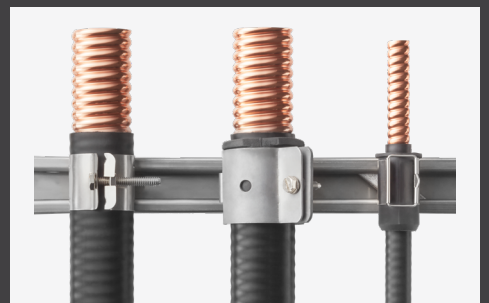




RADIO FREQUENCY SYSTEMS

WAVEGUIDES & ACCESSORIES SELECTION GUIDE

Edition 4 / 08.2024



RADIO FREQUENCY SYSTEMS

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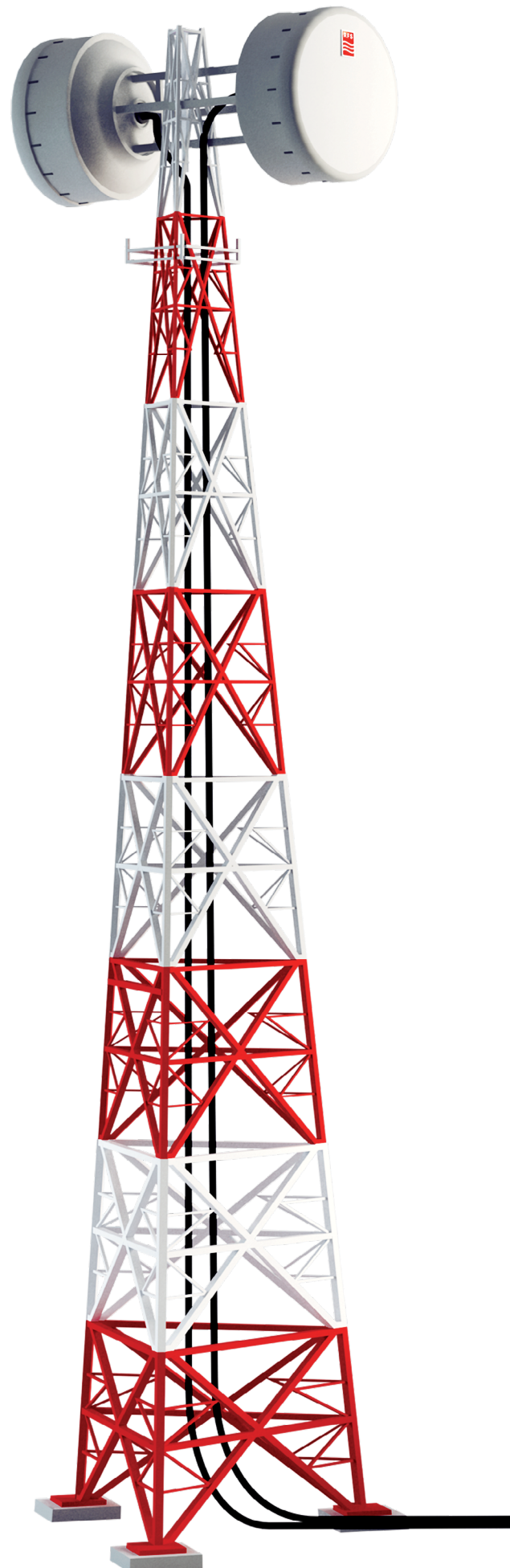
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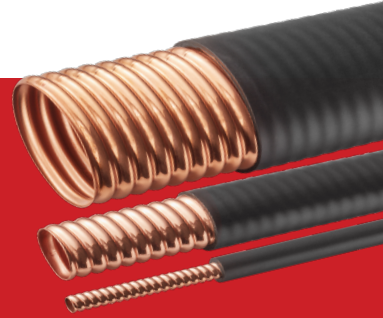
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RFS OFFERS A COMPLETE PORTFOLIO OF THE HIGHEST QUALITY & MOST RELIABLE WAVEGUIDES

RFS provides trusted and reliable solutions for all long haul, mobile, satellite and radar application needs through its broad portfolio of high quality FLEXWELL® Elliptical Waveguides, Connectors, Components, Tools and Pressurization Products.



RFS is the originator and designer of continuous seam welded corrugated transmission lines. FLEXWELL® products have been used in thousands of successful installations worldwide. They are the highest quality, best performing, and most reliable elliptical waveguides in the industry.

For more than 40 years, FLEXWELL elliptical waveguides have successfully supplemented traditional rigid rectangular and circular waveguide configurations for the transmission of RF energy at microwave frequencies. Available in a wide variety of premium and standard models, FLEXWELL is constructed of longitudinally continuous seam welded, highly conductive copper tube, corrugated and precision formed into an elliptical cross section. It is manufactured in continuous lengths using a special seam welding process developed exclusively by RFS. With FLEXWELL, RFS customers benefit from:

- Portfolio of elliptical waveguides that cover the entire range of microwave frequencies
- Unique corrugation design for maximum strength and flexibility
- Excellent electrical performance
- Low attenuation and good return loss (VSWR as low as 1.06); highest average power
- 24 hour pressure test performed on every waveguide
- Reduced installation cost compared to rigid rectangular waveguides due to flexibility
- Easy transportation in coils or on drums
- Training and superior technical support

Additional, RFS offers a full range of options, connectors, pressurization equipment and accessories to support your end-to-end radio link network.

RFS connectors based on the IEC Standard are all fixed tuned. Together with the dedicated flanging tools and premium waveguides, these connectors meet the highest VSWR / return loss requirements over the complete frequency range without tuning.

RFS offers the widest portfolio of standard and premium elliptical waveguides

Frequency GHz		5		6				7/8			10/11				13	15			18		23		28/30		38		
		4.4	5.0	5.6	5.9	6.425	7.1	7.125	7.75	8.5	9.0	10.0	10.7	11.7	13.25	13.4	15.35	17.3	19.7	21.2	23.6	27.5	33.4	37.5	39.5		
Elliptical Waveguide Models	Standard	ES46		E65											E130		E150		E185		E220		E300		E380		
				E60				E78																			
	Premium	ESP46		EP65										EP100		EP130		EP150		EP185							
				EP60				EP78																			

FLEXWELL

ELLIPTICAL WAVEGUIDE

ES46 Series: 4.4-5.0 GHz



ORDERING INFORMATION | IEC: R48 | EIA: WR187

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
3.90-5.00	ES46J	ESP46J

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	68 x 41	2.7 x 1.6
Weight	kg/m, lb/ft	1.6	1.08
Min. Bending Radii, without rebending E-Plane	mm, in	150	6
Min. Bending Radii, without rebending H-Plane	mm, in	500	20
Min. Bending Radii, with rebending E-Plane	mm, in	150	6
Min. Bending Radii, with rebending H-Plane	mm, in	600	24
Jacket Type	J JFN	PE, Black	PE, Flame Retardant, Black
Max. Twist	degree, m, ft	2	0.6
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	1.2	4

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		ES46J	ESP46J
Operating Frequency Band	GHz	4.4-5.0	
Low Band Attenuation	dB/100m, dB/100ft	3.7, 1.13	
Mid Band Attenuation	dB/100m, dB/100ft	6.6, 1.1	
High Band Attenuation	dB/100m, dB/100ft	3.5, 1.07	
Max. VSWR / Return Loss	- / dB	1.15 / 23.1	1.073 / 29.1

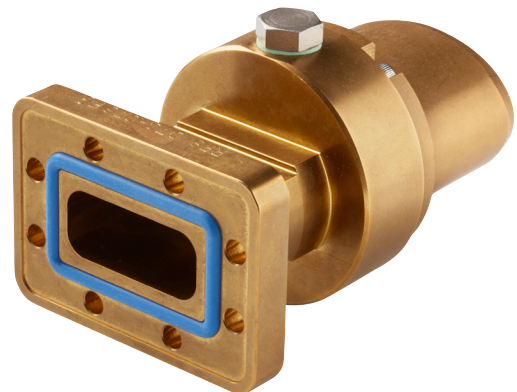
ACCESSORIES

IEC Accessories

Model Number	Description
D48-S46FP	Connector 154 IEC-PDR 48 (4.4-5.0 GHz)
PW048-V-1	Pressure window, light type, UDR 48, copper
SHIM048-D-1	SHIM R 48 for PDR 48
FDIE-US46	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide
P2000-001	Tube of Plast 2000 20ccm
HOIST1-214L	Hoisting grip, open, ES46

Accessories

Model Number	Description
BOOT4-046	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-S46P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-046	Clamp, bolt -on, stainless steel
ANGLE-ADP-SM8-10	Angle Adapter M8 light



Fixed tuned connector with PDR flange according IEC specification for FLEXWELL waveguide

FLEXWELL

ELLIPTICAL WAVEGUIDE

E60 Series: 5.6-6.425 GHz

ORDERING INFORMATION | IEC: R70 | EIA: WR137

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
4.50-6.425	E60J	EP60J

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	55 x 33	2.2 x 1.3
Weight	kg/m, lb/ft	1.1	0.74
Min. Bending Radii, without rebending E-Plane	mm, in	200	8
Min. Bending Radii, without rebending H-Plane	mm, in	550	22
Min. Bending Radii, with rebending E-Plane	mm, in	300	12
Min. Bending Radii, with rebending H-Plane	mm, in	800	31
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	4	1.2
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.9	3

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP60J	E60J
Operating Frequency Band	GHz	5.6-6.425	
Low Band Attenuation	dB/100m, dB/100ft	4.15, 1.26	
Mid Band Attenuation	dB/100m, dB/100ft	3.95, 1.2	
High Band Attenuation	dB/100m, dB/100ft	3.8, 1.16	
Max. VSWR / Return Loss	- / dB	1.062 / 30.5	1.15 / 23.1

ACCESSORIES

IEC Accessories

Model Number	Description
D70-060FP-W	Connector 154 IEC-PDR 70 (5.6-6.425 GHz)
PW070-V-1	Pressure window, light type, UDR 70, brass
SHIM070-D-1	Shim for PDR 70, copper beryllium
FDIE-U060	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide
P2000-001	Tube of Plast 2000 20ccm
HOIST1-158L	Hoisting grip, open, E58, E60, E65

Accessories

Model Number	Description
BOOT4-060	Wall/Roof Feed-Trough for Plate FTP4-xx
GKIT-24-060P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-060	Clamp, bolt -on
CLAMP-R-060	Universal clamp with clamp lining
ANGLE-ADP-SM8-10	Angle Adapter M8 light



Universal clamp with rubber clamp lining

FLEXWELL

ELLIPTICAL WAVEGUIDE

E65 Series: 5.9-7.125 GHz



ORDERING INFORMATION | IEC: R70 | EIA: WR137

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
5.00-7.125	E65J / E65JFN *	EP65J / EP65JFN *

* Flame and fire retardant jacket optional with MOQ (1500 m) available

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	51 x 30	2.0 x 1.2
Weight	kg/m, lb/ft	0.75	0.5
Min. Bending Radii, without rebending E-Plane	mm, in	200	8
Min. Bending Radii, without rebending H-Plane	mm, in	500	20
Min. Bending Radii, with rebending E-Plane	mm, in	300	12
Min. Bending Radii, with rebending H-Plane	mm, in	600	24
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	5	1.5
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.9	3

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP65J	E65J
Operating Frequency Band	GHz	5.9-7.125	
Low Band Attenuation	dB/100m, dB/100ft	4.9, 1.49	
Mid Band Attenuation	dB/100m, dB/100ft	4.5, 1.37	
High Band Attenuation	dB/100m, dB/100ft	4.25, 1.3	
Max. VSWR / Return Loss	- / dB	1.062 / 30.5	1.15 / 23.1

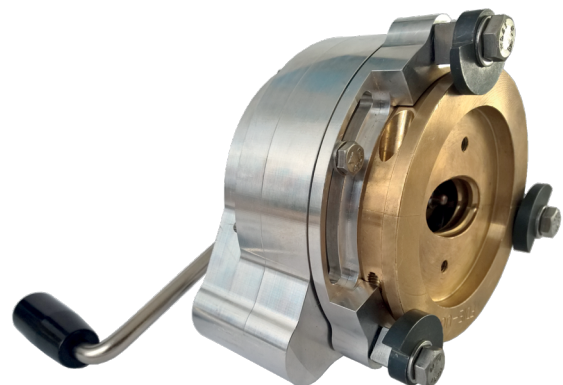
ACCESSORIES

IEC Accessories

Model Number	Description
D70-065FG	Connector 154 IEC-PDR 70 (5.9-7.15 GHz)
PW070-V-1	Pressure window, light, type, UDR 70, brass
SHIM070-D-1	SHIM R 70 for PDR 70, copper beryllium
FDIE-U065	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide

Accessories

Model Number	Description
BOOT4-065	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-065P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-114	Clamp, bolt -on, stainless steel
CLAMP-R-065	Universal clamp with clamp lining, galvanized steel
ANGLE-ADP-SM8-10	Angle Adapter M8 light



Basic Flanging Tool with Flanging Die

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ELLIPTICAL WAVEGUIDE

E78 Series: 7.1-8.5 GHz

ORDERING INFORMATION | IEC: R70, R84 | EIA: WR137, WR112



Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
5.90-8.50	E78J	EP78J / EP78JFN *

* Flame and fire retardant jacket optional with MOQ (1500 m) available

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	44 x 26	1.7 x 1.0
Weight	kg/m, lb/ft	0.6	0.4
Min. Bending Radii, without rebending E-Plane	mm, in	200	8
Min. Bending Radii, without rebending H-Plane	mm, in	500	20
Min. Bending Radii, with rebending E-Plane	mm, in	250	10
Min. Bending Radii, with rebending H-Plane	mm, in	600	24
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	5	1.5
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.9	3

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP78J	E78J
Operating Frequency Band	GHz	7.1-8.5	
Low Band Attenuation	dB/100m, dB/100ft	6.2, 1.89	
Mid Band Attenuation	dB/100m, dB/100ft	5.8, 1.77	
High Band Attenuation	dB/100m, dB/100ft	5.6, 1.71	
Max. VSWR / Return Loss	- / dB	1.062 / 30.5	1.15 / 23.1

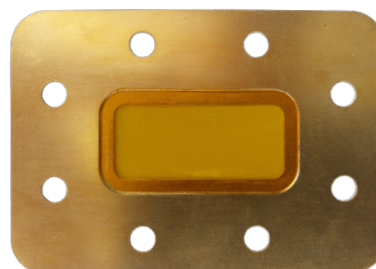
ACCESSORIES

IEC Accessories

Model Number	Description
D70-078FG	Connector 154 IEC-PDR 70 (7.1 - 8.5 GHz)
D84-078FG	Connector 154 IEC-PDR 84 (7.1 - 8.5 GHz)
B84-078FG	Connector 154 IEC-PBR 84 (7.1-8.5 GHz)
PW070-V-1	Pressure window, light type, UDR 70, brass
PW070-DV-1	Pressure window, heavy type, PDR/UDR 70, brass
PW084-V-1	Pressure window, light type, UDR 84, brass
PW084-W-1	Pressure window, light type, UBR 84, brass
PW084-DV-1	Pressure window, heavy type, PDR/UDR 84, brass
PW084-BW-1	Pressure window, heavy type, PBR/UBR 84, brass
SHIM070-D-1	Shim for PDR 70, copper beryllium
SHIM084-D-1	Shim for PDR 84, copper beryllium
FDIE-U078	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide
HOIST1-114L	Hoisting grip, open, E70, E78

Accessories

Model Number	Description
BOOT4-078	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-078P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-078	Clamp, bolt-on
CLAMP-R-078-E	Universal clamp with clamp lining
ANGLE-ADP-SM8-10	Angle Adapter M8 light



Pressure window, light type with UDR flange

FLEXWELL

ELLIPTICAL WAVEGUIDE

E100 Series: 8.5-10.00

ORDERING INFORMATION | IEC: R100 | EIA: WR90

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
8.00-10.00	N/A	EP100J / EP100JFN *

* Flame and fire retardant jacket optional with MOQ (1500 m) available

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	34 x 23	1.3 x 0.9
Weight	kg/m, lb/ft	0.5	0.34
Min. Bending Radii, without rebending E-Plane	mm, in	150	6
Min. Bending Radii, without rebending H-Plane	mm, in	350	14
Min. Bending Radii, with rebending E-Plane	mm, in	200	8
Min. Bending Radii, with rebending H-Plane	mm, in	400	16
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	6	1.8
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.6	2

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS		
EP100J		
Operating Frequency Band	GHz	8.5-10.0
Low Band Attenuation	dB/100m, dB/100ft	10.4, 3.17
Mid Band Attenuation	dB/100m, dB/100ft	9.5, 2.90
High Band Attenuation	dB/100m, dB/100ft	8.4, 2.56
Max. VSWR / Return Loss	- / dB	1.105 / 26

ACCESSORIES

IEC Accessories

Model Number	Description
B100-100FP-U	Connector 154 IEC-PBR 100 (9-10 GHz)
PW100-W-1	Pressure window, light type, UBR 100, brass
SHIM100-B-1	Shim for PBR 100, copper beryllium
FDIE-U100	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide
P2000-001	Tube of Plast 2000 20ccm
HOIST1-78L	Hoisting grip, open, E100, E105

Standard Accessories

Model Number	Description
BBOOT4-105	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-100/105P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-100/105	Clamp, bolt-on
ANGLE-ADP-SM8-10	Angle Adapter M8 light
RSB-100	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



RSB-clip with rubber clamp lining

FLEXWELL

ELLIPTICAL WAVEGUIDE

E130 Series: 10.7-13.25 GHz

ORDERING INFORMATION | IEC: R120 | EIA: WR75

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
9.30-13.25	E130J	EP130J

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	29 x 18	1.1 x 0.7
Weight	kg/m, lb/ft	0.4	0.27
Min. Bending Radii, without rebending E-Plane	mm, in	130	5
Min. Bending Radii, without rebending H-Plane	mm, in	280	11
Min. Bending Radii, with rebending E-Plane	mm, in	150	6
Min. Bending Radii, with rebending H-Plane	mm, in	300	12
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	6	1.8
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.6	2

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP130J	E130J
Operating Frequency Band	GHz	10.7-13.25	
Low Band Attenuation	dB/100m, dB/100ft	12.7, 3.87	
Mid Band Attenuation	dB/100m, dB/100ft	11.5, 3.51	
High Band Attenuation	dB/100m, dB/100ft	11.2, 3.41	
Max. VSWR / Return Loss	- / dB	1.083 / 28	1.15 / 23.1

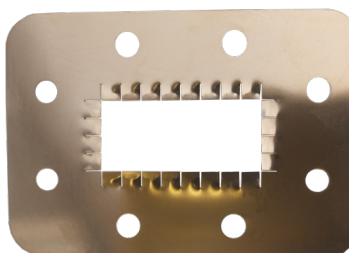
ACCESSORIES

IEC Accessories

Model Number	Description
D120-130FG-L	Connector 154 IEC-PDR 120 (10.7-12.75 GHz)
D120-130FG-U	Connector 154 IEC-PDR 120 (12.2-13.25 GHz)
B120-130FG-U	Connector 154 IEC-PBR 120 (12.2-13.25 GHz)
PW120-V-1	Pressure window, light type, UDR 120, brass
PW120-W-1	Pressure window, light type, UBR 120, brass
SHIM120-D-1	Shim for PDR 120, copper beryllium
SHIM120-B-1	Shim for PBR 120, copper beryllium
FDIE-C130	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
FDIE-U130	Flanging die for basic tool FTOOL-U038130
FTOOL-U038130	Basic Flanging Tool for E38 to E130 waveguide
HOIST1-58L	Hoisting grip, open, E130, E150

Standard Accessories

Model Number	Description
BOOT4-130	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-130P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-130/150	Clamp, bolt-on
ANGLE-ADP-SM8-10	Angle Adapter M8 light
RSB-130	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Shim for save connection of two PDR flanges

FLEXWELL

ELLIPTICAL WAVEGUIDE

E150 Series: 13.4-15.35



ORDERING INFORMATION | IEC: R120, R140 | EIA: WR75, WR62

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
10.80-15.35	E150J	EP150J

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	26 x 16	1.0 x 0.6
Weight	kg/m, lb/ft	0.4	0.27
Min. Bending Radii, without rebending E-Plane	mm, in	130	5
Min. Bending Radii, without rebending H-Plane	mm, in	280	11
Min. Bending Radii, with rebending E-Plane	mm, in	150	6
Min. Bending Radii, with rebending H-Plane	mm, in	300	12
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	7	2.1
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.6	2

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP150J	E150J
Operating Frequency Band	GHz	13.4-15.35	
Low Band Attenuation	dB/100m, dB/100ft	14.6, 4.45	
Mid Band Attenuation	dB/100m, dB/100ft	14.2, 4.33	
High Band Attenuation	dB/100m, dB/100ft	13.7, 4.18	
Max. VSWR / Return Loss	- / dB	1.083 / 28	1.15 / 23.1

ACCESSORIES

IEC Accessories

Model Number	Description
D120-150FP	Connector 154 IEC-PDR 120 (13.4-14.5 GHz)
B120-150FP	Connector 154 IEC-PBR 120 (14.0-14.5 GHz)
D140-150FP	Connector 154 IEC-PDR 140 (14.0-15.35 GHz)
B140-150FP	Connector 154 IEC-PBR 140 (14.0-15.35 GHz)
PW120-V-1	Pressure window, light type, UDR 120, copper
PW120-W-1	Pressure window, light type, UBR 120, copper
PW120-DV-1	Pressure window, heavy type, PDR/UDR 120, brass
PW120-BW-1	Pressure window, heavy type, PBR/UBR 120, brass
PW140-V-1	Pressure window, light type, UDR 140, copper
PW140-W-1	Pressure window, light type, UBR 140, copper
PW140-BW-1	Pressure window, heavy type, PBR/UBR 140, brass
SHIM120-D-1	Shim for PDR 120, copper beryllium
SHIM120-B-1	Shim for PBR 120, copper beryllium
SHIM140-D-1	Shim for PDR 140, copper beryllium
SHIM140-B-1	Shim for PBR 140, copper beryllium
FDIE-C150	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
P2000-001	Tube of Plast 2000 20ccm
HOIST1-58L	Hoisting grip, open, E130, E150

Accessories

Model Number	Description
BOOT4-150	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-150P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
CLAMP-130/150	Clamp, bolt -on, stainless steel
ANGLE-ADP-SM8-10	Angle Adapter M8 light
RSB-150	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Sealing compound for waveguide connectors

FLEXWELL

ELLIPTICAL WAVEGUIDE

E185 Series: 17.3-19.7 GHz

ORDERING INFORMATION | IEC: R180, R220 | EIA: WR51, WR42

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
13.70-19.70	E185J	EP185J

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	21 x 13	0.8 x 0.5
Weight	kg/m, lb/ft	0.3	0.2
Min. Bending Radii, without rebending E-Plane	mm, in	130	5
Min. Bending Radii, without rebending H-Plane	mm, in	280	11
Min. Bending Radii, with rebending E-Plane	mm, in	130	5
Min. Bending Radii, with rebending H-Plane	mm, in	300	12
Jacket Type	J	PE, Black	
Max. Twist	degree, m, ft	8	2.4
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.6	2

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS			
		EP185J	E185J
Operating Frequency Band	GHz	17.3-19.7	
Low Band Attenuation	dB/100m, dB/100ft	20.3, 6.19	
Mid Band Attenuation	dB/100m, dB/100ft	19.5, 5.94	
High Band Attenuation	dB/100m, dB/100ft	18.9, 5.76	
Max. VSWR / Return Loss	- / dB	1.083 / 28	1.15 / 23.1

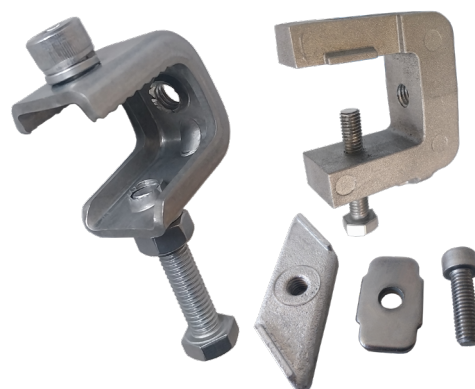
ACCESSORIES

IEC Accessories

Model Number	Description
D180-185FP	Connector 154 IEC-PDR 180 (17.3-19.7 GHz)
B220-185FP	Connector 154 IEC-PBR 220 (17.7-19.7 GHz)
PW220-W-1	Pressure window, light type, UBR 220, copper
PW220-BW-1	Pressure window, heavy type, PBR/UBR 220, brass
SHIM180-D-1	Shim for PDR 180, copper beryllium
SHIM220-B-1	Shim for PBR 220, copper beryllium
FDIE-C185	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
P2000-001	Tube of Plast 2000 20ccm

Accessories

Model Number	Description
BOOT4-185	Wall-/Roof Feed-Through for Plate FTP4-xx
GKIT-24-185P	Grounding kit, Grounding wire 7AWG (16 mm ²) 24"
RSB-185	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Angle adapter, RSB cleat and RSB hardware for anchor bar

FLEXWELL

ELLIPTICAL WAVEGUIDE

E220 Series: 21.2-23.6 GHz

ORDERING INFORMATION | IEC: R220 | EIA: WR42

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
16.70-23.60	E220J	N/A

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	18 x 12	0.7 x 0.5
Weight	kg/m, lb/ft	0.3	0.2
Min. Bending Radii, without rebending E-Plane	mm, in	110	4
Min. Bending Radii, without rebending H-Plane	mm, in	230	9
Min. Bending Radii, with rebending E-Plane	mm, in	130	5
Min. Bending Radii, with rebending H-Plane	mm, in	250	10
Jacket Type	J JFN	PE, Black PE, Flame Retardant, Black	
Max. Twist	degree, m, ft	8	2.4
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	100	305
Standard Hanger Spacing	m, ft	0.6	2

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS		
		E220J
Operating Frequency Band	GHz	21.2-23.6
Low Band Attenuation	dB/100m, dB/100ft	28.8, 8.78
Mid Band Attenuation	dB/100m, dB/100ft	28.3, 8.63
High Band Attenuation	dB/100m, dB/100ft	28.1, 8.56
Max. VSWR / Return Loss	- / dB	1.15 / 23.1

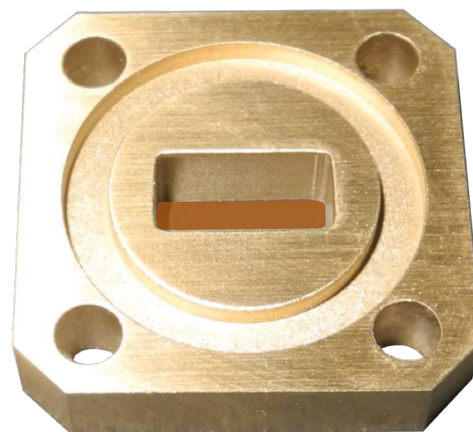
ACCESSORIES

IEC Accessories

Model Number	Description
B220-220FP	Connector 154 IEC-PBR 220 (21.2-23.6 GHz)
PW220-W-1	Pressure window, light type, UBR 220, copper
PW220-BW-1	Pressure window, heavy type, PBR/UBR 220, brass
SHIM220-B-1	Shim for PBR 220, copper beryllium
FDIE-C220	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
P2000-001	Tube of Plast 2000 20ccm
HOIST1-12L	Hoisting grip, open, E220, E250, E300, EO38, E380

Accessories

Model Number	Description
GKIT-ST-220	Grounding kit, Grounding wire (16 mm ²) 10"
RSB-220	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Pressure window, heavy type

FLEXWELL

ELLIPTICAL WAVEGUIDE

E300 Series: 27.5-33.4 GHz

ORDERING INFORMATION | IEC: R260, R320 | EIA: WR34, WR28

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
24.00-33.40	E300J	N/A

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	14 x 10	0.55 x 0.4
Weight	kg/m, lb/ft	0.15	0.1
Min. Bending Radii, without rebending E-Plane	mm, in	90	4
Min. Bending Radii, without rebending H-Plane	mm, in	150	6
Min. Bending Radii, with rebending E-Plane	mm, in	100	4
Min. Bending Radii, with rebending H-Plane	mm, in	180	7
Jacket Type	J	PE, Black	
Max. Twist	degree, m, ft	8	2.4
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	50	164
Standard Hanger Spacing	m, ft	0.5	1.6

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS		
E300J		
Operating Frequency Band	GHz	27.5-33.4
Low Band Attenuation	dB/100m, dB/100ft	50, 15.24
Mid Band Attenuation	dB/100m, dB/100ft	46, 14.02
High Band Attenuation	dB/100m, dB/100ft	44.4, 13.53
Max. VSWR / Return Loss	- / dB	1.15 / 23.1

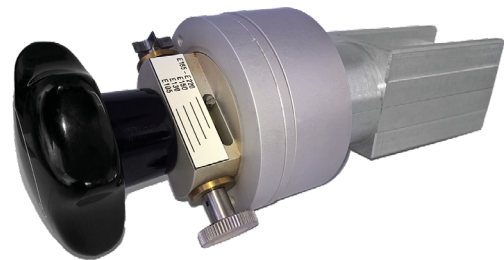
ACCESSORIES

IEC Accessories

Model Number	Description
B320-300FP	Connector 154 IEC-PBR 320, gasket sealing
B260-300FP	Connector 154 IEC-PBR 260, gasket sealing
PW260-W-1	Pressure window, light type, UBR 260, copper
PW260-BW-1	Pressure window, heavy type, PBR/UBR 260, brass
PW320-W-1	Pressure window, light type, UBR 320, copper
PW320-BW-1	Pressure window, heavy type, PBR/UBR 320, brass
SHIM260-B-1	Shim for PBR 260, copper beryllium
SHIM320-B-1	Shim for PBR 320, copper beryllium
FDIE-C300	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
HOIST1-12L	Hoisting grip, open, E220, E250, E300, EO38, E380

Accessories

Model Number	Description
GKIT-24-300P	Grounding kit, Grounding wire 7AWG (16 mm ²) 24"
RSB-300/380	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Compact Flanging Tool with Flanging Die

FLEXWELL

ELLIPTICAL WAVEGUIDE

E380 Series: 37.0-39.5 GHz

ORDERING INFORMATION | IEC: R320 | EIA: WR28

Maximum Frequency Band, GHz	Standard Waveguide Model Number	Premium Waveguide Model Number
29.0-39.5	E380J	N/A

PRODUCT SPECIFICATIONS

GENERAL SPECIFICATIONS			
Dimensions over Jacket	mm, in	12 x 9	0.5 x 0.3
Weight	kg/m, lb/ft	0.1	0.07
Min. Bending Radii, without rebending E-Plane	mm, in	80	3
Min. Bending Radii, without rebending H-Plane	mm, in	140	6
Min. Bending Radii, with rebending E-Plane	mm, in	90	4
Min. Bending Radii, with rebending H-Plane	mm, in	150	6
Jacket Type	J	PE, Black	
Max. Twist	degree, m, ft	8	2.4
Max. Operating Pressure	bar, psi	0.5	7
Max. Pulling Length per Hoisting Grip	m, ft	50	164
Standard Hanger Spacing	m, ft	0.3	1

TEMPERATURE SPECIFICATIONS			
Installation	°C, °F	-40 to 60	-40 to 140
Storage	°C, °F	-70 to 85	-94 to 185
Operation	°C, °F	-50 to 85	-58 to 185

ELECTRICAL SPECIFICATIONS		
E380J		
Operating Frequency Band	GHz	37.0-39.5
Low Band Attenuation	dB/100m, dB/100ft	61.9, 18.87
Mid Band Attenuation	dB/100m, dB/100ft	60.7, 18.5
High Band Attenuation	dB/100m, dB/100ft	60, 18.29
Max. VSWR / Return Loss	- / dB	1.15 / 23.1

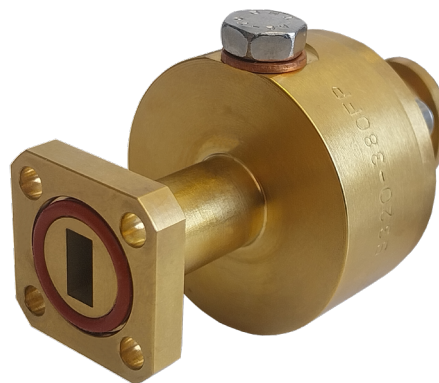
ACCESSORIES

IEC Accessories

Model Number	Description
B320-380FP	Connector 154 IEC-PBR 320, gasket sealing
PW320-W-1	Pressure window, light type, UBR 320, copper
PW320-BW-1	Pressure window, heavy type, PBR/UBR 320, brass
SHIM320-B-1	Shim for PBR 320, copper beryllium
FDIE-C380	Flanging die for compact tool
FTOOL-C105380	Compact Flanging Tool for E105 to E380 waveguide
HOIST1-12L	Hoisting grip, open, E220, E250, E300, EO38, E380

Accessories

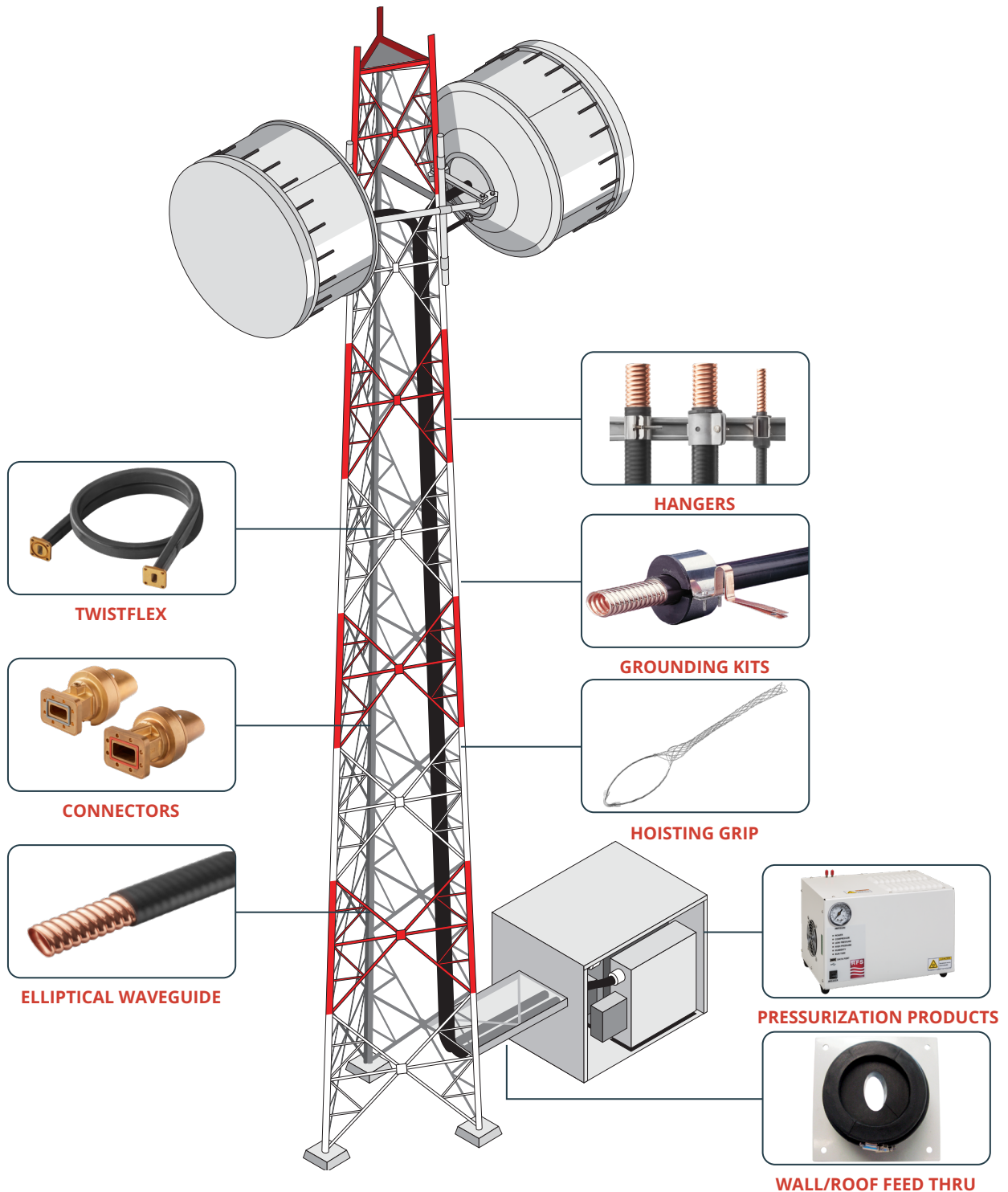
Model Number	Description
GKIT-24-380P	Grounding kit, Grounding wire 7AWG (16 mm²) 24"
RSB-300/380	RSB-Clip with clamp lining
RSB-310	RSB-Cleat for RSB-Clip
RSB-315	RSB Hardware for Anchor Bar



Field installable connector with PBR flange for elliptical FLEXWELL waveguide E380J

RFS END-TO-END MICROWAVE SITE SOLUTIONS

RFS offers a full range of waveguides, connectors, twistflex, pressurization equipment and accessories to support your end-to-end radio link network.



TWISTFLEX SELECTION GUIDE



RFS twistflex is fabricated from spiral wound silver plated bronze strip. It has a up to 206 kPa pressure tight protective jacket. The recommended operational pressure is 40 kPa. Allowable twist is 110°/m for R40 and 360°/m for R320 size. Twistflex includes gaskets and hardware for both flanges. Standard length are 60 cm, 90 cm and 120 cm.

IEC Twistflex

Frequency, GHz	Twistflex	R	Flange 1	Flange 2	Plating	Jacket	60	90	120
3.3 - 4.9	TF	040-	D	V	1-	S-	060M	090M	120M
3.95 - 5.85		048-	D	V			060M	090M	120M
5.85 - 8.2		070-	D	V			060M	090M	120M
				D			-	090M	120M
7.05 - 10.0		084-	D	V			060M	090M	120M
				D			-	090M	120M
			B	W			060M	090M	120M
				B			060M	090M	120M
8.2 - 12.4		100-	D	V			060M	090M	120M
				D			060M	090M	120M
			B	W			060M	090M	120M
				B			060M	090M	120M
10.0-15.0		120-	D	V			060M	090M	120M
				W			060M	090M	120M
			B	B			060M	090M	120M
				B			060M	090M	120M
12.4-18.0		140-	D	V			060M	090M	120M
				W			060M	090M	120M
			B	B			060M	090M	120M
				B			060M	090M	120M
18.0 - 26.5		220-	B	W			060M	090M	120M
				B			060M	090M	120M
22.0 - 33.0		260-	B	W			060M	090M	120M
				B			060M	090M	120M
26.5 - 40.0		320-	B	W			060M	090M	120M
				B			060M	090M	120M

All RFS twistflex models follow a naming structure
that indicates the following information:

Product Type	Cable Size	Flange 1	Flange 2	Plating Material	Jacket Material	Product Length
TF	070	D	V	1	S	060M
TF PRODUCT TYPE TF Twist & Flexible	070 CABLE SIZE R – according to IEC spec 040 3.3 - 4.9 GHz 048 3.95 - 5.85 GHz 070 5.85 - 8.2 GHz 084 7.05 - 10.0 GHz 100 8.2 - 12.4 GHz 120 10.0-15.0 GHz 140 12.4-18.0 GHz 220 18.0 - 26.5 GHz 260 22.0 - 33.0 GHz 320 26.5 - 40.0 GHz	D V FLANGE 1 & 2 D PDR B PBR V UDR W UBR		1 PLATING MATERIAL 1 Brass coated 3 Tin plated* * only on request	S JACKET MATERIAL S Silicone rubber	060M PRODUCT LENGTH 060M 60 cm 090M 90 cm 120M 120 cm



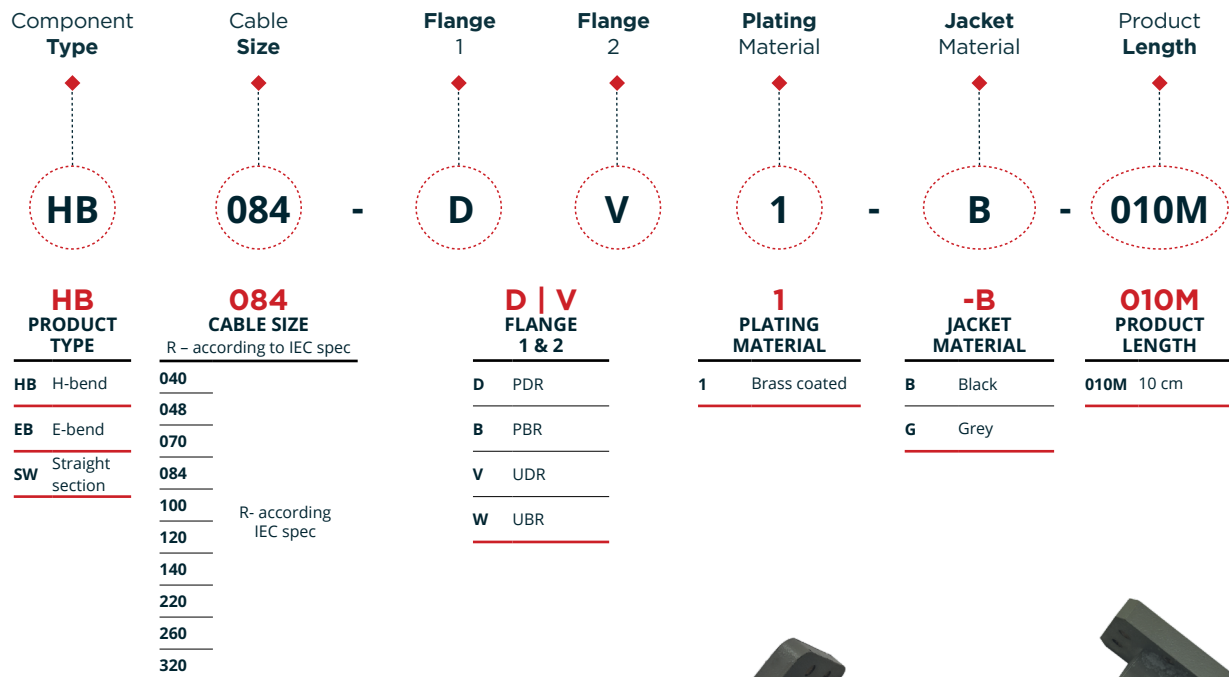
RECTANGULAR COMPONENTS SELECTION GUIDE

During site renovation, it is not uncommon to come across a mixture of different connector types or sizes between the antenna and the transmitter. For these cases RFS offers a large variety of rectangular waveguide components like straight sections, E and H-Bends.

IEC Components

Component Type	R	Flange 1	Flange 2	Plating	Color	Length, cm	Product Description
HB	040-120	-D	V	-1	-B		90 degree H-Bend
	084-320	-B	W				
EB	040-120	-D	V				90 degree E-Bend
	084-320	-B	W				
SW	040-084	-D	V			-010M	Straight Waveguide section
	084-320	-B	W				

All RFS rectangular component models follow a naming structure that indicates the following information:



Solid rectangular component:
90° H-bend

DEHYDRATION SYSTEMS

LARGE, MEDIUM AND SMALL CAPACITY

Prevent moisture, condensation and degradation in performance

The RFS digital dehydrator allows for increased system flexibility to suit individual customer requirements – easily configure options in the field as needed!

RFS recommend operating all waveguides in an air-tight environment to keep the excellent performance of RFS Flexwell waveguides over decades of lifetime.

It is the only way to avoid corrosion inside the waveguide which increases attenuation and reflection over the time and reduces the error free signal transmission.

RFS offers aligned solutions to their customers with a variety of dehydrators for large, medium and small installations. This helps our customers operating their microwave sites under most cost efficient conditions meeting all challenges of the different local circumstances.

All dehydrators have multi-port gas outlets allowing service of 4 or 6 waveguide runs with one dehydrator on the site.

With GOBI77A and GIBSONXF4 RFS provides dehydrators for sites with 230 V AC power supply. The operational pressure of GOBI77A can be adjusted on site and the status of the dehydrator is accessible via the included ethernet interface.

GIBSONXF4 has factory predefined output pressure and is equipped with a flow meter which allows detecting easily any leakage in the sealed waveguide system.

For applications where only DC power is available, RFS offers medium and small capacity dehydrators operating with voltage between 48 and 60 VDC.

These fully automatic dehydrators are factory pre-configured and include low/high pressure, high humidity and system and power alarms. An optional module for remote monitoring over Ethernet is available. The LAB4 dehydrator has 4 pressure ports and the MINILAB is delivered with 6 pressure ports that can be individually opened and closed.



GIBSONXF4 DEHYDRATOR



LAB4DC-B DEHYDRATOR

Style	Model Number	Air Flow		Power Supply	Output Pressure	
		NI/h	SCFM	V	kPa	psig
Large Capacity	GOBI77A	840	0,49	230 AC/50Hz	25-40	3.6-5.8
Medium Capacity	GIBSONXF4	290	0,17	230 AC/50Hz	11	1,6
	LAB4DC-B	300	0,18	48-60 DC	1-6	0.15-0.87
Small Capacity	MINILAB-DC	150	0,09	48-60 DC	2	0,3

PRESSURIZATION PRODUCTS COMPLETE END-TO-END SOLUTIONS

A vast array of products for installation, operation and maintenance



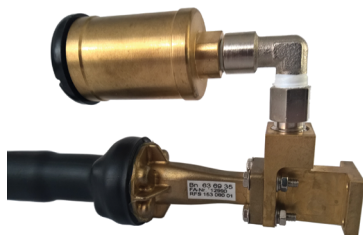
GIBSON77A DEHYDRATOR

For waveguide with small air volume (<2 liter) a humidity monitoring kit is deemed sufficient after filling the waveguide with dry air or nitrogen. For these applications RFS offers the cost-effective DC-Kits in several sizes. These kits can be used for 5 m of RFS E130 waveguide and up to 75m of RFS E380 waveguide. RFS offers all the necessary components to connect

the LAB4 and MINILAB dehydrators to the waveguide connectors. A flexible polyethylene hose is available in 50 m length with all necessary adapters and clamps for secure air connection. GOBI77A and GIBSONXF4 dehydrators include the basic components for installation in the default delivery.

DESICCANT CARTRIDGE KITS FOR MOISTURE MONITORING

Model Number	Description
DC-KIT-B	For E100 to E220
DC-KIT-260	For E300 with connectors with PBR260 flange
DC-KIT-320	For E300 and E380 with connectors with PBR320 flange
DC-001	Spare desiccant cartridge



UNDERSTANDING WAVEGUIDE MODEL NAMES

All RFS waveguide models follow a naming structure that indicates the following information:

Cable Type	Cable Size	Jacket Type
EP	78	J
EP CABLE TYPE	78 CABLE SIZE	J JACKET TYPE
E Standard version	46 4.4 - 5.0 GHz 150 13.4 - 15.35 GHz	J Standard PE jacket
ES Standard version, super flexible	60 5.6 - 6.425 GHz 185 17.3 - 19.7 GHz	JFN Flame retardant LSZH jacket
EP Premium version	65 5.9 - 7.125 GHz 220 21.2 - 23.6 GHz	
ESP Premium version, super flexible	78 7.1 - 8.5 GHz 300 27.5 - 33.4 GHz	
	100 8.5 - 10.0 GHz 380 37.0 - 39.5 GHz	
	130 10.7 - 13.25 GHz	

All RFS connectors for elliptical waveguide models follow a naming structure that indicates the following information:

Flange Type	Cable Size	Elliptical Waveguide	Sealing	Frequency Band
D	84	065	FG	W
D B FLANGE	84 CABLE SIZE R – according to IEC spec	065 ELLIPTICAL WAVEGUIDE	FG FP SEALING METHOD	W FREQUENCY BAND (optional)
D PDR	40	S46 ES46	FG Gasket	W Wide band
B PBR	48	060 E60	FP Plast 2000	U Upper band
	70	065 E65		L Lower band
	84	078 E78		
	100	100 E100		
	120 R- according IEC spec	130 E130		
	140	150 E150		
	180	185 E185		
	220	220 E220		
	260	300 E300		
	320	380 E380		

NOTES

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RADIO FREQUENCY SYSTEMS