

A PERFECT ALLIANCE.

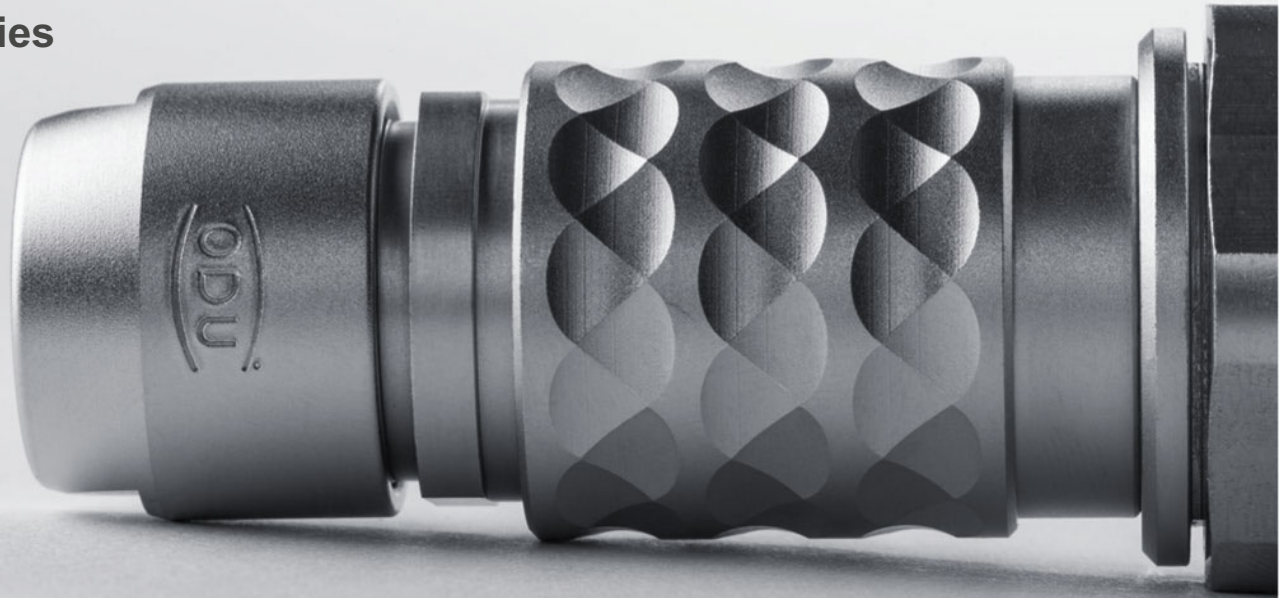


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# ADVANCED CONNECTOR SOLUTIONS

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**Product Training Module**  
**ODU MINI-SNAP® K Series**



## ODU MINI-SNAP® K Series

### Purpose:

- Introduce the ODU MINI-SNAP® K Series connector

### Objectives:

- Review features and benefits
- ODU ODU MINI-SNAP® K Series complete connector solution
- ODU ODU MINI-SNAP® K Series Plug Housing Models
- ODU ODU MINI-SNAP® K Series Receptacle Housing Models
- Contact configurations/technology
- Mechanical coding
- Cable collet system
- Water tightness with ODU MINI-SNAP® K Series
- Part number configuration
- Accessories
- Target markets and applications
- Certifications
- Summary

### Content:

- 23 pages



Welcome to ODU advanced metal circular connector solutions. This presentation will go over the ODU MINI-SNAP® K Series circular Push-Pull locking connectors. It will cover the main features and benefits, as well as the variety in housing options and inserts available. The presentation will also provide an overview of the ODU MINI-SNAP® K Series' main technology features, the part number configurator and the certifications.

## ODU MINI-SNAP<sup>®</sup> K Series

### Review Features and Benefits

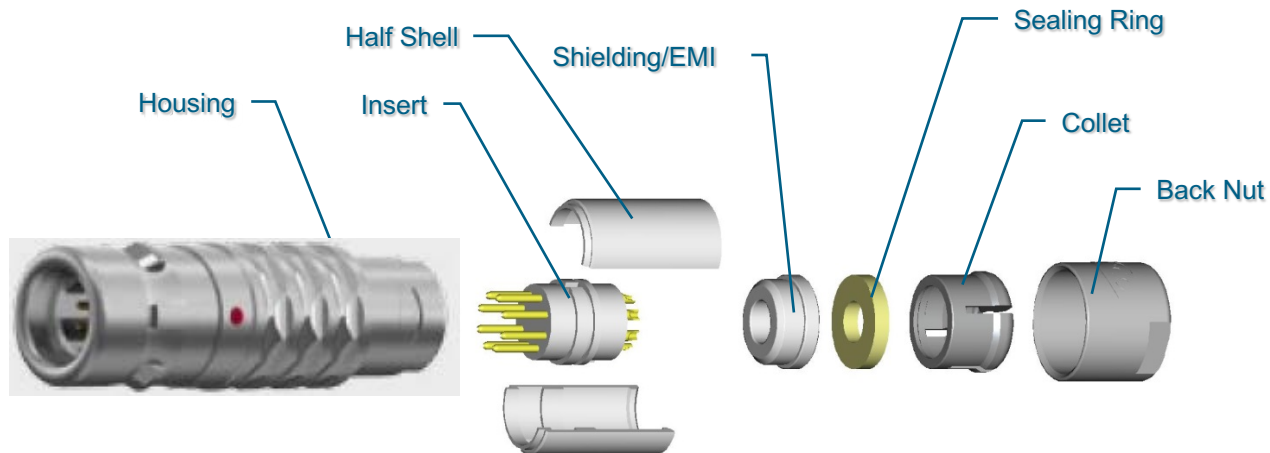
#### Series Overview:

- Circular connector series in a robust metal housing
- Up to 5 sizes
- Push-Pull locking mechanism
- Quick and easy mating and demating
- IP68 protection class in mated condition
- Up to 5,000 mating cycles
- 2 to 40 contacts/mixed configurations
- 8 mechanical coding options
- Terminations types – Solder, Crimp, PCB



The ODU MINI-SNAP<sup>®</sup> is an ideal self-locking circular connector for a wide range of applications due to its robust metal housing and wide range of sizes. Whether used for transmitting power, signals, data or other media, this Push-Pull locking connector solution has a mechanism for easy and secure mating and demating, IP68 protection class in mated condition, up to 5,000 mating cycles, 2-40 contacts and mixed configurations possible with 8 mechanical coding options. The ODU MINI-SNAP<sup>®</sup> K Series can be terminated in solder, crimp and PCB.

## ODU MINI-SNAP<sup>®</sup> K Series Complete Connector Solution



ODU offers high-quality connectors and comprehensive service for the complete assembly. Anything from connectors to watertight grouting, we provide the complete system from a single source.

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# ODU MINI-SNAP® K Series

## Plug Housing Models

**STRAIGHT PLUG**

IP 68 <sup>1</sup>		S 1
		S 2
		A 1
		A 2

**PANEL-MOUNTED PLUG**

IP 68 <sup>2</sup>		A A
		A D

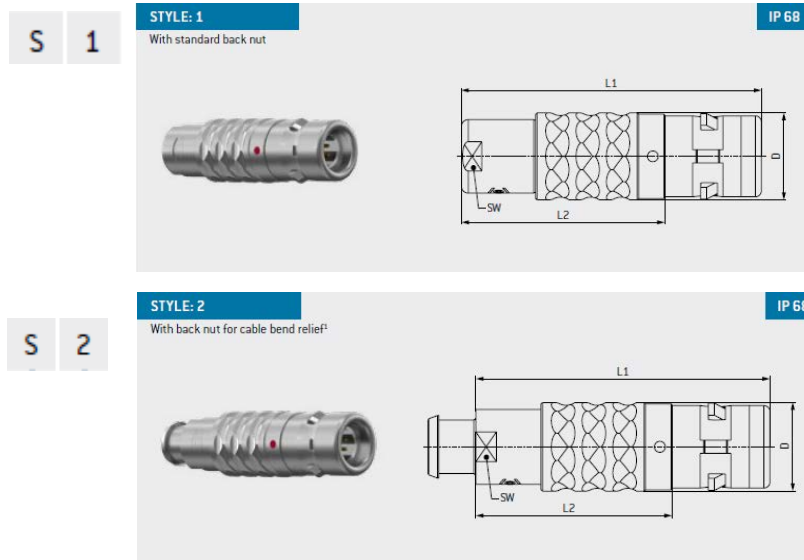
**RIGHT-ANGLED PLUG**

IP 68 <sup>1</sup>		W 1
		W 2

The ODU MINI-SNAP® K Series is available in a variety of styles and 5 different standards sizes from 11 mm to 25 mm. Housing is made of brass, nickel plated and then matte chrome plated, while the plug internals are made of nickel plated brass. S1/S2 plug housings G1/G5 panel receptacle housing are readily available through distribution. IP68 in mated condition.

# ODU MINI-SNAP® K Series

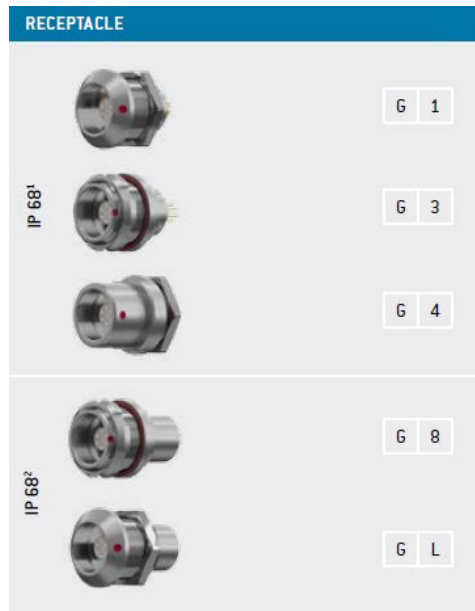
## Plug Housing Models



Size	L1 mm	L2 mm	D mm	S1 SW mm	S2 SW mm
0	≈ 37	≈ 26	11	7	7
1	≈ 44	≈ 30	13	10	10
2	≈ 50	≈ 34	16	12	13
3	≈ 60	≈ 40	19	14	15
4	≈ 73	≈ 52	25	20	20

The Style 1 and Style 2 shown here are the two most commonly used straight plug housing styles. The S1 model contains a standard back nut were the S2 model can accommodate a silicone bend relief.

## Receptacle Housing Models



There are a variety of housing models available for the ODU MINI-SNAP® K Series. IP68 rated in mated condition. IP68 can be achieved in reference to the end device in unmated condition. The red dot on the housing indicates the 12 o'clock position. Both front and rear mount panel receptacles models are available.

# Receptacle Housing Models

**G 1** **STYLE: 1** **IP 68**  
 Receptacle for installation from front of panel

Size	L1 <sup>1</sup> mm	L2 mm	L3 <sup>2</sup> mm	M mm	D mm	SW A mm	SW B mm	C mm	Panel cut-out	
									SW mm	Ø mm
0	≈ 21	≈ 5.5	15.5	14 × 1	18	12.5	17	4	12.6	14.1
1	≈ 28	≈ 9	20.5	16 × 1	20	14.5	19	4.5	14.6	16.1
2	≈ 31	≈ 9	23	20 × 1	25	18.5	24	5	18.6	20.1
3	≈ 36	≈ 11	28	24 × 1	31	22.5	30	6	22.6	24.1
2	≈ 40	≈ 11	31.5	30 × 1	37	28.5	36	6.5	28.6	30.1

**G 3** **STYLE: 3** **IP 68**  
 Receptacle with slotted mounting nut, installation from rear of panel

Size	L1 <sup>1</sup> mm	L2 mm	L3 <sup>2</sup> mm	L4 mm	M mm	D mm	C mm	SW A mm	Panel cut-out	
									SW mm	Ø mm
0	≈ 21	≈ 3	15.5	7	14 × 1	18	4	12.5	12.6	14.1
1	≈ 28	≈ 6	20.5	10	16 × 1	20	3.5	14.5	14.6	16.1
2	≈ 31	≈ 6	23	10	20 × 1	25	3.5	18.5	18.6	20.1
3 <sup>3</sup>	≈ 36	≈ 7.5	28	12	24 × 1	31	4.5	22.5	22.6	24.1
4	≈ 40	≈ 6.5	31.5	13.5	30 × 1	41.5	7	28.5	28.6	30.1

Shown are the most commonly used receptacle housing models in the series K. The G1 model is a front mount solution where the G3 is a rear mount solution.



## Contact Configurations

### TERMINATION TECHNOLOGIES FOR TURNED CONTACTS

#### Solder termination

The contacts are mounted in the insulator before the single connectors are assembled. An insulator with pre-installed contacts is referred to as a contact insert.

#### Crimp termination

Here, the individual contact is connected to the individual wires via deformation in the termination area. Then the contacts are individually installed in the insulator. 8-point deformation is generally used for turned crimp contacts.

#### PCB Termination

This is only used in the receptacle if the receptacle is to be mounted directly on a printed circuit board (PCB). Further information is available upon request.

SOLDER TERMINATION



CRIMP-CLIP-CONTACT FOR PEEK INSULATOR



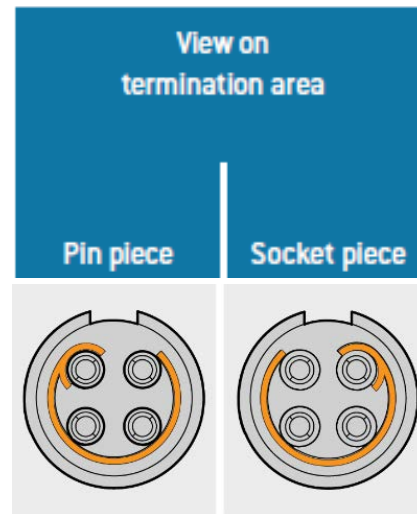
PRINT TERMINATION



Insulators with pin contacts fit into the receptacle or in-line receptacle, as well as into the plug. The same applies to insulators with socket contacts. In general, insulators with socket contacts are installed in the live part (to provide protection from accidental touch). The way of mounting the contacts in the insulator is important because of the termination technology. The termination technology for ODU MINI-SNAP® includes: soldering, crimping and PCB. Contacts are turned brass contacts, nickel plated with a gold finish – available in .5mm to 2mm diameter, and rated for 5,000 mating cycles, PEEK insulation used as a standard feature.

## Contact Configurations

### Pin Out Markings



















(example of pin guide markings)

Contact configurations are simple to understand following the visual cues. Pin #1 is designated by the half moon marking. The other pin numbers are determined by following the line around or inward to the last pin number as indicated by the examples on this pages.

# Contact Configurations

## Size 0 insert configurations

Number of contacts	Contact diameter	Termination cross-section		View on termination area		
		mm	AWG	mm <sup>2</sup>	Pin piece	Socket piece
0	2	0.9	22	0.38		
			20-24	0.50-0.25		
			22-26	0.38-0.15		
0	3	0.9	22	0.38		
			20-24	0.50-0.25		
			22-26	0.38-0.15		
0	4	0.7	22	0.38		
			26	0.15		
			22-26	0.38-0.15		
0	5	0.7	22	0.38		
			26	0.15		
			22-26	0.38-0.15		
0	6	0.5	28	0.08		
			-	-		
			-	-		

Number of contacts	Contact diameter	Termination cross-section		View on termination area		
		mm	AWG	mm <sup>2</sup>	Pin piece	Socket piece
0	7	0.5	28	0.08		
0	9	0.5	28	0.08		
			-	-		
			-	-		
1	0 <sup>B</sup>	0.5	28	0.08		
-	-	-	-	-		

Size 0 contact configurations shown here come in 2 – 10 pin configurations and will accommodate 22 AWG to 28 AWG, with .5 mm to .9 mm contact diameters available.

# Contact Configurations

## Size 1 insert configurations

Number of contacts		Contact diameter	Termination cross-section		View on termination area	
			mm	AWG	mm <sup>2</sup>	Pin piece
0	2	1.3	18	1		
			20	0.5		
			18-20	1.00-0.50		
			-	-		
0	3	1.3	18	1		
			20	0.5		
			18-20	1.00-0.50		
			-	-		
0	4	0.9	22	0.38		
			20-24	0.50-0.25		
			22-26	0.38-0.15		
			-	-		
0	5	0.9	20	0.50		
			22	0.38		
			20-24	0.50-0.25		
			22-26	0.38-0.15		
0	6	0.7	22	0.38		
			26	0.15		
			22-26	0.38-0.15		
			28-32	0.09-0.04		
			-	-		
0	7	0.7	22	0.38		
			26	0.15		
			22-26	0.38-0.15		
			28-32	0.09-0.04		
0	8	0.7	22	0.38		
			26	0.15		
			22-26	0.38-0.15		
			28-32	0.09-0.04		
1	0	0.5	26	0.15		
			28	0.08		
1	4	0.5	28	0.08		
			-	-		
1	6	0.5	28	0.08		
			-	-		

Size 1 contact configurations shown here come in 2 pin through 16 pin standard configurations. Contacts will accommodate 20 AWG through 28 AWG, .5 mm to 1.3 mm contact diameters available.

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# Contact Configurations

## Size 2 - 4 insert configurations

Number of contacts	Contact type			Part number key	Contact diameter	Single contact contact current <sup>1</sup>	Clearance and creepage distance		Test voltage <sup>2</sup>	Nominal voltage <sup>3</sup>	Termination diameter	Termination cross-section		View on termination area	
	Termination	Socket	Pin				Contact to contact min	Contact to housing min				mm	AWG	mm <sup>2</sup>	Pin place
0 2	Solder	L	M	T S 0	2	24	1.3	0.9	1.800	0.600	2.4	12	2.5		
				T 0 0											
0 3	Crimp <sup>4</sup>	N	P	T N 0	1.6	18	1.6	1.2	2.100	0.700	0.7	-	-		
				T 0 0											
0 4	Solder	L	M	S N 0	1.6	16	1.7	1.5	2.400	0.800	1.4	18	1.00		
				S N 0											
0 5	Crimp <sup>4</sup>	N	P	S N 0	1.3	25	1.5	1.3	1.950	0.650	-	14-18	1.50-1.00		
				S L 0											
0 6	Solder	L	M	S L 0	1.3	16	1.7	1.5	2.400	0.800	0.7	-	-		
				S 0 0											
0 7	Crimp <sup>4</sup>	N	P	S L 0	1.3	15	1.5	1.3	1.800	0.600	-	18-20	1.00-0.50		
				S 0 0											
0 8	Solder	L	M	P N 0	1.3	15	1.5	1.3	1.800	0.600	1.4	18	1.00		
				P H 0											
0 9	Crimp <sup>4</sup>	N	P	P H 0	1.3	12	1.8	1.6	1.950	0.650	-	20-24	0.50-0.25		
				P 0 0											
1 0	Solder	L	M	P 0 0	1.3	12	1.8	1.6	1.950	0.650	0.7	-	-		
				P 0 0											

Number of contacts	Contact type			Part number key	Contact diameter	Single contact contact current <sup>1</sup>	Clearance and creepage distance		Test voltage <sup>2</sup>	Nominal voltage <sup>3</sup>	Termination diameter	Termination cross-section		View on termination area	
	Termination	Socket	Pin				Contact to contact min	Contact to housing min				mm	AWG	mm <sup>2</sup>	Pin place
0 3	Solder	L	M	T S 0	2	24	1.8	1.5	1.800	0.600	2.4	12	2.5		
				T 0 0											
0 4	PCB <sup>4</sup>	Q	R	T 0 0	2	18	2	1.7	1.650	0.550	1.85	14	1.5		
				T 0 0											
0 7	Solder	L	M	T 0 0	1.6	16	1.5	1.6	1.800	0.600	1.4	18	1.00		
				T 0 0											
0 8	Crimp <sup>4</sup>	N	P	S L 0	1.3	16	1.5	1.6	1.800	0.600	0.7	-	-		
				S L 0											
1 0	Solder	L	M	S 0 0	1.3	15	1.1	1.3	1.350	0.450	1.4	18	1.00		
				S 0 0											
1 4	Crimp <sup>4</sup>	N	P	S 0 0	0.9	21	1.1	1.2	1.350	0.450	-	14-18	1.50-1.00		
				S 0 0											
1 6	Solder	L	M	S 0 0	1.3	12	1.2	1.4	1.350	0.450	1.1	20	0.50		
				S 0 0											
1 8	Crimp <sup>4</sup>	N	P	S 0 0	0.9	10	0.8	1	1.000	0.333	1.1	20	0.50		
				S 0 0											
2 0	Solder	L	M	J H 0	0.7	10	0.7	0.9	1.000	0.333	1.1	20	0.50		
				J G 0											
2 2	Crimp <sup>4</sup>	N	P	J H 0	0.7	7.5	0.9	1.1	1.350	0.450	0.85	22	0.38		
				J G 0											
2 6	Solder	L	M	J G 0	0.7	10	0.7	0.9	1.000	0.333	1.1	20	0.50		
				J G 0											
3 0	Crimp <sup>4</sup>	N	P	J G 0	0.7	7.5	0.9	1.1	1.350	0.450	0.85	22	0.38		
				J G 0											

Number of contacts	Contact type			Part number key	Contact diameter	Single contact contact current <sup>1</sup>	Clearance and creepage distance		Test voltage <sup>2</sup>	Nominal voltage <sup>3</sup>	Termination diameter	Termination cross-section		View on termination area	
	Termination	Socket	Pin				Contact to contact min	Contact to housing min				mm	AWG	mm <sup>2</sup>	Pin place
0 2	Solder	L	M	T S 0	2	24	1.3	0.9	1.800	0.600	2.4	12	2.5		
				T 0 0											
0 3	Crimp <sup>4</sup>	N	P	T N 0	1.6	18	1.6	1.2	2.100	0.700	0.7	-	-		
				T 0 0											
0 4	Solder	L	M	S N 0	1.6	16	1.7	1.5	2.400	0.800	1.4	18	1.00		
				S N 0											
0 5	Crimp <sup>4</sup>	N	P	S N 0	1.3	25	1.5	1.3	1.950	0.650	-	14-18	1.50-1.00		
				S L 0											
0 6	Solder	L	M	S L 0	1.3	16	1.7	1.5	2.400	0.800	0.7	-	-		
				S 0 0											
0 7	Crimp <sup>4</sup>	N	P	S L 0	1.3	15	1.5	1.3	1.800	0.600	-	18-20	1.00-0.50		
				S 0 0											
0 8	Solder	L	M	P N 0	1.3	15	1.5	1.3	1.800	0.600	1.4	18	1.00		
				P H 0											
0 9	Crimp <sup>4</sup>	N	P	P H 0	1.3	12	1.8	1.6	1.950	0.650	-	20-24	0.50-0.25		
				P 0 0											
1 0	Solder	L	M	P 0 0	1.3	12	1.8	1.6	1.950	0.650	0.7	-	-		
				P 0 0											







Additionally, there is a wide range of contact configurations for sizes 2-4, with contact diameters available from .5 mm to 2.0 mm.

# Contact Configurations





## High Data Inserts

### SPECIFIC INSERTS FOR HIGH DATA TRANSMISSION RATES





#### Size 0

Number of contacts		View on termination area	
		Pin piece	Socket piece
0	4		
U	4		
0	4		
1	0 <sup>1</sup>		

#### Size 1

Number of contacts		View on termination area	
		Pin piece	Socket piece
0	4		
0	8		

#### Size 2

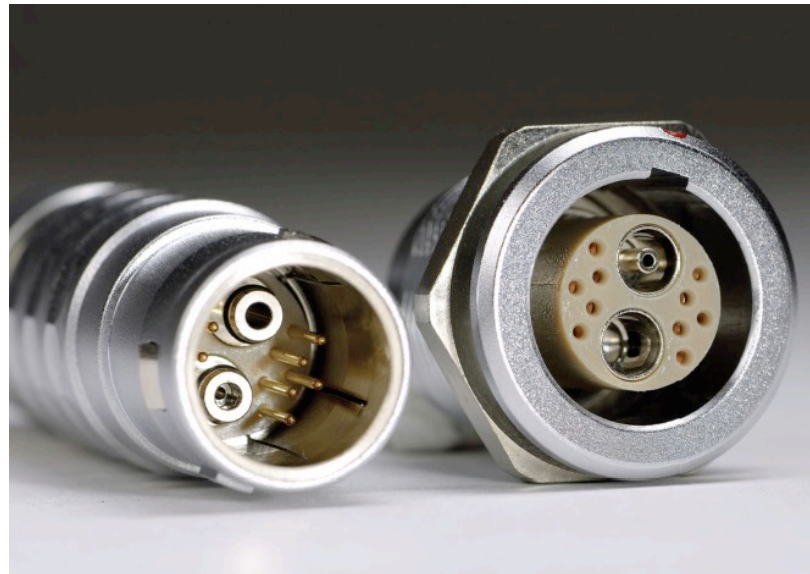
Number of contacts		View on termination area	
		Pin piece	Socket piece
0	4		
0	8		

High speed data transfer solutions are also available in multiple housing sizes, with data transfer speeds of Ethernet Type CAT5 up to 100 Mbit, USB<sup>®</sup> 2.0\* for size 0, Ethernet Type CAT5e up to 1 Gbit for size 1, Ethernet Type CAT6 up to 10 Gbit for size 2.

\*These ODU specific connectors can transmit common data transmission protocols such as USB<sup>®</sup> 2.0 but they are not USB<sup>®</sup>-standard connectors.

## Contact Configurations



### Hybrid configurations



ODU provides a wide range of custom connector solutions that can accommodate multiple pin counts and contact combinations. ODU's customer orientated connector systems ensure a reliable transmission of power, signal, data and media for a large variety of demanding applications. We provide all relevant areas of expertise and key technologies including design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly. Our advanced customer benefit portfolio include: competitive lead time, rapid prototyping & product development, local one-to-one engineering support, cable assembly integrated solutions and custom connector capabilities - all factory direct.

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## Mechanical Coding

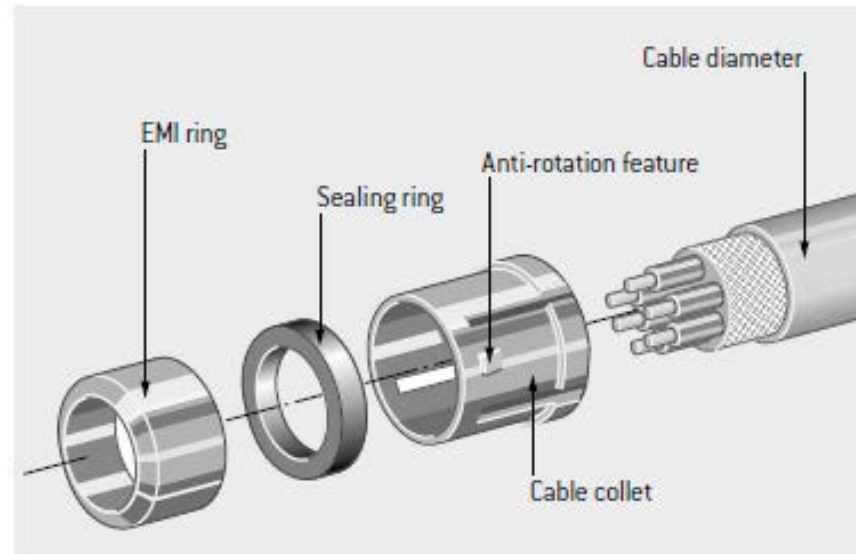
	Angle	Receptacle front view	Size					
			00	0	1	2	3	4
0	0°		•	•	•	•	•	•
A	30°		•	•	•	•	•	o

• Standard  
o On request

Additional layer of security is provided through the mechanical pin and groove coding. 8 different coding options are available with 0° and 30° being the standard.



## Cable Collet



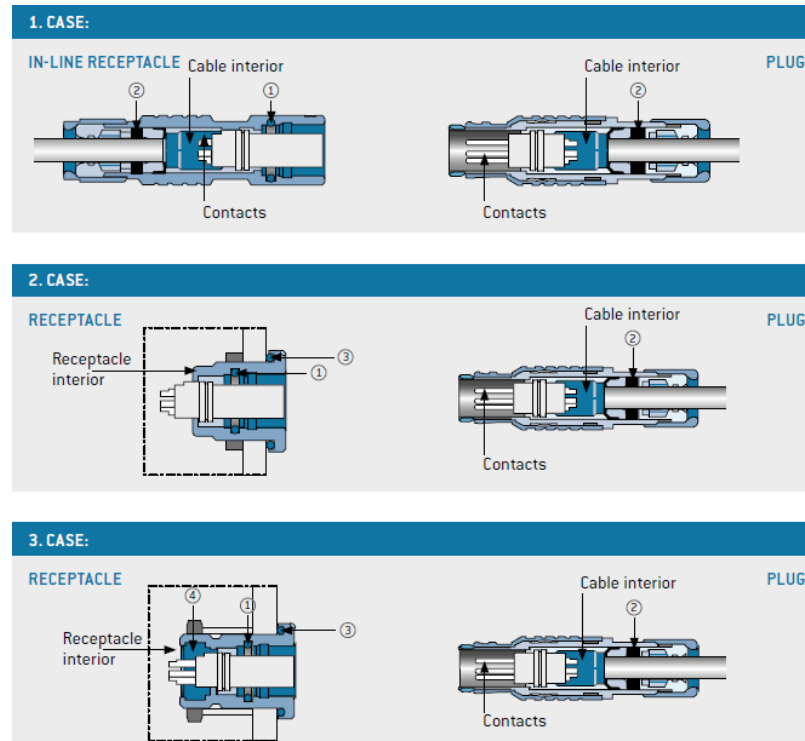
The cable collet components shown here saves the cable from being pulled out from the connector and damaging the termination points. Cable collets are used in all straight and in-line receptacles. It's important to correctly identify outer cable diameter measurements to match it to the correct collet size. The sealing ring is required to achieve the IP68 rating. EMI ring is for transmission of the shielding.

# Water Tightness

## PROTECTION AGAINST WATER BY THE FOLLOWING SEALINGS<sup>1</sup>

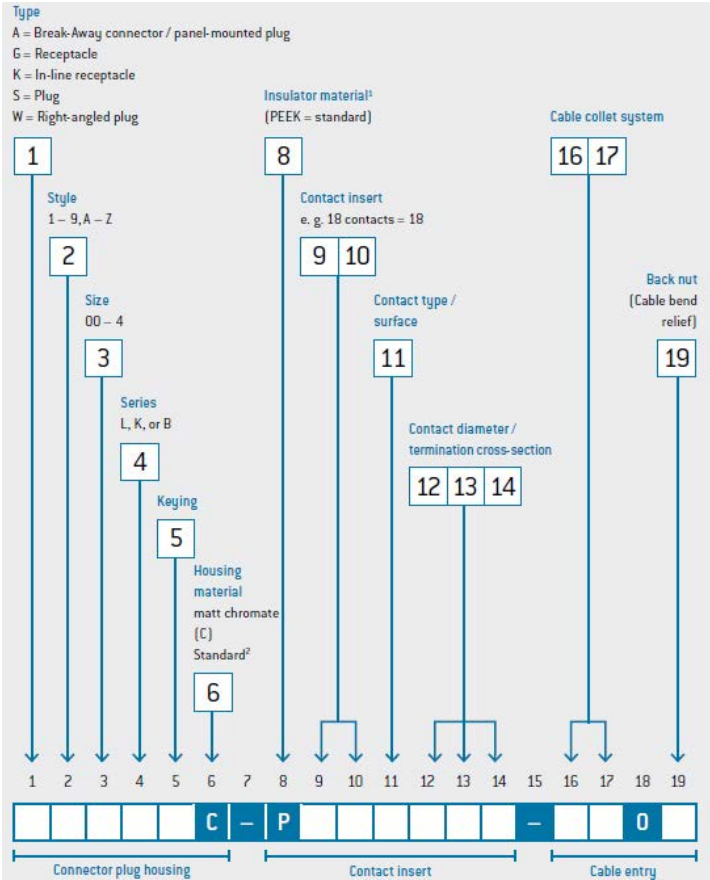
Case	Termination	Mated		Unmated	
		Tight	Position	Tight	Position
1	Cable interior	Yes	①②	No	
2	Receptacle interior	Yes	①②③	No	
3	Receptacle interior	Yes	①②③	Yes	③④

① O-ring    ② Elastic sealing<sup>2</sup>    ③ O-ring    ④ Grouting



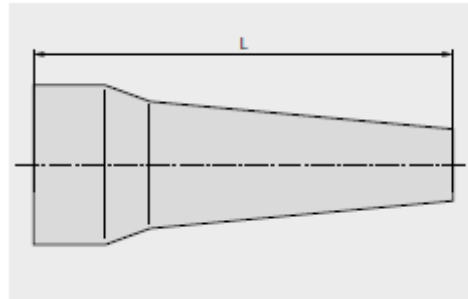
All IP68 rated connectors have a rated water depth of 2 m for 24 hrs in accordance with IEC 60529:2013. The Plug and In-line receptacles are sealed by use of a seal ring located over the cable. The Panel mount receptacles use an internal and external O-ring to achieve the IP68 rating.

# Part Number Configuration



The part number configurator breaks down ODU’s part number layout. Begin by selecting the plug housing style and size of the connector, followed by the contact insert details and finally the cable entry type.

## Accessories



### TEMPERATURE RANGE

Silicone: -50 °C up to +200 °C, short-term up to +230 °C  
Autoclaveable

### COLORS

Color code	Color	RAL no. <sup>1</sup> (minlar)
202	Red	3020
203	White	9010
204	Yellow	1016
205	Green	6029
206	Blue	5002
207	Gray	7005
208	Black	9005

Silicone bend sleeves are available for all plug and in-line housing sizes and come in 7 different colors.

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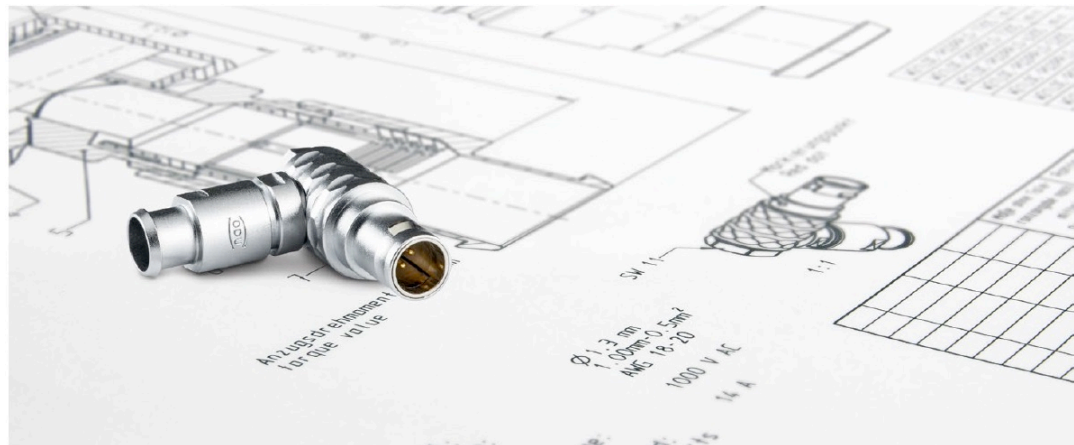
## Markets and Applications



ODU MINI-SNAP® K Series is valuable to a wide range of applications from the medical, industrial, test and measurement, military and security, and automotive applications including but not limited to: treatment and surgery, diagnostics, patient monitoring, hand-pulse oximeters, portable scanners, measuring sensors, data acquisition systems, thermal imaging cameras, high speed cameras, mobile security systems, video equipment, LiDAR systems, etc.

## Certifications

- ISO 9001
- IATF 16949
- ISO 13485
- ISO 14001
- ISO 50001
- UL, CSA, VG and VDE licenses
- UL certified cable assembly



ODU provides a large portfolio of quality certifications including ISO 9001, IATF 16949, ISO 13485 and 14001 and also UL, CSA, VG and VDE licenses. ODU cable assemblies are all UL certified.

## Summary

### ODU MINI-SNAP® K Series offers:

- Circular Push-Pull locking connector solution
- Robust metal housing
- IP68 rated in mated condition
- Wide range of contact configurations
- Hybrid and high speed insert solutions available
- Multiple coding options to prevent cross connection
- Up to 5 sizes and three termination types



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The ODU MINI-SNAP® Series K is a versatile circular Push-Pull locking connector solution with a robust metal housing that is IP68 rated in mated condition. Ideal for a wide range of applications due to its many contact configurations including its hybrid and high speed inserts. Available in 5 sizes, multiple coding options and 3 termination types, it becomes a viable solution for applications with specific requirements.

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