

# R&S®TS8991

# OTA PERFORMANCE TEST

# SYSTEM COMPONENTS

Specifications

Data Sheet  
Version 03.00

**ROHDE & SCHWARZ**

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# Definitions

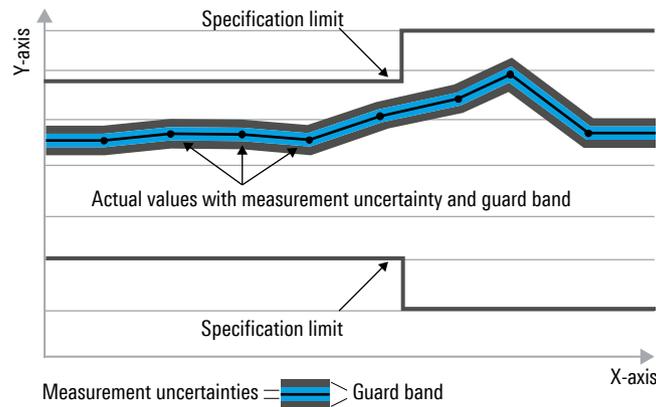
## General

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.



## Non-traceable specifications with limits (n. trc.)

Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

## 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 designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bits per second (Gbps), million bits per second (Mbps), thousand bits 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. RF amplifiers and frequency converters

# R&S®TS8991 OTA performance test system components

## R&S®TC-AZAMP67 RF amplifier unit for azimuth signal path, DC to 67 GHz

RF characteristics		
Frequency range	direct	DC to 67 GHz
	low noise amplifier	2 GHz to 67 GHz
Insertion loss, direct path	400 MHz to 18 GHz	< 1.50 dB
	18 GHz to 40 GHz	< 2.00 dB
	40 GHz to 67 GHz	< 3.00 dB
RF amplifier gain	2 GHz to 40 GHz	> 24 dB (typ.)
	40 GHz to 50 GHz	> 23 dB (typ.)
	50 GHz to 67 GHz	> 20 dB (typ.)
RF amplifier input power		-15 dBm (max.)
RF amplifier P1dB		+2 dBm
Repeatability with low noise amplifier	amplitude	< 0.20 dB
	phase	< 1°
RF connectors	RF input	1.85 mm (f)
	RF output	1.85 mm (f)
General data		
Power supply		R&S®TC-AZ-HOL1, R&S®TC-EL-HOL1
Control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Current		550 mA (nom.)
Dimensions	W x H x D	215 mm x 97.3 mm x 94.6 mm (8.46 in x 3.83 in x 3.72 in)
Weight		1.5 kg (3.3 lb)

## R&S®TC-ELAMP67 RF amplifier unit for elevation signal path, DC to 67 GHz

RF characteristics		
Frequency range	direct	DC to 67 GHz
	low noise amplifier	2 GHz to 67 GHz
Insertion loss, direct path	400 MHz to 18 GHz	< 2.00 dB
	18 GHz to 40 GHz	< 2.50 dB
	40 GHz to 50 GHz	< 4.00 dB
	50 GHz to 67 GHz	< 4.50 dB
RF amplifier gain	2 GHz to 40 GHz	> 23 dB (typ.)
	40 GHz to 50 GHz	> 22 dB (typ.)
	50 GHz to 67 GHz	> 20 dB (typ.)
RF amplifier input power		-15 dBm (max.)
RF amplifier P1dB		+2 dBm
Repeatability with low noise amplifier	amplitude	< 0.25 dB
	phase	< 1°
RF connectors	RF input	1.85 mm (f)
	RF output	1.85 mm (f)
General data		
Power supply		R&S®TC-AZ-HOL1, R&S®TC-EL-HOL1
Control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Current		550 mA (nom.)
Dimensions	W x H x D	215 mm x 97.3 mm x 94.6 mm (8.46 in x 3.83 in x 3.72 in)
Weight		1.5 kg (3.3 lb)

## R&S®TC-IFCON switching unit for LO/IF signals up to 18 GHz

<b>RF characteristics</b>		
Frequency range		100 MHz to 18 GHz
Insertion loss, direct path	100 MHz to 18 GHz	< 1.5 dB
Connectors	RF ports	3 × 2.4 mm (f)
	diplexer port	1 × SMA (f)
	LO/IF ports	2 × SMA (f)
Accessories (semi-rigid cables)		<ul style="list-style-type: none"> <li>diplexer combiner to diplexer combiner</li> <li>IF Out to R&amp;S®FSW (or any other measurement device)</li> <li>LO In to R&amp;S®FSW (or any other measurement device)</li> <li>RF Out to R&amp;S®FSW (or any other measurement device)</li> </ul>
<b>General data</b>		
Power supply/control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Dimensions	W × H × D	482.6 mm × 43 mm × 476 mm (19 in × 1.69 in × 18.74 in)
	for rack mounting only	1 HU
Weight		0.4 kg (0.88 lb)

## R&S®TC-FCON75A mixer downconverter unit for elevation signal path, 50 GHz to 75 GHz

<b>RF characteristics</b>		
Frequency range	RF	50 GHz to 75 GHz
	LO	8.0 GHz to 12.84 GHz
	IF	5 MHz to 3.5 GHz (depends on measurements)
RF gain	50 GHz to 55 GHz	25 dB
	55 GHz to 75 GHz	20 dB
Maximum input power	50 GHz to 75 GHz	-20 dBm
Drift over time (1 h warm-up time)	amplitude	< 0.1 dB
	phase	< 5° at 75 GHz (depends on instrument)
Connectors	RF input (front)	2 × 1.00 mm (f)
	RF output (rear)	SMA (f)
<b>General data</b>		
Power supply		R&S®TC-AZ-HOL1, R&S®TC-EL-HOL1
Control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Current		max. 2.0 A
Dimensions	W × H × D	215 mm × 72.3 mm × 94.6 mm (8.46 in × 2.85 in × 3.72 in)
Weight		1.5 kg (3.3 lb)

## R&S®TC-FCON90A mixer downconverter unit for elevation signal path, 60 GHz to 90 GHz

RF characteristics		
Frequency range	RF	60 GHz to 90 GHz
	LO	7.44 GHz to 15.34 GHz
	IF	5 MHz to 3.5 GHz (depends on measurements)
RF gain	60 GHz to 90 GHz	25 dB
Maximum input power	60 GHz to 90 GHz	-24 dBm
Drift over time (1 h warm-up time)	amplitude	< 0.1 dB
	phase	< 6° at 90 GHz (depends on instrument)
Connectors	RF input (front)	2 x 1.00 mm (f)
	RF output (rear)	SMA (f)
General data		
Power supply		R&S®TC-AZ-HOL1, R&S®TC-ELHOL1
Control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Current		max. 2.0 A
Dimensions	W x H x D	215 mm x 72.3 mm x 94.6 mm (8.46 in x 2.85 in x 3.72 in)
Weight		1.5 kg (3.3 lb)

## R&S®TC-FC-75T dual mixer down-converting unit for elevation signal path, 50 GHz to 75 GHz

RF characteristics		
Frequency range	RF	50 GHz to 75 GHz
	LO	10 GHz to 15 GHz
	IF	DC to 35 GHz (depends on measurements)
RF gain	50 GHz to 75 GHz	25 dB
Maximum input power	50 GHz to 75 GHz	-10 dBm
Drift over time (1 h warm-up)	amplitude	< 0.1 dB
	phase	< 5° at 75 GHz (depends on instrument)
Connectors	RF input (front)	2 x 1.00 mm (f)
	RF output (rear)	2 x SMA (f)
	LO input (rear)	SMA (f)
General data		
Power supply		R&S®TC-AZ-HOL1, R&S®TC-EL-HOL1
Control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Current		max. 2.2 A
Dimensions	W x H x D	215 mm x 72.3 mm x 94.6 mm (8.46 in x 2.85 in x 3.72 in)
Weight		1.5 kg (3.3 lb)

## R&S®TC-AZ-HOL1 mechanical mounting structure on a flat surface and power supply for boxes

Accessories		single 5 m 10-pin ODU cable for R&S®OSP-B153B connection
Mounting possibilities		R&S®TC-CCPXSH, R&S®TC-CCPSHP, R&S®TC-CCPMHP and R&S®CATR-MNT1
Controls		R&S®TC-AZAMP67, R&S®TC-ELAMP67, R&S®TC-FCON75A, R&S®TC-FCON90A and R&S®TC-FC-75T
General data		
Power supply/control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Dimensions	W x H x D	224 mm x 38 mm x 147 mm (8.81 in x 1.49 in x 5.79 in)
Weight		0.25 kg (0.55 lb)

## R&S®TC-EL-HOL1 mechanical mounting structure on a squared surface and power supply for boxes

Accessories		single 5 m 10-pin ODU cable for R&S®OSP-B153B connection
Mounting possibilities		R&S®TC-CCPXSH, R&S®TC-CCPSHP and R&S®TC-CCPMHP
Controls		R&S®TC-AZAMP67, R&S®TC-ELAMP67, R&S®TC-FCON75A, R&S®TC-FCON90A and R&S®TC-FC-75T
<b>General data</b>		
Power supply/control interface		R&S®OSP-B153B
Supply voltage		+28 V, ±12 V, +8 V, 5.2 V, +3.3 V DC
Dimensions	W x H x D	265 mm x 60 mm x 100 mm (10.43 in x 2.36 in x 3.72 in)
Weight		0.2 kg (0.44 lb)

## R&S®TC-AMP8 power amplifier, two channels, each from 2 GHz to 8 GHz

<b>RF characteristics</b>		
Frequency range		2 GHz to 8 GHz
RF amplifier	signal gain	30 dB (typ.)
	maximum input power	+15 dBm
	maximum output power	+30 dBm
VSWR	RF inputs	< 1.7
	RF outputs	< 1.3
Repeatability with low noise amplifier	amplitude	< 0.1 dB
	phase	< 1°
RF connectors	RF input	SMA (f)
	RF output	SMA (f)
<b>General data</b>		
Supply voltage		+15 V DC
Current		3 A (nom.)
Dimensions	W x H x D	356 mm x 137 mm x 291.5 mm (14.01 in x 5.39 in x 11.48 in)
Weight		4 kg (8.82 lb)

## R&S®TC-AMP8 power amplifier, two channels, channel 1 from 0.1 GHz to 18 GHz, channel 2 from 2 GHz to 8 GHz

<b>RF characteristics</b>		
Frequency range, channel 1		0.1 GHz to 18 GHz
RF amplifier, channel 1	signal gain	26 dB (typ.)
	maximum input power	+15 dBm
	maximum output power	+30 dBm
Frequency range, channel 2		2 GHz to 8 GHz
RF amplifier, channel 2	signal gain	30 dB (typ.)
	maximum input power	+15 dBm
	maximum output power	+30 dBm
VSWR	RF inputs	< 1.7
	RF outputs	< 1.3
Repeatability with low noise amplifier	amplitude	< 0.1 dB
	phase	< 1°
RF connectors	RF input	SMA (f)
	RF output	SMA (f)
<b>General data</b>		
Supply voltage		+15 V DC
Current		3 A (nom.)
Dimensions	W x H x D	356 mm x 137 mm x 291.5 mm (14.01 in x 5.39 in x 11.48 in)
Weight		4 kg (8.82 lb)

## R&S®TC-ELSW90 transfer relay for switching between two boxes on the elevation arm, DC to 90 GHz

RF characteristics		
Frequency range		DC to 90 GHz
RF connectors	RF input/output	2 × 1.00 mm (f)
	RF input/output	2 × 1.85 mm (f)
Switching time		< 10 ms
Accessories		<ul style="list-style-type: none"> <li>4-pin ODU cable to connect to R&amp;S®TC-FCON75A or R&amp;S®TC-FCON90A</li> <li>RF cable, 1 m (SF101) to connect to R&amp;S®TC-ELAMP67</li> </ul>
General data		
Power supply/control interface	4-pin ODU cable	R&S®TC-FCON75A, R&S®TC-FCON90A
Supply voltage		±12 V DC
Current		max. 150 mA
Dimensions	W × H × D	101 mm × 44 mm × 53 mm (4.00 in × 1.75 in × 2.10 in)
Weight		0.2 kg (0.45 lb)

## R&S®TC-SGH75M SGH calibration antenna, 50 GHz to 75 GHz, incl. multiplier

RF characteristics		
Frequency range		50 GHz to 75 GHz
RF amplifier	signal gain	20 dB (nom.)
Antenna realized gain		> 0 dBi (typ.)
VSWR	RF input	< 1.4 (nom.)
RF connectors	RF input	SMA (f)
General data		
Supply voltage		6 V DC
Current		0.5 A (nom.)
Dimensions	W × H × D	80 mm × 80 mm × 185 mm (3.15 in × 3.15 in × 7.28 in)
Weight		0.32 kg (0.70 lb)

## R&S®TC-SGH90M SGH calibration antenna, 60 GHz to 90 GHz, incl. multiplier

RF characteristics		
Frequency range		60 GHz to 90 GHz
RF amplifier	signal gain	20 dB (nom.)
Antenna realized gain		> 1 dBi (typ.)
VSWR	RF input	< 1.4 (nom.)
RF connectors	RF input	SMA (f)
General data		
Supply voltage		6 V DC
Current		0.5 A (nom.)
Dimensions	W × H × D	80 mm × 80 mm × 173.5 mm (3.15 in × 3.15 in × 6.83 in)
Weight		0.32 kg (0.70 lb)

## R&S<sup>®</sup>TC-CCPXST1 Rohacell<sup>®</sup> azimuth pedestal for WPTC-XS HP positioner

<b>Components of pedestal with dimensions</b>		
Dimensions of components	base with aluminum flange <sup>1</sup>	345 mm (13.58 in)
	removable height discs (1 each), H x Ø	30 mm x 480 mm (1.18 in x 18.90 in)
		40 mm x 480 mm (1.57 in x 18.90 in)
		50 mm x 480 mm (1.97 in x 18.90 in)
		60 mm x 480 mm (2.36 in x 18.90 in)
		70 mm x 480 mm (2.76 in x 18.90 in)
		200 mm x 480 mm (7.87 in x 18.90 in)
	disc for phantom head, H x Ø; e.g. SPEAG <sup>®</sup> Head-P10	70 mm x 480 mm (2.76 in x 18.90 in)
	disc for phantom head, H x Ø; e.g. for SPEAG <sup>®</sup> SAM-V4.5BS	40 mm x 480 mm (1.57 in x 18.90 in)
calibration disc, H x Ø; useable for antennas: R&S <sup>®</sup> TC-SGH26, R&S <sup>®</sup> TC-SGH40, R&S <sup>®</sup> TC-SGH60, R&S <sup>®</sup> TC-TA40REF, R&S <sup>®</sup> TC-TA18, R&S <sup>®</sup> DST-B215	40 mm x 480 mm (1.57 in x 18.90 in)	
<b>Height/height adjustment</b>		
Minimum usage height	height with 30 mm height disc + 70 mm phantom disc mounted <sup>1</sup>	445 mm
	distance top surface to elevation axis	approx. 385 mm
Maximum usage height	height with 70 mm phantom disc <sup>1</sup>	835 mm + (0 mm to 5 mm)
Height adjustment	between minimum and maximum usage height via exchange of removable discs	in steps of 1 cm
<b>General data</b>		
Maximum load	centered	23 kg
	off center (25 cm deviation from pedestal center to center of gravity load)	10 kg
Material <sup>2</sup>		Rohacell <sup>®</sup> HF71
Tolerances (at height 835 mm)	maximum flatness error of top surface	2 mm
	maximum deviation of concentricity	6 mm
Environmental conditions		controlled laboratory environment
Storage conditions	long term storage	air-conditioned laboratory environment or tightly sealed in plastic bags
Weight	usage condition: maximum height, phantom disc mounted	approx. 9 kg (19.8 lb)

<sup>1</sup> Height measurement from reference plane of aluminum flange.

<sup>2</sup> For the Rohacell<sup>®</sup> material applies: cosmetic failures of the surface, including but not limited to scratches, dents and cavities may occur, which do not negatively affect the operation. Such optical failures shall not constitute a deviation from any specified data, feature, quality or characteristics.

## R&S®TC-CCPST1 Rohacell® azimuth pedestal for WPTC-S HP positioner

<b>Components of pedestal with dimensions</b>		
Dimensions of components	base with aluminum flange <sup>3</sup>	595 mm (23.42 in)
	removable height discs (1 each), H x Ø	30 mm x 480 mm (1.18 in x 18.90 in)
		40 mm x 480 mm (1.57 in x 18.90 in)
		50 mm x 480 mm (1.97 in x 18.90 in)
		60 mm x 480 mm (2.36 in x 18.90 in)
		70 mm x 480 mm (2.76 in x 18.90 in)
		200 mm x 480 mm (7.87 in x 18.90 in)
		disc for phantom head, H x Ø; e.g. SPEAG® Head-P10
disc for phantom head, H x Ø; e.g. for SPEAG® SAM-V4.5BS	40 mm x 480 mm (1.57 in x 18.90 in)	
calibration disc; H x Ø; useable for antennas: R&S®TC-SGH26, R&S®TC-SGH40, R&S®TC-SGH60, R&S®TC-TA40REF, R&S®TC-TA18, R&S®DST-B215	40 mm x 480 mm (1.57 in x 18.90 in)	
<b>Height/height adjustment</b>		
Minimum usage height	height with 30 mm height disc + 70 mm phantom disc mounted <sup>3</sup>	695 mm
	distance top surface to elevation axis	approx. 385 mm
Maximum usage height	height with 70 mm phantom disc <sup>3</sup>	1085 mm + (0 mm to 7 mm)
Height adjustment	between minimum and maximum usage height via exchange of removable discs	in steps of 1 cm
<b>General data</b>		
Maximum load	centered	23 kg
	off center (25 cm deviation from pedestal center to center of gravity load)	10 kg
Material <sup>4</sup>		Rohacell®HF71
Tolerances (at height 835 mm)	maximum flatness error of top surface	2.2 mm
	maximum deviation of concentricity	7 mm
Environmental conditions		controlled laboratory environment
Storage conditions	long term storage	air-conditioned laboratory environment or tightly sealed in plastic bags
Weight	usage condition: maximum height, phantom disc mounted	approx. 10 kg (22.0 lb)

<sup>3</sup> Height measurement from reference plane of aluminum flange.

<sup>4</sup> For the Rohacell® material applies: cosmetic failures of the surface, including but not limited to scratches, dents and cavities may occur, which do not negatively affect the operation. Such optical failures shall not constitute a deviation from any specified data, feature, quality or characteristics.

## R&S<sup>®</sup>TC-CCPMT1 Rohacell<sup>®</sup> azimuth pedestal for WPTC-M HP positioner

<b>Components of pedestal with dimensions</b>		
Dimension of components	base with aluminum flange <sup>5</sup>	795 mm (31.30 in)
	removable height discs (1 each), H x Ø	30 mm x 480 mm (1.18 in x 18.90 in)
		40 mm x 480 mm (1.57 in x 18.90 in)
		50 mm x 480 mm (1.97 in x 18.90 in)
		60 mm x 480 mm (2.36 in x 18.90 in)
		70 mm x 480 mm (2.76 in x 18.90 in)
		200 mm x 480 mm (7.87 in x 18.90 in)
		disc for phantom head, H x Ø; e.g. SPEAG <sup>®</sup> Head-P10
	disc for phantom head, H x Ø; e.g. for SPEAG <sup>®</sup> SAM-V4.5BS	40 mm x 480 mm (1.57 in x 18.90 in)
	calibration disc; H x Ø; useable for antennas: R&S <sup>®</sup> TC-SGH26, R&S <sup>®</sup> TC-SGH40, R&S <sup>®</sup> TC-SGH60, R&S <sup>®</sup> TC-TA40REF, R&S <sup>®</sup> TC-TA18, R&S <sup>®</sup> DST-B215	40 mm x 480 mm (1.57 in x 18.90 in)
<b>Height/height adjustment</b>		
Minimum usage height	height with 30 mm height disc + 70 mm phantom disc mounted <sup>5</sup>	895 mm
	distance top surface to elevation axis	approx. 385 mm
Maximum usage height	height with 70 mm phantom disc <sup>5</sup>	1285 mm + (0 mm to 9 mm)
Height adjustment	between minimum and maximum usage height via exchange of removable discs	in steps of 1 cm
<b>General data</b>		
Maximum load	centered	23 kg
	off center (25 cm deviation from pedestal center to center of gravity load)	10 kg
Material <sup>6</sup>		Rohacell <sup>®</sup> HF71
Tolerances (at height 835 mm)	maximum flatness error of top surface	2.8 mm
	maximum deviation of concentricity	9 mm
Environmental conditions		controlled laboratory environment
Storage conditions	long term storage	air-conditioned laboratory environment or tightly sealed in plastic bags
Weight	usage condition: max. height, phantom disc mounted	approx. 11.5 kg (25.4 lb)

<sup>5</sup> Height measurement from reference plane of aluminum flange.

<sup>6</sup> For the Rohacell<sup>®</sup> material applies: cosmetic failures of the surface, including but not limited to scratches, dents and cavities may occur, which do not negatively affect the operation. Such optical failures shall not constitute a deviation from any specified data, feature, quality or characteristics.

## System accessories

### R&S®TC-RJ-26.5 RF rotary joint, DC to 26.5 GHz, SMA (f) connector

Frequency range		DC to 26.5 GHz
Impedance		50 Ω (nom.)
RF connector		2 × SMA (f)
Life time		min. 5 × 10 <sup>6</sup> revolutions
Dimensions	W × H × D	34.8 mm × 25.4 mm × 25.4 mm (1.37 in × 1.00 in × 1.00 in)
Weight		approx. 28 g (0.06 lb)

### R&S®TC-RJ-40 RF rotary joint, DC to 40 GHz, 2.92 mm (f) connector

Frequency range		DC to 40 GHz
Impedance		50 Ω (nom.)
RF connector		2 × 2.92 mm (f)
Life time		min. 5 × 10 <sup>6</sup> revolutions
Dimensions	W × H × D	34.8 mm × 25.4 mm × 25.4 mm (1.37 in × 1.00 in × 1.00 in)
Weight		approx. 28 g (0.06 lb)

### R&S®TC-RJ-50 RF rotary joint, DC to 50 GHz, 2.40 mm (f) connector

Frequency range		DC to 50 GHz
Impedance		50 Ω (nom.)
RF connector		2 × 2.40 mm (f)
Life time		min. 5 × 10 <sup>6</sup> revolutions
Dimensions	W × H × D	34.8 mm × 25.4 mm × 25.4 mm (1.37 in × 1.00 in × 1.00 in)
Weight		approx. 28 g (0.06 lb)

### R&S®TC-RJ-67 RF rotary joint, DC to 67 GHz, 1.85 mm (f) connector

Frequency range		DC to 67 GHz
Impedance		50 Ω (nom.)
RF connector		2 × 1.85 mm (f)
Life time		min. 0.2 × 10 <sup>6</sup> revolutions
Dimensions	W × H × D	53.0 mm × 25.4 mm × 25.4 mm (2.09 in × 1.00 in × 1.00 in)
Weight		approx. 50 g (0.11 lb)

### R&S®TC-WAPAN, access panel for anechoic chambers

Connections	FSMA feedthrough	8
	user cable feedthrough	2
Possible mountings	Rohde & Schwarz feedthroughs	8
	R&S®OSP2xx/R&S®OSP3xx modules	4
Dimensions	W × H × D	500 mm × 500 mm × 78 mm (19.68 in × 19.68 in × 3.07 in)
Weight		3.5 kg (7.7 lb)

## R&S®TC-Align, laser alignment panel for anechoic chambers

<b>Linear lasers (ceiling)</b>		2, color: red
X/Y axis alignment		±9 mm
Tilt alignment		±9°
Rotation alignment (axial)		360°
Focus		yes, up to 20 m
<b>Linear lasers (side)</b>		2, color: green
X/Y axis alignment		±9 mm
Tilt alignment		±9°
Rotation alignment (axial)		360°
Focus		yes, up to 20 m
<b>General data</b>		
Laser class		1M
Supply voltage		+9 V to +30 V DC
Current for two ceiling lasers		< 800 mA
Current for two side lasers		< 600 mA
Dimensions	W x H x D	610 mm x 30 mm x 610 mm (24.01 in x 1.18 in x 24.01 in)
Weight		3.5 kg (7.72 lb)

## R&S®OSP-B153B (control interface for various RSE/OTA system components)

Current consumption	internal OSP module bus	max. 800 mA (+28 V DC) max. 750 mA (+3.3 V DC)
Output current for each channel (to external boxes)	via 10-pin ODU connector	max. 800 mA (+28 V DC) max. 3.0 A (+15 V DC) max. 375 mA (+3.3 V DC)
Output current for each external output	via 2-pin ODU output connector	max. 1.5 A (+15 V DC)
External input with single power supply (with Y connector)	2 x 4-pin ODU input connector	7.0 A, 15 V DC, Ch1 + Ch2, max. 3.5 A, 15 V DC, Ch3 + Ch4, max. 3.5 A, 15 V DC
External input with dual power supply (without Y connector)	2 x 4-pin ODU input connector	14.0 A, 15 V DC, Ch1 + Ch2, max. 7 A, 15 V DC, Ch3 + Ch4, max. 7 A, 15 V DC
Digital output for each channel (to external boxes)	via 10-pin ODU connector	I2C bus
Slot position for R&S®OSP2xx/OSP3xx		without restrictions
Dimensions	W x H x D (standard width)	107.6 mm x 65.5 mm x 70 mm (4.24 in x 2.58 in x 2.76 in)
Weight	without accessories (PS, cables)	approx. 0.2 kg (0.42 lb)

## General data

Environmental conditions		
Temperature	operating temperature range	+5 °C to +35 °C
	storage temperature range	-25 °C to +70 °C
Damp heat		+30 °C/70 % rel. humidity/constant, in line with EN 60068-2-78

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.3 mm double amplitude, 55 Hz to 150 Hz, 0.5 g const., 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	45 Hz to 2000 Hz: max. 40 g, in line with MIL-STD-810, method 516, procedure I

## Ordering information

Designation	Type	Order No.
RF amplifier unit for azimuth signal path, DC to 67 GHz	R&S <sup>®</sup> TC-AZAMP67	1536.8348.02
RF amplifier unit for elevation signal path, DC to 67 GHz	R&S <sup>®</sup> TC-ELAMP67	1533.8354.02
Switching unit for LO/IF signals, up to 18 GHz	R&S <sup>®</sup> TC-IFCON	1536.8419.02
Frequency conversion unit, 50 GHz to 75 GHz	R&S <sup>®</sup> TC-FCON75A	1536.8390.02
Frequency conversion unit, 60 GHz to 90 GHz	R&S <sup>®</sup> TC-FCON90A	1536.8402.02
Dual mixer downconverter unit for elevation signal path, 60 GHz to 90 GHz	R&S <sup>®</sup> TC-FC-75T	1536.8502.02
Mechanical mounting structure on a flat surface and power supply for boxes	R&S <sup>®</sup> TC-AZ-HOL1	1536.8560.02
Mechanical mounting structure on a squared surface and power supply for boxes	R&S <sup>®</sup> TC-EL-HOL1	1536.5360.02
Power amplifier, two channels, each from 2 GHz to 8 GHz	R&S <sup>®</sup> TC-AMP8	1536.8525.02
Power amplifier, two channels, channel 1 from 0.1 GHz to 18 GHz, channel 2 from 2 GHz to 8 GHz	R&S <sup>®</sup> TC-AMP8	1536.8525.04
Transfer relay for switching between two boxes on the elevation arm, DC to 90 GHz	R&S <sup>®</sup> TC-ELSW90	1536.8548.02
SGH calibration antenna, 50 GHz to 75 GHz, incl. multiplier	R&S <sup>®</sup> TC-SGH75M	1536.8460.02
SGH calibration antenna, 60 GHz to 90 GHz, incl. multiplier	R&S <sup>®</sup> TC-SGH90M	1536.8454.02
Rohacell <sup>®</sup> azimuth pedestal for WPTC-XS HP positioner	R&S <sup>®</sup> TC-CCPXST1	1536.8425.02
Rohacell <sup>®</sup> azimuth pedestal for WPTC-S HP positioner	R&S <sup>®</sup> TC-CCPST1	1536.8431.02
Rohacell <sup>®</sup> azimuth pedestal for WPTC-M HP positioner	R&S <sup>®</sup> TC-CCPMT1	1536.8448.02
<b>Recommended extras</b>		
RF rotary joint, DC to 26.5 GHz, SMA (f) connector	R&S <sup>®</sup> TC-RJ-26.5	3637.4091.02
RF rotary joint, DC to 40 GHz, 2.92 mm (f) connector	R&S <sup>®</sup> TC-RJ-40	3637.4104.02
RF rotary joint, DC to 50 GHz, 2.40 mm (f) connector	R&S <sup>®</sup> TC-RJ-50	3637.4110.02
RF rotary joint, DC to 67 GHz, 1.85 mm (f) connector	R&S <sup>®</sup> TC-RJ-67	3658.7519.02
Access panel for anechoic chambers	R&S <sup>®</sup> TC-WAPAN	1538.2447.02
Laser alignment panel for anechoic chambers	R&S <sup>®</sup> TC-Align	1536.8477.02
Control interface for various RSE/OTA system components	R&S <sup>®</sup> OSP-B153B	1515.5791.02



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- ▶ Customized and flexible
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