

CALIBRATION COMPONENTS

These instructions were written for qualified and experienced personnel. Please read them carefully before starting work. Any liability or warranty for the results of improper or unsafe use is disclaimed!

Intended Use

The intended use of the calibration components is to calibrate vector network analyzers (VNAs) for measurements. Details and other limits are given in the product data sheet available for download on www.spinner-group.com.

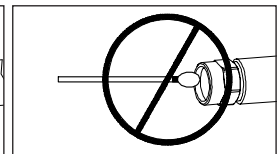
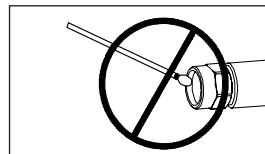
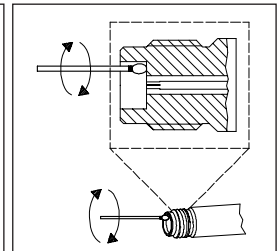
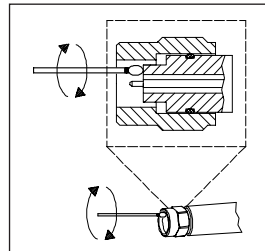
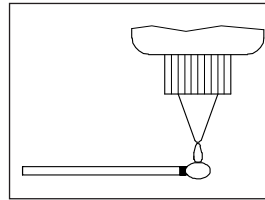
ATTENTION

Temperature changes may have an impact on electrical characteristics. Therefore, the operating temperature is a critical performance factor. During a calibration sequence, the temperature of the calibration components must be stable and within the specified operating temperature range. Avoid unnecessary touching of the calibration components during the calibration sequence; your fingers apply heat to them.

Cleaning Connectors

A sufficient cleaning of the connectors is essential to ensure the integrity of the RF connections. Dial gauge and connector interfaces, especially the outer conductor, should be kept clean and free of dirt and other debris.

- Use only denatured alcohol as a solvent.
- Use the proper size of cotton swab. Tweezers and a small piece of cotton can also be used.
- Only dampen the swab. Do NOT saturate it.
- Gently rotate the swab around the inner conductor being careful not to stress or bend the pin.
- Never put lateral pressure on the connector's inner conductor. The inner conductor does not require cleaning.
- Verify that no foreign material remains in the connector after cleaning.
- Verify that the inner conductor has not been bent or damaged.



ATTENTION:

- Do NOT use other cleaning fluids or solvents. Do NOT use water.
- Do NOT put cotton swabs in at an angle. Otherwise you will damage the connectors.
- Do NOT use too large cotton swabs. Otherwise you will damage the connectors.
- Standard cotton swabs are too large to fit in the smaller connector types. Appropriately sized swabs can be purchased through a medical-lab-type supply centre.

Gauging Connectors

Connector gauges are used to evaluate the pin depth of connectors. The accuracy of commercially available gauges is not sufficient to precisely measure the connector pin depth of the calibration components. Sufficient measurement accuracy for preventive maintenance and troubleshooting can be achieved as follows:

- Use SPINNER gauge considering the handling instructions of the SPINNER gauge
- Temperature of the gauge and the calibration component has to be within $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- Apply the recommended coupling torque (see table 1) with a torque wrench.

Connection

- Ground yourself and the calibration components to prevent electrostatic discharge from the measurement assembly.
- Perform visual inspection of the connectors.
- Clean the connectors sufficiently.
- Use a proper dial gauge to ensure that the inner conductor is within the pin depth limits extended by the measurement uncertainty.
- Align the connectors carefully. The plug inner conductor has to intrude concentrically into the bushing of the socket connector.
- Push the connectors straight together and tighten the coupling nut hand-tight until the mating plane surfaces have contact.
- Do not turn the component body. Only turn the coupling nut.
- Do not overstrain the connection.

ATTENTION Damage to the inner conductor may occur, if the component body is turned.

- Support the connectors properly. Relieve the connections from any bending torque, caused for example from heavy assemblies or cables.
- For the final connection use a suitable torque wrench to apply the recommended torque (see table 1).

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Disconnection

- Support the connectors properly to relieve the connections from any bending torques and forces.
- Do not turn the component body. Only turn the coupling nut.

ATTENTION Damage to the inner conductor may occur, if the component body is turned.

- Prevent the component body from turning.
- Unfasten the coupling nut with an open-end wrench.
- Separate the calibration component in turning only the coupling nut. Disconnect the calibration component straight without any bending, twisting or rocking of the connectors.

Handling and Storage

ATTENTION The calibration components are sensitive to impact. Do not drop!

Keep dry and avoid exposure to sudden temperature changes to prevent condensation. Environmental conditions for storage are specified in the product data sheet.

- Do not remove any connector protection until immediately prior to use to avoid formation of dust and scratches on the sensitive RF contact surface.
- Never store the calibration components loose without the protection of the supplied plastic tubes or storage bags if applicable. This is the most common cause of damages during storage. Close the plastic tubes when not in use.
- Avoid touching mating plane surfaces with your fingers. Residues on the connector interface may degrade the performance of the calibration components and can only be removed with difficulty.
- Always make sure that the connectors are in a clean condition.
- Avoid the contact of the calibration components interface surfaces with any hard material. The plating and the mating plane surfaces may be damaged if the interface contacts any hard surface uncontrolled.
- After any shock to the calibration components (e.g. drop down on the floor) recalibration is recommended.

Disposal

WARNING Improper disassembly or disposal may be hazardous.

Some parts are made of cross linked polystyrene and copper beryllium. The user is responsible for disposing of the products in accordance with the national waste disposal regulations.

Coupling Torque

Table 1

Connector	Torque	Ordering Number for torque wrench
0.8 mm	0.45 N·m	-
1.00 mm	0.45 N·m	-
1.35 mm	0.9 N·m	BN 15 41 41 R000
1.85 mm	0.9 N·m	BN 15 41 41 R000
2.4 mm	0.9 N·m	BN 15 41 41 R000
2.92 mm	0.9 N·m	BN 15 41 41 R000
3.5 mm	0.9 N·m	BN 15 41 41 R000
1.5-3.5	0.9 N·m	BN 15 41 41 R000
2.2-5	1.5 N·m	-
NEX10	1.5 N·m	BN 23 87 43 C0001
N	0.9 N·m	BN 53 70 91 R000
4.1-9.5	2.5 N·m	BN 23 87 40 C0001
4.3-10	2.5 N·m	BN 23 87 40 C0001
7-16	2.5 N·m	-