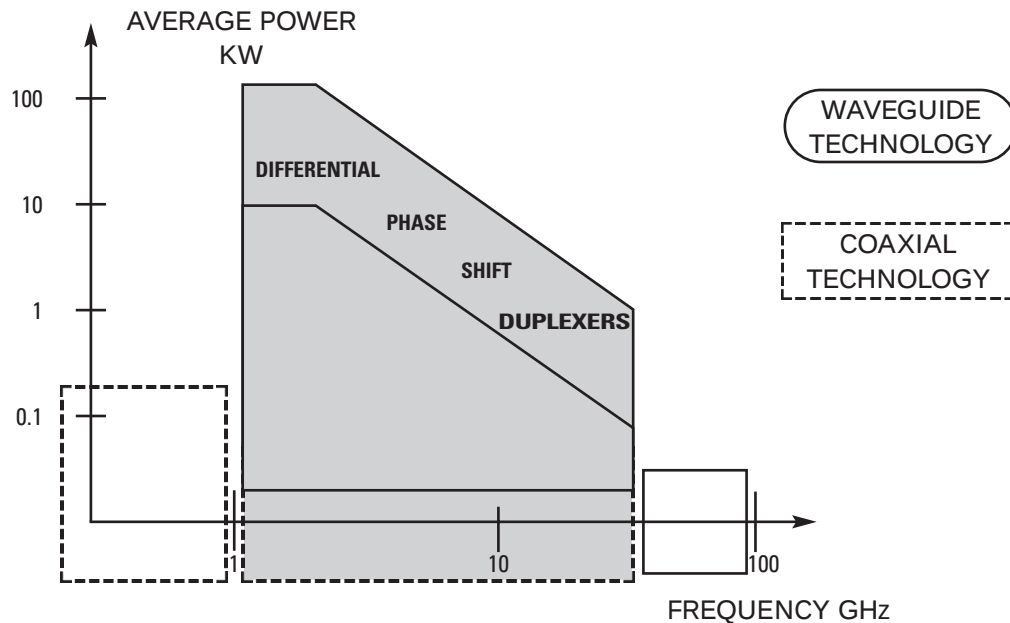


4-PORT WAVEGUIDE DIFFERENTIAL PHASE SHIFT CIRCULATORS (DUPLXERS)



General description

Designed for use in both high-peak and high-mean power applications, TEMEX COMPONENTS differential phase shift circulators offer high isolation while maintaining low-insertion loss.

These ruggedly constructed circulators can operate under the most severe environmental conditions, according to MIL-SPEC.

The addition of specific heat sinks, or liquid cooling jackets increases mean power handling; for example, of up to 200 kW-CW at 1.250 GHz.

Casting techniques can be used for pressurized waveguide in order to reduce leakage and weight, especially for airborne radars.

In-house [ferrite materials](#) facilities, computer-aided design, and experienced research and development teams, allow TEMEX COMPONENTS to offer customers specific designs with optimal features.

With the addition of a suitable waveguide load and a dummy load on the appropriate port, a 4-port differential phase shift circulator may be operated as a high-power isolator.

The reflected power which will be absorbed in the dummy load, or the output mismatch - (V.S.W.R.)- should be specified when ordering.

Options such as direction of circulation, mechanical output ports E-bend or H-bend are available upon request.

Electrical characteristics

Notes	Type	Frequency range (GHz)	Band-width (MHz)	Avg. power max. W	Peak power max. kW	Specifications at 25° C			Spec. in temperature range			Temperature range ° C	Flange	Length mm approx.	Weight kg. approx.
						Isolation. min. dB	Inse. loss max. dB	VSWR max.	Isolation. min. dB	Inse. loss max. dB	VSWR max.				
WR975 waveguide (R9)															
1-5	FC6001	1.000	-	350 K	350	-	-	-	20	0.15	1.10	25 ± 3	UDR 9	3044	-
WR650 waveguide (R14)															
1-4	FD6001	1.250-1.350	FULL	6 K	6500	20	0.5	1.15	20	0.5	1.15	-10 to +50	CPR 650	2075	80
1-7	FD6002	1.250-1.350	FULL	200 K	2000	20	0.2	1.15	20	0.2	1.15	+10 to +40	CPR 650	2136	130
WR340 waveguide (R26)															
1	FE6002	2.450	± 25	50 K	50	23	0.2	1.15	20	0.25	1.20	+10 to +30	UG 554A/U	1125	43
WR284 waveguide (R32)															
2-4	FE6004	2.700-2.900	FULL	3 K	1500	25	0.4	1.20	25	0.4	1.20	0 to +65	SPECIAL	600	25
1	FE6005	2.900-3.100	FULL	10 K	660	25	0.4	1.20	25	0.4	1.20	0 to +50	SPECIAL	965	19
1-5-7	FE6001	2.900-3.100	FULL	6 K	6000	20	0.3	1.15	20	0.3	1.15	0 to +50	CPR 284F	635	40
1-6	FE6003	2.995-3.005	FULL	7 K	15000	20	0.2	1.05	20	0.2	1.05	+15 to +30	SPECIAL	902	80
WR187 waveguide (R48)															
2	FG4201	4.4-5	FULL	2 K	2	23	0.2	1.12	23	0.2	1.12	-10 to +40	UER 48	588	8
WR137 waveguide (R70)															
2	FH6002	5.925-6.425	FULL	1.5 K	-	22	0.15	1.07	20	0.2	1.15	-10 to +65	CPR 137	418	4.8
2	FH6000	5.925-6.425	FULL	3 K	-	22	0.15	1.07	20	0.2	1.15	-10 to +65	CPR 137	418	4.8
WR112 waveguide (R84)															
	FI6006	7.9-8.4	FULL	1.8 K	-	30	0.2	1.10	30	0.2	1.10	-10 to +70	UG 138/U	324	1.6
2-4	FI6007	8.5-9.6	FULL	300	250	25	0.5	1.15	23	0.5	1.15	0 to +60	UG 138/U	324	1.6
2-4	FI6003	8.8-9.4	FULL	250	250	25	0.5	1.15	25	0.5	1.15	0 to +60	UG 138/U	254	0.7
WR90 waveguide (R100)															
2-4	FI6001	8.5-9.6	FULL	300	250	20	0.5	1.20	20	0.5	1.20	-40 to +70	UG 135/U	176	0.52
3	FI6008	9-9.6	FULL	540	180	22	0.4	1.20	20	0.5	1.20	-40 to +70	UG 135/U	152	0.52
2-4	FJ6013	9.6-10.4	FULL	1500	50	-	-	-	20	0.3	1.15	-40 to +70	UG 135/U	200	0.5
	FJ6008	9.9-10.5	FULL	500	-	22	0.3	1.20	20	0.5	1.20	-30 to +60	UG 135/U	207	1
1	FJ6004	10-10.25	FULL	2.5 K	-	25	0.25	1.10	20	0.35	1.15	0 to +60	UG 39/U	246	2.1
WR75 waveguide (R120)															
1	FJ6007	11.7-12.5	FULL	1 K	2	25	0.25	1.15	20	0.3	1.20	0 to +60	UBR 120	257	2.2
WR62 waveguide (R140)															
2	FJ6001	14-14.5	FULL	2.5 K	2.5	25	0.25	1.15	22	0.3	1.20	-10 to +55	UG 419/U	223	3.2
	FJ6009	15.7-17	FULL	150	60	20	0.4	1.15	20	0.4	1.15	-10 to +70	UG 419/U	171	0.55

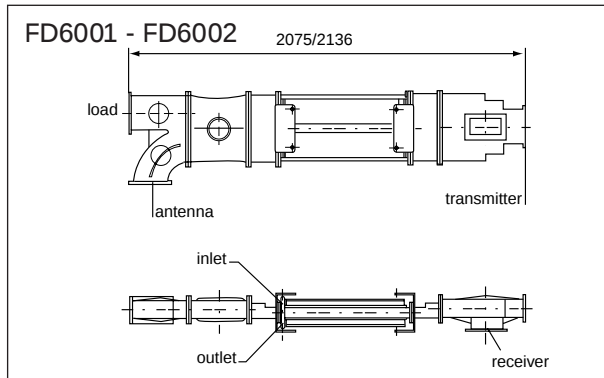
Notes:

- | | |
|---|--|
| 1 Water cooled | 5 Can operate with permanent short circuit |
| 2 Air cooled | 6 Pressurized SF ₆ (45 PSIG) |
| 3 Air cooled pressurized 30 PSIG (2 kg) | 7 Pressurized SF ₆ (15 PSIG) |
| 4 Pressurized 15 PSIG (1.1 kg) | |

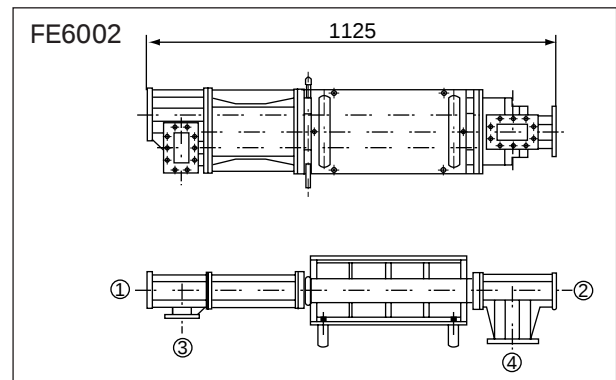
4-Port waveguide differential phase shift circulators (Duplexers)

Outline drawings

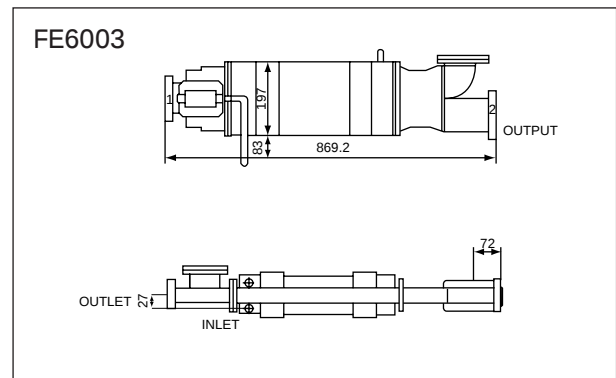
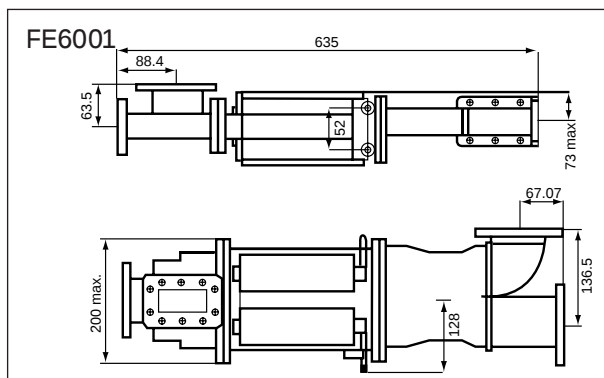
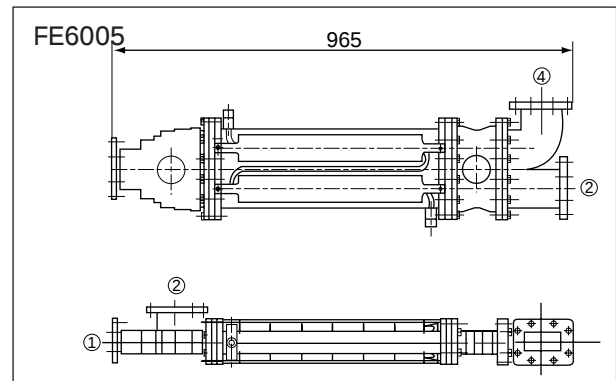
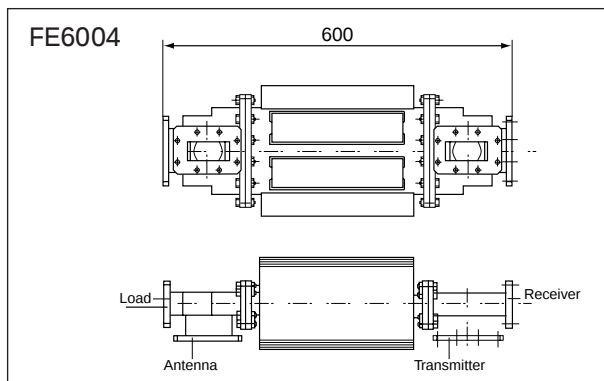
R14
WR650 waveguide



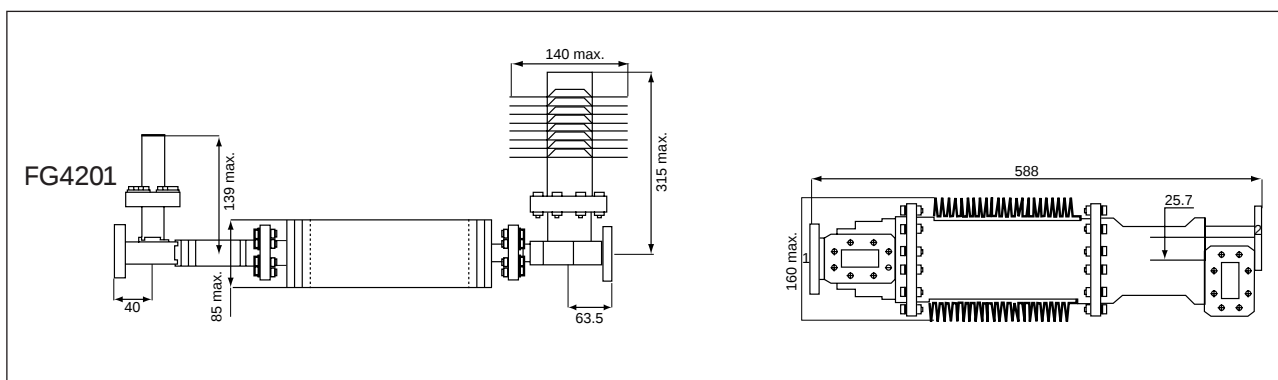
R26
WR340 waveguide



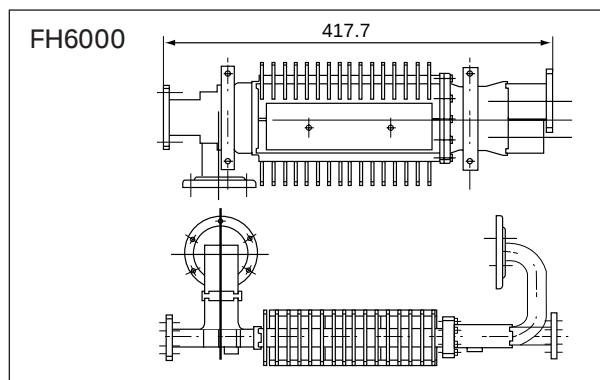
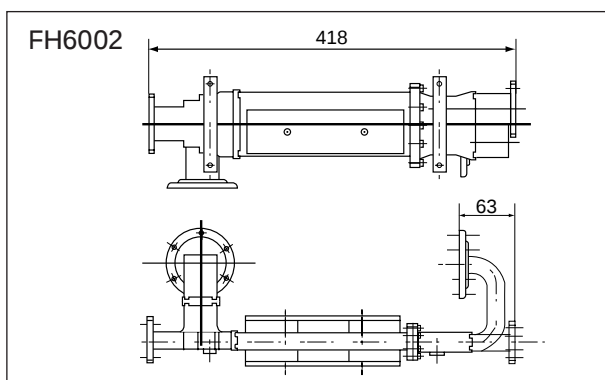
R32
WR284 waveguide



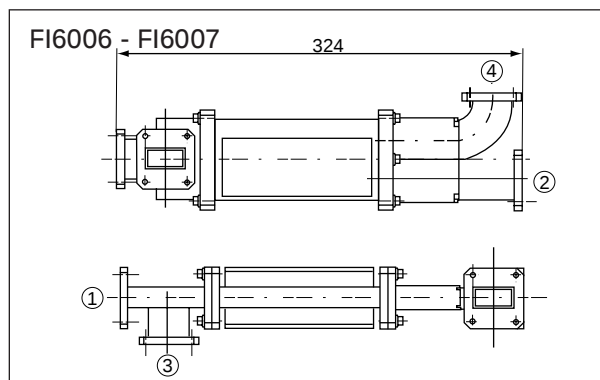
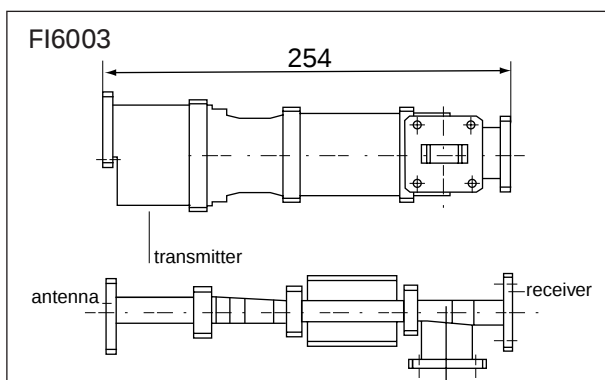
R48
WR187 waveguide



R70
WR137 waveguide

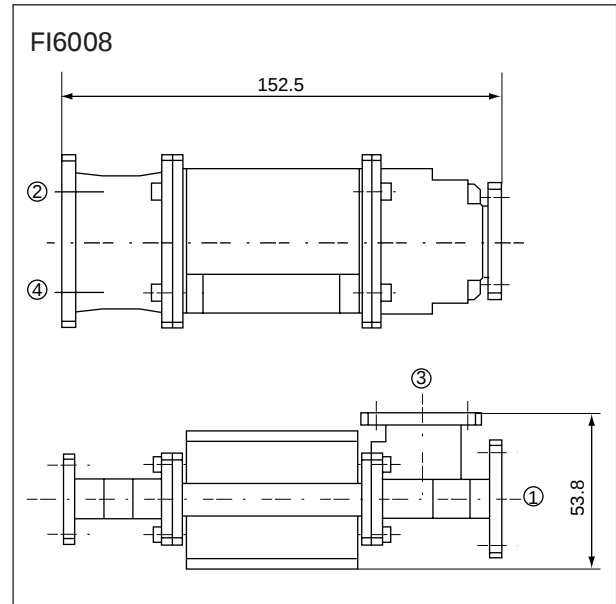
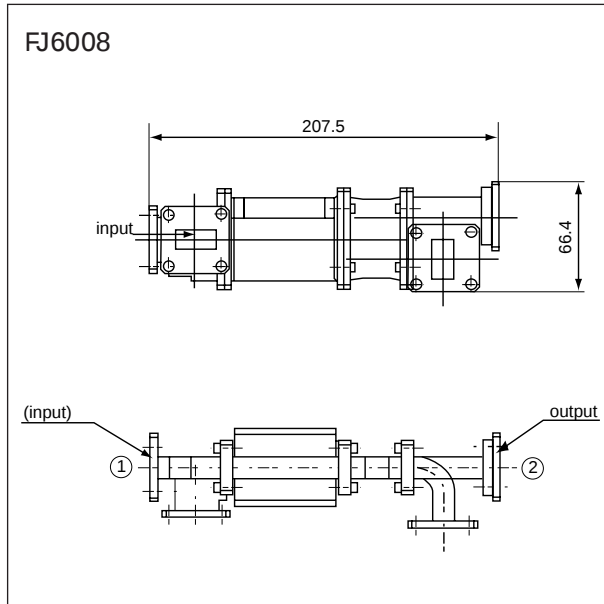


R84
WR112 waveguide

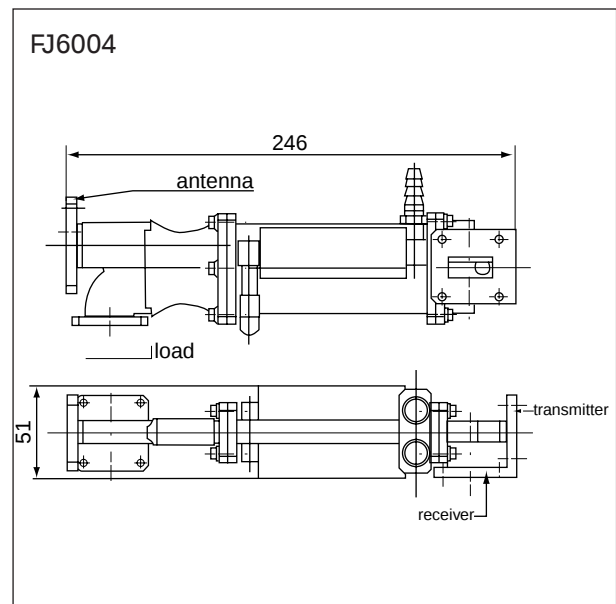
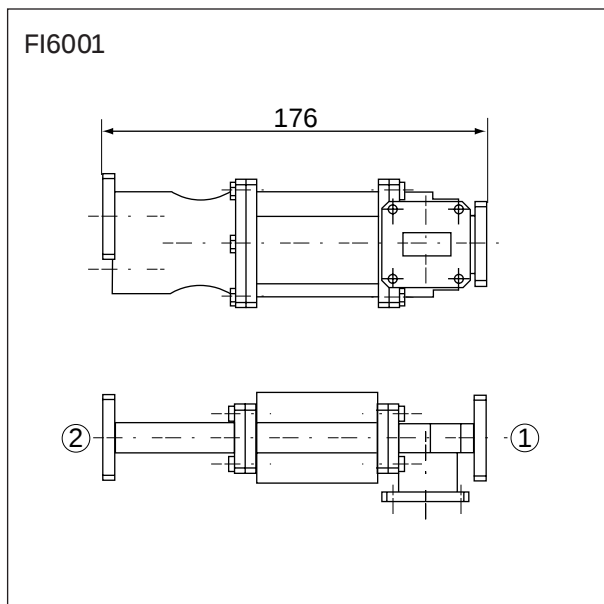


4-Port waveguide differential phase shift circulators (Duplexers)

R100 WR90 waveguide

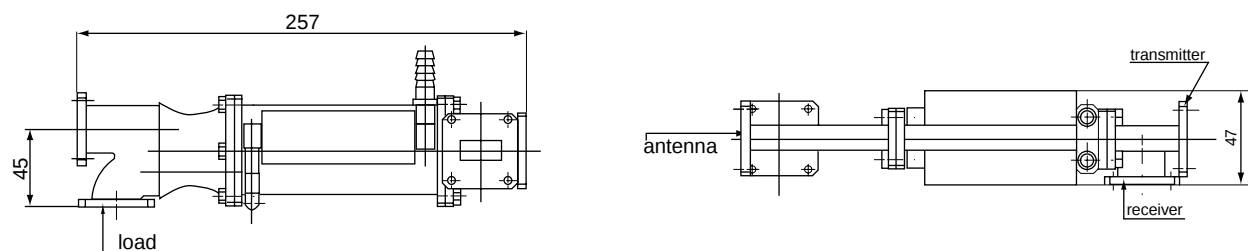


R100 WR90 waveguide



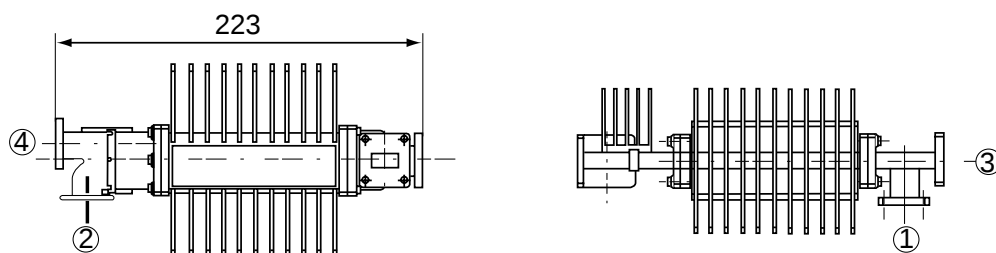
R120 WR75 waveguide

FJ6007



R140 WR62 waveguide

FJ6001



FJ6009

