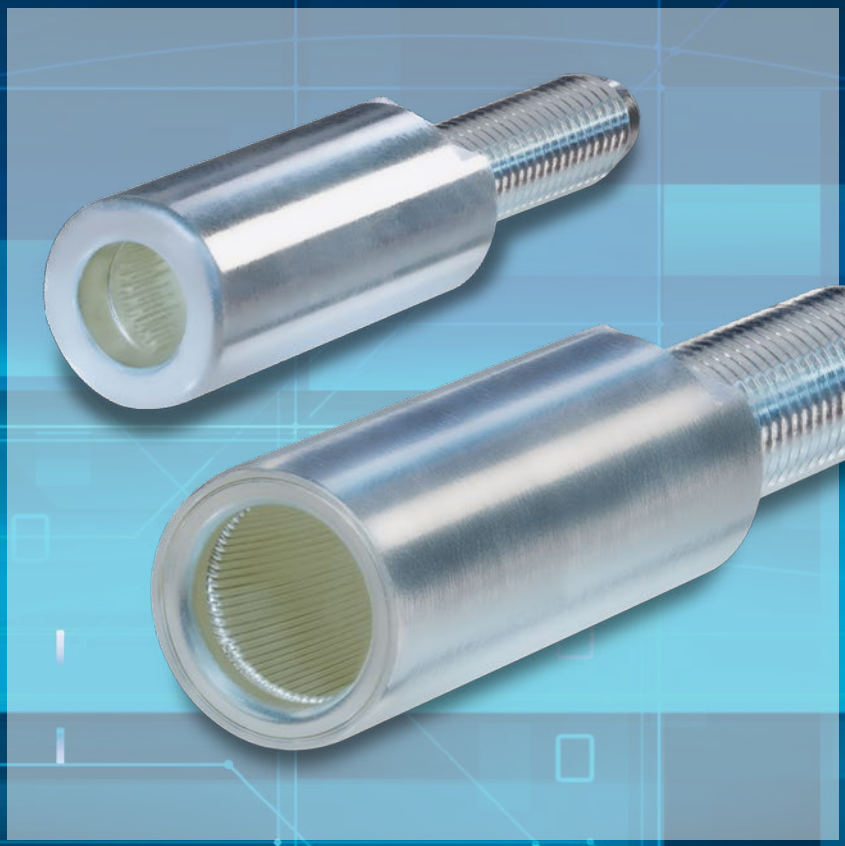
ODU Single Contacts

A perfect alliance.

ODU SPRINGTAC® (Contact with Springwire Technology) and ODU LAMTAC® (Contact with Lamella Technology)



www.odu.de

Single Contacts with Springwire and Lamella Technologies

Applications

– Measuring and testing
– Medical
– Energy
– Current and high current applications
– Complete connection systems
– Automotive

Features

– Contact diameters from 0.76 mm to 60 mm
– High current carrying capacity
– Vibration resistance
– High reliability
– High mating cycles (up to 1 million)

All shown connectors are connectors without breaking capacity (COC) in accordance with DIN EN 61984:2009.

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

U-File E110586
Tested to MIL.

Issue: 2015-03

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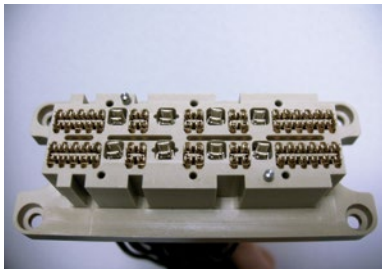
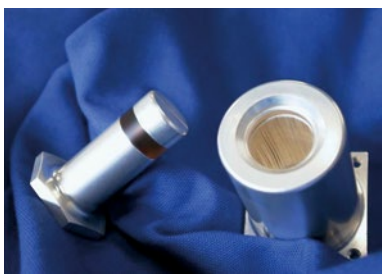
Product Description





Contact technology forms the backbone of any connectivity manufacturer, and this also holds true at ODU.

In this catalogue you will find all the information about our ODU SPRINGTAC (Contact with Springwire Technology) and ODU LAMTAC (Contact with Lamella Technology) Contact Technologies.

Both principles are characterized by an extremely high reliability level and excellent electrical and mechanical properties. These contact technologies are successfully used in some of our most important connector systems, for example, in the ODU-MAC, ODU DOCK and ODU ROB series, as well as in our heavy-duty connectors product line.

The following two pages provide an explanation of the contacts' main properties. On page 8 you will find a technical comparison of the two principles.

Contact Technology

ODU SPRINGTAC®

(Contact with Springwire Technology)

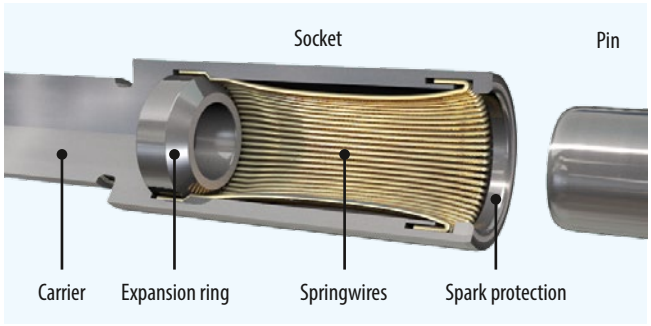
The ODU SPRINGTAC is the safest and most reliable contact system on the market. Because of the large number of individual, independently flexible springwires, constant transmission is ensured at all times. Even the smallest contact diameter of 0.76 mm holds 15 individual springs, which means that this small diameter provides 15 contact surfaces for power transmission. Larger diameters provide correspondingly more contact surfaces.

Key facts at a glance

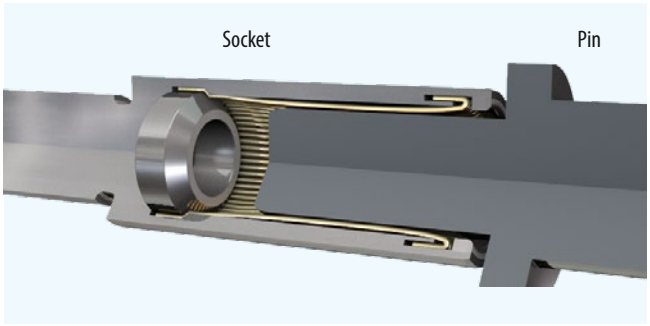
– Far more than 100,000 mating cycles (up to 1 million mating cycles are not unusual)
– High current carrying capacity – several kA
– Low contact resistances
– Large number of independently flexible contact springs – for example, 40 springs in the 5 mm diameter
– Low mating and demating forces
– Extremely certain contacting
– High vibration and shock resistance
– Long lifetime because of high-quality materials and surfaces
– Many styles and connection technologies are available or realizable

ODU SPRINGTAC® principle in cross-section

Unmated



Mated



Contact Technology

ODU LAMTAC®

(Lamella Technology Contact)

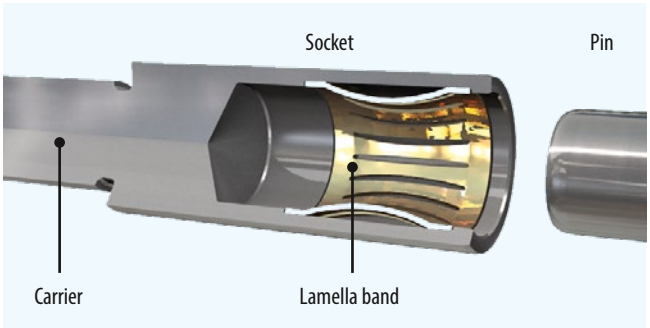
The ODU LAMTAC (Contact with Lamella Technology) consists of a turned carrier in which one or more stamped lamination bands are mounted. The individual pieces of the lamella provide a plurality of contact points, ensuring high contact reliability and optimal conductivity properties. The adjusted contact force ensures low mating and demating forces, thus providing a long service life with few signs of wear. At least 10,000 mating cycles are possible here.

Key facts at a glance

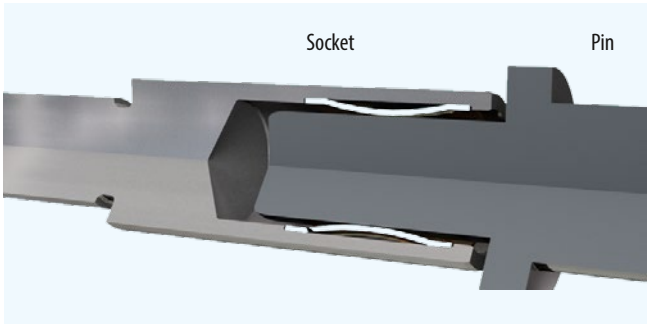
– Over 10,000 mating cycles
– High current carrying capacity
– Low contact resistances
– Low mating and demating forces
– Safe contacting
– High vibration and shock resistance
– Long lifetime because of high-quality materials and surfaces
– Many styles and termination technologies are available or realizable
– Economical alternative to springwire contacts

ODU LAMTAC® principle in cross-section

Unmated



Mated



Contact Technology

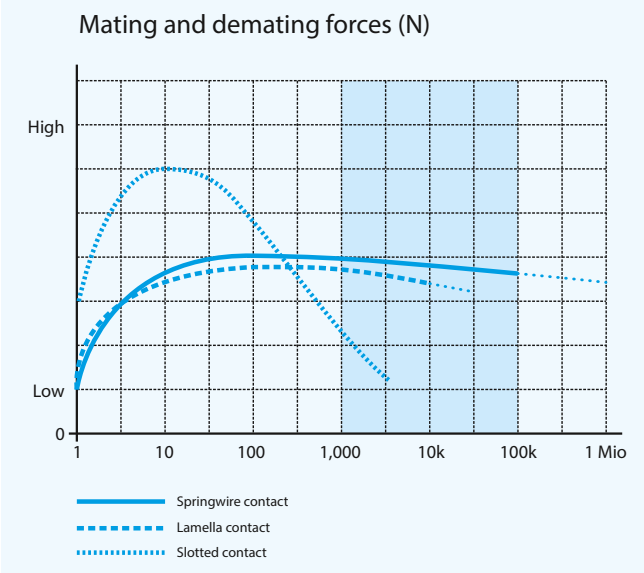
Evaluation of the different contact principles

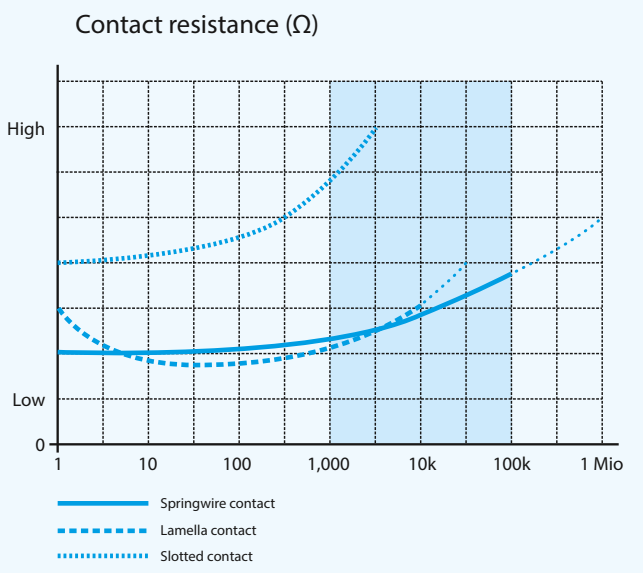
The lamella contact offers significant advantages over a slotted contact (see description below). Mating and demating forces and volume resistance are significantly lower; the number of mating cycles is double. When contact oil is used, these properties can be increased. The ODU LAMTAC contacts are always delivered already lubricated.

The most reliable contact option is the ODU SPRINGTAC. This contact offers all the properties of the ODU LAMTAC as well as:

– Extremely high contact reliability due to independently flexible springwires
– At least 100,000 mating cycles because of an optimized surface pressure
– Even in the very small diameters, the ODU SPRINGTAC still includes many independently flexible springwires.

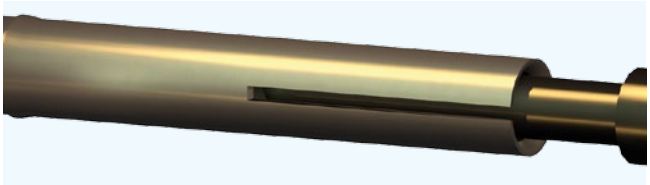
Evaluation of the three most common contact principles with respect to mating and demating forces and contact resistance



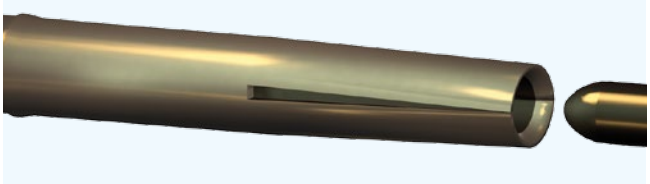


ODU TURNTAC® (slotted contacts)

Mated



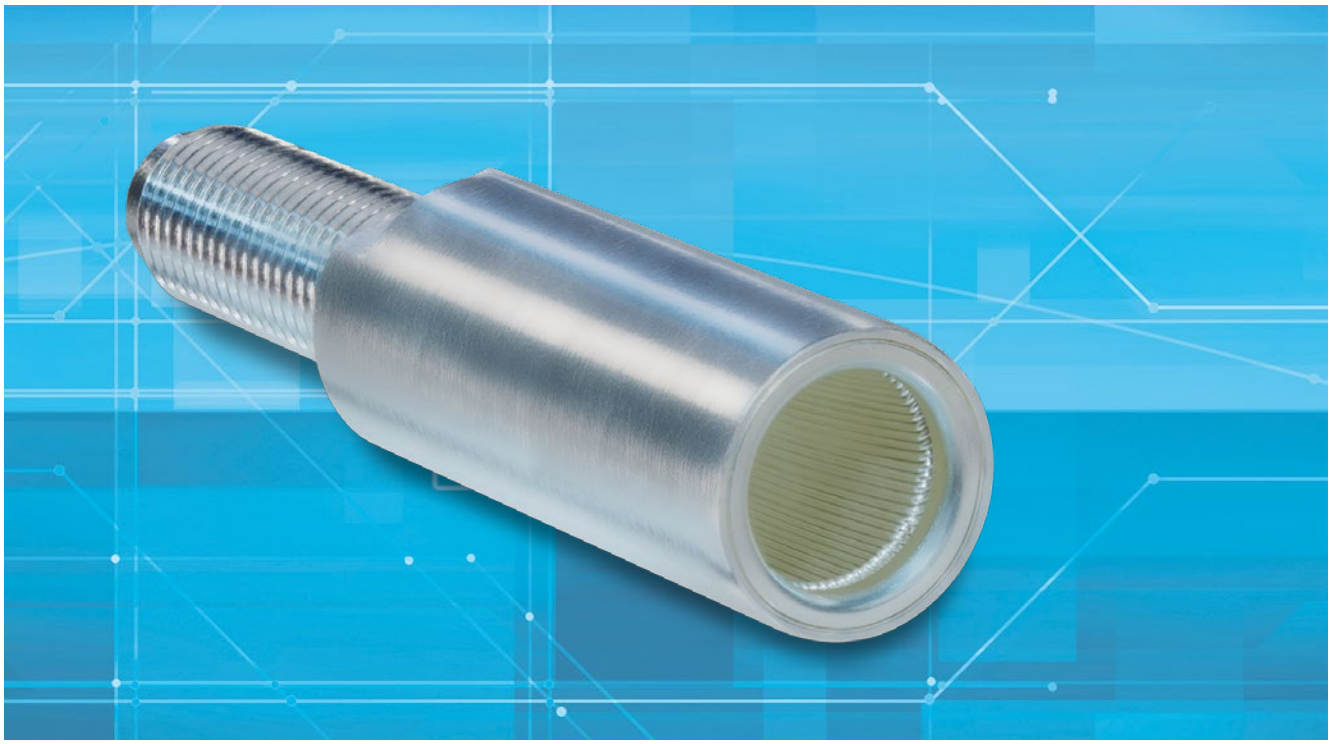
Unmated

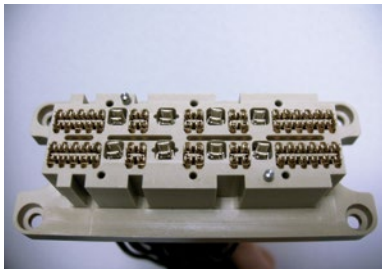


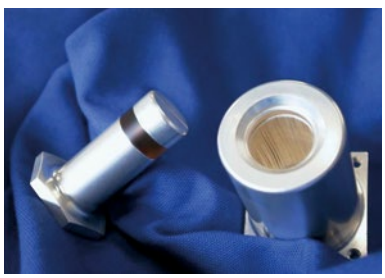
Slotted contacts provide two contact surfaces between the pin and socket. Slotted contacts are used in many ODU systems. With 5,000 or more mating cycles, this contact technology offers the best quality at economical prices. This contact is used on a large scale for standard demands. It offers quite good contact resistances and hence a high current carrying capacity, but it offers limited opportunities in terms of the number of mating cycles and the forces.

Slotted contacts are usually used for smaller diameters (up to about 3 mm) in the context of complete connectors.

ODU SPRINGTAC®
(Contact with Springwire Technology)

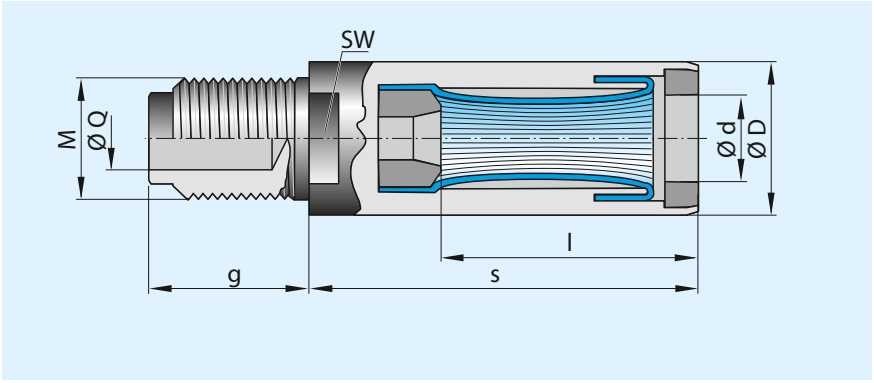






ODU SPRINGTAC® (Contact with Springwire Technology)

Socket for solder / screw termination



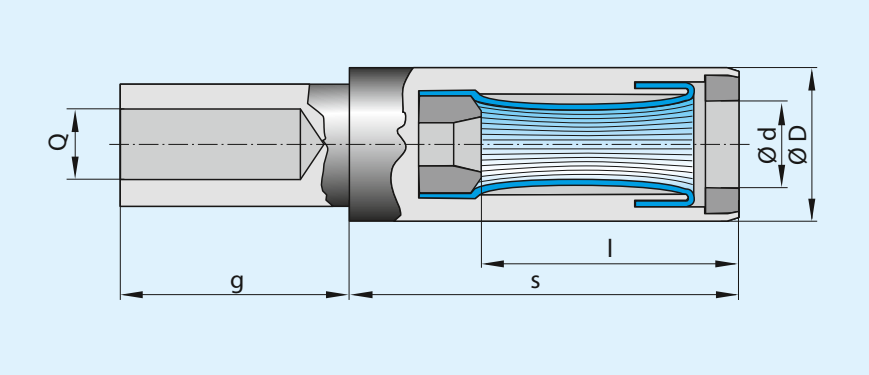
– Suitable for solid pins (page 13/14)
– Suitable for screwing to power busbars, backplanes and contact blocks
– Cables with lugs can be easily connected
– Cables can be soldered into the solder hole

Part number	Dimensions								Mechanical data[1]		Electrical data[1]			
	∅ d	∅ D	l	s	SW = width across flats	g	M = Thread	∅ Q	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ
170.106.100.201.000	1.5	4.0	12.0	15.5	–	12.5	2.6	1.25	5	3	25	35	1.5	500
170.107.100.201.000	2.0	4.0	12.0	15.5	–	12.5	3	1.8	6	4	30	40	2.5	400
170.109.100.201.000	2.5	6.0	12.0	15.5	5	12.5	3	1.8	8	5	30	45	3	300
170.110.100.201.000	3.0	7.0	15.0	22.5	5	15.0	4	2.3	10	7	35	50	4	250
170.111.100.201.000	4.0	8.0	15.0	22.5	6	19.0	5	3.0	15	10	55	80	7	210
170.112.100.201.000	5.0	9.0	15.0	22.5	7	19.0	5	3.0	18	12	85	110	10	200
170.113.100.201.000	6.0	11.0	24.0	33.5	8	22.0	6	3.6	20	13	95	140	13	180
170.115.100.201.000	8.0	14.0	24.0	33.5	11	26.0	8	4.8	25	15	140	210	18	160
170.117.100.201.000	10.0	16.0	24.0	33.5	12	30.0	10	6.2	30	20	175	275	25	150
170.119.100.201.000	12.0	18.0	36.0	47.0	14	34.0	12 × 1.5	7.6	35	25	230	340	34	140
170.121.100.201.000	16.0	23.0	36.0	47.0	19	42.0	16 × 1.5	11.5	45	35	340	460	50	130
170.123.100.201.000	20.0	27.0	48.0	66.0	22	50.0	20 × 2	14.5	55	45	450	600	70	115
170.125.100.201.000	24.0	32.0	48.0	66.0	27	58.0	24 × 2	17.8	70	55	500	700	90	105
170.127.100.201.000	28.0	36.0	48.0	66.0	32	62.0	32 × 2	25.0	90	65	650	850	110	90
170.128.100.201.000	30.0	38.0	48.0	66.0	32	62.0	32 × 2	25.0	100	70	720	950	120	80

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

ODU SPRINGTAC® (Contact with Springwire Technology)

Socket for crimp termination



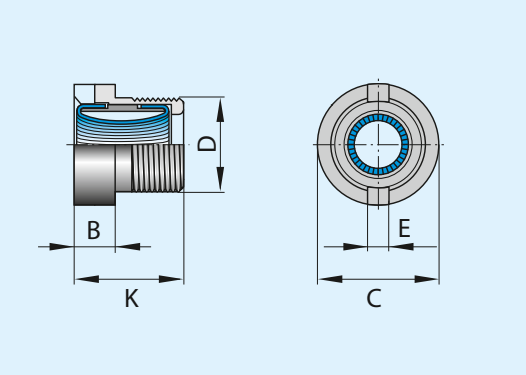
– Suitable for solid pins (page 13/14)
– Easy and quick connection by crimping (crimp information starting on page 33)
– Suitable for connecting harmonized cables

Part number	Dimensions						Mechanical data[1]		Electrical data[1]				Part number crimping tool
	∅ d	∅ D	l	s	g	Q = Termination cross-section in mm²	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ	
170.361.700.207.000	0.76	1.58	7.0	9.8	5.0	0.38	1.5	1	10	15	0.7	3,000	See table on page 36
170.362.700.207.000	1.02	1.98	7.0	9.8	5.0	0.5	2	1.5	12	18	1	2,000	
171.606.100.201.000	1.5	4.0	12.0	15.5	6.5	1.5	5	3	25	35	1.5	500	
171.607.100.201.000	2.0	4.0	12.0	15.5	6.5	2.5	6	4	30	40	2.5	400	
171.609.100.201.000	2.5	6.0	12.0	15.5	6.5	2.5	8	5	30	45	3	250	
170.610.100.201.000	3.0	5.5	15.0	22.5	6.5	2.5	10	7	30	45	4	220	
171.610.100.201.000	3.0	7.0	15.0	22.5	6.5	4	10	7	35	50	4	220	
170.611.100.201.000	4.0	8.0	15.0	22.5	12.5	4	15	10	35	50	4	210	
171.611.100.201.000	4.0	8.0	15.0	22.5	12.5	6	15	10	55	80	7	210	
171.612.100.201.000	5.0	9.0	15.0	22.5	17.5	10	18	12	85	110	10	200	
171.613.100.201.000	6.0	11.0	24.0	33.5	22.5	16	20	13	95	140	13	180	
171.615.100.201.000	8.0	14.0	24.0	33.5	22.5	25	25	15	140	210	18	160	
171.617.100.201.000	10.0	16.0	24.0	33.5	22.5	35	30	20	175	275	25	150	
171.619.100.201.000	12.0	18.0	36.0	47.0	28.0	50	35	25	230	340	34	140	
171.621.100.201.000	16.0	23.0	36.0	47.0	28.0	95	45	35	340	460	50	130	

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

ODU SPRINGTAC® (Contact with Springwire Technology)

Socket completely open

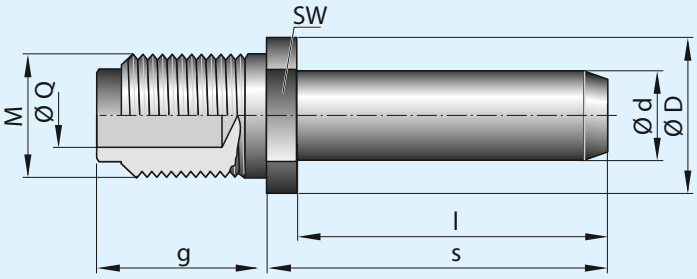


– Suitable for solid pins (page 13/14)
– Can be connected at both ends

Part number	Dimensions						Mechanical data[1]		Electrical data[1]			
	∅ Contact	D	K	B	C	E	Mating force in N	Demating force in N	Rated current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ
174.011.000.201.000	4.0	M 7 × 0.5	8.0	3.0	9.0	1.5	15	10	45	80	7	320

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

Solid Pins with Solder / Screw Termination for all ODU SPRINGTAC® and ODU LAMTAC® Sockets

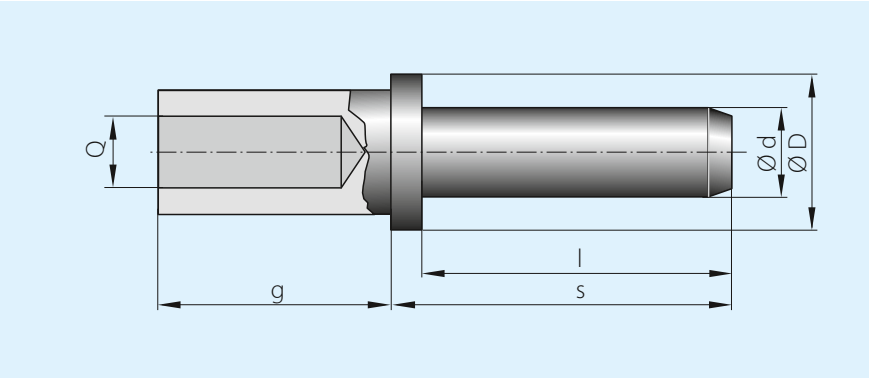


– Suitable for all round ODU SPRINGTAC and ODU LAMTAC sockets
– Suitable for screwing to power busbars, backplanes and contact blocks
– Cables with lugs can be easily connected
– Cables can be soldered into the solder hole

Part number	Dimensions								
	∅ d	Tolerance ∅ d	∅ D	l	s	SW = width across flats	g	M = Thread	∅ Q
181.106.000.301.000	1.5	-0.03	4.0	10.0	11.5	3	10.0	2.6	1.25
181.107.000.301.000	2.0	-0.03	5.0	10.0	11.5	4	12.5	3.0	1.80
181.109.000.301.000	2.5	-0.03	5.0	10.0	11.5	4	12.5	3.0	1.80
181.110.000.301.000	3.0	-0.03	6.0	14.0	15.5	5	15.0	4.0	2.30
181.111.000.301.000	4.0	-0.03	7.0	14.0	16.0	6	19.0	5.0	3.00
181.112.000.301.000	5.0	-0.03	7.0	14.0	16.0	6	19.0	5.0	3.00
181.113.000.301.000	6.0	-0.03	8.0	23.0	26.0	7	22.0	6.0	3.60
181.213.000.301.000	6.0	-0.03	11.0	23.0	26.0	8	22.0	8.0	4.80
181.115.000.301.000	8.0	-0.03	11.0	23.0	26.0	9	26.0	8.0	4.80
181.215.000.301.000	8.0	-0.03	14.0	23.0	26.0	11	26.0	10.0	6.20
181.117.000.301.000	10.0	-0.04	16.0	23.0	26.0	12	30.0	10.0	6.20
181.217.000.301.000	10.0	-0.04	16.0	23.0	26.0	12	30.0	12 × 1.5	7.60
181.119.000.301.000	12.0	-0.04	16.0	34.0	38.0	14	34.0	12 × 1.5	7.60
181.121.000.301.000	16.0	-0.04	20.0	34.0	38.0	17	42.0	16 × 1.5	11.50
181.123.000.301.000	20.0	-0.04	25.0	46.0	51.0	22	50.0	20 × 2.0	14.50
181.125.000.301.000	24.0	-0.04	30.0	46.0	51.0	27	58.0	24 × 2.0	17.80
181.127.000.301.000	28.0	-0.04	36.0	46.0	52.0	32	62.0	32 × 2.0	25.00
181.128.000.301.000	30.0	-0.04	38.0	46.0	52.0	32	62.0	32 × 2.0	25.00

Other variants, sizes and finishes available on request.

Solid Pins with Crimp Termination for all ODU SPRINGTAC® and ODU LAMTAC® Sockets



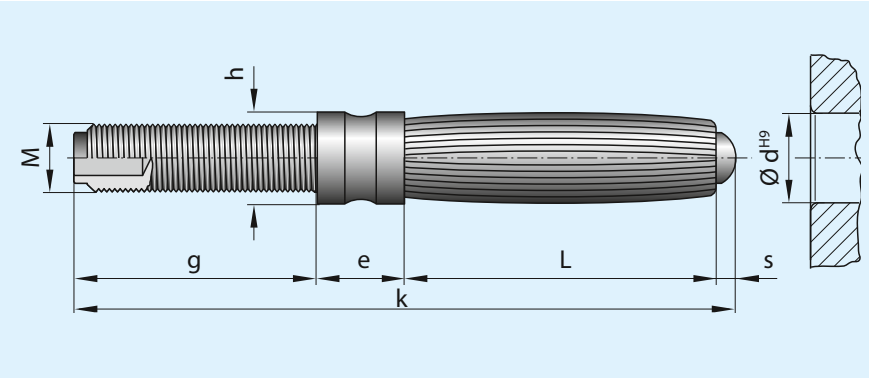
– Suitable for all round ODU SPRINGTAC and ODU LAMTAC sockets
– Easy and quick termination by crimping
– Suitable for connecting harmonized cables

Part number	Dimensions							Part number for crimping tool
	∅ d	Tolerance ∅ d	∅ D	l	s	g	Q = Termination cross-section in mm²	
180.361.000.307.000	0.765	-0.015	1.57	7.0	16.9	4.9	0.38	
180.362.000.307.000	1.02	-0.03	2.1	7.0	16.9	4.9	0.5	
181.606.000.301.000	1.5	-0.03	4.0	10.0	11.5	6.5	1.5	
181.607.000.301.000	2.0	-0.03	4.0	10.0	11.5	6.5	2.5	
181.609.000.301.000	2.5	-0.03	6.0	10.0	11.5	6.5	2.5	
181.610.000.301.000	3.0	-0.03	7.0	14.0	16.0	6.5	4	
181.611.000.301.000	4.0	-0.03	8.0	14.0	16.0	12.5	6	
181.612.000.301.000	5.0	-0.03	9.0	14.0	16.0	17.5	10	
181.613.000.301.000	6.0	-0.03	11.0	23.0	26.0	22.5	16	
181.713.000.301.000	6.0	-0.03	11.0	23.0	26.0	22.5	25	
181.615.000.301.000	8.0	-0.03	14.0	23.0	26.0	22.5	25	
181.715.000.301.000	8.0	-0.03	14.0	23.0	26.0	22.5	35	
181.617.000.301.000	10.0	-0.04	16.0	23.0	26.0	22.5	35	
181.717.000.301.000	10.0	-0.04	16.0	23.0	26.0	22.5	50	
181.619.000.301.000	12.0	-0.04	18.0	34.0	38.0	28.0	50	
181.621.000.301.000	16.0	-0.04	23.0	34.0	38.0	28.0	95	

See table on page 36

Other variants, sizes and finishes available on request.

Externally Flexed Contact Pins for Solder / Screw Termination

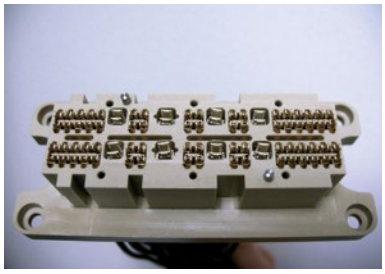


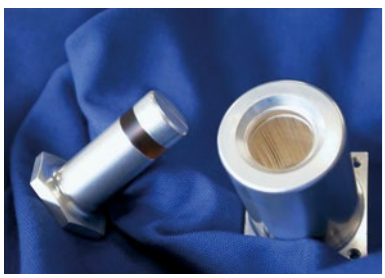
– Suitable for solid ODU sockets (page 17) and contact holes ∅d H9
– Cables with lugs can be easily connected
– Cables can be soldered into the solder hole

Part number	Dimensions								Mechanical data[1]		Electrical data[1]		
Without spark protection	∅ d	k	s	L	e	h	g	M = Thread	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Contact resistance in µΩ
150.001.100.201.000	1.5	19.0	–	6.0	5.0	3.0	8.0	2.3	2	2	10	15	800
150.002.100.201.000	2.0	23.0	–	9.0	5.0	3.0	9.0	2.3	4	3	15	18	675
150.005.100.201.000	3.0	30.0	0.5	12.5	5.5	3.5	11.5	2.6	6	5	25	35	600
150.006.100.201.000	4.0	39.0	0.5	20.0	5.5	5.0	13.0	3	10	8	36	50	525
150.007.100.201.000	5.0	41.5	0.5	20.0	5.5	6.0	15.0	4	15	12	45	65	475
150.008.100.201.000	6.0	46.0	1.0	21.0	7.0	7.0	17.0	5	19	14	55	80	425
150.009.100.201.000	7.0	46.0	1.0	21.0	7.0	8.0	17.0	6	21	16	65	100	375
150.010.100.201.000	8.0	60.5	1.0	32.0	8.5	9.0	19.0	6	24	18	78	130	325
150.011.100.201.000	9.0	62.0	1.0	32.0	8.5	10.5	20.5	8	28	22	90	150	275
150.012.100.201.000	10.0	63.5	1.0	32.0	8.5	11.5	22.0	8	32	25	104	175	250
150.013.100.201.000	12.0	66.5	1.0	32.0	8.5	14.0	25.0	10	38	30	135	215	200
150.015.100.201.000	16.0	91.0	2.0	43.0	14.0	18.0	32.0	14 × 1.5	50	40	175	270	165

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

ODU SPRINGTAC® Flatsockets (Flat Contact with Springwire Technology)





Especially in the automotive industry but also in many other areas, flat contacts or square contacts that are installed into commonly available series production connectors are often used at the electronic interfaces. Usually the square and flat pins are on the electronics and the matching flatsockets are on the cable side.

The pins are also used as test interfaces during series production of electronic units; this means that the electronic units are already inserted during production. But the stamped flatsockets available on the market are generally unsuitable for the corresponding test adapter, because these sockets are not designed for high numbers of mating cycles.

ODU has developed the SPRINGTAC flatsockets specifically for this test application.

Here high mating cycles combine with a contact structure that is plug and assembly compatible.

It is the perfect test contact for flat contact pins and square pins.

ODU SPRINGTAC® Flatsockets (Flat Contact with Springwire Technology)

For more than 50,000 mating cycles

Many flat contacts (pins) are used in automotive electronics and in apparatus engineering. The sockets for the series production connectors available on the market are stamped contacts, which are crimped to cables and engaged in insulators.

These stamped socket contacts of series production connectors allow only a very limited number of mating cycles and are also not suitable for testing because of the very large mating forces required in some cases.

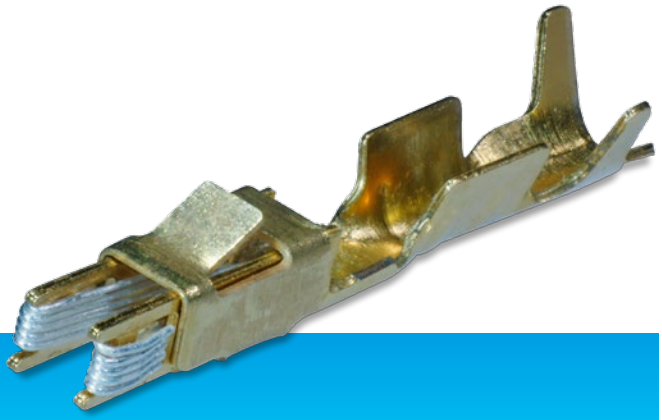
ODU has developed springwire flatsockets that are ideally suitable for measurements and testing.

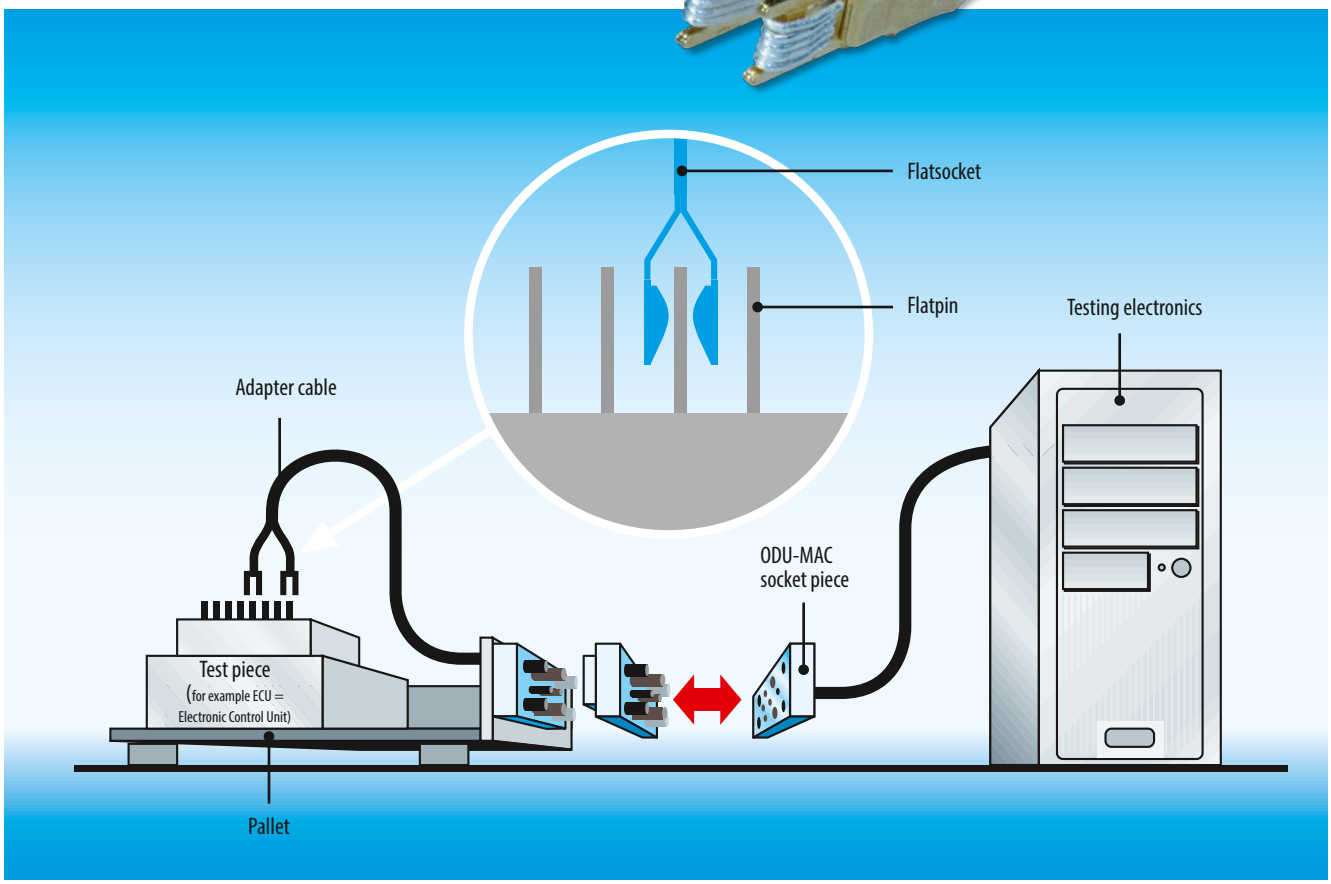
Essential characteristics

- Assembly-compatible with series production contacts that are already on the market (for example, the AMP Timer). Consequently, engagement with existing series production insulators is also possible.
- **Chamber dimensions, see page 47/48**
- Version for 2-point measurement (crimp termination) and 4-point measurement = Kelvin measurement (solder termination)
- Version for 2-point measurement also as connector saver for many millions of mating cycles

ODU SPRINGTAC® flatsockets for flat pins

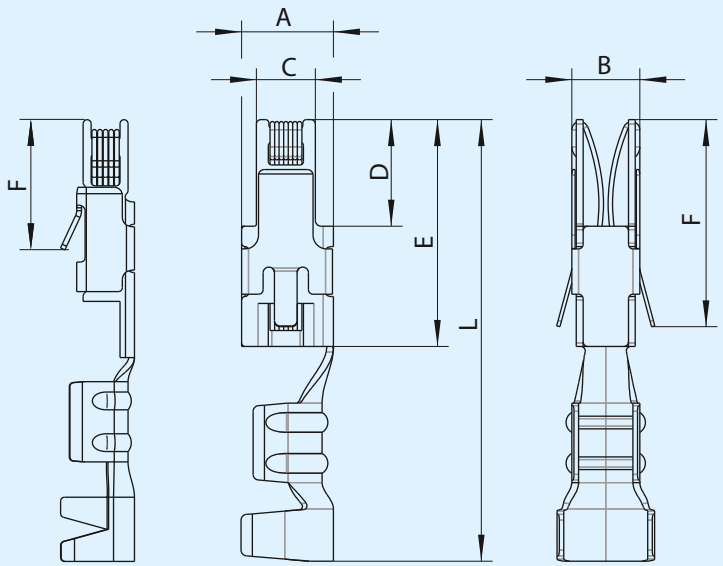
Testing in the automotive sector

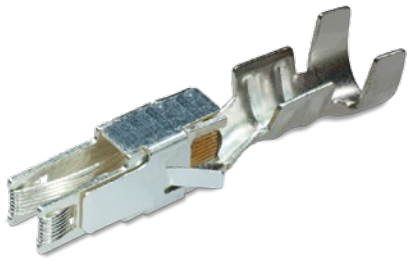




ODU SPRINGTAC® Flatsockets (Flat Contact with Springwire Technology)

For 2-point measurement with crimp termination





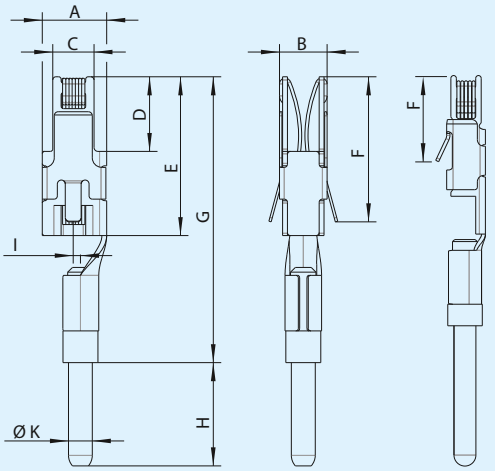
The springs are supported by a stamped frame. All contact parts are at the same potential. For instance, these contacts are used if stronger currents have to be transferred or if there are small changes in the volume resistance with signal currents without interfering influence.

Material: CuZn alloy

Part number	Surface	Size	For pin	Termination in mm²	Dimensions							Mechanical data[1]		Electrical data[1]		
					A	B	C	D	E	F	L	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Contact resistance in mΩ
190.222.700.201.000	Ag	00	0.64×0.64	0.25 – 0.5	1.8	1.85	1.4	2.0	5.6	4.0	13.7	1.5 ± 1	1 ± 0.6	7	9	7.5
190.222.700.207.000	Au															
190.218.100.201.000	Ag	0	1.6×0.6	0.5 – 1.0	2.6	2.2	1.35	4.3	10.0	8.3	19.5	2 ± 1.5	1.5 ± 1	13	18	2.7
190.218.700.207.000	Au		1.6×0.8													
190.214.100.201.000	Ag	1	2.8×0.8	1.0 – 1.5	4.0	3.0	2.6	4.7	10.0	9.2	19.5	4 ± 2	3 ± 2	16	22	2.0
190.214.700.207.000	Au															
190.215.100.201.000	Ag	2	4.8×0.8	1.5 – 2.5	6.8	3.0	4.8	6.0	11.0	10.5	20.5	6 ± 2	5 ± 2	22	30	1.3
190.215.700.207.000	Au		6.3×0.8													
190.216.100.201.000	Ag	2	4.8×0.8	4	6.8	3.0	4.8	6.0	11.0	10.5	24.5	6 ± 2	5 ± 2	27	36	1.3
190.216.700.207.000	Au		6.3×0.8													

ODU SPRINGTAC® Flatsockets (Flat Contact with Springwire Technology)

For 2-point measurement in the connector saver



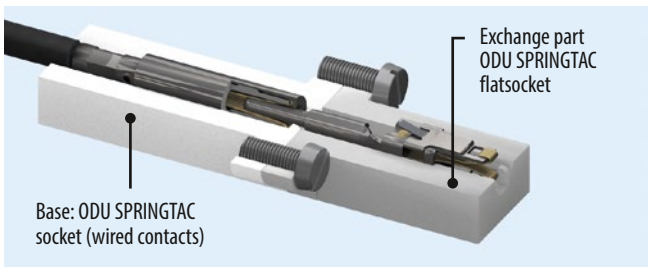
Connectors according to the ODU connector saver principle consist of a replaceable front side (insertion piece) and a back side (connection piece). The front side is made of insulator and springwire flat contacts with round connection pins. These are plugged into round springwire contacts. When the flat contacts are worn, the front side can be replaced in a very short time, without having to separate the connections that are connected to the contacts of the back piece. You will find the appropriate connecting parts on page 10 und 11.

Material: CuZn alloy

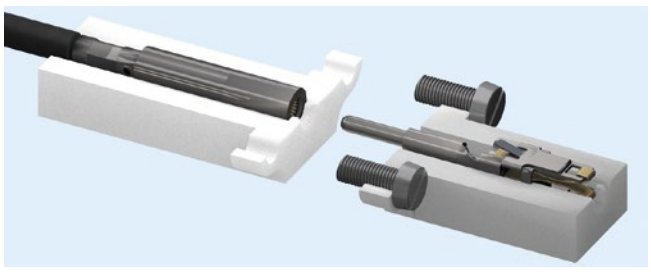
Part number	Surface	Sitze	For pin	Dimensions										Mechanical data[1]		Electrical data[1]		
				A	B	C	D	E	F	G	H	I	∅K	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Contact resistance in mΩ
190.242.700.201.000	Ag	00	0.64 × 0.64	1.8	1.85	1.4	2.0	5.6	4.0	11.5	6.5	0 ± 0.15	1.02	1.5 ± 1	1 ± 0.6	7	9	7.5
190.242.700.207.000	Au																	
190.238.100.201.000	Ag	0	1.6 × 0.6	2.6	2.2	1.35	4.3	10.0	8.3	18.0	6.5	0 ± 0.3	1.02	2 ± 1.5	1.5 ± 1	11	16	2.7
190.238.700.207.000	Au		1.6 × 0.8															
190.234.100.201.000	Ag	1	2.8 × 0.8	4.0	3.0	2.6	4.7	10.0	9.2	18.0	6.5	1 ± 0.5	1.5	4 ± 2	3 ± 2	16	22	2.0
190.234.700.207.000	Au																	
190.235.100.201.000	Ag	2	4.8 × 0.8	6.8	3.0	4.8	6.0	11.0	10.5	20.5	6.5	1 ± 0.5	3.0	6 ± 2	5 ± 2	27	36	1.3
190.235.700.207.000	Au		6.3 × 0.8															

The connector saver principle

Mated



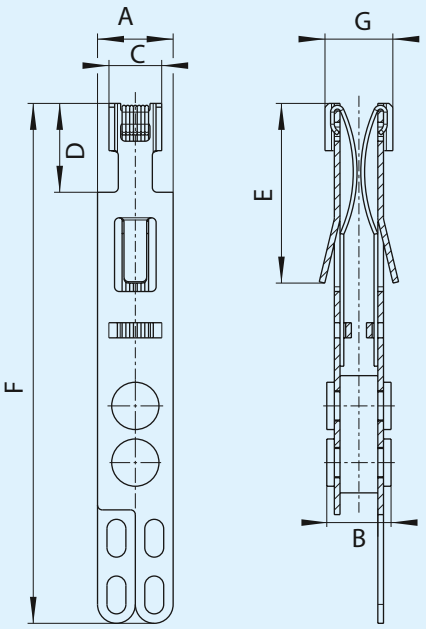
Unmated

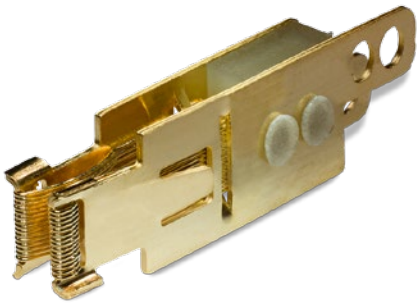


In case of service or wear the ODU SPRINGTAC flatsocket can be replaced in seconds. The wired contacts are simply plugged into the new socket.

ODU SPRINGTAC® Flatsockets (Flat Contact with Springwire Technology)

For 4-point measurement (Kelvin measurement) with solder termination



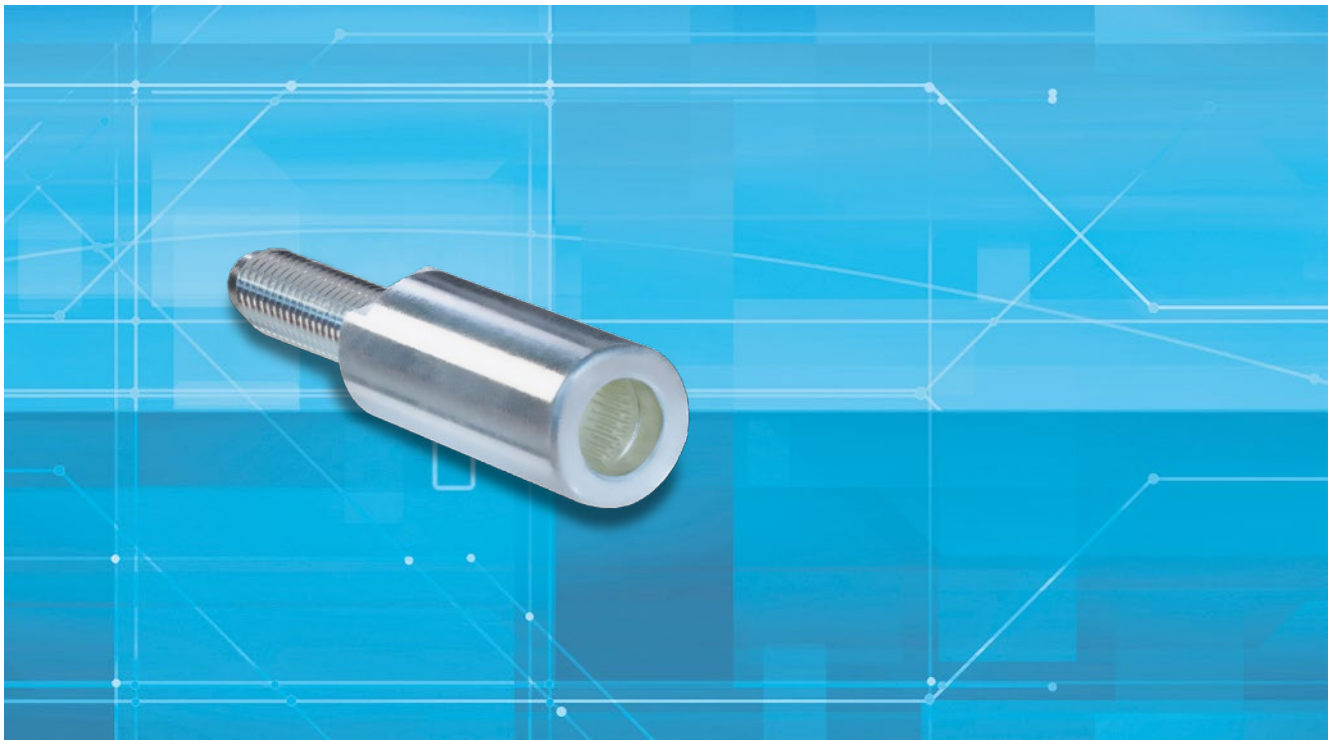


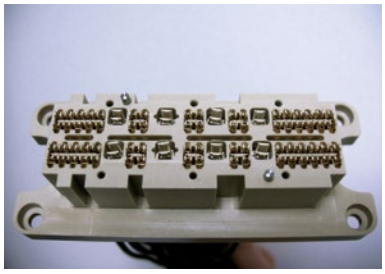
In this contact, the spring supporting parts are isolated from each other. This contact arrangement is used when low electrical resistances have to be measured with high precision.

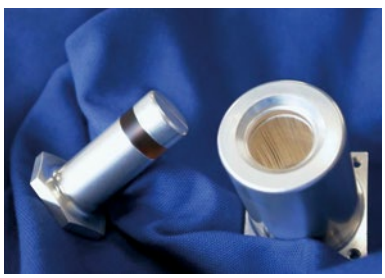
Material: CuZn alloy

Part number	Surface	Size	For Pin	Termination in mm²	Dimensions							Mechanical data[1]		Electrical data[1]		
					A	B	C	D	E	F	G	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Contact resistance in mΩ
190.224.100.201.000	Ag	1	2.8×0.8	Solder 1.5	4.0	3.4	2.6	4.7	9.5	27.5	3.6	4±2	3±2	7	12	2.0
190.224.700.207.000	Au															
190.225.100.201.000	Ag	2	4.8×0.8 6.3×0.8	Solder 2.5	6.8	3.4	4.8	6.0	10.5	27.5	3.6	6±2	5±2	12	17	2.0
190.225.700.207.000	Au															

ODU LAMTAC®
(Contact with Lamella Technology)

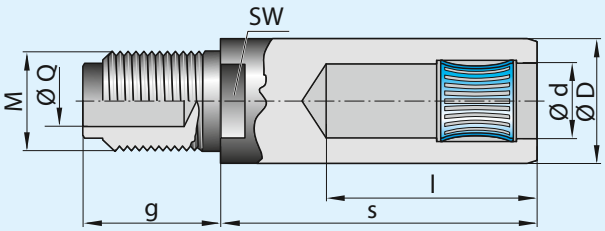






ODU LAMTAC® (Contact with Lamella Technology)

Socket for Solder / Screw Termination



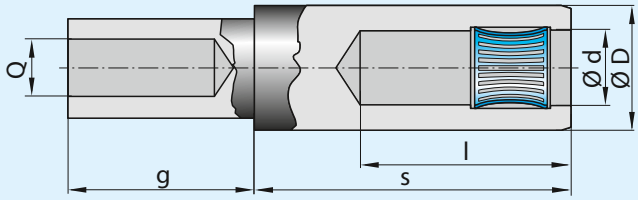
– Suitable for solid pins (page 27 / 28)
– Suitable for screwing to power busbars, backplanes and contact blocks
– Cables with lugs can be easily connected
– Cables can be soldered into the solder hole

Part number	Dimensions								Mechanical data[1]		Electrical data[1]			
	∅ d	∅ D	l	s	SW = width across flats	g	M = Thread	∅ Q	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ
178.106.100.201.000	1.5	4.0	10.5	15.5	–	12.5	2.6	1.25	4	3	20	40	2	450
178.107.100.201.000	2	4.0	10.5	15.5	–	12.5	3	1.8	6	5	25	45	2.5	400
178.110.100.201.000	3	7.0	15.0	22.5	5	15.0	4	2.3	8	8	35	65	5	350
178.111.100.201.000	4	8.0	15.0	22.5	6	19.0	5	3.0	10	10	55	95	8	300
178.112.100.201.000	5	9.0	18.5	22.5	7	19.0	5	3.0	15	13	70	125	12	250
178.113.100.201.000	6	11.0	24.0	33.5	8	22.0	6	3.6	20	15	105	190	19	170
178.213.100.201.000	6	11.0	24.0	33.5	8	26.0	8	4.8	20	15	130	225	19	170
178.115.100.201.000	8	14.0	24.0	33.5	11	26.0	8	4.8	25	20	140	250	26	120
178.215.100.201.000	8	14.0	24.0	33.5	11	30.0	10	6.2	25	20	160	290	26	120
178.117.100.201.000	10	16.0	24.0	33.5	12	30.0	10	6.2	30	25	175	300	27	100
178.217.100.201.000	10	16.0	24.0	33.5	12	34.0	12×1.5	7.6	30	25	185	310	27	100
178.119.100.201.000	12	18.0	36.0	47.0	14	34.0	12×1.5	7.6	30	25	190	340	35	80
178.121.100.201.000	16	23.0	36.0	47.0	19	42.0	16×1.5	11.5	35	30	340	550	48	70
178.123.100.201.000	20	27.0	48.0	66.0	22	50.0	20×2	14.5	40	35	450	700	56	50
178.125.100.201.000	24	32.0	48.0	66.0	27	58.0	24×2	17.8	45	40	510	900	62	40
178.127.100.201.000	28	36.0	48.0	66.0	32	62.0	32×2	25.0	50	45	840	1,450	68	30
178.128.100.201.000	30	38.0	48.0	66.0	32	62.0	32×2	25.0	55	50	910	1,570	70	25

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

ODU LAMTAC® (Contact with Lamella Technology)

Socket for Crimp Termination



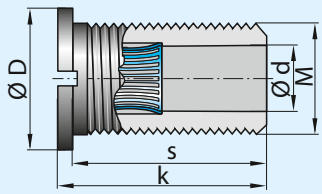
– Suitable for solid pins (page 27 / 28)
– Easy and quick termination by crimping
(Crimp information starting on page 33)
– Suitable for connecting harmonized cables

Part number	Dimensions						Mechanical data[1]		Electrical data[1]				Part number crimping tool
	∅ d	∅ D	l	s	g	Q = Termination cross-section in mm²	Mating force in N	Demating force in N	Nominal current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ	
178.606.100.201.000	1.5	4.0	10.5	15.5	6.5	1.5	4	3	20	40	2	450	See table on page 36
178.607.100.201.000	2	4.0	10.5	15.5	6.5	2.5	6	5	25	45	2.5	400	
178.610.100.201.000	3	7.0	15.0	22.5	6.5	4	8	8	35	65	5	350	
178.611.100.201.000	4	8.0	15.0	22.5	12.5	6	10	10	55	95	8	300	
178.612.100.201.000	5	9.0	18.5	22.5	17.5	10	15	13	70	125	12	250	
178.613.100.201.000	6	11.0	24.0	33.5	22.5	16	20	15	105	190	19	170	
178.713.100.201.000	6	11.0	24.0	33.5	22.5	25	20	15	130	225	19	170	
178.615.100.201.000	8	14.0	24.0	33.5	22.5	25	25	20	140	250	26	120	
178.715.100.201.000	8	14.0	24.0	33.5	22.5	35	25	20	160	290	26	120	
178.617.100.201.000	10	16.0	24.0	33.5	22.5	35	30	25	175	300	27	100	
178.717.100.201.000	10	16.0	24.0	33.5	22.5	50	30	25	185	310	27	100	
178.619.100.201.000	12	18.0	36.0	47.0	28.0	50	30	25	190	340	35	80	
178.621.100.201.000	16	23.0	36.0	47.0	28.0	95	35	30	340	550	48	70	

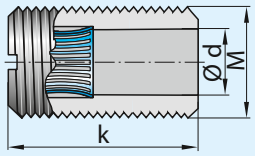
Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

ODU LAMTAC® (Contact with Lamella Technology)

Socket with outer thread



LF 1



LZ 1

LF 1

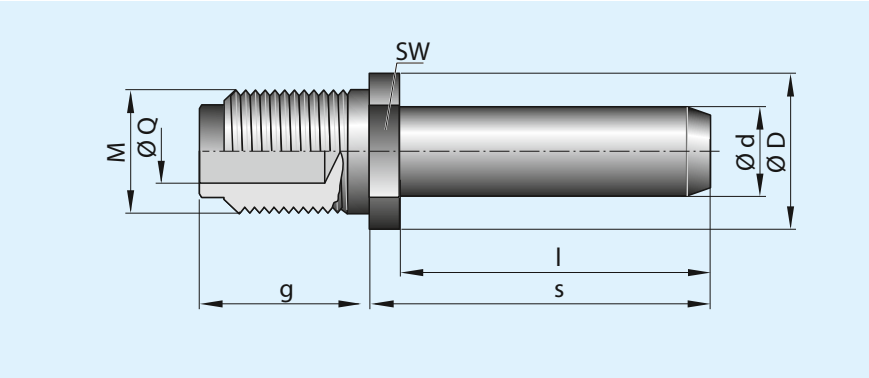
LZ 1

– Suitable for solid pins (page 27 / 28)
– Suitable for screwing to power busbars, backplanes and contact blocks

Part number	Dimensions					Mechanical data[1]			Electrical data[1]			
	∅ d	∅ D	k	s	M = Thread	Mating force in N	Demating force in N	Tightening-torque in Nm	Nominal current in A	Max. continuous current in A	Surge current in kA	Contact resistance in µΩ
Model LF1												
178.346.100.201.000	1.5	7.0	7.0	5.5	4	4	3	0.5	20	40	2.0	350
178.347.100.201.000	2.0	8.0	7.0	5.5	5	6	5	0.5	25	45	2.5	300
178.350.100.201.000	3.0	10.0	12.0	10.0	7 × 0.5	10	8	1.2	35	65	5.0	190
178.351.100.201.000	4.0	11.0	13.0	10.0	8 × 1	12	10	1.2	55	95	8.0	170
178.352.100.201.000	5.0	13.0	13.0	10.0	10	15	13	3	70	125	12.0	150
178.355.100.201.000	6.0	16.0	19.0	16.0	12 × 1.5	20	15	6	105	190	19.0	110
178.356.100.201.000	8.0	18.0	19.0	16.0	14 × 1.5	25	20	6	140	250	26.0	80
178.358.100.201.000	10.0	22.0	19.0	16.0	18 × 1.5	30	25	10	175	300	27.0	60
Model LZ1												
178.306.100.201.000	1.5	–	7.0	–	4	4	3	0.5	20	40	2.0	350
178.307.100.201.000	2.0	–	7.0	–	5	6	5	0.5	25	45	2.5	300
178.310.100.201.000	3.0	–	12.0	–	7 × 0.5	10	8	1.2	35	65	5.0	190
178.311.100.201.000	4.0	–	13.0	–	8 × 1	12	10	1.2	55	95	8.0	170
178.312.100.201.000	5.0	–	13.0	–	10	15	13	3	70	125	12.0	150
178.314.100.201.000	6.0	–	19.0	–	12 × 1.5	20	15	6	105	190	19.0	110
178.315.100.201.000	8.0	–	19.0	–	14 × 1.5	25	20	6	140	250	26	80
178.318.100.201.000	10.0	–	19.0	–	18 × 1.5	30	25	10	175	300	27	60

Other variants, sizes and finishes available on request.
[1] See "Technical Information" starting on page 39.

Solid pins with Solder / Screw Termination for all ODU SPRINGTAC® and ODU LAMTAC® Sockets

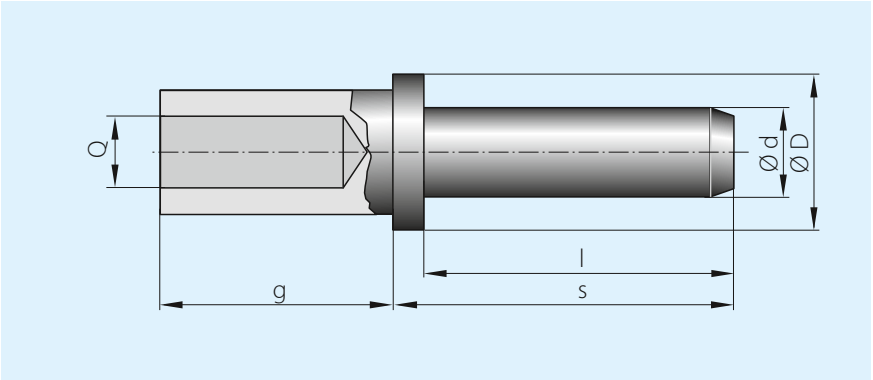


– Suitable for all round ODU SPRINGTAC and ODU LAMTAC sockets
– Suitable for screwing to power busbars, backplanes and contact blocks
– Cables with lugs can be easily connected
– Cables can be soldered into the solder hole

Part number	Dimensions								
	∅ d	Tolerance ∅ d	∅ D	l	s	SW = width across flats	g	M = Thread	∅ Q
181.106.000.301.000	1.5	-0.03	4.0	10.0	11.5	3	10.0	2.6	1.25
181.107.000.301.000	2.0	-0.03	5.0	10.0	11.5	4	12.5	3.0	1.80
181.109.000.301.000	2.5	-0.03	5.0	10.0	11.5	4	12.5	3.0	1.80
181.110.000.301.000	3.0	-0.03	6.0	14.0	15.5	5	15.0	4.0	2.30
181.111.000.301.000	4.0	-0.03	7.0	14.0	16.0	6	19.0	5.0	3.00
181.112.000.301.000	5.0	-0.03	7.0	14.0	16.0	6	19.0	5.0	3.00
181.113.000.301.000	6.0	-0.03	8.0	23.0	26.0	7	22.0	6.0	3.60
181.213.000.301.000	6.0	-0.03	11.0	23.0	26.0	8	22.0	8.0	4.80
181.115.000.301.000	8.0	-0.03	11.0	23.0	26.0	9	26.0	8.0	4.80
181.215.000.301.000	8.0	-0.03	14.0	23.0	26.0	11	26.0	10.0	6.20
181.117.000.301.000	10.0	-0.04	16.0	23.0	26.0	12	30.0	10.0	6.20
181.217.000.301.000	10.0	-0.04	16.0	23.0	26.0	12	30.0	12 × 1.5	7.60

Other variants, sizes and finishes available on request.

Solid Pins with Crimp Termination for all ODU SPRINGTAC® and ODU LAMTAC® Sockets

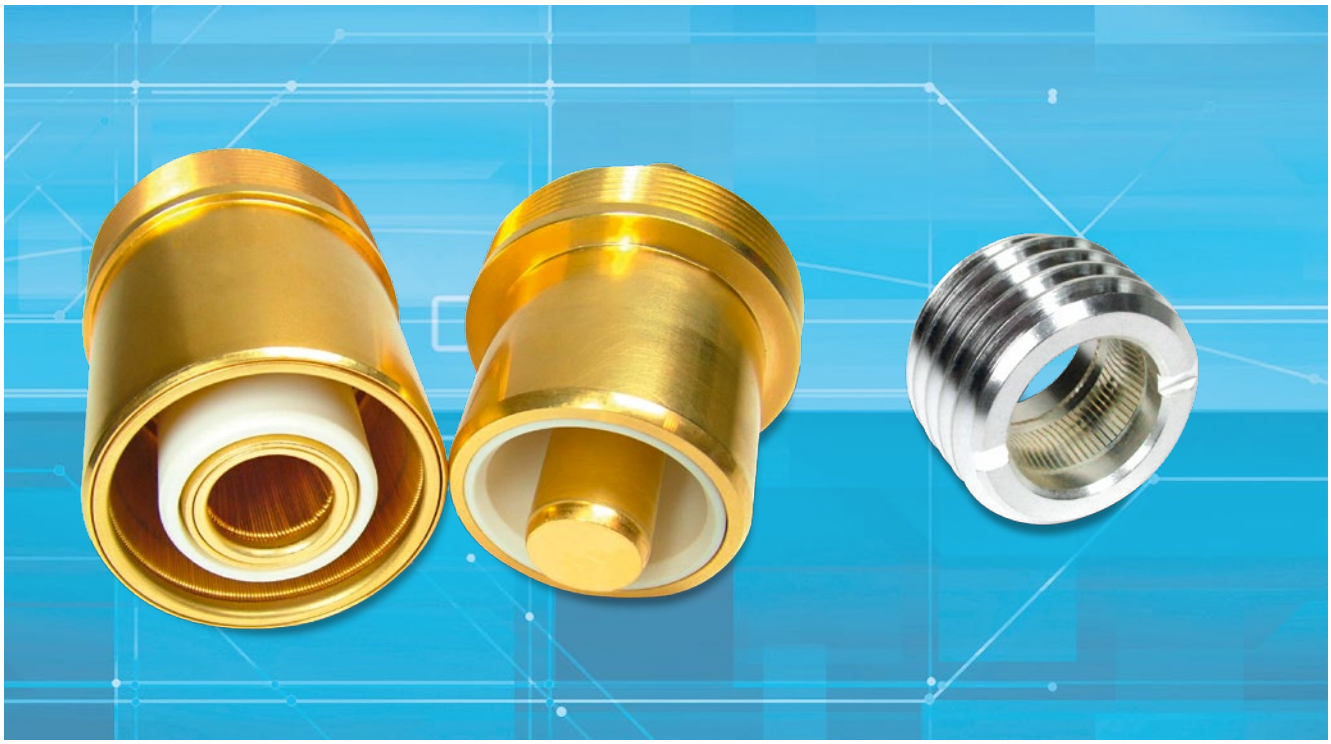


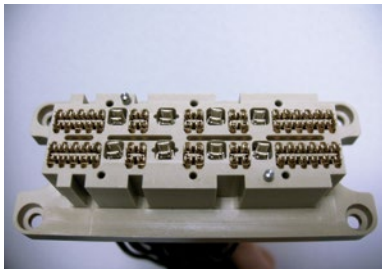
– Suitable for all round ODU SPRINGTAC and ODU LAMTAC sockets
– Easy and quick connection by crimping
– Suitable for connecting harmonized cables

Part number	Dimensions							Part number for crimping tool
	⌀ d	Tolerance ⌀ d	⌀ D	l	s	g	Q = Termination cross-section in mm²	
180.361.000.307.000	0.76	-0.03	1.57	7.0	16.9	4.9	0.38	See table on page 36
180.362.000.307.000	1.02	-0.03	2.1	7.0	16.9	4.9	0.5	
181.606.000.301.000	1.5	-0.03	4.0	10.0	11.5	6.5	1.5	
181.607.000.301.000	2.0	-0.03	4.0	10.0	11.5	6.5	2.5	
181.609.000.301.000	2.5	-0.03	6.0	10.0	11.5	6.5	2.5	
181.610.000.301.000	3.0	-0.03	7.0	14.0	16.0	6.5	4	
181.611.000.301.000	4.0	-0.03	8.0	14.0	16.0	12.5	6	
181.612.000.301.000	5.0	-0.03	9.0	14.0	16.0	17.5	10	
181.613.000.301.000	6.0	-0.03	11.0	23.0	26.0	22.5	16	
181.713.000.301.000	6.0	-0.03	11.0	23.0	26.0	22.5	25	
181.615.000.301.000	8.0	-0.03	14.0	23.0	26.0	22.5	25	
181.715.000.301.000	8.0	-0.03	14.0	23.0	26.0	22.5	35	
181.617.000.301.000	10.0	-0.04	16.0	23.0	26.0	22.5	35	
181.717.000.301.000	10.0	-0.04	16.0	23.0	26.0	22.5	50	
181.619.000.301.000	12.0	-0.04	18.0	34.0	38.0	28.0	50	

Other variants, sizes and finishes available on request.

Special Solutions





Application Specific Solutions

There are countless possible applications for the springwire and lamella technologies. Many applications naturally demand a specific design for the contacting.

The following are examples of some application specific solutions with lamella technology and springwire technology which we have implemented to our customers' satisfaction.

Application Specific Solutions Based on ODU Single Contacts

As a specialist for customized solutions, ODU has many skills: for example, in development, in tool making in its own tool shop and in turning, stamping, surface plating, manufacturing assembly machines and cable assembly. With all these options ODU can "tailor" the required connections for the customer.

When is a custom-made production worthwhile?
Are the development effort, tool-making and production costs in a reasonable proportion to the quantity and to the unit price?
ODU's many years of experience enable it to give you fast and competent information.

ODU SPRINGTAC contacts for transferring welding current in tool-changing systems:

– Tested up to 1 million mating cycles
– Interchangeable crimp terminations up to 35 mm^2
– Load current up to 200 A

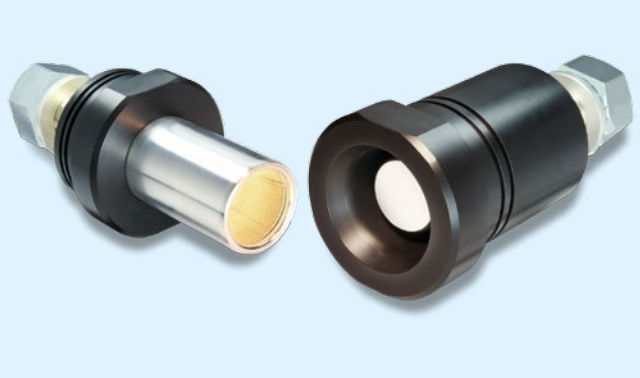
Coaxial power connector constructed with ODU SPRINGTAC (contacts with springwire technology) ⌀20 / ⌀40 mm:

– Nominal current approx. 500 A (2×)
– Special model for use in the lower NF range
– Special termination for coaxial wire management

ODU SPRINGTAC (contact with springwire technology) (⌀4.0 mm / ⌀4.7 mm und ⌀4.8 mm) with plastic insulation as protection against accidental contact. Special models are available for applications at higher temperatures.

ODU LAMTAC (contact with lamella technology) with application specific cable termination in welding technology.

Application Specific Solutions Based on ODU Single Contacts



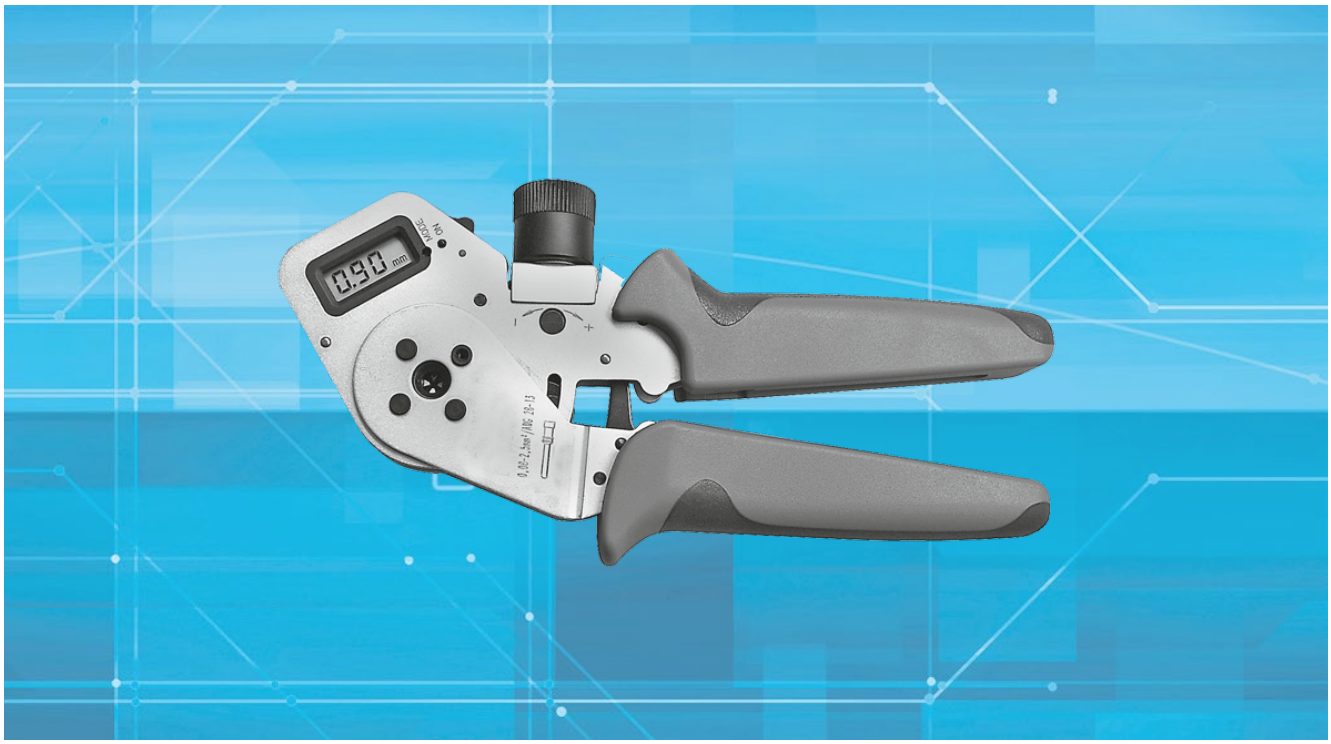
Connector with ODU SPRINGTAC
(springwire technology)
Power supply socket for silicon wafer production:
– Nominal current 720 A
– Contact diameter ⌀30 mm
– Robust model for industrial use

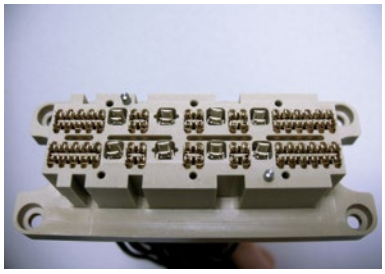
Special termination using standard ODU LAMELLA
⌀22 mm in special carrier for high-performance securing:
– Nominal current approx. 550 A

ODU SPRINGTAC with guide funnel
– ⌀26 mm
– Floating mounting on one contact side
– Funnel allows larger radial displacement

Application in the automotive sector:
– Special lamella with radial compensation (±0.3 mm)
– Nominal current 25 A
– Vibration-resistant
– Application temperature –40° C to +125° C, briefly +170° C

Tools and Termination Technologies





Termination Technologies

ODU offers three different contact termination technologies for the single contacts:

- Solder
- Screw
- Crimp

Solder termination
Soldering is a procedure to join metal components with the help of a molten joining metal (solder) with a melting temperature below the melting temperatures of the base materials that are to be joined. In contrast to crimping, the wire to be soldered can also be considerably smaller than the intended solder hole.
Warning: avoid unacceptable temperature increases in sockets.

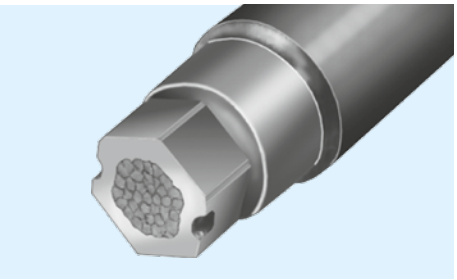
Screw termination
This method of terminating cables is usually done using lugs with serrated washers (flat washers) and nuts. Washers and nuts are not part of the standard delivery program (supplied if needed).

Crimp termination
Contacting by crimping in order to produce connection lines results in a permanent, corrosion-free and securely contacted connection. Crimping is a time-saving procedure that can be performed by non-experts.

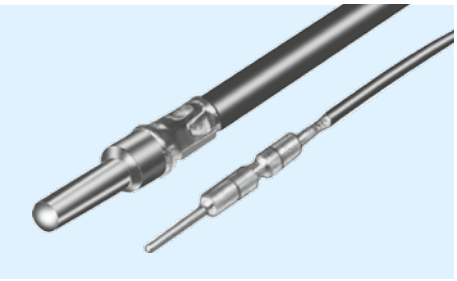
The cold pressing (crimping) causes the conductor and contact material to be compressed at the pressure point in such a way that an almost gas-tight connection is produced that resists pulling to an extent that depends on the conductor material.

Crimping can be done both on the smallest cross-sections and on large ones. Smaller cross-sections (0.5 – 2.5 mm^2) generally require 8-point crimping tools and the larger ones generally require hexagonal crimping tools. The width across corners of the crimping is no larger than the original diameter. The insulation of the cable is not damaged and can be brought up to the contact end.

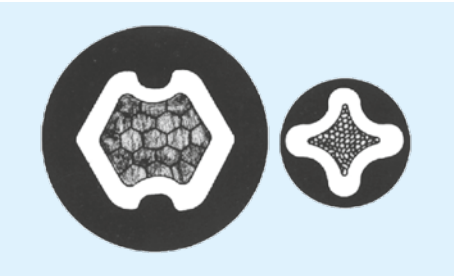
For a proper crimp, the diameter of the hole must be precisely matched to the cable. Proper crimping of our contacts can only be guaranteed with the crimping tools recommended by ODU. In order to advise you, we must know the type of cable and the cable cross-section, preferably with a sample and a datasheet.



Cross-section of hexagonal crimping



Contacts with 8-point crimping

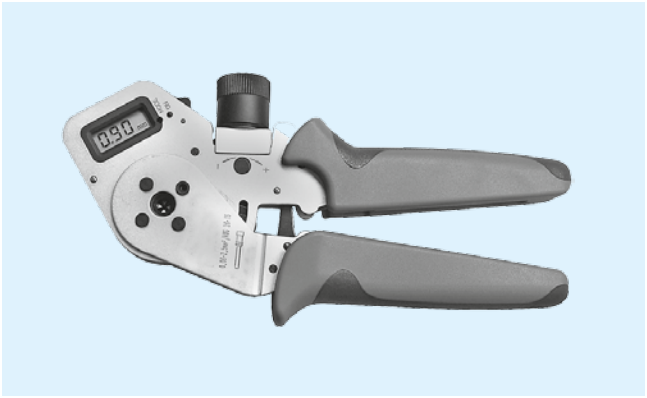


Sectional image of hexagonal and 8-point crimping:
For the 8-point crimping, two 4-point crimpings lie one behind the other.

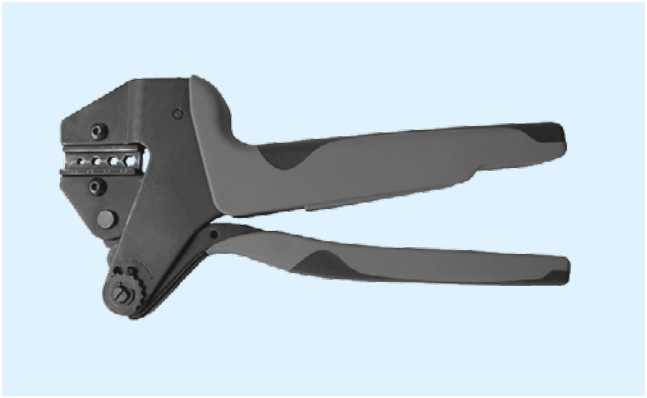
Crimping Tools *

Suitable for all round ODU SPRINGTAC® and ODU LAMTAC® sockets and pins

The crimping tools and their crimping inserts are designed for the necessary compression forces and with a locking system that prevents tools from opening prematurely. Opening is possible only after pressing at the required pressure has been completed.

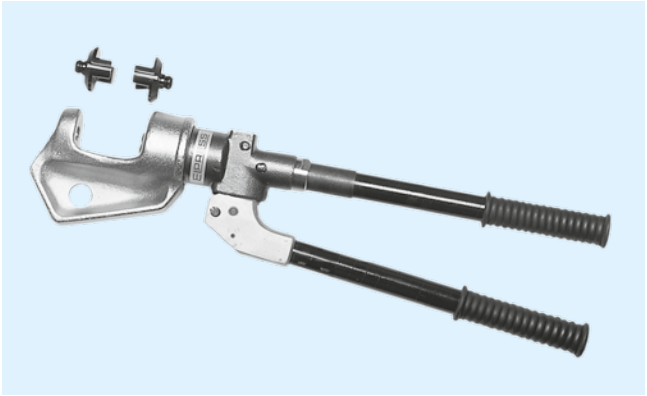


8-point crimping tool
It is suitable for cross-sections from 0.08 to 2.5 mm² (AWG28 – AWG12).
The crimping tool has a locking system that prevents it from opening before the pressing has been completed. It is provided with a user-friendly digital display.
Part number: 080.000.051.000.000



Hexagonal crimping tool
This is suitable for cross-sections of 1.5 mm², 2.5 mm², 4.0 mm² and 6.0 mm².
The crimping tool has a locking system that prevents it from opening before the pressing has been completed.
Part number: 080.000.062.000.000

Hydraulic crimping tool
It is suitable for cross-sections of 10 mm² and 50 mm². The crimping tool has a locking system that prevents it from opening before the pressing has been completed. It is provided with a safety valve that opens automatically as soon as the pressure required for complete compression has been reached.
Part number: 080.000.026.000.000



Hydraulic crimping tool
For cross-sections from 70 – 500 mm².
Part number for cross-section:
080.000.017.000.000

* Table for adjustment and contact holder (positioner) – see next page.

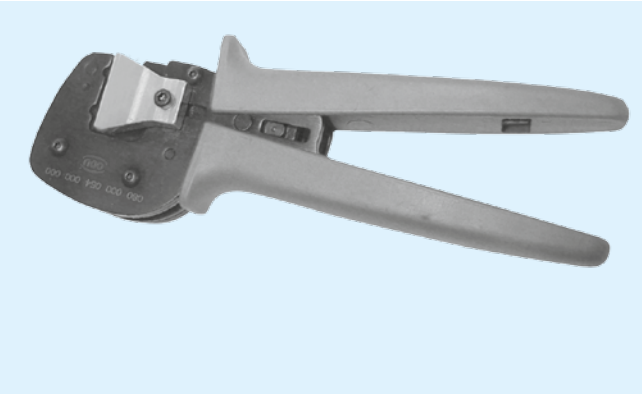
Crimping data: tools for circular contacts

Cross-section mm²	Part number		Gauge / profile
	Crimping tool	Crimp insert The inserts must be ordered separately for 10 mm² or more	
0.38	080.000.051.000.000		>0.65 <0.70
0.50	080.000.051.000.000		>0.90 <0.95
1.5[1)]	080.000.051.000.000		>1.40 <1.45
1.5	080.000.062.000.000		Profile 1
2.5	080.000.062.000.000		Profile 2
4	080.000.062.000.000		Profile 3
6	080.000.062.000.000		Profile 3
10	080.000.026.000.000	080.000.026.110.000	
16	080.000.026.000.000	080.000.026.116.000	
25	080.000.026.000.000	080.000.026.125.000	
35	080.000.026.000.000	080.000.026.135.000	
50	080.000.026.000.000	080.000.026.150.000	
70	080.000.017.000.000	921.000.005.000.009	
95	080.000.017.000.000	921.000.005.000.011	
120	080.000.017.000.000	921.000.005.000.013	
150	080.000.017.000.000	921.000.005.000.014	
185	080.000.017.000.000	921.000.005.000.015	
240	080.000.017.000.000	921.000.005.000.016	
300	080.000.017.000.000	921.000.005.000.017	
400	080.000.017.000.000	921.000.005.000.019	
500	080.000.017.000.000	921.000.005.000.020	

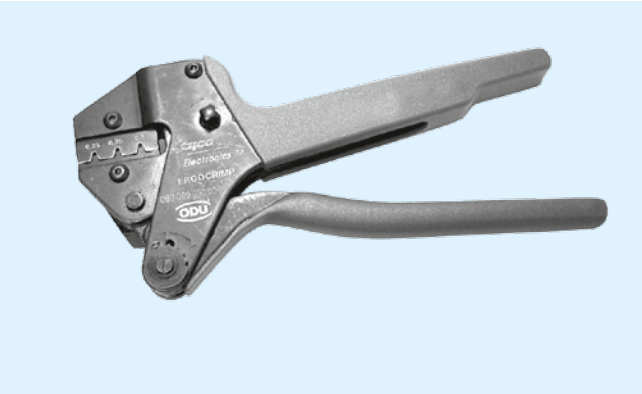
[1] Diameter „D“ < 4.5 mm required

Crimping Tools

For ODU SPRINGTAC® Flatsockets



B profile crimping tool
For ODU SPRINGTAC Flatsocket
Cross-sections **0.5 – 4.0 mm²**.
Part number: 080.000.054.000.000



B profile crimping tool
For ODU SPRINGTAC Flatsocket
Cross-sections **0.25 – 0.5 mm²**.
Part number: 080.000.050.000.000

Size	Cross-section mm²	Crimping tool	Profile	Positioner
0.64 × 0.64	0.25	080.000.050.000.000	Profile 0.25	Position 1
0.64 × 0.64	0.35	080.000.050.000.000	Profile 0.35	Position 1
0.64 × 0.64	0.5	080.000.050.000.000	Profile 0.5	Position 1
1.6 × 0.6 / 0.8	0.5 – 1.0	080.000.054.000.000	Profile 4	
2.8 × 0.8	1.0 – 1.5	080.000.054.000.000	Profile 1	
4.8 × 0.8	1.5 – 2.5	080.000.054.000.000	Profile 2	
6.3 × 0.8	4	080.000.054.000.000	Profile 3	

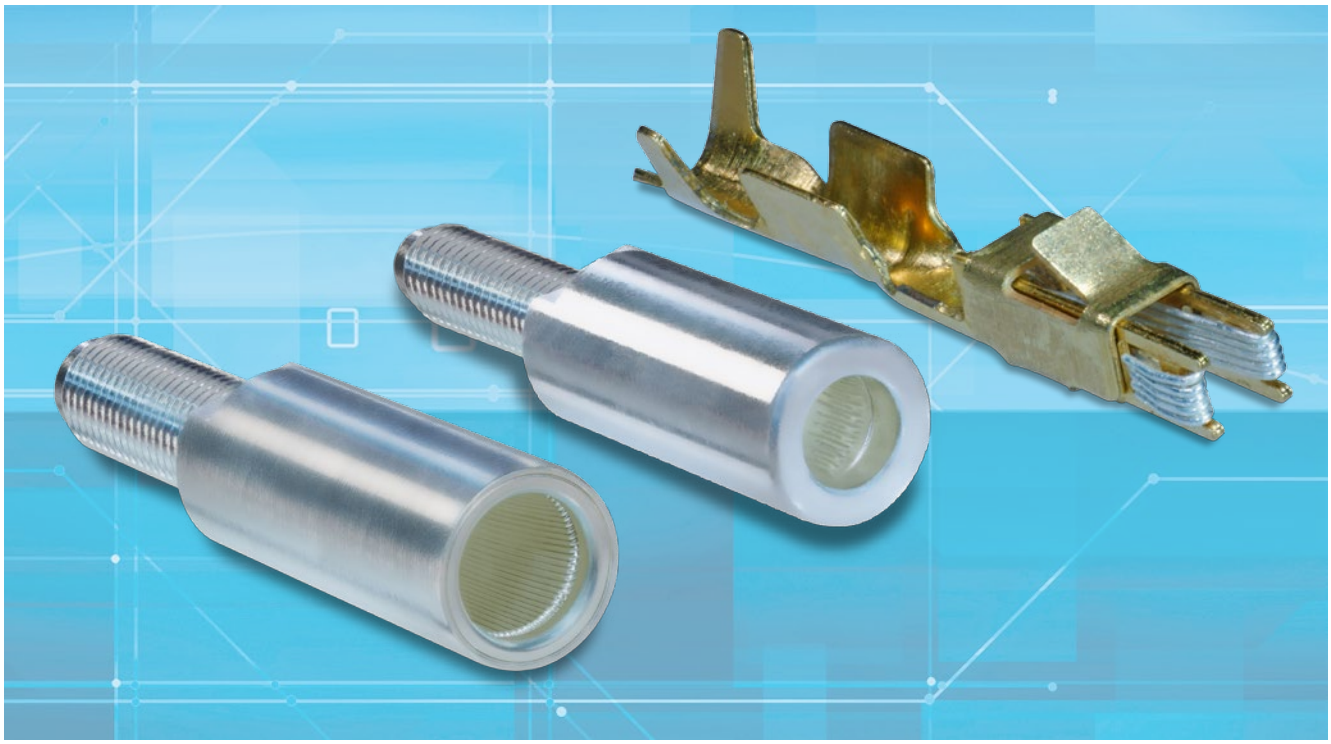
Screw termination

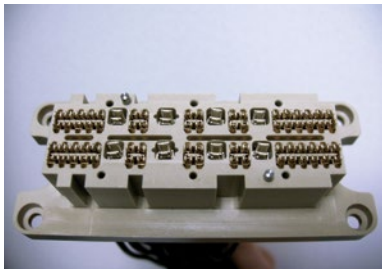
Tightening torques

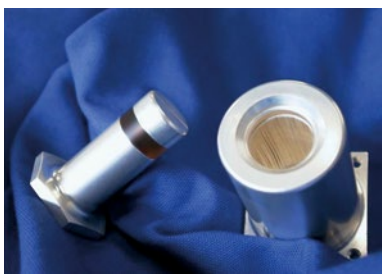
Connection thread	Tightening torque Maximum in Nm
M2	0.2
M3	0.5
M4	1.2
M5	2.0
M6	3.0
M8	6.0
M10	10.0
M12	16.0
M14	22.0
M16	30.0
M18	40.0
M20	50.0

Maximum tightening torque with solid screw termination and standard support material (brass).

Technical Information



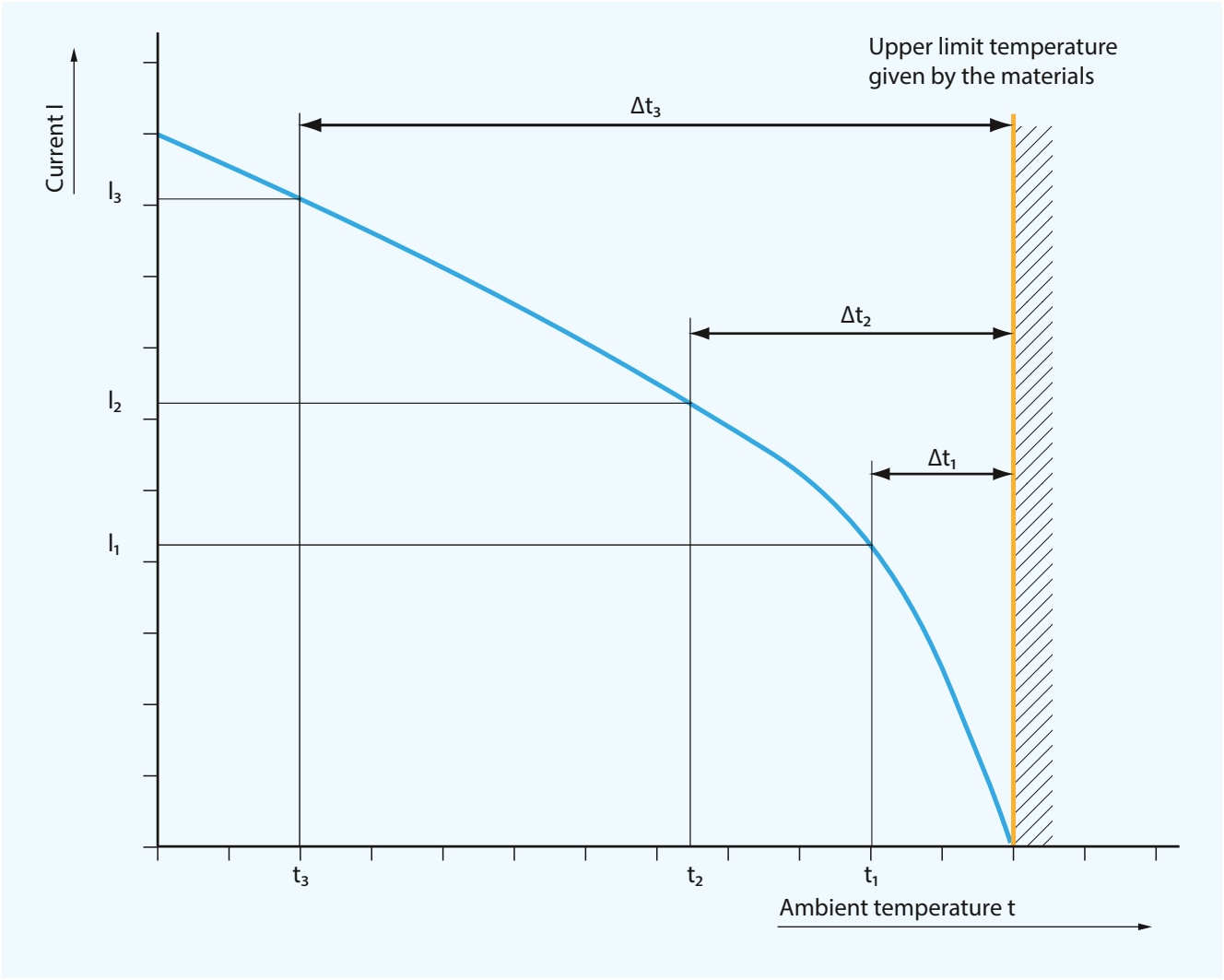




Principles of Current Carrying Capacity

Derating measurement procedure (DIN EN 60512-5-2: 2002)

Structure of the basis current carrying capacity curve



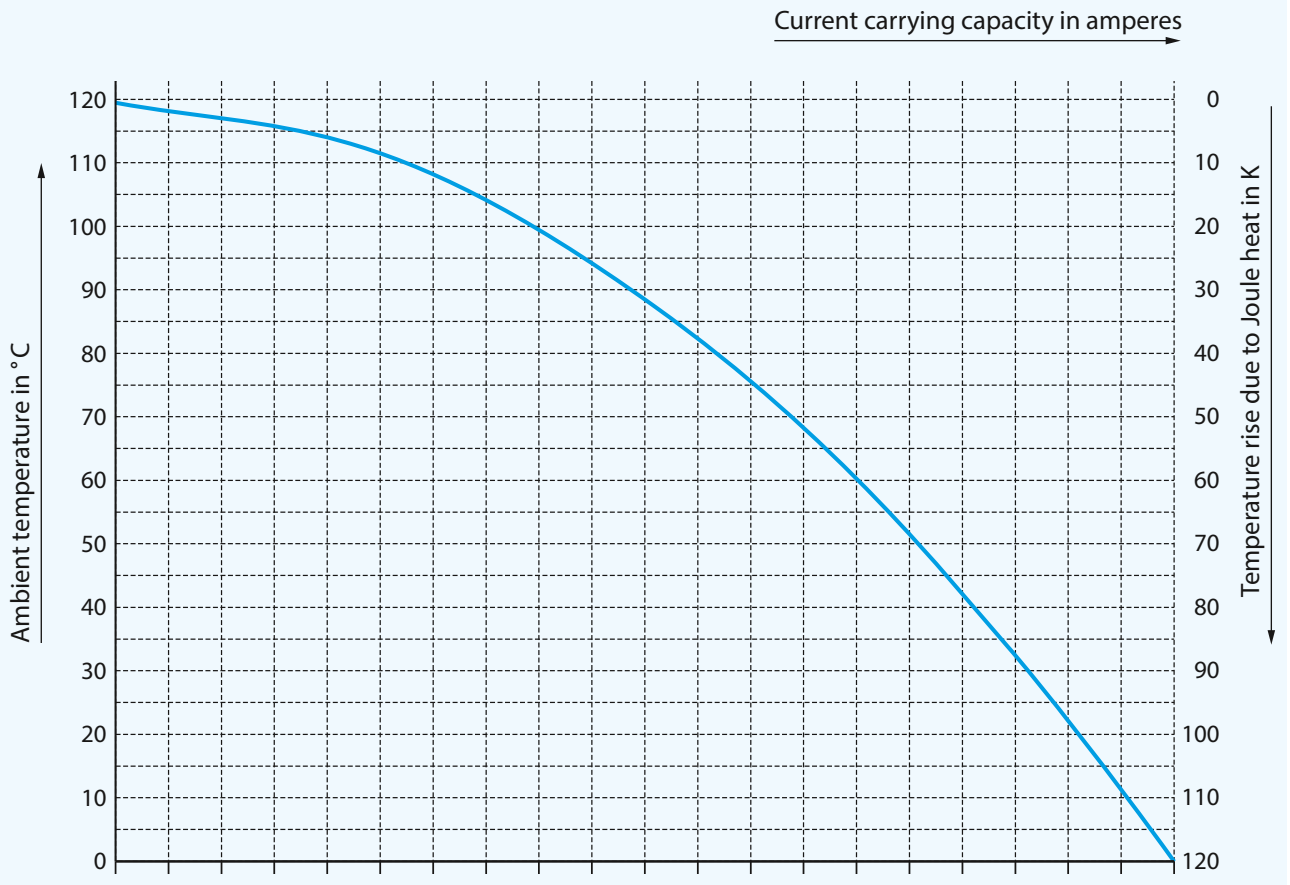
A connector's current carrying capacity is determined by measurement. It is determined by taking into account the self-heating due to Joule heat and the ambient temperature, and is limited by the thermal properties of the contact materials used; the upper limit temperatures of these materials should not be exceeded.

The relationship between current, the temperature increase caused as a result of the power dissipation at the contact resistor and the ambient temperature is depicted in a curve. The curve is drawn in a linear coordinate system with the current "I" as the ordinate and the temperature "t" as the abscissa. The upper limit temperature is used as a limit for the diagram.

In three measurements, the temperature rise due to Joule heat (Δt) is determined at different currents in at least three connectors and the points determined in this process are connected into a parabolic basis curve.

The corrected current carrying capacity curve (derating curve) can be derived from the basis curve. The safety factor (0.8 × In) can be used to give consideration to such values as manufacturing tolerances as well as to uncertainties in the temperature measurement and in the measurement setup.

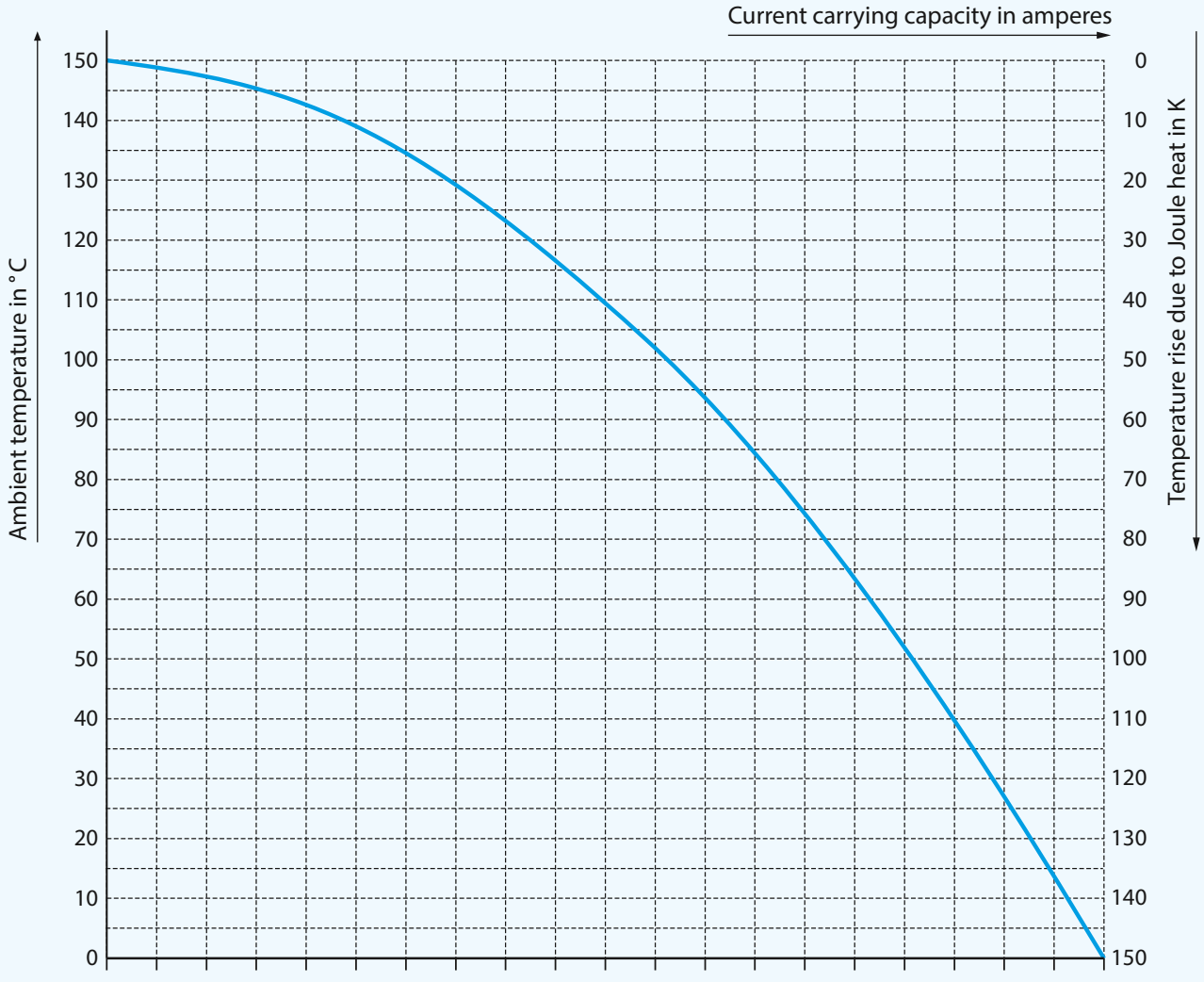
Current Carrying Capacity Diagram for ODU SPRINGTAC® (Contact with Springwire Technology)



∅1	0	2	4	6	8	10	**12**	14	16	**18**	20
∅1.5	0	4	8	12	16	20	**25**	27	31	**35**	40
∅2	0	5	10	15	20	25	**30**	35	40	**45**	50
∅2.5	0	5	10	15	20	25	**30**	35	40	**45**	50
∅3	0	5	10	20	25	30	**35**	40	45	**50**	55
∅4	0	10	20	25	35	45	**55**	60	70	**80**	90
∅5	0	15	30	40	55	70	**85**	90	100	**110**	120
∅6	0	15	30	45	60	80	**95**	110	125	**140**	155
∅8	0	25	45	70	90	115	**140**	160	185	**210**	230
∅10	0	30	60	85	115	145	**175**	200	235	**275**	300
∅12	0	40	75	110	150	190	**230**	265	300	**340**	375
∅14	0	45	90	140	185	230	**280**	320	360	**400**	450
∅16	0	55	110	165	220	280	**340**	380	420	**460**	500
∅18	0	60	120	180	245	310	**375**	430	480	**520**	570
∅20	0	75	150	220	295	370	**450**	500	550	**600**	660
∅22	0	80	160	235	315	400	**480**	540	590	**650**	710
∅24	0	80	165	245	330	410	**500**	575	640	**700**	770
∅26	0	85	175	260	350	435	**530**	600	675	**750**	825
∅28	0	105	215	320	425	535	**650**	710	780	**850**	930
∅30	0	120	235	350	470	590	**720**	800	875	**950**	1025
∅36	0	150	300	440	590	740	**900**	1000	1100	**1200**	1300
							Nominal current			Max. continuous current	

Measurement made in accordance to DIN EN 60512-5-2 (basis curve derived shown).
Upper limit temperature: +120° C. Termination with the largest specified nominal cross-section.

Current Carrying Capacity Diagram for ODU LAMTAC®
(Contact with Lamella Technology)



Ø1.5	0	4	8	12	16	**20**	30	35	**40**	45
Ø2	0	5	10	15	20	**25**	35	40	**45**	50
Ø3	0	7	14	20	30	**35**	50	55	**65**	70
Ø4	0	10	20	30	40	**55**	70	80	**95**	100
Ø5	0	15	25	40	50	**70**	95	110	**125**	140
Ø6	0	25	50	75	100	**130**	170	195	**225**	245
Ø8	0	30	60	90	120	**160**	220	250	**290**	315
Ø10	0	35	70	105	140	**185**	230	265	**305**	335
Ø12	0	35	70	110	145	**190**	250	290	**340**	375
Ø16	0	65	130	190	260	**340**	420	480	**550**	615
Ø20	0	85	170	255	350	**450**	555	620	**700**	770
Ø24	0	95	190	290	385	**510**	680	780	**900**	970
Ø28	0	160	320	475	635	**840**	1 100	1255	**1 450**	1 570
Ø30	0	170	340	515	690	**910**	1 190	1360	**1 570**	1 700
						Nominal current			Max. continuous current	

Measurement according to DIN EN 60512-5-2 (basis curve is shown).
Upper limit temperature +150 °C. Connection with the largest specified nominal cross-section.

Reduction Factors

Number of loaded wires	Reduction factors[1)]
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40

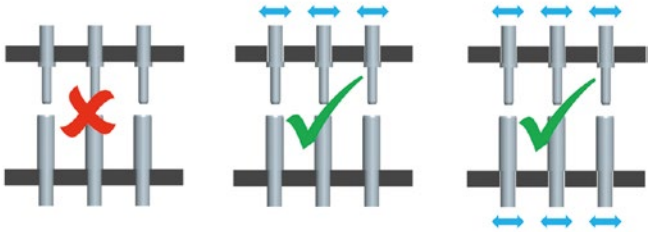
[1] Acc. to DIN VDE 0298 – part 4

This table shows the reduction factors in cable clusters. Extract from DIN VDE 0298-4 Table 26 – Conversion factors for multi-core cables with lines having cross-sections up to 10 mm^2.

Installation Instruction

ODU contact systems are used both as single contacts and in multi-pin connectors. One side (pin or socket side) or both sides should always have a "floating" mounting in order to compensate for manufacturing and assembly tolerances of the individual system components.

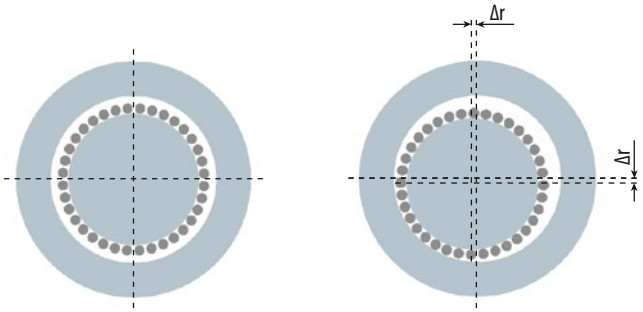
ODU contact systems are not suitable for guiding a plug-in system. Components should be separately provided in order to implement a preliminary guidance piece. Preliminary guidance pieces are always recommended.



permanently mounted | one-way floating | both-sided floating

Our ODU SPRINGTAC and ODU LAMTAC contact series are able to compensate for the radial displacements of the insertion axis. The figure shows a cross-section through a mated contact pair with a radial axis shift.

The contact springs or contact bars are still on the mating surfaces and consequently continue to ensure full contact reliability.



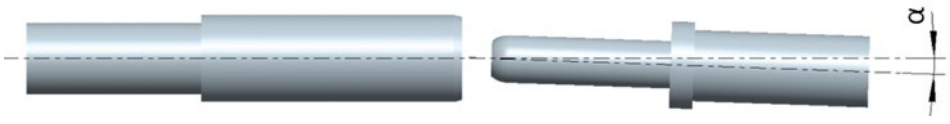
Mated with concentric axis

Mated with radial axis shift Δr

Nominal contact diameter	Max. Δr
≤ ∅ 2 mm	0.02 mm
≤ ∅ 4 mm	0.05 mm
≤ ∅ 14 mm	0.10 mm
≤ ∅ 30 mm	0.20 mm

The deviation angle α of the insertion axis of the pin and socket should be max. ±1°.

It is especially important to consider this when implementing a "floating" assembly position.



Maintenance Kit for ODU SPRINGTAC® and ODU LAMTAC® Contacts

Contact lubrication improves the mechanical characteristics of contact systems. We recommend that the contact surfaces also be cleaned before being lubricated in order to remove impurities. With proper care, it is possible to minimize significantly the wear caused by frequent matings and to reduce the mating and demating forces. The cleaning and lubrication interval must be adapted individually to the conditions, and these steps should be carried out only with products recommended by the contact manufacturer.

ODU has put together a maintenance kit for this step so that you can carry out lubrication directly at your site. A cleaning brush and a special cleaning cloth, together with precise instructions, allow optimal care of the contacts. The maintenance kit can be used for all ODU contacts and connectors as long as no other specifications apply.

Part number: 170.000.000.000.100

Technical characteristics of the maintenance kit can be found on our website:
www.odu.de/fileadmin/downloadcenter/anleitungen/170-000-000-000-100.pdf

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

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

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

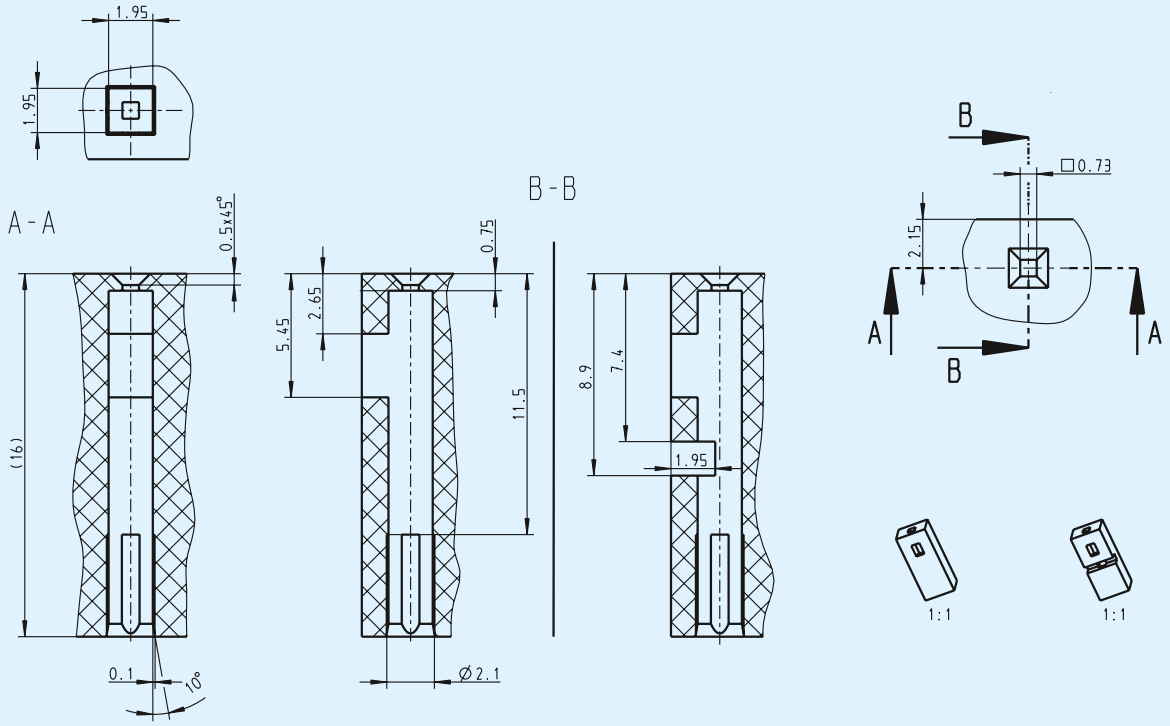
Stranded wires are made from wires with smaller gauge sizes (higher AWG gauge number). The AWG gauge number of the stranded wire is equal to that of a solid conductor of the same size wire. The cross section of the stranded conductor is the sum of cross sections of the single connectors. For example, a AWG-20 stranded wire of 7 AWG-28 conductors has a cross section of 0.563 mm^2; an AWG-20 stranded wire with 19 AWG-32 conductors has a cross section of 0.616 mm^2.

Conversion table: AWG – mm^2

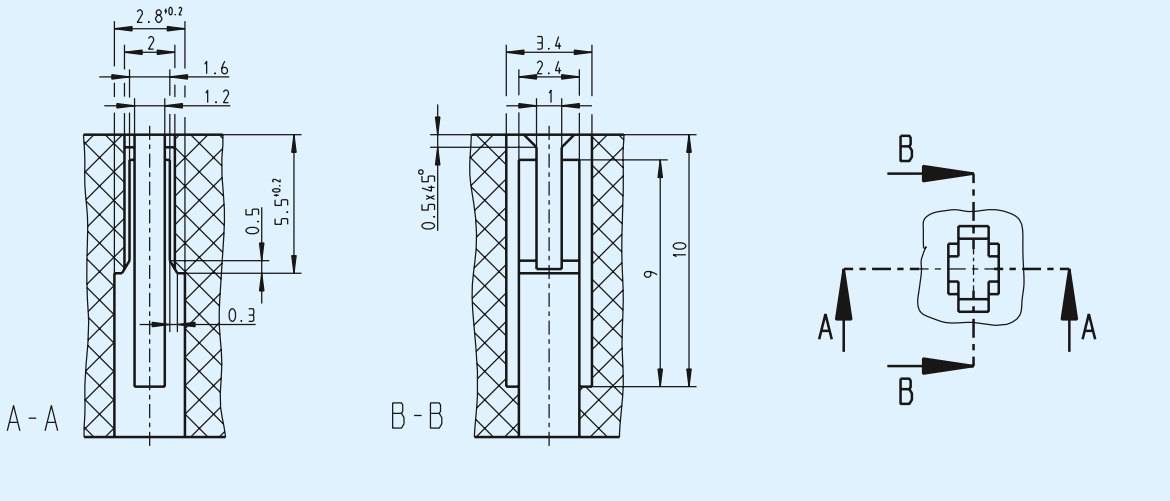
Circular wire					
AWG	Diameter		Cross-section	Weight	Max. resistance
	Inch	mm	mm^2	kg/km	Ω/km
10 (1)	0.1020	2.5900	5.2700	47.000	3.45
10 (37/26)	1.1090	2.7500	4.5300	43.600	4.13
12 (1)	0.0808	2.0500	3.3100	29.500	5.45
12 (19/25)	0.0895	2.2500	3.0800	28.600	6.14
12 (37/28)	0.0858	2.1800	2.9700	26.300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

ODU SPRINGTAC® Flatsockets (Contact with Springwire Technology)

Chamber dimensions for 0.64 × 0.64 mm [1)]



Chamber dimensions for 1.6 × 0.6 / 0.8 mm

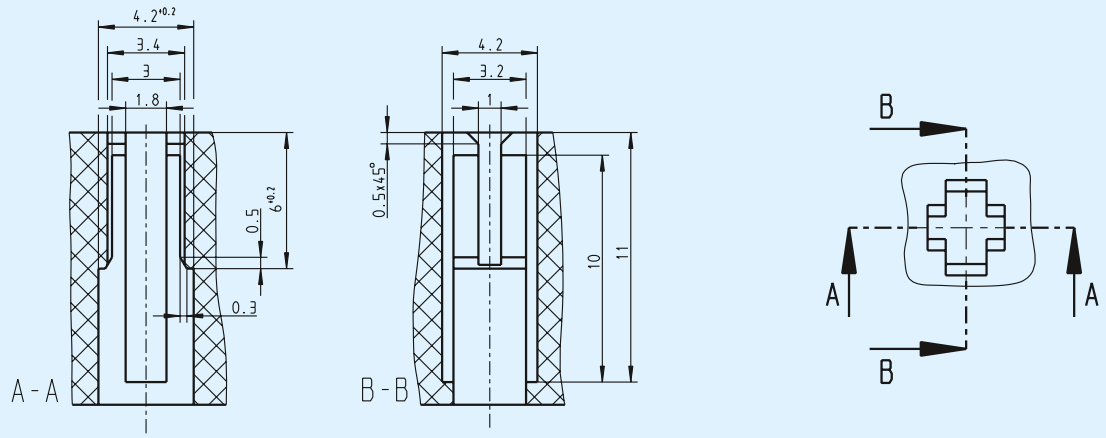


Dimensions without tolerance statement in accordance to DIN ISO 2768 fine

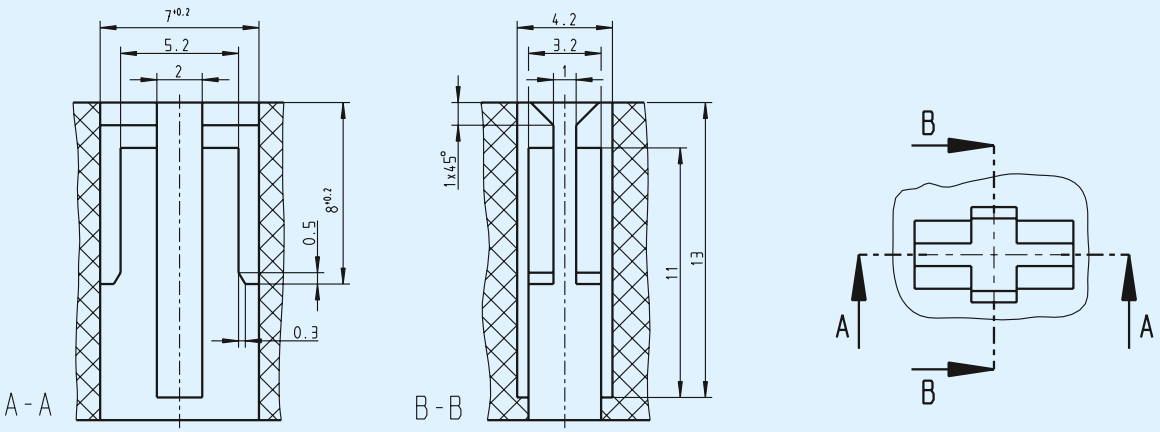
[1)] Version with groove for secondary locking

ODU SPRINGTAC® Flatsockets (Contact with Springwire Technology)

Chamber dimensions for 2.8 × 0.8 mm [2)]



Chamber dimensions for 6.3 × 0.8 (4.8 × 0.8) mm [2)]



Dimensions without tolerance statement in accordance to DIN ISO 2768 fine

[2)] Slightly increased mating and demating forces result for the articles 190.224 ... ... 000 and 190.225 ... ... 000.

Technical Information / Definitions / Terms

AWG
See page 46.

Basis curve
Metrologically established current carrying capacity curve for connectors according to the measurement procedure described in EN-60512-5-2:2002 depending on the permissible limit temperature of the materials.

Crimping
Termination technology in which a non-detachable, solderless electrical and mechanical connection is carried out by compression or pressure forming of the crimp barrel around the conductor.

Current carrying capacity
(Nominal and maximum continuous current)
The information refers to adequately sized connection cable according to DIN VDE 0295 (EN 60228) Class 5, so that this does not cause any further temperature increase. The stated temperature increase is from the contact. The values that are given are average values.

Derating curve
The corrected current carrying capacity curve, derived from the determined basis curve (0.8 × In). It takes into account manufacturing tolerances and uncertainties in the temperature measurement and in the measurement conditions.

Derating measurement method (DIN EN 60512-5-2)
Measuring method that determines the current carrying capacity of connectors, taking into account the maximum permissible limit temperature.

Limit temperature
The highest permissible temperature at which a connector is allowed to be operated. It includes contact heating due to the current carrying capacity. The limit is +120 °C for standard springwire contacts and +150 °C for standard lamella contacts.
For high temperature applications, please contact ODU.

Lubrication
All standard contacts are lubricated before leaving the factory. For re-lubrication we recommend the ODU maintenance kit (see page 45).

Materials (standard version)
Pins and carriers of the sockets are silver-plated and made of a CuZn alloy. The lamellas are made of a CuBe alloy and are also silver-plated. The wires of the springwire contacts are made of a CuSn alloy and are also silver-plated.

Mating cycles
Mechanical operation of connectors and plug-in devices by mating and demating. One mating cycle comprises one mating and one demating process.
The default value for lamella contacts is 10,000 mating cycles, for flatsockets 50,000 mating cycles and for springwire contacts 100,000 mating cycles. These values are valid only under the following conditions:
– Clean environment
– Adequate radial guidance
– Flawless counter pins.

Mating or demating force
For lamella contacts, the information refers to lubricated contacts (condition at delivery) and after approximately 30 mating cycles. The forces are higher for new contacts (lubricated).
For springwire contacts, the information refers to contacts in new condition. The information refers to silver-plated surfaces. The provided values are averages with a possible deviation of ±50 %.

Maximum continuous current
The current intensity, determined by measurement at room temperature (around 20° C), which causes a rise in the contact temperature up to limit temperature.

Nominal current
The current intensity determined by measurement which causes a contact temperature rise of 45 Kelvin. It is determined according to the derating measurement method (DIN EN 60512-5-2: 2002) and derived from the basis curve.

Solder connections
Termination technology in which two metallic materials are connected to each other with the help of a melted metal (solder) whose melting temperature is lower than the melting temperatues of the base materials that are to be connected.

Technical Information / Definitions / Terms

Surge current
Single pulse current with a load duration time of 10 ms.

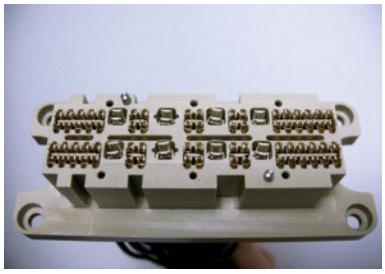
Termination technologies
Methods for connecting the cables to the electromechanical devices, for example solderless connections according to DIN EN 60352: Crimp, solder or press-in connections, etc. (see page 34).

Contact resistance
The total resistance from termination to termination. The interface resistance is considerably less than the volume resistance. The values given here are average values.

Suitable precautions must be taken in order to ensure that people do not come into contact with live conductors during installation or operation.
All entries were reviewed with utmost diligence before this catalogue was printed.

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

Company Information



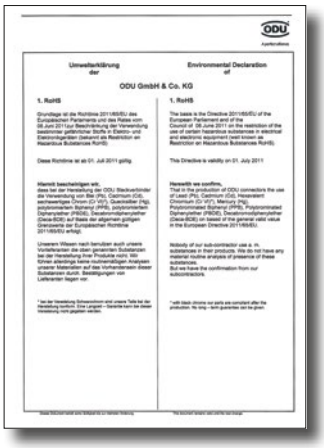
Quality Management and Certifications

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

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

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

ODU-USA is registered with the DDTC and able to complete ITAR restricted manufacturing projects

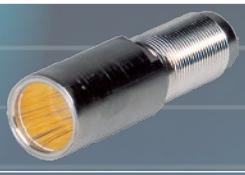
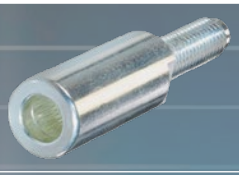
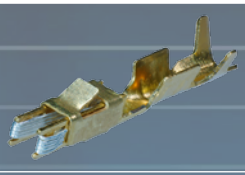
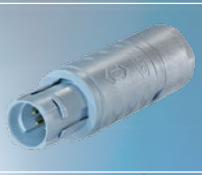
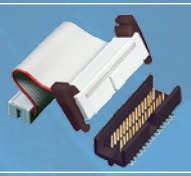
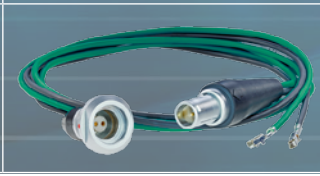
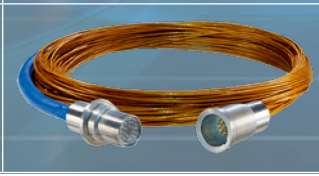


Your Partner in Many Application Areas

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

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

The Complete ODU Product Range

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

Everything From One Source: ODU – The System Supplier

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

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

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

ODU offers you everything from one source

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

Advantages for the customer

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

Application Specific Connectors

Innovative, dynamic markets call for innovative connectors.

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

In spite of the global trend toward standardized connectors, there are always applications that call for an application specific solution.

We accept this challenge and develop innovative products for our customers based on our many years of extensive know-how, our creativity and, not least, our high level of vertical integration.
Technology access and technology mastery, combined with intensive cooperation with the user, form the basis for achieving success together.

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

ODU Worldwide

A perfect alliance.

ODU GmbH & Co. KG

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Other qualified representatives shown on our website:
www.odu.de/sales

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