Catalogue No. 1006-e

Single Contacts

ODU Springtac™ Contacts and ODU Lamella™ Contacts

Ø 0,76 mm to Ø 60 mm

- for medical cables
- for Connectors
- for Power Supply
- for Testing in Automotive Electronics

and many more areas

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All dimensions in mm.
All figures are Illustrations.
Changes reserved.

Performance Requirements for Electrical Contacts

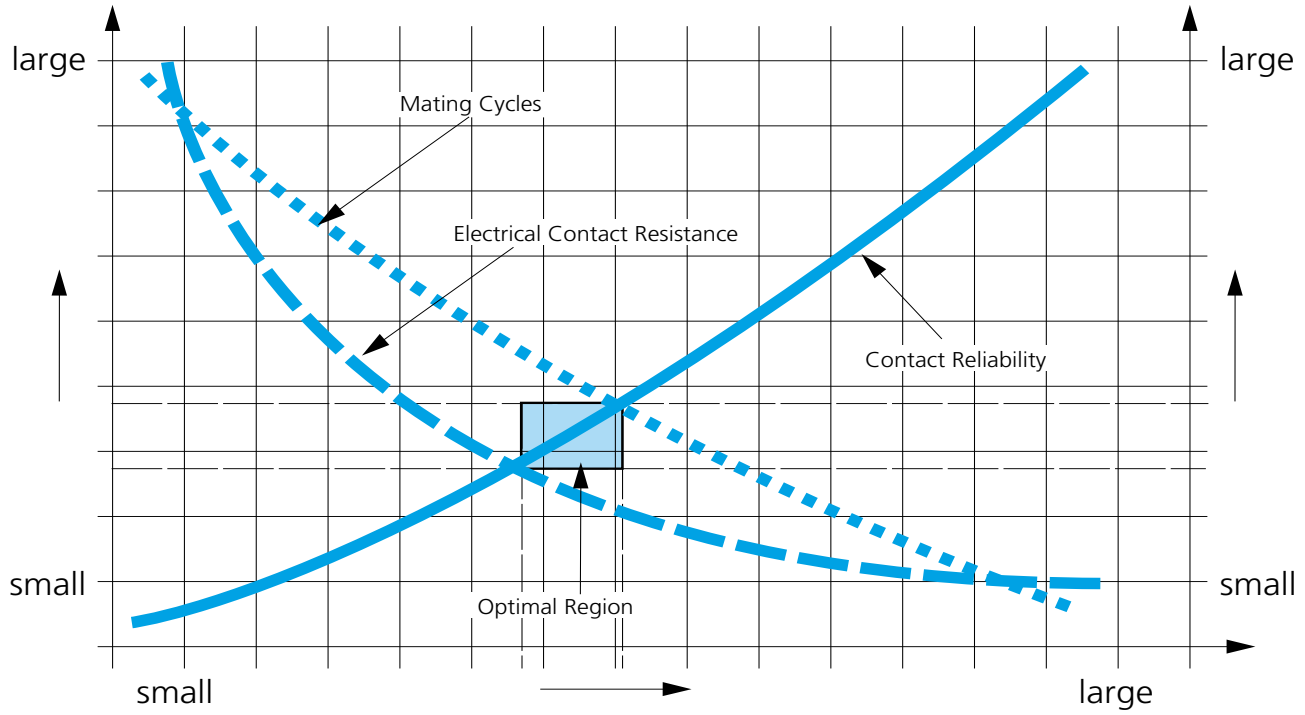
As a rule, connectors consist of housings, insulators, and contacts. Single contacts, as discussed in this catalog, are typically used without housings or insulators.

Important parameters for defining contact performance are:

- contact resistance
- max. temperature
- current load
- insertion and withdrawal force
- max. number of mating cycles
- contact reliability
- life cycle
- dimensions
- cost

It should be noted that there is a clear relationship between all these parameters. It is relatively easy to reduce. Insertion force or increase number of mating cycles, but it will cause an increase in contact resistance. Often, it will also have a negative effect on the contact reliability. (see Figure 1).

Contact resistance and current load are two very important contact characteristics.



Insertion and Withdrawal Force, Contact Normal force

Fig. 1
Shows relationship between mating cycles, electrical contact resistance, and contact reliability as a function of insertion and withdrawal force.

Contact Theory - Electrical Resistance

When two cylindrical conductors are pressed together as shown in Fig. 2 they create a simple electrical contact.

If an electrical power source is connected to the two contacts as shown in Fig. 2 an electrical current flows and one can measure a voltage drop Δ **U** along the path of the current. The voltage drop is a result of the current flowing through conductor resistance $\mathbf{R_b}$ and interface resistance $\mathbf{R_k}$ (sometimes called restriction resistance) at the point where the two conductors are in contact. The sum of the two resistances is defined as contact resistance $\mathbf{R_d}$.

$$\mathbf{R_d = R_b + R_k}$$

Contact resistance $\mathbf{R_d}$ is determined through measurement. The conductor resistance $\mathbf{R_b}$ can be calculated:

$$R_b = \frac{L \cdot \varrho}{A}$$

R_b (Ω) = Conductor Resistance
L (m) = Conductor Length
ϱ ($\Omega \cdot mm^2/m$) = Specific Resistance of Conductor
A (mm^2) = Conductor Cross Section

Example: L = 75 mm
ϱ (Cu) = 0,018 $\Omega \cdot mm^2/m$ ($\triangleq \mu\Omega \cdot m$)
d = 3,5 mm $\Rightarrow$ $A = \frac{\Pi \cdot d^2}{4} = 9{,}6\ mm^2$
R_b = 0,14 mΩ

(see. Fig. 2)

We now can determine $\mathbf{R_k}$ easily:

$$\mathbf{R_k = R_d - R_b}$$

The interface resistance is a function of several parameters - some of which are:

Surface plating material and finish (roughness), surface condition (corrosion), normal contact force (**F**), physical layout such as number of contact points, etc..

For practical application it is necessary to consider R_d of the contact as the resistance from one contact termination to the other.

Brand new single contacts (also single-position connectors) have contact resistance $\mathbf{R_d}$ from about 50 % of conductor resistance $\mathbf{R_b}$ and 50 % of the interface resistance $\mathbf{R_k}$, - which means that $\mathbf{R_d}$ is approximately ($\mathbf{R_b + R_k}$).

The conductor resistance $\mathbf{R_b}$ will generally remain constant over the life of the contact. The interface resistance $\mathbf{R_k}$ will typically change over time.

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Cylindrical Conductors (Pins)

Pressed together with normal force **F**.

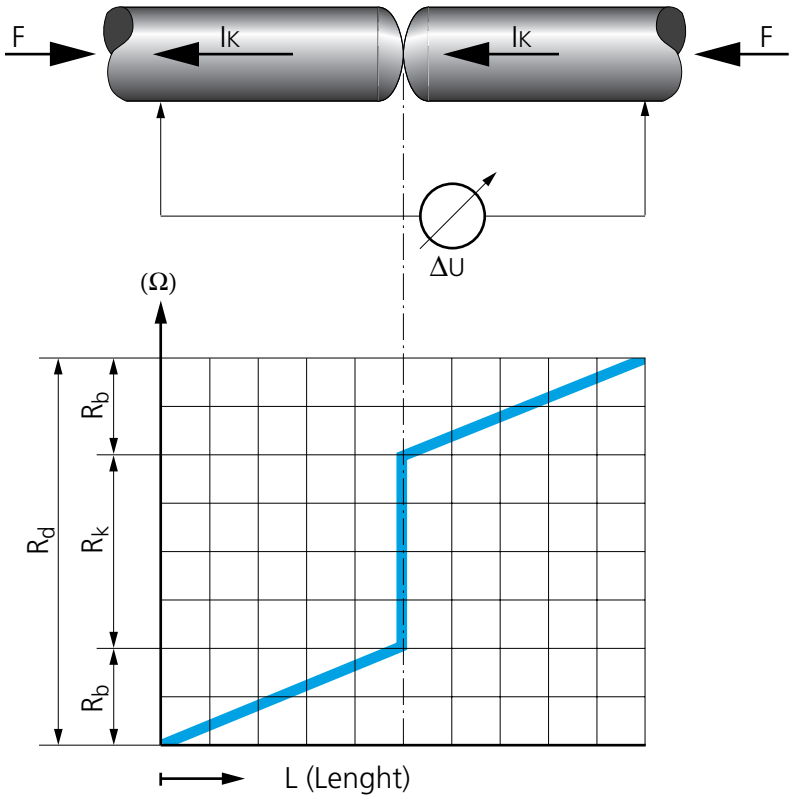

Fig. 2

Δ U	= Total voltage drop
	= $R_d \cdot I_k$
R_d	= Contact resistance
I_k	= Contact current
R_b	= Conductor resistance
R_k	= Surface resistance

Contact Principle of Machined Contacts

Major categories of machined, also known as turned, cylindrical contacts are:

- Slotted contacts
- Lamella (louvered) contacts
- Springwire contacts

The difference is only in the socket design. Pins are common to the three types of sockets. (Fig. 3).

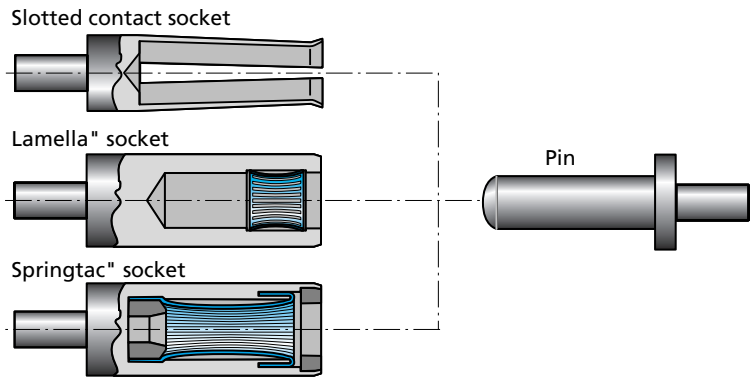

Fig. 3

Slotted sockets in their simplest form have one slot with two contact points between socket and pin. Sockets with two slots have four contact points (See Fig. 4 below).

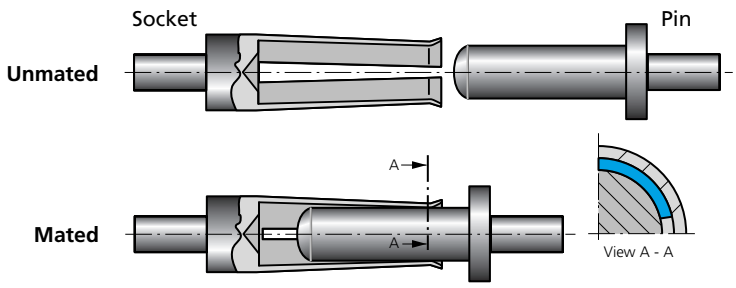

Fig. 4

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The lamella contact (ODU Lamella™) also known as louvered contact, has many contact points. One or more of the stamped contact bands can be used in the same carrier (Fig. 5).

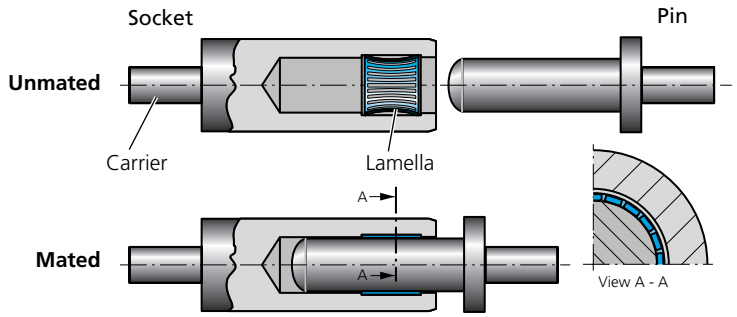

Fig. 5

The springwire contact (ODU-Springtac™) offers the largest number of contact points between pin and socket. The individual springwires are mounted in optimum position inside the socket carrier. The springwires make contact with the pin surface independently from each other (see Fig. 3 and 6).

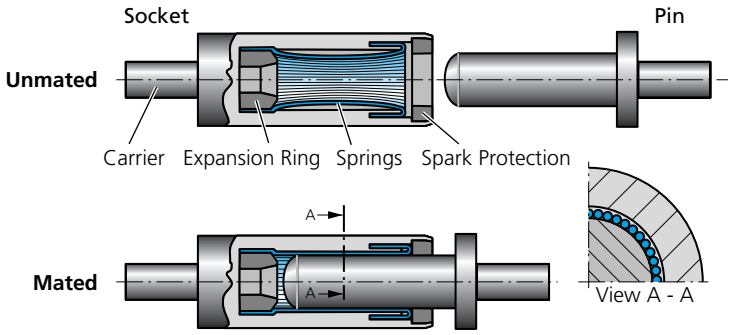

Fig. 6

A typical 4 mm contact has the following number of pin-to-socket contact points:

- Slotted contact 2 or 4
- Lamella™ contact 18
- Springtac™ contact 38

Evaluation of the Three Contact Designs

ODU manufactures all three types of contact.

The **slotted contact** is used extensively in all standard connector designs. It is less expensive to manufacture and offers relatively good performance in contact resistance and current load. It is limited in the number of mating cycles and contact force. (Fig. 7)

In its simplest form (without additional springs) it is generally used only in connectors with contacts of less than 3 mm in diameter. It is therefore not discussed in this single contact catalog.

The **lamella (louvered) contact** has important advantages over the slotted contact. For example, insertion and withdrawal forces are less, contact resistance is less, number of mating cycles is about ten times higher, and contact reliability is better (Fig. 7). With the use of contact lubricants further improvement are possible. The ODU Lamella™ contact has contact lubricant applied by the factory (without available on request). The Lamella™ contact can be manufacture very cost effectively.

The **springwire contact** has all the advantages of the lamella contact in addition to:

- extreme contact reliability due to:
  a) independent springwires
  b) long spring path of the springwires compensates for higher alignment tolerances, especially important in springwire pins for test leads.
- very high number of mating cycles when designed with optimum normal force and high quality surface finish. No contact lubricant is needed.
- can be as small as .76 mm pin diameter and still have 15 independent springwires!

The above technical advantages can only be realized with significant manufacturing know-how. The cost level for the three contact types is about 1:2:3 for slotted/lamella/springwire contacts.

Technical Characteristics of Turned Contacts

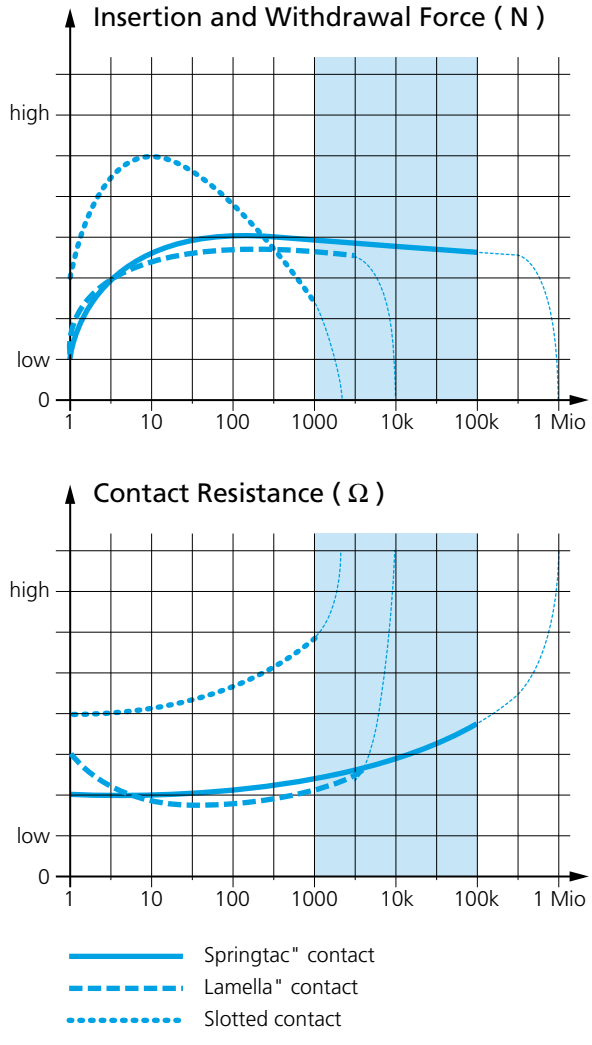

Fig. 7

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Comments to the Technical Parameters of ODU Contacts (see Page 10 and on).

Mechanical Parameters

- Insertion and withdrawal force:
  Data for **Lamella™contacts** is for standard contacts with lubricant and after 30 pre-conditioning mating cycles.

  Springtac™ data is for new contacts without lubricant.
  Surface finish is silver-plated for pin, socket carrier, springwires, and lamellas. All data are average values.

Electrical Data

- Current load (nominal and max. continuous):
  Data is based on contacts terminated to correct size of conductors. No additional contact temperature rise due to incorrect conductors or cables. All measured contact temperature rise is due to contact resistance, only. For temperature rise vs. current load see table on page 34.
- Nominal current:
  The current which causes a 45° C temperature rise (for example: from 23° C to 68° C)
- Max. continuous current:
  The current which causes a temperature rise to 120° C (VDE 0627)
- Short-term current:
  Current load for no more than 10 ms.
- Contact resistance:
  total resistance $\mathbf{R_d}$ (see Page 4) of the contact from termination to termination. The interface resistance is clearly less than the contact resistance (see Page 4). All data are average values.
- Mating cycles:
  Standard for Lamella™ contact 10,000 mating cycles, Standard for Flatsocket™ 50.000 mating cycles and Standard for Springtac™ contact 100,000 mating cycles. Before the first plugging it is necessary to attach factory-made a thin lubricant film on the contacts.

  Both values based on the following assumptions:

  - clean environment

  - correct radial alignment

  - clean mating pin.
- Lubricants:
  Standard use only in **Lamella™** contacts.

  For additional lubrication we suggest: Kontasynth BA 100 Spray – made by Klüber Lubrication.
- Materials (standard):
  Pin and carrier CuZn alloy with silver plated surfaces. Lamellas CuBe-alloy, silver-plated. Springwires CuSn-alloy silver-plated.
  (see ordering information page 39).

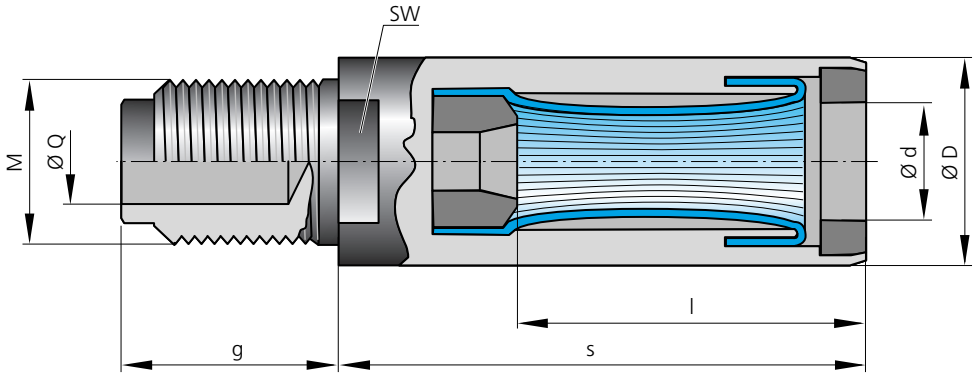
Series DSO

Springtac™ Sockets with Solder or Threaded Stud Termination.

– Springtac™ sockets with threaded stud termination mate with solid pins in corresponding size.

– Ideal for connections with power bus bars, backplanes and contact blocks.

– Easily connected to cables using standard cable lugs or soldered into solder cavity.



Part Number	Dimensions									Mech. Data[1]		Electrical Data[1]	
for Standard Parts	Ø d	Ø D	l	s	SW	g	M (Thread M ...)	Ø Q	Insertion Force in N	Withdrawal Force in N	Nominal Current in A	Max. Cont. Current in A	Shortterm Current in kA	Contact Resistance µΩ
170.106.100.201.000	1,5	4	10,5	15,5	–	12,5	2,6	1,25	2	1,5	25	35	1,5	500
170.107.100.201.000	2	4	10,5	15,5	–	12,5	3	1,8	4	3	30	40	2,5	340
170.109.100.201.000	2,5	6	10,5	15,5	5	12,5	3	1,8	5,5	4	30	40	3	300
170.110.100.201.000	3	7	15	22,5	5	15	4	2,3	6,5	4,5	35	50	4	250
170.111.100.201.000	4	8	15	22,5	6	19	5	3	11	8	55	80	7	210
170.112.100.201.000	5	9	15	22,5	7	19	5	3	15	10	85	110	10	195
170.113.100.201.000	6	11	24	33,5	8	22	6	3,6	18	13	95	140	13	180
170.115.100.201.000	8	14	24	33,5	11	26	8	4,8	22	15	140	210	18	160
170.117.100.201.000	10	16	24	33,5	12	30	10	6,2	30	22	175	275	25	150
170.119.100.201.000	12	18	36	47	14	34	12x1,5	7,6	35	25	230	340	34	140
170.120.100.201.000	14	21	36	47	17	38	14x1,5	9	40	30	280	400	40	135
170.121.100.201.000	16	23	36	47	19	42	16x1,5	11,5	50	35	340	460	50	130
170.122.100.201.000	18	25	48	66	19	46	18x1,5	12,8	55	40	375	520	60	120
170.123.100.201.000	20	27	48	66	22	50	20x2	14,5	65	45	450	600	70	115
170.124.100.201.000	22	30	48	66	24	54	22x2	16	70	50	480	650	80	110
170.125.100.201.000	24	32	48	66	27	58	24x2	17,8	80	55	500	700	90	105
170.126.100.201.000	26	34	48	66	27	62	27x2	20	85	60	530	750	100	100
170.127.100.201.000	28	36	48	66	32	62	32x2	25	90	60	650	850	110	90
170.128.100.201.000	30	38	48	66	32	62	32x2	25	100	70	720	950	120	80

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm. - Dim. ØD and s min. dimensions.

[1] See tech. info. Page 9

Additional variations and other dimensions are available on request. For ordering information see page 39

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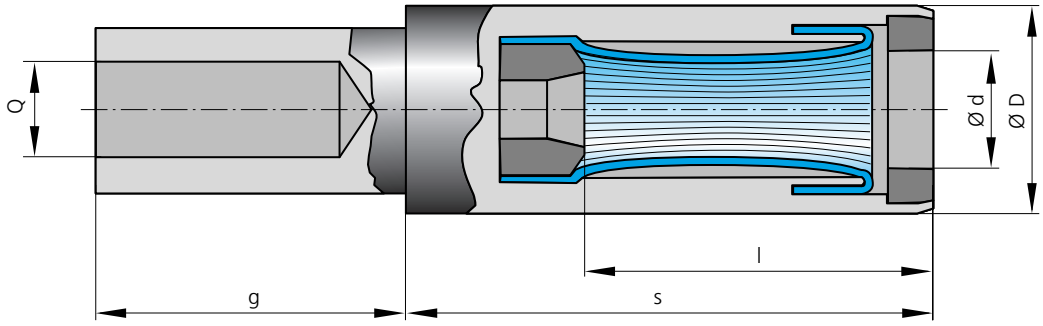
Series DCO

Springtac™ Sockets with Crimp Termination

– Springtac™ sockets with crimp termination mate with solid pins in corresponding size.

– Ideal for connections to stranded copper conductors.



Part Number	Dimensions						Mech. Data[1]		Electrical Data[1]			Part No. Crimp Tools
for Standard Parts	Ø d	Ø D	l	s	g	Q (Termination Cross-Section mm²)	Insertion Force in N	Withdrawal Force in N	Nominal Current in A	Max. Cont. Current in A	Shortterm Current in kA	Contact Resistance µΩ	
170.361.700.207.000	0,76	1,58	7	9,8	5	0,38	0,7	0,5	9	11,5	0,7	3800	See Table Page 28
170.362.700.207.000	1,02	1,98	7	9,8	5	0,5	1	0,8	11	15	1	2200	
171.606.100.201.000	1,5	4	12	15,5	6,5	1,5	2	1,5	25	35	1,5	500	
171.607.100.201.000	2	4	10,5	15,5	6,5	2,5	4	3	30	40	2,5	340	
171.609.100.201.000	2,5	6	10,5	15,5	6,5	2,5	5,5	4	30	40	3	300	
170.610.100.201.000	3	5,5	15	22,5	6,5	2,5	6,5	4,5	30	40	3	250	
171.610.100.201.000	3	7	15	22,5	6,5	4	6,5	4,5	35	50	4	250	
170.611.100.201.000	4	8	15	22,5	13	4	11	8	35	50	4	210	
171.611.100.201.000	4	8	15	22,5	12,5	6	11	8	55	80	7	210	
171.612.100.201.000	5	9	15	22,5	17,5	10	15	10	85	110	10	195	
171.613.100.201.000	6	11	24	33,5	22,5	16	18	13	95	140	13	180	
171.615.100.201.000	8	14	24	33,5	22,5	25	22	15	140	210	18	160	
171.617.100.201.000	10	16	24	33,5	22,5	35	30	22	175	275	25	150	
171.619.100.201.000	12	18	36	47	28	50	35	25	230	340	34	140	
171.620.100.201.000	14	21	36	47	28	70	40	30	280	400	40	135	
171.621.100.201.000	16	23	36	47	28	95	50	35	340	460	50	130	
171.622.100.201.000	18	25	48	66	34	120	55	40	375	520	60	120	
171.623.100.201.000	20	27	48	66	34	150	65	45	450	600	70	115	
171.624.100.201.000	22	30	48	66	34	185	70	50	480	650	80	110	
171.625.100.201.000	24	32	48	66	54	240	80	55	500	700	90	105	
171.626.100.201.000	26	34	48	66	64	300	85	60	530	750	100	100	
171.627.100.201.000	28	40	48	66	69	400	90	60	650	850	110	90	
171.628.100.201.000	30	42	—	135		500	100	70	720	950	120	80	

Standard surface finish: Carrier and springwires 6µ Ag. Other finishes on request.

Dimensions in mm. - Dim. ØD and s min. dimensions.

[1] See tech. info. Page 9

Additional variations and other dimensions are available on request. For ordering information see page 39

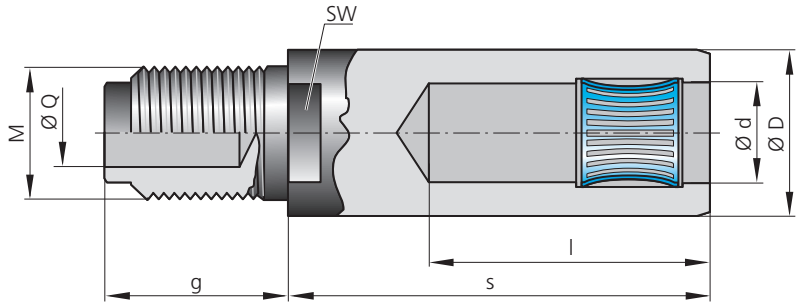
Series LS1

Sockets with Lamella™ Contacts for Threaded Stud Termination

– Lamella™ sockets with threaded stud termination mate with solid pins in corresponding size.

– Ideal for connections to power bus bars, backplanes and contact blocks.

– Easily connected to cables using standard cable lugs or soldered into solder cavity.



Part Number	Dimensions								Mech. Data[1]		Electrical Data[1]			
for Standard Parts	Ø d	Ø D	l	s	SW	g	M (Thread M ...)	Ø Q	Insertion Force in N	Withdrawal Force in N	Nominal Current in A	Max. Cont. Current in A	Shortterm Current in kA	Contact Resistance µΩ
178.106.100.201.000	1,5	4	10,5	15,5	–	12,5	2,6	1,25	6	4	25	30	2	420
178.107.100.201.000	2	4	10,5	15,5	–	12,5	3	1,8	7	5	30	40	2,5	370
178.110.100.201.000	3	7	15	22,5	5	15	4	2,3	10	8	40	55	5	270
178.111.100.201.000	4	8	15	22,5	6	19	5	3	15	13	60	80	8	220
178.112.100.201.000	5	9	15	22,5	7	19	5	3	17	14	75	110	11	190
178.113.100.201.000	6	11	24	33,5	8	22	6	3,6	19	16	100	140	14	140
178.213.100.201.000	6	11	24	33,5	8	26	8	4,8	35	32	120	160	16	100
178.115.100.201.000	8	14	24	33,5	11	26	8	4,8	35	30	150	210	22	110
178.215.100.201.000	8	14	24	33,5	11	30	10	6,2	65	60	170	230	25	80
178.117.100.201.000	10	16	24	33,5	12	30	10	6,2	40	35	200	290	28	90
178.217.100.201.000	10	16	24	33,5	12	34	12x1,5	7,6	75	70	220	310	32	65

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm. - Dim. ØD and s min. dimensions.

[1] See tech. info. Page 9

Additional variations and other dimensions are available on request. For ordering information see page 39

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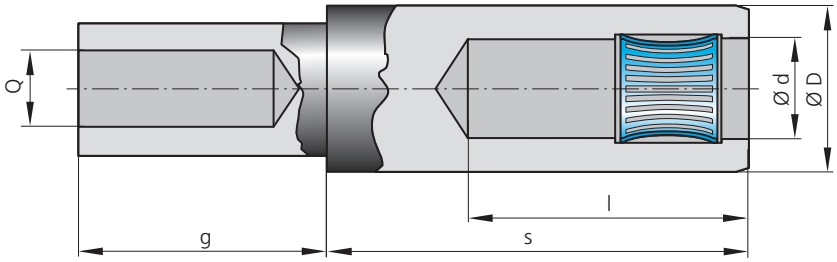
Series LC1

Sockets with Lamella™ Contacts for Crimp Termination

– Springtac™ sockets with crimp termination mate with solid pins in corresponding size.

– Ideal for connections to stranded copper conductors.



Part Number for Standard Parts	Dimensions Ø d	Ø D	l	s	g	Q (Termination Cross-Section mm²)	Mech. Data[1] Insertion Force in N	Withdrawal Force in N	Electrical Data[1] Nominal Current in A	Max. Cont. Current in A	Shortterm Current in kA	Contact Resistance µΩ	Part No. Crimp Tools
178.606.100.201.000	1,5	4	10,5	15,5	6,5	1,5	6	4	25	30	2	420	See Table Page 28
178.607.100.201.000	2	4	10,5	15,5	6,5	2,5	7	5	30	40	2,5	370	
178.610.100.201.000	3	7	15	22,5	6,5	4	10	8	40	55	5	270	
178.611.100.201.000	4	8	15	22,5	12,5	6	15	13	60	80	8	220	
178.612.100.201.000	5	9	15	22,5	17,5	10	17	14	75	110	11	190	
178.613.100.201.000	6	11	24	33,5	22,5	16	19	16	100	140	14	140	
178.713.100.201.000	6	11	24	33,5	22,5	25	35	32	120	160	16	100	
178.615.100.201.000	8	14	24	33,5	22,5	25	35	30	150	210	22	110	
178.715.100.201.000	8	14	24	33,5	22,5	35	65	60	170	230	25	80	
178.617.100.201.000	10	16	24	33,5	22,5	35	40	35	200	290	28	90	
178.717.100.201.000	10	16	24	33,5	22,5	50	75	70	220	310	32	65	

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm. - Dim. ØD and s min. dimensions.

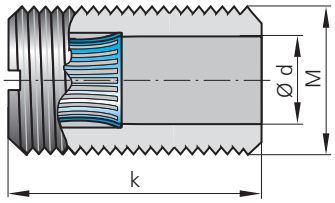
[1] See tech. info. Page 9

Additional variations and other dimensions are available on request. For ordering information see page 39

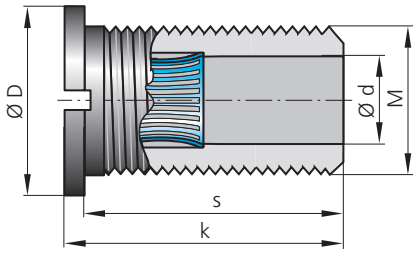
Series LZ1 – LF1

Sockets with Lamella™ Contacts and Outside Thread

Series LZ1



Series LF1



Part Number	Dimensions						Mech. Data[1]			Electrical Data[1]			
for Standard Parts	Ø d	Style	Ø D	k	s	M (Thread M...)	Insertion Force in N	Withdrawal Force in N	Torque in Nm	Nom. Current in A [2]	Max. Cont. Current in A [2]	Shortterm Current in kA	Contact Resistance µΩ
178.306.100.201.000	1,5	Z	–	7	–	4	6	4	0,5	25	30	2	300
178.346.100.201.000	1,5	F	7	7	5,5	4	6	4	0,5	25	30	2	300
178.307.100.201.000	2	Z	–	7	–	5	7	5	0,5	30	40	2,5	250
178.347.100.201.000	2	F	8	7	5,5	5	7	5	0,5	30	40	2,5	250
178.310.100.201.000	3	Z	–	12	–	7x0,5	10	8	1,2	40	55	5	170
178.350.100.201.000	3	F	10	13	10	7x0,5	10	8	1,2	40	55	5	170
178.311.100.201.000	4	Z	–	13	–	8x1	15	13	1,2	60	80	8	140
178.351.100.201.000	4	F	11	13	10	8x1	15	13	1,2	60	80	8	140
178.312.100.201.000	5	Z	–	13	–	10	17	14	3	75	110	11	120
178.352.100.201.000	5	F	13	13	10	10	17	14	3	75	110	11	120
178.314.100.201.000	6	Z	–	19	–	12x1,5	19	16	6	100	140	14	90
178.355.100.201.000	6	F	16	19	10	12x1,5	19	16	6	100	140	14	90
178.315.100.201.000	8	Z	–	26	–	14x1	35	30	6	150	210	22	60
178.356.100.201.000	8	F	18	26	13	14x1	35	30	6	150	210	22	60
178.318.100.201.000	10	Z	–	26	–	18x1,5	40	35	10	200	290	28	55
178.358.100.201.000	10	F	22	26	13	18x1,5	40	35	10	200	290	28	55

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm. - Dim. M and k min. dim..

[1] See tech. info. Page 9. [2] depends on mounting scheme.

Additional variations and other dimensions are available on request. For ordering information see page 39

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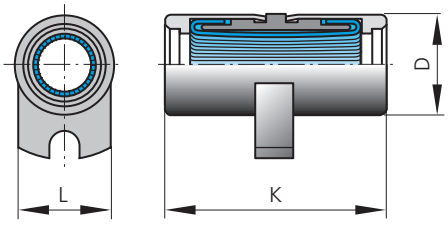
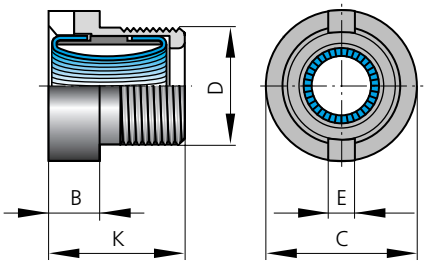
Series DZO – DFO

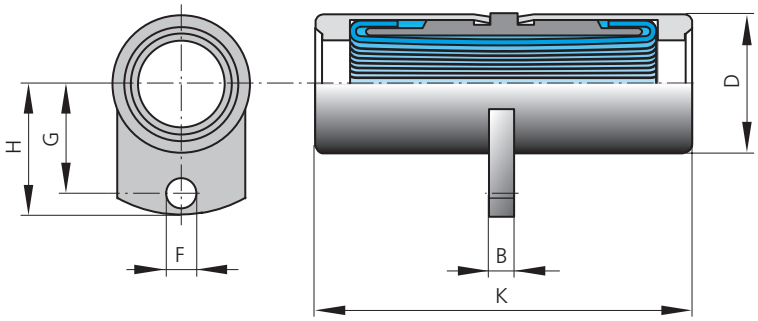
Springtac™ Sockets
open both ends



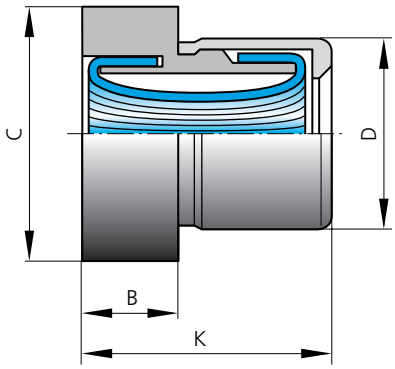
Picture I



Picture III



Picture II



Picture IV

Part Number: for Standard Parts	Picturenumber	Contact Ø	Dimensions: D	K	B	C	E	F	G	H	L	Mech. Data[1]: Insertion Force Mean value in N	Mech. Data[1]: Single Burden in A	Electrical Data[1]: Contact Resistance µΩ
174.010.100.201.000	IV	3	6	8	3	8	–	–	–	–	–	10	20	360
174.011.100.201.000	III	4	M7x0,5	8	3	9	1,5	–	–	–	–	11	25	320
174.014.100.201.000	II	6	10	20	–	–	–	–	–	–	–	19	60	260
174.016.100.201.000	II	6	10	20	2	–	–	2,5	8,5	11	–	19	60	260
174.017.100.201.000	I	8	14	16	2	–	–	–	11	13,5	4	26	80	210
174.018.100.201.000	II	10	16	32	5	–	–	7	13	18,5	–	35	120	170
174.019.100.201.000	II	14	21	43	–	–	–	–	–	–	–	45	115	125
174.020.100.201.000	II	16	22	55	–	–	–	–	–	–	–	50	250	110
174.021.100.201.000	II	20	27	55	8	–	–	17	35	47,5	–	70	375	75
174.024.100.201.000	III	22	M38x1,5	48	–	SW46 50Ø	–	–	–	–	–	75	400	70
174.028.100.201.000	III	30	M44x1,5	48	6	SW50 56Ø	–	–	–	–	–	100	600	60
174.022.100.201.000	II	36	44	55	–	–	–	30	47	66	–	105	800	55

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

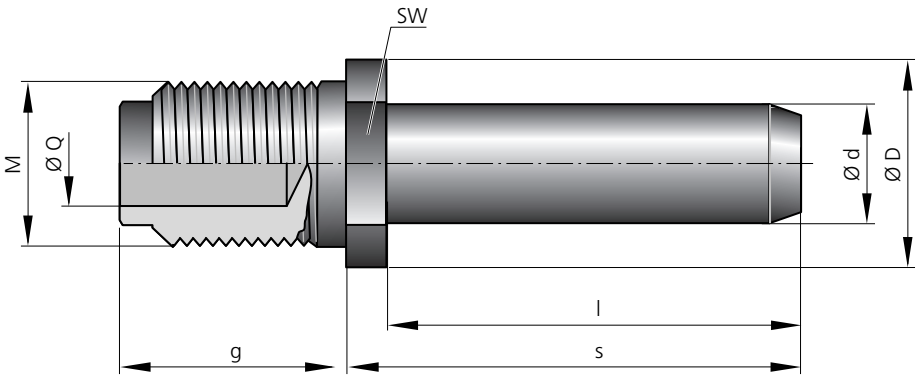
Dimensions in mm. - Dim. ØD and s min. dimensions.

[1] See tech. info. Page 9

Additional variations and other dimensions are available on request. For ordering information see page 39

Series SS0

Pins for Sockets Series DSO, DCO, LSX, LCX, LZX, LFX
with Solder or Threaded Stud Termination.



Part Number for Standard Parts	Dimensions Ø d	Tolerance	Ø D	l	s	SW	g	M (Thread M ...)	Ø Q
181.106.000.301.000	1,5	-0,03	4	10	11,5	3	10	2,6	1,25
181.107.000.301.000	2	-0,03	5	10	11,5	4	12,5	3	1,8
181.109.000.301.000	2,5	-0,03	5	10	11,5	4	12,5	3	1,8
181.110.000.301.000	3	-0,03	6	14	15,5	5	15	4	2,3
181.111.000.301.000	4	-0,03	7	14	16	6	19	5	3
181.112.000.301.000	5	-0,03	7	14	16	6	19	5	3
181.113.000.301.000	6	-0,03	8	23	26	7	22	6	3,6
181.213.000.301.000	6	-0,03	11	23	26	8	22	8	4,8
181.115.000.301.000	8	-0,03	11	23	26	9	26	8	4,8
181.215.000.301.000	8	-0,03	14	23	26	11	26	10	6,2
181.117.000.301.000	10	-0,04	16	23	26	12	30	10	6,2
181.217.000.301.000	10	-0,04	16	23	26	12	30	12x1,5	7,6
181.119.000.301.000	12	-0,04	16	34	38	14	34	12x1,5	7,6
181.120.000.301.000	14	-0,04	18	34	38	16	38	14x1,5	9
181.121.000.301.000	16	-0,04	20	34	38	17	42	16x1,5	11,5
181.122.000.301.000	18	-0,04	23	46	50	19	46	18x1,5	12,8
181.123.000.301.000	20	-0,04	25	46	51	22	50	20x2	14,5
181.124.000.301.000	22	-0,04	30	46	51	27	54	22x2	16
181.125.000.301.000	24	-0,04	30	46	51	27	58	24x2	17,8
181.126.000.301.000	26	-0,04	34	46	51	32	62	27x2	20
181.127.000.301.000	28	-0,04	36	46	52	32	62	32x2	25
181.128.000.301.000	30	-0,04	38	46	52	32	62	32x2	25

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm.
For mechanical and electrical data see information for sockets.

Additional variations and other dimensions are available on request. For ordering information see page 39

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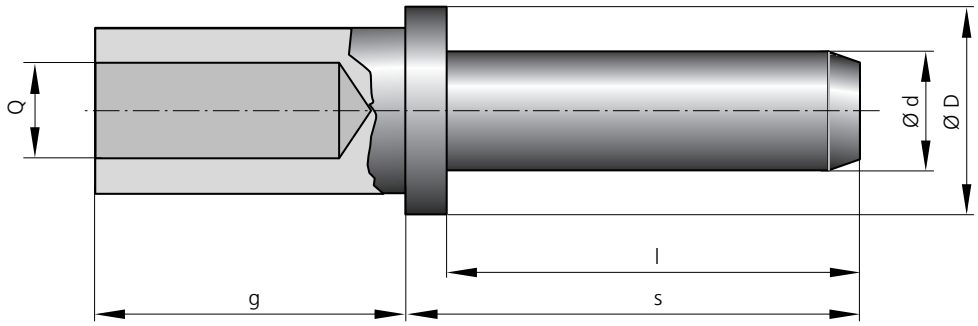
Series SC0

Pins for Sockets Series DSO, DCO, LSX, LCX, LZX, LFX
with Crimp Termination.

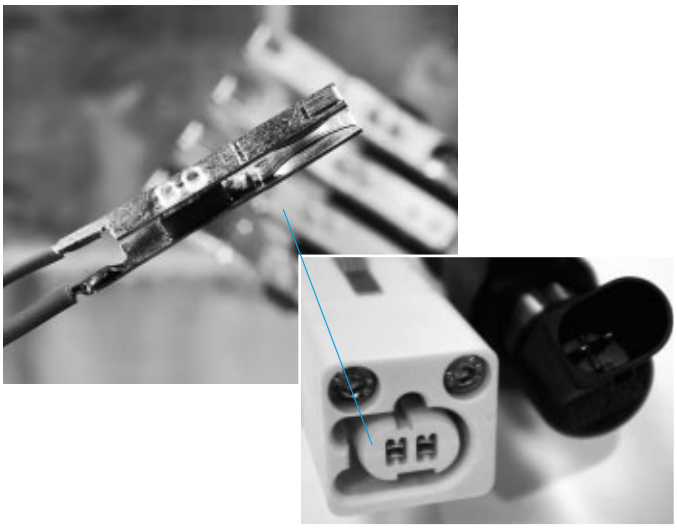


Part Number for Standard Parts	Dimensions Ø d	Ø D	l	s	g	Q (Termination Cross-Section mm²)	Part No. Crimp Tools
181.603.000.301.000	0,76	1,57	7	8,5	5	0,38	See Table Page 28
181.604.000.301.000	1,02	2,1	7	8,5	5	0,5	
181.606.000.301.000	1,5	4	10	11,5	6,5	1,5	
181.607.000.301.000	2	4	10	11,5	6,5	2,5	
181.609.000.301.000	2,5	6	10	11,5	6,5	2,5	
181.610.000.301.000	3	7	14	16	6,5	4	
181.611.000.301.000	4	8	14	16	12,5	6	
181.612.000.301.000	5	9	14	16	17,5	10	
181.613.000.301.000	6	11	23	26	22,5	16	
181.713.000.301.000	6	11	23	26	22,5	25	
181.615.000.301.000	8	14	23	26	22,5	25	
181.715.000.301.000	8	14	23	26	22,5	35	
181.617.000.301.000	10	16	23	26	22,5	35	
181.717.000.301.000	10	16	23	26	22,5	50	
181.619.000.301.000	12	18	34	38	28	50	
181.620.000.301.000	14	21	34	38	28	70	
181.621.000.301.000	16	23	34	38	28	95	
181.622.000.301.000	18	25	46	51	34	120	
181.623.000.301.000	20	27	46	51	34	150	
181.624.000.301.000	22	30	46	51	34	185	
181.625.000.301.000	24	32	46	51	54	240	
181.626.000.301.000	26	34	46	51	64	300	
181.627.000.301.000	28	40	46	51	69	400	
181.628.000.301.000	30	42	46	—	69	500	

Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm.
For dimensions see information for sockets.

Additional variations and other dimensions are available on request. For ordering information see page 39



Flat Springtac™ Socket

(Standard 50.000 mating cycles)

for test application of Pins

6,3 x 0,8 mm

4,8 x 0,8 mm

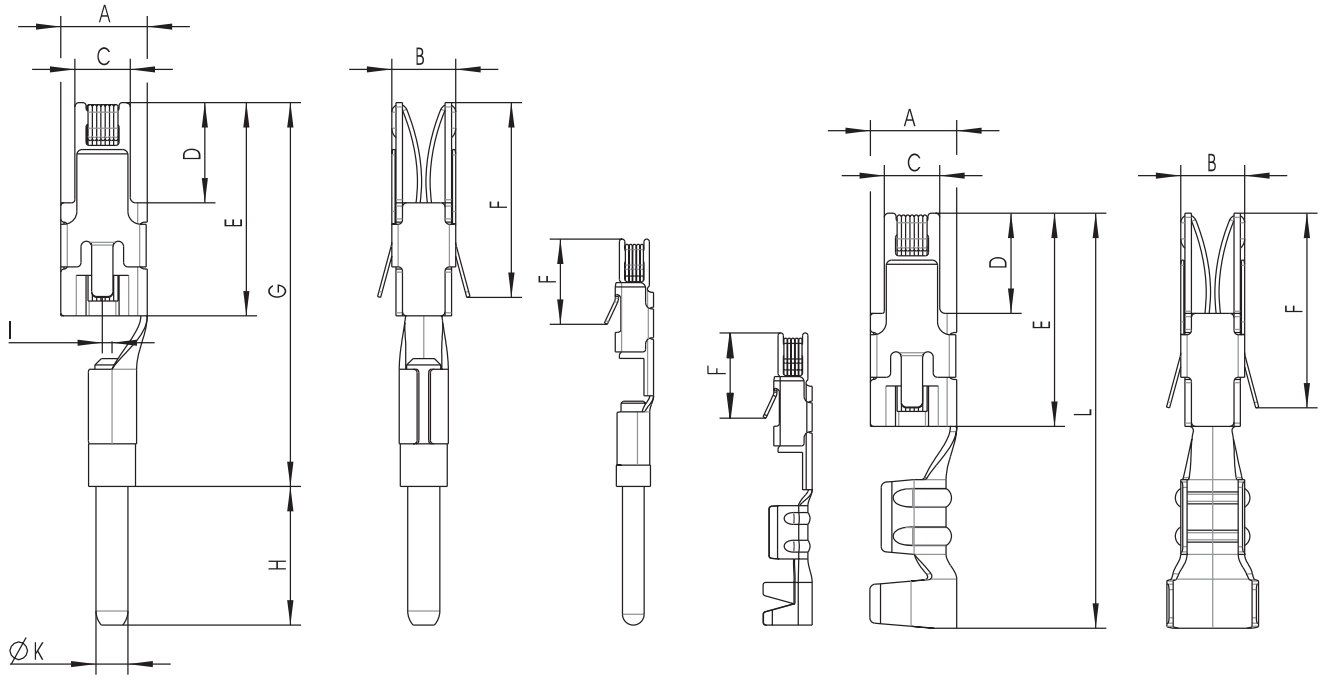
2,8 x 0,8 mm

1,6 x 0,8 mm (new)

1,6 x 0,6 mm (new)

0,64 x 0,64 mm (new)
for the testing of Pins in Grid 2,54

Can be supplied in special version
for Kelvin measurements.



Part Number		Dimensions												Mech. Data		Electrical Data	
with Crimp Termination	with Mate Termination	for Contact Pin	A	B	C	D	E	F	G	H	I	K	L	Termination Cross-Section in mm²	Insertion Force in N	Withdrawal Force in N	Nominal Current in A	max. Cont. Current in A	Contact Resistance µΩ
190.216.700.201.000		6,3 x 0,8 4,8 x 0,8	6,8	3	4,8	6	11	10,5					24,5	4 1,5-2,5	6	5	27 22	36 30	1,3
190.215.700.201.000													20,5						
	190.235.700.201.000								20,5	6,5	1±0,5	ø 3,0					27	36	
190.214.700.201.000		2,8 x 0,8	4	3	2,6	4,7	10	9,2					19,5	1,0-1,5	4	3	16	22	2
	190.234.700.201.000								18	6,5	1±0,5	ø 1,5							
190.218.700.201.000		1,6 x 0,8 1,6 x 0,6	2,6	2,2	1,35	4,3	10	8,3					19,5	0,5-1,0	2	1,5	13	18	2,7
	190.238.700.201.000								18	6,5	0±0,3	ø 1,02							
190.222.700.201.000		0,64 x 0,64	1,8	1,85	1,4	2	5,6	4					13,7	0,25-0,5	1,5	1	7	9	7,5
	190.242.700.201.000								11,5	6,5	0±0,15	ø 1,02							

* Mate contact for Quick-Change-Head see page 28

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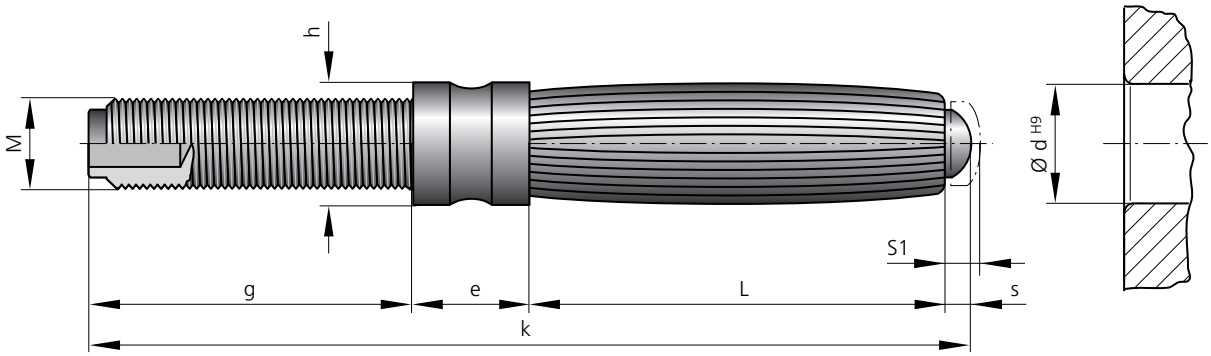
Series SDS

(Pins with threaded stud)

Springtac™ pin for Ø 1,5 bis 26 mm
with Solder and Threaded Stud Termination.



Part Number		Dimensions									Mech. Data[1]	Electrical Data[1]	
without Spark Protection	with Spark Protection	Contact Ø	k	s	S1	L	e	h	g	M (Thread M...)	Insertion Force Mean Value in N	Single Burden in A	Contact Resistance µΩ
150.001.100.201.000		1,5	19	0	0	6	5	3	8	2,3	2	10	800
150.002.100.201.000		2	23	0	0	9	5	3	9	2,3	4	15	675
150.005.100.201.000		3	30	0,5	0	12,5	5,5	3,5	11,7	2,6	5,5	25	600
150.006.100.201.000	150.106.100.201.000	4	39	0,5	1	20	5,5	5	13,7	3	12	36	525
150.007.100.201.000	150.107.100.201.000	5	41,5	0,5	1,5	20	5,5	6	15	4	16	45	475
150.008.100.201.000	150.108.100.201.000	6	46	1	1,8	21	7	7	17	5	19	55	425
150.009.100.201.000	150.109.100.201.000	7	46	1	1,8	21	7	8	17	6	21	65	375
150.010.100.201.000	150.110.100.201.000	8	60,5	1	2	32	8,5	9	19	6	24	78	325
150.011.100.201.000	150.111.100.201.000	9	62	1	2	32	8,5	10,5	20,5	8	28	90	275
150.012.100.201.000	150.112.100.201.000	10	63,5	1	2	32	8,5	11,5	22	8	32	104	250
150.013.100.201.000	150.113.100.201.000	12	66,5	1	2	32	8,5	14	25	10	38	135	200
150.014.100.201.000	150.114.100.201.000	14	69,5	2	2,5	32	8,5	16	28	12x1,5	43	160	175
150.015.100.201.000	150.115.100.201.000	16	91	2	2,5	43	14	18	32	14x1,5	52	175	165
150.016.100.201.000	150.116.100.201.000	18	95	2	2,5	43	14	20	36	16x1,5	55	190	145
150.017.100.201.000	150.117.100.201.000	20	99	2	3	43	14	22	40	16x1,5	65	210	140
150.018.100.201.000	150.118.100.201.000	22	104	2	3	43	14	24	56	18x1,5	70	225	130
150.019.100.201.000	150.119.100.201.000	24	109	2	3	43	14	26	50	20x2	84	240	125
150.020.100.201.000	150.120.100.201.000	26	114	2	3	43	14	28	55	20x2	85	260	115

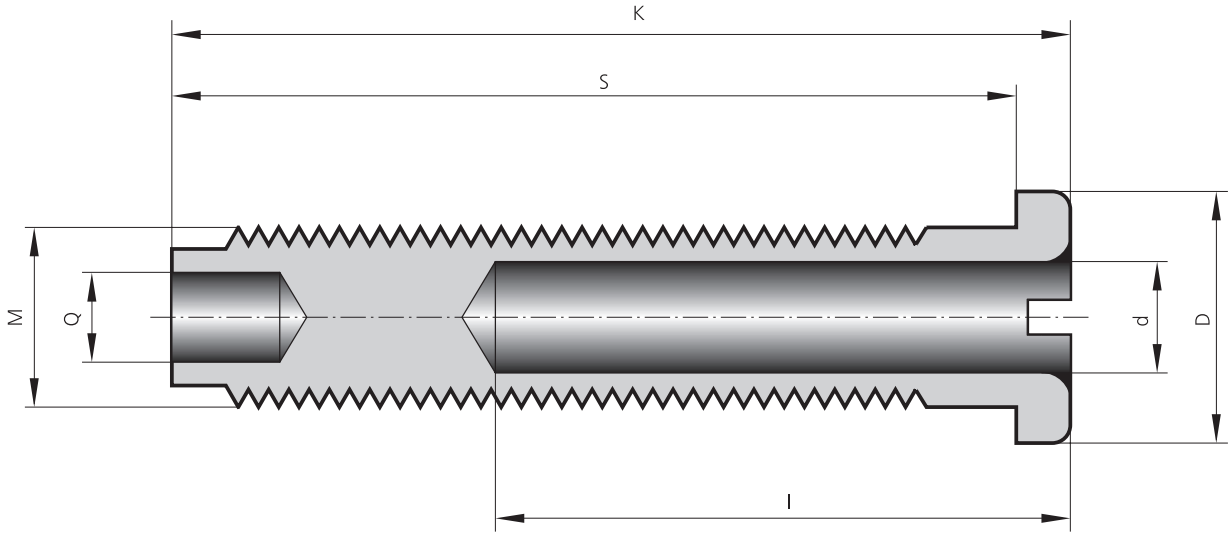
Standard surface finish: Carrier and springwires Ag. Other finishes on request.

Dimensions in mm.
For mechanical and electrical data see information for sockets.

Additional variations and other dimensions are available on request. For ordering information see page 39

Massiv ODU-Sockets

for spring mounted ODU Pins, with Screw- /Solder-Termination



Data for contacting of massiv sockets with spring mounted pins. Dimensions in mm

Part Number	Dimensions						
for Standard Parts	ø d	ø D	K	l	S	M (Thread M...)	Q
160.001.000.301.000	1,5	5	19	12	17,5	3	1,5
160.002.000.301.000	2	6	20	12	18,5	4	2,2
160.005.000.301.000	3	7	25	16	23,5	5	2,5
160.006.000.301.000	4	8	28	22	26	6 x 0,75	3
160.007.000.301.000	5	10	35	23	33	8 x 1	3,5
160.008.000.301.000	6	12	40	26	37,5	10	4,5
160.009.000.301.000	7	14	40	26	37,5	12 x 1,5	5
160.010.000.301.000	8	14	55	40	52	12 x 1,5	5
160.011.000.301.000	9	18	55	40	51	16 x 1,5	5,5
160.012.000.301.000	10	19	60	40	56	16 x 1,5	5,5
160.013.000.301.000	12	22	64	40	59	18 x 1,5	6,5
160.014.000.301.000	14	24	67	40	62	20 x 2	8,1
160.015.000.301.000	16	27	75	50	70	22 x 2	9,5
160.016.000.301.000	18	30	78	50	72	24 x 2	11,5
160.017.000.301.000	20	36	82	50	75	30 x 2	11,5
160.018.000.301.000	22	36	84	50	76	30 x 2	13
160.019.000.301.000	24	36	86	50	78	30 x 2	13,2
160.020.000.301.000	26	42	88	50	79	33 x 2	15

Applications:
Counterpart to ODU Springwire-Pin.
For the installation in instrument panels and devices.

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Application

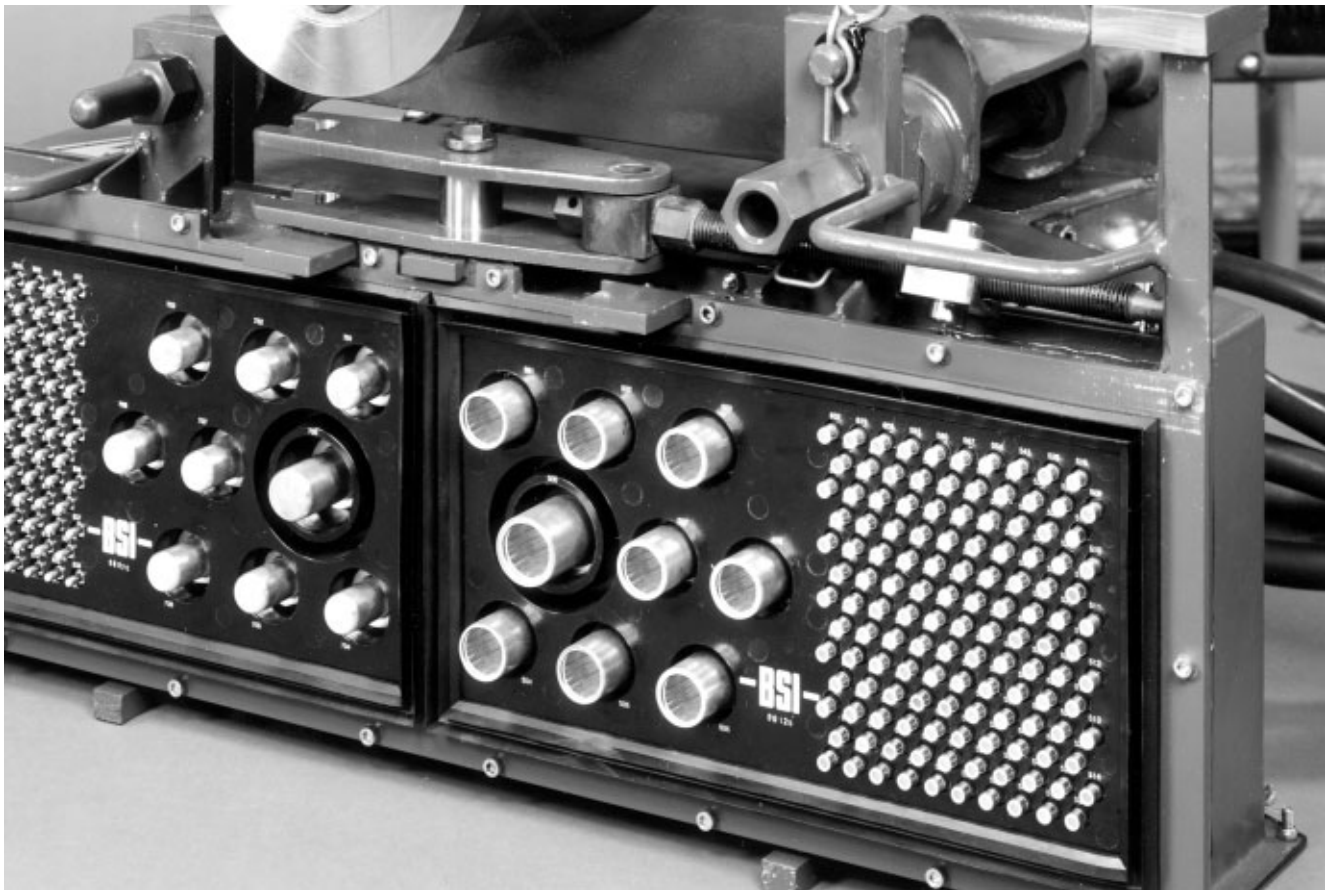
All contacts shown can be either used as stand-alone contacts or in connectors and interconnect systems. Due to the relatively large size of the single contacts it is generally better to use different styles of contacts for connectors.

The single contacts shown in this catalog are used mainly for:

- Power Supplies
  - mainframe computers
  - lighting systems
  - data transmission systems
  - rack-and-panel cabinets
  - electric vehicles
  - welding
- Power Distribution
- Testing
  - automotive
  - entertainment industry
  - industrial electronics
- Docking Systems
- Industrial (Heavy Duty) Connections
- Grounding
- Medical Cables
- Medical Connectors

Docking System

Railroad Cars.



Power supply – Welding sleeves for plastic pipes

ODU Springtac sockets (with insulation), Ø 4,0 /4,7 and 4,8 mm

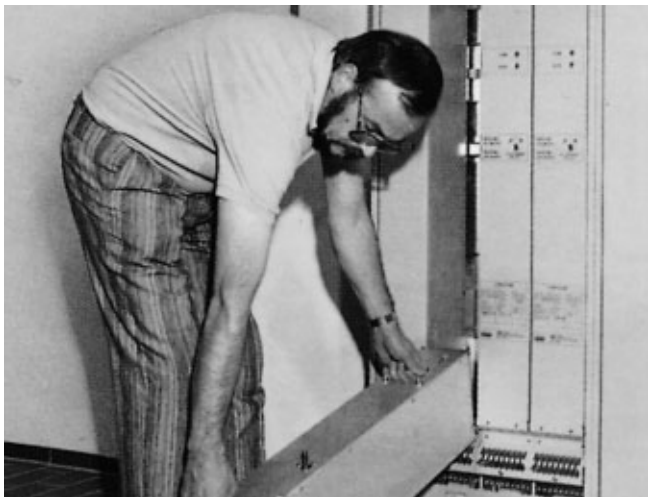
The connection between the equipment and the welding sleeve is made by ODU Springtac contacts, Ø 4,0 / 4,7 and 4,8 mm. Plastic insulation protects the ODU Springtac sockets against contact.

Why ODU Springtac contacts?

- extremely high number of mating cycles
- high current-carrying capacity

Power supply for Telecommunication

ODU Springtac high-power contacts



One outstanding feature of the ODU Springtac contacts, Ø 18 mm, is that they can compensate for a very large radial offset of over +/- 1 mm.

Why ODU Springtac contacts?

- absolutely secure contacting
- large radial tolerance compensation
- low contact resistance

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Medical technology – Portable inhalation devices

ODU Springtac contacts, Ø 1,5 mm

ODU Springtac contacts, Ø 1,5 mm, are used at the interface between the device itself and the battery.

Why ODU Springtac contacts?

- extremely high number of mating cycles
- high current-carrying capacity

Medical technology – ECG Cable

ODU-Lamella contacts Ø 1,5 mm

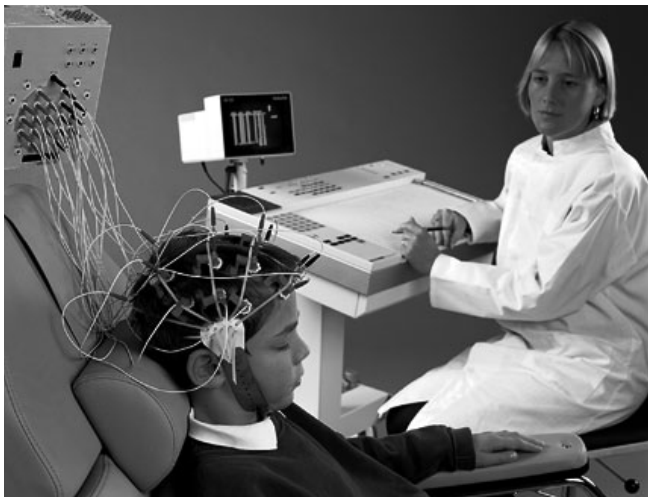
ECG Cable with ODU MINI-SNAP and 7 ODU Lamella contacts Ø 1,5 mm.

Why ODU-Lamella contacts?

- extremely high number of mating cycles
- low insertion and withdrawal forces
- high current-carrying capacity

EEG device

ODU Springtac pins



The ODU Springtac pins are located on the patient cable (electric line between the device and patient) and form the interface between the line and the electrode (contact plate that is pressed on to the skin).

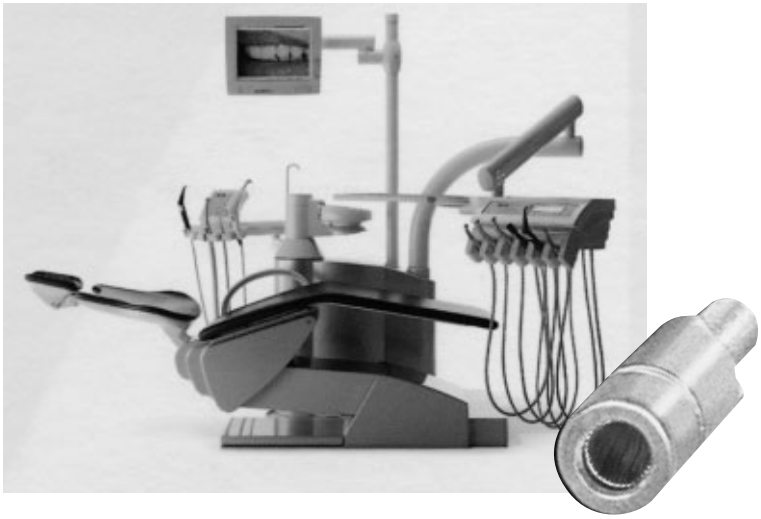
Medical technology – Dosing Module

ODU Springtac contacts Ø 3 mm

Custom specific solution for dosing module of anaesthesia with special insulation body and 3-pole insert.
(< 100.000 mating cycles)

Dental treatment unit

ODU Springtac contacts, Ø 1,02 mm



ODU Springtac contacts Ø 1,02 mm (spring-mounted sockets – standard pins) form the high-capacity interface to dental treatment units

Why ODU Springtac contacts?

- absolutely secure contacting
- can be disinfected/treated by autoclave

Operating-table

ODU-Springtac contacts Ø 5,00 mm

The storage batteries of this mobile Operating-table-system are pluggable and equipped with ODU-Springtac contacts Ø 5,00 mm.

Why ODU-Springtac contacts?

- extremely high number of mating cycles
- high current-carrying capacity

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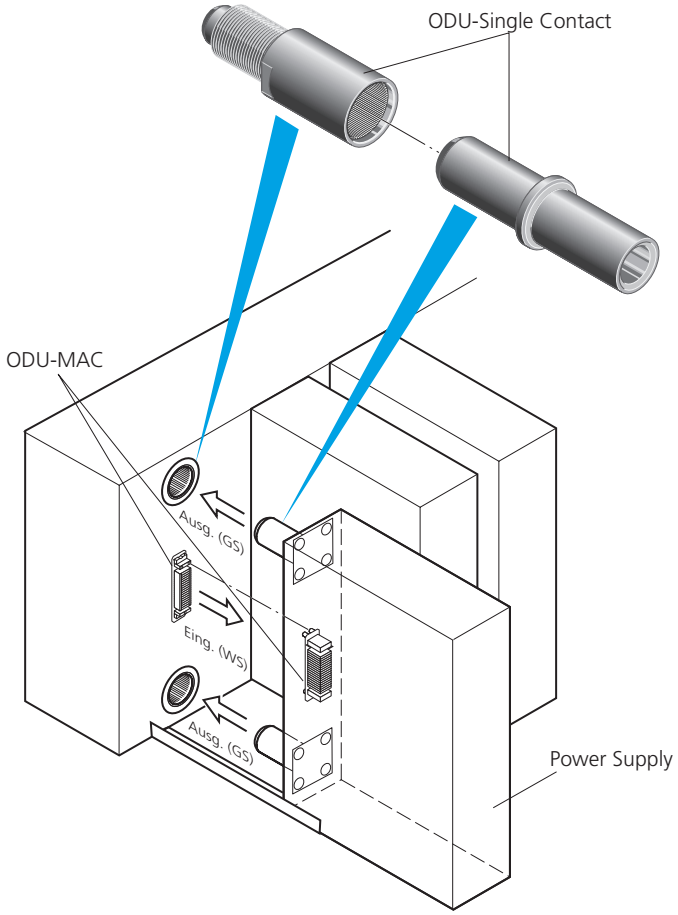

Safety power supply

Modular power supply unit with ODU MAC (for 220 V AC input and signals) and single contacts for DC output.

Safety power supply

Power distribution system.

(socket: crimp connection; pin: screw connection)

Explosion-proof plug-and-socket devices

with ODU Lamella contacts

Lamella contacts, Ø 4/6 and 8 mm, with spark protection (explosion protection) are used in explosion-proof plug-and-socket devices.

Railway Connectors

Lamella contacts Ø 4,2 mm are used in this high-quality railway connectors.

Why ODU Lamella contacts?

- absolutely secure contacting
- outstanding vibrational resistance
- extremely high number of mating cycles
- low insertion and withdrawal forces
- high current-carrying capacity
- robust

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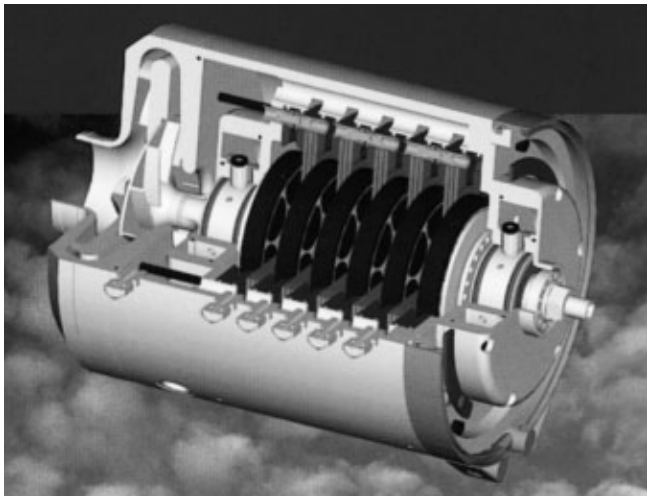
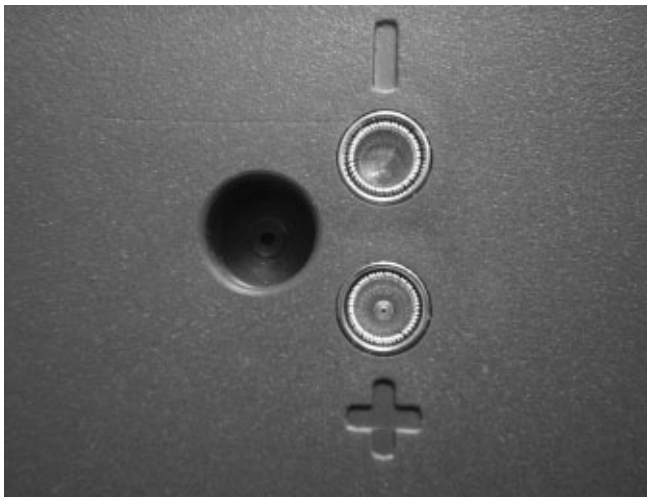
Lamella Contacts in High speed generators

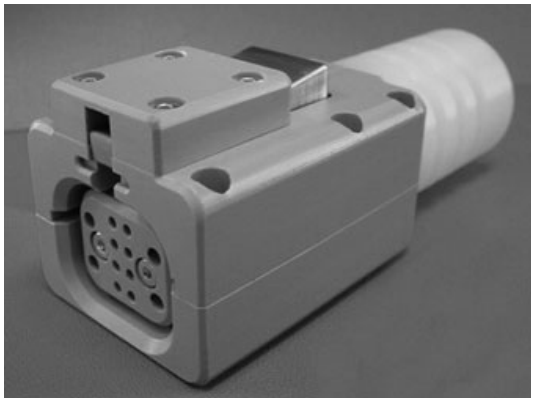


Batteries for radio devices (MIL-Application) with ODU-H-sockets

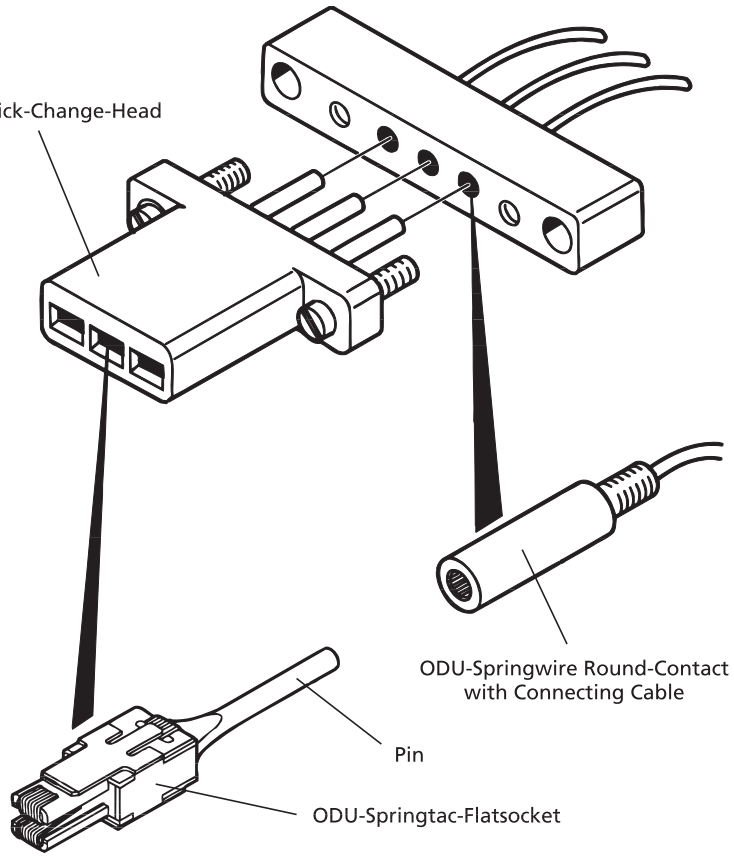


Test adapter

Manufacturers of Test adapter buy Single contacts and use them to build their own test connectors, for example, for the automobile industry.

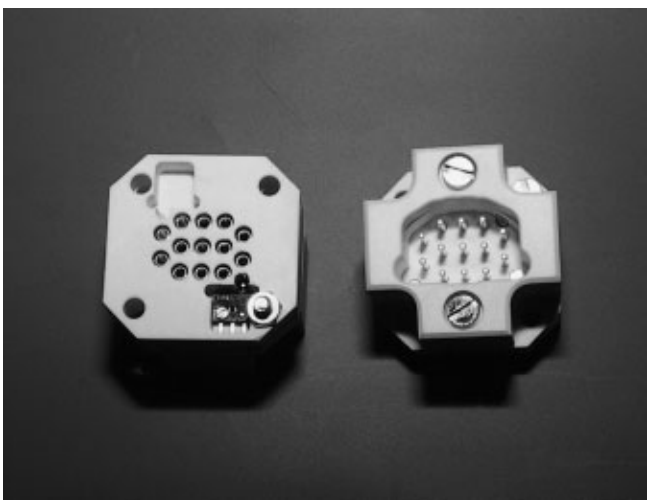


Test adapter with Quick-Change-Head



Test adapter

Built by ODU with ODU Springtac contacts, for example, for the automotive industry.



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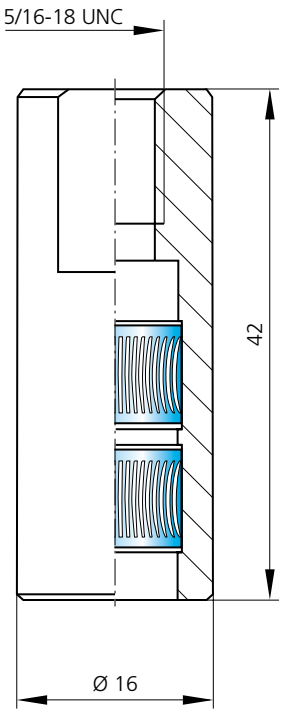
Power supply unit for pocket transmitters

6-position pin strip with ODU Springtac sockets

Computer Power Supply

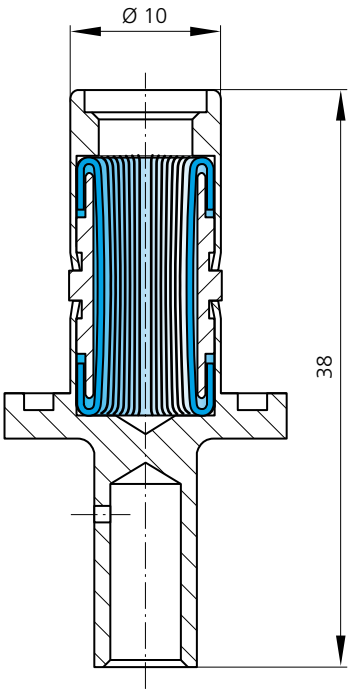
ODU-Lamella™ socket with 2 lamellas (mates with pins mounted on bus bar).



178.018.100.201.000

Laser

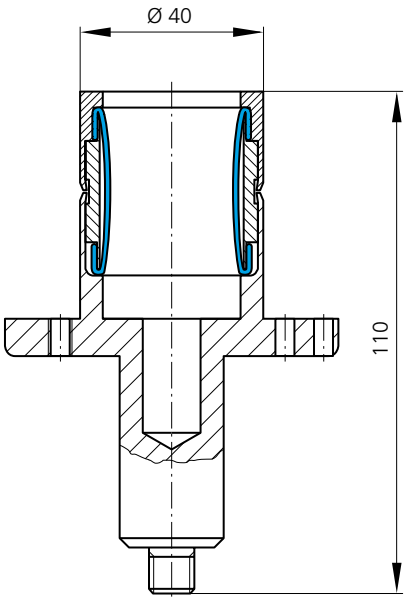
Precision Springtac™ socket Ø 6 mm.



172.555.490.249.000

Lamp for Wafer Stepper

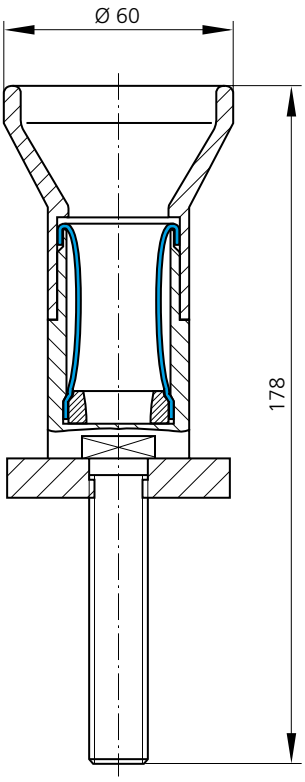
Springtac™ socket, Ø 30 mm with flange.



172.534.000.203.000

Steel Furnace

Springtac™ socket Ø 26 mm with lead-in.



172.538.000.201.000

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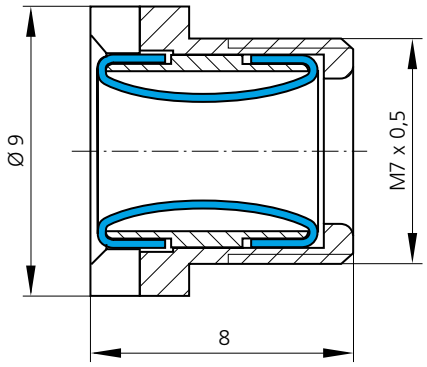
High-Power Battery

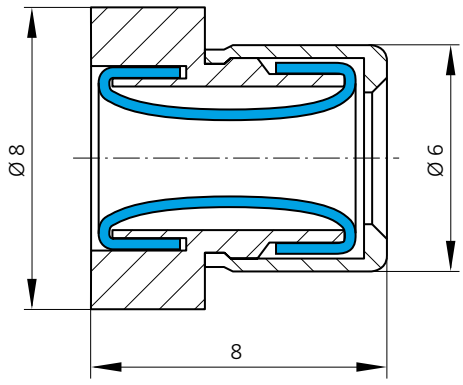
Open Springtac™ socket with outside thread
Ø 4 mm, 25 A.



174.011.000.201.000

Battery Grounding Socket

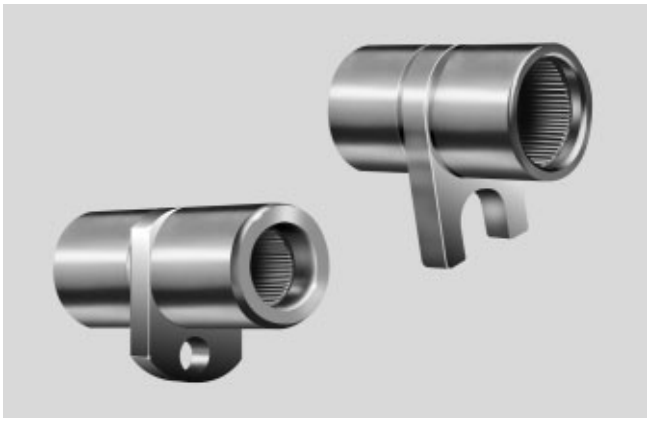
Open both end, press-in termination
Ø 3 mm, 20 A.

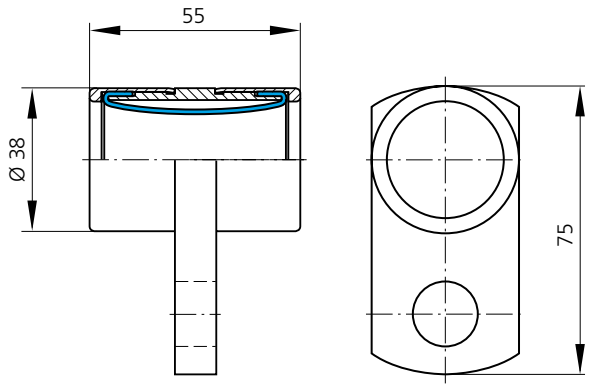


174.010.000.201.000

Mounting Sockets

Open both ends with mounting flange.

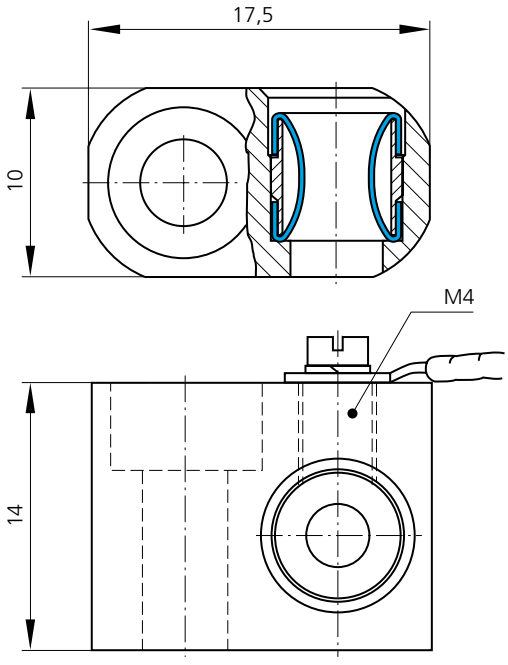




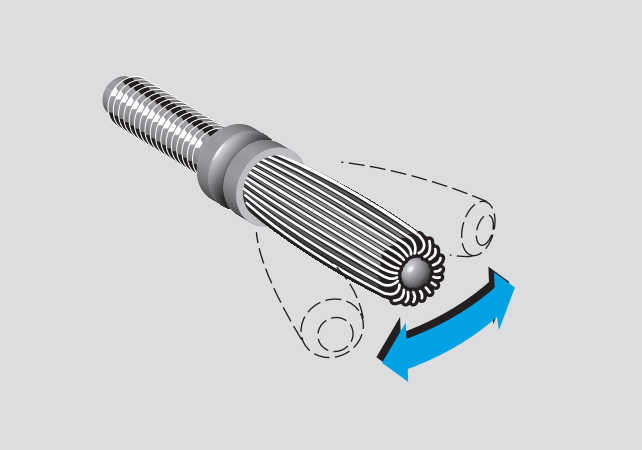
174.029.000.201.000

Socket

Open both ends, with mounting flange and locking screw.

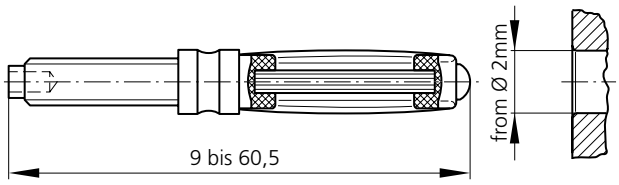


174.039.000.207.000



Flexible Springtac™ Pins

for solder or threaded stud termination,
from Ø 2 mm



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Crimp tools have a safety release which opens when the correct crimp pressure is reached. Premature opening of the crimp tool is thereby prevented.

8-Point Crimp Tool adjustable for AWG 28 to 2.5 mm² termination cross section. To adjust use gauge pin and operate at point (see adjustment table below). A contact positioner for easy positioning of the crimp contact is available on request.

A semi-automatic pneumatic 8-point crimp tool can be supplied.

The crimp tool has a ratchet which prevents premature opening of the crimp tool.

Part-No.: **080.000.014.000.000**

Hexagonal Crimp Tool for termination cross section from 2,5 to 6,0 mm² with locking system.

Part number for cross section 2,5 mm²: **080.000.012.000.000**
Part number for cross section 4,0 mm²: **080.000.011.000.000**
Part number for cross section 6,0 mm²: **080.000.011.000.000**

Hydraulic Hexagonal Crimp Tool for cross sections 10 mm² to 50 mm² with safety valve which opens only if correct crimp pressure is reached.

Part-No.: **080.000.026.000.000**

Hydraulic Hexagonal Crimp Tool for cross sections 70 mm² to 500 mm² with safety valve which opens only if correct crimp pressure is reached.

Part-No. crimp tool 70 mm² – 150 mm²: **080.000.017.000.000**
Part-No. crimp tool 185 mm² – 300 mm²: **080.000.018.000.000**
Part-No. crimp tool 400 mm² – 500 mm²: **080.000.020.000.000**

Tools-Crimpdatas

Cross Section (mm²)	Crimp Tool	Crimp Dies	Adjustment Table
0,08 - 0,25	080.000.014.000.000		>0,65 <0,70
0,38	080.000.014.000.000		>0,65 <0,70
0,5	080.000.014.000.000		>0,90 <0,95
1,5	080.000.014.000.000		>1,40 <1,45
2,5 [1]	080.000.014.000.000		>1,60 <1,65
2,5 [2]	080.000.012.000.000		
4	080.000.011.000.000		
6	080.000.011.000.000		
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	080.000.018.000.000	921.000.005.000.015	
240	080.000.018.000.000	921.000.005.000.016	
300	080.000.018.000.000	921.000.005.000.017	
400	080.000.020.000.000	921.000.005.000.019	
500	080.000.020.000.000	921.000.005.000.020	

[1] Diameter "D" = < 5,5 mm
[2] Diameter "D" = > 5,5 mm

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Single contacts can be connected to cables or bus bars using:

- Soldering
- Threaded Stud
- Crimp Barrel

Soldering is not the preferred technique**.** Crimping is used in most applications. As a rule, any crimp contact can be soldered, as long as the cable fits into the crimp barrel. Note that the cable can be smaller in OD than the ID of the crimp barrel, which is very much in contrast with crimping where the cable has to have the correct OD to guarantee a good connection. **Attention:** avoid excessive heating of the contact due to incorrect termination.

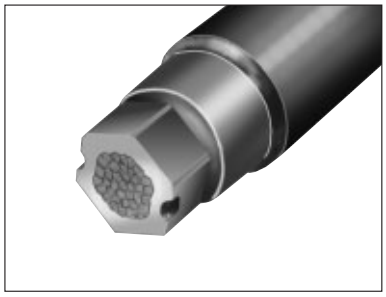
Threaded stud termination is generally used with cable lugs and washers, held in place with hex nuts. Nuts and washers are not part of the ODU standard product line but can be supplied on request.

Crimping is the preferred termination. Crimping creates an excellent connection between cable and contact. During crimping the conductors and the crimp barrel form a gas-tight connection as the conductors cold-flow and bond with the crimp barrel. Correctly performed crimps have excellent pull strength.

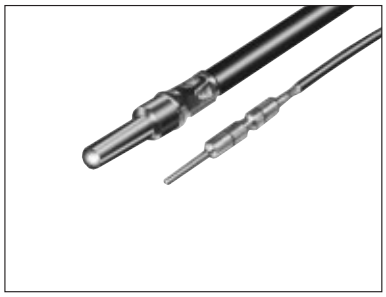
Crimping can be performed on small and large contacts and can be done by non-experts.

For cable cross sections of 0.5 to 2.5 mm^2 the crimp tool is an 8-point adjustable crimp tool. For larger cables the correct tool is a hex crimp tool. It is important to note that crimping should not increase the cross dimensions of the crimp barrel. Cable insulation is not damaged during crimping and can touch the crimp barrel.

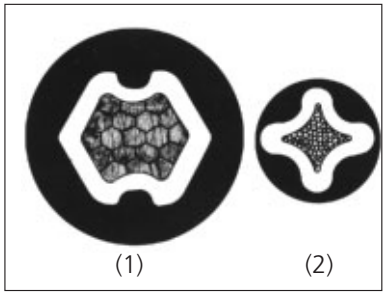
Very important is to make sure that the cable OD is exactly as specified to achieve optimum crimping.
ODU suggests that the cable specifications or cable samples are supplied by the customer to verify crimp performance.



Cross section of a hex crimp.



8-point crimping



Cut-away view of a hex- (1) and 8-point crimp (2).

8-point crimps have two 4-point crimps one behind the other.

ODU can with information about about correct tooling and proper crimp technique. Please provide contact and cable details (see Page 35 for ordering information).

Torques

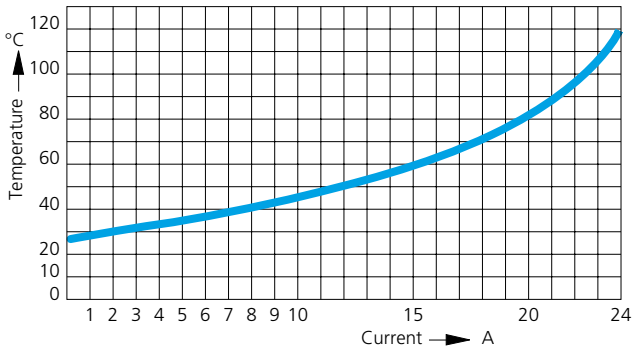
Connection Thread	max. Torque in Nm
M 2	0,2
M 3	0,5
M 4	1,2
M 5	2,0
M 6	3,0
M 8	6,0
M 10	10,0
M 12	16,0
M 14	22,0
M 16	30,0
M 18	40,0
M 20	50,0

Max. Torque
for solid threaded stud and brass contact material.

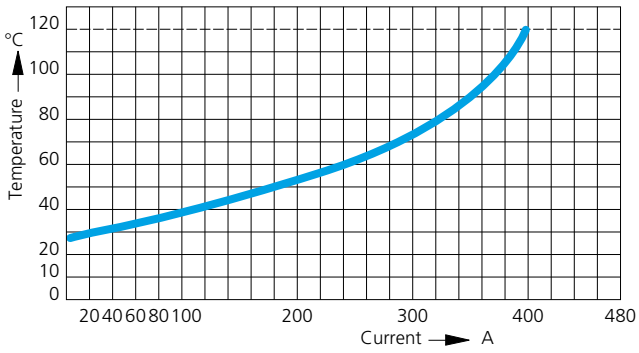
Current Load

Current load for contacts from 1 mm to 36 mm is shown on Page 33. The current load information is based on **ODU** Springtac™ contacts with correctly dimensioned pin contact.
ODU Lamella™ contacts with two lamella bands have nearly the same performance characteristic as Springtac™ contacts. As an example, please consider the two diagrams below. Diagram on the left is for a 1 mm contact, diagram on the right is for a 14 mm contact.

Contact Material: brass, silver-plated
Contact-Ø 1mm 1 mm² Conductor Cross Section



Contact Material: brass, silver-plated
Contact-Ø 14 mm 150 mm² Conductor Cross Section



Both diagrams show the relationship between current load and contact temperature. Contact temperature consists of the ambient temperature at 23° C and the temperature rise across the contact due to the current. The diagrams end at 120° C because this is the upper operating temperature limit for standard ODU contacts. ODU can supply special contacts for higher temperatures of up to 500° C.

When interpreting the diagrams one must keep in mind that often it is not possible to let the contact temperature rise to 120° C. Also, the ambient temperature can be higher than 23° C or the conductor cross section may not be correct.

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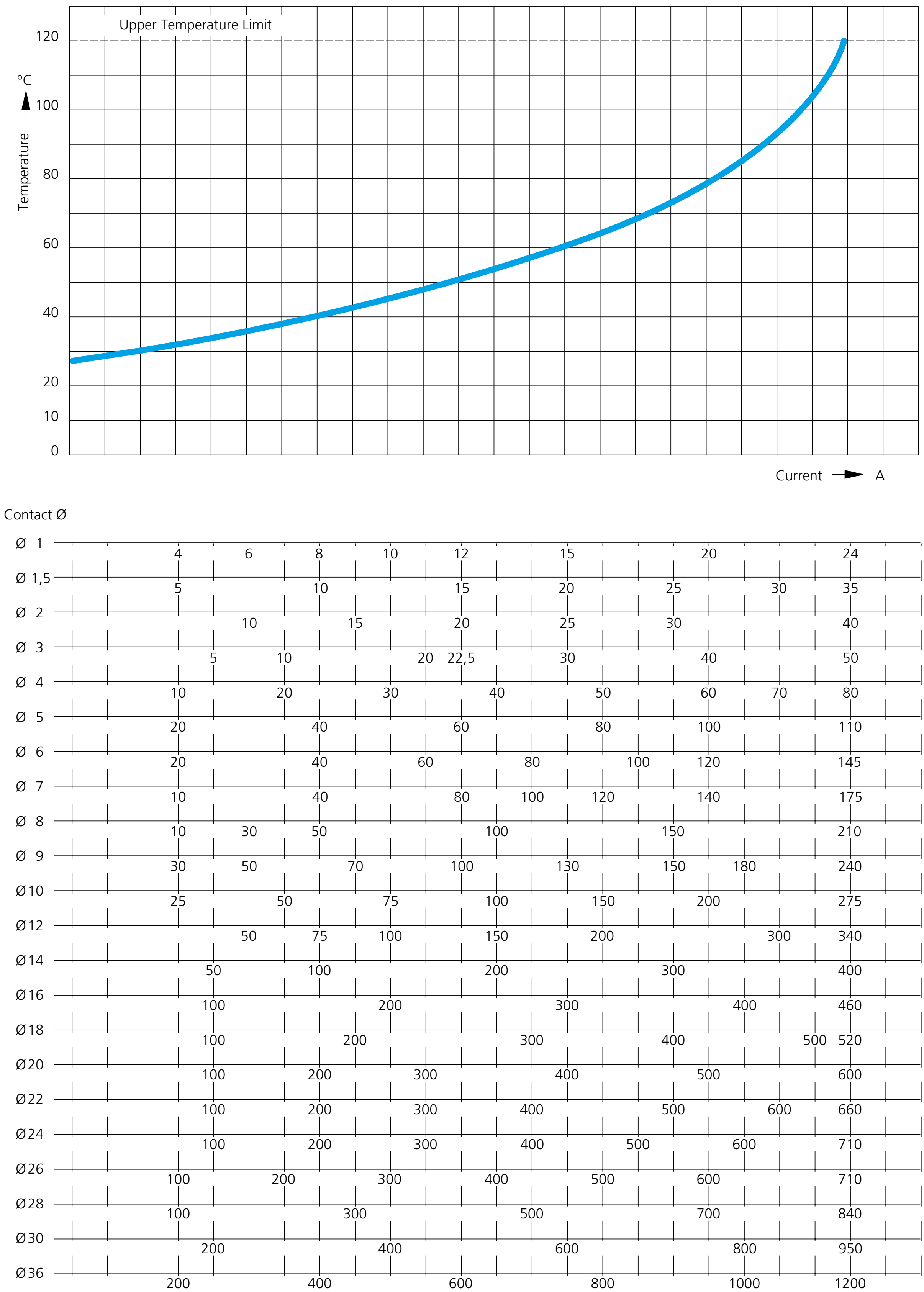
Current Load - Springtac Contacts and Lamella Contacts

Contact Material: brass, silver-plated
max. Conductor Cross Section
Measurement in accordance with DIN VDE 0627



Conversion Tables

Because ODU contacts are used worldwide, it has become necessary to define cable termination cross section not only in mm^2 but also in mm and AWG.

Termination Cross Section

Cond. Cross Section (mm^2)	Conductor O/D (mm)	AWG
0,08	0,33	28
0,15	0,41	26
0,25	0,51	24
0,38	0,64	22
0,50	0,81	20
1,00	1,02	18
1,33	1,30	16
2,09	1,63	14
3,33	2,06	12
5,27	2,59	10
8,30	3,25	8
13,30	4,11	6
21,10	5,18	4
33,50	6,53	2
53,60	8,26	0

The shown values may vary between cable types.

The table is based on AWG which results in conductor cross sections (mm^2) which are not standard in the German system.

AWG = **A**merican **W**ire **G**auge

Example:
Electric Copper Conductors

Single conductor, not tinned, PVC-jacket.
Max. operating temperature 70° C. [2)]

Nom. Conductor OD	Max. Resistance per Meter [1)] bei -20 °C	Max. Conductor Diameter [1)]	Nom. Wall Thickness Cable Insulation [1)]	Max. Conductor Outer Diameter [1)]	Continuous Load Current (Nominal [2)]) at ambient Temperature		Acceptable Current Density cont. Operation
					-30° C	+50° C	
mm^2	mΩ/m	mm	mm	mm	A	A	A/mm^2
1	18,6	1,5	0,6	2,7	19	13,5	10
1,5	12,7	1,6	0,6	3,0	24	17,0	10
2,5	7,60	2,2	0,7	3,5	32	22,7	10
4	4,71	2,5	0,8	4,4	42	29,8	10
6	3,14	3,4	0,8	5,0	54	38,3	6
10	1,82	4,5	1,0	6,5	73	51,8	6
15	1,15	5,6	1,0	8,3	98	69,6	6
25	0,743	7,8	1,3	10,4	129	91,6	4
35	0,527	9,0	1,3	11,5	155	112	4
50	0,368	10,5	1,5	13,5	198	140	4
70	0,259	12,5	1,5	15,5	245	174	3
95	0,196	14,8	1,6	18,0	292	207	3
120	0,153	15,5	1,6	19,7	344	244	3

Table 1

[1)] According to DIN ISO 6722, Part 3
[2)] According to VDE 0298, Part 4

Source: Bosch Handbook 18. + 22. Edition

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Ordering Information

1. ☞ Series

D S 0	Springtac™ Socket - Solder or Threaded Stud Termination
D C 0	Springtac™ Socket - Crimp Termination
L S 1	Lamella™Socket - Solder or Threaded Stud Termination
L C 1	Lamella™Socket - Crimp Termination
L Z 1	Lamella™Socket - open both ends - Cylindrical
L F 1	Lamella™Socket - open both ends - with Flange
D Z 0	Springtac™ Socket - open both ends - Cylindrical with Flange
D F 0	Springtac™ Socket - open both ends - Cylindrical with Flange
S S 0	Pin - Solder or Threaded Stud Termination
S C 0	Pin - Crimp Termination
S D S	Springtac™ Pin - Solder or Threaded Stud Termination

2. ☞ Diameter (d)

3. ☞ Possible Surface Finish

Carrier Ag, Springs Ag (Standard)
Carrier Ni, Springs Ag [1)]
Carrier Ni, Springs 1,25 µ Ni, 0,75 µ Au [1)]
Carrier Ag, Springs 1,25 µ Ni, 0,75 µ Au
Carrier and Springs 1,25 µ Ni, 0,75 µ Au
Carrier 1,25 µ Ni, 0,5 µ Au, Springs 1,25 µ Ni, 0,75 µ Au

4. ☞ Termination

Solder or Threaded Stud Termination (Series DS0, LS1 und SS0):

	Example
Dia. Thread (M)	M 10 x 1
Length (g)	20 mm Lg

Crimp Termination (Series DC0, LC1 und SC0):

Cable Type with Cross Section (Best to supply Cable Sample) — for example. H07 RNF ...

Contact open both Ends (Series LZ1, LF1, DZ0 und DF0):

Flange Diameter (D) - (larger than M)
Length (s) - smaller than (k)

Example:

Series:	LS1
Diameter (d):	10 mm
Surface:	Standard (Ag / Ag)
Termination:	M10 x 1 / 20 mm Lg

ODU will assign a part number for **special parts**

1) Not for Crimp Termination

TELEFAX

Fax-No. **+49 / 8631 / 6156-49 z. Hd. Vertrieb Einzelkontakte**

ODU-Steckverbindungssysteme GmbH & Co. KG
Pregelstraße 11
D-84453 Mühldorf am Inn

From:

Company: _____

Name: _____

Division: _____

Street: _____

City, State, ZIP Code: _____

Tel.: Date:

I / We need following Standard Types:

Part-No. (See tables in the Catalogue) **Number of Pieces:**

Pos.1				•				•				•				•			
Pos.2				•				•				•				•			
Pos.3				•				•				•				•			
Pos.4				•				•				•				•			
Pos.5				•				•				•				•			

I / We need following Special Solution:

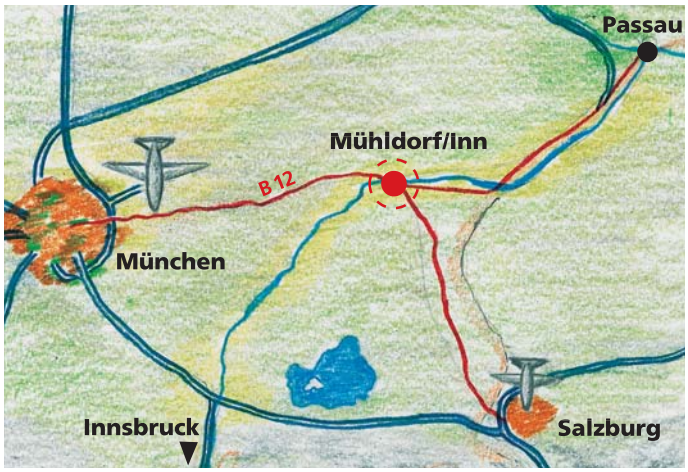
1. Series: _____
2. Diameter: _____
3. Surface finish:
   - ❒ Standard: Carrier Ag, Springs Ag
   - ❒ Special: _____
4. Termination:
   - ❒ Solder or Threaded Stud Termination (DS0, LS1, SS0)
     Dia. Thread (D)/(M): _____ mm
     Length (s)/(k): _____ mm
   - ❒ Crimp (DC0, LC1, SC0)
     Cable Type with Cross Section: _____
     (Best to supply Cable Sample)
     Length (g): _____ mm
   - ❒ Contact open both ends (LZ1, LF1, DZ0, DF0)
     Flange Diameter (D) / (M): _____ / _____ mm
     Length (s) / (k): _____ / _____ mm
5. Number of Pieces: _____

Please open

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

Bild der Stadt Mühldorf am Inn

Mühldorf, an idyllic small town with its typical Inn-Salzach architecture.



Steckverbindungssysteme

ODU-Steckverbindungssysteme GmbH & Co. KG
Otto Dunkel GmbH

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