R&S®ZV-Z129/Z135/Z170 Calibration Kits

Technical Information

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ROHDE&SCHWARZ

Test & Measurement

Technical Information

This technical information is valid for the following Rohde & Schwarz products:

- R&S®ZV-Z129, Calibration Kit 2.92 mm (male), order no. 1322.7471.02
- R&S®ZV-Z129, Calibration Kit 2.92 mm (female), order no. 1322.7471.03
- R&S®ZV-Z135, Calibration Kit 3.5 mm (male), order no. 1317.7677.02
- R&S®ZV-Z135, Calibration Kit 3.5 mm (female), order no. 1317.7677.03
- R&S®ZV-Z170, Calibration Kit N (male), order no. 1317.7683.02
- R&S®ZV-Z170, Calibration Kit N (female), order no. 1317.7683.03

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The following abbreviations are used throughout this guide: R&S® is abbreviated as R&S. E.g. R&S ZV-Z170 denotes R&S®ZV-Z170.

1 Calibration Kits R&S ZV-Z129/-Z135/-Z170

R&S ZV-Z129, R&S ZV-Z135 and R&S ZV-Z170 are calibration kits for Rohde & Schwarz vector network analyzers. With a frequency range from 0 Hz (DC) up to 40 GHz, they are particularly suitable for the following network analyzer types.

Network analyzer type	Ports	Frequency range
R&S ZNB4	2 ports or 4 ports	9 kHz to 4.5 GHz
R&S ZNB8	2 ports or 4 ports	9 kHz to 8.5 GHz
R&S ZNB20	2 ports	100 kHz to 20 GHz
R&S ZNB40	2 ports	10 MHz to 40 GHz
R&S ZNC3	2 ports	9 kHz to 3 GHz
R&S ZVL3	2 ports	9 kHz to 3 GHz
R&S ZVL6	2 ports	9 kHz to 6 GHz

Calibration of Rohde & Schwarz network analyzers is a fully menu-guided process. For details refer to the user manual or integrated help of your network analyzer. The technical specifications of the calibration kit are listed in the data sheet.

Operating temperature

The electrical characteristics of the calibration kits depend on the operating temperature. Notice the temperature range quoted in the data sheet and avoid unnecessary touching of the kit during calibration to ensure a stable temperature.

The purpose of this technical information is to inform you about the correct and safe use of your calibration kit. Please read the following sections carefully to avoid any damage and malfunctioning.

2 Connecting and Disconnecting the Kits

The connectors of the calibration kits are subject to wear and tear if they are handled improperly. Moreover, electrostatic discharge can occur when you connect the kits to the network analyzer.

NOTICE

Electrostatic discharge

Electrostatic discharge can cause damage to the electronic components of the network analyzer. To protect your equipment against electrostatic discharge, ground yourself using a wrist strap and cord following the instructions in your network analyzer documentation.

Prior to connecting your calibration kit, always ensure the connectors are clean and show no sign of damage. The pin depths must be in the permissible range; see chapter 4, "Gauging the Connectors", on page 7. Align the connectors concentrically and turn the coupling nut hand-tight until the mating plane surfaces have contact. Do not turn the body of the calibration kit. Finally, use a torque wrench to tighten the connection.

Torque wrench

The permissible torque for the type 2.92 mm, 3.5 mm and N connectors is 0.9 Nm. Rohde & Schwarz supplies the appropriate torque wrenches for all connector types; see table below.

Calibration kit	Connector type	Wrench size	Torque wrench
R&S ZV-Z129	2.92 mm	5/16" (8 mm)	1311.8213.02
R&S ZV-Z135	3.5 mm	5/16" (8 mm)	1311.8213.02
R&S ZV-Z170	N	19 mm	1311.8213.04

When the calibration kit is connected, support the equipment properly to relieve the connections from any bending torque caused by the connected components or cables.

To disconnect your calibration kit, unfasten the coupling nut with an open-end wrench.

NOTICE

Risk of mechanical damage to the connectors

The inner conductor of the connectors may be damaged if the connection is too tight, or if bending forces are applied. Always use a torque wrench to tighten the coupling nut. Do not turn the body of the calibration kit while it is connected and avoid any excessive force, bending or twisting during the connection or disconnection.

3 Cleaning the Connectors

The connectors of the calibration kits, in particular the outer conductors, should be kept clean to ensure a proper connection and avoid damage when they are tightened. The connectors are most easily cleaned using a swab (e.g. a cotton or nylon swab) of suitable size damped in alcohol. Gently move the swab around the inner conductor, avoiding lateral pressure on the center pin. After cleaning, you can use compressed air to remove foreign particles and dry the connector. Finally, inspect the cleaned connector to verify that the center pin has not been bent.

NOTICE

Risk of damage

Alcohol is the recommended cleaning solvent. Do not use any other solvents or water. Avoid applying an excess amount of solvent to the connector surfaces.

4 Gauging the Connectors

The pin depth of the connectors are critical for safe and accurate functioning:

- If the center pin is too long, the connector is likely to damage another connector when tightened. One connector can damage many others.
- If the center pin is too short, the connection is poor, causing potentially wrong measurement results.

The pin depths can be evaluated using a commercially available connector gauge. Refer to the operating instructions of your gauge for details. In particular, ensure that the gauge connectors are clean and that the temperature of both the gauge and the calibration kits is in the permissible range. Use a torque wrench and apply the recommended torque when connecting the gauge (see chapter 2, "Connecting and Disconnecting the Kits", on page 4).

5 Handling and Storing the Calibration Kits

The calibration kits are delivered in a storage bag; the connectors are protected by plastic tubes. Store your calibration kit in the bag, with the plastic tubes attached. Keep the kit dry and avoid sudden temperature changes to prevent condensation. Environmental conditions for storage are specified in the data sheet.

Keep the connectors clean; in particular do not touch the mating plane surfaces with your fingers. Avoid the contact of the connector surfaces with any hard material.

NOTICE

Risk of mechanical damage to the calibration kits

The RF components of your calibration kit are sensitive to impact. Do not drop or knock the kit. After any inadvertent shock, it is recommended to send in the kit to a Rohde & Schwarz service center in order verify the cal kit data.