

RF-CABLES

EC³ : Eupen Corrugated Copper Cables
for radio transmission systems

Including the
New LOW LOSS "A" Version

Edition 2007



KABELWERK EUPEN AG



**STANDARD****5062**

Cable type :

5062

Reference :

EC1-50

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT**HLFR**

Cable type :

5062-HLFR

Reference :

EC1-50-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS**Construction**

- **Inner conductor**
 - Material copper clad aluminium wire
 - Diameter (mm) 2.4
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 6.5
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 7.5
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.1
 - Diameter (mm) 9.7

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 3
 - b) 15 repeated bends (cm) 8
- **Maximum pulling strength** (daN) 40
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** -
- **Flat plate crush resistance** (kg/mm) 0.8
- **Bending moment** (Nm) 1.5
- **Weight** (kg/km) 110

[1] a = 0.41769

b = 0.00115

 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]**Electrical**

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 82
- **Relative propagation velocity** (%) 82
- **Inductance** (μ H/m) 0.200
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 5.85
 - outer conductor (Ω /km) 3.3
- **RF peak voltage** (kV) 0.83
- **RF peak power** (kW) 6.9
- **Cut-off-frequency** (GHz) 18.6
- **Insulation resistance** (M Ω .km) >>5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C(*) (dB/100m)	Mean power rating(**) (kW)
10	1.33	5.64
20	1.89	3.98
30	2.32	3.24
80	3.83	1.96
100	4.29	1.75
150	5.29	1.42
200	6.14	1.23
300	7.58	0.99
400	8.81	0.85
450	9.38	0.80
500	9.91	0.76
600	10.92	0.69
700	11.86	0.63
800	12.73	0.59
894	13.52	0.56
960	14.05	0.54
1000	14.36	0.52
1500	17.90	0.42
1700	19.18	0.39
1800	19.79	0.38
1880	20.27	0.37
2000	20.98	0.36
2170	21.95	0.34
2200	22.12	0.34
2300	22.68	0.33
2400	23.22	0.32
2500	23.76	0.32
3000	26.33	0.29
4000	31.02	0.24
6000	39.25	0.19

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading

CONNECTORS & TOOLS

Reference	Description
716MA14	7-16 DIN male, O-Ring
716FA14	7-16 DIN female, O-Ring
NM50A14	N male, O-Ring
NF50A14	N female, O-Ring
NM50AL14	N male, right angle, O-Ring
SPTC50A14	Cable preparation tool
Cutting knife (d)	Spare parts for cable preparation tools
Peeling knife (e)	(Refer to installation instruction of the tool)



SPTC50A14



NF50A14



NM50AL14

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02 (*)	≤ 0.02 (*)
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance ($m\Omega$)	≤ 1	≤ 1
• Inner contact resistance ($m\Omega$)	≤ 1.5	≤ 1.5
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 700

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass	
• Outer contact	Passivated silver plated brass	
• Inner contact	Passivated silver plated Cu alloy	
• Dielectric	PTFE	TPX
• Gaskets	High quality silicone	

(*) ≤ 0.03 for right angle connector

ACCESSORIES

Description	Reference
• Grounding clamp with normal outlet	GCS14
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48



GCS14

**STANDARD****5088**

Cable type :

5088

Reference :

EC2-50

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT**HLFR**

Cable type :

5088-HLFR

Reference :

EC2-50-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS**Construction**

- **Inner conductor**
 - Material copper clad aluminium wire
 - Diameter (mm) 3.25
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 8.4
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 9.6
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.1
 - Diameter (mm) 11.8

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 4
 - b) 15 repeated bends (cm) 12
- **Maximum pulling strength** (daN) 55
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 0.5
- **Flat plate crush resistance** (kg/mm) 1.2
- **Bending moment** (Nm) 2.8
- **Weight** (kg/km) 140

[1] $a = 0.30423$ $b = 0.000746$ $\propto(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]**Electrical**

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 76
- **Relative propagation velocity** (%) 88
- **Inductance** (μ H/m) 0.190
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 3.1
 - outer conductor (Ω /km) 2.65
- **RF peak voltage** (kV) 1.05
- **RF peak power** (kW) 11
- **Cut-off-frequency** (GHz) 14.2
- **Insulation resistance** (M Ω .km) $\gg$ 5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.97	7.17
20	1.38	5.05
30	1.69	4.11
80	2.78	2.50
100	3.12	2.23
150	3.84	1.81
200	4.45	1.56
300	5.49	1.26
400	6.38	1.09
450	6.79	1.02
500	7.18	0.97
600	7.90	0.88
700	8.57	0.81
800	9.20	0.75
894	9.76	0.71
960	10.14	0.68
1000	10.37	0.67
1500	12.90	0.54
1700	13.81	0.50
1800	14.25	0.49
1880	14.59	0.48
2000	15.10	0.46
2170	15.79	0.44
2200	15.91	0.44
2300	16.31	0.43
2400	16.69	0.42
2500	17.08	0.41
3000	18.90	0.37
4000	22.23	0.31
6000	28.04	0.25

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading



NF50V38

716MA38

CONNECTORS

Reference	Description
716MV38	7-16 DIN male, O-Ring
716FV38	7-16 DIN female, O-Ring
716MA38	7-16 DIN male, Sealant injection
716FA38	7-16 DIN female, Sealant injection
NM50V38	N male, O-Ring
NF50V38	N female, O-Ring
NM50A38	N male, Sealant injection
NF50A38	N female, Sealant injection
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02	≤ 0.02
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance ($m\Omega$)	≤ 1	≤ 1
• Inner contact resistance ($m\Omega$)	≤ 1.5	≤ 1.5
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 700

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu alloy
• Dielectric	TPX
• Gaskets	High quality silicone

ACCESSORIES

Description	Reference
• Grounding clamp with normal outlet	GCS38
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48



GCS38

**STANDARD****5128**

Cable type :

5128

Reference :

EC4-50

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT**HLFR**

Cable type :

5128-HLFR

Reference :

EC4-50-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS**Construction**

- **Inner conductor**
 - Material copper clad aluminium wire
 - Diameter (mm) 4.8
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 12.4
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 13.7
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.1
 - Diameter (mm) 16.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 7
 - b) 15 repeated bends (cm) 12.5
- **Maximum pulling strength** (daN) 100
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1
- **Flat plate crush resistance** (kg/mm) 1.9
- **Bending moment** (Nm) 3.5
- **Weight** (kg/km) 235

[1] $a = 0.2105$
 $b = 0.000625$
 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]

Electrical

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 76
- **Relative propagation velocity** (%) 88
- **Inductance** (μ H/m) 0.190
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 1.48
 - outer conductor (Ω /km) 2.04
- **RF peak voltage** (kV) 1.6
- **RF peak power** (kW) 25.6
- **Cut-off-frequency** (GHz) 9.8
- **Insulation resistance** (M Ω .km) >>5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.67	11.74
20	0.95	8.27
30	1.17	6.73
80	1.93	4.08
100	2.17	3.64
150	2.67	2.95
200	3.10	2.54
300	3.83	2.06
400	4.46	1.77
450	4.75	1.66
500	5.02	1.57
600	5.53	1.43
700	6.01	1.31
800	6.45	1.22
894	6.85	1.15
960	7.12	1.11
1000	7.28	1.08
1500	9.09	0.87
1700	9.74	0.81
1800	10.06	0.78
1880	10.30	0.77
2000	10.66	0.74
2170	11.16	0.71
2200	11.25	0.70
2300	11.53	0.68
2400	11.81	0.67
2500	12.09	0.65
3000	13.40	0.59
4000	15.81	0.50
6000	20.06	0.39

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading



NF50A12



716FV12



716MAL12

CONNECTORS & TOOL

Reference	Description
716MV12	7-16 DIN male, O-Ring
716FV12	7-16 DIN female, O-Ring
716MA12	7-16 DIN male, Sealant injection
716FA12	7-16 DIN female, Sealant injection
716MVL12	7-16 DIN male, angle, O-Ring
716MAL12	7-16 DIN male, right angle, Sealant injections
NM50V12	N male, O-Ring
NF50V12	N female, O-Ring
NM50A12	N male, Sealant injection
NF50A12	N female, Sealant injection
NM50VL12	N male, angle, O-Ring
NM50AL12	N male, right angle, Sealant injection
SPTC50AV12	Cable preparation tool
Cutting knife (d)	Spare parts for cable preparation tool
Peeling knife (e)	(Refer to installation instruction of the tool)
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.



SPTC50AV12

ACCESSORIES

Description	Reference
• Grounding clamp with parallel outlet	GCS12PAR
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48
• Lace-up hoisting grip	HG-12
Pre-laced hoisting grip	HG-12-L
	see page 44

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02 (*)	≤ 0.02 (*)
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	>128	>128
• Outer contact resistance ($m\Omega$)	≤ 1	≤ 1
• Inner contact resistance ($m\Omega$)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	>500	>1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass	
• Outer contact	Passivated silver plated brass	
• Inner contact	Passivated silver plated Cu alloy	
• Dielectric	TPX/PTFE	TPX
• Gaskets	High quality silicone	

(*) ≤ 0.03 for right angle connector



GCS12PAR

**STANDARD****5228**

Cable type :

5228

Reference :

EC5-50

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT**HLFR**

Cable type :

5228-HLFR

Reference :

EC5-50-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS**Construction**

- **Inner conductor**
 - Material smooth copper tube
 - Diameter (mm) 9.1
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 23.5
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 25.0
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.4
 - Diameter (mm) 28.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 10
 - b) 10 repeated bends (cm) 25
- **Maximum pulling strength** (daN) 170
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1.2
- **Flat Plate Crush resistance** (kg/mm) 1.7
- **Bending moment** (Nm) 14.5
- **Weight** (kg/km) 530

[1] a = 0.1117

b = 0.00042

 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]**Electrical**

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 76
- **Relative propagation velocity** (%) 88
- **Inductance** (μ H/m) 0.190
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 1.05
 - outer conductor (Ω /km) 1.0
- **RF peak voltage** (kV) 3.0
- **RF peak power** (kW) 90
- **Cut-off-frequency** (GHz) 5.3
- **Insulation resistance** (M Ω .km) >>5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.36	26.32
20	0.51	18.52
30	0.62	15.06
80	1.03	9.11
100	1.16	8.12
150	1.43	6.57
200	1.66	5.65
300	2.06	4.56
400	2.40	3.92
450	2.56	3.68
500	2.71	3.47
600	2.99	3.15
700	3.25	2.89
800	3.50	2.69
894	3.72	2.53
960	3.86	2.43
1000	3.95	2.38
1500	4.96	1.90
1700	5.32	1.77
1800	5.50	1.71
1880	5.63	1.67
2000	5.84	1.61
2170	6.11	1.54
2200	6.16	1.53
2300	6.32	1.49
2400	6.48	1.45
2500	6.64	1.42
3000	7.38	1.27
4000	8.74	1.08
6000	-	-

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading

CONNECTORS & TOOL

Reference	Description
716MV78M	7-16 DIN male, O-Ring
716FV78M	7-16 DIN female, O-Ring
716MA78M	7-16 DIN male, Sealant injection
716FA78M	7-16 DIN female, Sealant injection
NM50V78M	N male, O-Ring
NF50V78M	N female, O-Ring
NM50A78M	N male, Sealant injection
NF50A78M	N female, Sealant injection
SPTC50AV78M	Cable preparation tool
Inner ring (a)	Spare parts for cable preparation tool
Outer ring (b)	(Refer to installation instruction of the tool)
Spring (c)	
Cutting knife (d)	
Peeling knife (e)	
Flaring knife (f)	
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.
• EIA connectors available on request.



SPTC50AV78M

ACCESSORIES

Description	Reference
• Grounding clamp with parallel outlet	GCS78PAR
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48
• Lace-up hoisting grip	HG-78
Pre-laced hoisting grip	HG-78-L
	see page 44



NM50A78M



716FV78M

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02	≤ 0.02
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance (m Ω)	≤ 0.7	≤ 0.7
• Inner contact resistance (m Ω)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu alloy
• Dielectric	PTFE TPX
• Gaskets	High quality silicone



GCS78PAR



STANDARD

5228 A

Cable type :

5228 A

Reference :

EC5-50-A

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT

HLFR

Cable type :

5228A-HLFR

Reference :

EC5-50A-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS

Construction

- **Inner conductor**
 - Material smooth copper tube
 - Diameter (mm) 9.3
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 23.5
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 25.0
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.4
 - Diameter (mm) 28.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 10
 - b) 15 repeated bends (cm) 25
- **Maximum pulling strength** (daN) 150
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1.2
- **Flat Plate Crush resistance** (kg/mm) 1.4
- **Bending moment** (Nm) 11.6
- **Weight** (kg/km) 496

[1] a = 0.1107

b = 0.000333

 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]

Electrical

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 75
- **Relative propagation velocity** (%) 89
- **Inductance** (μ H/m) 0.187
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 1.34
 - outer conductor (Ω /km) 1.0
- **RF peak voltage** (kV) 2.9
- **RF peak power** (kW) 86
- **Cut-off-frequency** (GHz) 5.1
- **Insulation resistance** (M Ω .km) >>5000

• Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.35	25.46
20	0.50	17.93
30	0.62	14.60
80	1.02	8.85
100	1.14	7.89
150	1.41	6.40
200	1.63	5.51
300	2.02	4.46
400	2.35	3.83
450	2.50	3.60
500	2.64	3.41
600	2.91	3.09
700	3.16	2.85
800	3.40	2.65
894	3.61	2.49
960	3.75	2.40
1000	3.83	2.35
1500	4.79	1.88
1700	5.13	1.75
1800	5.30	1.70
1880	5.43	1.66
2000	5.62	1.60
2170	5.88	1.53
2200	5.92	1.52
2300	6.07	1.48
2400	6.22	1.45
2500	6.37	1.41
3000	7.06	1.27
4000	8.33	1.08
6000	-	-

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading

CONNECTORS & TOOL

Reference	Description
716MV78MA	7-16 DIN male, O-Ring
716FV78MA	7-16 DIN female, O-Ring
716MA78MA	7-16 DIN male, Sealant injection
716FA78MA	7-16 DIN female, Sealant injection
NM50V78MA	N male, O-Ring
NF50V78MA	N female, O-Ring
NM50A78MA	N male, Sealant injection
NF50A78MA	N female, Sealant injection
SPTC50AV78M	Cable preparation tool
Inner ring (a)	Spare parts for cable preparation tool
Outer ring (b)	(Refer to installation instruction of the tool)
Spring (c)	
Cutting knife (d)	
Peeling knife (e)	
Flaring knife (f)	
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.
• EIA connectors available on request.



SPTC50AV78M

ACCESSORIES

Description	Reference
• Grounding clamp with parallel outlet	GCS78PAR
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48
• Lace-up hoisting grip	HG-78
Pre-laced hoisting grip	HG-78-L
	see page 44



NM50A78MA



716FV78MA

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02	≤ 0.02
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance (m Ω)	≤ 0.7	≤ 0.7
• Inner contact resistance (m Ω)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu-Be and brass
• Dielectric	PTFE TPX
• Gaskets	High quality silicone



GCS78PAR

Ultra Low Loss



STANDARD

5328 A

Cable type :

5328 A

Reference :

EC6-50-A

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT

HLFR

Cable type :

5328 A-HLFR

Reference :

EC6-50-A-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS

Construction

- **Inner conductor**
 - Material smooth copper tube
 - Diameter (mm) 13.0
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 33.5
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 36.0
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.5
 - Diameter (mm) 39.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 20
 - b) 15 repeated bends (cm) 38
- **Maximum pulling strength** (daN) 250
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1.4
- **Flat plate crush resistance** (kg/mm) 2.4
- **Bending moment** (Nm) 32
- **Weight** (kg/km) 871

[1] a = 0.0783

b = 0.00031

 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]

Electrical

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 76
- **Relative propagation velocity** (%) 88
- **Inductance** (μ H/m) 0.189
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 0.72
 - outer conductor (Ω /km) 0.58
- **RF peak voltage** (kV) 4.3
- **RF peak power** (kW) 184
- **Cut-off-frequency** (GHz) 3.7
- **Insulation resistance** (M Ω .km) >>5000

• Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.25	37.13
20	0.36	26.12
30	0.44	21.24
80	0.73	12.84
100	0.81	11.44
150	1.01	9.26
200	1.17	7.96
300	1.45	6.42
400	1.69	5.51
450	1.80	5.17
500	1.91	4.88
600	2.10	4.42
700	2.29	4.07
800	2.46	3.78
894	2.62	3.56
960	2.72	3.42
1000	2.79	3.34
1500	3.50	2.66
1700	3.76	2.48
1800	3.88	2.40
1880	3.98	2.34
2000	4.12	2.26
2170	4.32	2.15
2200	4.35	2.14
2300	4.47	2.08
2400	4.58	2.03
2500	4.69	1.98
3000	5.22	1.78
4000	-	-
6000	-	-

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading



NF50V114M



716MA114M

CONNECTORS & TOOL

Reference	Description
716MV114M	7-16 DIN male, O-Ring
716FV114M	7-16 DIN female, O-Ring
716MA114M	7-16 DIN male, Sealant injection
716FA114M	7-16 DIN female, Sealant injection
NM50V114M	N male, O-Ring
NF50V114M	N female, O-Ring
NM50A114M	N male, Sealant injection
NF50A114M	N female, Sealant injection
SPTC50AV114M	Cable preparation tool
Inner ring (a)	Spare parts for cable preparation tool
Outer ring (b)	(Refer to installation instruction of the tool)
Spring (c)	
Cutting knife (d)	
Peeling knife (e)	
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.
• EIA connectors available on request.



SPTC50AV114M

ACCESSORIES

Description	Reference
• Grounding clamp with parallel outlet	GCS114PAR
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48
• Lace-up hoisting grip	HG-114
Pre-laced hoisting grip	HG-114-L
	see page 44

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02	≤ 0.02
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance (m Ω)	≤ 0.5	≤ 0.5
• Inner contact resistance (m Ω)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu-Be and brass
• Dielectric	TPX/PTFE
• Gaskets	High quality silicone



GCS114PAR

Ultra Low Loss



STANDARD

5438 A

Cable type :

5438 A

Reference :

EC7-50-A

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT

HLFR

Cable type :

5438-A-HLFR

Reference :

EC7-50-A-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS

Construction

- **Inner conductor**
 - Material corrugated copper tube
 - Diameter (mm) 17.7
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 43.0
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 46.6
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 1.7
 - Diameter (mm) 50.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 20
 - b) 15 repeated bends (cm) 40
- **Maximum pulling strength** (daN) 250
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1.5
- **Flat plate crush resistance** (kg/mm) 2.6
- **Bending moment** (Nm) 45
- **Weight** (kg/km) 1130

[1] a = 0.061
b = 0.000359
 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]

Electrical

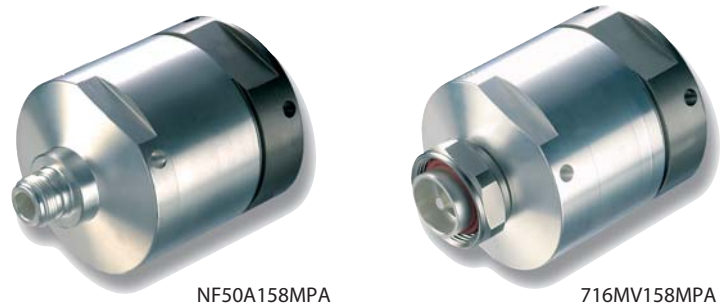
- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 75
- **Relative propagation velocity** (%) 89
- **Inductance** (μ H/m) 0.190
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 1.37
 - outer conductor (Ω /km) 0.39
- **RF peak voltage** (kV) 5.5
- **RF peak power** (kW) 302
- **Cut-off-frequency** (GHz) 2.7
- **Insulation resistance** (M Ω .km) >>5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.20	51.53
20	0.28	36.17
30	0.34	29.36
80	0.57	17.63
100	0.65	15.68
150	0.80	12.64
200	0.93	10.84
300	1.16	8.70
400	1.36	7.43
450	1.46	6.96
500	1.54	6.56
600	1.71	5.92
700	1.87	5.43
800	2.01	5.03
894	2.14	4.72
960	2.23	4.53
1000	2.29	4.43
1500	2.90	3.49
1700	3.13	3.24
1800	3.23	3.13
1880	3.32	3.05
2000	3.45	2.94
2170	3.62	2.80
2200	3.65	2.77
2300	3.75	2.70
2400	3.85	2.63
2500	3.95	2.57
3000	-	-
4000	-	-
6000	-	-

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C;
VSWR = 1.0; no solar loading



NF50A158MPA

716MV158MPA

CONNECTORS & TOOL

Reference	Description
716MV158MPA	7-16 DIN male, O-Ring
716FV158MPA	7-16 DIN female, O-Ring
716MA158MPA	7-16 DIN male, Sealant injection
716FA158MPA	7-16 DIN female, Sealant injection
NM50V158MPA	N male, O-Ring
NF50V158MPA	N female, O-Ring
NM50A158MPA	N male, Sealant injection
NF50A158MPA	N female, Sealant injection
SPTC50AV158M	Cable preparation tool
Inner ring (a)	Spare parts for cable preparation tool
Outer ring (b)	(Refer to installation instruction of the tool)
Spring (c)	
Cutting knife (d)	
Peeling knife (e)	
SIL-744 90 ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.
• EIA connectors available on request.



SPTC50AV158M

ACCESSORIES

Description	Reference
• Grounding clamps with parallel outlet	GCS158PAR
• Fixing clamps	see page 39
• Additional weatherproofing	see page 48
• Lace-up hoisting grip	HG-158
Pre-laced hoisting grip	HG-158-L see page 44

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.02	≤ 0.02
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance (m Ω)	≤ 0.5	≤ 0.5
• Inner contact resistance (m Ω)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu-Be and brass
• Dielectric	TPX / PTFE
• Gaskets	High quality silicone



GCS158PAR

**STANDARD****5528**

Cable type :

5528

Reference :

EC12-50

Cable with standard UV resistant PE jacket, halogen free according to IEC 60754

FLAME RETARDANT**HLFR**

Cable type :

5528-HLFR

Reference :

EC12-50-FR

Cable with UV resistant, halogen free, low smoke, flame retardant jacket according to IEC 60754-2, IEC 60332-1-2, IEC 60332-3 Cat. C and IEC 61034-1+2

CHARACTERISTICS**Construction**

- **Inner conductor**
 - Material corrugated copper tube
 - Diameter (mm) 21.0
- **Dielectric**
 - Material gas-injected cellular polyethylene
 - Diameter (mm) 52.0
- **Outer conductor**
 - Material corrugated copper tube
 - Diameter (mm) 56.0
- **Jacket**
 - Material black polyethylene
 - Thickness (mm) 2.0
 - Diameter (mm) 60.0

Mechanical

- **Minimum bending radius**
 - a) single bending (cm) 25
 - b) 15 repeated bends (cm) 55
- **Maximum pulling strength** (daN) 300
- **Recommended temperature range**
 - Storage -70 to +85°C
 - Installation -40 to +60°C
 - Operation -55 to +85°C
- **Maximum length per hoisting grip** (m) 70
- **Maximum hanger spacing** 1.8
- **Flat Plate Crush resistance** (kg/mm) 4.8
- **Bending moment** (kg/km) 90
- **Weight** (kg/km) 1960

[1] a = 0.05035

b = 0.00045

 $\alpha(f) = a \cdot \sqrt{f} + b \cdot f$ [dB/100m]**Electrical**

- **Characteristic impedance** (Ω) 50 $\pm$ 1
- **Nominal capacity** (pF/m) 76
- **Relative propagation velocity** (%) 88
- **Inductance** (μ H/m) 0.190
- **DC-resistance at 20°C**
 - inner conductor (Ω /km) 0.55
 - outer conductor (Ω /km) 0.25
- **RF peak voltage** (kV) 6.8
- **RF peak power** (kW) 462
- **Cut-off-frequency** (GHz) 2.3
- **Insulation resistance** (M Ω .km) >>5000

Attenuation [1] and power rating

Frequency (MHz)	Attenuation at 20°C ^(*) (dB/100m)	Mean power rating ^(**) (kW)
10	0.16	72.19
20	0.23	50.47
30	0.29	40.86
80	0.49	24.30
100	0.55	21.55
150	0.68	17.28
200	0.80	14.74
300	1.01	11.74
400	1.19	9.96
450	1.27	9.30
500	1.35	8.75
600	1.50	7.86
700	1.65	7.18
800	1.78	6.62
894	1.91	6.20
960	1.99	5.93
1000	2.04	5.79
1500	2.63	4.50
1700	2.84	4.16
1800	2.95	4.01
1880	3.03	3.90
2000	3.15	3.75
2170	3.32	3.56
2200	3.35	3.53
2300	-	-
2400	-	-
2500	-	-
3000	-	-
4000	-	-
6000	-	-

(*) nominal values

(**) Ambient temperature = 40°C; Temperature of inner conductor = 100°C; VSWR = 1.0; no solar loading



NF50A214

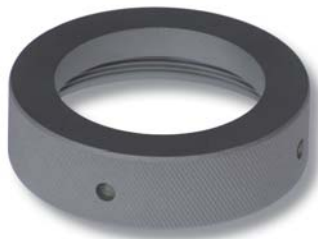


716MV214

CONNECTORS & TOOL

Reference	Description
716MV214	7-16 DIN male, O-Ring
716FV214	7-16 DIN female, O-Ring
716MA214	7-16 DIN male, Sealant injection
716FA214	7-16 DIN female, Sealant injection
NM50V214	N male, O-Ring
NF50V214	N female, O-Ring
NM50A214	N male, Sealant injection
NF50A214	N female, Sealant injection
SG 214	Saw guide
SIL-744 90ml	Sealant for connectors using sealant injection
SIL-744 310 ml	Sealant for connectors using sealant injection

Rem.: • Sealant for connectors using the sealant injection method must be purchased separately.



SG214

ACCESSORIES

Type	Reference	Description
• Grounding clamp with parallel outlet	GCS214PAR	
• Fixing clamps		see page 39
• Additional Weatherproofing		see page 48

Specification of N-connectors 7-16 connectors

Electrical

• Nominal impedance (Ω)	50	50
• Reflection coefficient at 2 GHz	≤ 0.025	≤ 0.025
• Insulation resistance ($G\Omega$)	≥ 5	≥ 10
• Test voltage (at sea level) (kV rms, 50 Hz)	2.5	4
• Working voltage (at sea level) (kV rms, 50 Hz)	1	2.7
• Screening effectiveness up to 1 GHz (dB)	> 128	> 128
• Outer contact resistance (m Ω)	≤ 0.5	≤ 0.5
• Inner contact resistance (m Ω)	≤ 1	≤ 1
• PIM ratio (2 x 20 W carrier) (dBc)		≤ -155 (Typical -163)

Mechanical

• Torque on coupling nut (Nm)	8	30
• Cable retention (N)	> 400	> 1000

Environmental

• Temperature range ($^{\circ}\text{C}$)	-40 to +85
• Degree of protection (humidity)	IP67, IP68

Materials

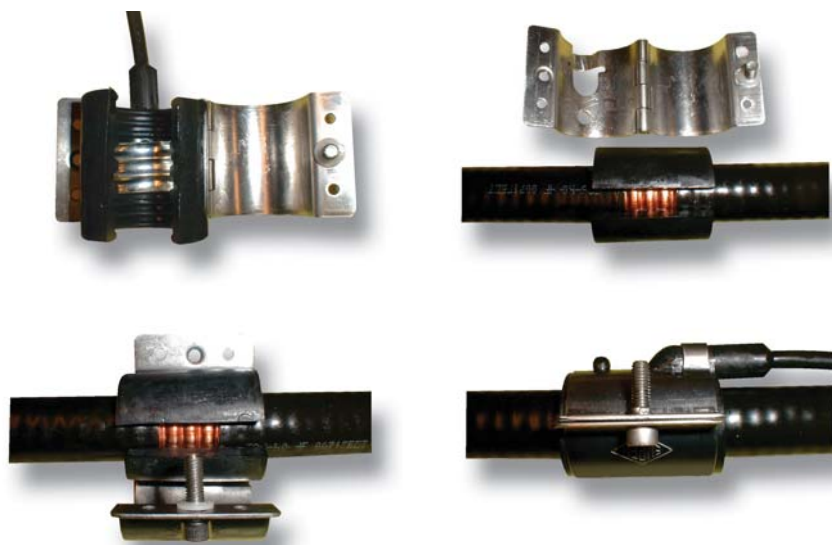
• External parts	Passivated silver plated or electroless nickel plated brass
• Outer contact	Passivated silver plated brass
• Inner contact	Passivated silver plated Cu alloy
• Dielectric	PTFE TPX/PTFE
• Gaskets	High quality silicone



GCS214PAR

3. 1ϕ1r f J R 0 r f R

A. GROUNDING CLAMPS WITH PARALLEL OUTLET



The optimal grounding of the transmission line antenna to base station is a very weak point. In order to guarantee the best grounding we recommend the use of the EUPEN grounding clamps in order to ground the coaxial outer conductor to the antenna tower or ground wire. The main features of the Eupen grounding clamps are:

- **Ultra quick and easy installation**
- **No loose parts**
- **Lightning resistant to 100kA lightning current (wave type 10/350 μs)**
- **Very low contact resistance < 1mOhm**
- **Waterproof according IP68 (5 m of water 2,5 hours) without additional tape or sealant**
- **Corrosion resistant**
- **Reusable**

GROUNDING CLAMPS

Reference	GCS14	GCS38	GCS12X	GCS12PAR	GCS78PAR	GCS114PAR	GCS158PAR	GCS214PAR
Cable size	1/4"	3/8"	1/2" Hiflex	1/2"	7/8", 7/8"A & 7/8" Hiflex	1-1/4" A & 1-1/4" Hiflex	1-5/8" A	2-1/4"
Outlet	normal	normal	normal	parallel	parallel	parallel	parallel	normal
see page	19	21	13	see above	see above	see above	see above	31
Cable cut (mm)	24	20	24	25	21	26	30	30

B. CONNECTOR GROUNDING KIT "CGC" 12-158

Description

- Stainless steel connector grounding clamp
- 60 cm lead with attachment lug and stainless steel M6 Allen screw, washer and nut.

Features

- Fast, easy and reliable installation
- Low contact resistance
- Corrosion resistant stainless steel material
- Reusable
- Only one model for all the connector sizes from 1/2" to 1-5/8"



4. s t r u c t u r e

A. NEW EUCATEC™ RF CABLE CLAMPS WITH LOCK NUT

Features

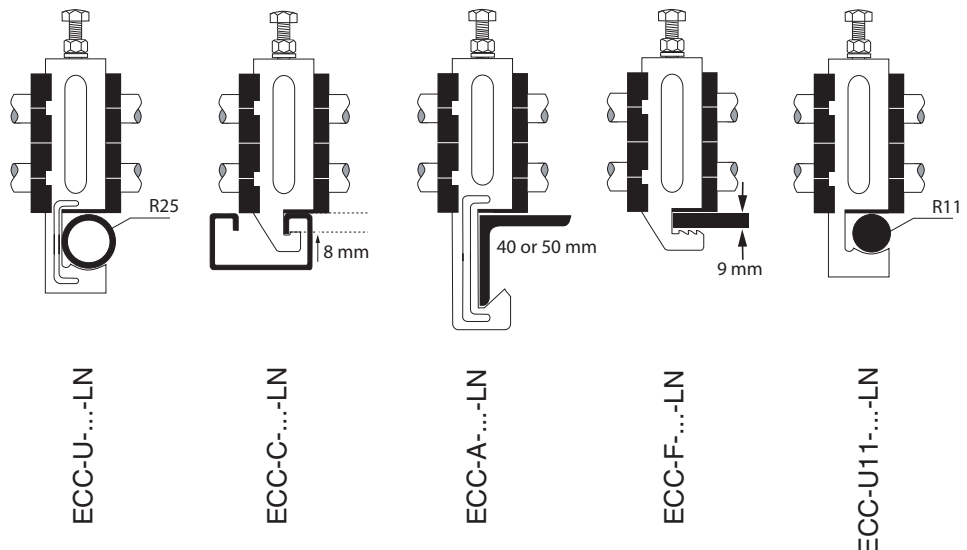
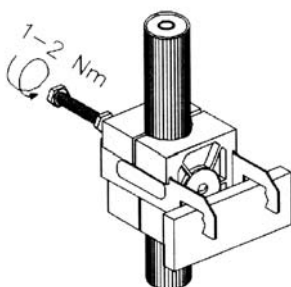
- High durability given by non-corrosive metal components of V2A stainless steel and calibrated saddles from ultraviolet and aging resistant polyamide
- Mountable at "C"-profile rails usual in radio systems as well as flat sections to a maximum of 25 mm thickness and tubes up to a diameter of 25 mm (according to clamp type)
- Easy handling; the cable clamps (single type) consist of merely two elements
- New inlet design with crotchet on both sides to retain the saddles in the clamp while fixing the cable
- Protection of the cable against a possible harm through the tensioning screw is ensured since the tensioning screw is combined firmly with the polyamide shell
- Extra-secure hold is achieved by the use of a lock nut
- All EUCATEC Cable Clamps are available in single, double or triple version
- Also available without lock nut



ECC-C-2x78-LN

Suitable profile types

- Standard C-Profile
- Flat sections
- Pipes
- Right angle



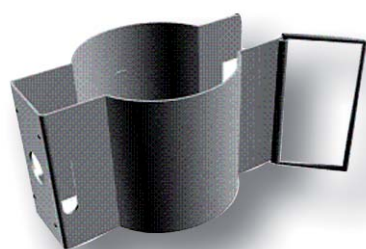
For further details please refer to technical specifications.

B. STAINLESS STEEL CLAMP SYSTEM



EU-SH78L

SNAP-IN HANGERS



EU-CH78NH

CLIP HANGERS

Reference	1/2"	7/8"	1-1/4"	1-5/8"	2-1/4"
Snap-In	EU-SH12L	EU-SH78L	EU-SH114L	EU-SH158L	EU-SH214L
Clip Hangers	EU-CH12NH	EU-CH78NH	EU-CH114NH	EU-CH158NH	–

Material : Stainless steel

OPTION: Angle Adapter for snap-in or clip hangers

Description	Reference
Angle Adapter	EU-AA-SL



C. ORIENTABLE STAINLESS STEEL SPRING CLAMP

- For mainting on flat plate or angle
- No additional hardware required
- Orientable



Reference	1/2"	7/8"	1-1/4"	1-5/8"
Spring Clamp	EU-ES9016	EU-ES9028	EU-ES9040	EU-ES9040

Other specific clamps are available on request

5. Hoisting grips



We offer two types of hoisting grips: the lace-up one and the pre-laced one.

Please refer to the table below.

Hoisting grips are used to raise the cable up the tower. They can be tied off as a permanent support. Use one hoisting grip for every 60 m cable length.

The hoisting grips are manufactured from high-grade tin coated bronze to provide highest corrosion resistance.

HOISTING GRIPS

Reference	1/2"	7/8"	1-1/4"	1-5/8"
Lace-up type	HG-12	HG-78	HG-114	HG-158
Pre-laced type	HG-12-L	HG-78-L	HG-114-L	HG-158-L

6. SIL-744

In outdoor installations the Connector/Cable interface is very sensitive to water ingress.

The Sealant injection waterproofing method creates a quick, secure seal between the back nut and jacket / outer conductor.

The SIL-744 is recommended to be used with all EUPEN connectors where sealant injection is required.

The SIL-744 is supplied either in a box with a 90 ml tube of sealant including connector adapter and key or in a tube containing 310 ml.



With one tube the following quantities of connectors can be sealed:

SIL-744

Reference	3/8"	1/2"	7/8"	1-1/4"	1-5/8"	2-1/4"
with 90 ml tube	26...30	20...25	13...15	7...9	4...5	3...4
with 310 ml tube	90...103	69...86	44...51	24...31	13...17	10...13

7. f u l u z

The Eucaseal is an additional and optional gel closure sealing system that provides a reliable sealing of coaxial connectors used at the transition between:

- jumper and antennas or the electric devices like TMA'S
- jumper and feeder cables exposed to the outside environment

Benefit

The housing contains an innovative gel material and provides an efficient moisture block. The ease of installation and the long-term protection makes it a reliable and cost effective solution.



ES-12-78



ES-12-114

Features

- Reliable protection over a wide temperature range: -30°C to 60°C
- Wraparound and no disconnection of the connector
- Quick and easy to install
- Easily removable and re-usable
- Gel material provides an effective barrier against ingress of water and other contaminants - IP 68 acc. EN 60529
- No tape, no mastics or tools required for installation and removal
- UV resistant
- Tested under extremely severe conditions, vibrations (acc. IEC 60068-2-6 Test Fc) and temperature cycles (acc. IEC 60068-2-14 Test Nb)
- Protection against excessive bending of the cable.



ES-12-114

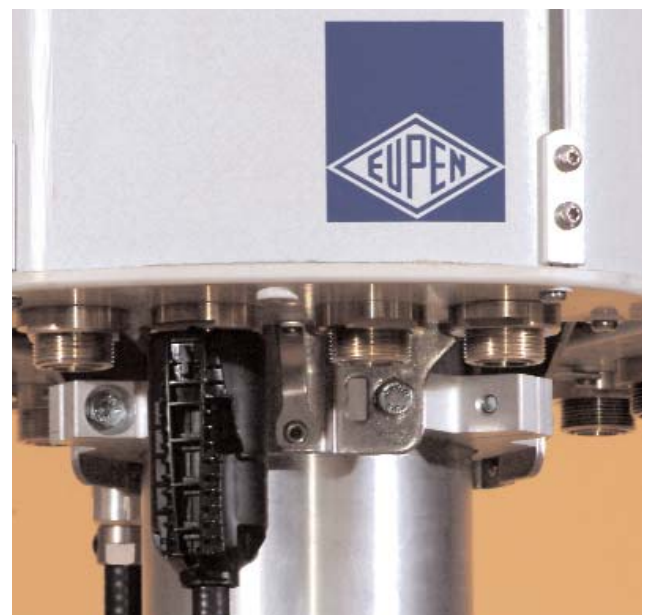
EUCASEAL

Application	1/2" jumper to antenna or box	1/2" jumper to 7/8" feeder	1/2" jumper to 1-1/4" feeder	1/2" jumper to 1-5/8" feeder
Reference	ES-12-BOX	ES-12-78	ES-12-114	ES-12-158
Cable type	1/2" & 1/2" Hiflex	1/2" & 1/2" Hiflex to 7/8", 7/8"A or 7/8" Hiflex	1/2" & 1/2" Hiflex to 1-1/4"A or 1-1/4" Hiflex	1/2" & 1/2" Hiflex to 1-5/8"A
Connector type	only DIN 7-16 - max. length 60 mm - max. body diameter 27 mm - nominal distance between panel connectors 45 mm	N or 7-16	N or 7-16	N or 7-16

Available in black and grey



ES-12-BOX



ES-12-BOX

8. 1tJ 1f 1ΦZ R 5Φ

The lightning arrester offers an additional protection for the BTS against lightning damages.

EUPEN Quarter Wave protector can be used in wideband applications from 800 to 2500 MHz.



EU-LA-QW-800-2500-DMDF

Features

- Quick and easy to install
- Basic range from 800 to 2500 MHz
- Arrester method: 1/4 Wave

Technical Data

- Impedance: 50 Ohm
- Insertion loss: < 0.1 dB
- Return Loss (VSWR): < 1.20
- Surge current handling capability at least 20 kA (8/20 μ S) up to 100 kA (following type)
- Residual pulse energy $\leq 0.5 \mu$ J (3kA @ 8/20 μ S)
- Residual pulse voltage $\leq \pm 3$ V (3kA @ 8/20 μ S)
- Max. power: 100W
- Available in DIN and N type

Reference

for ex.: EU-LA-QW-800-2500-DM-DF

9. Additional weatherproofing

If additional weatherproofing is required, it can be obtained with appropriate adhesive tapes wrapped around the cable/connector interface.

Eupen supplies a weatherproofing tape kit for additional protection of connector, cable and jumper interfaces. The tape kit includes selffusing butyl tape (65 mm x 2 m) and black PVC tape (25 mm x 10 m).

The following table indicates the quantity of connectors or splices which can be protected by tape kit:



WEATHERPROOFING TAPE KIT

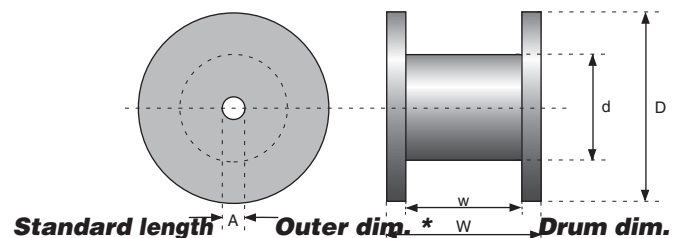
Cable/Connector	1/4" & 3/8"	1/2" & 1/2"X	7/8"	1-1/4"	1-5/8"
Single connector	10	9	7	5	3
Splice	6	5	4	3	2

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

The drums are provided with a label containing cable information as cable type, cable length, production batch as well as handling information such as indication of the reeling direction (see label on right). The drums can be impregnated on request.

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



Cable type		Drum type	(m)	D (cm)	d (cm)
EC1-50 (5062)	1/4"	HE 07	400-700	70	40
EC1-50-HF (5042)	1/4" Hiflex	HE 07	400-800	70	40
EC2-50 (5088)	3/8"	HE 07	400-600	70	40
EC2-50 (5088)	3/8"	HE 08 HF	600-1000	80	40
EC4-50 (5128)	1/2"	HE 07	200-250	70	40
EC4-50 (5128)	1/2"	HE 08 HF	250-550	80	40
EC4-50 (5128)	1/2"	HE 12	550-1200	120	47
EC4-50-HF (5092)	1/2" Hiflex	HE 07	200-300	70	40
EC4-50-HF (5092)	1/2" Hiflex	HE 08 HF	300-800	80	40
EC4-50-HF (5092)	1/2" Hiflex	HE 12	800-1200	120	47
EC5-50 (5228)/EC5-50A	7/8" 7/8"A	HE 12	200-550	120	47
EC5-50 (5228)/EC5-50A	7/8" 7/8"A	HE 13	550-850	130	46
EC5-50-HF (5228X)	7/8" Hiflex	HE 12	200-550	120	47
EC5-50-HF (5228X)	7/8" Hiflex	HE 13	550-850	130	46
EC6-50A (5328A)	1-1/4"A	HF 17S	100-400	170	90
EC6-50A (5328A)	1-1/4"A	HF 17	400-650	170	90
EC6-50A (5328A)	1-1/4"A	HF 20	650-1000	200	90
EC6-50-HF(5328X)	1-1/4" Hiflex	HF 17S	100-400	170	90
EC6-50-HF (5328X)	1-1/4" Hiflex	HF 17	400-650	170	90
EC6-50-HF (5328X)	1-1/4" Hiflex	HF 20	650-1000	200	90
EC7-50A (5438A)	1-5/8"A	HF 17S	100-250	170	90
EC7-50A (5438A)	1-5/8"A	HF 17	250-400	170	90
EC7-50A (5438A)	1-5/8"A	HF 20	350-700	200	90
EC12-50 (5528)	2-1/4"	HF 17	100-200	170	90
EC12-50 (5528)	2-1/4"	HF 20	200-400	200	90

* battened + 5 cm



DRUM LABEL



5228
EC5-50 (7/8")

04/99999
Nr. 1
500 m (1639 FT)
14.05.04
Art.Nr. 7658
HE1299999
1234

5228
EC5-50 (7/8")
04/99999
Nr. 1
500 m (1639 FT)
14.05.04
Art.Nr. 7658
HE1299999
1234

Outer width W (cm)	Inner width w (cm)	Shaft hole A (cm)	Drum freight Volume (m³)	Drum weight drum/battened drum (kg)	Cable weight (kg/km)
41.6	40	6.5	0.21	7/9	110
41.6	40	6.5	0.21	7/9	80
41.6	40	6.5	0.21	7/9	140
54	49	6.5	0.35	16/35	140
41.6	40	6.5	0.21	7/9	235
54	49	6.5	0.35	16/35	235
54	49	6.5	0.78	25/60	235
41.6	40	6.5	0.21	7/9	200
54	49	6.5	0.35	16/35	200
54	49	8	0.78	25/60	200
54	49	8	0.78	25/60	530
78	74	8	1.32	40/90	530
54	49	8	0.78	25/60	460
78	74	8	1.32	40/90	460
70	64	9	2.20	232/320	970
104	98	9	3.03	380/471	970
116	104	9	4.75	440/556	970
70	64	9	2.20	232/320	830
104	98	9	3.03	380/472	830
116	104	9	4.75	440/556	830
70	64	9	2.20	232/320	1200
104	98	9	3.03	380/472	1200
116	104	9	4.75	440/556	1200
104	98	9	3.03	380/472	1960
116	104	9	4.75	440/556	1960