R&S®ZN-ZE1xx CALIBRATION UNITS

Specifications

R&S®ZN-ZE104
R&S®ZN-ZE109
R&S®ZN-ZE118
R&S®ZN-ZE126

Specifications | Version 04.00

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Definitions

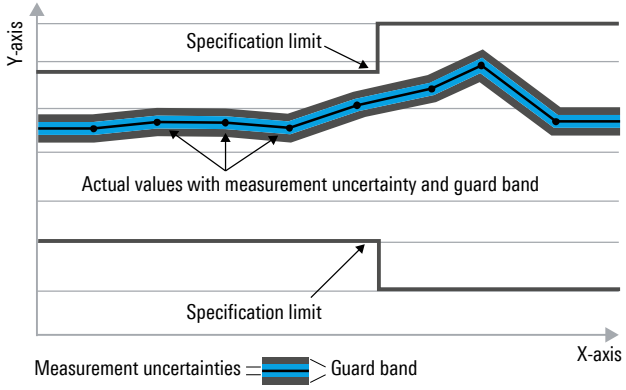
General

Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: “parameter: value”.

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

Calibration units for automatic calibration

Port options for the R&S®ZN-ZE104

Type	Connector	Number of ports	Frequency range
R&S®ZNZE1-B170 and R&S®ZNZE1 B270	type N, female and type N, female	2	5 kHz to 4.5 GHz
R&S®ZNZE1-B171 and R&S®ZNZE1-B270	type N, male and type N, female		
R&S®ZNZE1-B170 and R&S®ZNZE1-B271	type N, female and type N, male		
R&S®ZNZE1-B171 and R&S®ZNZE1-B271	type N, male and type N, male		
R&S®ZNZE1-B130 and R&S®ZNZE1-B230	3.5 mm [1], female and 3.5 mm [1], female		
R&S®ZNZE1-B131 and R&S®ZNZE1-B230	3.5 mm [1], male and 3.5 mm [1], female		
R&S®ZNZE1-B130 and R&S®ZNZE1-B231	3.5 mm [1], female and 3.5 mm [1], male		
R&S®ZNZE1-B131 and R&S®ZNZE1-B231	3.5 mm [1], male and 3.5 mm [1], male		

[1] Connectors of the R&S®ZNZE1-B130, R&S®ZNZE1-B131, R&S®ZNZE1-B230 and R&S®ZNZE1-B231 port options are not 3.5 mm connectors, but fully support these. They are mechanically compatible and electrically equivalent.

Port options for the R&S®ZN-ZE109

Type	Connector	Number of ports	Frequency range
R&S®ZNZE1-B170 and R&S®ZNZE1 B270	type N, female and type N, female	2	5 kHz to 9 GHz
R&S®ZNZE1-B171 and R&S®ZNZE1-B270	type N, male and type N, female		
R&S®ZNZE1-B170 and R&S®ZNZE1-B271	type N, female and type N, male		
R&S®ZNZE1-B171 and R&S®ZNZE1-B271	type N, male and type N, male		
R&S®ZNZE1-B130 and R&S®ZNZE1-B230	3.5 mm [1], female and 3.5 mm [1], female		
R&S®ZNZE1-B131 and R&S®ZNZE1-B230	3.5 mm [1], male and 3.5 mm [1], female		
R&S®ZNZE1-B130 and R&S®ZNZE1-B231	3.5 mm [1], female and 3.5 mm [1], male		
R&S®ZNZE1-B131 and R&S®ZNZE1-B231	3.5 mm [1], male and 3.5 mm [1], male		

Port options for the R&S®ZN-ZE118

Type	Connector	Number of ports	Frequency range
R&S®ZNZE1-B170 and R&S®ZNZE1 B270	type N, female and type N, female	2	5 kHz to 18 GHz
R&S®ZNZE1-B171 and R&S®ZNZE1-B270	type N, male and type N, female		
R&S®ZNZE1-B170 and R&S®ZNZE1-B271	type N, female and type N, male		
R&S®ZNZE1-B171 and R&S®ZNZE1-B271	type N, male and type N, male		
R&S®ZNZE1-B130 and R&S®ZNZE1-B230	3.5 mm [1], female and 3.5 mm [1], female		
R&S®ZNZE1-B131 and R&S®ZNZE1-B230	3.5 mm [1], male and 3.5 mm [1], female		
R&S®ZNZE1-B130 and R&S®ZNZE1-B231	3.5 mm [1], female and 3.5 mm [1], male		
R&S®ZNZE1-B131 and R&S®ZNZE1-B231	3.5 mm [1], male and 3.5 mm [1], male		

Port options for the R&S®ZN-ZE126

Type	Connector	Number of ports	Frequency range
R&S®ZNZE1-B130 and R&S®ZNZE1-B230	3.5 mm [1], female and 3.5 mm [1], female	2	5 kHz to 26.5 GHz
R&S®ZNZE1-B131 and R&S®ZNZE1-B230	3.5 mm [1], male and 3.5 mm [1], female		
R&S®ZNZE1-B130 and R&S®ZNZE1-B231	3.5 mm [1], female and 3.5 mm [1], male		
R&S®ZNZE1-B131 and R&S®ZNZE1-B231	3.5 mm [1], male and 3.5 mm [1], male		

Input power limits

Nominal input level range		–45 dBm to +10 dBm
Damage level		+10 dBm
Damage DC voltage		0 V

Effective system data

R&S®ZN-ZE104, R&S®ZN-ZE109, R&S®ZN-ZE118 (type N, female and male)

	5 kHz to 4.5 GHz	4.5 GHz to 9 GHz	9 GHz to 18 GHz
Directivity	≥ 39 dB, 41 dB (typ.)	≥ 39 dB, 41 dB (typ.)	≥ 37 dB, 39 dB (typ.)
Match	≥ 37 dB, 39 dB (typ.)	≥ 37 dB, 39 dB (typ.)	≥ 35 dB, 37 dB (typ.)
Reflection/transmission tracking	≤ 0.1 dB, 0.05 dB (typ.)	≤ 0.1 dB, 0.05 dB (typ.)	≤ 0.1 dB, 0.05 dB (typ.)

R&S®ZN-ZE104, R&S®ZN-ZE109, R&S®ZN-ZE118, R&S®ZN-ZE126, (3.5 mm, female and male)

	5 kHz to 4.5 GHz	4.5 GHz to 9 GHz	9 GHz to 18 GHz	18 GHz to 26.5 GHz
Directivity	≥ 39 dB, 41 dB (typ.)	≥ 39 dB, 41 dB (typ.)	≥ 37 dB, 39 dB (typ.)	≥ 36 dB, 38 dB (typ.)
Match	≥ 37 dB, 39 dB (typ.)	≥ 37 dB, 39 dB (typ.)	≥ 35 dB, 37 dB (typ.)	≥ 33 dB, 35 dB (typ.)
Reflection/transmission tracking	≤ 0.1 dB, 0.05 dB (typ.)	≤ 0.1 dB, 0.05 dB (typ.)	≤ 0.1 dB, 0.05 dB (typ.)	≤ 0.12 dB, 0.06 dB (typ.)

General data

Temperature loading	operating temperature range	+5 °C to +40 °C
	permissible temperature range	0 °C to +50 °C
	storage temperature range	–40 °C to +70 °C, in line with IEC 60068-2-1 and IEC 60068-2-2
Damp heat		+40 °C at 85 % relative humidity
Mechanical resistance	vibration test, sinusoidal	5 Hz to 55 Hz, displacement: 0.15 mm constant amplitude (1.8 g at 55 Hz); 55 Hz to 150 Hz, acceleration: 0.5 g constant, in line with IEC 60068-2-6
	vibration test, random	8 Hz to 500 Hz, acceleration: 1.2 g (RMS), in line with IEC 60068-2-64
	shock test	40 g shock spectrum, in line with MIL-STD-810E, method no. 516.4, procedure I
Calibration interval		12 months

EMC	RF emission	in line with CISPR 11/EN 55011 group 1 class A (for a shielded test setup); Instrument complies with the emission requirements stipulated by EN 55011 and EN 61326-1 class A, making the instrument suitable for use in industrial environments.
	immunity	in line with EMC Directive 2014/30/EU, including IEC/EN 61326-1 (immunity test requirement for industrial environment, EN 61326 table 2)
EU legislation	for details, see user documentation	EU: in line with Data Act – Regulation (EU) 2023/2854
Power supply	via USB	5 V, 350 mA
Power consumption		1.75 W
Digital connection	calibration unit side	USB type C plug, version 2.0
	host side	USB type A plug
	cable length	1.85 m (72.8 in)
Dimensions	W × H × D	109 mm × 90 mm × 32 mm (4.29 in × 3.54 in × 1.25 in)
Weight		108 g (0.23 lb)

Ordering information

Designation	Type	Order No.
Calibration unit, 2-port, 5 kHz to 4.5 GHz	R&S®ZN-ZE104	1350.8040.04
Calibration unit, 2-port, 5 kHz to 9 GHz	R&S®ZN-ZE109	1350.8040.09
Calibration unit, 2-port, 5 kHz to 18 GHz	R&S®ZN-ZE118	1350.8040.18
Calibration unit, 2-port, 5 kHz to 26.5 GHz	R&S®ZN-ZE126	1350.8040.26
Port options [2]		
Connector port 1, type N, female	R&S®ZNZE1-B170	1350.8079.70
Connector port 1, type N, male	R&S®ZNZE1-B171	1350.8085.71
Connector port 2, type N, female	R&S®ZNZE1-B270	1350.8079.80
Connector port 2, type N, male	R&S®ZNZE1-B271	1350.8085.81
Connector port 1, supports 3.5 mm, female	R&S®ZNZE1-B130	1350.8056.30
Connector port 1, supports 3.5 mm, male	R&S®ZNZE1-B131	1350.8062.31
Connector port 2, supports 3.5 mm, female	R&S®ZNZE1-B230	1350.8056.40
Connector port 2, supports 3.5 mm, male	R&S®ZNZE1-B231	1350.8062.41

Accredited calibration

Designation	Type	Order No.
Calibration unit, 2-port, 5 kHz to 4.5 GHz	R&S®ACAZNZE104	3599.0424.03
Calibration unit, 2-port, 5 kHz to 9 GHz	R&S®ACAZNZE109	3599.0430.03
Calibration unit, 2-port, 5 kHz to 18 GHz	R&S®ACAZNZE118	3599.0447.03
Calibration unit, 2-port, 5 kHz to 26.5 GHz	R&S®ACAZNZE126	3599.0453.03

[2] Type N connectors are not applicable to R&S®ZN-ZE126.

Warranty and service

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [3]	pay per calibration
Warranty and repair	up to five years [3]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

[3] For extended periods, contact your Rohde & Schwarz sales office.

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