

Programmable Rotary Vane Attenuators, Phase Changers & Control Processors



Model CP2020



Model 23621

Our new generation of Programmable Attenuators & Phase Changers provide higher measurement resolution, faster drive speed and an extendable attenuation range (85dB) when used with the new Flann Control Processor CP2020. Additionally, the CP2020 will recognise any Flann Programmable unit connected to either of its drive ports including our range of programmable microwave sources.

Features:

- Available from 3.3 (WR229) to 140GHz (WR 8)
- IEEE-488.2 (GPIB) bus control
- Full waveguide frequency ranges
- High accuracy
- High repeatability
- Proven reliability

Programmable Rotary Vane

Attenuators

- 0 to 60 dB continuously variable attenuators - up to 85dB in Steps Mode
- Direct dB scale read-out with manual control option
- Low phase change variation with attenuation
- Attenuation increments of 0.1dB or better (0.01dB below 21dB)

Programmable Rotary Vane Phase

Changers

- Continuously variable 0° to 360°
- Phase change increments of 0.2 degrees
- Direct reading

Applications:

- Automated test & measurement systems (ATE)
- Remote control systems
- Automated production testing of microwave radios
 - Fade margin
 - Bit error rate (BER)
 - Gain control

For Programmable Switches and Switch Drivers see pages 68-74

For Programmable Microwave Sources see page 14

For compatibility with our previous range of Series 610 and 611 Programmable Attenuators please refer to page 6

Programmable Rotary Vane Attenuators & Phase Changers

General Description

Flann Programmable Rotary Vane Attenuators and Phase Changers are well proven Precision Rotary Vane instruments driven by high resolution stepper motors, ensuring high accuracy and repeatability. The translation between the mechanical positioning of the instruments and the attenuation or phase shift characteristics is interpreted by the microprocessor based Control Processor.

Control Processors are available offering combinations of local (front panel) control and/or control via GPIB (IEEE-488.2). Sophisticated error detection and reporting verifies system performance, guaranteeing error free system operation. Positional stepping errors are non-cumulative.

Programmable Rotary Vane Attenuators

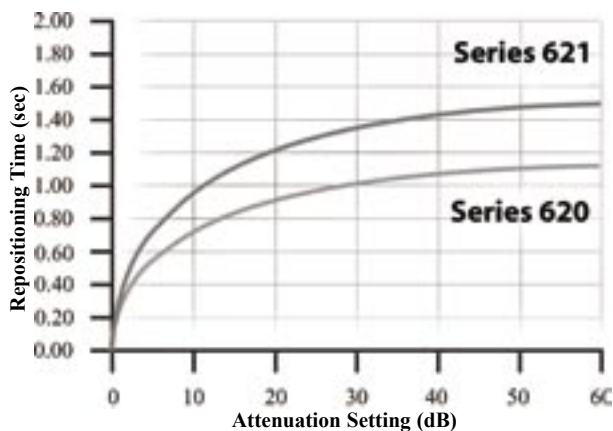
This range of Programmable Rotary Vane Attenuators uses a very high speed five phase stepper motor which, when used in conjunction with the sophisticated motor control circuitry and software of the Control Processor, provides precise, yet very fast positioning.

Programmable Rotary Vane Phase Changers

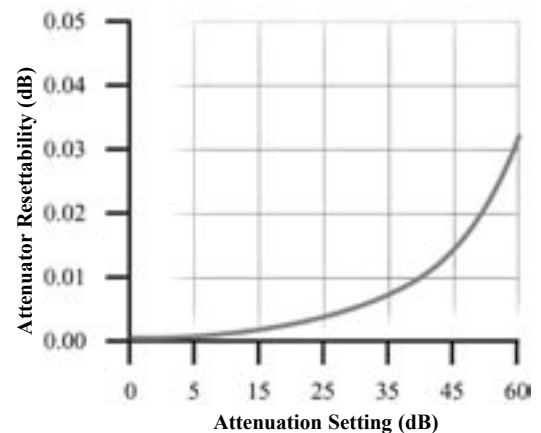
The Series 670 Rotary Vane Phase Changers employ the same high performance drive circuitry and precision mechanisms as the programmable attenuator range and operate at a repositioning rate of 1480 degrees per second with continuous phase change in both the forward and reverse directions. The smallest incremental phase change is 0.2°.

Figure 1 below illustrates the repositioning and resettability performance for the Series 620 and 621 Programmable Rotary Vane Attenuators.

Attenuator Repositioning Time (secs)



Attenuator Resettability



Please note:

The new series of programmable attenuators can be used with either the previous series of CP92 control processors or the latest series CP2020; an adaptor cable must be specified with order when using the CP92 versions of Control Processor.

Other features include:

- High repeatability/resettability
- Continuously variable over full attenuation / phase change range
- No momentary loss of signal during repositioning
- High Reliability

Two options of Programmable Attenuators are available:

- Series 620 Programmable Rotary Vane Attenuators without helical readout scale.
- Series 621 Programmable Rotary Vane Attenuators offering the additional feature of a high resolution visual helical scale. This unit can also be used as a stand-alone manual attenuator, ie not under power from a Control Processor.

Programmable Rotary Vane Attenuators

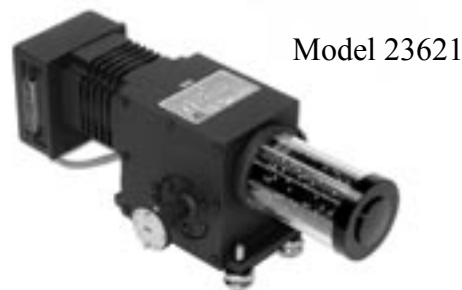
Series 620 and Series 621

Two basic types of Programmable Rotary Vane Attenuators, series 620 and 621, are available. The Series 620 has been extended to include models down to 3.3 GHz. The new Series 621 models offer an additional high resolution helical readout scale offering manual control.

High speed operation - Programmable Rotary Vane Attenuators are fitted with a high speed drive motor capable of repositioning the attenuator from 0 to 60 dB in less than 1.1 seconds when driven by our dedicated Control Processors.

High Accuracy

The attenuation accuracy of both models is 0.1 dB or 1% of setting, whichever is the greater, over the attenuation range of 0 to 60 dB.



Specifications

Attenuation range	0 to 60 dB (see note 1)
Attenuation accuracy	0.1 dB or 1% whichever is greater
Operating temperature range	5°C to 35°C
(Refer to Flann for wider temperature range consideration)	

Model Series 620 or 621	Frequency Range (GHz)	Waveguide			VSWR Max	Max Insertion Loss (dB)	Max Power (watts)	Model Series 620 or 621
		WG	R	WR				
11A62*	3.30 - 4.90	11A	40	229	1.15	0.5	10.0	11A62*
1262*	3.94 - 5.99	12	48	187	1.15	0.5	10.0	1262*
1362*	4.64 - 7.05	13	58	159	1.15	0.5	9.0	1362*
1462*	5.38 - 8.18	14	70	137	1.15	0.5	8.0	1462*
1562*	6.58 - 10.0	15	84	112	1.15	0.5	6.0	1562*
1662*	8.20 - 12.5	16	100	90	1.15	0.5	4.0	1662*
1762*	9.84 - 15.0	17	120	75	1.15	0.5	3.0	1762*
1862*	11.9 - 18.0	18	140	62	1.15	0.5	2.0	1862*
1962*	14.5 - 22.0	19	180	51	1.15	0.5	2.0	1962*
2062*	17.6 - 26.7	20	220	42	1.15	0.8	1.0	2062*
2162*	21.7 - 33.0	21	260	34	1.15	0.8	1.0	2162*
2262*	26.4 - 40.1	22	320	28	1.15	1.0	0.7	2262*
2362*	33.0 - 50.1	23	400	22	1.15	1.0	0.7	2362*
2462*	39.3 - 59.7	24	500	19	1.15	1.0	0.7	2462*
2562*	49.9 - 75.8	25	620	15	1.15	1.0	0.5	2562*
2662*	60.5 - 92.0	26	740	12	1.15	1.5	0.3	2662*
2762*	73.8 - 112.0	27	900	10	1.15	1.5	0.3	2762*
2862*	92.3 - 140	28	1200	8	1.20	2.0	0.2	2862*

* Enter 0 for 620 Series or 1 for 621 Series.

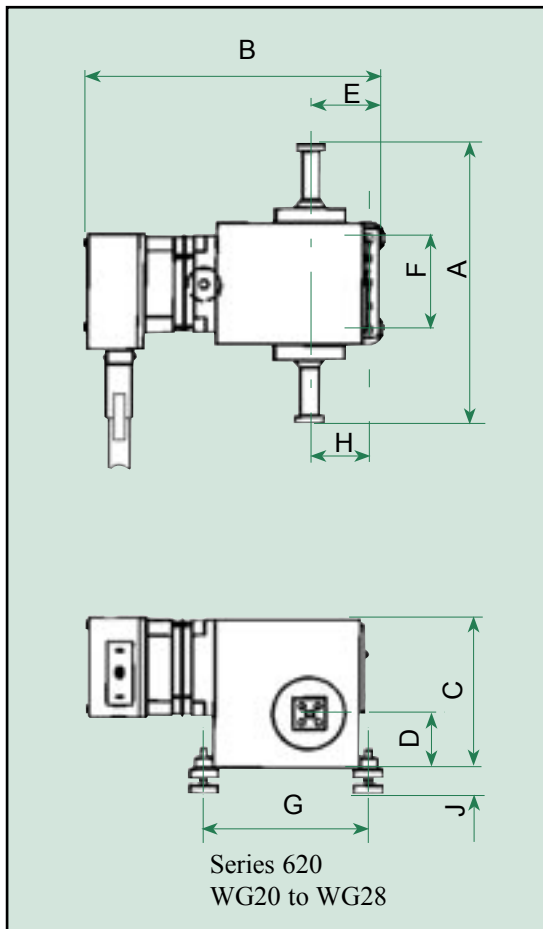
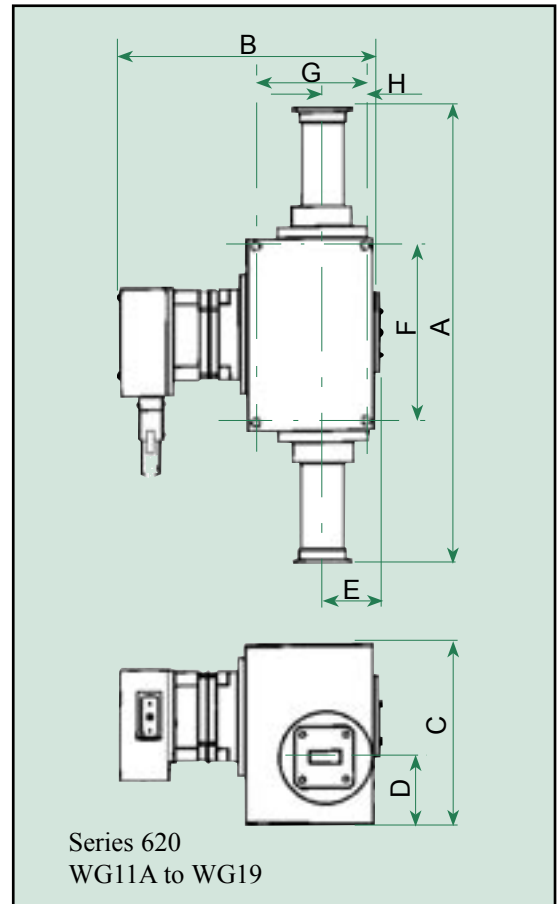
Note 1 Customised models with extended attenuation ranges can be supplied, please contact our Sales office for further details.

Programmable Rotary Vane Attenuators

Series 620

Outline Dimensions

Model	Series 620 WG 11A-WG19								Model
	Dimensions (mm)								
	A	B	C	D	E	F	G	H	
11A620	687	206.8	166	66	64	110	110	54	11A620
12620	560	196	155	55	63.8	110	92	51.3	12620
13620	520	196	155	55	63.8	110	92	51.3	13620
14620	420	196	155	55	63.8	110	92	51.3	14620
15620	340	173	120	43	40.9	116	73	30.9	15620
16620	300	173	120	43	40.9	116	73	30.9	16620
17620	276	173	120	43	40.9	116	73	30.9	17620
18620	250	173	120	43	40.9	116	73	30.9	18620
19620	250	173	120	43	40.9	116	73	30.9	19620



Model	Series 620 WG20 - WG28									Model
	Dimensions (mm)									
	A	B	C	D	E	F	G	H	J	
20620	250	173.5	95.5	35	43	95	100	37	13/21	20620
21620	225	173.5	95.5	35	43	95	100	37	13/21	21620
22620	174	173.5	95.5	35	43	56	100	37	13/21	22620
23620	140	173.5	95.5	35	43	50	100	37	13/21	23620
24620	134	173.5	95.5	35	43	50	100	37	13/21	24620
25620	100	181.5	95.5	35	46.7	56	103	41.7	13/21	25620
26620	89	181.5	95.5	35	46.7	56	103	41.7	13/21	26620
27620	89	181.5	95.5	35	46.7	56	103	41.7	13/21	27620
28620	89	181.5	95.5	35	46.7	56	103	41.7	13/21	28620

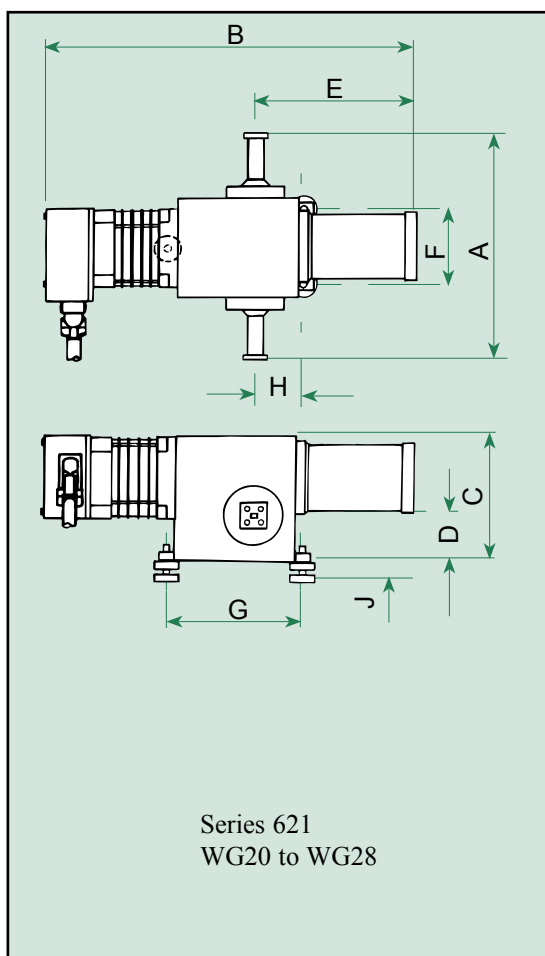
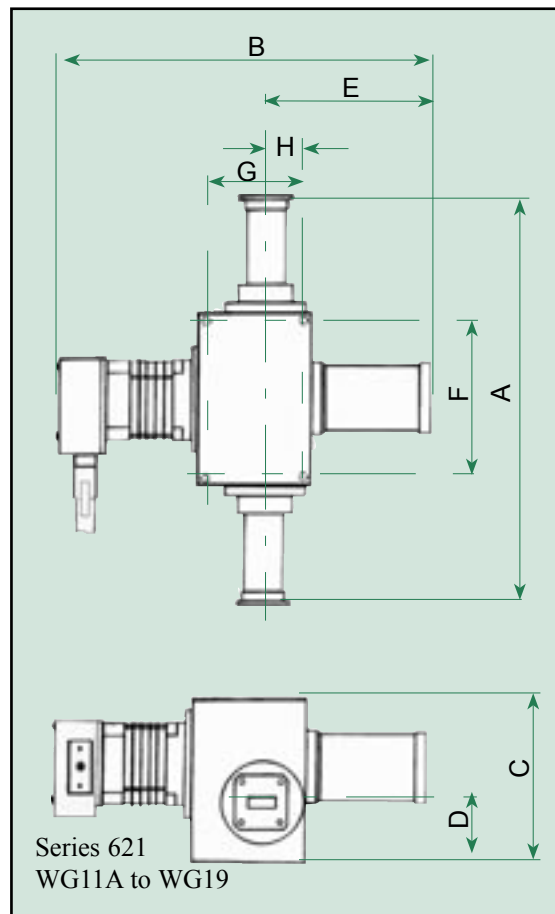
Customised systems are available to suit special applications.
Please contact our sales office for full details.

Programmable Rotary Vane Attenuators

Series 621

Outline Dimensions

Model	Series 621 WG11A -WG19								Model
	Dimensions (mm)								
	A	B	C	D	E	F	G	H	
11A621	687	311	166	66	148.5	110	110	54.0	11A621
12621	560	296	155	55	145.8	110	92	51.3	12621
13621	520	296	155	55	145.8	110	92	51.3	13621
14621	420	296	155	55	145.8	110	92	51.3	14621
15621	340	273	120	43	122.9	116	73	32.9	15621
16621	300	273	120	43	122.9	116	73	32.9	16621
17621	276	273	120	43	122.9	116	73	32.9	17621
18621	250	273	120	43	122.9	116	73	32.9	18621
19621	250	273	120	43	122.9	116	73	32.9	19621

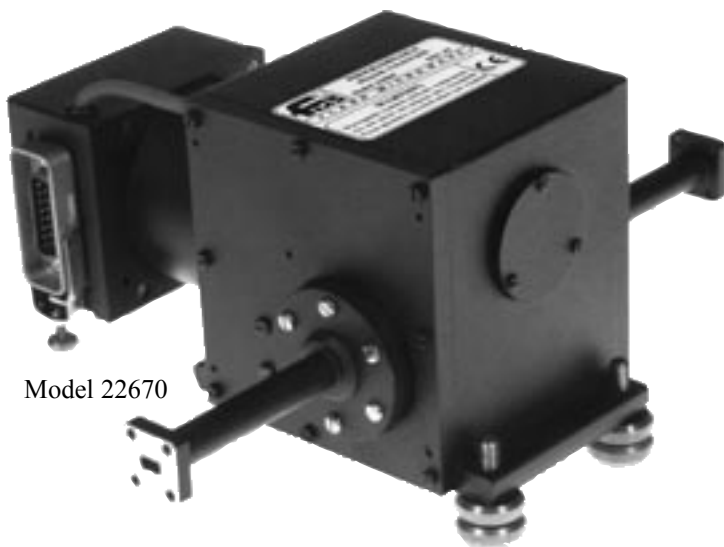


Model	Series 621 WG20 -WG28									Model
	Dimensions (mm)									
	A	B	C	D	E	F	G	H	J	
20621	250	273.5	95.5	35	118.7	95	100	37	13/21	20621
21621	225	273.5	95.5	35	118.7	95	100	37	13/21	21621
22621	174	274.5	95.5	35	118.7	56	100	37	13/21	22621
23621	140	274.5	95.5	35	118.7	50	100	37	13/21	23621
24621	134	274.5	95.5	35	118.7	50	100	37	13/21	24621
25621	100	281.5	95.5	35	125.7	56	103	41.7	13/21	25621
26621	89	281.5	95.5	35	125.7	56	103	41.7	13/21	26621
27621	89	281.5	95.5	35	125.7	56	103	41.7	13/21	27621
28621	89	281.5	95.5	35	125.7	56	103	41.7	13/21	28621

Customised systems are available to suit special applications.
Please contact our sales office for full details.

Programmable Rotary Vane Phase Changers

Series 670



Model 22670

Features

- 3.3 GHz - 140 GHz
- 0.2 Degree Increments

The Programmable Rotary Vane Phase Changers Series 670 includes models suitable for operation in frequency bands from 3.3 GHz to 140 GHz.

The stepper motor driven units provide continuous phase change in both forward and reverse direction with the smallest increment of 0.2 degrees; the rate of phase change is 1480 degrees per second when driven by the appropriate Flann Control Processor. Please see page 11 & 12 for technical details of Control Processors and page 13 for ordering information.

Specifications:

Operating Temperature Range 5°C to 35°C

(Please refer to Flann for wider temperature range consideration.)

Model	Frequency Range (GHz)	Waveguide			Accuracy	Max VSWR	Max Insertion Loss (dB)	Max Power	Model
		WG	R	WR					
11A670	3.30 - 4.90	11A	40	229	3°	1.25	1.0	10.0	11A670
12670	3.94 - 5.99	12	48	187	3°	1.25	1.0	10.0	12670
13670	4.64 - 7.05	13	58	159	3°	1.25	1.0	10.0	13670
14670	5.38 - 8.18	14	70	137	3°	1.25	1.0	10.0	14670
15670	6.58 - 10.0	15	84	112	3°	1.25	1.0	10.0	15670
16670	8.20 - 12.5	16	100	90	3°	1.25	1.0	10.0	16670
17670	9.84 - 15.0	17	120	75	3°	1.25	1.0	5.0	17670
18670	11.9 - 18.0	18	140	62	4°	1.30	1.0	5.0	18670
19670	14.5 - 22.0	19	180	51	4°	1.30	1.0	4.0	19670
20670	17.6 - 26.7	20	220	42	4°	1.30	1.0	3.0	20670
21670	21.7 - 33.0	21	260	34	4°	1.30	1.0	2.5	21670
22670	26.4 - 40.1	22	320	28	4°	1.30	1.0	2.0	22670
23670	33.0 - 50.1	23	400	22	4°	1.50	1.0	1.5	23670
24670	39.3 - 59.7	24	500	19	4°	1.50	1.5	1.0	24670
25670	49.9 - 75.8	25	620	15	5°	1.50	1.5	0.7	25670
26670	60.5 - 92.0	26	740	12	5°	1.50	2.0	0.5	26670
27670	73.8 - 112.0	27	900	10	6°	1.75	2.5	0.3	27670
28670	92.3 - 140.0	28	1200	8	6°	1.75	3.0	0.2	28670

Dimensions: Full details are available on request

ORDERING INFORMATION

Model: Description

Example: Model 12670 Programmable Rotary Vane Phase Changer

Outline dimensions available on request.