ODU MINI-SNAP®

A perfect alliance.

Miniature Circular Connectors with Push-Pull Locking Series F

www.odu.de

Miniature Circular Connectors with Push-Pull Locking Series F

Applications

– Medical
– Industrial
– Measuring and testing
– Military and security
– Energy
– Automotive

Features

– Fast and easy mating and demating in hard-to-access places easily possible
– Fast and easy separating
– Blind mating in difficult-to-reach places
– Low space requirements on the devices
– Clear and reliable locking states
– Low power requirement
– Robot-suitable
– Easy cleaning of the housing possible

All shown connectors are according to DIN EN 61984:2009 connectors without breaking capacity (COC).

All dimensions in mm.
Most of the pictures are illustrations.
All data and specifications subject to change without notice.

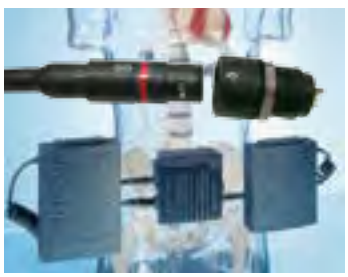
ODU MINI-SNAP F
– Achieves specifications of RoHS (2011/65/EU)
– Has a UL licence (E110586)
– Has a licence acc. to VDE (Reg.-No. 4000941)
– is specified acc. to MIL: see page 79

Issue: 2014-01

Table of Contents (Part I)

Table of Contents (Part II)

Product Description



The ODU MINI-SNAP® Family of Miniature Circular Connectors Features Push-Pull Locking

Circular connectors are generally available with several locking mechanisms.

The most frequently used are

– Threaded-locking sleeve
– Bajonett locking
– Push-Pull locking.

Push-Pull connectors have a very simple locking mechanism:

– As the plug is pushed into the receptacle, locking fingers on the plug snap into the receptacle creating a reliable connection between plug and receptacle.
– Pulling on the cable or the rear of plug causes the locking fingers to grab harder and a separation of plug and receptacle is almost impossible. Pulling on the outer plug housing causes the locking fingers to retract and the plug and receptacle separate easily.

Important Issues at a Glance

Certification
The series is certified acc. to RoHS and has licenses acc. to VDE and UL. RoHS 2011/65/EC

5 Sizes
Metal housing available in 5 sizes.
Outside diameter between 9.4 mm and 18 mm.
Number of contacts: 2 to 27 positions, mixed inserts possible.

Extensive range of termination possibilities
Plugs and in-line receptacles for solder and crimp termination. Receptacles for solder, crimp and PCB termination.

Applications and materials

	Insulator material PEEK	Contact material Ms
General application requirements (– 40° C to +120° C)	●	●
Connectors which are autoclavable (+134° C, see page 78)	●	●

Termination technologies

	Insulator material PEEK	Contact material Ms
Crimp termination	●[1]	●
Solder termination	●	●
Printed circuit board (PCB) termination	●	●

[1] Crimp-clip-contacts available with diameter 0.7 mm and 0.9 mm.

Protection class IP 50 and IP 68 are available.

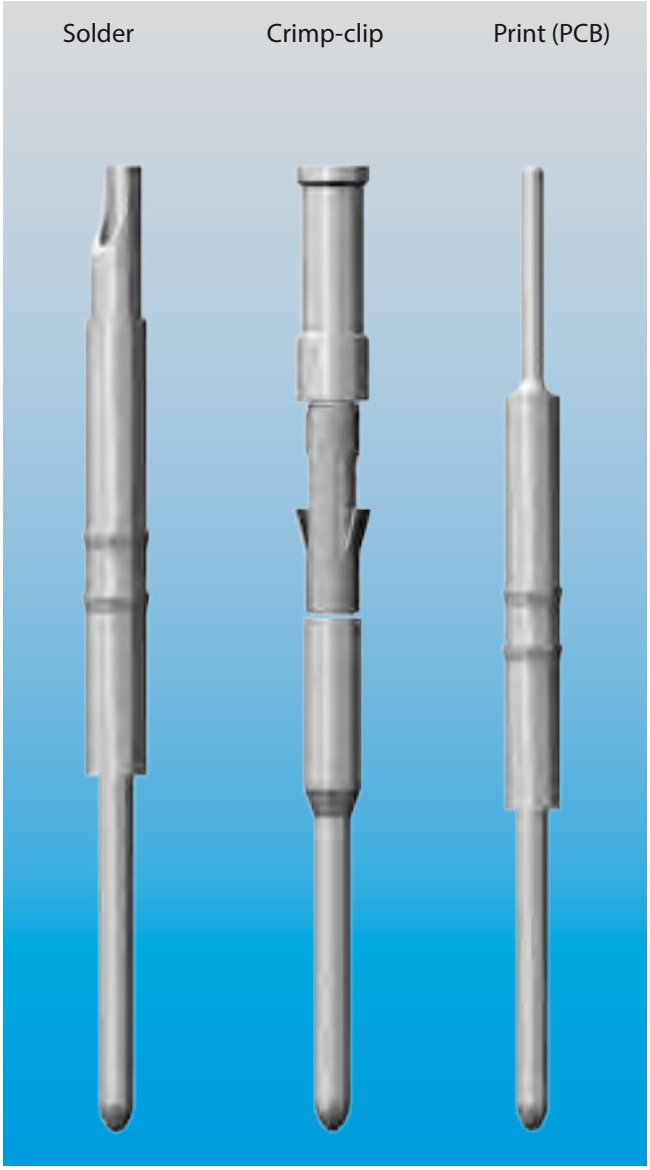
Turned Contact

Turned contacts are available in the diameters 0.5 mm to 1.3 mm. They are available with following terminations: Solder, crimp and print (PCB).

Mating cycles	> 5,000
Material	Brass
Treatment processing	Ni, Au

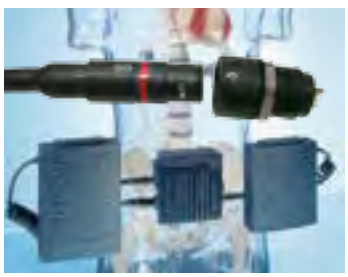
For information regarding diameter, termination style and current carrying capacity please see the contact configuration section.

Standard pin contacts



Series F, IP 50 and IP 68

FP Locking Principle
Half-Shell Keying

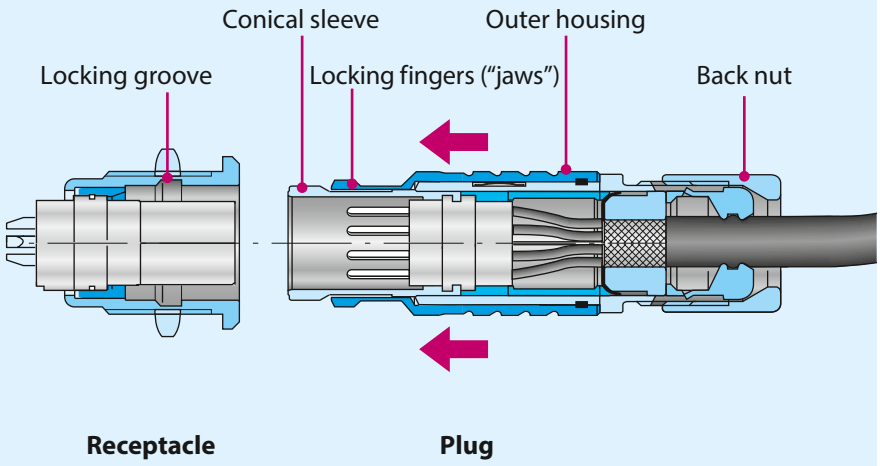


Part Number Key See Fold-out Page in the Rear Cover

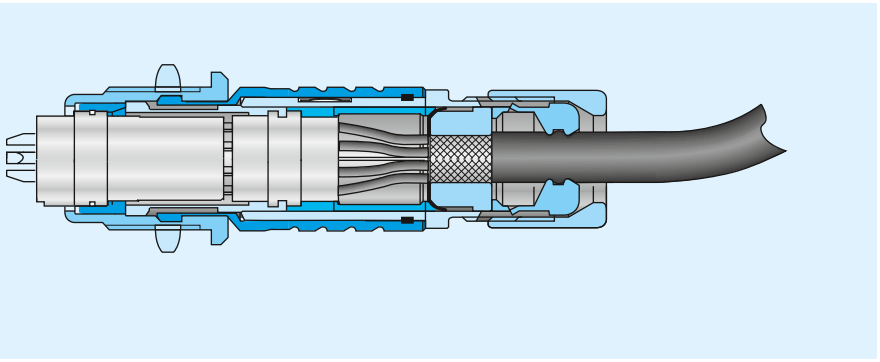
The FP Locking Principle

With Half-shells

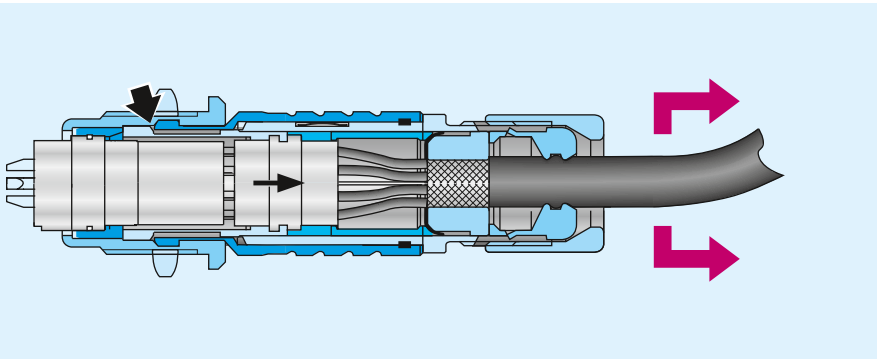
The first figure shows the ODU MINI-SNAP connection in **unmated** condition.



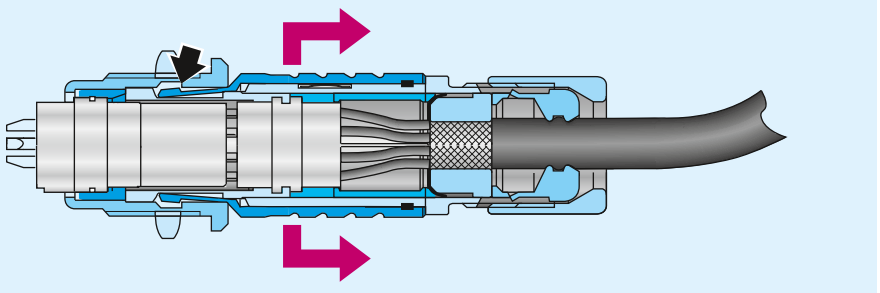
The second figure shows the ODU MINI-SNAP connection in **mated** condition.



Pulling on the cable or on the back nut causes the “jaws” to grip harder into the groove in the receptacle. A separation is virtually impossible.

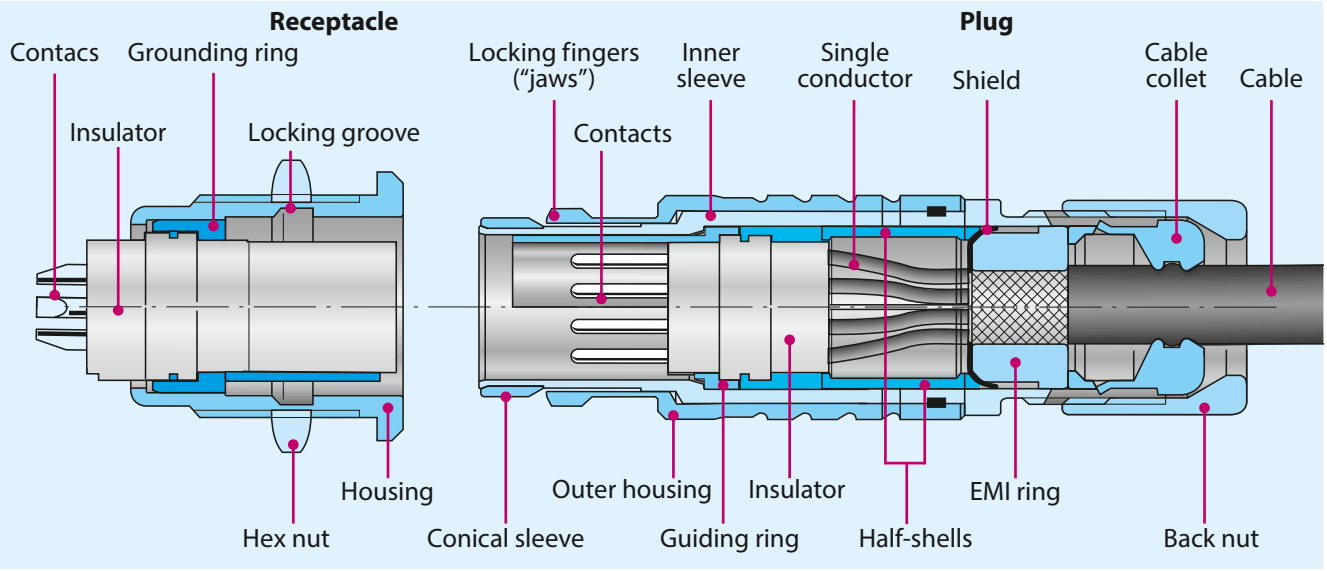


Pulling on the outer plug housing disengages the “jaws” from the receptacle groove and the connector separates easily.

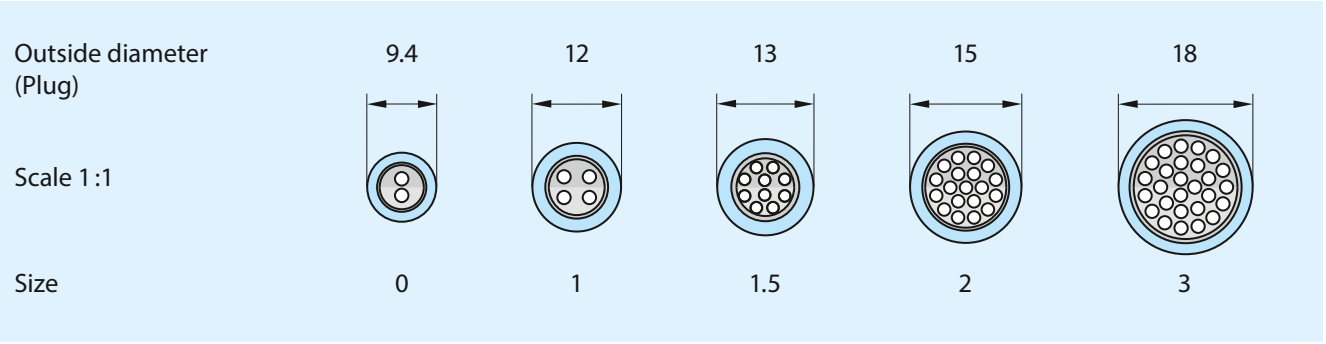


ODU MINI-SNAP® F

With FP Locking Scheme in Cross-Section



Available Housing Sizes



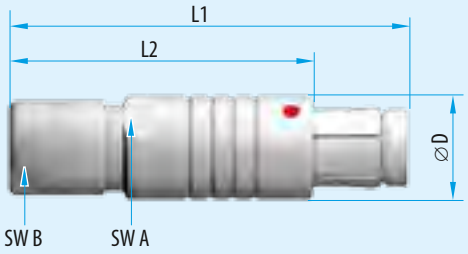
Straight Plug

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

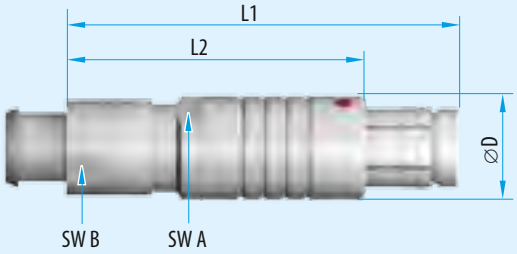
S 1

Style 1: IP 50, with standard back nut



S 2

Style 2: IP 50, with back nut for cable bend relief [1)]



	Size	Dimensions in mm L1	L2	D	SW A	S1 SW B	S2 SW B
0	0	~ 37.0	~ 27.0	9.4	8	7	7
1	1	~ 46.0	~ 35.0	12.0	10	10	10
A	1.5	~ 48.0	~ 38.0	13.0	11	12	12
2	2	~ 50.0	~ 38.0	15.0	13	12	13
3	3	~ 59.0	~ 44.0	18.0	16	15	15

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles.

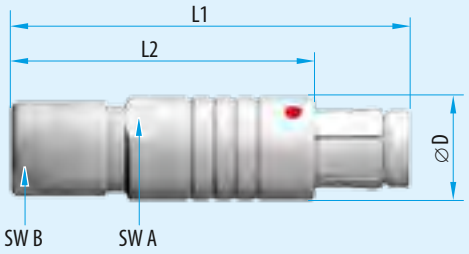
[1] Cable bend relief have to be ordered separately (see page 52).

Straight Plug

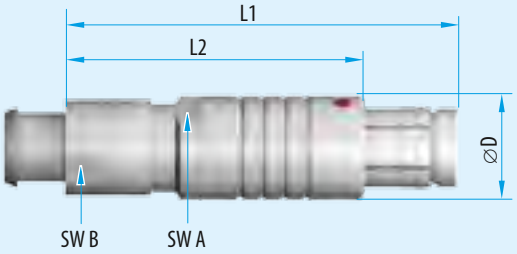
Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

S 3 Style 3: IP 68, watertight, with standard back nut



S 4 Style 4: IP 68, watertight, with back nut for cable bend relief [1)]



	Size	Dimensions in mm L1	L2	D	SW A	S3 SW B	S4 SW B
0	0	~40.0	~30.0	9.4	8	7	7
1	1	~49.0	~38.0	12.0	10	10	10
A	1.5	~50.0	~40.0	13.0	11	12	12
2	2	~53.0	~41.0	15.0	13	12	13
3	3	~61.0	~46.0	18.0	16	15	15

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles.

[1] Cable bend relief have to be ordered separately (see page 52).

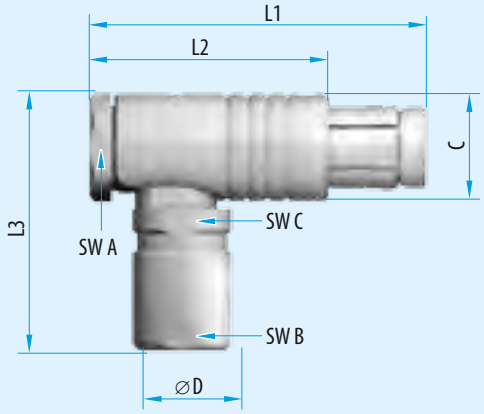
Right-Angled Plug

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

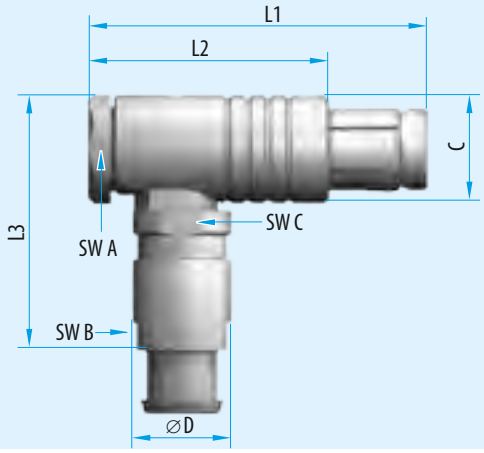
W 1

Style 1: IP 50, with standard back nut



W 2

Style 2: IP 50, with back nut for cable bend relief [1)]



	Size	Dimensions in mm								
		L1	L2	L3	C	D	SW A	W1 SW B	W2 SW B	SW C
0	0	33.0	23.0	~25.0	10.0	9.0	9	7	7	8
1	1	37.3	26.5	~28.0	12.0	11.0	11	10	10	10
A	1.5	39.0	29.0	~31.0	14.0	13.0	12	12	12	11
2	2	41.6	29.5	~34.5	16.0	14.0	14	12	13	13
3	3	50.0	35.0	~41.0	18.0	17.0	16	15	15	16

Technical data

– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles.

[1] Cable bend relief have to be ordered separately (see page 52).

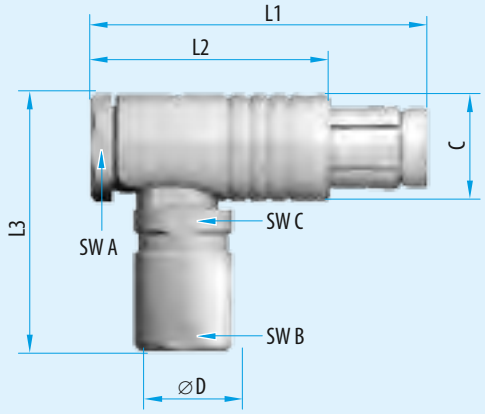
Right-Angled Plug

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

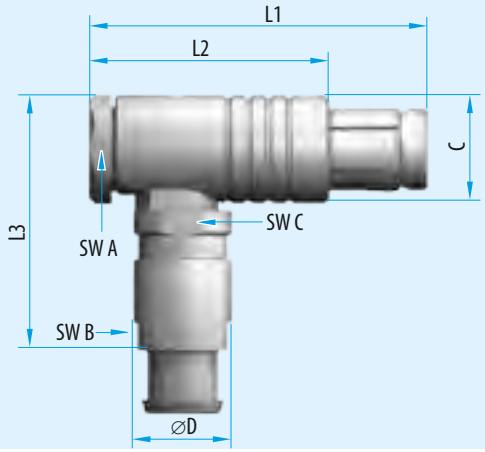
W 3

Style 3: IP 68, watertight, with standard back nut



W 4

Style 4: IP 68, watertight, with back nut for cable bend relief[1)]



	Size	Dimensions in mm								
		L1	L2	L3	C	D	SW A	W3 SW B	W4 SW B	SW C
0	0	36.0	26.0	~27.0	11.2	9.0	10	7	7	8
1	1	45.2	34.2	~33.0	13.0	11.0	12	10	10	10
A	1.5	41.5	31.5	~34.5	14.5	13.0	13	12	12	11
2	2	46.3	34.2	~36.0	16.0	14.0	14	12	13	13
3	3	59.7	44.6	~41.0	18.0	17.0	16	15	15	16

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles.

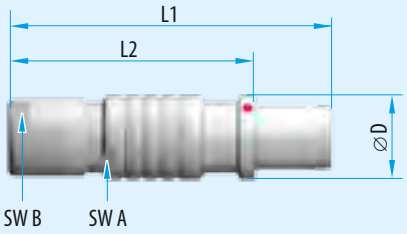
[1] Cable bend relief have to be ordered separately (see page 52).

Break-Away Connector (Without Locking)

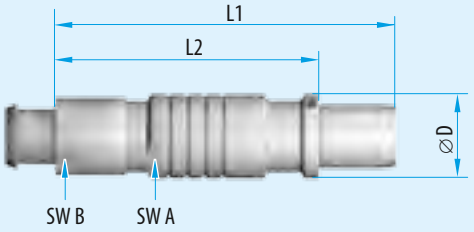
Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

A 7 Style 7: IP 50, with standard back nut



A 8 Style 8: IP 50, with back nut for cable bend relief [1)]



Size	Dimensions in mm					
	L1	L2	D	SW A	A7 SW B	A8 SW B
0	~ 37.0	~27.0	9.4	8	7	7
1	~ 46.0	~35.0	12.0	10	10	10
2	~ 50.0	~38.0	15.0	13	12	13

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles
– Plug can be separated by pulling on the cable.

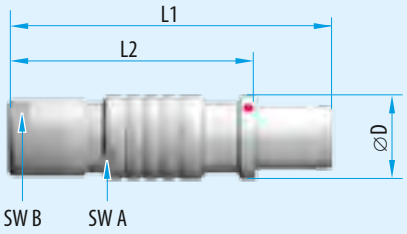
[1] Cable bend relief have to be ordered separately (see page 52).

Break-Away Connector (Without Locking)

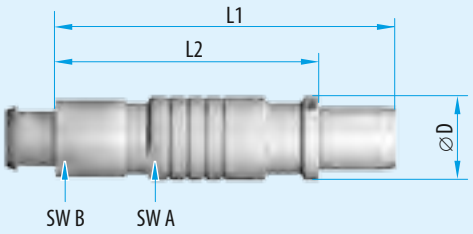
Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

A 5 Style 5: IP 68, watertight, with standard back nut



A 6 Style 6: IP 68, watertight, with back nut for cable bend relief [1)]



Size	Dimensions in mm					
	L1	L2	D	SW A	A5 SW B	A6 SW B
1	~49.0	~38.0	12	10	10	10
A	~50.0	~40.0	13	11	12	12
3	~61.0	~46.0	18	16	15	15

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles
– Plug can be separated by pulling on the cable.

[1] Cable bend relief have to be ordered separately (see page 52).

Panel Mounted Plug

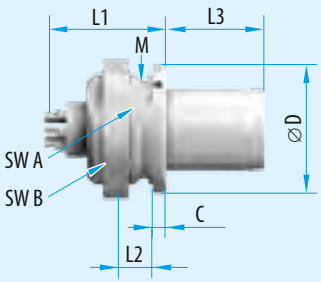
Created to Build Up a Docking Connection Between Two Instruments (E.g. a Charging Station)

Connector type

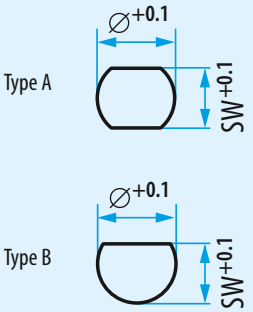
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	
A	A																	
A	A																	
A	D																	

Series F, IP 50 and IP 68

Style A: IP 50, with hex nut, without locking, installation from front of panel



Panel cut-out

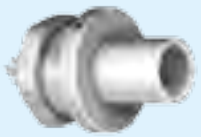


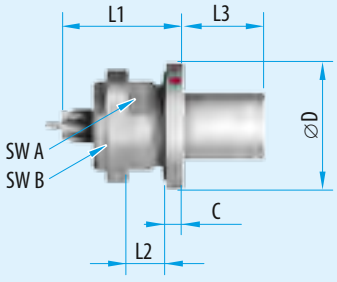
Size	Dimensions in mm								Panel cut-out		
	L1	L2 max.	L3	C	D	SW A	SW B	M	SW	⌀	Type
0	~12.0	~4.0	10.0	1.5	10.0	8.2	11	9×0.5	8.3	9.1	A
1	~15.5	~4.0	10.8	1.5	14.0	11.1	14	12×1	11.2	12.1	B
2	~17.5	~3.4	12.0	2.0	18.0	14.1	17	15×1	14.2	15.1	B
3	~17.0	~5.5	15.0	1.2	22.0	15.2	19	16×1	15.3	16.1	B

Technical data

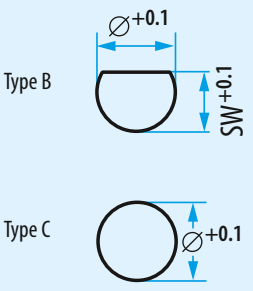
- Contact configuration see from page 35
- PCB layouts see from page 45
- Consistent with all following receptacles and in-line receptacles
- IP 50 related to the tightness of the end device
- Anti-rotation feature.

Style D: IP 68, watertight, with hex nut, without locking, installation from front of panel





Panel cut-out



Size	Dimensions in mm								Panel cut-out		
	L1	L2 max.	L3	C	D	SW A	SW B	M	SW	⌀	Type
0	~14.5	~4.5	10.0	3.0	13.0	–	11.0	9×0.5	–	9.1	C
1	~18.5	~6.5	10.8	2.5	17.0	11.0	14.0	12×1	11.2	12.1	B
2	~20.0	~7.0	12.0	3.0	22.0	15.2	19.0	16×1	15.3	16.1	B

Technical data

- Contact configuration see from page 35
- PCB layouts see from page 45
- Consistent with all following receptacles and in-line receptacles
- IP 68 related to the tightness of the end device also in unmated condition
- Anti-rotation feature.

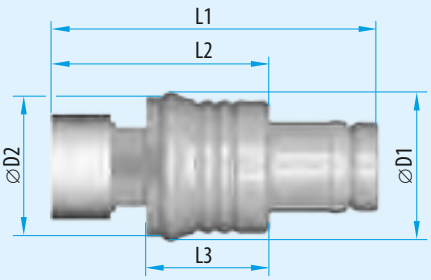
Super Shorty Push-Pull Plug

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

S **S**

Style S: IP 68, watertight

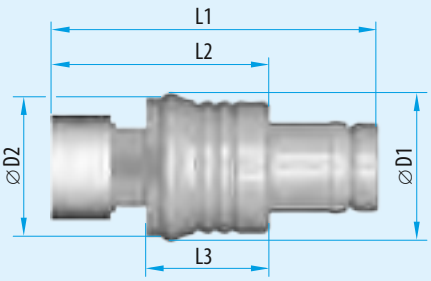


Size	Dimensions in mm					
	L1	L2	L3	D1	D2	Max. cable ∅
0 0	~ 28.0	~ 18.0	10.5	13.0	11.9	5
1 1	~ 32.7	~ 22.0	12.5	15.0	13.9	6.5
2 2	~ 34.3	~ 22.6	13.0	19.0	17.6	10

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles.
– Crimping of the cable shield causes strain relief.

A **S**

Style S: IP 68, watertight, without locking



Size	Dimensions in mm					
	L1	L2	L3	D1	D2	Max. cable ∅
0 0	~ 28.0	~ 18.0	10.5	13.0	11.9	5
1 1	~ 32.7	~ 22.0	12.5	15.0	13.9	6.5
2 2	~ 34.3	~ 22.6	13.0	19.0	17.6	10

Technical data
– Contact configuration see from page 35
– Consistent with all following receptacles and in-line receptacles
– Crimping of the cable shield causes strain relief.

In-Line Receptacle

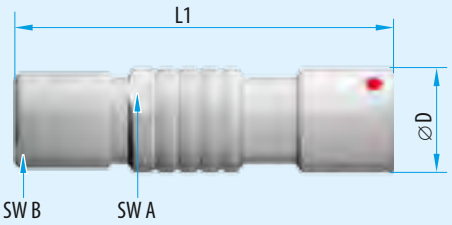
Suitable for Build Up a Cable to Cable Connection

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

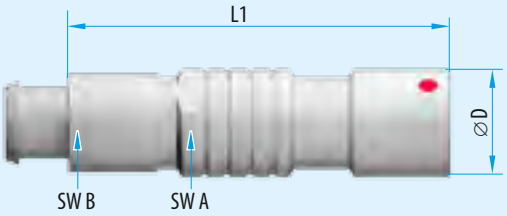
K 1

Style 1: IP 50, with standard back nut



K 2

Style 2: IP 50, with back nut for cable bend relief [1)]



	Size	Dimensions in mm L1	D	SW A	K1 SW B	K2 SW B
0	0	~ 35.0	9.5	8.0	7	7
1	1	~ 44.0	12.0	10.0	10	10
2	2	~ 48.0	15.0	13.0	12	13
3	3	~ 58.0	18.0	16.0	15	15

Technical data

– Contact configuration see from page 35.

[1] Cable bend relief have to be ordered separately (see page 52).

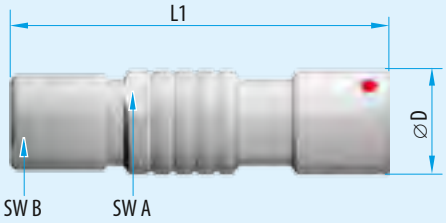
In-Line Receptacle

Suitable for Build Up a Cable to Cable Connection

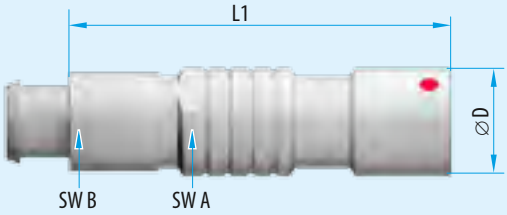
Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

K 3 Style 3: IP 68, watertight, with standard back nut



K 4 Style 4: IP 68, watertight, with back nut for cable bend relief [1)]



Size	Dimensions in mm				
	L1	D	SW A	K3 SW B	K4 SW B
0 0	~ 38.0	10.0	8.0	7	7
1 1	~ 47.0	13.0	10.0	10	10
2 2	~ 51.0	16.0	13.0	12	13

Technical data
– Contact configuration see from page 35.

[1] Cable bend relief have to be ordered separately (see page 52).

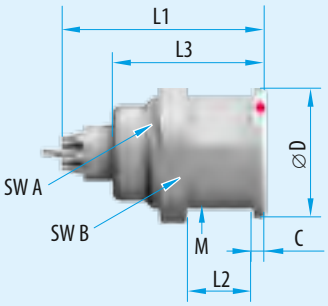
Receptacle

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

G **1**

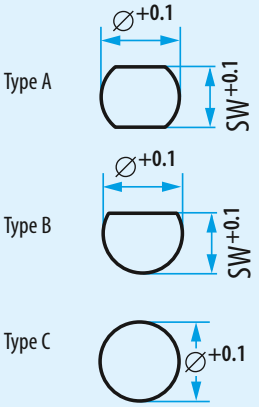
Style 1: IP 50, installation from front of panel



	Size	Dimensions in mm								Panel cut-out		
		L1 [1]	L2 max.	L3 [2]	C	M	D	SW A	SW B	SW	⌀	Type
0	0	~ 20.0	~ 9.0	14.5	1.5	M9 × 0.5	10.0	8.2	11.0	8.3	9.1	A
1	1	~ 24.0	~ 8.0	16.5	1.5	M12 × 1	14.0	10.0	14.0	10.1	12.1	A
A	1.5	~ 25.0	~ 8.0	15.5	2.0	M14 × 1	16.0	12.0	17.0	12.1	14.1	B
2	2	~ 27.0	~ 10.0	18.5	2.0	M15 × 1	18.0	14.1	17.0	14.2	15.1	C
3	3	~ 30.5	~ 13.0	22.5	2.0	M18 × 1	22.0	16.5	22.0	16.6	18.1	A

[1] L1 = max. length incl. contact insert
[2] L3 = length of housing

Panel cut-out



Technical data

- Contact configuration see from page 35
- PCB layouts see from page 45
- IP 50 related to the tightness of the end device
- Anti-rotation feature.

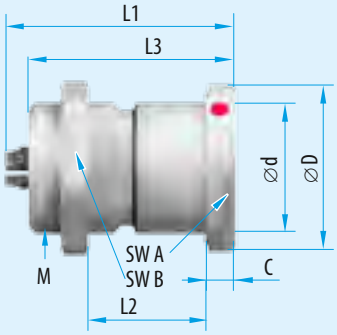
Receptacle

Connector type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

G 2

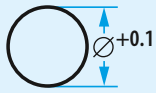
Style 2: IP 68 [4], watertight, suitable for installation from front of panel



Size	Dimensions in mm									Panel cut-out	
	L1 [1]	L2 [3]	L3 [2]	C	M	D	d	SW A	SW B	⌀	Type
0	~22.5	~8.0	18.5	3.0	M9 × 0.5	14.5	10.0	11.0	11.0	10.1	C
1	~27.0	~9.0	22.5	3.0	M14 × 1	18.0	14.0	14.0	17.0	14.1	C
A	1.5 ~27.0	~7.0	21.6	3.5	M14 × 1	19.0	14.0	15.0	17.0	14.1	C
2	2 ~29.5	~9.0	23.0	4.0	M16 × 1	22.0	16.0	17.0	19.0	16.1	C
3	3 ~32.0	~12.0	26.5	4.0	M20 × 1	26.0	20.0	24.0	25.0	20.1	C

Panel cut-out

Type C



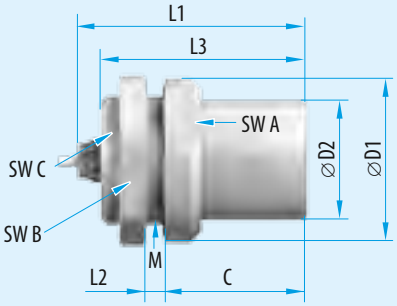
Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 68 related to the tightness of the end device also in unmated condition
– Distance ring for wall thickness compensation see chapter accessories
– No crimp contacts possible.

[1] L1 = max. length incl. contact insert
[2] L3 = length of housing
[3] min. wall thickness without use of a distance ring
[4] tight potted receptacle see page 71, case III

G 4

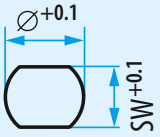
Style 4: IP 68, watertight, installation from front of panel, with small installation depth



Size	Dimensions in mm										Panel cut-out		
	L1 [1]	L2 [3] max.	L3 [2]	C	M	D1	D2	SW A	SW B	SW C	SW	⌀	Type
0	~22.5	~4.0	17.5	11.0	M9 × 0.5	14.5	10.5	12.0	11.0	8.2	8.3	9.1	A
1	~27.0	~4.0	22.5	15.5	M14 × 1	18.0	13.0	14.0	17.0	12.0	12.1	14.1	A
A	1.5 ~27.0	~5.0	21.6	13.6	M14 × 1	19.0	13.5	15.0	17.0	12.0	12.1	14.1	A
2	2 ~32.0	~4.5	23.0	15.5	M16 × 1	21.0	16.0	17.0	19.0	14.0	14.1	16.1	A

Panel cut-out

Type A



Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 68 related to the tightness of the end device also in unmated condition
– Anti-rotation feature
– No crimp contacts possible.

[1] L1 = max. length incl. contact insert
[2] L3 = length of housing
[3] tight potted receptacle see page 71, case III

Receptacle

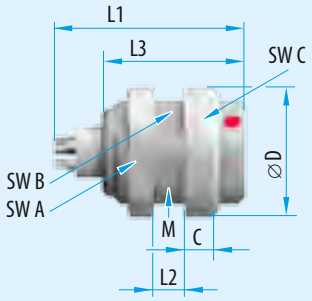
With Continuous Thread / With Design Nut

Connector type

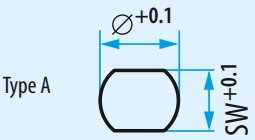
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

G 5

Style 5: IP 50, with continuous thread, installation from front and rear of panel with optimal distance adjustment



Panel cut-out



	Size	Dimensions in mm									Panel cut-out		
		L1 [1]	L2 max.	L3 [2]	C	M	D	SW A	SW B	SW C	SW	⌀	Type
0	0	~ 20.0	~ 8.0	14.5	2.5	M9 × 0.5	11.5	11.0	8.0	10.0	8.1	9.1	A
1	1	~ 24.0	~ 8.0	16.5	4.0	M12 × 1	15.0	14.0	10.0	13.0	10.1	12.1	A
A	1.5	~ 25.0	~ 8.0	15.5	3.0	M14 × 1	19.0	17.0	12.0	17.0	12.1	14.1	A
2	2	~ 27.0	~10.0	18.5	4.0	M15 × 1	20.0	17.0	13.5	17.0	13.6	15.1	A
3	3	~ 30.5	~12.0	22.5	5.0	M18 × 1	23.0	22.0	16.5	20.0	16.6	18.1	A

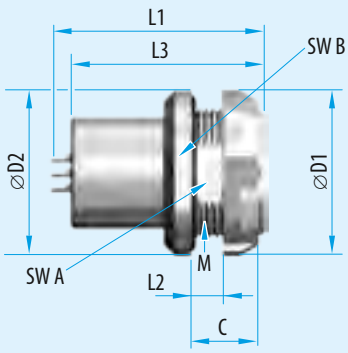
Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 50 related to the tightness of the end device
– Anti-rotation feature.

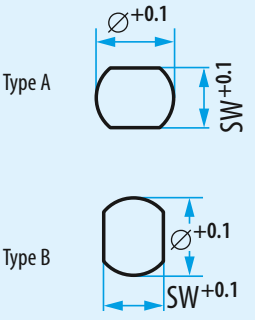
[1] L1 = max. length incl. contact insert
[2] L3 = length of housing

G 8

Style 8: IP 68 [3], watertight, installation from rear of panel, with design nut



Panel cut-out



	Size	Dimensions in mm									Panel cut-out		
		L1 [1]	L2 max.	L3 [2]	C	M	D1	D2	SW A	SW B	SW	⌀	Type
0	0	~ 22.5	~ 3.5	17.0	6.5	M9 × 0.5	12.0	14.0	8.2	11.0	8.3	9.1	B
1	1	~ 27.0	~ 4.0	21.0	8.0	M14 × 1	18.0	18.0	12.0	–	12.1	14.1	A
A	1.5	~ 27.0	~ 3.0	19.5	7.0	M14 × 1	18.0	19.0	12.0	–	12.1	14.1	B
2	2	~ 29.5	~ 3.0	23.0	8.0	M16 × 1	22.0	21.0	14.3	–	14.4	16.1	A
3	3	~ 32.0	~ 6.0	26.5	11.0	M20 × 1	25.0	26.0	18.0	–	18.1	20.1	A

Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 68 related to the tightness of the end device also in unmated condition
– Anti-rotation feature
– No crimp contacts possible
– Spanner wrench see page 64

[1] L1 = max. length incl. contact insert
[2] L3 = length of housing

Receptacle

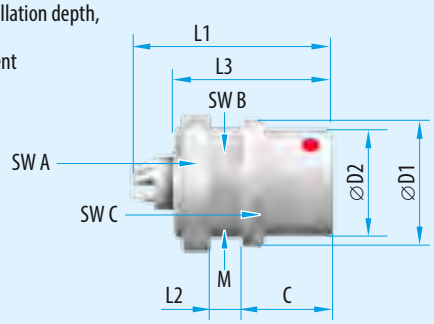
Projecting Receptacle

Connector type

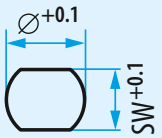
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

G H

Style H: IP 50, projecting receptacle with small installation depth, installation from front and rear of panel, installation with optimal distance adjustment



Panel cut-out



Size	Dimensions in mm										Panel cut-out		
	L1 [1]	L2 max.	L3 [2]	C	M	D1	D2	SW A	SW B	SW C	SW	⌀	Type
0	~20.0	~3.0	16.0	11.0	M9 × 0.5	11	9.0	11.0	8.2	–	8.3	9.1	A
1	~24.0	~4.5	17.5	10.0	M12 × 1	14	11.7	14.0	10.0	12.0	10.1	12.1	A
A	~25.0	~5.0	17.0	9.0	M14 × 1	18	13.5	17.0	12.0	15.0	12.1	14.1	A
2	~27.0	~5.5	19.5	11.0	M16 × 1	19	16.0	19.0	13.5	17.0	13.6	16.1	A

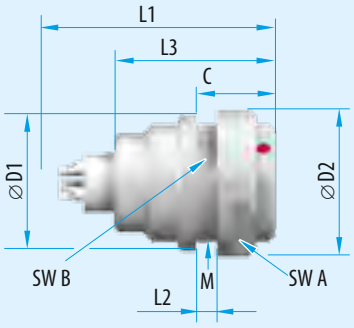
Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 50 related to the tightness of the end device
– Anti-rotation feature.

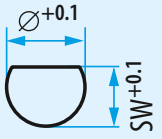
[1] L1 = max. length incl. contact insert
[2] L3 = length of housing

G K

Style K: IP 50, installation from rear of panel, with low installation depth



Panel cut-out



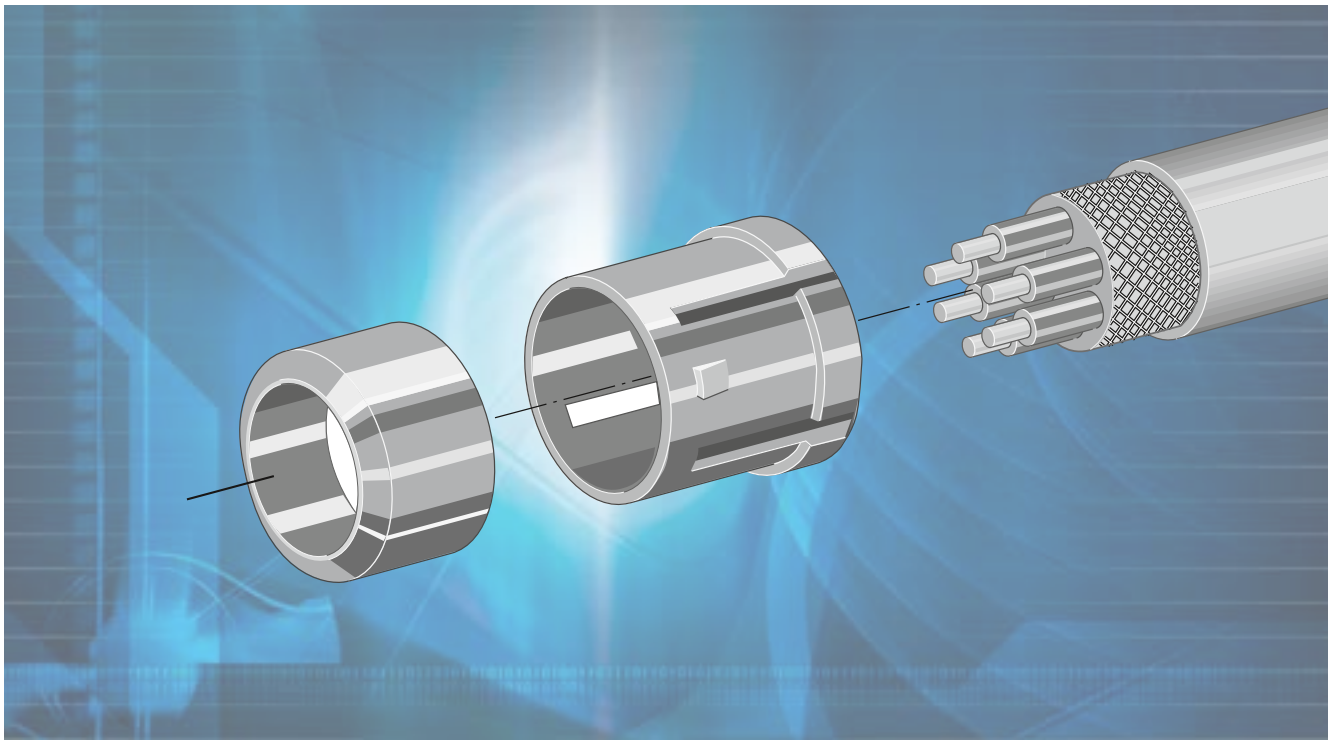
Size	Dimensions in mm									Panel cut-out		
	L1 [1]	L2 max.	L3 [2]	C	M	D1	D2	SW A	SW B	SW	⌀	Type
1	~ 24.0	~ 4.0	16.5	8.0	M12 × 1	14.0	15.0	13.0	11.0	11.1	12.1	B
2	~ 27.0	~ 5.0	18.5	9.0	M15 × 1	19.0	20.0	17.0	14.0	14.1	15.1	B
3	~ 30.5	~ 12.0	22.5	17.0	M18 × 1	22.0	23.0	20.0	17.2	17.3	18.1	B

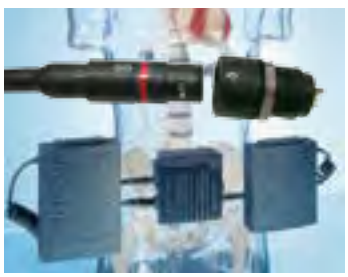
Technical data

– Contact configuration see from page 35
– PCB layouts see from page 45
– IP 50 related to the tightness of the end device
– Anti-rotation feature

[1] L1 = max. length incl. contact insert
[2] L3 = length of housing

Details for the Part Number Key





Keying Possibilities

Housing Materials

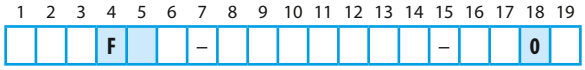
Cable Collet System

Right-Angled Print Contacts in the Receptacle

Definition of the Back Nut

Part Number Key See Fold-out Page in the Rear Cover

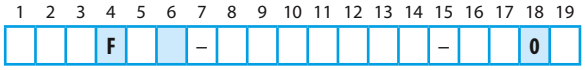
Keying Possibilites



	Keying	Receptacle front view	Size 0	1	1.5	2	3
	1		●	●	●	●	●
	2		●	●	●	●	●
	3		●	❍	●	●	●

● Standard
❍ On request

Housing Materials



	Housing material	Housing material
Standard	C	Cu-alloy / matt chrome plated
On Request	S	Cu-alloy / black chrome plated

Special materials and surfaces on request.

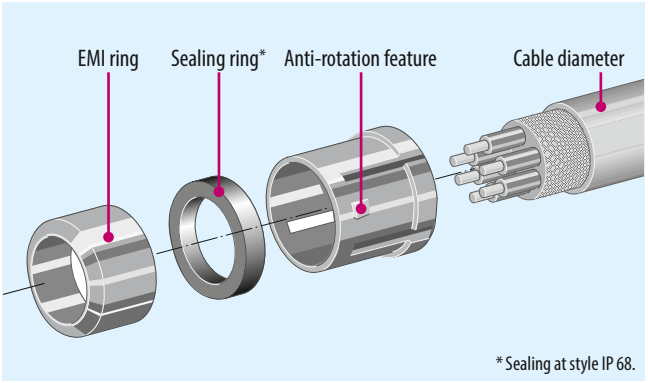
Cable Collet System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

Used by all plugs and in-line receptacles.

Cable diameter in mm	Size 0	1	1.5	2	3			
> 1.0 to 1.5	●	●					1	5
> 1.5 to 2.0	●	●					2	0
> 2.0 to 2.5	●	●		❍			2	5
> 2.5 to 3.0	●	●	❍	●			3	0
> 3.0 to 3.5	●	●	●	●	●		3	5
> 3.5 to 4.0	●	●	●	●	●		4	0
> 4.0 to 4.5	●	●	●	●	●		4	5
> 4.5 to 5.0	●	●	●	●	●		5	0
> 5.0 to 5.5		●	●	●	●		5	5
> 5.5 to 6.0		●	●	●	●		6	0
> 6.0 to 6.5		●	●	●	●		6	5
> 6.5 to 7.0		●	●	●	●		7	0
> 7.0 to 7.5		❍	●	●	●		7	5
>7.5 to 8.0				●	●		8	0
> 8.0 to 8.5				●	●		8	5
> 8.5 to 9.0				●	●		9	0
> 9.0 to 9.5				❍	●		9	5
> 9.5 to 10.0					●		0	1
> 10.0 to 10.5					●		0	2
> 10.5 to 11.5					❍		0	3
without cable collet system							0	0

● IP 50 and IP 68
❍ Only IP 50. This cable collets are not available for applications with cable bend relief.



Application: Cable collet for strain relief;
EMI ring for the transmission of the shielding.

Right-Angled Print Contacts in the Receptacle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	0

Right-angled print contact

A

Technical data
– PCB layouts see from page 45
– Pin version on request.

Definition of the Back Nut

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			–								–			0	

Standard back nut **0**

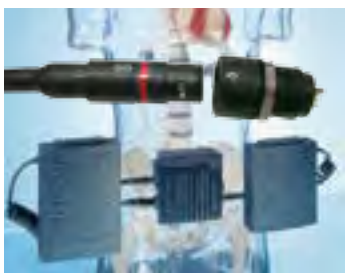
Back nut for silicone cable bend reliefs **S**

Usable for all straight plugs, right-angled and Break-Away connectors, in-line receptacles, receptacles style 6.

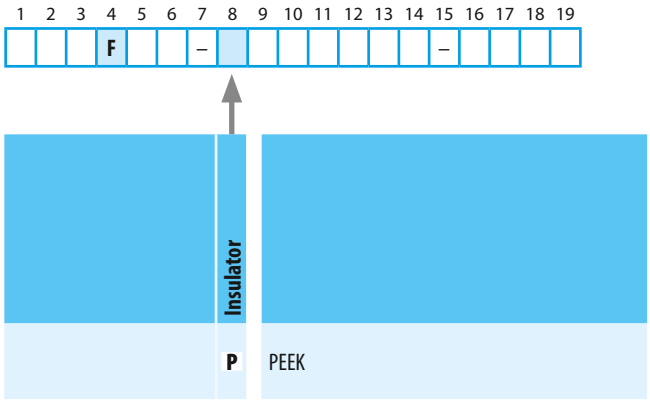
Cable bend reliefs see page 52.

Inserts

Part Number Key See Fold-out Page in the Rear Cover



Insulator Material



Further special equipment on request.

Turned contact

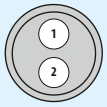
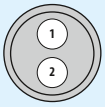
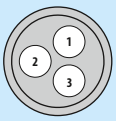
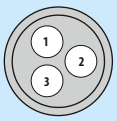
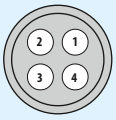
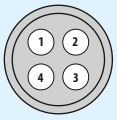
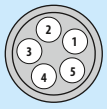
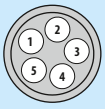
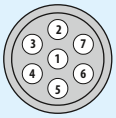
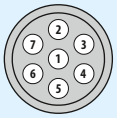
Termination	PEEK
Solder termination	●
Crimp termination	●
PCB termination	●

● Available

Contact Configuration

Size 0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		0	F			–								–			0	

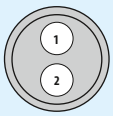
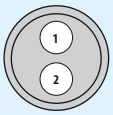
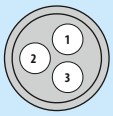
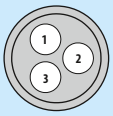
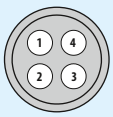
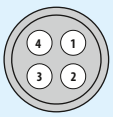
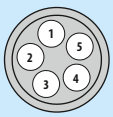
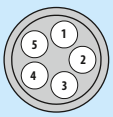
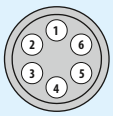
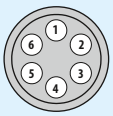
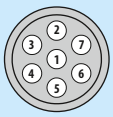
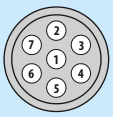
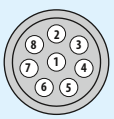
	Size		Insulator	Number of contacts		Contact diameter	Nominal current load per contact [1]	Clearance and creepage distance		Test voltage [2]	Nominal voltage [5]	Termination			View on the termination side	
								Contact to contact in mm	Contact to housing in mm			Solder	Crimp [3]	Print [4]	Pin piece	Socket piece
						mm	A			kVeff	kVrms					
	0		P	0	2	0.9	10	1.0	0.8	1.500	0.500	●		●		
	0		P	0	3	0.9	10	0.6	0.8	1.200	0.400	●		●		
	0		P	0	4	0.7	7	0.8	0.7	0.900	0.300	●	●	●		
	0		P	0	5	0.7	7	0.6	0.6	1.100	0.366	●		●		
	0		P	0	7	0.5	5	0.7	0.6	0.900	0.300	●		●		
	0		P	0	9	0.5	5	0.5	0.4	0.600	0.200	●		●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Size 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		1	F			–								–			0	

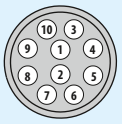
	Size		Insulator	Number of contacts		Contact diameter	Nominal current load per contact [1]	Clearance and creepage distance		Test voltage [2]	Nominal voltage [5]	Termination			View on the termination side	
								Contact to contact in mm	Contact to housing in mm			Solder	Crimp [3]	Print [4]	Pin piece	Socket piece
						mm	A			kVeff	kVrms					
	1		P	0	2	1.3	14	1.3	0.9	1.650	0.550	●		●		
	1		P	0	3	1.3	14	1.1	0.8	1.500	0.500	●		●		
	1		P	0	4	0.9	10	1.2	0.7	1.500	0.500	●	●	●		
	1		P	0	5	0.9	10	0.8	0.7	1.200	0.400	●	●	●		
	1		p	0	6	0.7	7	0.8	0.7	1.200	0.400	●	●	●		
	1		P	0	7	0.7	7	0.8	0.7	1.200	0.400	●	●	●		
	1		P	0	8	0.7	7	0.7	0.6	1.000	0.333	●		●		
	1		P	1	2	0.5	5	0.5	0.5	1.000	0.333	●		●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Size 1.5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		A	F			–								–			0	

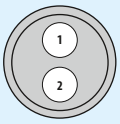
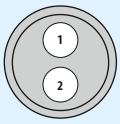
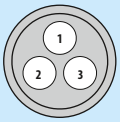
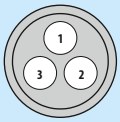
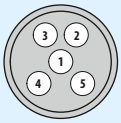
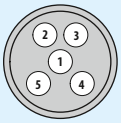
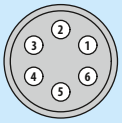
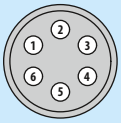
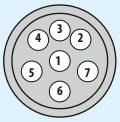
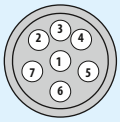
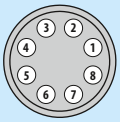
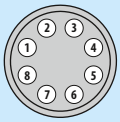
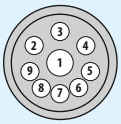
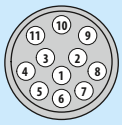
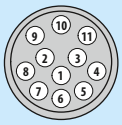
	Size		Insulator	Number of contacts		Contact diameter mm	Nominal current load per contact [1] A	Clearance and creepage distance: Contact to contact in mm	Clearance and creepage distance: Contact to housing in mm	Test voltage [2] kVeff	Nominal voltage [5] kVrms	Termination: Solder	Termination: Crimp [3]	Termination: Print [4]	View on the termination side: Pin piece	View on the termination side: Socket piece
	A		P	1	0	0.7	7	0.8	0.6	1.200	0.400	●		●		
	A		P	1	2	0.7	7	0.7	0.7	1.200	0.400	●	●	●		
	A		P	1	9	0.5	5	0.6	0.6	1.000	0.333	●		●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Size 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		2	F			–								–			0	

Size		Insulator	Number of contacts		Contact diameter mm	Nominal current load per contact [1] A	Clearance and creepage distance: Contact to contact in mm	Clearance and creepage distance: Contact to housing in mm	Test voltage [2] kVeff	Nominal voltage [5] kVrms	Termination: Solder	Termination: Crimp [3]	Termination: Print [4]	View on the termination side: Pin piece	View on the termination side: Socket piece
2		P	0	2	1.6	17	2.1	1.6	2.100	0.700	●		●		
2		P	0	3	1.6	17	1.6	1.5	1.800	0.600	●		●		
2		P	0	5	1.3	14	1.2	1.0	1.500	0.500	●	●	●		
2		P	0	6	0.9	10	1.5	1.2	1.800	0.600	●		●		
2		P	0	7	0.9	10	1.1	1.0	1.650	0.550	●		●		
2		P	0	8	0.9	10	1.0	0.5	1.500	0.500	●		●		
2	Mixed inserts	P	0	9	8×0.9 1×1.3	10 14	0.8 1.8	0.7 3.8	1.350 2.100	0.450 0.700	●		●		
2		P	1	1	0.9	10	0.8	0.7	1.350	0.450	●		●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Size 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		2	F			–								–			0	

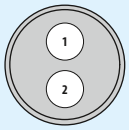
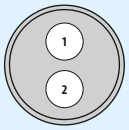
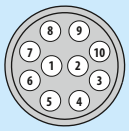
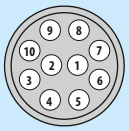
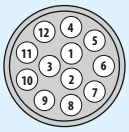
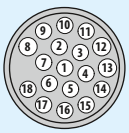
	Size		Insulator	Number of contacts		Contact diameter	Nominal current load per contact [1]	Clearance and creepage distance		Test voltage [2]	Nominal voltage [5]	Termination			View on the termination side	
								Contact to contact in mm	Contact to housing in mm			Solder	Crimp [3]	Print [4]	Pin piece	Socket piece
						mm	A			kVeff	kVrms					
	2		P	1	6	0.7	7	0.8	0.6	1.100	0.366	●	●	●		
	2		P	1	9	0.7	7	0.7	0.6	1.000	0.333	●	●	●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Size 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		3	F			–								–			0	

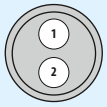
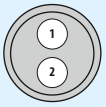
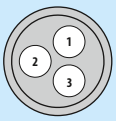
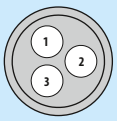
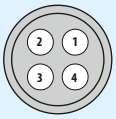
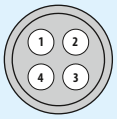
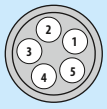
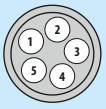
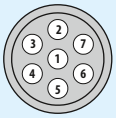
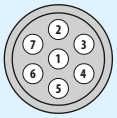
	Size		Insulator	Number of contacts		Contact diameter	Nominal current load per contact [1]	Clearance and creepage distance		Test voltage [2]	Nominal voltage [5]	Termination			View on the termination side	
								Contact to contact in mm	Contact to housing in mm			Solder	Crimp [3]	Print [4]	Pin piece	Socket piece
						mm	A			kVeff	kVrms					
	3		P	0	2	3.0	25	1.7	1.3	1.800	0.600	●				
	3		P	1	0	1.3	14	1.2	0.9	1.350	0.450	●		●		
	3		P	1	2	1.3	14	1.0	0.8	1.350	0.450	●		●		
	3		P	1	5	0.9	10	0.9	0.7	1.100	0.366	●	●	●		
	3		P	1	8	0.9	10	0.9	0.7	1.100	0.366	●	●	●		
	3		P	2	4	0.7	7	0.7	0.7	1.000	0.333	●		●		
	3		P	2	7	0.7	7	0.7	0.7	1.000	0.333	●	●	●		

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Super Shorty Size 0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		0	F			–								–	5	5	0	C

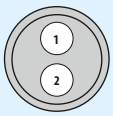
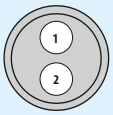
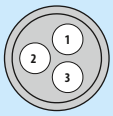
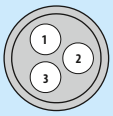
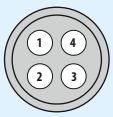
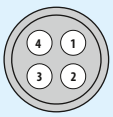
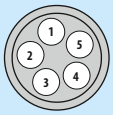
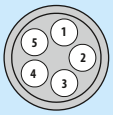
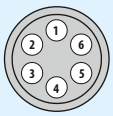
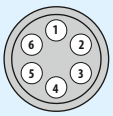
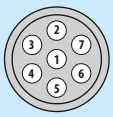
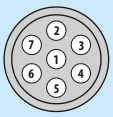
	Size		Insulator	Number of contacts		Contact diameter	Nominal current load per contact [1]	Clearance and creepage distance		Test voltage [2]	Nominal voltage [5]	Termination			View on the termination side	
								Contact to contact in mm	Contact to housing in mm			Solder	Crimp [3]	Print [4]	Pin piece	Socket piece
						mm	A			kVeff	kVrms					
	0		P	0	2	0.9	10	1.0	1.0	1.500	0.500	●				
	0		P	0	3	0.9	10	0.6	1.0	1.350	0.450	●				
	0		P	0	4	0.7	7	0.8	0.9	1.350	0.450	●				
	0		P	0	5	0.7	7	0.6	0.8	1.100	0.366	●				
	0		P	0	7	0.5	5	0.7	0.8	0.900	0.300	●				
	0		P	0	9	0.5	5	0.5	0.7	0.600	0.200	●				

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Configuration

Super Shorty Size 1

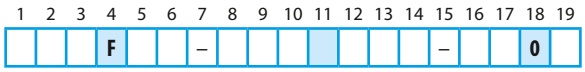
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		1	F			–								–	7	0	0	C

	Size		Insulator	Number of contacts		Contact diameter mm	Nominal current load per contact [1] A	Clearance and creepage distance: Contact to contact in mm	Clearance and creepage distance: Contact to housing in mm	Test voltage [2] kVeff	Nominal voltage [5] kVrms	Termination: Solder	Termination: Crimp [3]	Termination: Print [4]	View on the termination side: Pin piece	View on the termination side: Socket piece
	1		P	0	2	1.3	14	1.3	1.3	1.650	0.550	●				
	1		P	0	3	1.3	14	1.1	1.2	1.500	0.500	●				
	1		P	0	4	0.9	10	1.2	1.1	1.500	0.500	●				
	1		P	0	5	0.9	10	0.8	1.1	1.350	0.450	●				
	1		p	0	6	0.7	7	0.8	1.1	1.200	0.400	●				
	1		P	0	7	0.7	7	0.8	1.1	1.200	0.400	●				
	1		P	1	2	0.5	5	0.5	0.9	1.000	0.366	●				

[1] Derating factor see page 75
[2] SAE AS 13441:1998 method 3001.1 (kVeff)
[3] Tools for assembling see page 62
[4] PCB layouts see from page 45
[5] Maximal operating voltage at sea level up to 2.000 m acc. to SAE 13441. More information on page 76.

Contact Type / Surface

For All Sizes

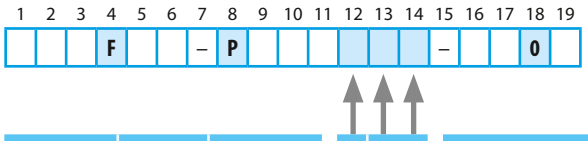


Termination	Contact type	Contact surface	Surface
Solder termination	Socket	L	Au
	Pin	M	Au
Crimp termination	Socket	N	Au
	Pin	P	Au
PCB termination	Socket	Q	Au
	Pin	R	Au

Termination Cross-Sections for Turned Contacts

For All Sizes

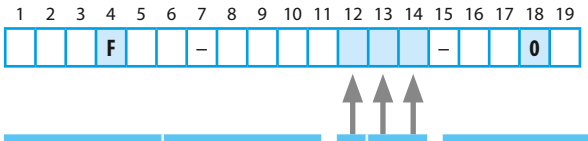
Crimp contact



Size	Number of contacts	Contact diameter mm	Contact diameter	Termination cross-section		Termination cross-section AWG	Termination cross-section mm²
0	4 to 5	0.7	F	C	0	28 to 32	0.09 to 0.04
			F	G	0	22 to 26	0.38 to 0.15
1	6 to 7	0.7	F	C	0	28 to 32	0.09 to 0.04
			F	G	0	22 to 26	0.38 to 0.15
	4 to 5	0.9	J	G	0	22 to 26	0.38 to 0.15
			J	H	0	20 to 24	0.50 to 0.25
1,5	12	0.7	F	C	0	28 to 32	0.09 to 0.04
			F	G	0	22 to 26	0.38 to 0.15
2	16 to 19	0.7	F	C	0	28 to 32	0.09 to 0.04
			F	G	0	22 to 26	0.38 to 0.15
	5	1.3	P	H	0	20 to 24	0.50 to 0.25
			P	L	0	18 to 20	1.00 to 0.50
3	24 to 27	0.7	F	G	0	22 to 26	0.38 to 0.15
	15 to 18	0.9	J	G	0	22 to 26	0.38 to 0.15
			J	H	0	20 to 24	0.50 to 0.25

Tools for crimping and their adjustments see page 62.

Solder contact



Contact diameter mm	Termination diameter mm	Contact diameter	Termination cross-section		Termination cross-section AWG	Termination cross-section mm²
0.5	0.4	C	C	0	28	0.08
0.7	0.6	F	D	0	26	0.15
0.7	0.85	F	G	0	22	0.38
0.9	0.85	J	G	0	22	0.38
1.3	1.1	P	H	0	20	0.50
1.6	1.4	S	N	0	18	1.00
2.0	1.85	T	Q	0	14	1.5
2.0	2.4	T	S	0	12	2.5
3.0	2.7	V	T	0	10	4.0

PCB (print) contact

0.5	0.5	C	0	0
0.7	0.5	F	0	0
0.9	0.7	J	0	0
1.3	0.7	P	0	0
1.6	0.7	S	0	0
2.0	0.7	T	0	0

Please consider for this the PCB layouts from page 45.

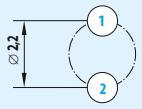
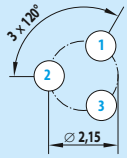
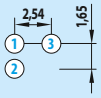
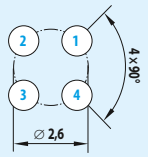
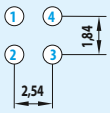
For mixed inserts [1)]

	M	0	

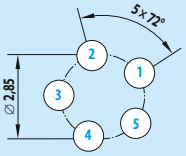
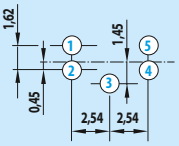
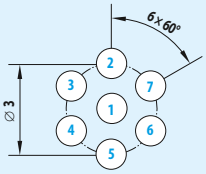
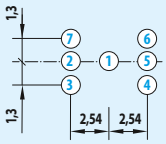
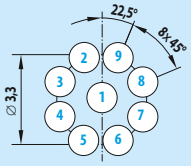
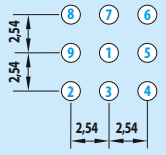
[1] Please provide details of termination cross-section!

PCB Layouts for Print Contacts

Size 0

Number of contacts	Straight	90° right-angled
2	Drill: 0.8 mm 	Drill: 0.7 mm 
3	Drill: 0.8 mm 	Drill: 0.7 mm 
4	Drill: 0.6 mm 	Drill: 0.6 mm 

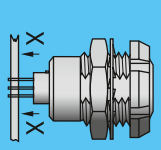
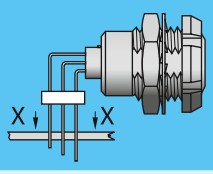
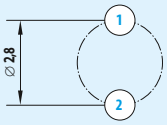
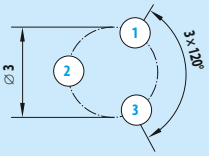
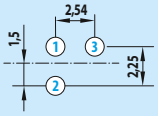
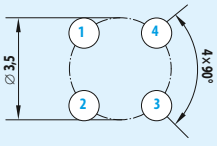
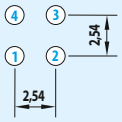
All specifications are only valid for socket inserts. Pin inserts on request.

Number of contacts	Straight	90° right-angled
5	Drill: 0.6 mm 	Drill: 0.6 mm 
7	Drill: 0.6 mm 	Drill: 0.6 mm 
9	Drill: 0.6 mm 	Drill: 0.6 mm 

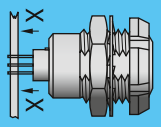
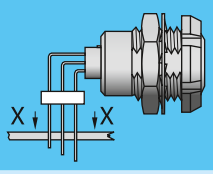
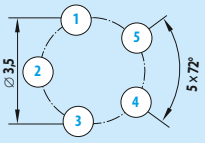
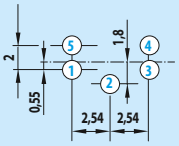
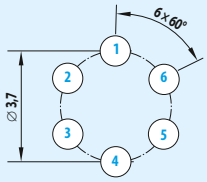
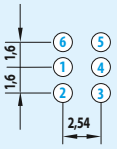
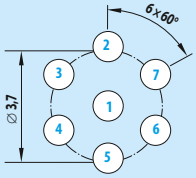
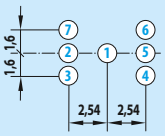
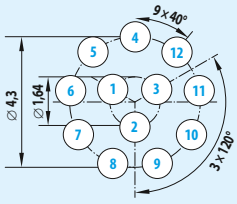
All specifications are only valid for socket inserts. Pin inserts on request.

PCB Layouts for Print Contacts

Size 1

Number of contacts	Straight 	90° right-angled 
2	Drill: 0.8 mm 	Drill: 0.9 mm 
3	Drill: 0.8 mm 	Drill: 0.9 mm 
4	Drill: 0.8 mm 	Drill: 0.7 mm 

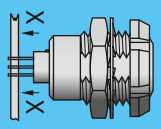
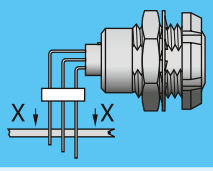
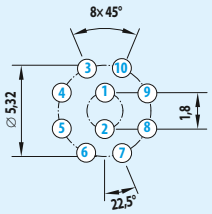
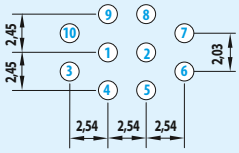
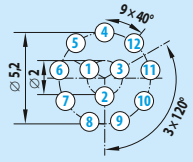
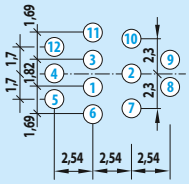
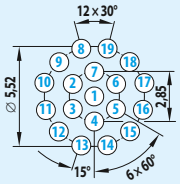
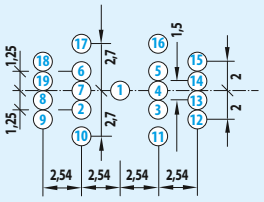
All specifications are only valid for socket inserts. Pin inserts on request.

Number of contacts	Straight 	90° right-angled 
5	Drill: 0.8 mm 	Drill: 0.7 mm 
6	Drill: 0.6 mm 	Drill: 0.7 mm 
7	Drill: 0.6 mm 	Drill: 0.7 mm 
12	Drill: 0.6 mm 	On request

All specifications are only valid for socket inserts. Pin inserts on request.

PCB Layouts for Print Contacts

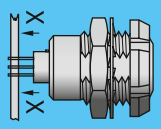
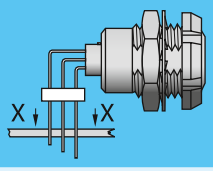
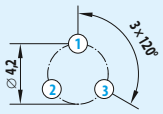
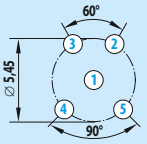
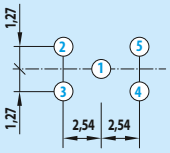
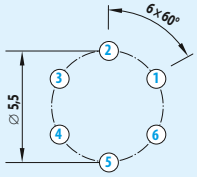
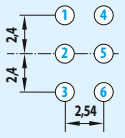
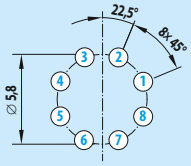
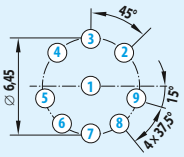
Size 1.5

Number of contacts	Straight	90° right-angled
		
10	Drill: 0.6 mm 	Drill: 0.7 mm 
12	Drill: 0.6 mm 	Drill: 0.7 mm 
19	Drill: 0.6 mm 	Drill: 0.6 mm 

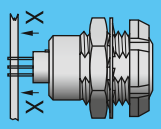
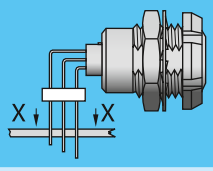
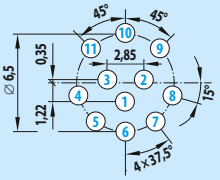
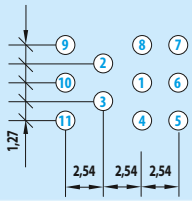
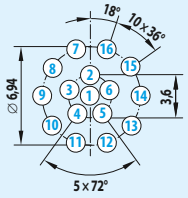
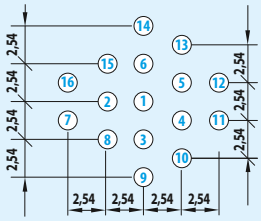
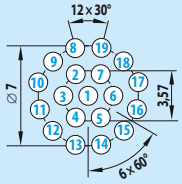
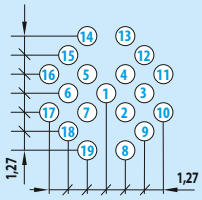
All specifications are only valid for socket inserts. Pin inserts on request.

PCB Layouts for Print Contacts

Size 2

Number of contacts	Straight 	90° right-angled 
3	Drill: 1.1 mm 	On request
5	Drill: 0.8 mm 	Drill: 0.9 mm 
6	Drill: 0.8 mm 	Drill: 0.7 mm 
8	Drill: 0.8 mm 	On request
9	Drill: 0.8 mm 	On request

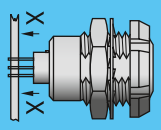
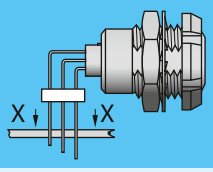
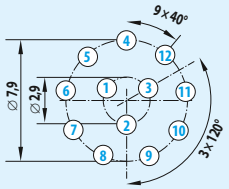
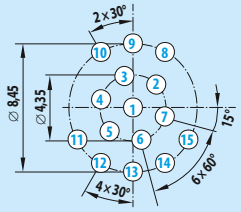
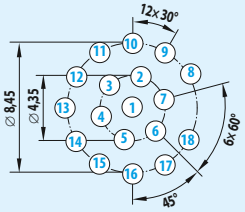
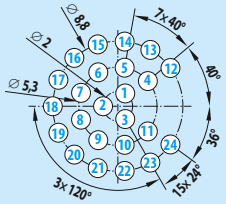
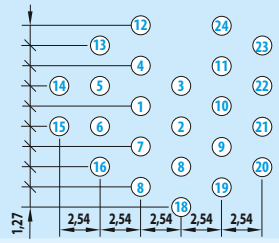
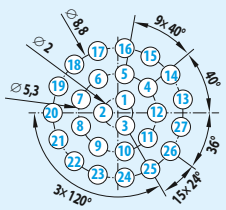
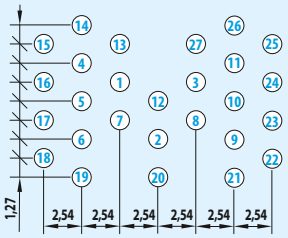
All specifications are only valid for socket inserts. Pin inserts on request.

Number of contacts	Straight 	90° right-angled 
11	Drill: 0.8 mm 	Drill: 0.7 mm 
16	Drill: 0.6 mm 	Drill: 0.7 mm 
19	Drill: 0.6 mm 	Drill: 0.7 mm 

All specifications are only valid for socket inserts. Pin inserts on request.

PCB Layouts for Print Contacts

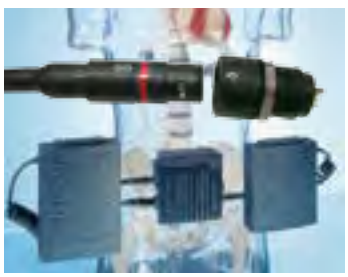
Size 3

Number of contacts	Straight	90° right-angled
		
12	Drill: 1.1 mm 	On request
15	Drill: 0.8 mm 	On request
18	Drill: 0.8 mm 	On request
24	Drill: 0.6 mm 	Drill: 0.7 mm 
27	Drill: 0.6 mm 	Drill: 0.7 mm 

All specifications are only valid for socket inserts. Pin inserts on request.

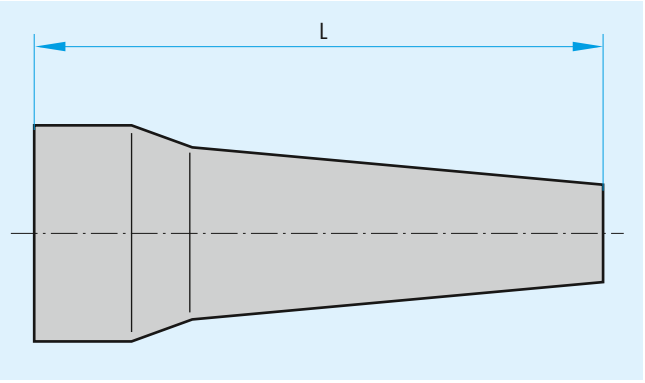
Accessories

Part Number Key See Fold-out Page in the Rear Cover



Silicone Cable Bend Relief

Size	Part number	Dim. L	Cable (outer diameter) min.	Cable (outer diameter) max.
0	700.023._.965.020	27	2.0	2.5
	700.023._.965.025		2.5	3.0
	700.023._.965.030		3.0	3.5
	700.023._.965.035		3.5	4.0
	700.023._.965.040		4.0	4.5
	700.023._.965.045		4.5	5.0
1	701.023._.965.025	30	2.5	3.0
	701.023._.965.030		3.0	3.5
	701.023._.965.035		3.5	4.0
	701.023._.965.040		4.0	5.0
	701.023._.965.050		5.0	6.0
	701.023._.965.060		6.0	6.5
	701.023._.965.070		6.5	7.5
2	702.023._.965.025	36	2.5	3.0
	702.023._.965.030		3.0	3.5
	702.023._.965.035		3.5	4.0
	702.023._.965.040		4.0	5.0
	702.023._.965.050		5.0	6.0
	702.023._.965.060		6.0	7.0
	702.023._.965.070		7.0	8.0
	702.023._.965.080		8.0	9.0
3	703.023._.965.040	42	4.0	5.0
	703.023._.965.050		5.0	6.0
	703.023._.965.060		6.0	7.0
	703.023._.965.070		7.0	8.0
	703.023._.965.080		8.0	9.0
	703.023._.965.090		9.0	10.0
	703.023._.965.100		10.0	11.0
	703.023._.965.110		11.0	12.0



Temperature range
Silicone: –50° C up to +200° C, short-term up to +230° C, autoclavable

Colours

Please indicate colour code.

Colour code	Colour	RAL-no. [1] (similar)
... 202 ...	Red	3020
... 203 ...	White	9010
... 204 ...	Yellow	1016
... 205 ...	Green	6029
... 206 ...	Blue	5002
... 207 ...	Grey	7005
... 208 ...	Black	9005

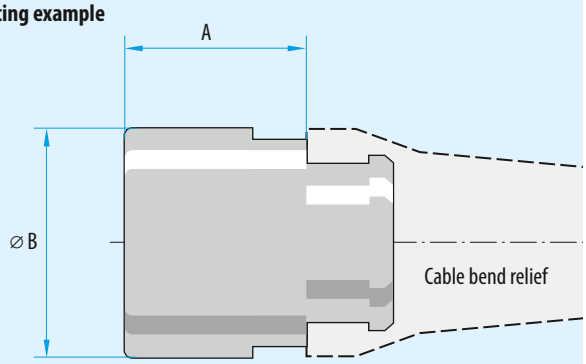
[1] Because of different raw materials the colours may slightly differ from RAL numbers.

Back Nut for Cable Bend Relief

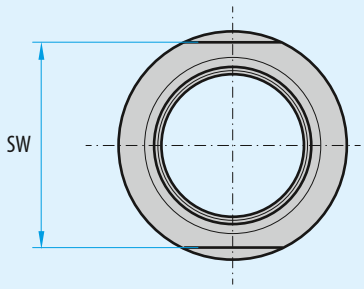
Size	Part number [1]	Dimensions in mm		
		A	∅ B	SW
0	700.022.117.3_.002	8.0	8.9	7
1	701.022.117.3_.002	10.0	10.9	10
1.5	715.022.117.3_.002	11.0	12.9	12
2	702.022.117.3_.002	11.5	13.9	13
3	703.022.117.3_.002	11.5	16.9	15

[1] In _ please indicate surface finish:
15 = Cu-alloy / matt chrome plated
11 = Cu-alloy / black chrome plated
04 = Cu-alloy / nickel

Mounting example



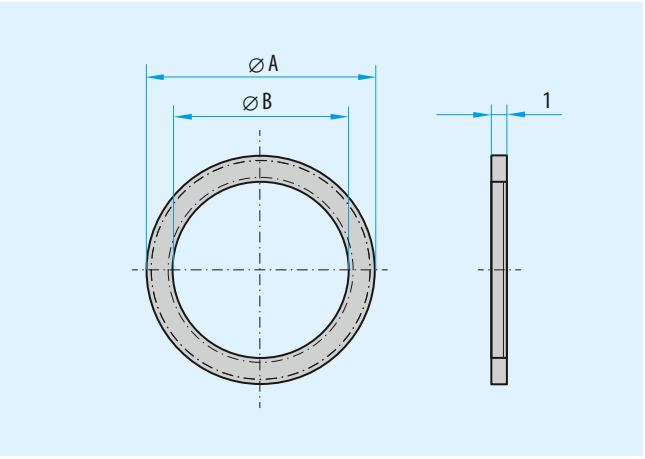
Back nut



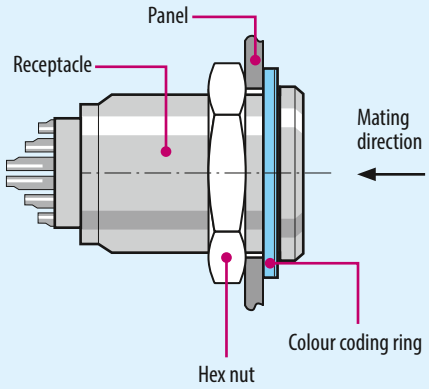
Colour Coding Rings

Size

Size	Part number	∅ A	∅ B
0	700.422._.922.009	13.5	9.1
0	700.422._.922.010	16.5	10.1
1	701.422._.922.012	17.0	12.1
1	701.422._.922.014	20.0	14.1
1.5	715.422._.922.014	21.0	14.1
2	702.422._.922.015	22.0	15.1
2	702.422._.922.016	23.0	16.1
3	703.422._.922.018	25.0	18.1
3	703.422._.922.020	28.0	20.1



Mounting example



Colours Please indicate colour code.

Colour code	Colour	RAL-no. [1] (similar)
... 202 ...	Red	3020
... 203 ...	White	9010
... 204 ...	Yellow	1016
... 205 ...	Green	6029
... 206 ...	Blue	5002
... 207 ...	Grey	7005
... 208 ...	Black	9005

[1] Because of different raw materials the colours may slightly differ from RAL numbers.

Order example

700.422.202.922.009

- Size 0
- Colour red
- Housing ∅M9

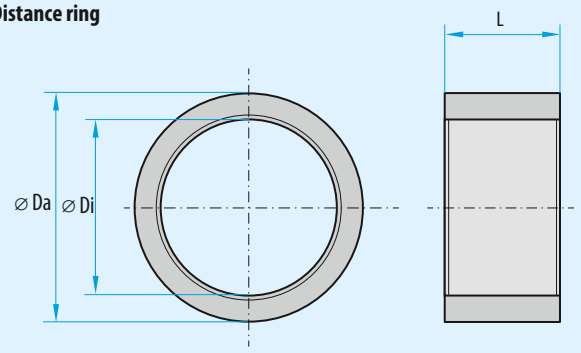
Distance Ring for Wall Thickness Adjustment for Receptacles of Style 2 [1)]

Size	Part number	Dimensions in mm			
		∅ Da	∅ Di	L	T
0	700.123.102.304.000	13.0	10.3	7.0	1 to 6
1	701.123.102.304.000[2)]	17.0	14.3	12.0	0.5 to 3
1	701.123.102.304.001[3)]	17.0	14.3	6.0	3 to 9
2	702.123.102.304.000	21.0	16.3	8.0	1 to 8
3	703.123.102.304.000	25.0	20.3	11.5	0.5 to 7

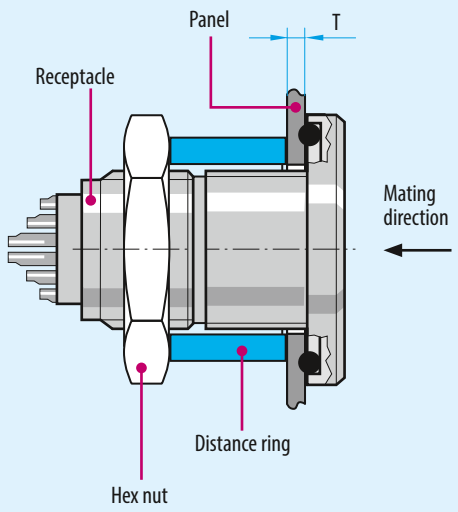
[1] See page 23
[2] Wall thickness: 0.5 to 6 mm
[3] Wall thickness: 6 to 16 mm

Material: brass
Surface: nickel

Distance ring



Mounting example



Locking Washers

Thread	Part number	Dimensions in mm		
		⌀A	⌀C	L
M9	945.000.001.000.046	12.5	9.1	1.0
M12	945.000.001.000.047	16.0	12.1	1.1
M14	945.000.001.000.070	19.5	14.2	1.1
M15	945.000.001.000.048	19.5	15.1	1.1
M16	945.000.001.000.072	21.5	16.1	1.1
M18	945.000.001.000.049	25.0	18.1	1.1
M20	945.000.001.000.121	25.0	20.1	1.1

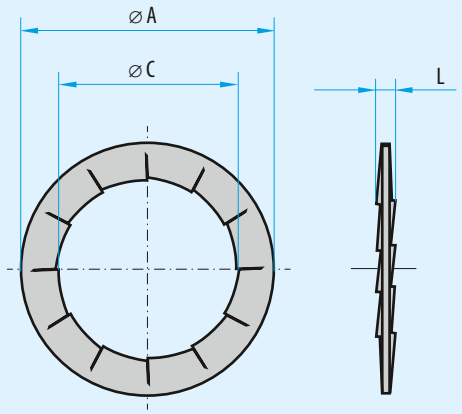
Surface: nickel-plated

Solder Lugs

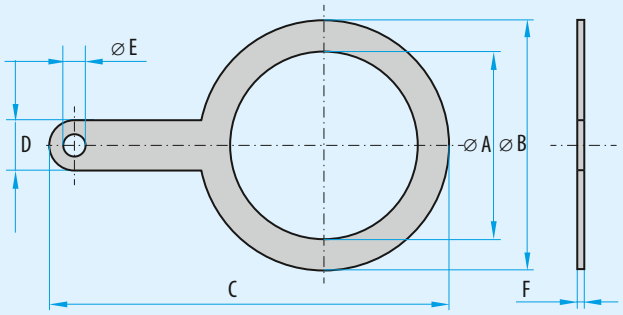
Thread	Part number	Dimensions in mm					
		⌀A	⌀B	C	D	⌀E	F
M9	700.140.246.301.000	9.7	13.2	21.6	4.0	1.6	0.5
M12	701.140.246.301.000	12.2	17.0	27.5	4.0	1.6	0.5
M14	715.140.246.301.000	14.1	18.0	27.0	4.0	2.0	0.5
M15	702.140.246.301.000	15.2	20.0	32.0	4.0	1.6	0.5
M16	721.140.246.301.000	16.2	20.0	32.0	4.0	1.6	0.5
M18	703.140.246.301.000	18.2	25.0	39.0	4.0	1.6	0.5
M20	722.140.246.301.000	20.2	25.0	39.0	4.0	1.6	0.5

Surface: silver-plated

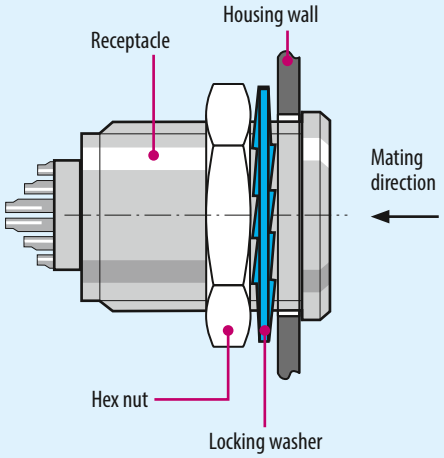
Locking washers



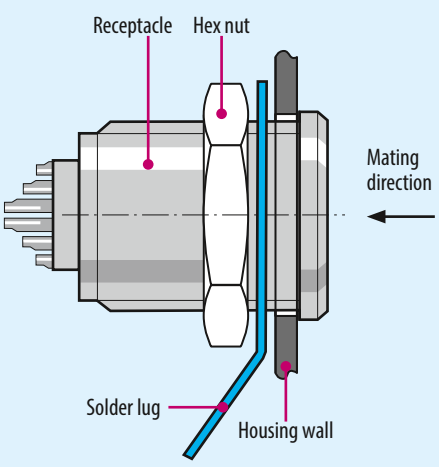
Solder lugs



Mounting example



Mounting example

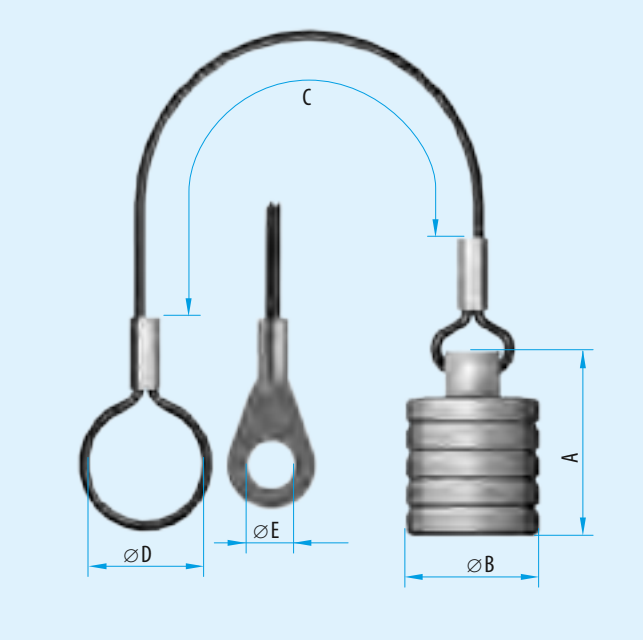


Protective Cover for Plug (IP 50)

Size	Part number [1]	Dimensions in mm				
		A	∅B	C	∅D	∅E
0	700.097.005.215._00	15.5	10	70	8	
1	701.097.005.215._00	16.5	12	75	10	
1.5	715.097.005.215._00	15.5	13	80	11	3.2
2	702.097.005.215._00	18.0	15	85	13	
3	703.097.005.215._00	20.5	18	100	16	

Surface: matt chrome plated

[1] With _ please register desired lanyard material:
0 = Polyamide lanyard with loop
1 = Stainless steel lanyard with loop
2 = Polyamide lanyard with solder lug
3 = Stainless steel lanyard with solder lug

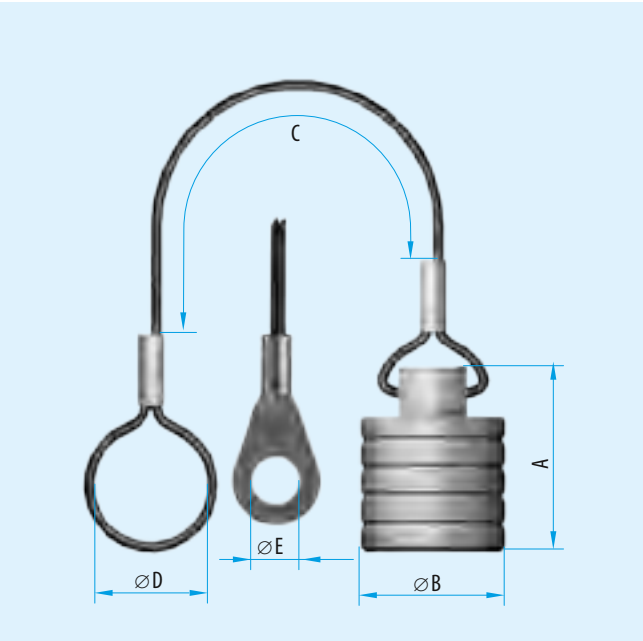


Protective Cover for Plug (IP 68)

Size	Part number [1]	Dimensions in mm				
		A	∅B	C	∅D	∅E
0	700.097.004.215._00	15.5	10.5	70	8	
1	701.097.004.215._00	16.5	13.0	75	10	
1.5	715.097.004.215._00	16.0	13.5	80	11	3.2
2	702.097.004.215._00	18.5	16.0	85	13	
3	703.097.004.215._00	21.0	19.0	100	16	

Surface: matt chrom plated

[1] With _ please register desired lanyard material:
0 = Polyamide lanyard with loop
1 = Stainless steel lanyard with loop
2 = Polyamide lanyard with solder lug
3 = Stainless steel lanyard with solder lug

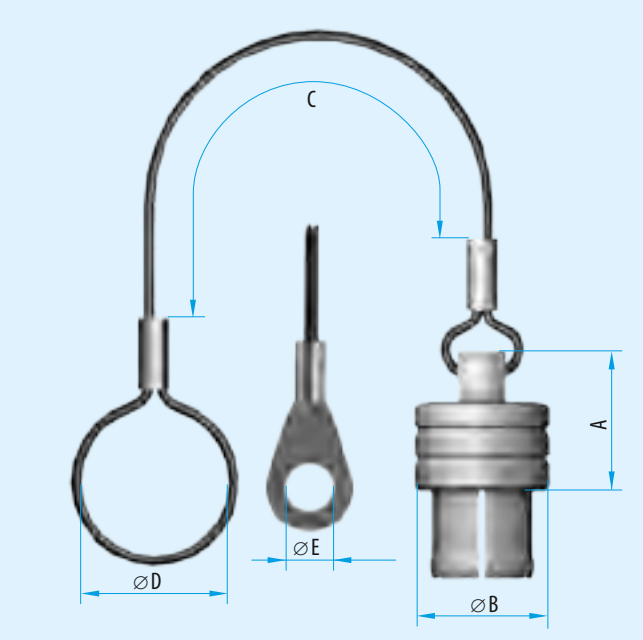


Protective Cover for Receptacle (IP 50)

Size	Part number [1]	Dimensions in mm				
		A	∅B	C	∅D	∅E
0	700.097.003.215._00	10.5	10.0	70	8.0	
1	701.097.003.215._00	12.5	12.0	75	13.0	
1.5	715.097.003.215._00	13.3	13.0	80	11.0	3.2
2	702.097.003.215._00	15.0	15.0	85	13.0	
3	703.097.003.215._00	16.6	18.0	100	16.0	

Surface: matt chrome plated

[1] With _ please register desired lanyard material:
0 = Polyamide lanyard with loop
1 = Stainless steel lanyard with loop
2 = Polyamide lanyard with solder lug
3 = Stainless steel lanyard with solder lug

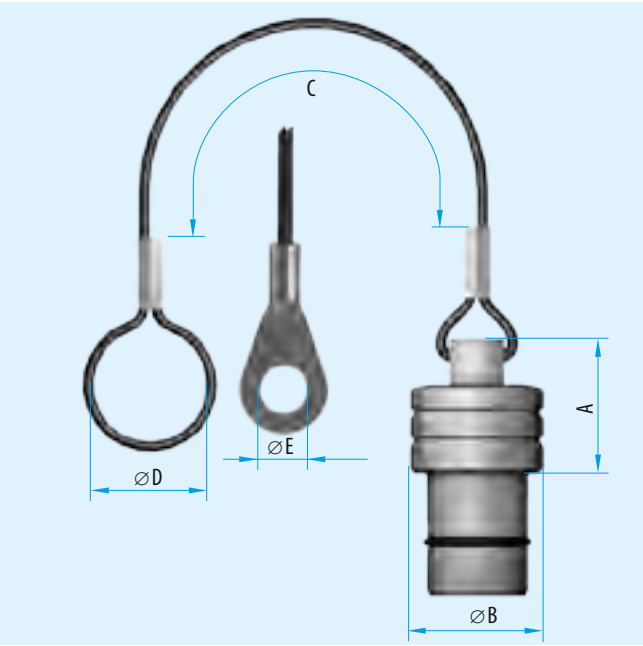


Protective Cover for Receptacle (IP 68)

Size	Part number [1]	Dimensions in mm				
		A	∅B	C	∅D	∅E
0	700.097.007.215._00	10.0	10.0	70	8.0	
1	701.097.007.215._00	12.0	12.0	75	10.0	
1.5	715.097.007.215._00	13.3	13.0	80	11.0	3.2
2	702.097.007.215._00	15.0	15.0	85	13.0	
3	703.097.007.215._00	17.0	18.0	100	16.0	

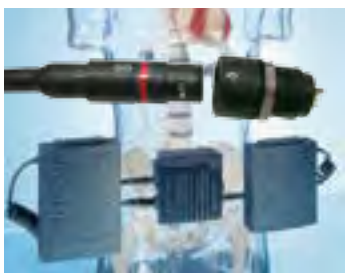
Surface: matt chrome plated

[1] With _ please register desired lanyard material:
0 = Polyamide lanyard with loop
1 = Stainless steel lanyard with loop
2 = Polyamide lanyard with solder lug
3 = Stainless steel lanyard with solder lug



Tools

Part Number Key See Fold-out Page in the Rear Cover



Crimping Tools / Assembly Tools

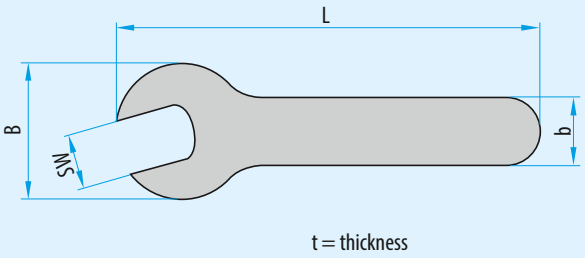
Part number crimping tool	080.000.051.000.000
Part number positioner	see table next page

Crimping and Removal Tools for Crimp Contacts

Size	Number of contacts	Contact diameter	Termination cross-section		Adjustment dimension	Positioner	Position		Removal tool
			AWG	mm^2			Pin	Socket	
0	4 to 5	0.7	28 to 32	0.09 / 0.04	0.57	080.000.051.108.000	1	2	087.7CC.070.001.000
	4 to 5	0.7	22 to 26	0.38 / 0.15	0.67	080.000.051.108.000	1	2	087.7CC.070.001.000
1	6 to 7	0.7	28 to 32	0.09 / 0.04	0.57	080.000.051.108.000	3	4	087.7CC.070.001.000
	6 to 7	0.7	22 to 26	0.38 / 0.15	0.67	080.000.051.108.000	3	4	087.7CC.070.001.000
	4 to 5	0.9	22 to 26	0.38 / 0.15	0.67	080.000.051.108.000	5	6	087.7CC.090.001.000
	4 to 5	0.9	20 to 24	0.50 / 0.25	0.67	080.000.051.108.000	5	6	087.7CC.090.001.000
1.5	12	0.7	28 to 32	0.09 / 0.04	0.57	080.000.051.108.000	3	7	087.7CC.070.001.000
	12	0.7	22 to 26	0.38 / 0.15	0.67	080.000.051.108.000	3	7	087.7CC.070.001.000
2	16 to 19	0.7	28 to 32	0.09 / 0.04	0.57	080.000.051.110.000	1	2	087.7CC.070.001.000
	16 to 19	0.7	22 to 26	0.38 / 0.15	0.67	080.000.051.110.000	1	2	087.7CC.070.001.000
	5	1.3	20 to 24	0.50 / 0.25	0.67	080.000.051.110.000	3	4	087.7CC.130.001.000
	5	1.3	18 to 20	1.00 / 0.50	1.12	080.000.051.110.000	3	4	087.7CC.130.001.000
3	24 to 27	0.7	22 to 26	0.38 / 0.15	0.67	080.000.051.110.000	1	6	087.7CC.070.001.000
	15 to 18	0.9	22 to 26	0.38 / 0.15	0.67	080.000.051.110.000	7	8	087.7CC.090.001.000
	15 to 18	0.9	20 to 24	0.50 / 0.25	0.67	080.000.051.110.000	7	8	087.7CC.090.001.000

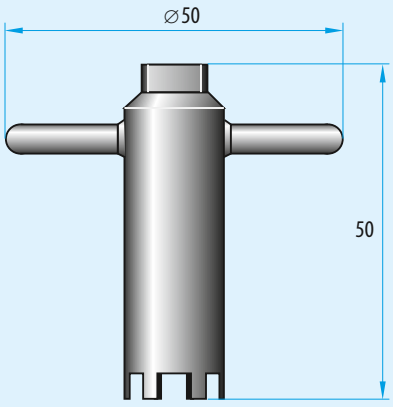
Spanner Wrench

Part number	Dimensions in mm				
	SW	t	B	L	b
598.700.001.016.000	5	1.5	16	92	8
598.700.001.015.000	5.5	1.5	16	92	8
598.700.001.021.000	6	2	16	92	8
598.700.001.011.000	7	2	16	92	8
598.700.001.001.000	8	2	16	92	8
598.700.001.022.000	9	2	21.5	102	9
598.700.001.002.000	10	2	21.5	102	9
598.700.001.012.000	11	2	24.5	115	10
598.700.001.013.000	12	2.5	24.5	115	10
598.700.001.017.000	12.5	4	24.5	115	10
598.700.001.004.000	13	2.5	30.5	98	16.5
598.700.001.005.000	14	2.5	30.5	98	16.5
598.700.001.006.000	15	3	35.5	145	15
598.700.001.007.000	16	3	35.5	145	15
598.700.001.008.000	17	3	35.5	145	15
598.700.001.023.000	18	3	42	172	16
598.700.001.013.000	19	3	42	172	16
598.700.001.009.000	20	3	42	172	16
598.700.001.018.000	21	3	42	172	16
598.700.001.010.000	22	3	47	119	23.5
598.700.001.014.000	24	3	54	119	23.5
598.700.001.024.000	27	3	55	150	25
598.700.001.019.000	30	3	50	150	25
598.700.001.020.000	31	3	50	150	25



Nutdriver for Slotted Mounting Nut

Nutdriver	Thread	
suitable for style 8		
700.098.002.000.000	M 9 × 0.5	
700.098.001.000.000	M 10 × 0.5	
700.098.001.000.000	M 12 × 1	
701.098.002.000.000	M 14 × 1	
701.098.001.000.000	M 15 × 1	
702.098.001.000.000	M 16 × 1	
702.098.001.000.000	M 18 × 1	
703.098.001.000.000	M 20 × 1	



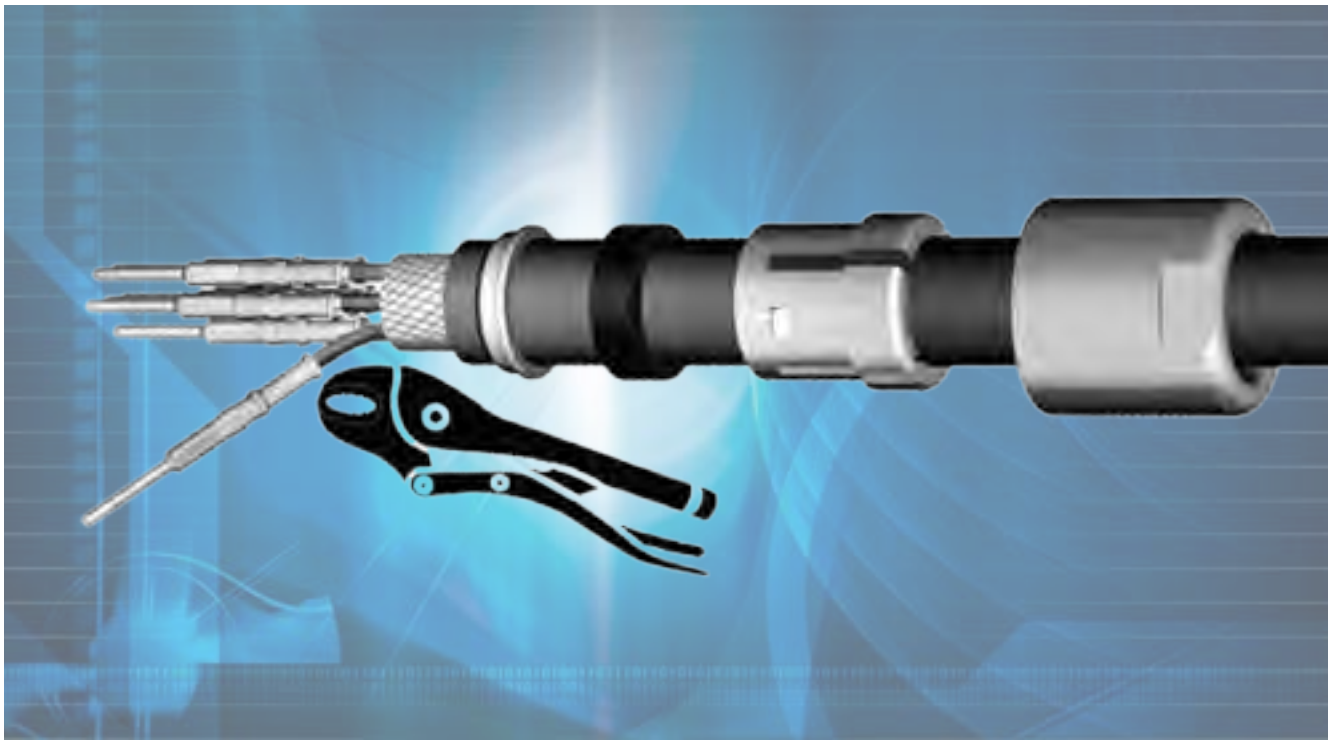
Removal Tool for Crimp-Clip-Contacts

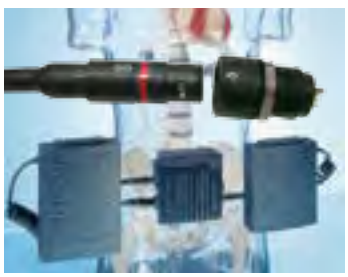
Part number	Contact diameter in mm
087.7CC.070.001.000	0.7
087.7CC.090.001.000	0.9
087.7CC.130.001.000	1.3
087.7CC.160.001.000	1.6

Crimp-clip-contact

Removal tool

Assembly Instructions



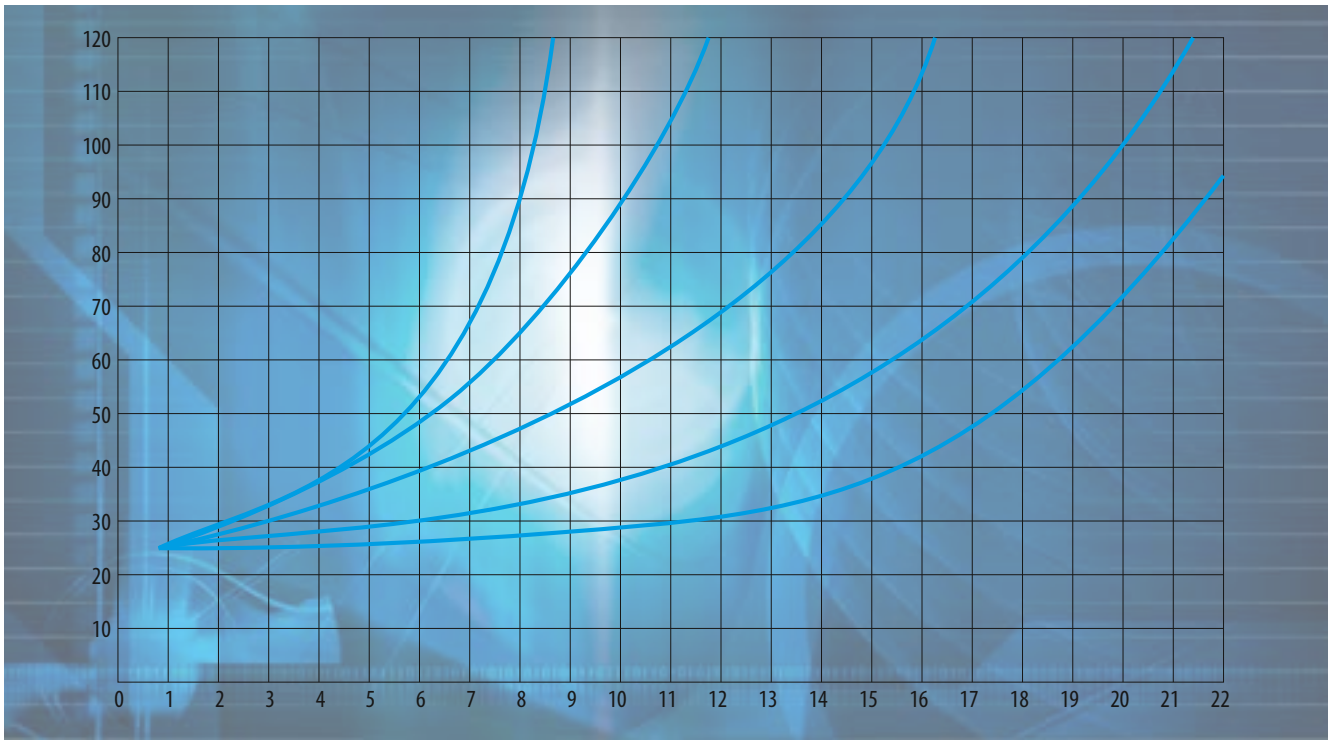


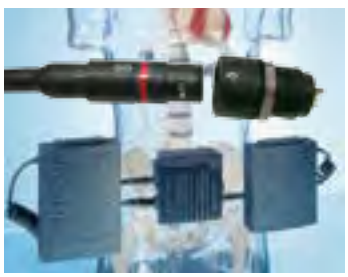
Our Assembly Instructions are available for Download on Our Website:

www.odu.de/downloads

The assembly instructions of MINI-SNAP F are available for download (www.odu.de/downloads):

Technical Information





International Protection (IP) Classes in Accordance with DIN EN 60 529 (or IEC 529 / VDE 0470 T1, respectively)

Code letters (International Protection) **IP**

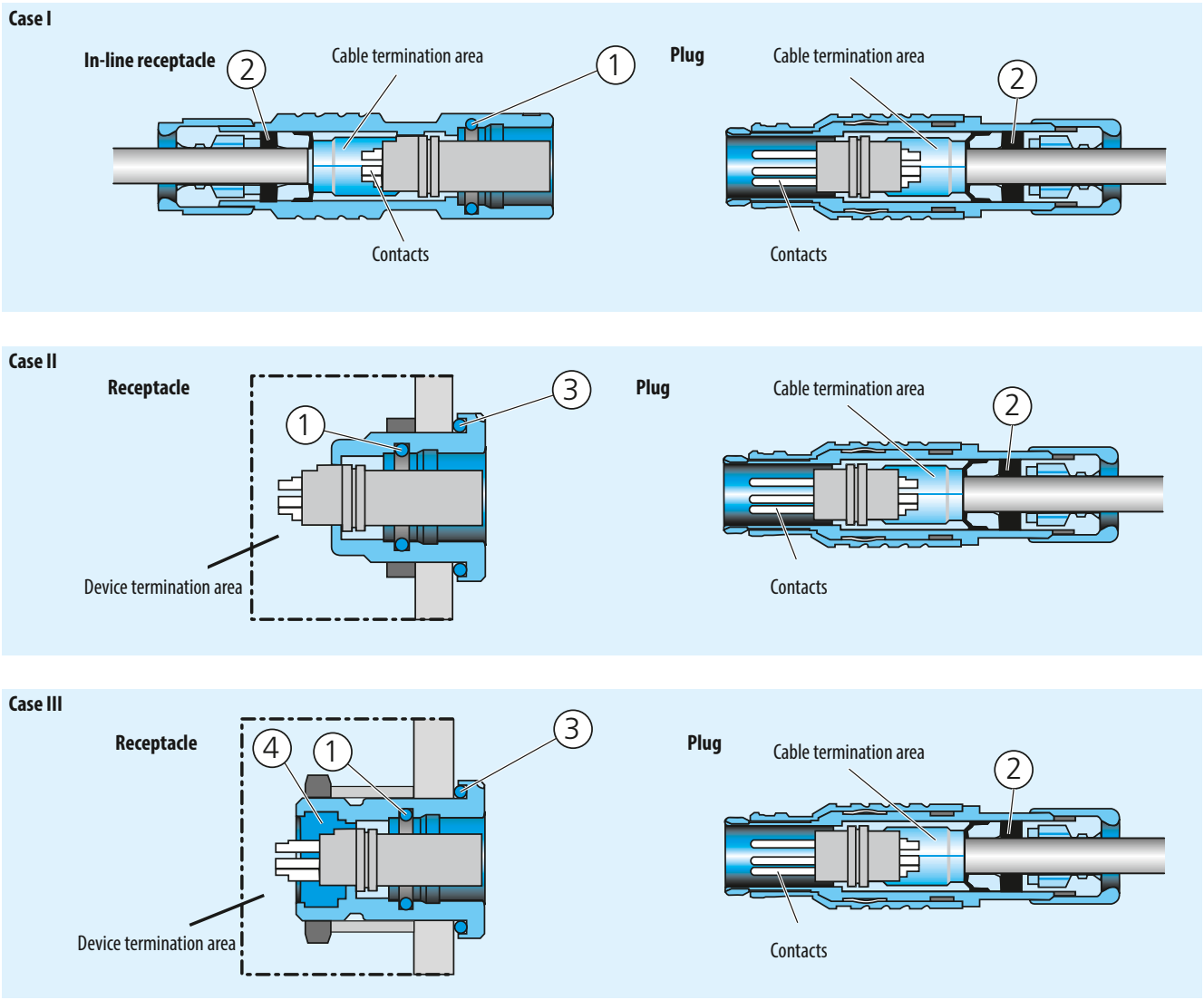
First code number (Protection against solid foreign bodies) **6**

Second code number (Protection against water) **5**

Code number	Extent of protection			Code number	Extent of protection		
0	No protection		No protection against contact, no protection against solid foreign bodies	0	No protection against water		No protection against water
1	Protection against large foreign bodies		Protection against large-surface contact with the back of the hand, protection against foreign bodies ∅ ≥ 50 mm	1	Protection against dripping water		Protection against vertically falling water drops
2	Protection against medium-sized foreign bodies		Protection against contact with the fingers, protection against foreign bodies. ∅ ≥ 12 mm	2	Protection against dripping water when tilted		Protection against falling water drops when tilted (any angle up to 15° from the vertical)
3	Protection against small foreign bodies		Protection against contact with tools, wires, or the like with ∅ ≥ 2.5 mm, protection against foreign bodies ∅ ≥ 2.5 mm	3	Protected against spraying water		Protection against water spraying at any angle up to 60° from the vertical
4	Protection against granular foreign bodies		The same as 3, except ∅ ≥ 1 mm	4	Protection against splashing water		Protection against splashing water from all directions
5	Protection against dust deposits		Protection against contact, protection against harmful dust deposit in the interior	5	Protection against water jet		Protection against water jet (nozzle) from any angle
6	Protection against dust ingress		Protection against foreign bodies ∅ ≥ 1 mm, protection against dust ingress	6	Protection against powerful water jet		Protection against powerful water jet from any angle
				7	Protection against immersion		Protection against water ingress during temporary immersion
				8	Protection against continuous immersion		Protection against pressurized water during continuous immersion
				9k[1]	Protection against high pressure		Protection against water from high-pressure/ steam jet cleaners.

[1] IP x9k is not included in EN 60529 or IEC 60529, but is included in DIN 40 050-9.

Principle of the Watertightness of ODU MINI-SNAP®



Protection against water through following seals[1)]:

Case	Termination area	Mated		Unmated	
		Sealed	Position	Sealed	Position
I	Cable termination area	Yes	❶ ❷	No	
II	Device termination area	Yes	❶ ❷ ❸	No	
III	Device termination area	Yes	❶ ❷ ❸	Yes	❸ ❹

No.	Sealing part
❶	O-ring
❷	Sealing ring[2)]
❸	O-ring
❹	Potting

[1] Contacts: in mated condition the contacts are protected (in cases I, II, III) .
In unmated condition the contacts can be protected using a protective cover (see page 57).
The cover must be removed before mating the plug with the receptacle.

[2] The sealing ring acts as the cable sealing. It requires exact knowledge of the cable dimension.
Important factors: Diameter tolerance, roundness, cable design and cable jacket hardness.

All IP 68 submersible ODU MINI-SNAP connectors are rated to 2 m water depth (0.2 bar) for 24 hours in accordance with DIN EN 60 529.
A watertight plug requires a cable grommet in the collet. The grommet has to fit tightly over the cable. The cable jacket must be smooth, cylindrical and free of grooves.
The plug should be potted for watertightness in unmated condition.

Housing Materials and Surfaces Finish

ODU MINI-SNAP housings are made from brass and are nickel-plated with a matt chrome plated surface finish (sand-blasted). Nickel-plated or black chrome plated finished housings are available on special request. Inside metal components are made from nickel-plated brass.

Component parts	Material name	Surface
Housing Back nut Design nut	Cu-alloy	Cr
Cable collet EMI ring Half-shells Locking washers Nut Retainer ring	Cu-alloy	Ni
Contact pin (solder / PCB) Contact socket (solder / PCB Contact pin (crimp) Contact socket (crimp)	Cu-alloy	Au

Insulator Material (RoHS 2011/65/EC recognized)

	Norm	Unit	PBT	PTFE [1)]	PEEK
Dielectric strength	DIN 53481	KV/mm	27	> 50	19
Operation temperature	ASTM D-149	°C	– 40/+140	– 100/+260	– 50/+250
Flammability class	UL–94	–	V-0	V-0	V-0
Creeping distance acc. to CTI	IEC 60 112	–	275	600	175

[1] PTFE (Teflon) is only used for coax and triax connectors.

Termination Technologies

Contact blocks (insulators with contacts) are interchangeable between receptacle and plug. The same applies to the insulator with the socket contacts. As a rule the socket contact blocks are mounted in the part under power (because touch-proof).

With respect to the termination technologies, the type of mounting used for the contacts in the insulator is important. ODU offers the following contact termination technologies:

– Solder
– Crimp
– Print (PCB)

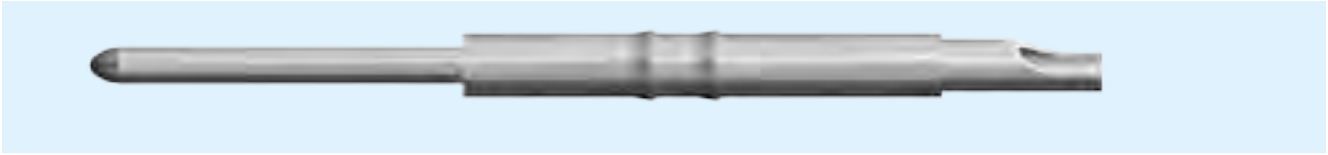
Termination technologies for turned contacts

Solder termination
The contacts come mounted by the factory. The insulator and the pre-assembled contacts are called a contact block.

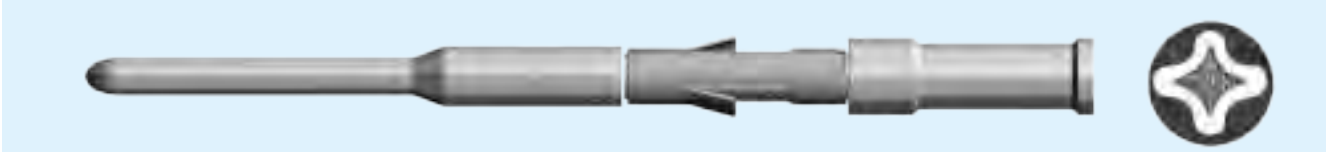
Crimp termination
A single contact is crimped to a single conductor. Subsequently, the crimped contact is pushed into the insulator. Crimp contacts and insulators are shipped separately. Crimping creates a reliable, corrosion-free and durable connection between the contact and the conductor. Crimping causes the crimp barrel of the contact and the conductor material to cold flow. It creates a gas-tight connection between contact and conductor. The ODU MINI-SNAP generally requires the industry standard 8-point crimping tool.

Printed circuit board (PCB) termination
PCB pins are used only for receptacles which are mounted directly to the PCB (further information upon request).

Solder termination



Crimp termination (Crimp-clip-contact for PEEK Insulator)



Printed circuit board (PCB) termination

Conversions AWG – Cross Section (AWG = American Wire Gauge)

The AWG system describes the cross section of a wire using a gauge number for every 26 % increase in conductor cross section. With larger wire diameters, the AWG gauge numbers decrease; as the wire sizes increase, the AWG gauge numbers decrease. **This is only valid for solid conductors.**

Most wires are made with **stranded conductors.** Compared to solid conductors stranded wires offer higher durability, higher flexibility and better performance under bending and vibration.

Stranded wires are made from wires with smaller gauge sizes (higher AWG gauge number). The AWG gauge number of the stranded wire is equal to that of a solid conductor of the same size wire. The cross section of the stranded conductor is the sum of cross sections of the single conductors.
For example, a AWG-20 stranded wire of 7 AWG-28 conductors has a cross section of 0.563 mm²; an AWG-20 stranded wire with 19 AWG-32 conductors has a cross section of 0.616 mm².

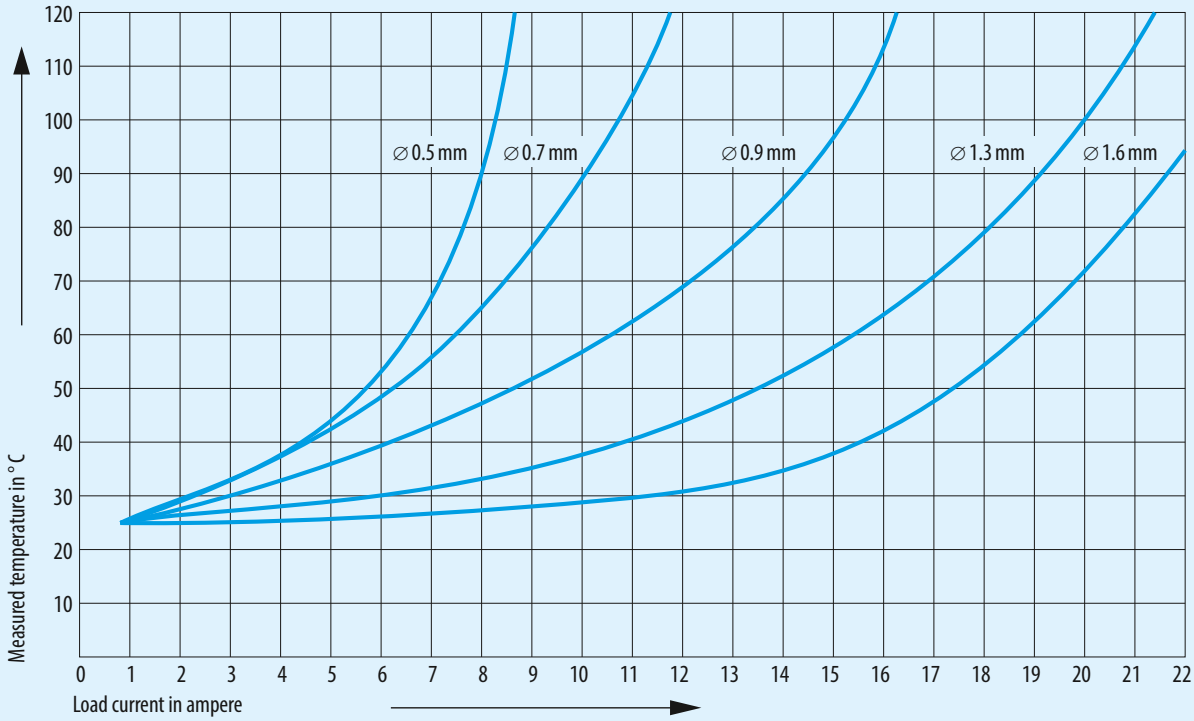
Conversion table AWG/mm²

Circular wire					
AWG	Diameter		Cross section	Weight	Max. resistance
	Inch	mm	mm²	kg/km	Ω/km
10 (1)	0.1020	2.5900	5.2700	47.000	3.45
10 (37/26)	1.1090	2.7500	4.5300	43.600	4.13
12 (1)	0.0808	2.0500	3.3100	29.500	5.45
12 (19/25)	0.0895	2.2500	3.0800	28.600	6.14
12 (37/28)	0.0858	2.1800	2.9700	26.300	6.36
14 (1)	0.0641	1.6300	2.0800	18.500	8.79
14 (19/27)	0.0670	1.7000	1.9400	18.000	9.94
14 (37/30)	0.0673	1.7100	1.8700	17.400	10.50
16 (1)	0.0508	1.2900	1.3100	11.600	13.94
16 (19/29)	0.0551	1.4000	1.2300	11.000	15.70
18 (1)	0.0403	1.0200	0.8200	7.320	22.18
18 (19/30)	0.0480	1.2200	0.9600	8.840	20.40
20 (1)	0.0320	0.8130	0.5200	4.610	35.10
20 (7/28)	0.0366	0.9300	0.5600	5.150	34.10
20 (19/32)	0.0384	0.9800	0.6200	5.450	32.00
22 (1)	0.0252	0.6400	0.3240	2.890	57.70
22 (7/30)	0.0288	0.7310	0.3540	3.240	54.80
22 (19/34)	0.0307	0.7800	0.3820	3.410	51.80
24 (1)	0.0197	0.5000	0.1960	1.830	91.20
24 (7/32)	0.0230	0.5850	0.2270	2.080	86.00
24 (19/36)	0.0252	0.6400	0.2400	2.160	83.30
26 (1)	0.1570	0.4000	0.1220	1.140	147.00
26 (7/34)	0.0189	0.4800	0.1400	1.290	140.00
26 (19/38)	0.0192	0.4870	0.1500	1.400	131.00
28 (1)	0.0126	0.3200	0.0800	0.716	231.00
28 (7/36)	0.0150	0.3810	0.0890	0.813	224.00
28 (19/40)	0.0151	0.3850	0.0950	0.931	207.00
30 (1)	0.0098	0.2500	0.0506	0.451	374.00
30 (7/38)	0.0115	0.2930	0.0550	0.519	354.00
30 (19/42)	0.0123	0.3120	0.0720	0.622	310.00
32 (1)	0.0080	0.2030	0.0320	0.289	561.00
32 (7/40)	0.0094	0.2400	0.0350	0.340	597.10
32 (19/44)	0.0100	0.2540	0.0440	0.356	492.00
34 (1)	0.0063	0.1600	0.0201	0.179	951.00
34 (7/42)	0.0083	0.2110	0.0266	0.113	1,491.00
36 (1)	0.0050	0.1270	0.0127	0.072	1,519.00
36 (7/44)	0.0064	0.1630	0.0161	0.130	1,322.00
38 (1)	0.0040	0.1000	0.0078	0.072	2,402.00
40 (1)	0.0031	0.0800	0.0050	0.043	3,878.60
42 (1)	0.0028	0.0700	0.0038	0.028	5,964.00
44 (1)	0.0021	0.0540	0.0023	0.018	8,660.00

Source: Gore & Associates, Pleinfeld

Current Load – Turned Contacts

Nominal single contact current load for pin / slotted socket (nominal diameter 0.5 mm to 1.6 mm)



Maximum operating temperature for standard contacts: +120° C

Test contact was terminated to largest possible conductor.

Connectors or cables with more than one contact or conductor generate a higher heat than a single contact. Therefore, a **derating factor** must be applied.
For connectors the derating factor is applied according to DIN 57 298 Teil 4 / VDE 0298 Teil 2.
The derating factor is used starting with 5 loaded wires (DIN 41 640 T3).

Derating factor

Number of loaded wires	Derating factor
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40

Operating Voltage acc. to SAE AS 13441-Method 3001.1

The values acc. to SAE AS 13441-method 3001.1 comply with MIL-STD 1344-method 3001.
The chart values results are acc. to IEC 60512-2; Test 4. The inserts have been tested in mated condition and the test voltage was applied to the pin insert.

75 % of the measured break-down voltage is the basic for the further calculation. 1⁄3 of this value is the corresponding operating voltage.

All tests were performed at standard environment conditions (room temperature) and can be applied up to an altitude of 2,000 m.
For any deviations one has to consider the reduction factor acc. to the relevant standards.

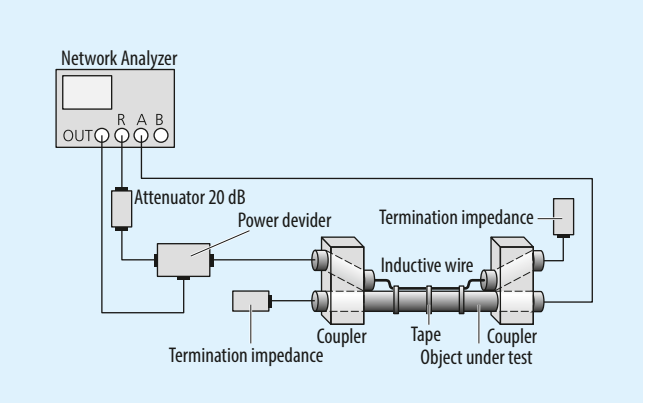
Test voltage: **Break-down voltage × 0.75**
Operating voltage: **Break-down voltage × 0.75 × 0.33**

Caution
Electrical appliances: for various applications the safety requirements regarding the operating voltage is even more severe!
The relevant datas in such cases for the operating voltage are the creepage and clearance distances.

For any advise how to choose the proper connector please consult us and indicate the safty standard which your product has to meet.

Electro Magnetic Compatibility (EMC)

When discussing electro magnetic compatibility (EMC) one should not only consider the device or the circuit, but also include the network and the entire data communication link. This involves all connecting elements such as conductors and connectors. Electromagnetic interference from the outside into the connector can lead to system malfunctioning. The best way to prevent this is by providing a high-quality shield between the cable and the connector. In order to provide reliable EMC data to our customers we engaged the services of a certified test laboratory to investigate the EMC characteristics of the ODU MINI-SNAP. They tested for us size 00, 0, 1, 2 and 3 MINI-SNAP connectors.



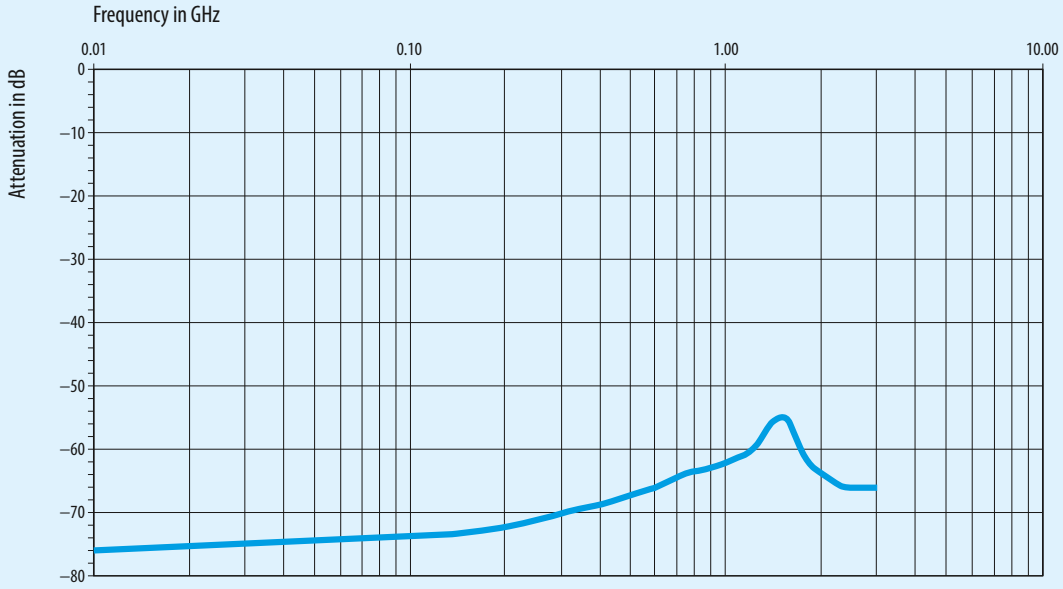
Measurements were conducted using the inductive wire or parallel wire method in accordance with test procedure VG 55214-6-2. In this set-up, the mated connector is connected on one end to a network analyzer and terminated on the other end with a suitable impedance. The inductive wire is then mounted in close proximity along the mated connector pair. The induction wire is a ribbon cable which permits to vary the level of induction by using more or less of the ribbon conductors.

Next, a signal with a frequency range of 10 kHz to 3 GHz is connected to the ribbon cable. The network analyzer is used to measure the amount of signal induced into the connector circuit. The result is shown as the shielding attenuation AT in dB. It is essential that all leads to the connector are shielded so that no signal can be induced into the circuit at any other place except the connector.

The various attenuation values are plotted on a logarithmic scale as attenuation in dB vs. frequency.

An attenuation of better than – 55 dB is generally required for reliable connector and system operation. It can be shown that our connectors will meet this requirement in all applications.

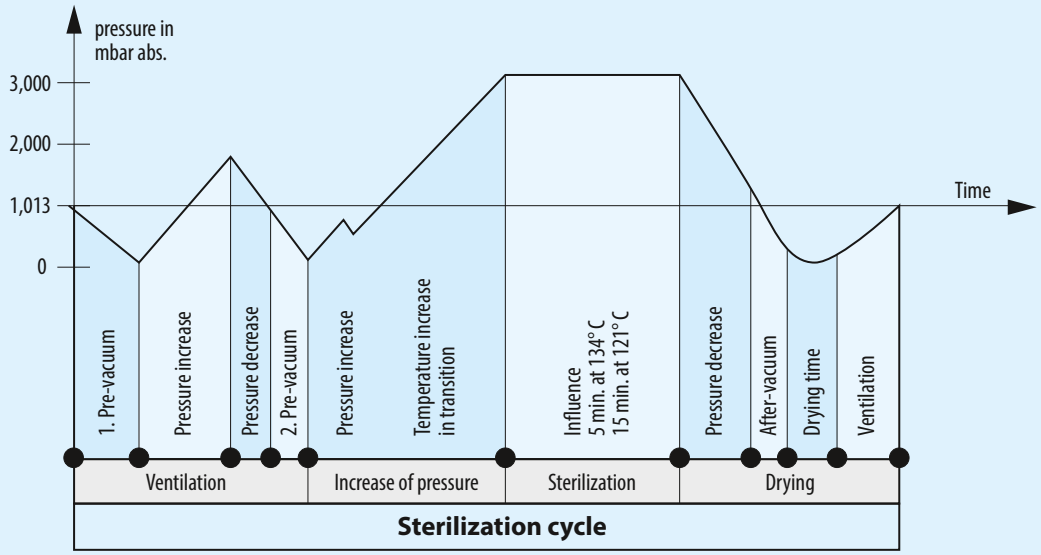
The following diagram is valid for all series and standard sizes.



Autoclaving of the ODU MINI-SNAP®

If required ODU can deliver MINI-SNAP connectors for the following sterilization process: Steam-sterilization with pre-vacuum or gravitation-process. Connectors were tested with autoklave equipment with reference to DIN EN 13060 at 134° C and 500 cycles.

Sterilization curve



For other sterilization-processes please contact our technical support team.

Test Standard

In the scope of quality approval the sizes 0 and 3 have been submitted to environmental and mechanical tests acc. to MIL. All tests have been passed.

Tests carried out

Definition	Standard
High temperature	MIL-STD 810 F / PV 501
Low temperature	MIL-STD 810 F / PV 502
Temperature shock	MIL-STD 810 F / PV 503
Humidity	MIL-STD 810 F / PV 507
Salt fog	MIL-STD 810 F / PV 509 and MIL-STD 1344 A / Method 1001.1
Free fall	MIL-STD 810 F / PV 516
Vibration	MIL-STD 1344 A / Method 2005.1 / IV
Watertightness IP 68	IEC 60529

Technical Information / Definitions / Terms

Air gap
Shortest distance between two conductive elements through the air.

Autoclavability
See page 78.

AWG
See page 74.

Creepage distance
The distance measured across the surface of a dielectric between two contacts or a contact and a metal part. The longer the distance, the lesser the risk of damage or tracking. Minimum creepage distances are specified according to the operating voltage and the applicable isolation group.

Crimping area
The part of a crimp barrel at which the crimp connection is achieved by pressure deformation or by reshaping the barrel around the conductor.

Crimp barrel
A hollow part of a contact which accepts one or more conductors and which may be crimped through the application of a crimping tool.

Crimp connection
The permanent attachment of a contact to a conductor by pressure deformation or by reshaping the crimp barrel around the conductor so that a good electrical and mechanical connection is established (see page 73).

Connector
A component which terminates conductors for the purpose of providing connection and disconnection to a suitable mating component. Depending on the fastening to a cabinet, panel, rack etc. or a cable, they are classification.

Delivery
Delivery of the connectors usually as components (that means not assembled).
Exception: Solder contacts are factory-installed in the insulation body.

Fixed connector
A connector for attachment to a rigid surface (panel).

Free connector
A connector for attachment to the free end of a wire or cable. Also called free hanging connector or in-line receptacle.

Insertion or withdrawal force
The force required to fully mate or unmate a set of connectors without the effect of coupling, locking or similar devices. The insertion force is usually greater than the withdrawal force. Also called mating and unmating force.

Insulation body
Non-conductive part of a connector, to electrically and mechanically separate live parts and to protect against accidental touch.

Insulation group
Classification of connectors according to the operating and working conditions (insulation groups according DIN VDE 0110).

Keying
System of projections and grooves on mating connectors which prevent otherwise identical connectors from being mated. This is useful when several connectors of the same style are used in the same application (see page 54).

Lower limit temperature
The lowest permissible temperature which a connector or a plug-in device is allowed to be operated.

Materials
The contacts are made of Cu-alloy and gold-plated. The standard housings are made of Cu-alloy with a matt chrome plated surface finish. All other materials and surfaces on special request (see page 72).

Mating cycles
Mechanical operation of connectors and plug-in devices by insertion and withdrawal. One mating cycle comprises one insertion and one withdrawal operation.

Nominal single contact current load
Current load, which can load every single contact (see page 75).

Nominal voltage
Nominal voltage characterizes a component.

Operating temperature of the ODU MINI-SNAP
Range between upper and lower temperature limits.
– 40° C to +120° C (see page 7).

Print (PCB) connection
See page 73.

Printed circuit board
Boards, typically made of epoxy-filled glass fiber fabric, with conductive pattern on one or both sides, or in case of multilayer boards, also imbedded inside the board. They feature metallized holes for soldering wire-mounted components or for the insertion of insertion of resilient or rigid press-in pins or instead, pads for attaching components using surface mount technology (SMT).

Reference current
The current at which a connector can be operated permanently simultaneously through all contacts without reaching maximum temperature.

Reference voltage
Normal voltage (VDE 0110) for a connector.

Solder termination
See page 73.

Termination cross-section
The indicated cross-sections correspond to a flexible conductor design in accordance with EN 60228:2005 class 5 or to a flexible conductor design (7/19 strands) in accordance with AWG (ASTM B258-02).

Termination techniques
Methods for connecting a wire to an electro-mechanical component, e.g. solderless connection according to IEC 60352: respectively such as crimp, press-in etc. or solder connections.

Test voltage
The voltage the connectors are tested, and are being referred on definite characteristics.

Upper limit temperature
Highest permissible temperature at which a connector or a plug-in device is allowed to operate. This temperature includes the self-heating and the ambient temperature. At ODU MINI-SNAP +120° C (see page 75).

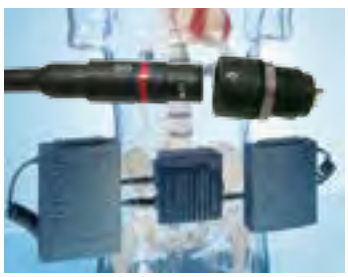
Watertightness
See page 71.

Wire
Wires may be provided with an insulation cover, an electrical shielding. Cables or conductors may consist of one or more wires.

Connectors shown in this catalog are designed to operate at high voltages and high frequencies. Care must be taken to assure that no person can come in contact with live conductors during installation or operation of the connectors.

ODU reserves the right to change design and performance of any product to meet changing technical developments without prior notice. ODU reserves the right to discontinue any part in this catalog without prior notice and without obligation to continue production after the change.

Company Information



Quality Management

ODU has had a powerful quality management system in place for years. ODU has been successfully certified to ISO 9001 since 1994. In addition, the automotive sector of the company group is certified to ISO TS 16949.
The certification process was carried out by the internationally active BVQI (Bureau Veritas Quality International) company.

ODU is also certified according to the medical standard ISO 13485 : 2003 + AC : 2007.

Additional to this ODU is certificated to DIN EN ISO 14001 : 2009 as well as to different certifications: VDE, UL, UL wiring harness, SCA, VG, MIL.

Your Partner in Many Application Areas

ODU stands for quality, flexibility and reliability. This is why customers working in many application areas rely on ODU products in markets such as the following:

– Medical
– Industrial
– Measuring and testing
– Military and security
– Energy
– Automotive.

Overview – All Push-Pull Connector Series from ODU

	Push-Pull series	Coding	Sizes	No. of mechanical coding	Diameter plug (mm)	Max. cable ∅ (mm)	Max. no. of contacts	Solder	Crimp	Print	IP Protection Class A[1]	IP Protection Class B[2]
ODU MINI-SNAP L		Pin and groove	00	4	6.5	3.5	04	●	●	●	IP 50	up to IP 68
			0	6	9.5	5.6	10					
			1	7	12.0	7.7	16					
			2	8	15.0	9.9	26					
			3	7	18.0	11.9	30					
			4	1	25.0	16.0	40					
ODU MINI-SNAP K		Pin and groove	0	4	11.0	5.0	10	●	●	●	IP 68	up to IP 68
			1		13.0	7.0	16					
			2		16.0	9.0	26					
			3	1	19.0	10.5	30					
			4	1	25.0	14.0	40					
ODU MINI-SNAP B		Pin and groove	0	6	9.4	5.0	10	●	●	●	IP 68	up to IP 68
			1	8	12.0	7.0	16					
			2	8	15.0	9.0	26					
			3	10	18.0	10.5	30					
ODU MINI-SNAP S		Insulation body	0	1	9.4	5.0	04	●	●		up to IP 68	up to IP 68
			1		12.0	7.0	05					
			2		15.0	9.0	10					
ODU MINI-SNAP F		Half shell	0	2	9.4	5.0	09	●	●	●	up to IP 68	up to IP 68
			1	2	12.0	7.5	12					
			1.5	2	13.0	7.5	19					
			2	2	15.0	9.5	19					
			3	3	18.0	11.5	27					
ODU AMC		Pin and groove	0	4	14.0	5.5	10	●		●	up to IP 69K	IP 68
			1		15.9	6.5	16					
			1.5		16.5	8.0	19					
			2		19.6	10.0	26					
			3		23.9	11.5	37					
			4		33.0	17.5	55					
ODU MINI-SNAP PC		Half shell	1	3	12.5	6.0	14	●	●	●	up to IP 67	IP 50
			2		15.7	9.0	19					
			3		18.7	10.5	27					
ODU MEDI-SNAP		Pin and groove	1	6	13.7	6.5	14	●	●	●	up to IP 64	IP 50
			2	1	18.5	9.2	19					

[1] IP Protection Class in mated condition.
[2] IP Protection Class in unmated condition to the end device.

The Complete ODU Product Range

Single contacts (round or flat)			
High current connectors			
Circular connectors with Push-Pull locking			
Modular rectangular connectors			
PCB connectors			
Robust connectors			
Disposable Systems			
Application specific solutions			
AMC – Advanced Military Connector			
Cable assembly			

Everything From One Source

Each connection needs its individual cable. Make no compromises when it comes to the quality of the complete connection system. ODU gives you the complete system solution from one source, with no intermediary suppliers.

Cable assembly is a very complex subject. It requires equal measures of expertise in the areas of connectors, cables and assembly. ODU meets all these requirements in full.

Our competent assembly team tests the complete system according your specifications. Our assembly service promises you the same quality found in our connectors – without compromises.

ODU offers you all from one source

- 100 % final inspections
- Production in clean room acc. to EN ISO14644-1 possible
- Automatic processes (cutting, stripping, attaching)
- Extrusion possible with a hot-melt and high pressure/ temperature process
- Ultrasound welding
- EMC-compatible assembly
- Application specific labeling
- Widest range of potting possibilities for sealed systems
- Extruded cable crossovers.

Advantages for the customer

- Modern manufacturing facilities in Mühldorf (Germany), Shanghai (China) and Sibiu (Romania)
- Reliability thanks to our company-wide quality strategy
- Products with durability and functional reliability
- Production according to UL (file: E333666) possible
- Inspections, such as crimp force monitoring, during production.

Application Specific Connectors

Innovative, dynamic markets call for innovative connectors.

As an expert for special applications and requirements, we develop forward-looking, appropriate connectors attuned to your needs!

In spite of the global trend toward standardized connectors, there are always applications that call for an application specific solution. We accept this challenge and develop innovative products for our customers based on our many years of extensive know-how, our creativity and, not least, our high level of vertical integration. Technology access and technology mastery, combined with intensive cooperation with the user, form the basis for achieving success together.

Design-to-cost is joined by design-for-application for the customer's benefit.

Telefax Inquiry ODU MINI-SNAP® F

Fax-No.: +49 8631 6156-49

ODU GmbH & Co. KG
Pregelstr. 11
84453 Mühldorf a. Inn
GERMANY

Company: .....

Name: .....

Department: .....

Street: .....

City: .....

Phone: ..... Date: .....

ODU MINI-SNAP® Summary of Technical Requirements

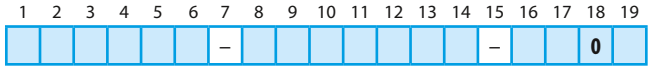
1)	Connector application	_____				
		_____				
2)	Environment	_____				
		❑ Plug		❑ Receptacle		❑ In-line receptacle
3)	Connector type	❑ Right-angled plug				
4)	Special version	_____				
5)	Style	_____				
6)	Size	❑ 0	❑ 1	❑ 1.5	❑ 2	❑ 3
7)	Series	❑ don't care		❑ F		
8)	Coding	_____				
9)	Number of contacts	_____				
10)	Termination	❑ Solder		❑ Crimp		❑ PCB
11)	Termination cross-section	_____ mm^2		_____ AWG		
12)	Cable diameter	_____ mm				
13)	Cable bend relief (colour)	_____		❑ PUR	❑ Silicone	
14)	Protection class acc. DIN EN 60 529	❑ IP 50 (Standard)		❑ IP 68 (watertight)		❑ other
15)	Requirement: Operating temperature	_____ °C max.		_____ °C min.		
16)	Electrical data:					
	Rated voltage	_____ V AC		_____ V DC		
	Rated current	_____ A (constant)		_____ A (short-term)		_____ sec.
17)	Chemical resistance against	_____				
18)	Other requirements	_____				
19)	Autoclavable, 134° C	❑ Yes	❑ No			

→ Required quantity _____

→ Production quantity _____

The Part Number Key

No.	Description	Coding	Page
1	Type: Break-Away plug / receptacle plug Receptacle In-line receptacle Plug Right-angled plug	A G K S W	12 to 25
2	Style (X = special version)	1 to 8, A, X	12 to 25
3	Size	0 to 3, A	12 to 25 35 to 40
4	Series	F	
5	Coding		28
6	Material / surface		28
8	Material insulator		34 to 40
9 10	Contact insert e.g. 18 positions = 18		35 to 40
11	Contact type / surface		43
12	Contact diameter (M = mixed insert)		44
13 14	Termination cross-section (for special inserts: field 14 = 9)		44
16 17	Cable collet system		29, 30
18		0	
19	Cable bend relief colour / material		52



Order example plug

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
S	2	2	F	1	C	–	P	1	6	M	F	D	0	–	7	5	0	S

1 = Plug
2 = Style 2
3 = Size 2
4 = Series F
5 = Coding 1
6 = Ms matt chrome plated housing

8 = Insulator PEEK
9/10 = 16 positions
11 = Pin (solder) 0.75 µm Au
12 = Cable diameter 7.1 to 7.5 mm
13/14 = Termination cross-section AWG 24/26

16/17 = Cable collet system
18 = 0
19 = Back nut for silicone cable bend relief (has to be ordered separately)

Order example receptacle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
G	5	2	F	1	C	–	P	1	6	L	F	D	0	–	0	0	0	0

1 = Receptacle
2 = Style 5
3 = Size 2
4 = Series F
5 = Coding 1
6 = Ms matt chrome plated housing

8 = Insulator PEEK
9/10 = 16 positions
11 = Socket (solder) 0.75 µm Au
12 = Cable diameter 7.1 to 7.5 mm
13/14 = Termination cross-section AWG 24/26

16/17 = Cable collet system
18 = 0
19 = 0

Please open

ODU Worldwide

A perfect alliance.

ODU GmbH & Co. KG

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Other qualified representatives shown on our website:
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