2. Charging Unit

2.1 9A0100.11 UPS 24 VDC

Figure 2: UPS Charging Unit 9A0100.11

2.1.1 Technical Data

UPS 24 VDC	9A0100.11
Input during Mains Operation Rated Voltage Value Voltage Range	Regulated DC voltage 24 VDC 20 - 30 VDC at a switching threshold of 18 V [1)] 23.5 - 30 VDC at a switching threshold of 21.5 V [1)]
Output during Mains Operation Rated Voltage Value Voltage Range Max. Output Current	24 VDC 20 - 30 VDC or 23.5 - 30 VDC depending on the set switching threshold [1)] 8 A
Output during Battery Operation Switching Threshold Mains / Battery Operation [1)] Rated Voltage Value Voltage Range Max. Output Current Mains Failure Bridging	18 V at 20 - 30 VDC input 21,5 V at 23.5 - 30 VDC input 24 VDC 21 - 26,8 VDC (40 °C) or 28.2 VDC (0 °C) 8 A (load-side) max. 20 minutes with 150 W load (with battery 9A0100.12, 24 V / 7.2 Ah)
Battery Charging Rating Charging Clearing Voltage Charging Current	27,6 VDC Can be set from 0.88 A to 2.88 A adjustable in 0.01 A increments, depending on type: using B&R Configuration Software and HyperTerminal (0.5 - 2.88 A) or 0.25 A: using button (0.88 to 2.88 A)

Table 4: Technical Data 9A0100.11

UPS 24 VDC	9A0100.11
Protection and Monitoring	
Deep Discharge Protection	Yes; depending on the set switching threshold: 21 V when 18 V [1] or 21.5 V when 21.5 V [1]
Short-circuit Protection	Yes
Fuses	Yes; for mains supply, battery and battery charger [2]
Reverse Polarity Protection	Yes; for mains supply and battery
Status Display	
Operating Mode	LED green (mains operation, battery operation, etc.)
Status	LED yellow (overload, temperature alarm, etc.)
Battery Charging Current	LED yellow (charging current strength)
Battery Status	LED yellow (battery change, age, etc.)
Battery Reverse Polarity	LED red (battery reverse polarity, not connected)
Fuses	LED red (mains supply, battery, battery charger)
Interface	Serial, RS232
CTS (Clear To Send)	Signals power failure
DCD (Data Carrier Detect)	Signals shutdown
DTR (Data Terminal Ready)	Signals remote shutdown of the UPS
Standards	UL
Environmental Temperature	
Operation	0 - 55 °C
Storage	- 20 °C to +60 °C
Transport	- 20 °C to +60 °C
Humidity	
Operation	5 - 95 % (non-condensing)
Storage	5 - 95 % (non-condensing)
Transport	5 - 95 % (non-condensing)
Vibration	
Operation	max. 9 - 200 Hz and 1 G (9.8 m/s² 0-peak)
Storage	max. 2 - 500 Hz and 4 G (39.2 m/s² 0-peak)
Transport	max. 2 - 500 Hz and 4 G (39.2 m/s² 0-peak)
Shock	
Operation	max. 15 G (147 m/s² 0-peak) and 11 ms length
Storage	max. 100 G (980 m/s² 0-peak) and 6 ms length
Transport	max. 100 G (980 m/s² 0-peak) and 6 ms length
Software Support	Microsoft Windows 95 / 98 / ME / NT4.0 / 2000 / XP
Altitude	Max. 3000 meters above sea level
Dimensions (W x H x D)	185 x 115 x 69 mm (see also figure 3 "Dimensions 9A0100.11" on Page 20)
Weight	Approx. 1.2 kg
Mounting Instructions	see Chapter 3 "Installation" on Page 41

Table 4: Technical Data 9A0100.11 (cont.)

1) Can be set using B&R UPS Configuration Software or HyperTerminal (18 or 21.5 VDC).

2) The charging unit fuse is not necessary with Revision L0 and higher.

2.1.2 Dimensions

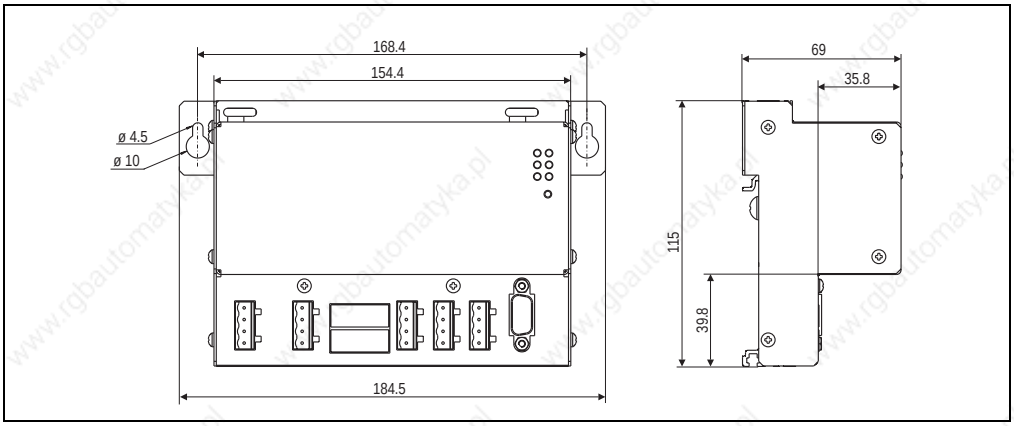


Figure 3: Dimensions 9A0100.11

2.1.3 Contents of Delivery

The following components are included in the delivery of the B&R UPS 24 VDC :

Amount	Component
1	UPS Charging Unit
5	orange connection plug (plugged in)

Table 5: Delivery 9A0100.11

2.1.4 Device Interfaces

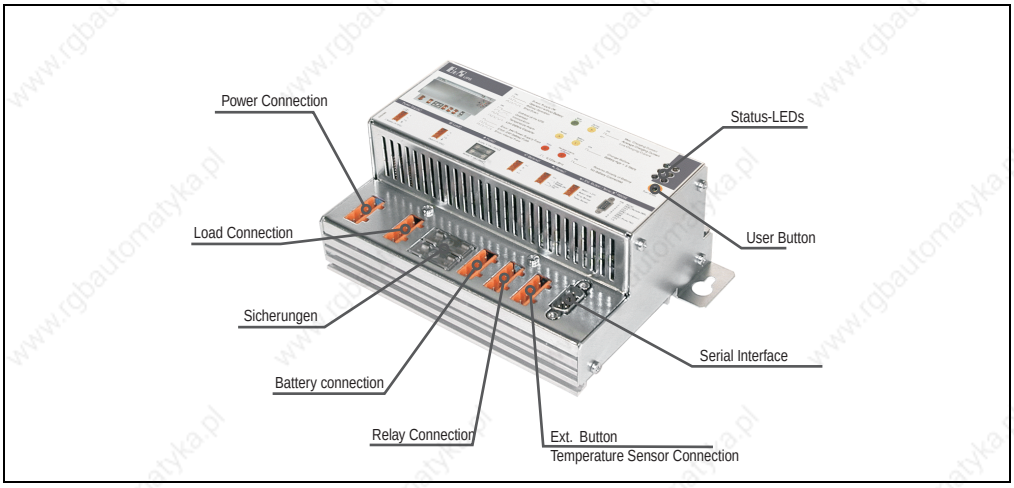


Figure 4: Device Interfaces 9A0100.11

Power mains connection

24 V mains supply connection. Regulated DC voltage, rated voltage value 24 VDC, voltage range according to the set switching threshold [1] when 18 V 20-30 VDC and when 21.5 V 23.5 - 30 VDC:

Power mains connection		
Pin	**Assignment**	
+	Input VDC +	
-	Input VDC -	
n.c.	Not connected	
⏚	Ground connection	

Table 6: Power mains connection

Correct pin assignments are also indicated on the UPS.

Warning!

Applying power over 30 VDC can damage the UPS! The UPS must be grounded using the ground connection provided.

1) Can be set using B&R UPS Configuration Software or HyperTerminal (18 or 21.5 VDC).

Load Connection

Load connection (e.g. B&R IPC with 24 VDC bus unit).

Power mains connection	
Pin	**Assignment**
+	Output VDC +
-	Output VDC -
n.c.	Not connected
⏚	Ground connection

Table 7: Load Connection

Correct pin assignments are also indicated on the UPS.

Warning!

The UPS must be connected with the load system ground connection, using the ground connection provided.

For mains operation:

Rated voltage value 24 VDC, voltage range is dependent on the set switching threshold [1)] 18 V: 20-30 VDC, 21.5 V: 23,5-30 VDC; maximum output current: 8 A

For battery operation:

Rated voltage value 24 VDC, voltage range 21 -26.8 VDC (40 °C) or 28.2 VDC (0 °C); maximum output current: 8 A

1) Can be set using B&R UPS Configuration Software or HyperTerminal (18 or 21.5 VDC).

Fuses

The two replaceable fuses on the front side of the device protect the power mains input and the battery connection from over-current, reverse polarity (using a diode which is controlled by the firmware to make a connection when the polarity is correct) and short circuits (using a fuse and firmware).

Type: Glass tube fuses 5 x 20 mm: T 10 A / 250 V

Fuses		
Network	10 A / 250 V	
Battery	10 A / 250 V	

Table 8: Fuses

Battery Connection

The battery units are connected using the cable included in delivery, using the red (+) and black (-) leads of the battery cable.

Battery Connection		
Pin	**Assignment**	
n.c.	Not connected	
+	Battery + Pin	
-	Battery - Pin	
n.c.	Not connected	

Table 9: Battery Connection

Correct pin assignments are also indicated on the UPS.

Warning!

Disconnecting the battery and reconnecting it with reversed polarity within one minute can damage the UPS!

Relay Output

A power failure is also signalled immediately by the UPS by setting a relay output. An external electrical circuit can be switched (closed or opened) using the relay output.

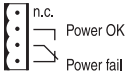
Relay output		
Pin	**Assignment**	
n.c.	Not connected	
Power OK Power fail	Relay output	

Table 10: Relay output

For relay output contact data, see Section "Relay Output", on Page 115.

External Button, Temperature Sensor Connection

The temperature sensor for the battery unit is connected using the supplied cable. Both of the battery cable's white leads are to be used for this.

Ext. Button, Temperature Sensor Connection		
Pin	**Assignment**	
Button +	Positive edge input	
Button -	Negative edge input	
Temp.	Temperature sensor	
Temp.	Temperature sensor	

Table 11: Ext. Button, Temperature Sensor Connection

See Section "ExternalButton User Button (Digital Input) and DIB (Digital Input Button)", on Page 109 for connecting an external button..

RS232 interface

The UPS communicates with the load system (e.g. B&R IPC) via the serial interface.

RS232 interface	
Pin	**Assignment**
1	DCD
2	RXD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	n.c.

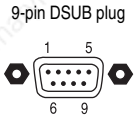


Table 12: RS232 interface

The 7 pin null modem cable required for this must have two 9 pin DSUB sockets (female). The appropriate cable can be ordered directly from B&R under the model number 9A0017.01 (length = 0.6 m) and 9A0017.02 (length = 1.8 m).

The cable can also be made. A self made cable can have a maximum length of 15 meters. The pins must be connected as follows:

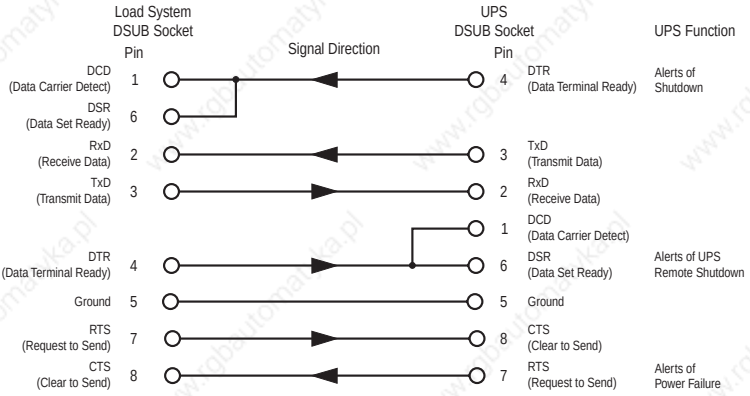


Figure 5: Pin assignment RS232 cable

User Button

See Section "ExternalButton User Button (Digital Input) and DIB (Digital Input Button)", on Page 109 for possible uses of the user button.

Status LEDs

The UPS has six status LEDs that show the operating state, indicate any faults or display information about the battery units. The LEDs are also used to manually set the charging current for the battery unit via the user button (see Section "Setting the Maximum Charging Current", on Page 118). Each LED can display several different types of information based on flashing sequence:

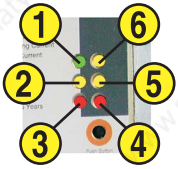


Figure 6: Status LEDs

Function	Color	LED Number	Flashing sequences / Interval: 0.125 s = 8 Hz
Operation	Green	1	Mains operation OK Mains operation with no battery Battery operation Shut Down Seconds
Status	Yellow	2	UPS self-test Overload Internal error Temperature alarm Battery capacity too low Seconds
Fuses	Red	3	1) Error: 24 V-mains fuse, or mains voltage < 20 V or 23.5 V (depending on the switching threshold 18 or 21,5V) Error: 24 V-battery fuse Error: internal fuse Seconds
Battery Reverse Polarity	Red	4	Battery polarity is reversed No battery attached Seconds

Table 13: LED Status - Flashing Sequences and their Meaning

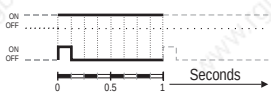
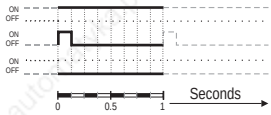
Function	Color	LED Number	Flashing sequences / Interval: 0.125 s = 8 Hz
Battery Status	Yellow	5	 Change battery (battery malfunctioned or did not pass capacity test) Battery lifespan exceeded (dependant on type) or low battery capacity
Battery Charging	Yellow	6	 Maximum Charging Current = max. Charging Current Medium Charging Current = 30 - 60 % of max. Charging C Low Charging Current = 0 - 30 % of max. Charging Curren

Table 13: LED Status - Flashing Sequences and their Meaning

1) A reliable detection of a defective fuse is guaranteed only if the supply voltage is in the specified range according to the operating mode (switching threshold mains/battery).