

RF-Components for Mobile Radio Base Stations

- Connectors
- EMP Protectors
- Jumper Cables
- Adaptors
- Tools and Accessories



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Publisher

Telegärtner Karl Gärtner GmbH
Lerchenstr. 35
D-71144 Steinenbronn

Tel.: +49 (0) 7157-125-100
Fax: +49 (0) 7157-125-120
e-mail: info@telegaertner.com

Design & Realisation

artintec e.K.
Dettinger Str. 150
D-73230 Kirchheim / Teck

Tel.: +49 (0) 7021-98016-0
e-mail: info@artintec.de
URL: www.artintec.de

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The Telegärtner Group

The head offices of the Telegärtner Group are situated in Steinenbronn, near Stuttgart, where coaxial connectors, as well as components for telecommunications and data networking systems, are manufactured. Further sites in Germany can be found in Höckendorf (by Dresden) and Crailsheim, which not only house the production of precision turned parts and components for fibre optic technology, but are also the centres for the design and manufacture of active and passive modules. In addition to this, the group maintains production sites and sales offices in China, England, Italy, Japan, and the USA.



Coaxial Connectors

Telegärtner has been developing and manufacturing high quality connectors to suit the requirements of radio frequency applications for over four decades. In addition to the standard ranges, custom built connectors to meet customer specifications can be designed developed and manufactured. As a result of many years of experience in interconnection technology, Telegärtner is now able to provide fully tested coaxial assemblies to meet the ever more demanding specifications requested by customers. Flexible as well as semi-rigid, semi-flex and copper corrugated cables are assembled.



Telegärtner Elektronik GmbH, Crailsheim, Germany



Telegärtner Gerätebau GmbH, Höckendorf, Germany



Telegärtner Kunststofftechnik GmbH, Steinenbronn, Germany



Japan Telegärtner Ltd., Tokio/Tokyo, Japan



Telegärtner Inc., Franklin Park, USA



Telegärtner China Ltd., Shenzhen, China



Telegärtner Italia S.r.l., Seveso, Italy



Production

Greater manufacturing flexibility is obtained by the use of fully and partially automated production methods. Manual production by experienced and well trained personnel using latest production equipment including CNC machines for sample production complement this flexibility.

State-Of-The Art Stocking Facilities

To meet the ever increasing logistic demands of a continuously growing market, we have invested in a new, fully automatic stocking facility. With more than 28.000 containers - serviced by four rack robots - this offers sufficient space for our wide range of products.



Development

New products are developed using CAD systems. The new product developments are then tested and optimised in our laboratories using the latest test and measurement equipment, such as network analyzers and intermodulation test equipment.



SIMFix® Pro

The new generation of connectors for corrugated cables

The RF connectors in the series SIMFix® are rugged connectors with threaded coupling for use in high performance transmitter applications. These connectors are waterproof and are suitable for external use. Furthermore, they are designed to provide excellent technical performance, especially concerning return loss and intermodulation.

New series SIMFix® Pro

The SIMFix® Pro range sees the introduction of a new family of RF connectors for terminating 1/2", 7/8", 1 1/4" and 1 5/8" sized corrugated cables. These connectors combine the compact design of our well tried-and-tested SIMFix® range with the especially high water impermeability (IP 68) of our SIMFix® Plus range. Assembly for all four sizes is simple and reliable, thus guaranteeing constantly good electrical performance with regard to Return Loss and Intermodulation. Ease of termination of the cables has been greatly enhanced by the use of specially developed tooling, which allows for exact stripping of the corrugated cables in the shortest of time.

- Return Loss typ. > 40 dB up to 3 GHz
- Passive Intermodulation >160 dBc (2x43 dB Test signals)
- Water Impermeability: IP 68
- No additional means of sealing necessary
- Simple assembly: only 2 piece-parts
- Tools for cable preparation
- Compact Design

Other available connector types

Telegärtner connectors for Feeder and Jumper cables (highly flexible) are available in 3 different types, as follows:

SIMFix®

For quick and easy assembly. Designed for Feeder cables. Watertight.

Standard

Watertight types for Feeder and Jumper cables.

Short

Compact types for Feeder and Jumper cables. Self-adhesive sleeving is necessary for watertight external installation.



SIMFix® Pro connectors



Easy and fast assembly using special tools

Types of tooling for cable preparation:

Manual tool and rotation tool for electrical drills.

IP 68 -

Waterproof with a high margin of safety

Special seals on the sheath and outer conductor of the cable provide reliable protection against the ingress of water. Tested to a pressure of 2.5 bar (equivalent to water pressure at a depth of 25 m), a high degree of security against damage from water is guaranteed - even after years of service - in every climate, world-wide.

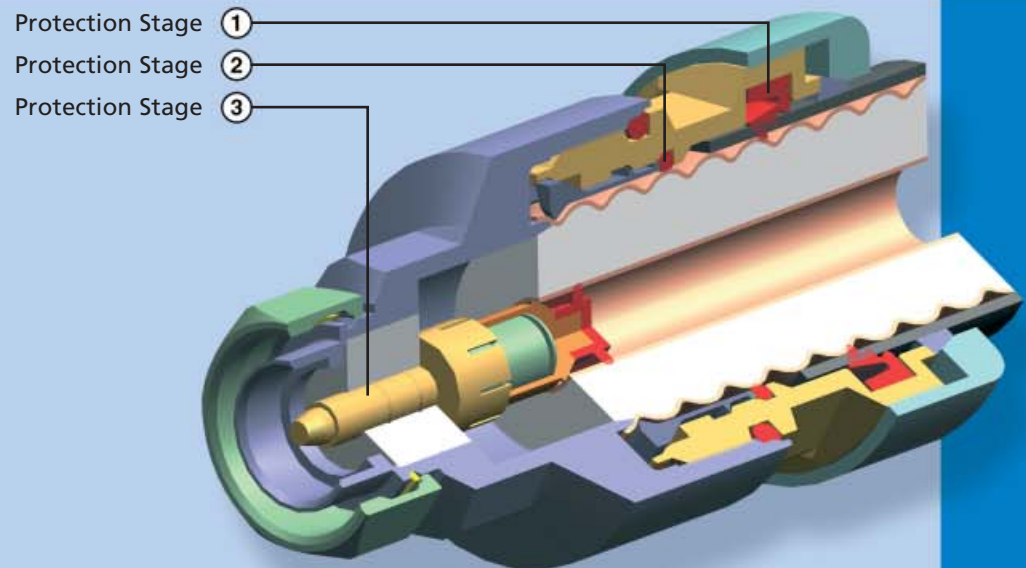
Protection Stage 1:

An O-ring on the outer jacket of the cable guarantees reliable protection against the ingress of water in normal applications of an undamaged cable.

Protection Stage 2:

A special sealing to the outer conductor of the cable. Damage to the cable's outer jacket poses a danger that water will enter the connector between the outer jacket and the outer conductor of the cable. This is prevented by the additional sealing.

3-step sealing safety concept



Protection Stage 3:

Barrier sealed by protective steps taken on centre contact. A massive destruction of the cable resulting in water ingress into the dielectric and possibly even into the inner conductor can destroy the following cable segment and even damage the base station, if water is able to seep through the connector.

Mechanical Characteristics Series 7-16

Finish

Inner conductor Silver
 Other conductive parts Silver or silver with Telealloy flash (CuSnZn3)
 Other parts Silver or Telealloy (CuSnZn3)
 Coupling torque 25-35 Nm
 Durability (mating cycles) > 500

Thermal and Climatic Characteristics

Category to DIN IEC 68 Part 1 55/155/56
 Protection to IEC 60529 SIMFix Pro and Plus types IP 68 (2.5 bar, axially and radially watertight)
 Short type with shrink sleeving, SIMFix and Standard types IP 67

Electrical Characteristics

Contact resistance (only) inner contact < 0.1 mΩ
 Contact resistance (overall) inner contact < 0.4 mΩ
 Contact resistance (only) outer contact < 0.1 mΩ
 Contact resistance (overall) outer contact < 0.2 mΩ
 Insulation resistance > 10 GΩ
 Voltage proof 4 kV_{eff}/50 Hz
 Impedance 50 Ω
 Working voltage < 2.7 kV_{eff}/50 Hz
 Power handling 1.8 kW/1 GHz
 Intermodulation product 3rd. Order (typical); 2 unmodulated test-signals at 43 dBm (20 W)
 at 800-1000 MHz -117 dBm/-160 dBc
 at 1600-2000 MHz -112 dBm/-155 dBc

Mechanical Characteristics Series N

Finish

Inner conductor Silver
 Other conductive parts Silver or silver with Telealloy flash (CuSnZn3)
 Other parts Silver or Telealloy (CuSnZn3)
 Coupling torque 4-6 Nm
 Durability (mating cycles) > 500

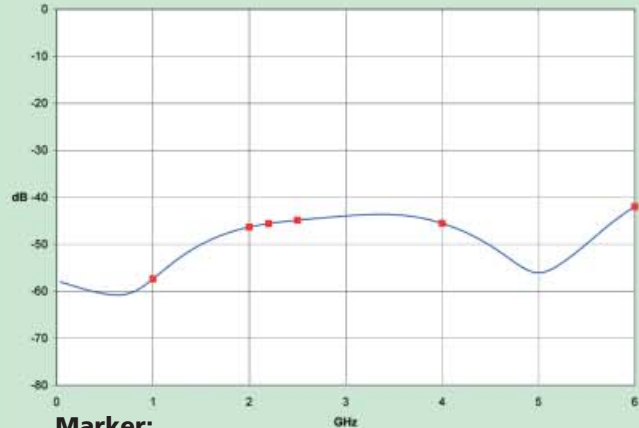
Thermal and Climatic Characteristics

Category to DIN IEC 68 Part 1 40/155/21
 Protection to IEC 60529 SIMFix Pro and Plus types IP 68 (2.5 bar, axially and radially watertight)
 Short type with shrink sleeving, SIMFix and Standard types IP 67

Electrical Characteristics

Contact resistance (overall) inner contact < 2 mΩ
 Contact resistance (overall) outer contact < 0.5 mΩ
 Insulation resistance > 5 GΩ
 Voltage proof 2.5 kV_{eff}/50 Hz
 Impedance 50 Ω
 Working voltage < 1 kV_{eff}/50 Hz
 Intermodulation product 3rd. Order (typical); 2 unmodulated test-signals at 43 dBm (20 W)
 at 800-1000 MHz -117 dBm/-160 dBc
 at 1600-2000 MHz -112 dBm/-155 dBc

Return loss (J01120B0085 typ.)



Marker:

- 1: 1,0 GHz = -57,4 dB
- 2: 2,0 GHz = -46,3 dB
- 3: 2,0 GHz = -45,6 dB
- 4: 2,0 GHz = -44,9 dB
- 5: 4,0 GHz = -45,5 dB
- 6: 6,0 GHz = -42,0 dB

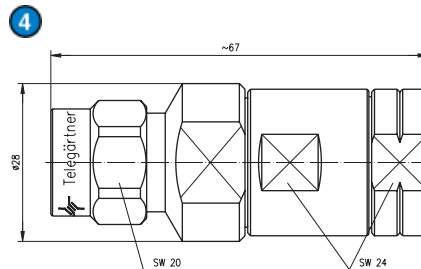
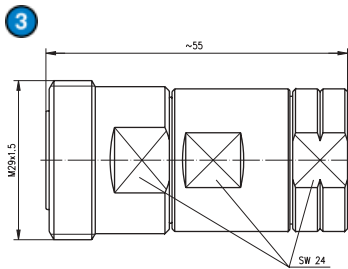
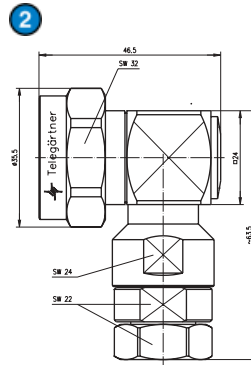
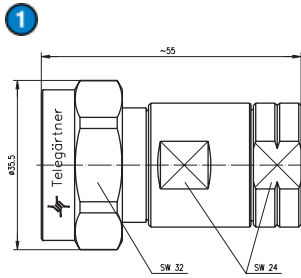
Intermodulation (J01120B0085 typ.)



Marker:

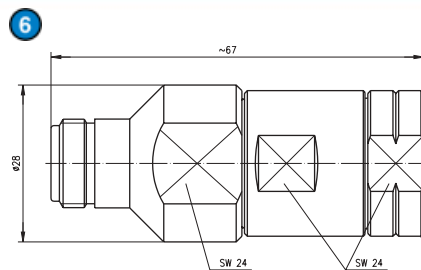
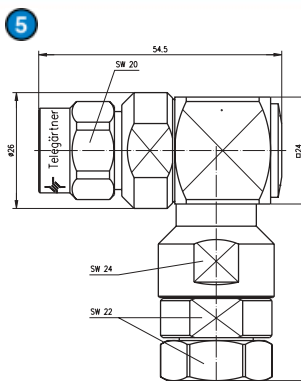
- | | |
|---|---|
| F1 UP (SolidLine)
from = 925 MHz
to = 940,8 MHz
IM3 = -167,4 dBc
at 909,2 MHz
Carrier Power Level = 43 dBm | F2 DOWN (DotLine)
from = 960 MHz
to = 933,4 MHz
IM3 = -167,6 dBc
at 906,8 MHz
CPL = 43 dBm |
|---|---|

Connectors for 1/2" highly flexible cables

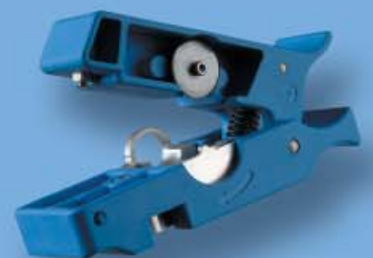


- Cable types**
- RFF 1/2" -50 ■
 - FSJ4-50B ■
 - UCF 12-50J ■
 - SCF 12-50J ■
 - Eupen 5092 ■
 - HPL50-1/2-SF ■
 - HFSC-1/2" ■

Series	Design	Type	Weight	Order-No.	Assembly	Tool	Fig.
7-16	Straight plug	SIMFix	170 g	J01120A0073	B65	N00091A0004	1
7-16	Straight plug	SIMFix Plus	170 g	J01120A0077	B68	N00091A0013	1
7-16	Angle plug	Short	250 g	J01120A0042	B48	-	2
7-16	Straight jack	SIMFix	160 g	J01121A0114	B65	N00091A0004	3
7-16	Straight jack	SIMFix Plus	160 g	J01121A0120	B68	N00091A0013	3
N	Straight plug	SIMFix	170 g	J01020A0098	B65	N00091A0004	4
N	Straight plug	SIMFix Plus	170 g	J01020A0105	B68	N00091A0013	4
N	Angle plug	Short	240 g	J01020A0074	B48	-	5
N	Straight jack	SIMFix	160 g	J01021A0156	B65	N00091A0004	6
N	Straight jack	SIMFix Plus	160 g	J01021A0163	B68	N00091A0013	6



Stripping Tool



1/2"

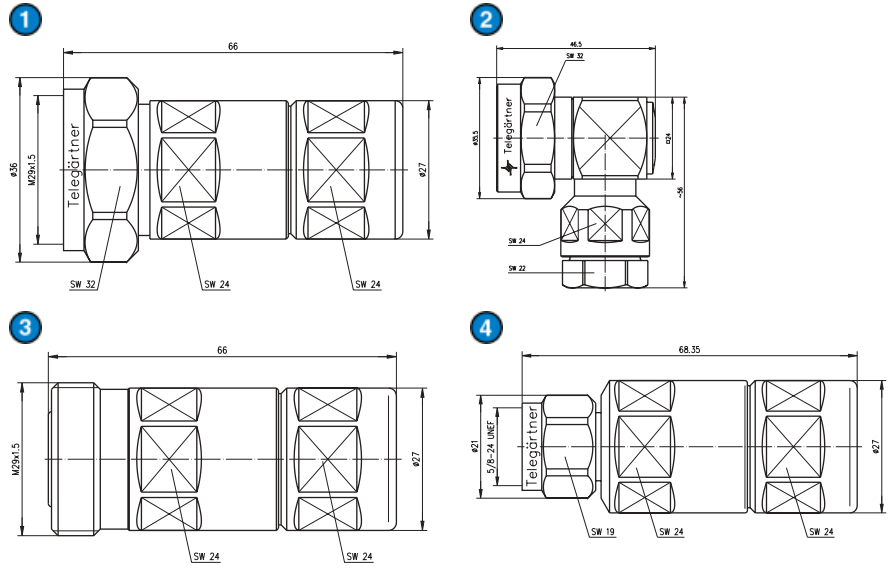


Connectors for 1/2" corrugated cables



Cable types

- RF 1/2"-50
- LCF 12-50
- Eupen 5128
- LDF4-50A
- HPL50-1/2
- 10D-SFCR
- HFC-1/2"



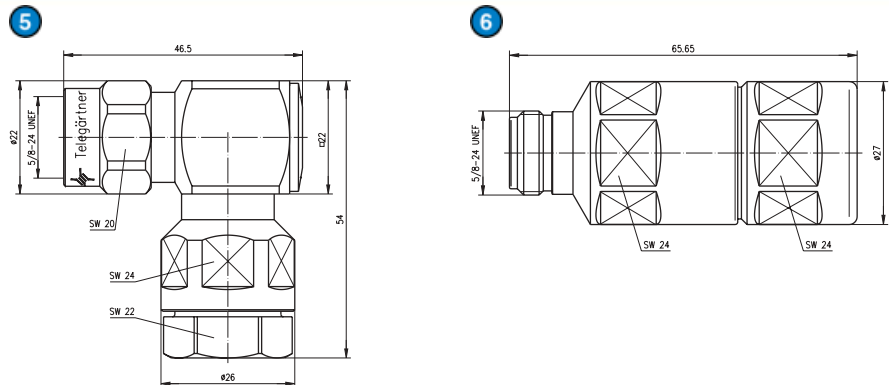
Series	Design	Type	Weight	Order-No.	Assembly	Tool		Fig.
						Hand	Electric	
7-16	Straight plug	SIMFix Pro	180 g	J01120B0085	B78	N00091A0015	N00091A0018	1
7-16	Angle plug	Short	220 g	J01120A0026	B42	-	-	2
7-16	Straight jack	SIMFix Pro	160 g	J01121B0136	B78	N00091A0015	N00091A0018	3
N	Straight plug	SIMFix Pro	180 g	J01020B0141	B78	N00091A0015	N00091A0018	4
N	Angle plug	Short	180 g	J01020A0044	B42	-	-	5
N	Straight jack	SIMFix Pro	160 g	J01021B0174	B78	N00091A0015	N00091A0018	6

Stripping Tools

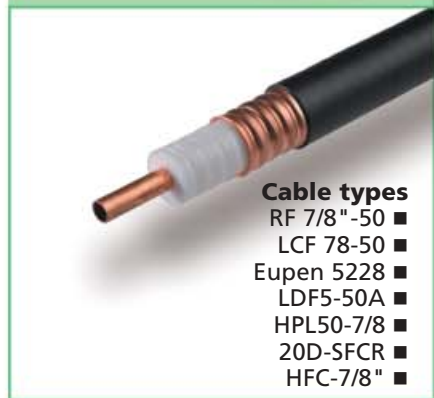
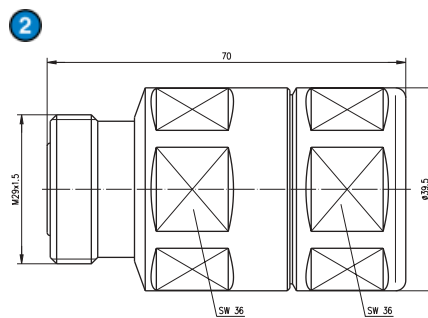
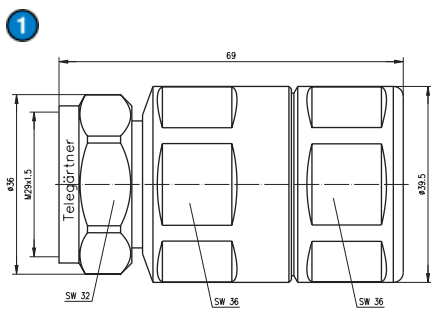


for electrical drills

manual

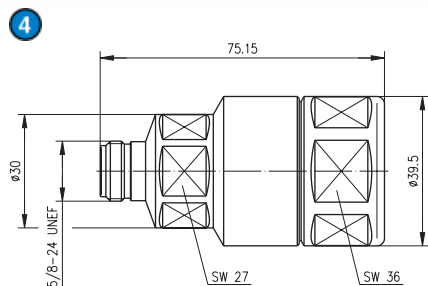
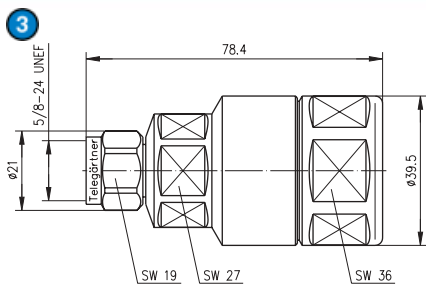


Connectors for 7/8" corrugated cables



- Cable types**
- RF 7/8" -50 ■
 - LCF 78-50 ■
 - Eupen 5228 ■
 - LDF5-50A ■
 - HPL50-7/8 ■
 - 20D-SFCR ■
 - HFC-7/8" ■

Series	Design	Type	Weight	Order-No.	Assembly	Tool		Fig.
7-16	Straight plug	SIMFix Pro	300 g	J01120B0084	B79	Hand		1
7-16	Straight jack	SIMFix Pro	320 g	J01121B0132	B79	Electric		2
N	Straight plug	SIMFix Pro	300 g	J01020B0142	B79	N00091A0014	N00091A0019	3
N	Straight jack	SIMFix Pro	320 g	J01021B0175	B79	N00091A0014	N00091A0019	4



for electrical drills

manual

1 1/4"

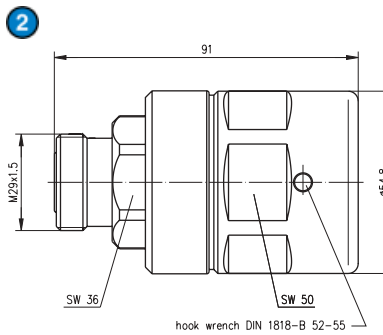
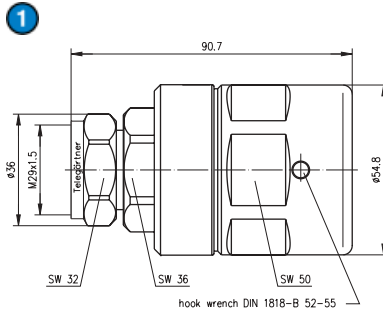


Connectors for 1 1/4" corrugated cables



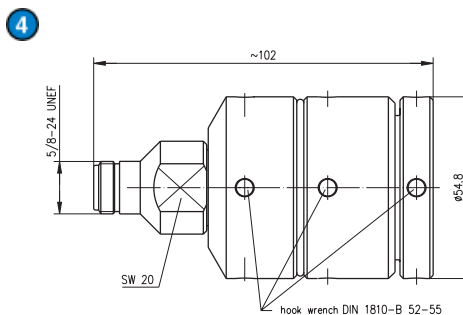
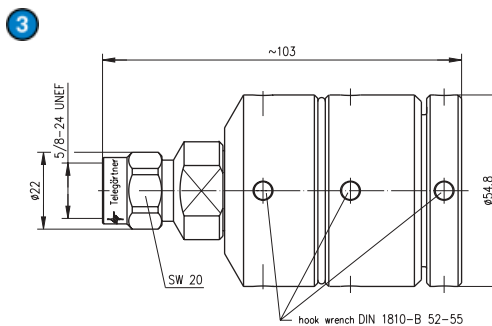
Cable types

- RF 1 1/4"-50
- LCF 114-50
- Eupen 5328
- LDF6-50A
- HPL50- 1 1/4



Series	Design	Type	Weight	Order-No.	Assembly	Tool	Fig.
7-16	Straight plug	SIMFix Pro	580 g	J01120B0087	B80	R00200A0011	1
7-16	Straight jack	SIMFix Pro	580 g	J01121B0138	B80	R00200A0011	2
N	Straight plug	Standard	790 g	J01020A0085	B54	-	3
N	Straight jack	Standard	790 g	J01021A0127	B54	-	4

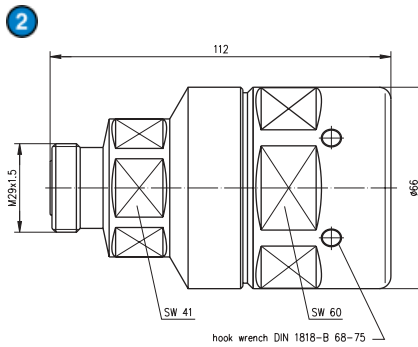
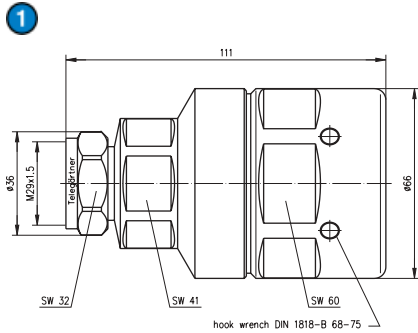
Termination Tool Set for 1 1/4" + 1 5/8" SIMFix Pro Order-No. R00200A0011



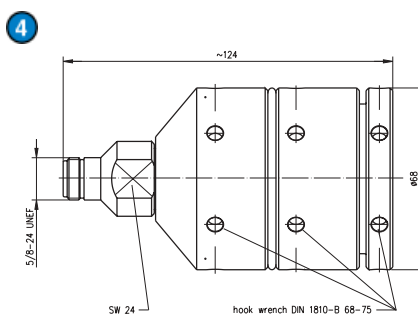
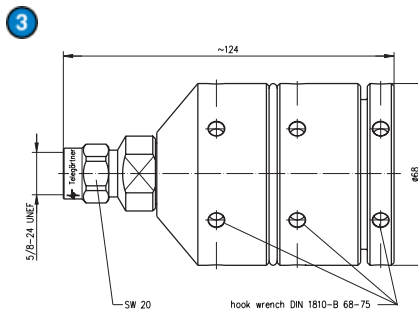
Connectors for 1 5/8" corrugated cables



- Cable types**
- RF 1 5/8"-50 ■
 - LCF 158-50 ■
 - Eupen 5438 ■
 - LDF7-50A ■
 - HPL50-1 5/8" ■
 - HFC-1 5/8" ■



Series	Design	Type	Weight	Order-No.	Assembly	Tool	Fig.
7-16	Straight plug	SIMFix Pro	900 g	J01120B0088	B81	R00200A0011	1
7-16	Straight jack	SIMFix Pro	900 g	J01121B0139	B81	R00200A0011	2
N	Straight plug	Standard	1300 g	J01020A0083	B55	-	3
N	Straight jack	Standard	1300 g	J01021A0058	B55	-	4



Termination Tool Set for 1 1/4" + 1 5/8" SIMFix Pro
Order-No. R00200A0011



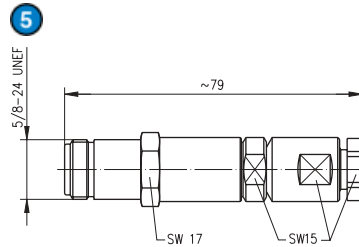
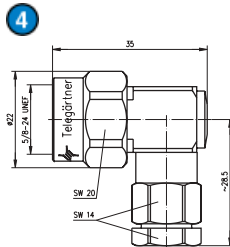
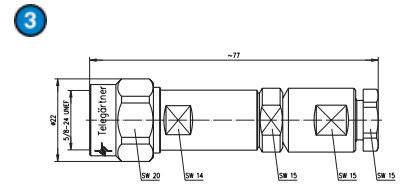
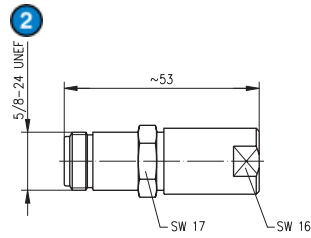
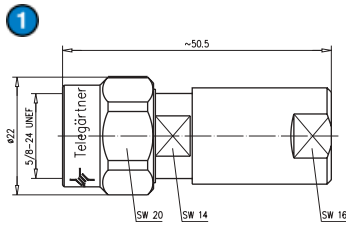


Connectors for 1/4" and 3/8" corrugated cables, RG-213 and RG-214 cables

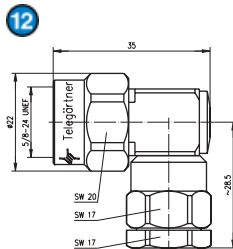
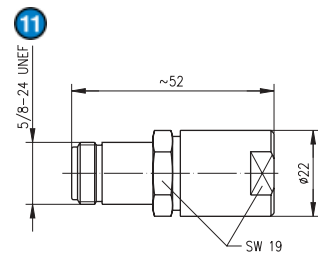
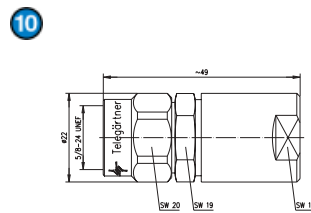
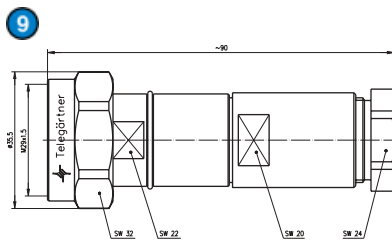
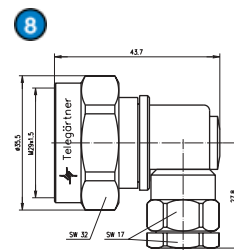
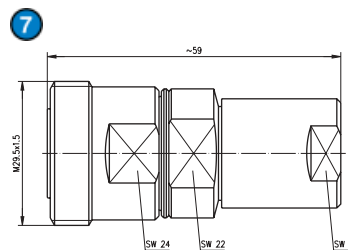
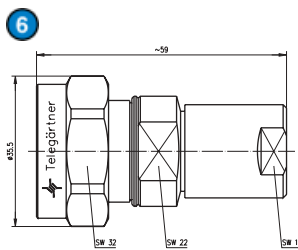


Ø	Cable	Series	Design	Type	Weight	Order-No.	Assembly	Fig.
1/4"	CF 14-50J; Eupen 5062; HPL 50-1/4	N	Straight plug	Standard	70 g	J01020A0028	B25	1
		N	Straight jack	Standard	70 g	J01021A0043	B25	2
	FSJ1-50; RFF 1/4" Cu2Y-50; SCF 14-50J; Eupen 5042	N	Straight plug	Standard	100 g	J01020A0033	B35	3
		N	Angle plug	Short	70 g	J01020A0126	B62	4
		N	Straight jack	Standard	100 g	J01021A0106	B35	5
3/8"	Eupen 5088; RF 3/8" -50; LCF 38-50J; HPL50-3/8	7-16	Straight plug	Standard	150 g	J01120A0019	B31	6
		7-16	Straight jack	Standard	150 g	J01121A0043	B31	7
	LDF2-50	7-16	Straight plug	Standard	150 g	J01120A0022	B31	6
		7-16	Straight jack	Standard	150 g	J01121A0045	B31	7
	SCF 38-50J	7-16	Angle plug	Short	140 g	J01120A0034	D07	8
	Flexwell 3/8" Cu2Y-50	7-16	Straight plug	Standard	200 g	J01120A0733	B08	9
	Eupen 5088; RF 3/8" -50; LCF 38-50J; HPL50-3/8	N	Straight plug	Standard	90 g	J01020A0010	B29	10
		N	Straight jack	Standard	90 g	J01021A0041	B29	11
	LDF2-50	N	Straight plug	Standard	90 g	J01020A0031	B29	10
		N	Straight jack	Standard	90 g	J01021A0045	B29	11
	SCF 38-50J	N	Angle plug	Short	75 g	J01020A0124	D07	12
	RG 213/214	RG-213/U	7-16	Straight plug	Standard	100 g	J01120A0732	B09
7-16			Straight jack	Standard	100 g	J01121A0011	B21	14
RG-214/U		7-16	Straight plug	Standard	100 g	J01120A0731	B09	13
		7-16	Straight jack	Standard	100 g	J01121A0012	B21	14
RG-213/U RG-214/U		N	Straight plug	Standard	100 g	J01020H1070	B01	15
		N	Straight jack	Standard	100 g	J01021H1076	B04	16

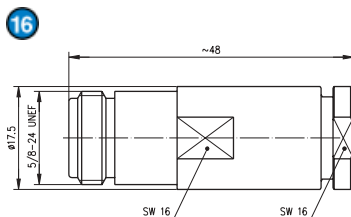
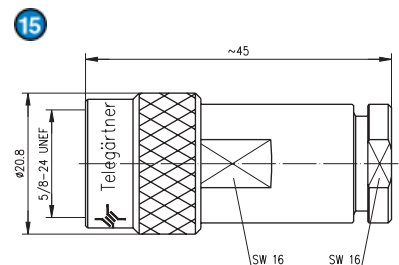
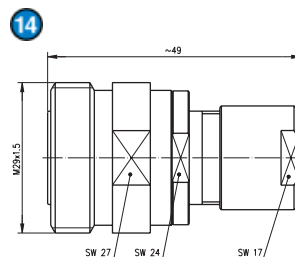
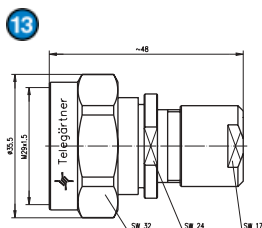
Connectors for 1/4"



Connectors for 3/8"



Connectors for RG-213, RG-214



7-16 (DIN) Connectors Overview

Ø	Cable	Cable type	Design	Order-No.	Type	IP Class	Weight	Assembly
	RG-213/U	B	Straight plug	J01120A0732	Standard	IP 67	100 g	B09
			Straight jack	J01121A0011	Standard	IP 67	100 g	B21
	RG-214/U	B	Straight plug	J01120A0731	Standard	IP 67	100 g	B09
			Straight jack	J01121A0012	Standard	IP 67	100 g	B21
3/8"	Eupen 5088; RF 3/8"-50; LCF 38-50J; HPL50-3/8	F	Straight plug	J01120A0019	Standard	IP 68	150 g	B31
			Straight jack	J01121A0043	Standard	IP 68	150 g	B31
	LDF2-50	F	Straight plug	J01120A0022	Standard	IP 68	150 g	B31
			Straight jack	J01121A0045	Standard	IP 68	150 g	B31
	SCF 38-50J	J	Angle plug	J01120A0034	Short	IP 54	140 g	D07
	Flexwell 3/8" Cu2Y-50	F	Straight plug	J01120A0733	Standard	IP 67	200 g	B08
1/2" Flex	RFF1/2"-50; FSJ-50B; UCF 12-50J; SCF 12-50J; Eupen 5092; HFSC-1/2"-SF; HPL50-1/2-SF	J	Straight plug	J01120A0073	SIMFix	IP 67	170 g	B65
			Straight plug	J01120A0077	SIMFix Plus	IP 68	170 g	B68
			Angle plug	J01120A0042	Short	IP 54	250 g	B48
			Straight jack	J01121A0114	SIMFix	IP 67	160 g	B65
			Straight jack	J01121A0120	SIMFix Plus	IP 68	160 g	B68
1/2"	RF 1/2"-50; LCF 12-50; Eupen 5128; LDF4-50A; HPL50-1/2; HFC-1/2"; 10D-SFCR	F/X	Straight plug	J01120B0085	SIMFix Pro	IP 68	180 g	B78
			Angle plug	J01120A0026	Short	IP 54	220 g	B42
			Straight jack	J01121B0136	SIMFix Pro	IP 68	160 g	B78
7/8"	RF 7/8"-50; LCF 78-50; Eupen 5228; LDF5-50A; HPL50-7/8; HFC-7/8"; 20D-SFCR	F	Straight plug	J01120B0084	SIMFix Pro	IP 68	300 g	B79
			Straight jack	J01121B0132	SIMFix Pro	IP 68	320 g	B79
	RFXT 7/8"-50	X	Straight plug*	J01120A0050	SIMFix	IP 67	450 g	B53
			Straight jack*	J01121A0086	SIMFix	IP 67	440 g	B53
	RFF 7/8"-50	J	Straight plug	J01120A0051	Short	IP 54	265 g	B52
			Straight jack	J01121A0090	Short	IP 54	255 g	B52
1 1/4"	RF 1 1/4"-50; RFX 1 1/4"; LCF 114-50; Eupen 5328; LDF6-50; HPL50-1 1/4;	F	Straight plug	J01120B0087	SIMFix Pro	IP 68	580 g	B80
			Straight jack	J01121B0138	SIMFix Pro	IP 68	580 g	B80
1 5/8"	RF 1 5/8"-50; LCF 158"-50; Eupen 5438; LDF7-50; HPL50-1 5/8; HFC-1 5/8"	F	Straight plug	J01120B0088	SIMFix Pro	IP 68	900 g	B81
			Straight jack	J01121B0139	SIMFix Pro	IP 68	900 g	B81

Packaging: Individually packed in PE foil, together with assembly instruction

* With integrated earthing wire

B: Braided Cable
 F: Feeder Cable (with annular corrugated outer conductor)
 J: Jumper Cable (with spiral corrugated outer conductor)
 X: Radiating Cable

N Connectors Overview

Ø	Cable	Cable type	Design	Order-No.	Type	IP Class	Weight	Assembly
	RG-213/U RG-214/U	B	Straight plug	J01020H1070	Standard	IP 67	60 g	B01
			Straight jack	J01021H1076	Standard	IP 67	60 g	B04
1/4"	CF 14-50J;Eupen 5062; HPL50-1/4	F	Straight plug	J01020A0028	Standard	IP 67	70 g	B25
			Straight jack	J01021A0043	Standard	IP 67	70 g	B25
	FSJ1-50; RFF 1/4" Cu2Y-50; SCF 14-50; Eupen 5042	F	Straight plug	J01020A0033	Standard	IP 67	100 g	B35
			Angle plug	J01020A0126	Short	IP 54	70 g	B62
			Straight jack	J01021A0106	Standard	IP 54	100 g	B35
3/8"	Eupen 5088; RF 3/8"-50; LCF 38-50J; HPL50-3/8	F	Straight plug	J01020A0010	Standard	IP 54	90 g	B29
			Straight jack	J01021A0041	Standard	IP 54	90 g	B29
	LDF2-50	F	Straight plug	J01020A0031	Standard	IP 54	90 g	B29
			Straight jack	J01021A0045	Standard	IP 54	90 g	B29
	SCF 38-50J (HCF 3/8")	J	Angle plug	J01020A0124	Short	IP 54	75 g	D07
1/2" Flex	RFF1/2"-50; FSJ-50B; UCF 12-50J; SCF 12-50J; Eupen 5092; HPL50-1/2; HFSC-1/2"-SF	J	Straight plug	J01020A0098	SIMFix	IP 67	170 g	B65
			Straight plug	J01020A0105	SIMFix Plus	IP 68	170 g	B68
			Angle plug	J01020A0074	Short	IP 54	240 g	B48
			Straight jack	J01021A0156	SIMFix	IP 67	160 g	B65
			Straight jack	J01021A0163	SIMFix Plus	IP 68	160 g	B68
1/2"	RF 1/2"-50; LCF 12-50; Eupen 5128; LDF4-50A; HPL50-1/2; HFC 1/2"; 10D-SFCR;	F/X	Straight plug	J01020B0141	SIMFix Pro	IP 68	180 g	B78
			Angle plug	J01020A0044	Short	IP 54	180 g	B42
			Straight jack	J01021B0174	SIMFix Pro	IP 68	160 g	B78
7/8"	RF 7/8"-50; LCF 78-50; Eupen 5228; LDF5-50A; HPL50-7/8; HFC-7/8"; 20D-SFCR	F	Straight plug	J01020B0142	SIMFix Pro	IP 68	300 g	B79
			Straight jack	J01021B0175	SIMFix Pro	IP 68	320 g	B79
	RFXT 7/8"-50	X	Straight plug*	J01020A0077	SIMFix	IP 67	450 g	B53
			Straight jack*	J01021A0052	SIMFix	IP 67	450 g	B53
	RFF 7/8"-50	J	Straight plug	J01020A0099	Short	IP 54	265 g	B52
			Straight jack	J01021A0157	Short	IP 54	265 g	B52
1 1/4"	RF 1 1/4"-50; RFX 1 1/4"-50; Eupen 5328; LDF6-50; HPL50-1 1/4;	F	Straight plug	J01020A0085	Standard	IP 68	790 g	B54
			Straight jack	J01021A0127	Standard	IP 68	790 g	B54
1 5/8"	RF 1 5/8"-50; Eupen 5438; LDF7-50; HPL50-1 5/8; LCF 158-50J; HFC-1 5/8"	F	Straight plug	J01020A0083	Standard	IP 68	1300 g	B55
			Straight jack	J01021A0058	Standard	IP 68	1300 g	B55

Packaging: Individually packed in PE foil, together with assembly instruction

* With integrated earthing wire

B: Braided Cable
F: Feeder Cable (with annular corrugated outer conductor)
J: Jumper Cable (with spiral corrugated outer conductor)
X: Radiating Cable

Surge Suppressors

To protect against EMP caused by lightning strikes in the direct vicinity of base stations, Telegärtner has developed a range of surge suppressors with 7/16- and N-Series interfaces. There are two different functional designs:

- Surge suppressors with Gas Discharge Tube
- Quarter Wavelength Shorting Stub - with or without DC pass



Quarter-Wavelength Shorting Stub



These surge suppressors act like narrow bandpass filters. Only a narrow bandwidth is allowed to pass; other frequencies are shorted and discharged to ground. The design of these surge suppressors involves a direct and solid short-circuit between the centre and outer conductor of the coaxial device.

This short-circuit path, in the form of a coaxial line and of a precisely defined length, is designed to have an electrical length equivalent to one quarter wavelength ($\lambda/4$) of the signal frequency to be transmitted. As an alternating voltage of the correct frequency passes along the quarter-wavelength shorting stub it experiences a 90° phase angle rotation, is then reflected totally at the short (180° phase angle rotation) and finally travels back along the quarter wavelength stub (= a further phase angle rotation of 90°). This represents a total phase angle rotation of 360° . The reflected signal and the incident signal are in phase and the operating signal does not see the short.

It is, therefore, not affected by it. However, if an alternating voltage of a different frequency is present, then these special factors are not given and the energy is short-circuited (= discharged to ground).

New quarter-wave shorting stub protectors with DC pass

New at Telegaertner are quarter-wave stub protectors, which - as is the case with gas capsule protection devices - allow a DC current to pass in order to feed, for example, mast top antennas (MTAs).

The advantage of these new quarter wave stub protectors (as opposed to the gas discharge types) is that they retain the excellent transmission and PIM characteristics of the quarter-wave shorting stub protectors.

Advantages

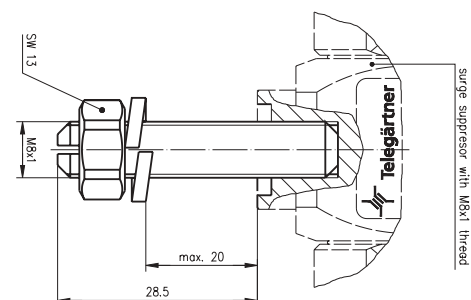
- Very high discharge currents are possible
- Very good transmission and intermodulation characteristics
- Complete discharge of the excess voltage
- Automatically operational again after the surcharge subsides, no special precautions necessary to protect the D.C. supply current
- Matching of the frequency range up to a range of over 10 GHz possible
- Maintenance free and waterproof
- Since only the desired frequency range is allowed to pass, there is an additional, useful filter effect (excluding odd multiples of the quarter wavelength frequency)

Applications

Quarter-wave stub protectors are used particularly in transmission paths between antenna and base station, as well as where transmit and receive signals use a common cable, involving high power signal levels. In principle, the use of quarter-wave shorting stubs in the receive path can also be recommended. In the event of a pre-amplifier being used at the Rx end, then it would be necessary to use the new special quarter-wave shorting stub protector with D.C. pass.

Accessory:

Fixing Kit: H06000A0024



Product Overview

$\lambda/4$ Shorting stub types

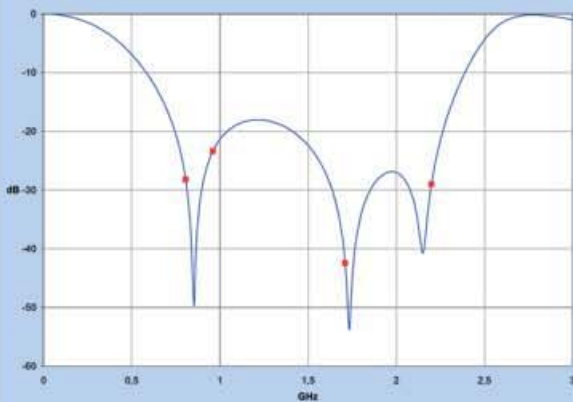
Type	Frequency range (MHz)									Fig.
	380-430	800-900	806-960 1710-2200	870-970	1700-1900	1700-2300	1850-2000	1920-2170	2250-2450	
7-16 f-f	J01125A0020 ⁽⁹⁾	J01125A0007 ⁽¹⁾	J01125A0023 ⁽¹⁰⁾	J01125A0000 ⁽¹⁾	J01125A0002 ⁽⁴⁾		J01125A0009 ⁽⁴⁾	J01125A0032 ⁽⁴⁾		1
7-16 m-f	J01125A0019 ⁽⁹⁾	J01125A0008 ⁽¹⁾	J01125A0024 ⁽¹⁰⁾	J01125A0001 ⁽¹⁾	J01125A0003 ⁽⁴⁾	J01125A0017 ⁽⁴⁾	J01125A0010 ⁽⁴⁾	J01125A0021 ⁽⁴⁾	J01125A0016 ⁽⁷⁾	2
7-16 f-f (Bulkhead)		J01125A0011 ⁽²⁾		EWA940108-00 ⁽²⁾	EWA940108-10 ⁽⁶⁾		J01125A0013 ⁽⁶⁾			3
7-16 m-f (Bulkhead)		J01125A0012 ⁽³⁾	J01125A0031 ⁽¹⁰⁾	J01125A0006 ⁽³⁾	J01125A0015 ⁽⁵⁾		J01125A0014 ⁽⁵⁾			4
7-16 f-f DC-Pass*			J01125A0029 ⁽¹⁰⁾							5
7-16 m-f DC-Pass*			J01125A0030 ⁽¹⁰⁾							6
N f-f		J01028A0015 ⁽⁴⁾		EWA950200-00 ⁽⁸⁾	EWA50200-30 ⁽⁴⁾	J01028A0020 ⁽⁴⁾	J01028A0017 ⁽⁴⁾		J01028A0019 ⁽⁷⁾	7
N m-f		J01028A0016 ⁽¹⁾		J01028A0008 ⁽¹⁾	J01028A0009 ⁽⁴⁾	J01028A0021 ⁽⁴⁾	J01028A0018 ⁽⁴⁾		J01028A0022 ⁽⁷⁾	8
N f-f (Bulkhead)	J01028A0029 ⁽⁹⁾					J01028A0028 ⁽¹¹⁾				9

Dimensions (compare to drawings):

7) Dimension a=97 mm; 2) Dimension a=98 mm; 3) Dimension a=102 mm; 4) Dimension a=64 mm; 5) Dimension a=69 mm; 6) Dimension a=65 mm; 7) Dimension a=59 mm; 8) Dimension a=92 mm; 9) Dimension a=178 mm; 10) Dimension a=72 mm; 11) Dimension a=58,5 mm

* 100 V (Operating voltage)

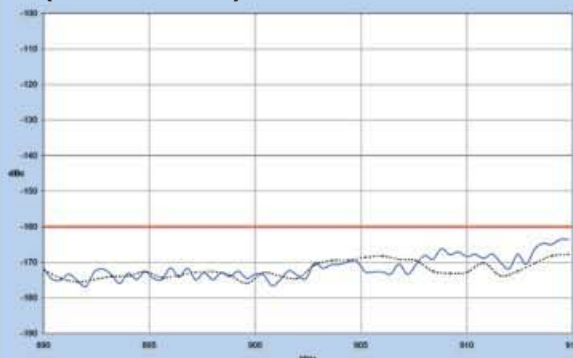
Return Loss Tri-Band-Type (J01125A0024)



Marker

- 1: 810 MHz = -27,3 dB
- 2: 960 MHz = -25,6 dB
- 3: 1710 MHz = -35,4 dB
- 4: 2200 MHz = -33,9 dB

Intermodulation Performance (PIM 3rd. order) < -160 dBc



Technical Data

Mechanical Characteristics

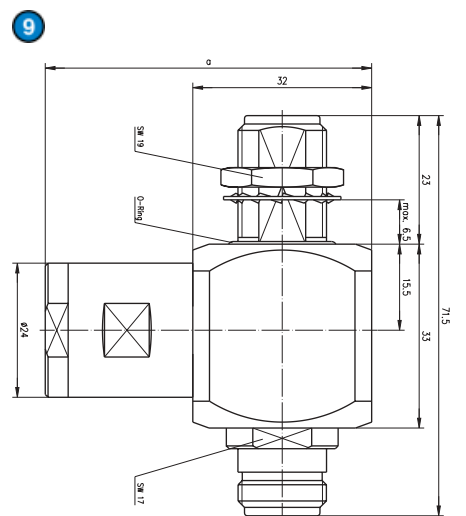
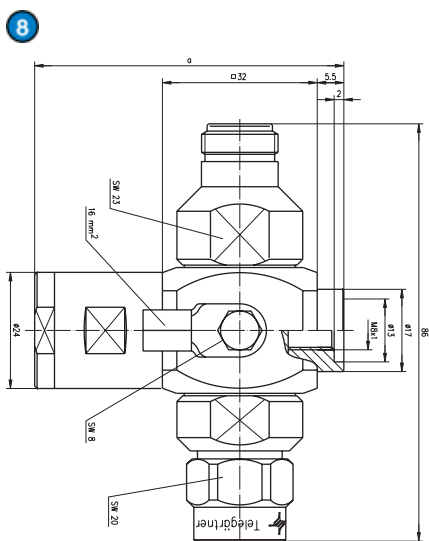
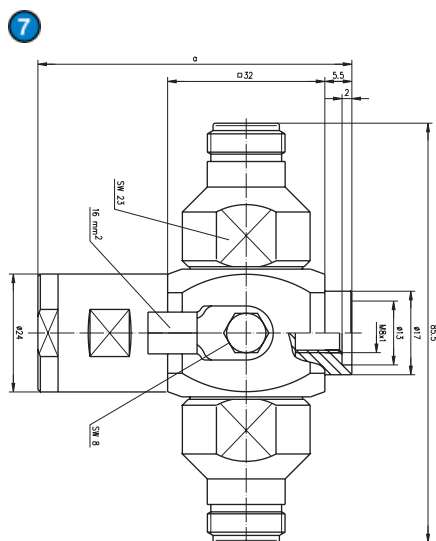
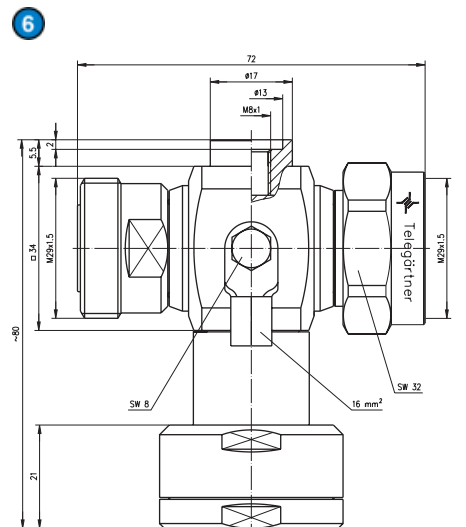
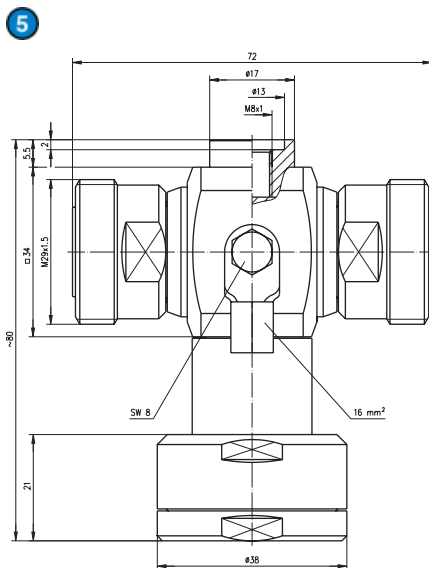
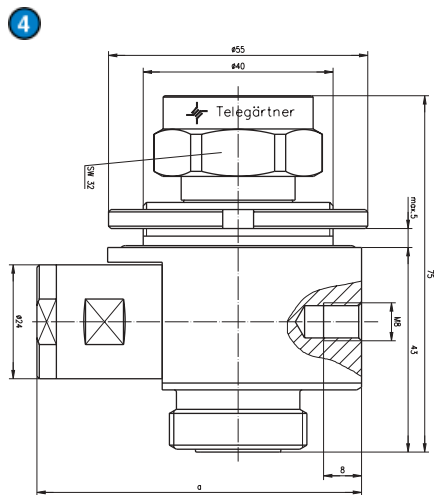
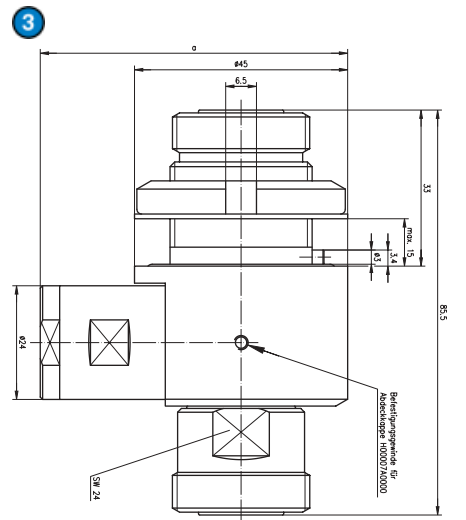
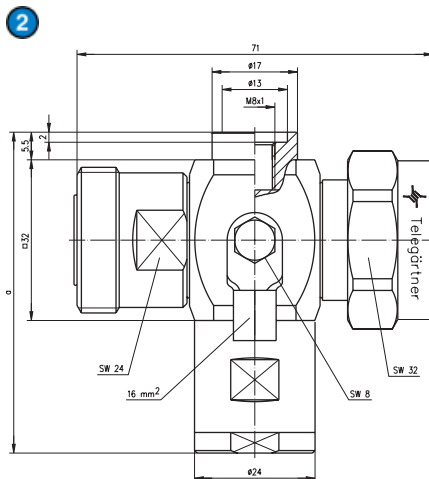
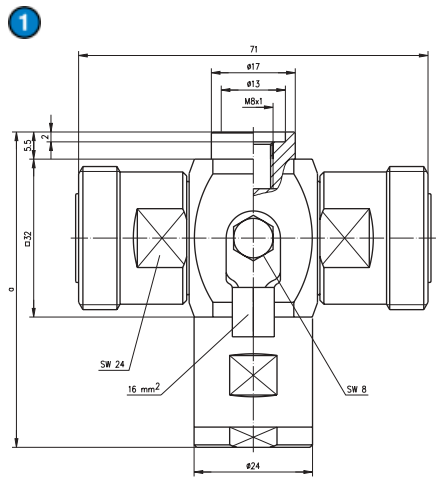
Materials	Spring contact	CuBe2
	Other metal parts	CuZn39Pb3
	Insulators	PTFE
Finish	Gaskets	Silicon
	Spring contact	Cu2Ag5
Coupling torque series N	Other metal parts	CuSnZn3
		4-6 Nm
Coupling torque series 7-16		25-35 Nm
Durability (mating cycles)		> 500

Thermal and Climatic Characteristics

Category to DIN IEC 68 Part 1	Series N	40/155/21
	Series 7-16	55/155/56
Protection level to DIN 40050/IEC 529		IP 67

Electrical Characteristics

VSWR		< 1.15
Insertion loss		< 0.1 dB
Intermodulation	Intermodulation product 3rd Order (typical)	
	at 800-1000 MHz	-160 dBc
	2 unmodulated test-signals at 43dBm (20W)	
	at 1600-2000 MHz	-155 dBc
max. power at 2200 MHz		500 W
Max. Discharge Current	Standard Types of quarter-wave shorting stubs	100 kA (8/50 μ s test impulses)
	Types with D.C Pass	30 kA (8/50 μ s test impulses, multiple)
Maximum Working Voltage for D.C.-pass types		85 V



Surge Suppressors with Gas Discharge Tube

Voltage Surge Protection with Gas Discharge Tube

The method of operation of this device can be likened in principle to an electrical switch which, when a certain voltage (d.c. sparkover voltage) is reached, switches the inner conductor to ground. The design of this device consists of a Gas Discharge Tube installed directly between the inner and outer conductors of a coaxial line. When a higher voltage than the impulse sparkover voltage (= overvoltage) appears on the line, the Gas Discharge Tube will fire and, depending on the prevalent energy, a glow discharge of between 75-90V (current in milliampere range) or ionisation with an arc voltage of 10-20V (currents ranging from amps to kiloamps) takes place. When the energy subsides (= is converted to heat), the discharge extinguishes itself automatically. After a cooling-down period of 30 secs., the Gas Discharge Tube is fully operational again. After several very high discharge currents occurring within a few seconds of each other, the functionality of the device may be impaired. It is recommended, therefore, that the gas capsules are replaced at certain intervals.

Advantages

- Broad-band applications (to around 2.5 GHz)
- Transmission of DC voltages possible, e.g. remote feeding of antenna amplifiers over the coaxial cable
- Maximum impulse Discharge current up to 40 KA
- Different variants available from 75 to 1400 V
- Installation in a waterproof unit

Applications

The main usage of the surge suppressor with gas discharge tube is between the antenna and the base station. For high power signal transmission lines, $\lambda/4$ surge arrestors are recommended, as the non-linear characteristics of the gas cartridge can produce intermodulation products.



Selection of suitable lightning protector with gas discharge tube

Generally speaking, the spark-over voltage of the discharge tube should be kept as low as possible. However, in order to avoid an unintentional ignition of the tube, the spark-over voltage should be at least twice the peak voltage occurring under normal working conditions.

Example:

$P = 100\text{W}; Z=50 \Omega$ (with VSWR 1:1)

Peak voltage = $u_{\text{max}} = \sqrt{P \times Z} = 71 \text{ V}$
Recommended spark-over voltage =
 $2 \times u_{\text{max}} = 142 \text{ V}$

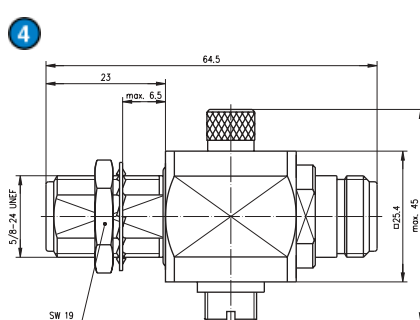
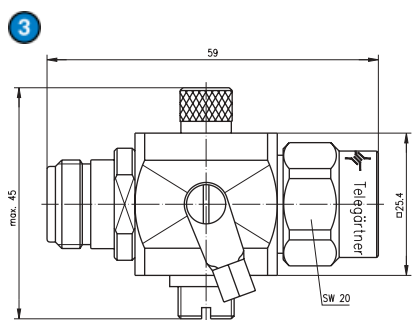
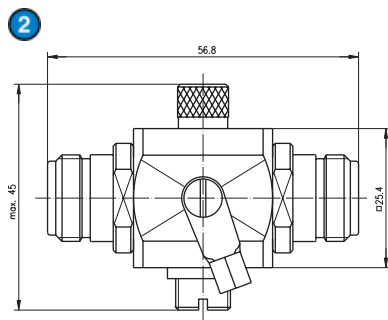
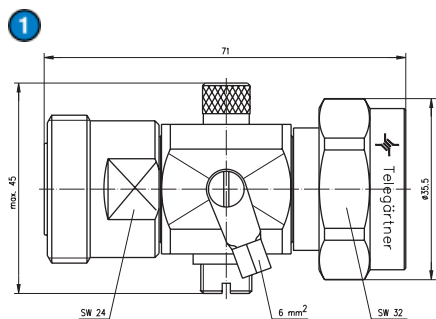
Most suitable Lightning Protector is
145 V Type (J01028A0006)

Product Overview

Gas Discharge Tube Types

Type	Nominal DC spark-over voltage								Fig.
	75 V	90 V	145 V	230 V	470 V	600 V	800V	1000 V	
7-16 m-f	-	EW940021-00	-	J01125A0004	-	-	EW940021-00	-	1
N f-f	J01028A0004	J01028A0000	J01028A0006	J01028A0002	J01028A0010	J01028A0011	J01028A0025	J01028A0026	2
N m-f	J01028A0005	J01028A0001	J01028A0007	J01028A0003	-	J01028A0014	-	EW930092-20	3
N f-f (Bulkhead)	-	J01028A0023	-	J01028A0024	-	-	-	-	4

Packaging: Individually packed in PE foil, together with assembly instruction. Mating-face of 7-16 jacks are protected with a PE-cap



Technical Data

Mechanical Characteristics

Materials	Spring contact	CuBe2
	Other metal parts	CuZn39Pb3
	Insulators	PTFE
Finish	Gaskets	Silicon
	Spring contact	Cu2Ag5
	Other metal parts	CuSnZn3
Coupling torque series N		4-6 Nm
Coupling torque series 7-16		25-35 Nm
Durability (mating cycles)		> 500

Thermal and Climatic Characteristics

Category DIN IEC 68 Part 1	series N	40/155/21
	series 7-16	55/155/56
Protection level to DIN 60529		IP 54

Electrical Characteristics

Nominal DC spark-over voltage	75 V / 90 V / 145 V / 230 V / 350 V / 470 V / 600 V / 800 V / 1000 V
Impulse Discharge Current	2500x10 A (10/1000 µs) 1000x500 A (10/1000 µs) 5x20000 A (8/20 µs) 1x40000 A (8/20 µs)
VSWR	< 1.06/1.5 GHz
Insertion loss	< 0.1 dB/1.5 GHz



Jumper Cables IP 68

The jumper cables are fitted at both ends with 7-16 connectors and/or N connectors. The cable is a highly flexible 1/2" corrugated type. The very low intermodulation products of the jumper cables are tested on special intermodulation test systems. They are tested up to a frequency of 2,2 GHz. The jumper cables are waterproof and sealed to allow external use. Intermodulation test results for the Jumper cables are also available. (Order-N° U00100A0000)

Protection Classification IP 68

The 7-16 connectors also incorporate an additional seal between centre contact and connector housing in the mating-face (barrier-seal).

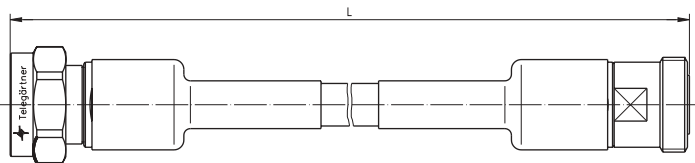
A 360° inductive solder of the outer conductor - apart from contributing to excellent PIM and Return Loss Characteristics - also provides additional protection against ingress of moisture in the event of the cable sheath being damaged

- Very low intermodulation products (IMP3)
- Hexagonal fixing nuts for correct torque and high-contact pressure
- Waterproof for external use
- Excellent return loss and attenuation
- Fully soldered inner- and outer conductor

3/8" Jumper cables and other cable size available on request

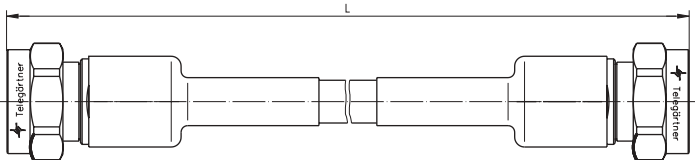
Plug - Jack (7-16)

Cable Length	Order-No.	Weight
0.5 m	L00010D0550	425 g
1.0 m	L00010D0551	550 g
1.5 m	L00011D0182	675 g
2.0 m	L00011D0183	800 g
2.5 m	L00012D0061	925 g
3.0 m	L00012D0062	1050 g
4.0 m	L00013D0056	1300 g
5.0 m	L00013D0057	1550 g

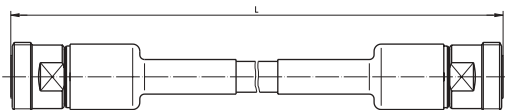


Plug - Plug (7-16)

Cable Length	Order-No.	Weight
0.5 m	L00010D0552	425 g
1.0 m	L00010D0553	550 g
1.5 m	L00011D0184	675 g
2.0 m	L00011D0185	800 g
2.5 m	L00012D0063	925 g
3.0 m	L00012D0064	1050 g
4.0 m	L00013D0058	1300 g
5.0 m	L00013D0059	1550 g

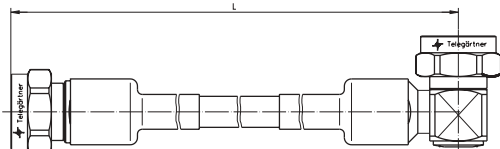


Jack - Jack (7-16)



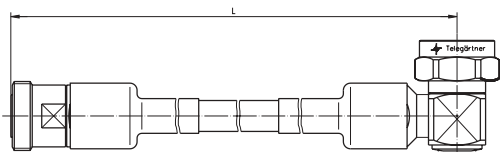
Cable Length	Order-No.	Weight
0.5 m	L00010D0559	425 g
1.0 m	L00010D0600	550 g
1.5 m	L00011D0198	675 g
2.0 m	L00011D0199	800 g
2.5 m	L00012D0073	925 g
3.0 m	L00012D0074	1050 g
4.0 m	L00013D0073	1300 g
5.0 m	L00013D0074	1550 g

Plug - Angle plug (7-16)



Cable Length	Order-No.	Weight
0.5 m	L00010D0565	425 g
1.0 m	L00010D0566	550 g
1.5 m	L00011D0186	675 g
2.0 m	L00011D0187	800 g
2.5 m	L00012D0065	925 g
3.0 m	L00012D0066	1050 g
4.0 m	L00013D0061	1300 g
5.0 m	L00013D0062	1550 g

Jack - Angle plug (7-16)



Cable Length	Order-No.	Weight
0.5 m	L00010D0567	425 g
1.0 m	L00010D0568	550 g
1.5 m	L00011D0188	675 g
2.0 m	L00011D0189	800 g
2.5 m	L00012D0067	925 g
3.0 m	L00012D0068	1050 g
4.0 m	L00013D0063	1300 g
5.0 m	L00013D0064	1550 g

Technical Data (7-16 types)

Mechanical Characteristics

Materials	Spring contacts	CuBe2
	Other metal parts	CuZn39Pb3
	Insulator	PTFE
Finish	Gaskets	Silicon
	Spring contacts	Cu2Ag5
Coupling torque	Outer surface	Cu2Ag5
		25-35 Nm

Cable

- 1/2" highly flexible spiral corrugated cable
- Colour: black (standard) or grey RAL7047 (option)
- Bend radius min. 30 mm

Thermal and Climatic Characteristics

Temperature range	-40°C - +60°C
Relative humidity	10% - 100%
Corrosion and UV resistant	
Protection to DIN 40050/IEC 529	IP 68

Electrical Characteristics

Return loss (VSWR)	up to 1000 MHz	-38 dB (1.02:1) typical -30 dB (1.06:1) min.
	up to 2200 MHz	-32 dB (1.05:1) typical -28 dB (1.08:1) min.
Attenuation (dB)	up to 1000 MHz	0,11 dB/m
	up to 2200 MHz	0.17 dB/m (+0.1 dB for connectors)
Power handling	up to 1000 MHz	500 W min.
	up to 2200 MHz	300 W min.
Impedance		50 Ω (±2 Ω)
Contact potential		no dissimilar metal surfaces
Voltage rating		1100 V
Velocity of propagation		78.5% min.
Intermodulation	Intermodulation products 3rd Order (typical) 2 unmodulated test signals each at 43dBm (20 W)	
	to 1000 MHz	-165dBc (-122 dBm) typ. -157 dBc (-114 dBm) min.
	to 2200 MHz	-165 dBc (-122 dBm) typ. -157 dBc (-114 dBm) min.

Adaptors and dust caps, 7-16 and N

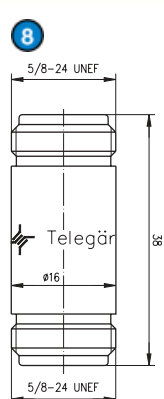
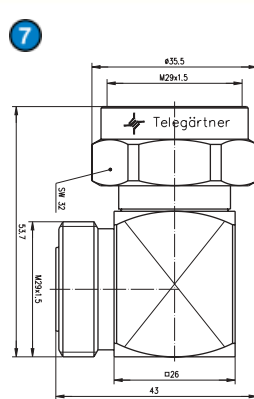
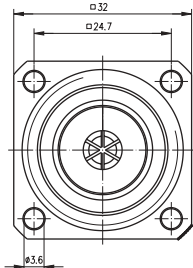
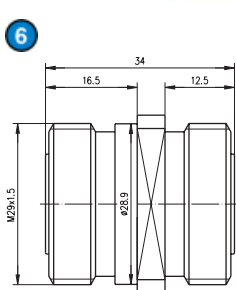
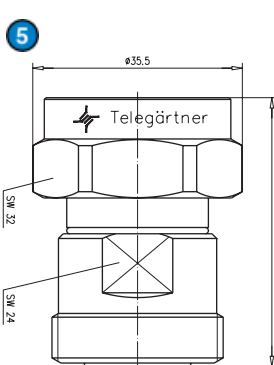
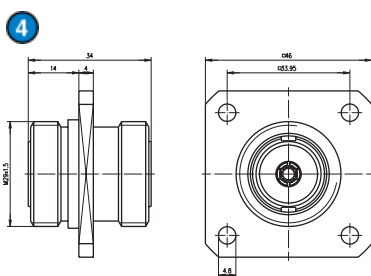
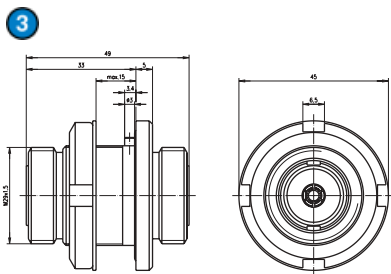
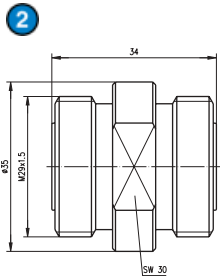
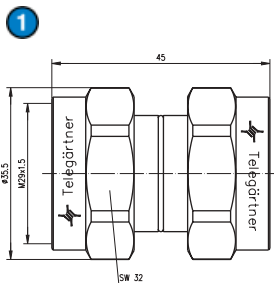
The adaptors in the 7-16 and N series are waterproof and suitable for external use. The connector plug is fitted with a hexagonal nut and should be connected utilising the recommended torque (7-16: 25 - 35 Nm; N: 4-6 Nm). This ensures a lasting connection with low return loss and excellent intermodulation characteristics.

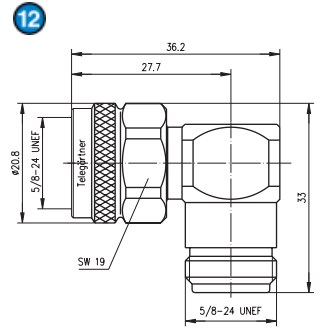
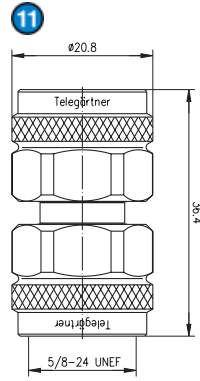
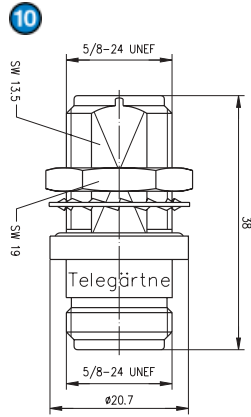
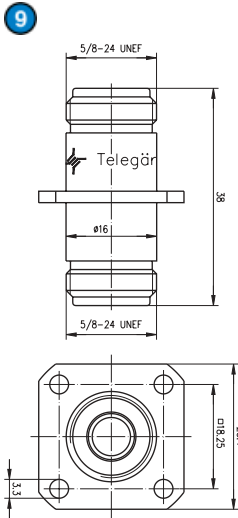
Adaptors

Type	Type	Order-No.	Assembly	Fig.
7-16 adaptor	Plug-Plug	J01123A0000		1
7-16 adaptor IEC Type 169-4 IEC-6	Jack-Jack	J01123A0001		2
7-16 adaptor IEC Type 169-4 IEC-8	Jack-Jack, bulkhead	J01123A0003	Z61	3
7-16 adaptor with flange IEC Type 169-4 IEC-7	Jack-Jack, flange	J01123A0002	Z60	4
7-16 adaptor	Plug-Plug	J01123A0006		5
7-16 adaptor	Jack-Jack	J01123A0007	Z12	6
7-16 angle adaptor	Plug-Plug	J01123A0004		7
N adaptor	Jack-Jack	J01024A0004		8
N adaptor with flange	Jack-Jack, flange	J01024A0005		9
N adaptor	Jack-Jack, bulkhead	J01024A0006	Z10	10
N adaptor	Plug-Plug	J01024J1094		11
N angle adaptor	Plug-Plug	J01024J1096		12

Packing:

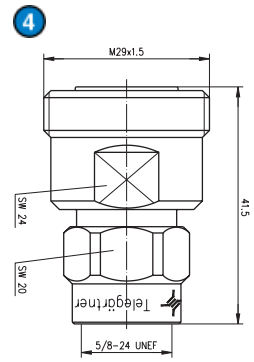
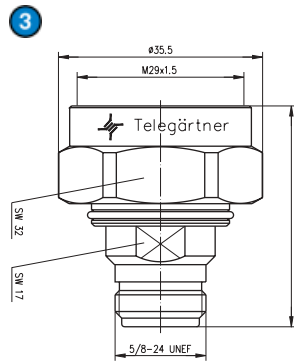
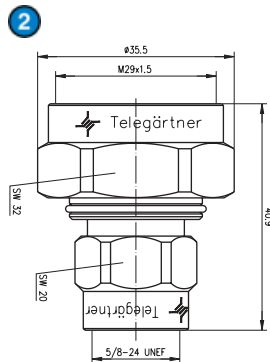
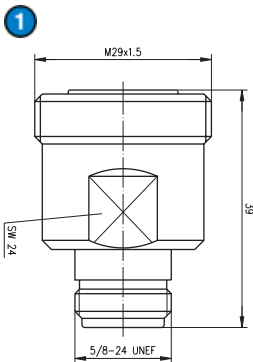
Individually packed in PE foil. Mating-face of 7-16 jacks are protected with a PE-cap





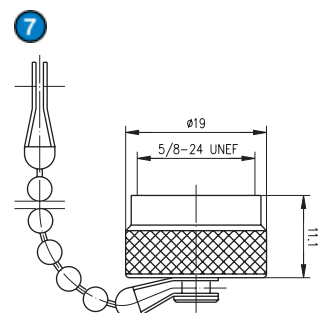
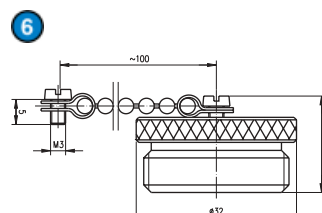
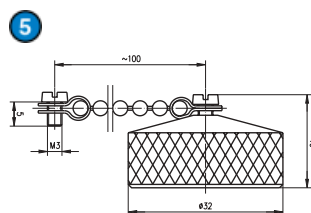
Inter Series Adaptors 7-16 - N

Type	Order-No.	Fig.
7-16 Jack-N Jack	J01122A0008	1
7-16 Plug-N Plug	J01122A0009	2
7-16 Plug-N Jack	J01122A0010	3
7-16 Jack-N Plug	J01122A0011	4



Dust caps

Type	Order-No.	Fig.
7-16 dust cap for Jacks	H00070A0000	5
7-16 dust cap for Plugs	H00070A0001	6
N dust cap for Jacks	H00010A1122	7



Tools and Accessories



Stripping Tools (1/2" and 7/8")

The stripping tools are used for preparing cables for terminating with SIMFix, SIMFix Plus and SIMFix Pro connectors.

Manual stripping tools:

- Precise cable outer jacket removal
- Precise cutting of outer conductor, dielectric and inner conductor
- Edge forming of the outer conductor
- Removal of burrs on the inner conductor
- Adjusting screw for accommodating cable tolerances
- The tool is supplied with a hardened blade (including spare blade) for prolonged use.

Rotating stripping tool for use with a electric power drill

- Exact stripping of cable jacket, outer conductor, dielectric and inner conductor.

Termination Tool set for SIMFix Pro® 1 1/4" + 1 5/8" Connectors

The tool kit includes tools for preparing the cable and for terminating all SIMFix Pro 1 1/4" + 1 5/8" connectors made by Telegärtner. Furthermore there are 2 empty pockets for adding on 1/2" + 7/8" stripping tools.

- Sheath Cutter for 1 1/4" and 1 5/8" corrugated cables
- Sawing Guides 1 1/4", 1 5/8"
- Deburring Tools 1 1/4", 1 5/8"
- Cable knife
- Brush for removing metal shavings
- Spanners for SIMFix Pro 1/2", 7/8", 1 1/4" and 1 5/8"



Cutting Tools

Cutting Tool for SIMFix Pro connectors
J01120B0085, J01121B0136, J01020B0141, J01021B0174
Cutting Tool for SIMFix Pro connectors
J01020A0098, J01021A0156, J01120A0073, J01121A0114
Cutting Tool for SIMFix Plus connectors
J01120A0077, J01121A0120, J01020A0105, J01021A0163
Cutting Tool for SIMFix Pro connectors
J01120B0084, J01121B0132, J01020B0142, J01021B0175
Spare blade (4 large, 1 small) for N00091A0014, N00091A0015
Spare blade (2 round, 1 small) for N00091A0004, N00091A0013
Rotating stripping Tool SIMFix Pro
J01120B0085, J01121B0136, J01020B0141, J01021B0174
Rotating stripping Tool SIMFix Pro
J01120B0084, J01121B0132, J01020B0142, J01021B0175
Termination Tool set for SIMFix Pro connectors
J01120B0087, J01121B0138, J01120B0088, J01121B0139

Cable

1/2"
1/2" (flex)
1/2" (flex)
7/8"
1/2" + 7/8"
1/2" (flex)
1/2"
7/8"
1 1/4" + 1 5/8"

Order-No.

N00091A0015
N00091A0004
N00091A0013
N00091A0014
N00099A0000
N00099A0001
N00091A0018
N00091A0019
R00200A0011

Spanner, Sheath Cutter, Open ended wrench

For terminating connectors on 1 1/4" and 1 5/8" corrugated cables (already included in Tool kit).



Spanner und Sheath Cutter

Spanner DIN 1810-B52-55 for J01120B0087, J01121B0138
 Sheath Cutter for J01120B0087, J01121B0138
 Spanner DIN 1810-B68-75 for J01120B0088, J01121B0139
 Sheath Cutter for J01120B0088, J01121B0139
 Double open ended wrench AF24/27 for J01120B0085, J01121B0136, J01020B0141, J01021B0174, J01020B0142, J01021B0175
 Open ended wrench AF36 for J01120B0084, J01121B0132, J01020B0142, J01021B0175, J01120B0087, J01121B0138

Cable

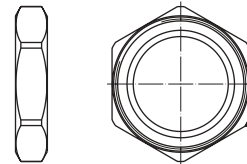
1 1/4"
 1 1/4"
 1 5/8"
 1 5/8"
 1/2" + 7/8"
 7/8" + 1 1/4"

Order-No.

N00050A0001
 N00080A0004
 N00050A0003
 N00080A0005
 N00050A0006
 N00050A0007

Sawing guide

For terminating connectors on 1 1/4" and 1 5/8" corrugated cables (already included in tool kit).



Sawing Guide

Sawing Guide for J01120B0087, J01121B0138
 Sawing Guide for J01120B0088, J01121B0139

Cable

1 1/4"
 1 5/8"

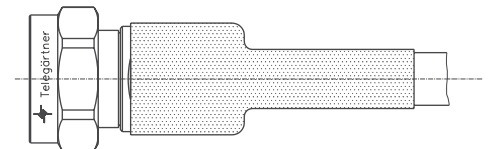
Order-No.

N00091A0016
 N00091A0017

Adhesive Shrink-Sleeves

An adhesive shrink-sleeve is required for the short bodied connector to ensure waterproofing. (Not required for SIMFix, -Plus and -Pro connectors)

These are fitted over the junction between the connector and cable. By applying heat the adhesive process begins, so that the adhesive shrink-sleeve follows the exact contours of the connector and cable junction. This distributes the adhesive on the inside of the sleeve and, on cooling and hardening, provides a watertight joint.



Adhesive Shrink-Sleeves

Adhesive Shrink-Sleeves for short connectors
 Adhesive Shrink-Sleeves for short connectors
 Adhesive Shrink-Sleeves for short connectors

Length

(l=70 mm)
 (l=70 mm)
 (l=100 mm)

Cable

1/4"
 3/8" + 1/2"
 7/8"

Order-No.

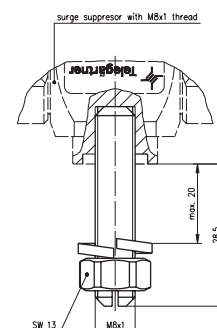
B00101A0008
 B00102A0005
 B00103A0000

Fixing kit for λ/4 Shorting Stubs

For mounting λ/4 Shorting Stubs on (earthing) bus bars.
 Contents: Bolt, hex. locking nut, lock washer

Mounting kit for λ/4 shorting stubs

Order-No. H06000A0024



Classification of Degree of Protection

The degree of protection is classified according to IEC 60529. The coding system used is the IP-Code (International Protection). The coding denotes the level of protection against the ingress of solid bodies (first code number) and the ingress of water (second code number).

Protection against touch and foreign bodies*

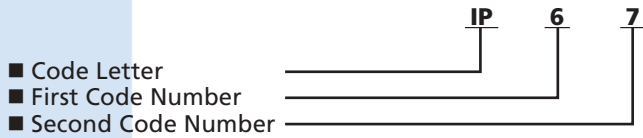
First Code Number	Description
0	No particular protection
1	Protection against ingress of solid foreign bodies with a diameter over 50 mm
2	Protection against solid foreign bodies with a diameter over 12.5 mm
3	Protection against ingress of solid foreign bodies with a diameter over 2.5 mm
4	Protection against ingress of solid foreign bodies with a diameter over 1.0 mm
5	Dust protected
6	Dust-proof

Protection against water*

Second Code Number	Description
0	No particular protection
1	Protection against dripping water
2	Protection against vertically dripping water. There must be no harmful effect on materials tipped (in a container) up to 15° from its normal position.
3	Protection against fine water spray
4	Protection against water spray
5	Protection against water jet
6	Protection against strong water jet
7	Protection against water, when the material is immersed in water
8	The material is suitable for continuous submersion in water

* Definitions see IEC 60529

Example of Classification in Accordance with the IP Code



A housing with **IP** Classification

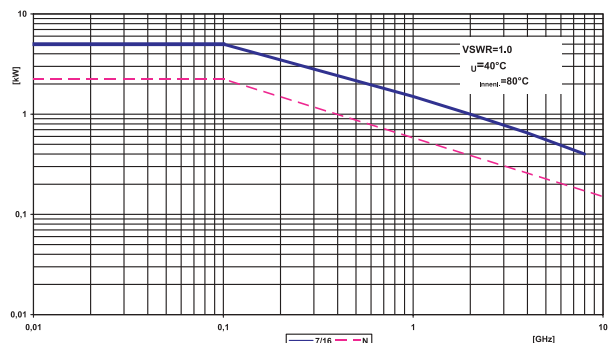
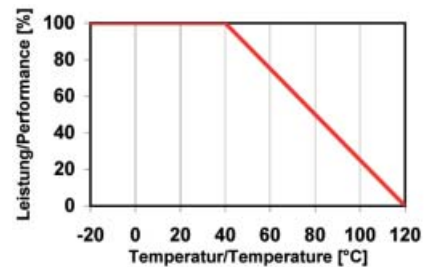
6 - No ingress of dust

7 - When subjected to submersion in water at a defined pressure and for a defined length of time, the ingress of water must be so restricted that no damage is caused. Submersion Bath: Water level above the enclosure: 0,15m measured from the top of the enclosure, 1,0m measured from the bottom of the enclosure. Duration of Test: 30 mins.

TG Specification for Simfix Connectors: height of water level: 25m; is equivalent to 2.5 bar; duration of test: 24 hrs.

Performance Diagrams

Power derating by temperature



Conversion Table

VSWR - Return Loss - Reflection Coefficient

The reflection behavior in coaxial connectors can be described as Return Loss, Reflection Coefficient or Voltage Standing Wave Ratio (VSWR). The relation between these three values is shown in the following table.

Use also our online calculator on our website www.telegaertner.com.

Here you can compute online the relationship of these three sizes to each other.

Return Loss	Reflection Coefficient	VSWR	Return Loss	Reflection Coefficient	VSWR
10	0.316	1.923	30.5	0.030	1.060
10.5	0.298	1.848	31	0.028	1.056
11	0.282	1.780	31.5	0.027	1.054
11.5	0.266	1.726	32	0.025	1.051
12	0.252	1.671	32.5	0.024	1.048
12.5	0.237	1.618	33	0.022	1.045
13	0.224	1.578	33.5	0.021	1.043
13.5	0.211	1.538	34	0.020	1.040
14	0.199	1.497	34.5	0.019	1.038
14.5	0.188	1.462	35	0.018	1.036
15	0.178	1.430	35.5	0.017	1.034
15.5	0.165	1.396	36	0.016	1.032
16	0.158	1.374	36.5	0.015	1.030
16.5	0.150	1.350	37	0.014	1.028
17	0.141	1.329	37.5	0.013	1.027
17.5	0.133	1.304	38	0.013	1.025
18	0.126	1.285	38.5	0.012	1.022
18.5	0.119	1.268	39	0.011	1.021
19	0.112	1.251	39.5	0.011	1.020
19.5	0.106	1.235	40	0.010	1.020
20	0.100	1.220	40.5	0.009	1.018
20.5	0.094	1.208	41	0.009	1.017
21	0.089	1.193	41.5	0.008	1.016
21.5	0.084	1.180	42	0.008	1.015
22	0.079	1.171	42.5	0.008	1.014
22.5	0.075	1.160	43	0.007	1.013
23	0.071	1.151	43.5	0.007	1.012
23.5	0.067	1.142	44	0.006	1.012
24	0.063	1.133	44.5	0.006	1.011
24.5	0.060	1.124	45	0.005	1.011
25	0.057	1.118	45.5	0.005	1.011
25.5	0.053	1.111	46	0.004	1.010
26	0.050	1.105	46.5	0.004	1.009
26.5	0.047	1.100	47	0.004	1.008
27	0.045	1.094	47.5	0.004	1.008
27.5	0.042	1.088	48	0.004	1.008
28	0.040	1.082	48.5	0.004	1.008
28.5	0.038	1.078	49	0.004	1.007
29	0.035	1.073	49.5	0.003	1.007
29.5	0.034	1.069	50	0.003	1.006
30	0.032	1.064			

Errors and omissions excepted!

Telegärtner Karl Gärtner GmbH

Lerchenstr. 35
D-71144 Steinenbronn, Germany
T +49-(0) 71 57 125-100
F +49-(0) 71 57 125-120

Telegärtner Inc.

411 Domenic Court
USA-Franklin Park IL 60131, United States
T +1-630-616-7600
F +1-630-616-8322

Japan Telegärtner Ltd.

Shibuya YT Bldg. 02, 5F
21-3, Shinsen-Cho, Shibuya-Ku
J-Tokyo 150-0045, Japan
T +81-3-5790-7621
F +49-3-5790-7622

Telegärtner China Ltd.

RM 23, 4/F Nan Fung Comm. Centre
No. 19 Lam Lok St.
HK-Kowloon Bay; Hongkong
T +852-2331-2090
F +852-2305-2377

Telegärtner Italia S.r.l.

Corso Garibaldi 40
I-20030 Seveso, Italy
T +39-362-540014
F +39-362-550282

Telegärtner Gerätebau GmbH

Frauenstr. 1
D-01774 Höckendorf, Germany
T +49-(0) 3 50 55 / 6 82-0
F +49-(0) 3 50 55 / 6 12 24

Telegärtner Elektronik GmbH

Hofäckerstr. 18
D-74564 Crailsheim, Germany
T +49-(0) 79 51 / 4 88-0
F +49-(0) 79 51 / 4 88-80

Telegärtner Kunststofftechnik GmbH

Hohewartstr. 9
D-71144 Steinenbronn, Germany
T +49-(0) 71 57 / 49 69
F +49-(0) 71 57 / 7 25 12

