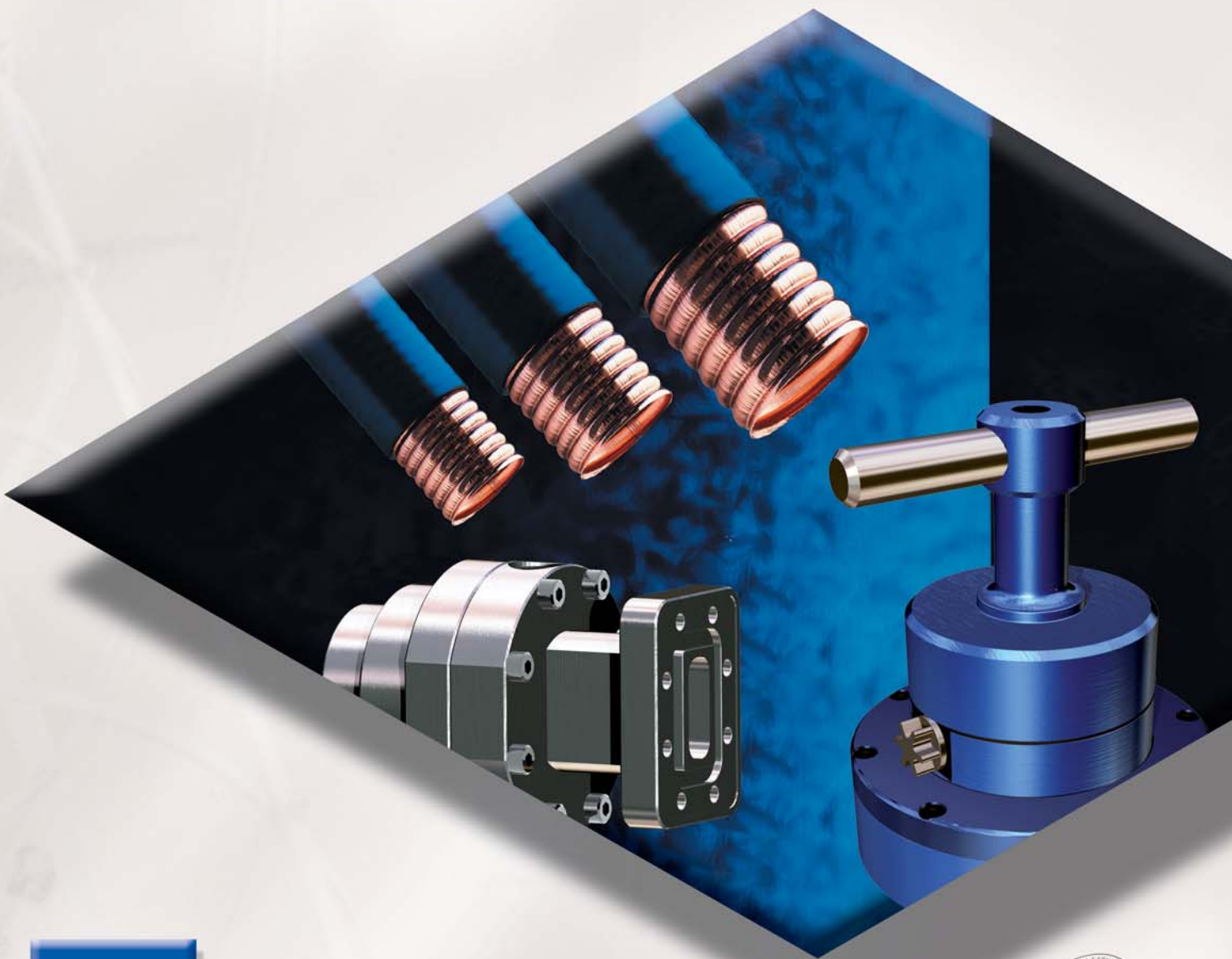


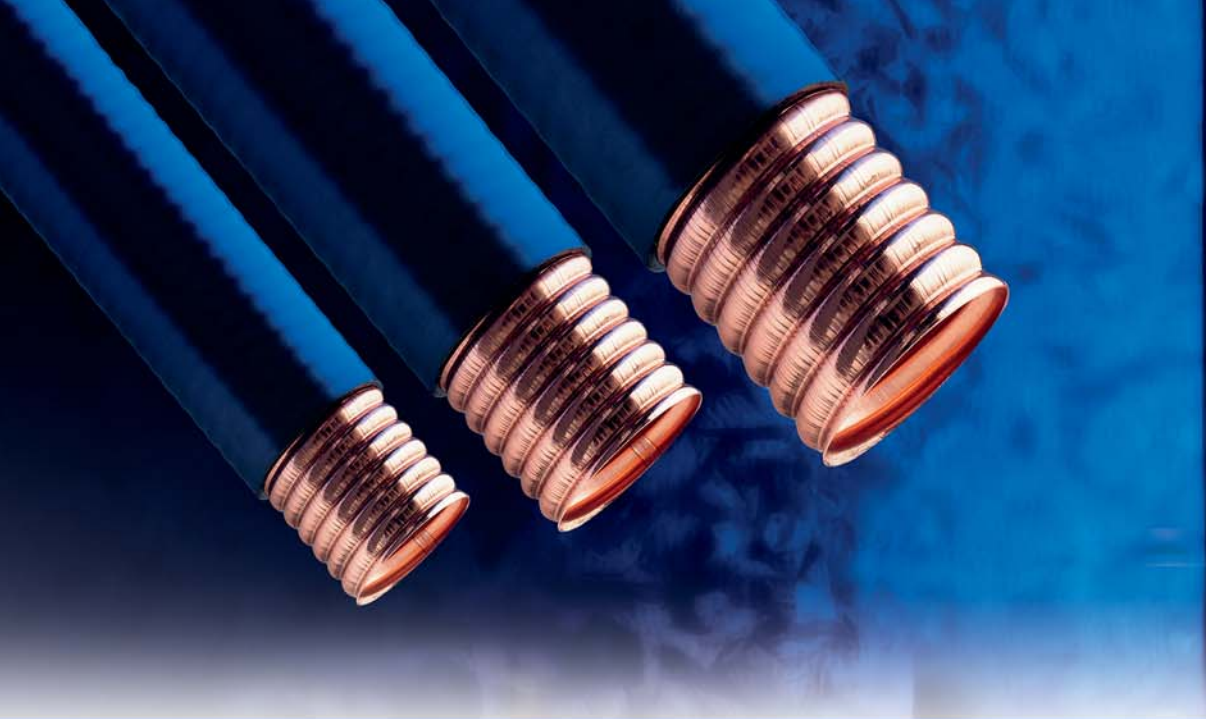
# WAVEGUIDE

Elliptical waveguide



KABELWERK EUPEN AG





# KABELWERK EUPEN AG THE SPECIALIST IN

The foundation of the cable factory KABELWERK EUPEN AG as manufacturer of electrical cables goes back to the beginning of this century. Today the company has a staff of 950 people producing power cables, telecommunication cables and RF-Cables.

Since broadband transmission became possible, KABELWERK EUPEN AG has been involved in the design and manufacture of coaxial cables.

The introduction of Cable Television in 1962 was decisive for the start of producing coaxial cables on a larger scale.

With the increasing demand for coaxial cables and the intensive R&D to improve cable construction and transmission characteristics, KABELWERK EUPEN AG has become **one of the world's leading manufacturer of coaxial cables.**

Over 40 years of experience in the field of RF-Cables, the company constantly developed its extensive manufacturing process bearing in mind the improvement of quality.

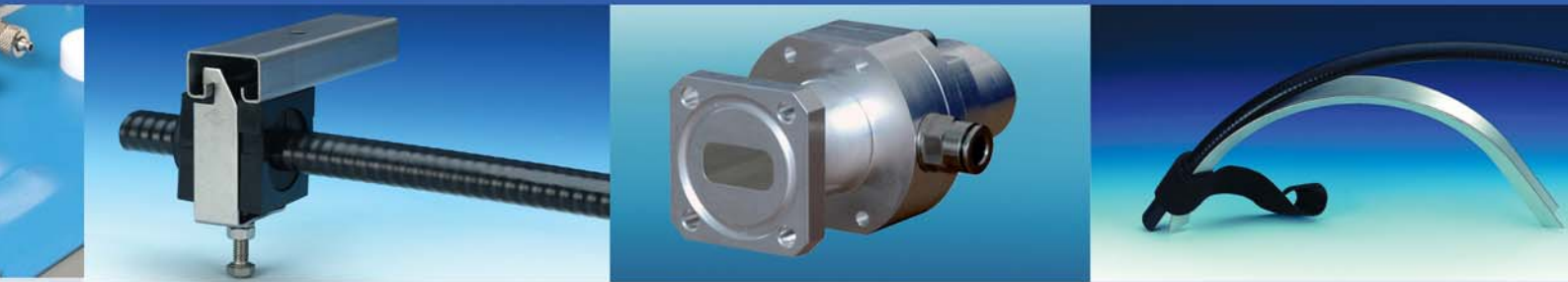
Since 1993 **the company is ISO 9001 certified for all its products.**



In 2005 a line of waveguides, including connectors and accessories, completed our RF product offering.

Today the cables and connectors from KABELWERK EUPEN AG form an unbeatable combination to guarantee superior performance and long service life.

# WAVEGUIDE



## INTRODUCTION

Introduction ..... 4

## WAVEGUIDE, CONNECTORS, TOOLS & GROUNDING CLAMPS

Overview ..... 8  
 Cable EU 63 ..... 10  
 Cable EU 77 ..... 12  
 Cable EU 90 ..... 14  
 Cable EU 127 ..... 16

## ACCESSORIES FOR CABLES

1. Bending tool ..... 17  
 2. Flaring tool ..... 18  
 3. Shim ..... 19  
 4. Pressure windows ..... 19  
 5. Twistflex ..... 20  
 6. Grounding kit ..... 21  
 7. Fixing clamps ..... 21  
 8. Hoisting grips ..... 22  
 9. Additional weatherproofing solutions ..... 23  
 10. Dehydrator ..... 24

## WAVEGUIDE PACKAGING INFORMATION

..... 26

Technical data, designs and specifications presented in this catalogue are not binding and are subject to change without prior notice.

**EUPEN CABLE MEXICO SA****EUPEN CABLE USA Inc.****EUPEN CABLES FRANCE****KABELWERK RHENANIA GmbH**

Avenida Manta 705  
Lindavista,  
07300 Mexico, D.F.  
MEXICO

5181 110th Avenue North  
Unit D,  
Clearwater, Florida-33760  
USA

Port de Bonneuil  
5, route de Stains  
94387 Bonneuil sur Marne  
FRANCE

Karl-Kuck-Str. 3  
52078 Aachen  
DEUTSCHLAND





## INTRODUCTION

EUPEN elliptical waveguides are the optimal choice for most microwave antenna feeder systems. EUPEN waveguides are precision-formed from corrugated high-conductivity copper and have an elliptical cross section. The corrugated wall gives the waveguide excellent crush strength and good flexibility for ease of handling. A rugged black polyethylene jacket provides protection during installation. The jacket is weatherproof and ultraviolet-stabilized to prevent deterioration. Standard jacketing material is suitable for operation down to  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) and installation down to  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ). A range of waveguide sizes is available for applications from 5.85 to 13.25 GHz.

### **PREMIUM PERFORMANCE**

**LOW LOSS** EUPEN elliptical waveguides are optimised for lowest loss in specific user bands. Attenuation is significantly lower than that of standard rectangular waveguides for these bands, resulting in highly efficient signal transfer which optimises overall system performance.

### **LOW SIGNAL DISTORTION**

The elliptical cross section has  $\text{HE}_{\text{C}11}$  as the principal mode, which is similar to the  $\text{TE}_{10}$  mode in rectangular waveguide, and propagates below the cut-off frequencies of higher-order modes. Operating in the frequency band where only the principal mode can exist eliminates signal distortion due to dispersion and minimizes VSWR.

**EXCELLENT & GUARANTEED VSWR PERFORMANCE** All EUPEN waveguides and factory assemblies are designed to meet our very low stated VSWR specifications. You get the performance you expect. No surprise, no risk.

**HIGHEST STRENGTH & FLEXIBILITY** Optimal crush and pulling strength as well as flexibility are given by the corrugated design of the waveguide. The low bending moment and bending radius provide good flexibility.

**MINIMUM INSTALLATION COST** EUPEN elliptical waveguide and accessories allow for simplified system planning and minimize the installation cost compared to other types of waveguide. Good flexibility of the corrugated copper construction provides easy installation and saves time and labour.

### **EUPEN Waveguides**

*The best choice for flexible transmission lines with superior electrical performance for modern microwave systems and other broadband wireless applications.*

# Premium

# elliptical waveguide

## Premium Waveguide type

Product reference

PE Jacket

**EU 63**

### Construction

**Outer dimensions** mm (in) 51,5 x 30,6 (2.03 x 1.20)

### Mechanical characteristics

#### Minimum bending radius

single bending

E Plane

H Plane



mm (in)

mm (in)

200 (7.9)

500 (19.7)

### Electrical characteristics

• <b>Frequency range</b>	GHz	5.70 - 7.75
• <b>Principal mode (<math>HE_{c11}</math>) cut-off frequency</b>	GHz	4.2
• <b>Attenuation at 20°C (68°F)</b>	dB/100 m (100 feet)	@ 6.3 GHz 4,32 (1.32)
• <b>Group velocity</b>	%	@ 6.3 GHz 74.5
• <b>VSWR max.</b>		≤ 1.06



**EU 77**

**EU 90**

**EU 127**

43,7 x 25,5 (1.72 x 1.00)

32,8 x 19,7 (1.29 x 0.78)

28,5 x 17,3 (1.12 x 0.68)

200 (7.9)  
500 (19.7)

150 (5.9)  
300 (11.8)

125 (4.9)  
250 (9.8)

7.125 - 8.5

8.5 - 11.7

11.7 - 13.25

5.0

6.75

7.9

@ 7.7 GHz  
6,21 (1.89)

@ 10.9 GHz  
9,30 (2.83)

@ 12.7 GHz  
11,74 (3.58)

@ 7.7 GHz  
76.0

@ 10.9 GHz  
78.5

@ 12.7 GHz  
79.2

≤ 1.06

≤ 1.06

≤ 1.08

## PE Jacket

Waveguide type:

**EU 63**





### CHARACTERISTICS

#### Construction

• <b>Description</b>	Corrugated elliptical copper tube	
• <b>Conductor</b>		
Material	copper	
Elliptical mm (in)	47,9 x 26,8 (1.89 x 1.06)	
• <b>Jacket</b>		
Material	UV resistant, black polyethylene (or black FRNH compound)	
Dimensions mm (in)	51,5 x 30,6 (2.03 x 1.20)	
Thickness mm (in)	1,8 (0.07)	

#### Mechanical

• <b>Minimum bending radius</b>		
a) single bending		
E plane mm (in)		200 (7.9)
H plane mm (in)		500 (19.7)
b) repeated bends		
E plane mm (in)	300 (11.8)	
H plane mm (in)	700 (27.6)	
• <b>Maximum twist</b> °/m (°/feet)	3 (1)	
• <b>Max. pulling length per hoisting grip</b> m (ft)	60 (197)	
• <b>Recommended temperature range</b>		
- Installation °C (°F)	-20 to +60 (-4 to +140)	
- Operation °C (°F)	-40 to +80 (-40 to +176)	
• <b>Weight approx.</b> kg/m (lb/ft)	0,84 (0.56)	
• <b>Minimum drum core diameter</b> mm (in)	1200 (47)	
• <b>Maximum operating pressure</b> bar (psi)	0,5 (7.3)	
• <b>Recommended clamp spacing</b> m (ft)	1 (3)	

#### Electrical

• <b>Frequency range</b> GHz	5.70 - 7.75
• <b>Principal mode cut-off frequency</b> $HE_{C11}$ GHz	4.2
• <b>Attenuation, group velocity of propagation, power</b>	

Frequency GHz	Attenuation <sup>(1)</sup> dB/100m (dB/100ft)	Group Velocity %	Av. Power <sup>(2)</sup> kW
5.7	4,76 (1.45)	67.6	4.44
5.8	4,67 (1.42)	69.0	4.53
5.9	4,58 (1.40)	70.2	4.61
6.0	4,51 (1.37)	71.4	4.69
6.1	4,44 (1.35)	72.5	4.76
6.2	4,38 (1.33)	73.6	4.83
6.3	4,32 (1.32)	74.5	4.90
6.4	4,27 (1.30)	75.5	4.96
6.5	4,22 (1.29)	76.3	5.01
6.6	4,17 (1.27)	77.1	5.07
6.7	4,13 (1.26)	77.9	5.12
6.8	4,09 (1.25)	78.6	5.17
6.9	4,06 (1.24)	79.3	5.21
7.0	4,03 (1.23)	80.0	5.25
7.1	3,99 (1.22)	80.6	5.30
7.2	3,96 (1.21)	81.2	5.33
7.3	3,94 (1.20)	81.8	5.37
7.4	3,91 (1.19)	82.3	5.41
7.5	3,89 (1.18)	82.8	5.44
7.7	3,84 (1.17)	83.8	5.50
7.75	3,83 (1.17)	84.0	5.52

<sup>(1)</sup> Attenuation at 20°C (68°F)

<sup>(2)</sup> Average power ratings based on VSWR 1.0, 82°C (180°F) inner temperature, 40°C (140°F) ambient temperature

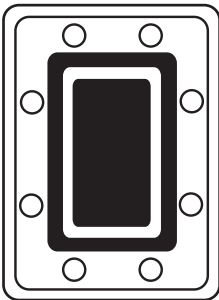
## CONNECTOR



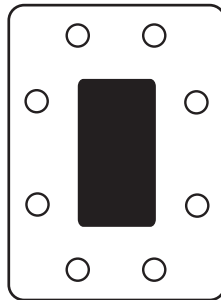
### Features

- Very low VSWR across entire frequency range
- No tuning required
- Easy and reliable installation

### Flange types



PDR70  
CPR137-G



UDR70\*  
CPR137-F#

# on request

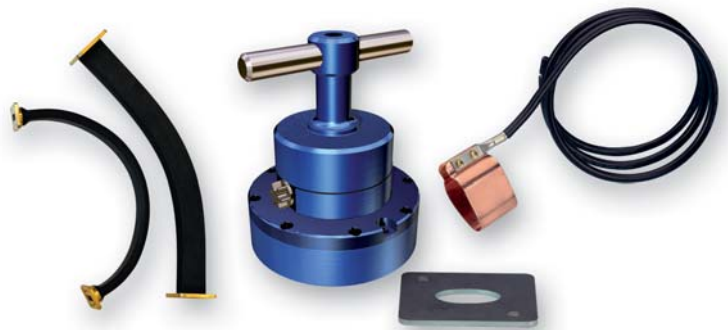
### Technical characteristics

• Frequency range (GHz)	5.70 - 7.75
• Recommended pressure bar (psi)	0,25 (3.6)
• Gas port thread	P 1/8"
• Temperature range °C (°F)	-40 / +80 (-40 / +176)
• Connector material	brass
• VSWR 5.710 - 7.125 GHz	< 1.04
• VSWR 7.125 - 7.75 GHz	< 1.05

### Connector types

Flange type	Sealing Method	Reference
• PDR70	Threaded gasket	EU63-G-PDR70
• CPR137-G	Threaded gasket	EU63-G-CPR137-G
• PDR70	Silicone sealant	EU63-S-PDR70
• CPR137-G	Silicone sealant	EU63-S-CPR137-G

## ACCESSORIES



### Description

- Flaring Tool
- Flaring Tool Adapter
- Saw Guide
- Bending Tool
- Shim\* for PDR flange
- Pressure Window
- Twist Flex
- Grounding Kit
- Fixing Clamps
- Hoisting Grips
- Weatherproofing solutions
- Dehydrator
- Full-thickness gasket\*\* for CPR flange
- Half-thickness gasket\*\* for CPR flange

### Reference

- EU-FT-1
- EU-FTA63
- EU-SG63
- see page 17
- EU-SH70
- see page 19
- see page 20
- EU-GK63
- see page 21
- EU-HG64
- see page 23
- see page 24
- EU-FGK137
- EU-HGK137

\* Use shim when mating two PDR flanges. Not required when mating PDR/UDR. Order separately.

\*\* Use full-thickness gasket (supplied with connector) when mating two CPR-G flanges. Use half-thickness gasket (order separately) when mating CPR-G with CPR-F.

## PE Jacket

Waveguide type:

**EU 77**





### CHARACTERISTICS

#### Construction

• <b>Description</b>	Corrugated elliptical copper tube
• <b>Conductor</b>	
Material	copper
Elliptical mm (in)	40,95 x 22,75 (1.61 x 0.90)
• <b>Jacket</b>	
Material	UV resistant, black polyethylene (or black FRNH compound)
Dimensions mm (in)	43,7 x 25,5 (1.72 x 1.00)
Thickness mm (in)	1,4 (0.06)

#### Mechanical

• <b>Minimum bending radius</b>		
a) single bending		
E plane mm (in)		200 (7.9)
H plane mm (in)		500 (19.7)
b) repeated bends		
E plane mm (in)		250 (9.8)
H plane mm (in)		600 (23.6)
• <b>Maximum twist</b> °/m (°/feet)		3 (1)
• <b>Max. pulling length per hoisting grip</b> m (ft)		60 (197)
• <b>Recommended temperature range</b>		
- Installation °C (°F)		-20 to +60 (-4 to +140)
- Operation °C (°F)		-40 to +80 (-40 to +176)
• <b>Weight approx.</b> kg/m (lb/ft)		0,7 (0.47)
• <b>Minimum drum core diameter</b> mm (in)		1200 (47)
• <b>Maximum operating pressure</b> bar (psi)		0,5 (7.3)
• <b>Recommended clamp spacing</b> m (ft)		1 (3)

#### Electrical

• <b>Frequency range</b> GHz	7.125 - 8.5
• <b>Principal mode cut-off frequency</b> $HE_{C11}$ GHz	5.0
• <b>Attenuation, group velocity of propagation, power</b>	

Frequency GHz	Attenuation <sup>(1)</sup> dB/100m (dB/100ft)	Group Velocity %	Av. Power <sup>(2)</sup> kW
7.1	6,65 (2.03)	71.0	2.88
7.2	6,56 (2.00)	72.0	2.92
7.3	6,48 (1.97)	72.9	2.96
7.4	6,40 (1.95)	73.7	2.99
7.5	6,33 (1.93)	74.5	3.03
7.6	6,27 (1.91)	75.3	3.06
7.7	6,21 (1.89)	76.0	3.09
7.8	6,15 (1.87)	76.8	3.12
7.9	6,10 (1.86)	77.4	3.14
8.0	6,05 (1.84)	78.1	3.17
8.1	6,00 (1.83)	78.7	3.20
8.2	5,96 (1.82)	79.3	3.22
8.3	5,91 (1.80)	79.8	3.24
8.4	5,87 (1.79)	80.4	3.26
8.5	5,84 (1.78)	80.9	3.28

<sup>(1)</sup> Attenuation at 20°C (68°F)

<sup>(2)</sup> Average power ratings based on VSWR 1.0, 82°C (180°F) inner temperature, 40°C (140°F) ambient temperature

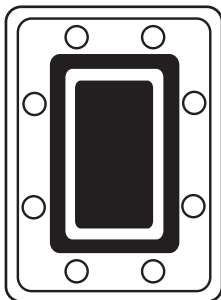
## CONNECTOR



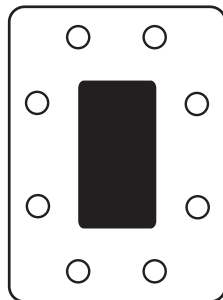
### Features

- Very low VSWR across entire frequency range
- No tuning required
- Easy and reliable installation

### Flange types



PDR84  
CPR112-G



UDR84\*  
CPR112-F#

# on request

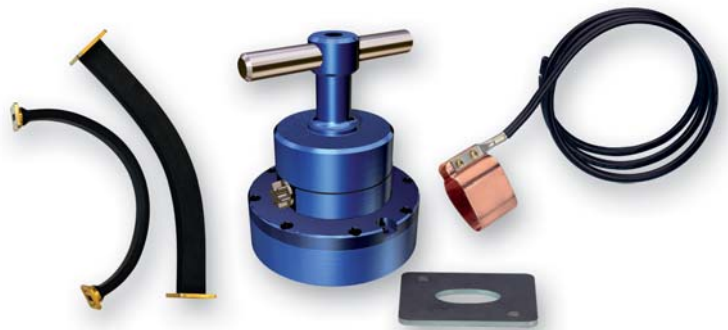
### Technical characteristics

• <b>Frequency range</b> (GHz)	7.125 - 8.5
• <b>Recommended pressure</b> bar (psi)	0,25 (3.6)
• <b>Gas port thread</b>	P 1/8"
• <b>Temperature range</b> °C (°F)	-40 / +80 (-40 / +176)
• <b>Connector material</b>	brass
• <b>VSWR</b>	< 1.03

### Connector types

Flange type	Sealing Method	Reference
• PDR84	Threaded gasket	EU77-G-PDR84
• CPR112-G	Threaded gasket	EU77-G-CPR112-G
• PDR84	Silicone sealant	EU77-S-PDR84
• CPR112-G	Silicone sealant	EU77-S-CPR112-G

## ACCESSORIES



### Description

- Flaring Tool
- Flaring Tool Adapter
- Saw Guide
- Bending Tool
- Shim\* for PDR flange
- Pressure Window
- Twist Flex
- Grounding Kit
- Fixing Clamps
- Hoisting Grips
- Weatherproofing solutions
- Dehydrator
- Full-thickness gasket\*\* for CPR flange
- Half-thickness gasket\*\* for CPR flange

### Reference

- EU-FT-2
- EU-FTA77
- EU-SG77
- see page 17
- EU-SH84
- see page 19
- see page 20
- EU-GK77
- see page 21
- EU-HG77
- see page 23
- see page 24
- EU-FGK112
- EU-HGK112

\* Use shim when mating two PDR flanges. Not required when mating PDR/UDR. Order separately.

\*\* Use full-thickness gasket (supplied with connector) when mating two CPR-G flanges. Use half-thickness gasket (order separately) when mating CPR-G with CPR-F.

## PE Jacket

Waveguide type:

**EU 90**





### CHARACTERISTICS

#### Construction

• <b>Description</b>	Corrugated elliptical copper tube
• <b>Conductor</b>	
Material	copper
Elliptical mm (in)	30,2 x 17,1 (1.19 x 0.67)
• <b>Jacket</b>	
Material	UV resistant, black polyethylene (or black FRNH compound)
Dimensions mm (in)	32,8 x 19,7 (1.29 x 0.78)
Thickness mm (in)	1,3 (0.05)

#### Mechanical

• <b>Minimum bending radius</b>		
a) single bending		
E plane mm (in)		150 (5.9)
H plane mm (in)		300 (11.8)
b) repeated bends		
E plane mm (in)		200 (7.9)
H plane mm (in)		500 (19.7)
• <b>Maximum twist</b> °/m (°/feet)		3 (1)
• <b>Max. pulling length per hoisting grip</b> m (ft)		60 (197)
• <b>Recommended temperature range</b>		
- Installation °C (°F)	-20 to +60 (-4 to +140)	
- Operation °C (°F)	-40 to +80 (-40 to +176)	
• <b>Weight approx.</b> kg/m (lb/ft)		0,5 (0.34)
• <b>Minimum drum core diameter</b> mm (in)		1200 (47)
• <b>Maximum operating pressure</b> bar (psi)		0,5 (7.3)
• <b>Recommended clamp spacing</b> m (ft)		1 (3)

#### Electrical

• <b>Frequency range</b> GHz	8.5 - 11.7
• <b>Principal mode cut-off frequency</b> $HE_{C11}$ GHz	6.75
• <b>Attenuation, group velocity of propagation, power</b>	

Frequency GHz	Attenuation <sup>(1)</sup> dB/100m (dB/100ft)	Group Velocity %	Av. Power <sup>(2)</sup> kW
8.5	12,01 (3.66)	60.8	1.33
8.6	11,78 (3.59)	62.0	1.35
8.7	11,57 (3.53)	63.1	1.38
8.8	11,38 (3.47)	64.2	1.40
8.9	11,20 (3.41)	65.2	1.42
9.0	11,04 (3.36)	66.1	1.44
9.1	10,88 (3.32)	67.1	1.46
9.2	10,74 (3.27)	67.9	1.48
9.3	10,61 (3.23)	68.8	1.50
9.4	10,49 (3.20)	69.6	1.52
9.5	10,37 (3.16)	70.4	1.53
9.6	10,27 (3.13)	71.1	1.55
9.7	10,16 (3.10)	71.8	1.57
9.8	10,07 (3.07)	72.5	1.58
9.9	9,98 (3.04)	73.2	1.60
10.0	9,89 (3.02)	73.8	1.61
10.1	9,81 (2.99)	74.4	1.62
10.3	9,66 (2.95)	75.5	1.65
10.5	9,53 (2.90)	76.6	1.67
10.7	9,41 (2.87)	77.6	1.69
10.9	9,30 (2.83)	78.5	1.71
11.1	9,20 (2.80)	79.4	1.73
11.3	9,10 (2.77)	80.2	1.75
11.5	9,02 (2.75)	81.0	1.77
11.7	8,94 (2.72)	81.7	1.78

<sup>(1)</sup> Attenuation at 20°C (68°F)

<sup>(2)</sup> Average power ratings based on VSWR 1.0, 82°C (180°F) inner temperature, 40°C (140°F) ambient temperature

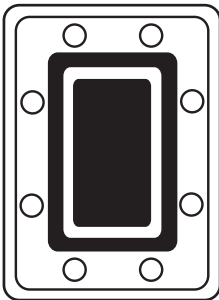
## CONNECTOR



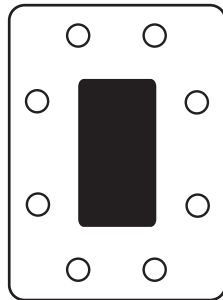
### Features

- Very low VSWR across entire frequency range
- No tuning required
- Easy and reliable installation

### Flange types



PDR100  
CPR90-G



UDR100\*  
CPR90-F#

# on request

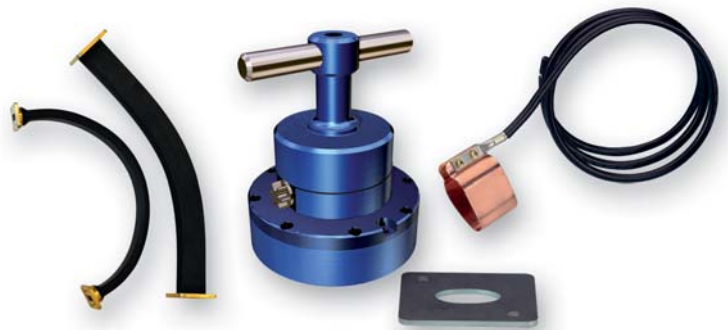
### Technical characteristics

• Frequency range (GHz)	8.5 - 11.7
• Recommended pressure bar (psi)	0,25 (3.6)
• Gas port thread	P 1/8"
• Temperature range °C (°F)	-40 / +80 (-40 / +176)
• Connector material	brass
• VSWR	< 1.05

### Connector types

Flange type	Sealing Method	Reference
• PDR100	Threaded gasket	EU90-G-PDR100
• CPR90-G	Threaded gasket	EU90-G-CPR90-G
• PDR100	Silicone sealant	EU90-S-PDR100
• CPR90-G	Silicone sealant	EU90-S-CPR90-G

## ACCESSORIES



### Description

- Flaring Tool
- Flaring Tool Adapter
- Saw Guide
- Bending Tool
- Shim\* for PDR flange
- Pressure Window
- Twist Flex
- Grounding Kit
- Fixing Clamps
- Hoisting Grips
- Weatherproofing solutions
- Dehydrator
- Full-thickness gasket\*\* for CPR flange
- Half-thickness gasket\*\* for CPR flange

### Reference

- EU-FT-2
- EU-FTA90
- EU-SG90
- see page 17
- EU-SH100
- see page 19
- see page 20
- EU-GK85
- see page 21
- EU-HG85
- see page 23
- see page 24
- EU-FGK90
- EU-HGK90

\* Use shim when mating two PDR flanges. Not required when mating PDR/UDR. Order separately.

\*\* Use full-thickness gasket (supplied with connector) when mating two CPR-G flanges. Use half-thickness gasket (order separately) when mating CPR-G with CPR-F.

## PE Jacket

Waveguide type:

### EU 127





## CHARACTERISTICS

### Construction

• <b>Description</b>	Corrugated elliptical copper tube	
• <b>Conductor</b>		
Material	copper	
Elliptical mm (in)	25,9 x 14,7 (1.02 x 0.58)	
• <b>Jacket</b>		
Material	UV resistant, black polyethylene (or black FRNH compound)	
Dimensions mm (in)	28,5 x 17,3 (1.12 x 0.68)	
Thickness mm (in)	1,3 (0.05)	

### Mechanical

• <b>Minimum bending radius</b>		
a) single bending		
E plane mm (in)		125 (4.9)
H plane mm (in)		250 (9.8)
b) repeated bends		
E plane mm (in)	150 (5.9)	
H plane mm (in)	400 (15.7)	
• <b>Maximum twist</b> °/m (°/feet)	3 (1)	
• <b>Max. pulling length per hoisting grip</b> m (ft)	60 (197)	
• <b>Recommended temperature range</b>		
- Installation °C (°F)	-20 to +60 (-4 to +140)	
- Operation °C (°F)	-40 to +80 (-40 to +176)	
• <b>Weight approx.</b> kg/m (lb/ft)	0,36 (0.24)	
• <b>Minimum drum core diameter</b> mm (in)	1000 (39)	
• <b>Maximum operating pressure</b> bar (psi)	0,5 (7.3)	
• <b>Recommended clamp spacing</b> m (ft)	1 (3)	

### Electrical

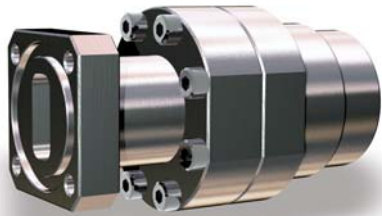
• <b>Frequency range</b> GHz	11.7 - 13.25
• <b>Principal mode cut-off frequency</b> $HE_{C11}$ GHz	7.75
• <b>Attenuation, group velocity of propagation, power</b>	

Frequency GHz	Attenuation <sup>(1)</sup> dB/100m (dB/100ft)	Group Velocity %	Av. Power <sup>(2)</sup> kW
11.7	12,41 (3.78)	74.9	1.16
11.8	12,33 (3.76)	75.4	1.17
11.9	12,26 (3.74)	75.9	1.18
12.0	12,18 (3.71)	76.3	1.19
12.1	12,11 (3.69)	76.8	1.19
12.2	12,04 (3.67)	77.2	1.20
12.3	11,98 (3.65)	77.7	1.21
12.4	11,91 (3.63)	78.1	1.21
12.5	11,85 (3.61)	78.5	1.22
12.6	11,80 (3.60)	78.8	1.23
12.7	11,74 (3.58)	79.2	1.23
12.8	11,69 (3.56)	79.6	1.24
12.9	11,63 (3.55)	79.9	1.24
13.0	11,58 (3.53)	80.3	1.25
13.1	11,54 (3.52)	80.6	1.25
13.2	11,49 (3.50)	80.9	1.26

<sup>(1)</sup> Attenuation at 20°C (68°F)

<sup>(2)</sup> Average power ratings based on VSWR 1.0, 82°C (180°F) inner temperature, 40°C (140°F) ambient temperature

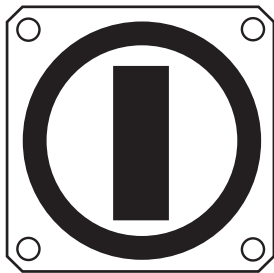
## CONNECTOR



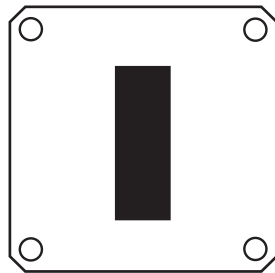
### Features

- Very low VSWR across entire frequency range
- No tuning required
- Easy and reliable installation

### Flange types



**PBR120**  
WR75 (CPR75-G)  
(pressurizable  
cover flange)



**UBR120\***  
WR75\* (CPR75-F)  
(cover flange)

\* on request

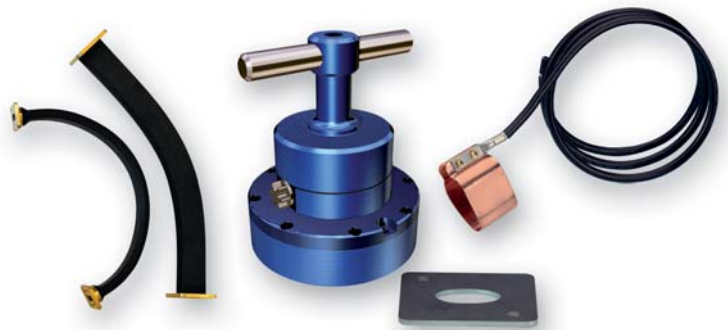
### Technical characteristics

• <b>Frequency range</b> (GHz)	10.2 - 11.7
• <b>Recommended pressure</b> bar (psi)	0,25 (3.6)
• <b>Gas port thread</b>	P 1/8"
• <b>Temperature range</b> °C (°F)	-40 / +80 (-40 / +176)
• <b>Connector material</b>	brass
• <b>VSWR</b>	< 1.05

### Connector types

Flange type	Sealing Method	Reference
• PBR120	Threaded gasket	EU127-G-PBR120
• CPR75-G	Threaded gasket	EU127-G-CPR75-G
• PBR120	Silicone sealant	EU127-S-PBR120
• CPR75-G	Silicone sealant	EU127-S-CPR75-G

## ACCESSORIES



### Description

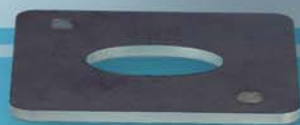
- Flaring Tool
- Flaring Tool Adapter
- Saw Guide
- Bending Tool
- Shim\* for PDR flange
- Pressure Window
- Twist Flex
- Grounding Kit
- Fixing Clamps
- Hoisting Grips
- Weatherproofing solutions
- Dehydrator
- Full-thickness gasket\*\* for CPR flange
- Half-thickness gasket\*\* for CPR flange

### Reference

- EU-FT-2
- EU-FTA127
- EU-SG127
- see page 17
- EU-SH120
- see page 19
- see page 20
- EU-GK127
- see page 21
- EU-HG127
- see page 23
- see page 24
- EU-FGK75
- EU-HGK75

\* Use shim when mating two PDR flanges. Not required when mating PDR/UDR. Order separately.

\*\* Use full-thickness gasket (supplied with connector) when mating two CPR-G flanges. Use half-thickness gasket (order separately) when mating CPR-G with CPR-F.



# Waveguide Accessories



# ACCESSORIES FOR WAVEGUIDE

## 1. BENDING TOOL



### **BENDING TOOL E-PLANE**

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-BTE63-77
EU 77	EU-BTE63-77
EU 90	EU-BTE90-127
EU 127	EU-BTE90-127

### **BENDING TOOL H-PLANE**

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-BTH63-77
EU 77	EU-BTH63-77
EU 90	EU-BTH90-127
EU 127	EU-BTH90-127

## 2. FLARING TOOL

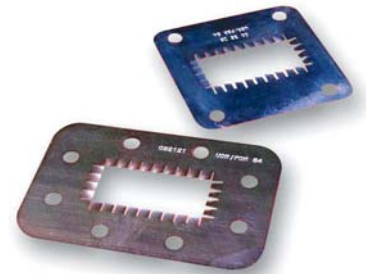


### **FLARING TOOL**

<b>Waveguide type</b>	<b>Ref. Tool</b>	<b>Ref. Flaring Tool Adapter</b>	<b>Ref. Saw guide</b>
EU 63	EU-FT1	EU-FTA63	EU-SG63
EU 77	EU-FT2	EU-FTA77	EU-SG77
EU 90	EU-FT2	EU-FTA90	EU-SG90
EU 127	EU-FT2	EU-FTA127	EU-SG127

### 3. SHIM

Shims are required when matching flanges PDR to PDR or PBR to PBR. They are not required when matching PDR to UDR or PBR to UBR. In all cases they can be used to improve electromagnetic sealing. Ordered separately.

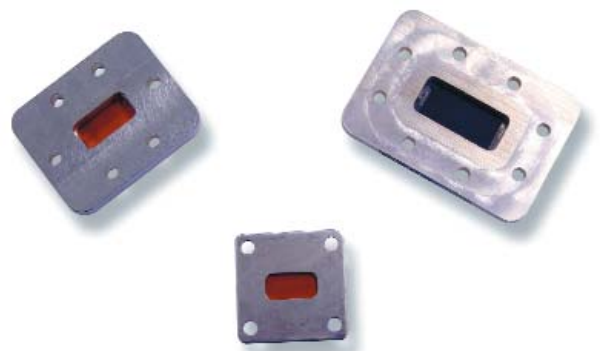


#### SHIM FOR PDR/PBR FLANGE

Waveguide type	Flange type	Ref.
EU 63	PDR 70	EU-SH70
EU 77	PDR 84	EU-SH84
EU 90	PDR 100	EU-SH100
EU 127	PBR 120	EU-SH120

### 4. PRESSURE WINDOWS

Pressure windows must be installed as close as possible to the antenna input, if antenna feed is not pressurized or does not have a built-in window.

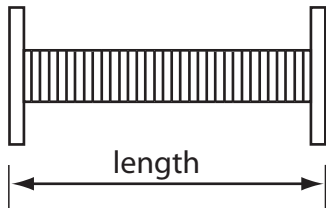


#### PRESSURE WINDOWS

Connector type	Waveguide type	Thickness	Flange type	Flange	Ref.
<b>EUROPE</b>	EU 63	2 mm	flat/flat	UDR70/UDR70	EU-PW-UU70
	EU 63	6 mm	flat/grooved	UDR70/PDR70	EU-PW-UP70
	EU 77	2 mm	flat/flat	UDR84/UDR84	EU-PW-UU84
	EU 90	2 mm	flat/flat	UDR100/UDR100	EU-PW-UU100
	EU 127	2 mm	flat/flat	UDR120/UDR120	EU-PW-UU120
<b>USA</b>	EU 63	1/4"	flat/flat	CPR137-F/CPR137-F	EU-PW-FF137
	EU 63	1/4"	flat/grooved	CPR137-F/CPR137-G	EU-PW-FG137
	EU 77	1/4"	flat/flat	CPR112-F/CPR112-F	EU-PW-FF112
	EU 77	1/4"	flat/grooved	CPR112-F/CPR112-G	EU-PW-FG112
	EU 90	1/4"	flat/flat	CPR90-F/CPR90-F	EU-PW-FF90
	EU 90	1/4"	flat/grooved	CPR90-F/CPR90-G	EU-PW-FG90
	EU 127	1/4"	flat/flat	CPR75-F/CPR75-F	EU-PW-FF75
	EU 127	1/4"	flat/grooved	CPR75-F/CPR75-G	EU-PW-FG75

## 5. TWIST FLEX

Twist flex sections can be used as jumper on the antenna side as well as on the radio side.



### TWIST FLEX

Connector type	Waveguide type	Length	Flange type	Flange	Ref.
<b>EUROPE</b>	EU 63	100 cm	flat/grooved	UDR70/UDR70	EU-TF-UDR-PDR70-100
	EU 77	100 cm	flat/grooved	UDR84/UDR84	EU-TF-UDR-PDR84-100
	EU 90	66 cm	flat/grooved	UDR100/UDR100	EU-TF-UDR-PDR100-66
	EU 127	66 cm	flat/grooved	UDR120/UDR120	EU-TF-UBR-PBR120-66
<b>USA</b>	EU 63	36"	flat/grooved	CPR137-F/CPR137-G	EU-TF-CPRF-CPRG137-36
	EU 77	36"	flat/grooved	CPR112-F/CPR112-G	EU-TF-CPRF-CPRG112-36
	EU 90	24"	flat/grooved	CPR90-F/CPR90-G	EU-TF-CPRF-CPRG90-24
	EU 127	24"	flat/grooved	CPR75-F/CPR75-G	EU-TF-CPRF-CPRG75-24

Note: All models have silver plated flex sections, with standard neoprene jacket and unplated flanges. Other finishes and jackets, as well as other lengths, are available upon request. Other flange combinations are possible.

## 6. GROUNDING KITS

### GROUNDING KITS

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-GK63
EU 77	EU-GK77
EU 90	EU-GK85
EU 127	EU-GK127



## 7. FIXING CLAMPS

### A. BUTTERFLY HANGER

#### BUTTERFLY HANGER

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-BH63-NH
EU 77	EU-BH77-NH
EU 90	EU-BH85-NH
EU 127	EU-BH127-NH



## B. CLAMPS

### CLAMPS

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-CC63
EU 77	EU-CC77
EU 90	EU-CC85
EU 127	EU-CC127



## 8. HOISTING GRIPS

### HOISTING GRIPS

<i>Waveguide type</i>	<i>Ref.</i>
EU 63	EU-HG64
EU 77	EU-HG77
EU 90	EU-HG85
EU 127	EU-HG127



## 9. ADDITIONAL WEATHERPROOFING SOLUTIONS



### A. TAPE KIT

Tape Kit Ref.: F722-996

One Kit is sufficient for:

#### **TAPE KIT**

<b>Connector type</b>	<b>Single connector</b>	<b>Connector pair</b>
EU 63	1	0.75
EU 77	1.5	1
EU 90	1.5	1
EU 127	2	1



### B. COLD SHRINK SLEEVE

#### **COLD SHRINK SLEEVE**

<b>Waveguide type</b>	<b>Ref.</b>
EU 63	EU-CS63
EU 77	EU-CS77
EU 90	EU-CS90
EU 127	EU-CS127

# 10. DEHYDRATOR

## **Humidity, the critical issue**

In theory waveguides and cables are airtight, however practice shows humidity leakage problems occur relatively soon after installation. Wind and temperature fluctuations cause pressure differences between inside and outside so that wet, ambient air enters the system.

In addition, antenna-windows and connections are not completely water vapour tight.

To remove the resulting humidity efficiently, a regular rinsing with dry air is required. A combination of a pressurizer/dryer at the base of the tower, and an exhaust assembly in the waveguide near the antenna-window guarantees sufficient removal of water vapour. This results in a reduced risk of corrosion and arcing and keeps the transmission performance at maximum efficiency. The benefit: low maintenance costs with optimum service to users.

Each delair Etsiline pressurizer is equipped with two heat-regenerated adsorbers, an air compressor, a pressure relief valve and a microprocessor-controller.

Exhaust assembly (controlled leak), to be mounted on the connector which is farthest away from the dehydrator.



## **How delair® Etsiline Pressurizers Work**

Etsiline pressurizers use porous materials (desiccants) to adsorb the water molecules from the air flow. Two desiccant adsorbers guarantee a continuous operation. When one adsorber is removing moisture the other one is being regenerated.

## **Benefits & Features**

- Flexible arrangement suitable for wall, floor, ETSI and 19" rack mounting
- Plug and Play
- Low noise and vibration
- High reliability
- Digital control and read-out
- Low power consumption and high efficiency



The Etsiline pressurizers are equipped with 6 valves, eliminating the need for a separate manifold.



## DEHYDRATOR

### Etsiline 32 and 52

Microprocessor controlled printed circuit board			•
Digital display:			
- Digital pressure indication			•
- Analog pressure indication			•
- Operating time indication			•
- Process read-out			•
Programmable pressure level			-
- standard pressure ranges (factory set)	mbar (psi)	20 - 30 (0.3 - 0.4)	
- other pressure ranges on request	mbar (psi)	40 - 80 (0.6 - 1.2)	
Outlets, each equipped with shut-off valve			6
Tubing 6 mm OD, other sizes on request			•
Remote pressure sense input			•
Optical dew point indication			•
Safety relief valve			•
Electrical fuse			•
Low pressure alarm			•
Mounting			
- ETSI-rack			•
- 19" rack			•
- Wall mounting			•
- Floor/table mounting			•
Tropical version (ambient dew point <+19°C(66°F))			•
Medium		Ambient air	
Operation		Fully automatic and continuous	
Location		Indoors	
Enclosure		IP 40	
Ambient temperature	°C (°F)	-10 tot +45 (14 to 113)	
Relative humidity		max. 95%	
Outlet dew point @ full load, 23°C (73°F) inlet, 83% R.H.	°C (°F)	< -40 (< -40)	
Power supply		110V, 230V, 50/60 Hz 24V, 48V, 60V DC	
Drying time		6 hours	
Regeneration time		3 hours	
Stand-by time		depending on requirements	

## TECHNICAL DATA

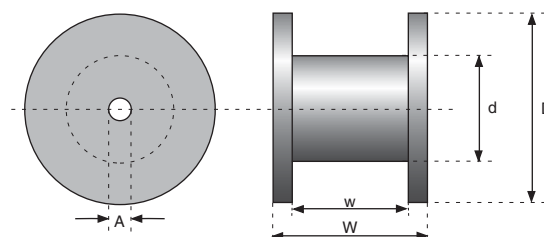
Model	Configuration	Outlet capacity	Power consumption			Sound level	Dimensions			Weight
			Drying	Regeneration	Stand-by		Width	Depth	Height	
		l/h (ft <sup>3</sup> /h)	W	W	W	dB(A)	mm (inch)	mm (inch)	mm (inch)	kg (lb)
delair Etsiline 32	ETSI-rack	30 (1.1)	9	53	5	< 43	535 (21.1)	200 (7.9)	221,5 (8.7)	10 (22)
	19" rack						482,6 (19.0)	200 (7.9)	221,5 (8.7)	
	Wall mounting						420 (16.5)	234 (9.2)	221,5 (8.7)	
	Floor/table mounting						420 (16.5)	200 (7.9)	243,5 (9.6)	
delair Etsiline 52	ETSI-rack	50 (1.8)	9	53	5	< 43	535 (21.1)	200 (7.9)	221,5 (8.7)	10 (22)
	19" rack						482,6 (19.0)	200 (7.9)	221,5 (8.7)	
	Wall mounting						420 (16.5)	234 (9.2)	221,5 (8.7)	
	Floor/table mounting						420 (16.5)	200 (7.9)	243,5 (9.6)	

# WAVEGUIDE PACKING AND HANDLING INFORMATION

The waveguide will be supplied on wooden drums made of planed wooden boards or plywood. In order to protect the waveguide during transportation and storage, the drums will be battened with wooden boards nailed on the flanges.

The drums are provided with a label containing waveguide information as waveguide type, waveguide length, production batch as well as handling information. The drums can be impregnated on request.

The standard drum sizes used for the different waveguide types are shown in the table below.



Waveguide type	Drum type	Waveguide length	Outer dim. *	Drum dim. *	Outer width
		m (ft)	D cm (inch)	d cm (inch)	W cm (inch)
EU 63	HL 20S*	270 (886)	200 (79)	160 (63)	74 (29)
	HL 20B*	500 (1640)	200 (79)	160 (63)	116 (46)
	HL 20S	400 (1312)	200 (79)	140 (55)	74 (29)
	HL 20B	700 (2296)	200 (79)	140 (55)	116 (46)
EU 77	HL 17S	330 (1082)	170 (67)	140 (55)	74 (29)
	HL 20S*	320 (1050)	200 (79)	160 (63)	74 (29)
	HL 20B*	550 (1804)	200 (79)	160 (63)	116 (46)
	HL 20S	550 (1804)	200 (79)	140 (55)	74 (29)
	HL 20B	950 (3116)	200 (79)	140 (55)	116 (46)
EU 90	HL 17S	380 (1246)	170 (67)	140 (55)	74 (29)
	HL 17B	570 (1870)	170 (67)	140 (55)	102 (40)
	HL 20S*	600 (1968)	200 (79)	160 (63)	74 (29)
	HL 20B*	1100 (3608)	200 (79)	160 (63)	116 (46)
	HL 20S	1050 (3444)	200 (79)	140 (55)	74 (29)
EU 127	HL 17S	500 (1640)	170 (67)	140 (55)	74 (29)
	HL 17B	800 (2624)	170 (67)	140 (55)	102 (40)
	HL 20S*	800 (2624)	200 (79)	160 (63)	74 (29)
	HL 20B*	1200 (3936)	200 (79)	160 (63)	116 (46)

\* drums with 160 cm (63 inch) inner diameter will be discontinued in the near future



<b>Inner width w</b> cm (inch)	<b>Shaft hole A</b> cm (inch)	<b>Drum freight Volume</b> m <sup>3</sup> (ft <sup>3</sup> )	<b>Drum weight drum/battened drum</b> kg (lb)	<b>Waveguide weight</b> kg/km (lb/100ft)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	840 (56.3)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	840 (56.3)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	840 (56.3)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	840 (56.3)
64,4 (25)	9 (3.5)	2,2 (78)	332/412 (730/906)	700 (46.9)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	700 (46.9)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	700 (46.9)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	700 (46.9)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	700 (46.9)
64,4 (25)	9 (3.5)	2,2 (78)	332/412 (730/906)	500 (33.5)
92,4 (36)	9 (3.5)	3 (106)	380/465 (836/1023)	500 (33.5)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	500 (33.5)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	500 (33.5)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	500 (33.5)
64,4 (25)	9 (3.5)	2,2 (78)	332/412 (730/906)	360 (24.1)
92,4 (36)	9 (3.5)	3 (106)	380/465 (836/1023)	360 (24.1)
62 (24)	9 (3.5)	3 (106)	390/470 (858/1034)	360 (24.1)
104 (41)	9 (3.5)	4,7 (166)	440/556 (968/1223)	360 (24.1)

# KABELWERK EUPEN AG



Malmedyer Str. 9 - B-4700 EUPEN - BELGIEN

Tel.: +32(0)87.59.70.00  
Fax: +32(0)87.59.71.00

<http://www.eupen.com>  
e-mail: [info@eupen.com](mailto:info@eupen.com)

