 0100-710 and the "Agreement on Quality Assurance Measures for Outpatient Surgery pursuant to Section 14 of the Contract under Section 115b(1) of the German Social Code, Book V (SGB V)."

RSV Ruhstrat offers battery-backed backup power supplies from the R-BSV series specifically designed to meet the needs of medical practices and medical care centers.

These are characterized by the following features:

- Compatible with all standard surgical lights
- space-saving design
- easy operation
- Minimal maintenance requirements, thanks to a modular system design, continuous monitoring, and protective functions
- reliable and powerful
- tailored product range
- low power dissipation
- Remote support via TeamViewer is available
- Modbus-protocol

R-BSV Ultimate Kombi

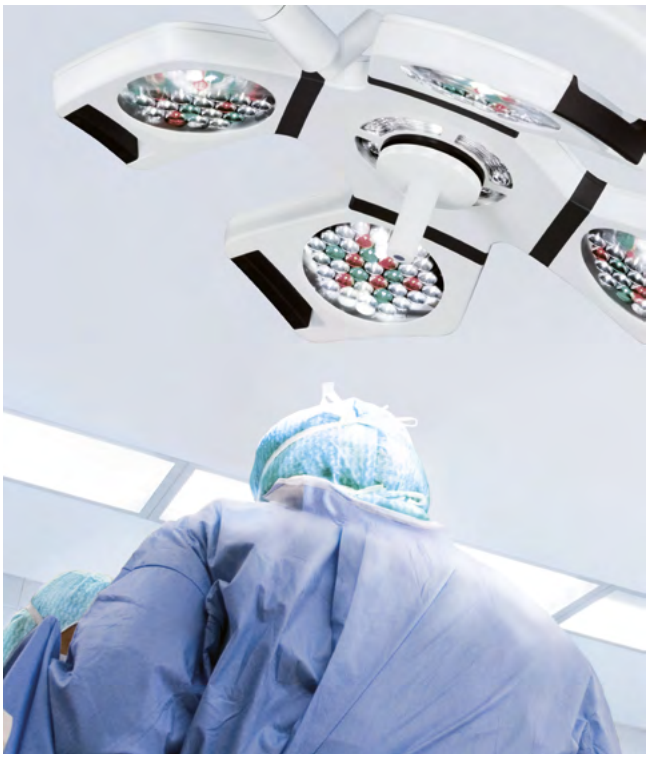
The R-BSV Ultimate Kombi meets the requirements of the standards DIN VDE 0100-710 / DIN VDE 0558-507 and DIN VDE 0510 Part 2, which also apply to medical practices, as UPS systems intended for use in IT environments must under no circumstances be used in medical settings. R-BSV-Ultimate Kombi for surgical lights (24 V) and outlets (230 V) in the operating room area (rooms in Application Class 2).

General Information

Surgical lights compliant with DIN EN 60601-2-41 (VDE 0750 Part 2-41) and other essential lights must be capable of continuing to operate automatically from an additional safety power supply with a switchover time of up to 0.5 seconds, in addition to the safety power supply specified in 710.564.3. R-BSV generally operates without interruption, thereby offering the highest level of safety during surgery and even exceeding the requirements of the standard. The connected outlets are stably supplied with a voltage of 230 V / 50 Hz. Both the 230 V loads and the 24 V surgical lights are galvanically isolated from the mains. This ensures that the required IT network is implemented for each area, and each area is equipped with an isolation monitor.

The R-BSV Ultimate Combination Systems generally operate in standby parallel mode. Due to this operating mode, the R-BSV Ultimate Combination System provides an uninterruptible power supply. The DC load is powered either via the rectifier from the utility grid or, in the absence of the utility grid, from the battery.

The power supply unit is designed to cover both the load current and the battery charging current. The operating voltage for the highly sensitive halogen or LED lamps is 24 volts and is maintained with an accuracy of 1%. This results in optimal illumination and a long service life for the connected surgical lights.



Design of the R-BSV Ultimate Kombi

The R-BSV Ultimate hybrid systems consist of a rectifier, an inverter, a static bypass, and the battery bank. The inverter converts the DC voltage supplied by the rectifier or the battery into a regulated sinusoidal AC voltage. This meets all the requirements of modern medical devices in terms of waveform, voltage stability, and frequency stability.

The rectifiers in our systems are generously dimensioned so that the batteries are recharged within the prescribed time of 6 hours, even while supplying all loads simultaneously. The rectifier is equipped with the monitoring, display, and control elements required by DIN VDE 0100-710.

R-BSV Ultimate Kombi

The 24-V DC output can be adjusted between 23 V and 29 V. This allows for compensation of power losses. Dimming of the circuit from the OP via buttons is available as an optional.

Charging Device

In the R-BSV Ultimate Combi System, the charger operates with an IU characteristic curve in accordance with DIN 41773. This design compensates for mains voltage fluctuations of 10% and frequency variations of 4%. The output voltage is thus maintained at a constant 1%. The charging/float voltage ensures that the battery is always kept fully charged and does not suffer any damage. The charging system is designed so that the amount of current drawn is recharged within six (6) hours.

Monitoring and Test System

The electronic monitoring and testing system records all measured values, such as battery voltage or charge/discharge current. The battery test displays the energy consumed in Ah. This allows the battery's state of aging to be accurately determined. Operating and fault messages are displayed on the clearly laid-out touchscreen on the front panel. Signal contacts for forwarding are routed to terminals. Faults are recorded in the event log as initial reports and displayed on the screen. The event log stores all messages for a period of well over four years.

Automatic Bypass Circuit of the Inverter

The output voltage is continuously monitored during operation. If a fault occurs, the system immediately switches to bypass mode. The corresponding message appears on the display. At the same time, a potential-free signal is triggered by the signaling system. Any deviation is reported as soon as it occurs. In conjunction with the signaling and testing system, this fault is also logged. A manual bypass circuit is also included, which can be activated manually.

Anzeigen

- Digital display of battery voltage, device current, charging current, and load current
- Touchscreen display with operating messages and fault indications in plain text
- Digital displays for load circuits – current and voltage
- Display for operating and fault messages

The systems are housed in an optimized sheet steel floor-standing cabinet with an integrated battery compartment and are naturally ventilated.

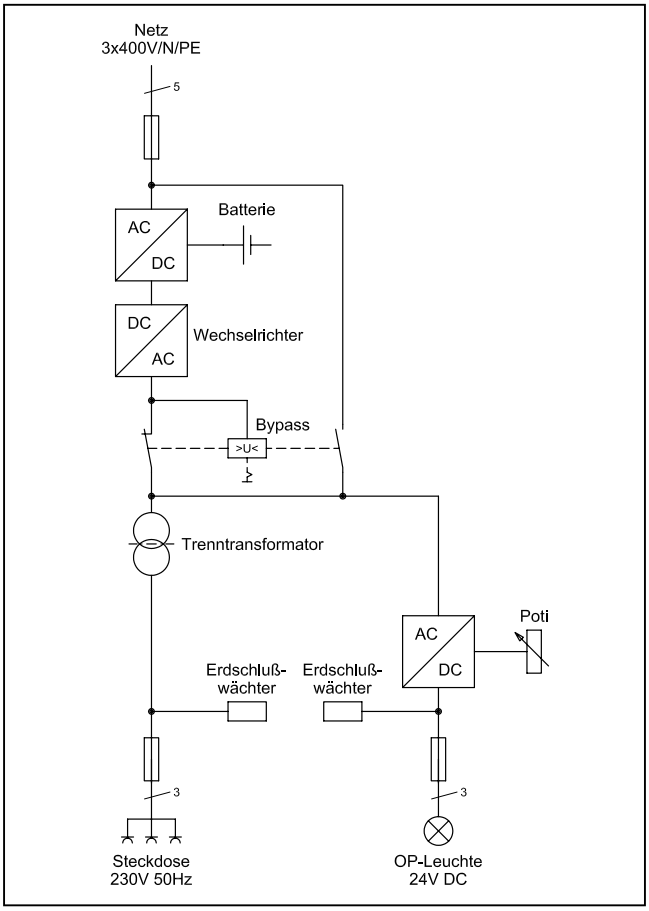
Battery

Due to the need to save space in medical care centers, Ruhstrat prefers the maintenance-free, sealed OPzV battery. According to Eurobat, the service life is 12–15 years. The battery has 1,200 discharge cycles in accordance with DIN VDE 0100 Part 710 and DIN VDE 0510 Part 2. The standard versions of the systems are each equipped with one 230 V / 50 Hz outlet and one 24 V DC (250 W) outlet. Variants are available.

Miscellaneous

The systems are suitable for connection to all standard operating room monitoring and switching devices. The same applies to the operating room panels. Upon request, the systems can be equipped with signal converters. To establish the IT network, transformers with very low magnetic interference fields are used. This ensures there is no risk to medical devices. Encapsulating the wound toroidal isolation transformer in casting resin enables the higher protection class (IP54) required by the standard.

The transformers feature reinforced insulation and a static shielding winding, as well as temperature monitors. The inrush current is 1×IN.



Technical Data

Feature	R-BSV Ultimate-Kombi 1,5/1	R-BSV Ultimate-Kombi 1,5/3	R-BSV Ultimate-Kombi 2,5/1	R-BSV Ultimate-Kombi 2,5/3
Indication	1,5 kVA	1,5 kVA	2,5 kVA	2,5 kVA
Rated Power	3 × 400 V / N / PE	3 × 400 V / N / PE	3 × 400 V / N / PE	3 × 400 V / N / PE
Mains Supply Voltage	3 × 20 A	3 × 20 A	3 × 25 A	3 × 25 A
Input Fuse	40 A	60 A	75 A	85 A
Rectifier Current	1 × 10 A	1 × 10 A	1 × 16 A	1 × 16 A
Output Fuse 230 V	1 × 10 A - 200 W	1 × 10 A - 200 W	1 × 10 A - 200 W	1 × 10 A - 200 W
Output Fuse 24 V	3,15 kVA	3,15 kVA	3,15 kVA	3,15 kVA
Isolation Transformer	1 h	3 h	1 h	3 h
Supply Time	24 V	24 V	24 V	24 V
Battery Voltage	50 Ah	100 Ah	150 Ah	200 Ah
Battery Capacity C10	yes	yes	yes	yes
Battery Type OPzV	800 x 2.000 x 600 mm	800 x 2.000 x 600 mm	800 x 2.000 x 600 mm	800 x 2.000 x 600 mm
Cabinet Dimensions (W×H×D)	600 x 2.000 x 600 mm	600 x 2.000 x 600 mm	600 x 2.000 x 600 mm	600 x 2.000 x 600 mm
Expansion Cabinet (W×H×D)	IP 21	IP 21	IP 21	IP 21
Degree of Protection	all the above	all the above	all the above	all the above
Cable Entry	RAL 7035	RAL 7035	RAL 7035	RAL 7035
Color	N	N	N	N
Electromagnetic Interference Level	300 kg	340 kg	420 kg	540 kg
Weight incl. Battery	0,5 m^3	1 m^3	1,5 m^3	2 m^3
Airflow Volume / h	14 cm^2	28 cm^2	42 cm^2	56 cm^2
Supply / Exhaust Air Opening	max. 30 A	max. 30 A	max. 30 A	max. 30 A
Inverter Short-Circuit Current	max. 35°C	max. 35°C	max. 35°C	max. 35°C
Ambient Temperature	yes	yes	yes	yes
Electrical Monitoring/Test System	yes	yes	yes	yes
Insulation Monitoring	yes/optional	yes/optional	yes/optional	yes/optional
Plain Text Message Display	yes/optional	yes/optional	yes/optional	yes/optional
Control Keypad	yes/optional	yes/optional	yes/optional	yes/optional
Event Memory	yes	yes	yes	yes
LED-Operating Display	yes	yes	yes	yes
Automatic Bypass	yes	yes	yes	yes
Manual Bypass	yes	yes	yes	yes
Timer Function	yes	yes	yes	yes
Automatic Capacity Test	yes	yes	yes	yes
Supply to External Panel	yes	yes	yes	yes
Control Contact for External Fan	yes	yes	yes	yes
Potential-Free Signals	optional	optional	optional	optional
Printer	optional	optional	optional	optional
Signal Converter	optional	optional	optional	optional
Dimmable Surgical Lighting	optional	optional	optional	optional
Additional Output 24 V	optional	optional	optional	optional
Additional Output 230 V	upon request	upon request	upon request	upon request
Other Specifications	optional	optional	optional	optional
ISO Fault Detection System	optional	optional	optional	optional

Other configurations are available upon request.

Notes

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Notes

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