

# Waveguide Switches

## Series 333/4

### SWITCHES

#### Features

- **Manual and Motorised Models**
- **2 or 3 Channel Rotor**
- **High Repeatability**
- **High Reliability**
- **High Isolation**
- **Motorised versions with Speed & Precision modes of operation**
- **Low VSWR**



### DRIVERS

#### Features

- **GPIB**
- **Bench, "through panel" & "board level" versions**

The Flann range of waveguide switches, series 333, includes manual and motorised models operating in the frequency bands up to 140 GHz.

The 4 port switches are optionally available with 2 channel or 3 channel rotors in most waveguide sizes and offer high isolation between non-coupled ports.

#### Manual switches - series 333-2 (or -3)

See page 69

Precision manual switches offering unsurpassed accuracy and repeatability.

#### Motorised switches - series 333-2E (or-3E)

See page 70

Stepper motor driven switches offering superior reliability and repeatability to alternative solenoid operated units. A feature unique to the Flann 333 series of electrical switches is the user's ability to choose between "speed" and "precision" modes of operation. In "speed" mode switching time is minimised by using all possible rotor positions. In "precision" mode, only one of the two possible rotor positions is used ensuring optimum microwave path repeatability. The speed/precision mode facility is available when series 333 switches are used in conjunction with SD57 or SD58 series switch drivers. Standard drive cable length is 2 metres for all models.

#### Low cost DC motor driven switches - series 334-2E

See page 71

A new model, series 334, is a low cost, DC motor driven, 2 channel rotor switch operating in the frequency bands from 8.2 GHz to 140 GHz and to the same high performance specification as the 333 series. A high speed, DC Motor driven switch offering a low cost yet highly reliable alternative to solenoid or TTL operated units.

#### Double ridge waveguide switches DC motor driven - series WRD \*\*\* 334-2E

See page 72

Double Ridge waveguide switches are manufactured for either manual or electrical operation and are available in most of the recognised double ridge waveguide configurations.

#### Switch drivers - series SD

See pages 73-74

An associated range of low cost drivers is available in bench and board level versions. Bench models are available suitable for the control of one or two switch units. Models offering local control, via front panel, and remote control via GPIB interface are optionally available. Refer to page 73,74,&75 for specifications and input voltages.

# Manual Waveguide Switches

## Series 333

### Features

- Models up to 140 GHz
- High Accuracy
- High Repeatability
- 2 or 3 Channel Rotor
- High Isolation

The Flann range of Manual Waveguide Switches, Series 333, are 4 port devices and are optionally available with 2 or 3 channel rotor. Efficient choke design ensures a high RF isolation between non-coupled ports.

Accurate channel to port alignment and excellent repeatability are achieved by a light yet positive rotor indexing mechanism. The well proven design ensures long reliable service without deterioration in performance.



Model 20333-2

### Specification:

Isolation (minimum) 75 dB

Model	Frequency range (GHz)	Waveguide			VSWR (max)	Insertion Loss (dB)	Dimensions (mm)*							Weight (kg)	Model
		WG	R	WR			A	B	C	D	E	F	G		
16333	8.20 - 12.5	16	100	90	1.10	0.15	ON REQUEST								16333
17333	9.84 - 15.0	17	120	75	1.10	0.2	ON REQUEST								17333
18333	11.9 - 18.0	18	140	62	1.10	0.2	ON REQUEST								18333
19333	14.5 - 22.0	19	180	51	1.10	0.3	55	29	71	92	50	60	56	0.95	19333
20333	17.6 - 26.7	20	220	42	1.10	0.3	44	30	73	94	45	60	50	0.8	20333
21333	21.7 - 33.0	21	260	34	1.10	0.4	44	30	73	94	45	60	50	0.55	21333
22333	26.4 - 40.1	22	320	28	1.10	0.4	44	28	69	90	45	60	50	0.7	22333
23333	33.0 - 50.1	23	400	22	1.10	0.4	47	28	69	90	45	60	50	0.7	23333
24333	39.3 - 59.7	24	500	19	1.10	0.5	47	28	69	90	45	60	50	0.7	24333
25333	49.9 - 75.8	25	620	15	1.10	0.6	44	28	69	90	45	60	50	0.6	25333
26333	60.5 - 92.0	26	740	12	1.10	0.8	44	28	69	90	45	60	50	0.6	26333
27333	73.8 - 112	27	900	10	1.10	1.0	44	28	69	90	45	60	50	0.6	27333
28333	93.2 - 140.0	28	1200	8	1.15	1.2	44	28	69	90	45	60	50	0.6	28333

\* These dimensions refer to 2 channel rotor switches only; for 3 channel rotor switch dimensions consult our sales office.

**ORDERING INFORMATION**  
 Model: Rotor Type; Description  
 Example: Model 22333-2 Manual waveguide switch 2 Channel Rotor

Series 333

For standard flange types and recommendations see pages 108 onwards

# Motorised Waveguide Switches

## Series 333-\*E

### Features

- Models up to 140 GHz
- High Accuracy
- High Repeatability
- 2 or 3 Channel Rotor
- High Isolation

### Specification:

Isolation (minimum) 75 dB

See pages 73 - 75 for Switch Drivers



Model 27333-3E

Model	Frequency Range (GHz)	Waveguide			VSWR (max) max	Insertion Loss max(dB)	Dimension C	Flange to Flange length**		Model
		WG	R	WR				A (mm)	B (mm)	
17333 - 2E	9.84 - 15.0	17	120	75	1.10		56.0	152	17333 - 2E	
18333 - 2E	11.9 - 18.0	18	140	62	1.10		50.0	147	18333 - 2E	
19333 - 2E	14.5 - 22.0	19	180	51	1.10	29	55.0	140	19333 - 2E	
20333 - *E	17.6 - 26.7	20	220	42	1.10	29.7	44.0	140	20333 - *E	
21333 - *E	21.7 - 33.0	21	260	34	1.10	30	44.0	140	21333 - *E	
22333 - *E	26.4 - 40.1	22	320	28	1.10	28	44.0	137	22333 - *E	
23333 - *E	33.0 - 50.1	23	400	22	1.10	28	47.0	137	23333 - *E	
24333 - *E	39.3 - 59.7	24	500	19	1.10	28	47.0	137	24333 - *E	
25333 - *E	49.9 - 75.8	25	620	15	1.10	28	44.0	137	25333 - *E	
26333 - *E	60.5 - 92.0	26	740	12	1.10	28	44.0	137	26333 - *E	
27333 - *E	73.8 - 112	27	900	10	1.10	28	44.0	137	27333 - *E	
28333 - *E	92.3 - 140	28	120	8	1.15	28	44.0	137	28333 - *E	

The suffix "-2E" denotes a 2 channel rotor whilst "-3E" denotes a 3 channel rotor.

\*\* These dimensions refer to 2 channel rotor switches only; for 3 channel rotor switch dimensions consult our sales office.

2 channel rotor type

3 channel rotor type

**ORDERING INFORMATION**  
 Model: rotor type, E; description  
 Example: Model 22333-2E Motorised waveguide switch, 2 channel rotor

Our range of waveguide switches is subject to continual development and additional models, not detailed in this catalogue, may be available to special order. Please consult our sales office for information.

**A Flann switch driver is essential for driving any of the electrically operated switches listed.**  
 Please see page 73 for details.

Series 333

For standard flange types and recommendations see pages 108 onwards

# D.C. Operated Waveguide Switches

## Series 334-2E

### Features

- **Competitively Priced**
- **Low VSWR**
- **High Repeatability**
- **High Isolation, 60dB**
- **2 Channel Rotor**

**This new series of 2 channel, 4 port D.C. Operated waveguide switch incorporates previous well proven designs offering high isolation between ports at a competitive prices.**

The drive circuitry is an integral part of each switch and derives all its power from the input drive pulse which is generated by the user according to the electrical drive specifications.

### Operation

The single mode of operation incorporates two input lines, one line for each switch position. For example a drive pulse on line 1 will drive switch to position 1 if not already in that position. A pulse on line 2 will drive switch to position 2. Alternatively, pulse both inputs simultaneously to toggle between the two positions.

The unit provides positional indication of the switch position via two sensors.



Model  
16334 - 2E

### Electrical drive specification:-

Operating voltage	+24 v dc $\pm$ 2v
Optional continuous output sensor	+5 v dc $\pm$ .25 v dc
Drive current	1 amp maximum
Control	24 V pulses of 500mA 100 ms min in duration
Switching time	> 80ms
Max switching repetition	8 cycles per second

### Environmental specification:

Temperature:	-10 <sup>o</sup> C to +60 <sup>o</sup> C non-condensing
Non Operating:	-40 <sup>o</sup> C to +85 <sup>o</sup> C non-condensing

Model	Frequency Range (GHz)	Waveguide			VSWR (max)	Insertion Loss max (dB)	Flange to Flange length	Overall Height	Model
		WG	R	WR					
16334-2E	8.20 - 12.5	16	100	90	1.10	0.2	47	160	16334-2E
17334-2E	9.84 - 15.0	17	120	75	1.10	0.2	47	160	17334-2E
18334-2E	11.9 - 18.0	18	140	62	1.10	0.2	47	160	18334-2E
19334-2E	14.5 - 22.0	19	180	51	1.10	0.3	47	160	19334-2E
20334-2E	17.6 - 26.7	20	220	42	1.10	0.3	47	160	20334-2E
21334-2E	21.7 - 33.0	21	260	34	1.10	0.4	47	160	21334-2E
22334-2E	26.4 - 40.1	22	320	28	1.10	0.4	47	160	22334-2E
23334-2E	33.0 - 50.1	23	400	22	1.10	0.4	47	160	23334-2E
24334-2E	39.3 - 59.7	24	500	19	1.10	0.5	47	160	24334-2E
25334-2E	49.9 - 75.8	25	620	15	1.10	0.6	47	160	25334-2E
26334-2E	60.5 - 92.0	26	740	12	1.10	0.8	47	160	26334-2E
27334-2E	73.8 - 112	27	900	10	1.10	1.0	47	160	27334-2E
28334-2E	92.3 - 140	28	1200	8	1.15	1.2	47	160	28334-2E

### ORDERING INFORMATION

Model description

Example: Model 22334-2E D.C. Operated waveguide switch, 60dB isolation, 2 port rotor.

**Various Driver options are available for the new switch, please contact our sales office for details.**

Our range of waveguide switches is subject to continual development and additional models, not detailed in this catalogue may be available to special order. Please consult our sales office for information.

Series 334-2E

For standard flange types and recommendations see pages 108 onwards





# D.C. Operated Double Ridge Waveguide Switches

## Series WRD\*\*\*334-2E

### Features

- **Competitively Priced**
- **Low VSWR**
- **High Repeatability**
- **High Isolation, 70dB**
- **Manual Versions Available**
- **Up to 40GHz**

Flann have now further extended their product range by offering D.C. Operated Double Ridge Waveguide Switches based on our successful range of series 334-2E switches

We also offer manual operated double ridge waveguide switches on request. Please consult our sales office for more details.

This new series of 2 channel, 4 port D.C. Operated waveguide switch incorporates previous well proven designs offering high isolation between ports at competitive prices.

The drive circuitry is an integral part of each switch and derives all its power from the input drive pulse which is generated by the user according to the electrical drive specifications.

#### Electrical drive specification:-

Operating voltage	+24 v dc $\pm$ 2v
Optional continuous output sensor	+5 v dc $\pm$ .25 v dc
Drive current	1 amp maximum
Control	24 V pulses of 500mA 100 ms min in duration
Switching time	< 80ms
Max switching repetition	8 cycles per second

#### Environmental specification:

Temperature:	-10 <sup>o</sup> C to +60 <sup>o</sup> C non-condensing
Non Operating:	-40 <sup>o</sup> C to +85 <sup>o</sup> C non-condensing



Model WRD180334-2E

### Operation

The single mode of operation incorporates two input lines, one line for each switch position for example a drive pulse on line 1 will drive switch to position 1 if not already in that position. A pulse on line 2 will drive switch to position 2. Alternatively, pulse both inputs simultaneously to toggle between the two positions.

The unit provides positional indication of the switch position via two sensors.

Model	Frequency Range (GHz)	Waveguide Size	VSWR (Better Than)	Insertion Loss (dB)	Isolation
<b>WRD580334</b>	5.8 - 16.0	WRD580D28	1.15	0.3	70
<b>WRD650334</b>	6.5 - 18.0	WRD650D28	1.15	0.3	70
<b>WRD750334</b>	7.5 - 18.0	WRD750D24	1.15	0.3	70
<b>WRD180334</b>	18.0 - 40.0	WRD180C24	1.15	0.2	75

#### ORDERING INFORMATION

Model: description  
Example: Model WRD180334 -2E D.C. Operated double ridge waveguide switch

**Various Driver options are available for the new switch, please contact our sales office for details.**

Our range of waveguide switches is subject to continual development and additional models, not detailed in this catalogue may be available to special order. Please consult our sales office for information.

Series 334-2E