## THE CIRCULAR CONNECTOR MEDI-SNAP® WITH PLASTIC AND METAL HOUSING



The ODU MEDI-SNAP® combines distinctive coding options with 2,000 / 5,000 mating cycles depending on the connector style. The efficient plastic connector is available both with user-friendly Push-Pull locking and the easy-to-release Break-Away function, which comes as a premolded plug & play solution. The ODU MEDI-SNAP® portfolio offers also a High-Voltage solution for up to 1,000 V AC / 16 A including a hot-plugging prevention.

Its space-saving product design enables top performance even in the smallest available construction space. Because of its plastic housing, this connector is up to 75 % lighter than comparable metal products. The great diversity makes the ODU MEDI-SNAP® perfectly suited to your requirements in medical technology, industrial electronics as well as digital test and measurement technology.

The IEC 60601-1:2012 (VDE 0750-1:2013-12) standard has special requirements. In detail it defines strict requirements in regards to protection against electrical shock of medical devices and their components for both patients and operators. The various protection measures (MOP: Means Of Protection) are described in detail from page 25 and 63.

#### **VERSATILE CONFIGURATION OPTIONS**

There are 8 color codings, up to 6 mechanical codings, 2 sizes, 3 termination types and a wide range of different contact inserts available.

### SUMMARY ODU MEDI-SNAP® PLASTIC HOUSING SIZE 1

The ODU MEDI-SNAP® with plastic housing in size 1 is coded by pin and groove. These circular connectors can have a variety of configurations: numerous styles of connectors, receptacles and in-line receptacles as well as various termination types, contact inserts and color codings.

- Coding over pin and groove
- 7 color codings
- 6 mechanical codings
- 2-14 contacts
- 3 termination types
- Contacts for solder, crimp and PCB termination
- A selection of numerous connectors as well as receptacles and in-line receptacles
- IP50 / IP64 and IP67 available in mated condition
- Up to 5,000 mating cycles







For assembly instructions, please refer to our website: www.odu-connectors.com/downloads/assembly-instructions



#### IEC 60601-1:2012

#### MEANS OF OPERATOR PROTECTION (MOOP) / MEANS OF PATIENT PROTECTION (MOPP)

Table is valid for working voltage of medical device max. 250 V AC (degree of pollution 2). For working voltage of connectors see insert configuration.

MOOP/MOPP	Clearance distance to the test finger mm	Creepage distances to the test finger mm	Test voltage V AC
1 MOOP	≥ 2	≥ 2.5	1,500
2 M00P	≥ 4	≥ 5	3,000
1 MOPP	≥ 2.5	≥ 4	1,500
2 MOPP	≥ 5	≥ 8	4,000

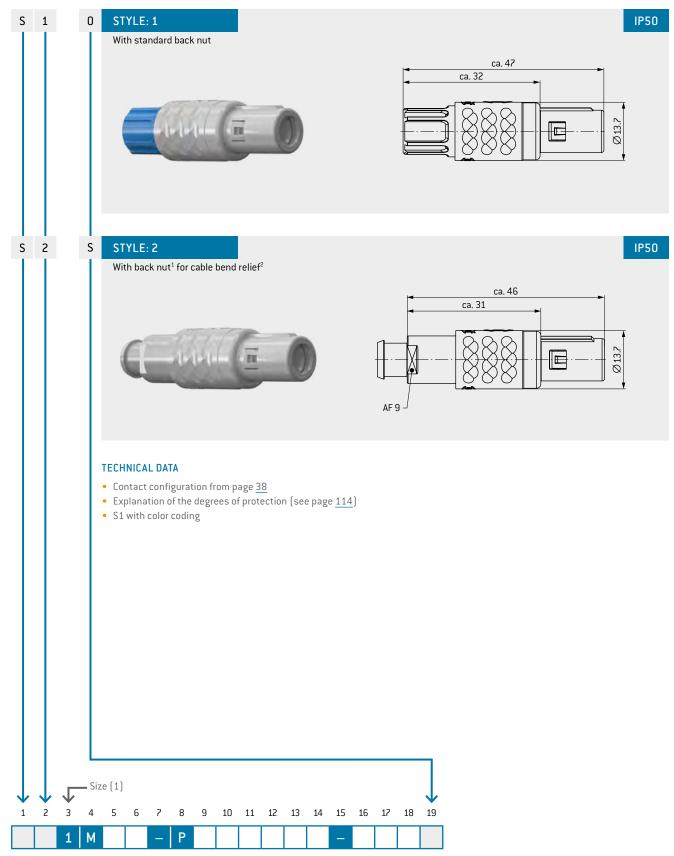
The information refers to all plugs in mated condition on page  $\underline{24}$ .

 $<sup>^{1}</sup>$ As per IEC 60601-1:2012 (VDE 0750-1:2013-12)  $^{2}$  IP68 in unmated condition

#### STRAIGHT PLUG

#### Push-Pull styles





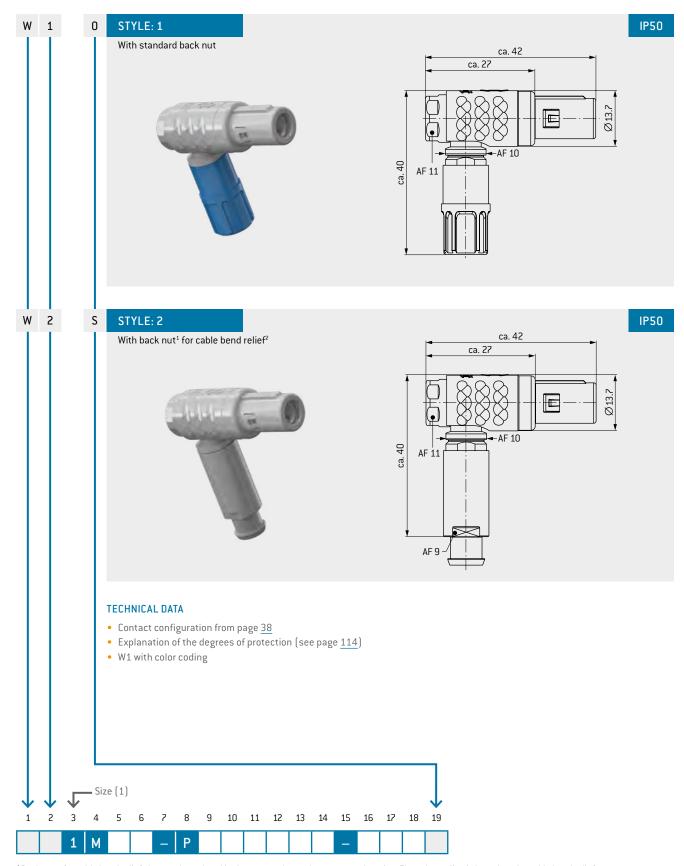
<sup>1</sup> Back nuts for cable bend reliefs have to be ordered in the same color as the connector housing. The color coding is based on the cable bend relief.

 $<sup>^{\</sup>rm 2}$  Cable bend reliefs have to be ordered separately (see page  $\underline{50}$  ).

### RIGHT-ANGLED PLUG

#### Push-Pull styles





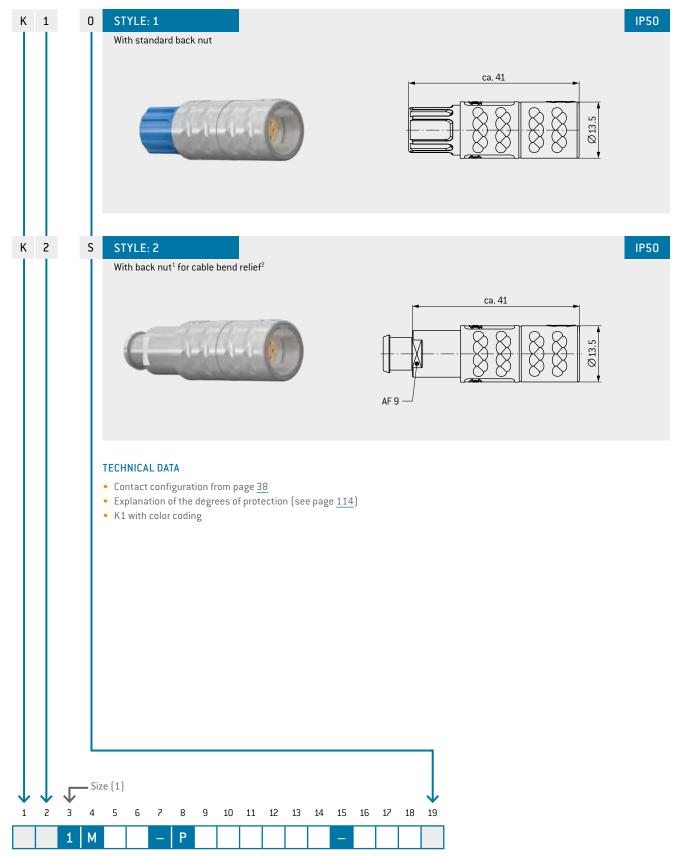
<sup>&</sup>lt;sup>1</sup>Back nuts for cable bend reliefs have to be ordered in the same color as the connector housing. The color coding is based on the cable bend relief.

 $<sup>^{2}</sup>$  Cable bend reliefs have to be ordered separately (see page  $\underline{50}\xspace$  ).

#### IN-LINE RECEPTACLE



#### Suitable for creating a cable-cable connection



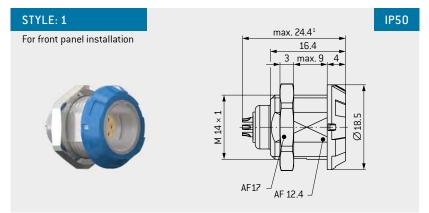
<sup>1</sup> Back nuts for cable bend reliefs have to be ordered in the same color as the connector housing. The color coding is based on the cable bend relief.

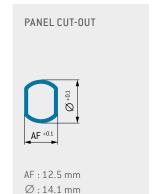
 $<sup>^{\</sup>rm 2}$  Cable bend reliefs have to be ordered separately (see page  $\underline{50}$  ).

#### **RECEPTACLE**





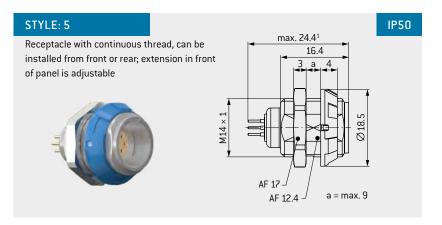


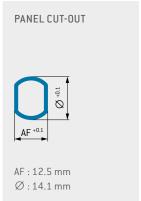


#### **TECHNICAL DATA**

- Contact inserts and PCB layouts (see page 38)
- Explanation of the degrees of protection (see page  $\underline{114}$ )
- IP50 in reference to the tightness of the end device
- Anti-rotation feature
- With color coding

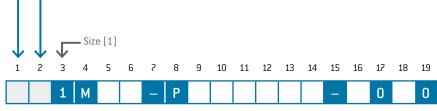






#### TECHNICAL DATA

- Contact inserts and PCB layouts (see page  $\underline{38}$ )
- Explanation of the degrees of protection (see page 114)
- IP50 in reference to the tightness of the end device
- Anti-rotation feature
- With color coding
- Right-angled PCB contact possible (see page 42)



<sup>&</sup>lt;sup>1</sup> Depending on the insert

### **CODINGS**

### HOUSING MATERIAL



	Angle	Receptacle front view
0	0°	
Α	40°	
С	60°	
E	80°	
Н	170°	
J	205°	

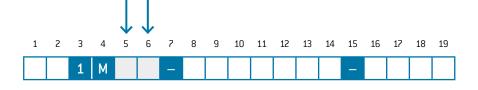
	Housing material <sup>1</sup>	Biocompatible material <sup>3</sup>
Standard	Plastic, Gray (PSU)	•
Standard	Plastic, Black (PSU)	•
Standard	Plastic, Black (PEI), autoclavable <sup>2</sup>	not available
On request	Plastic, White (PSU)	not available
On request	Plastic, Gray (PEI), autoclavable <sup>2</sup>	•

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DIN EN ISO 10993-5:2009-10: Tests for in vitro cytotoxicity. Testing determines whether toxic components from the material cause cell damage. DIN EN ISO 10993-10:2014-10: Tests for irritation and skin sensitization. The test for skin irritations and skin sensitization is designed to determine irritating and sensitizing characteristics of medical products. DIN EN ISO 10993-11:2018-09: Tests for systemic toxicity. DIN EN ISO 10993-18:2009-08: Chemical characterization of medical device materials within a risk management process.



 $<sup>^1</sup>$  Styles A5 and G2 only available with housing material PSU  $^2$  More detailed information on the topic of "autoclaving" on page  $\underline{123}$ 

<sup>&</sup>lt;sup>3</sup> Biocompatibility acc. to DIN EN ISO 10993:

### **CONTACT INSERTS**



Num o cont		Contact t	ype	l	Pa	rt num key inser		Contact style	Contact diameter	Single con- tact nominal current <sup>1</sup>	Nominal current insert	Clearance and creepage dis- tance contact	Test voltage <sup>2</sup>	Test volt- age <sup>6,8</sup>	Operat- ing volt- age <sup>6,7</sup>	Termi- nation diameter		ination -section		w on tion area
		Termination	Socket	Pin					mm	A	A	to contact mm	SAE kV DC	IEC kV RMS	IEC V RMS	mm	AWG	mm²	Pin piece	Socket piece
		Solder	L	М	Р	N	0			15	15	1	1.6	0.67	38	1.4	18	1		
0	2	Print straight <sup>4</sup>	Q		P P	Н	0	0	1.3	12	12	1.3	1.9	0.67	48	1.1 0.7	20 -	0.5 -	(8)	(8)
		Angled <sup>4</sup>			Р	N	9	A		15	15	0.9	1.6	0.67	37	0.8 1.4	- 18	1		
0	3 <sup>5</sup>	Solder	L	М	Р	Н	9	0	1.3							1.1	20	0.5		
Ū	3	Print straight <sup>4</sup> Angled <sup>4</sup>	Q		Р	0	9	A	1.5	12	12	1.2	1.9	0.67	48	0.7	-	-		
		Solder	L	М	J	Н	0			10	10	0.9	1.6	0.67	37	1.1	20	0.5		
					J	G	0	0		7.5 10	7.5 10	1.2 0.9	1.9 1.6	0.67	48 37	0.85	22 20–24	0.38 0.5-0.25		
0	4	Crimp <sup>3</sup>	N	Р	J	G	0	Ü	0.9	10	10	0.5	1.0	0.01	31	-	22-26	0.38-0.15		
		Print straight <sup>4</sup>	Q		J	0	0			7.5	7.5	1.2	1.9	0.67	48	0.7	-	-		
		Angled <sup>4</sup>			J	Н	0	Α		10	7.5	0.5	1.35	0.67	25	0.6 1.1	- 20	0.5		
		Solder	L	М	J	G	0			7.5	5.6	0.8	1.6	0.67	35	0.85	22	0.38		
0	5	Crimp <sup>3</sup>	N	Р	J	Н	0	0	0.9	10	7.5	0.5	1.35	0.67	25	-	20-24	0.5-0.25		
Ü	J	·		ļ.	J	G	0		0.5	7.5	5.0	0.0	4.0	0.07	25	-	22–26	0.38-0.15		
		Print straight <sup>4</sup>	Q		J	0	0	Α		7.5	5.6	0.8	1.6	0.67	35	0.7	_	_		
		Angled <sup>4</sup>			F	G	0	A		7.5	5.6	0.65	1.35	0.67	33	0.85	22	0.38		
		Solder	L	М	F	D	0	0		6	4.5	0.85	1.6	0.67	36	0.65	26	0.15		
0	6	Crimp <sup>3</sup>	N	Р	F	G	0	0	0.7	7.5	5.6	0.65	1.35	0.67	33	-	22-26	0.38-0.15		
		Print straight <sup>4</sup> Angled <sup>4</sup>	Q		F	0	0	Α		6	4.5	0.85	1.6	0.67	36	0.5 0.6	-	-		
		_			F	G	0			7.5	4.9	0.65	1.35	0.67	33	0.85	22	0.38		
		Solder	L	М	F	D	0	0		6	3.9	0.85	1.6	0.67	36	0.65	26	0.15		
0	7	Crimp <sup>3</sup>	N	Р	F	G	0	· ·	0.7	7.5	4.9	0.65	1.35	0.67	33	-	22–26	0.38-0.15		
		Print straight <sup>4</sup> Angled <sup>4</sup>	Q		F	0	0	A		6	3.9	0.85	1.6	0.67	36	0.5 0.6	-	-		
		Solder	L	М	F	G	0			7.5	4.9	0.4	1.2	0.67	10	0.85	22	0.38		
					F	D	0	0		6	3.9	0.6	1.6	0.67	32	0.65	26	0.15	600	6
0	8	Crimp <sup>3</sup> Print straight <sup>4</sup>	N	Р	F	G	0		0.7	7.5	4.9	0.4	1.2	0.67	10	0.5	22–26	0.38-0.15		
		Angled <sup>4</sup>	Q		F	0	0	Α		6	3.9	0.6	1.6	0.67	32	0.6	-	-	_	
		Solder	L	М	С	D	0			6	3.9	0.45	1.2		16	0.65	26	0.15		
0	9	Print straight <sup>4</sup>	Q		С	С	0	0	0.5	4	2.6	0.65	1.35	0.67	33	0.45 0.5	28 -	0.08		
		Angled <sup>4</sup>	u					Α								0.5	-	-		
		Solder	L	М	C	D C	0	0		6	3.3	0.3	0.75	0.67	7.5	0.65 0.45	26 28	0.15 0.08		
1	0	Print straight <sup>4</sup>			L	Ť		U	0.5	4	2.2	0.5	1.35	0.67	25	0.43	-	-		
		Angled <sup>4</sup>	Q		С	0	0	Α								0.5	-	-		
		Solder	L	м	С	D	9			6	3.3	0.4			10	0.65	26	0.15		
1	25				С	С	9	0	0.5	4	2.2	0.5	1.2	0.67	25	0.45	28	0.08		
		Print straight <sup>4</sup> Angled <sup>4</sup>	Q		С	0	9	Α		4	2.2	0.5			25	0.5 0.5	_	_		
		Solder	L	м	С	D	0			6	3	0.3	0.75	0.67	7.5	0.65	26	0.15	4-6	4-6
1	4				С	С	0	0	0.5	4	2	0.5	4.2	0.67	25	0.45	28	0.08		
		Print straight <sup>4</sup> Angled <sup>4</sup>	Q		С	0	0	A		4	2	0.5	1.2	0.67	25	0.5 0.5	_	_		
		<b></b>	Siz	e (1	.)	_									<sup>1</sup> Deratin <sup>2</sup> SAE AS: <sup>3</sup> Tools fo dimens <sup>4</sup> PCB lay only av: <sup>5</sup> Not com <sup>6</sup> IEC 606	nstalled in plug. Rev g factor, s 13441:20 r crimping ions for cr outs (see ailable for npatible to 64-1:200	ee page 04 metl gand ad imping page 4: recepta compe 7 (VDE 0	122 nod 3001. justment tool, see p l); print to cle styles tition	1 age 108 rmination 5 and 8	reques
1		2 3	4	5		6	7	8 9	9 10	11 12	13 14	15 16	17 18	19	vvervolf	tage categ 64-1:200	z (vne 1	1110 1.20	I∩Ω_∩1Ì.	
	_	1   1			_	_												1110-1:2L	υυờ-U1J:	
			M				_	Р				_	0		Pollution	n degree 2	)			

38

### CABLE COLLET SYSTEM

For plugs, in-line receptacles as well as receptacles of style 6





Cable diameter
Cable collet
Anti-rotation \
feature
8
5
W.

 Cable diameter
 Material
 Part number

 mm
 > 2.7-3.9
 KM1.020.121.934.007

 > 4.0-5.2
 PSU
 KM1.020.122.934.007

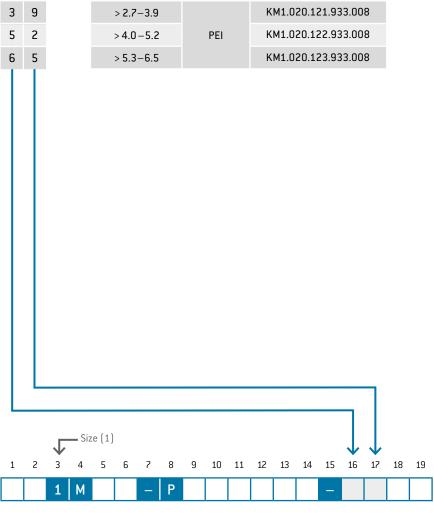
 > 5.3-6.5
 KM1.020.123.934.007

 > 2.7-3.9
 KM1.020.121.933.008

 > 4.0-5.2
 PEI
 KM1.020.122.933.008

**APPLICATION:** for all plugs and in-line receptacles and for receptacle style 6

USE: cable collet for strain relief



3 9

5

6 5

2

### **COLOR CODINGS**



Color coding possibility of the back nut (for plugs, right-angled plugs, in-line receptacles) and the front nut (for receptacles style 6).

Back nuts for cable bend relief have to be ordered in the same color as the connector housing. The color coding is based on the cable bend relief.



	Color	Similar RA	L systems	Material	
		Design	Classic		
2	Red	030 40 40	3002		
3	White	000 90 00	9003		
4	Yellow	095 90 59	1016	Plastic (PSU)	
5	Green	170 60 50	6032		0
6	Blue	250 40 40	5019		0
7	Gray	000 55 00	7045	Plastic	O m
8	Black	000 25 00	9004	(PSU/PEI)	O I
	Siz	re (1)			
1	2 3 4	5 6 7 8	3 9 10 11	12 13 14	15 16 17 18 19

### SUMMARY ODU MEDI-SNAP® PLASTIC HOUSING SIZE 2

The ODU MEDI-SNAP® with plastic housing in size 2 is coded by pin and groove. These circular connectors can have a variety of configurations: numerous styles of connectors and receptacles as well as various termination types, contact inserts and color codings.

- Coding over pin and groove
- 8 color codings
- 3 mechanical codings
- 3-26 contacts
- 2 termination types
- Contacts for solder and PCB termination
- A selection of numerous connectors and receptacles
- IP50 and IP64 available in mated condition
- Up to 5,000 mating cycles



 $For assembly instructions, please \ refer \ to \ our \ website: \\ \underline{www.odu-connectors.com/downloads/assembly-instructions}$ 



#### IEC 60601-1:2012

#### MEANS OF OPERATOR PROTECTION (MOOP) / MEANS OF PATIENT PROTECTION (MOPP)

Table is valid for working voltage of medical device max. 250 V AC (degree of pollution 2). For working voltage of connectors see insert configuration.

MOOP/MOPP	Clearance distance to the test finger mm	Creepage distances to the test finger mm	Test voltage V AC
1 MOOP	≥ 2	≥ 2.5	1,500
2 M00P	≥ 4	≥ 5	3,000
1 MOPP	≥ 2.5	≥ 4	1,500
2 MOPP	≥ 5	≥ 8	4,000

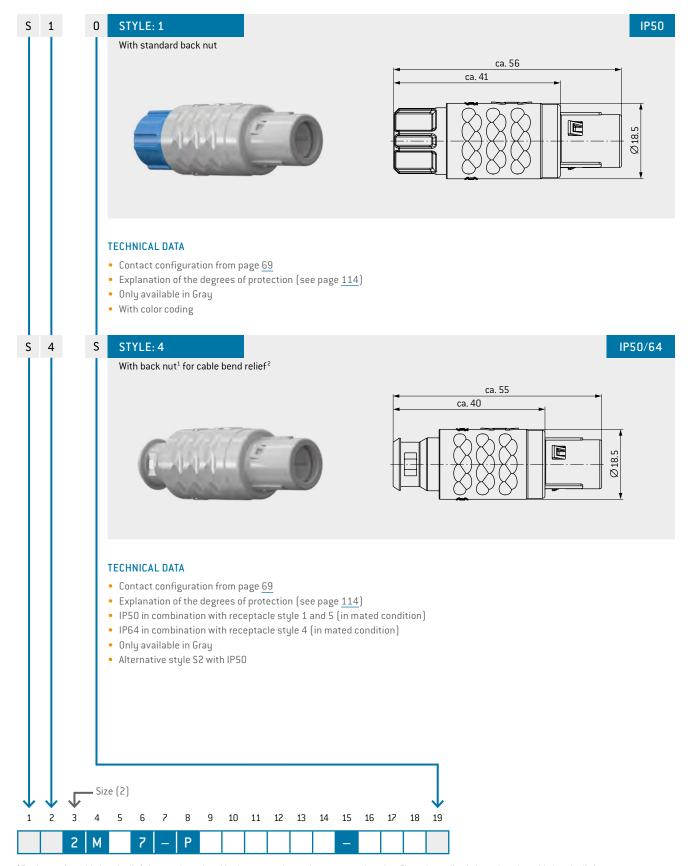
The information refers to all plugs in mated condition on page  $\underline{56}$ .

<sup>&</sup>lt;sup>1</sup>Acc. IEC 60601-1:2012 (VDE 0750-1:2013-12)

#### STRAIGHT PLUG

#### Push-Pull styles





<sup>&</sup>lt;sup>1</sup>Back nuts for cable bend reliefs have to be ordered in the same color as the connector housing. The color coding is based on the cable bend relief.

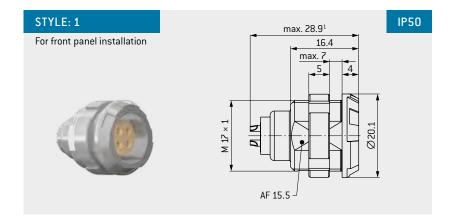
<sup>&</sup>lt;sup>2</sup> Cable bend reliefs have to be ordered separately (see page <u>76</u>).

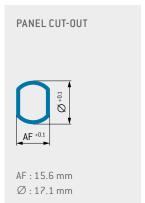
#### **RECEPTACLE**





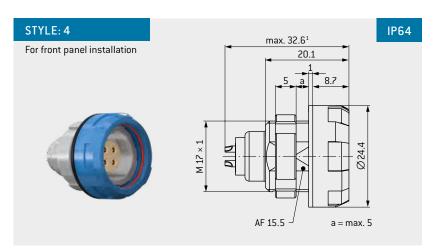
G 4

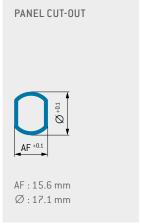




#### **TECHNICAL DATA**

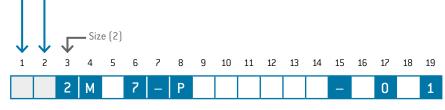
- Contact inserts and PCB layouts (see page <u>69</u>)
- Explanation of the degrees of protection (see page 114)
- IP50 in reference to the tightness of the end device
- Anti-rotation feature
- Front flange in color of housing
- Color coding on request





#### **TECHNICAL DATA**

- Contact inserts and PCB layouts (see page <u>69</u>)
- Explanation of the degrees of protection (see page 114)
- IP50 in reference to the tightness of the end device
- IP64 in combination with connector style 4 in mated condition
- IP64 in combination with Break-Away Plug style 5 as overmolded version (see page 84)
- With color coding



 $<sup>^{\</sup>scriptsize 1}$  Depending on the insert

### **CODINGS**

#### HOUSING MATERIAL



	Angle	Receptacle front view
С	60°	
E	80°	
F	90°	

8

	Housing material	Biocompatible material <sup>1</sup>
Standard	Plastic, Gray (PSU)	•
On request	Plastic, Black (PSU)	•
On request	Plastic, Orange (PSU)	not available

Further codings on request

Further housing materials on request

<sup>1</sup>Biocompatibility acc. to DIN EN ISO 10993:
DIN EN ISO 10993-5:2009-10: Tests for in vitro cytotoxicity. Testing determines whether toxic components from the material cause cell damage.
DIN EN ISO 10993-10:2014-10: Tests for irritation and skin sensitization.
The test for skin irritations and skin sensitization is designed to determine irritating and sensitizing characteristics of medical products.
DIN EN ISO 10993-11:2018-09: Tests for systemic toxicity.
DIN EN ISO 10993-18:2009-08: Chemical characterization of medical device materials within a risk management process.

10 11 12 13 14 15 16 17 18 19

### **CONTACT INSERTS**



Num- ber of con- tacts	Contact t	key insert style diameter tact nominal current ance a current <sup>t</sup> insert creeps		Clear- ance and creepage distance	Test voltage <sup>2</sup>	Test volt- age <sup>4, 6</sup>	Operat- ing volt- age <sup>4, 5</sup>	Termi- nation diameter		nation section		v on tion area							
	Termination	Socket	Pin					mm	A	A	contact to contact mm	SAE kv DC	IEC kv RMS	IEC V RMS	mm	AWG	mm²	Pin piece	Socket piece
	Solder	١.	М	Р	N	0			15	15	1.6				1.4	18	1		
0 4	Solder	ļ -	М	Р	Н	0	0	1.3				3	0.67	48	1.1	20	0.5	(00)	(O)
0 4	Print straight <sup>3</sup> Angled <sup>3</sup>	Q		Р	0	0	A	1.5	12	12	2	3	U.br	,,	0.7	-	-		
	Solder	Ι,	М	F	G	0			7.5	3.75	0.8			37	0.85	22	0.38		
1 2		Ľ	141	F	D	0	0	0.7				1.6	0.67		0.65	26	0.15		
	Print straight <sup>3</sup>	Q		F	0	0			6	3	1			48	0.7 0.6	-	-		
	Angled <sup>3</sup>			F	G	0	Α		7.5	3.75	0.5			25	0.85	- 22	0.38		
	Solder	L	М	F	D	0	0		1.5			1.6		23	0.65	26	0.15	(88)	(3)
1 6	Print straight <sup>3</sup>	0		F		0		0.7	6	3	0.7		0.67	34	0.7	-	-		
	Angled <sup>3</sup>	Q		r	0	0	Α								0.6	-	-	90	
	Solder	L	М	F	G	0			7.5	3.4	0.5			25	0.85	22	0.38		
1 9				F	D	0	0	0.7		0.7	0.7	1.35	0.67	0.67	0.65	26	0.15		
	Print straight <sup>3</sup> Angled <sup>3</sup>	Q		F	0	0	Α		6	2.7	0.7			34	0.7	-	_		
	Solder	L	М	С	С	0	0								0.45	28	0.08	(28a)	(ASS)
2 6	Print straight <sup>3</sup> Angled <sup>3</sup>	Q		С	0	0	A	0.5	4	1.6	0.5	1.35	0.67	25	0.5 0.5	-	-		
T			Ľ		L				1 1						installed eversed g				
L		Siz	e (2	2)				1.					in t	, 0	eversed g			n req	uest

13 14 15 16

17

18 19

### SPECIAL-CONTACT INSERT

Р

2

10

11 12

- $^{\scriptscriptstyle 1}$  Derating factor, see page  $\underline{122}$
- <sup>2</sup> SAE AS 13441:2004 method 3001.1
- <sup>3</sup>PCB layouts, see page <u>70</u>; print termination only available for receptacle style 5 <sup>4</sup>IEC 60664-1:2007 (VDE 0110-1:2008-01):
- Overvoltage category III 5 IEC 60664-1:2007 (VDE 0110-1:2008-01): Pollution degree 2
- <sup>6</sup> Surge voltage

	Insulator material <sup>13</sup>	No be co ta	um- er of on- icts		ontac type			Part numb ny ins	er	Contact diameter	Single con- tact nominal current	curi				Clearance and creepage distance contact to contact			Contact-	-to-contact	ŭ		Termi- nation diameter	Termi cross-	nation section	View on termination area	
	Insulato			Termination	Socket	Pin				mm	A	,	4	mat mi		unmat mm		Operating voltage <sup>2,8,9</sup> IEC	VRMS	Test voltage <sup>8, 1</sup> mated IEC KV		Test voltage <sup>s, 10</sup> unmated IEC KV	mm	AWG	mm²	Pin piece	Socket piece
	Р	0	311	Solder	L	М	Т	S	0	1 × 2 (first mate last break) 2 × 2	22	2	2	4.	.7	2		230		5		3	2.4	12	2.5		
HIGH-VOLTAGE SOLUTION	T	0	5	Solder	L <sup>14</sup>		P	Q	9	1 × 1.3 (first mate last break) 2 × 1.3 (lagging)	16	1	2	9.	.9	3.2		60012		7.4 <sup>12</sup>		512	1.9	14	1.5		
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\						M <sup>15</sup>	r	U	_	2×1.3				13	3.6	3.2		100012		9.912		5 <sup>12</sup>				-	<b>J</b>
			2	1			ze (			7		10 1		12	12	01 8 IE 2 9 IE 2	nly b C 60 008- C 60 008-	case of t e applied 664-1:20 01): 0ve 664-1:20 01): Polli	l in m 007 ( rvolta 007 ( ution	ated cor VDE 011 age cate VDE 011 degree	nditioi 10-1: gory l 10-1:	n.	pin is ir 12 Voltage	cket is nstalle e may o bled ar	installed in the confusion on the confusion of the confus	ed in the perceptace applied to ed connec	cle. o fully
	1	_	2	3		4	į	5	6	7 1	8 9 1	.0 1	.1	12 :	13 14 15			.6 17	18	18 19			<sup>14</sup> 4 x soc				
				2	2	М			7														<sup>15</sup> 1 x soc	ket/4	x pin		

### CABLE COLLET SYSTEM

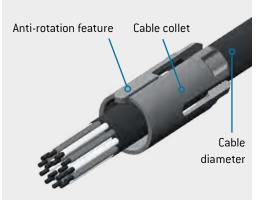
#### For plug parts

5 4

7 4



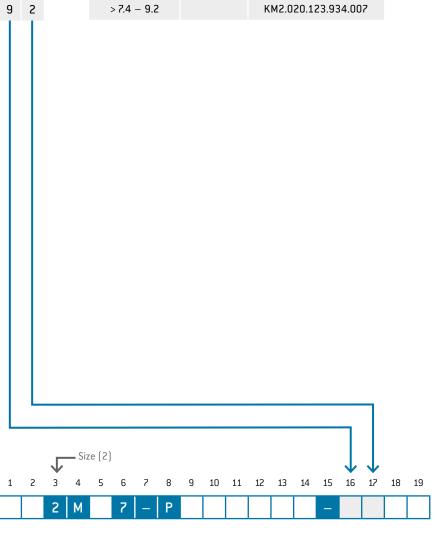




Cable diameter	Material	Part number
mm		
> 3.2 – 5.4		KM2.020.121.934.007
> 5.4 - 7.4	PSU	KM2.020.122.934.007
> 74 - 92		KM2 020 123 934 007

**APPLICATION:** for all plug parts

**USE**: cable collet for strain relief



# PLASTIC HOUSI

### **COLOR CODINGS**



**Color coding of the front nut** only for receptacles G4 and G5 **Color coding of the back nut** only for straight plug S1

The color coding for plug style 4 is based on the cable bend relief.

