Precision Rotary Vane Attenuators
Series 110

Features

- 1% Accuracy
- 0 dB – 60 dB
- Direct Reading
- Unsurpassed Reliability
- 2.60 GHz to 500 GHz



Model 32110

Flann Precision Rotary Vane Attenuators are considered by many to represent the 'Industry Standard' in precision waveguide attenuators, offering high accuracy and unsurpassed repeatability and reliability. The Rotary Vane Attenuator is the ideal instrument for use in waveguide systems where broadband direct reading of attenuation is required, particularly as a standard for reflectometer and swept systems. The Flann Rotary Vane Attenuator consists of a rotating circular waveguide section flanked by a pair of low VSWR rectangular to circular transitions. The three waveguide sections are fitted with stable high attenuation elements which ensure close agreement of the attenuation characteristic to the theoretical law. The attenuation is directly related to the relative angular position of the attenuating element in the centre section (Ø) and can be seen to follow the law 40 log (sec Ø).

The attenuation is insensitive to frequency;

Attenuation (dB)	Repeatability (dB)
10	0.002
20	0.003
40	0.005
60	0.008

Variations of phase with attenuation are negligible. Chocking of the rotating joints is employed to minimise RF leakage whilst sound mechanical design ensures the instruments are free from backlash. A precision 10 turn, 75 mm diameter helical drum scale provides extremely high resolution as the table below indicates: -

Attenuation Scale Range	1-4 dB	4-30dB	30-40 dB	40-60dB
Scales Increment	0.01 dB	0.1 dB	0.2 dB	0.5 dB

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FLANN

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Specifications

Model	Frequency Range (GHz)	Waveguide				VSWR (better than)	Maximum Insertion Loss (dB)	Maximum Power (W)
		WG	WM	R	WR			
10110	2.60 – 3.95	10	-	32	284	1.15	0.25	12
11A110	3.22 – 4.90	11A	-	40	229	1.15	0.25	10
12110	3.95 – 5.99	12	-	48	184	1.15	0.25	10
13110	4.64 – 7.05	13	-	58	159	1.15	0.25	9
14110	5.38 – 8.18	14	-	70	137	1.15	0.25	8
15110	6.58 – 10.0	15	-	84	112	1.15	0.25	6
16110	8.20 – 12.5	16	-	100	90	1.15	0.25	4
17110	9.84 – 15.0	17	-	120	75	1.15	0.25	3
18110	11.9 – 18.0	18	-	140	62	1.15	0.3	2
19110	14.5 – 22.0	19	-	180	51	1.15	0.4	1.5
20110	17.6 – 26.7	20	-	220	42	1.15	0.6	1
21110	21.7 – 33.0	21	-	260	34	1.15	0.8	0.75
22110	26.4 – 40.1	22	-	320	28	1.15	0.9	0.5
23110	33.0 – 50.1	23	-	400	22	1.15	1	0.3
24110	39.3 – 59.7	24	-	500	19	1.15	1	0.25
25110	49.9 – 75.8	25	-	620	15	1.15	1	0.15
26110	60.5 – 92.0	26	-	740	12	1.15	1.3	0.1
27110	73.8 – 112	27	-	900	10	1.15	1.3	0.07
28110	92.3 – 140	28	-	1200	8	1.2	1.8	0.05
29110	114 – 173	29	-	1400	6	1.25	2.2	0.035
30110	145 – 220	30	-	1800	5	1.28	2.7	0.02
31110	172 – 261	31	-	2200	4	1.4	3	0.015
32110	217 – 330	32	-	2600	3	1.55	3.5	0.01
710110	260 – 400	-	710	-	‘2.8’	1.75	4	0.007
570110	330 – 500	-	570	-	‘2.2’	2.2	4.5*	0.005

*5.3 dB @ 500 GHz

By using high value attenuation markings on the scale, symmetrically positioned about the maximum attenuation position, the user is able to verify the attenuation characteristics alignment which gives the highest confidence in the accuracy of subsequent measurements.

All ranges 0 dB to 60 dB with the following accuracy;

Model	WG10 to WG29	WG30	WG31	WG32	WM710	WM570
Attenuation Accuracy	0 dB to 60 dB	0 dB to 50 dB	0 dB to 45 dB	0 dB to 40 dB	0 dB to 35 dB	0 dB to 30 dB
	0.1 dB or 1% whichever is greater	0.15 dB or 1.2% whichever is greater	0.2 dB or 1.5% whichever is greater	0.2 dB or 1.5% whichever is greater	0.3 dB or 2% whichever is greater	0.4 dB or 2.5% whichever is greater

Operating temperature range +5°C to +35°C (Refer to Flann for wider temperature range consideration)

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Custom Design

Special attenuators can be supplied with a calibration range in excess of 60 dB. Combined rotary vane attenuator and rotary vane phase changer units are also available; these units are usually coupled at the circular waveguide section thereby minimising mismatch errors at low attenuation settings.
Please contact the sales team for more information sales@flann.com

Ordering Information

Model	Series	-	Flange
WG10 – WM570	110		See flann.com

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