



# ODU MINI-SNAP

Miniature Cylindrical Connectors  
with  
Push-Pull-Locking  
Series F



---

Dieses PDF Dokument ist mit interaktiven Funktionen ausgestattet:

**Blau** unterstrichene Texte führen zu den entsprechenden Seiten im Katalog bzw. zu den entsprechenden Internet-Seiten.

The latest version of this catalogue is posted on our websites:

**[www.odu.de](http://www.odu.de)**

**[www.odu-usa.com](http://www.odu-usa.com)**

**[www.odu-china.com](http://www.odu-china.com)**

**More Push-Pull series see [page 83](#)**

**UL-File E110586 00 RT03566:**

**MIL-Specification: see [page 78](#)**

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

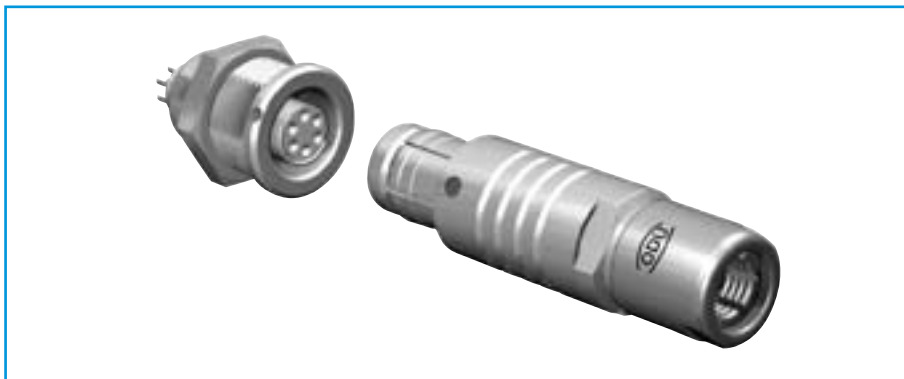
All data and specifications subject to change without notice.  
All dimensions in mm.  
All pictures are illustrations.

<b>ODU MINI-SNAP Product Description</b> .....	<b>5</b>
<u>Applications</u> .....	7
<u>Important Issues At A Glance</u> .....	8
<u>ODU System Supplier</u> .....	9
<u>Turned contact</u> .....	10
<b>ODU MINI-SNAP Series F</b> .....	<b>11</b>
- <u>The FP Locking Concept</u> .....	12
- <u>Sizes</u> .....	14
- <b>Part Number Key</b> (see also cover) .....	<b>15</b>
- <u>Housings</u> .....	16
- <b>Details for the Part Number Key</b> .....	25
- <u>Coding</u> .....	26
- <u>Housing Materials/Surfaces</u> .....	26
- <u>Insulation Body Material</u> .....	27
- <b>Inserts Series F</b> .....	28
- <u>Size 0</u> .....	28
- <u>Size 1</u> .....	29
- <u>Size 1,5</u> .....	30
- <u>Size 2</u> .....	31
- <u>Size 3</u> .....	32
- <u>Contact Type / Contact Surface-Contact Diameter</u> .....	33
- <u>Contact Termination Cross Section</u> .....	34
- <u>Collet System</u> .....	36
- <u>Right-Angled Print Contacts in the Receptacle</u> .....	37
- <u>Definition of the back nut</u> .....	37
- <u>Cable Bend Relief</u> .....	38
- <u>Drilling Patterns for PCB-contacts</u> .....	39
<b>Variations and Special Designs of the ODU MINI-SNAP</b> .....	<b>41</b>
<b>Accessories</b> .....	<b>45</b>
<b>Tools</b> .....	<b>55</b>
<u>Crimping Tools / Assembly Tools</u> .....	56
<u>Assembly Tools for Crimp Contacts (037 and 038)</u> .....	57
<u>Adjustment of the Crimp Tongs</u> .....	58
<u>Spanner Wrench</u> .....	59
<u>Nutdriver for Slotted Mounting Nut</u> .....	59
<u>Removal Tool</u> .....	60
<b>Assembly Instructions</b> .....	<b>61</b>
<u>Assembly Instructions</u> .....	62
<u>Cable Preparation</u> .....	65

**See next page**

<b><u>Technical Information</u></b> .....	67
<u>International Protection (IP) Classes (DIN EN 60 529)</u> .....	68
<u>Watertightness of the ODU MINI-SNAP</u> .....	69
<u>Operating Voltage acc. to SAE AS 13441-method 3001.1</u> .....	70
<u>Current Load – Contacts</u> .....	71
<u>Termination Styles</u> .....	72
<u>Conversion Table AWG to Metric</u> .....	73
<u>Housing Materials / Surfaces</u> .....	74
<u>Electromagnetic Compatibility (EMC)</u> .....	75
<u>Autoclaving of ODU MINI-SNAP</u> .....	76
<u>Quality Management</u> .....	77
<u>Tests</u> .....	78
<u>Technical Terms &amp; Definitions</u> .....	79
<b><u>Inquiry Form (Fax)</u></b> .....	Inside gatefold

# Product Description



## The ODU MINI-SNAP family of Miniature Cylindrical Connectors features Push-Pull-Locking

Cylindrical Connectors are generally available with several locking mechanisms.

**The most frequently used are:**

- Threaded-Locking Sleeve
- Bayonet-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.

### **The Advantages of Push-Pull-Connectors:**

- Quick and easy mating and demating
- Quick and easy separating
- Easy blind mating in difficult-to-reach places
- Less panel space required
- Definite and secure locking condition
- Less mating required
- Robotic mating and demating possible
- Easy cleaning of housing possible

### **Important Applications for Push-Pull Connectors:**

- Medical Electronics
- Test and Laboratory
- Measurement Instrumentation
- Data and Telecom Systems
- Audio and Video Applications
- Military and Aerospace
- Industrial Controls
- Nuclear Technology

## Applications



**Medical**



**Consumer electronics**


**Test and Measurement**



**Telecommunication**

**Industrial and Automation**

## Important Issues at a Glance:

- The series is certified acc.  and VDE.
- **Connector with metal shells available in 5 sizes**  
 Outside diameter between 9.4 mm and 18 mm  
 Number of contact positions: 2 to 27 position, mixed insert arrangements
- **Plugs and inline receptacles** are offered with solder and crimp termination.  
**Receptacles** are available for solder, crimp, and PCB termination.
- **Applications and Contact Material**

	Insulation Body Material PBT	Material PEEK	Contact Material Ms
General Application requirements <sup>1)</sup> (-40 °C +120 °C)	●	●	●
Connectors which are autoclavable (+134 °C, see <a href="#">page 76</a> )		●	●

- **Termination Style**
  - Crimp Termination                   ●                   ● \*
  - Solder Termination                   ●                   ●
  - Printed Circuit Board (PCB) Termination                   ●                   ●

- **Environmental Protection Classification**  
 IP 50 and IP 68 are available

\* = Crimp-Clip Contacts with 0.7 mm diameter are available.

**→ What we don't have yet, we can build for you!**

## Everything from one source – ODU, the System Supplier

Every connection also needs its cable. Make no compromises here 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.



### Benefits for the customer

- **ODU handles the complete processing**, from procuring the cable to procuring connectors from other companies and assembly up to individual extrusion or potting
- **No one knows our products better than we do** – no one knows how our products have to be processed better than we do
- **Close cooperation and experience** with well-know cable manufacturers
- Assembly of **all standard lines**, as well as special lines such as **hybrid cable**
- Assembly of extruded cable crossovers
- **100 % inspection** – systems can be used at the customer without testing
- Various **potting options** for a water-tight or vacuum-tight system
- **UL Approval** (File E333666) for cable assembly
- **Production in Cleanroom** acc. EN ISO 14644-1 possible
- Production acc. to **Medical Certification ISO 13485** : 2003 + AC : 2007 possible
- **State-of-the-art production facilities** in Mühlendorf, Shanghai (China), Camarillo (USA) and Sibiu (Romania).

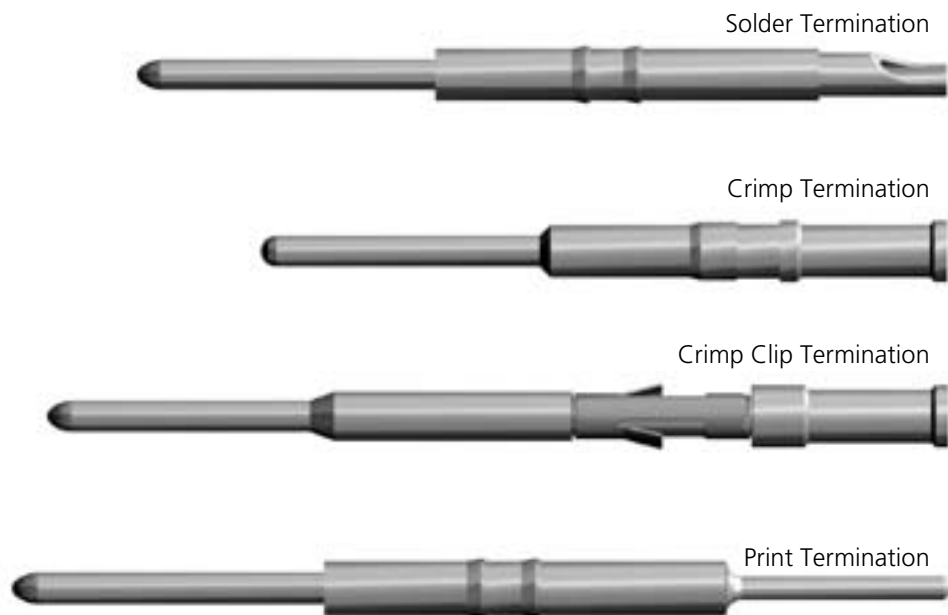
## Turned contact

Turned contacts are available from the metal version ODU MINI-SNAP in the diameters 0.5 to 1.3 mm.

The contacts are available with following terminations:

- Solder
- Crimp
- Print

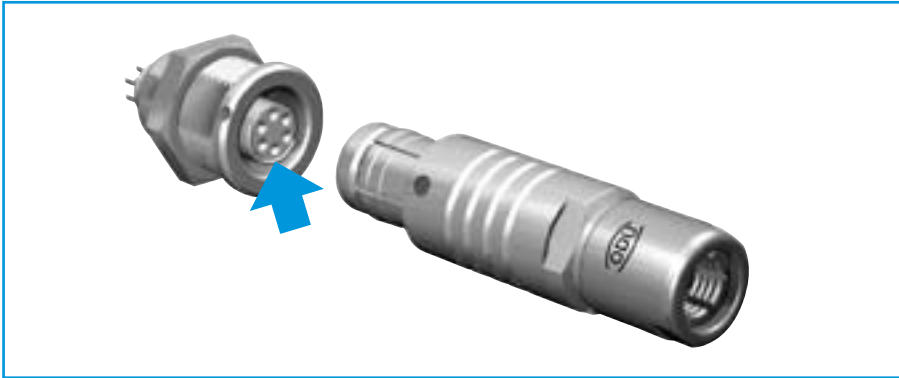
### Standard Pin Contacts



Mating cycles:	> 5000
Material:	Brass
Treatment processing:	At least. 1.25 µm Ni; at least. 0.75 µm Au on the mating area

**For information regarding diameter, termination style and current load please see the Contact Configuration section.**

# ODU MINI-SNAP

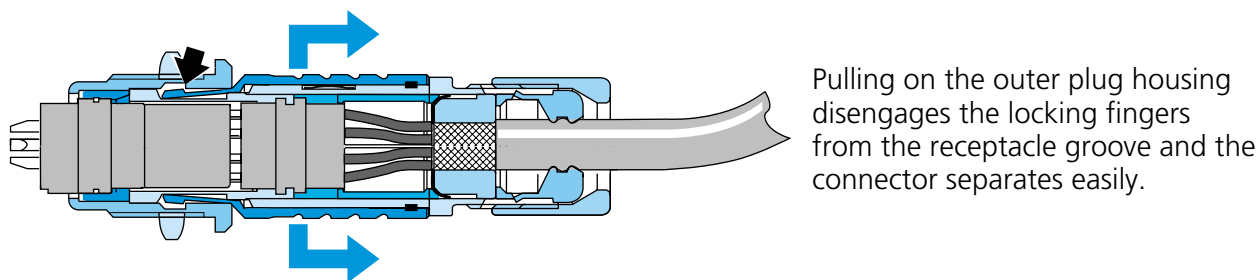
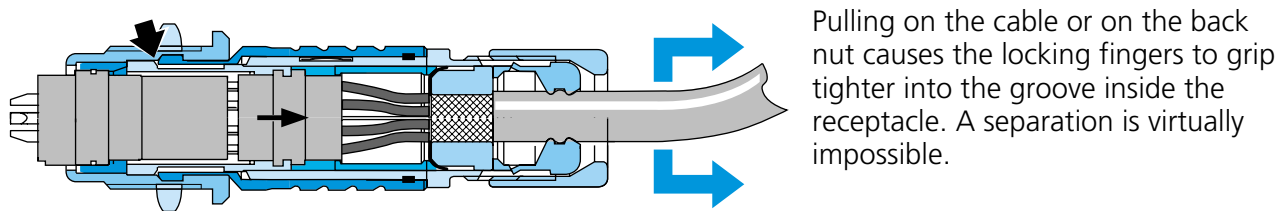
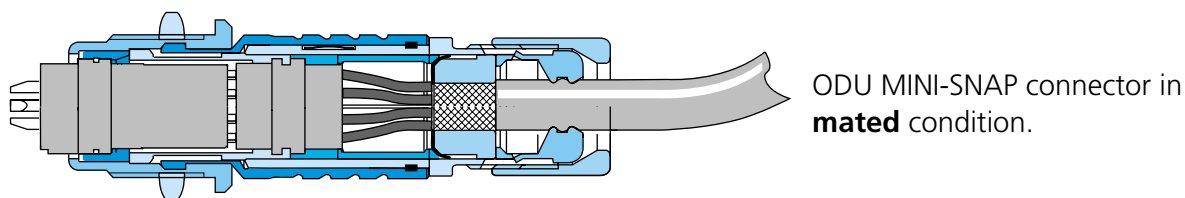
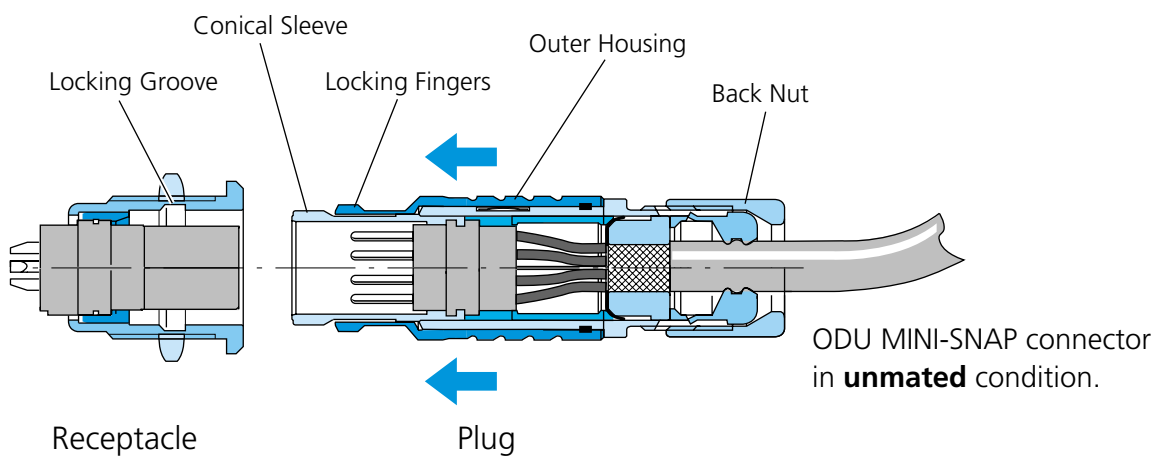


**Series F - IP 50 and IP 68**  
FP-Locking Concept  
Keying with Halfshells



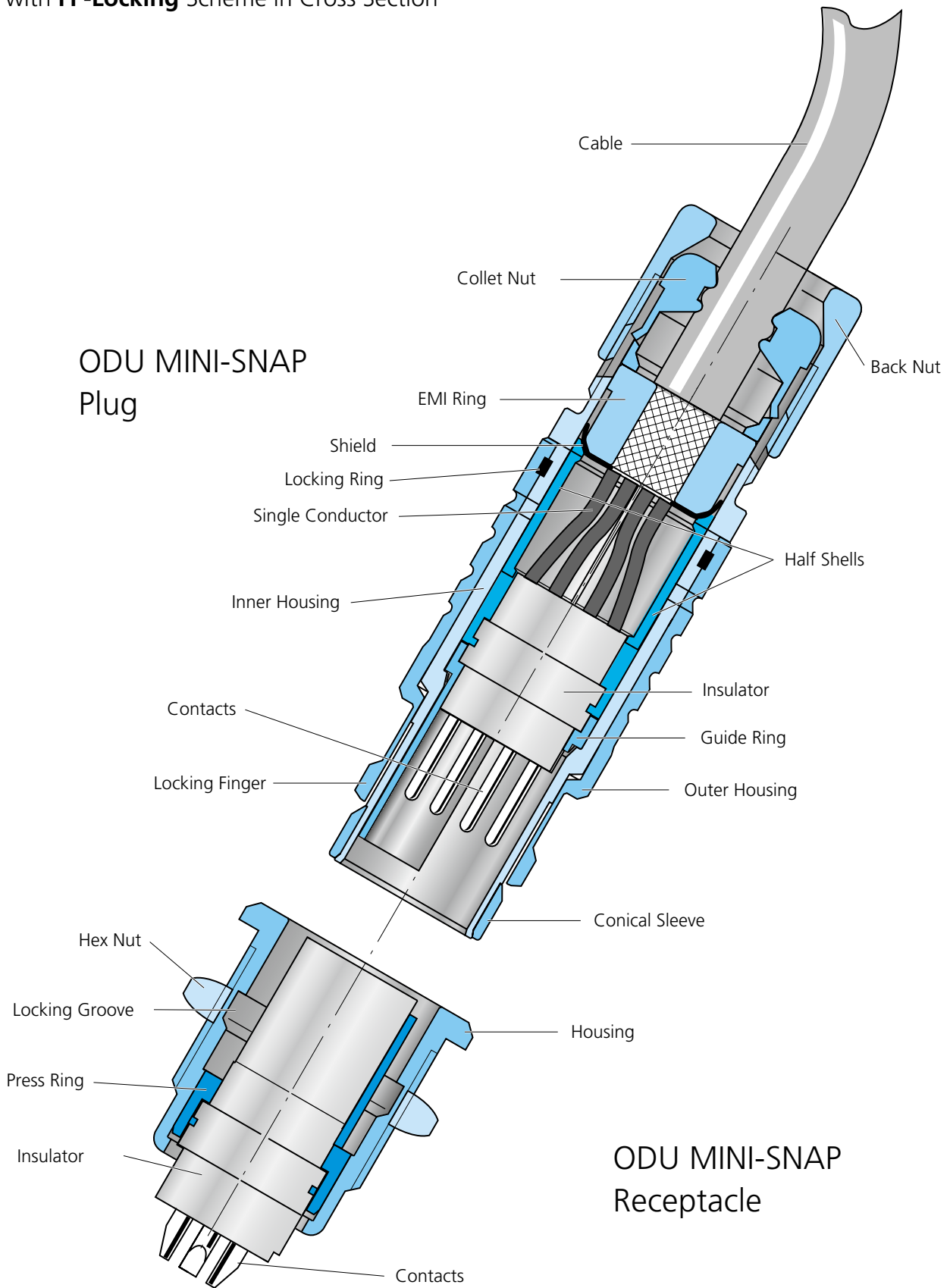
## The Push-Pull Locking Principle: FP

with Halfshells



# ODU MINI-SNAP

with **FP-Locking** Scheme in Cross Section

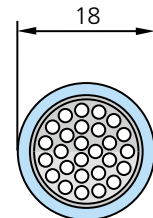
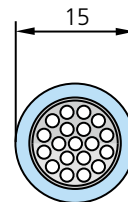
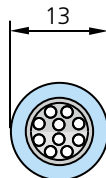
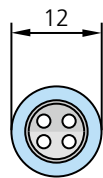
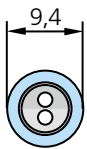


## Available Housing Sizes

(Scale 1 : 1)

**OD** = Outside Diameter (Plug)  
**S** = Size

**OD:**



**S:**

0

1

1.5

2

3

# The Part Number Key

## Part number key

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

- 1. Type **A** = Break-Apart-Plug  
Panel Mounted Plug  
**G** = Receptacle  
**K** = In-Line Receptacle  
**S** = Straight Plug  
**W** = Right-Angle Plug
- 2. Style **1 - 9** and **A**  
**X** = Special
- 3. Size **0 - 3** and **A**  
**A** = 1,5
- 4. Series **F**
- 5. Coding (page 26)
- 6. Material/Surface - Housing (page 26)
- 7. empty
- 8. Material - Insulator (page 27)
- 9. + 10. Contact Insert (page 28 - 32)  
e.g. 18-way = **18**
- 11. Contact Type/Surface (page 33)
- 12. Contact Diameter (page 33)  
**M** = mixed arrangement
- 13. + 14. Term. Cross Section (page 34 - 35)  
14. for special Contact **9**
- 15. empty
- 16. + 17. Collet System (page 36)
- 18. + 19. Cable Bend Relief (page 38)

### Example:

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	-	T	1	6	L	F	D	0	-	0	0	0	0

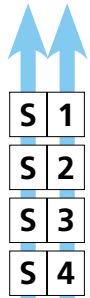
Receptacle - Style 5 - Size 2 - Series F - Coding 1 - Brass matt chromate Housing - PBT Insulator - 16pos. - Socket (solder) 0.75 µm Au -Term. Cross Section AWG24/26

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	E	S

Plug - Style 2 - Size 2 - Series F - Coding 1 - Brass matt chromate Housing - PEEK Insulator - 16pos. - Pin (solder) 0.75 µm Au - Term. Cross Section AWG24/26 - Cable Diameter 7.1-7.5 -Blue Cable Bend Relief - Material Silicone

### Part number key

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

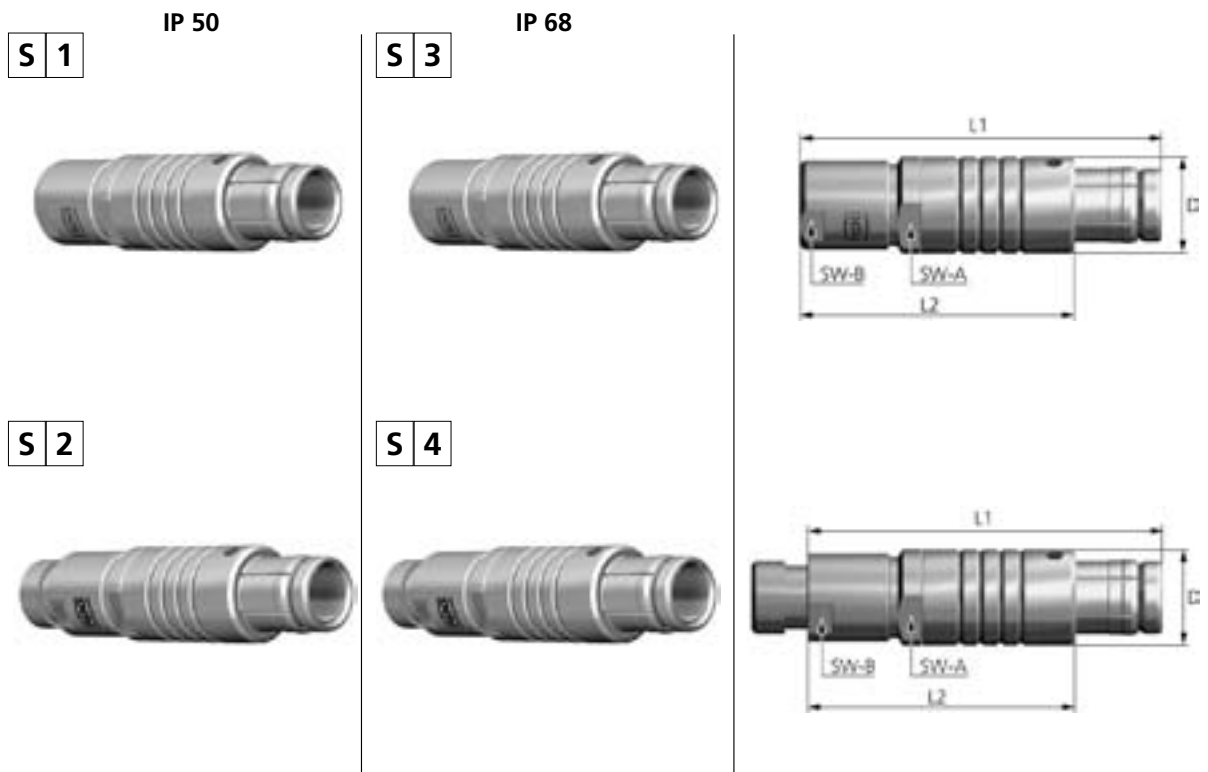


## Straight Plug

(Suitable for all following receptacles and in-line receptacles)

- S 1** - IP 50 – with Standard Back Nut
- S 2** - IP 50 – with Back Nut for Cable Bend Relief\*
- S 3** - IP 68 – watertight with Standard Back Nut
- S 4** - IP 68 – watertight with Back Nut for Cable Bend Relief\*

contact configuration from [page 28](#)



**IP 50**

**IP 68**

Size	Dimensions in mm				S1 SW-B	S2 SW-B
	L1	L2	D	SW-A		
0	~ 37	~ 28	9.4	8	7	7
1	~ 46	~ 35	12	10	10	10
1.5	~ 48	~ 38	13	11	12	12
2	~ 50	~ 38	15	13	12	13
3	~ 60	~ 44	18	16	15	15

Size	Dimensions in mm				S3 SW-B	S4 SW-B
	L1	L2	D	SW-A		
0	~ 40	~ 30	9.4	8	7	7
1	~ 49	~ 38	12	10	10	10
1.5	~ 50	~ 40	13	11	12	12
2	~ 53	~ 40	15	13	12	13
3	~ 62	~ 47	18	16	15	15

\* **Cable Bend Reliefs**  
(see [page 38](#))

**Part number key**

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

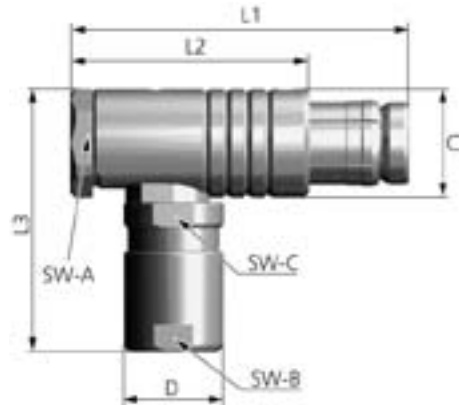


**Right-Angle Plug**

(Suitable for all following receptacles and in-line receptacles)

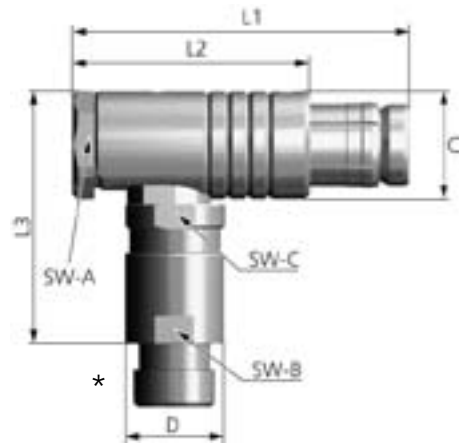
- W 1** - IP 50 – with Standard Back Nut
- W 2** - IP 50 – with Back Nut for Cable Bend Relief\*

**W 1**



contact configuration from [page 28](#)

**W 2**

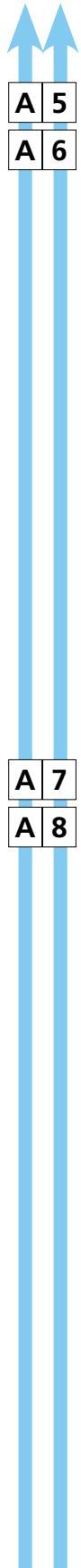


Size	Dimensions in mm						W1	W2	SW-C
	L1	L2	L3	C	D	SW-A	SW-B		
0	~ 33	~ 23	~ 25	10	9	9	7	7	8
1	~ 37	~ 26.5	~ 29	12	11	11	10	10	10
1.5	~ 39	~ 29	~ 31	14	13	12	12	12	11
3	~ 50	~ 35	~ 38	18	17	16	15	15	16

\* **Cable Bend Reliefs**  
(see [page 38](#))

### Part number key

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



### Break-Apart-Plug (without latching)

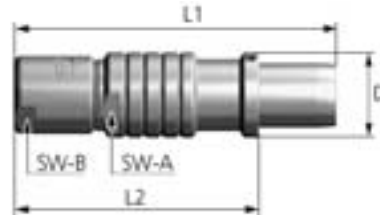
(Suitable for all following receptacles and in-line receptacles)

- A 5** - IP 68 – with Standard Back Nut
- A 6** - IP 68 – with Back Nut for Cable Bend Relief\*

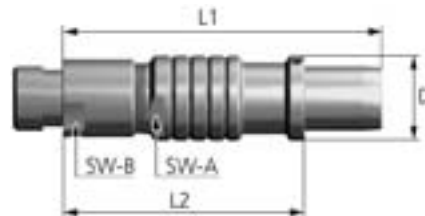
**A 5**



contact configuration from [page 28](#)



**A 6**



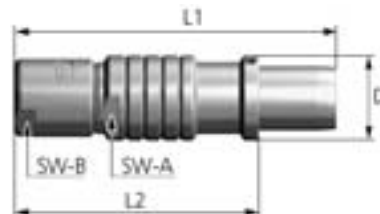
Size	Dimensions in mm				
	L1	L2	D	SW-A	SW-B
3	~ 62	~ 46	17.5	16	15

- A 7** - IP 50 – with Standard Back Nut
- A 8** - IP 50 – with Back Nut for Cable Bend Relief\*

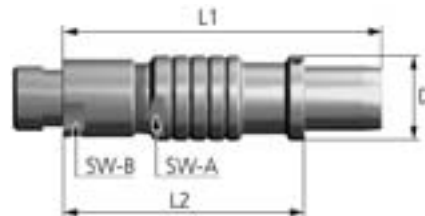
**A 7**



contact configuration from [page 28](#)



**A 8**



Size	Dimensions in mm				A7	A8
	L1	L2	D	SW-A	SW-B	SW-B
1	~ 46.0	~ 35	12	10	10	10
2	~ 50.0	~ 38	15	13	12	13

Connector can be separated by pulling the cable.

\* **Cable Bend Reliefs**  
(see [page 38](#))

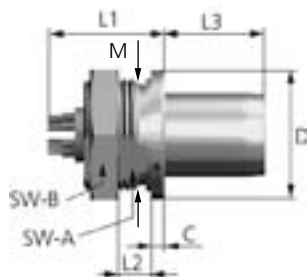
### Part number key

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

## Panel mounted plug



(Suitable for all following receptacles and in-line receptacles)

**A A** - IP 50 – with hex nut, non-latching, installation from front of panel



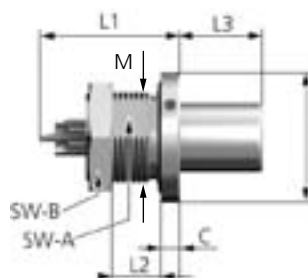
### Technical Data

- IP 50 in mated condition
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)

Size	Dimensions in mm								Panel Cut-Out	
	L1	L2 max.	L3	C	D	SW-A	SW-B	M		
0	12	4	10	1.5	10	8.2	11	M 9 x 0,5	SW 8.3 / Ø 9,1*)	
1	15.5	4.2	10.8	1.5	14	11.1	14	M12 x 1	SW 11.2 / Ø 12.1**)	
2	17.5	3.4	12	2	18	14.1	17	M15 x 1	SW 14.2 / Ø 15.1**)	
3	17.5	5.5	15	1,2	22	15.2	19	M16 x 1	SW 15.3 / Ø 16.1**)	



Created to build up a docking connection between 2 instruments (E.g. a charging station)

**A D** - IP 68 – with hex nut, non latching, installation from front of panel



### Technical Data

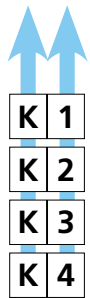
- IP 68 in mated condition
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- no crimp contacts possible

Size	Dimensions in mm								Panel Cut-Out	
	L1	L2 max.	L3	C	D	SW-A	SW-B	M		
0	14.5	4.5	10	3	13	9	11	M 9 x 0,5		/ Ø 9.1*)
1	18.5	6.5	10.8	2.5	17	11	14	M12 x 1	SW 11.2 / Ø 12.1**)	
2	19.7	7	12.1	3	22	15.2	19	M16 x 1	SW 15.3 / Ø 16.1**)	

Created to build up a docking connection between 2 instruments (E.g. a charging station)

### Part number key

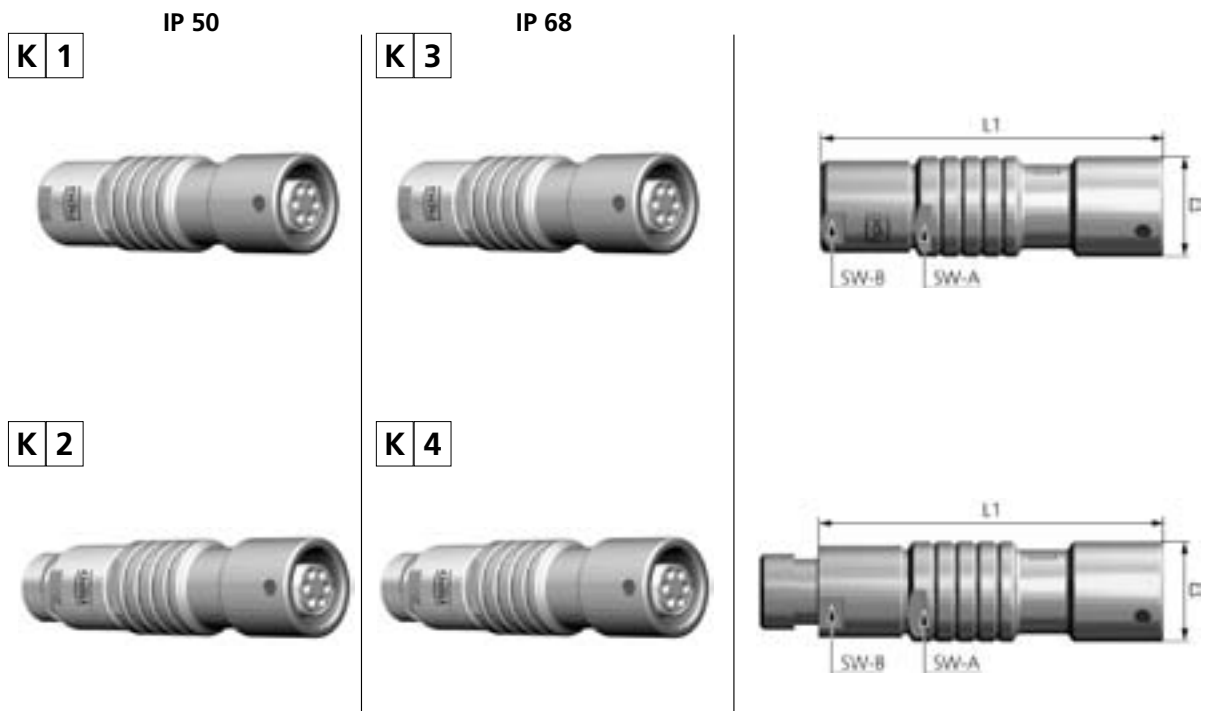
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			F			-								-				



### In-Line Receptacle

- K 1** - IP 50 – with Standard Back Nut
- K 2** - IP 50 – with Back Nut for Cable Bend Relief\*
- K 3** - IP 68 – watertight with Standard Back Nut
- K 4** - IP 68 – watertight with Back Nut for Cable Bend Relief\*

contact configuration from [page 28](#)



**IP 50**

Size	Dimensions in mm			K1	K2
	L1	D	SW-A	SW-B	SW-B
0	~ 35	9.5	8	7	7
1	~ 43	12	10	10	10
2	~ 49	15	13	12	13
3	~ 58	18	16	15	15

**IP 68**

Size	Dimensions in mm			K3	K4
	L1	D	SW-A	SW-B	SW-B
0	~ 39	10	8	7	7
1	~ 47	13	10	10	10
2	~ 50	16	13	12	13

\* **Cable Bend Reliefs**  
(see [page 38](#))

**ODU MINI-SNAP In-line Receptacle connect to plug for cable-to-cable connection.**

### Part number key

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

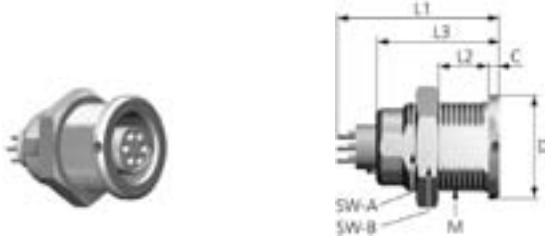
<sup>1)</sup> L1 = Maximum Length incl. Contact Insert

<sup>2)</sup> L3 =Length of Housing

<sup>3)</sup> =min. wallthickness without using a distance ring




## Receptacle

**G 1** **Style 1** – ODU MINI-SNAP RECEPTACLE IP 50, installation from front of panel

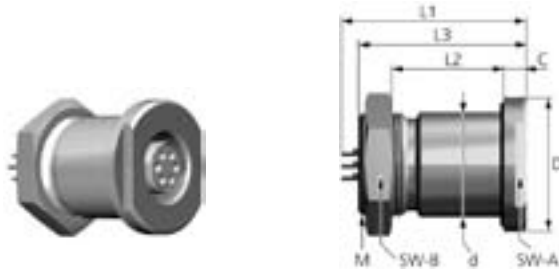


### Technical Data

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)

Size	Dimensions in mm								Panel Cut-Out		
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	C			
0	~ 20	9	14.5	9x0.5	10	8.2	11	1.5	SW 8.3 / Ø 9.1 <sup>*</sup> )		
1	~ 24	8	16.5	12x1	14	10	14	1.5	SW 10.1 / Ø 12.1 <sup>*</sup> )		
1,5	~ 25	~ 8	15.5	14x1	16	12	17	2	SW 12.1 / Ø 14.1 <sup>***)</sup> )		
2	~ 27	10	18.5	15x1	18	14.1	17	2	SW 14.2 / Ø 15.1 <sup>**)</sup> )		
3	~ 30.5	13	22.5	18x1	22	16.5	22	2	SW 16.6 / Ø 18.1 <sup>*</sup> )		

**G 2** **Style 2** – ODU MINI-SNAP WATERTIGHT RECEPTACLE IP 68\*, installation from front of panel

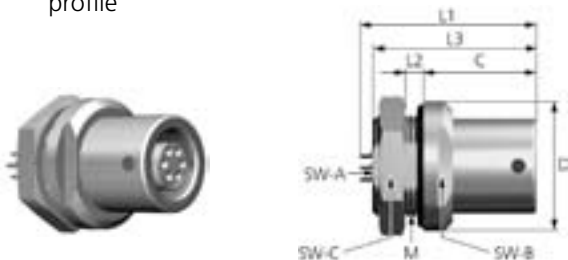


### Technical Data

- IP 68 in reference to the end device and in unmated condition
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- Distance ring for wall-thickness adjustment, see accessories [page 52](#)
- no crimp contacts possible

Size	Dimensions in mm										Panel Cut-Out
	<sup>1)</sup> L1	<sup>3)</sup> L2max.	<sup>3)</sup> L2min.	<sup>2)</sup> L3	M	D	SW-A	SW-B	C	d	
0	~ 22.5	12.5	8	18.5	9x0.5	14.5	11	11	3	10	Ø 10.1
1	~ 26	16	9	22.5	14x1	18	14	17	3	14	Ø 14.1
1,5	~ 27	14	7	21.5	14x1	19	15	17	3,5	14	Ø 14.1
2	~ 29	16	8	23	16x1	22	17	19	4	16	Ø 16.1
3	~ 32	18.5	12	26.5	20x1	26	24	25	4	20	Ø 20.1

**G 4** **Style 4** – ODU MINI-SNAP WATERTIGHT RECEPTACLE IP 68\*, installation from front of panel with low rear profile



### Technical Data

- IP 68 in reference to the end device and in unmated condition
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- no crimp contacts possible

Size	Dimensions in mm									Panel Cut-Out
	<sup>1)</sup> L1	L2max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	SW-C	C	
0	~ 22.5	5	17.5	9x0.5	14.5	8.2	12	11	11	SW 8.3 / Ø 9.1
1	~ 26	4	22.5	14x1	18	12	14	17	15.5	SW 12.1 / Ø 14.1
1,5	~ 28	5	21.6	14x1	19	12	15	17	13.6	SW 12.1 / Ø 14.1
2	~ 30	4	23	16x1	21	14	17	19	15.5	SW 14.1 / Ø 16.1

\*Reference: Potted Receptacle please see [page 69](#)

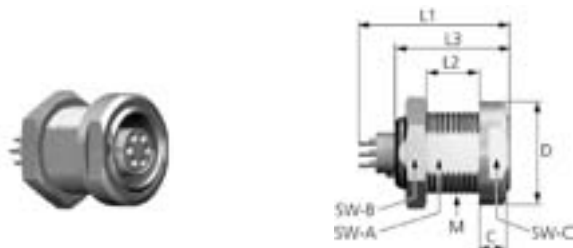
### Part number key

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

<sup>1)</sup> L1 = Maximum Length incl. Contact Insert  
<sup>2)</sup> L3 = Length of Housing

## Receptacle

**G 5** **Style 5** – ODU MINI-SNAP **RECEPTACLE IP 50**, CONTINUOUS THREAD, installation from rear or front of panel. Front extension adjustable



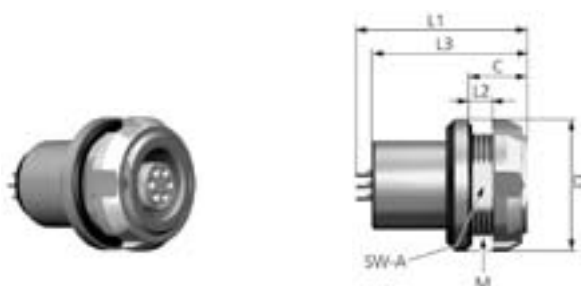
### Technical Data

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)

Size	Dimensions in mm									Panel Cut-Out
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	SW-C	C	
0	~ 20	8	14.5	9x0.5	11.5	8	11	10	2.5	SW 8.1 / Ø 9.1
1	~ 24	8	16.5	12x1	15	10	14	13	4	SW 10.1 / Ø 12.1
1,5	~ 25	8	15.5	14x1	19	12	17	17	3	SW 12.1 / Ø 14.1
2	~ 27	10	18.5	15x1	20	13.5	17	17	4	SW 13.6 / Ø 15.1
3	~ 30.5	14	22.5	18x1	23	16.5	22	20	5	SW 16.6 / Ø 18.1

## Receptacle

**G 8** **Style 8** – ODU MINI-SNAP **WATERTIGHT RECEPTACLE IP 68\***, with slotted nut, installation from rear of panel



### Technical Data

- IP 68 in reference to the end device and in unmated condition
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- nutdriver for slotted mounting nut, see [page 59](#)
- no crimp contacts possible

Size	Dimensions in mm							Panel Cut-Out
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	C	SW-A	
0	~ 22	3,5	17	9x0.5	14	6.5	8.2	SW 8.3 / Ø 9.1 **)
1	~ 27.5	4	21	14x1	18	8	12	SW 12.1 / Ø 14.1 *)
1,5	~ 24	3	19.5	14x1	19	7	12	SW 12.1 / Ø 14.1 **)
2	~ 29	3	23	16x1	21	8	14.3	SW 14.4 / Ø 16.1 *)
3	~ 33	6	26.5	20x1	26	11	18	SW 18.1 / Ø 20.1 *)

\*Reference: Potted Receptacle please see [page 69](#).

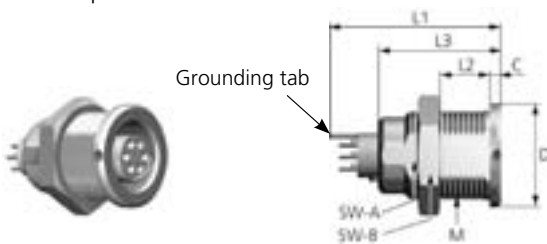
### Part number key

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

<sup>1)</sup> L1 = Maximum Length incl. Contact Insert  
<sup>2)</sup> L3 = Length of Housing



## Receptacle

**G B** **Style B** – ODU-MINI-SNAP **RECEPTACLE IP 50** (similar style 1), with grounding tab, installation from front of panel

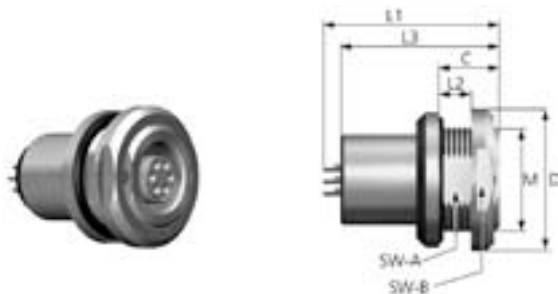


### Technical Data

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)



Size	Dimensions in mm									Panel Cut-Out	
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	C			
0	~21	9	14.5	9x0,5	10	8.2	11	1.5	SW 8.3 / Ø 9.1 <sup>*)</sup>	Ø 9.1 <sup>**) / SW 8.3</sup>	
1	~24.5	8	16.5	12x1	14	10	14	1.5	SW 10.1 / Ø 12.1 <sup>*)</sup>	Ø 12.1 <sup>**) / SW 10.1</sup>	
2	~27	10	18.5	15x1	18	14.1	17	2	SW 14.2 / Ø 15.1 <sup>**) / SW 14.2</sup>	Ø 15.1 <sup>**) / SW 14.2</sup>	

**G D** **Style D** – ODU-MINI-SNAP **RECEPTACLE IP 68\***, with round nut , installation from rear of panel



### Technical Data

- IP 68 in reference to the end device and in unmated condition
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- no crimp contacts possible

Size	Dimensions in mm									Panel Cut-Out	
	<sup>1)</sup> L1	<sup>3)</sup> L2max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	C			
0	~ 22	3.5	17	9x0.5	14	8.2	10	6.5	SW 8.3 / Ø 9.1 <sup>**) / SW 8.3</sup>	Ø 9.1 <sup>**) / SW 8.3</sup>	
1	~ 27	5	21	14x1	19	12	17	8	SW 12.1 / Ø 14.1 <sup>*) / SW 12.1</sup>	Ø 14.1 <sup>*) / SW 12.1</sup>	
1.5	~ 24	4	19.5	14x1	19	12	17	7	SW 12.1 / Ø 14.1 <sup>**) / SW 12.1</sup>	Ø 14.1 <sup>**) / SW 12.1</sup>	
2	~ 30	5	23	16x1	22	14.3	19	8	SW 14.4 / Ø 16.1 <sup>*) / SW 14.4</sup>	Ø 16.1 <sup>*) / SW 14.4</sup>	
3	~ 33	6	26.5	20x1	26	18	24	-	SW 18.1 / Ø 20.1 <sup>*) / SW 18.1</sup>	Ø 20.1 <sup>*) / SW 18.1</sup>	

\*Reference: Potted Receptacle please see [page 69](#).

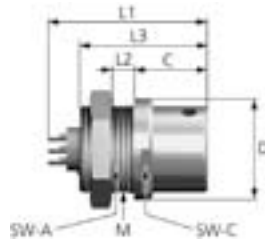
**Part number key**

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

<sup>1)</sup> L1 = Maximum Length incl. Contact Insert  
<sup>2)</sup> L3 = Length of Housing

**Receptacle**

**G H** **Style H** – ODU MINI-SNAP **RECEPTACLE IP 50**, installation from front of panel

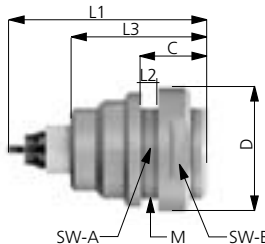


**Technical Data**

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)

Size	Dimensions in mm									 Panel Cut-Out
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	SW-C	C	
0	~ 20	3	16	9x0.5	11	8.2	11	-	10	SW 8.2 / Ø 9.1
1	~ 24	4.5	17.5	12x1	14	10	14	12	10	SW 10.1 / Ø 12.1
1.5	~ 25	5	17	14x1	18	12	17	15	9	SW 12.1 / Ø 14.1
2	~ 27	5.5	19.5	16x1	19	13.5	19	17	11	SW 13.6 / Ø 16.1

**G K** **Style K** – ODU-MINI-SNAP **RECEPTACLE IP 50**, installation from rear of panel.

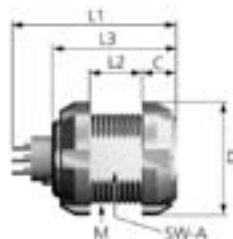


**Technical Data**

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)

Size	Dimensions in mm								 Panel Cut-Out
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	SW-B	C	
1	~24	4	16.5	12x1	15	11	13	8	SW 11.1 / Ø 12.1
2	~27	5	18.5	15x1	20	14	17	9	SW 14.1 / Ø 15.1
3	~30.5	12	22	18x1	23	17.2	20	17	SW 17.3 / Ø 18.1

**G Q** **Style Q** – ODU-MINI-SNAP **RECEPTACLE IP 50, CONTINUOUS THREAD**, (see Style 5, but 2 special nuts) installation from rear or front of panel. Extension in front of panel is adjustable

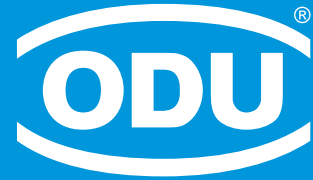
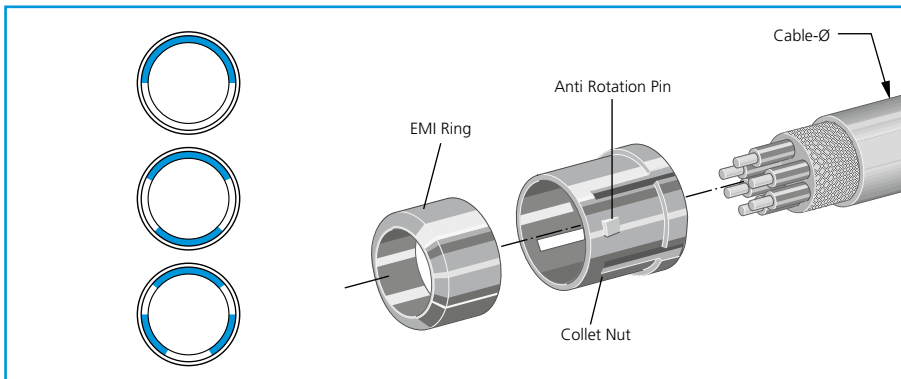


**Technical Data**

- IP 50
- Anti-rotation feature
- Contact configuration from [Page 28](#)  
PCB-Layouts from [Page 39](#)
- Nutdriver [Page 59](#)

Size	Dimensions in mm							 Panel Cut-Out
	<sup>1)</sup> L1	L2 max.	<sup>2)</sup> L3	M	D	SW-A	C	
0	~20	7	14.5	9x0,5	12	8	3	SW 8.1 / Ø 9.1
1	~24	7	16.5	12x1	15	10	4	SW 10.1 / Ø 12.1
1,5	~25	7	15.5	14x1	18	12	4	SW 12.1 / Ø 14.1

# Details for the Part Number Key

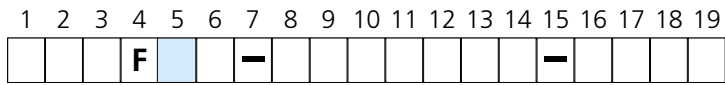


**Keying**  
**Housing Materials / Surfaces**  
**Inserts**  
**Collet System**  
**Cable Bend Reliefs**



### Coding

#### Part number key



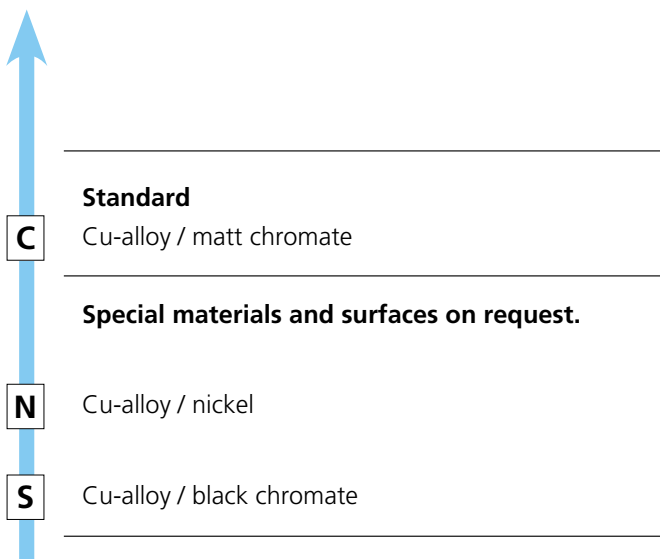
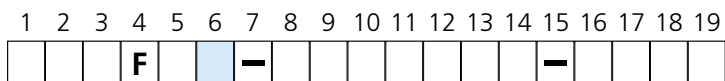
#### Serie F

	Angle	Receptacle Front View	Size				
			0	1	1.5	2	3
1			●	●	●	●	●
2			●	●	●	●	●
3					●	●	●

● = Standard  
○ = On request

### Housing Materials / Surfaces

#### Part number key



### Insulation Body Material

#### Part number key

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



**P**

PEEK

**T**

PBT

available size 1.5 - 3

#### Additional materials on request

#### Turned Contacts

Article Number	PBT	PEEK
Solder Termination	●	●
Crimp Termination		●
PCB Termination	●	●

● = available

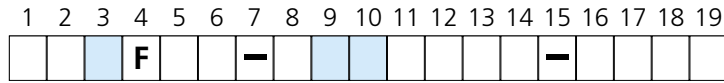
#### Advice for insulation body selection regarding PCB termination:

wave-solder: PBT or PEEK insulation body.

All other methods: only PEEK insulation body.

# Size 0

## Part number key



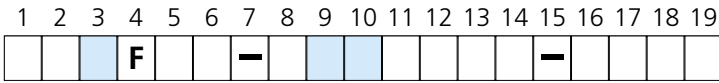
Standard Contact Configuration	Size 1) ↑	Positions ↑	Positions ↑	Contact Ø mm	Nominal Signal Contact Current Load in A (Derating Factor see page 74)		Clearance and creepage distance		Test Voltage acc. SAE AS13441:1998 method 3001.1 (kVeff)	Nominal Voltage acc. SAE AS13441:1998 method 3001.1 (kVrms) 2	Termination			View on termination side	
					Contact to contact in mm	Contact to housing in mm	Solder	Crimp (Tools for assembling see page 56)			Print (PCB Layout see page 39)	Pin part	Socket		
0		0 2		0,9	10	1,0	1,0	1,500	0,500	●	●	●			
0		0 3		0,9	10	0,6	1,0	1,350	0,450	●	●	●			
0		0 4		0,7	7	0,8	0,9	1,350	0,450	●	●	●			
0		0 5		0,7	7	0,6	0,8	1,000	0,333	●	●	●			
0		0 7		0,5	5	0,7	0,8	1,000	0,333	●	●	●			
0		0 9		0,5	5	0,5	0,7	0,600	0,200	●	●	●			

1) Inserts in size 0 are only available in PEEK

2) Nominal Voltage acc. SAE AS 13441:1998 method 3001.1 meet the MIL-STD 1344, method 3001, Test acc. IEC 60512 test 4a. Method of calculation, utilization warning and Proposals see [page 70](#).

# Size 1

## Part number key



Standard Contact Configuration	Size 1 <sup>1)</sup>	Positions		Contact Ø mm	Nominal Signal Contact Current Load in A (Derating Factor see page 74)		Clearance and creepage distance		Test Voltage acc. SAE AS13441:1998 method 3001.1 (kVeff)	Nominal Voltage acc. SAE AS13441:1998 method 3001.1 (kVrms) <sup>2)</sup>	Termination			View on termination side	
		Positions	Positions		Contact to contact in mm	Contact to housing in mm	Solder	Crimp (Tools for assembling see page 56)			Print (PCB Layout see page 39)	Pin part	Socket		
	1	0	2	1,3	14	1,3	1,3	1,650	0,550	●	●				
	1	0	3	1,3	14	1,1	1,2	1,500	0,500	●	●				
	1	0	4	0,9	10	1,2	1,1	1,500	0,500	●	●				
	1	0	5	0,9	10	0,8	1,1	1,350	0,450	●	●				
	1	0	6	0,7	7	0,8	1,1	1,200	0,400	●	●				
	1	0	7	0,7	7	0,8	1,1	1,200	0,400	●	●				
	1	1	2	0,5	5	0,5	0,9	1,000	0,333	●	●				

1) Inserts in size 1 are only available in PEEK

2) Nominal Voltage acc. SAE AS 13441:1998 method 3001.1 meet the MIL-STD 1344, method 3001, Test acc. IEC 60512 test 4a. Method of calculation, utilization warning and Proposals see [page 70](#).

## Size 1,5

### Part number key

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

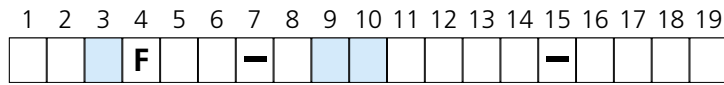
Standard Contact Configuration	Size <sup>1)</sup>	Positions		Contact Ø mm	Nominal Signal Contact Current Load in A (Derating Factor see page 74)	Clearance and creepage distance		Test Voltage acc. SAE AS13441:1998 method 3001.1 (kVeff)	Nominal Voltage acc. SAE AS13441:1998 method 3001.1 (kVrms) <sup>2)</sup>	Termination			View on termination side	
		1	0			Contact to contact in mm	Contact to housing in mm			Solder	Crimp (Tools for assembling see page 56)	Print (PCB Layout see page 39)	Pin part	Socket
	1,5	1	0	0,7	7	1,0	0,8	1,650	0,550	●	●			
	1,5	1	2	0,7	7	0,6	0,9	1,500	0,500	●	●			
	1,5	1	9	0,5	5	0,6	0,8	1,350	0,450	●	●			

1) Inserts in size 1.5 are only available in PEEK

2) Nominal Voltage acc. SAE AS 13441:1998 method 3001.1 meet the MIL-STD 1344, method 3001, Test acc. IEC 60512 test 4a. Method of calculation, utilization warning and Proposals see [page 70](#).

# Size 2

## Part number key



Standard Contact Configuration	Size 1) ↑	Positions ↑ ↑		Contact Ø mm	Nominal Signal Contact Current Load in A (Derating Factor see page 74)		Clearance and creepage distance		Test Voltage acc. SAE AS13441:1998 method 3001.1 (kVeff)	Nominal Voltage acc. SAE AS13441:1998 method 3001.1 (kVrms) 2)	Termination			View on termination side	
		Contact to contact in mm	Contact to housing in mm		Solder	Crimp (Tools for assembling see page 56)	Print (PCB Layout see page 40)	Pin part			Socket				
												Pin part	Socket		
	2	0	2	1,6	17	2,1	1,8	2,100	0,700	●	●				
	2	0	3	1,6	17	1,6	1,7	2,100	0,700	●	●				
	2	0	5	1,3	14	1,2	1,3	1,500	0,500	●	●				
	2	0	6	0,9	10	1,5	1,5	1,800	0,600	●	●				
	2	0	8	0,9	10	1,0	1,3	1,650	0,550	●	●				
	2	0	9	0,9 1,3	10 14	0,8 1,8	1,0 4,1	1,350 2,100	0,450 0,700	●	●				
	2	1	1	0,9	10	0,8	1,0	1,500	0,500	●	●				
	2	1	6	0,7	7	0,6	0,7	1,350	0,450	●	●				
	2	1	9	0,7	7	0,7	0,8	1,350	0,450	●	●				

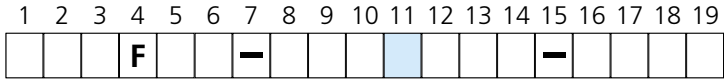
1) Inserts in size 2 are only available in PEEK

2) Nominal Voltage acc. SAE AS 13441:1998 method 3001.1 meet the MIL-STD 1344, method 3001, Test acc. IEC 60512 test 4a. Method of calculation, utilization warning and Proposals see page 70.



**Contact Type / Contact Surface - Contact Diameter**

**Part number key**



		Type	Surface	
Solder	Socket	<b>L</b> - 0.75 µm Au (min.)		<b>L</b>
	Pin	<b>L</b> - 0.75 µm Au (min.)		<b>M</b>
Crimp	Socket	<b>C</b> - 0.75 µm Au (min.)		<b>N</b>
	Pin	<b>C</b> - 0.75 µm Au (min.)		<b>P</b>
Print	Socket	<b>P</b> - 0.75 µm Au (min.)		<b>Q</b>
	Pin	<b>P</b> - 0.75 µm Au (min.)		<b>R</b>



### Contact Termination Cross Sections

#### Part number key

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

#### Crimp Contact



Size	Positions	Contact Ø	AWG	mm <sup>2</sup>	
0	4-5	0.7	28-32	0.09-0.04	F C O
			22-26	0.38-0.15	F G O
	2-3	0.9	22-26	0.38-0.15	J G O
			20-24	0.50-0.25	J H O
1	6-7	0.7	28-32	0.09-0.04	F C O
			22-26	0.38-0.15	F G O
	4-5	0.9	22-26	0.38-0.15	J G O
			20-24	0.50-0.25	J H O
2-3	1.3	18-20	1.00-0.50	P L O	
1,5	10-12	0.7	28-32	0.09-0.04	F C O
			22-26	0.38-0.15	F G O
2	16-19	0.7	28-32	0.09-0.04	F C O
			22-26	0.38-0.15	F G O
	6-11	0.9	22-26	0.38-0.15	J G O
			20-24	0.50-0.25	J H O
5	1.3	18-20	1.00-0.50	P L O	
3	24-27	0.7	28-32	0.09-0.04	F C O
			22-26	0.38-0.15	F G O
	15-18	0.9	22-26	0.38-0.15	J G O
			20-24	0.50-0.25	J H O
12	1.3	18-20	1.00-0.50	P L O	

Tools for crimping and adjustments  
see from [page 55](#).

#### 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).

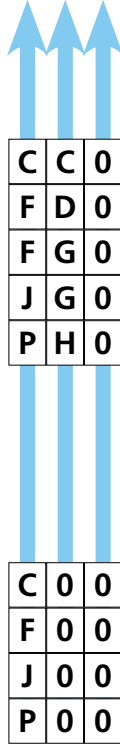
### Contact Termination Cross Sections

#### Part number key

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

#### Solder Contact

Contact Ø	Term. Ø	Term. Cross	
		AWG	mm <sup>2</sup>
0,5	0,4	28	0,08
0,7	0,6	26	0,15
0,7	0,85	22	0,38
0,9	0,85	22	0,38
1,3	1,1	20	0,50



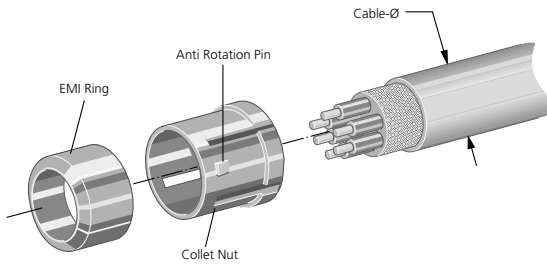
#### PCB Contact

Contact Ø	Term. Ø
0,5	0,5
0,7	0,5
0,9	0,7
1,3	0,7

Please see the PCB-layouts on [page 39-40](#).

## Collet System

### Part number key



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

**Insert:** for all Plugs and In-Line receptacles.

**Application:** **Collet nut** for strain relief, **EMI ring** for conductive path between shield and housing.

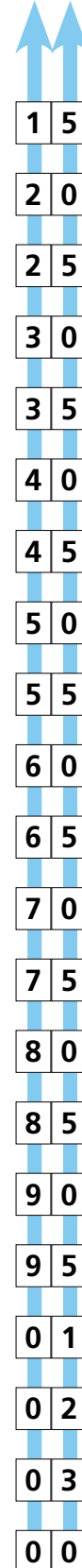
**References:**

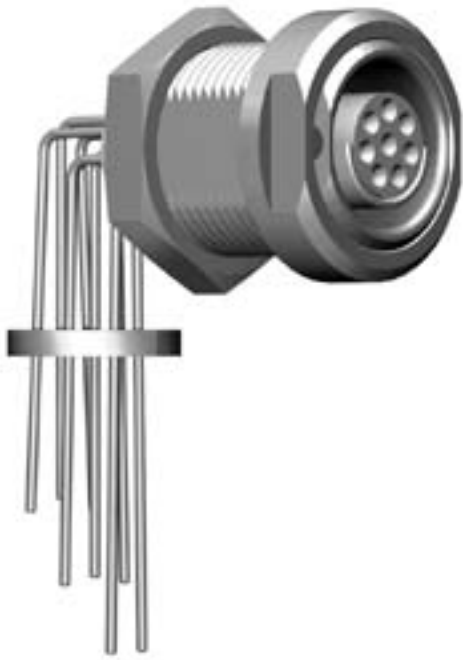
- This diameters are not available for applications in IP 68
- 1 This application is not available for applications with cable bend relief.

It's possible that the collet nut cannot be covered completely over the cable



Cable diameter in mm	Size				
	0	1	1,5	2	3
> 1,0 - 1,5	●	●			
> 1,5 - 2,0	●	1			
> 2,0 - 2,5	●	●		●	
> 2,5 - 3,0	●	●	●	●	
> 3,0 - 3,5	●	●	●	●	●
> 3,5 - 4,0	●	●	●	●	●
> 4,0 - 4,5	●	●	●	●	●
> 4,5 - 5,0	●	●	●	●	●
> 5,0 - 5,5		●	●	●	●
> 5,5 - 6,0		●	●	●	●
> 6,0 - 6,5		●	●	●	●
> 6,5 - 7,0		●	●	●	●
> 7,0 - 7,5		●	●	●	●
> 7,5 - 8,0				●	●
> 8,0 - 8,5				●	●
> 8,5 - 9,0				●	●
> 9,0 - 9,5				●	●
> 9,5 - 10,0					●
> 10,0 - 10,5					●
> 10,5 - 11,5					●
without collet system					





### Right-Angled Print Contacts in the Receptacle

#### Part number key

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

Right-Angled Print Contact

A

Pin contacts on request  
PCB-Layout see [Page 39 - 40](#)

### Definition of the back nut

Straight-angled-break apart plugs,  
inline receptacles, receptacles style 6 and 7

#### Part number key

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

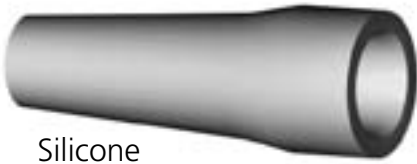


Back nut for silicon cable bend reliefs

S

Cable bend reliefs on [page 38](#)

### Cable Bend Reliefs



Silicone

**Temperature range**

Silicone -50°C up to +200°C  
 short term up to +230°C  
 autoclavable

**Part number key**

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

**Color of the Cable Bend Relief**





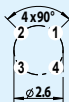

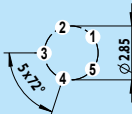
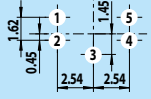
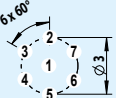
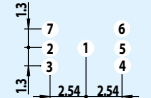
Color / RAL-number <small>(similar)</small>	
red	RAL 3020
white	RAL 9010
yellow	RAL 1016
green	RAL 6029
blue	RAL 5002
grey	RAL 7005
black	RAL 9005
<b>without cable bend relief</b>	

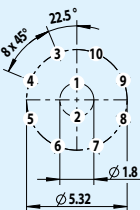
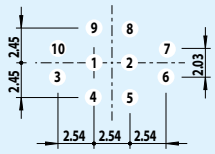
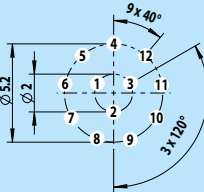
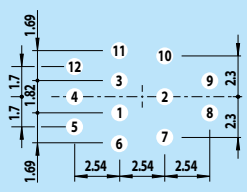
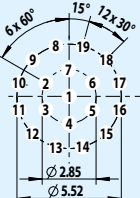
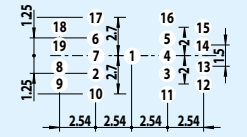
- A
- B
- C
- D
- E
- F
- G
- 0



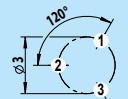
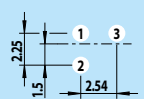
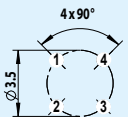
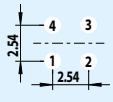
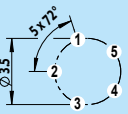
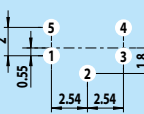
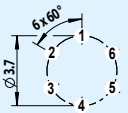
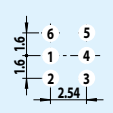
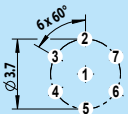
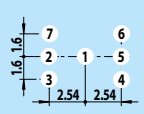
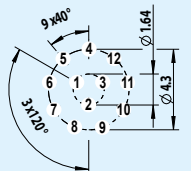
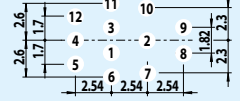


## Drilling Patterns for PCB-contacts

## Drilling Patterns for PCB-contacts

Size 0	straight	right-angled
2 pos.	Drill: 0.8 mm 	Drill: 0.7 mm 
3 pos.	Drill: 0.8 mm 	Drill: 0.7 mm 
4 positions	Drill: 0.6 mm 	Drill: 0.6 mm 
5 positions	Drill: 0.6 mm 	Drill: 0.6 mm 
7 positions	Drill: 0.6 mm 	Drill: 0.6 mm 

Size 1.5	straight	right-angled
10 pos.	Drill: 0.6 mm 	Drill: 0.7 mm 
12 positions	Drill: 0.6 mm 	Drill: 0.7 mm 
19 positions	Drill: 0.6 mm 	Drill: 0.6 mm 

Size 1	straight	right-angled
2 pos.	Drill: 0.8 mm 	Drill: 0.9 mm 
3 positions	Drill: 0.8 mm 	Drill: 0.9 mm 
4 positions	Drill: 0.8 mm 	Drill: 0.7 mm 
5 positions	Drill: 0.8 mm 	Drill: 0.7 mm 
6 positions	Drill: 0.6 mm 	Drill: 0.7 mm 
7 positions	Drill: 0.6 mm 	Drill: 0.7 mm 
12 positions	Drill: 0.6 mm 	Drill: 0.7 mm 

All declarations are legal for socket inserts. Pin inserts on request.

## Drilling Patterns for PCB-contacts

Size 2	straight	right-angled
2 pos.	Drill: 1.1 mm 	on request
3 positions	Drill: 1.1 mm 	on request
5 positions	Drill: 0.8 mm 	Drill: 0.9 mm 
6 positions	Drill: 0.8 mm 	Drill: 0.7 mm 
8 positions	Drill: 0.8 mm 	on request
9 positions	Drill: 0.8 mm 	on request
11 positions	Drill: 0.8 mm 	Drill: 0.7 mm 
16 positions	Drill: 0.6 mm 	Drill: 0.7 mm 
19 positions	Drill: 0.6 mm 	Drill: 0.7 mm 

## Drilling Patterns for PCB-contacts

Size 3	straight	right-angled
12 pos.	Drill: 0.8 mm 	on request
15 positions	Drill: 0.8 mm 	on request
18 positions	Drill: 0.8 mm 	on request
24 positions	Drill: 0.6 mm 	Drill: 0.7 mm 
27 positions	Drill: 0.6 mm 	Drill: 0.8 mm 

All declarations are legal for socket inserts. Pin inserts on request.

# Special Solutions



## Customer specific solutions for ODU MINI-SNAP

ODU as a specialist for customized solutions have all main competences under one roof.

Development, an own tool shop, stamping, molding, surface plating, manufacturing of complete assembly machines etc. etc. .

With all these possibilities we are able to offer "Custom tailored" solutions for our customers.

### When do we actively pursue customer specific solutions?

First we have to study the customers requirements. In order to use existing development resources efficiently, it is necessary to concentrate on those ideas that are very likely to produce sustained earnings. And so we work very closely with you to develop exactly the product that optimally fulfills the requirements. And naturally the feasibility is analyzed in the starting phase of every development in order to make it possible to estimate the costs for a new development.

### Here are a few examples how a special solution may look like:

**Custom Specific Inserts**



**Special insulators and special assemblies for High-Voltage applications**



**Custom specific PCB assembling**

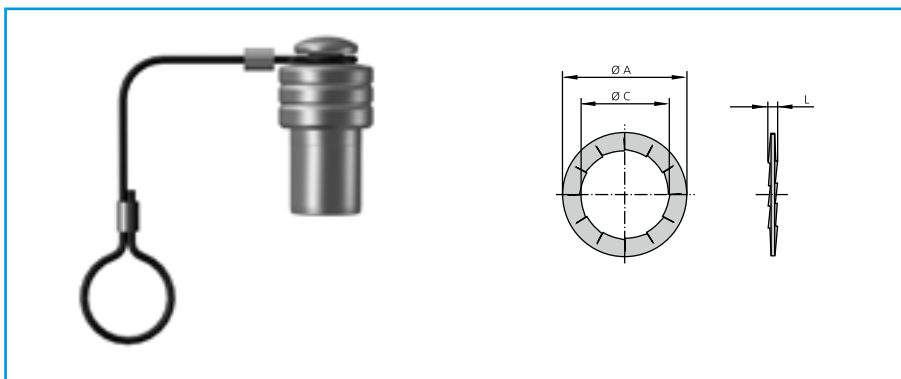
**Special overmouldings and insulation sleeves**



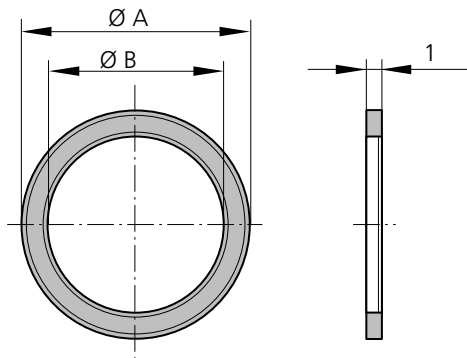
**Also different locking mechanisms are possible (picture: Bajonett and Threaded Locking)**



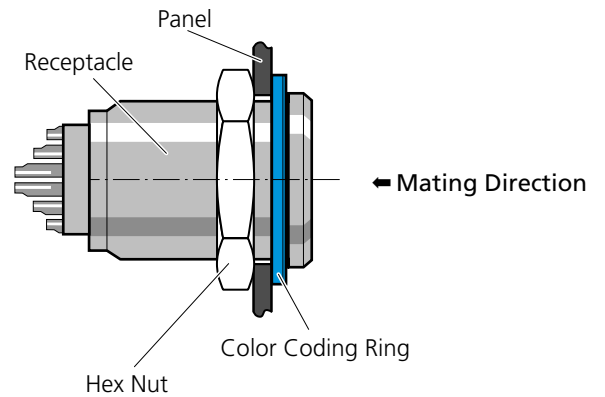
# Accessories



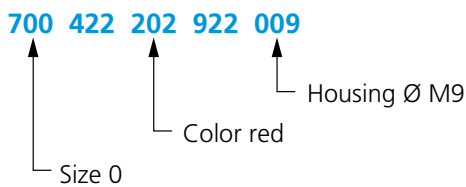
### Color Coding Ring



### Mounting Example:



### Order Example



\*= In ... please indicate color code

#### Size

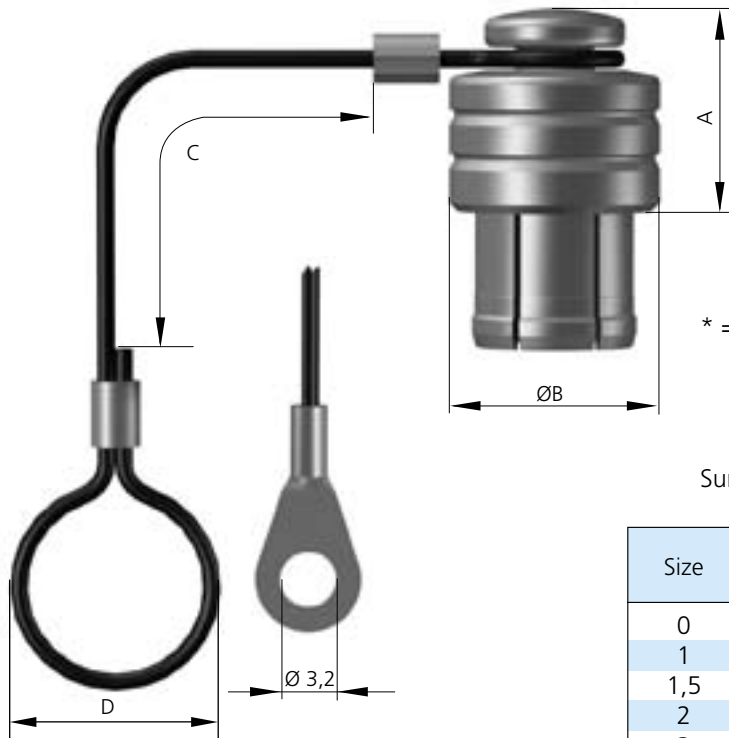
Size	Part Number with Colour	Ø A	Ø B
0	700 422 ... 922 009	13,5	9,1
0	700 422 ... 922 010	16,5	10,1
1	701 422 ... 922 012	17,0	12,1
1	701 422 ... 922 014	20,0	14,1
1,5	715 422 ... 922 014	21,0	14,1
2	702 422 ... 922 015	22,0	15,1
2	702 422 ... 922 016	23,0	16,1
3	703 422 ... 922 018	25,0	18,1
3	703 422 ... 922 020	28,0	20,1

#### Color

Part Number with color	Color	RAL-No. (similar)
202	red	3020
203	white	9010
204	yellow	1016
205	green	6029
206	blue	5002
207	grey	7005
208	black	9005
209	orange	2004
210	violet	4005
212	brown	8016
215	light green	6018
216	light blue	5012

Because of different raw materials the colors may slightly differ from RAL numbers.

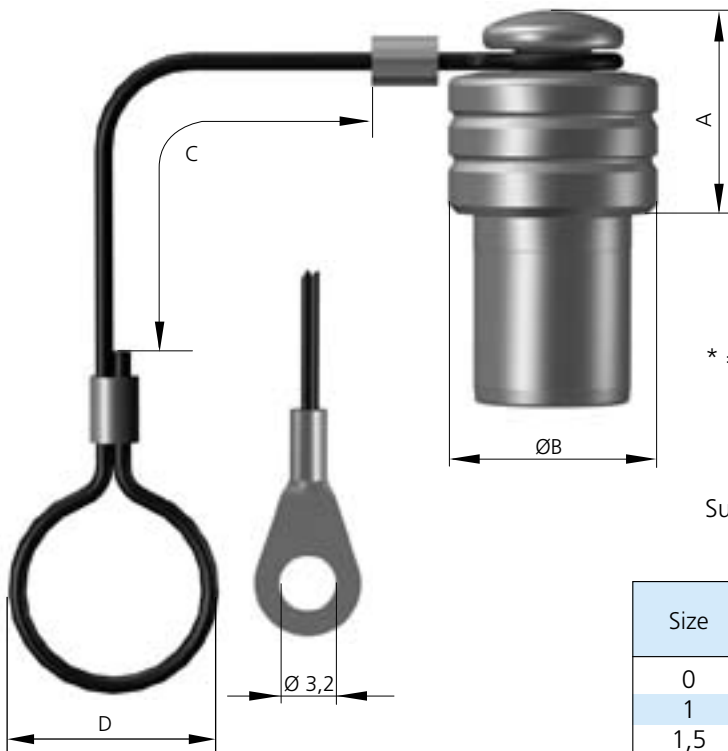
### Protective Covers for Receptacles (IP 50)



\* = With . please, register desired lanyard material  
 0 = Polyamide lanyard with loop  
 1 = Stainless steel lanyard with loop  
 2 = Polyamide lanyard solder lug  
 3 = Stainless steel lanyard solder lug  
 Surface: Matt chromate

Size	Part Number*	Dimensions in mm			
		A	B	C	D
0	700 097 003 215 .00	10,5	10	70	8
1	701 097 003 215 .00	12,5	12	75	10
1,5	715 097 003 215 .00	13,3	13	80	11
2	702 097 003 215 .00	14,85	15	85	13
3	703 097 003 215 .00	16,6	18	100	16

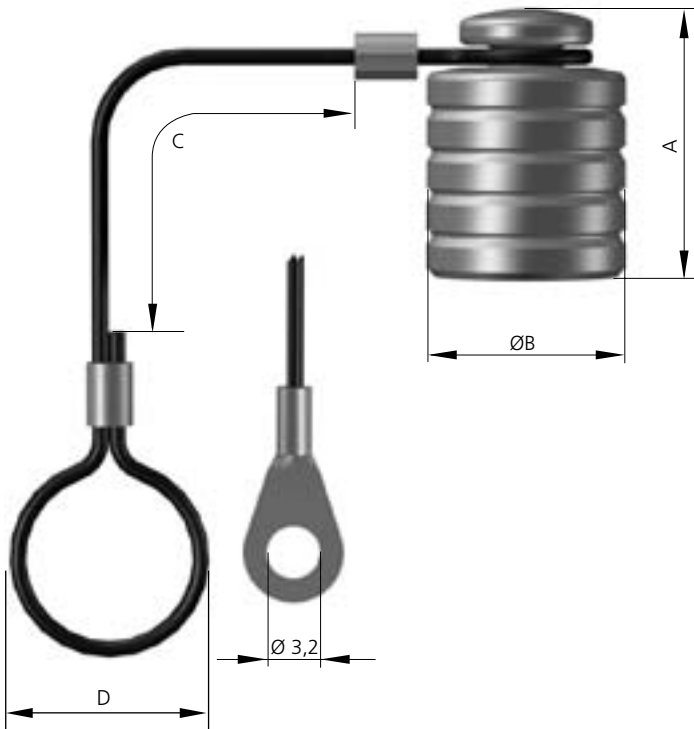
### Protective Covers for Receptacles (IP 68)



\* = With . please, register desired lanyard material  
 0 = Polyamide lanyard with loop  
 1 = Stainless steel lanyard with loop  
 2 = Polyamide lanyard solder lug  
 3 = Stainless steel lanyard solder lug  
 Surface: Matt chromate

Size	Part Number*	Dimensions in mm			
		A	B	C	D
0	700 097 007 215 .00	9,5	10	70	8
1	701 097 007 215 .00	12,0	12	75	10
1,5	715 097 007 215 .00	13,3	13	80	11
2	702 097 007 215 .00	15,0	15	85	13
3	703 097 007 215 .00	17,1	18	100	16

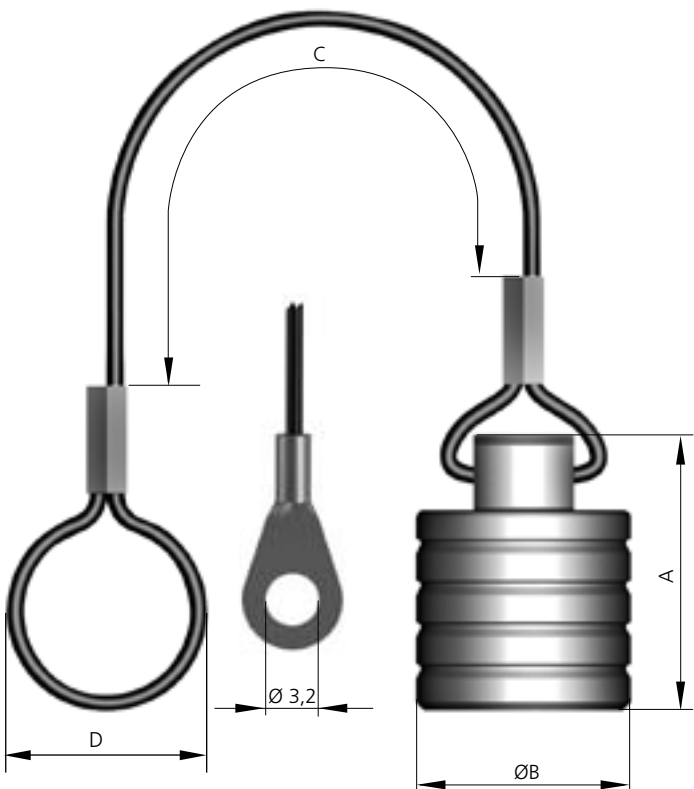
### Protective Covers for Plugs (IP 50)



\* = With . please, register desired lanyard material  
 0 = Polyamide lanyard with loop  
 1 = Stainless steel lanyard with loop  
 2 = Polyamide lanyard solder lug  
 3 = Stainless steel lanyard solder lug  
 Surface: Matt chromate

Size	Part Number*	Dimensions in mm			
		A	B	C	D
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
2	702 097 005 215 .00	18.5	15	85	13
3	703 097 005 215 .00	20,5	18	100	16

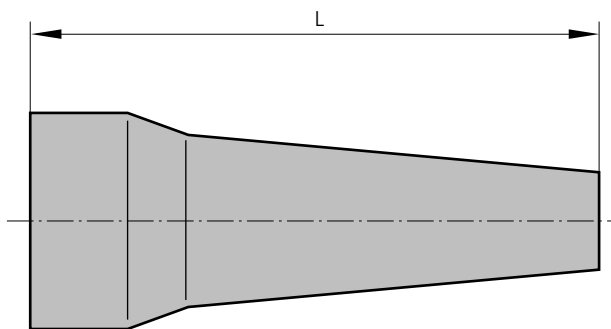
### Protective Covers for Plugs (IP 68)



\* = With . please, register desired lanyard material  
 0 = Polyamide lanyard with loop  
 1 = Stainless steel lanyard with loop  
 2 = Polyamide lanyard solder lug  
 3 = Stainless steel lanyard solder lug  
 Surface: Matt chromate

Size	Part Number*	Dimensions in mm			
		A	B	C	D
0	700 097 004 215 .00	15.5	10.5	70	8
1	701 097 004 215 .00	16.5	13	75	10
1.5	715 097 004 215 .00	16.0	13.5	80	11
2	702 097 004 215 .00	18.5	16	85	13
3	703 097 004 215 .00	20.5	19	100	16

## Silicone-Cable Bend Relief



\* = In ... please indicate color code

Size	Part Number*	Dim. L	Cable O.D.	
			min	max
0	700 023 ... 965 020	27	> 2.0	2.5
0	700 023 ... 965 025	27	> 2.5	3.0
0	700 023 ... 965 030	27	> 3.0	3.5
0	700 023 ... 965 035	27	> 3.5	4.0
0	700 023 ... 965 040	27	> 4.0	4.5
0	700 023 ... 965 045	27	> 4.5	5.0
1	701 023 ... 965 025	30	> 2.5	3.0
1	701 023 ... 965 030	30	> 3.0	3.5
1	701 023 ... 965 035	30	> 3.5	4.0
1	701 023 ... 965 040	30	> 4.0	5.0
1	701 023 ... 965 050	30	> 5.0	6.0
1	701 023 ... 965 060	30	> 6.0	6.5
1	701 023 ... 965 070	30	> 6.5	7.5
1.5	715 023 ... 965 025	36	>2.5	3.0
1.5	715 023 ... 965 030	36	>3.0	3.5
1.5	715 023 ... 965 035	36	>3.5	4.0
1.5	715 023 ... 965 040	36	>4.0	4.5
1.5	715 023 ... 965 050	36	>5.0	6.0
1.5	715 023 ... 965 060	36	>6.0	7.0
1.5	715 023 ... 965 070	36	>7.0	8.0
2	702 023 ... 965 030	36	> 3.0	3.5
2	702 023 ... 965 035	36	> 3.5	4.0
2	702 023 ... 965 040	36	> 4.0	5.0
2	702 023 ... 965 050	36	> 5.0	6.0
2	702 023 ... 965 060	36	> 6.0	7.0
2	702 023 ... 965 070	36	> 7.0	8.0
2	702 023 ... 965 080	36	> 8.0	9.0
3	703 023 ... 965 040	42	> 4.0	5.0
3	703 023 ... 965 050	42	> 5.0	6.0
3	703 023 ... 965 060	42	> 6.0	7.0
3	703 023 ... 965 070	42	> 7.0	8.0
3	703 023 ... 965 080	42	> 8.0	9.0
3	703 023 ... 965 090	42	> 9.0	10.0
3	703 023 ... 965 100	42	> 10.0	11.0
3	703 023 ... 965 110	42	> 11.0	12.0

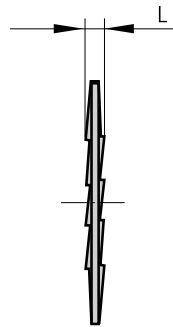
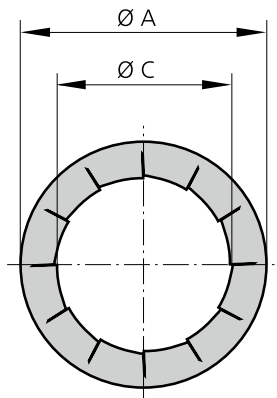
Color Code	Color	RAL-Nr. (similar)
202	red	3020
203	white	9010
204	yellow	1016
205	green	6029
206	blue	5002
207	grey	7005
208	black	9005

Because of different raw materials the colors may slightly differ from RAL numbers.

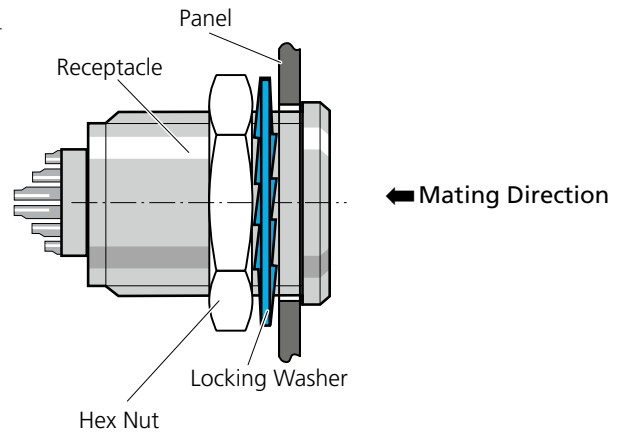
### Temperature range

Silicone -50°C up to +200°C  
Short-term up to +230°C  
autoclavable

### Locking Washers



#### Mounting example:

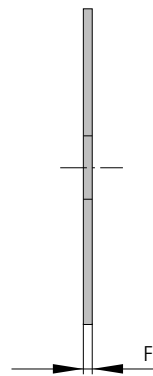
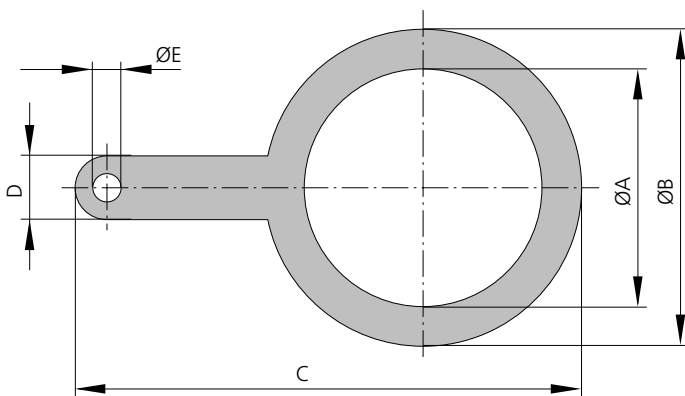


Nickel-plated surface

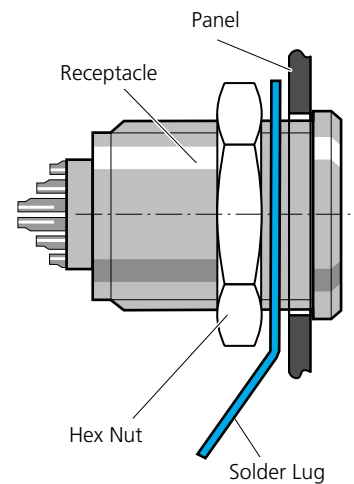
Size	Part number	Dimensions in mm		
		A	C	L*
M9	945 000 001 000 046	12.5	9.1	1.1
M12	945 000 001 000 047	16.0	12.1	1.1
M14	945 000 001 000 070	19.5	14.2	1.1
M15	945 000 001 000 048	19.5	15.1	1.1
M16	945 000 001 000 072	21.5	16.1	1.1
M18	945 000 001 000 049	25.0	18.1	1.1
M20	945 000 001 000 121	25.0	20.1	1.1

\*) Measurement under pressure

### Solder Lugs for Series L and B



#### Mounting example:

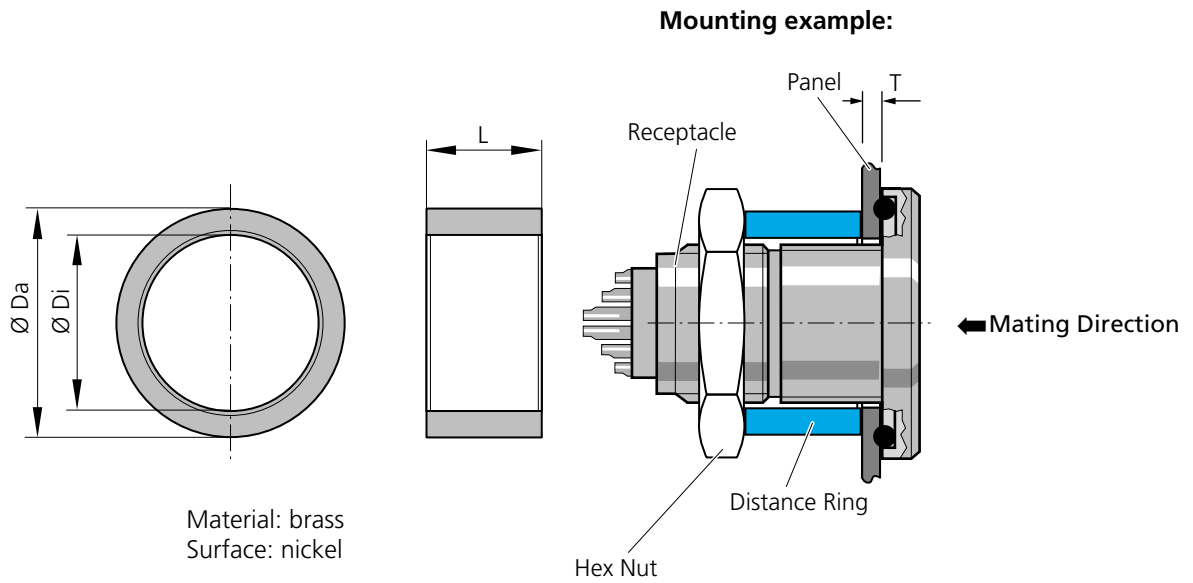


Silver-plated surface

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	1.6	0.5
M12	701 140 246 301 000	12.2	17.0	27.5	4	1.6	0.5
M14	715 140 246 301 000	14.1	18.0	27.0	4	2.0	0.5
M15	702 140 246 301 000	15.2	20.0	32.0	4	1.6	0.5
M16	721 140 246 301 000	16.2	20.0	32.0	4	1.6	0.5
M18	703 140 246 301 000	18.2	25.0	39.0	4	1.6	0.5
M20	722 140 246 301 000	20.2	25.0	39.0	4	1.6	0.5

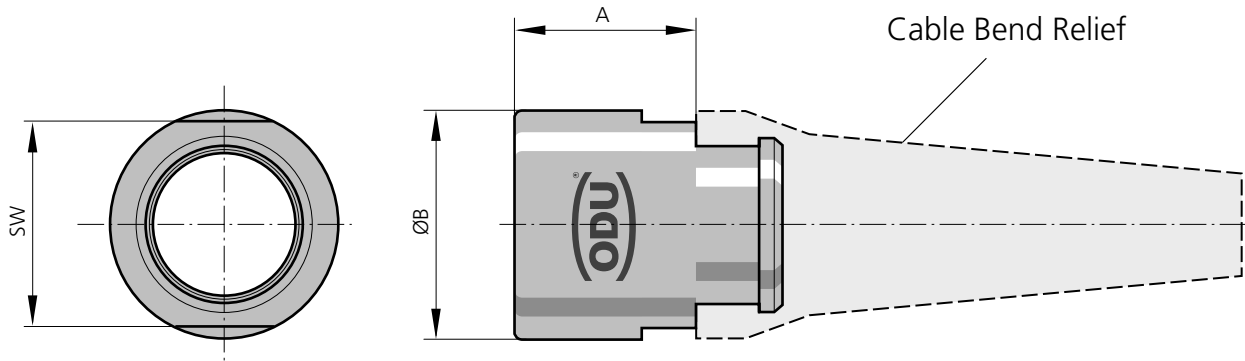
## Distance Ring for Wall Thickness Adjustment for style 2

(see [page 21](#))



Part number	Size	Da	Di	L	T
700 123 102 304 000	0	13	10.3	7	1-6
701 123 102 304 000	1	17	14.3	12	0.5-6
701 123 102 304 001	1	17	14.3	6	6-16
702 123 102 304 000	2	21	16.3	8	1-9
703 123 102 304 000	3	25	20.3	11.5	0.5-7

### Backnut for Silicone-Cable Bend Relief



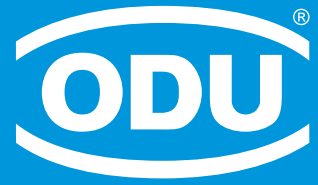
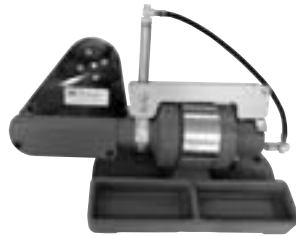
\* = In ... please indicate surface finish:  
 15 = Cu-alloy / matt chromate  
 11 = Cu-alloy / black chromate  
 04 = Cu-alloy / nickel

Size	Part number	Dimensions in mm		
		A	ØB	SW
0	700 022 117 3.. 002	8,0	8,9	7
1	701 022 117 3.. 002	10,0	11,2	10
2	702 022 117 3.. 002	11,5	13,9	13
3	703 022 117 3.. 002	11,5	16,9	15





# Tools



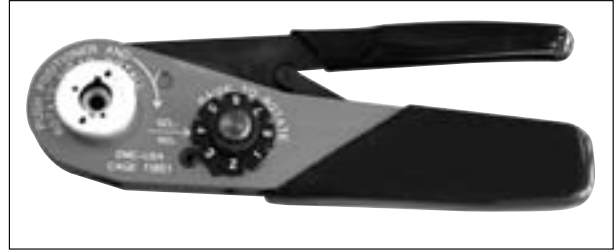
## Crimping Tongs and Assembling Tools for Turned Contacts

### 8-point-crimptong

**Order-Nr.: 080.000.037.000.000**

for crimp contacts: 0.7 mm and 0.9 mm.  
cross section: 0.08 mm<sup>2</sup> up to 0.5 mm<sup>2</sup>

You can find all informations about adjustment and using of this tools on [page 57](#)

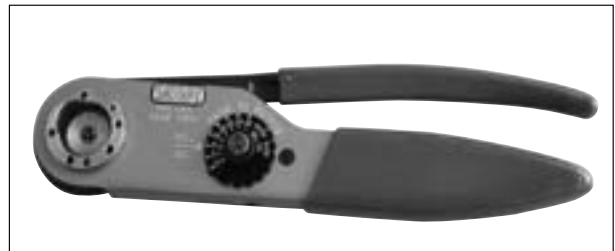


### 8-point-crimptong

**Order-Nr.: 080.000.038.000.000**

for crimp contacts: 1.3 mm and 1.6 mm.  
for cross section: 0.38 mm<sup>2</sup> up to 2.5 mm<sup>2</sup>

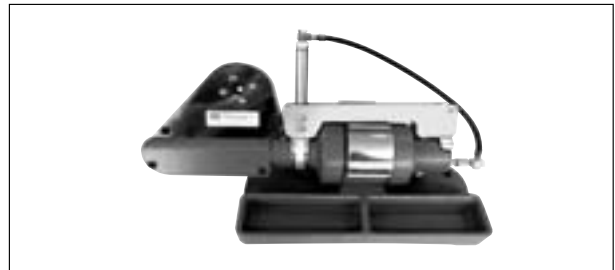
You can find all informations about adjustment and using of this tools on [page 57](#)



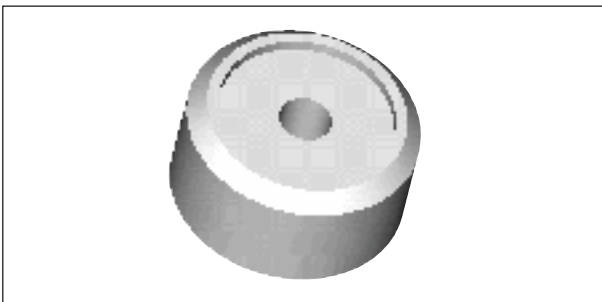
### Pneumatic crimping tool

**Order-Nr.: 080.000.032.000.000**

For all MINI-SNAP contacts applicable  
cross section: 0.08 mm<sup>2</sup> up to 2.5 mm<sup>2</sup>



## Assembly Jig for the assembling of our Crimp Contacts into the insulation body (see [page 61](#))



Size	Part number
0	700 098 004 300 000
1	701 098 004 300 000
1.5	715 098 004 300 000
2	702 098 004 300 000
3	703 098 004 300 000

## Crimping and Assembly Tools for Crimp Contacts (037 and 038)

Size	Positions	Contact diameter	AWG	cross sections mm <sup>2</sup>	Crimptool	Identification groove	Positioner socket	Positioner pin	Removal tool
1	4	0.9	24	0.25	080.000.037.000.000	5	081.701.003.749.037	081.701.003.849.037	087.7CC.090.001.000
		0.9	22	0.38		6			
		0.9	20	0.50		7			
		0.9	22-26	0.38-0.15		4			
	5	0.9	24	0.25		5	081.701.003.749.037	081.701.003.849.037	
		0.9	22	0.38		6			
		0.9	20	0.50		7			
		0.9	22-26	0.38-0.15		4			
	6	0.7	28-32	0,09-0,04		3			
		0.7	22-26	0,38-0,15		4			
		0.7	28-32	0,09-0,04		3			
		0.7	22-26	0,38-0,15		4			
1.5	12	0.7	28-32	0,09-0,04	080.000.037.000.000	3	081.700.001.748.037		
		0.7	22-26	0,38-0,15		4			
2	5	1.3	18-20	1,00-0,50	080.000.038.000.000	5	081.702.002.744.038	081.702.002.844.038	
		1.3	20-24	0,50-0,25		2			
	16	0.7	28-32	0,09-0,04	080.000.037.000.000	3			
		0.7	22-26	0,38-0,15		4			
3	15	0.9	24	0,25	080.000.037.000.000	5	081.702.002.749.037	081.701.003.849.037	087.7CC.090.001.000
		0.9	22	0,38		6			
		0.9	20	0,50		7			
		0.9	22-26	0,38-0,15		4			
	27	0.7	22-26	0,38-0,15		4	081.703.004.748.037	081.703.001.848.037	

**Order example for the tongs type 037 and 038:**  
 Assumed Connector: S12F1C-T06PJH0-7500  
 In this size 2 connector is a 6-way Pin Insert used.  
 The contact diameter is 0.9 mm.  
 The cable cross section is AWG 20/22

Therefore you have to order following tools:

**080.000.037.000.000 Crimp Tong 037 (Adjustment 7)**  
**081.702.001.849.038 Positionier for Pin Contacts**  
**085.180.689.000.000 Insertion tool**  
**702.098.004.300.000 Assembly Jig (see page 56)**

You can find all informations about adjustment and using of this tools on the [page 59](#) et seq.

## Adjustment of the Crimp Tongs 080.000.037.000.000 and 080.000.038.000.000

(see [page 56](#))



### 1. Fasten the Positionier on the Crimp Tong



Please fasten the Positionier under consideration of the guiding into the tong



037: Therby push the positionier down and turn it right at the same time.

038: You don't have to do this with this tong.



037: To fix the positionier in this position, you have to use the attached safety pin.

038: Here you have to fix the positionier with some attached allen screw and the suitable spanner.

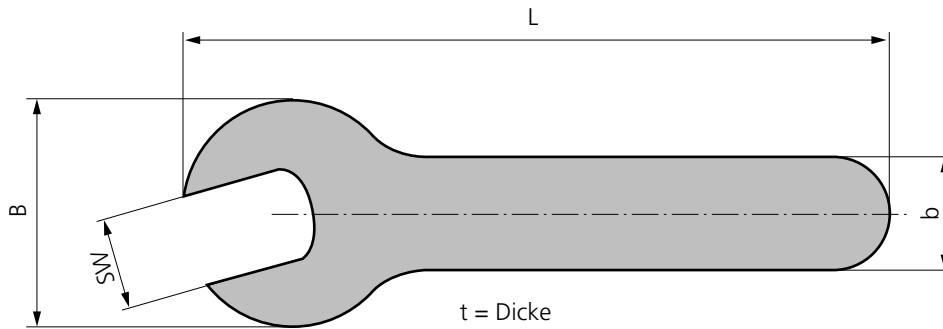
### 2. Adjust of the Crimp Tong for the cable cross section



Please turn the adjustment wheel onto the right position. If the adjustment is done, so please fix the wheel with the attached safety pin.

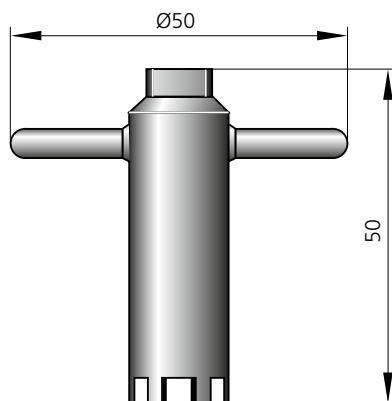
Now the tong is ready adjusted. You can start with the crimp process

## Spanner Wrench



Order No.	SW	t	B	L	b
598.700.001.016.000	5	1,5	18,5	92	8
598.700.001.015.000	5,5	1,5	18,5	92	8
598.700.001.021.000	6	2	18,5	92	8
598.700.001.011.000	7	2	18,5	92	8
598.700.001.001.000	8	2	18,5	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
598.700.001.003.000	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	47	119	23,5
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 suitable for style 8 , C, Q



Nutdriver	Thread
700 098 002 000 000	M 9x0,5
700 098 001 000 000	M 10x0,5
700 098 001 000 000	M 12x1
701 098 002 000 000	M 14x1
701 098 001 000 000	M 15x1
702 098 001 000 000	M 16x1
702 098 001 000 000	M 18x1
703 098 001 000 000	M 20x1

## Removal tool for Crimp-Clip-Contacts

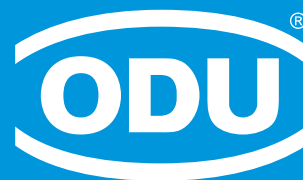


Part-Number	Contact Ø
087 7CC 050 001 000	0.5 mm
087 7CC 070 001 000	0.7 mm
087 7CC 090 001 000	0.9 mm
087 7CC 130 001 000	1.3 mm
087 7CC 160 001 000	1.6 mm

Crimp-Clip-Contact

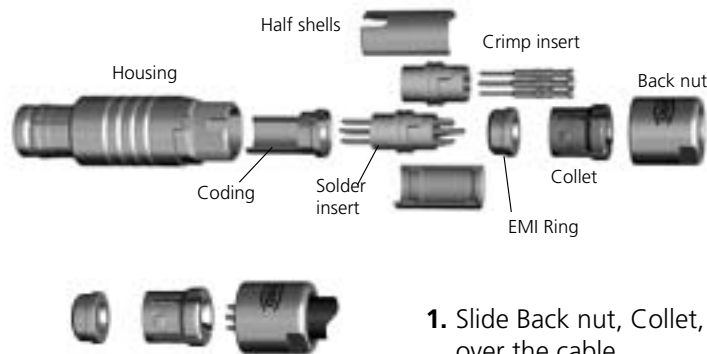


# Assembly Instructions



# Assembly Instruction

## For unsealed connectors (IP 50)



1. Slide Back nut, Collet, and EMI-Ring over the cable.

### Crimp termination

Detail information see [page 56](#) et seq.



Part number see [page 57](#)

2. Strip cable and wire.
3. Fit wire into the contact barrel and crimp.

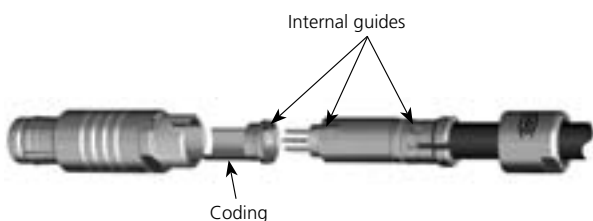


Part number see [page 56 - 57](#)

4. insert contacts into insulator, use the insertion tool to push them in.



Half shells



Coding



A

### Solder termination



2. Strip cable and wire.
3. Pre-tinning of strands recommended.



4. Solder each wire to the corresponding contact.

5. Bend cable shield outwards.

6. Slide the EMI-ring against the sleeve and clamp the shield against it.

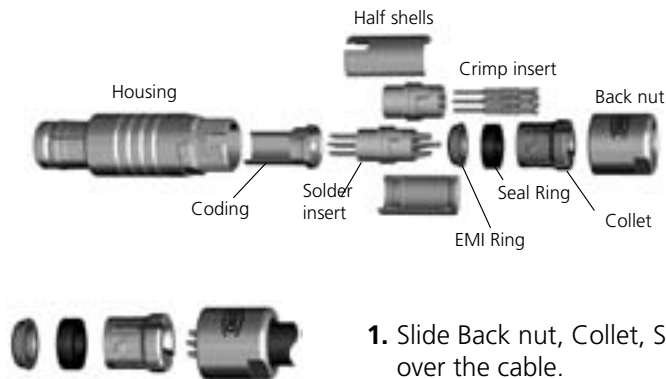
7. Now you can put the coding and the assembled cable into the plug housing.

8. Screw back nut on the plug and fasten cable in the housing.  
Hold against with flat spanner at flat A\* (**Torque see [page 65](#)**).  
Now the plug ist assembled.

\* ODU-Spanner-Wrench: see [page 59](#)

# Assembly Instruction

## For sealed connectors (IP 68)



1. Slide Back nut, Collet, Seal Ring and EMI-Ring over the cable.

### Crimp termination

Detail information see [page 56](#) et seq.



Part number see [page 57](#)

2. Strip cable and wire.
3. Fit wire into the contact barrel and crimp.

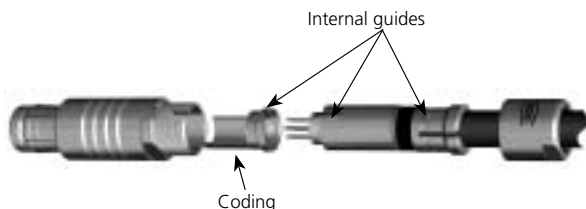


Part number see [page 56 - 57](#)

4. insert contacts into insulator, use the insertion tool to push them in.



Half shells



Coding



A

### Solder termination



2. Strip cable and wire.
3. Pre-tinning of strands recommended.



Solder iron

4. Solder each wire to the corresponding contact.

5. Bend cable shield outwards.

6. Slide the EMI-ring against the sleeve and clamp the shield against it.

7. Now you can put the coding and the assembled cable into the plug housing.

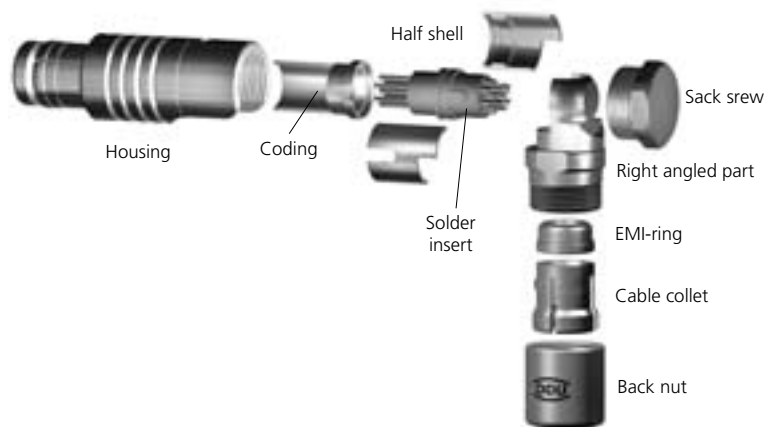
8. Screw back nut on the plug and fasten cable in the housing.  
Hold against with flat spanner at flat A\* (Torque see [page 65](#)).  
Now the plug is assembled.

\* ODU-Spanner-Wrench: see [page 59](#)

**Watertight connectors require a grommet seal designed for the intended cable.  
We require either the exact specification or a sample of the cable.**

## Assembly Instruction

### for unsealed right-angled plugs (IP 50)



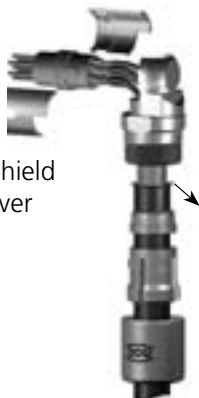
1. Slide back nut, collet nut, EMI-ring and right-angled-part over the cable.



2. Strip cable and wire.
3. Pre-tinning of strands recommended.

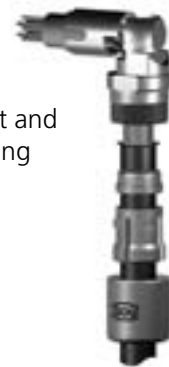


4. Solder each wire to the corresponding contact (Crimp version see straight connector on [page 64](#)).

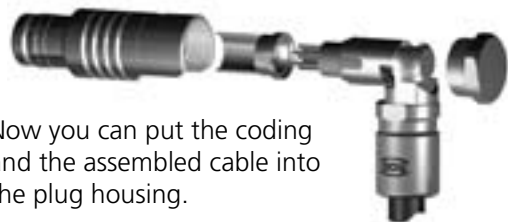


5. Pull cable back, bend cable shield outwards, place half shells over insulator.

6. Slide collet nut and EMI-ring against the right-angled-part and clamp shield between EMI-ring and right-angled-part. Install back nut.



7. Now you can put the coding and the assembled cable into the plug housing.



8. Mount sack screw on the plug and fasten cable in the housing. Hold against with flat spanner at flat A\* (**Torque see [page 65](#)**). Now the plug is assembled.



\* ODU-Spanner-Wrench: see [page 59](#)

## Torque for back-nuts

### Torque for styles

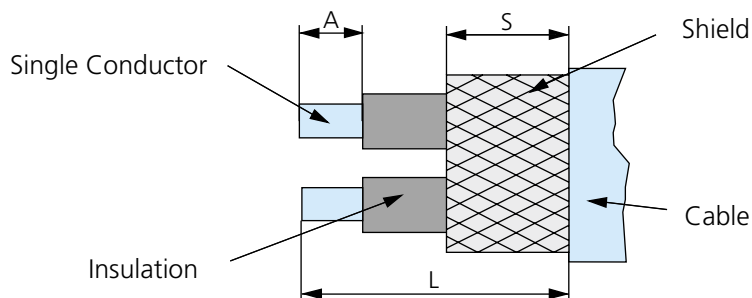
- Straight plug S1; S2; S3; S4
- Right-angled-plug W1; W2
- Break-apart-plug A5; A6; A7; A8
- In-line-receptacle K1; K2; K3; K4
- Receptacle G6; G7

Style	0	1	1,5	2	3
Torque	0,6 Nm	1,0 Nm	1,5 Nm	2,0 Nm	3,5 Nm

1 Nm = 8,85 inch-pounds

## Cable preparation:

The following table provides recommended guidelines for cable preparation:



A = Stripping length single conductor  
 L = Stripping length cable jacket  
 S = Stripping length braided shield

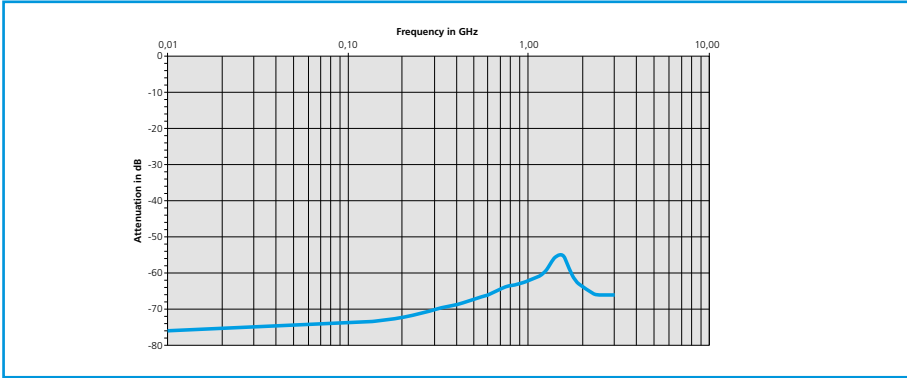
Size	Contact Ø	Solder Termination			Crimp Termination		
		L	A	S	L	A	S
Size 0	0.5	6	2	2.5	–	–	–
	0.7	6	2.5	2.5	6	3	2.5
Size 1	0.9	6	2.5	2.5	6	3	2.5
	0.5	9	2	2.5	–	–	–
	0.7	9	2.5	2.5	13	4	2.5
Size 1.5	0.9	9	2.5	2.5	13	4	2.5
	1.3	9	3	2.5	13	4	2.5
	0.5	12	2	2.5	–	–	–
Size 2	0.7	12	2.5	2.5	16	4	2.5
	0.9	11	2.5	2.5	15	4	2.5
Size 3	1.3	11	2	2.5	15	4	2.5
	0.7	14	2.5	2.5	18	4	2.5
	0.9	14	2.5	2.5	18	4	2.5
	1.3	14	3	2.5	18	4	2.5

All dimensions in mm      Tolerance: + 10 %

Exceptions are noted on special instructions.  
 Right-angle plugs have special instructions.



# Technical Information



**INDEX:**

	Page
<a href="#">International Protection (IP) Classes (DIN EN 60 529)</a> .....	68
<a href="#">Watertightness of the ODU MINI-SNAP</a> .....	69
<a href="#">Operating Voltage acc. to SAE AS 13441-method 3001.1</a> .....	70
<a href="#">Current Load - Turned Contacts</a> .....	71
<a href="#">Termination Styles</a> .....	72
<a href="#">Conversion Table AWG to Metric</a> .....	73
<a href="#">Housing Materials / Surfaces</a> .....	74
<a href="#">Electromagnetic Compatibility (EMC)</a> .....	75
<a href="#">Autoclaving of ODU MINI-SNAP</a> .....	76
<a href="#">Quality Management</a> .....	77
<a href="#">Tests acc. to MIL</a> .....	78
<a href="#">Technical Terms &amp; Definitions</a> .....	79



## International Protection (IP) Classes DIN EN 60 529 (respectively IEC 529 / VDE 0470 T1)

The housing and the locking system of the ODU MINI-SNAP protect the contacts against outside mechanical influence, such as impact shocks, impurities, dust, unintended contact and penetration of moisture, water or other liquids (coolants, oils, etc.).

Protection classification is indicated with the letters **IP** and two numbers.

IP: International Protection

**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 60529.**

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.

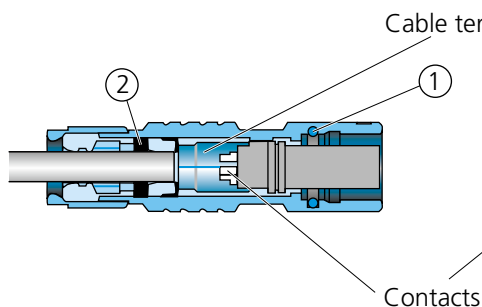
(Higher requirements for Watertightness on request)

Code letters (International Protection)		First Index Figure (Foreign bodies protection)	Second Index Figure (Water protection)	
<b>IP</b>		<b>6</b>	<b>8</b>	
Index	Degree of protection	Index	Degree of protection	
<b>0</b>	No protection against accidental contact, no protection against intrusion of solid foreign bodies	<b>0</b>	No protection against water	
<b>1</b>	Protection against contact with any large area by hand and against large solid foreign bodies with Ø > 50 mm	<b>1</b>	Protection against vertical water drips	
<b>2</b>	Protection against contact with the fingers, protection against large solid foreign bodies with Ø > 50 mm	<b>2</b>	Protection against water drips (up to a 15° angle)	
<b>3</b>	Protection against tools, wires or similar objects with Ø > 2.5 mm. Protection, against small foreign solid bodies with Ø > 2,5 mm	<b>3</b>	Protection against diagonal water drips (up to a 60° angle)	
<b>4</b>	As 3 however Ø > 1 mm	<b>4</b>	Protection against splashed water from all directions	
<b>5</b>	Full protection against contact. Protection against interior detrimental dust deposition.	<b>5</b>	Protection against water spray from all directions	
<b>6</b>	Total protection against contact. Protection against intrusion of dust	<b>6</b>	Protection against temporary flooding	
		<b>7</b>	Protection against temporary immersion	
		<b>8</b>	Protection against water pressure	

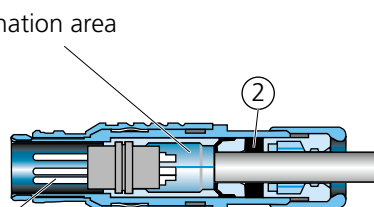
In accordance with DIN VDE 0470, DIN EN 60 529, IEC 529  
Source: ZVEI = German Association of the Electrotechnical and Electronic Industry e.V.

## Watertightness of the ODU MINI-SNAP

I) In-line receptacle



Plug

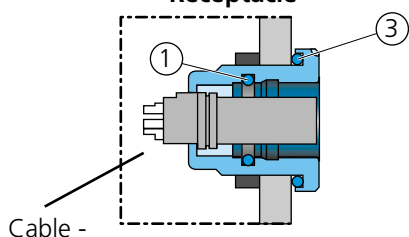


**Sealing Part**

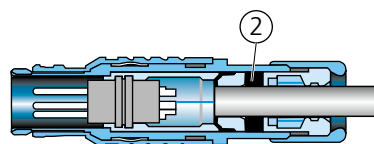
- ① O-ring
- ② Grommet \*2
- ③ O-ring
- ④ Potting

II)

Receptacle

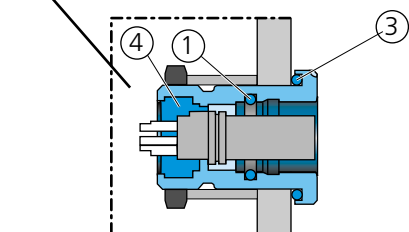


Plug

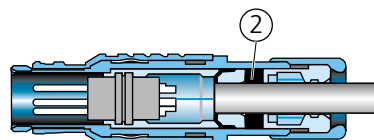


III)

Receptacle



Plug



Protection against Water through following seals: \*1

		<b>mated</b>	<b>unmated</b>
I	<b>Cable – Cable termination area</b>	<b>Yes</b> ① + ②	<b>No</b>
II	<b>Device – Cable termination area</b>	<b>Yes</b> ① + ③ + ②	<b>No</b>
III	<b>Device – Cable termination area</b>	<b>Yes</b> ① + ③ + ②	<b>Yes</b> ③ + ④

\*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 47 - 48](#)). The cover must be removed before mating the plug with the receptacle.

\*2 The elastic grommet acts as the cable seal. It requires exact knowledge of the cable dimension.  
**Important factors:** Diameter tolerance, roundness, cable design and cable jacket hardness.

## 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. 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 2000 m.

For any deviations one has to consider the reduction factor acc. to the relevant standards.

**Test voltage:** **Break-down voltage x 0.75**

**Operating voltage:** **Break-down voltage x 0.75 x 0.33**

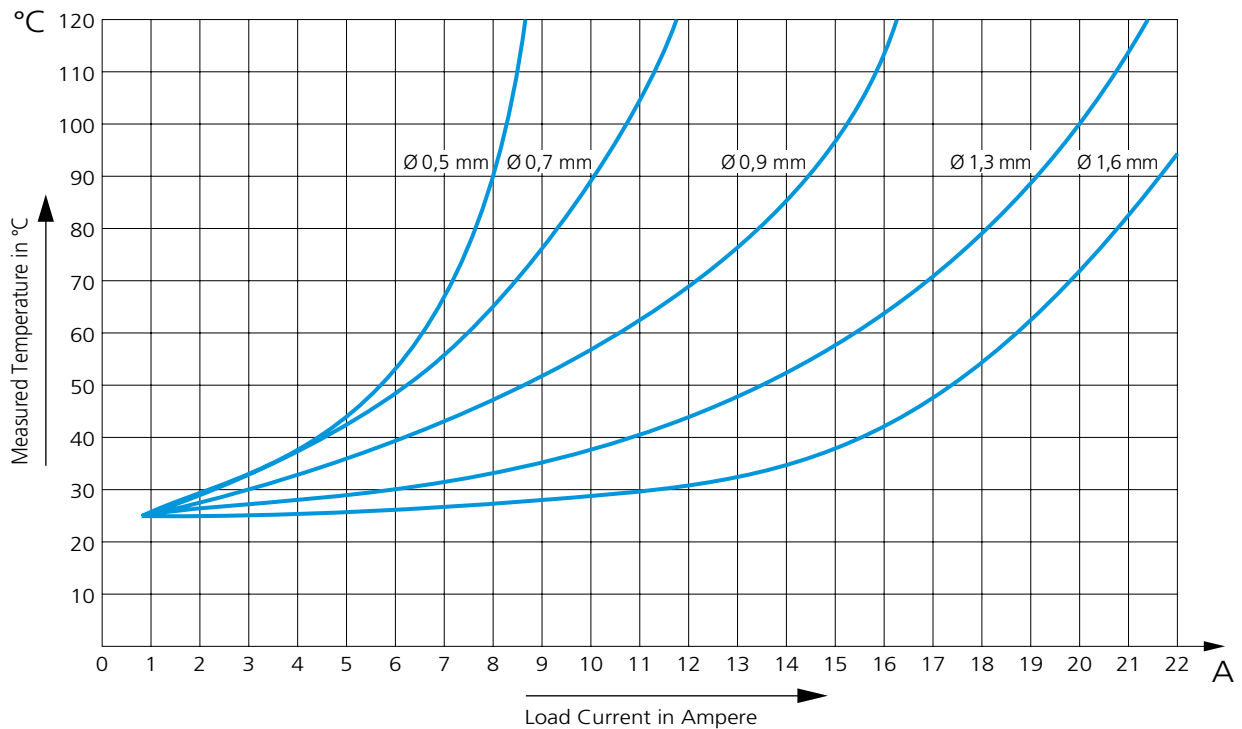
### Caution:

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 chose the proper connector please consult us and indicate the safty standard which your product has to meet.

## Current Load - Contacts

### Nominal Single Contact Current Load for pin / slotted socket

(Nominal Diameter 0.5 mm - 1.6 mm)



→ Upper Maximum 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 IEC 60512-3 / VDE 0276-1000. The Derating Factor is used starting with 5 loaded wires.

#### 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

## Termination Styles

Contact blocks (insulation bodies with contacts) are interchangeable between receptacle and plug. As a rule the socket contact blocks are mounted in the part under power.

ODU offers the following contact termination styles:

- **Solder**
- **Crimp**
- **PCB**

### Termination Styles for Turned Contacts

#### Solder Termination:

The contacts come mounted by the factory. The insulation body 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 insulation body. Crimp contacts and insulation bodies 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 crimp tool .



#### Printed Circuit Board (PCB) Termination:

PCB pins are used only for receptacles which are mounted directly to the PCB. The contacts are permanently installed in the insulation body.



## Conversion / AWG

### 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.

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 mm<sup>2</sup>; an AWG-20 stranded wire with 19 AWG-32 conductors has a cross section of 0.616 mm<sup>2</sup>.

Conversion Table AWG / mm<sup>2</sup>

AWG	Circular Conductor		
	Diameter		mm <sup>2</sup>
	in	mm	
10 (1)	0,102	2,59	5,27
10 (37/26)	1,109	2,75	4,53
12 (1)	0,0808	2,05	3,31
12 (19/25)	0,0895	2,25	3,08
12 (37/28)	0,0858	2,18	2,97
14 (1)	0,0641	1,63	2,08
14 (19/27)	0,0670	1,70	1,94
14 (37/30)	0,0673	1,71	1,87
16 (1)	0,0508	1,29	1,31
16 (19/29)	0,0551	1,40	1,23
18 (1)	0,0403	1,02	0,82
18 (19/30)	0,0480	1,22	0,96
20 (1)	0,032	0,813	0,52
20 (7/28)	0,0366	0,93	0,56
20 (19/32)	0,0384	0,98	0,62
22 (1)	0,0252	0,64	0,324
22 (7/30)	0,0288	0,731	0,354
22 (19/34)	0,0307	0,780	0,382
24 (1)	0,0197	0,50	0,196
24 (7/32)	0,023	0,585	0,227
24 (19/36)	0,0252	0,640	0,240
26 (1)	0,157	0,40	0,122
26 (7/34)	0,0189	0,48	0,140
26 (19/38)	0,0192	0,487	0,15
28 (1)	0,0126	0,32	0,08
28 (7/36)	0,015	0,381	0,089
28 (19/40)	0,0151	0,385	0,095
30 (1)	0,0098	0,250	0,0506
30 (7/38)	0,0115	0,293	0,055
30 (19/42)	0,0123	0,312	0,072
32 (1)	0,0080	0,203	0,032
32 (7/40)	0,0094	0,240	0,035
32 (19/44)	0,0100	0,254	0,044
34 (1)	0,0063	0,160	0,0201
34 (7/42)	0,0083	0,211	0,0266
36 (1)	0,0050	0,127	0,0127
36 (7/44)	0,0064	0,163	0,0161
38 (1)	0,0040	0,100	0,0078
40 (1)	0,0031	0,080	0,0050
42 (1)	0,0028	0,0700	0,0038
44 (1)	0,0021	0,054	0,0023

(Font: Gore & Associates, Pleinfeld)

## Housing Materials and Surface Finish

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

Inside metal components are made from nickel-plated brass.

Component Parts	Material	Surface
	Designation	Thickness of the film
Housing Back Nut Slotted Nut	→ Cu-alloy	+ 1 µm Cu + 3-6 µm Ni + 0.3-1 µm matt chromate
Collet EMI-Ring Half-Shells Locking Washer Nut Retainer Ring	→ Cu-alloy	→ Ni matt: 4-9 µm
Pin (solder or PCB) Socket (solder or PCB) Pin (crimp) Socket (crimp)	→ Cu-alloy	+ 1.25 µm Ni → + 0.75 µm Au

## Insulation Body Material ( recognized)

	Norm		Unit	PBT	PTFE 1)	PEEK
<b>Dielectric Strength</b>	DIN 53481	ASTM D-149	KV / mm	27	> 50	19
<b>Operating Temperature</b>	--	--	°C	- 40 / +140	-100 / +260	-50 / +250
<b>Flammability rating</b>	UL-94	--	--	V-0	V-0	V-0
<b>Creeping distance acc. to CTI</b>	IEC 60112		(V)	275	600	175

<sup>1)</sup> PTFE (Teflon) is only used for Coax- and Triax Connectors

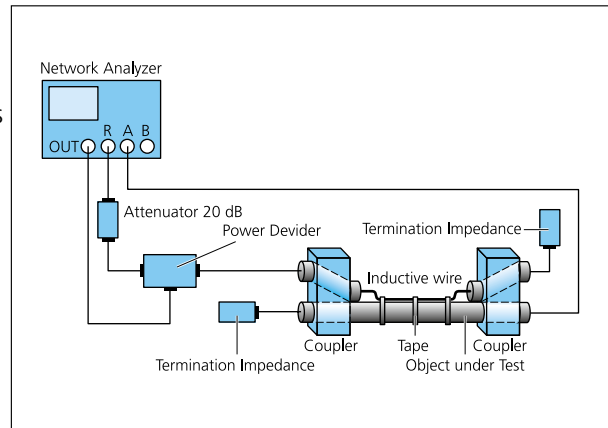
## Electromagnetic Compatibility (EMC)

When discussing electromagnetic 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.

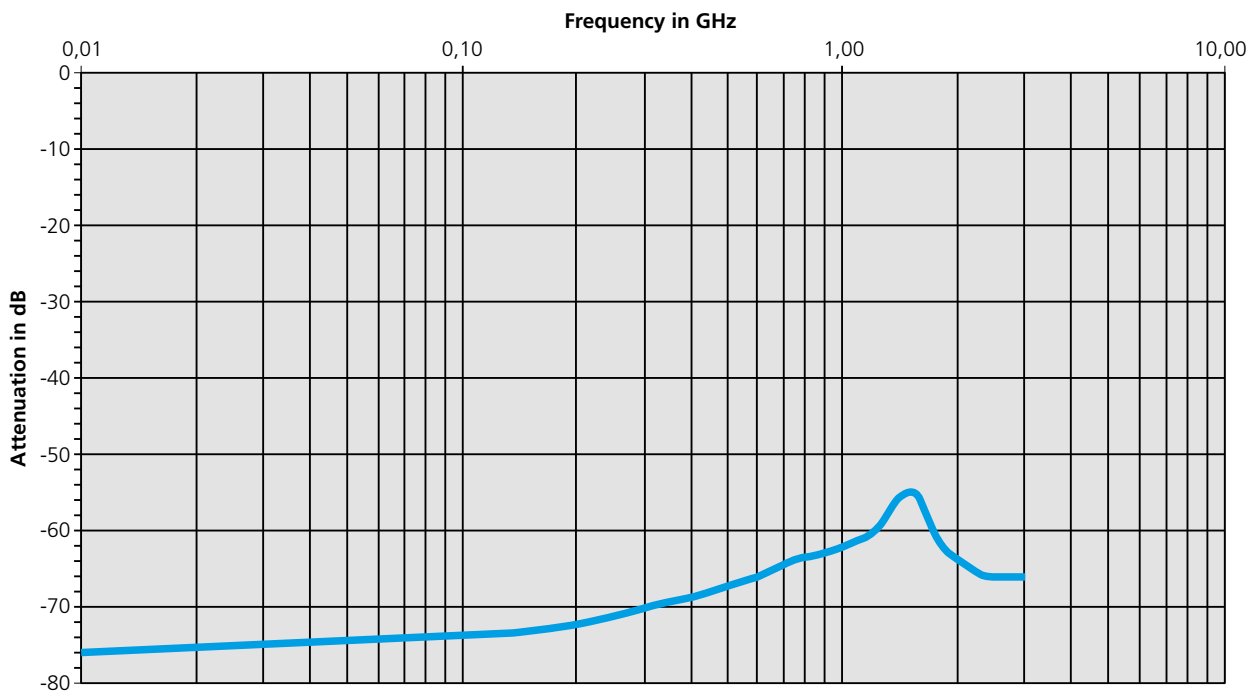
Measurements were conducted using the inductive wire or parallel wire method in accordance with test procedure VG 95214-6-2. In this set-up, the mated connector is connected on one end to a network analyzer and terminated on the other end with a suitable impedance. The inductive wire is then mounted 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  $A_T$  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.



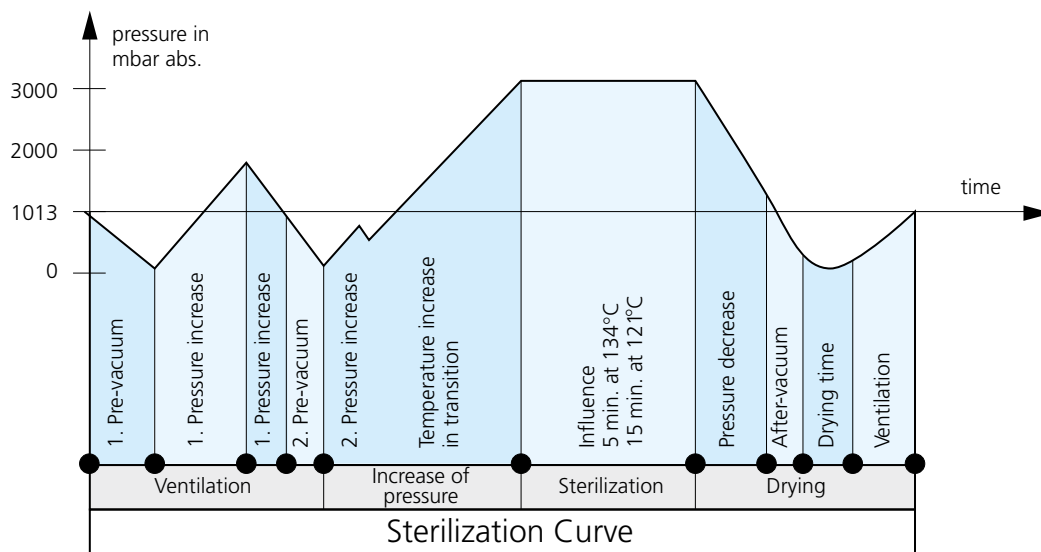
The following diagram is valid for all series and standard sizes.



## Autoclaving of ODU MINI-SNAP Connectors

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 13 060 at 134° C and 500 cycles.

### Sterilization Curve:



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

## Quality Management at ODU

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 the medical norm ISO 13485 : 2003 + AC : 2007. Additional to this ODU ist approved to different certifications: VDE, UL, UL wiring harness, SCA, VG and MIL.



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:**

<b>Definition</b>	<b>Nach Norm</b>
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 / Methode 1001.1
Shock	MIL-STD 810 F / PV 516
Vibration	MIL-STD 1344 A / Methode 2005.1 / IV
Water Thightness IP 68	IEC 60529

## Technical Terms and Definitions

### **Air Gap**

= Shortest distance between two conductive elements through the air.

### **Autoclavability**

(See [page 76](#))

### **AWG**

(See [page 73](#))

### **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.

### **Crimp 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 72](#))

### **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 inline 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.

**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 26](#)).

**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 CuZn-alloy and gold-plated. The standard housings are made of brass with a matt-chromate surface finish. All other materials and surfaces on special request. (see [page 74](#)).

**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 71](#)).

**Operating Temperature of the ODU MINI-SNAP**

= Range between upper and lower temperature limits.

- 40 °C to + 120 °C (see [page 8](#))

**Print Connection**

(see [page 72](#))

**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 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.

**Solder Termination**

(see [page 72](#) Termination Styles)

**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.

**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 71](#)).

**Watertightness**

(See [page 69](#))

**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 assured that at the time of print all information in this catalog was correct. 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.

# Please visit our websites

[www.odu.de](http://www.odu.de)

[www.odu-usa.com](http://www.odu-usa.com)

[www.odu-china.com](http://www.odu-china.com)



# Additional ODU Push-Pull Series

## ODU MINI-SNAP Series L



- ▶ keying with pin and groove
- ▶ locking: LP push-pull principle with locking fingers
- ▶ degree of protection: IP 50
- ▶ special features: a multitude of keying options

## ODU MINI-SNAP Series K



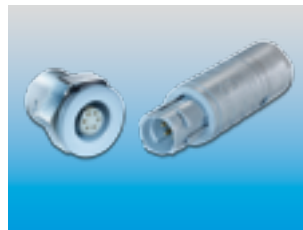
- ▶ keying with pin and groove
- ▶ locking: LP push-pull principle with locking fingers
- ▶ degree of protection: IP 68

## ODU MINI-SNAP Series B



- ▶ keying with pin and groove
- ▶ locking: FP push-pull principle with locking fingers
- ▶ degree of protection: IP 50 and IP 68
- ▶ special features: tight sealing with low outside diameter

## ODU MINI-SNAP PC



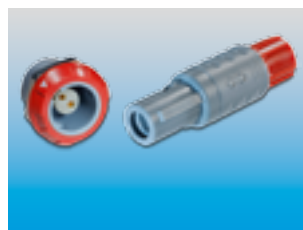
- ▶ made out of plastic
- ▶ keying with half-shells
- ▶ locking: FP push-pull principle using conical sleeves
- ▶ degree of protection:
  - IP 50,
  - IP 50+EMC protection
  - IP 67,
  - IP 67+EMC protection

## ODU MINI-SNAP Series S



- ▶ keying with insulator
- ▶ locking: LP push-pull principle with locking fingers
- ▶ degree of protection: IP 50 and IP 68

## ODU MEDI-SNAP



- ▶ made out of plastic
- ▶ keying with pin and groove
- ▶ locking: LP push-pull principle with locking fingers
- ▶ sterilizable/Auto-claveable

Ask for the separate product catalog:  
[zentral@odu.de](mailto:zentral@odu.de)



---

Please open

---



# TELEFAX-INQUIRY ODU MINI-SNAP

Fax-No. **0 86 31 / 61 56-49** z. Hd. Vertrieb ODU MINI-SNAP  
**ODU-Steckverbindingssysteme GmbH & Co. KG**  
 Pregelstraße 11  
 D-84453 Mühldorf am Inn

From:

Company:	_____
Name:	_____
Dept.:	_____
Street:	_____
City:	_____
Phone:	_____ Date: _____

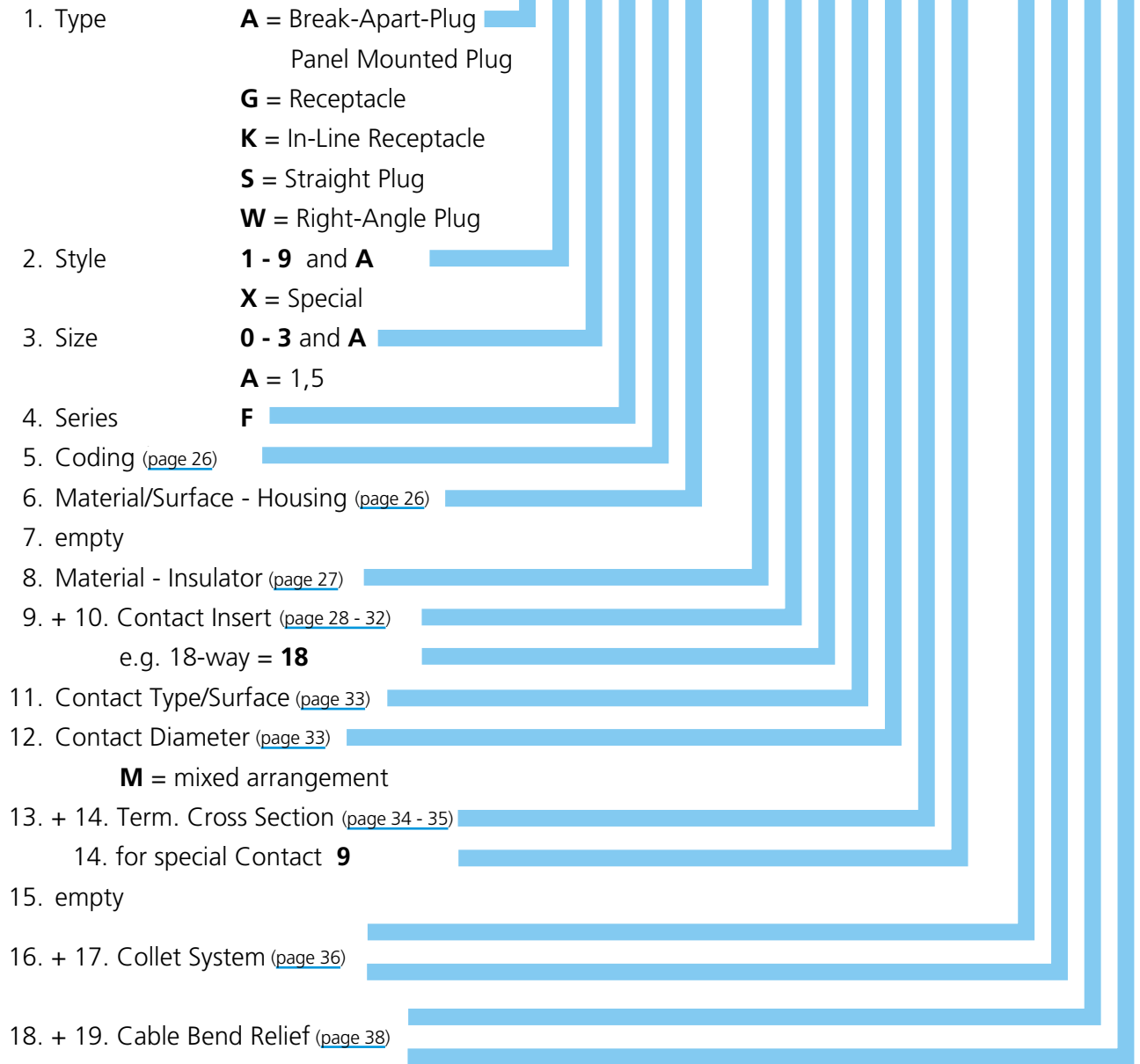
## ODU MINI-SNAP Summary of Technical Requirements

1) Connector application	: _____
2) Environment	: _____
3) Connector Type	: <input type="checkbox"/> Plug <input type="checkbox"/> Receptacle <input type="checkbox"/> Inline Receptacle <input type="checkbox"/> 90° Plug <input type="checkbox"/> 90° receptacle
4) Special Version	: _____
5) Style	: _____
6) Size	: <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 1,5 <input type="checkbox"/> 2 <input type="checkbox"/> 3
7) Series	: <input type="checkbox"/> don't care <input type="checkbox"/> F
8) Keying	: _____
9) Number of Positions	: _____
10) Termination	: <input type="checkbox"/> solder <input type="checkbox"/> crimp <input type="checkbox"/> PCB
11) Cross section of wire	: _____ mm <sup>2</sup> _____ AWG
12) Cable Dia.	: _____ mm
13) Bend Sleeve (color)	: _____
14) Protection DIN EN 60 529	: <input type="checkbox"/> IP 50 (Standard) <input type="checkbox"/> IP 68 (watertight) <input type="checkbox"/> other _____
15) Operating Temperature	: _____ °C max.    _____ °C min.
16) Electrical Specs:	
Operating Voltage	: _____ V AC    _____ V DC
Operating Current	: Constant _____ A    Short-term _____ A, _____ sec.
17) Chemical resistance against	: _____
18) Other requirements	: _____
19) Autoclavable, +134° C (see p. 82)	: <input type="checkbox"/> Yes <input type="checkbox"/> No
⇨ Number required	: _____
⇨ Production Quantity	: _____

# The Part Number Key

## Part Number Key

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



### Example:

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	-	T	1	6	L	F	D	0	-	0	0	0	0

Receptacle - Style 5 - Size 2 - Series F - Coding 1 - Brass matt chromate Housing - PBT Insulator - 16-pos. - Socket (solder) 0.75 µm Au - Term. Cross Section AWG24/26

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	E	S

Plug - Style 2 - Size 2 - Series F - Coding 1 - Brass matt chromate Housing - PBT Insulator - 16-pos. - Pin (solder) 0.75 µm Au - Term. Cross Section AWG22 - Cable Diameter 7.1-7.5 - Blue Cable Bend Relief - Material Silicone

**ODU worldwide**



ODU Steckverbindungssysteme  
GmbH & Co. KG  
Otto Dunkel GmbH  
Pregelstr. 11  
84453 Mühldorf a. Inn  
Germany  
Phone: +49/86 31/6156-0  
Fax: +49/86 31/6156-49  
E-Mail: zentral@odu.de  
Internet: www.odu.de

ODU France  
Phone: +33/1/39 35-46 90  
E-Mail: jean-nicolas.vikelas@odu.fr

ODU Scandinavia  
Phone: +46/1 76/1 82 61  
E-Mail: peter.biloch@odu.se

ODU UK  
Phone: +44/15 09-2 66-4 33  
E-Mail: sales@odu-uk.co.uk

ODU USA  
Phone: +1/8 05/4 84 05 40  
E-Mail: sales@odu-usa.com

ODU Shanghai Trading  
Phone: +86/21/58 34 78 28-1 06  
E-Mail: oduchina@odu.com.cn



ODU's headquarters and factory are located in Mühldorf at the river Inn, approximately 50 miles east of Munich, at the foothills of the Bavarian Alps.