

DC Power Supply and Battery Operation R&S FSV-B30/-B32/-B34 Installation Manual



1321393702

Version 02

ROHDE & SCHWARZ

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This installation manual describes the following functions and options:

- DC Power Supply (R&S FSV-B30, Order no. 1329.0243.02)
- Li-Ion Battery Pack (R&S FSV-B32, Order no. 1321.3750.04)
- Battery Charger (R&S FSV-B34, Order no. 1321.3950.02)

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Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol, e.g. R&S®FSV is indicated as R&S FSV.

1 Safety Instructions for Lithium Batteries

The product contains exchangeable or built-in lithium polymer or lithium ion cells or batteries. The use of the word battery in the following always means all types. Only the battery contents are potentially hazardous. As long as a battery is undamaged and the seals remain intact, there is no danger.

Impact, shock or heat can cause damage such as dents, punctures and other deformations. A damaged battery poses a risk of personal injury. Handle a damaged or leaking battery with extreme care. Immediately ventilate the area since the battery releases harmful gases. If you come into contact with the battery fluid, immediately remove all contaminated clothing. Irritation can occur if the battery fluid comes in contact with your skin or eyes. Immediately and thoroughly rinse your skin or eyes with water and seek medical aid.

For safe handling, follow these rules:

- Do not short-circuit the battery.
- Do not mechanically damage the battery. Do not open or disassemble the battery.
- Do not expose the battery to high temperatures such as open flames, hot surfaces and sunlight.
- Only use the battery with the designated Rohde & Schwarz product.
- Only use the appropriate Rohde & Schwarz charger to charge the batteries. If the batteries are improperly charged, there is a risk of explosion. For charging and discharging temperature ranges, see the product documentation.
- Replace exchangeable batteries only with the same battery type.
- Store the battery in the product or use the product packaging.
- Dispose of exchangeable batteries separately from normal household waste as specified by the local waste disposal agency.

If you disregard these rules, you risk serious personal injury or even death due to explosion, fire or hazardous chemical substances. The product documentation provides further details.

If exchangeable batteries or products with built-in batteries are defective, contact the Rohde & Schwarz customer service. Rohde & Schwarz classifies the severity of the defect. When returning batteries or Rohde & Schwarz products containing batteries, use a carrier qualified to transport dangerous goods and notify the carrier of this classification. Follow the carrier's transport stipulations in line with IATA-DGR, IMDG-Code, ADR or RID.



Figure 1-1: Disposal information in line with EU battery directive

2 DC power supply

Using the DC power supply (option R&S FSV-B30), the instrument can be operated with a DC voltage of 10 V to 28 V. The voltage source can have a current of 25 A to 12.5 A.

If you use an external power supply unit to supply safety extra-low DC voltage (SELV) to the instrument, be sure to meet the requirements for reinforced/double insulation in accordance with DIN/EN/IEC 61010 (UL 3111, CSA C22.2 No. 1010.1) or DIN/EN/IEC 60950 (UL 1950, CSA C22.2 No. 950). Provide current limitation in accordance with DIN EN 61010-1 Appendix F2.1. Use a cable no longer than 3 m.

2.1 Installing the DC power supply

The DC power supply is attached to the rear panel of the instrument.

To install the DC power supply on the instrument

Installing the DC power supply requires technically trained personnel.

1. Disconnect the DC power supply from the voltage source to avoid long-term damage to the device.
2. Disconnect the power cable from the instrument.
3. Only for instruments with B1 option (ruggedized housing):

Installing the DC power supply

- a) Unscrew and remove the right corner protector (1).

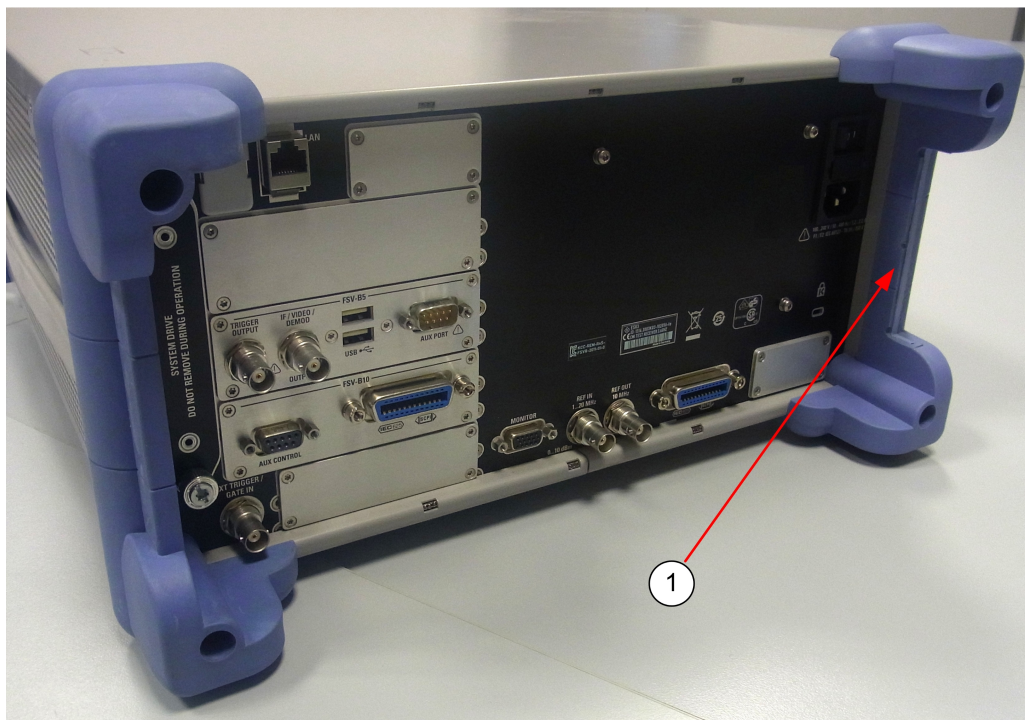
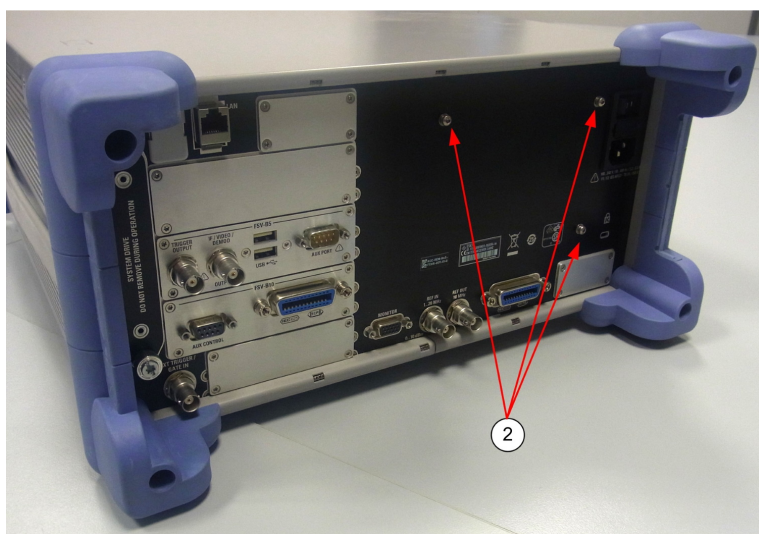


Figure 2-1: Replacing the corner protector

- b) Replace it by the corner protector supplied with the B30 option to ensure sufficient ventilation of the DC power supply.
4. Remove the three screws (2) from the rear panel.
5. Secure the holding plate (3) to the rear panel using three screws (2). Use the upper holes of the holding plate for R&S FSV and R&S ESRP, the lower holes for R&S ESR. Use the screws supplied with the option.



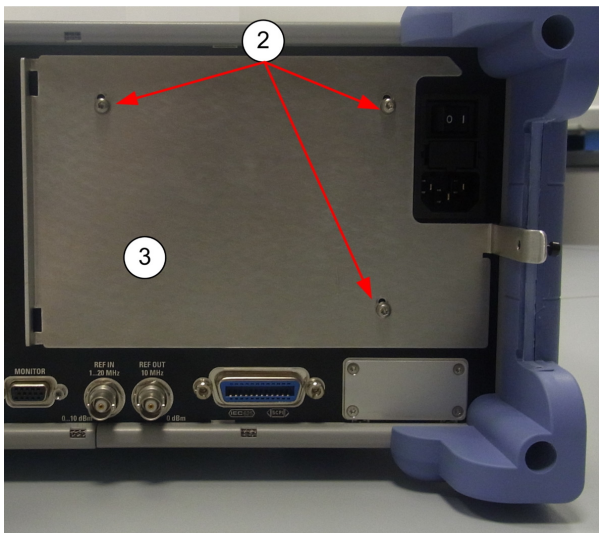


Figure 2-2: Attaching the holding plate to the rear panel of the instrument

6. Set the power switch on the rear panel of the instrument to "I" ([ON]).
7. Hold the DC power supply (4) to the edge of the holding plate and press it towards the rear panel.

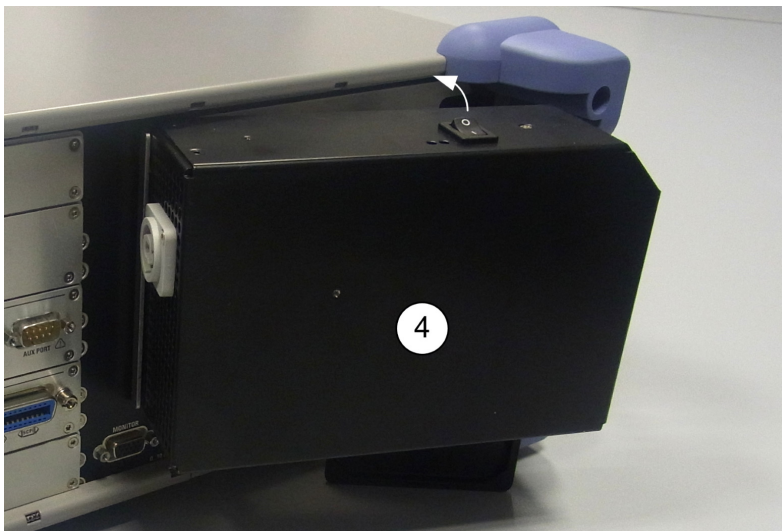


Figure 2-3: Attaching the DC power supply to the rear panel

8. Secure the DC power supply on the holding plate using the screw (5).

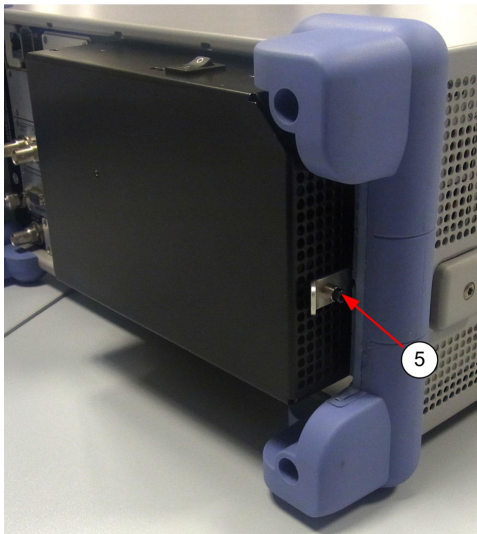


Figure 2-4: Securing the DC power supply on the rear panel

2.2 Connecting the DC cable

Use a voltage source with a DC voltage of 10 V to 28 V and a current of 25 A to 12.5 A. It is recommended that you fuse the voltage source with maximum 25 A.

1. Switch off the DC power supply to avoid long-term damage to the device.
2. **NOTICE!** Risk of instrument damage. Do not connect or disconnect the DC cable to the DC power supply while the DC power supply is on. Connecting the cable falsely or while the voltage source is powered can result in long-term damage to the cable or the device.

Connect the supplied cable (6) to the DC power supply.

Switching the instrument on and off

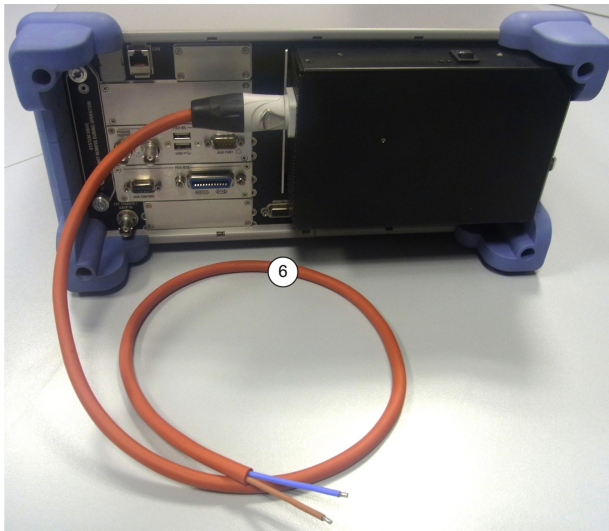


Figure 2-5: DC connection

brown = +10 V to +28 V
blue = GND

3. Connect the DC cable to the voltage source. Check for right polarity.

2.3 Switching the instrument on and off

To switch on the instrument

The instrument is off but connected to the DC power supply.

1. Set the switch on the DC power supply to "I".
A green LED indicates that the DC power supply is ready for operation.
If overvoltage or undervoltage occurs, the DC power supply switches off automatically. A red LED indicates the error state.
2. Press the [ON/OFF] key on the front panel of the instrument. A green LED above the [ON/OFF] key indicates that the instrument is ready for operation.

To switch off the instrument

1. Press the [ON/OFF] key on the front panel of the instrument and wait until the instrument has shut down.
2. Set the switch on the DC power supply to "0".

3 Li-ion battery pack and charger

With the Li-ion battery pack (option R&S FSV-B32), together with the DC power supply (R&S FSV-B30), the instrument can be operated independently of an AC power supply. The R&S FSV-B32 option contains 4 Li-ion rechargeable batteries.

The rechargeable batteries can be charged externally using the R&S FSV-B34 charger.

3.1 Installing the battery pack

Note the [Chapter 1, "Safety Instructions for Lithium Batteries"](#), on page 3.

1. Attach the battery pack (7) to the top of the instrument.
 - a) Place the battery pack on the instrument and push it forward until it locks into place.
 - b) Secure the battery pack to the side panels using two knurled screws (8).

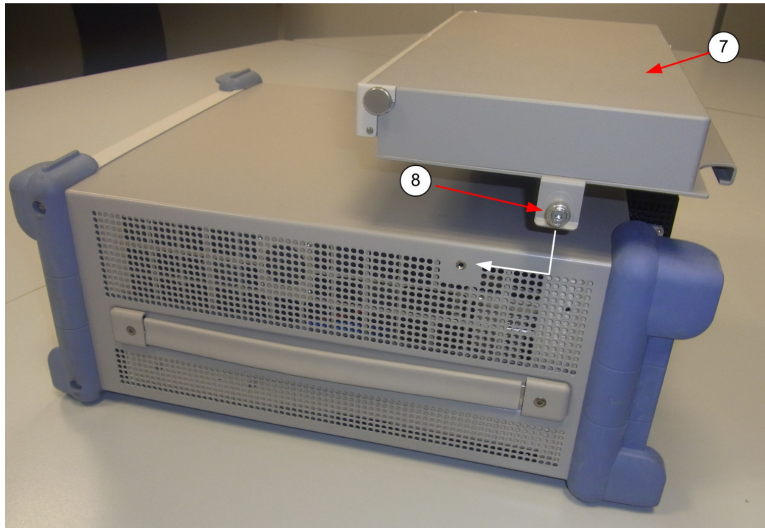


Figure 3-1: Installing the battery pack

2. **NOTICE!** Do not connect or disconnect the DC cable while the DC power supply is on to avoid long-term damage to the cable.
Set the switch on the DC power supply to "0".
3. Connect the DC cable to the battery pack and the DC power supply.

4. Optionally, attach the cable to the DC power supply with a cable clamp (9).

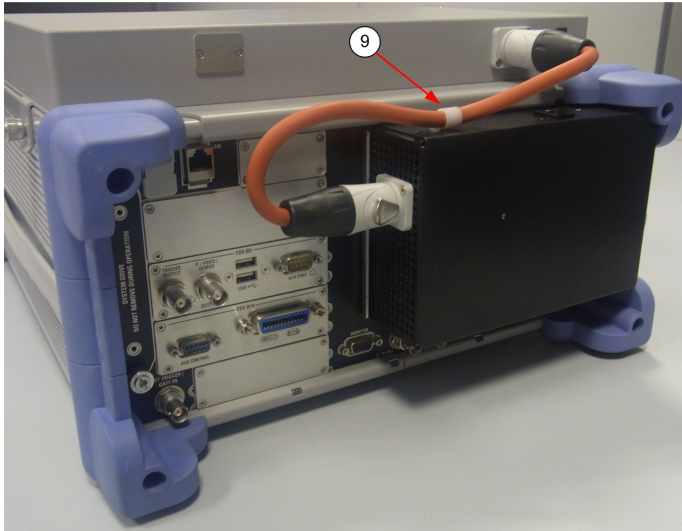


Figure 3-2: Battery pack and cable with clamp

3.2 Charging the batteries

The R&S FSV-B34 charger is a standalone charging device which can be used to charge all four rechargeable batteries of the R&S FSV-B32 battery pack simultaneously.

Charge the battery before using it for the first time. Following a long storage period, it can be necessary to charge and discharge the battery several times to reach full capacity. For charging, use the R&S FSV-B34 charger.

Look up the following details in the data sheet:

- Charging conditions
 - Recharging interval to avoid deep discharge
1. Unscrew the knurled screws (10) on the front of the battery pack.
 2. Open the flap (11).
 3. Pull the rechargeable batteries (12) out of the housing by the tab.

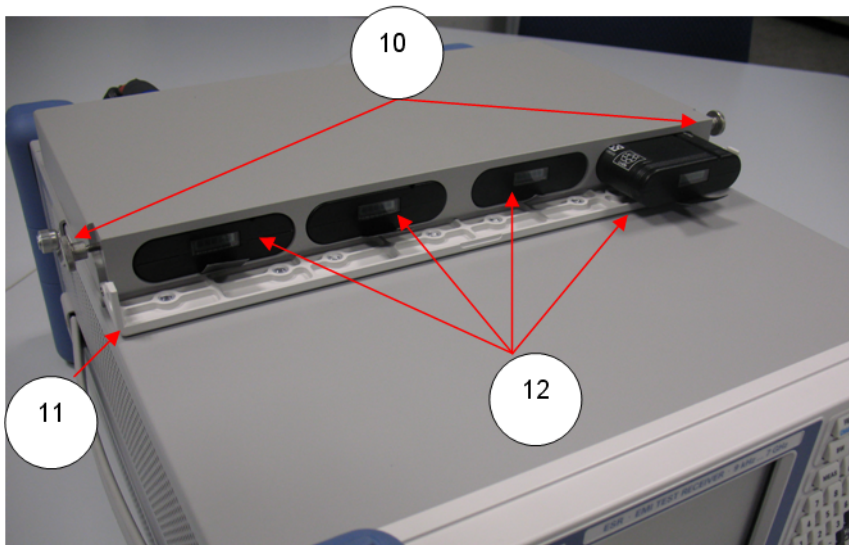


Figure 3-3: Battery compartment

4. Connect the power cable to the charger.
5. Insert the rechargeable batteries into the charging slots of the charger.



Figure 3-4: R&S FSV-B34 charger

LEDs indicate the operating state of each charging slot:

- Charging
Green LED flashes
- Charging completed

- Green LED remains lit
 - Fault
 - Red LED lights up
6. When charging is complete, you can remove the rechargeable batteries from the charger. The LCD on the front of the rechargeable battery indicates the charge level in increments of 20 %.
 7. Disconnect the charger from the power supply.
 8. Insert the rechargeable batteries into the battery pack. Make sure the tab sticks out of the housing to ensure the correct polarity.
 9. Close the flap on the front.
 10. Secure the flap using the two knurled screws.

3.3 Switching the instrument on and off

To switch on the instrument

The instrument is off but connected to the DC power supply.

1. Set the switch on the battery pack to "I".
2. Set the switch on the DC power supply to "I".
A green LED indicates that the DC power supply is ready for operation. If overvoltage or undervoltage occurs, the DC power supply switches off automatically. A red LED indicates the error state.
3. Press the [ON/OFF] key on the front panel of the instrument. A green LED above the [ON/OFF] key indicates that the instrument is ready for operation.

To switch off the instrument

1. Press the [ON/OFF] key on the front panel of the instrument and wait until the instrument has shut down.
2. Set the switch on the DC power supply to "0".
3. Set the switch on the battery pack to "0".

3.4 Storing and transporting batteries

Safe handling of batteries is described in [Chapter 1, "Safety Instructions for Lithium Batteries"](#), on page 3.

Keep the batteries clean and dry. If the terminals become soiled, clean them with a dry, clean cloth.

Storing batteries

Ideally, store the batteries in the battery pack. Otherwise, observe the following rules:

- Prevent short-circuiting of the batteries, which can happen if batteries touch each other or come into contact with metallic objects in the storage container. As storage container, you can use the product packaging.
- Do not expose to direct sunlight.
- Store the batteries at room temperature.
- Store the batteries at a state of charge between 50 % and 70 %.

Transporting products containing batteries

Products with built-in batteries or exchangeable batteries are dangerous goods and have to be transported as such. Consider the requirements described in [Chapter 1, "Safety Instructions for Lithium Batteries"](#), on page 3.