

ODU-MAC[®] | ODU DOCK **Silver-Line**

HDMI   
ODU HIGH-SPEED DATA TRANSMISSION



ODU-MAC® | ODU DOCK

FEATURES

- Robust design
- High number of mating cycles ($\geq 100,000$)
- Stable low contact resistance
- Vibration resistance
- High reliability
- Wide variety of transmission modules
- Compact solution possibilities
- Maximum packing density
- Blind mating

APPLICATIONS

- Medical
- Industrial
- Test and Measurement
- Military, Security and Communication
- Mass Interconnect
- Automotive

ATTENTION: All ODU-MAC® connectors must only be (un)mated without current load.



All shown connectors are according to IEC 61984-2008 (VDE 0627:2009-11); connectors without breaking capacity (COC).

The majority of ODU-MAC® modules and contacts have been certified according to UL 1977/CSA C 22.2 no. 182.3 (E file no.: E110586) and tested to MIL/SAE/EIA.

All dimensions are in mm.

Some figures are for illustrative purposes only. Subject to change without notice. Errors and omissions excepted. We reserve the right to change our products and their technical specifications at any time in the interest of technical improvement. This publication supersedes all prior publications.

In the ODU-MAC® Silver- / White-Line product portfolio we explicitly recommend that the modules are purchased assembled with the frames in order to prevent possible errors in the assembly process.

Only in exceptional cases we can supply individual parts. However, we cannot take any liability therefore.

We would like to emphasize the usage of our ODU tools as well as our current assembly instructions in the download area:
<https://odu-connectors.com/silver-white-line-instructions>

Data transmission protocols

Unless explicitly confirmed otherwise the contact arrangement of an ODU data transmission connector differs from a standard data transmission connector due to the robust ODU specific design. However, the ODU design meets the electrical specifications of the respective standard data transmission protocol.



Non-magnetic



ODU DOCK



Quick Change Head (QCH)

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ODU-MAC®



PRODUCT INFORMATION

ODU-MAC®

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ODU-MAC® – A MODULAR ALL-ROUNDER FOR THE MOST VARIED APPLICATIONS

THE INTELLIGENT WAY TO A CONSOLIDATED CONNECTION

The ODU-MAC®'s flexible, modular design enables multiple connection types to be combined in just one connector. Whether signal, power, high-current, high-voltage, RF-signal (coax), high-speed data transmission, fiber optic and other media such as air or fluid – all types can be selected from the module and integrated into the consolidated connector solution. The connection options are just as versatile.

Many options are available for a variety of applications, such as end-of-line test benches, mobile robots, and high-end medical equipment. The ODU-MAC® Silver-Line for automatic docking relies on rigid aluminum frames to maximize reliability in your application.

The result is an effective, compact and attractive complete connection that is unrivaled in terms of functionality. Confusion due to an excessive number of connections is a thing of the past – an ODU-MAC® customized to meet your requirements is today's solution.



SEE PRODUCT VIDEOS
FOR MORE INFORMATION



THE ODU-MAC® SILVER-LINE LEAVES NOTHING TO BE DESIRED:

- 100,000 mating cycles for minimized total cost of ownership
- Diversified docking solutions to optimally suit the applications needs
- Rigid aluminum frames for automatic docking
- High degree of modularity for maximized flexibility
- Space saving due to high contact density



ODU-MAC® White-Line

For manual mating and highest mating cycles.



ODU-MAC® Blue-Line

For manual mating and most cost-effective solutions.

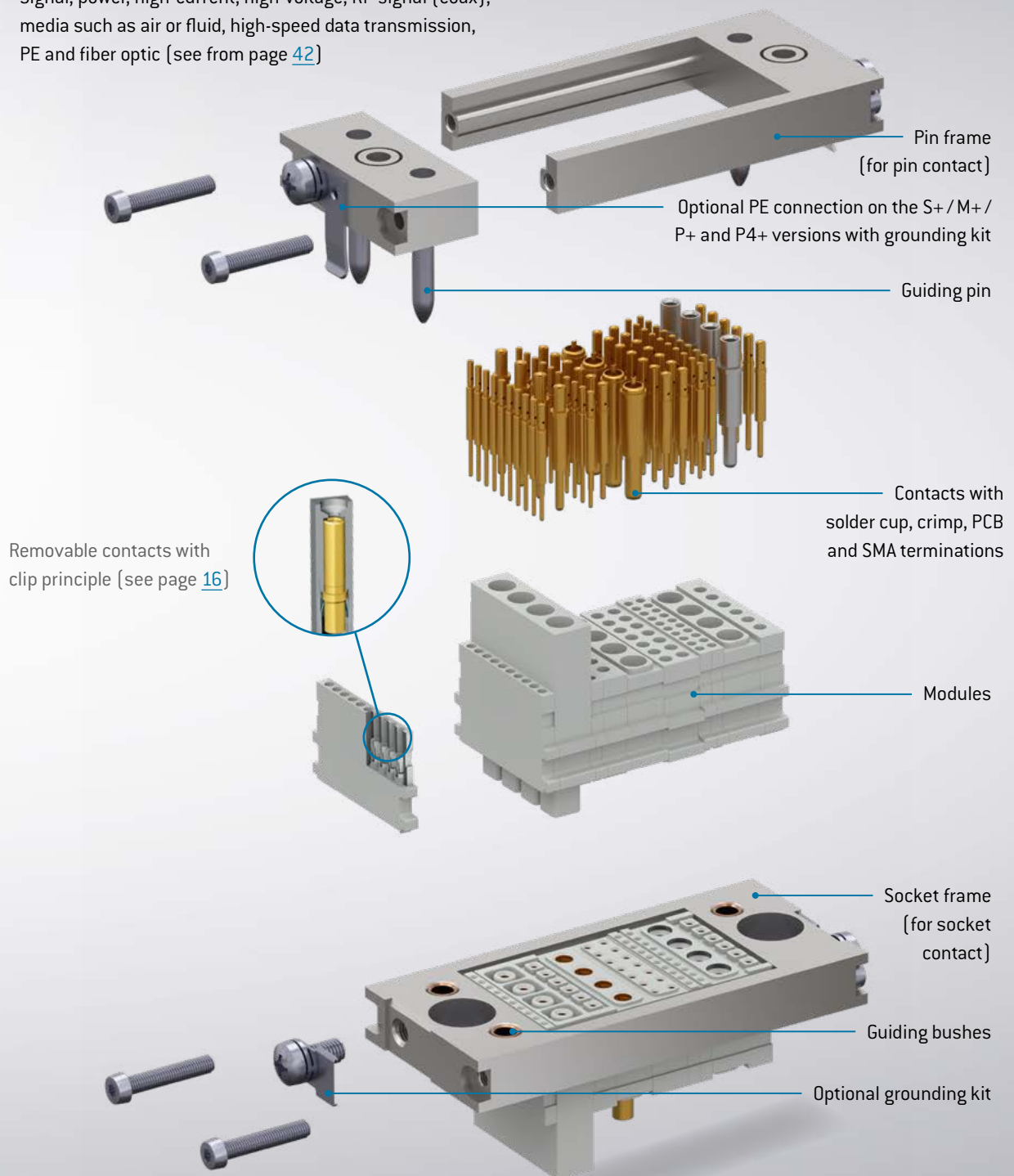
More information: odu-connectors.com/downloads

THE MODULARITY AT A GLANCE:

6 Various docking frames available in customizable lengths (see page [10](#))

37 Modules to choose from:
Signal, power, high-current, high-voltage, RF-signal (coax), media such as air or fluid, high-speed data transmission, PE and fiber optic (see from page [42](#))

100,000
Mating cycles and more



CONFIGURATOR

Individual configuration of your ODU-MAC® Silver-Line connection

With the ODU-MAC® configurator it's possible to configure your connection simply according to your requirements. The configurator guides you through the different choices step by step and offers a lot of further information.

CONFIGURE YOUR ODU-MAC® SILVER-LINE HERE:



**GO TO
CONFIGURATOR**

www.odu-mac.com takes you directly to the ODU-MAC® configurator.



Find a variety of videos explaining the functions of automatic docking and use cases of our ODU-MAC® Silver-Line on ODU's [vimeo channel](#).

**WATCH
VIDEO**



YOUR WAY TO A CONSOLIDATED CONNECTION

How to configure your ODU-MAC®.

INDIVIDUAL REQUIREMENTS – CONSOLIDATED CONFIGURATION

With ODU-MAC®, we offer a modular connector system configured to your requirements. This means that you always receive the hybrid connection for your particular application.

SELECT & REQUEST OFFERS

You will receive a drawing and a detailed offer within one working day after submitting your request. When placing an order you will receive the complete article number for connections preassembled by ODU (contacts supplied as accompanying loose items). **We ask you to enquire directly about customized connector solutions.**



For information to the configuration of your connector please refer to our website: www.odu-mac.com

ODU-MAC® **Silver-Line**

AUTOMATIC DOCKING

1ST STEP: FRAME SELECTION

Depending on your requirements, you can choose different frame types as a base for automatic docking.

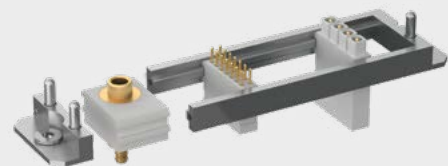
Frames	
ODU-MAC® S+	ODU-MAC® M+
ODU-MAC® P+	ODU-MAC® S
ODU-MAC® P4+	ODU-MAC® QCH (Quick Change Head)
ODU-MAC® L	



2ND STEP: MODULE SELECTION

Choose from different modules and assemble your ODU-MAC® individually.

Modules	
Signal	Compressed air and fluid
Power	Fiber optic
High-Current, PE	Shielded feedthrough / High-Speed connector
RF-signal (coax)	Thermocouples
High-Voltage	Blank modules / Spacer modules / Coding modules / Pin protection modules



ODU-MAC® **Silver-Line**

AUTOMATIC DOCKING.

OVERVIEW OF DOCKING FRAMES

ODU-MAC® Silver-Line is the best suitable solution for automatic docking. Choose from a variety of different frames, adjust the length individually and assemble the frame with the modules you need for your requirements.

With ODU-MAC® you can always find the perfect solution. And if your requirements for a connection go beyond the standard solutions, we also offer customized solutions.

ODU-MAC® can be configured for 3 to 60 units. Thereby, up to 600 contacts fit into just one ODU-MAC® Silver-Line.

FURTHER INFORMATION FROM PAGE [19](#).

ODU-MAC® S+ (p. 26)

Standard solution for docking tasks with optional PE transmission

Tolerance compensation: ± 1.2 mm



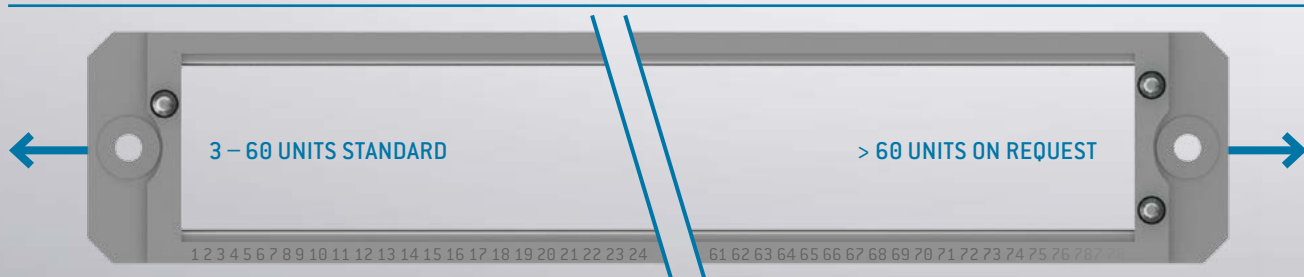
ODU-MAC® P+ (p. 27)

Reinforced frame design for highest mechanical requirements

Tolerance compensation: ± 2.5 mm



The length of the frames can be ordered individually depending on the number of required modules.



ODU-MAC® P4+ (p. 28)

Reinforced frame design with extended tolerance compensation
Tolerance compensation: ± 4.0 mm



ODU-MAC® L (p. 29)

Frame with higher tolerance compensation and reinforced guiding bushes, as well as extended guiding pins
Tolerance compensation: ± 1.2 mm



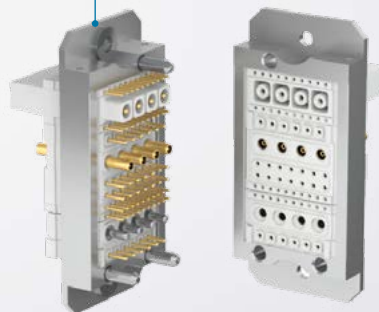
ODU-MAC® M+ (p. 30)

Compact design with minimal space requirements and optional PE transmission
Tolerance compensation: ± 0.6 mm



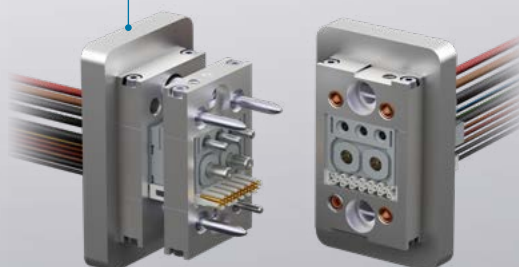
ODU-MAC® S (p. 31)

Standard solution for docking tasks
Tolerance compensation: ± 0.6 mm



ODU-MAC® QCH (QUICK CHANGE HEAD – p. 32)

For maximized mating cycle capabilities (connector saver), minimized maintenance downtime and expense
Tolerance compensation: ± 1.2 mm



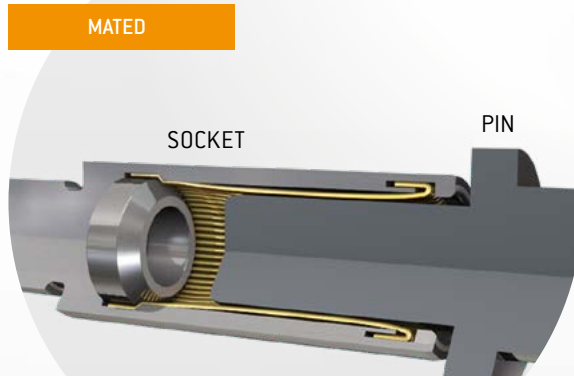
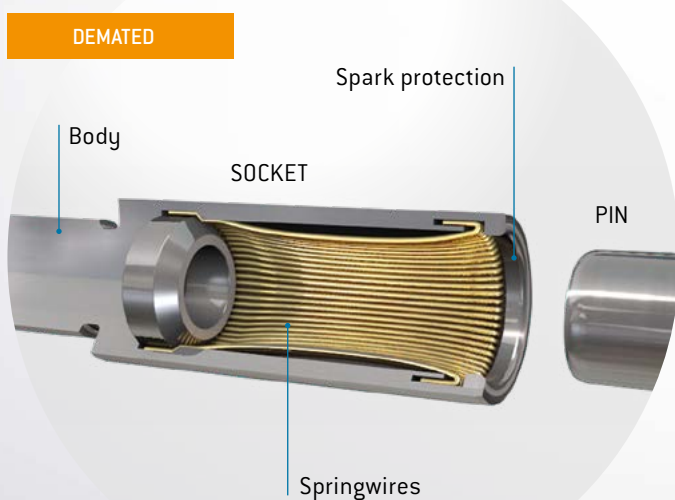
BEST CONNECTIONS – THE CONTACT PRINCIPLE

ODU contacts fulfill the highest quality standards and enable secure and reliable connections. ODU has the highest performance contact technologies at its disposal. Principally, a differentiation of machined contacts is made between lamella, springwire and slotted contacts. The socket side differs in architecture, whereas the pins are always based on a solid design.

ODU SPRINGTAC®

Contacts with springwire technology

The ODU SPRINGTAC® is the most effective contact system on the market. Constant transfer is always guaranteed thanks to the large number of individual, independently flexible springwires. Even with the smallest contact diameter of 0.76 mm, 15 individual springs are installed, meaning that even this small diameter provides 15 contact surfaces for ideal current transfer.



ADVANTAGES

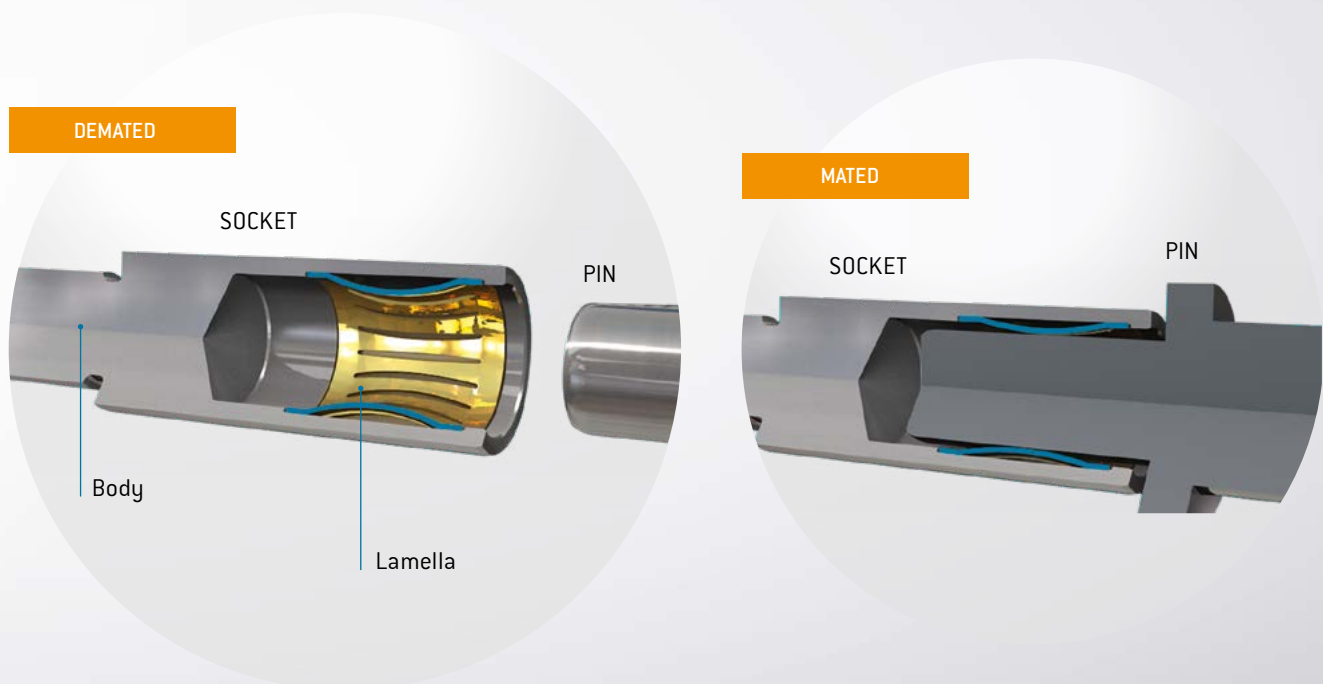
- $\geq 100,000$ mating cycles
(up to 1 million mating cycles can be achieved)
- High current-carrying capacity – surge current capacity
- Low contact resistances
- Large number of independently flexible contact springs, e.g. 40 springs with a diameter of 5 mm
- Low mating and demating forces
- Extremely secure connection
- High vibration and shock resistance
- Individual contacts on request

Standard contact principle for	
Signal	20 to 5 contacts
Power	4 to 2 contacts
High-Current	2 contacts
High-Voltage	4 contacts
RF-signal (coax)	2 contacts
Shielded feedthrough	8, 5, 4 contacts

ODU LAMTAC®

Contacts with lamella technology

The ODU LAMTAC® contact consists of a machined body in which one or more stamped lamella strips are mounted. The individual bars of the lamella provide numerous contact points which guarantee high contact reliability and optimum conductive properties. The adapted contact force ensures low mating and demating forces, and a long service life with low wear. The mating cycles here are $\geq 10,000$.



ADVANTAGES

- $\geq 5,000$ mating cycles
- High current-carrying capacity – surge current capacity
- Low contact resistances
- Low mating and demating forces
- High vibration and shock resistance
- Economical alternative to springwire contacts
- Individual contacts on request

Standard contact principle for	
High-Current	2 to 1 contact(s)
PE	1 contact
High-Voltage	1 contact
RF-signal (coax)	4 contacts
Shielded feedthrough	Shielded transmission

ODU TURNTAC®

Contacts in slotted version

The universal ODU TURNTAC® contact system combines the very best contact properties and high quality with economic prices. By means of the optimum guidance and assembly in the ODU-MAC® system, the longevity of 10,000 mating cycles and more can be achieved.

The contact principle can even be used in dimensions as tiny as 0.3 mm in diameter. Depending on the variety of slotted contact, the connector systems offers two or four contact areas.



ADVANTAGES

- $\geq 10,000$ mating cycles
- Economical solution
- The smallest dimensions are possible
- Individual contacts on request

Standard contact principle for

Shielded feedthrough

Signal contacts

ODU STAMPTAC®

Contacts in stamped model

Thanks to its economical manufacture, the ODU STAMPTAC® is the most affordable alternative for large numbers of units. Available in various coil sizes for processing with hand crimpers and (semi-) automatic stripper crimpers. This reduces the preparation time enormously.

This contact is used in the 10 contacts module (see page [56](#)).



ADVANTAGES

- $\geq 5,000$ mating cycles
- High quality materials and selectively plated surfaces
- Economical contact for high quantities
- Cost-effective processing
- Automatic processing from tape reel possible

Standard contact principle for	
Signal	10 contacts

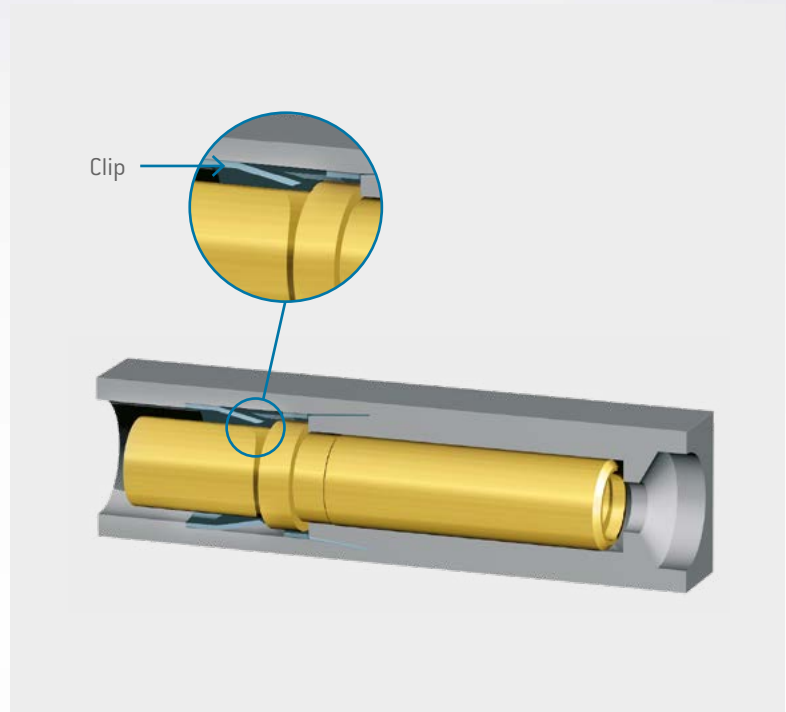
CONTACT RETENTION WITH THE CLIP PRINCIPLE (STANDARD)

The adjacent photo shows how the contact is fixed in the insulator. The contact is pushed from the termination area (rear insertion) into the insulator and locked in by a metal clip (barbed hook) snapping behind a flange.

The contacts can be easily removed again at any time with a removal tool.

Compared to permanent connections, the clip principle allows quick replacement of contacts and easy repair. Contact assembly can be performed independently of the insulator.

Not all modules are equipped with the clip principle, but removal is possible. The 10-position stamped contact does not have a removable contact system.



Most modules rely on the clip principle



3 mounting tabs for optimal stability

APPLICATION SPECIFIC SOLUTIONS

Problem solvers who think outside the box are required when standard solutions find their limits. ODU offers just this kind of experts: the ones who focus on your specific requirements. For every development order we get, we not only perform a thorough review study, but we intensively involve our customers in the ongoing design process.

This guarantees an impressive, custom-fit final result. Our standard connectors are frequently the base for custom modifications.

ODU-MAC® NON-MAGNETIC

White-Line **Silver-Line**

Catalog for MRI solutions



COMPLETE DOCKING UNIT

Three ODU-MAC® rows incl. spindle locking are mounted in a special stainless steel frame.

Advantages

Special floating support with tolerance compensation ± 3 mm



FOR INDUSTRIAL



FOR ROBOTICS



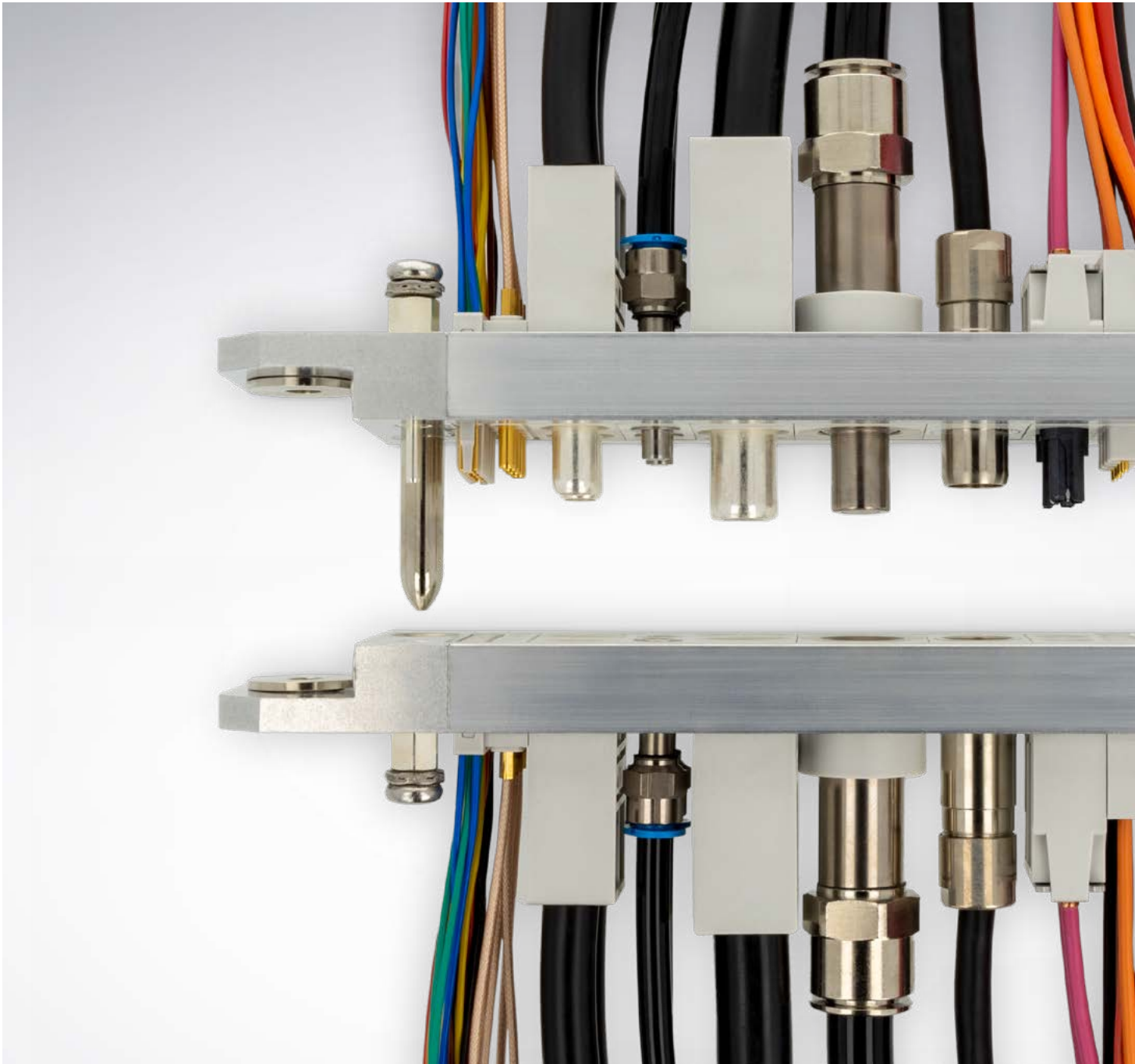
FOR MEDICAL



MONOBLOC INSULATOR

Used for customized housings that capitalize on the advantages of standard ODU-MAC® contacts.





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ODU-MAC® – AUTOMATIC DOCKING

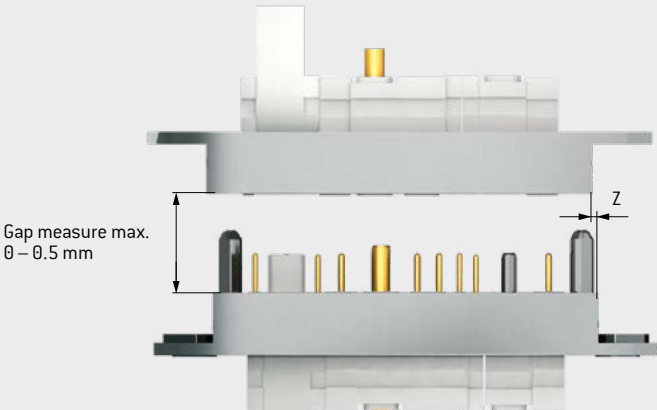
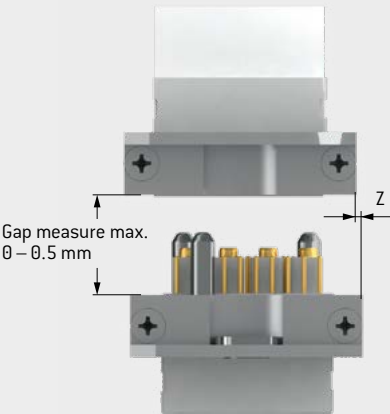
System requirements and tolerances	20
Selection guide for frames	22

SYSTEM REQUIREMENTS AND TOLERANCES

High mating cycles and perfect transfer rates – in order to ensure these properties for automatic docking over the long term, the docking system must be designed accordingly [e.g. centering systems].

Clean and smooth docking is secured by guiding pins that are designed for reliable centering of the connector. Please pay attention to the mechanical requirements as elucidated in the following.

MAXIMUM PERMISSIBLE OFFSET + STANDARD GAP MEASURE IN MATED CONDITION (RADIAL PLAY)

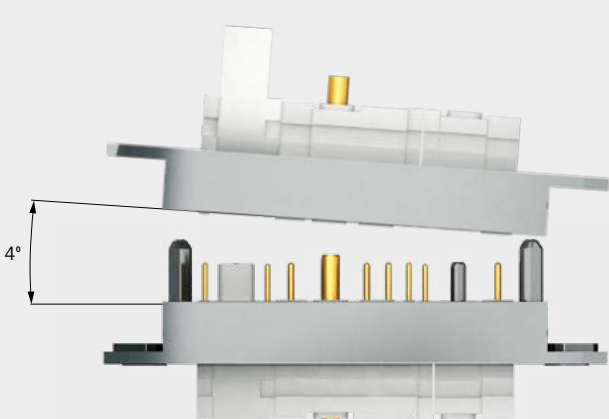
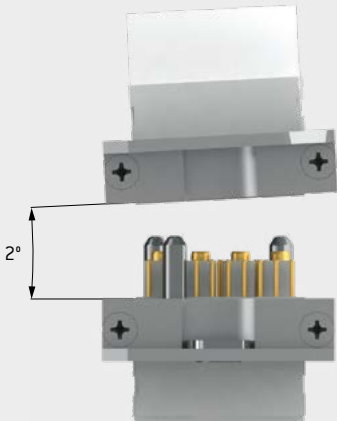


Frame	Tolerance Z
S+	± 1.2 mm
P+	± 2.5 mm
P4+	± 4.0 mm
L	± 1.2 mm

Frame	Tolerance Z
M+	± 0.6 mm
S	± 0.6 mm
QCH	Up to ± 4.0 mm

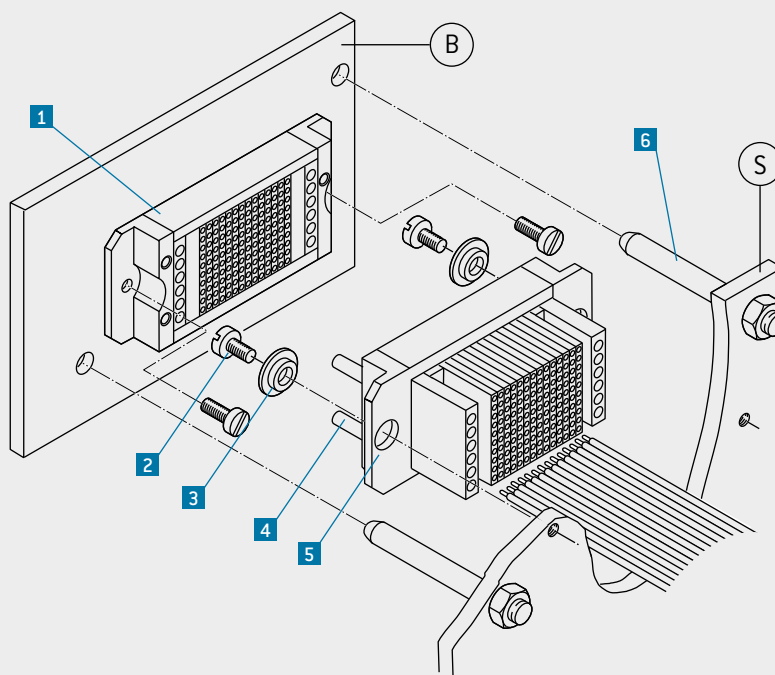
For tolerance compensation in mating direction to prevent damage of the connector and to ensure complete docking, use spring pack acc. to page [36](#)

MAXIMUM PERMISSIBLE ANGLE DEVIATION WHEN MATING



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EXAMPLE OF AN S FRAME SYSTEM (MECHANICAL REQUIREMENTS)



Strain relief for cables / braids must be provided by the customer. See our strain relief housing on page [38](#).

- 1** ODU-MAC® socket piece (fixed)
(screwed without play onto wall B)
- 2** Fastening screw
- 3** Centering bushing for tolerance compensation
- 4** ODU-MAC® guiding pins
- 5** ODU-MAC® pin piece (floating)
(with play via centering bushing; screwed onto wall S)
- 6** Pre-guiding system for walls B and S
(customer performance)

The values for the connected condition [pin S in B] result from the axial play of the centering sockets.

NOTE: AUTOMATIC DOCKING SYSTEMS

- The pin piece of the ODU-MAC® S has to be fixed with the accompanying centering bushing to allow floating for tolerance compensation
- The guiding system of the ODU-MAC® requires additional guiding hardware for the system
- The maximum permissible gap between socket and pin piece is 0.5 mm as standard. Extension with long contact pins is possible
- A suitable pre-guiding system (e.g. guide rails, etc.) is necessary to achieve high mating cycles. The max. tolerance compensation of the ODU-MAC® itself is determined by the selected frame, see page [22](#)
- Strain relief for the cables / braids must be provided by the customer or by usage of our strain relief housing, see page [38](#)
- Sufficient rigidity of the basements (docking plates B and S) of the connector must be ensured to guarantee complete mating

FAILURE TO OBSERVE THESE SPECIFICATIONS MAY RESULT IN DAMAGE.

SELECTION GUIDE FOR FRAMES

The ODU-MAC® Silver-Line product portfolio contains six different frame types to select from. Each of these frame types provides different technical properties at different price levels.

The following overview assists you in selecting the best suitable frame solution.

		Frame type						
		S+	P+	P4+	L	M+	S	QCH
								
		Page 26	Page 27	Page 28	Page 29	Page 30	Page 31	Page 32
Tolerance compensation [mm]	Axial	0.4	1.0	1.0	0.4	0.4	0.2	Up to 1.0
	Radial	± 1.2	± 2.5	± 4.0	± 1.2	± 0.6	± 0.6	Up to ± 4.0
Floating side		Pin and socket	Pin and socket	Pin and socket	Pin and socket	Pin and socket	Pin	Pin and socket
PE connection via frame		Yes	Yes	Yes	No	Yes	No	Depending on frame type
Mating cycles		≥ 100,000						≥ 10 Mio. ¹
Max guiding pin length [mm]		18.0	25.0	31.0	18.0	12.5	21.0	Up to 25.0
Recommended for modules with contact-Ø > 5 mm		–	●	●	–	–	–	–
Mandatory for modules with contact-Ø > 8 mm		–	●	●	–	–	–	–
Recommended for frame length > 40 units		–	●	●	–	–	–	–
Compatible for QCH		●	●	On request	–	–	●	–
Space requirement		● ●	● ● ●	● ● ●	● ●	●	●	● ● ●

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¹ Possible by means of interchangeable parts.





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ODU-MAC® – FRAMES FOR AUTOMATIC DOCKING

ODU-MAC® S+	26
ODU-MAC® P+	27
ODU-MAC® P4+	28
ODU-MAC® L	29
ODU-MAC® M+	30
ODU-MAC® S	31
ODU-MAC® QCH (Quick Change Head)	32
ODU-MAC® Silver-Line strain relief housing	38

ODU-MAC® S+

Standard solution for docking tasks with optional PE transmission



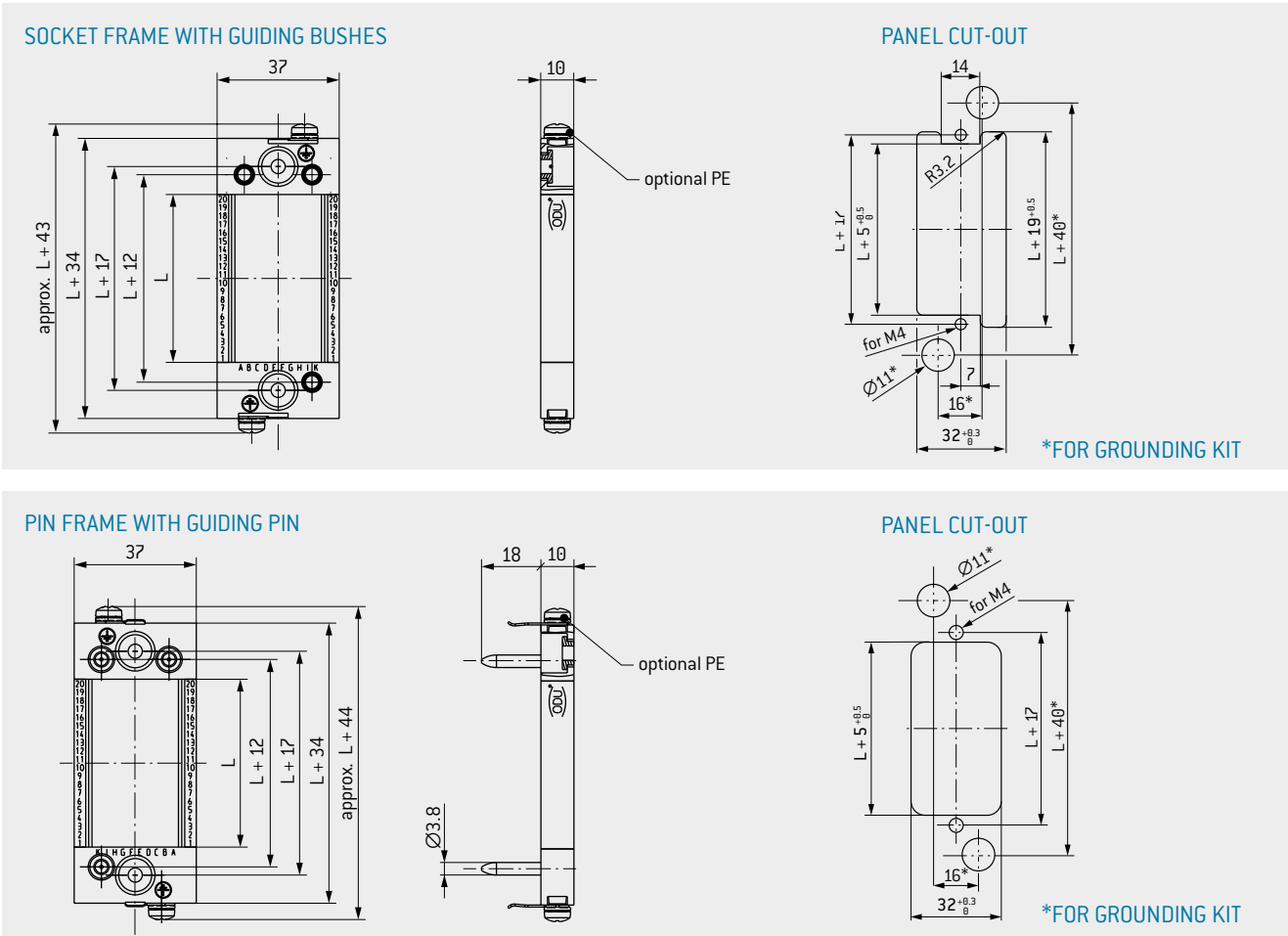
TECHNICAL DATA

- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 1.2 mm
- Floating supported (pin and socket side)
- $\geq 100,000$ mating cycles
- Optional PE transmission see page [36](#)

[Product Finder](#)



Non-magnetic version available on request



Description	Part number
Pin frame	611.750.0__ .600.00_
Socket frame	610.750.0__ .600.00_

- L Number of units $\times 2.54$
- __ Select number of desired units (03 to 60, > 60 on request)
- 0 = without PE
- 1 = with metal sheet style PE
- 2 = with pin-socket style PE

NOT COMPATIBLE WITH ODU-MAC® S FRAME

ODU-MAC® P+

Reinforced frame design for highest mechanical requirements



TECHNICAL DATA

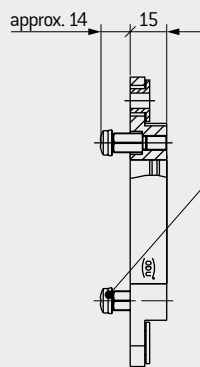
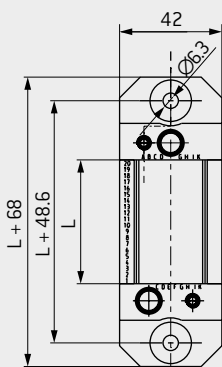
- Tolerance compensation:
Axial play: 1 mm
Radial play: ± 2.5 mm
- Floating supported (pin and socket side)
- Recommended for modules
with contact diameter > 5 mm
or frame length > 40 units [depending on configuration]
- Mandatory for modules with contact diameter > 8 mm
- $\geq 100,000$ mating cycles
- Optional PE transmission see page [36](#)

Product Finder

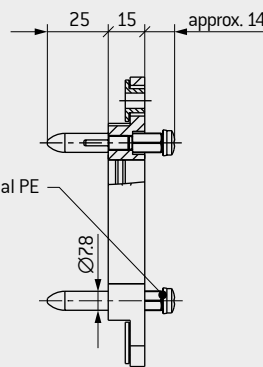


Non-magnetic version available on request

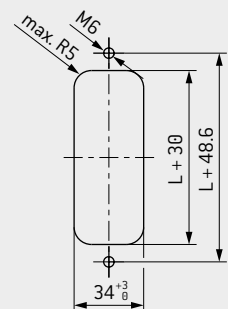
SOCKET FRAME WITH GUIDING BUSHES



PIN FRAME WITH GUIDING PIN



PANEL CUT-OUT¹



¹ Panel cut-out applies for mounting plate thickness ≤ 6 mm. For mounting plate thickness > 6 mm please [refer to our assembly instruction](#).

Description	Part number
Pin frame	611.730.0__ .600.00 _
Socket frame	610.730.0__ .600.00 _

- L Number of units $\times 2.54$
- __ Select number of desired units (03 to 60, > 60 on request)
- _ 0 = without PE | 1 = with PE

ODU-MAC® P+ FRAME WITHOUT OPTIONAL PE TRANSMISSION BACKWARDS COMPATIBLE WITH ODU-MAC® P FRAME

ODU-MAC® P4+

Reinforced frame design with extended tolerance compensation



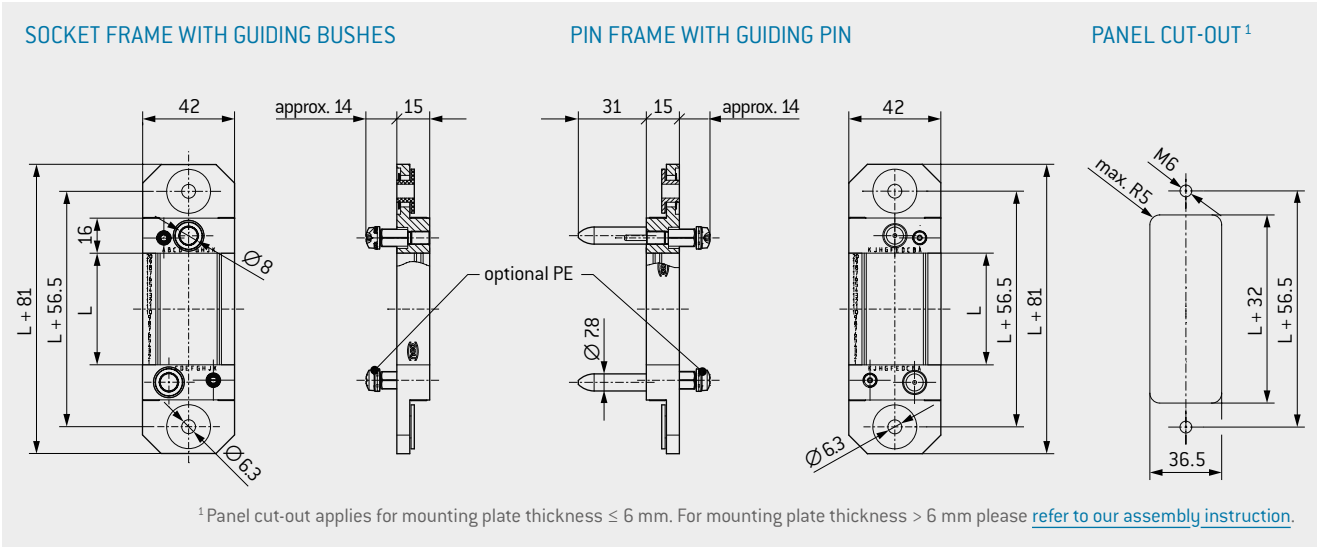
TECHNICAL DATA

- Tolerance compensation:
Axial play: 1 mm
Radial play: ± 4.0 mm
- Floating supported (pin and socket side)
- Recommended for modules
with contact diameter > 5 mm
or frame length > 40 units (depending on configuration)
- Mandatory for contact diameter > 8 mm
- $\geq 100,000$ mating cycles
- Optional PE transmission see [page 36](#)

[Product Finder](#)



Non-magnetic version available on request



Description	Part number
Pin frame	611.735.0__600.00__
Socket frame	610.735.0__600.00__

- L Number of units $\times 2.54$
- Select number of desired units
 (05 to 60 in steps of 5, ≥ 60 on request)
- _ 0 = without PE | 1 = with PE

ODU-MAC® L

Frame with higher tolerance compensation and reinforced guiding bushes as well as extended guiding pins



TECHNICAL DATA

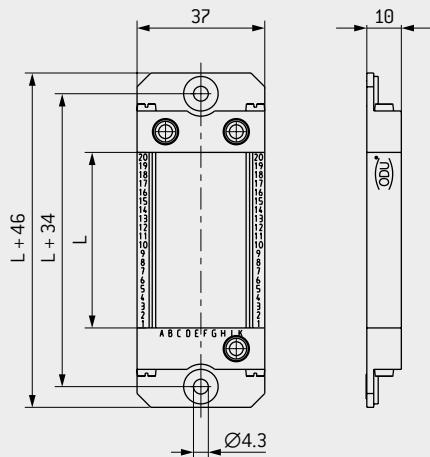
- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 1.2 mm
- Floating supported (pin and socket side)
- $\geq 100,000$ mating cycles

[Product Finder](#)

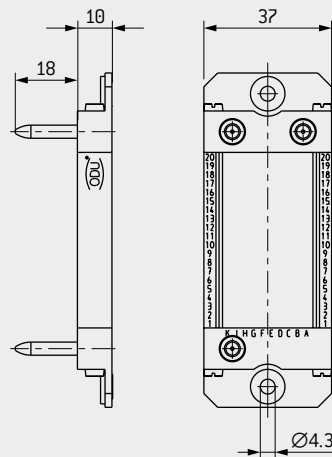


Non-magnetic version available on request

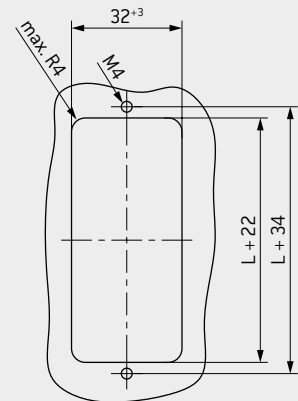
SOCKET FRAME WITH GUIDING BUSHES



PIN FRAME WITH GUIDING PIN



PANEL CUT-OUT



Description	Part number
Pin frame	611.009.0___.600.000
Socket frame	610.009.0___.600.000

L Number of units $\times 2.54$

__ Select number of desired units (03 to 60, > 60 on request)

ODU-MAC® M+

Compact design with minimal space requirements and optional PE transmission



TECHNICAL DATA

- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 0.6 mm
- Floating supported (pin and socket side)
- $\geq 100,000$ mating cycles
- Optional PE transmission see page [36](#)

[Product Finder](#)



Non-magnetic version available on request

SOCKET FRAME WITH GUIDING BUSHES

PANEL CUT-OUT

PIN FRAME WITH GUIDING PIN

PANEL CUT-OUT

Description	Part number
Pin frame	611.716.0__ .600.00_
Socket frame	610.716.0__ .600.00_

- L Number of units $\times 2.54$
- __ Select number of desired units (03 to 60, > 60 on request)
- _ 0 = without PE | 1 = with PE

ODU-MAC[®] S

Standard solution for docking tasks



TECHNICAL DATA

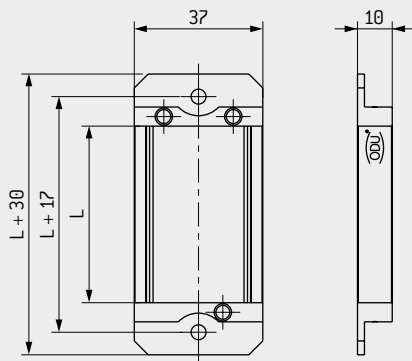
- Tolerance compensation:
Axial play: 0.2 mm
Radial play: ± 0.6 mm
- Floating supported (pin side)
- $\geq 100,000$ mating cycles

[Product Finder](#)

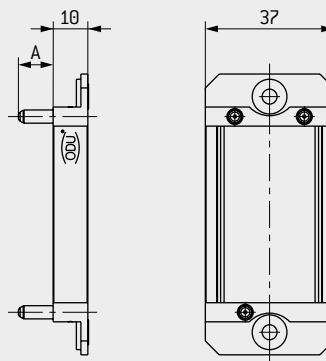


Non-magnetic version available on request

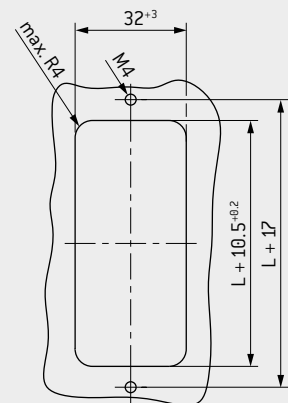
SOCKET FRAME WITH GUIDING HOLE



PIN FRAME WITH GUIDING PIN



PANEL CUT-OUT



Description	Part number	Dim. A	Note
Pin frame	611.020.0__600.000	10	
Socket frame	610.020.0__600.000		
Pin frame	611.021.0__600.000	12.5	
Socket frame	610.020.0__600.000		
Pin frame	611.025.0__600.000	21	Model with long guiding pins
Socket frame	610.020.0__600.000		
Pin frame	611.050.0__600.000	10	With labeling
Socket frame	610.050.0__600.000		

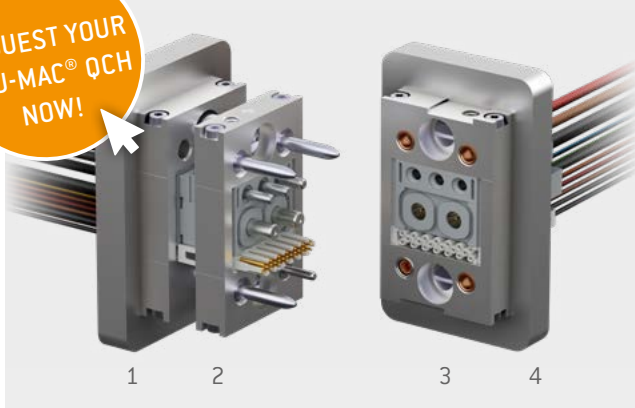
L Number of units $\times 2.54$

-- Select number of desired units
(03 to 60, > 60 on request)

ODU-MAC® QCH (QUICK CHANGE HEAD)

For maximized mating cycle capabilities (connector saver), minimized maintenance downtime and expense

REQUEST YOUR
ODU-MAC® QCH
NOW!



TECHNICAL DATA (S+ FRAME)

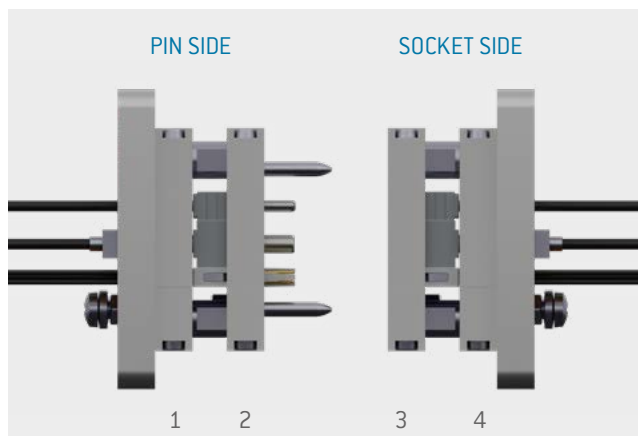
- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 1.2 mm
- Floating supported (pin and socket side)
- Min. 10 million mating cycles (≥ 100,000 per interchange part)
- Minimized maintenance effort thanks to interchangeable parts

[Product Finder](#)

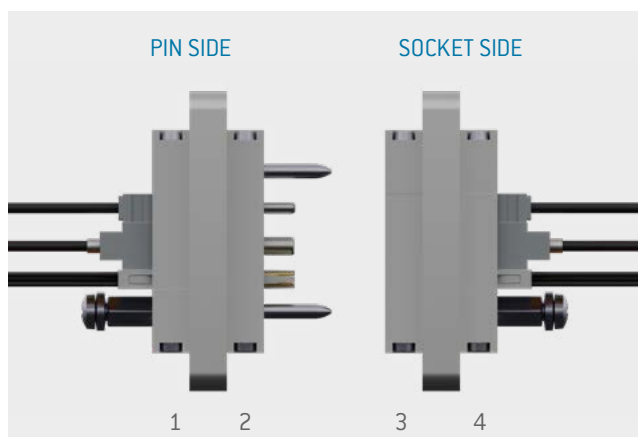


Non-magnetic version available on request

The ODU-MAC® QCH allows to fulfill the highest requirements towards mating cycles. The system consists of four parts – two base parts plus two interchange parts. Assembly of one base and interchange part build one unit for socket and pin side, respectively. The mounting wall can either be rear (requires distance piece for base parts) or central. ODU-MAC® QCH can also be implemented one-sidedly.



Description	Part number Mounting wall rear
Part 1: Base part incl. distance piece	611.752.0___.600.00_
Part 2: Interchange part (pin)	
without PE	611.750.0___.600.000
with PE	611.751.0___.600.001
Part 3: Interchange part (socket)	
without PE	610.750.0___.600.000
with PE	610.751.0___.600.001
Part 4: Base part	610.752.0___.600.00_
Distance piece as a spare part	610.026.201.304.000



Description	Part number Mounting wall central
Part 1: Base part incl. distance piece	611.753.0___.600.00_
Part 2: Interchange part (pin)	
without PE	611.750.0___.600.000
with PE	611.751.0___.600.001
Part 3: Interchange part (socket)	
without PE	610.750.0___.600.000
with PE	610.751.0___.600.001
Part 4: Base part	610.753.0___.600.00_

__ = Select number of desired units
(05 to 60, > 60 on request)
_ = Enter "1" to include or "0" to exclude PE contacts

Interchange parts can be ordered fully assembled

Description	Part number
PE Base part	174.103.100.201.100
PE Interchange part (pin)	182.104.000.301.000
PE Interchange part (socket)	174.104.100.201.000

In the event of maintenance or repair only the interchange parts (2 and 3) need to be replaced, while the base parts (1 and 4) with the cable harness remain assembled. Therefore, the ODU-MAC® QCH enables operation with a competitive advantage:

- Cost efficient due to reduced Total Cost of Ownership
- Extremely low maintenance effort
- Time saving
- Extended lifespan

Interchange parts can also be ordered fully equipped with contacts.

OTHER COMPATIBLE FRAMES FOR ODU-MAC® QCH (ON REQUEST)

- ODU-MAC® P+ (see page 27) – radial play: ± 2.5 mm
- ODU-MAC® P4+ (see page 28) – radial play: ± 4.0 mm

ODU-MAC® SILVER-Line
QUICK CHANGE HEAD

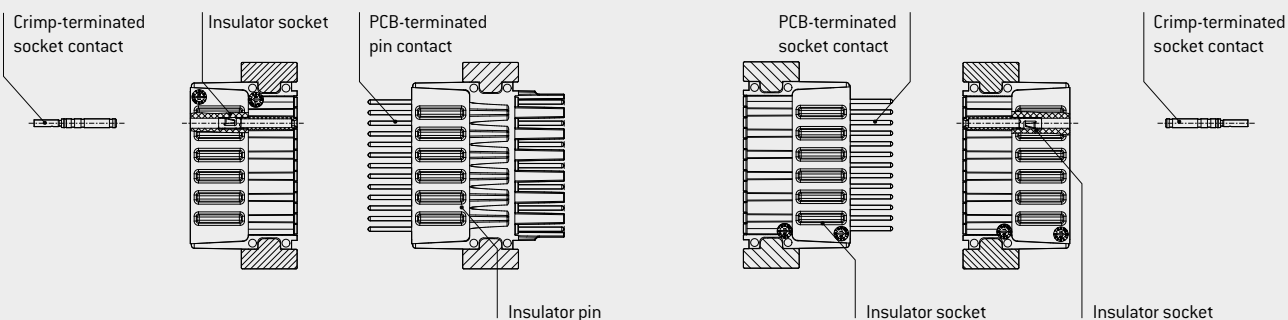


HOW MODULES FOR YOUR QCH ARE COMPOSED

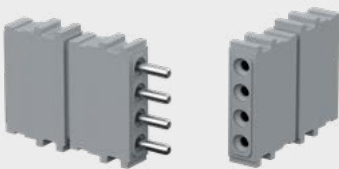
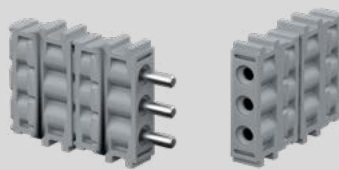
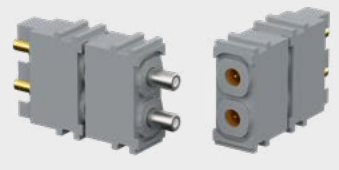


On the module pages, this icon marks compatibility with QCH.

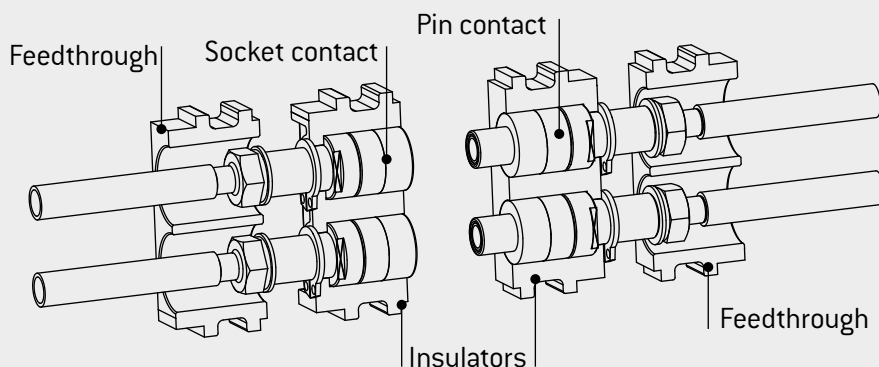
PCB TERMINATED CONTACTS



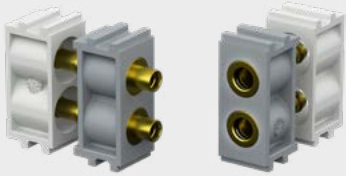
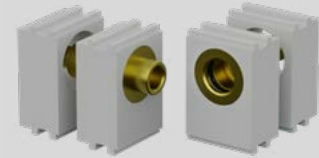
	Modules	Description	Units / width	Features	Page
Signal		20 contacts for turned contacts Contact Ø: 0.76 mm	 5.08 mm	Operating voltage ¹ 250 V Rated impulse voltage ¹ 1,500 V Max. continuous current ² 11 A for 0.38 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	50
		14 contacts for turned contacts Contact Ø: 1.02 mm	 7.62 mm	Operating voltage ¹ 320 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 13.5 A for 0.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	52
		10 contacts for turned contacts Contact Ø: 0.76 mm	 2.54 mm	Operating voltage ¹ 250 V Rated impulse voltage ¹ 1,500 V Max. continuous current ² 11 A for 0.38 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	54
		6 contacts for turned contacts Contact Ø: 1.02 mm	 5.08 mm	Operating voltage ¹ 400 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 13.5 A for 0.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	58
		5 contacts for turned contacts Contact Ø: 1.5 mm	 5.08 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 27 A for 1.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	60

	Modules	Description	Units / width	Features	Page
Power		4 contacts for turned contacts Contact Ø: 2.41 mm	 7.62 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 41 A for AWG 12 Degree of pollution ¹ 2 Mating cycles ≥ 100,000	62
		3 contacts for turned contacts Contact Ø: 3 mm	 7.62 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 58 A for 6 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	64
RF-signal (coax)		2 contacts for 50 Ω RF-signal (coax) contacts	 12.7 mm	Frequency range 0 to 1.5 GHz Mating cycles ≥ 100,000	88

FEEDTHROUGHS



RF-signal (coax)		2 contacts for 50 Ω RF-signal (coax) contacts SMA termination	 12.7 mm	Frequency range 0 to 9.0 GHz Mating cycles ≥ 100,000	86
High-Voltage		1 contact Contact Ø: 2 mm	 20.32 mm	High-Voltage Operating voltage ¹ 6,300 V Rated impulse voltage ¹ 20,000 V Degree of pollution ¹ 2 Mating cycles ≥ 10,000	82

	Modules	Description	Units / width	Features	Page
Compressed air and fluid modules		2 contacts for compressed air valves	 12.7 mm	20 bar Tube diameter Mating cycles	M5 or max. 4 mm $\geq 100,000$ 94
		1 contact for compressed air valve	 20.32 mm	12 bar Tube diameter Inner diameter tube Mating cycles	max. 6 mm max. 6 mm $\geq 100,000$ 96

ACCESSORIES FOR DOCKING FRAMES

PE TRANSMISSION FOR ODU-MAC® S+ AND M+

GROUNDING KIT FOR S+ AND M+ SOCKET FRAME



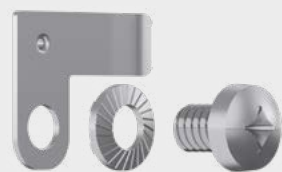
TECHNICAL DATA

- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 1.2 mm
- $\geq 100,000$ mating cycles
- Double-sided version (redundant)
- Surface: nickel-plated



Non-magnetic version available on request

GROUNDING KIT FOR S+ AND M+ PIN FRAME



Description	Part number	Connection threads
Socket contact	190.270.001.000.000	M4
Pin contact	190.270.002.000.000	M4

Max. 6 mm² lug connection for PE transmission
 Contact resistance compliant with $< 0.1 \Omega$ standard
 Not compatible with ODU-MAC® S frame

SPRING PACK FOR ODU-MAC® S+



Part number: 656.573.011.000.000

For tolerance compensation in mating direction to prevent damage of the connector and to ensure complete docking.

PE TRANSMISSION FOR ODU-MAC® S+, P+ AND P4+

GROUNDING KIT FOR S+, P+ AND P4+ SOCKET FRAME



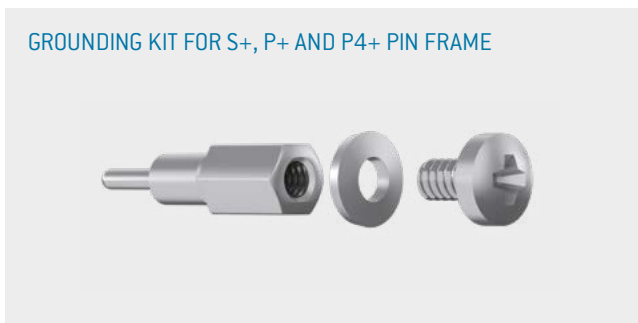
TECHNICAL DATA

- Tolerance compensation:
Axial play: 0.4 mm
Radial play: ± 1.2 mm
- $\geq 100,000$ mating cycles
- Double-sided version (redundant)
- Surface: nickel-plated



Non-magnetic version available on request

GROUNDING KIT FOR S+, P+ AND P4+ PIN FRAME



Description	Part number	Connection threads
Socket contact	174.100.100.201.100	M5
Pin contact	180.100.000.301.100	M5

SPRING PACK FOR ODU-MAC® P4+



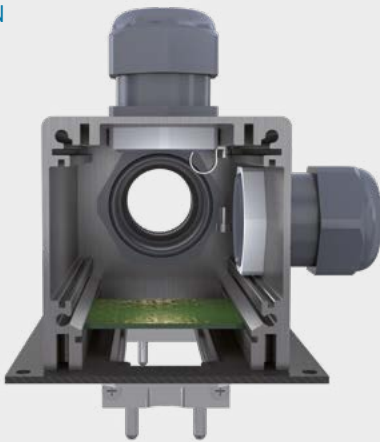
Part number: 656.573.011.000.001

For tolerance compensation in mating direction to prevent damage of the connector and to ensure complete docking.

ODU-MAC® SILVER-LINE STRAIN RELIEF HOUSING



APPLICATION EXAMPLE



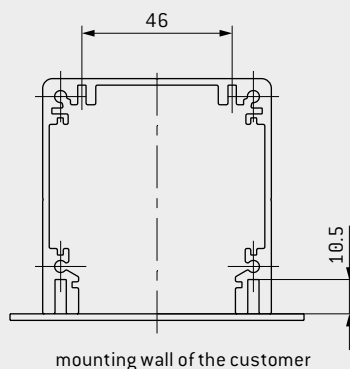
TECHNICAL DATA

- Material: aluminum
- Operating temperature: $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$
- Protection class¹ can be adjusted individually
- Cable clamps, see page [194](#)
- Locknut for cable clamp see page [194](#)

CHARACTERISTICS

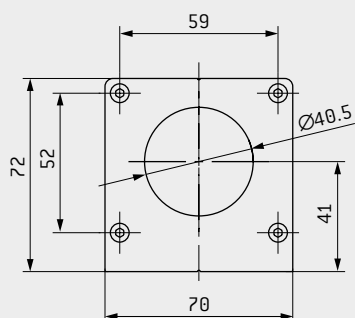
- Resistant and compact
- Protection of the termination area
- Individual strain-relief variations, cable entries as well as grounding connections
- Suitable for all ODU-MAC® docking frames
- 6 standard lengths, compatible with all ODU-MAC® docking frame varieties (further lengths available on request)
- Optional fixation of the PCBs and components in the protected interior
- ODU logo included as a standard; customer logo can also be delivered on request

[Product Finder](#)

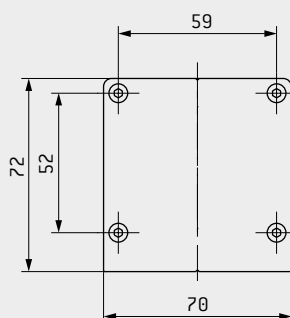
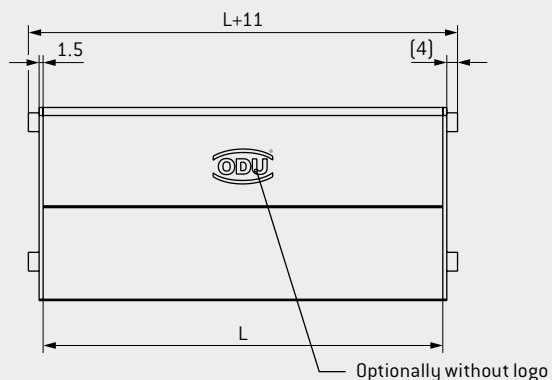


¹ A higher protection class is possible with additional sealing of the housing.

COVER WITH HOLE



COVER WITHOUT HOLE

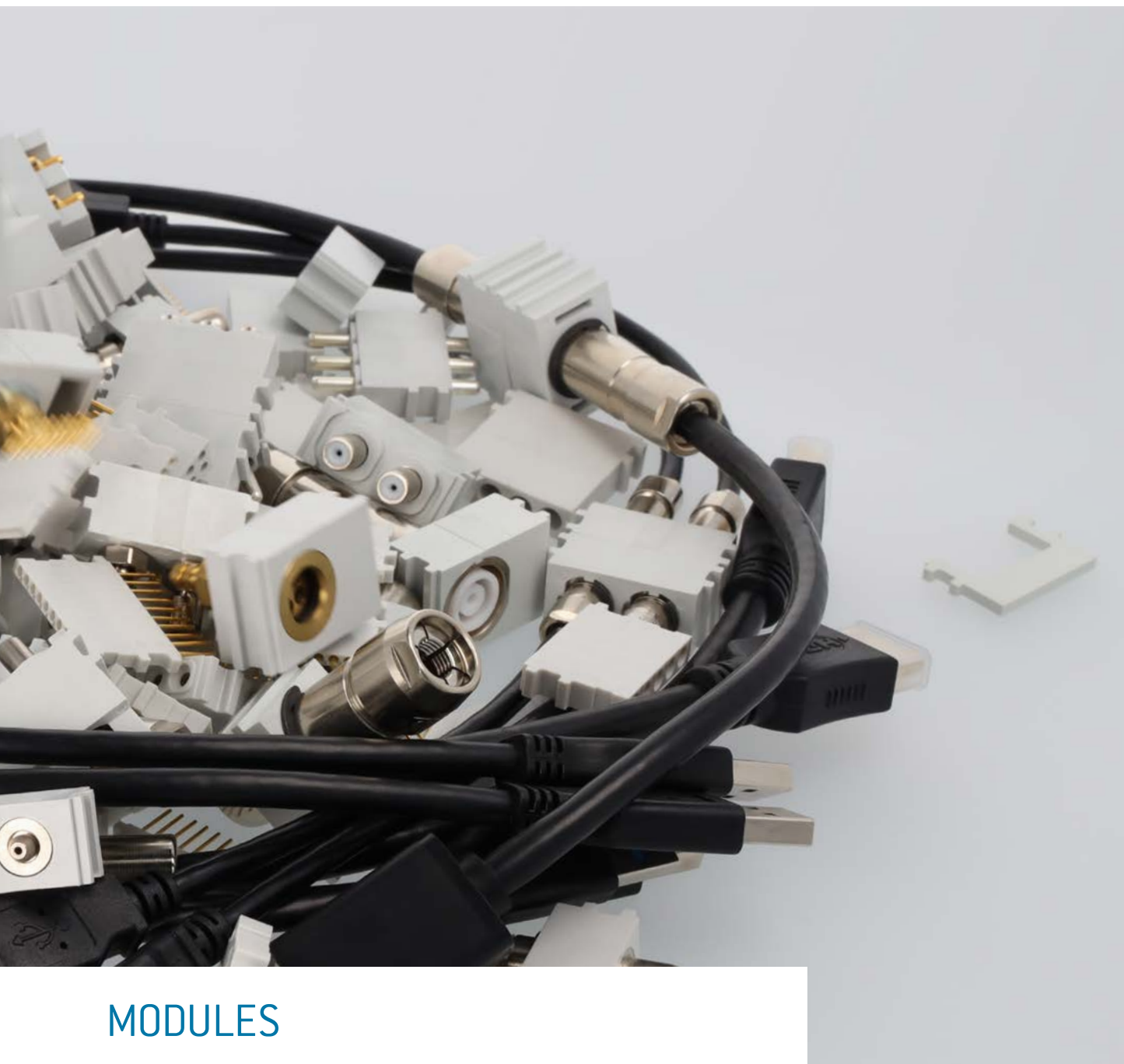
HOUSING SET¹

For mounting on an existing mounting wall of the customer.

Part number 2 × cover without hole	Part number 1 × cover with / 1 × cover without hole	Part number 2 × cover with hole	Units 2.54 mm	Dim. L mm
616.010.100.600.000	616.010.114.600.000	616.010.144.600.000	10	97
616.020.100.600.000	616.020.114.600.000	616.020.144.600.000	20	123
616.030.100.600.000	616.030.114.600.000	616.030.144.600.000	30	149
616.040.100.600.000	616.040.114.600.000	616.040.144.600.000	40	174
616.050.100.600.000	616.050.114.600.000	616.050.144.600.000	50	199
616.060.100.600.000	616.060.114.600.000	616.060.144.600.000	60	224

¹ The set comprises a housing including two covers and corresponding fastening screws for assembly. Fastening material for an existing mounting wall of the customer is not included in the scope of delivery.





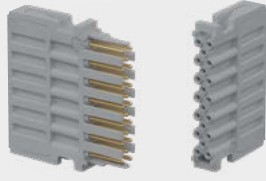
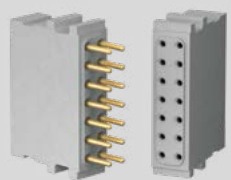
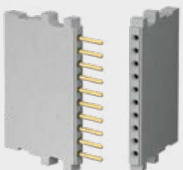
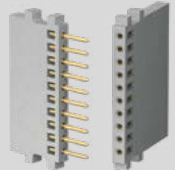
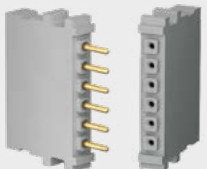
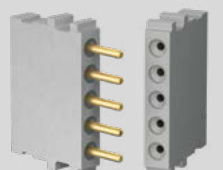
MODULES

Overview	42
Signal	50
Power	62
High-Current	70
PE	78
High-Voltage	80
RF-signal (coax)	84
Compressed air and fluid modules	94
Fiber optic	106
Shielded feedthrough / High-Speed connector	116
Preassembled module for multi-position feedthrough / High-Speed connector	114
Thermocouple	124
Blank modules / Spacer modules / Coding modules / Pin protection modules	126

OVERVIEW

Recommended stripping lengths can be found in corresponding [assembly instruction](#) per module.

 This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
Signal		20 contacts for turned contacts Contact Ø: 0.76 mm	 5.08 mm	Operating voltage ¹ 250 V Rated impulse voltage ¹ 1,500 V Max. continuous current ² 11 A for 0.38 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000 + Highest contact density + Supports last-mate-first break	50
	 	14 contacts for turned contacts Contact Ø: 1.02 mm	 7.62 mm	High contact density Operating voltage ¹ 320 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 13.5 A for 0.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000 + Supports last-mate-first break	52
	 	10 contacts for turned contacts Contact Ø: 0.76 mm	 2.54 mm	Highest contact density Operating voltage ¹ 250 V Rated impulse voltage ¹ 1,500 V Max. continuous current ² 11 A for 0.38 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000 + Supports last-mate-first break	54
	 	10 contacts for stamped contacts Contact Ø: 0.7 mm	 2.54 mm	Economical solution Operating voltage ¹ 16 V Rated impulse voltage ¹ 1,200 V Max. continuous current ² 6 A for 0.38 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 5,000 + Supports last-mate-first break	56
	 	6 contacts for turned contacts Contact Ø: 1.02 mm	 5.08 mm	Operating voltage ¹ 400 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 13.5 A for 0.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000 + Supports last-mate-first break	58
	 	5 contacts for turned contacts Contact Ø: 1.5 mm	 5.08 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 27 A for 1.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000 + Supports last-mate-first break	60

¹ Acc. to IEC 60664-1:2020 [VDE 0110-1:2022-07] for degree of pollution 2 | ² Definition max. continuous current see page [205](#)

OVERVIEW



This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
Power		4 contacts for turned contacts Contact Ø: 2.41 mm	 7.62 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 41 A for AWG 12 Degree of pollution ¹ 2 Mating cycles ≥ 100,000	62
		3 contacts for turned contacts Contact Ø: 3 mm	 7.62 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 58 A for 6 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	64
		3 contacts for turned contacts Contact Ø: 3 mm	 10.16 mm	High-Voltage Operating voltage ¹ 2,500 V Rated impulse voltage ¹ 10,000 V Max. continuous current ² 58 A for 6 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	66
		2 contacts for turned contacts Contact Ø: 5 mm	 12.7 mm	Operating voltage ¹ 1,000 V Rated impulse voltage ¹ 4,000 V Max. continuous current ² 119 A for 16 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	68
High-Current		2 contacts for turned contacts with ODU SPRINGTAC® ³ Contact Ø: 8 mm	 15.24 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 142 A for 25 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	70
		2 contacts for turned contacts with ODU LAMTAC® ⁴ Contact Ø: 8 mm	 15.24 mm	Operating voltage ¹ 500 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 154 A for 25 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 10,000	72

¹ Acc. to IEC 60664-1:2020 [VDE 0110-1:2022-07] | ² Definition max. continuous current see page [205](#) | ³ Contact with springwire technology

⁴ Contact with lamella technology

OVERVIEW



This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
High-Current		1 contact for turned contacts with ODU LAMTAC® ⁴ Contact Ø: 10 mm	 17.78 mm	Highest current Operating voltage ¹ 500 V Rated impulse voltage ¹ 4,000 V Max. continuous current ² 179 A for 35 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 10,000	74
		1 contact for turned contacts with ODU LAMTAC® ⁴ Flex Contact Ø: 12 mm	 12.7 mm	Operating voltage ¹ 160 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 255 A for 50 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 10,000	76
PE		1 contact for turned contacts with ODU LAMTAC® ³ Contact Ø: 10 mm	 12.7 mm	Mating cycles ≥ 10,000 Conductor cross-section 10 / 16 / 25 mm ²	78
High-Voltage		4 contacts for turned contacts Contact Ø: 1.5 mm	 7.62 mm	High contact density High-Voltage Operating voltage ¹ 2,500 V Rated impulse voltage ¹ 10,000 V Max. continuous current ² 27 A for 1.5 mm ² Degree of pollution ¹ 2 Mating cycles ≥ 100,000	80
		1 contact Contact Ø: 2 mm	 20.32 mm	High-Voltage Operating voltage ¹ 6,300 V Rated impulse voltage ¹ 20,000 V Degree of pollution ¹ 2 Mating cycles ≥ 10,000	82
RF-signal (coax)		4 contacts for 50 Ω RF-signal (coax) contacts	 7.62 mm	High contact density Frequency range 0 to 1.3 GHz Mating cycles ≥ 60,000 	84

¹ Acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) for degree of pollution 2 | ² Definition max. continuous current see page [205](#) | ³ Contact with lamella technology

OVERVIEW



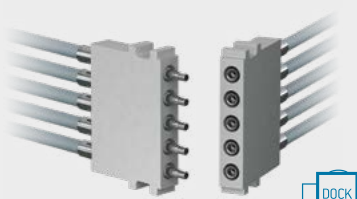
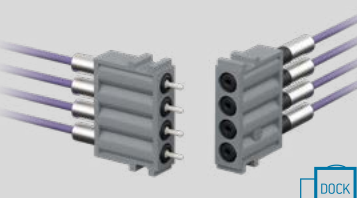
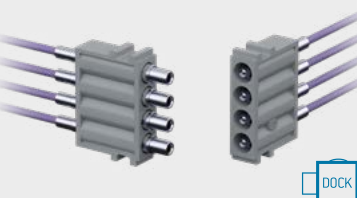
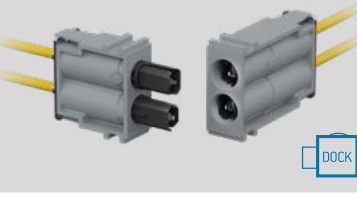
This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
RF-signal (coax)		2 contacts for 50 Ω RF-signal (coax) contacts SMA termination	 12.7 mm	9.0 GHz Frequency range Mating cycles 0 to 9.0 GHz ≥ 100,000	86
		2 contacts for 50 Ω RF-signal (coax) contacts	 12.7 mm	Frequency range Mating cycles 0 to 2.4 GHz ≥ 100,000 	88
		2 contacts for 50 Ω RF-signal (coax) contacts	 12.7 mm	High-Voltage Frequency range Mating cycles 0 to 2.8 GHz ≥ 100,000	90
		2 contacts for 75 Ω RF-signal (coax) contacts	 12.7 mm	Frequency range Mating cycles 0 to 3.0 GHz ≥ 100,000	92
Compressed air modules		2 contacts for compressed air valves	 12.7 mm	20 bar Tube diameter Mating cycles M5 or max. 4 mm ≥ 100,000	94
		1 contact for compressed air valve	 20.32 mm	12 bar Tube diameter Inner diameter tube Mating cycles max. 6 mm max. 6 mm ≥ 100,000	96

OVERVIEW



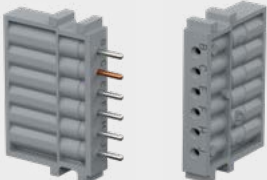
This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
Fluid modules	 	2 contacts for fluid coupling plug	 12.7 mm	16 bar Tube diameter Mating cycles M5 internal thread $\geq 100,000$	98
		1 contact for fluid coupling plug	 22.86 mm	25 bar Inner diameter tube Mating cycles G1/4 $\geq 100,000$	102
Fiber optic	 	5 contacts for fiber optic contacts for plastic fiber (POF)	 5.08 mm	High contact density Insertion loss typical Mating cycles 1.5 dB for 670 nm $\geq 40,000$	106
	 	4 contacts for fiber glass (GOF), Physical Contact	 7.62 mm	Insertion loss typical Mating cycles Contacts only available pre-assembled ≤ 0.5 dB $\geq 1,000$	108
	 	4 contacts for fiber glass (GOF), Expanded Beam	 7.62 mm	Insertion loss typical Mating cycles Contacts only available pre-assembled ≤ 1.5 dB $\geq 100,000$	110
	 	2 contacts for fiber glass (GOF), Expanded Beam Performance	 12.7 mm	Mating cycles Insertion loss typical $\geq 50,000$ 0.35 (SM) 0.15 (MM)	112

OVERVIEW



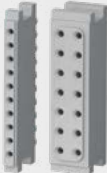
This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
Shielded feedthrough / High-Speed connector		2 to 10 contacts for inserts size 0	 12.7 mm	Mating cycles $\geq 10,000$ Suitable for all common bus systems SPE (1 Gbit/s), Ethernet (100 Mbit/s), USB® 3.2 Gen 1x1 (5 Gbit/s)	116
		2 to 14 contacts for inserts size 1	 15.24 mm	Mating cycles $\geq 10,000$ with springwire $\geq 60,000$ Suitable for all common bus systems SPE (1 Gbit/s) Ethernet (100 Mbit/s), USB® 3.2 Gen 1x1 (5 Gbit/s)	118
		4 to 22 contacts for inserts size 2	 17.78 mm	Mating cycles $\geq 10,000$ with springwire $\geq 60,000$ Suitable for all common bus systems Ethernet (10 Gbit/s), USB® (10 Gbit/s), HDMI® 2.0 (18 Gbit/s), DisplayPort® (40 Gbit/s), HDMI® (48 Gbit/s).	120
		10 to 30 contacts for inserts size 3	 20.32 mm	Mating cycles $\geq 10,000$ Suitable for all common bus systems Ethernet	122
Thermocouples		6 contacts Contact Ø: 1.00 mm	 5.08 mm	Temperature range Type K -200 °C to $1,250\text{ °C}$ Type T -250 °C to 350 °C Mating cycles $\geq 5,000$	124

OVERVIEW



This icon marks compatibility with ODU DOCK; pay attention to the space requirements.

	Modules	Description	Units / width	Features	Page
Blank modules / spacer modules / coding modules / pin protection modules	 	Blank modules	1 Unit 2.54 mm 3 Units 7.62 mm 5 Units 12.7 mm	Used to fill incomplete frames. Useful to increase the maximum allowed voltage by increasing the clearance and creepage distance.	126
	 	Spacer module	1 Unit 2.54 mm 2 Units 5.08 mm 3 Units 7.62 mm 5 Units 12.7 mm	Not equipped with retaining clips. The populated pin modules on mating connectors can still be inserted into these spacers without interference. For information on the individual spacer modules please look at the corresponding modules.	127
	 	Coding modules	1 Unit 2.54 mm	Arranged between the modules to create keyed guiding system.	128
	 	Pin protection modules	1 Unit 2.54 mm	Used to protect the pins in conjunction with small pin diameters. Useful to increase the maximum allowed voltage by increasing the clearance and creepage distance.	129



MODULE 20 CONTACTS

With pin protection against mechanical damage



Removal of the already assembled contact (incl. cable)
Part number: 087.170.361.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000

For an overview of all tools please see from page [191](#).

Contact diameter: 0.76 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 11 A

[Product Finder](#) 

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Module up to 175 °C on request
- Crimp information see page [182](#)
- Module can't be used in ODU-MAC® Zero
- Capable of transmitting following data protocols:
Fast-Ethernet 100 Mbit/s, Gigabit-Ethernet 1 Gbit /s, USB 2.0
- Supports last-mate-first-break function

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	250 V	50 V
Rated impulse voltage	1,500 V	1,500 V
Degree of pollution	2	3
Clearance distance	0.9 mm	0.9 mm
Creepage distance	1.5 mm	1.5 mm

Voltage information acc. to MIL, EIA-364-20F:2019 see page [202](#)

Operating voltage	500 V
Test voltage	1,500 V

Mechanical data

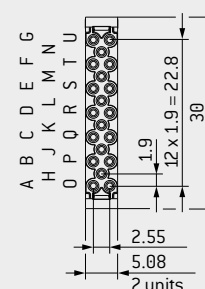
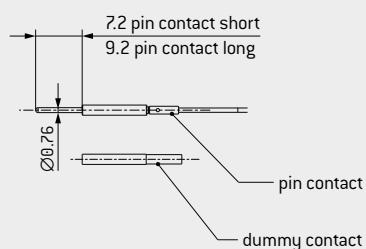
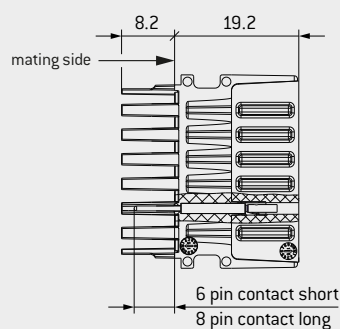
Total mating force (average)	27 N / Module
Total sliding force (average)	19.6 N / Module
Contact diameter	0.76 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

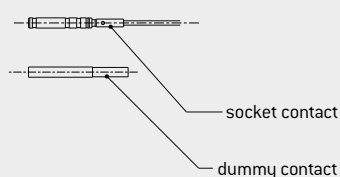
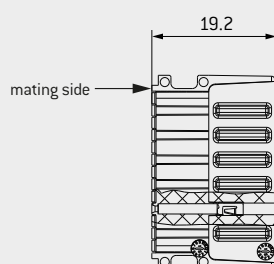
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact plating	Au over Ni

¹ Definition max. continuous current see page [205](#)

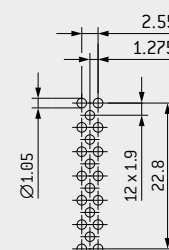
INSULATOR PIN



INSULATOR SOCKET



PCB LAYOUT



Module 20 contacts	Part number
Insulator socket	610.178.120.922.000
Insulator pin	611.178.120.922.000
Dummy contact	021.341.123.300.000

The last-mate-first-break function can be implemented by using short and long contacts.

Description	Part number	Conductor cross-section mm ²	Termination AWG / mm	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.361.000.307.000	0.38	22	7.5	4	11	3.8
Pin contact long ¹	180.381.000.307.000						
Socket contact ¹	170.361.700.207.000						
Pin contact short ¹	180.540.000.307.000	0.25 – 0.08	24 – 28	6	3.5	9	3.8
Pin contact long ¹	180.570.000.307.000						
Socket contact ¹	170.540.700.207.000						
Pin contact short ¹	180.850.000.307.000	–	PCB termination Ø 0.76 mm	7.5	4	11	3.8
Pin contact long ¹	180.851.000.307.000						
Socket contact ¹	170.850.700.207.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 at a temperature increase of 45 K
³ Definition max. continuous current see page 205.

MODULE 14 CONTACTS



Contact diameter: 1.02 mm
Mating cycles: ≥ 100,000
Current-carrying capacity¹: 13.5 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Module up to 175 °C on request
- Crimp information see page [182](#)
- Capable of transmitting following data protocols:
Ethernet (1 Gbit/s), USB® 2.0 (480 Mbit/s), USB® 3.2 Gen 1x1 (5 Gbit/s), HDMI® 1.4 (10 Gbit/s).
- Supports last-mate-first-break function



Removal of the already assembled contact (incl. cable)
Part number: 087.170.362.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000

For an overview of all tools please see from page [191](#).

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	320 V	100 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3
Clearance distance	1.6 mm	1.6 mm
Creepage distance	1.8 mm	1.8 mm

Voltage information acc. to MIL, EIA-364-20F:2019 see page [202](#)

Operating voltage	950 V
Test voltage	2,850 V

Mechanical data

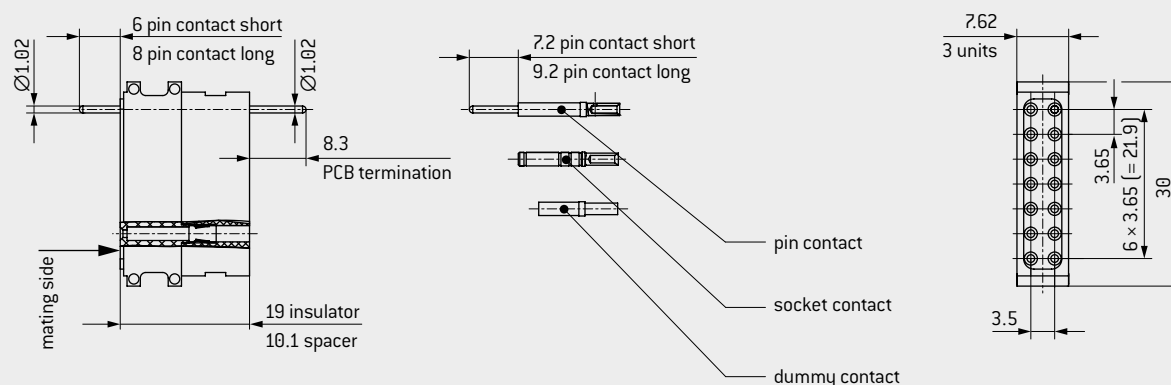
Total mating force (average)	18.9 N / Module
Total sliding force (average)	13.7 N / Module
Contact diameter	1.02 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 100,000

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact plating	Au over Ni

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



Module 14 contacts	Part number
Insulator	611.130.114.923.000
Spacer	611.130.111.923.000
Dummy contact	021.341.124.923.000

The last-mate-first-break function can be implemented by using short and long contacts.

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.362.000.307.000	0.5 – 0.38	20 – 22	9	7	13.5	2.1
Pin contact long ¹	180.382.000.307.000						
Socket contact	170.362.700.207.000						
Pin contact short ¹	180.544.000.307.000	0.25 – 0.08	24 – 28	6	5	9	2.1
Pin contact long ¹	180.574.000.307.000						
Socket contact	170.544.700.207.000						
Pin contact short ¹	180.818.000.307.000	–	PCB termination Ø 1.02 mm	9	7	13.5	2.1
Pin contact long ¹	180.819.000.307.000						
Socket contact	170.818.700.207.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-51:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K
³ Definition max. continuous current see page 205

MODULE 10 CONTACTS FOR TURNED CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.361.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000

For an overview of all tools please see from page [191](#).

Contact diameter: 0.76 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 11 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#)).
- The 10 contacts modules with turned contacts are not compatible with modules for stamped contacts.
- Module up to 175 °C on request
- Crimp information see page [182](#)
- Capable of transmitting following data protocols:
Ethernet (1 Gbit/s), USB® 2.0 (480 Mbit/s)
- Supports last-mate-first-break function.

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	250 V	32 V
Rated impulse voltage	1,500 V	1,500 V
Degree of pollution	2	3
Clearance distance	0.9 mm	0.9 mm
Creepage distance	1.3 mm	1.3 mm

Voltage information acc. to MIL, EIA-364-20F:2019 see page [202](#)

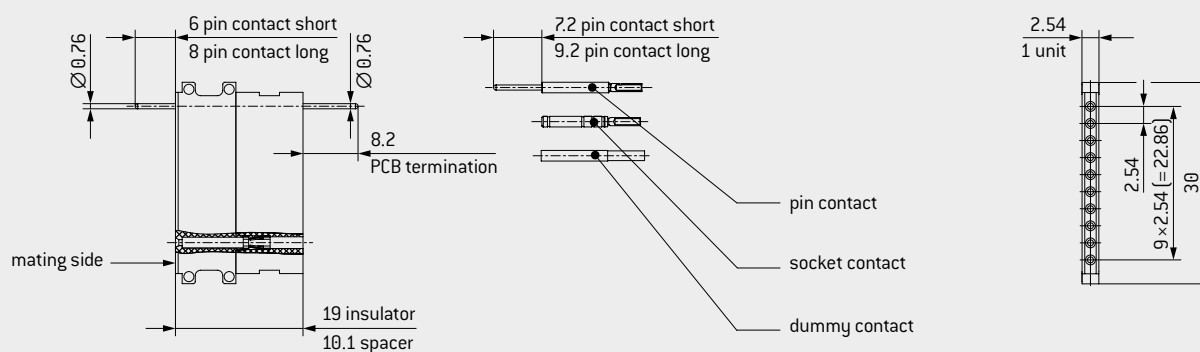
Operating voltage	500 V
Test voltage	1,500 V

Mechanical data	
Total mating force (average)	13.5 N / Module
Total sliding force (average)	9.8 N / Module
Contact diameter	0.76 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials	
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact plating	Au over Ni

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



Module 10 contacts	Part number
Insulator	611.122.110.923.000
Spacer	611.122.111.923.000
Dummy contact	021.341.123.923.000

The last-mate-first-break function can be implemented by using short and long contacts.

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.361.000.307.000	0.38	22	7.5	6	11	3.8
Pin contact long ¹	180.381.000.307.000						
Socket contact ¹	170.361.700.207.000						
Pin contact short ¹	180.540.000.307.000	0.25 – 0.08	24 – 28	6	5	9	3.8
Pin contact long ¹	180.570.000.307.000						
Socket contact ¹	170.540.700.207.000						
Pin contact short ¹	180.850.000.307.000	–	PCB termination Ø 0.76 mm	7.5	6	11	3.8
Pin contact long ¹	180.851.000.307.000						
Socket contact ¹	170.850.700.207.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 10 CONTACTS FOR STAMPED CONTACTS



Contact diameter: 0.7 mm
Mating cycles: mind. 5,000
Current-carrying capacity¹: 6 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- The 10 contacts modules with turned contacts are not compatible with stamped contacts or modules.
- Contacts are not removable
- Crimp information see page [199](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [191](#)

Operating voltage	16 V	Operation is only permitted in pollution degree 2
Rated impulse voltage	1,200 V	
Degree of pollution	2	
Clearance distance	0.45 mm	
Creepage distance	0.45 mm	

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	450 V
Test voltage	1,350 V

Mechanical data

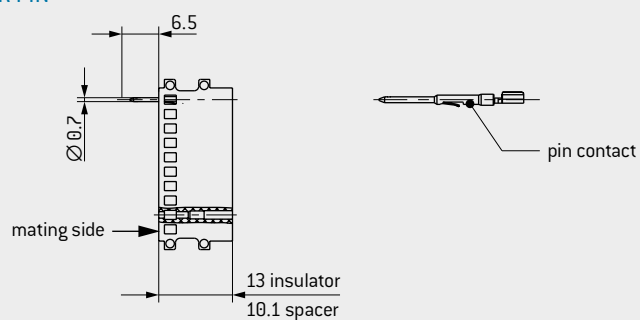
Total mating force (average)	5.0 N / Module
Total sliding force (average)	4.8 N / Module
Contact diameter	0.7 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 5,000

Materials

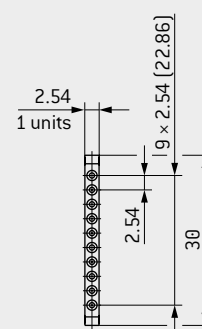
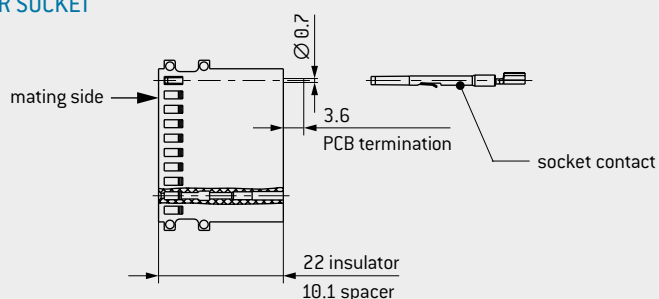
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact	Cu alloy
Contact plating	
in termination area	Sn over Ni
in contact area	Au over Ni

¹ Definition max. continuous current see page [205](#)
² Voltage data does not apply when mounting metal components (e.g., spindle). In this case, blank modules are required

INSULATOR PIN



INSULATOR SOCKET



Module 10 contacts	Part number
Insulator socket	610.158.110.923.000
Insulator pin	611.158.110.923.000
Insulator socket (PCB equipped)	610.158.010.923.000
Spacer	611.122.111.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact	186.080.103.535.1__	0.14 – 0.08	26 – 28	3.5	2.5	4.5	3.8
Socket contact	176.082.103.535.1__						
Pin contact	186.080.103.535.2__	0.38 – 0.25	22 – 24	4.5	3.5	6	3.8
Socket contact	176.082.103.535.2__						

Packaging unit for crimp model (per reel)

Quantity	500	900	5,000	10,000	20,000
Code number	51	52	54	55	50

¹ Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ² Definition max. continuous current see page 205

MODULE 6 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.362.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 1.02 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 13.5 A

[Product Finder](#)

- TECHNICAL NOTES**
- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
 - Modules up to 175 °C on request
 - Crimp information see page [182](#)
 - Capable of transmitting following data protocols:
Ethernet (1 Gbit/s)
 - Supports last-mate-first-break function.

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.0 mm	2.0 mm
Creepage distance	2.2 mm	2.2 mm

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	850 V
Test voltage	2,550 V

Mechanical data

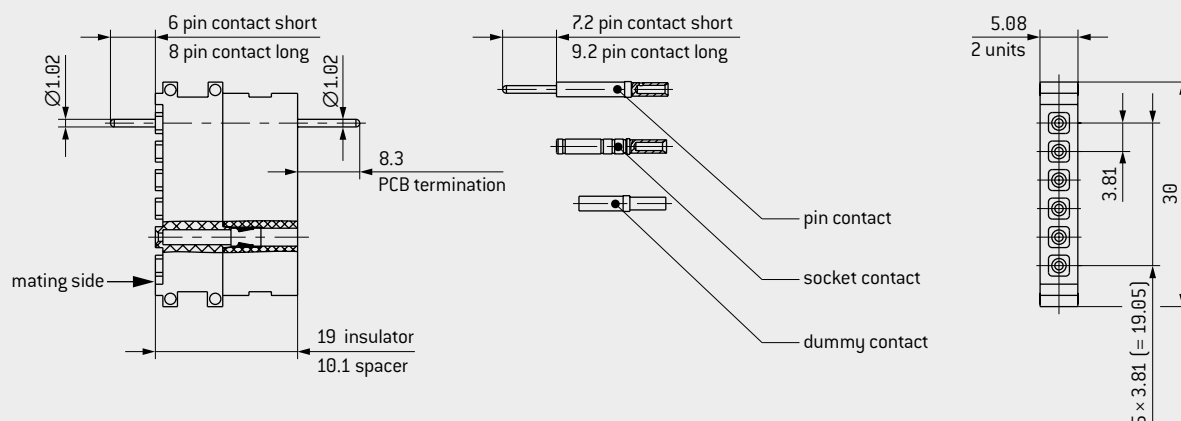
Total mating force (average)	8.1 N / Module
Total sliding force (average)	5.9 N / Module
Contact diameter	1.02 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact	Cu alloy
Contact spring	CuBe alloy
Contact plating	Au over Ni

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



Module 6 contacts	Part number
Insulator	611.123.106.923.000
Spacer	611.123.111.923.000
Dummy contact	021.341.124.923.000

The last-mate-first-break function can be implemented by using short and long contacts.

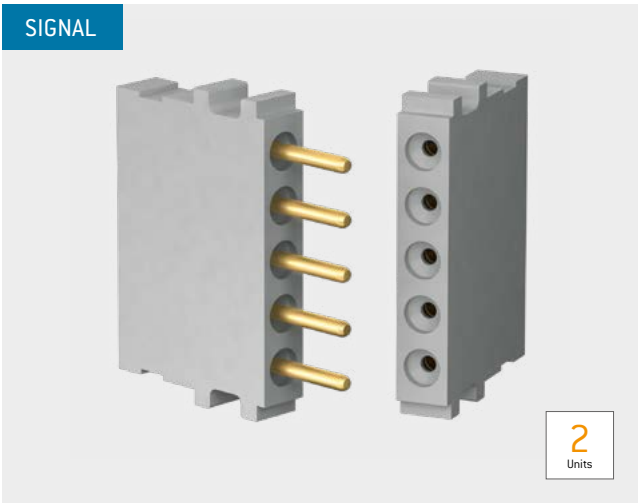
Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.362.000.307.000	0.5 – 0.38	20 – 22	9	8	13.5	2.1
Pin contact long ¹	180.382.000.307.000						
Socket contact ¹	170.362.700.207.000						
Pin contact short ¹	180.544.000.307.000	0.25 – 0.08	24 – 28	6	6	9	2.1
Pin contact long ¹	180.574.000.307.000						
Socket contact ¹	170.544.700.207.000						
Pin contact short ¹	180.818.000.307.000	–	PCB termination Ø 1.02 mm	9	8	13.5	2.1
Pin contact long ¹	180.819.000.307.000						
Socket contact ¹	170.818.700.207.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 5 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.138.000.000



Removal of the already assembled contact (incl. cable)
Part number: 087.170.363.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 1.5 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 27 A

[Product Finder](#)

- TECHNICAL NOTES**
- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
 - Modules up to 175 °C on request
 - Capable of transmitting following data protocols:
Ethernet (1 Gbit/s)
 - Crimp information see page [182](#)
 - Supports last-mate-first-break function.

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3
Clearance distance	1.8 mm	1.8 mm
Creepage distance	2.6 mm	2.6 mm

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	750 V
Test voltage	2,250 V

Mechanical data

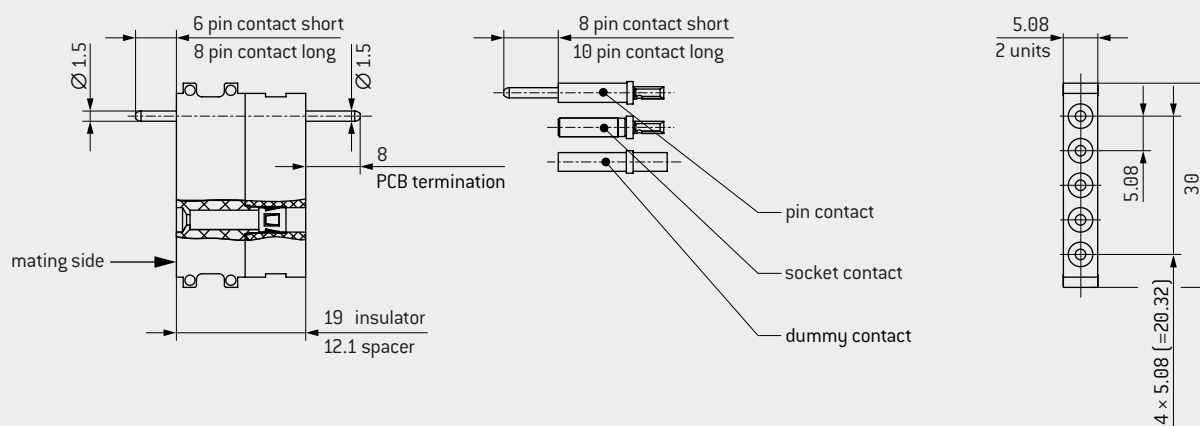
Total mating force (average)	15.0 N / Module
Total sliding force (average)	11.3 N / Module
Contact diameter	1.5 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	
Contact body	Au over Ni
Contact springs	Ag

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



Module 5 contacts	Part number
Insulator	611.124.105.923.000
Spacer	611.124.111.923.000
Dummy contact	021.341.125.923.000

The last-mate-first-break function can be implemented by using short and long contacts.

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.363.000.307.000	1.5	14	18	14.5	27	0.95
Pin contact long ¹	180.383.000.307.000						
Socket contact ¹	170.363.700.201.000						
Pin contact short	180.543.000.307.000	—	16	18	14.5	27	0.95
Pin contact long	180.573.000.307.000						
Socket contact	170.543.700.201.000						
Pin contact short ¹	180.545.000.307.000	1 – 0.75	18	16	13	22.5	0.95
Pin contact long ¹	180.575.000.307.000						
Socket contact ¹	170.545.700.201.000						
Pin contact short ¹	180.541.000.307.000	0.5 – 0.38	20 – 22	10	8	15	0.95
Pin contact long ¹	180.571.000.307.000						
Socket contact ¹	170.541.700.201.000						
Pin contact short	180.857.000.307.000	0.25 – 0.08	24 – 28	6	6	9	0.95
Pin contact long	180.856.000.307.000						
Socket contact	170.857.700.201.000						
Pin contact short	180.539.000.307.000	—	PCB termination Ø 1.5 mm	18	14.5	27	0.95
Pin contact long	180.569.000.307.000						
Socket contact	170.539.700.201.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 4 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.139.000.000



Removal of the already assembled contact (incl. cable)
Part number: 087.170.365.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 2.41 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 41 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Modules up to 175 °C on request
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.6 mm	2.6 mm
Creepage distance	3.1 mm	3.1 mm

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	1,100 V
Test voltage	3,300 V

Mechanical data

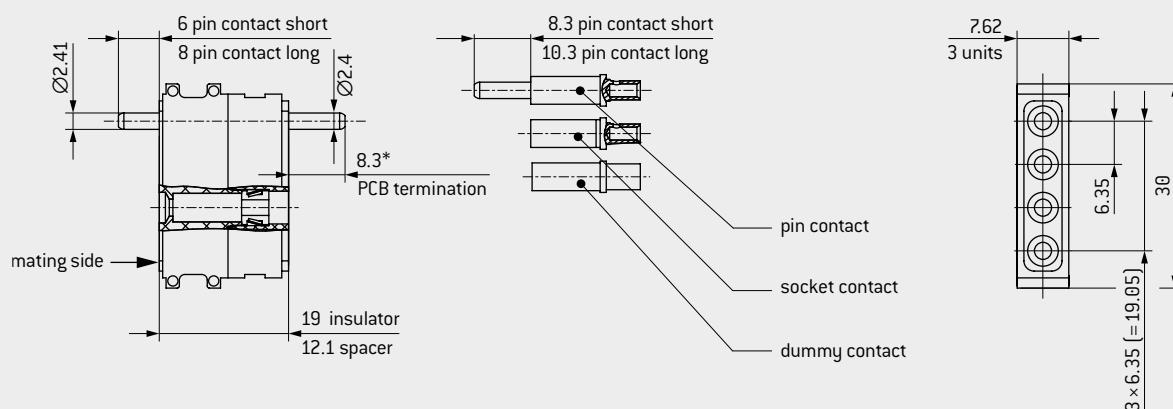
Total mating force (average)	13.8 N / Module
Total sliding force (average)	12.0 N / Module
Contact diameter	2.41 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	Ag

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



* PCB termination / crimp termination at 6 mm², protection against contact in the termination area recommended, e.g. heat-shrink tubing.

Module 4 contacts	Part number
Insulator	611.126.104.923.000
Spacer	611.126.111.923.000
Dummy contact	021.341.127.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	180.365.000.301.000	—	12	28	25	41	0.45
Pin contact long	180.385.000.301.000						
Socket contact	170.365.100.201.000						
Pin contact short ¹	180.910.000.301.000	2.5	—	24	19	33.5	0.45
Pin contact long ¹	180.911.000.301.000						
Socket contact ¹	170.910.100.201.000						
Pin contact short	182.607.000.301.000	1.5	14	18	15	27	0.45
Pin contact long	182.604.000.301.000						
Socket contact	172.604.100.201.000						
Pin contact short	182.606.000.301.000	1 – 0.75	18	16	13	23.5	0.45
Pin contact long	182.603.000.301.000						
Socket contact	172.603.100.201.000						
Pin contact short	182.608.000.301.000	0.5 – 0.38	20 – 22	10.5	8	15.5	0.55
Pin contact long	182.605.000.301.000						
Socket contact	172.605.100.201.000						
Pin contact short	180.820.000.301.000	—	PCB termination Ø 2.4 mm	28	25	41	0.65
Pin contact long	180.821.000.301.000						
Socket contact	170.820.100.201.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 3 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.136.000.000



Removal of the already assembled contact (incl. cable)
Part number: 087.170.366.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 3 mm
Mating cycles: $\geq 100,000$
Termination cross-section: from 0.38 to 6 mm²

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Modules up to 175 °C on request
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.3 mm	2.3 mm
Creepage distance	2.7 mm	2.7 mm

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	1,200 V
Test voltage	3,600 V

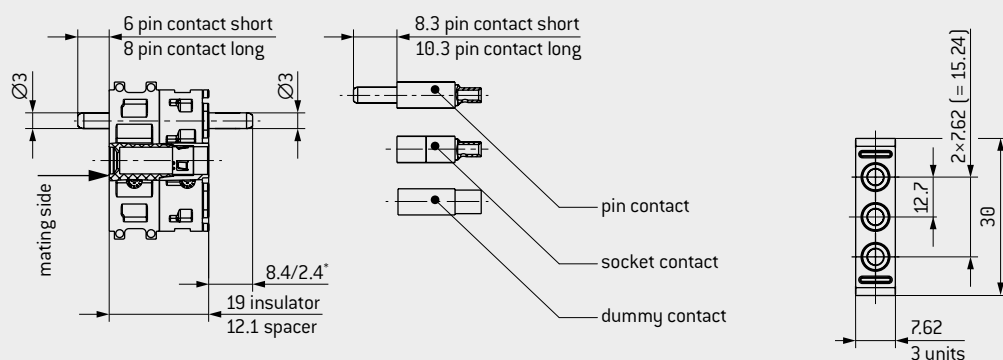
Mechanical data

Total mating force (average)	13.5 N / Module
Total sliding force (average)	10.4 N / Module
Contact diameter	3.0 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	Ag

INSULATOR PIN AND SOCKET



* PCB termination / crimp termination at 6 mm², protection against contact in the termination area recommended, e.g. heat-shrink tubing.

Module 3 contacts	Part number
Insulator	611.127.103.923.000
Spacer	611.127.111.923.000
Dummy contact	021.341.128.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	182.980.000.301.000	6	—	39	30	58	0.3
Pin contact long	182.981.000.301.000						
Socket contact	172.978.100.201.000						
Pin contact short ¹	180.366.000.301.000	4	—	39	30	58	0.3
Pin contact long ¹	180.386.000.301.000						
Socket contact ¹	172.366.100.201.000						
Pin contact short	180.546.000.301.000	2.5	—	25	21	37	0.3
Pin contact long	180.576.000.301.000						
Socket contact	170.546.100.201.000						
Pin contact short ¹	182.582.000.301.000	1.5	14	19	16	28	0.3
Pin contact long	182.583.000.301.000						
Socket contact ¹	172.582.100.201.000						
Pin contact short	182.584.000.301.000	1 – 0.75	18	16.5	14	24.5	0.3
Pin contact long ¹	182.585.000.301.000						
Socket contact ¹	172.584.100.201.000						
Pin contact short	182.586.000.301.000	0.5 – 0.38	20 – 22	11.5	9.5	17	0.4
Pin contact long	182.587.000.301.000						
Socket contact	172.586.100.201.000						
Pin contact short	182.571.000.301.000	—	PCB termination Ø 3.0 mm	39	30	58	0.3
Pin contact long	182.572.000.301.000						
Socket contact	172.843.100.201.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 3 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.136.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 3 mm
Mating cycles: ≥ 100,000
Current-carrying capacity¹: 58 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Modules up to 175 °C on request
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	2,400 V	950 V
Rated impulse voltage	9,000 V	9,000 V

Higher voltages can be reached under certain conditions.

Degree of pollution	2	3
Clearance distance	15.1 mm	15.1 mm
Creepage distance	16.1 mm	16.1 mm

Voltage information acc. to MIL, EIA-364-20F:2019² see page [202](#)

Operating voltage	1,850 V
Test voltage	5,600 V

Mechanical data

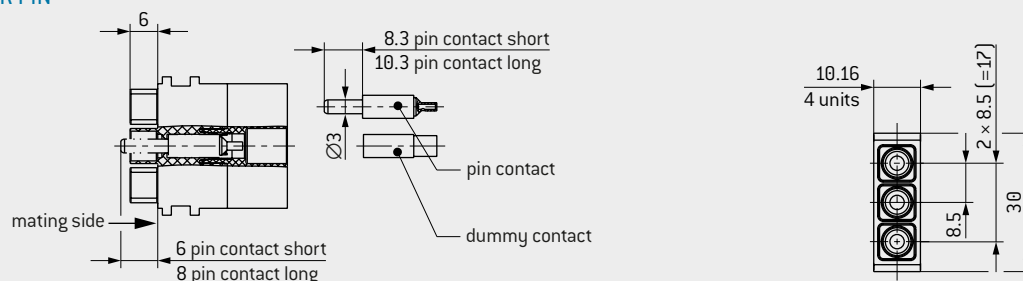
Total mating force (average)	13.5 N / Module
Total sliding force (average)	10.4 N / Module
Contact diameter	3.0 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 100,000

Materials

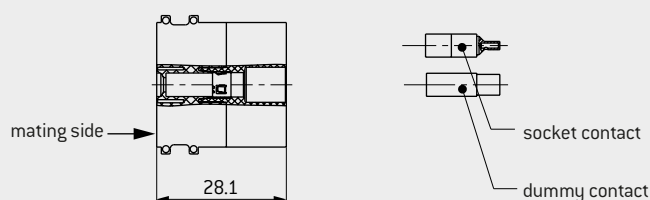
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	Ag

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN



INSULATOR SOCKET



Module 3 contacts	Part number
Insulator socket	610.162.103.923.000
Insulator pin	611.162.103.923.000
Dummy contact	021.341.128.300.000

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact	182.980.000.301.000	6	—	39	30	58	0.3
Pin contact long	182.981.000.301.000						
Socket contact	172.978.100.201.000						
Pin contact short ¹	180.366.000.301.000	4	—	39	30	58	0.3
Pin contact long ¹	180.386.000.301.000						
Socket contact ¹	172.366.100.201.000						
Pin contact short	180.546.000.301.000	2.5	—	25	21	37	0.3
Pin contact long	180.576.000.301.000						
Socket contact	170.546.100.201.000						
Pin contact short ¹	182.582.000.301.000	1.5	14	19	16	28	0.3
Pin contact long	182.583.000.301.000						
Socket contact ¹	172.582.100.201.000						
Pin contact short	182.584.000.301.000	1 – 0.75	18	16.5	14	24.5	0.3
Pin contact long ¹	182.585.000.301.000						
Socket contact ¹	172.584.100.201.000						
Pin contact short	182.586.000.301.000	0.5 – 0.38	20 – 22	11.5	9.5	17	0.4
Pin contact long	182.587.000.301.000						
Socket contact	172.586.100.201.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003-01) at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 2 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.391.000.000
For an overview of all tools please see from page [191](#).

Contact diameter: 5 mm
Mating cycles: $\geq 100,000$
Current-carrying capacity¹: 119 A

[Product Finder](#)

- TECHNICAL NOTES
- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
 - Due to the high mating forces and cable cross sections, we recommend to use the ODU-MAC® P+ or P4+ frame (see page [27](#))
 - Modules up to 175 °C on request
 - Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	1,000 V	250 V
Rated impulse voltage	4,000 V	4,000 V
Degree of pollution	2	3
Clearance distance	3.8 mm	3.8 mm
Creepage distance	5.2 mm	3.8 mm

Voltage information acc. to MIL, EIA-364-20F:2019 see page [202](#)

Operating voltage	1,250 V
Test voltage	3,750 V

Mechanical data

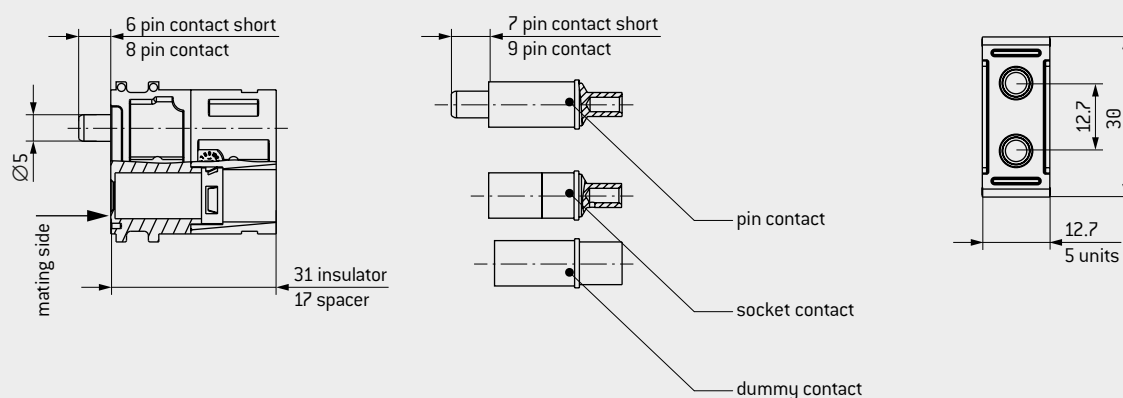
Total mating force (average)	21.0 N / Module
Total sliding force (average)	15.0 N / Module
Contact diameter	5.0 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	Ag

¹ Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



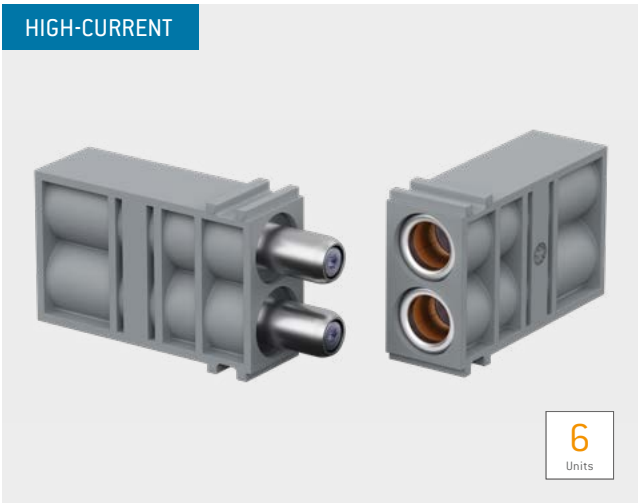
Module 2 contacts	Part number
Insulator	611.129.102.923.000
Spacer	611.129.111.923.000
Dummy contact	021.341.130.923.000

Description	Part number	Conductor cross-section mm ²	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact short	182.891.000.301.000	16	80	70	119	0.21
Pin contact long	182.892.000.301.000					
Socket contact	172.891.100.201.000					
Pin contact short	180.490.000.301.000	10	65	57	97	0.21
Pin contact long	180.491.000.301.000					
Socket contact	170.490.100.201.000					
Pin contact short	180.404.000.301.000	6	47	43	72	0.21
Pin contact long	180.405.000.301.000					
Socket contact	170.403.100.201.000					
Pin contact short	180.369.000.301.000	4	39	34	58	0.21
Pin contact long	180.389.000.301.000					
Socket contact	170.369.100.201.000					

¹ Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ² Definition max. continuous current see page 205

MODULE 2 CONTACTS

ODU SPRINGTAC® (contacts with springwire technology)



Torque wrench
Part number: 598.054.004.000.000
Locking torque: 1.5 Nm

Bit Torx TX10
Part number: 598.054.104.000.000
For an overview of all tools please see from page [191](#).

Contact diameter: 8 mm
Mating cycles¹: ≥ 100,000
Current-carrying capacity²: 142 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Due to high mating forces and cable cross sections, it is mandatory to use the ODU-MAC® P+ or P4+ frame (see page [27](#)).
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.5 mm	2.5 mm
Creepage distance	2.5 mm	2.5 mm

Voltage information acc. to MIL, EIA-364-20F:2019 see page [202](#)

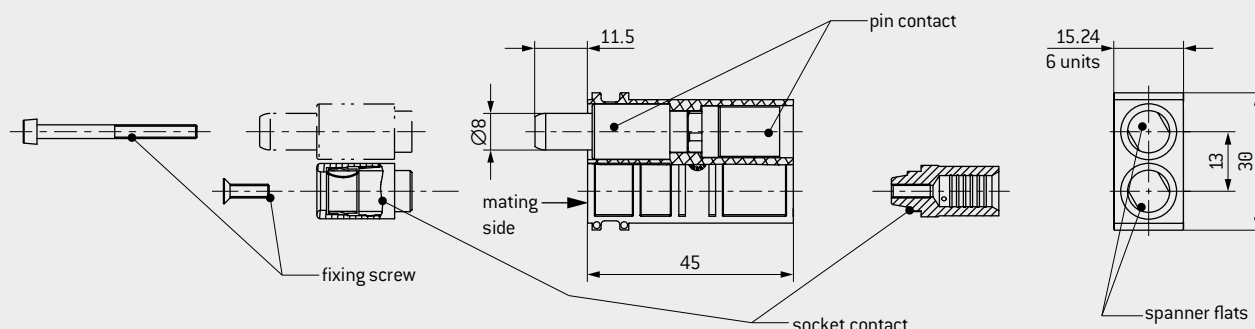
Operating voltage	700 V
Test voltage	2,100 V

Mechanical data	
Total mating force (average)	54.0 N / Module
Total sliding force (average)	39.0 N / Module
Contact diameter	8.0 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 100,000

Materials	
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	Ag

¹ Higher mating cycles by easy exchange of the wear parts (pin / socket from front) possible. The termination area remains unaffected, because of two-part contact
² Definition max. continuous current see page [205](#)

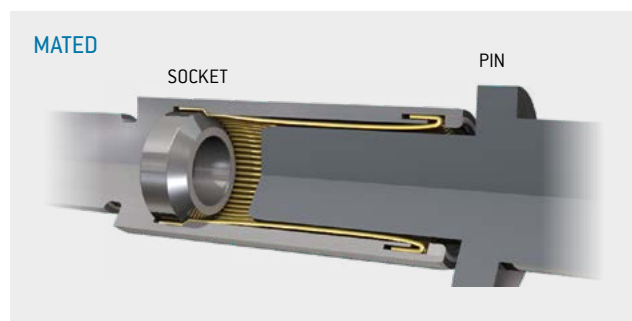
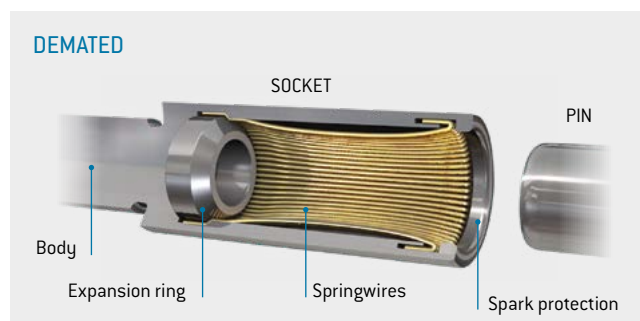
INSULATOR PIN AND SOCKET



In application with a housing please check the cable space requirement.

ODU SPRINGTAC® (CONTACTS WITH SPRINGWIRE TECHNOLOGY)

ODU Springtac® offers a large number of contact surfaces. The wires are mounted individually and connected with a machined body. The springwires contact and flex independently from one another (see also page [12](#)).



Module 2 contacts	Part number
Insulator	611.173.102.923.000

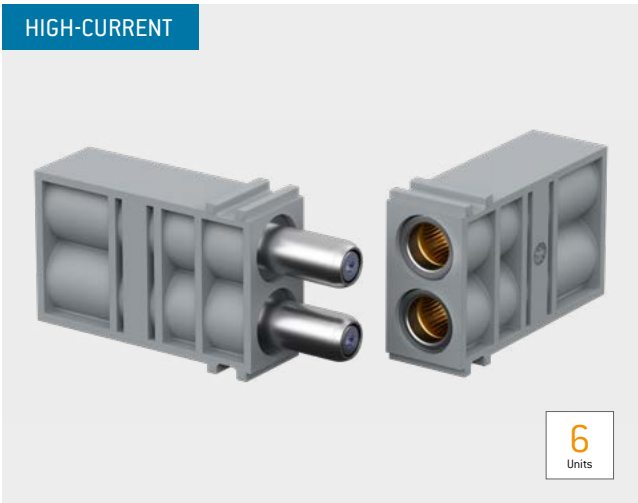
Description	Part number	Conductor cross-section ¹ mm ²	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	181.873.100.200.001	25	105	100	142	0.2
Socket contact	170.045.100.201.001					
Pin contact	181.872.100.200.001	16	85	80	111	0.2
Socket contact	171.045.100.201.001					
Pin contact	181.876.100.200.001	10	71	70	96	0.2
Socket contact	172.045.100.201.001					

¹ Extra fine wire acc. to DIN EN IEC 60228 VDE 0295:2024-12, class 5

² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ³ Definition max. continuous current see page [205](#).

MODULE 2 CONTACTS

ODU LAMTAC® (contacts with lamella technology)



Torque wrench
Part number: 598.054.004.000.000
Locking torque: 1.5 Nm

Bit Torx TX10
Part number: 598.054.104.000.000
For an overview of all tools please see from page [191](#).

Contact diameter: 8 mm
Mating cycles¹: ≥ 10,000
Current-carrying capacity²: 154 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Due to high mating forces and cable cross sections, it is mandatory to use the ODU-MAC® P+ or P4+ frame (see page [27](#)).
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.7 mm	2.7 mm
Creepage distance	2.7 mm	2.7 mm

Voltage information acc. to MIL, ANSI/ EIA-364-20F:2019 see page [202](#)

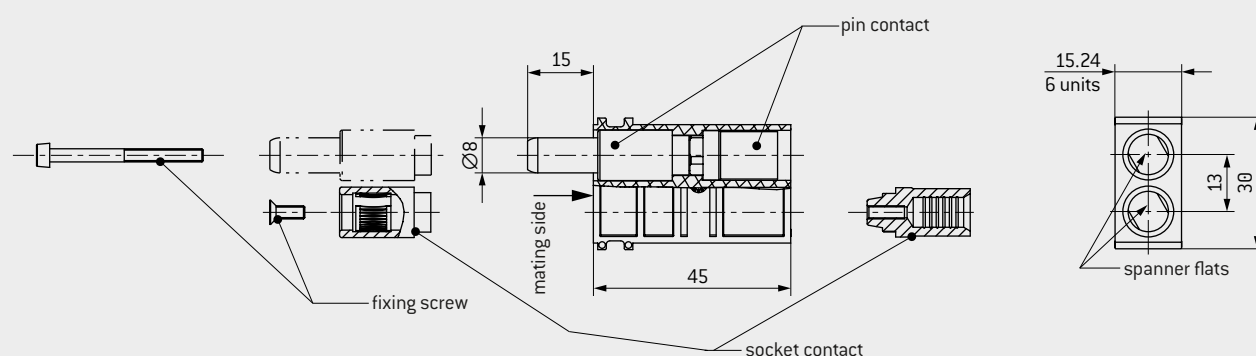
Operating voltage	900 V
Test voltage	2,700 V

Mechanical data	
Total mating force (average)	60.0 N / Module
Total sliding force (average)	45.0 N / Module
Contact diameter	8.0 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 10,000

Materials	
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact plating	Ag

¹ Higher mating cycles by easy exchange of the wear parts (pin / socket from front) possible. The termination area remains unaffected, because of two-part contact
² Definition max. continuous current see page [205](#)

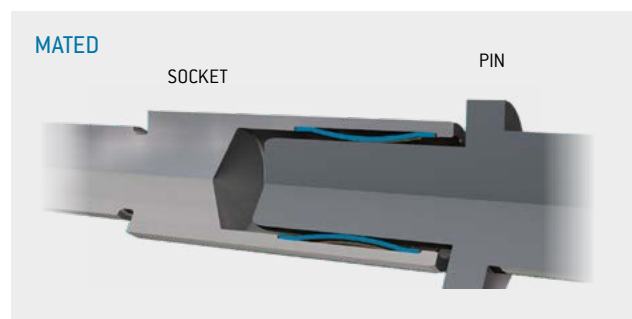
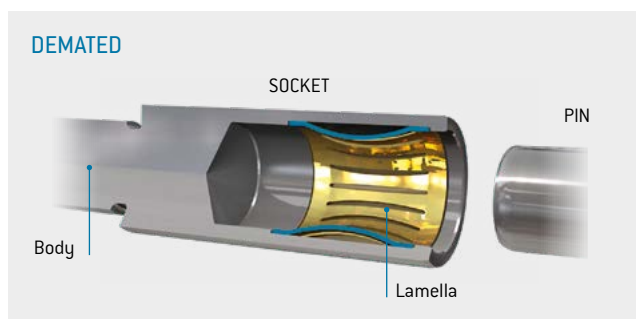
INSULATOR PIN AND SOCKET



In application with a housing please check the cable space requirement.

ODU LAMTAC® (CONTACTS WITH LAMELLA TECHNOLOGY)

In comparison to the ODU Springtac® contact, ODU LAMTAC® offers a lower number of contact surfaces. One or more of the stamped lamellas are mounted in a machined body (see also page 13).



Module 2 contacts	Part number
Insulator	611.161.102.923.000

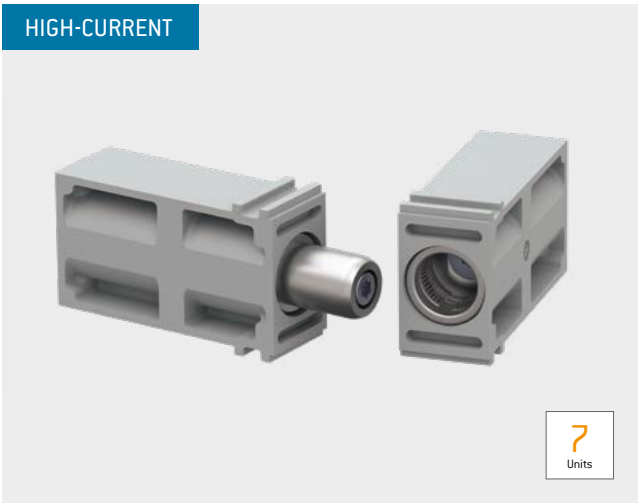
Description	Part number	Conductor cross-section ¹ mm ²	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	181.874.100.200.001	25	105	100	154	0.2
Socket contact	178.874.100.201.001					
Pin contact	181.875.100.200.001	16	90	85	133	0.2
Socket contact	178.875.100.201.001					
Pin contact	181.956.100.200.001	10	74	72	102	0.2
Socket contact	178.956.100.201.001					

¹ Extra fine wire acc. to DIN EN IEC 60228 VDE 0295:2024-12, class 5

² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ³ Definition max. continuous current see page 205

MODULE 1 CONTACT

ODU LAMTAC® (contacts with lamella technology)



Torque wrench
Part number: 598.054.006.000.000
Locking torque: 2.2 Nm

Bit Torx TX20
Part number: 598.054.105.000.000
For an overview of all tools please see from page [191](#).

Contact diameter: 10 mm
Mating cycles¹: ≥ 10,000
Current-carrying capacity²: max. 180 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Due to the high mating forces and cable cross sections, it is mandatory to use the ODU-MAC® P+ or P4+ frame (see page [27](#)).
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	4,000 V	4,000 V
Degree of pollution	2	3
Clearance distance	3.0 mm	3.0 mm
Creepage distance	3.0 mm	3.0 mm

Voltage information acc. to MIL, ANSI/ EIA-364-20F:2019 see page [202](#)

Operating voltage	2,000 V
Test voltage	6,000 V

Mechanical data

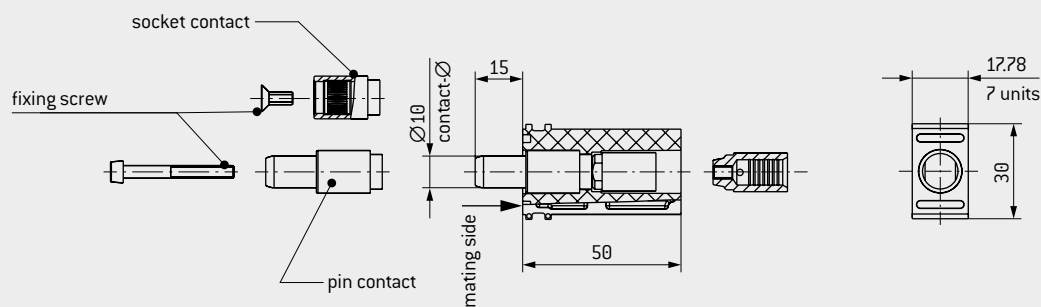
Total mating force (average)	33.0 N / Module
Total sliding force (average)	24.0 N / Module
Contact diameter	10.0 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 10,000

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact lamella	CuBe alloy
Contact plating	Ag

¹ Higher mating cycles by easy exchange of the wear parts (pin / socket from front) possible. The termination area remains unaffected, because of two-part contact
² Definition max. continuous current see page [205](#)

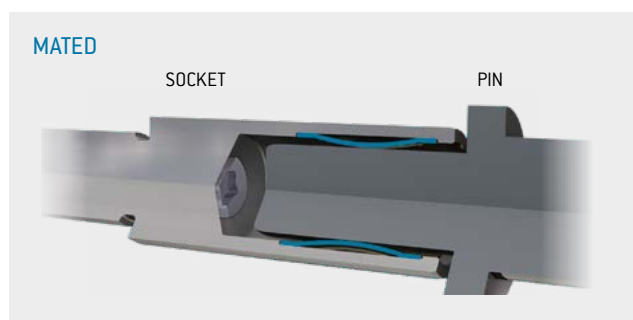
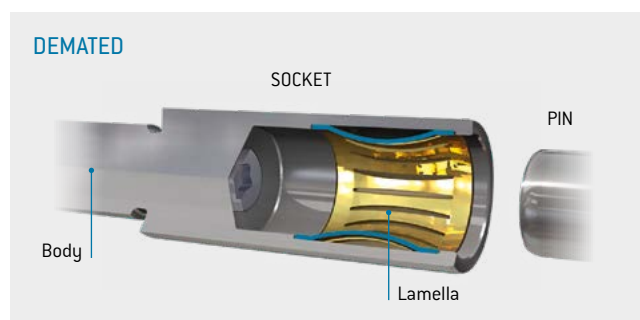
INSULATOR PIN AND SOCKET



In application with a housing please check the cable space requirement.

ODU LAMTAC® (CONTACTS WITH LAMELLA TECHNOLOGY)

In comparison to the ODU Springtac® contact, ODU LAMTAC® offers a lower number of contact surfaces. One or more of the stamped lamellas are mounted in a machined body (see also page [13](#)).



Module 1 contact	Part number
Insulator	611.169.101.923.000

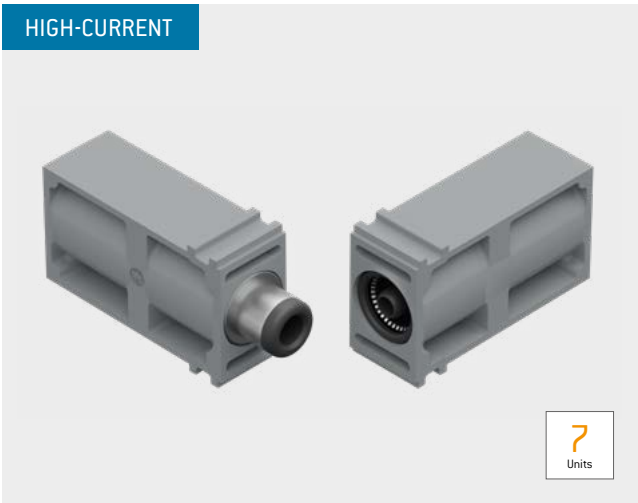
Description	Part number	Conductor cross-section ¹ mm ²	Nominal current ² Single contact A	Max. continuous current ³ Single contact A	Contact resistance mΩ
Pin contact	181.878.100.200.001	35	125	180	0.15
Socket contact	178.878.100.201.001				
Pin contact	181.946.100.200.001	25	110	160	0.15
Socket contact	178.954.100.201.001				

¹ Extra fine wire acc. to DIN EN IEC 60228 VDE 0295:2024-12, class 5

² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ³ Definition max. continuous current see page [205](#)

MODULE 1 CONTACT

ODU LAMTAC® and LAMTAC® Flex (contacts with lamella technology)



Torque wrench
Part number: 598.054.006.000.000
Locking torque: 2.2 Nm

Bit Torx TX20
Part number: 598.054.105.000.000
For an overview of all tools please see from page [191](#).

Contact diameter: 12 mm
Mating cycles¹: ≥ 100,000
Current-carrying capacity²: max. 225 A

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#))
- Due to the high mating forces and cable cross sections, it is mandatory to use the ODU-MAC® P+ or P4+ frame (see page [27](#)).
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3
Clearance distance	2.0 mm	2.0 mm
Creepage distance	2.0 mm	2.0 mm

Voltage information acc. to MIL, ANSI/ EIA-364-20F:2019 see page [202](#)

Operating voltage	1,500 V
Test voltage	4,500 V

Mechanical data

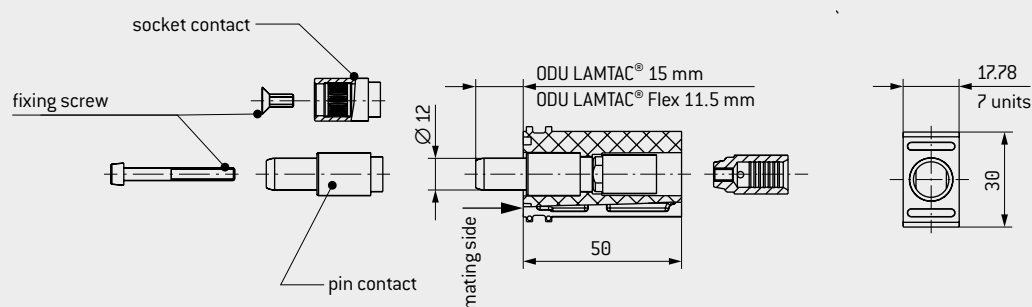
	ODU LAMTAC®	ODU LAMTAC® Flex
Total mating force (average)	45.0 N / Module	10.0 N / Module
Total sliding force (average)	30.0 N / Module	6.0 N / Module
Contact diameter	12.0 mm	12.0 mm
Operating temperature	−40 °C to +125 °C	−40 °C to +125 °C
Mating cycles	≥ 10,000	≥ 100,000

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94	
	ODU LAMTAC®	ODU LAMTAC® Flex
Contact body	Cu alloy	Cu alloy
Contact lamella	CuBe alloy	CuCr alloy
Contact plating	Ag	Ag
Touch protection	—	PPSU

¹ Higher mating cycles by easy exchange of the wear parts (pin / socket from front) possible. The termination area remains unaffected, because of two-part contact
² Definition max. continuous current see page [205](#)

INSULATOR PIN AND SOCKET



In application with a housing please check the cable space requirement.

Module 1 contact	Part number
Insulator	611.172.101.923.000

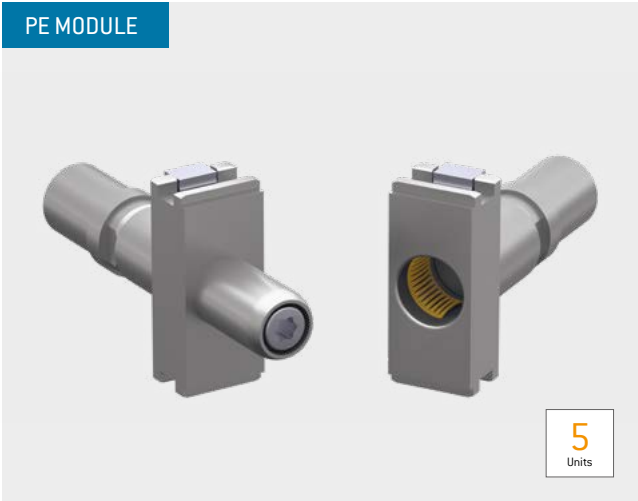
Description		Part number	Conductor cross-section ¹	Nominal current ² Single contact	Max. continuous current ³ Single contact	Contact resistance
			mm ²	A	A	mΩ
Pin contact	ODU LAMTAC® Flex	181.762.140.201.000	50	165	255	0.1
Socket contact		178.762.140.249.000				
Pin contact		181.761.140.201.000	35	130	205	0.1
Socket contact		178.761.140.249.000				
Pin contact		181.760.140.201.000	25	95	150	0.1
Socket contact		178.760.140.249.000				
Pin contact	ODU LAMTAC®	181.943.100.200.001	50	155	225	0.1
Socket contact		178.943.100.201.001				
Pin contact		181.945.100.200.001	35	135	195	0.1
Socket contact		178.953.100.201.001				
Pin contact		181.944.100.200.001	25	115	167	0.1
Socket contact		178.948.100.201.001				
Pin contact		181.700.100.200.000	Busbar M8	On request		
Socket contact		178.700.100.201.000				

¹ Extra fine wire acc. to DIN EN IEC 60228 VDE 0295:2024-12; class 5), class 5

² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K | ³ Definition max. continuous current see page [205](#)

PE MODULE 1 CONTACT

Protective grounding for all conductive housings and docking frames



Torque wrench for PE contact
Part number: 598.054.003.000.000

Torque wrench for PE module
Part number: 598.054.002.000.000

Bit torx TX 20 for PE contact
Part number: 598.054.105.000.000

Bit torx TX 10 for PE module
Part number: 598.054.104.000.000

For an overview of all tools please see from page [191](#).

Contact diameter: 10 mm
Mating cycles¹: ≥ 10,000
Conductor cross-section: 10 / 16 / 25 mm²

[Product Finder](#)

TECHNICAL NOTES

- The module can be freely positioned in any frame and allows contacting to the frame and conductive housing
- Due to high mating forces and cable cross sections, it is mandatory to use the ODU-MAC® P+ or P4+ frame (see page [27](#))
- Crimp information see page [182](#)

TECHNICAL DATA

Mechanical data	
Total mating force (average)	33.0 N / Module
Total sliding force (average)	24.0 N / Module
Contact diameter	10.0 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	≥ 10,000

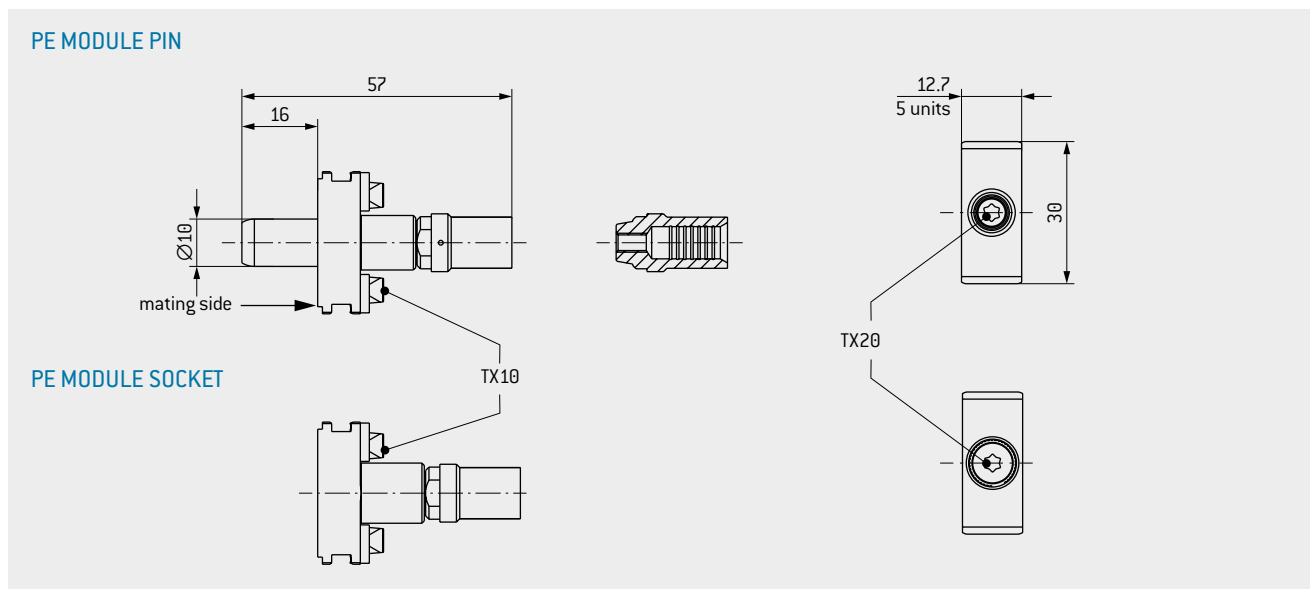
Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact lamella	CuBe alloy
Contact plating	Ag

The cross-section of a PE conductor must be designed in accordance with DIN EN 61984 VDE 0627:2009-11 depending on the largest live conductor. The cross-section can be reduced from 25 mm². This relationship is explained via the following table:

Nominal cross-section of the current-carrying conductor	≥ cross-section of the protective conductor in accordance with DIN EN 61984 VDE 0627:2009-11
mm ²	mm ²
10	10
16, 25, 35	16
50	25

¹ Higher mating cycles are possible simply by replacing the module (including pin / socket from the rear). The termination area remains unaffected, because of two-part contact



ODU LAMTAC® (CONTACTS WITH LAMELLA TECHNOLOGY)

In comparison to the ODU Springtac® contact, ODU LAMTAC® offers a lower number of contact surfaces. One or more of the stamped lamellas are mounted in a machined body. The contact resistance of 0.1Ω required by the standard is easily achieved.



Description	Part number	Conductor cross-section ¹ mm ²	Nominal current ² Single contact A	Impulse current kA	Contact resistance mΩ
PE module / Pin	181.886.100.200.000	25	125	> 20	0.1
PE module / Socket	178.886.100.201.000				
PE module / Pin	181.885.100.200.000	16	90	> 20	0.1
PE module / Socket	178.885.100.201.000				
PE module / Pin	181.884.100.200.000	10	65	> 20	0.1
PE module / Socket	178.884.100.201.000				
Conductor cross-section 35 / 50 mm ²	On request				

¹ Extra fine wire acc. to DIN EN IEC 60228 VDE 0295:2024-12 | ² Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003-01) at a temperature increase of 45 K

MODULE 4 CONTACTS



Removal of the already assembled contact (incl. cable)
Part number: 087.170.138.000.000



Removal of the still unassembled contact (without cable, which may have to be cut off)
Part number: 087.611.001.001.000
For an overview of all tools please see from page [191](#).

Contact diameter: 1.5 mm
Mating cycles: $\geq 100,000$
Operating voltage: 2,500 V

[Product Finder](#)

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page [205](#)).
- Crimp information see page [182](#)

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page [199](#)

Operating voltage	2,500 V	1,000 V
Rated impulse voltage	10,000 V	10,000 V
Degree of pollution	2	3
Clearance distance	14.4 mm	14.4 mm
Creepage distance	14.4 mm	14.4 mm

Voltage information acc. to MIL, ANSI/EIA-364-20F:2019 see page [202](#)

Operating voltage	2,500 V
Test voltage	7,500 V

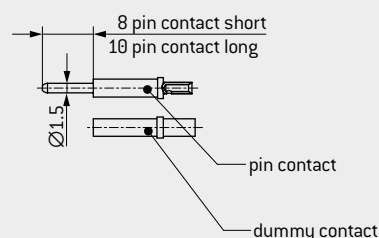
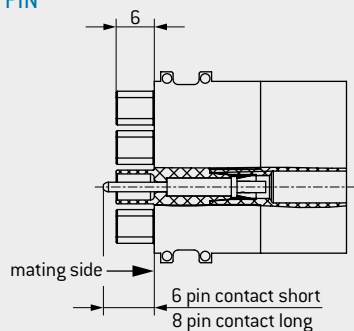
Mechanical data

Total mating force (average)	12.0 N / Module
Total sliding force (average)	9.2 N / Module
Contact diameter	1.5 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 100,000$

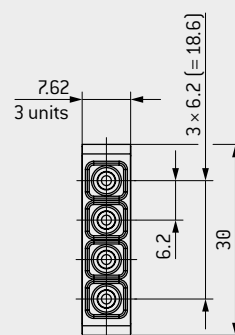
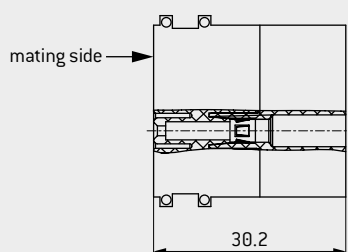
Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact plating	
Contact body	Au over Ni
Contact springs	Ag

INSULATOR PIN



INSULATOR SOCKET



Module 4 contacts	Part number
Insulator socket	610.159.104.923.000
Insulator pin	611.159.104.923.000
Dummy contact	021.341.125.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG	Nominal current ²		Max. continuous current ³ Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short ¹	180.363.000.307.000	1.5	14	18	14.5	27	0.95
Pin contact long ¹	180.383.000.307.000						
Socket contact ¹	170.363.700.201.000						
Pin contact short	180.543.000.307.000	—	16	18	14.5	27	0.95
Pin contact long	180.573.000.307.000						
Socket contact	170.543.700.201.000						
Pin contact short ¹	180.545.000.307.000	1 – 0.75	18	16	13	22.5	0.95
Pin contact long ¹	180.575.000.307.000						
Socket contact ¹	170.545.700.201.000						
Pin contact short ¹	180.541.000.307.000	0.5 – 0.38	20 – 22	10	8	15	0.95
Pin contact long ¹	180.571.000.307.000						
Socket contact ¹	170.541.700.201.000						
Pin contact short	180.857.000.307.000	0.25 – 0.08	24 – 28	6	6	9	0.95
Pin contact long	180.856.000.307.000						
Socket contact	170.857.700.201.000						



¹ Non-magnetic version on request | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K

³ Definition max. continuous current see page 205

MODULE 1 CONTACT



Contact diameter: 2 mm
Mating cycles: ≥ 10,000
Operating voltage: 6,300 V

Product Finder

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to DIN VDE 0298-4:2023-06 (see page 205).
- Center contact soldered
- Outer contact crimped

TECHNICAL DATA

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page 199

Operating voltage	6,300 V	2,500 V
Rated impulse voltage	20,000 V	20,000 V
Degree of pollution	2	3

Test of the partial discharge voltage (PDV) acc. to
DIN EN 60664-1:2020 (VDE 0110-1:2022-07)

Operating voltage	6,000 V
Test voltage	5,700 V

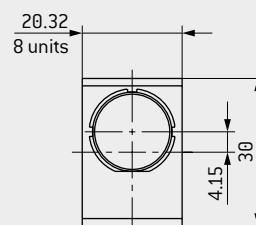
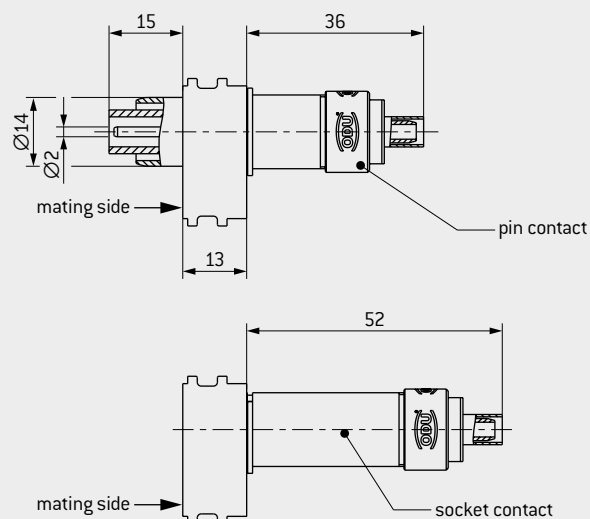
Mechanical data

Total mating force (average)	17.0 N / Module
Total sliding force (average)	15.0 N / Module
Contact diameter	2.0 mm / 14.0 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	≥ 100,000

Materials

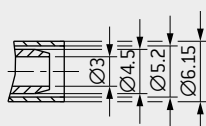
Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy / PTFE
Contact spring	CuBe alloy
Contact finish	
Outer contact	gal. Ni
Center contact	gal. Ag

INSULATOR PIN AND SOCKET



In application with a housing please check the cable space requirement.

CABLE TERMINATION



Module 1 contact	Part number
Insulator	611.171.101.923.000
Feedthrough for QCH	611.171.055.923.000

Description	Part number	Part number crimp insert	Conductor cross-section AWG	Nominal current A	Contact resistance average mΩ
Pin contact	122.138.001.201.000	082.000.039.106.000	22 / 24	3.5	0.4
Socket contact	122.138.002.201.000				
Crimping tool for shielding sleeve	080.000.039.000.000				

¹Partial discharge test carried out with recommended cable construction

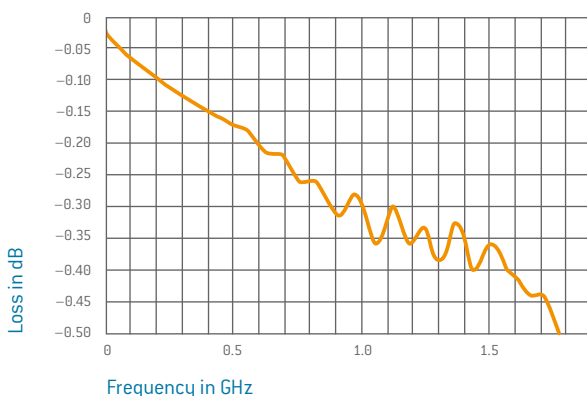
MODULE 4 CONTACTS FOR 50 Ω

RF-SIGNAL (COAX)

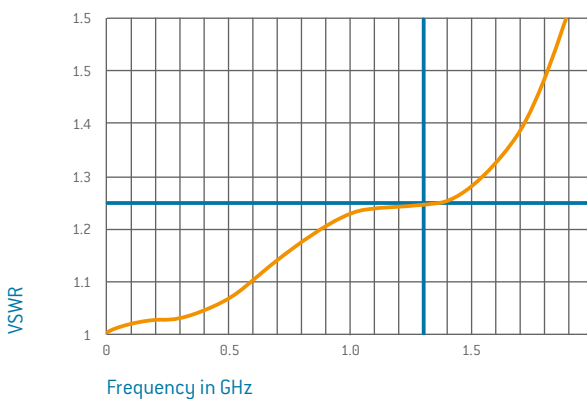


High-frequency characteristics for 50 Ω coax contacts¹

Transmission lost



Voltage standing-wave ratio VSWR



¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 × 5 cm conductor length.

² Clearance and creepage distance between inner conductor and outer conductor

Mating cycles: $\geq 60,000$



Non-magnetic

Frequency range¹: 0 – 1.3 GHz

[Product Finder](#)

TECHNICAL NOTES

- Crimp information see page [182](#)

TECHNICAL DATA

Frequency range ¹	0 – 1.3 GHz
Insulation resistance	> 100 G Ω
Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page 199	

Operating voltage	10 V
Rated impulse voltage	1.2 kV
Pollution degree	2
Clearance distance ²	0.4 mm
Creepage distance ²	0.4 mm

Voltage information acc. to MIL, ANSI/ EIA-364-20F: 2019 see page [202](#)

Operating voltage	350 V
Test voltage	1,050 V

Mechanical data

Total mating force (average)	17.8 N / Module
Total sliding force (average)	15.3 N / Module
Contact diameter	2.0 mm / 14.0 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 60,000$

Materials

Insulator	Thermoplastic fiber glass reinforced acc. to UL 94
Contact body	Cu alloy / PTFE
Dielectric	PTFE
Contact body	Cu alloy
Contact spring	CuSn / CuBe alloy
Contact plating	Au over NiP

REMOVAL TOOL I (STRAIGHT)

Removal of the already assembled contact (incl. cable)

Part number: 087.170.139.000.000

REMOVAL TOOL I (ANGLED)

Removal of the already assembled contact (incl. cable)

Part number: 087.170.365.000.000

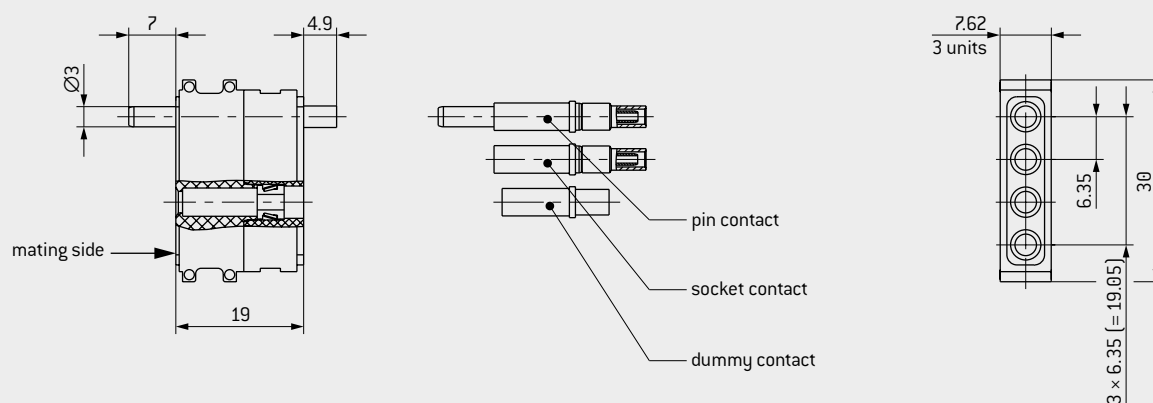
REMOVAL TOOL II

Removal of the still unassembled contact (without cable, which may have to be cut off)

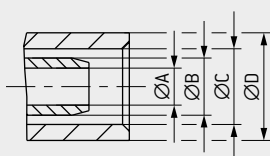
Part number: 087.611.001.001.000

For an overview of all tools please see from page [191](#).

INSULATOR PIN AND SOCKET



CABLE TERMINATION



Center contact: soldered, outer contact: crimped

Module 4 contacts	Part number
Insulator	611.149.104.923.000
Dummy contact	021.341.127.923.000

Description	Part number	Characteristic impedance	Frequency range	Cable ¹	A	B	C	D	Part number crimp inserts
		Ω	GHz						
Pin contact	122.120.001.270.000	50	1.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.120.003.270.000		0.8	RG 174 / RG 188 / RG 316 [75 Ω: RG 179. RG 187]	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.120.011.270.000		0.85	G 02232 D (RG174 D) / K 02252 D / RG316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Socket contact	122.120.002.270.000	50	1.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.120.004.270.000		0.8	RG 174 / RG 188 / RG 316 [75 Ω: RG 179. RG 187]	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.120.012.270.000		0.85	G 02232 D (RG174 D) / K 02252 D / RG316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Crimping tool for shielding sleeve	080.000.039.000.000								

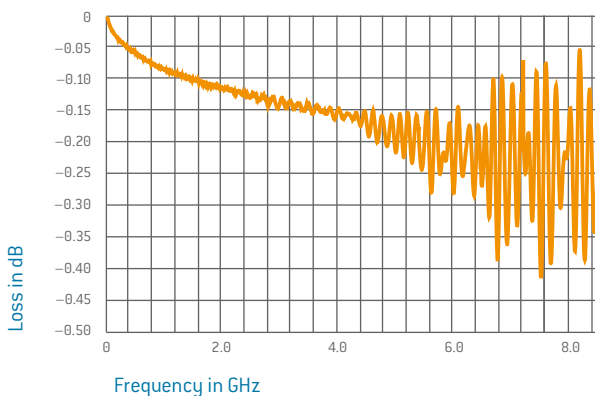
¹ Special cables and alternative models on request

MODULE 2 CONTACTS FOR 50 Ω WITH SMA TERMINATION

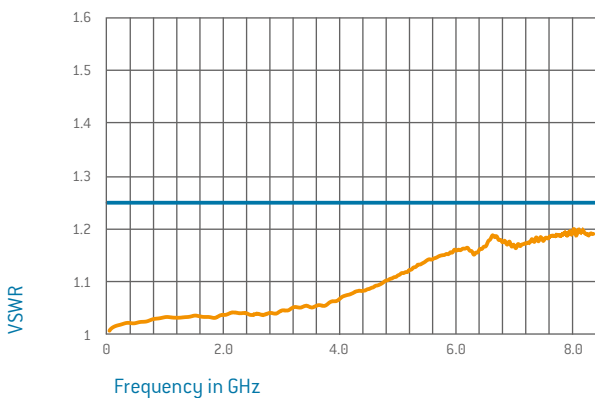


High-frequency characteristics for 50 Ω coax contacts¹

Transmission lost



Voltage standing-wave ratio VSWR



Mating cycles: $\geq 100,000$
Frequency range¹: 0 – 9.0 GHz

[Product Finder](#)

TECHNICAL NOTES

- Contacts connected to SMA connectors with outer diameters > 9.1 mm cannot be removed once mounted into the insulator.

TECHNICAL DATA

Frequency range ¹	0 – 9.0 GHz
Insulation resistance	> 100 G Ω

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
[see page 199](#)

Operating voltage	200 V	10 V
Rated impulse voltage	2.0 kV	2.0 kV
Pollution degree	2	3
Clearance distance	1.0 mm	1.0 mm
Creepage distance	1.0 mm	1.0 mm

Voltage information acc. to MIL, ANSI/EIA-364-20F: 2019

Operating voltage	350 V
Test voltage	1,050 V

Mechanical data

Total mating force (average)	11.9 N / Module
Total sliding force (average)	8.5 N / Module
Operating temperature	-40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Dielectric	PTFE
Contact body	Cu alloy
Contact spring	CuSn / CuBe alloy
Contact finish	
Center contact	Au over Ni
Outer contact	Ni

REMOVAL TOOL

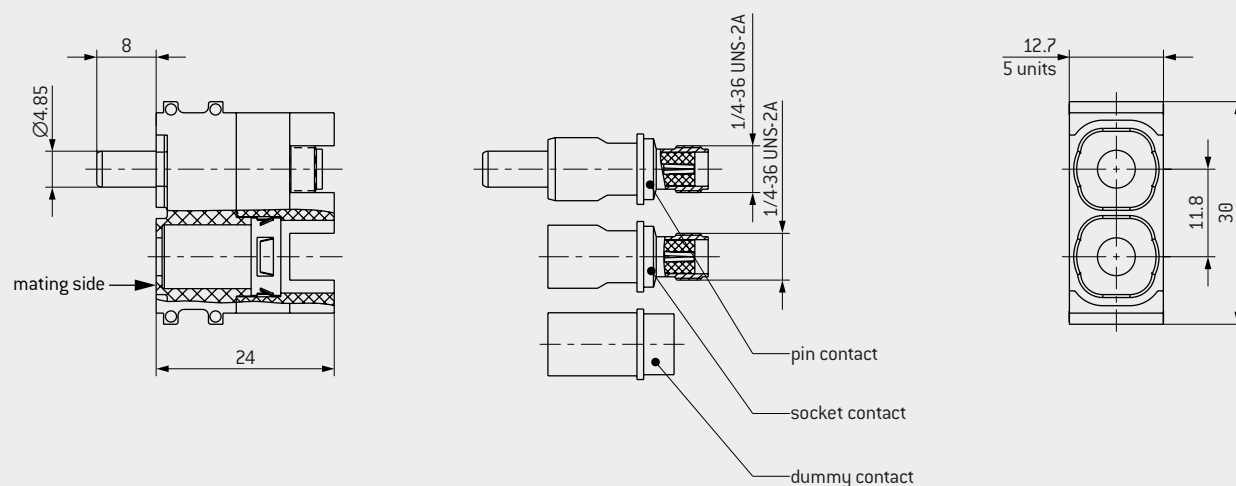


Part number: 087.122.349.000.000

For an overview of all tools please see from page [191](#).

¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 × 5 cm conductor length

INSULATOR PIN AND SOCKET



Module 2 contacts	Part number
Insulator	611.152.102.923.000
Feedthrough for QCH	611.148.055.923.000 ¹
Dummy contact	021.341.177.300.000

Description	Part number	Characteristic impedance	Frequency range
		Ω	GHz
Pin contact	122.349.001.207.000	50	9.0
Socket contact	122.349.002.207.000		

¹Pay attention to compatibility with accessories on p. [96](#)

MODULE 2 CONTACTS FOR 50 Ω

RF-SIGNAL (COAX)



Mating cycles: $\geq 100,000$
Frequency range¹: 0 – 2.4 GHz

[Product Finder](#)

TECHNICAL NOTES

- Crimp information see page [182](#)

TECHNICAL DATA

Frequency range ¹	0 – 2.4 GHz	
Insulation resistance	> 100 GΩ	
Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page 199		
Operating voltage	200 V	100 V
Rated impulse voltage	2.0 kV	2.0 kV
Pollution degree	2	3
Clearance distance	1.0 mm	1.0 mm
Creepage distance	1.0 mm	1.0 mm

Voltage information acc. to MIL, ANSI/EIA-364-20F: 2019

Operating voltage	400 V
Test voltage	1,200 V

Mechanical data

Total mating force (average)	11.9 N / Module
Total sliding force (average)	8.5 N / Module
Operating temperature	–40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Dielectric	PTFE
Contact body	Cu alloy
Contact spring	CuSn / CuBe alloy
Contact finish	
Center contact	Au over Ni
Outer contact	Ni

REMOVAL TOOL

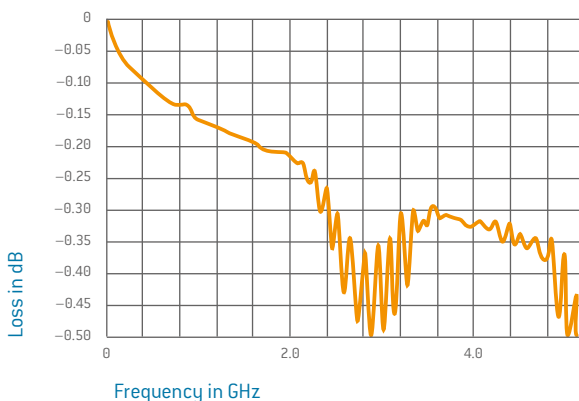


Part number: 087.170.391.000.000

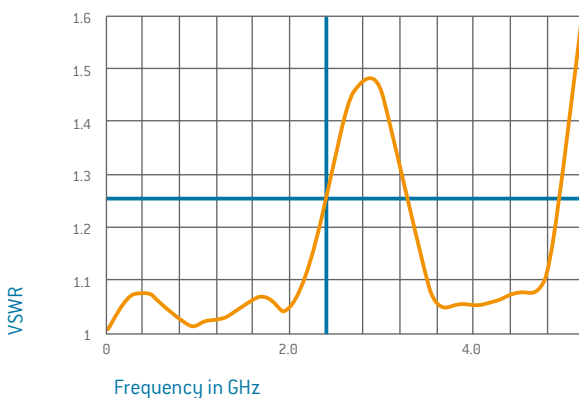
For an overview of all tools please see from page [191](#).

High-frequency characteristics for 50 Ω coax contacts¹

Transmission lost

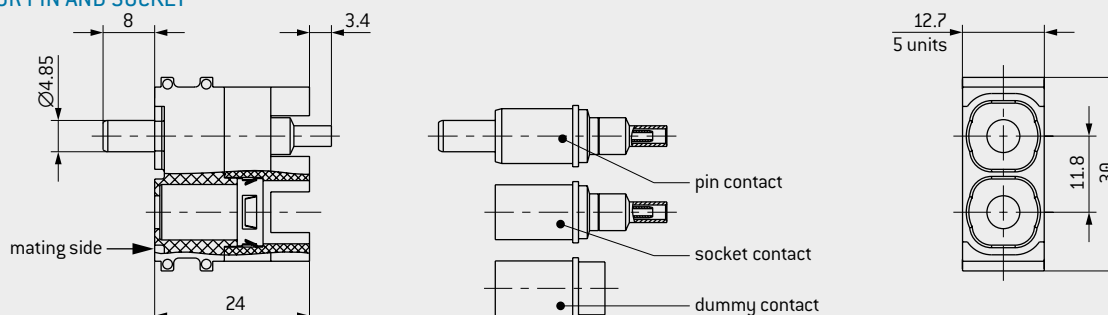


Voltage standing-wave ratio VSWR



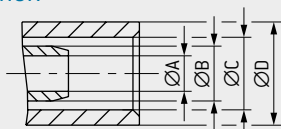
¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 × 5 cm conductor length

INSULATOR PIN AND SOCKET



CABLE TERMINATION

Center contact:
soldered,
Outer contact:
crimped



Module 2 contacts	Part number
Insulator	611.152.102.923.000
Insulator for QCH interchange parts	611.157.102.923.000
Dummy contact	021.341.177.300.000



Description	Part number	Characteristic impedance Ω	Frequency range GHz	Cable ¹	A	B	C	D	Part number crimp inserts
Pin contact	122.346.001.207.000	50	1.25	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
PCB terminated pin contact	122.350.001.207.000		1.5						
Pin contact	122.346.003.207.000		2.1	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.346.005.207.000			RG 122 (75 Ω : 2YCY 0.4 / 2.5)	2.75	3.7	4.2	5	082.000.039.104.000
Pin contact	122.346.007.207.000		2.4	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Pin contact	122.346.009.207.000			RG 223 / RG 142	3.15	4.5	5.5	6.15	082.000.039.108.000
Pin contact	122.346.011.207.000		2.1	G 02232 D / K 02252 D / RG316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Socket contact	122.346.002.207.000	50	1.25	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.351.002.207.000		1.5	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
PCB terminated socket contact	122.350.002.207.000								
Socket contact	122.346.004.207.000		2.1	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.346.006.207.000			RG 122 (75 Ω : 2YCY 0.4 / 2.5)	2.75	3.7	4.2	5	082.000.039.104.000
Socket contact	122.346.008.207.000		2.4	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Socket contact	122.346.010.207.000			RG 223 / RG 142	3.15	4.5	5.5	6.15	082.000.039.108.000
Socket contact	122.346.012.207.000		2.1	G 02232 D / K 02252 D / RG316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Crimping tool for shielding sleeve	080.000.039.000.000								

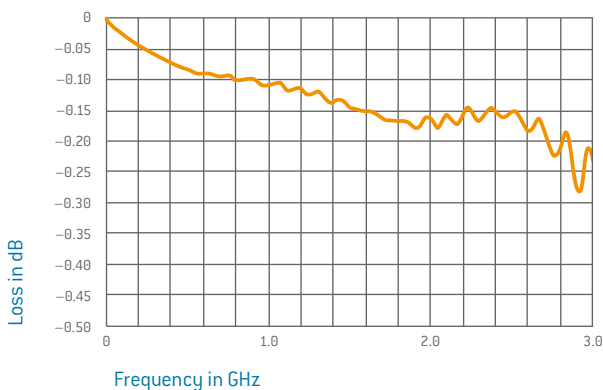
¹ Special cables on request

MODULE 2 CONTACTS FOR 50 Ω AND HIGH-VOLTAGE

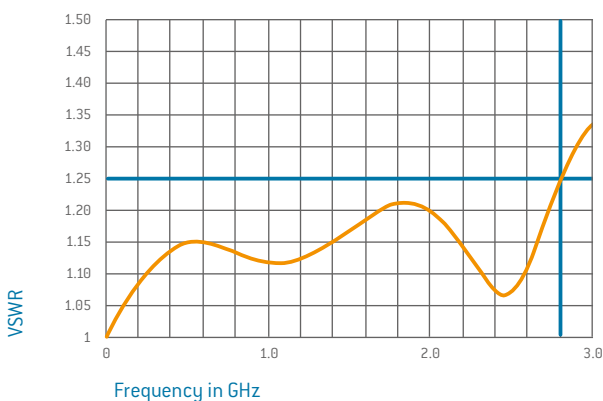


High-frequency characteristics for 50 Ω coax contacts¹

Transmission lost



Voltage standing-wave ratio VSWR



Mating cycles: $\geq 100,000$



Non-magnetic

Frequency range¹: 0 – 2.8 GHz

[Product Finder](#)

TECHNICAL NOTES

- Crimp information see page [182](#)

TECHNICAL DATA

Frequency range ¹	0 – 2.8 GHz	
Insulation resistance	> 100 GΩ	
Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07) see page 199		
Operating voltage	500 V	200 V
Rated impulse voltage	4.0 kV	4.0 kV
Pollution degree	2	3
Clearance distance	3.0 mm	3.0 mm
Creepage distance	3.0 mm	3.0 mm

Voltage information acc. to MIL, ANSI/EIA-364-20F: 2019

Operating voltage	850 V
Test voltage	2,600 V

Mechanical data

Total mating force (average)	12 N / Module
Total sliding force (average)	10 N / Module
Operating temperature	-40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Dielectric	PTFE
Contact body	Cu alloy
Contact spring	CuSn / CuBe alloy
Contact plating	Au over NIP

REMOVAL TOOL

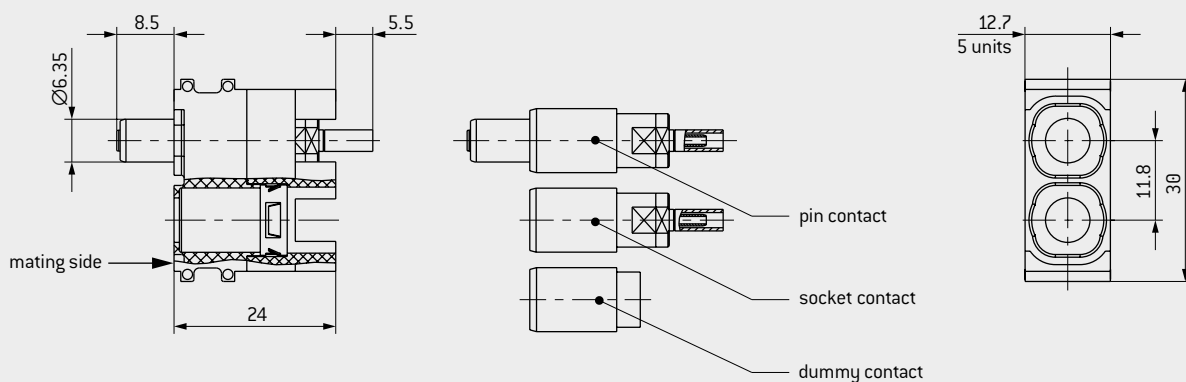


Part number: 087.170.391.000.000

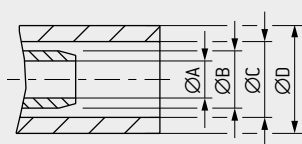
For an overview of all tools please see from page [191](#).

¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 × 5 cm conductor length

INSULATOR PIN AND SOCKET



CABLE TERMINATION



Center contact: soldered, outer contact: crimped

Module 2 contacts	Part number
Insulator	611.155.102.923.000
Dummy contact	021.341.179.923.000

Description	Part number	Characteristic impedance	Frequency range	Cable ¹	A	B	C	D	Part number crimp inserts
		Ω	GHz						
Pin contact	122.126.001.270.000	50	0.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.126.003.270.000		2.0	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.126.013.270.000		2.8	RG 223 / RG 142	3.15	4.5	5.9	6.75	082.000.039.108.000
Pin contact	122.126.007.270.000		2.6	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Socket contact	122.126.002.270.000	50	0.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.126.004.270.000		2.0	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.126.014.270.000		2.8	RG 223 / RG 142	3.15	4.5	5.9	6.75	082.000.039.108.000
Socket contact	122.126.008.270.000		2.6	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Crimping tool for shielding sleeve	080.000.039.000.000								

¹ Special lines on request

MODULE 2 CONTACTS FOR 75 Ω

RF-SIGNAL (COAX)



Mating cycles: $\geq 100,000$
Frequency range¹: 0 – 3.0 GHz

[Product Finder](#)

TECHNICAL NOTES

- Crimp information see page [182](#)
- Tested according to SMPTE-Standard

TECHNICAL DATA

Frequency range ¹	0 – 3.0 GHz
Insulation resistance	> 100 G Ω

Voltage information acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07)
see page [199](#)

Operating voltage	500 V	200 V
Rated impulse voltage	4.0 kV	4.0 kV
Pollution degree	2	3
Clearance distance	3.0 mm	3.0 mm
Creepage distance	3.0 mm	3.0 mm

Voltage information acc. to MIL, ANSI/EIA-364-20F: 2019

Operating voltage	475 V
Test voltage	1,425 V

Mechanical data

Total mating force (average)	13.3 N / Module
Total sliding force (average)	9.5 N / Module
Operating temperature	–40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Dielectric	PTFE
Contact body	Cu alloy
Contact spring	CuSn / CuBe alloy
Contact plating	
Center contact	Au over Ni
Outer contact	Ni

REMOVAL TOOL

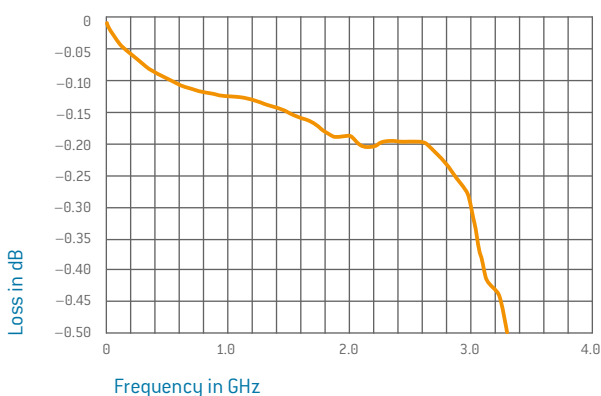


Part number: 087.170.391.000.000

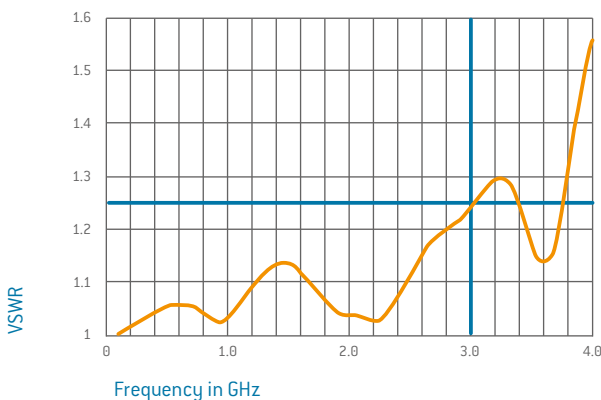
For an overview of all tools please see from page [191](#).

High-frequency characteristics for 75 Ω coax contacts¹

Transmission lost

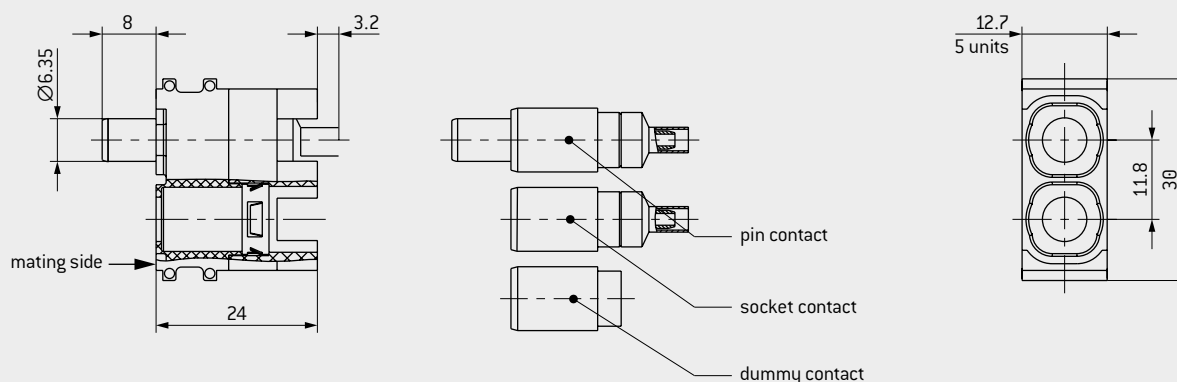


Voltage standing-wave ratio VSWR



¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 × 5 cm conductor length

INSULATOR PIN AND SOCKET



CABLE TERMINATION



Center contact: soldered, outer contact: crimped

Module 2 contacts	Part number
Insulator	611.155.102.923.000
Dummy contact	021.341.179.923.000

Description	Part number	Characteristic impedance	Frequency range	Cable ¹	A	B	C	D	Part number crimp inserts
		Ω	GHz						
Pin contact	122.348.003.207.000	75	3.0 SMPTE-Standard: ST2081 (6G-SDI)	RG 179 / RG 187	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.348.007.207.000		0.55 SMPTE-Standard: not tested	G 03233 (H+S)	3.15	4.5	5.2	6.15	082.000.039.106.000
Pin contact	122.348.009.207.000		3.0 SMPTE-Standard: ST2082 (12G-SDI)	RG 59	4	5.4	6.3	7.2	082.000.039.109.000
Socket contact	122.348.004.207.000	75	3.0 SMPTE-Standard: ST2081 (6G-SDI)	RG 179 / RG 187	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.348.008.207.000		0.55 SMPTE-Standard: not tested	G 03233 (H+S)	3.15	4.5	5.2	6.15	082.000.039.106.000
Socket contact	122.348.010.207.000		3.0 SMPTE-Standard: ST2081 (12G-SDI)	RG 59	4	5.4	6.3	7.2	082.000.039.109.000
Crimping tool for shielding sleeve	080.000.039.000.000								

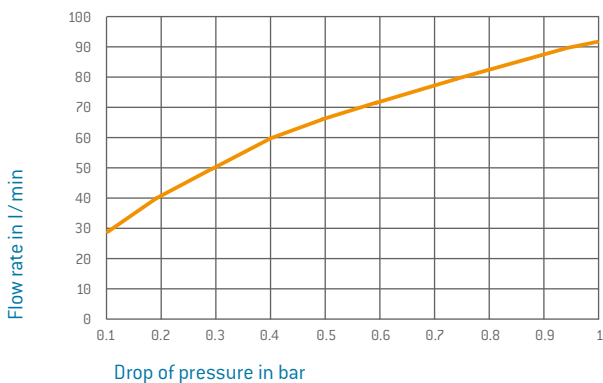
¹ Special lines on request

MODULE 2 CONTACTS FOR COMPRESSED AIR

Inner diameter of tube max. 4 mm, push-in diameter max. 6 mm.



Flow rate diagram



The flow rate diagram refers to the locking version with a maximum gap between socket and pin piece of ≤ 0.5 mm. If the clearance is modified, the drop of pressure increases.

¹ Specified mating cycles possible with regular service intervals

Operating pressure: 20 bar

Mating cycles¹: $\geq 100,000$

Inner diameter tube: M5 or max. 4 mm

[Product Finder](#)

TECHNICAL NOTES

- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device
- Vacuum model and further termination types on request
- Not suitable for mixtures containing more than 25 % oxygen content or explosive gases

TECHNICAL DATA

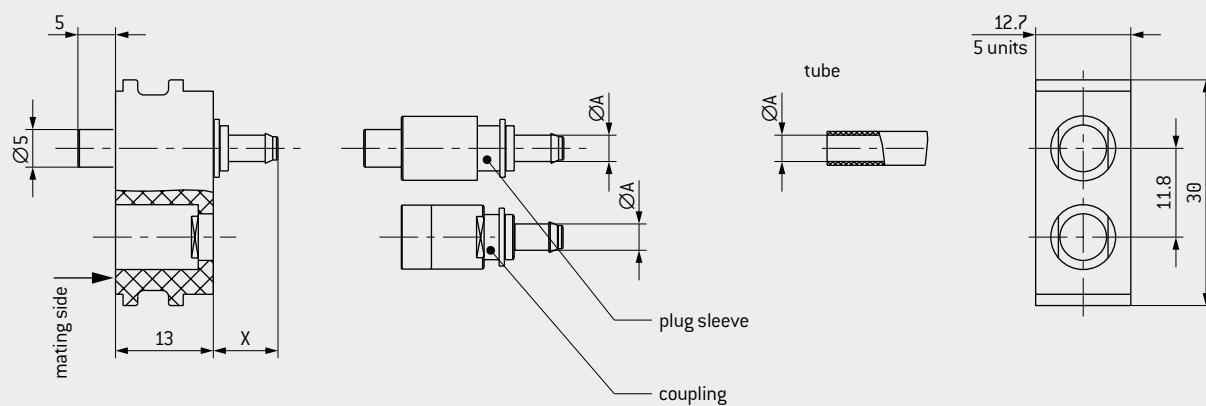
Mechanical data

Valid max. operating pressure	20 bar
Total mating force (average)	
non shut-off	27 N / Module
one side shut-off	28 N / Module
both side shut-off	29 N / Module
Total sliding force (average)	
non shut-off	12.6 N / Module
one side shut-off	12.6 N / Module
both side shut-off	9.2 N / Module
Operating temperature	-40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$
Tube termination	M5 internal thread for: commonly available push-in connections

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Valve body	Cu alloy, blank
Sealing	NBR / FKM

INSULATOR PIN AND SOCKET

Accessories see page [100](#)

Module 2 contacts	Part number
Insulator	611.141.102.923.000
Feedthrough for QCH	611.148.055.923.000 ¹

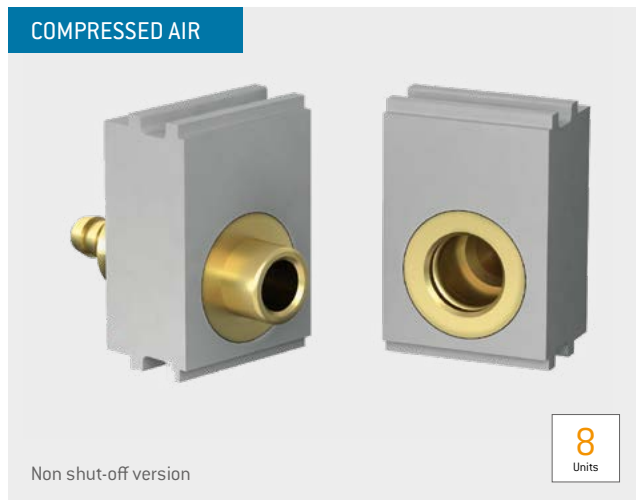


Description	Part number	Dim. A mm	Dim. X mm	Termination types see page 100	
				I	II
Plug sleeve (non shut-off)	196.023.001.300.000	3	8.5	x	—
Plug sleeve (non shut-off)	196.024.001.300.000	4	10.5	x	—
Plug sleeve (non shut-off)	196.025.001.300.000	M5	—	—	x
Coupling plug (non shut-off)	196.023.003.300.000	3	8.5	x	—
Coupling plug (non shut-off)	196.024.003.300.000	4	10.5	x	—
Coupling plug (non shut-off)	196.025.003.300.000	M5	—	—	x
Plug sleeve (shut-off) ^{2,3}	196.025.014.300.000	M5	7.0	—	x
Coupling plug (shut-off)	196.023.002.300.000	3	8.5	x	—
Coupling plug (shut-off)	196.024.002.300.000	4	10.5	x	—
Coupling plug (shut-off) ²	196.025.012.300.000	M5	7.0	—	x

¹ Pay attention to compatibility with accessories on page [100](#) | ² Only pluggable on coupling plug 196.025.012.300.000 | ³ Material sealing: FKM

MODULE 1 CONTACTS FOR COMPRESSED AIR VALVES

Inner diameter of tube max. 6 mm



Operating pressure: 12 bar

Mating cycles¹: $\geq 100,000$

Inner diameter tube: max. 6 mm

[Product Finder](#)

TECHNICAL NOTES

- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device
- Vacuum model and further termination types on request
- Not suitable for mixtures containing more than 25 % oxygen content or explosive gases

TECHNICAL DATA

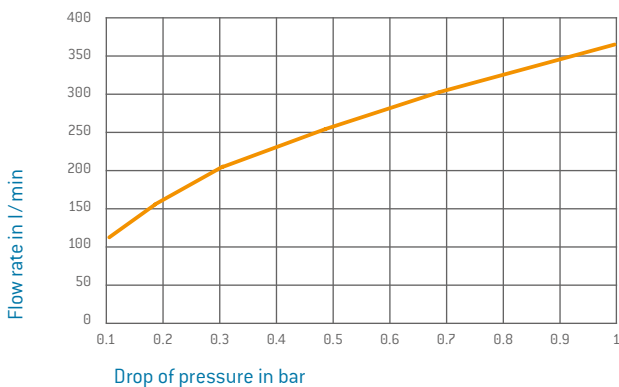
Mechanical data

Operating pressure	–0.8 to 12.0 bar
Total mating force (average)	64 N / Module
non shut-off	5.4 N / Module
one side shut-off	6.4 N / Module
Total sliding force (average)	0 N / Module
non shut-off	3.4 N / Module
one side shut-off	3.4 N / Module
Operating temperature	–40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Valve body	Cu alloy, blank
Sealing	NBR

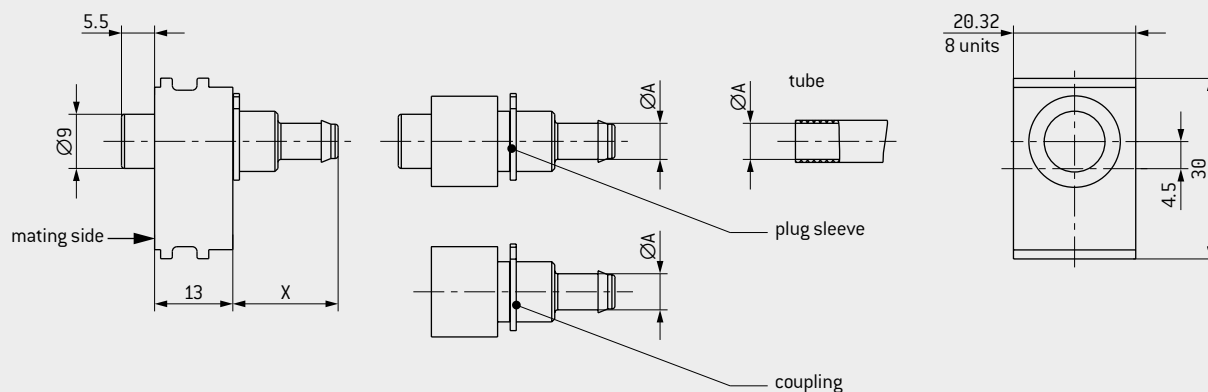
Flow rate diagram



The flow diagram refers to the blocking variant with a maximum gap between socket and pin piece of ≤ 0.5 mm. The pressure reduction increases in the event of a changed gap measurement.

¹ Specified mating cycles possible with regular service intervals

INSULATOR PIN AND SOCKET



Module 1 contact	Part number
Insulator	611.142.101.923.000
Feedthrough for QCH	611.142.055.923.000



Description	Part number	Dim. A mm	Dim. X mm
Plug sleeve (non shut-off)	196.001.001.300.000	4	15
Plug sleeve (non shut-off)	196.002.001.300.000	6	17.5
Coupling plug (non shut-off)	196.001.003.300.000	4	15
Coupling plug (non shut-off)	196.002.003.300.000	6	17.5
Coupling plug (shut-off)	196.001.002.300.000	4	15
Coupling plug (shut-off)	196.002.002.300.000	6	17.5

MODULE 2 CONTACTS

Suitable for conducting air, water and other fluids



Operating pressure: 16 bar low-leakage model
 Mating cycles¹: $\geq 100,000$
 Inner diameter tube: M5

[Product Finder](#)

TECHNICAL NOTES

- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device
- The use of flammable or explosive liquids or gases is not allowed
- Not suitable for mixtures containing more than 25 % oxygen content or explosive gases

TECHNICAL DATA

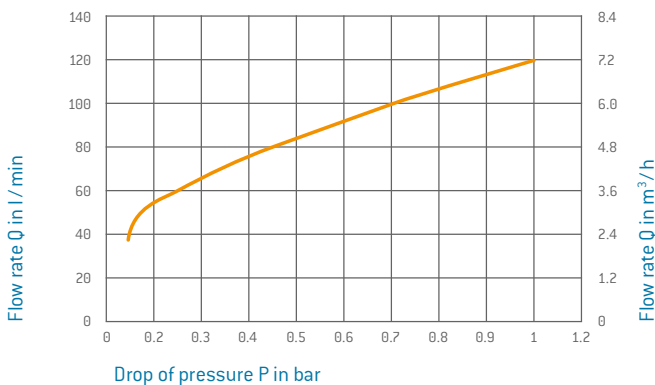
Mechanical data

Valid max. operating pressure	16 bar
Tube termination	M5 internal thread for: commercially available Push-in connections
Total mating force (average)	64 N / Module
Total sliding force (average)	0 N / Module
Operating temperature	-40 °C to +125 °C
Mating cycles ¹	$\geq 100,000$

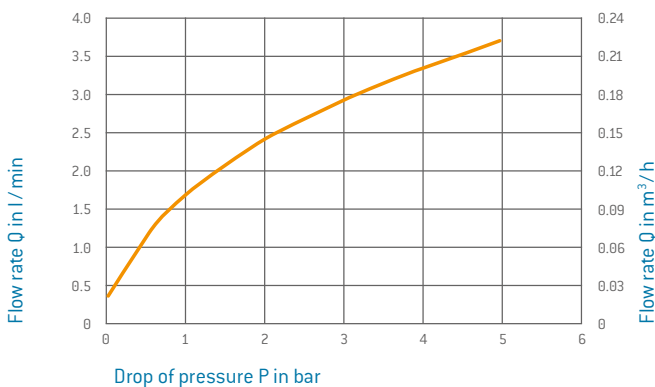
Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Fluid model	Stainless steel
Sealing	NBR

Flow rate diagram air



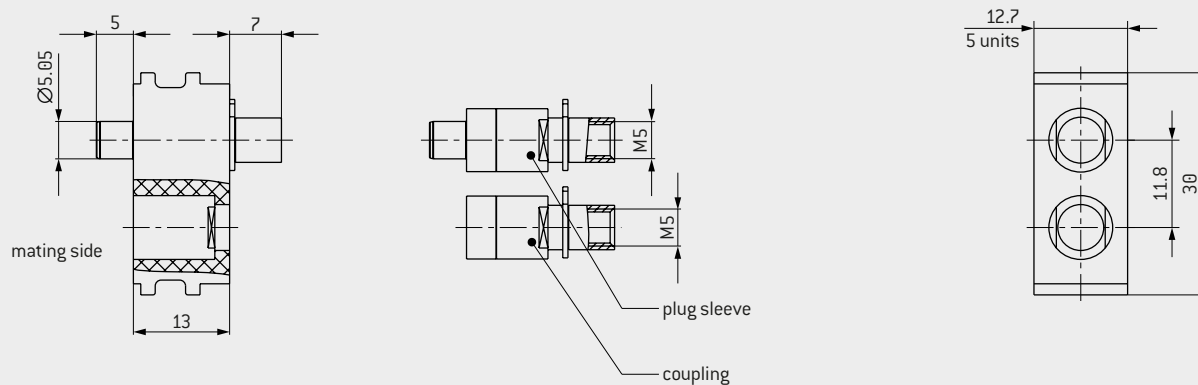
Flow rate diagram water



The flow diagram refers to the blocking variant with a maximum gap between socket and pin piece of ≤ 0.5 mm. The pressure reduction increases in the event of a changed gap measurement.

¹ Specified mating cycles possible with regular service intervals

INSULATOR PIN AND SOCKET

Accessories see page [100](#)

Module 2 contacts	Part number
Insulator	611.141.102.923.000
Feedthrough for QCH	611.148.055.923.000 ¹

Description	Part number	Termination
		mm
Plug sleeve (pin piece)	196.025.015.902.001	M5
Coupling plug (socket piece)	196.025.016.902.001	M5

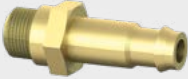
¹ Pay attention to compatibility with accessories on page [100](#)

ACCESSORIES M5

COMPRESSED AIR AND FLUID MODEL

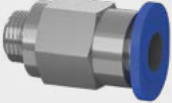
TERMINATION TYPE I

Nipple fitting



TERMINATION TYPE II PUSH-IN

Push-in fitting



L connection

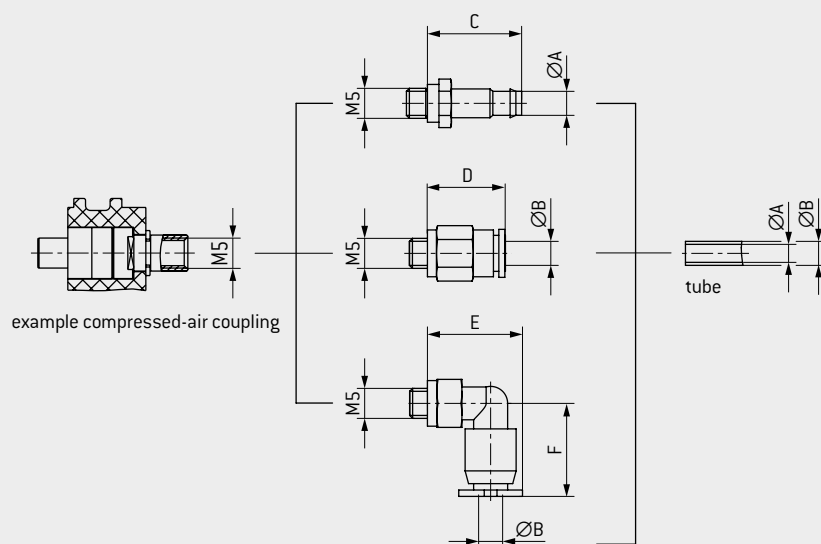


TECHNICAL DATA	
Mechanical data	
Valid operating pressure (static)	0.95 to 14 bar
Operating temperature	−10 °C to +80 °C
Thread termination	M5
Materials	
Nipple fitting	
Body	Steel
Push-in fitting	
Body	Brass (nickel-plated)
Release ring	POM
Sealing	NBR
L-connection	
Body	PBT
Release ring	POM
Sealing	NBR
Hose ring	Stainless steel

Description	Part number	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F
		Inner Ø of tube mm	Outer Ø of tube mm	incl. sealing washer			mm
Nipple fitting	945.000.001.000.123	2	—	10.2	—	—	—
Nipple fitting	945.000.001.000.136	3	—	14.2	—	—	—
Nipple fitting	945.000.001.000.137	4	—	15.8	—	—	—
Push-in fitting	945.000.001.000.138	—	3	—	13	—	—
Push-in fitting	945.000.001.000.139	—	4	—	13.2	—	—
Push-in fitting	945.000.001.000.140	—	6	—	14.2	—	—
L connection Push-in	945.000.001.000.141	—	3	—	—	14	11
L connection Push-in	945.000.001.000.142	—	4	—	—	14.9	15.6
L connection Push-in	945.000.001.000.143	—	6	—	—	17.2	16.2

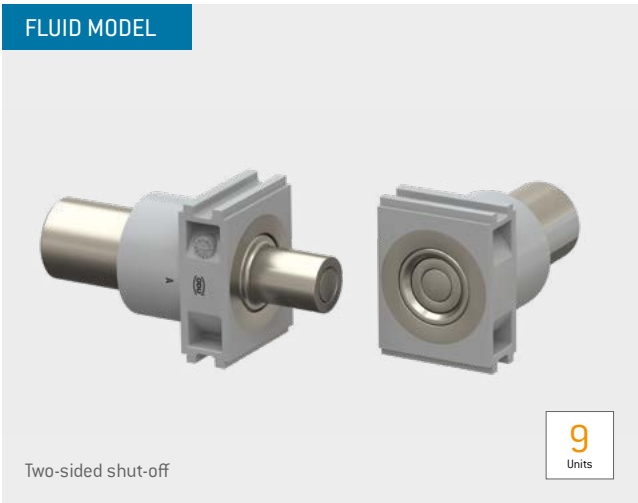


TERMINATION DIMENSIONS, FOR ACCESSORIES USED WITH FLUID COUPLING AND RETAINER RING.



MODULE 1 CONTACT

Suitable for conducting air, water, and other fluids (e.g., coolants)



Operating pressure: 25 bar low-leakage model
Mating cycles¹: $\geq 100,000$
Inner diameter tube: G1/4

[Product Finder](#)

TECHNICAL NOTES

- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device
- The use of flammable or explosive liquids or gases is not allowed.
- Not suitable for mixtures containing more than 25 % oxygen content.
- Module cannot be used with M+ frame.

TECHNICAL DATA

Mechanical data	
Valid max. operating pressure	−0.8 ² to 25 bar
Tube termination	G1/4 inner thread for standard Push-in connections
Total mating force (average)	60 N / Module
Total sliding force (average)	0 N / Module
Operating temperature	−15 °C to +90 °C
Mating cycles ¹	$\geq 100,000$

Materials

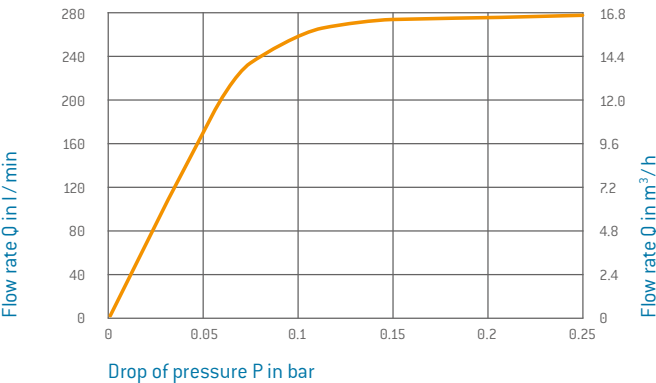
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Fluid model	Cu alloy, nickel-plated
Sealing	NBR

REMOVAL TOOL

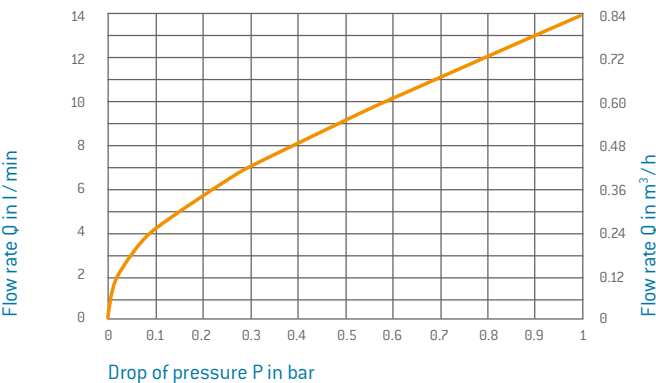


Removal of the fully assembled coupling (including cable).
Part number: 087.196.050.000.000

Flow rate diagram air



Flow rate diagram water

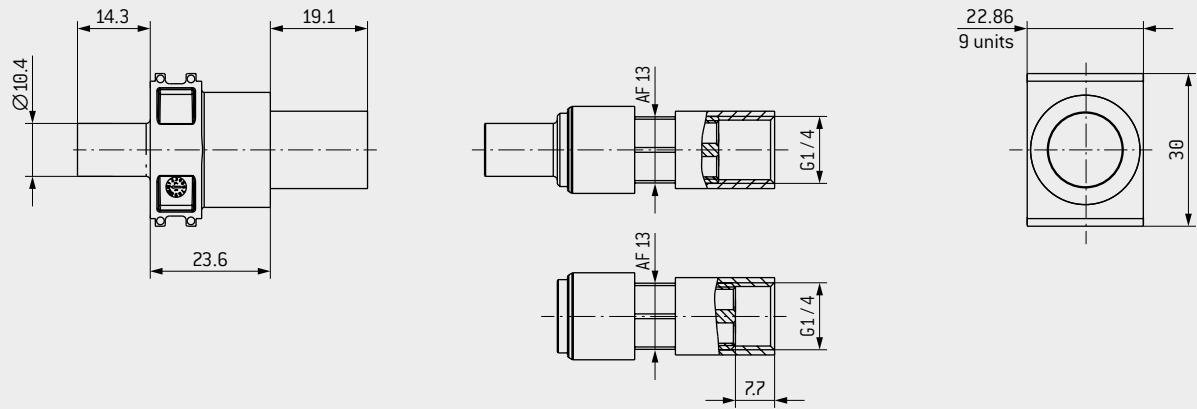


The flow diagram refers to the blocking variant with a maximum gap between socket and pin piece of ≤ 0.5 mm. The pressure reduction increases in the event of a changed gap measurement.

¹ Specified mating cycles possible with regular service intervals | ² Pressure specification as relative value (absolute value: 0.05 bar)

INSULATOR PIN AND SOCKET

Accessories see page [104](#)



For use in a strain relief housing, the space requirements must be checked.

Module 1 contacts	Part number
Insulator	611.177.101.923.000

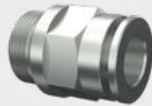
Description	Part number	Termination	Outer Ø of tube
Plug sleeve (shut-off)	196.050.001.380.000	G1/4	see termination
Coupling plug (shut-off)	196.050.002.380.000	G1/4	accessories on p. 104

ACCESSORIES G1/4

FLUID MODEL G1/4

TERMINATION TYPE PUSH-IN

Push-in fitting



L CONNECTION



TECHNICAL DATA

Mechanical data

Operating pressure (static)	−0.8 to 16 bar
Operating temperature	−20 °C to +70 °C
Thread termination	G1/4

Materials

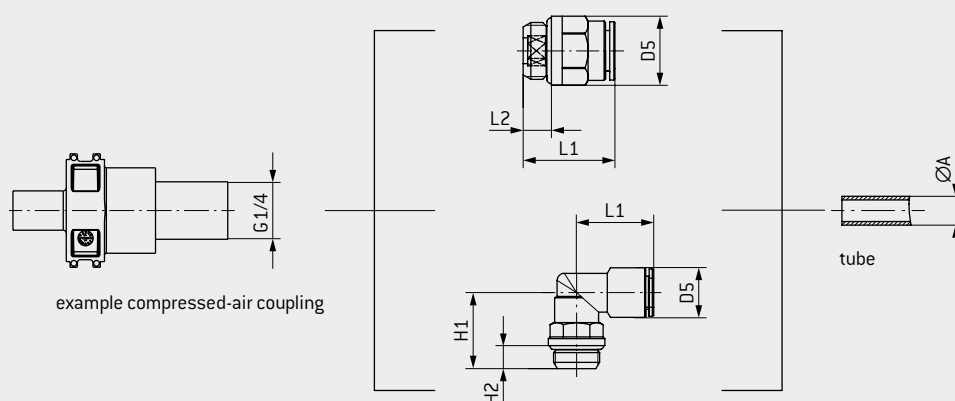
Body	Brass (nickel-plated)
Sealing	NBR

Description	Part number	Dim. A Outer Ø of tube mm	D5 Ø mm	L1 mm	L2 mm	Weight g
ODU-MAC® Push-in fitting G1/4	945.000.001.000.322	6	16	19.5	6.5	12.7
	945.000.001.000.323	8	16	21.5	6.5	13.6
	945.000.001.000.324	10	16	27.5	6.5	17.4
	945.000.001.000.325	12	16	28.5	6.5	26.2

Description	Part number	Dim. A Outer Ø of tube mm	D5 Ø mm	L1 mm	H1 mm	H2 mm	Weight g
ODU-MAC® L connection Push-in. Push-in G1/4 ¹	945.000.001.000.318	6	12	22	21.5	6.5	21.8
	945.000.001.000.319	8	14	22.5	21.5	6.5	25.3
	945.000.001.000.320	10	16	26	22	6.5	34
	945.000.001.000.321	12	19	28.5	25.5	6.5	58.5

¹ For use in a strain relief housing, the space requirements must be checked

TERMINATION DIMENSIONS FOR ACCESSORIES USED WITH FLUID COUPLING



MODULE 5 CONTACTS FOR PLASTIC FIBER POF



Removal from front, cutting-off not necessary
Part number: 087.611.001.002.000
For an overview of all tools please see page [191](#).

Ferrule
Mating cycles: $\geq 40,000$
Type of fiber: POF
Non-magnetic on request

[Product Finder](#)

TECHNICAL NOTES

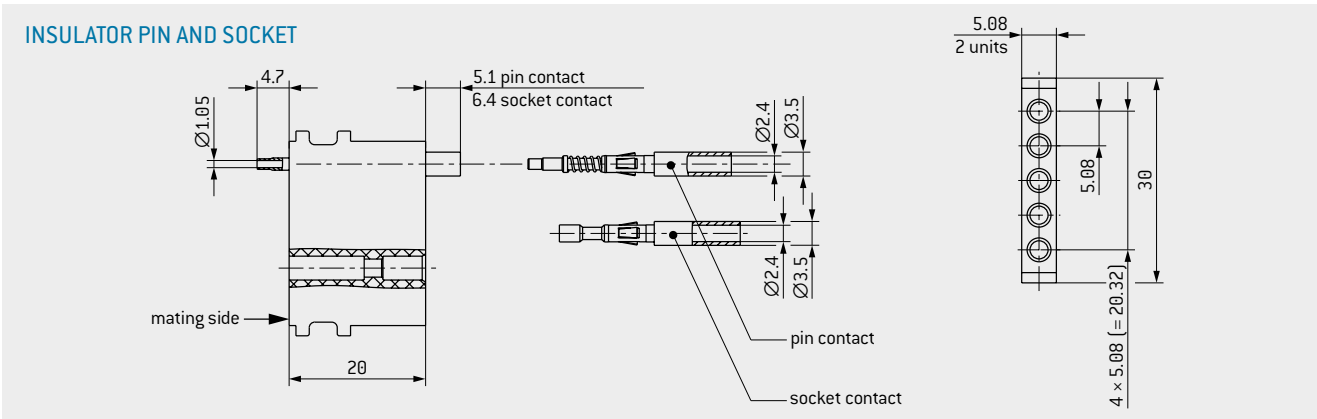
- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device

TECHNICAL DATA

Mechanical data	
POF (Polymer Optical Fiber)	1 mm
Outer diameter	2.2 mm – 2.3 mm
Fiber fastening	Crimp
Insertion loss typical	1.5 dB at 670 nm
Insertion loss during life-time	< 2 dB at 670 nm
Total mating force (average)	< 17.5 N
Operating temperature (depending on fiber)	
Standard fiber	–40 °C to +85 °C
High-temperature fiber	–40 °C to +115 °C
Mating cycles	$\geq 40,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Fiber optic contact	Cu alloy
Type of fiber	Plastic fiber 980 / 1.000 (POF)



Description	Part number
Pin contact 980 / 1,000 μm	196.503.002.901.000
Socket contact 980 / 1,000 μm	196.503.001.901.000
Processing set (multi-purpose and crimping tool)	080.000.048.000.000
Cutting / stripping universal pliers	080.000.048.100.000
Crimping tool	080.000.048.300.000

Module 5 contacts	Part number
Insulator	611.163.105.923.000

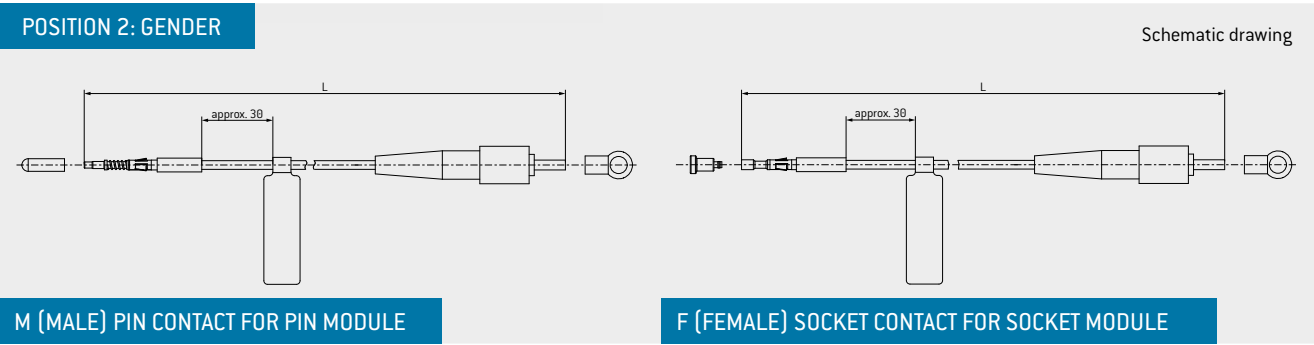
PREASSEMBLED CONTACTS

MODULE 5 CONTACTS



TECHNICAL NOTES

- Please see the composition of the number key below to define your individual fiber optic contact



Pos. 12 – 13		Count number	
	Mode	Type and polish of Fiber Optic interface connector (2nd side)	
ZF	Multimode	ST/PC	
ZE	Multimode	FSMA/PC	

Pos. 14 – 19	Length
Length L of assembly in mm (minimum cable length 1,000 mm) Example: 1,000 mm = 001000	

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

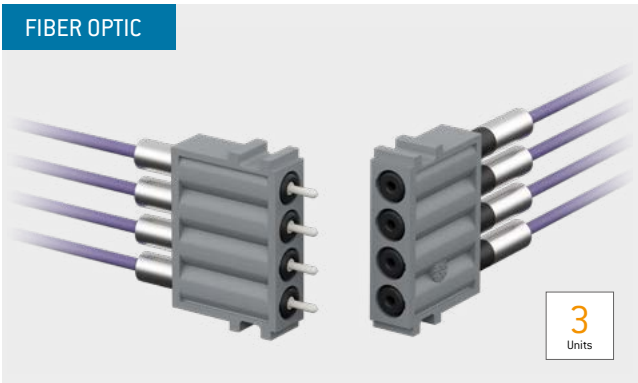
F 0 P 9 8 0 0 1 G P

PART NUMBER KEY

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

MODULE 4 CONTACTS

FOR FIBER GLASS GOF PHYSICAL CONTACT



Removal of the still unassembled contact
(without cable, which may have been cut off)

Part number: 087.7CC.125.001.000

For an overview of all tools please see page [191](#).

Ceramic ferrule
Single-mode / multi-mode
Mating cycles¹: $\geq 1,000$
Type of fiber: PC / APC

[Product Finder](#)

TECHNICAL NOTES

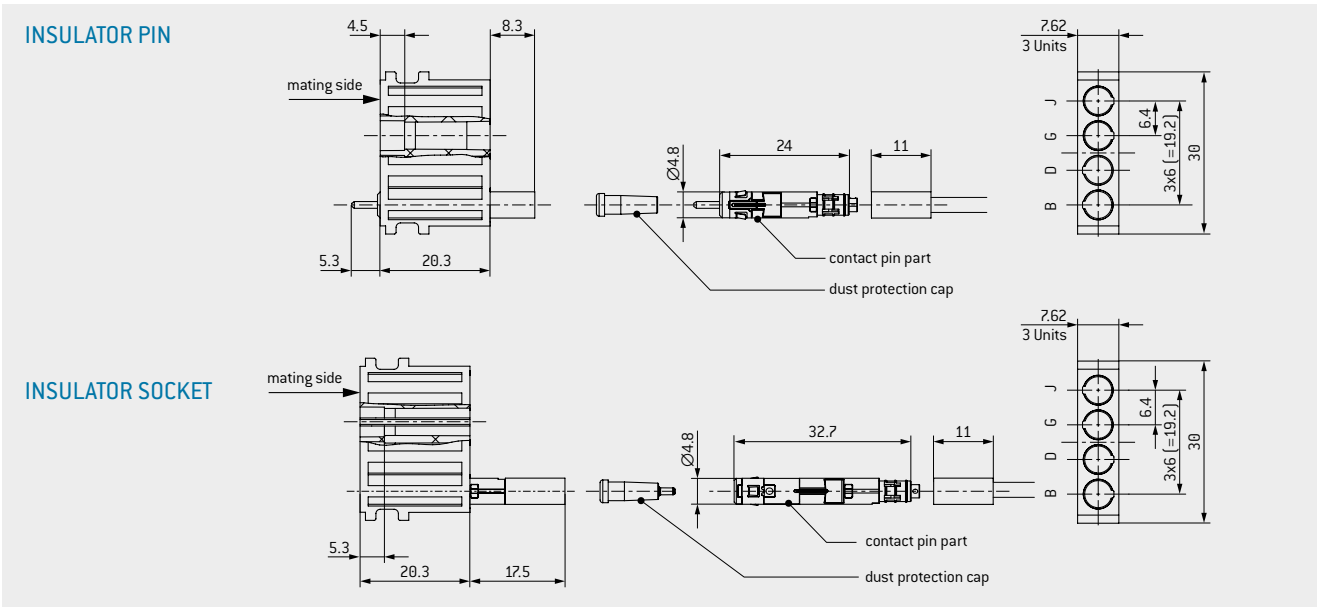
- Contacts can only be ordered pre-assembled

TECHNICAL DATA

Mechanical data	
Fiberglass	Single-mode – 9 / 125 μm Multi-mode – 50 / 125 μm
Fiber fastening	Clamped ²
Insertion loss typical	$\leq 0.5 \text{ dB}$
Total mating force (average)	$< 35 \text{ N}$
Total sliding force (average)	$\leq 10 \text{ N}$
Operating temperature	$-25 \text{ }^{\circ}\text{C}$ to $+75 \text{ }^{\circ}\text{C}$
Mating cycles ¹	$\geq 1,000$

Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Contact material	PARA, stainless steel, Cu-alloy, ceramic



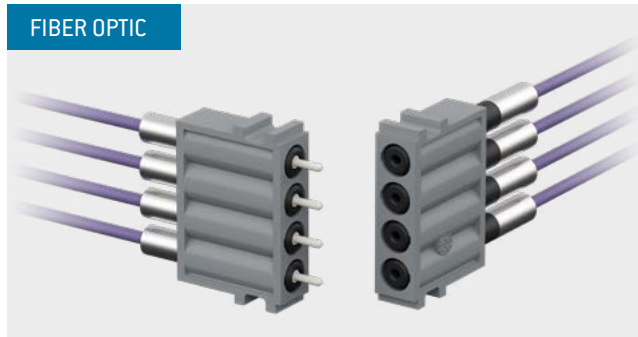
Module 4 contacts	Part number
Insulator pin	611.181.104.923.000
Insulator socket	610.181.104.923.000

¹ Tested under controlled environment | ² Fiber assembly (glue and polish) on request | Cleaning instruction see: www.odu-connectors.com/downloads

PREASSEMBLED CONTACTS

MODULE 4 CONTACTS

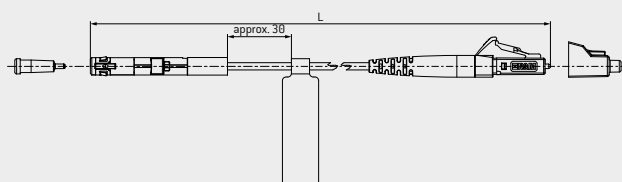
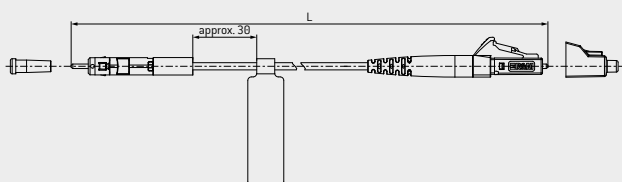
FIBER OPTIC



- Contacts can only be ordered pre-assembled.
- Please see the composition of the number key below to define your individual fiber optic contact

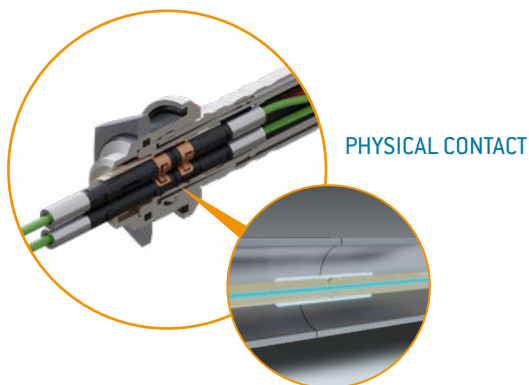
POSITION 2: GENDER

Schematic drawing



M (MALE) PIN CONTACT FOR PIN MODULE

F (FEMALE) SOCKET CONTACT FOR SOCKET MODULE



Pos. 5 – 7	Mode
500	Multimode
090	Singlemode

Pos. 12 – 13	Count number	
	Mode	Type and polish of Fiber Optic interface connector (2nd side)
ZZ	Multimode	LC / PC
ZY	Singlemode	LC / PC
ZX	Singlemode	LC / APC
ZW	Multimode	SC / PC
ZV	Singlemode	SC / PC
ZU	Singlemode	SC / APC
ZT	Multimode	ST / PC
ZS	Singlemode	ST / PC
ZR	Singlemode	ST / APC
ZQ	Multimode	FC / PC
ZP	Singlemode	FC / PC
ZO	Singlemode	FC / APC
ZN	Multimode	E2000 / PC
ZM	Singlemode	E2000 / PC
ZL	Singlemode	E2000 / APC

Pos. 14 – 19	Length
Length L of assembly in mm (minimum cable length 1,000 mm) Example: 1,000 mm = 001000	

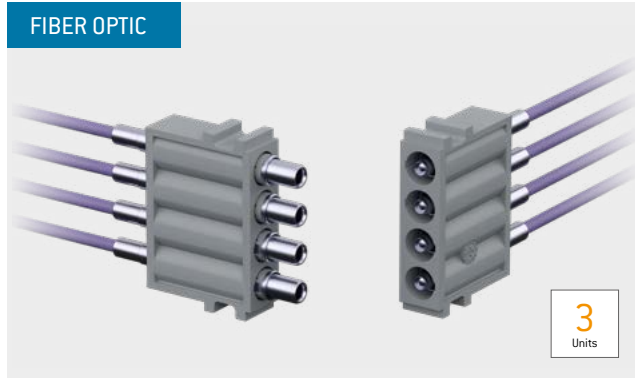
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F		0	P				0	1	G	P								

PART NUMBER KEY

MODULE 4 CONTACTS

FOR FIBER GLASS GOF EXPANDED BEAM

FIBER OPTIC



Ceramic ferrule

Multi-mode

Mating cycles¹: $\geq 100,000$

Type of fiber: Expanded Beam

[Product Finder](#)

REMOVAL TOOL



Removal of the still unassembled contact
(without cable, which may have been cut off)

Part number: 087.7CC.125.001.000

For an overview of all tools please see page [191](#).

TECHNICAL NOTES

- Contacts can only be ordered pre-assembled

TECHNICAL DATA

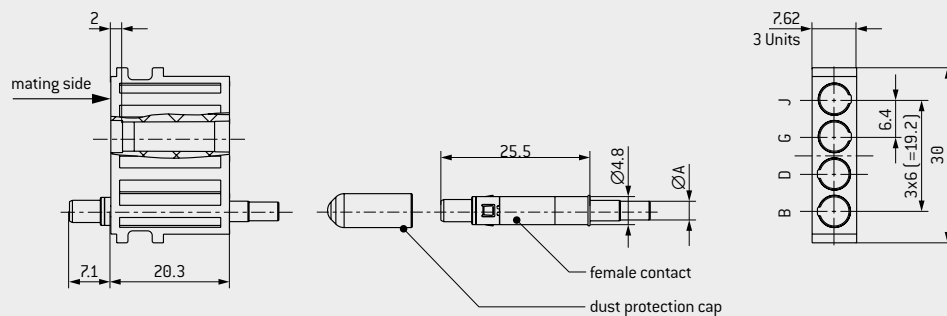
Mechanical data

Fiberglass	Multi-mode – 50 / 125 µm
Fiber fastening	Glued ²
Insertion loss typical	≤ 1.5 dB
Total mating force (average)	< 4 N
Total sliding force (average)	≤ 4 N
Operating temperature	-40 °C to $+85$ °C
Mating cycles ¹	$\geq 100,000$

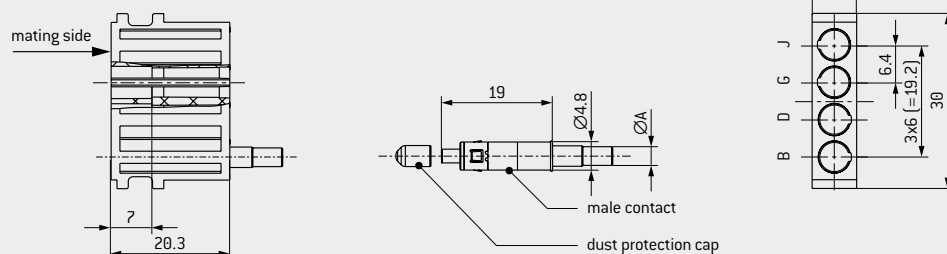
Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Contact material	Cu-alloy, stainless steel, ceramic

INSULATOR PIN



INSULATOR SOCKET

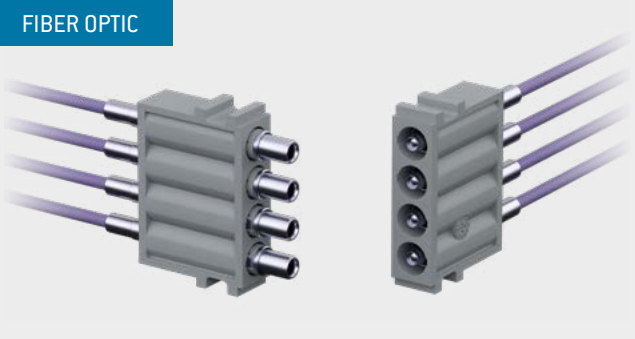


Module 4 contacts	Part number
Insulator pin	611.183.104.923.000
Insulator socket	610.183.104.923.000

¹ Tested under controlled environment | ² Fiber assembly (glue and polish) on request | Cleaning instruction see: www.odu-connectors.com/downloads

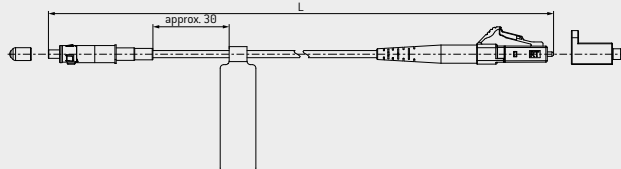
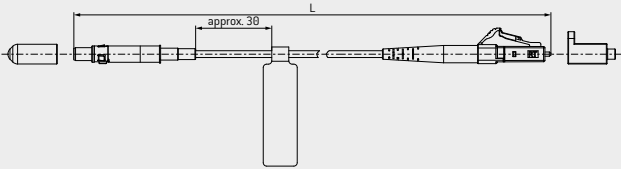
PREASSEMBLED CONTACTS

MODULE 4 CONTACTS



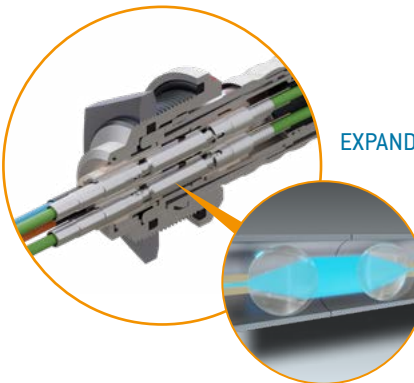
- Contacts can only be ordered pre-assembled.
- Please see the composition of the number key below to define your individual fiber optic contact

POSITION 2: GENDER

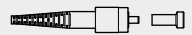


M (MALE) PIN CONTACT FOR PIN MODULE

F (FEMALE) SOCKET CONTACT FOR SOCKET MODULE



EXPANDED BEAM

Pos. 12 – 13		Count number	
	Mode	Type and polish of Fiber Optic interface connector (2nd side)	
ZK	Multimode	LC / PC	
ZJ	Multimode	SC / PC	
ZI	Multimode	ST / PC	
ZH	Multimode	FC / PC	
ZG	Multimode	E2000 / PC	

Pos. 14 – 19

Length

Length L of assembly in mm
(minimum cable length 1,000 mm)
Example: 1,000 mm = 001000

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

F 0 E 5 0 0 0 1 G P

PART NUMBER KEY

MODULE 2 CONTACTS FOR FIBER OPTIC EXPANDED BEAM PERFORMANCE



Single-mode / multi-mode
Mating cycles: $\geq 50,000$
Type of fiber: Expanded Beam Performance

[Product Finder](#)

TECHNICAL NOTES

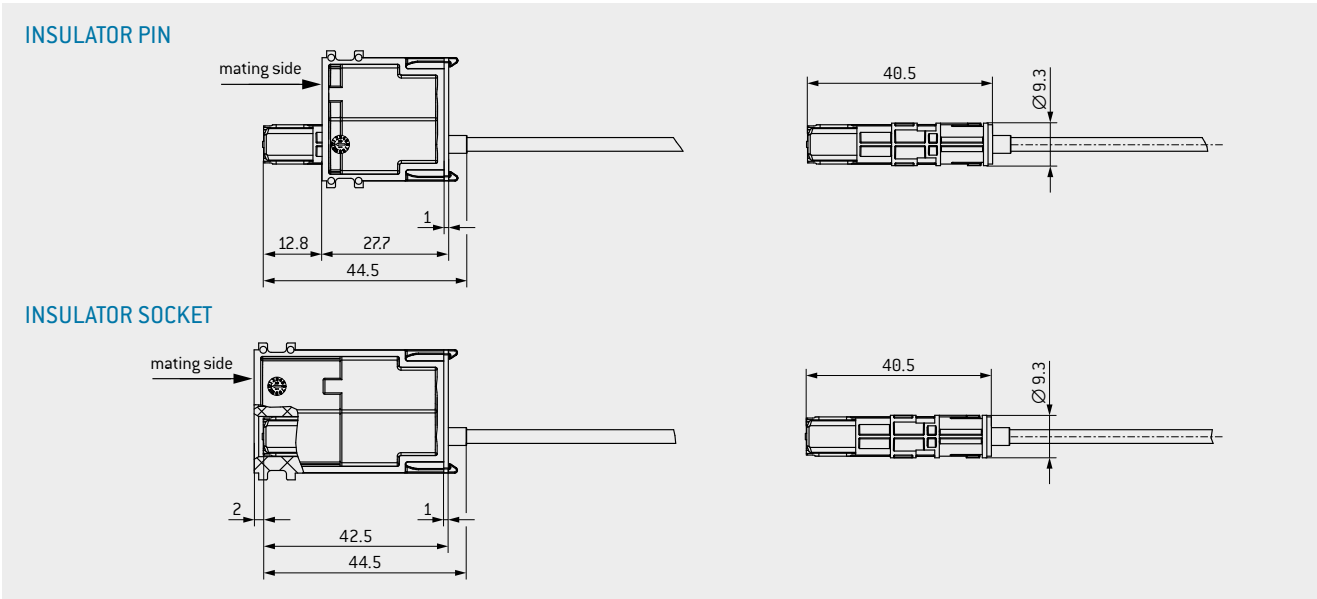
- Available as cable assembly

TECHNICAL DATA

Mechanical data	
Fiberglass	Single-mode – 9 / 125 μm Multi-mode – 50 / 125 μm
Fiber fastening	Fiber optic glued
Insertion loss typical	Single-mode: 0.7 dB Multi-mode: 0.3 dB
Total mating force (average)	< 15 N
Total sliding force (average)	< 2 N
Operating temperature	–40 °C to +105 °C
Mating cycles	$\geq 50,000$

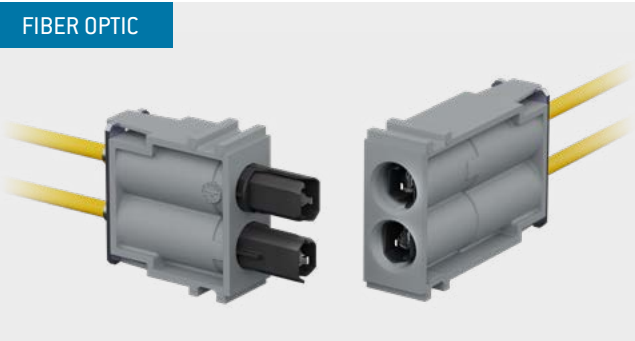
Materials

Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
Fiber optic contact	Cu alloy
Contact material	Thermoplastic fiberglass reinforced, Cu-alloy, Ni-alloy, Polymer

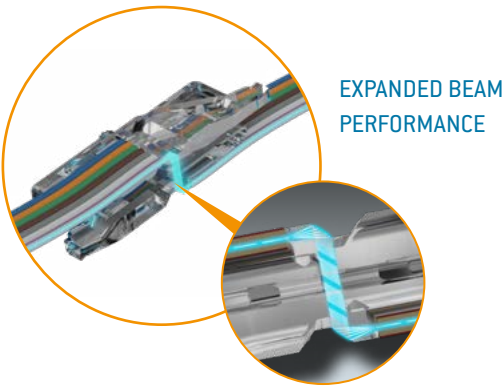


Module 2 contacts	Part number
Insulator pin	611.184.102.923.000
Insulator socket	610.184.102.923.000

MODULE 2 CONTACTS FOR FIBER OPTIC EXPANDED BEAM PERFORMANCE CONTACT ASSEMBLY



- Contacts can only be ordered pre-assembled.
- Contact pre-assembly available on request.



Select your Pigtail		
IN-CABINET		
EBP – EBP	crossed	straight
EBP – MPO	crossed	straight
EBP – MT	crossed	–
BREAKOUT / EBP	crossed	straight
EBP – EBO PUSH-PULL	crossed	straight

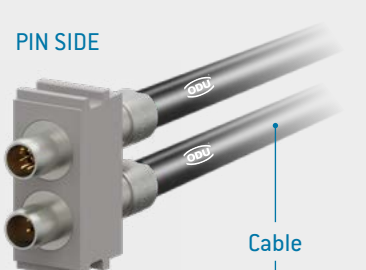
PREASSEMBLED MODULE FOR MULTI-POSITION FEEDTHROUGH / HIGH-SPEED CONNECTOR

PREASSEMBLED MODULE:

- The inserts listed here for shielded feedthroughs / high-speed connectors are optimally suitable for transfer of Ethernet, USB® 3.2 and HDMI®¹.
- We offer the preassembled module with individually defined cable length, so that you do not need to assemble the cable by yourselves. We are happy to advise you on the best solution.

SIZE 0 / FEEDTHROUGH / HIGH-SPEED CONNECTOR

PIN SIDE



SOCKET SIDE



Cable

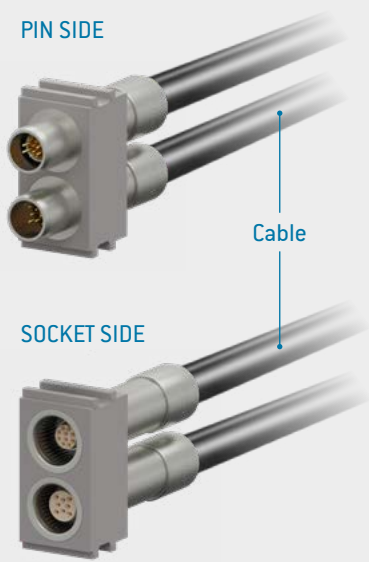
Type & configuration	Data transmission protocols
Connector A	USB® 2.0 ¹ (cable length 0.2 – 4.0 m)
Micro-connector B	
Receptacle A	
Connector A	USB® 3.2 Gen 1x1 ¹ (cable length 0.2 – 4.0 m)
Micro-connector B	
Receptacle A	

Category ²	No. of contacts (insert)
USB® 2.0 ¹	4
USB® 3.2 Gen 1x1 ¹	10



¹For data transmission protocols please see page | ²Classification acc. to ISO/IEC 11801(1-6):2017-11

SIZE 1 / FEEDTHROUGH / HIGH-SPEED CONNECTOR



PIN SIDE

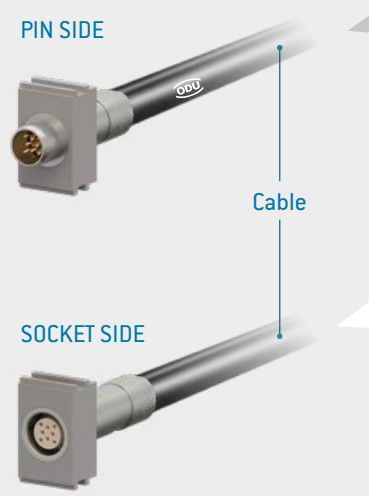
SOCKET SIDE

Cable

Type & configuration	Data transmission protocols
RJ 45	Ethernet (cable length 0.2 – 100.0 m)
Connector A	USB® 3.2 Gen 1x1 ¹ (cable length 0.2 – 1.8 m)
Micro-connector B	
Receptacle A	

Category ²	No. of contacts (insert)
Ethernet	8
USB® 3.2 Gen 1x1 ¹	10

SIZE 2 / FEEDTHROUGH / HIGH-SPEED CONNECTOR



PIN SIDE

SOCKET SIDE

Cable

Type & configuration	Data transmission protocols
RJ 45	Ethernet (cable length 0.2 – 100.0 m)
Connector A	HDMI® ¹ 2.0 or 2.1 (cable length 0.2 – 3.0 m)
Receptacle A	
Connector C	USB® 3.2 Gen 1x2 ¹ (cable length 0.2 – 1.8 m)

Category ²	No. of contacts (insert)
Ethernet	4 or 8
HDMI® ¹	16 or 22
USB® 3.2 Gen 1x2 ¹	22
DisplayPort® 2.0 ¹	22

¹For data transmission protocols please see page | ²Classification acc. to ISO/IEC 11801(1-6):2017-11

MODULE FOR MULTI-POSITION, SHIELDED FEEDTHROUGH / HIGH-SPEED CONNECTOR

Size 0 [e.g. insert in bus systems], 2 feedthroughs



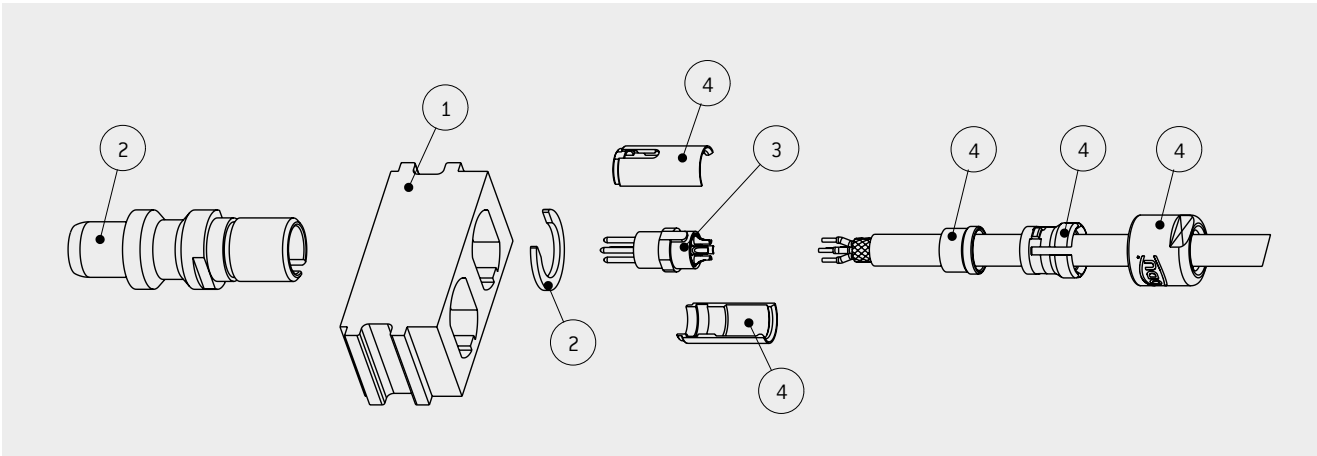
Mating cycles: $\geq 10,000$
SPE [1 Gbit/s], Ethernet [100 Mbit/s],
USB® 3.2 Gen 1x1 [5 Gbit/s]

[Product Finder](#)

TECHNICAL NOTES

- The inserts listed here for shielded feedthrough / high-speed connectors are optimally suitable for all common bus systems with transfer rates up to 10 MHz. For example, Profibus®¹, USB® 1.1, RS485, FlexRay®¹, CAN-Bus and RS232
- Selected inserts are suitable and qualified for data rates up to 5 Gbit/s. For example, SPE [1 Gbit/s], Ethernet [100 Mbit/s], USB® 3.2 Gen 1x1 [5 Gbit/s], FireWire® S400 [on request], IEEE 1394

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



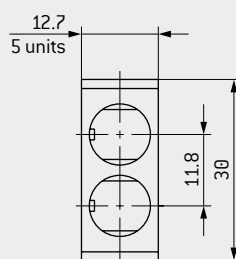
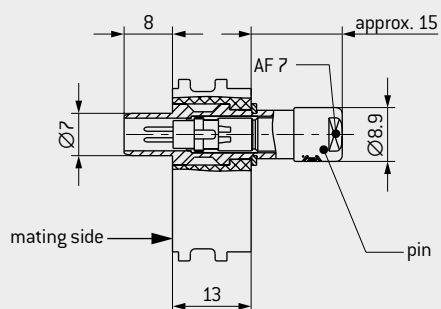
ASSEMBLY SET

Order	Base parts	Part number
1	Insulator	611.148.102.923.000
2	Socket housing complete	653.001.001.304.000
2	Connector housing complete	653.001.002.304.000
	Dummy contact	021.341.182.300.000
3	Insert complete solder cup contacts ¹	See next page
4	Assembly set	See table on the right

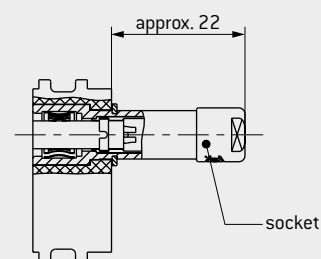
Cable Ø mm	Part number
1.5 to 2	653.001.001.304.020
2 to 2.5	653.001.001.304.025
2.5 to 3	653.001.001.304.030
3 to 3.5	653.001.001.304.035
3.5 to 4	653.001.001.304.040
4 to 4.5	653.001.001.304.045
4.5 to 5	653.001.001.304.050
5 to 6.1	653.001.001.304.061

¹ Available with crimp contact on request | ² It's possible that the cable collet cannot cover the cable completely

INSULATOR PIN



INSULATOR SOCKET



In application with a housing please check the cable space requirement.

CONTACT ARRANGEMENT: VIEW ON PIN INSULATOR



2 contacts
SPE (1 Gbit/s)



3 contacts



4 contacts
CAT5 (100 Mbit/s),
USB® 2.0 (480 Mbit/s)



5 contacts



6 contacts



7 contacts



9 contacts



10 contacts
USB® 3.2 Gen 1x1
(5 Gbit/s)

Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage ¹ V	Rated impulse voltage ¹ kV	Degree of pollution ¹	Nominal voltage ² V AC	Model	Category ³	Insert complete ⁴ Part number	Total mating force N	Total sliding force N
INSERT WITH ODU TURNTAC® (MATING CYCLES ≥ 10,000)											
2	0.9	22	32	2	2	500	Pin	—	700.849.724.002.200	6.2	5.2
							Socket	—	700.749.724.002.200		
	0.7	22	32	1.5	2	300	Pin	SPE 1000	700.848.724.002.000	5.7	4.8
							Socket	BASE-T ¹	700.748.724.002.000		
3	0.9	22	32	1.5	2	400	Pin	—	700.849.724.003.200	7.1	5.9
							Socket	—	700.749.724.003.200		
4	0.7	26	32	1.5	2	300	Pin	CAT 5	700.848.724.004.200	6.8	5.7
							Socket	100 Mbit/s	700.748.724.004.200		
4	0.7	22	32	1.5	2	300	Pin	USB® 2.0	700.848.724.404.221	6.8	5.7
							Socket	(480 Mbit/s)	700.748.724.404.200		
5	0.7	26	25	1.5	2	366	Pin	—	700.848.724.005.200	7.4	6.2
							Socket	—	700.748.724.005.200		
6	0.5	28	32	1.5	2	300	Pin	—	700.841.724.006.200	7.9	6.6
							Socket	—	700.741.724.006.200		
7	0.5	28	32	1.5	2	300	Pin	—	700.841.724.007.200	8.4	7
							Socket	—	700.741.724.007.200		
9	0.5	28	10	1.2	2	200	Pin	—	700.841.724.009.200	9.5	7.9
							Socket	—	700.741.724.009.200		
10	0.5	28	7.5	1.2	2	200	Pin	—	700.841.724.010.221	10.1	8.4
							Socket	—	700.741.724.010.221		
10	6 × 0.3 4 × 0.5	28 24	7.5	1.2	2	100	Pin	USB® 3.2	700.831.724.410.000	10.1	8.4
							Socket	Gen 1x1 (5 Gbit/s)	700.731.724.410.000		

¹ Acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07), see page 199 | ² Acc. to EIA-364-20F:2019 | ³ Classification acc. to ISO / IEC 11801:2017-1

⁴ Inserts with crimp contacts available on request

MODULE FOR MULTI-POSITION, SHIELDED FEEDTHROUGH / HIGH-SPEED CONNECTOR

Size 1 [e.g. insert in bus systems], 2 feedthroughs



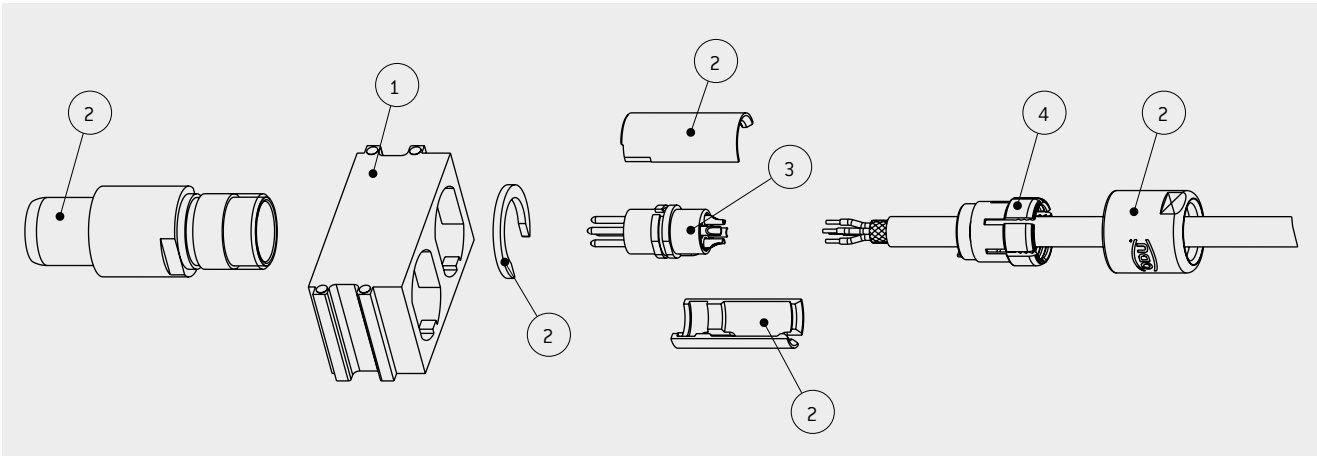
Mating cycles: $\geq 10,000 / 60,000$
USB[®] 2.0 (480 Mbit/s),
Ethernet (100 Mbit/s)
2 to 14 contacts

[Product Finder](#)

TECHNICAL NOTES

- The inserts listed here for shielded feedthroughs / high-speed connectors are optimally suitable for all common bus systems with transfer rates up to 10 MHz. For example, Profibus[®], RS485, FlexRay[®], CAN-Bus and RS232.
- Selected inserts are suitable and qualified for data rates up to 5 Gbit/s. For example, SPE (1 Gbit/s), CAT 5 (100 Mbit/s), USB[®] 3.2 Gen 1x1 (5 Gbit/s), IEEE 1394, FireWire[®] S400 (on request)

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



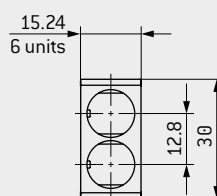
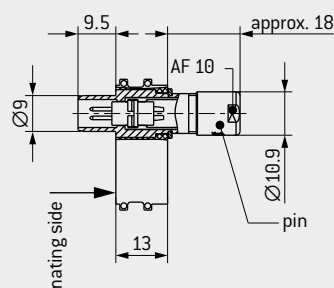
Order	Base parts	Part number
1	Insulator	611.167.102.923.000
2	Socket housing complete	653.002.001.304.000
2	Connector housing complete	653.002.002.304.000
	Dummy contact	021.341.186.300.000
3	Insert complete solder cup contacts ¹	See next page
4	Assembly set	See table on the right

ASSEMBLY SET

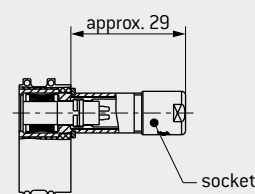
Cable Ø mm	Part number
1.5 to 2.1	751.020.188.304.022
2 to 3.2	751.020.188.304.032
3 to 4.2	751.020.188.304.042
4 to 5.2	751.020.188.304.052
5 to 6.2	751.020.188.304.062
6 to 7.2	751.020.188.304.072
7 to 7.7	751.020.188.304.077

¹ Available with crimp contact on request | ² It's possible that the cable collet cannot cover the cable completely

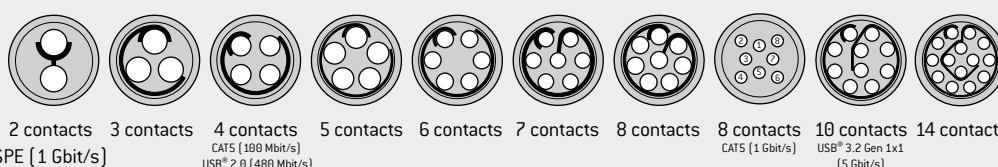
INSULATOR PIN



INSULATOR SOCKET



In application with a housing please check the cable space requirement.

CONTACT ARRANGEMENT:
VIEW ON PIN INSULATOR

Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage ¹ V	Rated impulse voltage ¹ kV	Degree of pollution ¹	Nominal voltage ² V AC	Model	Category ³	Insert complete ⁴ Part number	Total mating force N	Total sliding force N
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INSERT WITH ODU TURNTAC® (MATING CYCLES ≥ 10,000)

2	1.3	20	32	2	2	550	Pin	—	701.844.724.002.200	8.6	7.1
	0.7	22	32	1.5	2	300	Socket	—	701.744.724.002.200		
3	1.3	20	32	1.5	2	500	Pin	SPE 1000	701.848.724.002.D00	6.1	5.1
	0.7	22	32	1.5	2	300	Socket	BASE-T ¹	701.748.724.002.D00		
4	0.9	22	40	2	2	500	Pin	—	701.844.724.003.200	10.4	8.7
	0.9	22	40	2	2	500	Socket	—	701.744.724.003.200		
4	0.9	22	40	2	2	500	Pin	CAT5 (100 Mbit/s)	701.849.724.004.200	8.3	6.9
	0.9	22	40	2	2	500	Socket	—	701.749.724.004.200		
4	0.9	22	40	2	2	500	Pin	USB® 2.0 (480 Mbit/s)	701.849.724.004.D00	8.3	6.9
	0.9	22	40	2	2	500	Socket	—	701.749.724.004.D00		
5	0.9	22	32	1.5	2	450	Pin	—	701.849.724.005.200	9.1	7.6
	0.9	22	32	1.5	2	450	Socket	—	701.749.724.005.200		
6	0.7	22	32	1.5	2	400	Pin	—	701.848.724.406.200	8.3	7
	0.7	22	32	1.5	2	400	Socket	—	701.748.724.406.200		
7	0.7	22	32	1.5	2	400	Pin	—	701.848.724.407.200	8.9	7.4
	0.7	22	32	1.5	2	400	Socket	—	701.748.724.407.200		
8	0.7	22	32	1.5	2	333	Pin	—	701.848.724.408.200	9.5	7.9
	0.7	22	32	1.5	2	333	Socket	—	701.748.724.408.200		
8	0.5	26	32	1.5	2	333	Pin	CAT5 (1 Gbit/s)	701.841.724.408.D00	9.3	7.8
	0.5	26	32	1.5	2	333	Socket	—	701.741.724.408.D00		
10	0.5	28	25	1.5	2	333	Pin	—	701.841.724.010.400	10.4	8.7
	0.5	28	25	1.5	2	333	Socket	—	701.741.724.010.200		
10	6 × 0.3	28	7.5	1.2	2	100	Pin	USB® 3.2 Gen1x1 (5 Gbit/s)	701.831.724.410.D00	12.6	10.5
	4 × 0.5	24	7.5	1.2	2	100	Socket	—	701.731.724.410.D00		
14	0.5	28	25	1.5	2	300	Pin	—	701.841.724.014.400	15.7	13.1
	0.5	28	25	1.5	2	300	Socket	—	701.741.724.014.200		

INSERT WITH ODU SPRINGTAC® (MATING CYCLES ≥ 60,000)

4	0.76	22	63	2	2	450	Pin	CAT5 (100 Mbit/s)	701.842.724.004.700	9.6	8
	0.76	22	63	2	2	450	Socket	—	701.742.724.004.700		
5	0.76	22	63	1.5	2	400	Pin	—	701.842.724.005.700	10.8	9
	0.76	22	63	1.5	2	400	Socket	—	701.742.724.005.700		

¹ Acc. to IEC 60664-1:2020 [VDE 0110-1:2022-07], see page 199 | ² Acc. to EIA-364-20F:2019 | ³ Classification acc. to ISO / IEC 11801:2017-1

⁴ Inserts with crimp contacts available on request

MODULE FOR MULTI-POSITION, SHIELDED FEEDTHROUGH / HIGH-SPEED CONNECTOR

Size 2 [e.g. insert in bus systems], 1 feedthrough



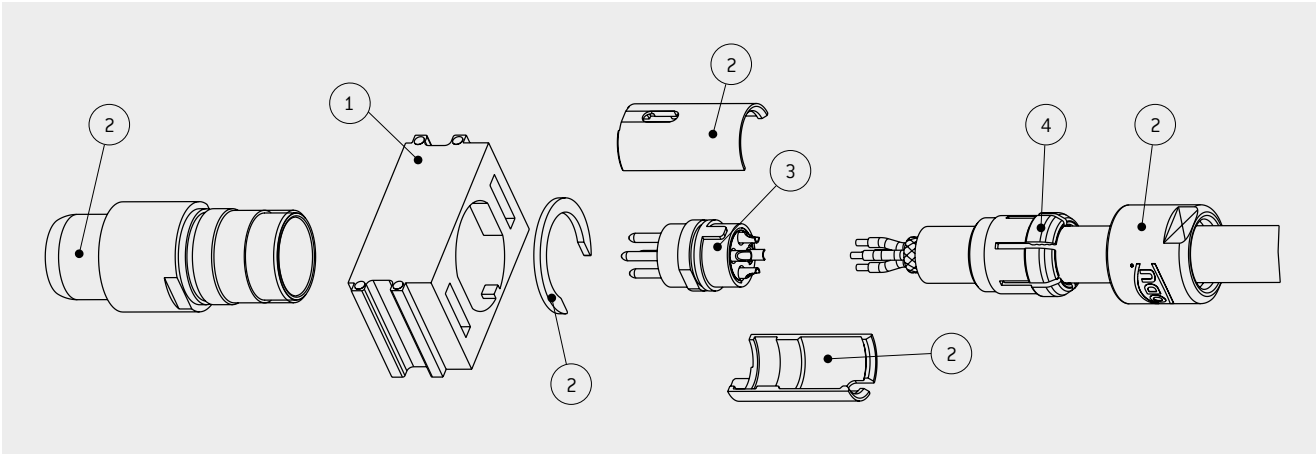
Mating cycles: $\geq 10,000 / 60,000$
Ethernet up to 10 Gbit/s
USB® up to 10 Gbit/s
DisplayPort® up to 40 Gbit/s,
HDMI® up to 48 Gbit/s
4 to 16 contacts

[Product Finder](#)

TECHNICAL NOTES

- The inserts listed here for shielded feedthroughs / high-speed connectors are optimally suitable for all common bus systems with transfer rates up to 10 MHz. For example, Profibus®, RS485, FlexRay®, CAN-Bus and RS232.
- Selected inserts are suitable and qualified for data rates up to 48 Gbit/s. For example, Ethernet (10 Gbit/s), USB® (10 Gbit/s), HDMI® 2.0 (18 Gbit/s), DisplayPort® (40 Gbit/s), HDMI® (48 Gbit/s), IEEE1394

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



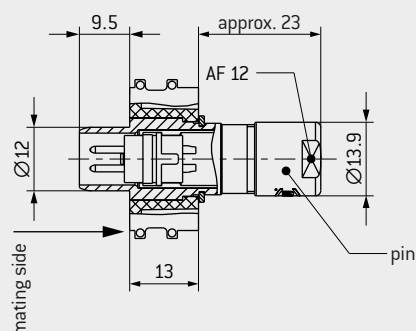
ASSEMBLY SET

Order	Base parts	Part number
1	Insulator	611.170.101.923.000
2	Socket housing complete	653.003.001.304.000
2	Connector housing complete	653.003.002.304.000
3	Insert complete solder cup contacts ¹	See next page
4	Assembly set	See table on the right

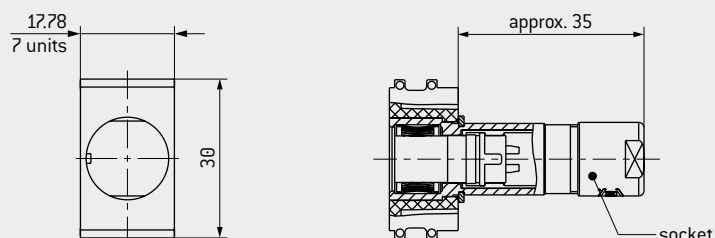
Cable Ø mm	Part number
2 to 3.2	752.020.188.304.032
3 to 4.2	752.020.188.304.042
4 to 5.2	752.020.188.304.052
5 to 6.2	752.020.188.304.062
6 to 7.2	752.020.188.304.072
7 to 8.2	752.020.188.304.082
8 to 9.2	752.020.188.304.092
9 to 9.9	752.020.188.304.099

¹ Available with crimp contact on request

INSULATOR PIN



INSULATOR SOCKET

CONTACT
ARRANGEMENT:
VIEW ON PIN
INSULATOR

Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage ¹ V	Rated impulse voltage ¹	Degree of pollution ¹	Nominal voltage ² V AC	Model	Category ³	Insert complete ⁴ Part number	Total mating force N	Total sliding force N
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INSERT WITH ODU TURNTAC[®] (MATING CYCLES ≥ 10,000)

3	1.6	18	125	2.5	2	800	Pin Socket	—	702.851.724.003.200 702.751.724.003.200	13.9	11.6
4	1.3	20	160	2.5	2	650	Pin Socket	CAT5 (100 Mbit/s)	702.844.724.004.200 702.744.724.004.200	13.1	10.9
6	1.3	20	80	2	2	600	Pin Socket	—	702.844.724.006.200 702.744.724.006.200	16.2	13.5
		18	32	1.5		366	Pin Socket	—	702.844.724.406.200 702.744.724.406.200		
7	1.3	20	80	2	2	600	Pin Socket	—	702.844.724.007.200 702.744.724.007.200	17.8	14.8
		18	32	1.5	2	366	Pin Socket	—	702.844.724.407.200 702.744.724.407.200		
8	0.9	22	40	2	2	500	Pin Socket	CAT6 _A (10 Gbit/s)	702.849.724.008.D00 702.749.724.008.D00	16.2	13.5
12	0.7	26	32	2	2	450	Pin Socket	—	702.848.724.012.200 702.748.724.012.200	16.1	13.4
14	0.7	26	32	1.5	2	400	Pin Socket	—	702.848.724.014.200 702.748.724.014.200	17.6	14.7
16	0.5	26	32	1.5	2	250	Pin Socket	HDMI 2.0 [®] (18 Gbit/s)	702.841.724.416.D00 702.741.724.416.D00	19.1	15.9
19	0.7	26	32	1.5	2	333	Pin Socket	—	702.848.724.019.200 702.748.724.019.200	21.4	17.9
22	0.5	22 / 28	6.3	1.2	2	200	Pin Socket	USB [®] (10 Gbit/s) DisplayPort [®] (40 Gbit/s) HDMI [®] (48 Gbit/s)	702.841.724.022.D00 702.741.724.022.D00	23.7	19.8

INSERT WITH ODU SPRINGTAC[®] (MATING CYCLES ≥ 60,000)

8	0.76	22	16 40	2	2	550	Pin Socket	CAT5 (100 Mbit/s)	702.842.724.008.D00 702.742.724.008.D00	23.5	19.6
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¹ Acc. to IEC 60664-1:2020 [VDE 0110-1:2022-07], see page 199 | ² Acc. to EIA-364-20F:2019 | ³ Classification acc. to ISO / IEC 11801:2017-1⁴ Inserts in crimp contacts available on request

MODULE FOR MULTI-POSITION, SHIELDED FEEDTHROUGH / HIGH-SPEED CONNECTOR

Size 3 [e.g. for use in bus systems], 1 feedthrough

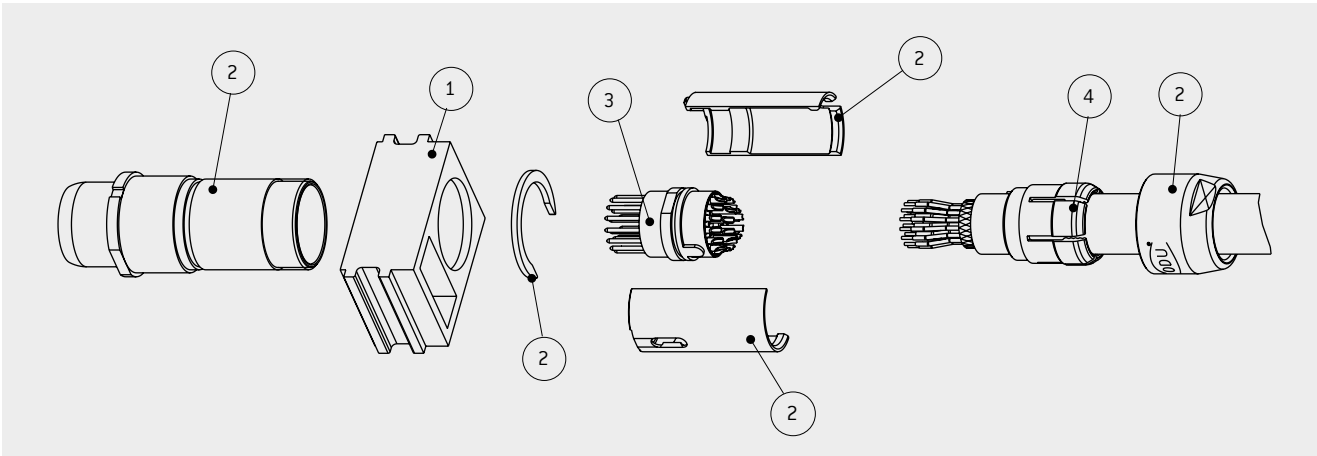


Mating cycles: $\geq 10,000$
10 to 30 contacts

[Product Finder](#)

- TECHNICAL NOTES**
- The inserts listed here for shielded feedthroughs / high-speed connectors are optimally suitable for all common bus systems with transfer rates to 10 MHz. For example, Profibus®, RS485, FlexRay®, CAN-Bus and RS232.
 - Selected inserts can be qualified for data rates on request

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



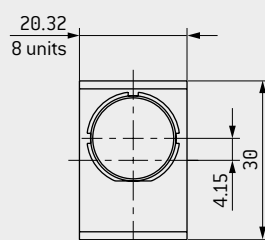
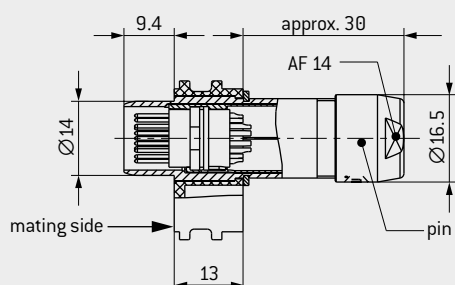
ASSEMBLY SET

Order	Base parts	Part number
1	Insulator	611.171.101.923.000
2	Socket housing complete	653.004.001.304.000
2	Connector housing complete	653.004.002.304.000
3	Insert complete solder cup contacts ¹	See next page
4	Assembly set	See table on the right

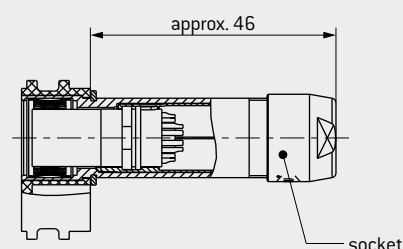
Cable Ø mm	Part number
3 to 4.2	753.020.188.304.042
4 to 5.2	753.020.188.304.052
5 to 6.2	753.020.188.304.062
6 to 7.2	753.020.188.304.072
7 to 8.2	753.020.188.304.082
8 to 9.2	753.020.188.304.092
9 to 10.2	753.020.188.304.102

¹ Available with crimp contact on request

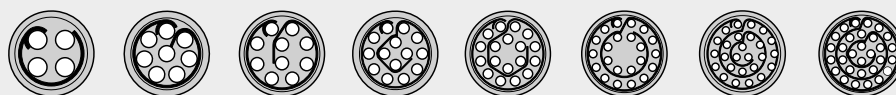
INSULATOR PIN



INSULATOR SOCKET



In application with a housing please check the cable space requirement.

CONTACT ARRANGEMENT:
VIEW ON PIN INSULATOR

4 contacts 8 contacts 10 contacts 14 contacts 18 contacts 22 contacts 26 contacts 30 contacts

Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage ¹ V	Rated impulse voltage ¹ kV	Degree of pollution ¹	Nominal voltage ² V AC	Model	Category ³	Insert complete ⁴ Part number	Total mating force N	Total sliding force N
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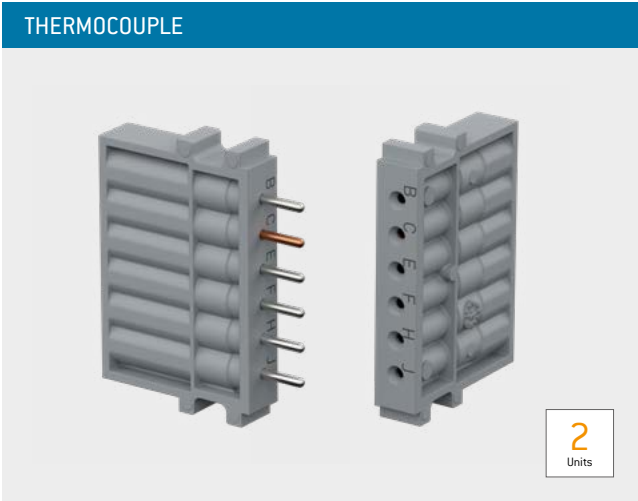
INSERT WITH ODU TURNTAC® (MATING CYCLES ≥ 10,000)

4	2	14	100	2	2	550	Pin		703.802.724.004.200	18.5	15.4
							Socket		703.702.724.004.200		
8	1.3	18	40	2	2	450	Pin		703.844.724.408.200	20.5	17.1
							Socket		703.744.724.408.200		
10	1.3	20	32	1.5	2	450	Pin		703.844.724.010.200	23.6	19.7
							Socket		703.744.724.010.200		
14	0.9	22	40	2	2	450	Pin		703.849.724.014.200	24.3	20.3
							Socket		703.749.724.014.200		
18	0.9	22	32	1.5	2	450	Pin		703.849.724.018.200	29.0	24.2
							Socket		703.749.724.018.200		
22	0.7	22	32	1.5	2	333	Pin		703.848.724.422.200	24.9	20.8
							Socket		703.748.724.422.200		
26	0.7	22	25	1.5	2	300	Pin		703.848.724.426.200	28	23.3
							Socket		703.748.724.426.200		
		26	32			333	Pin		703.848.724.026.200		
							Socket		703.748.724.026.200		
30	0.7	22	10	1.2	2	300	Pin		703.848.724.430.200	31.1	25.9
							Socket		703.748.724.430.200		

¹ Acc. to IEC 60664-1:2020 (VDE 0110-1:2022-07), see page [199](#) | ² Acc. to EIA-364-20F:2019 | ³ Classification acc. to ISO / IEC 11801:2017-1

⁴ Inserts with crimp contacts available on request

MODULE 6 CONTACTS / 3 THERMOCOUPLES



Removal of the already assembled contact (incl. cable)
Part number: 087.170.999.000.000



Removal of the still unassembled contact
(without cable, which may have to be cut off)
Part number: 087.611.001.003.000

For an overview of all tools please see from page 191.

Contact diameter: 1.00 mm
Mating cycles: $\geq 5,000$
Thermocouple: Type K, Type T (Standard)

Product Finder

TECHNICAL NOTES

- Available as cable assembly
- Further thermocouple types on request
- Crimp information see page 182

TECHNICAL DATA

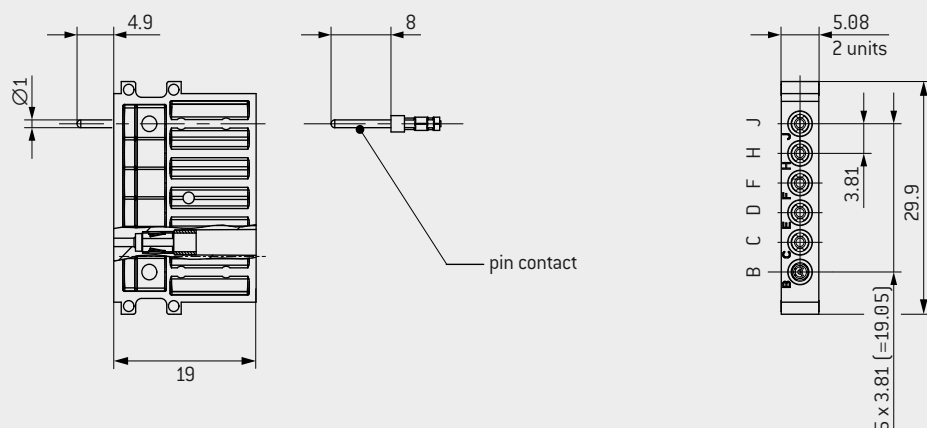
Mechanical data	
Total mating force (average)	8.4 N / Module
Total sliding force (average)	6.0 N / Module
Contact diameter	1.00 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	$\geq 5,000$

Materials

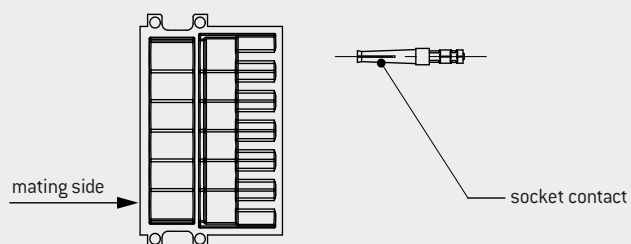
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94
CTI value ¹	600

¹ Acc. to IEC 60112:2025

INSULATOR PIN



INSULATOR SOCKET



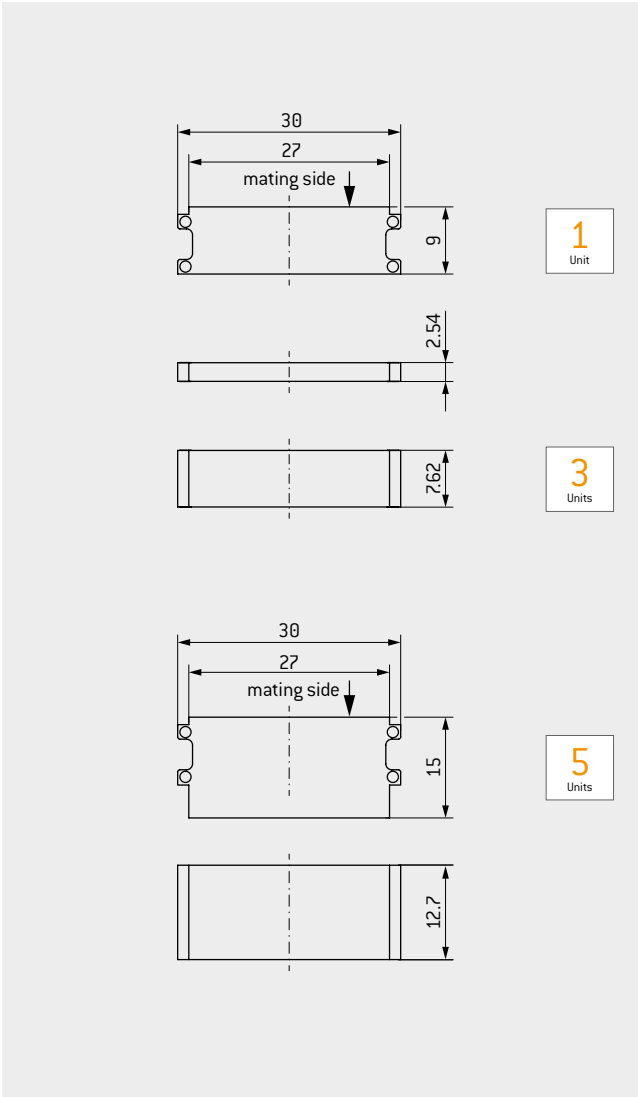
* $\leq \varnothing 1.15$ removal possible / $\leq \varnothing 1.75$ removal not possible

Module 6 contacts	Part number
Insulator pin	611.182.106.923.000
Insulator socket	610.182.106.923.000

Description	Type ¹	Part number	Conductor cross-section ² mm ²	Termination AWG	Color code		
					Contact	ANSI	IEC ³
Pin contact Ni-Cr (+)	K Temperature range -200 °C to 1,250 °C	186.050.000.905.000	0.22 – 0.50	20 – 24	Green	Yellow	Green
Pin contact Ni (-)		186.051.000.905.000			White	Red	White
Socket contact Ni-Cr (+)		176.050.000.905.000			Green	Yellow	Green
Pin contact short Ni (-)		176.051.000.905.000			White	Red	White
Pin contact Cu (+)	T Temperature range -250 °C to 350 °C	186.052.000.905.000	0.22 – 0.50	20 – 24	Red	Blue	Brown
Pin contact Cu-Ni (-)		186.053.000.905.000			Yellow	Red	White
Socket contact Cu (+)		176.052.000.905.000			Red	Blue	Brown
Pin contact short Cu-Ni (-)		176.053.000.905.000			Yellow	Red	White

¹ Thermocouples are characterized by combination of different metals | ² Turned contacts with bigger termination cross-section on request | ³ acc. to: IEC 60584-1:2013

BLANK MODULES



Used to fill gaps in incomplete frames:

The frame has to be fully mounted with insulators, spacers or blank modules.

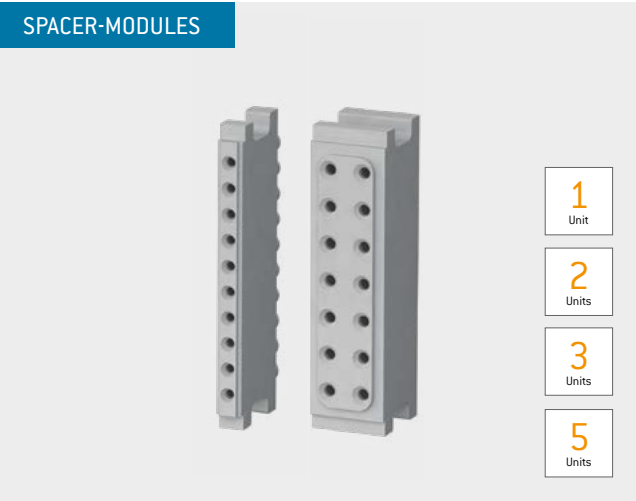
Blank and pin protection modules can also be used to increase the maximum allowed voltage by increasing the clearance and creepage distance.

Product Finder

TECHNICAL DATA	
Materials	
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94

Units	Part number
1	611.122.113.923.000
3	611.130.113.923.000
5	611.128.113.923.000

SPACER MODULES



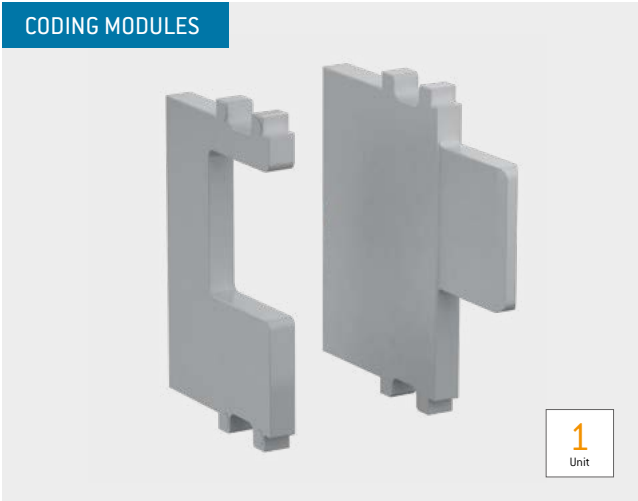
Cannot be retroactively equipped with contacts.
Information on the availability of the individual spacer modules can be found on the respective module sides.

Supplied without contact arrangements and enable blind mating despite differing contact arrangements.
This is the case, for example, with test lanes with various testing scenarios. This means that various tasks can be carried out with one contact arrangement.

[Product Finder](#)

TECHNICAL DATA	
Materials	
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94

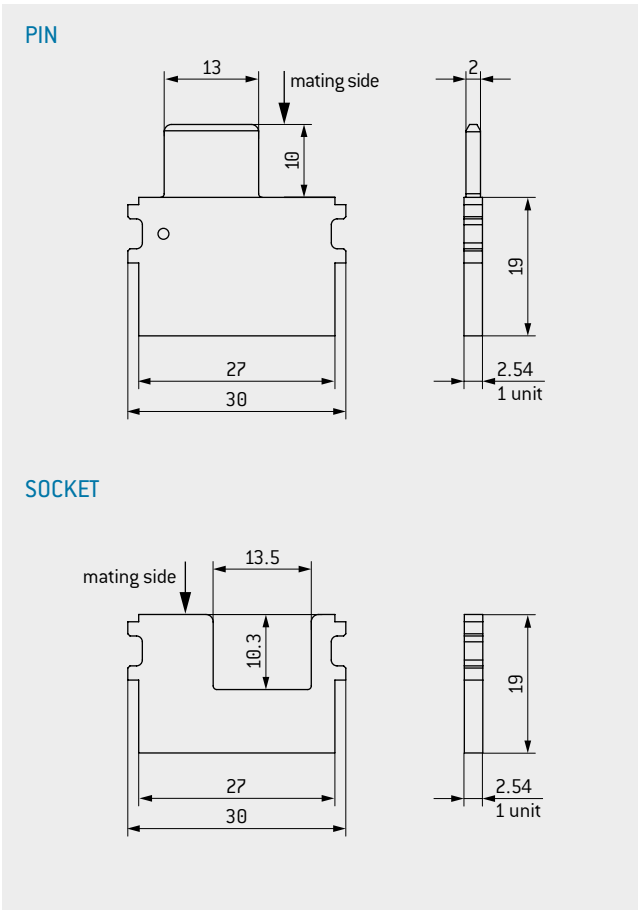
CODING MODULES



Coding modules are placed between the modules to enable coding in addition to the guiding system.

[Product Finder](#)

TECHNICAL DATA	
Materials	
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94



Description	Part number
Coding module (pin)	611.161.101.923.000
Coding module (socket)	610.161.101.923.000

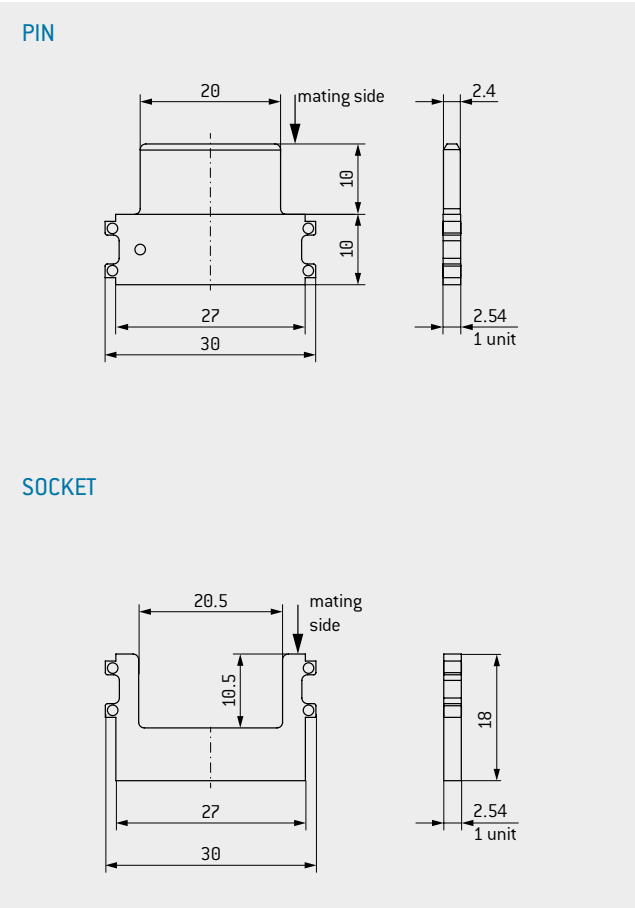
PIN PROTECTION MODULES



For connections with small pin diameters, these modules serve as protection for the pins. Especially in the case of small contact diameters ($\varnothing$ 0.76 / 1.02 mm), pin protection modules provide additional protection against unintentional bending of the pins. Pin protection and blank modules can also be used to increase the maximum allowed voltage by increasing the clearance and creepage distance.

[Product Finder](#)

TECHNICAL DATA	
Materials	
Insulator	Thermoplastic fiberglass reinforced acc. to UL 94



Description	Part number
Pin protection module (pin)	611.122.115.923.000
Pin protection module (socket)	610.122.115.923.000



ODU DOCK



PRODUCT INFORMATION ODU DOCK

For automatic docking and robot systems	132
Main fields of application	134
Best connections – the contact principle	136
Housing versions for ODU DOCK	138
Inserts with Quick Change Head (QCH)	139
Your way to an individual connection	140
ODU DOCK product overview	142

ODU DOCK **Silver-Line**

FOR AUTOMATIC DOCKING AND ROBOT SYSTEMS

Connectors for docking and robot systems have restricted guidance and can be inserted automatically. The force can be applied manually, electrically or pneumatically. Connectors for docking and robot systems have a simple design and a huge variety of contact inserts. ODU DOCK comes with high mating cycle capabilities.

From simple standard connectors for docking and robot systems to the complex docking unit (z. B. IP65 and EMC protection) – ODU is able to provide practically any solution you could imagine.



FEATURES

- Easy assembly from the rear
- Simple handling and usability
- Straight and angled cable outlet
- Robust aluminum or plastic housing available in three sizes
- 2+PE to 36+PE inserts for transmission of signal, power, current, data and media
- High density with small contact diameter
- Standard contacts with crimp termination; solder cup termination on request
- Proven ODU SPRINGTAC® contacts: $\geq 100,000$ mating cycles
- ODU DOCK Quick Change Head meets the requirement for up to 10 million mating cycles



ODU DOCK AT A GLANCE:

3

Available docking plate thicknesses:
10 mm, 14 mm, 20 mm

2

Contact surfaces

32

Modules to choose from:
Signal, power, high-current, high-voltage,
RF-signal (coax), media such as air or
fluid, high-speed data transmission or
fiber optic (see from page [106](#))

2

Housing versions: Plastic or
aluminum nickel-plated

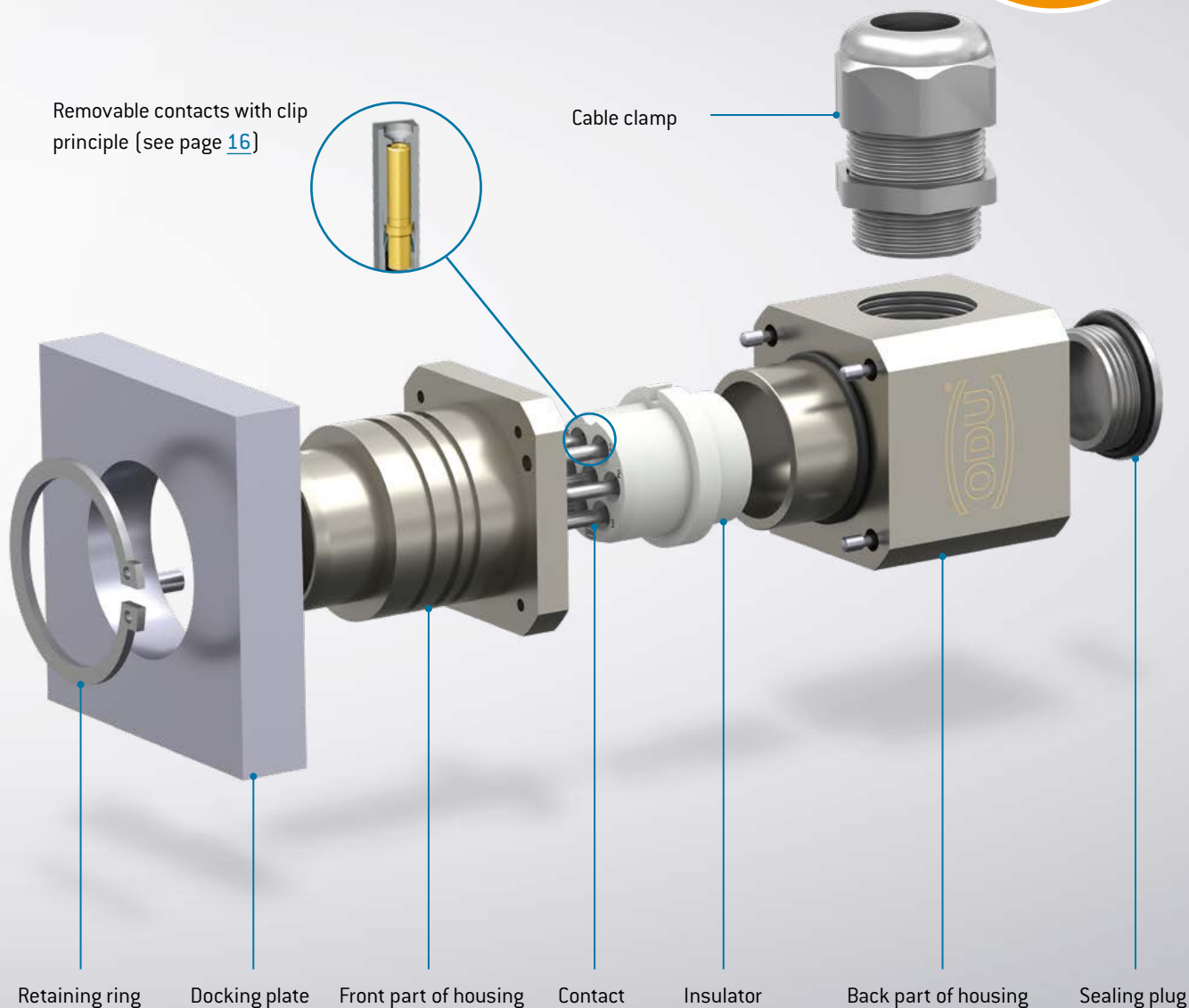
15

Versions with different
numbers of poles for signal,
power, and hybrid transmission

100,000
MATING CYCLES
AND MORE

Removable contacts with clip
principle (see page [16](#))

Cable clamp



Retaining ring

Docking plate

Front part of housing

Contact

Insulator

Back part of housing

Sealing plug

ODU DOCK **Silver-Line** FOR AUTOMATIC DOCKING AND ROBOT SYSTEMS

MAIN FIELDS OF APPLICATION

Whether industrial robots, test systems, switchgear, or tool change systems – all these applications rely on dependable automatic docking and call for an extremely robust connection system with a high level of contact safety. The ODU DOCK Silver-Line has been designed for all these interfaces. ODU SPRINGTAC® technology guarantees vastly more than 100,000 mating cycles at a constant contact resistance and contact quality. The robust housing design meets the requirements of a harsh industrial environment.

ODU-MAC® modules open up a world of transmission possibilities, from signals and power to HF signals (coax), media such as air and fluids, data, and light waves.



ODU DOCK FOR INDUSTRIAL APPLICATIONS

THE ODU DOCK SILVER-LINE IS USED FOR THE FOLLOWING APPLICATIONS:

- Tool change systems
- Test equipment
- Industrial robot systems
- Automation systems in production lines



ODU DOCK FOR MILLING AND GRINDING MACHINES
(Source: Waldrich Siegen Werkzeugmaschinen GmbH)



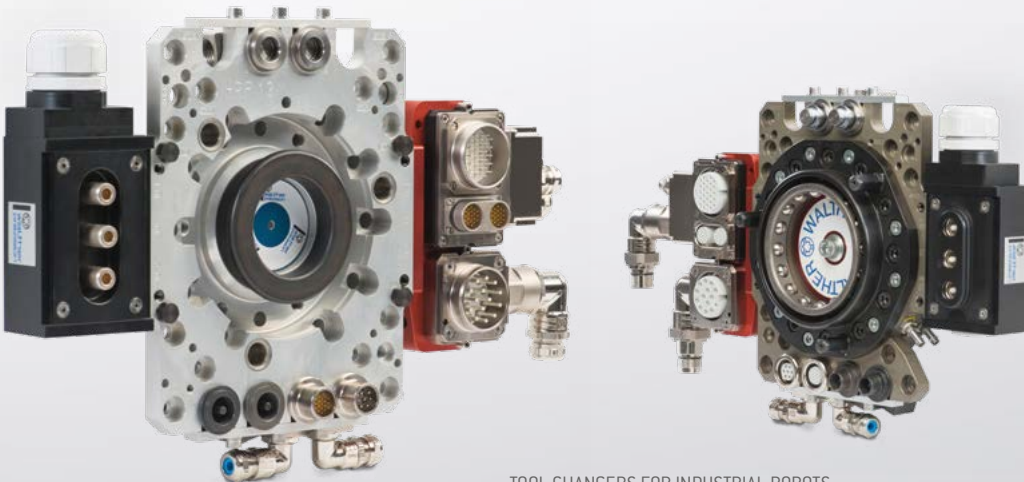
ODU DOCK FOR WELDING HEADS

IN USE

Today's industrial manufacturing and production processes would be unthinkable without docking and robot systems. Industrial robots, tool change and depot systems, cable connections and test equipment are just a few examples of the applications for these systems. ODU docking systems are built into combined quick coupling systems (electrical / pneumatic) where they enable the greatest possible flexibility.



TOOL CHANGERS FOR INDUSTRIAL ROBOTS



TOOL CHANGERS FOR INDUSTRIAL ROBOTS

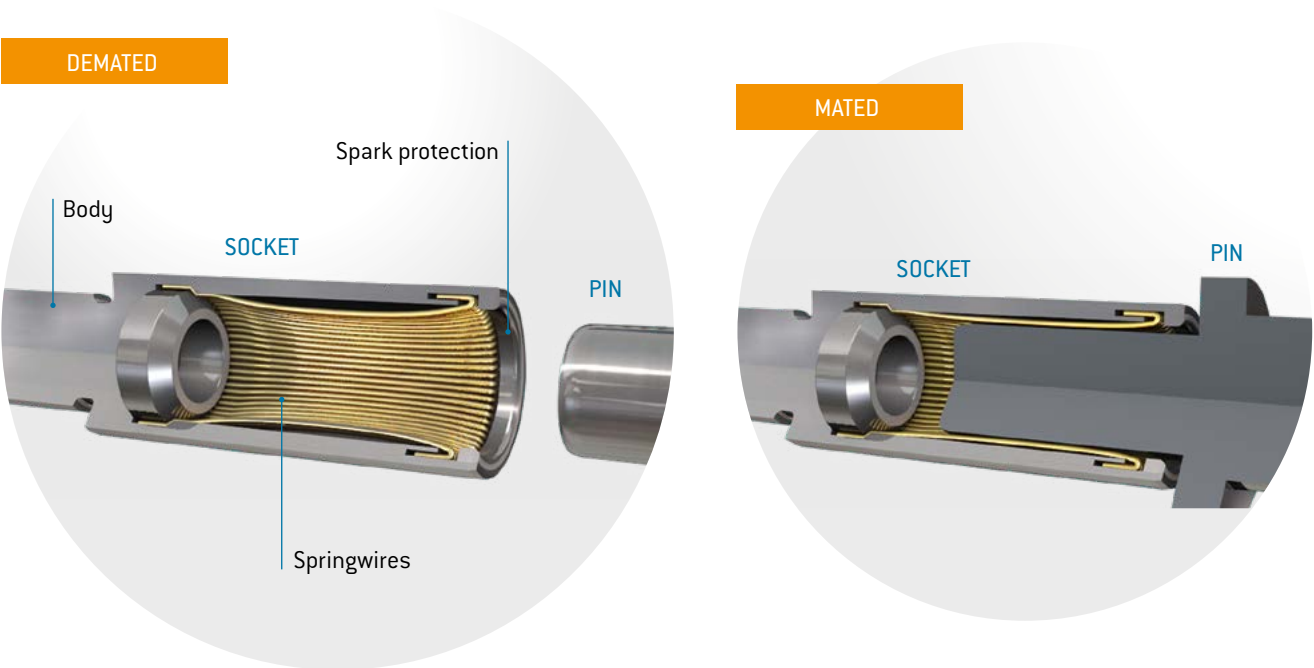
BEST CONNECTIONS – THE CONTACT PRINCIPLE

ODU contacts fulfill the highest quality standards and enable secure and reliable connections. ODU has the highest performance contact technologies at its disposal. Principally, a differentiation of machined contacts is made between lamella, springwire and slotted contacts. The socket side differs in architecture, but the pins are always the same and always solid.

ODU SPRINGTAC®

Contacts with springwire technology

The ODU SPRINGTAC® is the most effective contact system on the market. Constant transfer is always guaranteed thanks to the large number of individual, independently flexible springwires. Even with the smallest contact diameter of 0.76 mm, 15 individual springs are still installed, meaning that even this small diameter provides 15 contact surfaces for current transfer.



ADVANTAGES

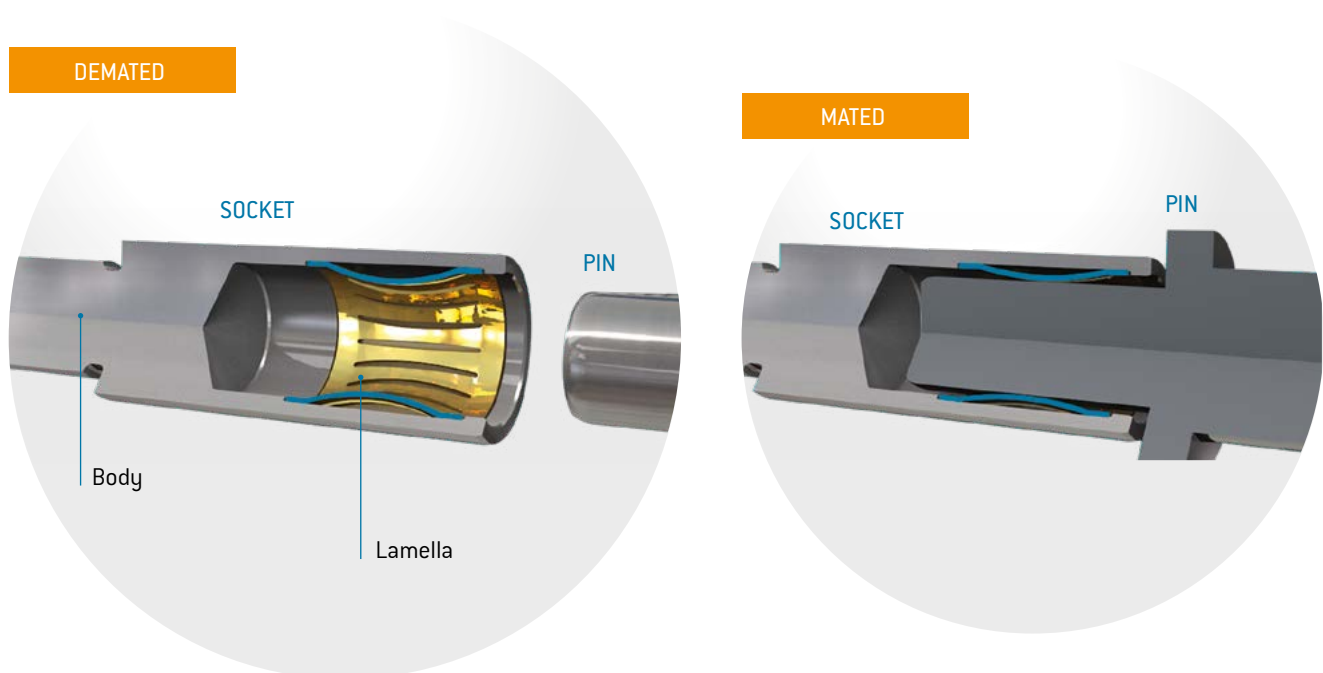
- ≥ 100,000 mating cycles
(up to 1 million mating cycles can be achieved)
- High current-carrying capacity – surge current capacity
- Low contact resistances
- Large number of independently flexible contact springs,
e.g. 40 springs with a diameter of 5 mm
- Low mating and demating forces
- Extremely secure connection
- High vibration and shock resistance
- Individual contacts on request

Standard contact principle for:	
Signal	36+PE to 6+PE
Power	2+PE to 36+PE
High-Current	2+PE to 6+PE
Hybrid	2+PE+9 and 3+PE+4
High-Voltage	4 contacts
RF-signal (coax)	2 contacts

ODU LAMTAC®

Contacts with lamella technology

The ODU LAMTAC® contact consists of a machined body in which one or more stamped lamella strips are mounted. The individual bars of the lamella provide numerous contact points which guarantee high contact reliability and optimum conductive properties. The adapted contact force ensures low mating and demating forces, and a long service life with low wear. The mating cycles here are $\geq 10,000$.



ADVANTAGES

- $\geq 10,000$ mating cycles
- High current-carrying capacity – surge current capacity
- Low contact resistances
- Low mating and demating forces
- High vibration and shock resistance
- Economical alternative to springwire contacts
- Individual contacts on request

Standard contact principle for:

ODU DOCK Quick Change Head base parts ¹

¹ Quick Change Head base parts for size 1, 18+PE feature ODU TURNTAC® contacts

HOUSING VERSIONS FOR ODU DOCK

Robust housing available in two materials and three sizes

You can choose from two housing versions: a nickel-plated aluminum housing and a plastic housing. The housing can also offer IP65 and EMC protection as optional extras. The robust design meets all the requirements of industrial applications. The socket and pin housings each consist of two parts (front part and back part), which are screwed together. The inserts are located in the front part, while the rear housing protects the termination side and is home to strain relief devices such as cable clamps.

Cable clamps are available in plastic or metal to enable strain relief or EMC protection. All housings are suitable for three plate thicknesses and come with the required assembly material in the scope of delivery.

PLASTIC HOUSING

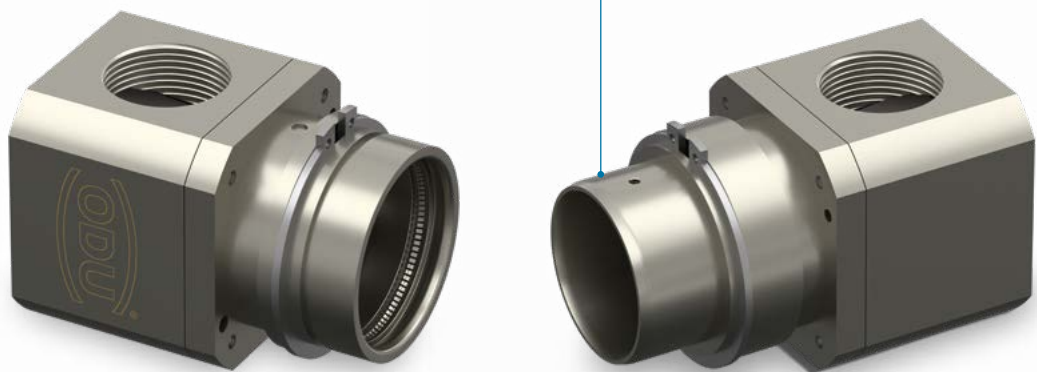
Material: POM, Black



ALUMINUM HOUSING, NICKEL-PLATED

Material: aluminum, nickel-plated

Available with or without EMC protection



INSERTS WITH QUICK CHANGE HEAD (QCH)

For maximized mating cycle capabilities (connector saver), minimized maintenance downtime and expense.



The ODU Springtac® contacts offer contact stability for up to 100,000 mating cycles. The ODU DOCK Quick Change Head is suitable for applications that require even more mating cycles.

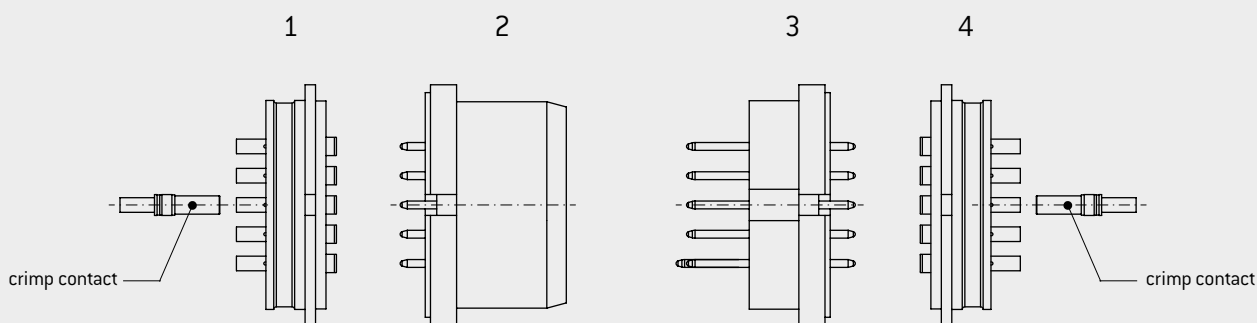
MATERIAL	
Insulator	PBT-GF (UL 94)
Contacts	Cu alloy

PRINCIPLE BEHIND THE QUICK CHANGE HEAD

The QCH allows to fulfill the highest requirements towards mating cycles. The system consists of four parts – two base parts plus two interchange parts. Assembly of one base and interchange part build one unit for socket and pin side, respectively.

SOCKET SIDE

PIN SIDE



In the event of maintenance or repair only the interchange parts (2 and 3) will be replaced, while the base parts (1 and 4) with the cable harness remain assembled.

YOUR WAY TO A CONSOLIDATED CONNECTION

How to configure your ODU DOCK

INDIVIDUAL REQUIREMENTS – CONSOLIDATED CONFIGURATION

ODU DOCK is always the right choice for all your signal, power, high-current, media and data transmission needs. You can configure them to precisely fit your requirements, so as to obtain the perfect interface.

CONFIGURATION IS CHILD'S PLAY

A complete ODU DOCK product consists of a housing, insulator, contacts, and dummy contact (where necessary). You can select exactly which components you need step by step. [We ask you to enquire directly about customized connector solutions.](#)

ODU DOCK

1st STEP: SELECT YOUR HOUSING

Depending on your requirements, you can choose from two different housing materials for automatic docking.

Material	
Aluminum, nickel-plated EMC protection available	Plastic (POM)



2nd STEP: SELECT YOUR INSERT

The standard inserts are suitable for transmission of signals, high-current and power. Each insert consists of an insulator and contacts. Dummy contacts can be ordered optionally.

Insert	
Insulator	3 sizes, 2+PE to 36+PE
Pin contact	Silver-plated (gold-plated on request)
Socket contact	With ODU Springtac® and ODU LAMTAC®
Ground contact	Depending on contact arrangements
Dummy contact	Optional

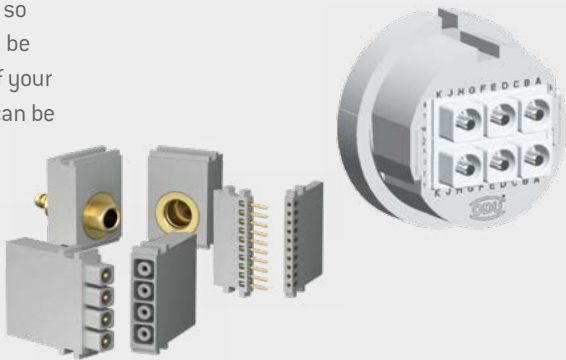


OPTIONAL STEP: SELECT YOUR ODU-MAC® MODULES

The ODU-MAC® adapter increases the modular options available for size 3. You can choose from 32 modules from the ODU-MAC® range, so bus signals, data, light waves, and media such as air and fluids can be transmitted. You can configure modules to meet the exact needs of your application for up to eight units. The part numbers of the modules can be found on page [52](#).

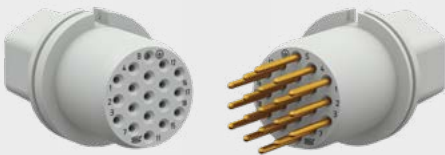
Compatible modules are marked with 

ODU-MAC® adapter	
Insulator pin	1 × 209.611.000.000.000
Insulator socket	1 × 209.610.000.000.000



OPTIONAL STEP: SELECT YOUR QUICK CHANGE HEAD

Our unique Quick Change Head technology significantly reduces the amount of time that needs to be spent on servicing. Exchange components can be replaced easily (while the base parts remain cabled), so the number of mating cycles can be vastly increased. Explore the ODU DOCK Quick Change Head on page [139](#).



3rd STEP: SELECT YOUR CABLE CLAMPS

Cable clamps are available with or without EMC protection. You can choose from two different materials. See page [194](#).

Cable clamp material	
Metal (available with EMC protection)	Plastic



ODU DOCK PRODUCT OVERVIEW

CONTACTS				
Conductor cross-section		Contact diameter	Material surface	Max. nominal current
mm ²	AWG	mm		A
0.08 – 0.25	24 – 28	Ø 0.76	Au	6
0.38	22	Ø 0.76	Au	7.5
0.38 – 0.5	20 – 22	Ø 1.02	Au	9
		Ø 1.50	Ag	10
1	–	Ø 1.02	Au	12
		Ø 2.00	Ag	15
1.5	–	Ø 1.50	Ag	18
		Ø 2.00	Ag	18
		Ø 3.00	Ag	19
		Ø 5.00	Ag	19
2.5	–	Ø 3.00	Ag	25
		Ø 6.00	Ag	25
4	–	Ø 3.00	Ag	35
		Ø 5.00	Ag	39
6	–	Ø 6.00	Ag	46
		Ø 5.00	Ag	46
10	–	Ø 5.00	Ag	65
16	–	Ø 6.00	Ag	80

Please take note of the derating charts on page 204 when selecting conductor cross-sections.
Other methods of contact processing are possible on request.

	SIZE 1					SIZE 2				SIZE 3					
	250 V	200 V	320 V	250 V	80 V	800 V	320 V	320 V	160 V	800 V	500 V	630 V	630 V	320 V	320 V
	2+PE ¹	6+PE ¹	2+PE+9	18+PE	31	3+PE+4	4+PE ¹	6+PE ¹	15+PE ¹	2+PE	4+PE ¹	6+PE ¹	13+PE ¹	26+PE ¹	36+PE ¹
	—	—	—	—	•	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	•	—	—	—	—	—	—	—	—	—	—
	—	—	—	•	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	•	•
	—	—	—	•	—	—	—	—	—	—	—	—	—	—	—
	—	•	—	—	—	—	—	—	•	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	•	—	—	—	—

from page [145](#)

from page [157](#)

from page [167](#)

¹ Solder cup termination on request



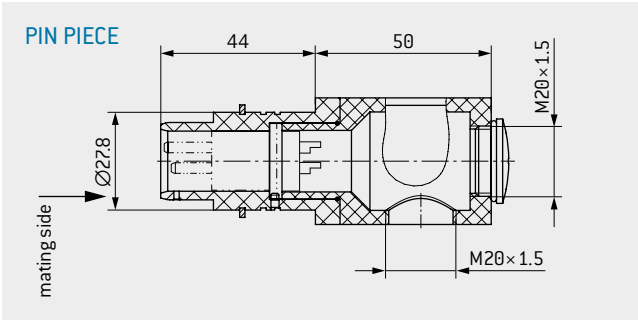
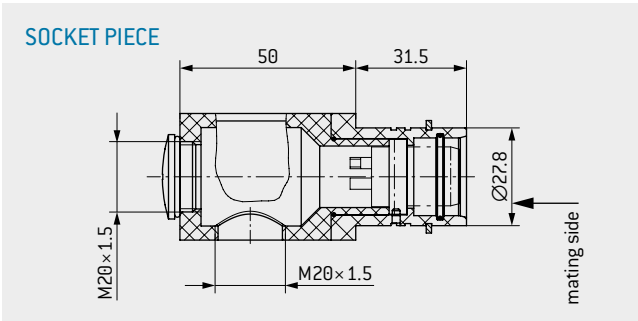
ODU DOCK



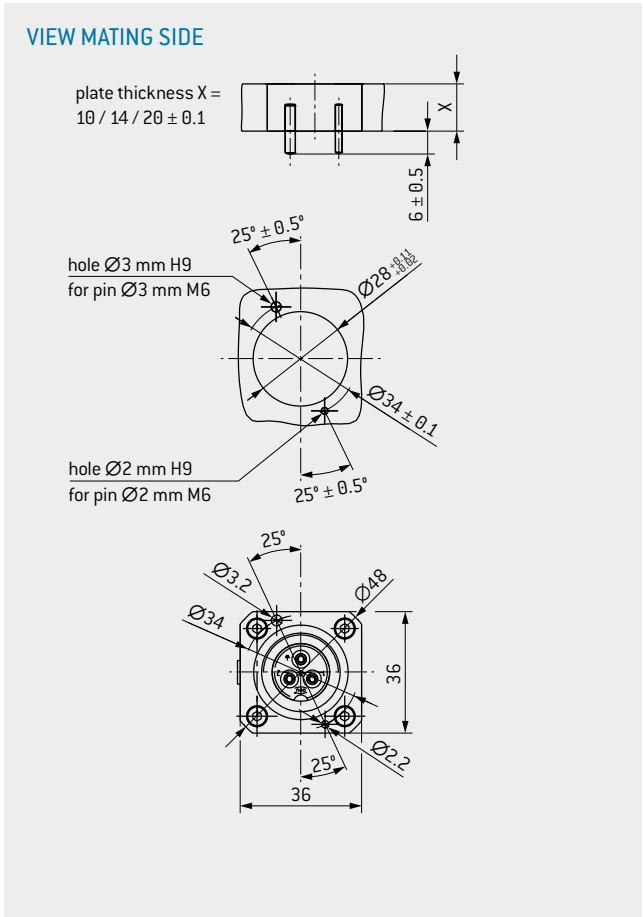
ODU DOCK SIZE 1

Housing	146
Pin and socket inserts	148
Quick Change Head	153

PLASTIC HOUSING



TECHNICAL DATA	
Material	POM, Black
Protection class ¹	IP65 (in mated condition)
Operating temperature	–40 °C to +100 °C
Cable exit	Straight and right angled



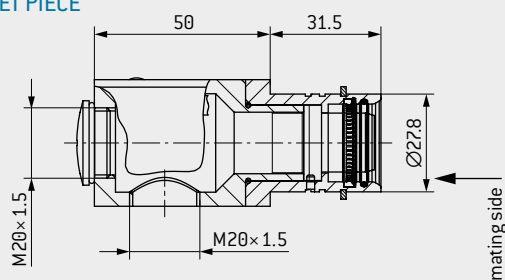
Description	Part number	IP40	IP65
Socket piece	656.164.011.000.000	—	•
Pin piece	656.164.012.000.000	—	•

¹ IEC 60529:2013 [VDE 0470-1:2014-09] (depends on the cable clamps used)

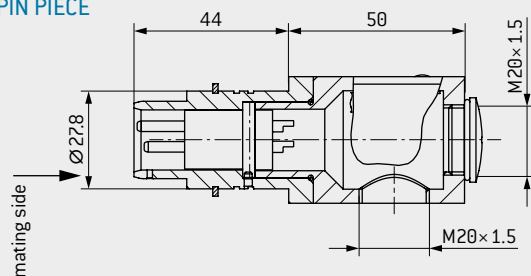
ALUMINUM HOUSING, NICKEL-PLATED



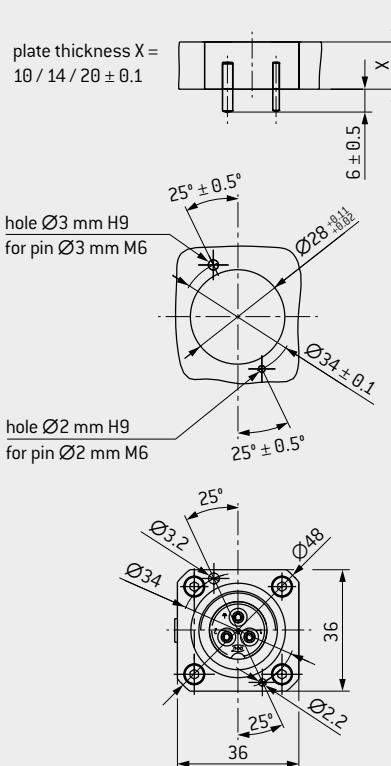
SOCKET PIECE



PIN PIECE



VIEW MATING SIDE



TECHNICAL DATA

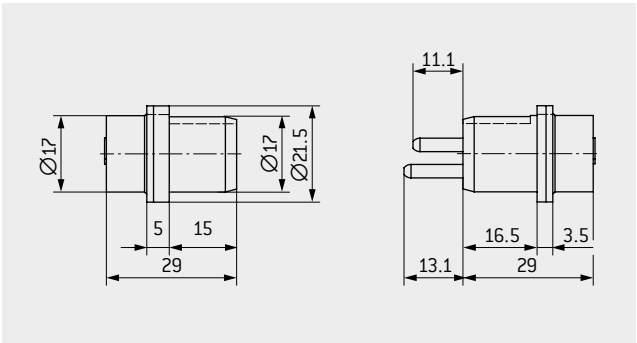
Material	Aluminum, nickel-plated
Protection class ¹	IP65 (while mated, depending on version)
Operating temperature	−40 °C to +100 °C
Cable exit	Straight and right angled
EMC protection	Optional

Description	Part number	IP40	IP65	EMC protection
Socket piece	656.164.021.000.000	—	•	•
	656.164.023.000.000	•	—	—
	656.164.024.000.000	•	—	•
	656.164.025.000.000	—	•	—
Pin piece	656.164.022.000.000	•	•	•

¹ DIN EN 60529 VDE 0470-1:2014-09 (depends on the cable clamps used)

CONTACT INSERT

2+PE



Contact diameter: 3 mm
Conductor cross-section: 2.5 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA				
Voltage information ¹				
Material housing	PLASTIC		METAL	
Operating voltage	630 V	250 V	500 V	200 V
Rated impulse voltage	4,000 V	4,000 V	3,000 V	3,000 V
Degree of pollution	2	3	2	3
Mechanical data				
Total mating force (average)	34 N			
Total sliding force (average)	21 N			
Operating temperature	-40 °C to +120 °C			
Mating cycles	≥ 100,000			
Materials				
Insulator	PBT-fiberglass reinforced acc. to UL 94			
Contact body	Cu alloy			
Contact springs	CuSn alloy			
Contact plating	Ag			

Crimping tools from page [183](#)
Assembly and removal tools from page [192](#)

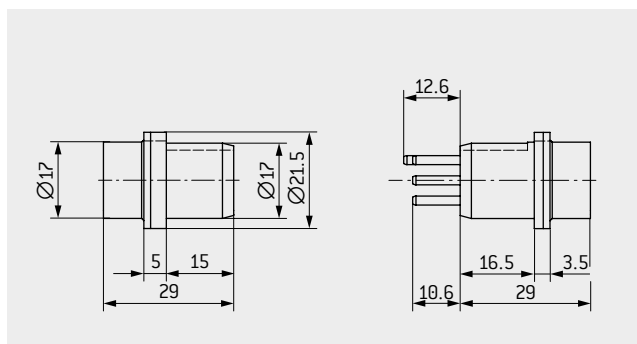
Description	Part number
Insulator socket	207.703.004.003.000
Insulator pin	207.803.004.003.000
Dummy contact	021.341.136.304.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact	Contact resistance
		mm	mm ²	AWG	A	mΩ
Socket contact	170.382.000.201.000	3	2.5	—	25	1
Pin contact	180.334.000.301.000					
Grounding pin contact	180.335.000.301.000					
Socket contact	170.499.100.201.000	3	1.5	—	19	1
Pin contact	180.374.000.301.000					
Grounding pin contact	180.375.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

6+PE



Contact diameter: 2 mm
Conductor cross-section: 1 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	500 V	200 V	500 V	160 V
Rated impulse voltage	3,000 V	3,000 V	3,000 V	3,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	53 N
Total sliding force (average)	27 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	207.702.004.007.000
Insulator pin	207.802.004.007.000
Dummy contact	021.341.135.924.000

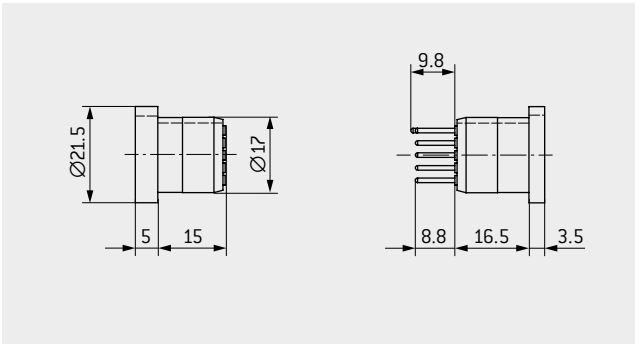
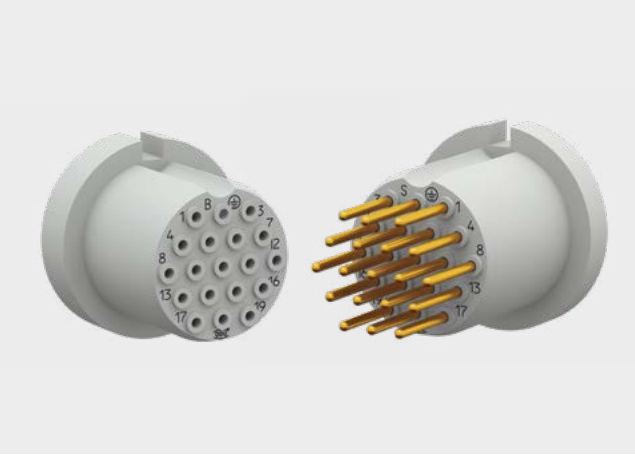
Description	Part number	Contact Ø mm	Conductor cross-section mm ²	AWG	Nominal current ² Single contact A	Contact resistance mΩ
Socket contact	170.381.000.201.000	2	1.5	–	18	1.5
Pin contact	180.332.000.301.000					
Grounding pin contact	180.333.000.301.000					
Socket contact	170.827.100.201.000	2	1	–	15	1.5
Pin contact	180.827.000.301.000					
Grounding pin contact	180.828.000.301.000					

CONDUCTOR CROSS-SECTION 2.5 mm² IS AVAILABLE ON REQUEST.

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

18+PE



Contact diameter: 1.02 mm
Conductor cross-section: 1 / 0.38 – 0.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
Operating voltage	630 V	250 V	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	27 N
Total sliding force (average)	19 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuBe alloy
Contact plating	Au

No extra grounding contact necessary. Grounding is provided via the insulator geometry.

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

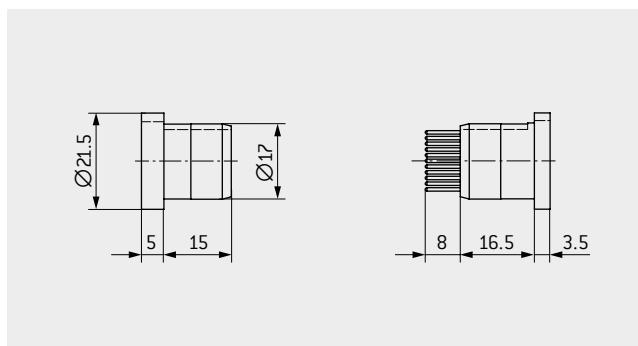
Description	Part number
Insulator socket	207.701.001.019.000
Insulator pin	207.801.001.019.000
Dummy contact	021.341.124.300.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ²	Contact resistance
		mm	mm ²	AWG	Single contact A	mΩ
Socket contact	170.362.700.207.000	1.02	0.38 – 0.5	20 – 22	9	2
Pin contact	182.970.000.307.000					
Socket contact	172.368.700.207.000	1.02	1	–	12	2
Pin contact	182.972.000.307.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#).

CONTACT INSERT

31 CONTACTS



Contact diameter: 0.76 mm

Conductor cross-section: 0.38 / 0.08 – 0.25 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	320 V	80 V	250 V	50 V
Rated impulse voltage	2,500 V	2,500 V	2,000 V	2,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	44 N
Total sliding force (average)	31 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuBe alloy
Contact plating	Au

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

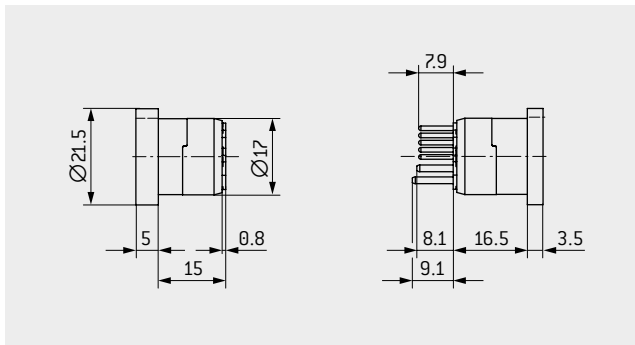
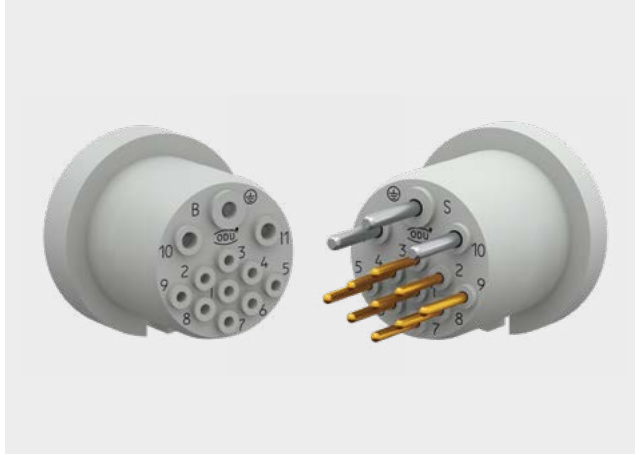
Description	Part number
Insulator socket	207.742.001.031.000
Insulator pin	207.842.001.031.000
Dummy contact	021.341.123.923.000

Description	Part number	Contact $\varnothing$ mm	Conductor cross-section mm ² AWG		Nominal current ² Single contact A	Contact resistance m Ω
Socket contact	170.361.700.207.000	0.76	0.38	22	7.5	3.5
Pin contact	180.381.000.307.000					
Socket contact	170.540.700.207.000	0.76	0.08 – 0.25	24 – 28	6	3.5
Pin contact	180.570.000.307.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

2+PE+9



Description	Part number
Insulator socket	207.700.001.012.000
Insulator pin	207.800.001.012.000
Dummy contact (Ø 1.5 mm)	021.341.125.923.000
Dummy contact (Ø 1.02 mm)	021.341.124.300.000

Contact diameter: 1.5 / 1.02 mm
Conductor cross-section: 1.5 / 0.38 – 0.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	Contact diameter 1.5			
	PLASTIC		METAL	
Operating voltage	800 V	320 V	630 V	250 V
Rated impulse voltage	4,000 V	4,000 V	3,000 V	3,000 V
Degree of pollution	2	3	2	3

Contact diameter 1.02

Material housing	PLASTIC		METAL	
Operating voltage	630 V	250 V	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	22 N
Total sliding force (average)	16 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	Cu alloy
Contact plating	Ag 1.5 mm / Au 1.02 mm

No extra grounding contact necessary. Grounding is provided via the insulator geometry.

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
		mm	mm ²	AWG		
Socket contact (10, 11, PE)	170.363.100.201.001	1.5	1.5	–	18	1.5
Pin contact (10, 11, PE)	180.383.000.301.000					
Socket contact (1 to 9)	170.362.700.207.000	1.02	0.38 – 0.5	20 – 22	9	2
Pin contact (1 to 9)	180.382.000.307.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

6+PE



Contact diameter: 2 mm

Conductor cross-section: 0.5 – 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	160 V	32 V	160 V	32 V
Rated impulse voltage	2,500 V	2,500 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	55 N
Total sliding force (average)	29 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

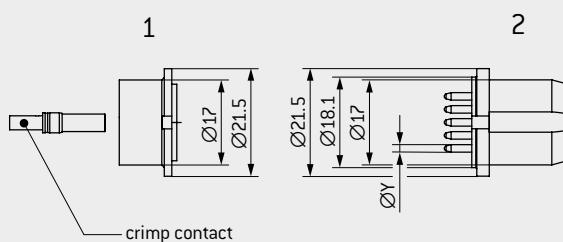
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

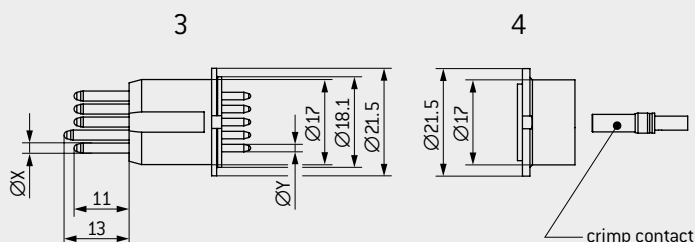
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
Contacts are included in the scope of the delivery (already assembled)				mm ²	AWG		
Part 1: Base part	252.089.011.007.000	2	1.5	0.5 – 1.5	20 – 22	16	6
Part 2: Interchange part (socket)	252.087.001.007.000			–	–		
Part 3: Interchange part (pin)	252.088.002.007.000	2	1.5	–	–	16	
Part 4: Base part	252.089.012.007.000			0.5 – 1.5	20 – 22		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

18+PE



Contact diameter: 1 mm

Conductor cross-section: 0.5 – 1 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
Operating voltage	400 V	160 V	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	65 N
Total sliding force (average)	50 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

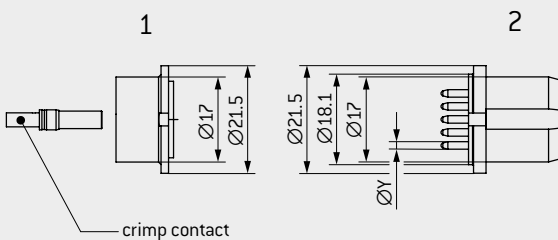
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Au

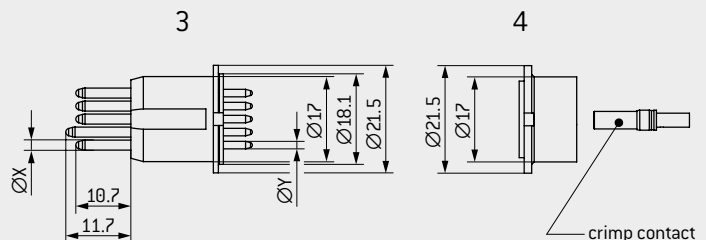
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section		Nominal current ² Single contact	Contact resistance
Contacts are included in the scope of the delivery (already assembled)				mm ²	AWG	A	mΩ
Part 1: Base part	252.089.011.019.000	1	0.9	0.5 – 1.0	–	10	9
Part 2: Interchange part (socket)	252.087.001.019.000			–	–		
Part 3: Interchange part (pin)	252.088.001.019.000	1	0.9	–	–	10	
Part 4: Base part	252.089.012.019.000			0.5 – 1.0	–		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)





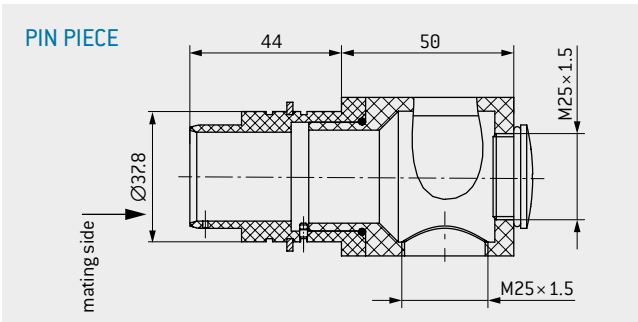
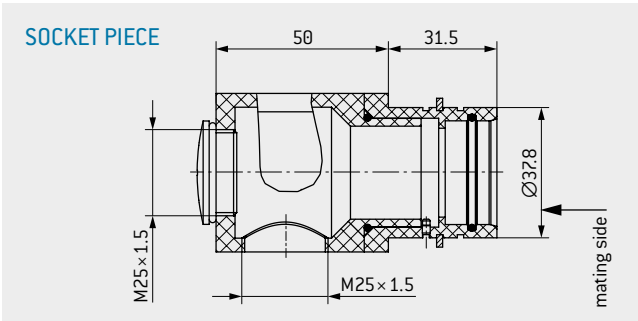
ODU DOCK



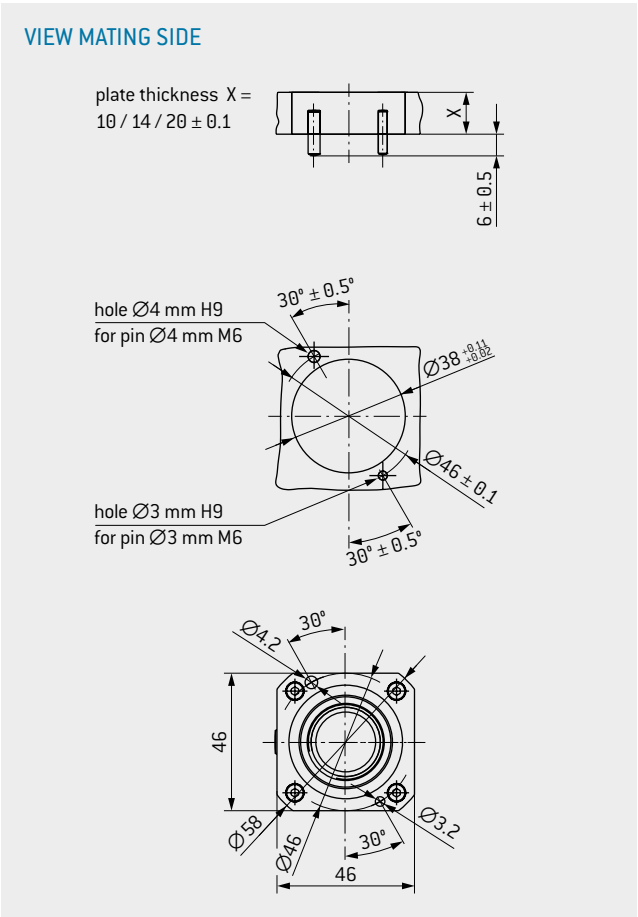
ODU DOCK SIZE 2

Housing	158
Pin and socket inserts	160
Quick Change Head	164

PLASTIC HOUSING

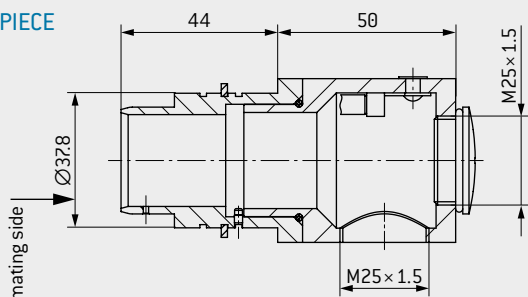
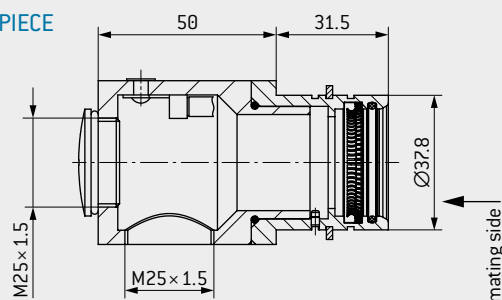


TECHNICAL DATA	
Material	POM, Black
Protection class ¹	IP65 (in mated condition)
Operating temperature	-40 °C to +100 °C
Cable exit	Straight and right angled

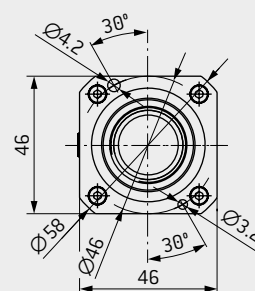
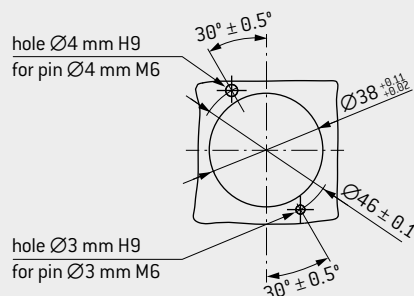
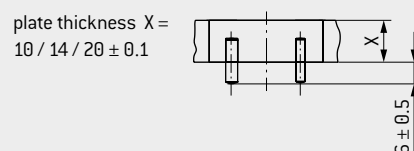


Description	Part number	IP40	IP65
Socket piece	656.162.011.000.000	—	•
Pin piece	656.162.012.000.000	—	•

¹ IEC 60529:2013 [VDE 0470-1:2014-09] (depends on the cable clamps used)



Material	Aluminum, nickel-plated
Protection class ¹	IP65 (while mated, depending on version)
Operating temperature	–40 °C to +100 °C
Cable exit	Straight and right angled
EMC protection	Optional

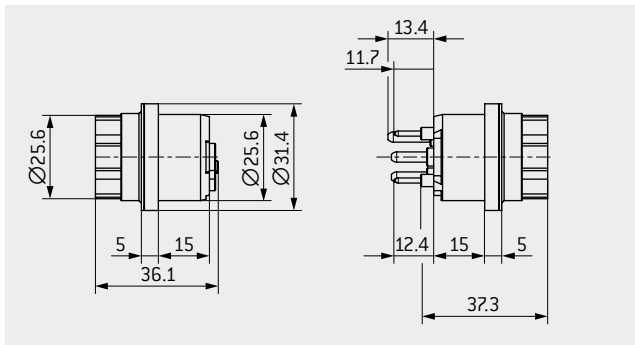


Description	Part number	IP40	IP65	EMC protection
Socket piece	656.162.021.000.000	—	•	•
	656.162.023.000.000	•	—	—
	656.162.024.000.000	•	—	•
	656.162.025.000.000	—	•	—
Pin piece	656.162.022.000.000	•	•	•

¹ IEC 60529:2013 (VDE 0470-1:2014-09) (depends on the cable clamps used)

CONTACT INSERT

3+PE+4



Contact diameter: 3 / 1.5 mm

Conductor cross-section: 4 / 2.5 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	Contact diameter 3			
	PLASTIC		METAL	
Operating voltage	1,600 V	800 V	1,600 V	800 V
Rated impulse voltage	8,000 V	8,000 V	6,000 V	6,000 V
Degree of pollution	2	3	2	3

Contact diameter 1.5

Material housing	PLASTIC		METAL	
Operating voltage	1,600 V	800 V	630 V	250 V
Rated impulse voltage	8,000 V	8,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	57 N
Total sliding force (average)	36 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

No extra grounding contact necessary. Grounding is provided via the insulator geometry.

Crimping tools from page [183](#)

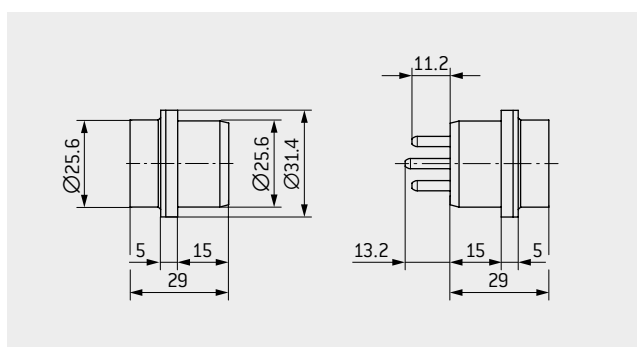
Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	208.700.001.008.000
Insulator pin	208.800.001.008.000
Dummy contact socket / pin (Ø 3 mm)	021.341.136.924.000
Dummy contact socket (Ø 1.5 mm)	021.341.131.923.000
Dummy contact pin (Ø 1.5 mm)	021.341.132.923.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
		mm	mm ²	AWG		
Socket contact	172.085.100.201.000	3	4	—	35	1
Pin contact	182.085.000.301.000					
Socket contact	170.382.000.201.000	3	2.5	—	25	1
Pin contact	180.335.000.301.000					
Socket contact	170.499.100.201.000	3	1.5	—	19	1
Pin contact	180.375.000.301.000					
Socket contact	170.363.100.201.001	1.5	1.5	—	18	1.5
Pin contact	181.135.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT 4+PE



Contact diameter: 3 mm
Conductor cross-section: 2.5 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	800 V	320 V	800 V	320 V
Rated impulse voltage	4,000 V	4,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	57 N
Total sliding force (average)	34 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

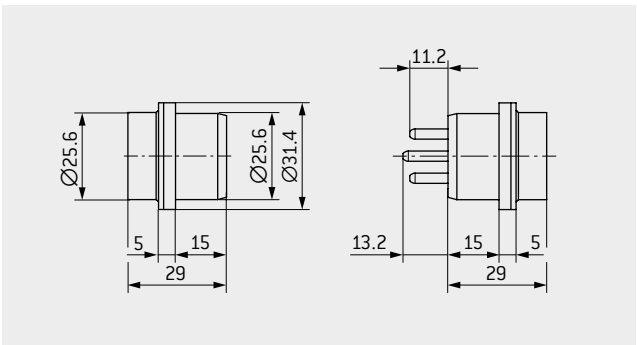
Description	Part number
Insulator socket	208.703.004.005.000
Insulator pin	208.803.004.005.000
Dummy contact	021.341.136.304.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact	Contact resistance
		mm	mm ²	AWG	A	mΩ
Socket contact	170.382.000.201.000	3	2.5	–	25	1
Pin contact	180.334.000.301.000					
Grounding pin contact	180.335.000.301.000					
Socket contact	170.499.100.201.000	3	1.5	–	19	1
Pin contact	180.374.000.301.000					
Grounding pin contact	180.375.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

6+PE



Contact diameter: 3 mm
Conductor cross-section: 2.5 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA				
Voltage information ¹				
Material housing	PLASTIC		METAL	
Operating voltage	800 V	320 V	800 V	320 V
Rated impulse voltage	4,000 V	4,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3
Mechanical data				
Total mating force (average)	79 N			
Total sliding force (average)	48 N			
Operating temperature	-40 °C to +120 °C			
Mating cycles	≥ 100,000			
Materials				
Insulator	PBT-fiberglass reinforced acc. to UL 94			
Contact body	Cu alloy			
Contact springs	CuSn alloy			
Contact plating	Ag			

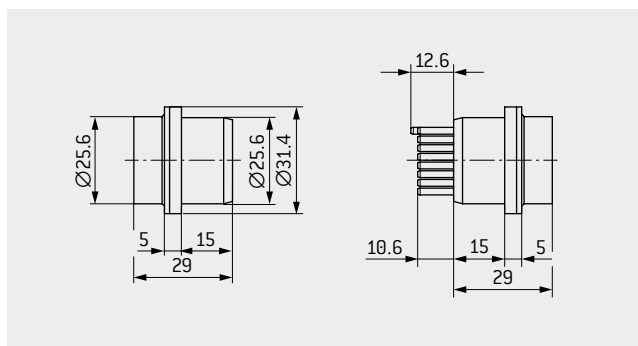
Crimping tools from page [183](#)
Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	208.703.004.007.000
Insulator pin	208.803.004.007.000
Dummy contact	021.341.136.304.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact	Contact resistance
		mm	mm ²	AWG	A	mΩ
Socket contact	170.382.000.201.000	3	2.5	—	25	1
Pin contact	180.334.000.301.000					
Grounding pin contact	180.335.000.301.000					
Socket contact	170.499.100.201.000	3	1.5	—	19	1
Pin contact	180.374.000.301.000					
Grounding pin contact	180.375.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT 15+PE



Contact diameter: 2 mm

Conductor cross-section: 1 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
	400 V	160 V	400 V	160 V
Operating voltage	400 V	160 V	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V	3,000 V	3,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	120 N
Total sliding force (average)	60 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	208.702.004.016.000
Insulator pin	208.802.004.016.000
Dummy contact	021.341.135.924.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
		mm	mm ²	AWG		
Socket contact	170.381.000.201.000	2	1.5	–	18	1.5
Pin contact	180.332.000.301.000					
Grounding pin contact	180.333.000.301.000					
Socket contact	170.827.100.201.000	2	1	–	15	1.5
Pin contact	180.827.000.301.000					
Grounding pin contact	180.828.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

6+PE



Contact diameter: 3 mm

Conductor cross-section: 0.5 – 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
Operating voltage	400 V	250 V	400 V	250 V
Rated impulse voltage	4,000 V	4,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	82 N
Total sliding force (average)	50 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

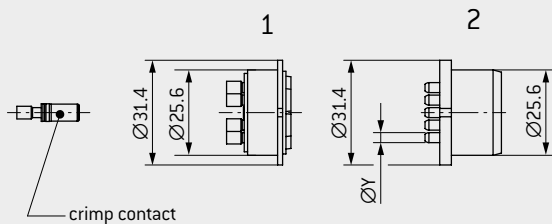
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

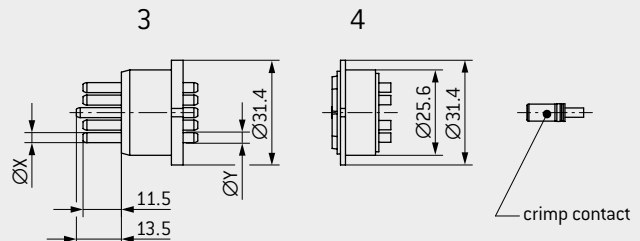
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
Part 1: Base part	252.082.011.107.150	3	3	0.5 – 1.5	—	18	2.5
Part 2: Interchange part (socket)	252.080.001.007.000			—	—		
Part 3: Interchange part (pin)	252.081.001.007.000			—	—		
Part 4: Base part	252.082.012.107.150	3	3	0.5 – 1.5	—	18	

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#).

QUICK CHANGE HEAD

15+PE



Contact diameter: 2 mm

Conductor cross-section: 0.5 – 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	160 V	32 V	160 V	32 V
Rated impulse voltage	2,500 V	2,500 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	126 N
Total sliding force (average)	66 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

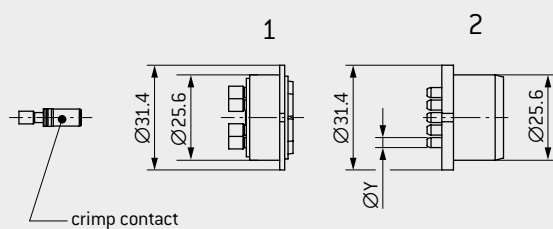
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

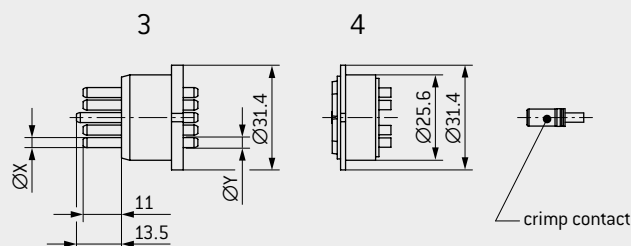
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
Part 1: Base part	252.082.011.016.000	2	1.5	0.5 – 1.5	—	16	6
Part 2: Interchange part (socket)	252.080.001.016.000			—	—		
Part 3: Interchange part (pin)	252.081.002.016.000	2	1.5	—	—	16	
Part 4: Base part	252.082.012.016.000			0.5 – 1.5	—		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)



ODU DOCK



ODU DOCK SIZE 3

Housing	168
Pin and socket inserts	170
Quick Change Head	176



PIECE

55

34

Ø51.8

M32 x 1.5

M32 x 1.5

mating side

Material	POM, Black
Protection class ¹	IP65 (in mated condition)
Operating temperature	−40 °C to +100 °C
Cable exit	Straight and right angled

Technical drawing of a square plate with four holes. The drawing includes a top view and a side view.

Top View:

- Overall dimensions: 60 ± 0.1 mm (width and height).
- Inner square dimensions: 52 ± 0.1 mm (width and height).
- Four holes: $\varnothing 3 \text{ mm H9}$ for pin $\varnothing 3 \text{ mm M6}$.
- Four holes: $\varnothing 4 \text{ mm H9}$ for pin $\varnothing 4 \text{ mm M6}$.
- Angles: $30^\circ \pm 0.5^\circ$ (between the hole axes and the diagonal).

Side View:

- Plate thickness $X = 10 / 14 / 20 \pm 0.1$.
- Dimension 6 ± 0.5 mm (distance from the top surface to the center of the holes).

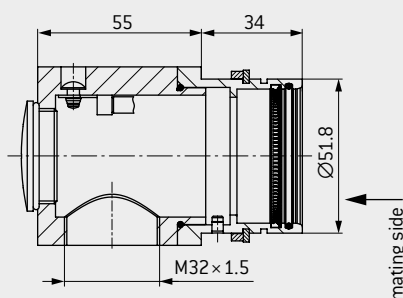
Description	Part number	IP40	IP65
Socket piece	656.163.011.000.000	—	•
Pin piece	656.163.012.000.000	—	•

168

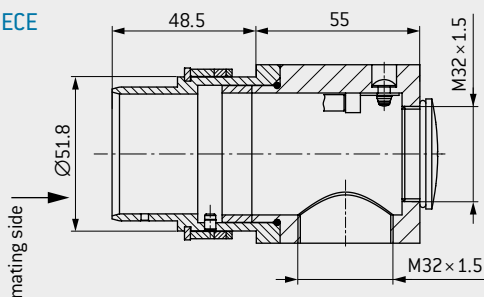
ALUMINUM HOUSING, NICKEL-PLATED



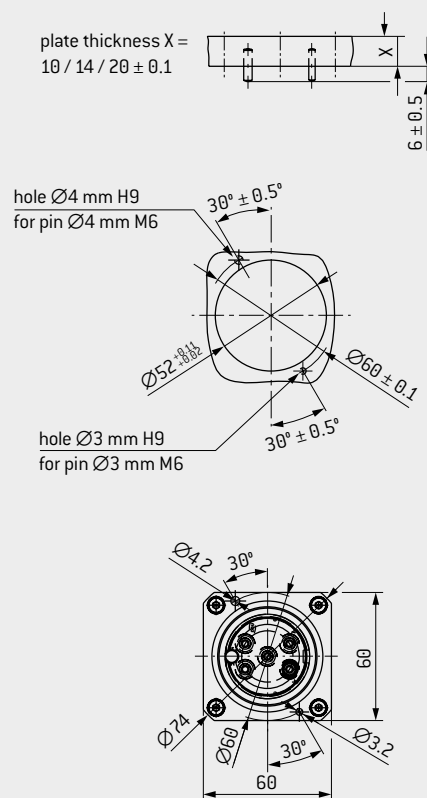
SOCKET PIECE



PIN PIECE



VIEW MATING SIDE



TECHNICAL DATA

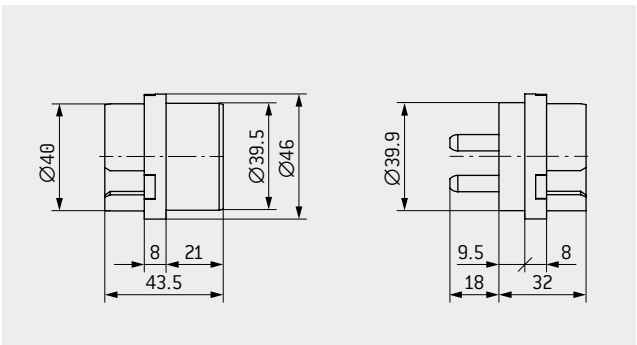
Material	Aluminum, nickel-plated
Protection class ¹	IP65 (while mated, depending on version)
Operating temperature	-40 °C to +100 °C
Cable exit	Straight and right angled
EMC protection	optional

Description	Part number	IP40	IP65	EMC protection
Socket piece	656.163.021.000.000	—	•	•
	656.163.023.000.000	•	—	—
	656.163.024.000.000	•	—	•
	656.163.025.000.000	—	•	—
Pin piece	656.163.022.000.000	—	•	•

¹ IEC 60529:2013 [VDE 0470-1:2014-09] (depends on the cable clamps used)

CONTACT INSERT

2+PE



Contact diameter: 6 mm
Conductor cross-section: 16 / 6 / 2.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
Operating voltage	1,600 V	800 V	1,000 V	400 V
Rated impulse voltage	6,000 V	6,000 V	5,000 V	5,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	54 N
Total sliding force (average)	32 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Insulator without holding clip – contacts are inserted from the side.

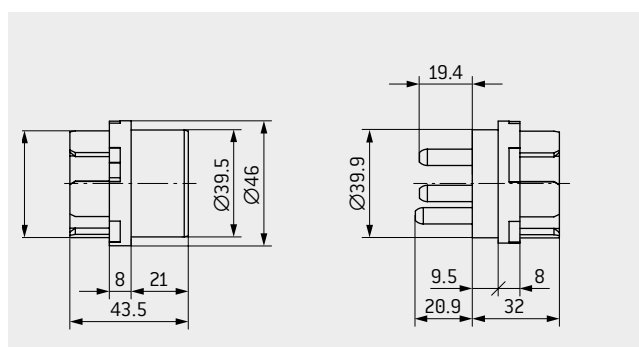
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	209.706.004.003.000
Insulator pin	209.806.004.003.000

Description	Part number	Contact Ø mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
			mm ²	AWG		
Socket contact	172.929.100.201.000	6	16	–	80	0.5
Pin contact	181.146.000.301.000					
Grounding pin contact	172.930.100.201.000					
Socket contact	172.927.100.201.000	6	6	–	46	0.5
Pin contact	181.144.000.301.000					
Grounding pin contact	172.928.100.201.000					
Socket contact	172.925.100.201.000	6	2.5	–	25	1
Pin contact	181.142.000.301.000					
Grounding socket contact	172.926.100.201.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)



Description	Part number
Insulator socket	209.706.004.005.000
Insulator pin	209.806.004.005.000

Conductor cross-section: 16 mm²

	PLASTIC		METAL	
Material housing				
Operating voltage	1,250 V	500 V	1,000 V	400 V
Rated impulse voltage	6,000 V	6,000 V	5,000 V	5,000 V
Degree of pollution	2	3	2	3

Total mating force (average)	90 N
Total sliding force (average)	53 N
Operating temperature	-40 °C to +120 °C
Mating cycles	≥ 100,000

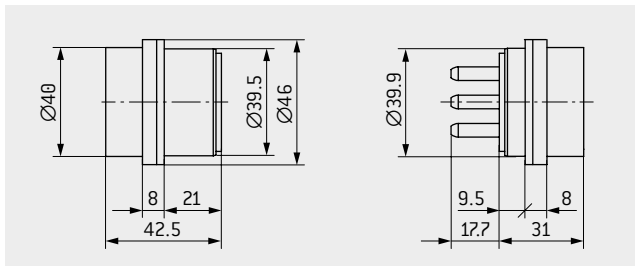
Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Assembly and removal tools from page 192

Description	Part number	Contact Ø mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
			mm ²	AWG		
Socket contact	172.650.100.201.000	6	16	—	80	0.5
Pin contact	182.504.000.301.000					

CONTACT INSERT

6+PE



Description	Part number
Insulator socket	209.705.004.007.000
Insulator pin	209.805.004.007.000
Dummy contact (socket)	021.341.141.924.000
Dummy contact (pin)	021.341.142.924.000

Contact diameter: 5 mm

Conductor cross-section: 10 / 6 / 4 / 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
Operating voltage	1,600 V	630 V	1,600 V	630 V
Rated impulse voltage	6,000 V	6,000 V	6,000 V	6,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	158 N
Total sliding force (average)	126 N
Operating temperature	−40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

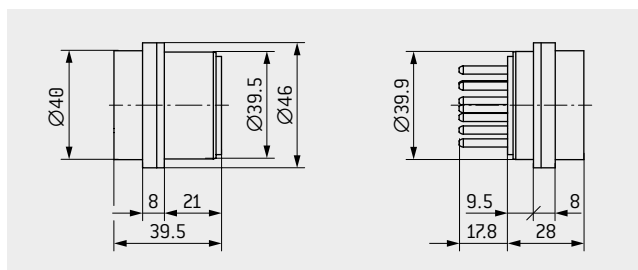
Assembly and removal tools from page [192](#)

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact	Contact resistance
		mm	mm ²	AWG		
Socket contact	170.633.100.201.000	5	10	–	65	0.5
Pin contact	180.633.000.301.000					
Grounding pin contact	170.634.100.201.000					
Socket contact	170.452.100.201.000	5	6	–	46	1
Pin contact	180.452.000.301.000					
Grounding pin contact	170.453.100.201.000					
Socket contact	172.931.100.201.000	5	4	–	39	1
Pin contact	181.140.000.301.000					
Grounding socket contact	172.932.100.201.000					
Socket contact	170.492.100.201.000	5	1.5	–	19	1
Pin contact	180.492.000.301.000					
Grounding socket contact	170.493.100.201.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

13+PE



Description	Part number
Insulator socket	209.703.004.014.000
Insulator pin	209.803.004.014.000
Dummy contact (socket)	021.341.137.300.000
Dummy contact (pin)	021.341.138.300.000

Description	Part number	Contact Ø mm	Conductor cross-section mm ²	Conductor cross-section AWG	Nominal current ² Single contact A	Contact resistance mΩ
Socket contact	172.160.100.201.000	3	4	–	35	1
Pin contact	181.160.000.301.000					
Grounding pin contact	172.161.100.201.000					
Socket contact	172.918.100.201.000	3	2.5	–	25	1
Pin contact	181.138.000.301.000					
Grounding pin contact	172.919.100.201.000					
Socket contact	172.916.100.201.000	3	1.5	–	19	1
Pin contact	181.136.000.301.000					
Grounding socket contact	172.917.100.201.000					

Contact diameter: 3 mm

Conductor cross-section: 4 / 2.5 / 1.5 mm²
[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	1,600 V	630 V	1,600 V	630 V
Rated impulse voltage	5,000 V	5,000 V	5,000 V	5,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	158 N
Total sliding force (average)	95 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

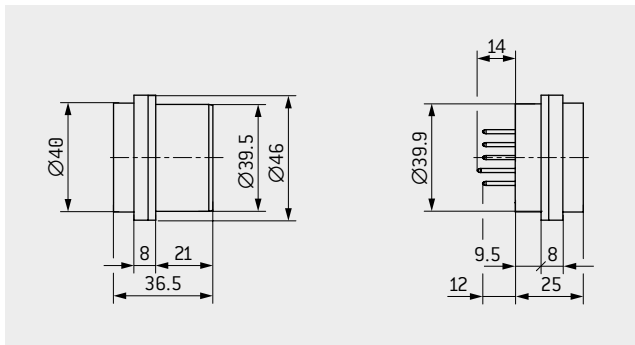
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)Assembly and removal tools from page [192](#)

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT 26+PE



Contact diameter: 1.5 mm

Conductor cross-section: 1.5 / 0.38 – 0.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	800 V	320 V	800 V	320 V
Rated impulse voltage	4,000 V	4,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	162 N
Total sliding force (average)	102 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

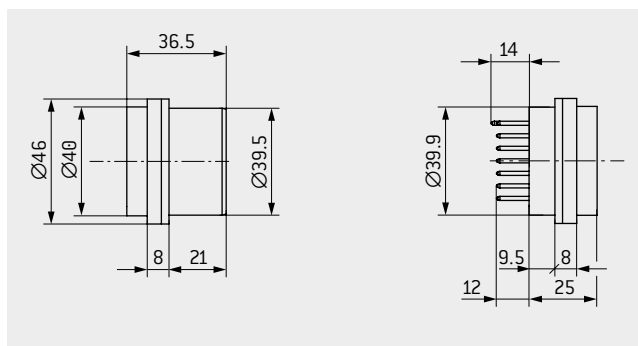
Description	Part number
Insulator socket	209.745.004.027.000
Insulator pin	209.845.004.027.000
Dummy contact (socket)	021.341.131.923.000
Dummy contact (pin)	021.341.132.923.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact	Contact resistance
		mm	mm ²	AWG	A	mΩ
Socket contact	170.370.000.201.000	1.5	1.5	16 / 15	18	2
Pin contact	181.134.000.301.000					
Grounding pin contact	181.135.000.301.000					
Socket contact	172.912.100.201.000	1.5	0.38 – 0.5	–	10	2.5
Pin contact	181.132.000.301.000					
Grounding pin contact	181.133.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

CONTACT INSERT

36+PE



Contact diameter: 1.5 mm

Conductor cross-section: 1.5 / 0.38 – 0.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	800 V	320 V	800 V	320 V
Rated impulse voltage	4,000 V	4,000 V	4,000 V	4,000 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	222 N
Total sliding force (average)	139 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

Description	Part number
Insulator socket	209.745.004.037.000
Insulator pin	209.845.004.037.000
Dummy contact (socket)	021.341.131.923.000
Dummy contact (pin)	021.341.132.923.000

Description	Part number	Contact Ø	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
		mm	mm ²	AWG		
Socket contact	170.370.000.201.000	1.5	1.5	22	18	2
Pin contact	181.134.000.301.000					
Grounding pin contact	181.135.000.301.000					
Socket contact	172.912.100.201.000	1.5	0.38 – 0.5	–	10	2.5
Pin contact	181.132.000.301.000					
Grounding pin contact	181.133.000.301.000					

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

26+PE



Contact diameter: 1.5 mm

Conductor cross-section: 0.5 – 1.5 mm²
[Product Finder](#)

TECHNICAL DATA

Voltage information ¹

Material housing	PLASTIC		METAL	
	200 V	63 V	200 V	63 V
Operating voltage	200 V	63 V	200 V	63 V
Rated impulse voltage	3,000 V	3,000 V	3,000 V	3,000 V
Degree of pollution	2	3	2	3

Mechanical data

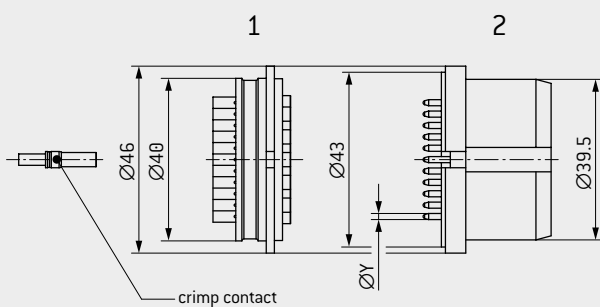
Total mating force (average)	173 N
Total sliding force (average)	112 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials

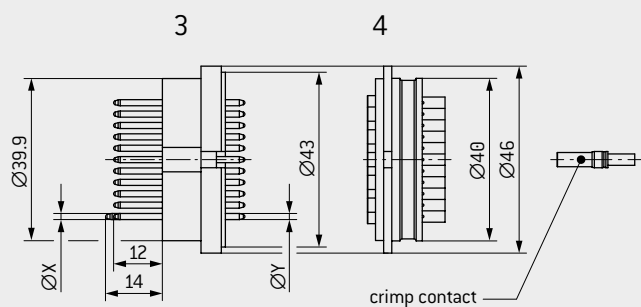
Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchangeable parts are replaced.

Description Contacts are included in the scope of the delivery (already assembled)	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section mm² AWG		Nominal current ² Single contact A	Contact resistance mΩ
Part 1: Base part	252.061.012.027.000	1.5	1.5	0.5 – 1.5	–	16	7
Part 2: Interchange part (socket)	252.058.002.027.000			–	–		
Part 3: Interchange part (pin)	252.059.002.027.000	1.5	1.5	–	–	16	
Part 4: Base part	252.061.013.027.000			0.5 – 1.5	–		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

36+PE



Contact diameter: 1.5 mm

Conductor cross-section: 0.5 – 1.5 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information¹

Material housing	PLASTIC		METAL	
Operating voltage	160 V	40 V	160 V	40 V
Rated impulse voltage	2,500 V	2,500 V	2,500 V	2,500 V
Degree of pollution	2	3	2	3

Mechanical data

Total mating force (average)	237 N
Total sliding force (average)	153 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

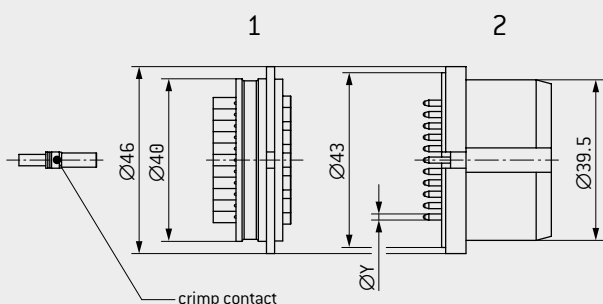
Materials

Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

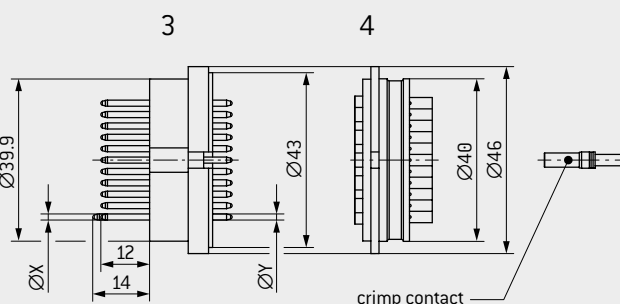
Crimping tools from page [183](#)

Assembly and removal tools from page [192](#)

SOCKET SIDE



PIN SIDE



The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section		Nominal current ² Single contact A	Contact resistance mΩ
Contacts are included in the scope of the delivery (already assembled)				mm²	AWG		
Part 1: Base part	252.061.011.037.000	1.5	1.5	0.5 – 1.5	–	16	7
Part 2: Interchange part (socket)	252.058.001.037.000			–	–		
Part 3: Interchange part (pin)	252.059.002.037.000	1.5	1.5	–	–	16	
Part 4: Base part	252.061.012.037.000			0.5 – 1.5	–		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K. When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

QUICK CHANGE HEAD

13+PE



Contact diameter: 3 mm
Conductor cross-section: 2.5 – 4 mm²

[Product Finder](#)

TECHNICAL DATA

Voltage information ¹		
Material housing	PLASTIC	METAL
Operating voltage	630 V	630 V
Rated impulse voltage	5,000 V	4,000 V
Degree of pollution	3	3

Mechanical data	
Total mating force (average)	163 N
Total sliding force (average)	100 N
Operating temperature	–40 °C to +120 °C
Mating cycles	≥ 100,000

Materials	
Insulator	PBT-fiberglass reinforced acc. to UL 94
Contact body	Cu alloy
Contact springs	CuSn alloy
Contact plating	Ag

Crimping tools from page [183](#)
Assembly and removal tools from page [192](#)

SOCKET SIDE

crimp contact

PIN SIDE

crimp contact

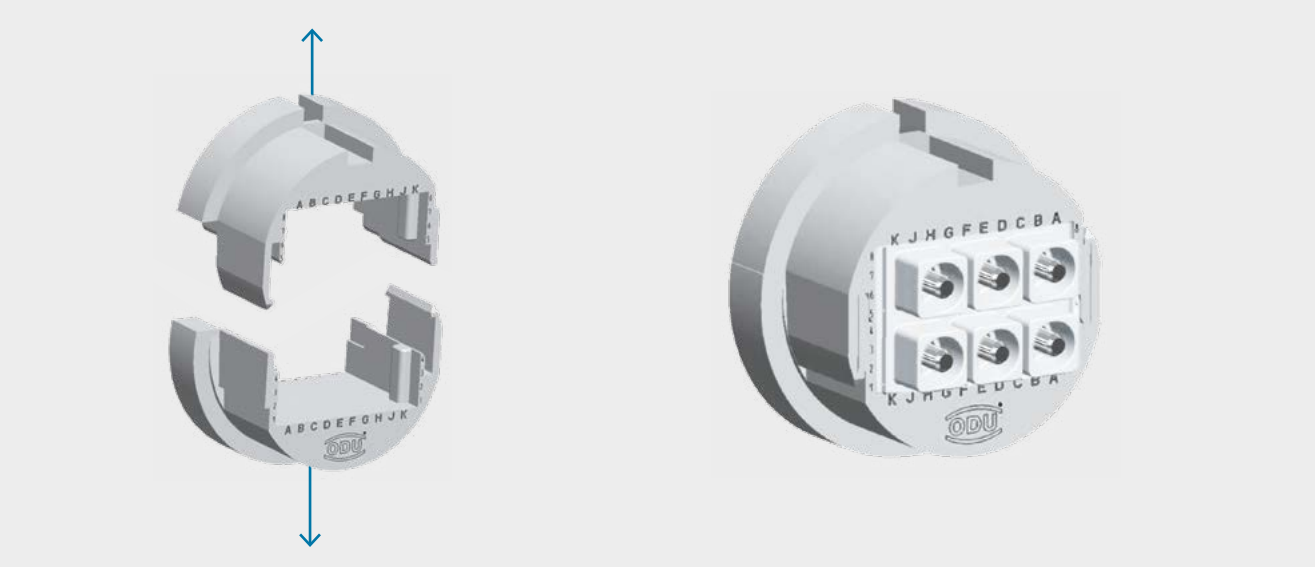
The base parts are equipped with crimp contacts. If service is required, the base parts keep wired, while the interchange parts are replaced.

Contacts are included in the scope of the delivery (already assembled)	Description	Part number	Contact Ø X mm	Contact Ø Y mm	Conductor cross-section mm² AWG		Nominal current ² Single contact A	Contact resistance mΩ
	Part 1: Base part	252.061.003.014.000	3.0	3.0	2.5 – 4.0	–	30	3.5
	Part 2: Interchange part (socket)	252.058.002.014.000			–	–		
	Part 3: Interchange part (pin)	252.059.002.014.000	3.0	3.0	–	–	30	
	Part 4: Base part	252.061.004.014.000			2.5 – 4.0	–		

¹ Acc. to IEC 60664-1:2020 [VDE0110-1:2022-07], see page [199](#) | ² Determined acc. to IEC 60512-5-1:2002 [DIN EN 60512-5-1:2003-01] at a temperature increase of 45 K: When determining the current-carrying capacity for a fully equipped insert, take the reduction factor into account, see page [205](#)

FLEXIBLE CIRCULAR CONNECTORS WITH ODU-MAC® MODULES

Suitable for rugged housing ODU DOCK Silver-Line size 3



Modular circular connectors from the existing portfolio can be easily configured with the flexible ODU-MAC® inserts. The insulator half shells are compatible with ODU DOCK Silver-Line size 3 housings, resulting in a modular circular connector with a very robust housing.

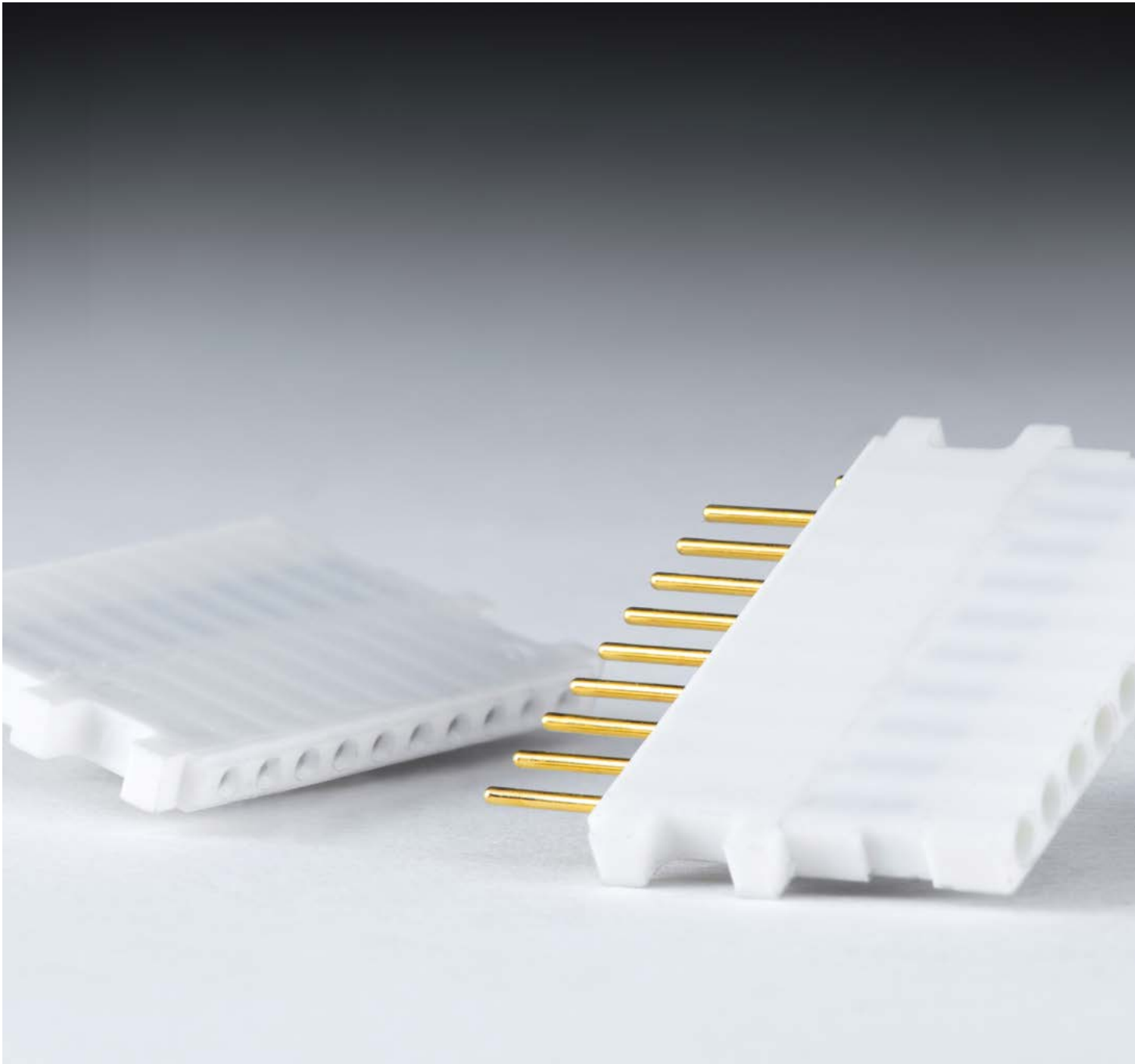
The divided insulator design allows to comprise ODU-MAC® modules for 8 units.

Due to the combination of two proven ODU products you can arrange the inserts individually:

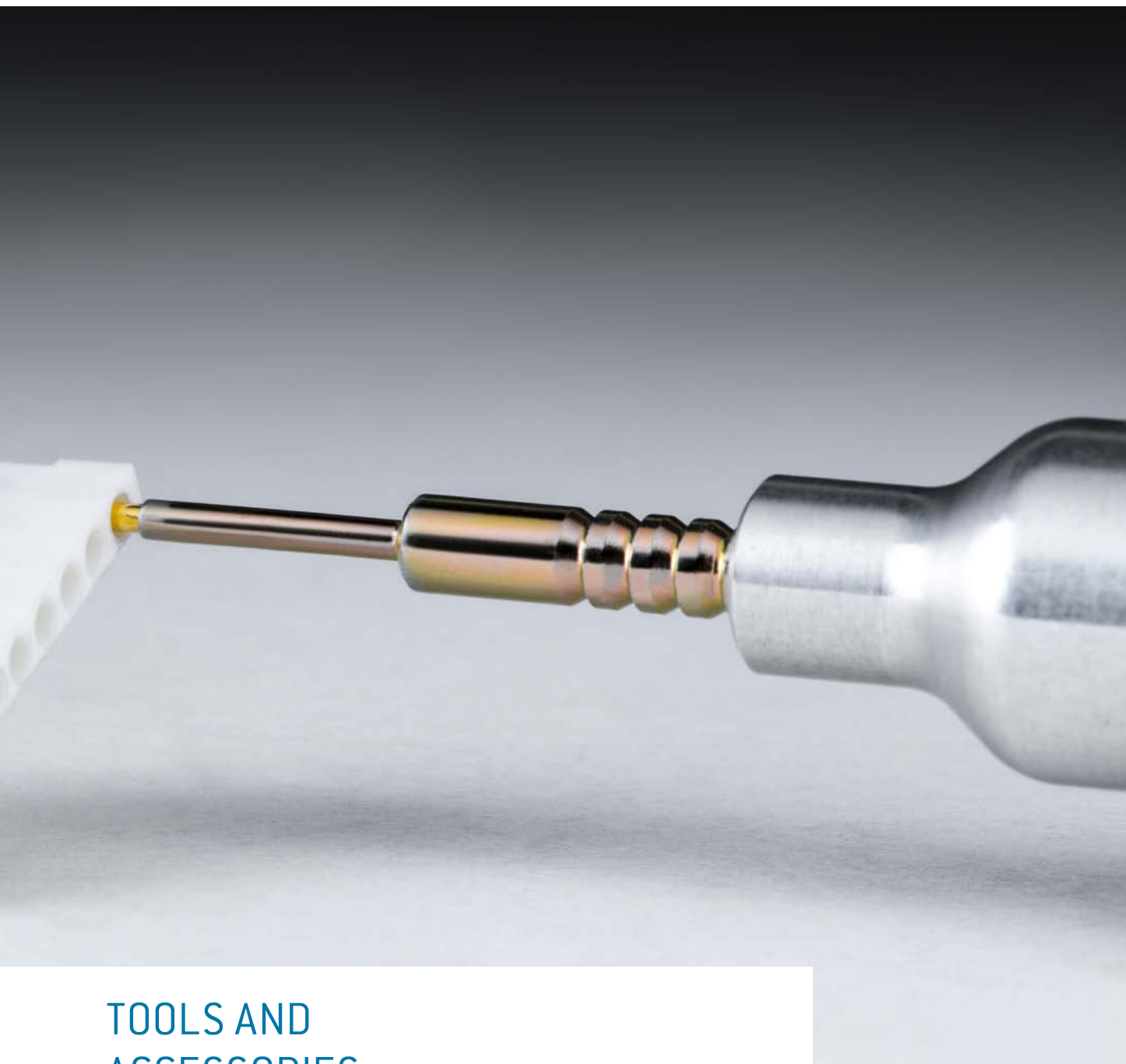
- Combination of ODU DOCK housings with integrated modules from the ODU-MAC® program
- Space for 8 units (1 unit = 2.54 mm)
- Material insulator: PBT

Description	Part number Insulator socket	Part number Insulator pin
Insulator half-shells	209.610.000.000.000	209.611.000.000.000

- Note:
- Recommendation: use first make / last break contacts from Ø 1.02 mm
 - Assembly instruction available on our [website](#)



ODU-MAC[®]



TOOLS AND ACCESSORIES

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TERMINATION TECHNOLOGY

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

- Crimp
- Solder cup
- PCB

CRIMP TERMINATION

The contact processing for the production of connecting cables via crimping creates a secure, durable, and corrosion-free contact.

For most people, crimping is easy and quick to carry out.

Through crimping, the conductor and contact materials in the compressed areas become so dense as to create a connection which is nearly gas-tight, and with a tensile strength befitting the conductor material.

Crimping can be carried out on the tiniest of diameters as well as in larger diameters. For small diameters ($0.08 - 2.5 \text{ mm}^2$), eight-point crimp tools are used; hexagonal crimp tools are used for larger crosssections. The corner measurement of the crimping is never larger than the original diameter. The cable insulation is not damaged in the process and can be directly attached to the connector end.

For error-free crimping, the bore diameter must be perfectly fitted to the cable. Such error-free crimping is only guaranteed if using ODU-recommended crimping tools. In order to correctly advise you, we need to know your cable type and profile, preferably by means of a sample and corresponding data sheet.

HEXAGONAL CRIMPING



8-POINT CRIMPING



FOR ASSEMBLY INSTRUCTIONS PLEASE REFER TO OUR WEBSITE: WWW.ODU-CONNECTORS.COM

CRIMPING TOOLS

For further crimp information please refer to the tables from page [186](#).

8-POINT CRIMPING TOOL FOR CONDUCTOR CONNECTIONS FROM 0.08 TO 2.50 mm²



With user-friendly digital display

PART NUMBER: 080.000.051.000.000

POSITIONER FOR CONTACT DIAMETER FROM 0.76 TO 3 MM

PART NUMBER: 080.000.051.101.000

Has to be ordered separately

8-POINT CRIMPING TOOL FOR CONDUCTOR CONNECTIONS FROM 1.50 TO 6.00 mm²



With user-friendly digital display

PART NUMBER: 080.000.057.000.000

POSITIONER FOR CONTACT DIAMETER FROM 1.5 TO 3 MM

PART NUMBER: 080.000.057.101.000

Has to be ordered separately

HEXAGONAL CRIMPING TOOL FOR CROSS-SECTIONS (AWG 12), 4.00 TO 6.00 mm²



With crimp dies

PART NUMBER: 080.000.062.000.000

MECHANICAL HEXAGONAL HAND CRIMPING TOOL FROM 10.00 TO 50.00 mm²



PART NUMBER: 080.000.064.000.000

High pressing force with low manual force through precision mechanics. Folding head facilitates processing of unwieldy connector forms and changing of crimp inserts.

CRIMPING JAWS FOR CONTACT DIAMETER FROM 5 TO 12 mm SEE PAGE [187](#).

Has to be ordered separately

HEXAGONAL CRIMPING TOOL FOR COAX-CONTACTS



With crimp dies

PART NUMBER: 080.000.039.000.000

CRIMPING JAWS PLEASE SEE PAGE [186](#).

Has to be ordered separately

CRIMPING TOOLS

For further crimp information please refer to the tables from page [186](#).

HAND CRIMPING TOOL FOR SINGLE CRIMP CONTACTS (STAMPED CONTACTS)



PART NUMBER: 080.000.040.000.000

Single contacts are positioned manually in the pliers and get crimped.

HAND CRIMPERS WITH ROLL FOR SPOOL GOODS (STAMPED CONTACTS)



PART NUMBER: 080.000.041.000.000

Contacts are supplied on the reel and are automatically isolated. The feed occurs by hand operation.

- Suitable for coil size: 115 mm
Therefore 500 / 900 contacts can be processed.
- Processing with automatic stripper crimper possible, further information on request.

HYDRAULIC CRIMPING TOOL



With crimp dies

PART NUMBER: 080.000.026.000.000

For cross-sections of 10 mm² and 16 mm²

With safety valve, which opens automatically if the pressure required for full compression is reached.

CRIMPING JAWS PLEASE SEE PAGE [189](#)

Has to be ordered separately

8-POINT CRIMPING TOOL FOR CROSS-SECTIONS FROM 0.38 TO 2.5 mm²



With crimp dies

PART NUMBER: 080.000.038.000.000

Single contacts are positioned manually in the pliers and get crimped.

CRIMPING TOOL FOR THERMOCONTACTS



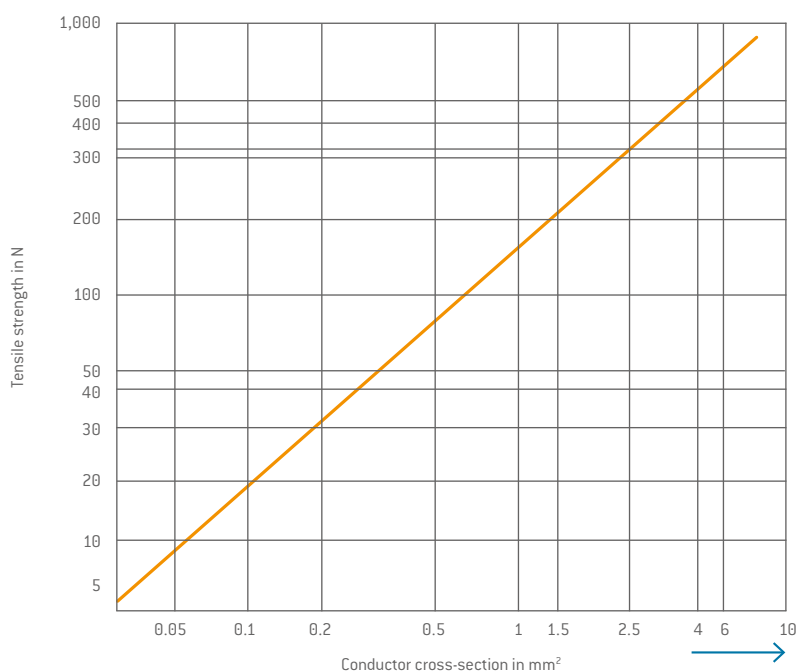
PART NUMBER: 080.000.071.000.000

Single contacts are positioned manually in the pliers and get crimped.

TENSILE STRENGTH FOR CRIMP TERMINATIONS

IEC 60352-2:2013 (DIN EN 60352-2:2014-04)

Tensile strength diagram of a crimp termination depending on the conductor cross-section IEC 60352-2:2013 (DIN EN 60352-2:2014-04). Example: A 2.5 mm² conductor must achieve a $\geq$ tensile strength of approx. 320 N.



NOTE

Internal standards and guidelines are used for cross-sections ($> 10 \text{ mm}^2$), as these are not clearly defined in the international standard.

TESTING ELECTRICAL CONTINUITY FOLLOWING ASSEMBLY / TESTING OF WIRING:

One of the most important functional features is the observance of the specified mating and sliding forces. All socket contacts in fully automatic systems supplied by ODU are therefore tested for 100 % observance of these values in the context of process monitoring. This takes place with the correctly chosen testing systems without damage to the socket. However, ODU points out that incorrectly chosen test systems (e.g. test pin) or

processing methods (e.g. test speed) following packaging can damage the sockets / pins. Please note the instructions in the assembly instructions (www.odu-connectors.com/downloads/assembly-instructions).

We recommend using suitable test adapters here.



CRIMP INFORMATION

ODU-MAC® **Silver-Line**

Contact diameter	Termination cross-section ¹		8-pt-crimping tool 080.000.051.000.000 without positioner Positioner 080.000.051.101.000	8-pt-crimping tool 080.000.057.000.000 without positioner Positioner 080.000.057.101.000	Crimping tool for coax 080.000.039.000.000	Hexagonal crimping tool
	mm	AWG	mm²	position / adjustment dim.	position / adjustment dim.	Crimping jaws
0.76	24 – 28	0.25 – 0.08	1 / 0.67	—	—	—
1.02			2 / 0.67	—		—
1.50			3 / 0.67	—		—
0.70	26 – 28	—	—	—	—	—
0.70	22 – 24		—	—	—	—
0.76	22	0.38	1 / 0.67	—	—	—
1.02	20 – 22	0.5 – 0.38	2 / 0.92	—	—	—
1.50			3 / 0.92	—		—
2.41			4 / 0.92	—		—
3.00			5 / 0.92	—		—
1.50	18	1.00 – 0.75	3 / 1.12	—	—	—
2.41			4 / 1.12	—		—
3.00			5 / 1.12	—		—
1.50	16	—	3 / 1.42	10 / 1.42 ²	—	—
1.50	—	1.50	3 / 1.32	10 / 1.42 ²	—	—
2.41			4 / 1.32	9 / 1.42 ²		—
3.00			5 / 1.32	6 / 1.42 ²		—
1.50	14	—	3 / 1.42	10 / 1.42 ²	—	—
2.41			4 / 1.42	9 / 1.42 ²		—
3.00			5 / 1.42	6 / 1.42 ²		—
2.41	—	2.50	—	9 / 1.67 ²	—	—
3.00			—	6 / 1.67 ²		
2.41	12 [7 – 20]	—	—	9 / 2.12 ²	—	Profile no. 2
2.41	12 [19 – 26]	—	—	9 / 1.92 ²	—	Profile no. 2
3.00	—	4.00	—	6 / 2.12 ²	—	Profile no. 3
5.00			—	—		
3.00	—	6.00	—	8 / 2.22 ²	—	Profile no. 3
5.00	—		—	—		
5.00	—	10.00	—	—	—	—
5.00	—	16.00	—	—	—	—
8.00	—	16.00	—	—	—	—
8.00	—	25.00	—	—	—	—
10.00			—	—		—
12.00			—	—		—
10.00	—	35.00	—	—	—	—
12.00			—	—		—
12.00	—	50.00	—	—	—	—
RG 178 / RG 196			—	—	082.000.039.101.000	—
RG 174 / RG 188 / RG 316 / RG 179 / RG 187			—	—	082.000.039.102.000	—
G 02232 D / K 02252 D			—	—	082.000.039.103.000	—
RG 122 / 2YCY 0.4 / 2.5			—	—	082.000.039.104.000	—
RG 58 / G 03233 (H&S)			—	—	082.000.039.106.000	—
RG 223			—	—	082.000.039.108.000	—
RG 59			—	—	082.000.039.109.000	—

CRIMP INFORMATION

ODU-MAC® **Silver-Line**

Contact diameter	Termination cross-section ¹		Hexagonal crimping tool 080.000.064.000.000	Hand crimping tool stamped contacts	Hand crimping tool stamped contacts
mm	AWG	mm ²	Crimping jaws		Spool goods
0.76	24 – 28	0.25 – 0.08	–	–	–
1.02			–	–	–
1.50	24 – 28	0.25 – 0.08	–	–	–
0.70	26 – 28	–	–	080.000.040.000.000	080.000.041.000.000
0.70	22 – 24		–	080.000.040.000.000	080.000.041.000.000
0.76	22	0.38	–	–	–
1.02	20 – 22	0.5 – 0.38	–	–	–
1.50			–	–	–
2.41			–	–	–
3.00			–	–	–
1.50	18	1 – 0.75	–	–	–
2.41			–	–	–
3.00			–	–	–
1.50	16	–	–	–	–
1.50	–	1.5	–	–	–
2.41			–	–	–
3.00			–	–	–
1.5	14	–	–	–	–
2.41			–	–	–
3.00			–	–	–
2.41	–	2.5	–	–	–
3.00			–	–	–
2.41	12{7 – 20}	–	–	–	–
2.41	12{19 – 26}	–	–	–	–
3.00	–	4	–	–	–
5.00	–		–	–	–
3.00	–	6	–	–	–
5.00	–	10	080.000.064.110.000	–	–
5.00	–	16	080.000.064.101.000	–	–
8.00	–	16	080.000.064.116.000	–	–
8.00	–	25	–	–	–
10.00			080.000.064.125.000	–	–
12.00			–	–	–
10.00	–	35	080.000.064.135.000	–	–
12.00			–	–	–
12.00	–	50	080.000.064.150.000	–	–

CRIMP INFORMATION FOR THERMOCONTACT

Description	Part number
Crimping tool for thermocontacts	080.000.071.000.000

¹ The listed cross section correspond to a finely stranded conductor design according to DIN EN IEC 60228 VDE 0295:2024-12 class 5 or a finely stranded conductor design (7- / 19-stranded) according to AWG ASTM B258:2018 | ² Recommended by ODU as a standard tool and setting

CRIMP INFORMATION

ODU DOCK SIZE 1

Contact diameter mm	Termination cross-section ¹		Stripping length mm	8-pt-crimping tool 080.000.051.000.000 without positioner	Hexagonal crimping tool 080.000.062.000.000 Profile no. / Check gauge X
	AWG	mm ²		Positioner 080.000.051.103.000 position / adjustment dim. Y	
0.76	24 / 28	0.08 – 0.25	4.3 ± 0.5	1 / 0.67	–
1.02					
0.76	22	0.38	4.3 ± 0.5	1 / 0.67	–
1.02	20 / 22	0.38 – 0.50	4.6 ± 0.5	2 / 0.92	–
2.00			5.5 ± 0.5	4 / 0.92	–
1.02	–	1.00	4.7 ± 0.5	2 / 1.12	–
2.00			7.0 ± 1.0	4 / 1.12	–
1.50	–	1.50	5.0 ± 0.5	3 / 1.42 ²	1 / 2.15 ± 0.05
2.00			7.0 ± 1.0	4 / 1.42 ²	
3.00			8.0 ± 1.0	5 / 1.42 ²	
2.00	–	2.50	7.0 ± 1.0	4 / 1.62	–
3.00			8.5 ± 1.0	5 / 1.62 ²	2 / 2.8 ± 0.05

ODU DOCK SIZE 2

Contact diameter mm	Termination cross-section ¹		Stripping length mm	8-pt-crimping tool 080.000.051.000.000 without positioner	Hexagonal crimping tool 080.000.062.000.000 Profile no. / Check gauge X
	AWG	mm ²		Positioner 080.000.051.103.000 position / adjustment dim. Y	
2.00	–	1.0	7.0 ± 1.0	4 / 1.12	1 / 2.15 ± 0.05
1.50 (socket)	–	1.5	5.0 ± 0.5	3 / 1.42 ²	
1.50 (pin)			8.0 ± 1.0	6 / 1.42 ²	
2.00			7.0 ± 1.0	4 / 1.42 ²	
3.00			8.0 ± 1.0	5 / 1.42 ²	
3.00	–	2.5	8.5 ± 1.0	5 / 1.62 ²	2 / 2.8 ± 0.05
3.00	–	4.0	8.5 ± 1.0	–	3 / 3.5 ± 0.05

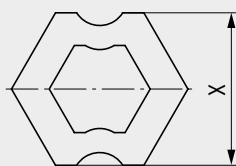
¹ The listed cross section correspond to a finely stranded conductor design according to DIN EN IEC 60228 VDE 0295:2024-12 class 5 or a finely stranded conductor design (7- / 19-stranded) according to AWG ASTM B258:2018 | ² Recommended by ODU as a standard tool and setting

CRIMP INFORMATION

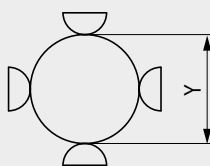
ODU DOCK **Silver-Line** SIZE 3

Contact diameter mm	Termination cross-section ¹		Stripping length mm	8-pt-crimping tool 080.000.051.000.000 without positioner Positioner 080.000.051.104.000 position (socket / PE-socket / pin) / adjustment dim. Y	Hexagonal crimping tool 080.000.062.000.000 Profile no.	Hexagonal crimping tool 080.000.026.000.000 Crimping jaws / Check gauge X
	AWG	mm ²				
1.50	24 / 28	0.08 – 0.25	8.0 ± 1.0	{1 / – / 2} / 0.67	–	–
1.50	–	0.38 – 0.50	8.0 ± 1.0	{1 / – / 2} / 0.92	–	–
1.50	–	1.50	8.0 ± 1.0	{1 / – / 2} / 1.42 ²	1 2.15 ± 0.05	–
3.00				{3 / 8 / 5} / 1.42 ²		–
5.00			10.0 ± 1.0	–		–
1.50	–	2.50	8.0 ± 1.0	–	2 2.80 ± 0.05	–
3.00			8.5 ± 1.0	{3 / 8 / 5} / 1.62 ²		–
6.00			9.5 ± 1.0	–		–
3.00	–	4.00	9.5 ± 1.0	–	3 3.50 ± 0.05	–
5.00				–		–
5.00	–	6.00	10.0 ± 1.0	–	4 3.50 ± 0.05	–
6.00			10.0 ± 1.0	–		–
5.00	–	10.00	11.0 ± 1.0	–	–	080.000.026.110.000 5.4 ± 0.05
6.00	–	16.00	13.5 ± 2.0	–	–	080.000.026.116.000 6.5 ± 0.05

CHECK GAUGE (CONTACT)



ADJUSTMENT DIMENSION (TOOL)



FOR ALL SIZES

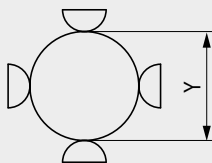
¹ The listed cross section correspond to a finely stranded conductor design according to DIN EN IEC 60228 VDE 0295:2024-12 class 5 or a finely stranded conductor design {7- / 19-stranded} according to AWG ASTM B258:2018 | ² Recommended by ODU as a standard tool and setting

CRIMP INFORMATION

ODU DOCK **Silver-Line** QCH SIZE 1 / 2 / 3

Contact diameter mm	Termination cross-section ¹		Stripping length mm	8-pt-crimping tool 080.000.051.100.000 without positioner		8-pt-crimping tool 080.000.038.000.000 without positioner	8-pt-crimping tool 080.000.057.000.000 without positioner
	AWG	mm ²		Positioner 080.000.051.105.000 position / adjustment dim. Y	Positioner 080.000.051.103.000 Position / adjustment dim. Y	Positioner 080.000.038.200.000 Position	Positioner 080.000.057.101.000 Position / adjustment dim. Y
0.90	22 / 26	0.38 – 0.15	4.2 ± 0.5	4 / 0.67	–	–	–
0.90	18 – 20	1.00 – 0.50	4.1 ± 0.5	4 / 1.12	–	–	–
1.50	24 – 28	0.25 – 0.08	5.5 ± 1.0	–	4 / 0.67	–	–
1.50	–	0.50	7.0 ± 1.0	–	4 / 1.02 ²	4	–
1.50	20	–	7.0 ± 1.0	–	4 / 1.07 ²	4	–
1.50	–	0.75	7.0 ± 1.0	–	4 / 1.12 ²	5	–
1.50	18	1.00	7.0 ± 1.0	–	4 / 1.12 ²	5	–
1.50	–	1.50	7.0 ± 1.0	–	Lamella 4 / 1.22	6	–
					Springwire 4 / 1.32 ²		
1.50	14	–	7.0 ± 1.0	–	4 / 1.37 ²	6	–
1.50	–	1.5	7.0 ± 1.0	–	–	–	3 / 1.42
1.50	–	2.5	7.0 ± 1.0	–	–	–	3 / 1.67
3.00	Insert size 2	20	0.50	4.5 ± 0.5	–	4	–
3.00		–	0.75	4.5 ± 0.5	–	5	–
3.00		18	1.00	4.5 ± 0.5	–	5	–
3.00		14	1.50	4.5 ± 0.5	–	6	–
3.00		–	2.50	4.5 ± 0.5	–	8	–
3.00		–	4.00	4.5 ± 0.5	–	8	–
3.00	Insert size 3	20	0.50	7.0 ± 1.0	–	–	6 / 1.05
3.00		–	0.75	7.0 ± 1.0	–	–	6 / 1.15
3.00		18	1.00	7.0 ± 1.0	–	–	6 / 1.25
3.00		14	1.50	7.0 ± 1.0	–	–	6 / 1.45
3.00		–	2.50	5.5 ± 0.5	–	–	6 / 1.80
3.00		–	4.00	5.5 ± 0.5	–	–	6 / 2.12

ADJUSTMENT DIMENSION (TOOL)



¹ The listed cross section corresponds to a finely stranded conductor design according to DIN EN IEC 60228 VDE 0295:2024-12 class 5 or a finely stranded conductor design [7- / 19-stranded] according to AWG ASTM B258:2018. | ² Recommended by ODU as a standard tool and setting

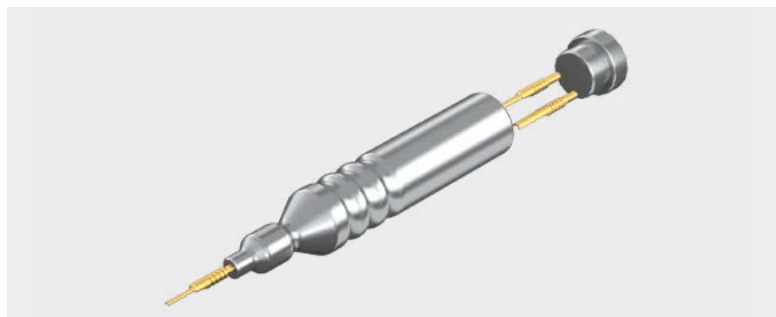
ASSEMBLY AID

ODU-MAC® **Silver-Line**

Description	Usage for	Part number	Nm	Recommended tightening torque
Torque wrench With cross handle, fixed, automatic release (for inner hexagonal bits with C6.3- or E6.3-shaft). Bit has to be ordered separately.		598.054.001.000.000	0.9	—
		598.054.002.000.000	1.2	—
		598.054.003.000.000	3.0	—
		598.054.004.000.000	1.5	—
		598.054.005.000.000	0.6	—
		598.054.006.000.000	2.2	—
		598.054.007.000.000	4.2	—
		598.054.011.000.000	3.5	—
Bit slot 2.5 [0.4 / 70]	Mounting of spindle coding	598.054.109.000.000	—	0.9 Nm ± 0.2 Nm
Bit slot 3.5 [0.5 / 50]	Screwing of the rails in the T frame	598.054.103.000.000	—	0.9 Nm ± 0.2 Nm
Bit slot 5.5 [0.8 / 50]	Screwing of the rails in the L frame	598.054.104.000.000	—	1.2 Nm ± 0.2 Nm
Bit slot 8 [1.2 / 50]	Mounting of frame coding (coded socket)	598.054.110.000.000	—	1.2 Nm ± 0.2 Nm
Special bit	Coding pin for frames in a housing	598.054.203.000.000	—	1.2 Nm ± 0.2 Nm
Bit combi slot size 1	Mounting screw on frames in a housing	598.054.102.000.000	—	1.2 Nm ± 0.2 Nm
Bit Phillips cross slot size 1	Grounding screw on frames in a housing and M+ / S+ frame	598.054.106.000.000	—	1.2 Nm ± 0.2 Nm
Bit Phillips cross slot size 1	Mounting of screw for grounding socket (P+ frame)	598.054.106.000.000	—	3.0 Nm ± 0.3 Nm
Bit Phillips cross slot size 1	Mounting of screw for grounding pin (P+ frame)	598.054.106.000.000	—	3.0 Nm ± 0.3 Nm
AF 8	Mounting of grounding socket P+ frame	598.054.111.000.000	—	3.5 Nm ± 0.4 Nm
AF 8	Mounting of grounding pin P+ frame	598.054.111.000.000	—	3.5 Nm ± 0.4 Nm
Bit Torx TX 8	Rails on frames in a housing	598.054.103.000.000	—	0.9 Nm ± 0.2 Nm
Bit Torx TX 10	Screwing of the rails in the S and M+ / S+ frame and spare spindle knob and PE module	598.054.104.000.000	—	1.2 Nm ± 0.2 Nm
Bit Torx TX 20	Screwing of the rails in the P+ frame / contact PE module	598.054.105.000.000	—	3.0 Nm ± 0.3 Nm
Bit Torx TX 10	High-Current contacts Ø 8	598.054.104.000.000	—	1.5 Nm ± 0.3 Nm
Bit Torx TX 20	High-Current contacts Ø 10 and Ø 12	598.054.105.000.000	—	2.2 Nm ± 0.2 Nm
Bit for coding pin	Mounting of coding pins	598.054.203.000.000	—	1.2 Nm ± 0.2 Nm
Distance spacer / QCH	S frame for quick-change head and rear mounting panel	598.054.204.000.000	—	1.5 Nm ± 0.3 Nm
Receiving of back nut	Mounting, shielded implementation size 0	598.055.002.000.000	—	0.6 Nm ± 0.1 Nm
Receiving of back nut	Mounting, shielded implementation size 0 for cable diameters from 5.5 to 6.5 mm	598.055.001.000.00	—	1.0 Nm ± 0.1 Nm
Receiving of back nut	Mounting, shielded implementation size 1	598.055.001.000.000	—	1.0 Nm ± 0.2 Nm
Receiving of back nut	Mounting, shielded implementation size 2	598.055.003.000.000	—	2.0 Nm ± 0.2 Nm
Receiving of back nut	Mounting, shielded implementation size 3	598.055.004.000.000	—	3.5 Nm ± 0.3 Nm

ASSEMBLY AID

ODU-MAC[®] AND ODU DOCK **Silver-Line**



INSERTION TOOL Ø 0.76 – 1.5 mm

For assembly aid of contacts with flexible / thin conductors (pin and socket side).

PART NUMBER: 085.611.001.001.000

Contact Ø	Assembly tool High-Current	Assembly aid insertion tool	Assembly aid ODU DOCK QCH
0.76	–	085.611.001.001.000	–
1.02	–	085.611.001.001.000	–
1.50	–	085.611.001.001.000	–
8.00	598.054.004.000.000 598.054.104.000.000	–	–
12 / 10	598.054.006.000.000 598.054.105.000.000	–	–

REMOVAL AND ASSEMBLY OF CONTACTS IS ONLY POSSIBLE WITH ODU TOOLS.

REMOVAL OF CONTACTS

ODU-MAC® AND ODU DOCK **Silver-Line**



REMOVAL TOOL I

Removal of the already assembled contact (incl. cable):
The removal tool is pressed from behind into the insulator until a quiet click is heard. The contact is removed from the insulator by pulling on the cable or by lightly pressing the contact with the extraction tools.



REMOVAL TOOL II

Removal of the still unassembled contact (without cable, which may have to be cut off). The removal tool is pressed from behind into the insulator until a quiet click is heard. The contact can be removed from the insulator by lightly pushing it with the extraction tools.

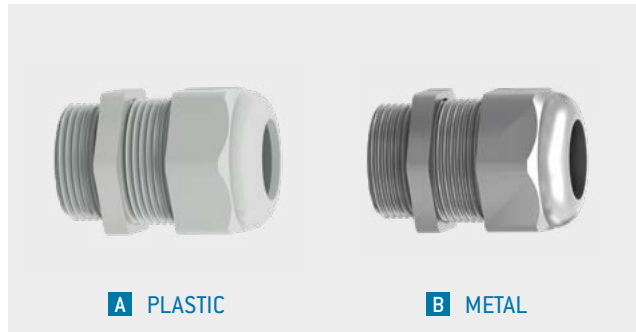
REMOVAL ONLY POSSIBLE WITH ODU TOOLS.

Contact Ø	Removal tool I straight	Removal tool I angled	Removal tool II	Removal tool	Removal tool ODU DOCK QCH
0.76	—	087.170.361.000.000	087.611.001.001.000	—	—
1.00	087.170.999.000.000	—	087.611.001.003.000	—	—
1.02	—	087.170.362.000.000	087.611.001.001.000	—	—
1.50	087.170.138.000.000	087.170.363.000.000 ^{1,2}	087.611.001.001.000	—	087.170.323.000.000
2.00	—	087.170.364.000.000	—	—	—
2.41	087.170.139.000.000	087.170.365.000.000	087.611.001.001.000	—	—
3.00	087.170.136.000.000	087.170.366.000.000 ^{1,2}	087.611.001.001.000	—	087.178.057.000.000
5.00	—	—	—	087.170.391.000.000	—
Coax 50 Ω 4 contacts	087.170.139.000.000	087.170.365.000.000	087.611.001.001.000 ²	—	—
Coax 50 Ω 2 contacts	—	—	—	087.170.391.000.000	—
Coax 50 Ω 2 contacts SMA	—	—	—	087.122.349.000.000	—
Coax 75 Ω 2 contacts	—	—	—	087.170.391.000.000	—
Fiber optic 5 contacts	—	—	087.611.001.002.000	—	—
Fiber optic 4 contacts	—	—	087.7CC.125.001.000	—	—
Fiber optic 3 contacts	087.170.136.000.000	—	—	—	—
Fluid 1 contact	—	—	—	087.196.050.000.000	—

¹ In use with high-voltage module, 4 contacts, (see page [80](#)) the angled version cannot be used | ² For ODU DOCK: Only straight removal tool can be used

CABLE CLAMP AND LOCKNUT

CABLE CLAMP¹ FOR STRAIN RELIEF HOUSING ACCORDING TO IEC 62444:2010 (VDE 0619:2014-05)



TECHNICAL DATA TYPE A	
Material Body	PA
Sealing	NBR; sealing material
Protection class	IP68 to 5 bar
Temperature range	-40 °C to +100 °C

TECHNICAL DATA TYPE B	
Material Body	Nickel-plated brass
Sealing	NBR; sealing material
Protection class	IP68 to 10 bar
Temperature range	-40 °C to +100 °C

Part number	Thread	Product	Material	Color	Width across flats	Cable diameter mm	
						min.	max.
027.820.070.130.007	M20 × 1.5	ODU DOCK size 1	Plastic	Gray	25	7	13
028.620.070.125.000	M20 × 1.5	ODU DOCK size 1	Metal	Brass	25	7	12.5
027.825.060.130.007	M25 × 1.5	ODU DOCK size 2	Plastic	Gray	30	6	13
027.825.090.170.007	M25 × 1.5	ODU DOCK size 2	Plastic	Gray	30	9	17
028.625.070.125.000	M25 × 1.5	ODU DOCK size 2	Metal	Brass	30	7	12.5
028.625.090.165.000	M25 × 1.5	ODU DOCK size 2	Metal	Brass	30	9	16.5
027.832.070.150.007	M32 × 1.5	ODU DOCK size 3 Strain relief housing	Plastic	Gray	36	7	15
027.832.110.210.007	M32 × 1.5	ODU DOCK size 3 Strain relief housing	Plastic	Gray	36	11	21
028.632.090.165.000	M32 × 1.5	ODU DOCK size 3	Metal	Brass	36	9	16.5
028.632.110.210.000	M32 × 1.5	ODU DOCK size 3	Metal	Brass	36	11	21
027.832.070.150.003	M32 × 1.5	Strain relief housing	Plastic	White	36	7	15
027.832.110.210.003	M32 × 1.5	Strain relief housing	Plastic	White	36	11	21
027.832.070.150.008	M32 × 1.5	Strain relief housing	Plastic	Black	36	7	15
027.832.110.210.008	M32 × 1.5	Strain relief housing	Plastic	Black	36	11	21
027.840.190.280.003	M40 × 1.5	Strain relief housing	Plastic	White	46	19	28
027.840.190.280.008	M40 × 1.5	Strain relief housing	Plastic	Black	46	19	28

LOCKNUT FOR CABLE CLAMP



TECHNICAL DATA

Material Nickel-plated brass

Part number	Thread
931.000.003.000.112	M32 × 1.5
931.000.003.000.113	M40 × 1.5

For fixation of the cable clamp in the ODU-MAC® strain relief housing

¹ Cable clamp is not included in the scope of the housing delivery

SERVICE KIT FOR ODU SPRINGTAC® AND ODU LAMTAC® CONTACTS



Contact lubrication improves the mechanical properties of contact systems. Cleaning the contact surfaces prior to lubrication is also recommended in order to remove pollution. With appropriate care, wear due to high mating frequency can be significantly minimized and the mating and unmating forces reduced. The cleaning and lubricating interval must be individually adapted to circumstances and should only be carried out with products recommended by the contact manufacturer.

ODU has put together a service kit for this purpose, so that lubrication can be carried out directly on location. A cleaning brush and a special cleaning cloth, as well as precise instructions allow optimal care of the contacts. In the absence of other specifications, the service kit can be used for all ODU contacts and connections.

PART NUMBER: 170.000.000.000.100

For technical properties of the service kit please refer to our website: www.odu-connectors.com/downloads

CLEANING INFORMATION

Service manual 003.170.000.000.000

FURTHER INFORMATION

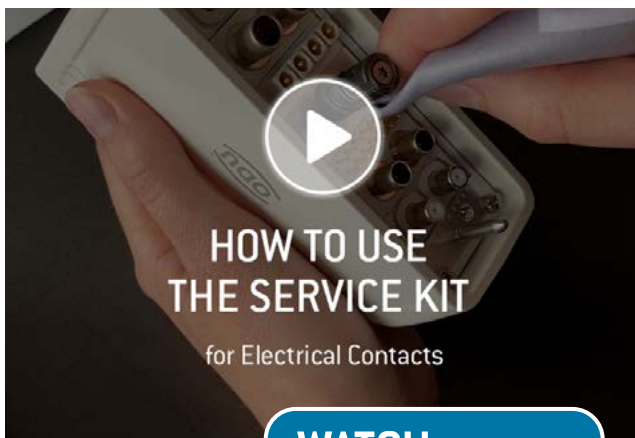
Never submerge the connector in liquid. The connector may only be put back into operation again when it has been assured that it is completely dry.

Ensure that contact pins are not bent or otherwise damaged. The connector may no longer be used when damage or other signs of wear are detected. Clean with maximum 2.5 bar compressed air to avoid contact damage. A slight blackening of the contact points may occur over the course of the service life and represents no impairment of the electrical properties.

Recommended cleaning agent

Soap: liquid soaps on sodium bicarbonate or potassium base.

Alcohol: ethanol 70 %, isopropyl alcohol 70 %.

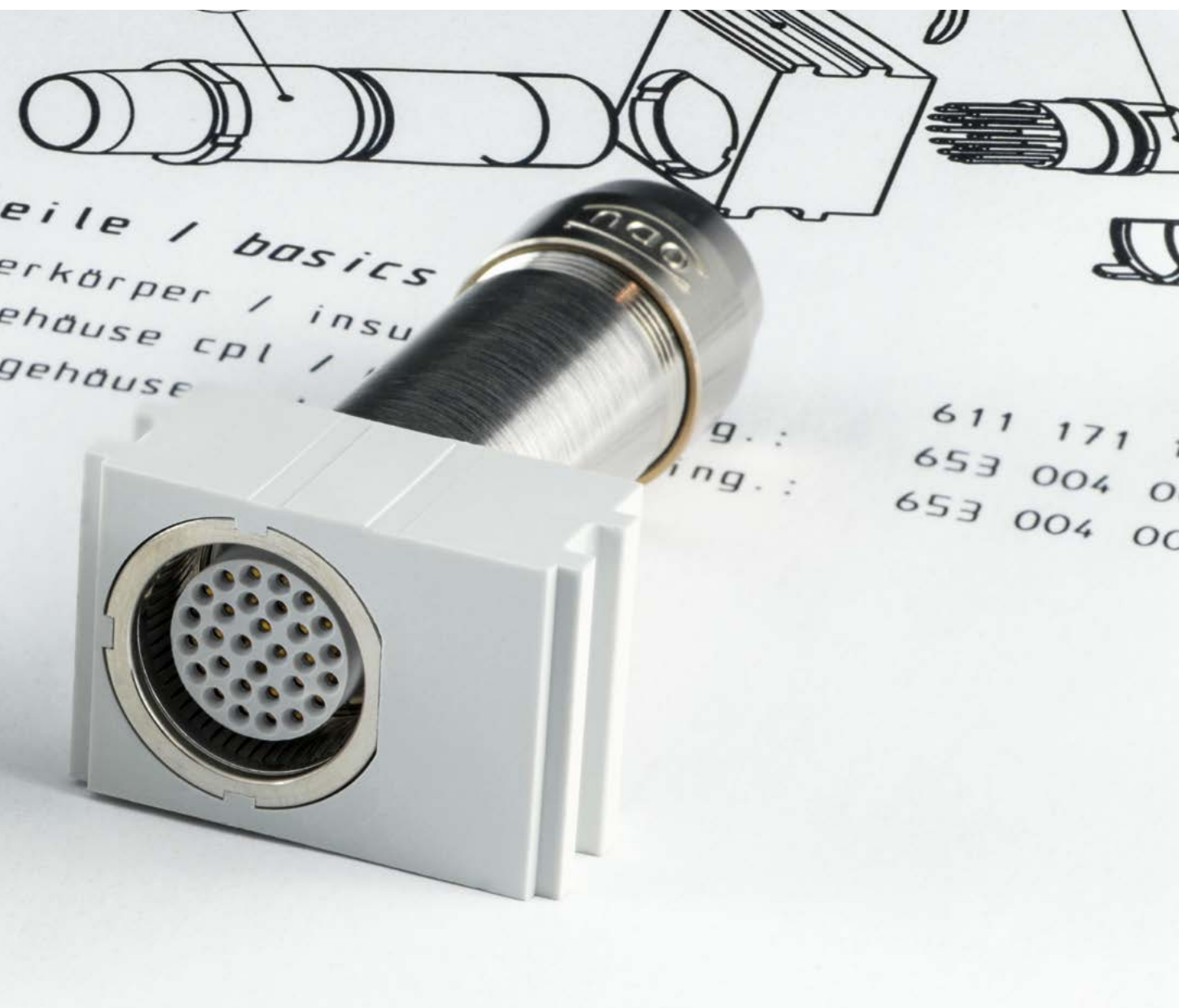


WATCH VIDEO *vimeo*

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ODU-MAC®

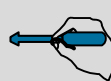
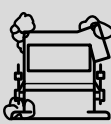
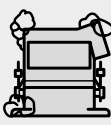


TECHNICAL INFORMATION

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INTERNATIONAL PROTECTION CLASSES

Acc. IEC 60529:2013 (VDE 0470-1:2014-09)

Code letters (International Protection)			First code number (Degrees of protection against access to hazardous parts respectively against solid foreign objects)	Second code number (Degrees of protection against water)		
IP			6	5		
Code number	Protection against access to hazardous parts / Protection against ingress of solid foreign objects			Code number	Protection against harmful effects due to the ingress of water	
0	No protection		No protection against contact / No protection against solid foreign objects	0	No protection against water	No protection against water
1	Protection against large foreign objects		Protection against contact with the back of the hand / Protection against solid foreign objects $\varnothing \geq 50 \text{ mm}$	1	Protection against dripping water	Protection against vertically falling waterdrops
2	Protection against medium-sized foreign objects		Protection against contact with the fingers / Protection against solid foreign objects $\varnothing \geq 12.5 \text{ mm}$	2	Protection against dripping water (tilted)	Protection against falling waterdrops when tilted (any angle up to 15° from the vertical)
3	Protection against small foreign objects		Protection against contact with tools / Protection against solid foreign objects $\varnothing \geq 2.5 \text{ mm}$	3	Protection against spray water	Protection against spray water (any angle up to 60° from the vertical)
4	Protection against granular foreign objects		Protection against contact with a wire / Protection against solid foreign objects $\varnothing \geq 1.0 \text{ mm}$	4	Protection against splashing water	Protection against splashing water from all directions
5	Dustproof		Protection against contact with a wire / Protection against uncontrolled ingress of dust	5	Protection against water jet	Protection against water jet from all directions
6	Dustproof		Protection against contact with a wire / Complete protection against ingress of dust	6	Protection against powerful water jet	Protection against powerful water jet from all directions
—	—	—	—	7	Protection against the effects of temporary immersion in water	Protection against ingress of harmful quantities of water by temporary submersion into water
—	—	—	—	8	Protection against the effects of continuous immersion in water	Protection against ingress of harmful quantities of water by continuous submersion into water
—	—	—	—	9	Protection against high pressure and high water jet temperatures	Protection against water from all directions by high pressure and high temperatures

EXPLANATIONS AND INFORMATION ON SAFETY REQUIREMENTS, TESTS, AND VOLTAGE DATA

GENERAL

All the technical information listed in this catalog and the data sheets has been determined by drawing on various standards. Unless otherwise stated, standard IEC 61984:2008 (VDE 0627:2009-11) "Connectors – Safety requirements and tests" has been used to dimension and determine the values provided.

This international standard applies to connectors with rated voltages of 50 V to 1,000 V AC and DC and rated currents up to 125 A per contact, for which either no detail specification exists or the detailed specification calls up this standard for safety aspects.

For connectors with rated voltage up to 50 V, this standard may be used as a guide. In this case, reference is made to IEC 60664-1 for clearance and creepage distances.

This standard may also be used as a guide for connectors with rated current higher than 125 A per pole.

A protective conductor termination is mandatorily required, if the "limits for TOUCHABLE PARTS" described in the respective standards are exceeded and no other protective measures against electric shock have been taken. In any case, before commissioning, a check of the protective connection and all TOUCHABLE PARTS must be carried out according to the relevant standards.

When mated, the housings listed in this data sheet correspond to the requirements specified in IEC 61984:2008 with regard to protection against contact in accordance with IEC 61984:2008. When using mounting housings or comparable device parts without complete IP protection in the cable connection area or when using the connectors without housing, the required touch protection according to DIN EN 61984 VDE 0627:2009-11 must be provided by the customer (e.g. by suitable installation in the control cabinet with IP degree of protection). Suitable strain relief of the individual conductors / cables is recommended.

In the ODU-MAC® Silver- / White-Line product portfolio we explicitly recommend that the modules are purchased assembled with the frames in order to prevent possible errors in the assembly process.

Only in exceptional cases we can supply individual parts. However we cannot take any liability therefore.

We would like to emphasize the usage of our ODU tools, as well as our current assembly instructions in the download area: odu-connectors.com/silver-white-line-instructions

All the connectors and cable assemblies shown here are without breaking capacity (COC) according to IEC 61984:2008 (VDE 0627:2009-11).

All of the voltage data listed in this catalog refers to the use of insulators, which have been installed according to assembly regulations for the ODU-MAC portfolio. Customer-specific attachments, which could reduce the clearance and creepage distances, have not been taken into account here.

The clearance and creepage distances are determined as specified in IEC 60664-1:2020 (VDE 0110-1:2022-07). The most important variables that influence safety together with the matching electrical parameters are explained in more detail below in the section IEC 60664-1:2020 (VDE 0110-1:2022-07) "Insulation coordination for equipment within low-voltage systems".

We would be happy to assist you with any further questions. The texts and tables given here are excerpts from the indicated standards. As a rule, product committees lay down application-specific safety requirements for various fields of use; these requirements also regulate the insulation coordination and inspection of connectors.

In such cases, the "product standards" take precedence and must be observed instead of the "basic safety standards" stated here. Since this catalog cannot take all product standards into consideration, the following standard in terms of voltage data is used:

IEC 60664-1:2020 (VDE 0110-1:2022-07) "INSULATION COORDINATION FOR EQUIPMENT WITHIN LOW-VOLTAGE SYSTEMS"

This is what is known as a basic safety standard, which regulates the minimum requirements for dimensioning clearance and creepage distances, as well as their inspection. The standard applies to equipment used up to an altitude of 2,000 m above sea level and with a rated alternating voltage of up to 1,000 V and a nominal frequency of up to 30 kHz or a rated

direct voltage of up to 1,500 V. It applies in those cases where corresponding product standards do not define any values for clearance and creepage distances, nor lay down any requirements for solid insulation, or where no product standards are even available.

The permissible overvoltages and rated voltages may be significantly influenced by the use of blank or pin protection modules as well as varying positioning of the contacts in the insulators.

The following general specifications have been defined for dimensioning:

- **Insulation** between electrical circuits (functional insulation between the contacts) or between an electrical circuit and local ground (contact with grounded frame) has been dimensioned as **basic insulation**. If “**double insulation**” or “**reinforced insulation**” is required, the voltage data provided may no longer apply; insulating clearances may need to be extended.
- If not noted otherwise, all voltage is in rms value
- **Overvoltage category III** is used, along with the TT and TN system types, to dimension the rated impulse voltage
- Condition A is always used for the inhomogeneous field when dimensioning the clearance distances used
- The inspections prescribed for solid insulation and for clearance distances (if necessary) shall be carried out in accordance to the tables shown in annex F
- Unless otherwise noted, all values for test voltages are values for type tests
- The clearance and creepage distances are determined on the bases specified in this standard

OPERATING VOLTAGE / RATED VOLTAGE / NOMINAL VOLTAGE

The **max. operating voltage** (= rated voltage) is the value of a voltage that is specified by the manufacturer for a component, device, or item of equipment according to various applicable standards, and to which the operating and performance features relate. Some standards use the term “rated voltage” or “working voltage” instead of “operating voltage”. In these explanations, the term “nominal voltage” is used for the value of the issued voltage indicated by the power supply company (PSC) or by the manufacturer of the voltage source for classification of the overvoltage category.

RATED IMPULSE VOLTAGE

Value of an impulse withstand voltage that is indicated by the manufacturer for an operating medium or a part of this, and which indicates the defined endurance of its insulation against transient (brief, duration of a few milliseconds) overvoltages. The impulse withstand voltage is the highest value of the surge voltage of a defined form and polarity which will not result in the dielectric breakdown of the insulation under defined conditions.

Depending on the indicated pollution degree, the rated surge voltage varies in accordance with the clearance distance between the individual contacts or contacts to the housing. The rated surge voltage may be influenced significantly by the usage of blank or pin protection modules as well as varied positioning of the contacts in the insulators, (see Table F.2 in IEC 60664-1:2020 [VDE 0110-1:2022-07]).

According to this standard, the minimum clearance distances for equipment not connected directly to the low voltage mains should be measured according to the possible permanent voltages, the temporary overvoltages, or periodic peak voltages (see Table F.8 in IEC 60664-1:2020 [VDE 0110-1:2022-07]).

If a “periodic peak voltage” is present for a long time over the service life (more than approximately 60 minutes), this is not an overvoltage as regards insulation dimensioning under the terms of the standard, but must be considered a continuous voltage instead. In such cases, the “periodic peak voltage” must be used as the operating voltage.

INFLUENCE OF POLLUTION DEGREE ON THE INSULATION COORDINATION

Any pollution combined with moisture can influence the insulation capacity on the surface of the connector. In order to define various rating parameters, a pollution degree must be selected for the equipment according to the criteria listed below.

In the case of a connector with a degree of protection of minimum IP54 IEC 60529:2013 [VDE 0470-1:2014-09], the insulating parts may be measured enclosed according to the standard for a low degree of pollution. This also applies for mated connectors for which enclosure is ensured by the connector housing and which are only disconnected for testing and maintenance purposes.

Degree of pollution 1

No or only dry, non-conductive pollution is present. The pollution has no influence. For example, computer systems and measuring devices in clean, dry or air-conditioned rooms.

Degree of pollution 2

Only non-conductive pollution is present. However, temporary conductivity due to condensation must be anticipated. For example, devices in laboratories, residential, sales and other business areas.

Degree of pollution 3

(= standard, if no special degree of pollution is indicated)
Conductive pollution occurs or dry, non-conductive pollution that becomes conductive because of dewfall must be expected. For example: Devices in industrial, commercial and agricultural operations, unheated storage areas and workshops.

Degree of pollution 4

Permanent conductivity is present, caused by conductive dust, rain or moisture. For example, devices in the open air or outdoor facilities and construction machinery.

Depending on the indicated degree of pollution, the rated voltage depends on the insulating material group of the connector and the respective creepage distances between the individual contacts.

CLEARANCE DISTANCE

The shortest distance in the air between two conductive parts.

CREEPAGE DISTANCE

The shortest distance between two conductive parts over the surface of an insulation material. The creepage distance is influenced by the degree of pollution applied.

TEST VOLTAGE

The dielectric strength of the connector is confirmed according to the standard corresponding to the indicated rated surge voltage by applying the test voltage according to table F.5 over a defined time range.

IEC 60664-1:2020 (VDE 0110-1:2022-07): TABLE F.6 – TEST VOLTAGES FOR TESTING CLEARANCE DISTANCES AT DIFFERENT ALTITUDES (THE VOLTAGE LEVELS ARE VALID ONLY TO VERIFY THE CLEARANCE DISTANCES).

Rated impulse voltage	Test impulse voltage at sea level	Test impulse voltage at 200 m elevation	Test impulse voltage at 500 m elevation
$\hat{U}$ kV	$\hat{U}$ kV	$\hat{U}$ kV	$\hat{U}$ kV
0.33	0.357	0.355	0.350
0.5	0.541	0.537	0.531
0.8	0.934	0.920	0.899
1.5	1.751	1.725	1.685
2.5	2.920	2.874	2.808
4	4.923	4.874	4.675
6	7.385	7.236	7.013
8	9.847	9.648	9.350
12	14.770	14.471	14.025
15	18.464	18.091	17.533

EXPLANATIONS AND INFORMATION ON VOLTAGE RATINGS FOR LOW VOLTAGE INSERTS

GENERAL WORKING VOLTAGE (RATED VOLTAGE)

All shown connectors and cable assemblies with the exemption of inserts with explicitly stated operating voltage (for example mains and high-voltage inserts) are default rated to fulfill safety extra low voltage (SELV), based on IEC 61140:2016 (VDE 0140-1:2016-11) "Protection against electric shock – Common aspects for installation and equipment". The connectors and cable assemblies are default rated to a voltage of less than 50 V AC / 75 V DC.

If the application requires a higher operating voltage and the standard EIA-364-20F:2019-02 is applicable, please refer to the following section.

In case other standards define a specific use of the connector, then the application specific safety criteria shall be considered first. These other standards must be evaluated during the engineering and design of the equipment.

VOLTAGE DATA ACCORDING TO "MIL"

EIA-364-20F:2019 "Withstanding Voltage – Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts"

The withstanding voltage values stated in this catalog were determined according to the method described in EIA-364-20F:2019 "Withstanding Voltage – Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts". The inserts were tested while mated, and the test current was applied to the pin insert.

75 % of the calculated dielectric withstanding voltage is used as the test voltage for further calculations. The operating voltage is 1/3 of this value.

This standard refers to IEC 60512-4-1:2003 "Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof".

Test voltage: dielectric withstanding voltage $\times 0.75$

Operating voltage: dielectric withstanding voltage $\times 0.75 \times 0.33$

If there are any deviations, the derating factors are to be factored in according to the applicable standards.

All tests were conducted at the prescribed indoor climate and apply up to an altitude of 2,000 m.

CONVERSIONS / AWG (AMERICAN WIRE GAUGE)

AWG	CIRCULAR WIRE		Cross-section mm ²	Weight kg/km	Max. resistance Ω/km
	Diameter Inch	Diameter mm			
4/0 [259/21]	0.6010	15.300	107.0	997.00	0.17
3/0 [259/22]	0.5360	13.600	85.0	793.00	0.22
2/0 [259/23]	0.4770	12.100	67.4	628.00	0.27
1/0 [259/24]	0.4240	10.800	53.5	497.00	0.34
1 [259/25]	0.3780	9.600	42.2	395.00	0.43
2 [259/26]	0.3350	8.500	33.6	312.00	0.55
4 [133/25]	0.2660	6.800	21.1	195.00	0.87
6 [133/27]	0.2100	5.300	13.3	122.00	1.38
8 [133/29]	0.1670	4.200	8.37	76.80	2.18
10 [1]	0.1019	2.590	5.26	46.77	3.45
10 [37/26]	0.1150	2.921	4.74	42.10	4.13
12 [1]	0.0808	2.050	3.31	29.41	5.45
12 [19/25]	0.0930	2.362	3.08	27.36	5.94
12 [37/28]	0.0910	2.311	2.97	26.45	6.36
14 [1]	0.0641	1.630	2.08	18.51	8.79
14 [19/27]	0.0730	1.854	1.94	17.23	9.94
16 [1]	0.0508	1.290	1.31	11.625	13.94
16 [19/29]	0.0590	1.499	1.23	10.928	15.70
18 [1]	0.0403	1.020	0.823	7.316	22.18
20 [1]	0.0320	0.813	0.519	4.613	35.10
20 [7/28]	0.0390	0.991	0.563	5.003	34.10
20 [19/32]	0.0420	1.067	0.616	5.473	32.00
22 [1]	0.0253	0.643	0.324	2.883	57.70
22 [19/34]	0.0330	0.838	0.382	3.395	51.80
24 [1]	0.0201	0.511	0.205	1.820	91.20
24 [7/32]	0.0250	0.635	0.227	2.016	86.00
24 [19/36]	0.0270	0.686	0.241	2.145	83.30
26 [1]	0.0159	0.404	0.128	1.139	147.00
26 [7/34]	0.0200	0.508	0.141	1.251	140.00
26 [19/38]	0.0220	0.559	0.154	1.370	131.00
28 [1]	0.0126	0.320	0.0804	0.715	231.00
28 [7/36]	0.0160	0.406	0.0889	0.790	224.00
28 [19/40]	0.0170	0.432	0.0925	0.823	207.00
30 [1]	0.0100	0.254	0.0507	0.450	374.00
30 [7/38]	0.0130	0.330	0.0568	0.505	354.00
32 [1]	0.0080	0.203	0.0324	0.288	561.00
32 [7/40]	0.0110	0.279	0.0341	0.303	597.10
34 [1]	0.0063	0.160	0.0201	0.179	951.00
34 [7/42]	0.0070	0.180	0.0222	0.197	1,491.00
36 [1]	0.0050	0.127	0.0127	0.1126	1,519.00
36 [7/44]	0.0060	0.150	0.0142	0.1263	1,322.00

The American Wire Gauge (AWG) is based on the principle that the cross-section of the wire changes by 26 % from one gauge number to the next. The AWG numbers decrease as the wire diameter increases, while the AWG numbers increase as the wire diameter decreases. This only applies to solid wire.

However, stranded wire is predominately used in practice. This has the advantage of a longer service life under bending and vibration as well as greater flexibility in comparison with solid wire.

Stranded wires are made of multiple, smaller-gauge wires (higher AWG number). The stranded wire then receives the AWG numbers of a solid wire with the next closest cross-section to that of the stranded wire. In this case, the cross-section of the stranded wire refers to the sum of the copper cross-sections of the individual wires.

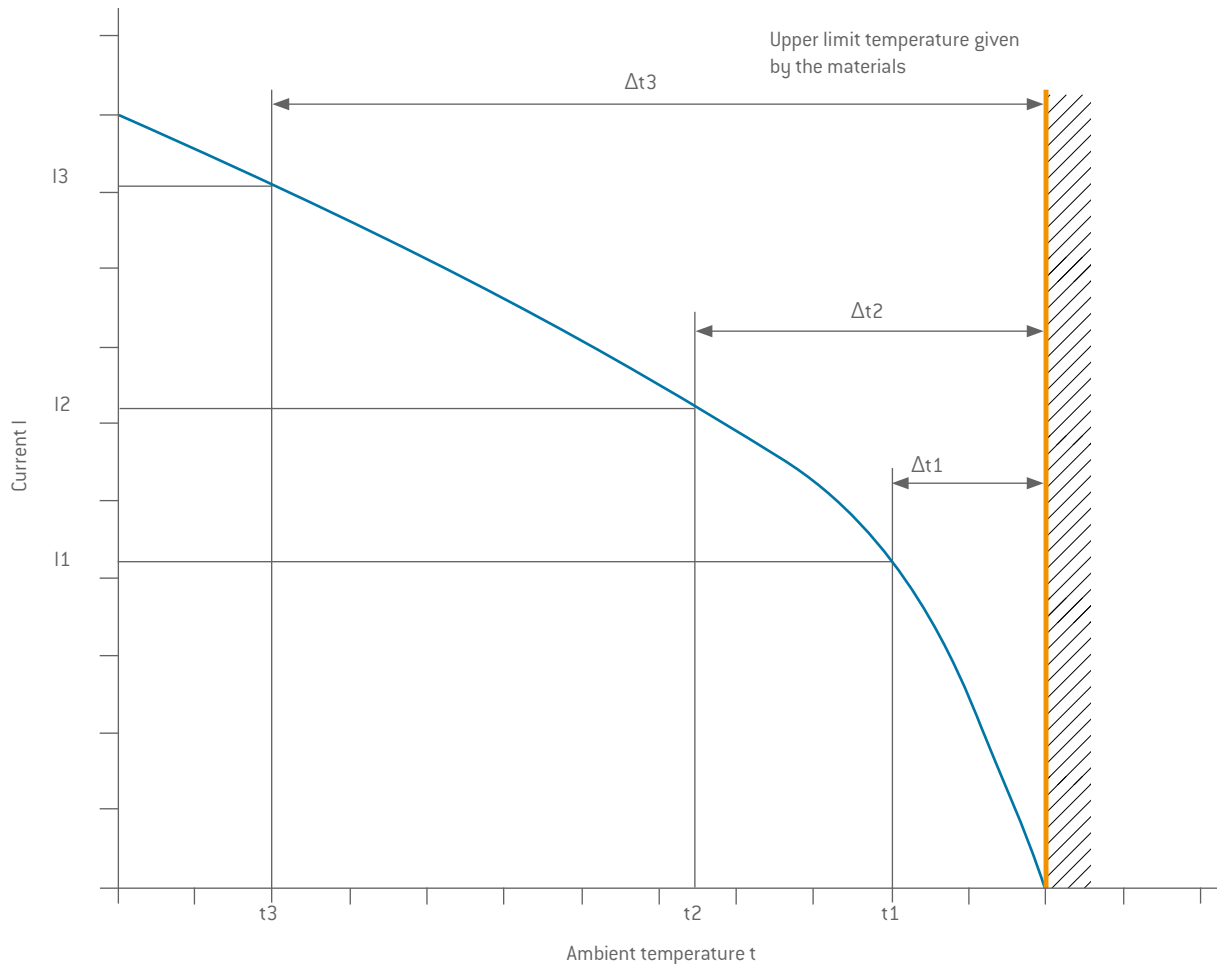
Accordingly, strands with the same AWG number but different numbers of wires differ in cross-section. For instance, an AWG 20 strand of 7 AWG 28 wires has a cross-section of 0.563 mm², while an AWG 20 strand of 19 AWG 32 wires has a cross-section of 0.616 mm².

Source: ASTM

BASE FOR CURRENT-CARRYING CAPACITY

Derating measurement procedure IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003-01)

STRUCTURE OF THE BASE CURRENT-CARRYING CAPACITY CURVE



The current-carrying capacity of a connector is determined by measurement. It is determined taking self-heating by current heat and the ambient temperature into account, and is limited by the thermal properties of the contact materials used. Their upper limit temperature may not be exceeded in the process.

The relationship between current, the resulting temperature increase, conditioned by the dissipation loss at the contact resistance, and the ambient temperature is represented in a curve. The curve is plotted in a linear coordinate system with current " I " as Y-axis and temperature " t " as X-axis. The upper limiting temperature forms the limit of the diagram.

Over three measurements, the temperature rise due to current heat (Δt) is measured respectively for different currents on minimum three connectors, and the resulting values are joined to produce the parabolic basic curve. The basic curve is then used to derive the corrected current-carrying capacity curve (derating curve). The safety factor ($0.8 \times I_n$) also makes allowance for factors such as manufacturing tolerances and uncertainties in temperature measurement or the measuring arrangement.

CURRENT LOAD

In dependence on DIN VDE 0276-1000:1995-06

RATED CURRENT (NOMINAL CURRENT)

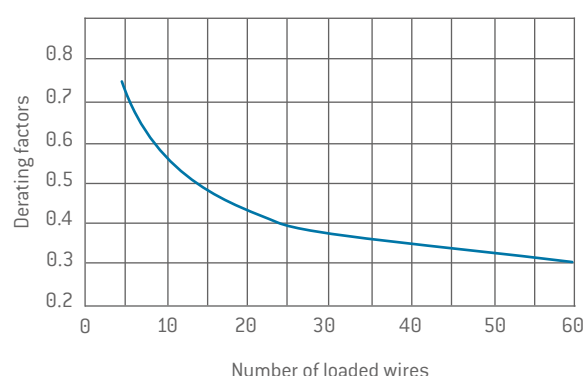
The metrologically determined current which is permitted to flow continuously through all contacts at the same time and will increase the contact temperature by 45 Kelvin. The amperage is determined according to the derating measurement method IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003-01) and derived from the derating curve. The values specified in the catalog apply to either individual contacts or completely assembled inserts / modules, as indicated.

DERATING FACTORS

In the case of multi-position connectors and cables, heating is greater than with individual contacts. It is therefore calculated with a derating factor.

There are no direct regulations for connectors in this context.

The derating factors for multi-core cables pursuant to DIN VDE 0298-4:2023-06 are applied. The derating factor assumes relevance as of 5 live wires.



Example:

VA cable with 24 wires is used (24 contacts). The nominal cross-section of a wire is 6 mm². A derating factor of 0.4 (e.g. cable installed in the open air) is to be presumed for the load reduction depending on the number of live cable wires. A 6 mm² Cu line (contact diameter 3.0 mm) can be used according to current-carrying capacity with 39 ampere. The 24 contacts plug can thus be loaded with a max. of 15.6 A/contact (0.4 × 39 A).

NOTE

Designs may differ depending on the wiring of the modules and be verified with a heating test.

MAX. CONTINUOUS CURRENT

The measured amperage at room temperature (approx. 20 °C) which increases the contact temperature to the limit temperature. The values specified in the catalog apply to either individual contacts or completely assembled inserts/modules, as indicated.

Number of loaded wires	Derating factor
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40
40	0.35
61	0.30

Load and derating factors

Multi-core plastic cable with conductor cross-section of 1.5 to 10 mm² when installed in the open air

CURRENT-CARRYING CAPACITY DIAGRAM

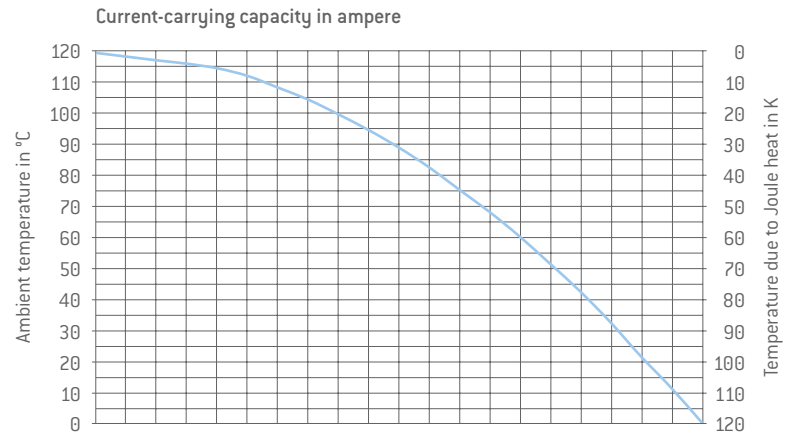
ODU-MAC® Silver-Line

FOR SINGLE CONTACTS

Measurement made in acc. with IEC 60512-5-2:2002
(DIN EN 60512-5-2:2003-01)
(derived base curve shown = $0.8 \times$ base curve).

Upper limit temperature: +120 °C

Termination with nominal cross-section



Contact	Contact Ø mm	Termination cross-section mm²	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
ODU SPRINGTAC®	0.76	0.25	0	1	2	3	4	5	6	7	8	9	10									
		0.38	0	1.5	2.5	3.5	5	6	7.5	8.5	9.5	11	12									
	1.02	0.25	0	1	2	3	4	5	6	7	8	9	10									
		0.5	0	1.5	3	4.5	6	7.5	9	10.5	12	13.5	14.5									
	1.5	0.25	0	1	2	3	4	5	6	7	8	9	10									
		0.5	0	1.5	3.5	5	6.5	8	10	11.5	13	15	16.5									
		1	0	2.5	5	7.5	10	12.5	15	17.5	19.5	22.5	24.5									
		AWG16	0	3	6	9	12	15	18	21	24	27	29.5									
		1.5	0	3	6	9	12	15	18	21	24	27	29.5									
	2.41	0.5	0	1.5	3.5	5	7	8.5	10.5	12	13.5	15.5	17									
		1	0	2.5	5.5	8	10.5	13	16	18.5	21	23.5	26									
		1.5	0	3	6	9	12	15	18	21	24	27	30									
		2.5	0	4	8	12	16	20	24	27.5	31.5	35.5	39									
		AWG12	0	4.5	9	13.5	18.5	23	28	32	36.5	41	45									
	3	0.5	0	2	4	5.5	7.5	9.5	11.5	13	15	17	18.5									
		1	0	2.5	5.5	8	11	13.5	16.5	19	21.5	24.5	27									
		1.5	0	3	6	9	12	15.5	19	22	25	28	31									
		2.5	0	4	8	12	16	20	25	29	33	37	41									
		4	0	6	13	19	25	32	39	45	51	58	64									
		6	0	6	13	19	25	32	39	45	51	58	64									
	5	4	0	6	13	19	25	32	39	45	51	58	64									
		6	0	7.5	15.5	23.5	31.5	39.5	47	55.5	63.5	72	79.5									
		10	0	11	21	32	42	53	65	75	85	97	106									
		16	0	13	26	39	52	65	80	93	106	119	130									
	8	10	0	11.5	23.5	35	46.5	58.5	71	82.5	94	105.5	117									
		16	0	14	28	42	56	70.5	85	94	103	111	123									
		25	0	17.5	35	52.5	70	87.5	105	117.5	130	142	155									
		10	0	12	24	36.5	48.5	61	74	83.5	93	102	112									
		16	0	15	29	44	59	74	90	104	118	133	147									
ODU LAMTAC®	10	25	0	17	34	52	69	87	105	121	137	154	171									
		25	0	18	36	54	72	90	110	126	144	164	180									
		35	0	20.5	41	61.5	82	102.5	125	143.5	164	187	205									
	12	25	0	19	38	56.5	75.5	94.5	115	132	151	172	189									
		35	0	22	44	66	88.5	110.5	135	155	178	203	221									
		50	0	25	51	76	101.5	127	155	178	203	231	254									
	12	25	0	16	32	48	64	79.5	95	112	129	150	165									
		35	0	19	38	57	76	95	115	134	154	175	192									
		50	0	21.5	43	64.5	86	108	130	152	174	200	220									

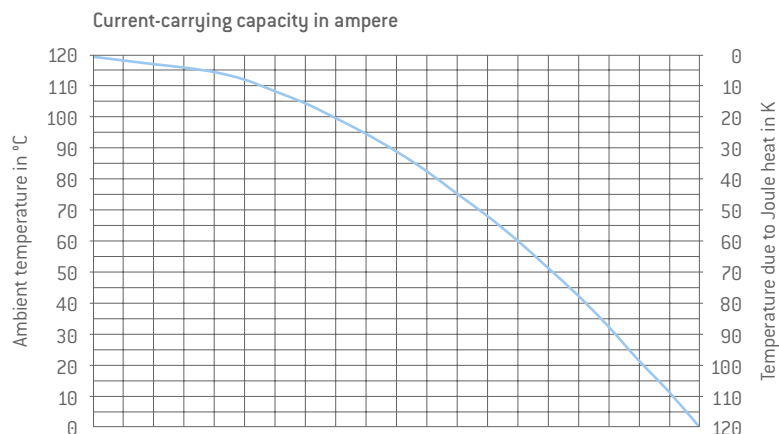
Nominal current

Max. continuous current

Measurement made in acc. with IEC 60512-5-2:2002
(DIN EN 60512-5-2:2003-01)
[derived base curve shown = $0.8 \times$ base curve].

The values of the 4 contact high-voltage module (page [80](#)) correspond to the values of the 5 contacts signal module (page [60](#)).

The values of the 3 contacts power module (page [66](#)) correspond to the values of the 3 contacts power module (page [64](#)).



Contact	Module	Contact Ø mm	Termination cross-section mm²	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I					
ODU SPRINGTAC®	10 contacts	0.76	0.25	0	1	2	3	3.5	4	5	6	7	8	8.5														
			0.38	0	I	1	I	2	I	3	I	4	I	5	I	6	I	7	I	8	I	9	I	10				
	20 contacts	0.76	0.25	0	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8	5.4	5.9														
			0.38	0	I	0.7	I	1.4	I	2.1	I	2.8	I	3.5	I	4.2	I	4.9	I	5.6	I	6.3	I	7				
	6 contacts	1.02	0.25	0	1	2	3	4	5	6	7.5	8.5	9.5	10.5														
			0.5	0	I	1.5	I	3	I	4.5	I	6	I	7	I	8	I	9.5	I	11	I	12.5	I	14				
	14 contacts	1.02	0.25	0	1	2	3	3.5	4.5	5	6	7	8	9														
			0.5	0	I	1.5	I	2.5	I	4	I	5	I	6	I	7	I	8.5	I	9.5	I	11	I	12				
	5 contacts	1.5	0.25	0	1	2	3	4	5	6	7.5	8.5	10	11														
			0.5	0	I	1.5	I	2.5	I	4	I	5	I	6.5	I	8	I	9	I	10.5	I	11.5	I	13				
			1	0	2	4.5	6.5	9	11	13	15	17.5	20	22														
			AWG16	0	I	2.5	I	5	I	7.5	I	10	I	12.5	I	14.5	I	17.5	I	20	I	22.5	I	25				
			1.5	0	2.5	5	7.5	10	12.5	14.5	17.5	20	22.5	25														
	4 contacts	2.41	0.5	0	I	1.5	I	3	I	4	I	5.5	I	7	I	8	I	9.5	I	11	I	12.5	I	14				
			1	0	2.5	5	7	9	11	13	15.5	18	20.5	23														
			1.5	0	I	2.5	I	5	I	7.5	I	10	I	12.5	I	15	I	18	I	21	I	24	I	27				
			2.5	0	3.5	7	10	13	16	19	22.5	26	29.5	33														
			AWG12	0	I	4	I	8	I	12.5	I	16.5	I	20.5	I	25	I	29	I	33	I	37	I	41				
	3 contacts	3	0.5	0	2	3.5	5	6.5	8	9.5	10.5	12	13	14.5														
			1	0	I	2.5	I	5	I	7	I	9.5	I	12	I	14	I	16.5	I	19	I	21.5	I	24				
			1.5	0	2.5	5.5	8	11	13.5	16	19	21.5	24.5	27														
			2.5	0	I	3.5	I	7	I	10.5	I	14	I	17.5	I	21	I	25	I	29	I	33	I	37				
			4	0	5	10	15	20	25	30	35.5	41	46.5	52														
			6	0	I	5	I	10	I	15	I	20	I	25	I	30	I	35.5	I	41	I	46.5	I	52				
	2 contacts	5	4	0	5.5	11	17	22.5	28	34	39.5	45	50.5	56														
			6	0	I	7	I	14	I	21	I	28.5	I	35.5	I	43	I	50	I	57.5	I	65	I	71.5				
			10	0	9.5	19	28	37.5	47	56.5	66	75	84.5	94														
			16	0	I	11.5	I	23	I	34.5	I	46	I	58	I	70	I	81	I	92	I	103	I	114				
	2 contacts	8	10	0	11.5	23	34.5	46	57.5	70	76	82	87	93														
			16	0	I	13	I	26	I	39.5	I	52.5	I	66	I	80	I	89	I	97	I	105	I	114				
			25	0	16.5	33	49.5	66	82.5	100	112	124	137	150														
	2 contacts	8	10	0	I	12	I	24	I	35.5	I	47	I	59	I	72	I	77	I	82	I	87	I	93				
			16	0	14	28	42	55.5	70	85	98	111	126	139														
			25	0	I	16	I	33	I	49	I	65	I	82	I	100	I	116	I	132	I	149	I	164				
	ODU LAMTAC®	2 contacts	8	10	Nominal current																		Max. continuous current					
	16																											
25																												

CURRENT-CARRYING CAPACITY DIAGRAM

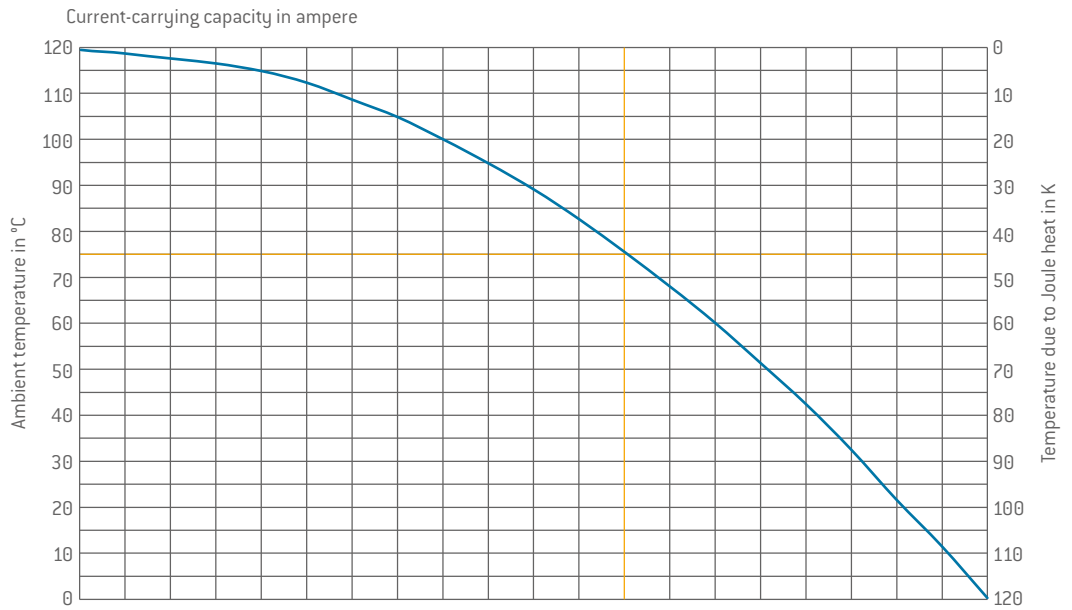
ODU DOCK

FOR FULLY EQUIPPED INSERTS

Measurement made in acc.
with IEC 60512-5-2:2002
(DIN EN 60512-5-2:2003-01)
[derived base curve
shown = 0.8 × base curve].

Upper limit temperature:
+120 °C

Termination with
nominal cross-section



Size	Inserts	Contact Ø mm	Termination cross-section mm ²																					
1	31 contacts	0.76	0.38	0	0.4		0.9		1.4		1.9		2.4		2.8		3.3		3.8		4.2		4.6	
1	19 contacts	1	0.5	0		0.6		1.3		1.9		2.5		3.1		3.8		4.4		5		5.7		6.3
1/QCH	19 contacts	1	1	0	0.9		1.8		2.8		3.8		4.8		5.8		6.7		7.6		8.6		9.5	
1	12 contacts	1.02	0.5	0		0.8		1.6		2.3		3		3.7		4.4		5.1		5.8		6.6		7.4
1	12 contacts	1.5	1.5	0	1.2		2.4		3.7		4.9		6.1		7.3		8.5		9.8		11		12.3	
1	7 contacts	2	1.5	0		1.9		3.8		5.8		7.8		9.8		11.8		13.8		15.7		17.6		19.5
1	3 contacts	3	2.5	0	3.4		6.8		10.1		13.4		16.7		20		23.3		26.6		29.8		33.1	
2	16 contacts	2	1.5	0		1.7		3.4		5		6.6		8.3		10		11.6		13.2		14.9		16.5
2	7 contacts	3	2.5	0	3.1		6.2		9.3		12.4		15.5		18.6		21.7		24.8		27.8		30.8	
3	37 contacts	1.5	1.5	0		2.2		4.4		6.6		8.8		11		13.2		15.3		17.5		19.7		21.8
3	14 contacts	3	4	0	3.4		6.8		10.2		13.7		17.2		20.6		24		27.4		30.8		34.3	
3/QCH	14 contacts	3	4	0		3.8		7.9		11.4		15.2		19		22.8		26.6		30.4		34.1		37.8
3	7 contacts	5	10	0	7.1		14.1		21.2		28.3		35.4		42.5		49.5		56.5		63.5		70.5	
3	5 contacts	6	16	0		10.9		21.8		32.7		43.6		54.4		65.2		75.9		86.6		97.3		108

Nominal current

Max. continuous current

LINE CURRENT LOAD

The current-carrying capacity of the individual conductors is frequently lower than that of the individual contacts used.
When determining the maximum current-carrying capacity, the lowest value is always to be taken into account.

Laying procedure	Exposed in air	or on surfaces		
	Single-wire lines PVC, PE, PUR, TPE heat resistant	Multi-wire highly flexible lines for hand-held devices, wire / sheath cold-resistant, PVC insulated		Multi-wire movable lines PVC, PE, PUR, TPE standard program harmonised series
Number of loaded wires	1	2	3	4
Nominal cross-section copper conductor in mm ²	Current load in A			
0.14 ¹	3	–	–	2
0.25 ¹	5	–	–	4
0.34 ¹	8	–	–	6
0.5 ¹	12	3	3	9
0.75	15	6	6	12
1	19	10	10	15
1.5	24	16	16	18
2.5	32	25	20	26
4	42	32	25	34
6	54	40	–	44
10	73	63	–	61
16	98	–	–	82
25	129	–	–	108
35	158	–	–	135
50	198	–	–	168
Current load acc. to:	VDE 0298-4:2013 table 11			

Carrying capacity of cables with a rated voltage of up to 1,000 V and of heat resistant cables.
The specification of data does not release one from the need to conduct the test.
The original standards remain authoritative for all of the listed technical specifications.

¹ DIN VDE 0891-1:1990-05

TECHNICAL TERMS

AMBIENT TEMPERATURE

Temperature of the air or another medium in which a connector or corresponding cable assembly is intended to be used.

AWG

American Wire Gauge – see page [203](#)

BASE CURVE

See page [204](#)

CHEMICAL RESISTANCE

Chemical resistance is the ability of a material to protect itself against chemical attack or solvent reaction. In contrast to corrosion, there is no removal of material, which is typical for plastics and elastomers.

Adhesives, cleaning agents or other chemicals are often used on our products within the scope of general deployment and further handling. Contact with unsuitable chemicals may have an adverse effect on the mechanical and electrical properties of the insulation and housing materials. The connector specifications may no longer be sustainable. Please observe our handling suggestions and technical instructions as given in this catalog or corresponding assembly instructions as well as the special information for the plastic housings.

CLEARANCE DISTANCE

The shortest distance by air between two conductive parts (according to IEC 60664-01:2020). The insulation coordination is explained in detail from page [199](#).

CREEPAGE DISTANCES

The shortest distance between two conductive parts along the surface of a solid insulation material (according to IEC 60664-01:2020). This factors in all elevations and recesses in the insulator, as long as defined minimum dimensions are on hand. The insulation coordination is explained in detail from page [199](#).

CONNECTOR

An element which enables electrical conductors to be connected and is intended to create and/or separate connections with a suitable counterpart (according to IEC 61984:2008 (VDE 0627:2009-11)). If not otherwise specified, these are connectors without breaking capacity (COC).

CODING (MECHANICAL)

Geometry detail that prevents interchangeability of otherwise identical connectors. This is useful when two or more identical connectors are attached to the same device.

CONNECTOR WITH BREAKING CAPACITY (COC)

Connector that may be mated or unmated during intended use, live or under load (according to IEC 61984:2008 (VDE 0627:2009-11)).

CONNECTOR WITHOUT BREAKING CAPACITY (COC)

Connector which is not deemed to be engaged or disengaged in normal use when live under load (according to IEC 61984:2008 (VDE 0627:2009-11)).

CONTACT RESISTANCE

The resistance at the contact zone of an electrical contact pair. The contact resistance is significantly lower than the total resistance (referred to as total resistance). The specifications are average values.

CORES

Electrical conductor, solid wire or multi-wire strand, with insulation as well as any conductive layers. Cables or leads may have one or more cores.

CRIMP BARREL

A terminal sleeve which can accommodate one or more conductors and be crimped by a crimping tool.

CRIMP CONNECTION (CRIMP TERMINATION)

The permanent, non-detachable and solder-free mounting of a contact to a conductor via deforming or shaping under pressure to make a good electrical and mechanical connection. Executed with crimping tool, press or automatic crimping machine (see page [183](#)).

CRIMP TERMINATION

Termination technology, see crimp connection.

CRIMPING AREA

The specified area of the crimp barrel in which the crimp termination is executed by means of deforming or shaping the barrel under pressure around the conductor.

TECHNICAL TERMS

CURRENT-CARRYING CAPACITY

(NOMINAL CURRENT AND MAXIMUM CONTINUOUS CURRENT)

The value is derived from an adequately dimensioned connection cable in accordance with DIN EN IEC 60228 VDE 0295:2024-12, so that a significant temperature increase is not incurred. The indicated temperature increase takes place through the contact. The specifications are average values.

DELIVERY FORM

In the ODU-MAC® Silver-/White-Line product portfolio we explicitly recommend that the modules are purchased assembled with the frames in order to prevent possible errors in the assembly process. Only in exceptional cases we can supply individual parts. However we cannot take any liability therefore. We would like to emphasize the usage of our ODU tools, as well as our current assembly instructions in the download area:
<https://odu-connectors.com/silver-white-line-instructions>

DERATING CURVE

See page [204](#)

DERATING MEASUREMENT METHOD IN ACCORDANCE WITH IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003-01)

See page [204](#)

INSERTION AND WITHDRAWAL FORCE

The force required to fully insert or withdraw pluggable elements without the influence of a coupling or locking device.

INSULATOR

Part of a connector that separates conductive parts with different potentials, usually identical to the contact carrier.

LUBRICATION

All standard contacts are lubricated at the factory. We recommend to use the ODU Electrical Contacts Service Kit. See page [205](#)

MATING CYCLES

A mating cycle consists of one insertion and withdrawal action of both connector parts with each other. The given values are only valid under the following conditions: clean environment, adequate radial alignment, flawless counter contact pins.

MAX. CONTINUOUS CURRENT

The metrologically determined amperage at room temperature (approx. 20 °C) which increases the contact temperature

to the limit temperature. The values specified in the catalog apply to either individual contacts or completely assembled inserts / modules, as indicated.

Refer to page [204](#) for the derating curve, if a different ambient temperature is valid.

NOMINAL CURRENT

See rated current.

NOMINAL SINGLE CONTACT CURRENT LOAD

The current-carrying capacity which each individual contact can be loaded with on its own (see page [204](#)).

NOMINAL VOLTAGE

The nominal voltage of the power source for which the connector is being used. The nominal voltage may not be higher than the rated voltage of the connector.

OPERATING TEMPERATURE FOR ODU-MAC®

Permissible temperature range between the uppermost and lowermost limits. This includes contact heating through current-carrying capacity.

OPERATING VOLTAGE

The operating voltage is the voltage supply at the device. The operating voltage may not be higher than the rated voltage of the connector.

PCB TERMINATION

A conductive connection between the PCB and an element in through-hole assembly, THT (through-hole technology).

POLLUTION DEGREE

Numerical value indicating the expected pollution of the micro-environment. The pollution levels 1 – 4 were defined. (Pollution: any deposit of solid, liquid or gaseous foreign matter that may reduce the electrical strength or surface resistance of the insulation; micro-environment: immediate vicinity of the insulation, which in particular influences the dimensioning of the creepage distances). See IEC 60664-1:2020 (VDE 0110-1:2022-07).

PRINTED CIRCUIT BOARD (PCB)

A PCB is a carrier for electronic components. It serves the purposes of mechanical mounting and electrical connection.

RATED CURRENT (NOMINAL CURRENT)

The values specified in this catalog apply to individual contacts or to completely assembled inserts/modules, depending on the specification. See page [205](#)

RATED VOLTAGE

The rated voltage which the manufacturer specifies for a connector and which the operating and performance features relate to.

REDUCTION FACTOR

Based on DIN VDE 0298-4:2023-06, connectors and cables with more than 5 contacts have a higher heating rate compared to individual contacts. For this reason, the aforementioned standard is calculated with a reduction.

SLIDING FORCE

Please refer to insertion and withdrawal force.

The higher value of the insertion force is caused by the „attachment peak“. Subsequently, only the pure sliding force has an effect. In the case of lamella contacts, the data refers to contacts in the lubricated state (status at delivery) and after approx. 30 mating cycles. The forces are/may be higher in new condition (lubricated). In the case of springwire contacts, the data refers to contacts in new condition. The data represents average values with a potential fluctuation of $\pm 50\%$.

SOLDER CONNECTION (SOLDER CUP TERMINATION)

Termination technology in which a molten additional metal (solder) with a lower melting point than the base materials to be connected is used to attach two metallic materials to one another.

SOLDER CUP TERMINATION

Termination technology, see solder cup connection.

SPINDLE LOCKING

Ergonomic locking of the housings with an easy-to-operate precision locking spindle. This spindle enables easy closing and opening of the housings with a single turning movement. The mating and sliding forces which are thereby overcome ease handling significantly. For relubrication, we recommend the ODU Electrical Contacts Service Kit. See page [195](#).

STRANDED WIRE

The stranded wire is an electrical conductor consisting of thin individual wires and is therefore easy to bend.

TERMINATION CROSS-SECTION

The specified cross-sections correspond to a “fine-wire” conductor structure (7/19 wire) according to AWG (ASTM B258-14) or to a “fine-wire” conductor structure pursuant to DIN EN IEC 60228 VDE 0295:2024-12, borderline conductor structures require a separate review.

TERMINATION TECHNOLOGIES

Methods for connecting the leads to the electro-mechanical element, such as solder-free connections pursuant to IEC 60352-5:2020 (DIN EN IEC 60352-5:2022-07): crimp, screw connection etc. or solder cup connection (see page [182](#)).

TEST VOLTAGE

The test voltage which a connector or a corresponding cable assembly can withstand under defined conditions without dielectric breakdown or flashover.

TIGHTNESS IEC 60529:2013 (VDE 0470-1:2014-09)

See protection types on page [198](#)

THERMOCOUPLE

The thermocouple module is used as a reliable interface in a measurement chain in the high temperature range. It is a process in which a voltage is generated between two wires made of different materials (thermocouple). The thermal influence on the temperature sensor causes a variation in the voltage (thermoelectric effect), whereby the voltage change allows the precise temperature to be determined.

TOTAL RESISTANCE

Total resistance value measured from terminal to terminal (e.g. without crimp resistance). The specifications are average values.

UPPERMOST LIMIT TEMPERATURE

The maximum permissible temperature at which a connector may be operated. It includes contact heating through current-carrying capacity. With contacts with standard springwire, it amounts to $+120\text{ }^{\circ}\text{C}$, with contacts with standard lamella $+150\text{ }^{\circ}\text{C}$. Please consult ODU for high-temperature applications.

WIRE

Solid conductor

GENERAL NOTE

The connectors and cable assemblies listed in this catalog are generally designed as connectors without breaking capacity unless otherwise stated. The rated voltage specification given on the respective data sheet must be respected. Suitable precautionary measures must be taken to ensure that people do not come into contact with live conductors during installation and operation. All entries in this catalog were thoroughly reviewed before printing. ODU reserves the right to make changes based on the current status of knowledge without prior notice and without being obliged to provide replacement deliveries or refinements of older designs.



Printed on certified
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prior publications.

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