

R&S®ZN-ZE1xx CALIBRATION UNITS

Specifications

R&S®ZN-ZE104

R&S®ZN-ZE109

R&S®ZN-ZE118

R&S®ZN-ZE126



Data Sheet | Version 03.00

ROHDE & SCHWARZ

Make ideas real



CONTENTS

Definitions	3
Definitions	3
Specifications	5
Calibration units for automatic calibration	5
R&S®ZN-ZE104	5
R&S®ZN-ZE109	6
R&S®ZN-ZE118	7
R&S®ZN-ZE126	8
Input power limits	9
Effective system data	10
R&S®ZN-ZE104, R&S®ZN-ZE109, R&S®ZN-ZE118 (type N, female and male).....	10
R&S®ZN-ZE104, R&S®ZN-ZE109, R&S®ZN-ZE118, R&S®ZN-ZE126, (3.5 mm, female and male)	10
General data	11
Ordering information	13
Accredited calibration	13
Service options	14

Definitions

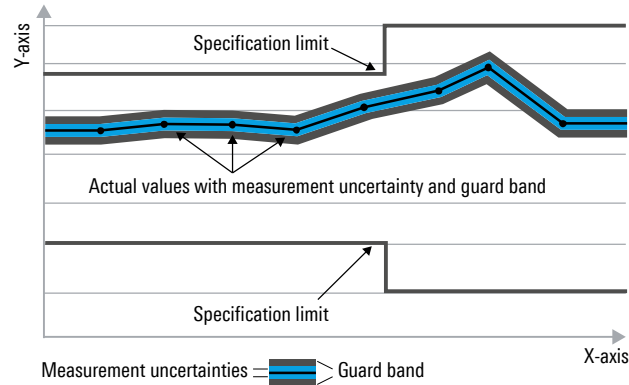
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes 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 $<$, \leq , $>$, \geq , \pm , 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

R&S®ZN-ZE104

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

R&S®ZN-ZE109

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

R&S®ZN-ZE118

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

R&S®ZN-ZE126

Type	Connector	Number of ports	Frequency range
R&S®ZNZE1-B130 + R&S®ZNZE1-B230	3.5 mm ¹ , female + 3.5 mm ¹ , female	2	5 kHz to 26.5 GHz
R&S®ZNZE1-B131 + R&S®ZNZE1-B230	3.5 mm ¹ , male + 3.5 mm ¹ , female		
R&S®ZNZE1-B130 + R&S®ZNZE1-B231	3.5 mm ¹ , female + 3.5 mm ¹ , male		
R&S®ZNZE1-B131 + R&S®ZNZE1-B231	3.5 mm ¹ , male + 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)
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 x H x D	109 mm x 90 mm x 32 mm (4.29 in x 3.54 in x 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.

Service options

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
Extended warranty with accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

Extended warranty with a term of one to four years (WE1 to WE4)

Repairs carried out during the contract term are free of charge³. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW4)

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs³ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

³ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Extended warranty with accredited calibration (AW1 to AW4)

Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs³ and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

Service at Rohde & Schwarz You're in great hands

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Rohde & Schwarz customer support

www.rohde-schwarz.com/support



Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG
Trade names are trademarks of the owners
PD 3683.5597.22 | Version 03.00 | February 2023 (st)
R&S®ZN-ZE1xx Calibration Units
Data without tolerance limits is not binding | Subject to change
© 2022 - 2023 Rohde & Schwarz GmbH & Co. KG | 81671 Munich, Germany

3683.5597.22



3683.5597.22.03.00.PDPPDW1.en