R&S®RT-Zxx
HIGH VOLTAGE AND CURRENT PROBES

Specifications

Specifications | Version 29.00

ROHDE&SCHWARZ

Make ideas real

CONTENTS

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

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.

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

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

Probe/oscilloscope chart

Base unit	Probe interface	R&S®RTC1000	R&S®RTB2000	R&S®RTM3000	R&S®RTA4000	MXO 4 MXO 5	R&S®RTO	R&S®RTP	R&S®RTH	Page
Passive probes										
R&S®RT-ZH03	BNC, 1 MΩ	●	●	●	●	●	●			8
R&S®RT-ZH10		○	○	●	●	●	●			10
R&S®RT-ZH11		○	○	●	●	●	●			10
R&S®RT-ZI10	BNC, 1 MΩ, readout								●	13
R&S®RT-ZI10C									●	13
R&S®RT-ZI11									●	13
R&S®RT-ZPMMCX [1]		○	○	○	○	●	○			17

[1] Automatic detection of the probe only together with the MXO oscilloscopes.

Base unit	Probe interface	R&S®RTC1000	R&S®RTB2000	R&S®RTM3000	R&S®RTA4000	MXO 4 MXO 5	R&S®RTO	R&S®RTP	R&S®RTH	Page
Differential probes										
R&S®RT-ZISO	Rohde & Schwarz or BNC, 50 Ω [2]	○	○	○	○	●	●	●	○	20
R&S®RT-ZD002 [3]	BNC, 1 MΩ	●	●	○	○	○	○			36
R&S®RT-ZD003 [3]		●	●	○	○	○	○			36
R&S®RT-ZD02 [3]	BNC, 50 Ω [2]	○	○	●	●	●	●	●		39
R&S®RT-ZD08 [3]		○	○	●	●	●	○	●		39
R&S®RT-ZHD07	Rohde & Schwarz, 1 MΩ			●	●	●	●			41
R&S®RT-ZHD15				●	●	●	●			46
R&S®RT-ZHD16				●	●	●	●			46
R&S®RT-ZHD60				●	●	●	●			50

[2] Probe requires 50 Ω input coupling. It can be attached to oscilloscopes with 1 MΩ input coupling using a BNC feedthrough termination adapter.

[3] Discontinued product.

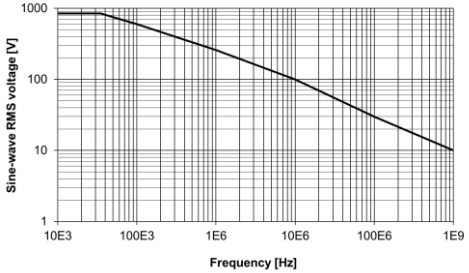
Base unit	Probe interface	R&S®RTC1000	R&S®RTB2000	R&S®RTM3000	R&S®RTA4000	MXO 4 MXO 5	R&S®RTO	R&S®RTP	R&S®RTH	Page
Current probes										
R&S®RT-ZC02	BNC, 1 MΩ	●	●	○	○	○	○		●	54
R&S®RT-ZC03		●	●	○	○	○	○		●	54
R&S®RT-ZC10		●	●	○	○	○	○		○	58
R&S®RT-ZC20		●	●	○	○	○	○		○	58
R&S®RT-ZC30		●	●	●	●	●	●		○	58
R&S®RT-ZC31		●	●	●	●	●	●		○	63
R&S®RT-ZC05B	Rohde & Schwarz, 1 MΩ			●	●	●	●			58
R&S®RT-ZC10B				●	●	●	●			58
R&S®RT-ZC15B				●	●	●	●			58
R&S®RT-ZC20B				●	●	●	●			58

● recommended extra
○ possible accessory, with limited functionality of probe or base unit

R&S®RT-ZH03 high voltage passive probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZH03
Step response		
Rise time	system, 10 % to 90 %	1.4 ns (meas.)
Frequency response		
Bandwidth	system, –3 dB, starting at DC	> 250 MHz (meas.)
Input impedance		
DC input resistance	system	100 MΩ
Input capacitance	system	6.5 pF (meas.)
DC characteristics		
Attenuation	system, automatically corrected on base unit display	100:1
Attenuation error	probe only, with ideal 1 MΩ load impedance	±2 % (meas.)
Attenuation voltage coefficient		±0.0025 %/V (meas.)
Maximum rated input voltage		
Continuous voltage	derated, see figure on page 9	850 V (RMS)
Transient overvoltage		±1200 V
Base unit		
Input capacitance	must be compensated by probe's LF compensation	10 pF to 50 pF
Input coupling	AC/DC	1 MΩ



R&S®RT-ZH03 maximum rated sine-wave root mean square voltage versus frequency

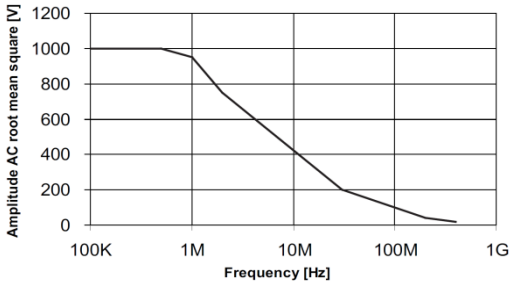
General data

Temperature		
Temperature loading	operating temperature range	0 °C to +40 °C
Climatic loading		80 % relative humidity without condensation
Altitude	operation	up to 2000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	cable length	approx. 1.3 m (51 in)
Weight	probe only	approx. 55 g (0.12 lb)
Probe interface		
Connector		BNC

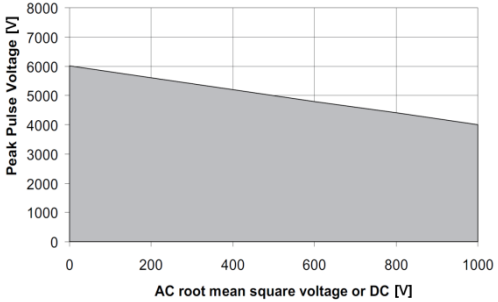
R&S®RT-ZH10/-ZH11 high voltage passive probes

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

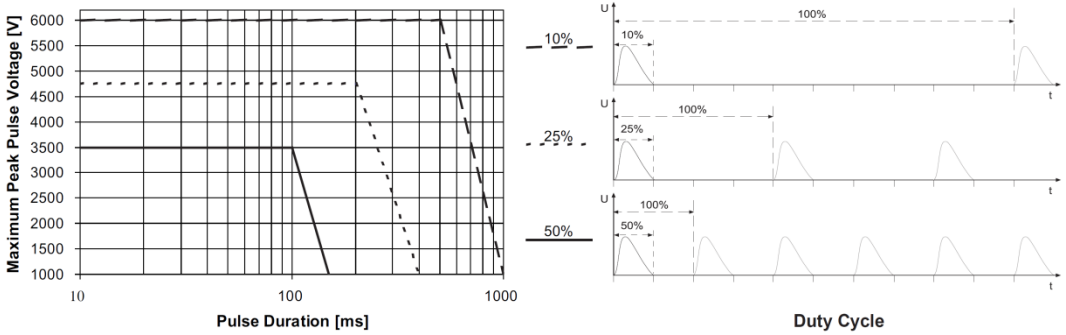
		R&S®RT-ZH10	R&S®RT-ZH11
Step response			
Rise time	system, 10 % to 90 %	900 ps (meas.)	
Frequency response			
Bandwidth	system, –3 dB, starting at DC	> 400 MHz (meas.)	
Input impedance			
DC input resistance	system	50 MΩ ± 2 %	
Input capacitance	system	7.5 pF (meas.)	
DC characteristics			
Attenuation	system, automatically corrected on base unit display	100:1	1000:1
Attenuation error	probe only, with ideal 1 MΩ load impedance	±2 %	
Attenuation voltage coefficient		±0.0005 %/V (meas.)	
Maximum rated input voltage			
Continuous voltage	derated, see figures on page 11	1000 V (RMS) CAT II	
Transient overvoltage		±4000 V	
Base unit			
Input capacitance	must be compensated by probe's LF compensation	5 pF to 20 pF	
Input coupling	AC/DC	1 MΩ	



R&S®RT-ZH10/-ZH11 maximum rated sine-wave root mean square voltage versus frequency, CAT I



R&S®RT-ZH10/-ZH11 maximum root mean square voltage versus peak pulse voltage, CAT I



R&S®RT-ZH10/-ZH11 maximum pulse derating, CAT I

General data

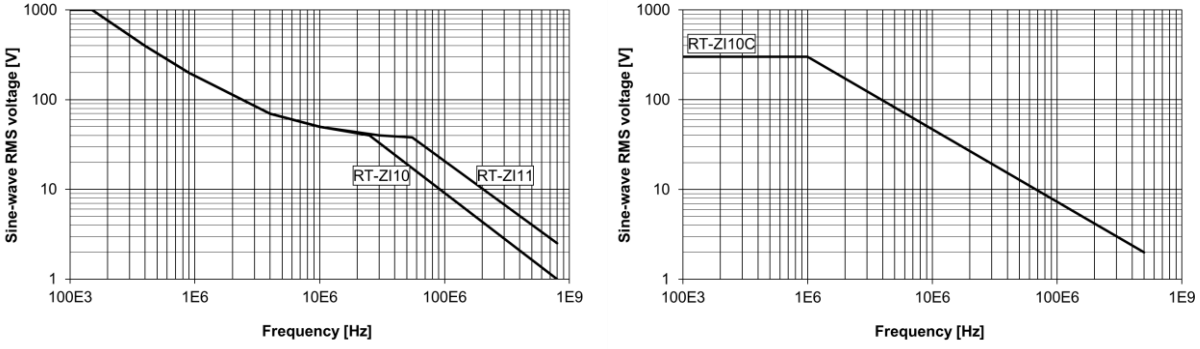
Temperature		
Temperature loading	operating temperature range	0 °C to +50 °C
	storage temperature range	−40 °C to +70 °C
Climatic loading		80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +50 °C
Altitude	operation	up to 2000 m
	transport	up to 15000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	cable length	approx. 2 m (79 in)
Weight	probe only	approx. 67 g (0.15 lb)
Probe interface		
Connector		BNC with readout

R&S®RT-ZI10(C)/-ZI11 isolated probes

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ.
The R&S RT-ZI10/-ZI11 must be used only with insulated oscilloscopes provided with touch-protected inputs.
See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZI10	R&S®RT-ZI11
Step response			
Rise time	system, 10 % to 90 %	900 ps (meas.)	
Frequency response			
Bandwidth	system, –3 dB, starting at DC	> 500 MHz (meas.)	
Input impedance			
DC input resistance	system	10 MΩ ± 1 %	100 MΩ ± 1 %
Input capacitance	system	12 pF (meas.)	4.6 pF (meas.)
DC characteristics			
Attenuation	system	10:1	100:1
Attenuation error	system	±2 %	
Maximum rated input voltage	between probe tip and probe reference terminal derated, see figure on page 15	1000 V (RMS)	3540 V (RMS)
		1000 V (RMS) CAT III	
		600 V (RMS) CAT IV	
	between probe terminals and earth ground derated, refer to base unit manual	1000 V (RMS)	
Base unit			
Use with		R&S®RTH	
Input capacitance	must be compensated by probe's LF compensation	10 pF to 22 pF	10 pF to 25 pF
Input coupling	AC/DC	1 MΩ	

		R&S®RT-ZI10C
Step response		
Rise time	system, 10 % to 90 %	700 ps (meas.)
Frequency response		
Bandwidth	system, –3 dB, starting at DC	> 500 MHz (meas.)
Input impedance		
DC input resistance	system	10 MΩ ± 1 %
Input capacitance	system	11 pF (meas.)
DC characteristics		
Attenuation	system	10:1
Attenuation error	system	±2 %
Maximum rated input voltage	between probe tip and probe reference terminal derated, see figure on page 15	300 V (RMS) CAT III
	between probe terminals and earth ground derated, refer to base unit manual	300 V (RMS)
Base unit		
Use with		R&S®RTH
Input capacitance	must be compensated by probe's LF compensation	10 pF to 22 pF
Input coupling	AC/DC	1 MΩ



R&S®RT-ZI10(C)/-ZI11 maximum rated sine-wave root mean square voltage between probe tip and probe reference terminal versus frequency (CAT III)

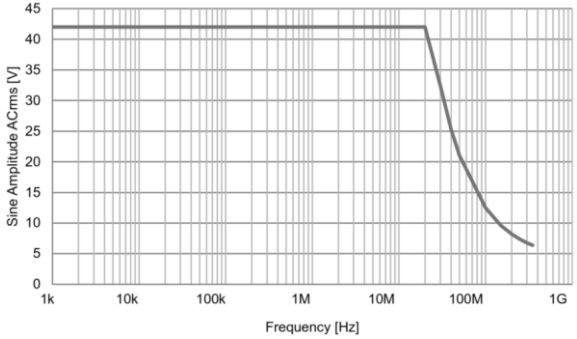
General data

Temperature		
Temperature loading	operating temperature range	+5 °C to +40 °C
Climatic loading		80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +50 °C
Altitude	operation	up to 2000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	diameter of reference terminal (R&S®RT-ZI10 and R&S®RT-ZI11 only)	approx. 2 mm (0.08 in)
	cable length	approx. 1.2 m (47 in)
Weight	probe only	approx. 75 g (0.17 lb)
Probe interface		
Connector		BNC, isolated

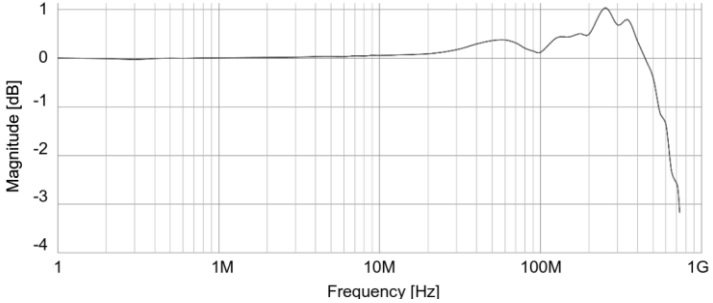
R&S®RT-ZPMMCX passive probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

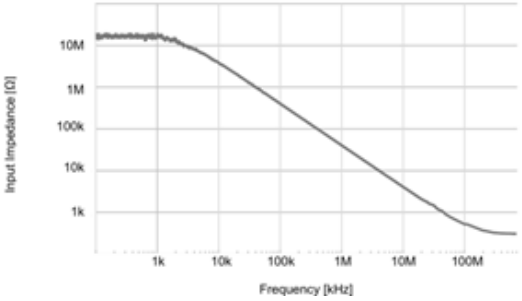
		R&S®RT-ZPMMCX
Step response		
Rise time	system, 10 % to 90 %	< 570 ps (meas.)
Frequency response		
Bandwidth	system, –3 dB, starting at DC	> 700 MHz (meas.)
Propagation delay		< 5 ns (meas.)
Input impedance		
DC input resistance	system	14.9 MΩ ± 1 %
Input capacitance	system	< 4 pF (meas.)
DC characteristics		
Attenuation	system, automatically corrected on base unit display	25:1
Attenuation error	probe only, with ideal 1 MΩ load impedance	±2 % at DC
Maximum rated input voltage		
DC voltage		±60 V
AC voltage	derated, see figure on page 18	30 V (RMS)
Transient peak voltage		±42 V
Base unit		
Use with		MXO
Input capacitance	must be compensated by probe's LF compensation	7 pF to 20 pF
Input coupling	AC/DC	1 MΩ



R&S®RT-ZPMMCX typical voltage derating



R&S®RT-ZPMMCX typical frequency response (normalized)



R&S®RT-ZPMMCX typical differential input impedance (full bandwidth)

General data

Temperature		
Temperature loading	operating temperature range	−40 °C to +60 °C
	storage temperature range	−40 °C to +71 °C
Climatic loading	operating climatic loading	80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +45 °C, non-condensing humidity
	storage climatic loading	95 % relative humidity for temperatures up to +40 °C
Altitude	operation	up to 2000 m
	transport	up to 15000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
EMC		in line with IEC/EN 61326-1
Mechanical data		
Dimensions	length	approx. 1.2 m (47 in)
Weight	probe only	approx. 45 g (0.1 lb)
Probe interfaces		
Input connector		MMCX (male)
Output connector		BNC (male) with readout

R&S®RT-ZISO isolated probing system

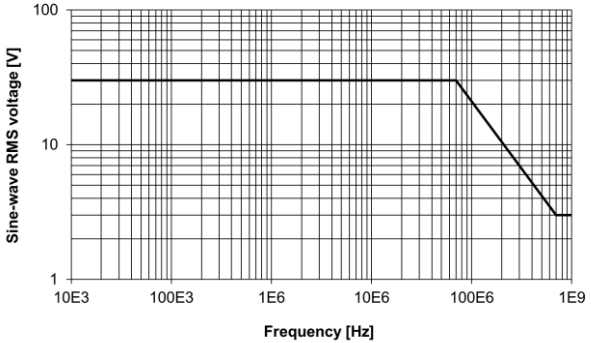
All parameters are valid when the probe is connected to an appropriate oscilloscope with an input impedance of 50 Ω. The probe settings are set by the oscilloscope settings (operation via oscilloscope connector cable on an appropriate Rohde & Schwarz oscilloscope)
See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

Step response		
Rise time	10 % to 90 %	
	with R&S®ZISO-B901 option	< 4 ns (meas.)
	with R&S®ZISO-B902 option or -B202 upgrade	< 2 ns (meas.)
	with R&S®ZISO-B903 option or -B203 upgrade	< 1.14 ns (meas.)
	with R&S®ZISO-B905 option or -B205 upgrade	< 800 ps (meas.)
	with R&S®ZISO-B910 option or -B210 upgrade	< 450 ps (meas.)
Flatness	starting 10 ns after edge	3 % (meas.)
Propagation delay	incl. oscilloscope connector cable	
	with R&S®ZISO-B403 option (3 m fiber cable)	27 ns (meas.)
	with R&S®ZISO-B410 option (10 m fiber cable)	63 ns (meas.)
Frequency response		
Bandwidth	starting at DC, calculated from 0.45/rise time	
	with R&S®ZISO-B901 option	100 MHz
	with R&S®ZISO-B902 option or -B202 upgrade	200 MHz
	with R&S®ZISO-B903 option or -B203 upgrade	350 MHz
	with R&S®ZISO-B905 option or -B205 upgrade	500 MHz
	with R&S®ZISO-B910 option or -B210 upgrade	1 GHz

Common mode rejection (meas.)	DC	145 dB
	1 MHz	145 dB
	100 MHz	110 dB
	200 MHz	100 dB
	500 MHz	100 dB
	1 GHz	90 dB
Input impedance		
DC input resistance		1 MΩ ± 1 %
Input capacitance		8 pF (meas.)
DC characteristics		
Attenuation	automatically set by oscilloscope vertical setting (operation on appropriate Rohde & Schwarz oscilloscope, see table on page 5)	0.04:1
		0.01:1
		0.2:1
		0.4:1
		2:1
		4:1
		20:1
		40:1
		120:1
Attenuation error	after self-alignment	
	input voltage range > ±0.01 V	±1.5 % full scale
	input voltage range ±0.01 V	±2.5 % full scale
Temperature drift, attenuation		±0.15 %/°C (meas.)
Zero error	after self-alignment (input related)	±0.5 mV ±0.02 × input voltage range

Dynamic range		
Input voltage range	0.04:1	±0.01 V
	0.1:1	±0.025 V
	0.2:1	±0.05 V
	0.4:1	±0.1 V
	2:1	±0.5 V
	4:1	±1 V
	20:1	±5 V
	40:1	±10 V
	120:1	±30 V
Offset compensation range	in all attenuation settings applicable	±30 V
Offset compensation error		±(0.35 % × |offset| + 0.35 % × input voltage range) (meas.)
Operating voltage window	each signal socket to ground, not handheld, with 1 m protective distance to probe head	±60 kV
	handheld in combination with R&S®ZISO-Zxxx (excl. R&S®ZISO-Z301)	1000 V (RMS) CAT III
	handheld in combination with R&S®ZISO-Z301	300 V (RMS) CAT III

System noise voltage (meas.)	measured with compatible Rohde & Schwarz oscilloscope (system noise is depending on oscilloscope frontend); R&S®					
	input voltage range	ZISO-B901 (100 MHz)	ZISO-B902 (200 MHz)	ZISO-B903 (350 MHz)	ZISO-B905 (500 MHz)	ZISO-B910 (1 GHz)
	±0.01 V	107 µV	121 µV	153 µV	172 µV	245 µV
	±0.025 V	140 µV	161 µV	220 µV	252 µV	383 µV
	±0.05 V	211 µV	255 µV	363 µV	417 µV	623 µV
	±0.1 V	382 µV	465 µV	683 µV	780 µV	1.16 mV
	±0.5 V	1.84 mV	2.26 mV	3.35 mV	3.81 mV	5.65 mV
	±1 V	5.90 mV	7.27 mV	9.49 mV	10.9 mV	16.0 mV
	±5 V	18.9 mV	23.5 mV	34.3 mV	39.0 mV	58.5 mV
	±10 V	37.0 mV	45.7 mV	67.4 mV	77.1 mV	115 mV
	±30 V	110 mV	134 mV	201 mV	229 mV	342 mV
Maximum rated input voltage						
Continuous voltage	derated, refer to manual, input inner and outer conductor to ground with R&S®ZISO-Zxxx (excl. R&S®ZISO-Z301)			1000 V (RMS) CAT III		
	derated, refer to manual, input inner and outer conductor to ground with R&S®ZISO-Z301			300V (RMS) CAT III		
	derated, see figure on page 24, input inner conductor to reference terminal without R&S®ZISO-Zxxx			30 V (RMS), 42.4 V (peak)		
	DC voltage, input inner conductor to reference terminal without R&S®ZISO-Zxxx			±60 V		
Base unit						
Input coupling	DC			50 Ω		



R&S®RT-ZISO maximum rated sine-wave root mean square voltage between probe input and probe reference terminal versus frequency

R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter can be used to measure differential voltage.

Measurement error		
DC coupling (meas.)	probe head only and with R&S®ZISO-Zxxx (excl. R&S®ZISO-Z302)	
	+15 °C to +35 °C	±0.2 % of reading, ±0.01 V × tip attenuation
	0 °C to +40 °C	±0.4 % of reading, ±0.02 V × tip attenuation
	with R&S®ZISO-Z302	
	+15 °C to +35 °C	±0.8 % of reading, ±0.01 V × tip attenuation
	0 °C to +40 °C	±1.6 % of reading, ±0.02 V × tip attenuation
AC coupling (meas.)	probe head only and with R&S®ZISO-Zxxx (excl. R&S®ZISO-Z302)	
	+15 °C to +35 °C	±0.4 % of reading, ±0.01 V × tip attenuation
	0 °C to +40 °C	±0.8 % of reading, ±0.02 V × tip attenuation
	with R&S®ZISO-Z302	
	+15 °C to +35 °C	±0.4 % of reading, ±0.01 V × tip attenuation
	0 °C to +40 °C	±1.6 % of reading, ±0.02 V × tip attenuation
Temperature drift		0.02 %/°C of reading ±2 mV/°C (meas.)
50/60 Hz rejection		> 87 dB
Integration time		147 ms (typ.)

General data

Temperature		
Temperature loading	operating temperature range	0 °C to +40 °C
	storage temperature range	−40 °C to +70 °C
Climatic loading		+25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30
Altitude	operation	up to 2000 m
	transport	up to 4500 m
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 2 g at 55 Hz, 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6
	random	8 Hz to 500 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810G
EMC		in line with EMC Directive 2014/30/EC, IEC/EN 61326-1 (table 2), IEC/EN 61326-2-1, CISPR 11/EN 55011(class A)
Calibration interval		2 years (or 10000 h of operation)
Safety		in line with IEC/EN 61010-1, IEC/EN 61010-031, IEC 60825-1
RoHS		in line with RoHS Directive 2011/65/EU
External power supply		100 V to 240 V ±10 % at 50/60 Hz, max. 1.0 A or 1.4 A

Mechanical data		
Dimensions	probe head, without connectors and bend protection (W × H × L)	approx. 50 mm × 40 mm × 172 mm (1.97 in × 1.58 in × 6.77 in)
	probe receiver, without connectors and bend protection (W × H × L)	approx. 120 mm × 69 mm × 158 mm (4.72 in × 2.72 in × 6.22 in)
	fiber cable length	
	R&S®ZISO-B403 option	approx. 3 m (10 ft)
	R&S®ZISO-B410 option	approx. 10 m (33 ft)
Weight	probe without accessory	approx. 1.5 kg (3.3 lb)
	probe with standard accessory (incl. bag)	approx. 3.2 kg (7.1 lb)
Minimum bend radius of optical fiber		10 cm (4 in)
Probe interface		
Input socket		SMA (female)
Connector	via oscilloscope connector cable	Rohde & Schwarz probe interface
	without oscilloscope connector cable	SMA (female)

R&S®ZISO-Z1xx probe tip modules

		R&S®ZISO-Z101
Step response		
Rise time	system, 10 % to 90 %	< 450 ps (meas.)
Flatness	starting 10 ns after edge	2 % (meas.)
Frequency response		
Bandwidth	system, –3 dB, starting at DC	> 1 GHz (meas.)
Flatness	1 kHz up to half of the system bandwidth	0.2 dB (meas.)
Common mode rejection (meas.)	DC	145 dB
	1 MHz	120 dB
	100 MHz	100 dB
	200 MHz	95 dB
	500 MHz	95 dB
	1 GHz	80 dB
Input impedance		
DC input resistance	system	50 Ω ± 1 %
Reflection coefficient	system	< –12 dB (meas.)
DC characteristics		
Attenuation	system	1.5:1
Attenuation error	system	±2 %
Maximum rated input voltage		
Continuous voltage	between probe tip and probe reference terminal	8 V (RMS)
	between probe terminals and earth ground derated, refer to base unit manual	1000 V (RMS) CAT III
Transient voltage		±45 V (peak)

Dynamic range		
Input voltage range		±45 V
Base unit		
Use with		R&S®RT-ZISO

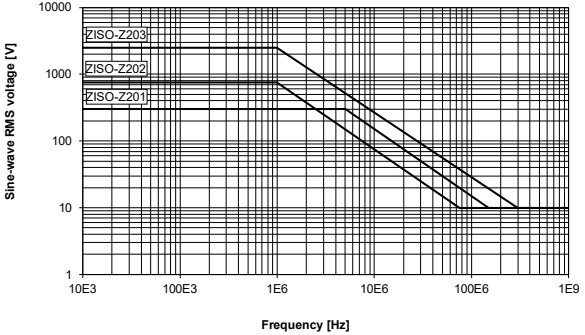
General data

Temperature		
Temperature loading	operating temperature range	0 °C to +40 °C
Climatic loading		+25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30
Altitude	operation	up to 2000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	cable length	approx. 37 cm (14.6 in)
Weight	probe only	approx. 75 g (0.17 lb)
Probe input		
Connector		MMCX (male)

R&S®ZISO-Z2xx probe tip modules

		R&S®ZISO-Z201	R&S®ZISO-Z202	R&S®ZISO-Z203
Step response				
Rise time	system, 10 % to 90 %	< 450 ps (meas.)	< 450 ps (meas.)	< 450 ps (meas.)
Flatness	starting 10 ns after edge	2 % (meas.)	2 % (meas.)	2 % (meas.)
Frequency response				
Bandwidth	system, –3 dB, starting at DC	> 1 GHz (meas.)		
Flatness	1 kHz up to half of the system bandwidth	0.2 dB (meas.)		
Common mode rejection (meas.)	DC	145 dB	129 dB	120 dB
	1 MHz	105 dB	105 dB	98 dB
	100 MHz	85 dB	47 dB	44 dB
	200 MHz	80 dB	43 dB	40 dB
	500 MHz	75 dB	30 dB	28 dB
	1 GHz	60 dB	11 dB	8 dB
Input impedance				
DC input resistance	system	10 MΩ ± 1 %	10 MΩ ± 1 %	40 MΩ ± 1 %
Input capacitance	system	3.7 pF (meas.)	3.5 pF (meas.)	3.2 pF (meas.)
DC characteristics				
Attenuation	system	10:1	25:1	100:1
Attenuation error	system	±2 %		

Maximum rated input voltage				
Continuous voltage	between probe tip and probe reference terminal derated, see figure on page 31	300 V (RMS)	750 V (RMS)	2500 V (RMS)
	between probe terminals and earth ground derated, refer to base unit manual	1000 V (RMS) CAT III		
Transient voltage	between probe tip and reference terminal	±500 V (peak)	±1000 V (peak)	±3500 V (peak)
Dynamic range				
Input voltage range		±300 V	±750 V	±3000 V
Base unit				
Use with		R&S®RT-ZISO		



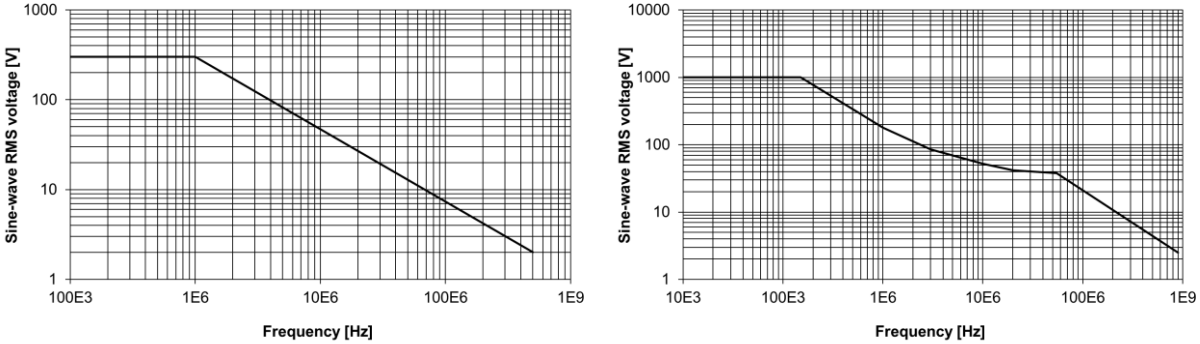
R&S®ZISO-Z201/-Z202/-Z203 maximum rated sine-wave root mean square voltage between probe tip and probe reference terminal versus frequency (CAT III)

General data

Temperature		
Temperature loading	operating temperature range	0 °C to +40 °C
Climatic loading		+25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30
Altitude	operation	up to 2000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	cable length	
	R&S®ZISO-Z201	approx. 21.5 cm (8.5 in)
	R&S®ZISO-Z202	approx. 32 cm (12.6 in)
	R&S®ZISO-Z203	approx. 38 cm (15 in)
Weight	probe only	approx. 75 g (0.17 lb)
Probe input		
Connector	R&S®ZISO-Z201	MMCX (male)
	R&S®ZISO-Z202	SQPIN (2.54 mm (0.1 in), female)
	R&S®ZISO-Z203	WSQPIN (5.08 mm (0.2 in), female)

R&S®ZISO-Z3xx probe tip modules

		R&S®ZISO-Z301	R&S®ZISO-Z302
Step response			
Rise time	system, 10 % to 90 %	700 ps (meas.)	900 ps (meas.)
Flatness	starting 10 ns after edge	2 % (meas.)	2 % (meas.)
Frequency response			
Bandwidth	system, –3 dB, starting at DC	> 500 MHz (meas.)	
Input impedance			
DC input resistance	system	10 MΩ ± 1 %	100 MΩ ± 1 %
Input capacitance	system	11 pF (meas.)	4.6 pF (meas.)
DC characteristics			
Attenuation	system	10:1	100:1
Attenuation error	system	±2 %	
Maximum rated input voltage			
Continuous voltage	between probe tip and probe reference terminal derated, see figure on page 34	300 V (RMS)	3540 V (RMS)
	between probe terminals and earth ground derated, refer to base unit manual	300 V (RMS) CAT III	1000 V (RMS) CAT III
Dynamic range			
Input voltage range		±300 V	±3000 V
Base unit			
Use with		R&S®RT-ZISO	



R&S®ZISO-Z301 (left)/R&S®ZISO-Z302 (right) maximum rated sine-wave root mean square voltage between probe tip and probe reference terminal versus frequency (CAT III)

General data

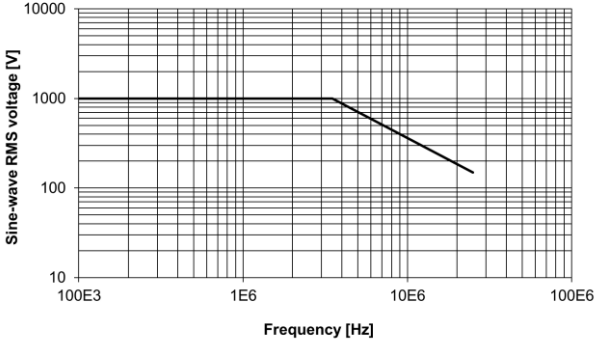
Temperature		
Temperature loading	operating temperature range	–5 °C to +40 °C
Climatic loading		+25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30
Altitude	operation	up to 2000 m
Safety		in line with Low Voltage Directive 2014/35/EU, IEC/EN 61010-031 (pollution degree 2)
RoHS		in line with RoHS Directive 2011/65/EU
Mechanical data		
Dimensions	diameter of probe tip	approx. 5 mm (0.2 in)
	diameter of reference terminal	approx. 2 mm (0.08 in)
	cable length	approx. 1.2 m (47 in)
Weight	probe only	approx. 75 g (0.17 lb)
Probe input		
Connector		browser

R&S®RT-ZD002/-ZD003 high voltage differential probes (discontinued products)

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZD002	R&S®RT-ZD003
Step response			
Rise time	10 % to 90 %	14 ns (meas.)	
Frequency response			
Bandwidth	–3 dB, starting at DC, calculated from 0.35/rise time	25 MHz	
Common mode rejection	DC to 100 Hz	86 dB (meas.)	80 dB (meas.)
	100 Hz to 20 kHz	66 dB (meas.)	60 dB (meas.)
Input impedance			
DC input resistance	differential (between signal sockets)	8 MΩ (meas.)	
	single-ended (each signal socket to ground)	4 MΩ (meas.)	
Input capacitance	differential (between signal sockets)	2.75 pF (meas.)	
	single-ended (each signal socket to ground)	5.5 pF (meas.)	
DC characteristics			
Attenuation	low/high attenuation	10:1, 100:1	20:1, 200:1
Attenuation error		±2 % (meas.)	±2 % (meas.)
Maximum differential input	between signal sockets, low/high attenuation	±70 V, ±700 V	±140 V, ±1400 V
Operating voltage window	each signal socket to ground	±700 V	±1400 V
Zero error	referenced to probe output	±5 mV (meas.)	
Noise voltage	referenced to probe output	0.7 mV (RMS)	
Maximum rated input voltage			
Continuous voltage	derated, see figure, each signal socket to ground	1000 V (RMS) CAT III	

Base unit		
Input coupling		1 MΩ



Maximum rated sine-wave root mean square voltage versus frequency

General data

		R&S®RT-ZD002	R&S®RT-ZD003
Temperature			
Temperature loading	operating temperature range	−10 °C to +40 °C	
	storage temperature range, with battery removed	−30 °C to +70 °C	
Climatic loading		85 % relative humidity without condensation	
Altitude	operation	up to 2000 m	
Safety		in line with EN 61010-1	
RoHS		in line with RoHS Directive 2011/65/EU	
EMC		in line with EN 61326-1	
Calibration interval		2 years	
Mechanical data			
Dimensions	probe head (L × W × H)	approx. 170 mm × 63 mm × 21 mm (6.7 in × 2.5 in × 0.8 in)	
	length of probe cable	approx. 95 cm (37 in)	
	length of input leads	approx. 45 cm (18 in)	
Weight	probe only	approx. 400 g (0.88 lb)	
Probe interface			
Connector		BNC	
Input sockets		4 mm	
Supply voltage		4.5 V to 12 V, 360 mW	
Supply type		battery or USB adapter	
Battery type		4 times AA cells	

R&S®RT-ZD02/-ZD08 high voltage differential probes (discontinued products)

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 50 Ω. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZD02	R&S®RT-ZD08
Step response			
Rise time	10 % to 90 %	1.75 ns (meas.)	437 ps (meas.)
Frequency response			
Bandwidth	–3 dB, starting at DC, calculated from 0.35/rise time	200 MHz	800 MHz
Common mode rejection	DC to 100 Hz	80 dB (meas.)	60 dB (meas.)
	100 Hz to 10 MHz	50 dB (meas.)	–
	100 Hz to 500 MHz	–	15 dB (meas.)
Noise voltage	referenced to probe input	2.6 mV (RMS) (meas.)	2.3 mV (RMS) (meas.)
Input impedance			
DC input resistance	differential (between signal sockets)	1 MΩ (meas.)	200 kΩ (meas.)
	single-ended (each signal socket to ground)	500 kΩ (meas.)	100 kΩ (meas.)
Input capacitance	differential (between signal sockets)	3.5 pF (meas.)	1 pF (meas.)
	single-ended (each signal socket to ground)	7 pF (meas.)	2 pF (meas.)
DC characteristics			
Maximum differential input	between signal sockets	±20 V	±15 V
Operating voltage window	each signal socket to ground	±60 V	±30 V
Attenuation		10:1	10:1
Attenuation error	probe only, with ideal 50 Ω load impedance	±1 % (meas.)	±2 % (meas.)
Zero error	at probe output	±2 mV (meas.)	±5 mV (meas.)
Base unit input coupling		50 Ω	
Maximum rated input voltage			
DC peak voltage	single-ended (each signal socket to ground)	±60 V	±40 V
AC peak voltage	single-ended (each signal socket to ground)	±60 V	±40 V

General data

		R&S®RT-ZD02	R&S®RT-ZD08
Temperature			
Temperature loading	operating temperature range	+5 °C to +40 °C	
	storage temperature range, with battery removed	−20 °C to +70 °C	
Climatic loading		85 % relative humidity without condensation	
Altitude	operation	up to 3000 m	
	transport	up to 15.300 m	
Safety		in line with EN 61010-1	
RoHS		in line with RoHS Directive 2011/65/EU	
EMC		in line with EN 61326-1	
Calibration interval		2 years	
Mechanical data			
Dimensions	probe head (L × W × H)	approx. 111 mm × 22 mm × 14 mm (4.3 in × 0.9 in × 0.6 in)	
	length of probe cable	approx. 1.2 m (47 in)	
	length of input leads	approx. 15 cm (6 in)	–
Weight	probe only	approx. 170 g (0.37 lb)	
Probe interface			
Connector		BNC	
Input sockets	diameter	4 mm (0.2 in)	0.635 mm (0.02 in)
	spacing	180 mm (7 in)	2.54 mm (0.1 in)
Supply voltage		4.5 V to 12 V	
Supply type		battery or USB adapter	
Battery type		9 V Alkaline battery	
Battery lifetime		7.5 h (meas.)	4.5 h (meas.)

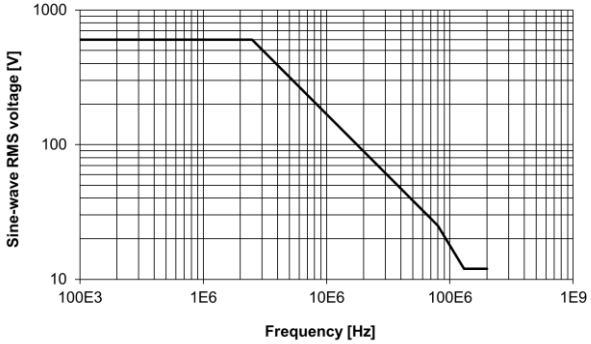
R&S®RT-ZHD07 high voltage differential probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

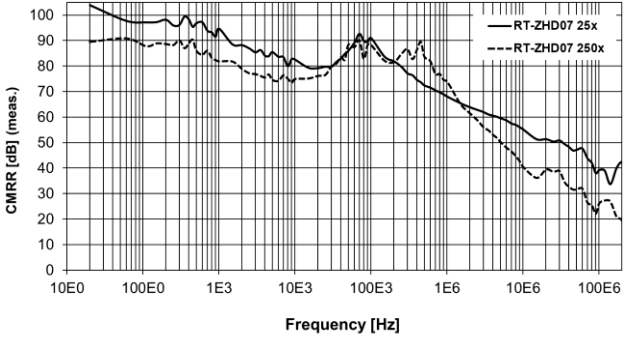
Attenuation setting		25:1	250:1
Step response			
Rise time	10 % to 90 %, both attenuations	< 2 ns	
Frequency response			
Bandwidth	starting at DC, calculated from 0.4/rise time	200 MHz	
Common mode rejection [4]	DC to 60 Hz		
	+15 °C to +35 °C	> 80 dB	
	0 °C to +50 °C	> 75 dB	
	60 Hz to 100 kHz	70 dB (typ.)	65 dB (typ.)
	100 kHz to 1 MHz	60 dB (typ.)	55 dB (typ.)
	1 MHz to 50 MHz	35 dB (typ.)	20 dB (typ.)
Input impedance			
DC input resistance	differential (between signal sockets)	5 MΩ	
	single-ended (each signal socket to ground)	2.5 MΩ	
Input capacitance	differential (between signal sockets)	2.5 pF (meas.)	
	single-ended (each signal socket to ground)	5 pF (meas.)	

[4] Valid for probes starting with serial number 200 000. Older probes have lower CMRR performance. For further information, please refer to the manual.

DC characteristics			
Attenuation error	after applying digital correction factors	±0.5 %	
Temperature drift, attenuation		±60 ppm/°C	
Zero error	after applying digital correction factors, referenced to probe input		
	+15 °C to +35 °C	±12.5 mV	±35 mV
	0 °C to +50 °C	±25 mV	±55 mV
Temperature drift, zero error	referenced to probe input	±0.75 mV/°C	±1.12 mV/°C
	referenced to probe output	±30 µV/°C	±4.5 µV/°C
Dynamic range			
Differential input	between signal sockets	±75 V	±750 V
Offset compensation range	in both attenuations	±1000 V	
Offset compensation error	offset compensation setting = 0 V	no additional error	
	offset compensation setting ≠ 0 V	±0.2 % of setting ±40 mV (meas.)	
Operating voltage window	each signal socket to ground	±750 V	
Noise voltage	referenced to probe input	12 mV (RMS) (meas.)	40 mV (RMS) (meas.)
Maximum rated input voltage			
Continuous voltage	derated, see figure, each signal socket to ground	300 V (RMS) CAT III	
		600 V (RMS) CAT II	
		600 V (RMS)	
Transient voltage	each signal socket to ground	±4500 V (peak)	
Base unit			
Input coupling	AC/DC	1 MΩ	



Maximum rated sine-wave root mean square voltage versus frequency; each signal socket to ground



Measured common mode rejection versus frequency

R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter can be used to measure differential and common mode voltages.

Measurement error, differential mode and common mode	+15 °C to +35 °C 0 °C to +50 °C	±0.1 % of reading ±0.02 V ±0.2 % of reading ±0.04 V
Temperature drift		±60 ppm/°C of reading ±1 mV/°C
Common mode rejection, for differential measurement	+15 °C to +35 °C 0 °C to +50 °C	> 80 dB > 75 dB
50/60 Hz rejection		> 87 dB
Integration time		147 ms

General data

Temperature		
Temperature loading	operating temperature range	0 °C to +50 °C
	storage temperature range	−40 °C to +70 °C
Climatic loading		+25 °C/+40 °C cyclic at 95 % relative humidity without condensation, in line with IEC 60068-2-30
Altitude	operation	up to 3000 m
	transport	up to 4600 m
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 2 g at 55 Hz, 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6
	random	10 Hz to 500 Hz, acceleration 1.9 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E
EMC		in line with EMC Directive 2014/30/EC, IEC/EN 61326-1 (table 2), IEC/EN 61326-2-1, CISPR 11/EN 55011(class B)
Calibration interval		2 years
Safety		in line with IEC/EN 61010-031
RoHS		in line with RoHS Directive 2011/65/EU

Mechanical data		
Dimensions	probe amplifier box, without protector (W × H × L)	approx. 55 mm × 26 mm × 165 mm (2.17 in × 1.02 in × 6.5 in)
	cable length	approx. 1.3 m (52 in)
	overall length	approx. 1.6 m (63 in)
Weight	probe amplifier only	approx. 360 g (0.8 lb)
Probe interface		
Connector		Rohde & Schwarz probe interface
Input sockets		4 mm

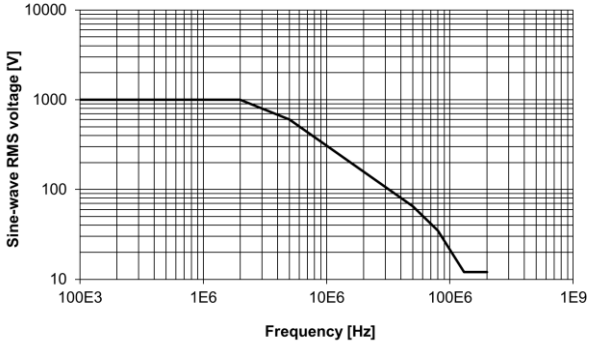
R&S®RT-ZHD15/-ZHD16 high voltage differential probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

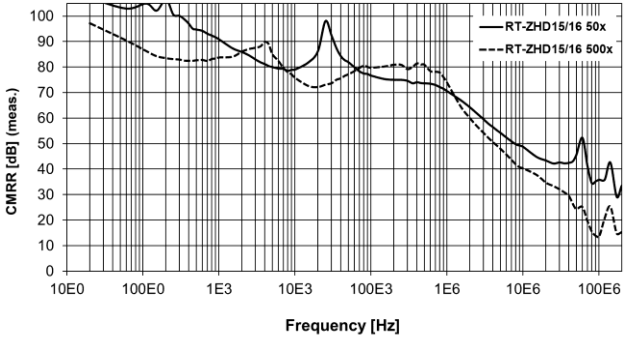
Attenuation setting		50:1	500:1
Step response			
Rise time	10 % to 90 %, both attenuations		
	R&S®RT-ZHD15	< 4 ns	
	R&S®RT-ZHD16	< 2 ns	
Frequency response			
Bandwidth	starting at DC, calculated from 0.4/rise time		
	R&S®RT-ZHD15	100 MHz	
	R&S®RT-ZHD16	200 MHz	
Common mode rejection [5]	DC to 60 Hz		
	+15 °C to +35 °C	> 80 dB	
	0 °C to +50 °C	> 75 dB	
	60 Hz to 100 kHz	70 dB (typ.)	65 dB (typ.)
	100 kHz to 1 MHz	60 dB (typ.)	55 dB (typ.)
	1 MHz to 50 MHz	35 dB (typ.)	20 dB (typ.)
Input impedance			
DC input resistance	differential (between signal sockets)	10 MΩ	
	single-ended (each signal socket to ground)	5 MΩ	
Input capacitance	differential (between signal sockets)	2 pF (meas.)	
	single-ended (each signal socket to ground)	4 pF (meas.)	

[5] Valid for probes starting with serial number 200 000. Older probes have lower CMRR performance. For further information, please refer to the manual.

DC characteristics			
Attenuation error	after applying digital correction factors	±0.5 %	
Temperature drift, attenuation		±60 ppm/°C	
Zero error	after applying digital correction factors, referenced to probe input		
	+15 °C to +35 °C	±25 mV	±65 mV
	0 °C to +50 °C	±50 mV	±95 mV
Temperature drift, zero error	referenced to probe input	±1.5 mV/°C	±1.75 mV/°C
	referenced to probe output	±30 µV/°C	±3.5 µV/°C
Dynamic range			
Differential input	between signal sockets	±150 V	±1500 V
Offset compensation range	in both attenuations	±2000 V	
Offset compensation error	offset compensation setting = 0 V	no additional error	
	offset compensation setting ≠ 0 V	±0.2 % of setting ± 80 mV (meas.)	
Operating voltage window	each signal socket to ground	±1500 V	
Noise voltage	referenced to probe input, (RMS)		
	R&S®RT-ZHD15	20 mV (meas.)	70 mV (meas.)
	R&S®RT-ZHD16	25 mV (meas.)	80 mV (meas.)
Maximum rated input voltage			
Continuous voltage	derated, see figure, each signal socket to ground	1000 V (RMS) CAT III	
		1000 V (RMS)	
Transient voltage	each signal socket to ground	±6800 V (peak)	
Base unit			
Input coupling	AC/DC	1 MΩ	



Maximum rated sine-wave root mean square voltage versus frequency; each signal socket to ground



Measured common mode rejection versus frequency

R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter can be used to measure differential and common mode voltages.

Measurement error, differential mode and common mode	+15 °C to +35 °C	
	≤ 1000 V	±0.1 % of reading ±0.03 V
	> 1000 V	±0.1 % of reading ±0.03 V (meas.)
	0 °C to +50 °C	
	≤ 1000 V	±0.2 % of reading ±0.06 V
	> 1000 V	±0.2 % of reading ±0.06 V (meas.)
Temperature drift		±60 ppm/°C of reading ±1.5 mV/°C
Common mode rejection, for differential measurement	+15 °C to +35 °C	> 80 dB
	0 °C to +50 °C	> 75 dB
50/60 Hz rejection		> 87 dB
Integration time		147 ms

General data

See page 44.

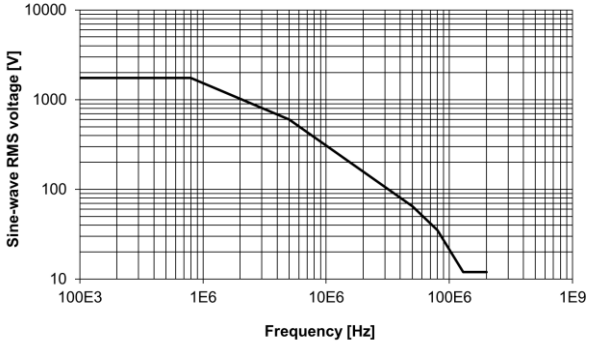
R&S®RT-ZHD60 high voltage differential probe

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

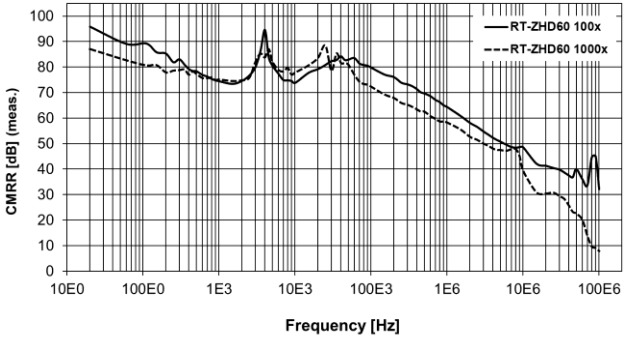
Attenuation setting		100:1	1000:1
Step response			
Rise time	10 % to 90 %, both attenuations	< 4 ns	
Frequency response			
Bandwidth	starting at DC, calculated from 0.4/rise time	100 MHz	
Common mode rejection [6]	DC to 60 Hz		
	+15 °C to +35 °C	> 80 dB	
	0 °C to +50 °C	> 75 dB	
	60 Hz to 100 kHz	70 dB (typ.)	65 dB (typ.)
	100 kHz to 1 MHz	60 dB (typ.)	55 dB (typ.)
	1 MHz to 50 MHz	35 dB (typ.)	20 dB (typ.)
Input impedance			
DC input resistance	differential (between signal sockets)	40 MΩ	
	single-ended (each signal socket to ground)	20 MΩ	
Input capacitance	differential (between signal sockets)	2 pF (meas.)	
	single-ended (each signal socket to ground)	4 pF (meas.)	

[6] Valid for probes starting with serial number 200 000. Older probes have lower CMRR performance. For further information, please refer to the manual.

DC characteristics			
Attenuation error	after applying digital correction factors	±0.5 %	
Temperature drift, attenuation		±80 ppm/°C	
Zero error	after applying digital correction factors, referenced to probe input		
	+15 °C to +35 °C	±90 mV	±150 mV
	0 °C to +50 °C	±150 mV	±230 mV
Temperature drift, zero error	referenced to probe input	±5 mV/°C	±5.5 mV/°C
	referenced to probe output	±50 µV/°C	±5.5 µV/°C
Dynamic range			
Differential input	between signal sockets	±600 V	±6000 V
Offset compensation range	in both attenuations	±2000 V	
Offset compensation error	offset compensation setting = 0 V	no additional error	
	offset compensation setting ≠ 0 V	±0.2 % of setting ±100 mV (meas.)	
Operating voltage window	each signal socket to ground	±6000 V	
Noise voltage	referenced to probe input	70 mV (RMS) (meas.)	280 mV (RMS) (meas.)
Maximum rated input voltage			
Continuous voltage	derated, see figure, each signal socket to ground	1000 V (RMS) CAT III	
		1750 V (RMS)	
Transient voltage	each signal socket to ground	±6800 V (peak)	
Base unit			
Input coupling	AC/DC	1 MΩ	



Maximum rated sine-wave root mean square voltage versus frequency; each signal socket to ground



Measured common mode rejection versus frequency

R&S®ProbeMeter

Specifications for measurement error apply only when offset compensation setting is 0 V. The R&S®ProbeMeter can be used to measure differential and common mode voltages.

Measurement error, differential mode and common mode	+15 °C to +35 °C	
	≤ 1000 V	±0.12 % of reading ±0.1 V
	> 1000 V	±0.12 % of reading ±0.1 V (meas.)
	0 °C to +50 °C	
	≤ 1000 V	±0.25 % of reading ±0.2 V
	> 1000 V	±0.25 % of reading ±0.2 V (meas.)
Temperature drift		±80 ppm/°C of reading ±4.5 mV/°C
Common mode rejection, for differential measurement	+15 °C to +35 °C	> 80 dB
	0 °C to +50 °C	> 75 dB
50/60 Hz rejection		> 87 dB
Integration time		147 ms

General data

See page 44.

R&S®RT-ZC02/-ZC03 current probes

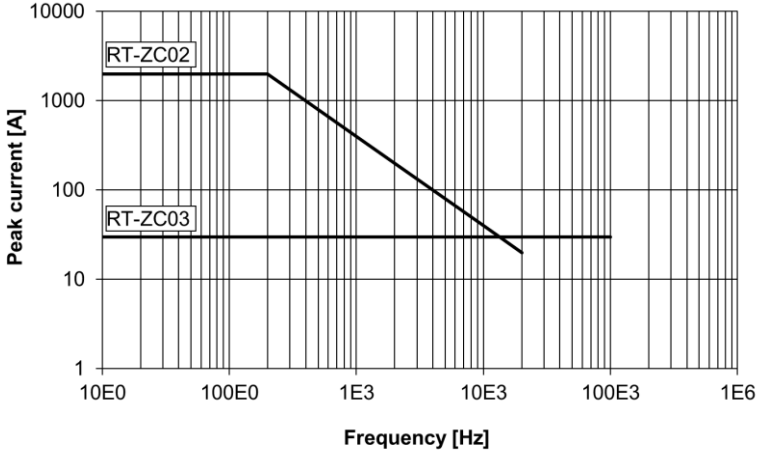
All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZC02	
Sensitivity setting		0.01 V/A	0.001 V/A
Step response			
Rise time	10 % to 90 %	20 µs (meas.)	
Frequency response			
Bandwidth	–3 dB, starting at DC	20 kHz (meas.)	
DC characteristics			
Dynamic range	derated, see figures on page 57	±200 A	±2000 A
Sensitivity error	+23 °C ±1 °C, ±1500 A	±1 % (meas.)	
	+23 °C ±1 °C, ±2000 A	±5 % (meas.)	
Temperature drift, sensitivity		±0.15 %/°C (meas.)	
Zero error	referenced to probe input after demagnetizing and zero adjustment	±100 mA (meas.)	±500 mA (meas.)
AC characteristics			
Maximum slew rate		±20 A/µs (meas.)	
Maximum rated input			
Maximum continuous current		1000 A (RMS)	
Maximum working voltage	for uninsulated conductors	300 V (RMS) CAT III	
Other			
Noise	with 20 MHz lowpass filter	30 mA (RMS) (meas.)	80 mA (RMS) (meas.)
Base unit			
Input coupling		1 MΩ	

		R&S®RT-ZC03
Step response		
Rise time	10 % to 90 %	1 µs (meas.)
Frequency response		
Bandwidth	–0.5 dB, starting at DC	100 kHz (meas.)
DC characteristics		
Dynamic range	derated, see figures on page 57	±30 A
Sensitivity		0.1 V/A
Sensitivity error	+23 °C ±1 °C	±1 % (meas.)
Temperature drift, sensitivity		±0.01 %/°C (meas.)
Zero error	referenced to probe input after demagnetizing and zero adjustment	±2 mA (meas.)
AC characteristics		
Maximum slew rate		±20 A/µs (meas.)
Maximum rated input		
Maximum continuous current		20 A (RMS)
Maximum working voltage	for uninsulated conductors	300 V (RMS) CAT III
Other		
Noise	with 20 MHz lowpass filter	2 mA (RMS) (meas.)
Base unit		
Input coupling		1 MΩ

General data

		R&S®RT-ZC02	R&S®RT-ZC03
Temperature			
Temperature loading	operating temperature range	0 °C to +50 °C	
	storage temperature range, with battery removed	−20 °C to +85 °C	
Climatic loading		80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +50 °C	
Altitude	operation	up to 2000 m	
Safety		in line with EN 61010-1 in line with EN 61010-2-032 (pollution degree 2)	
RoHS		in line with RoHS Directive 2011/65/EU	
EMC		in line with EN 61326-2-2	
Calibration interval		2 years	
Mechanical data			
Dimensions	diameter of probe tip	approx. 32 mm (1.3 in)	approx. 25 mm (1.0 in)
	cable length	approx. 2.0 m (79 in)	
Weight	probe only	approx. 320 g (0.7 lb)	
Probe interface			
Connector		BNC	
Battery type		9 V Alkaline battery, PP3, MN 1604 or IEC6LR61	
Battery lifetime		50 h (meas.)	25 h (meas.)



Maximum rated peak input current versus frequency

R&S®RT-ZC05B/-ZC10(B)/-ZC15B/-ZC20(B)/-ZC30 current probes

All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

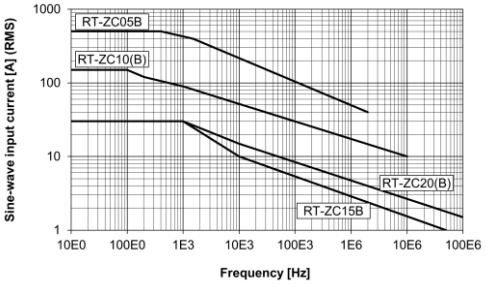
		R&S®RT-ZC05B	R&S®RT-ZC10(B)
Step response			
Rise time	10 % to 90 %, calculated from bandwidth	175 ns	35 ns
Propagation delay		100 ns (meas.)	36 ns (meas.)
Frequency response			
Bandwidth	–3 dB, starting at DC	> 2 MHz	> 10 MHz
Input impedance		see figure on page 65	
DC characteristics			
Sensitivity		0.01 V/A	
Sensitivity error	+23 °C ±3 °C	±1 %	
Zero error	referenced to probe input after demagnetizing and zero adjustment	±500 mA (meas.)	±100 mA (meas.)
AC characteristics			
AC sensitivity error (sinusoidal, 45 Hz to 66 Hz)	+23 °C ±3 °C	±1 % ± 500 mA (RMS)	±1 % ± 100 mA (RMS)
	0 °C to +40 °C	±3 % ± 500 mA (RMS) (meas.)	±3 % ± 100 mA (RMS) (meas.)
Measurement due to external magnetic fields	400 A/m magnetic field, DC or 60 Hz, referenced to probe input	< 800 mA (RMS) (meas.)	< 150 mA (RMS) (meas.)
Maximum rated input			
Maximum continuous current	derated, see figures on page 65	500 A (RMS)	150 A (RMS)
Maximum transient current	peak	±700 A	±300 A
Other			
Noise	20 MHz measurement bandwidth, referenced to probe input	25 mA (RMS) (meas.)	

		R&S®RT-ZC15B	R&S®RT-ZC20(B)
Step response			
Rise time	10 % to 90 %, calculated from bandwidth	7 ns	3.5 ns
Propagation delay		16.5 ns (meas.)	14.8 ns (meas.)
Frequency response			
Bandwidth	–3 dB, starting at DC	> 50 MHz	> 100 MHz
Input impedance		see figure on page 65	
DC characteristics			
Sensitivity		0.1 V/A	
Sensitivity error	+23 °C ±3 °C	±1 %	
Zero error	referenced to probe input after demagnetizing and zero adjustment	±10 mA (meas.)	
AC characteristics			
AC sensitivity error (sinusoidal, 45 Hz to 66 Hz)	+23 °C ±3 °C	±1 % ± 10 mA (RMS)	
	0 °C to +40 °C	±3 % ± 10 mA (RMS) (meas.)	
Measurement due to external magnetic fields	400 A/m magnetic field, DC or 60 Hz, referenced to probe input	< 20 mA (RMS) (meas.)	< 5 mA (RMS) (meas.)
Maximum rated input			
Maximum continuous current	derated, see figures on page 65	30 A (RMS)	
Maximum transient current	peak	±50 A	
Other			
Noise	20 MHz measurement bandwidth, referenced to probe input	2.5 mA (RMS) (meas.)	

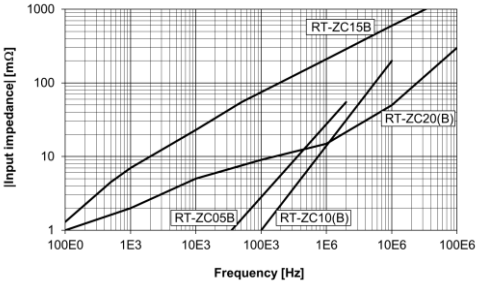
		R&S®RT-ZC30
Step response		
Rise time	10 % to 90 %, calculated from bandwidth	2.9 ns
Frequency response		
Bandwidth	–3 dB, starting at DC	> 120 MHz
Input impedance		see figure on page 65
DC characteristics		
Sensitivity		1 V/A
Sensitivity error	+23 °C ±3 °C	±3 %
Zero error	referenced to probe input after demagnetizing and zero adjustment	±1 mA (meas.)
AC characteristics		
AC measurement error (sinusoidal, 45 Hz to 66 Hz)	+23 °C ±3 °C	±3 % ±1 mA (RMS)
	0 °C to +40 °C	±5 % ±1 mA (RMS) (meas.)
Measurement due to external magnetic fields	400 A/m magnetic field, DC or 60 Hz, referenced to probe input	< 5 mA (RMS) (meas.)
Maximum rated input		
Maximum continuous current	derated, see figures on page 65	5 A (RMS)
Maximum transient current	peak	±7.5 A
Other		
Noise	30 MHz measurement bandwidth, referenced to probe input	60 µA (RMS) (meas.)

General data

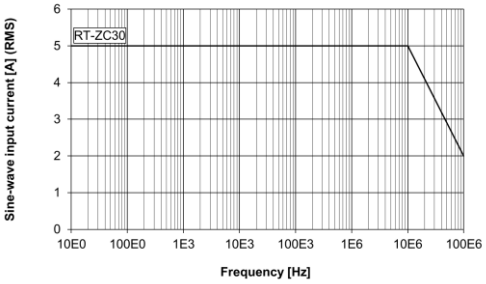
		R&S®RT-ZC05B/ R&S®RT-ZC10(B)	R&S®RT-ZC15B/ R&S®RT-ZC20(B)/ R&S®RT-ZC30
Temperature			
Temperature loading	operating temperature range	0 °C to +40 °C	
	storage temperature range	−10 °C to +50 °C	
Climatic loading		80 % relative humidity	
Altitude	operation	up to 2000 m	
Safety		in line with EN 61010-2-032 (type D sensor, insulated conductor only)	
RoHS		in line with RoHS Directive 2011/65/EU	
EMC		in line with EN 61326-1, CISPR 11/EN 55011 (class B, table 2)	
Calibration interval		2 years	
Mechanical data			
Dimensions	max. conductor diameter	approx. 20 mm (0.79 in)	approx. 5 mm (0.2 in)
	cable length, probe	approx. 2 m (78.7 in)	approx. 1.5 m (59 in)
	cable length, power supply of R&S®RT-ZCxx	approx. 1 m (39.4 in)	approx. 1 m (39.4 in)
	probe head (W × H × L, approx.)	27 mm × 69 mm × 176 mm (1.06 in × 2.72 in × 6.93 in)	18 mm × 40 mm × 175 mm (0.71 in × 1.57 in × 6.89 in)
Weight	probe only	approx. 500 g (1.1 lb)	approx. 240 g (0.53 lb)
Probe interface			
Connector	R&S®RT-ZCxx	BNC	
	R&S®RT-ZCxxB	Rohde & Schwarz probe interface	
Supply voltage	R&S®RT-ZCxx	external power supply necessary (e.g. R&S®RT-ZA13) ±12 V ± 0.5 V (5.5 W)	
	R&S®RT-ZCxxB	power supply by Rohde & Schwarz probe interface	



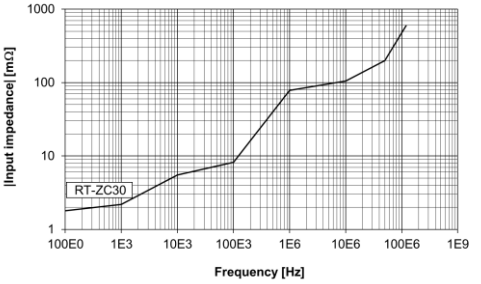
Maximum rated sine-wave root mean square input current versus frequency



Input impedance (meas.)



Maximum rated sine-wave root mean square input current versus frequency



Input impedance (meas.)

R&S®RT-ZC31 current probe

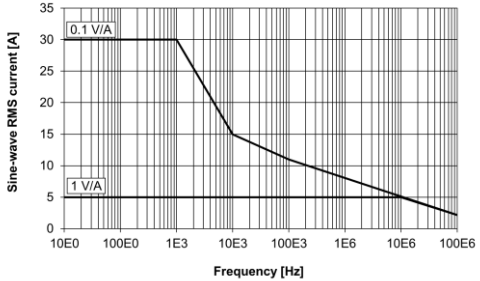
All parameters are valid when the probe is connected to an appropriate Rohde & Schwarz oscilloscope with an input impedance of 1 MΩ. See table on page 5 and Rohde & Schwarz oscilloscope operating manual for more details.

		R&S®RT-ZC31		
Sensitivity setting		0.1 V/A	1 V/A	10 V/A
Step response				
Rise time	10 % to 90 %, calculated from bandwidth	2.9 ns		
Propagation delay		12 ns (meas.)	12 ns (meas.)	13 ns (meas.)
Frequency response				
Bandwidth	–3 dB, starting at DC	> 120 MHz		
Input impedance		see figure on page 65		
DC characteristics				
Sensitivity error	+23 °C ±5 °C	±3 %, ±1 % (meas.)		
Zero error	referenced to probe input after demagnetizing and zero adjustment	±10 mA (meas.)	±1 mA (meas.)	±1 mA (meas.)
AC characteristics				
AC measurement error (sinusoidal, 45 Hz to 66 Hz)	+23 °C ±5 °C	±3 % ±10 mA (RMS)	±3 % ±1 mA (RMS)	±3 % ±1 mA (RMS)
	(meas.)	±1 % ±10 mA (RMS)	±1 % ±1 mA (RMS)	±1 % ±1 mA (RMS)
Measurement due to external magnetic fields	400 A/m magnetic field, DC or 60 Hz, referenced to probe input	< 5 mA (RMS) (meas.)		
Maximum rated input				
Maximum continuous current	derated, see figures on page 65	30 A (RMS)	5 A (RMS)	0.5 A (RMS)
Maximum transient current	peak, input for max. 2 s	±50 A	±7.5 A	±0.75 A
Other				
Noise	20 MHz measurement bandwidth, referenced to probe input			60 µA (RMS) (meas.)

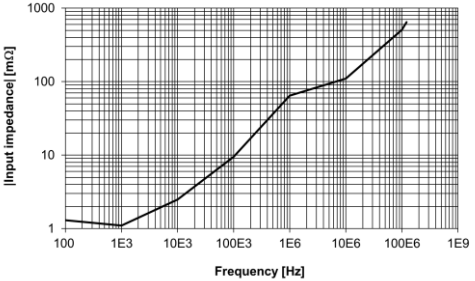
General data

		R&S®RT-ZC31
Temperature		
Temperature loading	operating temperature range	0 °C to +40 °C
	storage temperature range	−10 °C to +50 °C
Climatic loading		80 % relative humidity
Altitude	operation	up to 2000 m
Safety		in line with EN 61010-2-032 (type D sensor, insulated conductor only)
RoHS		in line with RoHS Directive 2011/65/EU
EMC		in line with EN 61326-1, CISPR 11/EN 55011 (class B, table 2)
Calibration interval		2 years
Mechanical data		
Dimensions	max. conductor diameter	approx. 5 mm (0.2 in)
	cable length, probe cord	approx. 1.5 m (59.6 in)
	cable length, junction box to interface box	approx. 0.15 m (6.0 in)
	cable length, power cord	approx. 1 m (39.4 in)
	probe head (W × H × L)	approx. 18 mm × 26 mm × 155 mm (0.71 in × 1.02 in × 6.10 in)
	junction box (W × H × L)	approx. 45 mm × 25 mm × 120 mm (1.77 in × 0.98 in × 4.72 in)
	interface box (W × H × L)	approx. 29 mm × 40 mm × 83 mm (1.14 in × 1.57 in × 3.27 in)
Weight	probe only	approx. 370 g (0.82 lb)

Probe interface		
Connector		BNC
Supply voltage		external power supply necessary (e.g. R&S®RT-ZA13) ±12 V ± 0.5 V (7.8 W)



Maximum rated sine-wave root mean square input current versus frequency



Input impedance (meas.)

R&S®RT-ZA13 probe power supply

Electrical data		
Number of channels		4
Output voltage		±12 V ±0.5 V
Maximum output current	sum total of all channels	2.5 A
Power requirements		100 V to 240 V, 50/60 Hz
Maximum rated input power		170 W

General data

Safety		in line with EN 61010-1
RoHS		in line with RoHS Directive 2011/65/EU
EMC		in line with EN 61326-1 (class B equipment), EN 61000-3-2, EN 61000-3-3
Mechanical data		
Dimensions	W × H × L	approx. 80 mm × 119 mm × 200 mm (3.1 in × 4.7 in × 7.9 in)
Weight		approx. 1.1 kg (2.4 lb)
Connector		LEMO FFA.OS.304.CLAC44Z

Ordering information

Designation	Type	Order No.
High voltage passive probes		
250 MHz high voltage probe, passive, 100:1, 100 MΩ, 6.5 pF, 850 V (RMS) Incl. adjustment tool; coding clips (set) 2 × 4 colors; signal pin (2); sprung hook 5 mm; ground lead 14 cm; insulating cap; protective cap; operating manual	R&S®RT-ZH03	1333.0873.02
400 MHz high voltage probe, passive, 100:1, 50 MΩ, 7.5 pF, 1 kV (RMS) Incl. adjustment tool; BNC adapter 5.0-L; coding rings (set) 3 × 4 colors; flexible adapter 5.0-L; ground lead 22 cm (2); ground lead 22 cm to 4 mm banana plug; insulating cap 5.0-L; operating manual; protection cap 5.0-L; safety alligator clip (2); solid tip 0.8 mm (5); spring tip 0.8 mm (5); sprung hook 5.0-L (2)	R&S®RT-ZH10	1409.7720.02
400 MHz high voltage probe, passive, 1000:1, 50 MΩ, 7.5 pF, 1 kV (RMS) See R&S®RT-ZH10 for equipment included	R&S®RT-ZH11	1409.7737.02
500 MHz isolated probe, passive, 10:1, 10 MΩ, 12 pF, 1 kV (RMS) CAT III Incl. coding rings (set) 5 × 2 colors; ground lead 32 cm with safety alligator clip; sprung hook; ground pin; operating manual	R&S®RT-ZI10	1326.1761.02
500 MHz isolated probe, passive, 10:1, 10 MΩ, 11 pF, 300 V (RMS) CAT III Incl. coding rings (set) 5 × 2 colors; ground lead with safety alligator clip; sprung hook; ground pin; BNC adapter, operating manual	R&S®RT-ZI10C	1326.3106.02
500 MHz isolated probe, passive, 100:1, 100 MΩ, 4.6 pF, 1 kV (RMS) CAT III Incl. coding rings (set) 5 × 2 colors; ground lead 32 cm with safety alligator clip; sprung hook; ground pin; operating manual	R&S®RT-ZI11	1326.1810.02
700 MHz passive probe, MMCX, 25:1, 14.9 MΩ, 4 pF, 30 V (RMS) Incl. MMCX Y-lead adapter, Pico Hook (red), Pico Hook (black), adjustment tool and user manual	R&S®RT-ZPMMCX	1803.1599.02

Designation	Type	Order No.
Differential probes		
Isolated probing system, ±30 V, 1 kV (RMS) CAT III (depending on tip module), Rohde & Schwarz probe interface and BNC; Incl. carrying case; operating manual	R&S®RT-ZISO	1804.5000K02
MMCX 1.5:1, 50 Ω, tip module for R&S®RT-ZISO, 8 V (RMS), ±45 V (peak), 1 kV (RMS) CAT III	R&S®ZISO-Z101	1803.4100.02
MMCX 10:1, 10 MΩ, tip module for R&S®RT-ZISO, ±300 V (peak), 1 kV (RMS) CAT III	R&S®ZISO-Z201	1803.4200.02
SQPIN 25:1, 10 MΩ, tip module for R&S®RT-ZISO, ±750 V (peak), 1 kV (RMS) CAT III	R&S®ZISO-Z202	1803.4300.02
WSQPIN 100:1, 40 MΩ, tip module for R&S®RT-ZISO, ±3 kV (peak), 1 kV (RMS) CAT III	R&S®ZISO-Z203	1803.4400.02
Browser 10:1 10 MΩ, tip module for R&S®RT-ZISO, ±300 V (peak), 300 V (RMS) CAT III	R&S®ZISO-Z301	1803.4500.02
Browser 100:1 100 MΩ, tip module for R&S®RT-ZISO, ±3 kV (peak), 1 kV (RMS) CAT III	R&S®ZISO-Z302	1803.4600.02
25 MHz differential probe, ±700 V, 1 kV (RMS) CAT III, BNC Incl. sprung hook 4 mm (red, black); safety alligator clip 4 mm (red, black); USB power cord; trimming tool; operating manual	R&S®RT-ZD002	1337.9700.02
25 MHz differential probe, ±1.4 kV, 1 kV (RMS) CAT III, BNC Incl. sprung hook 4 mm (red, black); safety alligator clip 4 mm (red, black); USB power cord; trimming tool; operating manual	R&S®RT-ZD003	1337.9800.02
200 MHz differential probe, ±20 V, BNC Incl. safety alligator clip 4 mm (2); sprung hook 4 mm (2); USB power cord; 9 V battery; carrying case; operating manual	R&S®RT-ZD02	1333.0821.02
800 MHz differential probe, ±15 V, BNC Incl. lead 11 cm (2); lead 7 cm (2); signal pin (6); dual pin (4); mini clip (2); micro clip (2); USB power cord; 9 V battery; carrying case; operating manual	R&S®RT-ZD08	1333.0838.02
200 MHz differential probe, ±750 V, 600 V (RMS) CAT II, Rohde & Schwarz probe interface Incl. R&S®RT-ZA24 accessory kit; R&S®RT-ZA22 test leads; R&S®RT-ZHD protector; carrying case; operating manual	R&S®RT-ZHD07	1800.2307.02
100 MHz differential probe, ±1.5 kV, 1 kV (RMS) CAT III, Rohde & Schwarz probe interface Incl. R&S®RT-ZA24 accessory kit; R&S®RT-ZA22 test leads; R&S®RT-ZHD protector; carrying case; operating manual	R&S®RT-ZHD15	1800.2107.02

Designation	Type	Order No.
200 MHz differential probe, ±1.5 kV, 1 kV (RMS) CAT III, Rohde & Schwarz probe interface Incl. R&S®RT-ZA24 accessory kit; R&S®RT-ZA22 test leads; R&S®RT-ZHD protector; carrying case; operating manual	R&S®RT-ZHD16	1800.2207.02
100 MHz differential probe, ±6 kV, 1 kV (RMS) CAT III, Rohde & Schwarz probe interface Incl. R&S®RT-ZA24 accessory kit; R&S®RT-ZA22 test leads; R&S®RT-ZHD protector; carrying case; operating manual	R&S®RT-ZHD60	1800.2007.02
Current probes		
20 kHz current probe, AC/DC, 0.01/0.001 V/A, 1000 A, 300 V (RMS) CAT III, BNC Incl. operating manual	R&S®RT-ZC02	1333.0850.02
100 kHz current probe, AC/DC, 0.1 V/A, 30 A, 300 V (RMS) CAT III, BNC Incl. operating manual	R&S®RT-ZC03	1333.0844.02
10 MHz current probe, AC/DC, 0.01 V/A, 150 A (RMS), BNC Incl. carrying case; operating manual	R&S®RT-ZC10	1409.7750K02
100 MHz current probe, AC/DC, 0.1 V/A, 30 A (RMS), BNC Incl. carrying case; operating manual	R&S®RT-ZC20	1409.7766K02
120 MHz current probe, AC/DC, 1 V/A, 5 A (RMS), BNC Incl. carrying case; operating manual	R&S®RT-ZC30	1409.7772K02
120 MHz current probe, AC/DC, 0.1 V/A / 1 V/A / 10 V/A, 30 A (RMS), BNC Incl. carrying case; operating manual	R&S®RT-ZC31	1801.4932K02
2 MHz current probe, AC/DC, 0.01 V/A, 500 A (RMS), Rohde & Schwarz probe interface Incl. carrying case; operating manual	R&S®RT-ZC05B	1409.8204.02
10 MHz current probe, AC/DC, 0.01 V/A, 150 A (RMS), Rohde & Schwarz probe interface Incl. carrying case; operating manual	R&S®RT-ZC10B	1409.8210.02
50 MHz current probe, AC/DC, 0.1 V/A, 30 A (RMS), Rohde & Schwarz probe interface Incl. carrying case; operating manual	R&S®RT-ZC15B	1409.8227.02
100 MHz current probe, AC/DC, 0.1 V/A, 30 A (RMS), Rohde & Schwarz probe interface Incl. carrying case; operating manual	R&S®RT-ZC20B	1409.8233.02

Designation	Type	Order No.
Accessories and sets		
Mini clips, contains: mini clip (10)	R&S®RT-ZA4	1416.0428.02
Micro clips, contains: micro clip (4)	R&S®RT-ZA5	1416.0434.02
Lead set, contains: lead 6 cm (2.4 in) (5); lead 15 cm (5.9 in) (5)	R&S®RT-ZA6	1416.0440.02
Probe box to N/USB adapter	R&S®RT-ZA9	1417.0909.02
SMA(f) to BNC(m) adapter	R&S®RT-ZA10	1416.0457.02
Adapter BNC to 4 mm dual banana	R&S®RT-ZA11	1333.0796.02
Probe power supply	R&S®RT-ZA13	1409.7789.02
Spare accessory set for R&S®RT-ZI10/11 isolated probes Contains: insulating sleeve (2), reference contact (2), reference leads with crocodile clip, color clips, sprung hook	R&S®RT-ZA20	1326.1978.02
Extended accessory set for R&S®RT-ZI10/11 isolated probes Contains: jaw clip, safety jaw clip, reference lead with 4 mm connector, reference lead with hook clip, 4 mm test probe, BNC connector, dual 4 mm to safety BNC adapter	R&S®RT-ZA21	1326.1984.02
Multimeter test leads, two leads (red/black), 1000 V CAT III	R&S®RT-ZA22	1326.0988.02
Accessory kit for R&S®RT-ZHD high-voltage differential probes Contains: safety alligator clip (red/black); pincer clip (red/black); test clip (red/black); spade terminal (red/black); lead 17 cm (red/black); lead 100 cm (red/black)	R&S®RT-ZA24	1800.2707.02
Probe positioner, 2 legged	R&S®RT-ZA29	1801.4803.02
Probe tip accessory set for R&S®RT-ZP03, R&S®RT-ZP05S, R&S®RT-ZH03 passive voltage probes Contains: ground lead; retractable hook; adjustment tool; protection cap; identification tags; IC insulating cap; solid probe tip (2); spring-loaded probe tip (2); ground clip; BNC adapter	R&S®RT-ZA40	1338.0742.02
MMCX Y-lead adapter	R&S®RT-ZAMXSQ	1803.1647.02
MMCX solder-in to HT	R&S®RT-ZAMXPAD	1803.1653.02
MMCX solder-in to HT open	R&S®RT-ZAMXHTS	1803.1660.02
MMCX cable adapter UF.L	R&S®RT-ZAMXUFL	1803.1676.02
3D probe positioner	R&S®RT-ZAP	1326.3641.02
Power deskew fixture	R&S®RT-ZF20	1800.0004.02

Warranty and service

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [7]	pay per calibration
Warranty and repair	up to five years [7]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

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

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- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

PD 5214.2362.22 | Version 29.00 | April 2025 (sk)
R&S®RT-Zxx High Voltage and Current Probes
Data without tolerance limits is not binding | Subject to change