

## DC211: Directional Coupler for WR975 Waveguide

### General Description

DC211 is a directional coupler intended for sampling of the powers of incident or reflected waves in high-power 900 MHz industrial applications using a WR975 (R9) rectangular waveguide.

The coupling mechanism involves two probes (antennas) inserted into the waveguide, outputs of which are appropriately combined and distributed to the output connector.

The coupler integrates an attenuator to isolate the internal coupling structure from the coupled port load, and to improve the coupled port match.

The output connector can be either Nf (DC211N) or SMAf (DC211S).

Two coupling factor options are available: -60 dB for maximal waveguide working power 10 kW, and -70 dB for maximal working power 100 kW.

The coupler module is fastened to a parent waveguide with a set of M3 or similar-diameter screws after machining of appropriate openings in the waveguide wall according to the waveguide machining template. Alternatively, a calibrated assembly consisting of the coupler module fixed to a precisely machined parent waveguide with standard length of 300 mm can be provided.

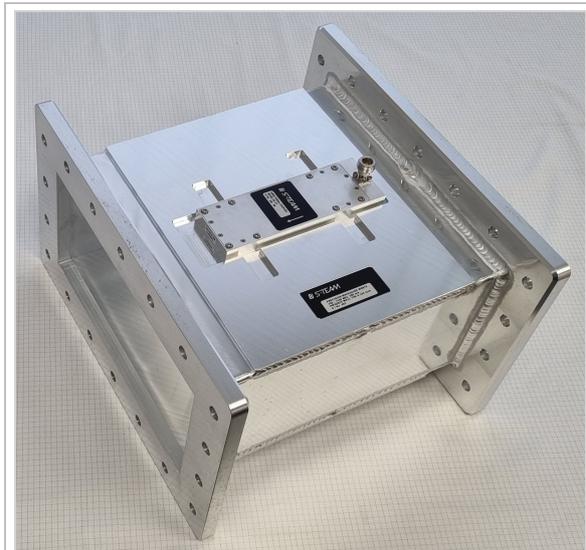
Reversing the coupler causes it to sample the wave propagating in the opposite direction.

The calibrated assembly is shown in [Fig. 2](#) above.

The waveguide machining template is shown in [Fig. 5](#) on page 4.



**Fig. 1.** Directional coupler DC211N.

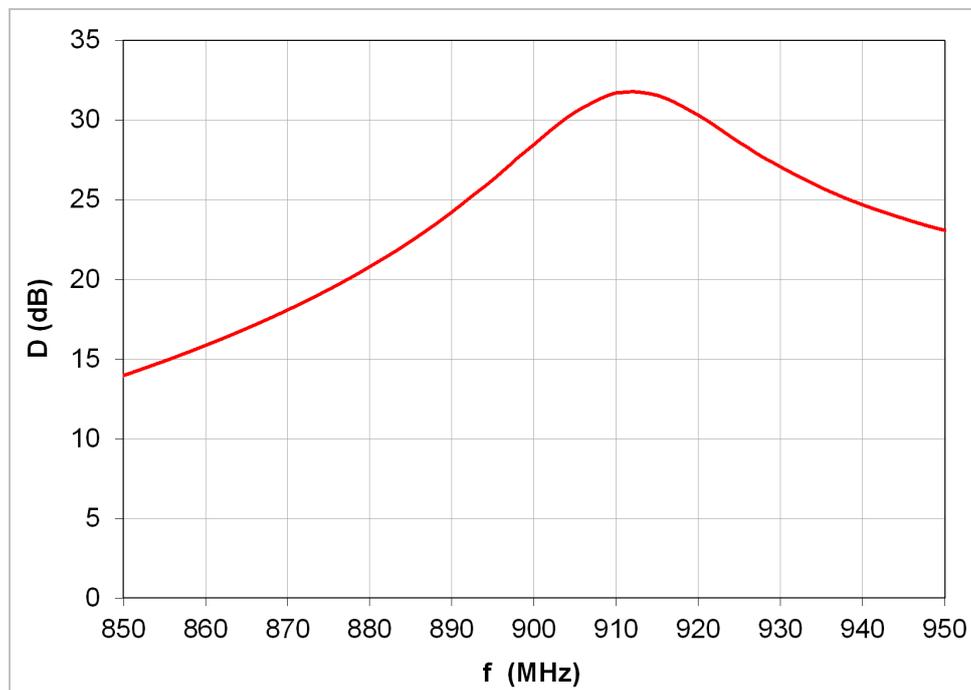


**Fig. 2.** DC211N installed on a standard-length waveguide.

## Specifications

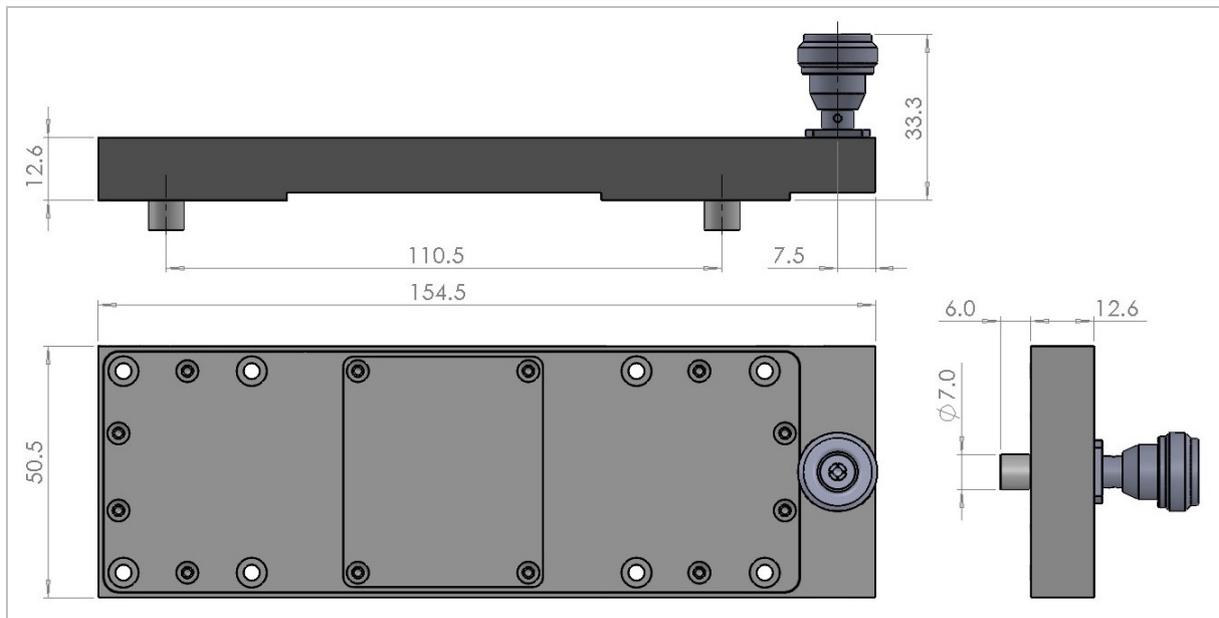
Waveguide of destination	WR975 (R9)
Waveguide wall thickness	4 mm, optionally 0.125 inch
Frequency range	895 – 925 MHz
Coupling factor / Max working power	-60 dB / 10 kW -70 dB / 100 kW
Coupling factor uncertainty limits (3- $\sigma$ deviation)	$\pm 1$ dB
Directivity	25 dB min
Coupled port impedance	50 $\Omega$
Coupled port connector	DC211N: N-female (Nf) DC211S: SMA-female (SMAf)
Dimensions (L x W x H)	DC211N: 154.5 $\times$ 50.5 $\times$ 39.3 mm DC211S: 154.5 $\times$ 50.5 $\times$ 28.1 mm
Mass	205 g (DC211N), 195 g (DC211S)
Waveguide surface flatness required at DC interface	0.04 mm
Surface finish	E-CLPS 4600
Operating temperature range	-10 $^{\circ}$ C to +65 $^{\circ}$ C
Storage temperature range	-20 $^{\circ}$ C to +80 $^{\circ}$ C

## Typical Directivity



**Fig. 3.** Typical DC211 directivity.

## Dimensional Drawing



**Fig. 4.** Basic DC211N dimensions in millimeters. Compared to DC211N, DC211NS is shorter by 11.2 mm.

