

R&S® M3SR HS9043

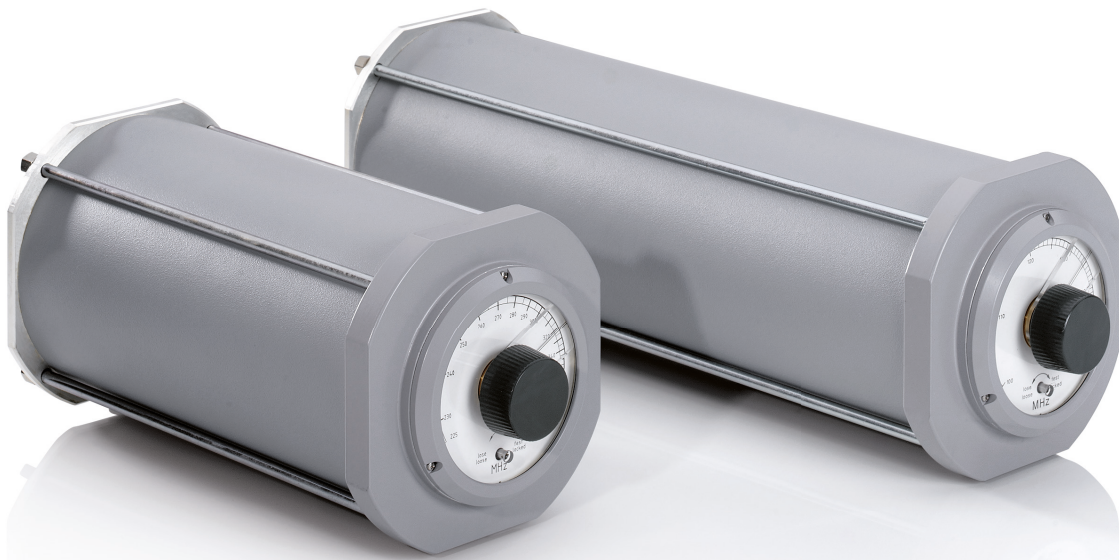
VHF/UHF Cavity

Antenna Filters

For multiport filters

or multicouplers

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R&S®M3SR HS9043

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Antenna Filters

At a glance

The R&S®HS9043 cavity antenna filters are proven “workhorses” that have been used successfully for decades. They are used in single-channel systems where medium power handling capacity and medium selectivity are sufficient. The filters make it possible to set up radiocommunications systems where radios can be simultaneously operated in very tight spaces.

There are two basic types: the R&S®HS9043/9 VHF cavity antenna filter and the R&S®HS9043/0 UHF cavity antenna filter. They are equal in design and function, but differ in their specifications and dimensions.

The R&S®HS9043 is cylinder-shaped and designed as a coaxial resonant-line circuit with an inner and outer conductor. The input and output coupling is made using variable coupling loops that can be rotated separately to vary the coupling degree (K) and selectivity of the filter.

Special filter and multicoupler capability

The R&S®HS9043 can be configured for the following:

- Special filter types, e.g.
 - with three ports for three radios and three antennas
 - with two filters per port (double-section filter) to increase selectivity
- Starpoint multicouplers

The appropriate number of R&S®HS9043 VHF/UHF cavity antenna filters is assembled together with a mechanical slide-in unit, special coaxial two-, four- or eight-way starpoints, RF cables, transformation stages etc. to form a compact 19" plug-in for rack integration.

Key facts

- Manually tuned
- Excellent mechanical precision
- Versatility for use in multipoint filters or multicouplers
- Reasonable size
- Good price/performance ratio

Specifications ¹⁾

R&S®HS9043 cavity antenna filter – common data

Insertion loss	≤ 2.0 dB (K3) ²⁾ ; ≤ 0.5 dB (K10) ²⁾
Circuit design characteristics	variable coupled cavity resonator filters
Input and output coupling degree	manually settable: $K \leq 10$
Input impedance (radio port) of a single-section filter	50 Ω
VSWR (valid for filters; multicouplers see below)	$\leq 1.1:1$ (f_0); $\leq 2.0:1$ ($f_0 \pm 0.1\%$ at coupling degree K5)
Input impedance (radio port) of a double-section filter	50 Ω
VSWR	$\leq 1.2:1$ (f_0); $\leq 1.5:1$ ($f_0 \pm 100$ kHz)
Output impedance (antenna port)	50 Ω
RF connectors (radio or antenna port)	N female
Effect of temperature	≤ 3 kHz/°C
Operating temperature range	0°C to +55°C
Weight	approx. 7 kg (15.4 lb)

R&S®HS9043/9 VHF cavity antenna filter

Frequency range	100 MHz to 156 MHz
RF power handling	50 W AM carrier
Bandwidth	$\geq 0.2\%$ (K3) ³⁾
Selectivity	≥ 14 dB $\pm 1\%$ ³⁾ (K3) ²⁾

Specifications¹⁾

Different specifications for multicouplers	
Number of inputs (radio ports)	up to 4, depends on type and model
Total RF input power	up to 4 × 50 W AM carrier, 100% ⁴⁾
Insertion loss	depends on installation-specific filter settings
Dimensions (diameter × length)	148 mm × 446 mm (5.83 in × 17.6 in)
VHF filter or multicoupler with 3 × R&S®HS9043/9, 19" 4 HU rack plug-in (W × H × D)	483 mm × 177 mm × 446 mm (19 in × 7.0 in × 17.6 in)
R&S®HS9043/0 UHF cavity antenna filter	
Frequency range	225 MHz to 400 MHz
RF power handling	50 W AM carrier, 100 W FM
Bandwidth	3 dB bandwidth ≥ 0.2% (K3) ³⁾
Selectivity	≥ 17 dB ± 1% ³⁾ (K3) ²⁾
Different specifications for multicouplers	
Number of inputs (radio ports)	up to 4, depends on type and model
Total RF input power	up to 4 × 30 W AM carrier, 100% ⁴⁾
Insertion loss	depends on installation-specific filter settings
Dimensions (diameter × length)	148 mm × 290 mm (5.83 in × 11.4 in)
UHF filter or multicoupler with 3 × R&S®HS9043/0, 19" 4 HU rack plug-in (W × H × D)	483 mm × 177 mm × 446 mm (19 in × 7.0 in × 17.6 in)
Filter/multicoupler configurations with n × R&S®HS9043/0	n = 4 to 6: 19", 8 HU; n = 7 to 9: 19", 12 HU

¹⁾ Specifications refer to filters and multicouplers, unless stated otherwise, and to nominal RF terminations (50 Ω).

²⁾ R&S®HS9043 cavity antenna filters have variable coupling degrees (K1 to K10).

³⁾ Attenuation at x % frequency spacing from center frequency f_0 .

⁴⁾ The maximum power handling capacity is a function of the coupling degree.

Ordering information

Designation	Type	Order No.
VHF cavity antenna filter		
VHF cavity antenna filter (cylinder-type filter)	R&S®HS9043/9	0138.5746.02
VHF filters and combiners, configuration examples: 19" plug-in assemblies with several inputs (radio ports)		
VHF one-port filter (1 × R&S®HS9043/9)	R&S®FU432W1	0713.7305.02
VHF two-port filter (1 × R&S®HS9043/9 per port)	R&S®FU256	0682.7016.02
VHF two-port filter (2 × R&S®HS9043/9 per port)	R&S®FU255	0679.8815.02
VHF three-port filter (1 × R&S®HS9043/9 per port)	R&S®FU253	6009.3000.xx (RX filter = 02, TX filter = 03)
UHF cavity antenna filter		
UHF cavity antenna filter (cylinder-type filter)	R&S®HS9043/0	0156.5738.02
UHF filters and combiners, configuration examples		
UHF one-port filter (1 × R&S®HS9043/0)	R&S®FD256	0682.7216.11
UHF two-port filter (1 × R&S®HS9043/0 per port)	R&S®FD256	0682.7216.02
UHF three-port filter (1 × R&S®HS9043/0 per port)	R&S®FD256	0682.7216.13
UHF two-port filter (2 × R&S®HS9043/0 per port)	R&S®FD255	0679.8515.02
UHF two-port multicoupler (1 × R&S®HS9043/0 per port)	R&S®FD432W4	0745.6504.02
UHF three-port multicoupler (1 × R&S®HS9043/0 per port)	R&S®FD432W4	0745.6504.03
UHF four-port multicoupler (1 × R&S®HS9043/0 per port)	R&S®FD432W4	0745.6504.04
Other options on request.		

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