Precision Halfwave Dipole Sets HZ-12 and HZ-13

HZ-12 for 30 MHz to 300 MHz and HZ-13 for 300 MHz to 1000 MHz

Antenna calibration, critical cases of field-strength measurement and the testing of antenna-calibration and field-strength measurement sites require special measures for establishing test standards. At both the balanced and unbalanced sides of the balun, Dipoles HZ-12 and HZ-13 contain attenuators which ensure broadband stabilization of the matching and define the total power attenuation between the dipoles and the 50 Ω termination.

As a consequence, a pair of dipoles coupled head to head will always have an exactly calibrated attenuation.

Dipole Sets HZ-12 and HZ-13 provide high precision for

- antenna calibration,
- field-strength measurement and
- site attenuation measurement.

Halfwave dipoles are especially important in the VHF/UHF range because they show the same radiation pattern at all frequencies. This is due to the fact that the dipoles are tuned to 0.5 λ and have characteristics which can be defined exactly if the elements are sufficiently thin.

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The radiation pattern of most broadband antennas is frequency-dependent and also affected by ambient conditions. The antenna factors of broadband antennas cannot be calculated to the same accuracy as those of halfwave dipoles. For this reason, VHF/UHF broadband antennas have to be calibrated at a precision standard site (reference site) or by means of a precision dipole. Antenna-calibration and field-strength measurement sites have to be tested according to CISPR. A deviation of ±4 dB from the theoretical values of normalized site attenuation is allowed for RFI field-strength measurement sites. Calculated coupling correction factors that provide the theoretical prerequisites for accurate measurements are available for testing sites with halfwave dipoles. Halfwave dipoles are the only tool suitable for testing the suitability of reference sites, i.e. sites used for calibrating antennas to ANSI C63.5.

Dipoles HZ-12 and HZ-13 contain attenuators at the balanced and unbalanced sides of the balun. These attenuators ensure the broadband termination of radiators with 73 Ω and match and fix the total power attenuation to approximately 10 dB between dipole radiators and 50 Ω termination. A pair of dipoles coupled head to head yields an average attenuation of 20 dB. The balun and attenuators of the dipole heads are practically identical and so, the antenna factor of each dipole can exactly be determined. The sum of the antenna factors, which has to be known for testing sites, is obtained from the precisely measured attenuation of the dipole pair, the voltage transformation and the logarithmic antenna factor. Dipoles HZ-12 comprise two sets of telescopic rods and Dipoles HZ-13 thin, exchangeable elements.

HZ-12 and HZ-13 are supplied with flanges for the Rohde&Schwarz Mast Systems HFU-Z und HCM. Each dipole set comes in a handy transit case accommodating all associated parts and providing protection during transportation. The manual supplied contains attenuation charts and a table for the height-dependent correction of antenna factors above a conductive ground.

Precision Halfwave Dipole Sets HZ-12 (left) and HZ-13 in handy transit cases

Specifications

Precision Halfwave Dipole Set HZ-12

Frequency range	30 MHz to 300 MHz
Power attenuation of a pair of dipoles (head to head)	20 dB (calibration curve supplied)
Power attenuation of matching pad per dipole	10 dB
VSWR	<1.1
Antenna factor	7.5 dB to 27.6 dB
Connectors	N female, 50 Ω
Power-handling capacity if used as transmit antenna	<0.5 W
Dimensions, support	0.58 m
1st dipole pair (telescopic)	0.66 m to 2.5 m each
2nd dipole pair (telescopic)	0.24 m to 0.67 m each
Weight, dipole set in transit case	7.8 kg
1 complete dipole	1.9 kg
Nominal temperature range	0°C to +50°C

Precision Halfwave Dipole Set HZ-13

Frequency range	300 MHz to 1000 MHz
Power attenuation of a pair of dipoles (head to head)	20 dB (calibration curve supplied)
Power attenuation of matching pad per dipole	10 dB
VSWR	<1.2 (300 MHz to 800 MHz) <1.3 (800 MHz to 1000 MHz)
Antenna factor	27.4 dB to 38.0 dB
Connectors	N female, 50 Ω
Power-handling capacity if used as transmit antenna	<0.5 W
Dimensions, support	0.58 m
radiators	4 pairs of radiators, adjustable in length
Weight, dipole set in transit case	7.5 kg
1 complete dipole	1.2 kg
Nominal temperature range	0°C to +50°C

Order designation

Precision Halfwave Dipole Set 30 MHz to 300 MHz	HZ-12	0816.2870.02
Precision Halfwave Dipole Set 300 MHz to 1000 MHz	HZ-13	0816.2940.02

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ROHDE&SCHWARZ GmbH & Co. KG · Mühldorfstraße 15 · 81671 München · Germany · P.O.B. 80 14 69 · 81614 München · Germany · Telephone +49 89 41 29-0
www.rohde-schwarz.com · Customer Support: Tel. +49 1805 12 42 42, Fax +49 89 41 29-13777, E-mail: CustomerSupport@rohde-schwarz.com

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