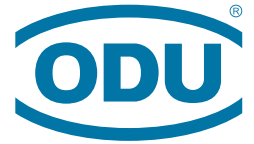


A PERFECT ALLIANCE.



## ODU-MAC<sup>®</sup>

Compact modular connector system.

Up to 6,300 V, 20 bar, 10 GBit/s, 100,000 mating cycles and 9,0 GHz.

AUTOMATIC DOCKING  
MANUAL MATING



ODU-MAC<sup>®</sup>

OPEN MODULAR SYSTEM

FEATURES

- Rugged version
- High number of mating cycles (≥ 100,000)
- Low contact resistances
- High contact stability with multiple individual contact points
- High reliability
- Enormous module variety
- Versatile solution possibilities
- High contact density
- Blind mating

APPLICATIONS

- Medical
- Industrial
- Measuring and testing
- Military and security
- Energy
- Automotive




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


Tested acc. UL 1977/CSA C22.2 No. 1823. Tested acc. MIL/SAE/EIA. (ODU-USA is registered with the DDTC and able to complete ITAR restricted manufacturing projects.)

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


Issue: 2015-10




FireWire




USB 2.0




USB 3.0




Network



CAT6<sub>A</sub>



HDMI



Non-magnetic

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For assembly instructions please refer to our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).

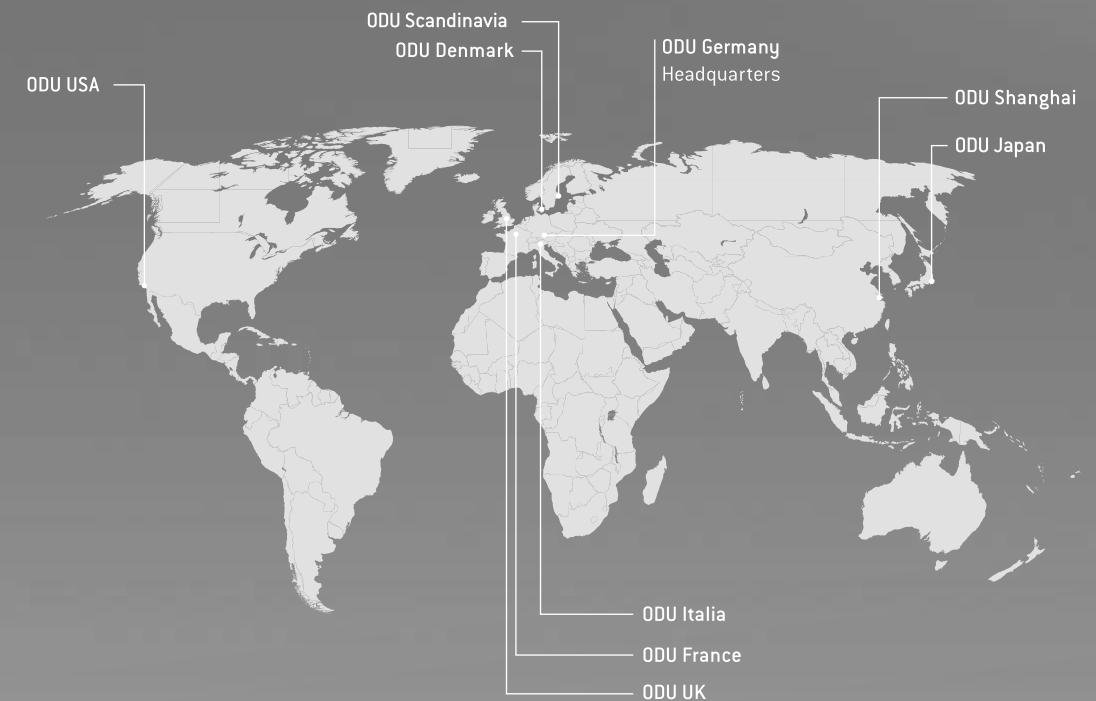
# A PERFECT ALLIANCE.

**CREATING CONNECTIONS, BUILDING ALLIANCES, COLLABORATING INTO THE FUTURE:** WHETHER TWO TECHNICAL COMPONENTS COME TOGETHER TO FORM A UNIT OR PEOPLE COME TOGETHER TO STRIVE FOR GREAT RESULTS – THE KEY IS TO ASPIRE IN ACHIEVING SUPERB RESULTS. THIS GOAL DRIVES OUR WORK. **PERFECT CONNECTIONS THAT INSPIRE AND DELIVER ON THE PROMISES.**



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## ODU WORLDWIDE



### ODU GROUP OVERVIEW

- More than 70 years of connector experience
- €146 million\* in turnover
- Over 1,650 employees worldwide
- 9 sales subsidiaries: China, Denmark, France, Germany, Italy, Japan, Sweden, the UK and the US
- All technologies under one roof: Design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly

\*As of February 2016

### CERTIFIED QUALITY

- DIN EN ISO 9001
- DIN ISO TS 16949
- DIN EN ISO 14001
- ISO 13485
- Wide range of UL, CSA, VG and DVA licenses
- UL-certified cable assembly

For a complete list of our certifications, please visit our website.



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# INGENIOUS IDEAS PERFECT SOLUTIONS

ODU'S PRODUCT PORTFOLIO.



+ Versatile connector solutions for transmission of power, signals, data, or media – ODU never fails to offer the right interface when quality and absolute reliability are the top priorities.



## COMPACT MODULAR CONNECTOR SOLUTION

- The highest packing density with flexible modular construction
- 6 standard docking solutions
- Multitude of data transmission modules
- Spindle locking / quick-release connector
- Springwire technology and more than 100,000 mating cycles
- Blind mating



## PUSH-PULL CIRCULAR CONNECTORS

- Circular connector series in robust metal or plastic housing
- Contacts for soldering, crimping and PCB termination
- With Push-Pull locking mechanism for a secure connector
- 2 up to 55 contacts
- IP 50 to IP 69
- Autoclavable for medical applications



## SINGLE CONTACTS

- Versatile connector technologies
- More than 100,000 mating cycles [patented springwire technology]
- Reliable transmission of power and signal
- High level of vibration resistance with low wear
- Up to 2,000 A current-carrying capacity
- Low transition resistance



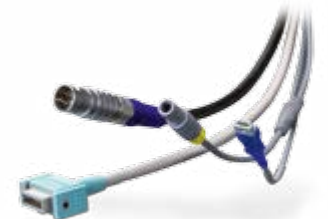
## HEAVY-DUTY & DOCKING AND ROBOTIC CONNECTOR SOLUTIONS

- Extremely durable even under extreme / harsh environments
- Interference-free and secure connection, even under vibration
- Up to 1,500 A current-carrying capacity
- High contact security due to the springwire technology
- High pin density due to a minimum contact diameter
- Low transition resistance



## APPLICATION AND CUSTOMER-SPECIFIC SOLUTIONS

- Contacts, connectors and assemblies for the highest technical requirements as well as special applications
- First-class implementation expertise
- High level of vertical manufacturing – all competences and key technologies under one roof
- Expert advice based on mutual partnership
- Fast development and production



## CABLE ASSEMBLY

- Extensive expertise in cable assembly integrated solutions
- Cutting-edge production facilities at all ODU production sites, including testing laboratory
- Custom-assembled connectors, assembly with heat shrunk parts and insert-molding assemblies
- Soldering and crimping technology, testing included
- Special assemblies [grouting, pressure testing]
- Prototype production



# MORE THAN A CONNECTION

OUR KNOW-HOW FOR YOUR SUCCESS.

All shown connectors are according to DIN EN 61984:2009 connectors without breaking capacity (COC)!

General tolerances to  
DIN ISO 2768-mK  
Tolerance to  
DIN ISO 8015

2013

prep.

app.

norm.

date

11.06

name

Unterblom

designation

Break-A

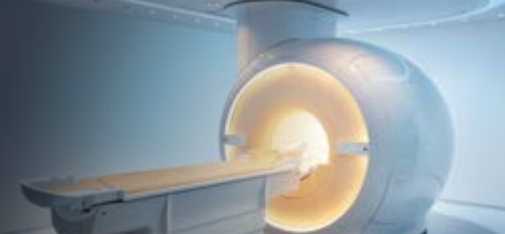


3:1



A PERFECT ALLIANCE.

MEDICAL



MEASUREMENT AND TESTING



MILITARY AND SECURITY



INDUSTRIAL



ENERGY



EMOBILITY



## HIGH PERFORMANCE CONNECTOR TECHNOLOGY FOR DEMANDING KEY MARKETS

Customers rely on ODU technology wherever first-class, high-performance connector solutions are required. All our skills go into our products to ensure your success. In addition to the top quality, reliable stability and maximum flexibility in customer-specific requirements, our products also stand for dynamics, reliability, safety, precision, efficiency and sustainability. And they guarantee unrestricted functionality for the final product due to our high quality connectors. ODU – A PERFECT ALLIANCE.

## APPLICATION-SPECIFIC SOLUTIONS

Demands that can't be pigeon-holed call for creative specialists who think outside the box. ODU offers the type of expertise that focuses solely on the specific requirements of our customers. For every development order we get, we not only perform a thorough check to make sure it's feasible, we intensively incorporate our customers in the ongoing design process. This guarantees an impressive, custom-fit final result. Our solutions are frequently based on the modifications of our products, especially for the ODU MINI-SNAP and ODU-MAC connectors.

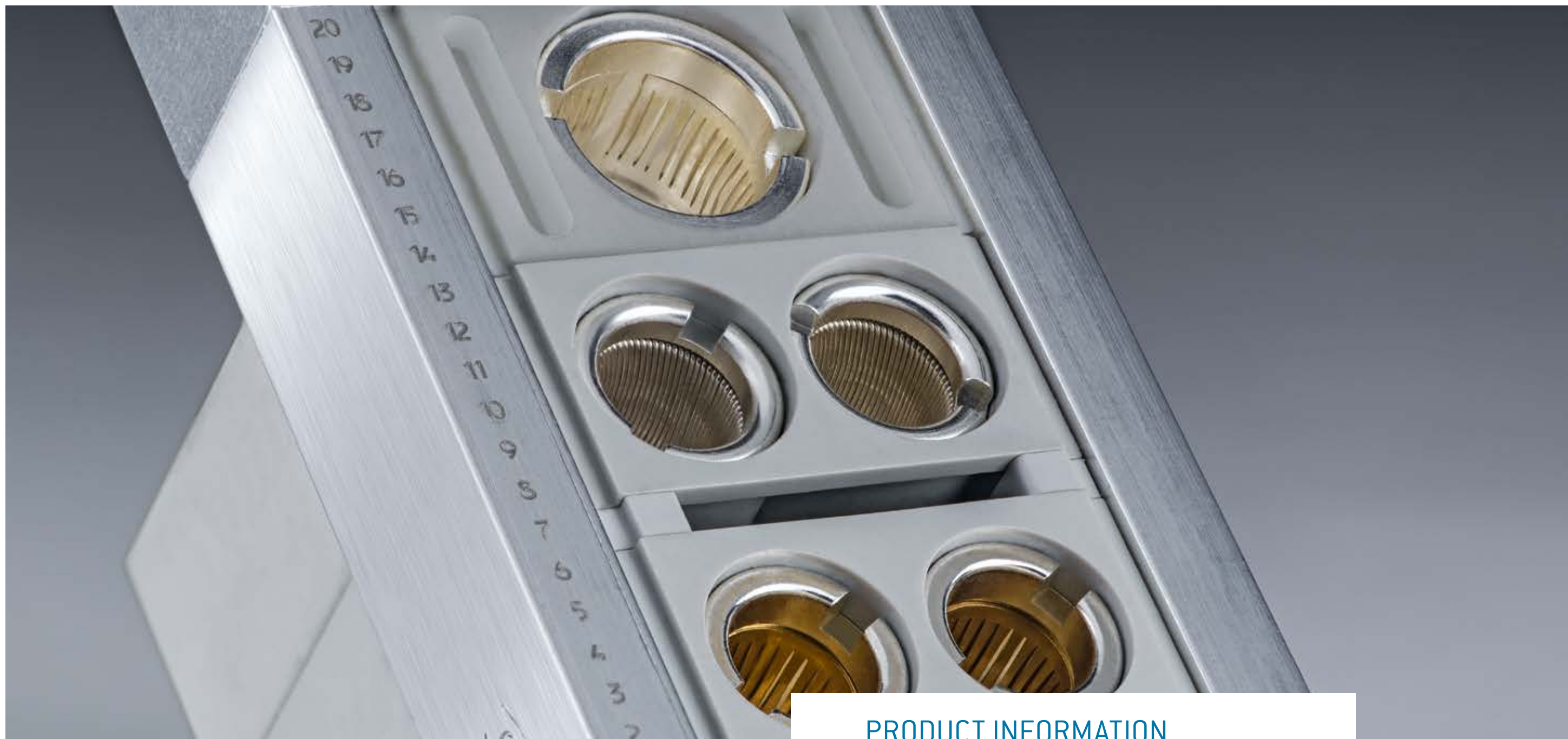
## HIGH LEVEL OF VERTICAL INTEGRATION

ODU combines all the competences and key technologies for the connector manufacturing. These include design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly and our own test laboratory.

## INDIVIDUAL CABLE ASSEMBLY

Our production skills together with our cutting edge production facilities from Europe, China and the USA enable us to deliver to our customers local tested assemblies and also global ones.





CONFIGURE THE ODU-MAC®.  
SIMPLY ONLINE AT [WWW.ODU-MAC.COM](http://WWW.ODU-MAC.COM)

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# ODU-MAC® – A UNIVERSAL TALENT FOR THE MOST VARIED APPLICATIONS

## THE INTELLIGENT PATH TO INDIVIDUAL CONNECTION

The flexible modular design of ODU-MAC enables the combination of a variety of connection types within single contacts. Whether signal, power, high current, high voltage, coax, high-speed data transmission, fibre optic and other media such as air or fluid – all types can be selected from the module and integrated into the individual connector solution. The connection options are just as versatile.

Many options are available for a variety of applications in industry or medical technology: for example, installation in the stable frame for rack and panel applications or for automatic docking, or the version in the robust housing.

The result is an effective, compact and attractive complete connection that cannot be beaten in terms of functionality. Confusion caused by many connections is a thing of the past – an ODU-MAC assembled for the relevant requirements is the solution of today.

ODU-MAC is available in two basic versions. You have a choice between a flexible adjustable aluminium frame for automatic docking and the version in the housing for manual mating.

You can find out more about individual configurations on the following pages.

## LEAVES NOTHING TO BE DESIRED:

- Up to 100,000 mating cycles and more
- Versions in the docking frame for automatic docking
- Versions for robust housing suitable for use in tough environments or for manual mating
- Easy locking of the housing with spindle or lever
- Many different module options available
- Extremely compact due to the high contact density

## AUTOMATIC DOCKING



## MANUAL MATING



# ODU-MAC® MODULE CONSTRUCTION

2 possible applications:  
automatic docking or manual mating

37 cable hood versions

6 different docking frames  
independently configurable length (see page 18)

removable contacts with clip principle  
(see page 28)

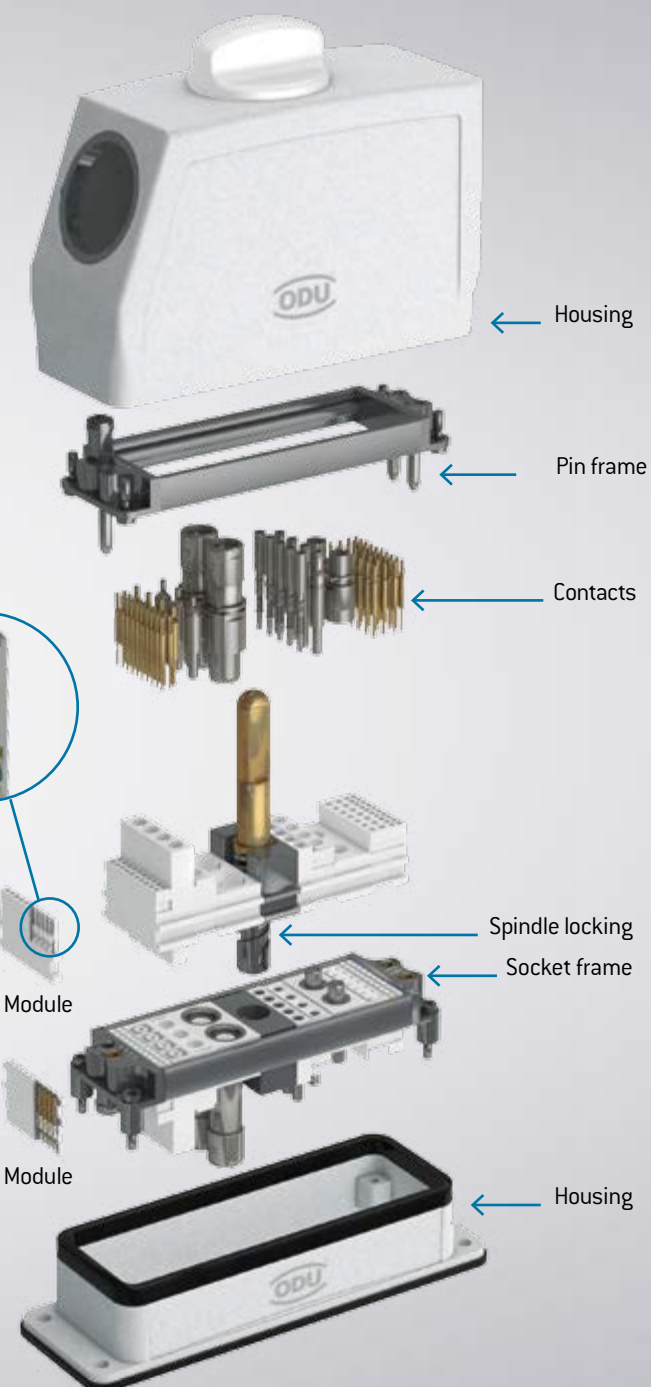
2 locking types:  
spindle or lever locking

5 different spindle geometries

34 modules for selection:  
signal, power, high voltage,  
high current, fibre-optic, coax, pneumatic,  
fluid and data rates

5 variations of bulkhead mounted and  
surface mounted housing and  
cable to cable hoods in different sizes

100,000  
mating cycles and more



# ODU-MAC® WEB CONFIGURATOR

Individual configuration of your ODU-MAC® connection.

With ODU-MAC web 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 many continuative information. There are two ways to the ODU-MAC web configurator:

1. ACCESS: THROUGH [WWW.ODU-CONNECTORS.COM](http://www.odu-connectors.com)



Entry via [www.odu-connectors.com](http://www.odu-connectors.com) provides you with a great deal of product information and many application examples prior to configuration of your ODU-MAC.



Access to the configurator via the product category Modular Connectors.


2. ACCESS: DIRECTLY THROUGH [WWW.ODU-MAC.COM](http://www.odu-mac.com)



[www.odu-mac.com](http://www.odu-mac.com) takes you directly to the configuration spacer, allowing you to start assembling your ODU-MAC immediately.

PRODUCT VIDEOS ON FUNCTIONALITY



Videos explaining the functions of automatic docking and manual mating can be found under  Explanation on the welcome page of the configurator at [www.odu-mac.com](http://www.odu-mac.com).



# YOUR WAY TO AN INDIVIDUAL CONNECTION

How to configure your ODU-MAC®.

## INDIVIDUAL REQUIREMENTS – INDIVIDUAL CONFIGURATION

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

## SELECT & REQUEST OFFERS

You will receive a drawing and a detailed offer within one working day of 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 customised versions not covered by the standard.**



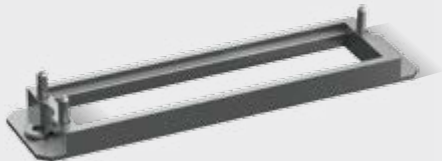
For information to the configuration of your connector please refer to our website: [www.odu-mac.com](http://www.odu-mac.com)

# AUTOMATIC DOCKING

## 1ST STEP: FRAME SELECTION

Depending upon your requirements, you can choose 6 different frame types as a base for automatic docking.

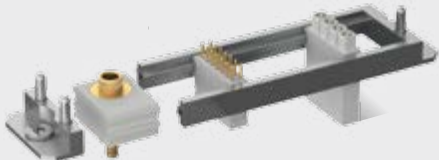
Frames	
ODU-MAC® S (Standard)	ODU-MAC® T (Transverse)
ODU-MAC® L (Large)	ODU-MAC® P (Power)
ODU-MAC® M (Mini)	ODU-MAC® QCH (quick change head) (connector saver)



## 2ND STEP: MODULE SELECTION

Choose from 34 different modules for transferring signal, power, high current, high voltage, coax, high-speed data transmission, fibre optic and other media such as air or fluid and assemble your ODU-MAC individually.

Modules	
Signal	Power
High current	High voltage
Coax	Pneumatic and fluid model
Fibre-optic	Shielded implementation / high-speed connector
Blank modules / spacer modules / coding modules / pin protection module	



# MANUAL MATING

## 1ST STEP: LOCKING

Select the type of lock in this first step. You have the choice between lever and spindle locking.

Spindle locking	Lever locking
-----------------	---------------



## 2ND STEP: CONNECTOR HOUSING

Depending upon the lock, choose the housing suited to your requirements. The following housings are available:

For spindle locking	For lever locking
Cable hood	Cable hood
Cable hood XXL	Cable hood XXL
	Cable hood wide



## 3RD STEP: RECEPTACLE SELECTION

Depending upon the requirements for the receptacle and the selected connector housing, a wide variety of designs is available.

Cable hood	Cable hood XXL
Bulkhead mounted housing	Bulkhead mounted housing
Surface mounted housing	Surface mounted housing
Cable to cable hood	



The cable hood wide housing is only compatible with the bulkhead and surface mounted housing for cable hood wide housings.

## 4TH STEP: MODULE SELECTION

Choose from 34 different modules for transferring transferring signal, power, high current, high voltage, coax, high-speed data transmission, fibre optic and other media such as air or fluid and assemble your ODU-MAC individually.

Modules
See page <a href="#">70</a>



# YOUR PARTNER FOR AUTOMATIC DOCKING SOLUTIONS

## Overview of docking frames.

ODU-MAC in the docking frame is used only 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 should your requirements for a connection go beyond the standard solutions, we also offer customised special solutions.

ODU-MAC is configured for 3 to 60 grid units (more upon request), meaning that up to 600 contacts can be installed when the 10 contacts module with a module width of 2.54 mm (1 unit) is used. Versions for limited space (ODU-MAC M (Mini)), increased requirements for floating support (ODU-MAC L (Large)) and increased mechanical load (ODU-MAC P (Power)) are also available.

FURTHER INFORMATION FROM PAGE 32.

### ODU-MAC® S (STANDARD) P. 36

Standard solution for docking tasks.  
Tolerance compensation +/- 0.6 mm.



### ODU-MAC® M (MINI) P. 38

Compact size with the smallest space requirement and low tolerance compensation.



### ODU-MAC® P (POWER) P. 39

The frame for the highest requirements thanks to reinforced frame design.  
Tolerance compensation +/- 2.5 mm.



### ODU-MAC® L (LARGE) P. 37

Frame with higher tolerance compensation and reinforced guiding bushes, as well as extended guiding pins.  
Tolerance compensation +/- 1.2 mm.



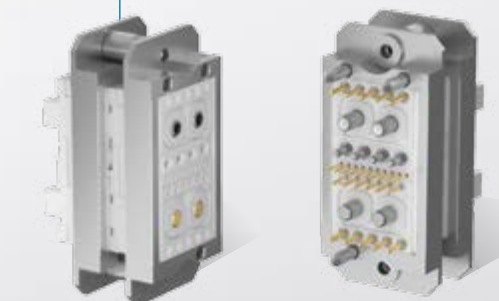
### ODU-MAC® T (TRANSVERSE) P. 40

Transverse frames for installation in customised housing solutions or where low clearance heights make this necessary.



### ODU-MAC® QCH (QUICK CHANGE HEAD) P. 41

Docking frames for the highest requirements with regard to mating cycles (connector saver) with the lowest maintenance time and expense thanks to easy exchange of the replacement parts.  
Tolerance compensation +/- 0.6 mm.



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





# BEST CONNECTIONS FOR MANUAL MATING

## Overview of housings with spindle locking.

In the case of spindle locking, the housings can be equipped with an easy to operate precision locking spindle. This spindle enables easy closing and opening of the housing with a single turning movement. The mating and sliding forces overcome in this way ease handling significantly. Only 5 units of space are required for this purpose.

Especially in case of high connection frequency and limited space for locking, the use of precision locking is a preferred option.

Depending upon the application scenario, the mechanisms are designed for up to 30,000 locking cycles. Easy to mount replacement sets are available for larger numbers of mating cycles (see page 45).

### FURTHER INFORMATION FROM PAGE 44.

- **Low profile** – less space for operation than lever latching
- **Ease of use** – one hand operation
- **Ergonomic design** – easy single spindle knob
- **Improved reliability** – preferred designed for high mating cycles
- **Fully enclosed** – internal mechanism prevents damage
- **Repairable** – can be replaced without removal of the hood or frame
- **User friendly** – lower force required for operation
- **Precision** – materials, design and tolerances assist the life of contacts over time

Size	Units <sup>1</sup>	
2	16	
3	24	
4	34	

#### CABLE HOOD XXL:

4	34	
---	----	--

<sup>1</sup> 5 units of space required for spindle



CABLE HOOD P. 46  
WITH SIDE M40/M32 CABLE ENTRY  
Connector housing for assembly on the cable.

CABLE HOOD XXL P. 47  
WITH SIDE M50 CABLE ENTRY  
Connector housing with expanded assembly space and side M50 cable entry.



BULKHEAD MOUNTED HOUSING P. 48  
For mounting on device with spindle locking.

SURFACE MOUNTED HOUSING P. 49  
For surface mounting on your device/wall with spindle locking and two side cable entries.

# BEST CONNECTIONS FOR MANUAL MATING

Overview of housings with lever locking.

ODU-MAC with lever locking offers a wide variety of combination possibilities for manual mating. With the exception of the dual housing, all housings can be combined with one another.

Appropriate frames in various sizes are available for use in the standard DIN EN 175301-801:2007 housing with lever. Size 4, for example, can receive up to 34 modules with a module width of 2.54 mm (1 unit), meaning that a total of 34 modules (34 units), or 340 contacts in the case of 10 contacts, can be accommodated. Size 6 of the dual housing can even accommodate up to 680 contacts.

FURTHER INFORMATION FROM PAGE 50.

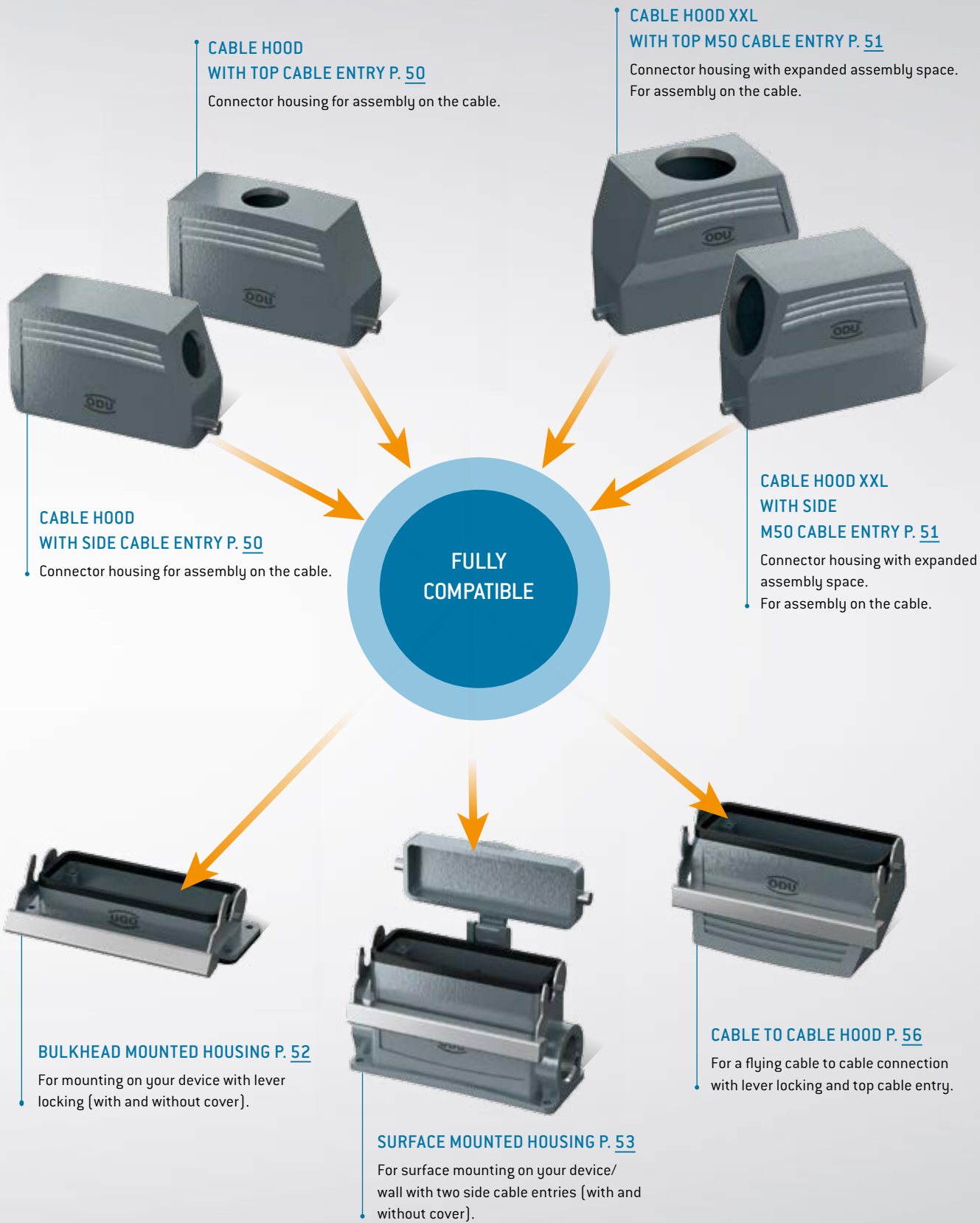
Size	Units	
1	10	
2	16	
3	24	
4	34	

CABLE HOOD XXL:

4	34	
---	----	--

CABLE HOOD WIDE:

5	48	
6	68	





# BEST CONNECTIONS – THE CONTACT PRINCIPLE

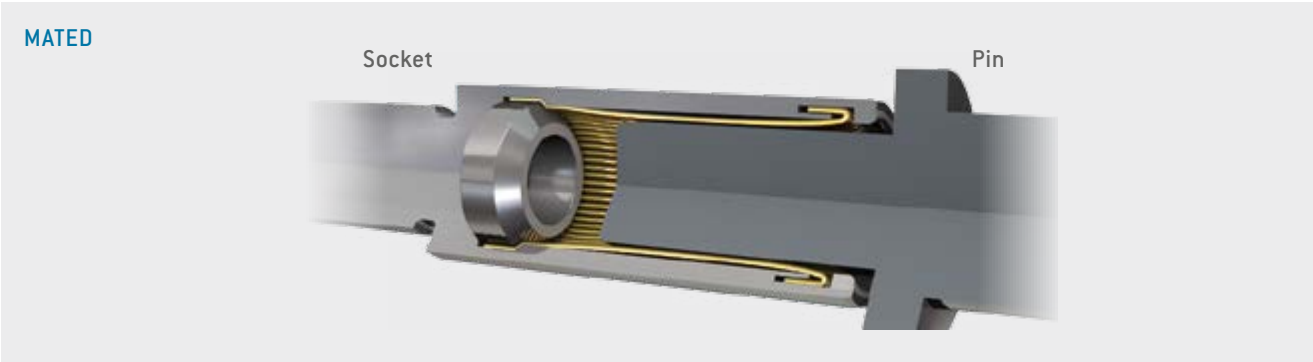
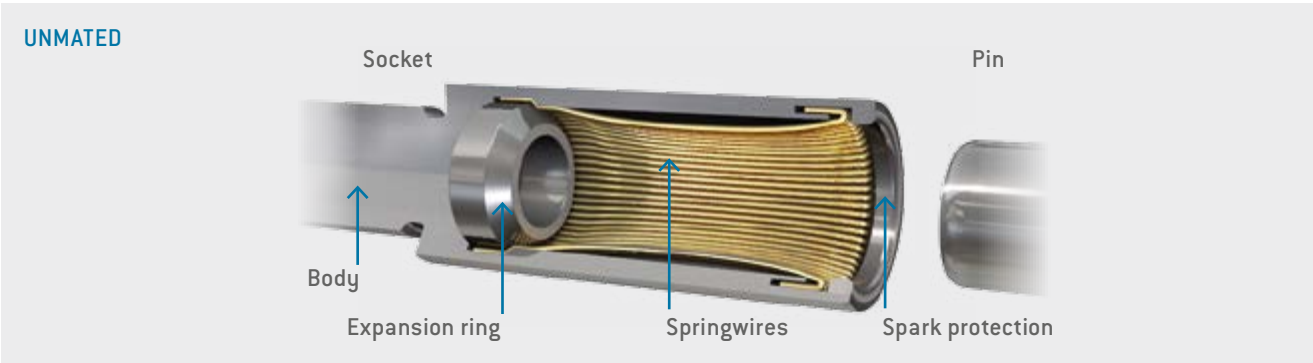
ODU contacts fulfil the highest quality standards and enable secure and reliable connections. ODU has the highest performance contact technologies at its disposal. Principally, a differentiation of lathe-turned contacts is made between lamella, springwire and slotted contacts. The socket side differ 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 Ø 0.76 mm,

15 individual springs are still installed, meaning that even this small diameter provides 15 contact surfaces for current transfer. Correspondingly more for larger diameters.



ADVANTAGES

- Greater than 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 unmating forces
- Extremely secure connection
- High vibration and shock resistance
- Long service life thanks to high quality materials and plating
- Many styles and termination types available or can be customised
- Individual contacts upon request

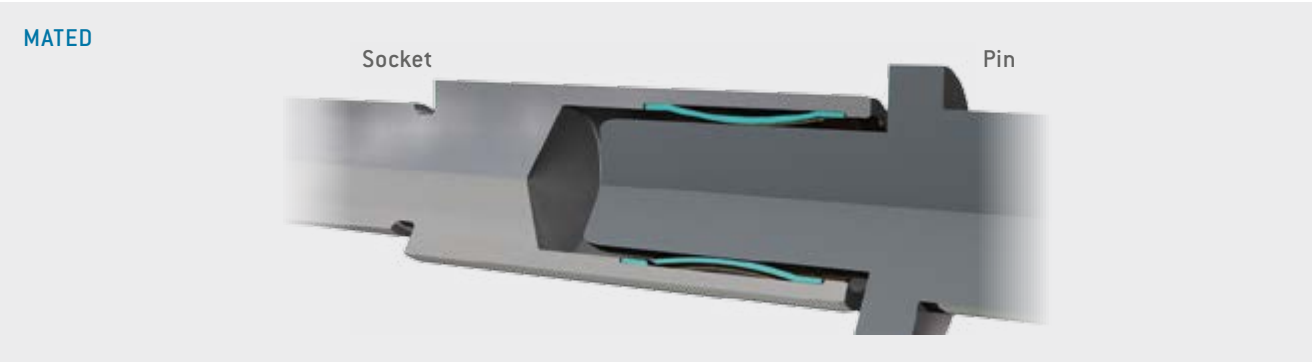
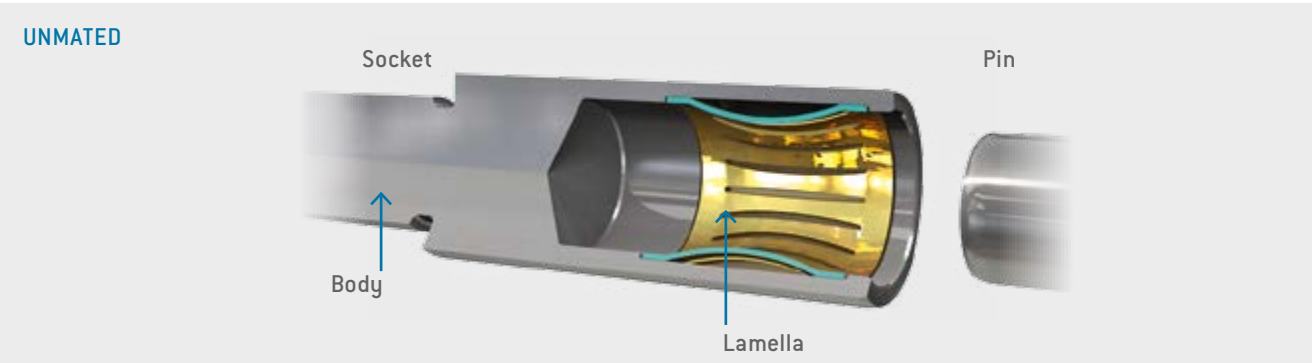
Standard contact principle for:	
Signal	14 to 5 contacts
Power	4 to 2 contacts
High current	2 contacts
High voltage	4 contacts
Coax	2 contacts
Shielded implementation	8, 5, 4 contacts

## ODU LAMTAC®

Contacts with lamella technology.

The ODU LAMTAC contact consists of a lathe-turned 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 unmating forces, and a long service life with low wear. The mating cycles here are minimum 10,000.



ADVANTAGES

- Over 10,000 mating cycles
- High current-carrying capacity – surge current capacity
- Low contact resistances
- Low mating and unmating forces
- Secure connection
- High vibration and shock resistance
- Long service life thanks to high quality materials and plating
- Many styles and termination types available or can be customised
- Economical alternative to springwire contacts
- Individual contacts upon request

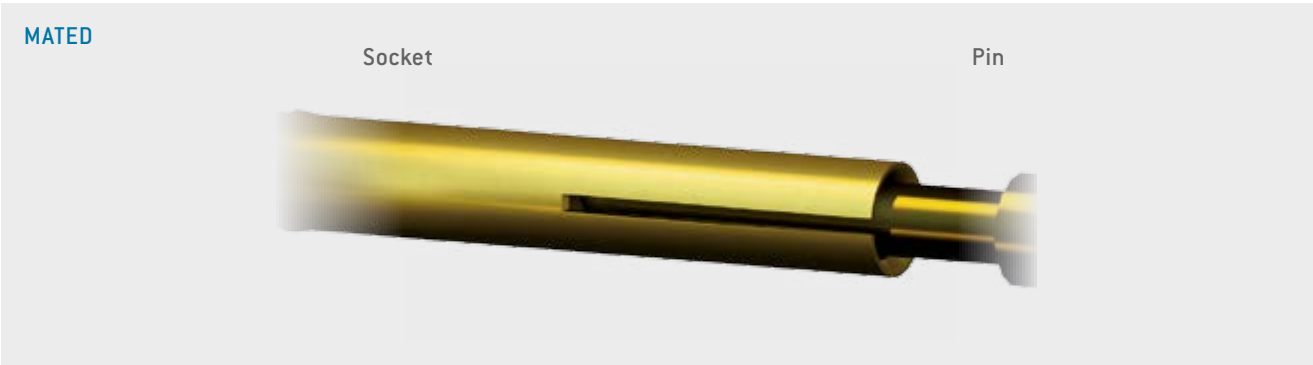
Standard contact principle for:	
High current	2 to 1 contact(s)
High voltage	1 contact
Coax	4 contacts
Shielded implementation	Shielded transmission

# ODU TURNTAC®

Contacts in slotted version.

ODU TURNTAC has two contact surfaces between the pin and the socket. Slotted contacts are used in many ODU mating systems. For mating cycles of 5,000 and more, this contact technology offers the best quality at economical prices. This contact is often used for standard requirements. It provides

good contact resistances and high current-carrying capacity, but only limited potential in terms of number of mating cycles and forces. Slotted contacts are mostly used for smaller diameters (up to approx. 3 mm) in the context of complete connectors.



ADVANTAGES

- 5,000 mating cycles
- Economical solution
- The smallest dimensions are possible
- High quality materials and plating
- Individual contacts upon request

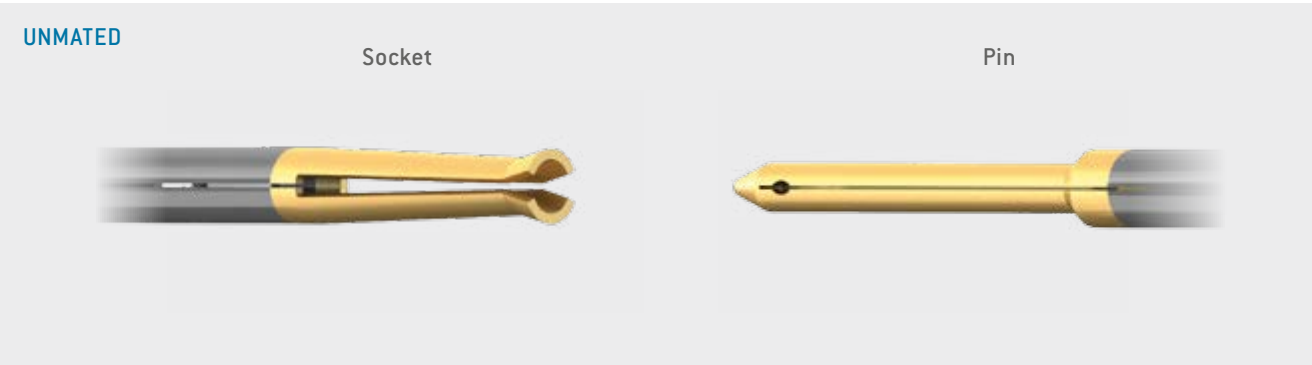
Standard contact principle for:	
Shielded implementation	Signal contacts

# ODU STAMPTAC®

Contacts in stamped version.

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 [82/83](#)).



ADVANTAGES

- 5,000 mating cycles
- High quality materials and surfaces with selective plating
- Most affordable alternative for large numbers of units
- Cost-effective processing
- Automatic processing from tape reel possible

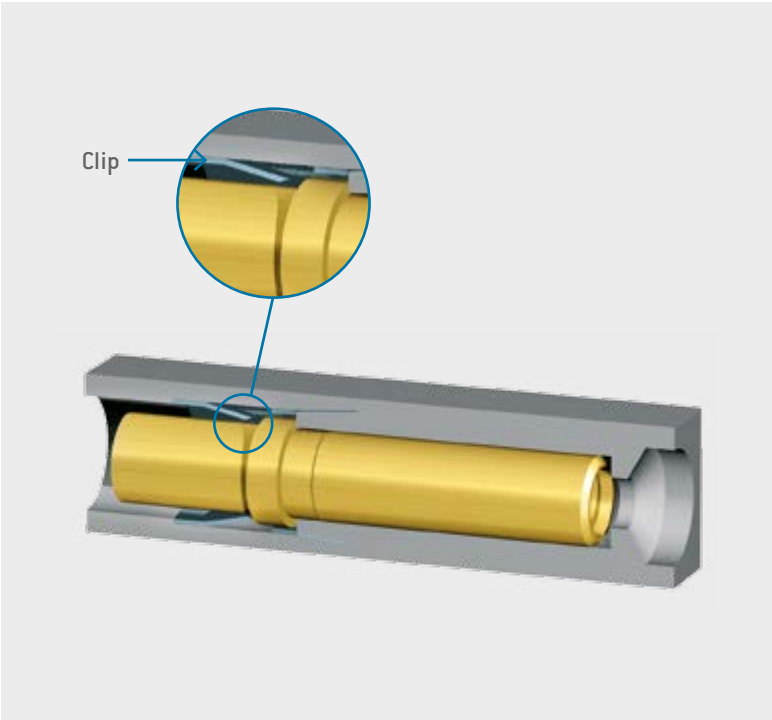
Standard contact principle for:	
Signal	10 contacts

# CONTACT RETENTION CLIP (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.

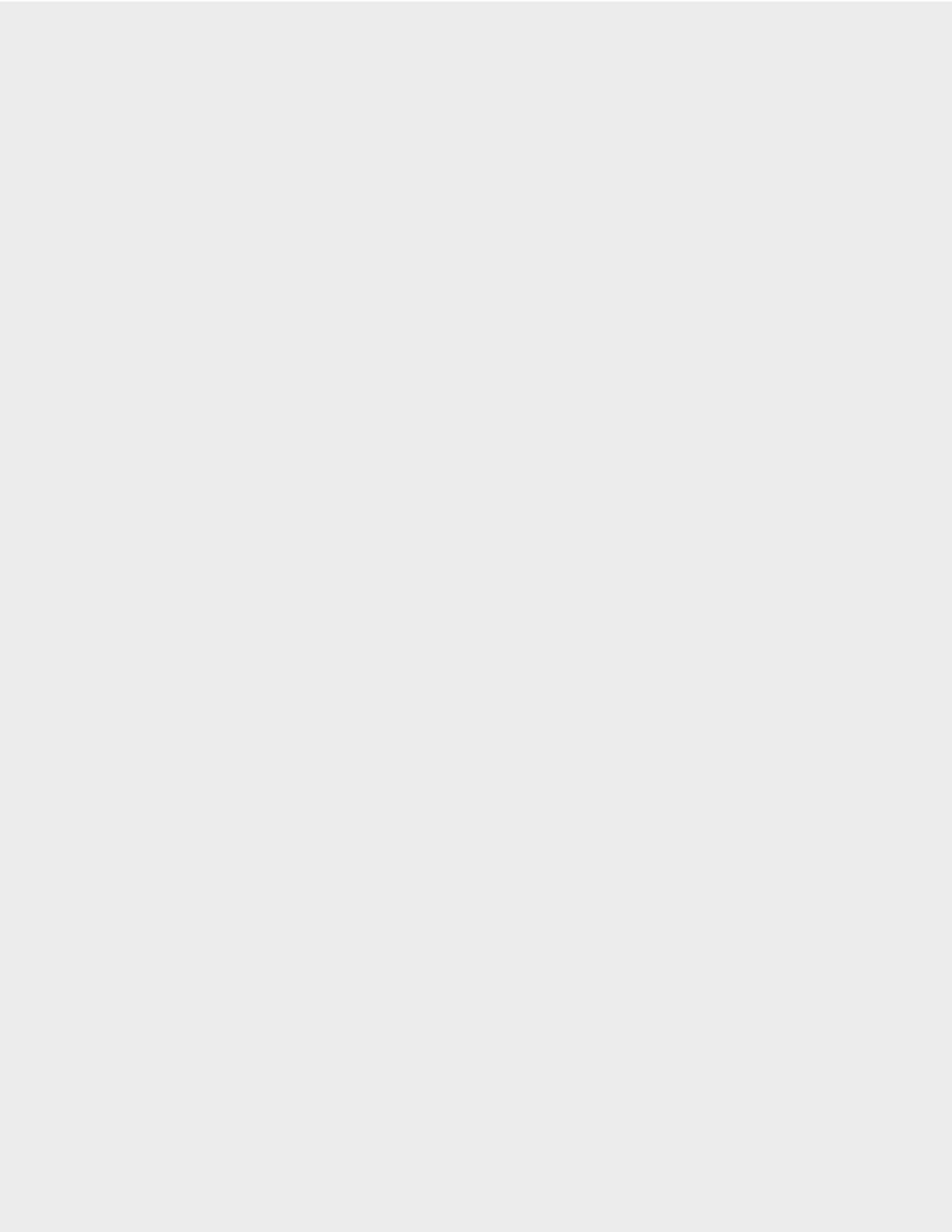
Compared with permanent connections, crimp technology allows replacement of contacts and easy repair. Voltage values can be increased by leaving contact positions free. Contact assembly can be performed independently of the insulator.

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



Most of the modules include this fastening technology.

# FOR YOUR NOTES





# APPLICATION SPECIFIC SOLUTIONS

Problem solvers who think outside the box are required when standard solutions find their limits. ODU offers you just this kind of expert: the ones who focus on your specific requirements. For every development order we get, we not only perform a thorough review study, 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.

## FOR INDUSTRIAL



## FOR MEDICAL



### MONOBLOC INSULATOR

Customers install this insulator block, equipped with standard ODU-MAC contacts, into its own custom housing.

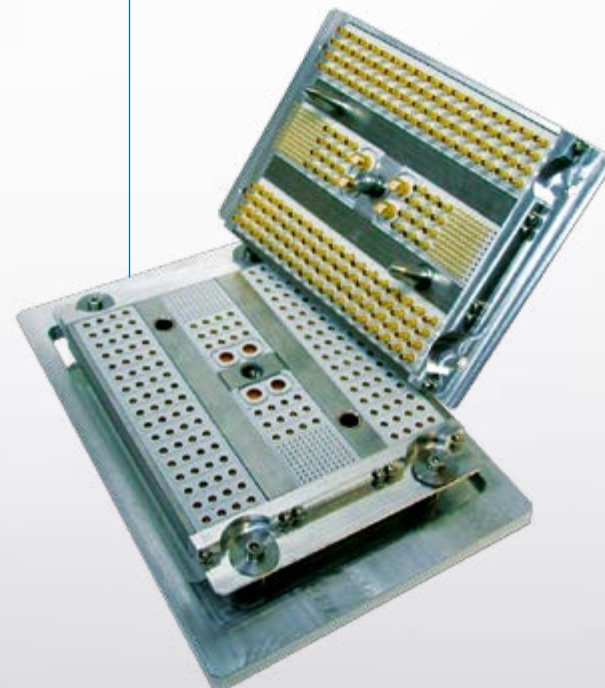


### COMPLETE DOCKING UNIT

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

#### Advantages

- Special floating support with tolerance compensation +/- 3 mm



### MANUAL MATING

Well-known manufacturers worldwide trust in the ODU-MAC system as a reliable connector between the various patient coils and the MRI device. In addition to increased ease of operation, the connector is also available in a version with non-magnetic materials.

#### Advantages

- Non-magnetic version, e.g. for MRI application
- Plastic sleeve housing with individual monobloc
- Customised contact configuration possible
- Spindle locking
- Minimum 30,000 mating and locking cycles



### MANUAL MATING

An insulator developed specific to the application, equipped with coaxial and signal contacts, forms the connector between the MRI device and the individual body coils.

#### Advantages

- Minimum 50,000 mating and locking cycles
- Non-magnetic
- 1.3 and 2.8 GHz frequency range
- 50  $\Omega$
- High packing density



### ODU-MAC® FOR SHOCK WAVE THERAPY DEVICE

ODU-MAC is used in this innovative therapy device as a secure connection between the therapy device and the applicator. The sophisticated assembly has also been adopted by ODU.

#### Advantages

- Compact size
- Motor-operated spindle locking
- Drip-tight fluid routing
- Customised high voltage module





CONFIGURE THE ODU-MAC®.  
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ODU-MAC®

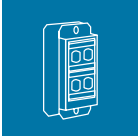
## AUTOMATIC DOCKING

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# SYSTEM REQUIREMENTS AND TOLERANCES



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

Clean and smooth docking is secured by special guiding pins that are designed for the forces which guide the connector. Please note the mechanical requirements behind the design.

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

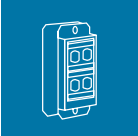
Frame	Tolerance Z
S	+/- 0.6 mm
L	+/- 1.2 mm

Frame	Tolerance Z
P	+/- 2.5 mm
QCH	+/- 0.6 mm

The maximum permissible gap between socket and pin pieces is 0.5 mm as a standard. Extension with long contact pins is possible.

MAXIMUM PERMISSIBLE ANGLE DEVIATION WHEN MATING

OUR TEAM IS HAPPY TO ANSWER ANY ENQUIRIES YOU MAY HAVE.



EXAMPLE OF AN S FRAME SYSTEM

1 ODU-MAC® socket piece (fixed) (screwed tight without play to wall B)  
2 Fastening screw  
3 Tolerance compensation in the example of an S frame:  
Axial play: 0.2 mm  
Radial play: +/- 0.6 mm  
4 Pins for self-centering of ODU-MAC®  
5 ODU-MAC® pin piece (floating) (with play via centering socket; screwed tight to wall S)  
6 Pin for guiding 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.

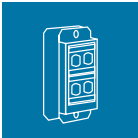
- NOTE: AUTOMATIC DOCKING SYSTEMS
- The pin piece of the ODU-MAC S is to be fixed with the accompanying centering sockets and has mounted floating
  - The guiding system of the ODU-MAC requires additional guiding hardware for the system
  - The maximum permissible gap between socket and pin pieces is 0.5 mm as standard. Extension with long contact pins is possible.
  - A alignment system (e.g. guide rails, etc.) is necessary to achieve high mating cycles. The max. permissible alignment error is, for example, with the ODU-MAC S frame, less than +/- 0.6 mm radial
  - Strain relief for the cables/braids must be provided by the customer.

FAILURE TO OBSERVE THESE SPECIFICATIONS MAY RESULT IN DAMAGE.



# ODU-MAC® S (STANDARD)

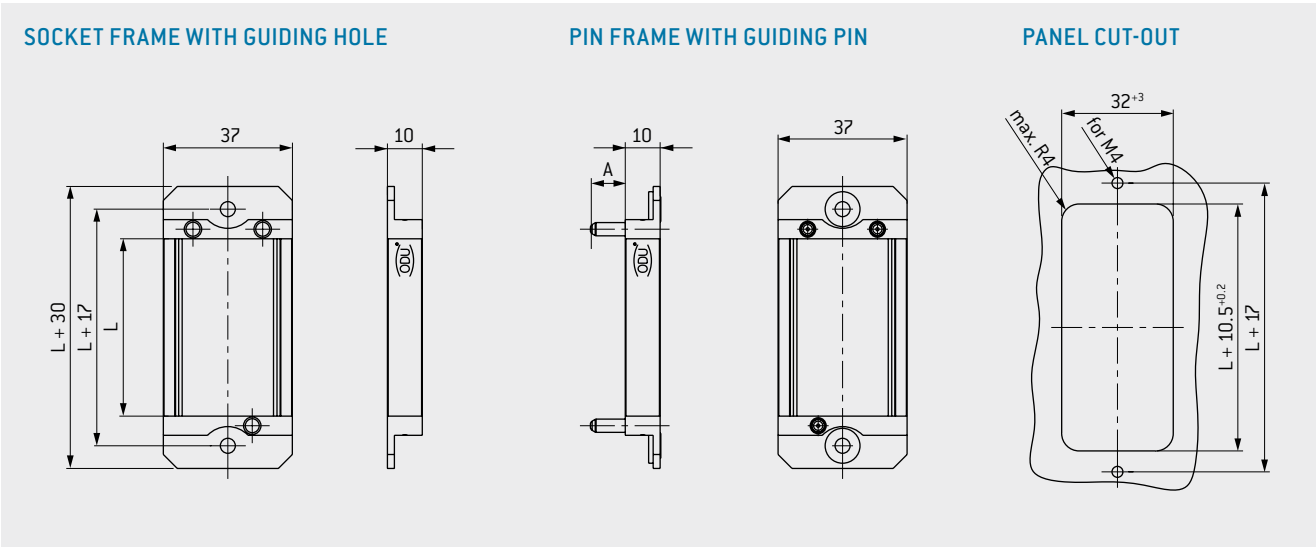
Standard solutions for docking applications.



- TECHNICAL DATA**
- Tolerance compensation:  
Axial play: 0.2 mm  
Radial play: +/- 0.6 mm
  - Pin piece floating supported



Non-magnetic on request.

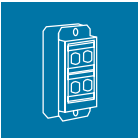


Description	Part number	Dim. A	Note
Pin frame	611.020.0__600.000	10	
Socket frame	610.020.0__600.000		
Pin frame	611.021.0__600.000	12.5	
Socket frame	610.020.0__600.000		
Pin frame	611.025.0__600.000	21	Model for spindle locking
Socket frame	610.020.0__600.000		
Pin frame	611.050.0__600.000	10	With labelling
Socket frame	610.050.0__600.000		

L = Number of units × 2.54  
\_\_ = Here please register number of desired units (03 to 60, above 61 on request)

# ODU-MAC® L (LARGE)

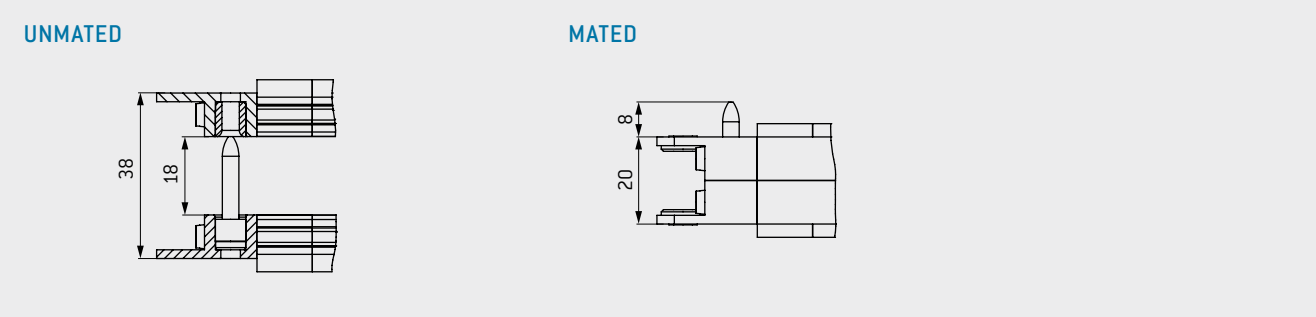
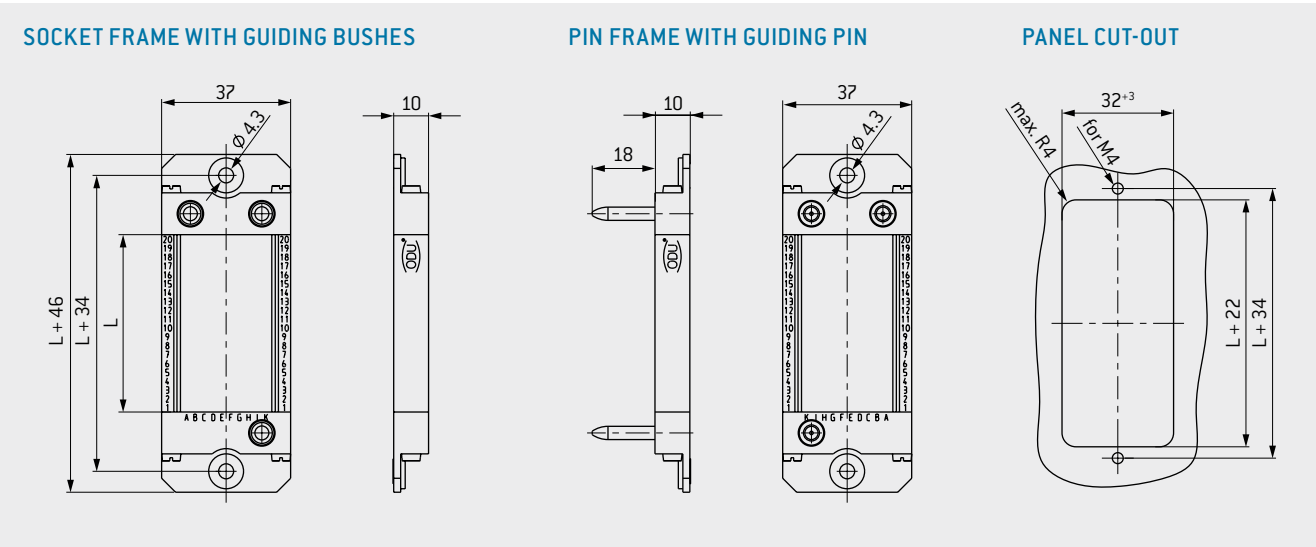
Frame with higher tolerance compensation and reinforced guiding bushes as well as extended guiding pins.



- TECHNICAL DATA**
- Tolerance compensation:  
Axial play: 0.4 mm  
Radial play: +/- 1.2 mm
  - Both-sided floating supported



Non-magnetic on request.

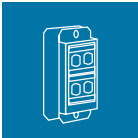


Description	Part number
Pin frame	611.009.0__600.000
Socket frame	610.009.0__600.000

L = Number of units × 2.54  
\_\_ = Here please register number of desired units (03 to 60, above 61 on request)

# ODU-MAC® M (MINI)

Compact style with minimum space requirement.



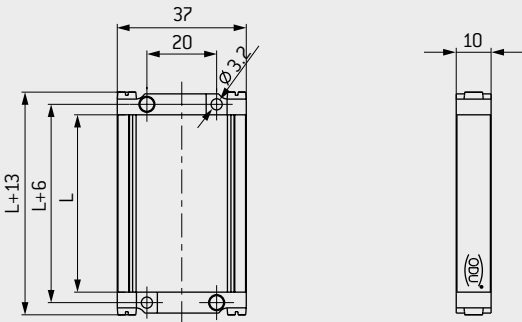
TECHNICAL DATA

- Axial and radial play on request
- Compact style

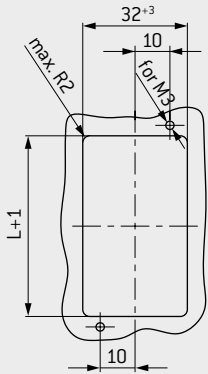


Non-magnetic on request.

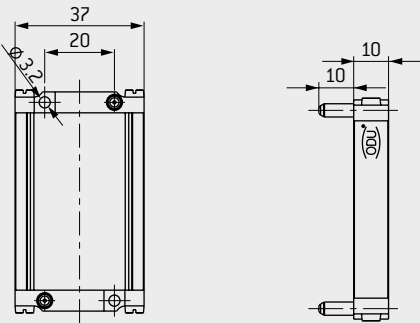
SOCKET FRAME WITH GUIDING HOLE



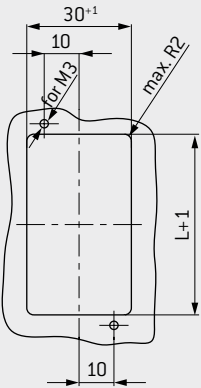
PANEL CUT-OUT



PIN FRAME WITH GUIDING PIN



PANEL CUT-OUT

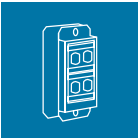


Description	Part number
Pin frame	611.017.0__600.000
Socket frame	610.017.0__600.000

L = Number of units × 2.54  
\_\_ = Here please register number of desired units  
[03 to 60, above 61 on request]

# ODU-MAC® P (POWER)

The frame for highest requirements by a reinforced frame design. High tolerance compensation +/- 2.5 mm.



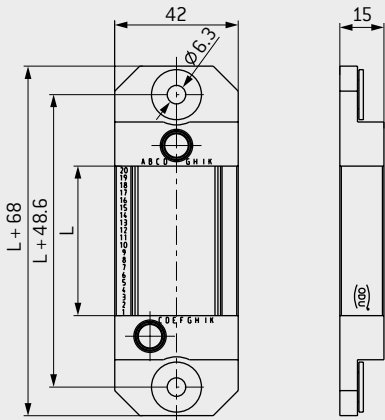
TECHNICAL DATA

- Tolerance compensation:  
Axial play: 1 mm  
Radial play: +/- 2.5 mm
- Both-sided floating supported
- Advisable for modules  
with contact diameter > 5 mm  
and frame length > 40 units (depending on configuration)
- Contact diameter > 8 mm: this frame has to be used
- Standard bearing bush

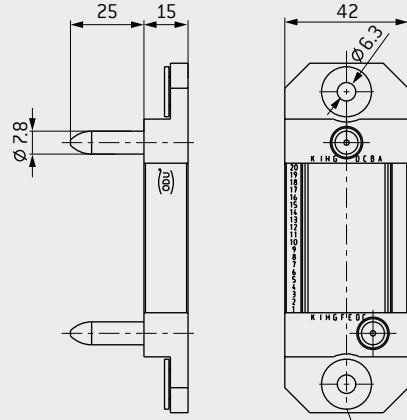


Non-magnetic on request.

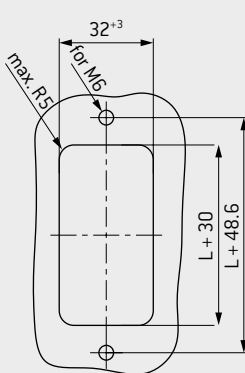
SOCKET FRAME WITH GUIDING BUSHES



PIN FRAME WITH GUIDING PIN



PANEL CUT-OUT



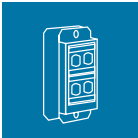
Description	Part number
Pin frame	611.030.0__600.000
Socket frame	610.030.0__600.000

L = Number of units × 2.54  
\_\_ = Here please register number of desired units  
[05 to 60 in steps of 5, above 61 on request]



# ODU-MAC® T (TRANSVERSE)


Transverse frame for installation in application specific housing solutions respectively by need of a low installation height.



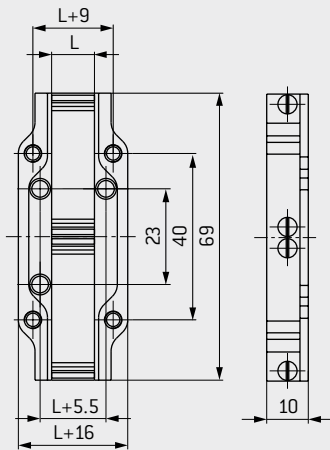
**TECHNICAL DATA**

- Installation even in housing solution

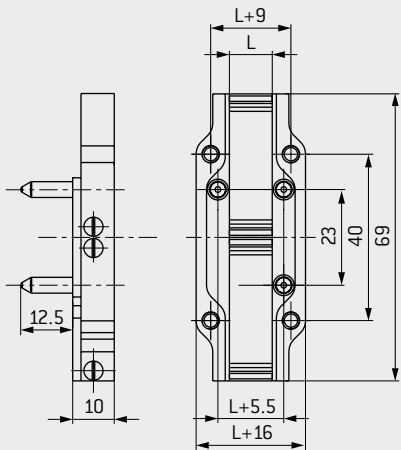
These model is available on request.  
Technical specifications have to be clarified in detail.

 Standard non-magnetic.

## SOCKET FRAME WITH GUIDING HOLE

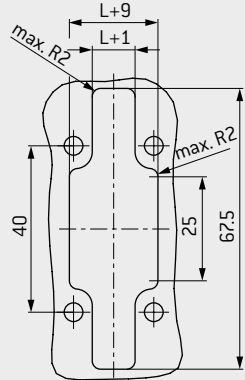


## PIN FRAME WITH GUIDING PIN



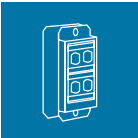
Part number	Part number	Dim. L	Units
Pin frame	Socket frame	mm	
611.055.029.303.600	610.055.029.103.600	7.62	3 × 2
611.055.029.304.600	610.055.029.104.600	10.16	4 × 2
611.055.029.305.600	610.055.029.105.600	12.7	5 × 2
611.055.029.306.600	610.055.029.106.600	15.24	6 × 2
611.055.029.307.600	610.055.029.107.600	17.78	7 × 2
611.055.029.308.600	610.055.029.108.600	20.32	8 × 2
611.055.029.309.600	610.055.029.109.600	22.86	9 × 2
611.055.029.310.600	610.055.029.110.600	25.4	10 × 2

## PANEL CUT-OUT



# ODU-MAC® QCH (QUICK CHANGE HEAD)

Frames for the highest mating cycles requirements (connector saver) and with a low maintenance time downtime due replaceable parts.



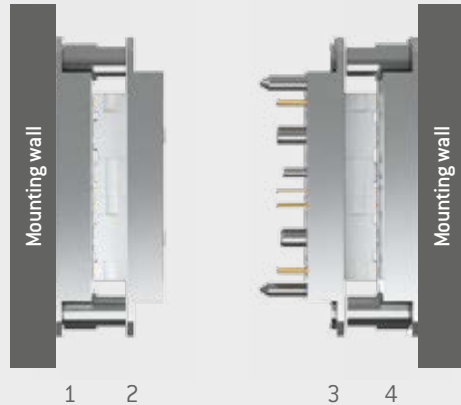
**TECHNICAL DATA**

- Tolerance compensation:  
Axial play: 0.2 mm  
Radial play: +/- 0.6 mm
- Pin piece floating supported
- Unlimited number of mating cycles
- Replacement of the interchange parts without assembly effort

These model is available on request.  
Technical specifications have to be clarified in detail.

 Non-magnetic on request.

## MOUNTING WALL BACK



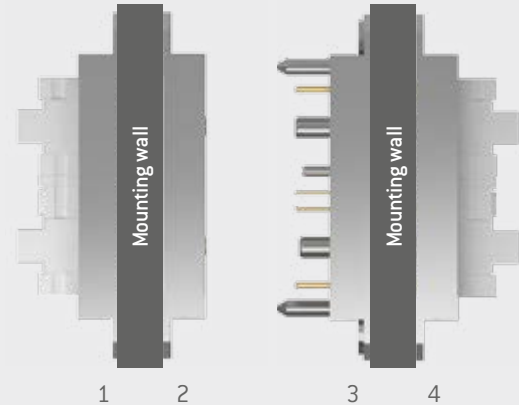
Description	Part number
Part 1: Base part incl. distance piece	610.026.0 __.600.000
Part 2: Socket frame – interchange part	610.020.0 __.600.000
Part 3: Pin frame – interchange part	611.021.0 __.600.000
Part 4: Base part incl. distance piece	610.026.0 __.600.000
Distance piece as a spare part	610.026.201.304.000

The quick change head (connector saver) consists of 4 frames. Pin and socket frames are disconnected or connected when disconnecting or connecting between the second and third frame.

Pieces 1 and 2 or 3 and 4 always remain together.

In the event of damage or wear to the contacts, both replacement parts 2 and 3 are disconnected from pieces 1 and 4 and can be quickly and easily replaced with the new replacement parts without time spent on assembly. The connection is ready to use again within a matter of seconds.

## MOUNTING WALL CENTRAL – FOR WALL THICKNESS 10 MM



Description	Part number
Part 1: Base part	610.027.0 __.600.000
Part 2: Socket frame – interchange part	610.020.0 __.600.000
Part 3: Pin frame – interchange part	611.021.0 __.600.000
Part 4: Base part	611.027.0 __.600.000

**FRAMES FOR THE QUICK CHANGE HEAD SYSTEM**

The standard ODU-MAC S docking frames can be used for the connector saver. ODU-MAC L docking frames upon request. (M and P frames are not possible).

**MODULES AND CONTACTS FOR THE QUICK CHANGE HEAD SYSTEM**

All modules with depths not exceeding 19 mm can be used in the connector saver system. PCB contacts are installed in pieces 2 and 3. All socket contacts (crimp and PCB termination) suitable for pieces 2 and 3 can be used in pieces 1 and 4.



CONFIGURE THE ODU-MAC®.  
SIMPLY ONLINE AT [WWW.ODU-MAC.COM](http://WWW.ODU-MAC.COM)

## MANUAL MATING

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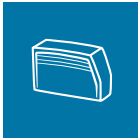
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ODU-MAC®

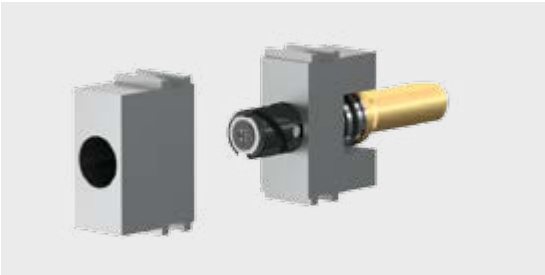


# SPINDLE LOCKING

Module for installation in ODU-MAC® frames for housings. Quick-action locking system with 30,000 locking cycles. Simple replacement of the front (spindle exchange set) enables further mating cycles of the complete system.

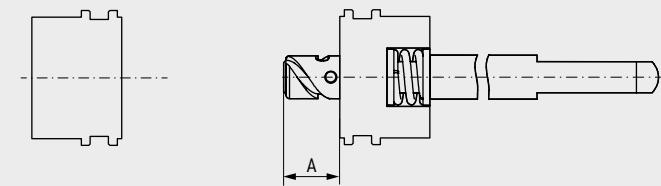


## VERSION 1: FOR SOCKETS IN BULKHEAD MOUNTED OR SURFACE MOUNTED HOUSING AND PINS IN CABLE HOOD



CENTER MODULE

SPINDLE LOCKING



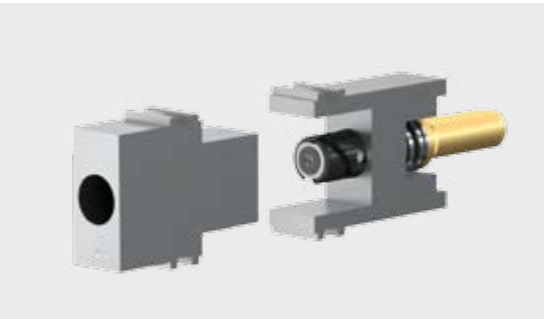
Size	Part number Center module for bulkhead mounted and surface mounted housing	Part number Spindle locking for cable hood	Angle of rotation	Dim. A mm
2 (52 mm high)	614.090.001.304.000	615.091.003.200.000	180°	12
2 (72 mm high)	614.090.001.304.000	615.091.001.200.000	180°	12
3/4	614.090.001.304.000	615.092.021.200.003	360°	21.5
4 /XXL	614.090.001.304.000	615.093.021.200.003	360°	21.5

- Max. locking cycles 30,000<sup>1</sup>
- Space requirement 5 units (5 × 2.54 mm)
- Further spindle geometries on request
- Can account for 80 lbf (in 9 Nm) of mating forces

<sup>1</sup> 30,000 cycles depending on mating force of the used modules.

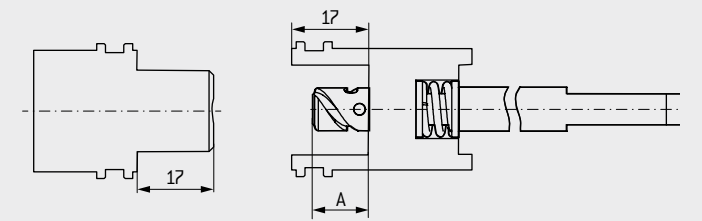


## VERSION 2: FOR PINS IN BULKHEAD MOUNTED OR SURFACE MOUNTED HOUSING AND SOCKETS IN CABLE HOOD (REVERSED GENDER)



CENTER MODULE

SPINDLE LOCKING



Size	Part number Center module for bulkhead mounted and surface mounted housing	Part number Spindle locking for cable hood	Angle of rotation	Dim. A mm
2 (52 mm high)	614.090.002.304.000	615.091.004.200.000	180°	12
2 (72 mm high)	614.090.002.304.000	615.091.002.200.000	180°	12
3/4	614.090.002.304.000	615.092.022.200.003	360°	21.5
4 /XXL	614.090.002.304.000	615.093.022.200.003	360°	21.5

- Max. locking cycles 30,000<sup>1</sup>
- Space requirement 5 units (5 × 2.54 mm)
- Further spindle geometries on request

## REPLACEMENT SPINDLE SET FOR VERSION 1 AND 2



Part number spindle exchange set	Angle of rotation	Dim. A mm
615.090.104.249.000	180°	12
615.090.104.249.003	360°	21.5

Replacement set for easy and rapid replacement of spindle screw from the front.

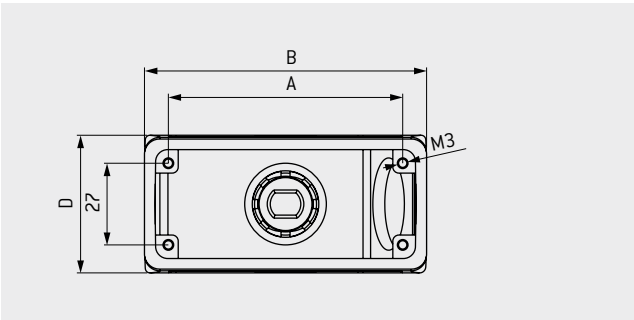
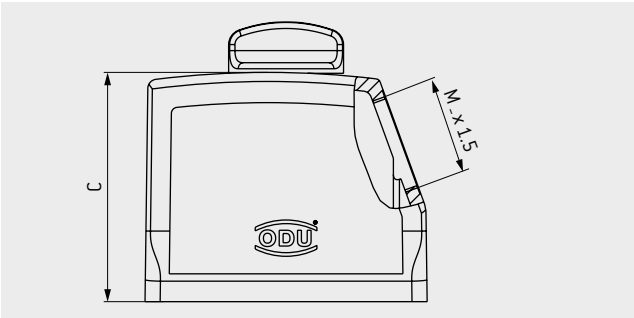
<sup>1</sup> 30,000 cycles depending on mating force of the used modules.

CABLE HOOD



Connector housing for assembly on the cable with side cable entry.

SPINDLE LOCKING



TECHNICAL DATA	
Colour of housing	Grey (standard, similar to RAL 7001) or white (similar RAL 9010)
Material	Aluminium die casting
Protection class <sup>1</sup>	IP 50 IP 65 on request
Operating temperature	−40 °C to +125 °C
Cable clamp	see page 63
Number of locking cycles	see page 44
Adapter	for PG clamp see page 63

Size	Part number A Colour of housing grey/ spindle knob black	Part number B Colour of housing white/ spindle knob white	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. M Cable entry	Part number protective cover (see page 64)
2	613.091.513.644.208	613.091.513.653.203	57	73	52	43	M25	491.097.613.644.000
	613.091.514.644.208	613.091.514.653.203	57		72	43		
3	613.092.514.644.208	613.092.514.653.203	77.5	93.5	76	45.5	M32	492.097.613.644.000
4	613.093.514.644.208	613.093.514.653.203	104	120	76	45.5		493.097.613.644.000

M40 CABLE ENTRY AVAILABLE ON REQUEST.

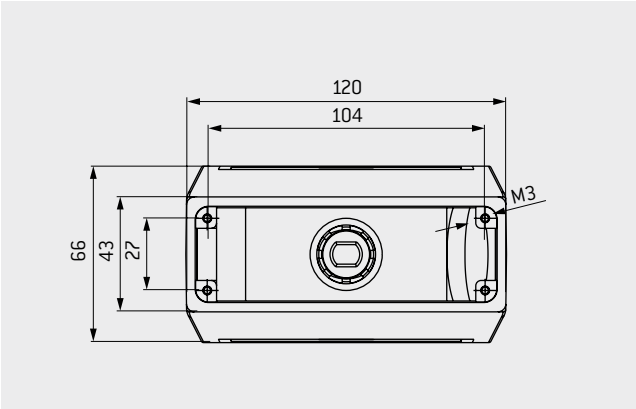
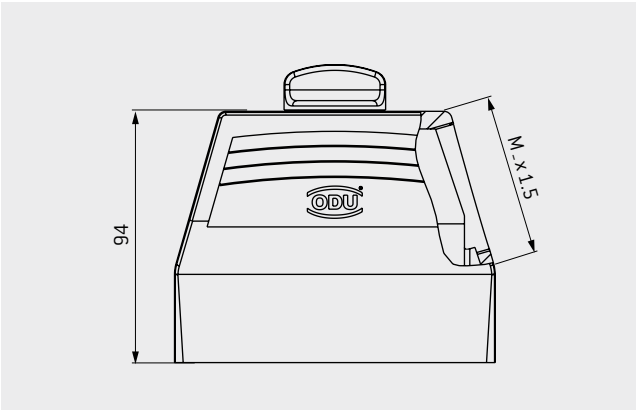
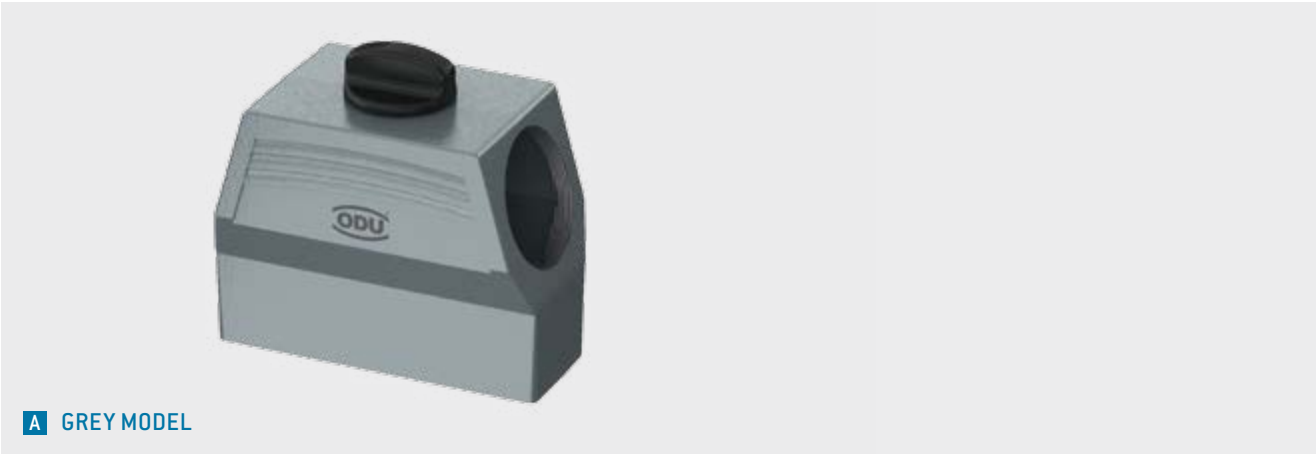
<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp and spindle knob model).

CABLE HOOD XXL



Connector housing for assembly on the cable. With expanded assembly space and side M50 cable entry.

SPINDLE LOCKING



TECHNICAL DATA	
Colour of housing	Grey (similar to RAL 7001) white on request
Material	Aluminium die casting
Protection class <sup>1</sup>	IP 50 IP 65 on request
Operating temperature	−40 °C to +125 °C
Cable clamp	see page 63
Number of locking cycles	see page 44

Size	Part number Colour of housing grey/ spindle knob black	Dim. M Cable entry	Part number protective cover (see page 64)
4	613.093.516.644. 208	M50	493.097.613.644.000

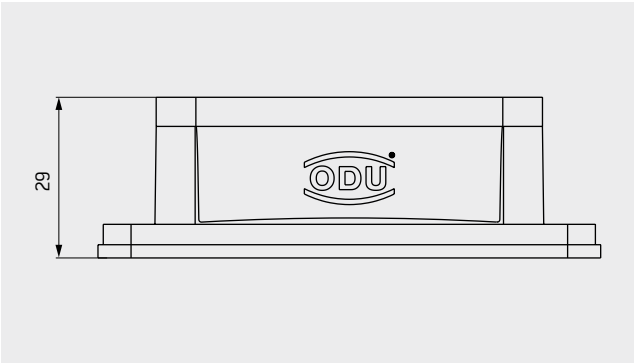
<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp and spindle knob model).

BULKHEAD MOUNTED HOUSING

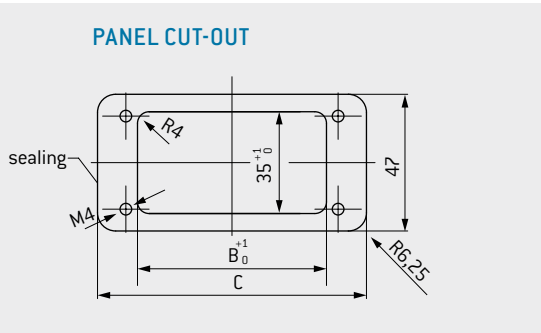
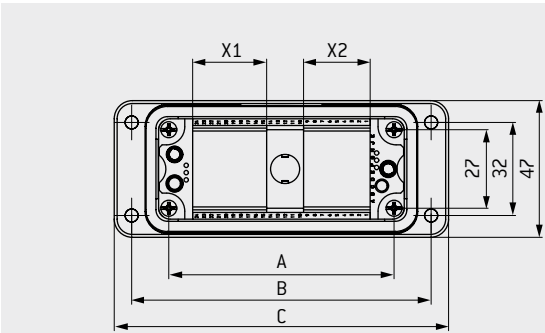


For mounting on the device.

SPINDLE LOCKING



TECHNICAL DATA	
Colour of housing	Grey (standard, similar to RAL 7001) or white (similar to RAL 9010)
Material	Aluminium die casting
Protection class <sup>1</sup>	IP 65
Operating temperature	–40 °C to +125 °C (short duration) –40 °C to +85 °C (operating)
Sealing	NBR; sealing material FKM on request (higher temperature range)



Size	Part number A	Part number B	Dim. A	Dim. B Panel cut-out	Dim. C	X1	X2
	Grey	White	mm	mm	mm	Units à 2.54 mm	Units à 2.54 mm
2	612.091.010.644.000	612.091.010.653.000	57	83	95	6	5
3	612.092.010.644.000	612.092.010.653.000	77.5	103	115	10	9
4	612.093.010.644.000	612.093.010.653.000	104	130	143	15	14

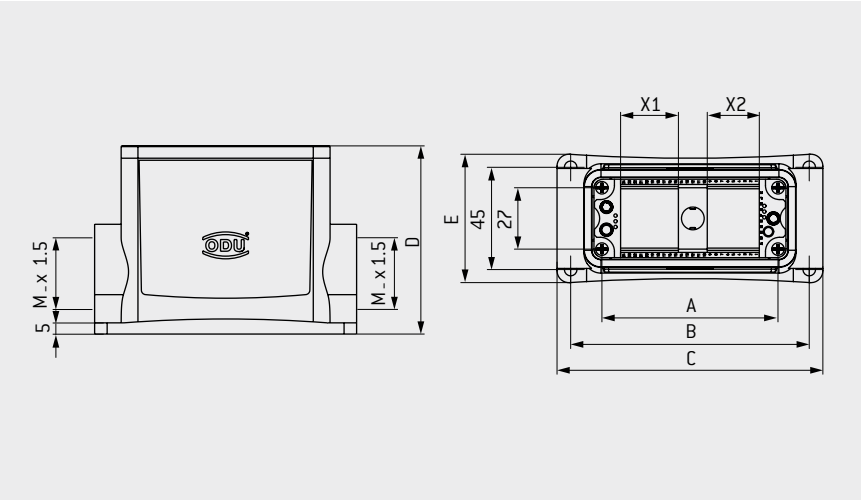
<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable hood).

SURFACE MOUNTED HOUSING



For surface mounting on your device/wall with two side cable entries.

SPINDLE LOCKING



TECHNICAL DATA	
Colour of housing	Grey (standard, similar to RAL 7001) white on request
Material	Aluminium die casting
Protection class <sup>1</sup>	IP 65
Operating temperature	–40 °C to +125 °C (short duration) –40 °C to +85 °C (operating)
Sealing	NBR; sealing material FKM on request (higher temperature range)
Cable clamp Adapter	see page 63 for PG clamp see page 63

Size	Part number A	Part number B	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	X1	X2	Dim. M
	Colour of housing grey	Colour of housing white	mm	mm	mm	mm	mm	Units à 2.54 mm	Units à 2.54 mm	Cable entry
2	612.091.025.644.102	612.091.025.653.102	57	82	92.5	74	55.5	6	5	M32
3	612.092.025.644.102	612.092.025.653.102	77.5	105	117	84	56.5	10	9	M32
4	612.093.025.644.102	612.093.025.653.102	104	132	144	84	57.5	15	14	M32

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp and cable hood).



# CABLE HOOD

Connector housing for assembly on the cable. With straight and side cable entry.

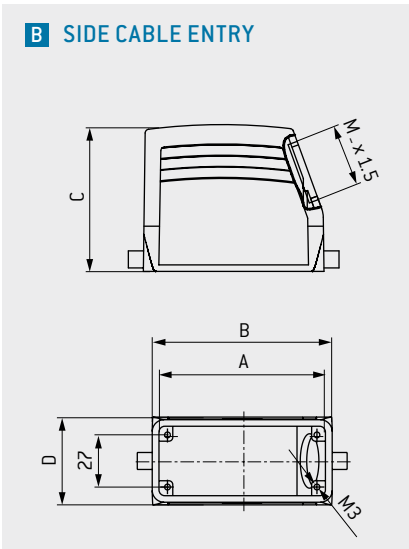
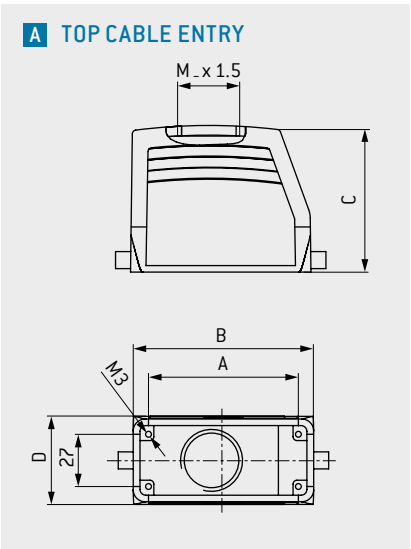
LEVER LOCKING



A TOP CABLE ENTRY



B SIDE CABLE ENTRY



**TECHNICAL DATA**

Colour of housing      Grey (standard, similar to RAL 7001)

Material                Aluminium die casting

Protection class<sup>1</sup>    IP 65

Operating temperature    -40 °C to +125 °C

Cable clamp            see page 63

Adapter                for PG clamp see page 63

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.

Size	Part number A Top cable entry	Part number B Side cable entry	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. M Cable entry	Part number protective cover (see page 64)
1	490.214.450.644.102	490.414.450.644.102	44	60	52	43	M25	490.097.500.644.000
	490.215.450.644.102	490.415.450.644.102			72		M32	
2	491.214.450.644.102	491.414.450.644.102	57	73	52	43	M25	491.097.212.644.000
	491.215.450.644.102	491.415.450.644.102			72		M32	
3	492.215.450.644.102	492.415.450.644.102	77.5	93.5	76	45.5	M32	492.097.214.644.000
4	493.215.450.644.102	493.415.450.644.102	104	120	76	45.5	M32	493.097.214.644.000
	493.217.550.644.000	493.417.550.644.000					M40	

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp).

# CABLE HOOD XXL

Connector housing for assembly on the cable. With expanded assembly space as well as side and top M50 cable entry.

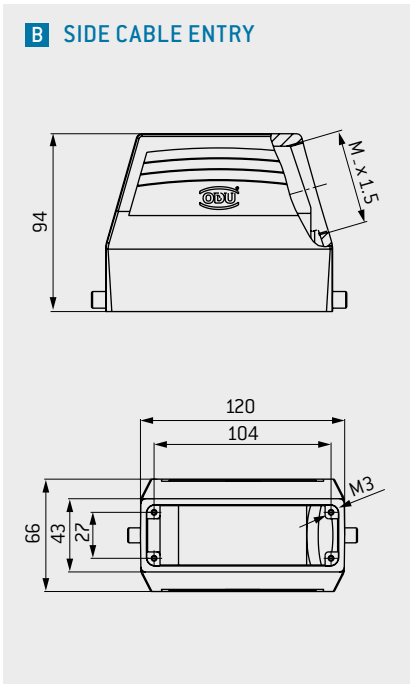
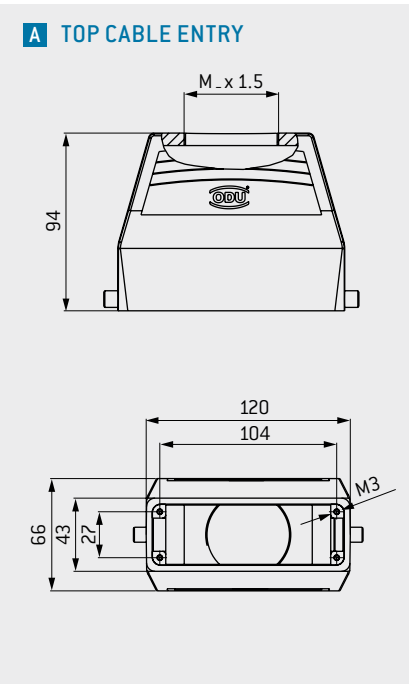
LEVER LOCKING



A TOP CABLE ENTRY



B SIDE CABLE ENTRY



**TECHNICAL DATA**

Colour of housing      Grey (standard, similar to RAL 7001)

Material                Aluminium die casting

Protection class<sup>1</sup>    IP 65

Operating temperature    -40 °C to +125 °C

Cable clamp            see page 63

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.

Size	Part number A Top cable entry	Part number B Side cable entry	Dim. M Cable entry	Part number protective cover (see page 64)
4	493.218.550.644.000	493.419.550.644.000	M50	493.097.214.644.000

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp).

# BULKHEAD MOUNTED HOUSING



With or without cover.

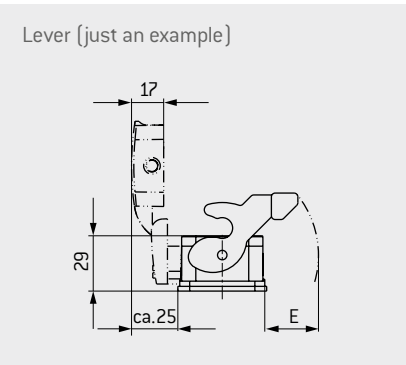
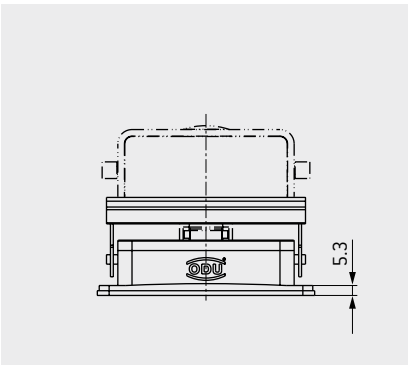
## LEVER LOCKING



A WITHOUT COVER



B WITH COVER



**TECHNICAL DATA**

Colour of housing Grey (standard, similar to RAL 7001)

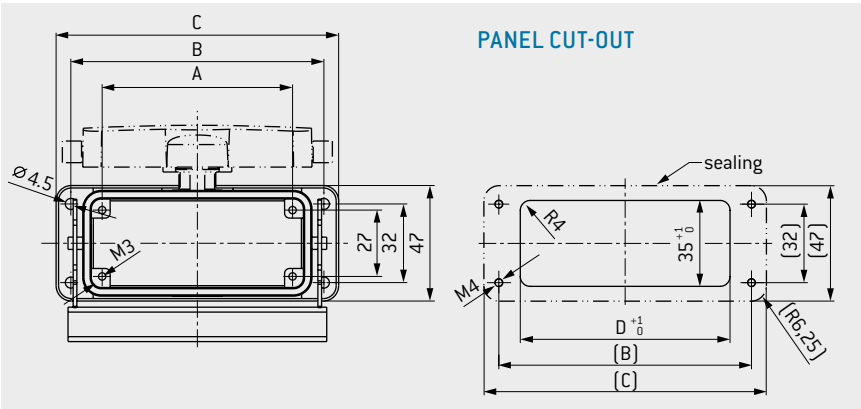
Material Aluminium die casting

Protection class<sup>1</sup> IP 65

Operating temperature in mated condition  
–40 °C to +125 °C (short duration)  
–40 °C to +85°C (operating)

Sealing NBR; sealing material FKM on request (higher temperature range)

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.



Size	Part number A Without protective cover	Part number B With protective cover	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D Panel cut-out mm	Dim. E mm
1	490.130.400.644.000	490.131.400.644.000	44	70	82	52.2	≈ 22
2	491.130.400.644.000	491.131.400.644.000	57	83	95	65.2	≈ 27
3	492.130.400.644.000	492.131.400.644.000	77.5	103	115	85.5	≈ 28
4	493.130.400.644.000	493.131.400.644.000	104	130	143	112.2	≈ 28

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable hood).

# SURFACE MOUNTED HOUSING



For surface mounting on your device/wall with two side cable entries.

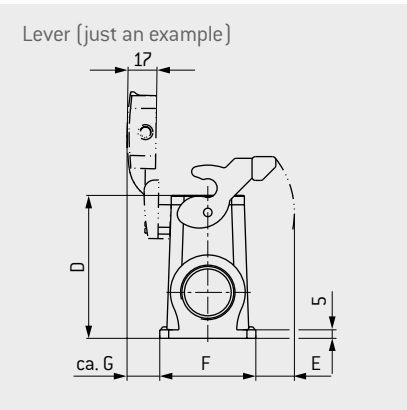
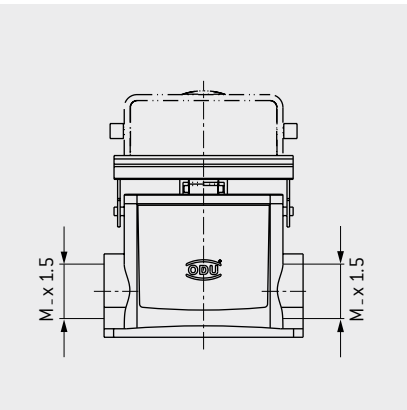
## LEVER LOCKING



A WITHOUT COVER



B WITH COVER



**TECHNICAL DATA**

Colour of housing Grey (standard, similar to RAL 7001)

Material Aluminium die casting

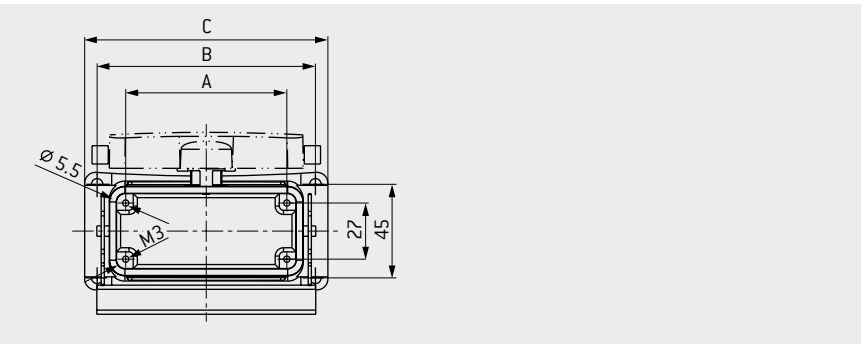
Protection class<sup>1</sup> IP 65

Operating temperature in mated condition  
–40 °C to +125 °C (short duration)  
–40 °C to +85°C (operating)

Sealing NBR; sealing material FKM on request (higher temperature range)

Adapter for PG clamp see page 63

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.



Size	Part number A Without protective cover	Part number B With protective cover	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. E mm	Dim. F mm	Dim. G mm	Dim. M Cable entry
1	490.133.450.644.102	490.135.450.644.102	44	70	82	74	≈ 17	55.5	20	M32
2	491.133.450.644.102	491.135.450.644.102	57	82	92.5	74	≈ 23	55.5	20	
3	492.133.450.644.102	492.135.450.644.102	77.5	105	117	84	≈ 23	56.5	20	
4	493.133.450.644.102	493.135.450.644.102	104	132	144	84	≈ 22	58	19	

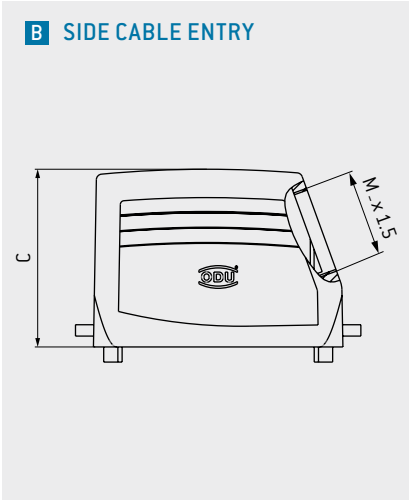
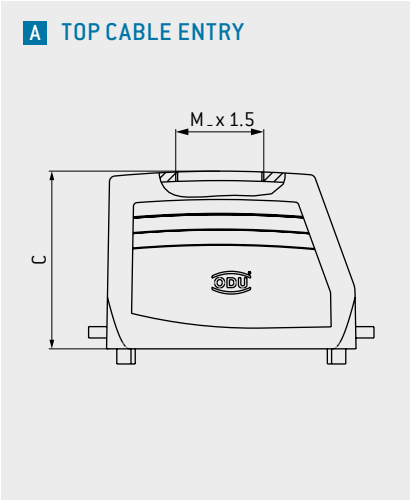
M40 CABLE ENTRY AVAILABLE ON REQUEST.

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp and cable hood).

CABLE HOOD WIDE

With straight and side cable entry for double contact arrangement on the frame.

LEVER LOCKING



**TECHNICAL DATA**

Colour of housing    Grey (standard, similar to RAL 7001)

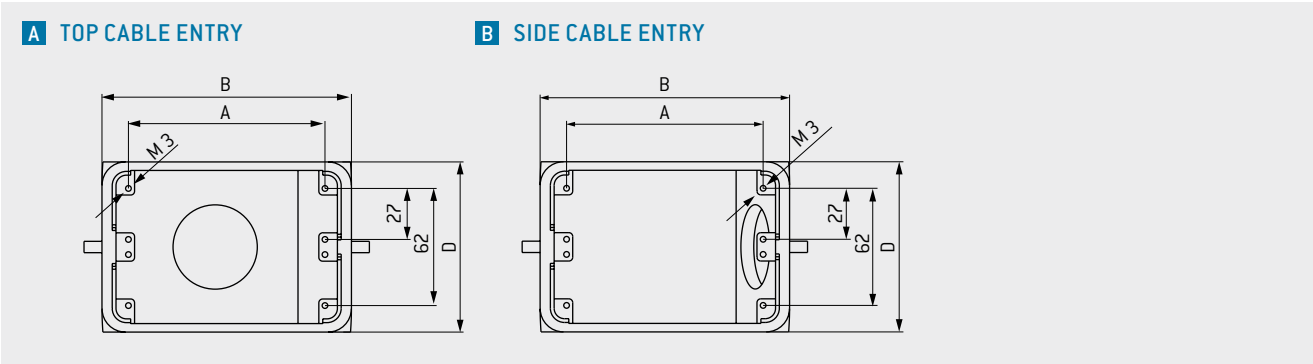
Material             Aluminium die casting

Protection class<sup>1</sup>    IP 65

Operating temperature    in mated condition  
                                 without housing sealing:  
                                 –40 °C to +125 °C

Housing suitable for two standard frames size 3 or 4.  
2 × size 3 = size 5  
2 × size 4 = size 6

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.



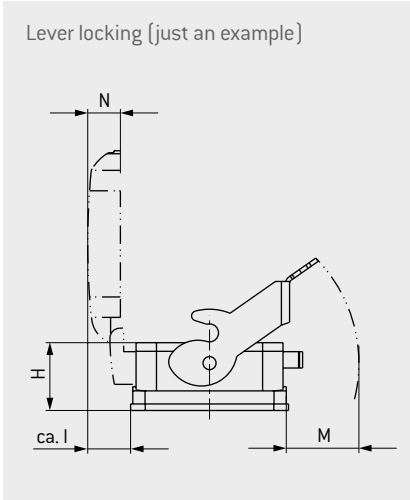
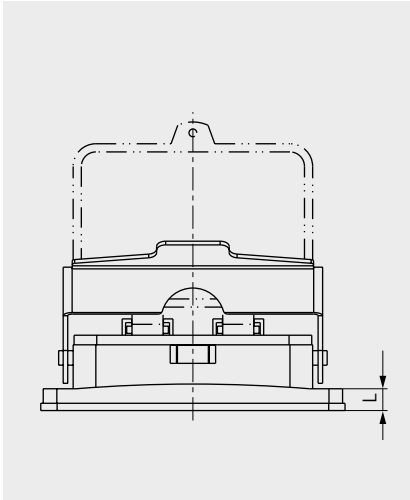
Size	Part number A Top cable entry	Part number B Side cable entry	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. M Cable entry
5	494.215.550.644.000	494.415.550.644.000	77.5	94	79	82.5	M40
6	495.215.550.644.000	495.415.550.644.000	104	132	94	90	M50

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp).

BULKHEAD MOUNTED HOUSING FOR CABLE HOOD WIDE

With and without cover

LEVER LOCKING



**TECHNICAL DATA**

Colour of housing    Grey (standard, similar to RAL 7001)

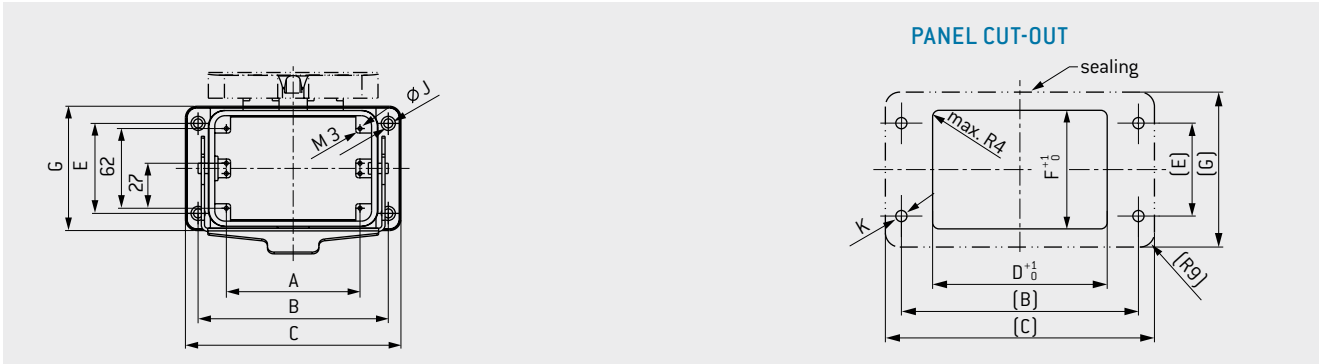
Material             Aluminium die casting

Protection class<sup>1</sup>    IP 65

Operating temperature    in mated condition  
                                 –40 °C to +125 °C  
                                 (short duration)  
                                 –40 °C to +85 °C  
                                 (operating)

Sealing                NBR; sealing material  
                                 FKM on request (higher temperature range)

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.



Size	Part number A Without protective cover	Part number B With protective cover	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. E mm	Dim. F mm	Dim. G mm	Dim. H mm	Dim. I mm	Dim. J mm	Dim. K mm	Dim. L mm	Dim. M mm	Dim. N mm
5	494.130.500.644.000	494.131.500.644.000	77.5	110	127	79	65	74	89	38	≈ 23	5.5	M5	7	31	17
6	495.130.500.644.000	495.131.500.644.000	104	148	168	117	70	80	96.7	41.5	≈ 26	7	M6	12	43	20

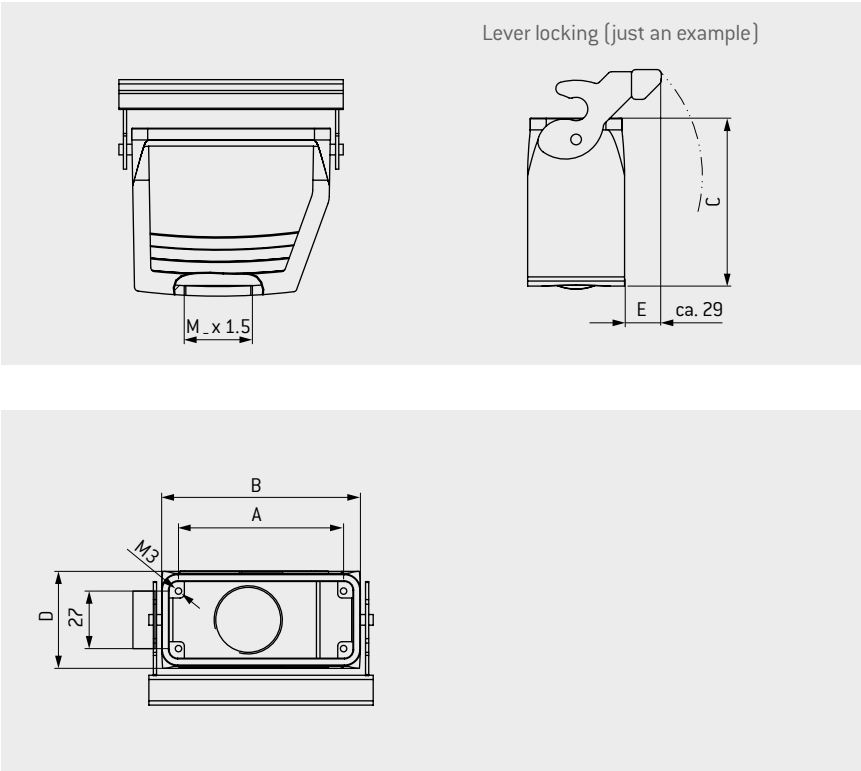
<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable hood wide).



# CABLE TO CABLE HOOD

With top cable entry. For a flying cable to cable connection.

## LEVER LOCKING



### TECHNICAL DATA

- To build a cable to cable connection.  
Suitable to cable hoods (page 50).
- Colour of housing     Grey (standard, similar to RAL 7001)
- Material             Aluminium die casting
- Protection class<sup>1</sup>   IP 65  
                              in mated condition
- Operating temperature    –40 °C to +125 °C (short duration)  
                                     –40 °C to +85 °C (operating)
- Sealing                NBR; sealing material FKM on request (higher temperature range)
- Cable clamp           see page 63
- Adapter                for PG clamp see page 63

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.

Size	Part number	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. M Cable entry	Part number Protective cover (see page 64)
1	490.331.450.644.102	44	60	75	43	M32	490.097.500.644.001
2	491.331.450.644.102	57	73	75	43		491.097.133.644.000
3	492.331.450.644.102	77.5	93.3	79	45.5		492.097.133.644.000
4	493.331.450.644.102	104	120	79	45.5		493.097.133.644.000

M40 cable entry available on request.

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp).

# TRANSVERSE LOCKING

Housing with side lockings.  
On request.



### TECHNICAL DATA

- Colour of housing     Grey (standard, similar to RAL 7001)
- Material             Aluminium die casting
- Protection class       IP 65<sup>1</sup> in mated condition
- Operating temperature    –40 °C to +125 °C (short duration)  
                                     –40 °C to +85 °C (operating)
- Sealing                NBR

At the lever locking minimum 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles there is no lubrication required.

<sup>1</sup> IEC 60529:2013 (VDE 0470-1:2014) (depends on used cable clamp).

# CABLE HOOD IN IP 68/IP 69

For applications with extreme requirements. With 360° EMC shielding according to VG 95373-41:1997.  
On request.

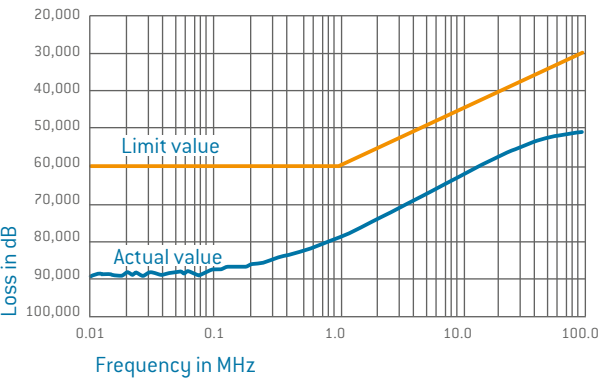


A TOP CABLE ENTRY



B SIDE CABLE ENTRY

## INSERTION LOSS



## TECHNICAL DATA

### EMC model

Surface	Electrically conductible
Sealing	Inside
Housing	Aluminium die casting alloy seawater resistance
Temperature range	−50 °C to +120 °C
Shielding attenuation	ca. 65 dB

### Corrosion protection model

Pressure tightness	> 5 bar
Colour	Black (similar to RAL 9002)
Protection class <sup>1</sup>	IP 68, IEC 60529:2013 (VDE 0470-1:2014) IP 69, IEC 60529:2013 (VDE 0470-1:2014)

Screw locking

### Application areas

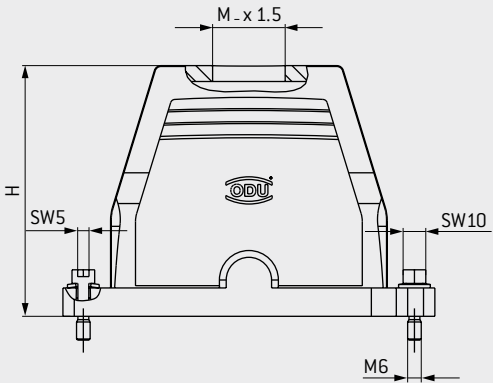
Used in EMC shielded applications.  
Housing construction according to IEC 61373:2010 (VDE 0115-106:2011)  
Cat. 2 (bogie) from rail engineering.

Size	Part number A Top cable entry	Part number B Side cable entry	Dim. B mm	Dim. C mm	Dim. M mm	Dim. H mm
1	490.260.550.641.000	490.261.550.641.000	132	44	M32	100.5
2	491.262.550.641.000	491.263.550.641.000	144	57	M32	100.5
3	492.262.550.641.000	492.263.550.641.000	164	77.5	M32	110.5
4	493.262.550.641.000	493.263.550.641.000	191	104	M40	110.5

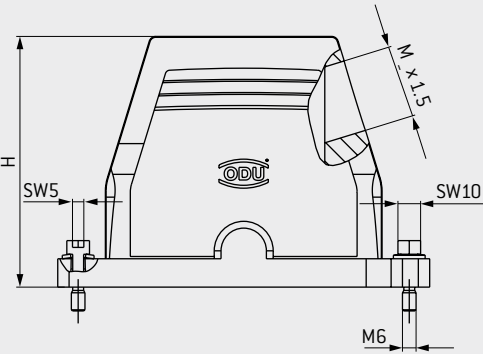
<sup>1</sup> IEC 60529:2013 (depends on used cable clamp).



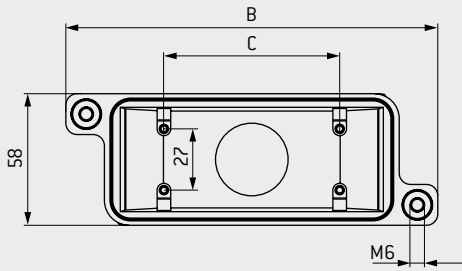
A TOP CABLE ENTRY



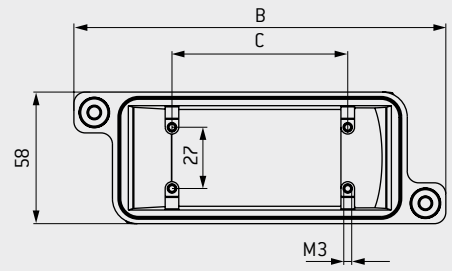
B SIDE CABLE ENTRY



A

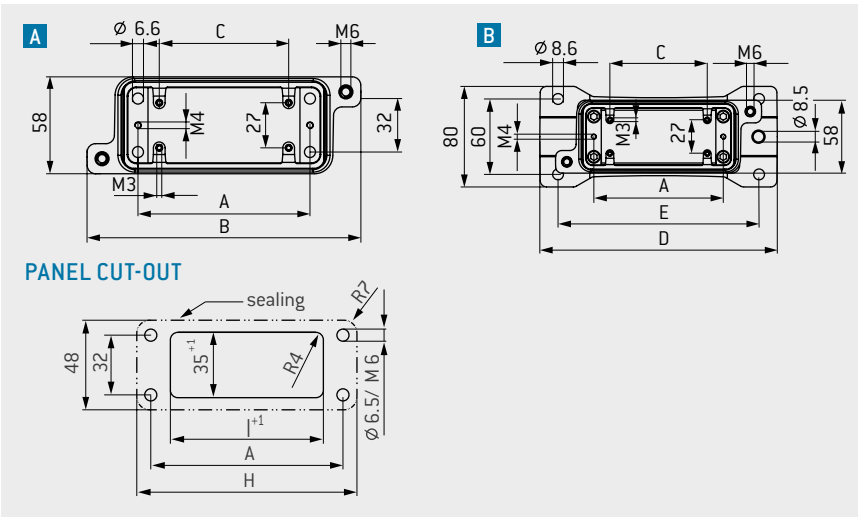
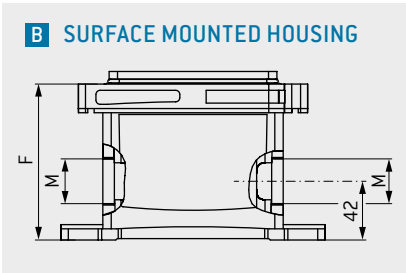
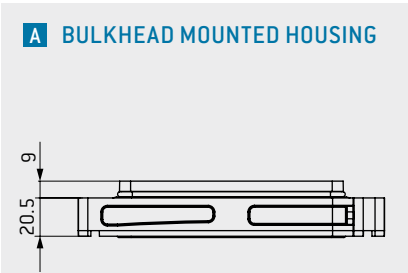
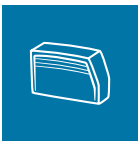


B



# BULKHEAD MOUNTED- AND SURFACE MOUNTED HOUSING IN IP 68/IP 69

For applications with extreme requirements. With 360° EMC shielding according to VG 95373-41:1997.  
On request.



**TECHNICAL DATA**

**EMC model**  
Surface Electrically conductible  
Sealing Inside  
Housing Aluminium die casting alloy  
seawater resistance  
Temperature range -50 °C to +120 °C  
Shielding attenuation ca. 65 dB

**Corrosion protection model**  
Pressure tightness > 5 bar  
Colour Black (similar to RAL 9002)  
Protection class<sup>1</sup> IP 68, IEC 60529:2013 (VDE 0470-1:2014)  
IP 69, IEC 60529:2013 (VDE 0470-1:2014)  
Sealing Silicone

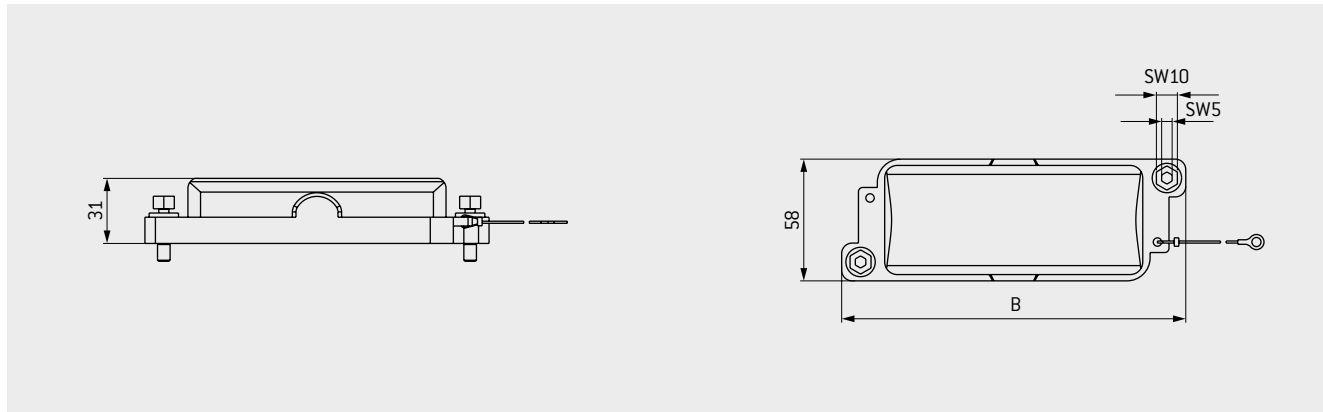
**Application areas**  
Used in EMC shielded applications.  
Housing construction according to IEC 61373:2010 (VDE 0115-106:2011, bogie) from rail engineering.

Size	Part number Bulkhead mounted housing	Part number Surface mounted housing	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. E mm	Dim. F mm	Dim. H mm	Dim. I mm	Dim. M Cable entry
1	490.160.500.641.000	490.161.550.641.000	70	132	44	216	127	100.5	85	48	M32
2	491.161.500.641.000	491.162.550.641.000	83	144	57	189	140	100.5	98	60	M32
3	492.161.500.641.000	492.162.550.641.000	103	164	77.5	169	160	111.5	118	82	M32
4	493.161.500.641.000	493.162.550.641.000	130	191	104	156	187	111.5	145	108	M40

<sup>1</sup> IEC 60529:2013 (depends on used cable clamp).

# PROTECTIVE COVER FOR BULKHEAD MOUNTED AND SURFACE MOUNTED HOUSING IN IP 68/IP 69

For applications with extreme requirements. With 360° EMC shielding according to VG 95373-41:1997.  
On request.

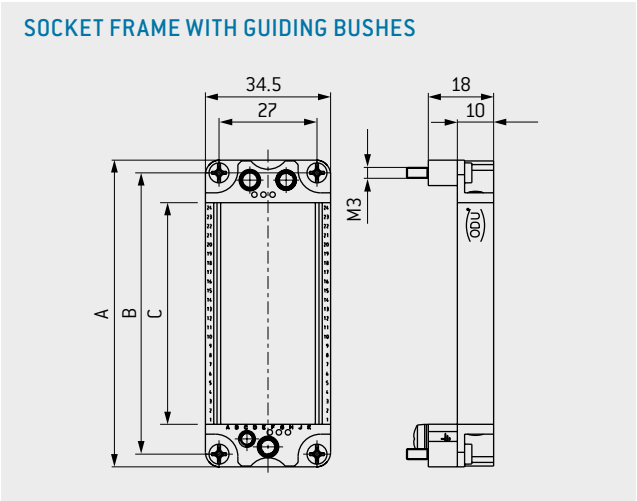


Size	Part number protective cover for bulkhead mounted and surface mounted housing with lanyard	Dim. B mm
1	490.060.500.641.000	132
2	491.060.500.641.000	144
3	492.060.500.641.000	164
4	493.060.500.641.000	191

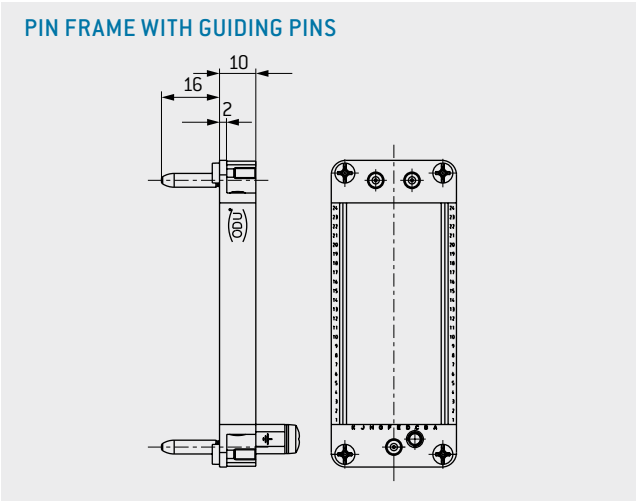


# ODU-MAC® FRAME FOR HOUSING

With grounded housing.



Sockets in bulkhead mounted housing, cable to cable hood or surface mounted housing. Pins in cable hood. Modules are mounted, contacts are not fixed enclosed. Coding possibilities see page 68.



For the height of the contact pins the same dimensions are valid as described by the respective modules.

Size	Part number Socket frame	Part number Pin frame	Max. units à 2.54 mm <sup>1</sup>	Dim. A mm	Dim. B mm	Dim. C mm
1	610.190.000.600.000	611.190.000.600.000	10	51	44	25.5
2	610.191.000.600.000	611.191.000.600.000	16	64	57	40.8
3	610.192.000.600.000	611.192.000.600.000	24	84.5	77.5	61.1
4/XXL	610.193.000.600.000	611.193.000.600.000	34	111	104	86.5

### FRAMES FOR CABLE HOOD WIDE

5	2 × part number size 3	2 × part number size 3	2 × 24	84.5	77.5	61.1
6	2 × part number size 4	2 × part number size 4	2 × 34	111	104	86.5

For contact arrangement in the cable hood wide please be aware that the frames in each case must be ordered double.

<sup>1</sup> If the configuration doesn't fill the frame completely, please use blank modules (see page 140).

# CABLE CLAMPS, BLIND GROMMET AND ADAPTER RING



### CABLE CLAMP<sup>1</sup> FOR HOUSINGS ACCORDING TO IEC 62444:2010 (VDE 0619:2014)



#### TECHNICAL DATA

Material body PA  
Sealing NBR  
Protection class IP 68 to 5 bar  
Temperature range −40 °C to +100 °C

EMC clamp on request.

Part number	Thread	Colour	Width across flats	Tightening torque	Cable diameter mm	
					min.	max.
027.825.060.130.007	M25 × 1.5	Grey	30	8	6	13
027.825.090.170.007					9	17
027.832.070.150.007	M32 × 1.5		36	10	7	15
027.832.110.210.007					11	21
027.840.190.280.007	M40 × 1.5		46	13	19	28
027.850.270.350.007	M50 × 1.5		55	15	27	35
027.825.060.130.003	M25 × 1.5	White	30	8	6	13
027.825.090.170.003					9	17
027.832.070.150.003	M32 × 1.5		36	10	7	15
027.832.110.210.003					11	21
027.840.190.280.003	M40 × 1.5		46	13	19	28

### BLIND GROMMET FOR SURFACE MOUNTED HOUSING

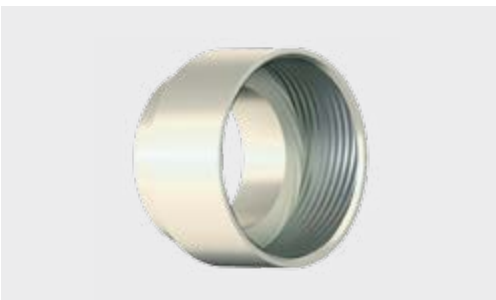


#### TECHNICAL DATA

Colour Grey  
Material PA fibre glass reinforced  
Protection class IP 68  
Temperature range −40 °C to +100 °C  
Sealing NBR

Part number	Thread [M]
921.000.006.000.279	25 × 1.5
921.000.006.000.268	32 × 1.5
On request	40 × 1.5
On request	50 × 1.5

### ADAPTER RING FOR CABLE CLAMPS WITH PG THREAD



#### TECHNICAL DATA

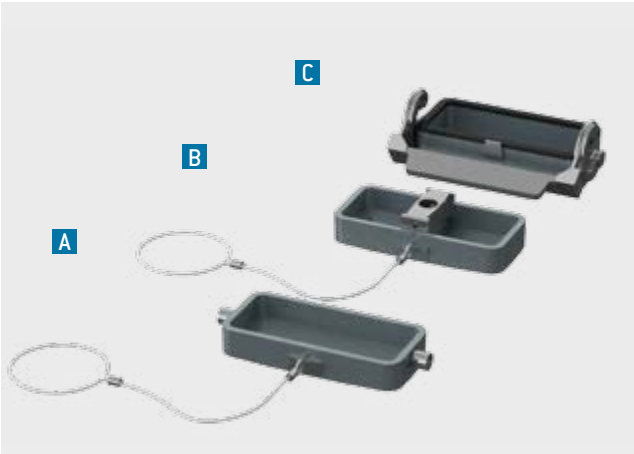
Material Nickel-plated brass

Part number	External thread	Internal thread
921.000.006.000.254	25 × 1.5	PG 21
921.000.006.000.255	32 × 1.5	PG 29
921.000.006.000.267	32 × 1.5	M40

<sup>1</sup> Delivery doesn't contain cable clamp, but o-ring is enclosed to the housing.

# PROTECTIVE COVER

For cable hood, cable to cable hood and cable hood XXL.



TECHNICAL DATA

Colour

Grey (standard, similar to RAL 7001)

Protection class IP 65 in locked condition

Metal protective cover with locking latch [C]  
Metal protective cover with bolt and lanyard [A]

Protection class IP 54 in locked condition

Metal protective cover with middle section for spindle locking with lanyard and middle section [B]

Material

Aluminium die casting (body)

Temperature range

−40 °C to +125 °C

Sealing

NBR

A METAL PROTECTIVE COVER with bolt and lanyard

A VIEW WITHOUT LANYARD

B METAL PROTECTIVE COVER for spindle locking with lanyard and middle section

B VIEW WITHOUT LANYARD

C METAL PROTECTIVE COVER with locking latch

Lever locking just an example

C VIEW WITHOUT LOCKING LATCH

Size	IP 65 Part number A Metal protective cover with bolt and lanyard	IP 50 Part number B Metal protective cover for spindle locking with lanyard and middle section	IP 65 Part number C Metal protective cover with locking latch	Dim. A mm
1	490.097.500.644.001	—	490.097.500.644.000	60
2	491.097.133.644.000	491.097.613.644.000	491.097.212.644.000	73
3	492.097.133.644.000	492.097.613.644.000	492.097.214.644.000	93.5
4/XXL	493.097.133.644.000	493.097.613.644.000	493.097.214.644.000	120

# TRANSPORT PROTECTIVE COVER

For protection of the assembled connector during transport.



TECHNICAL DATA

Material

Plastic PP / antistatic

Colour

Black (similar to RAL 9002)

Size	Part number With holding lanyard	Part number Without holding lanyard
1	490.097.900.924.000	490.097.900.924.101
2	491.097.900.924.000	491.097.900.924.101
3	492.097.900.924.000	492.097.900.924.101
4/XXL	493.097.900.924.000	493.097.900.924.101

# CODING POSSIBILITIES IN THE HOUSING



To prevent mismating.

In order to prevent mismating, hardware can be configured for connection systems with coding.

In place of cylinder screws, coding pins/sockets can be used in the housing of the ODU-MAC. ODU offers 16 different coding possibilities. The frames are supplied as standard without additional coding. If multiple connectors are used side by side, mismating can be prevented.



## POSSIBLE CODINGS

CODE 1

CODE 2

CODE 3

CODE 4

CODE 5

CODE 6

CODE 7

CODE 8

CODE 9

CODE 10

CODE 11

CODE 12

CODE 13

CODE 14

CODE 15

CODE 16



## CODING EXAMPLE

CODE 1

Frame	Part number suitable for frame no.	Coding	
		● Part number pin <sup>1</sup>	● Part number socket <sup>2</sup>
Pin	611.19X.000.600.000	611.090.301.902.000 	610.090.302.902.000 
		611.090.302.902.000 	610.090.301.902.000 
Socket	610.19X.000.600.000		

PART NUMBER TORQUE WRENCH: 1.2 NM: 598.054.002.000.000, PLUS 2 × BIT SEE PAGE 152

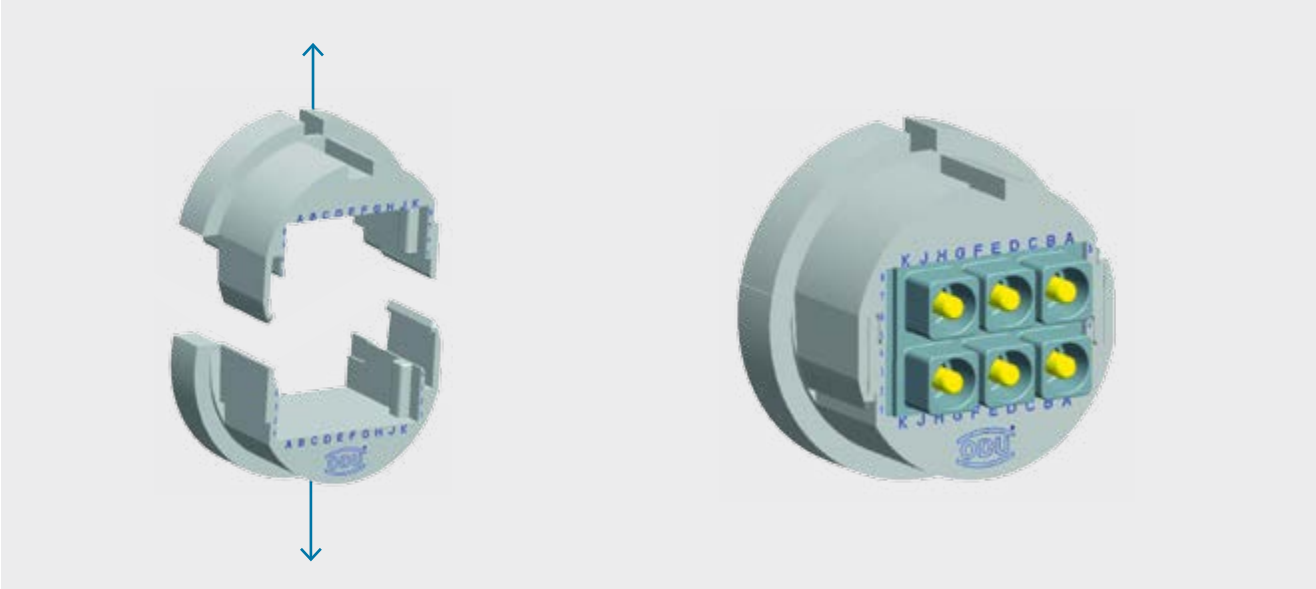
<sup>1</sup>Insert: 598.054.107.000.000. <sup>2</sup>Insert 598.054.203.000.000.



# FLEXIBLE CIRCULAR CONNECTORS WITH ODU-MAC® INSERTS



Suitable for rugged housing from series 209 and housing ODU DOCK.



Modular circular connectors from the existing portfolio can be easily configured with the flexible ODU-MAC inserts. The flexible insulators (half shells) are compatible with the housings of the series 209 and ODU DOCK and can be easily installed in them. The result is a modular circular connector with a very robust housing.

The flexible use provides space for ODU-MAC modules with 8 units. Thanks to the divided insulator, installation of ODU-MAC modules is possible without a large expenditure of time. The modules are easily inserted into the insulator. Following the completed contact arrangement, the two halves are clipped together and integrated into the respective housing.

Due to the combination of two proven ODU products you can arrange the inserts individual:

- 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	Part number
	Insulator socket	Insulator pin
Insulator half-shells	209.610.000.000.000	209.611.000.000.000

**NOTE**

- Please use only protruding contacts from Ø 1.02 mm
- Assembly instruction available on our website
- Delivery times according to series 209 and ODU DOCK



## APPLICATION EXAMPLES





CONFIGURE THE ODU-MAC®.  
SIMPLY ONLINE AT [WWW.ODU-MAC.COM](http://WWW.ODU-MAC.COM)

## MODULES

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Coax .....	106
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Blank modules/spacer modules/coding modules/pin protection modules .....	140

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OVERVIEW OF ALL MODULES



	Modules	Description	Units/width	Features		Page
Signal		14 contacts for turned contacts  Contact Ø: 1.02 mm	3 units (7.62 mm)	<b>High contact density</b> Operating voltage <sup>1</sup> 320 V Rated impulse voltage <sup>1</sup> 2,500 V Max. continuous current <sup>2</sup> 13.5 A at 0.5 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">78</a>
		10 contacts for turned contacts  Contact Ø: 0.76 mm	1 unit (2.54 mm)	<b>Highest contact density</b> Operating voltage <sup>1</sup> 250 V Rated impulse voltage <sup>1</sup> 1,500 V Max. continuous current <sup>2</sup> 11 A at 0.38 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">80</a>
		10 contacts for stamped contacts  Contact Ø: 0.7 mm	1 unit (2.54 mm)	<b>Economical solution</b> Operating voltage <sup>1</sup> 32 V Rated impulse voltage <sup>1</sup> 1,500 V Max. continuous current <sup>2</sup> 6 A at 0.38 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 5,000		<a href="#">82</a>
		6 contacts for turned contacts  Contact Ø: 1.02 mm	2 units (5.08 mm)	Operating voltage <sup>1</sup> 400 V Rated impulse voltage <sup>1</sup> 3,000 V Max. continuous current <sup>2</sup> 13.5 A at 0.5 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">84</a>
		5 contacts for turned contacts  Contact Ø: 1.5 mm	2 units (5.08 mm)	Operating voltage <sup>1</sup> 500 V Rated impulse voltage <sup>1</sup> 2,500 V Max. continuous current <sup>2</sup> 27 A at 1.5 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">86</a>
Power		4 contacts for turned contacts  Contact Ø: 2.41 mm	3 units (7.62 mm)	Operating voltage <sup>1</sup> 500 V Rated impulse voltage <sup>1</sup> 3,000 V Max. continuous current <sup>2</sup> 41 A at AWG 12 Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">88</a>

<sup>1</sup>Acc. to IEC 60664-1:2007 (VDE 0110-1:2008) for degree of pollution 2. <sup>2</sup>Definition max. continuous current see page 165.

OVERVIEW OF ALL MODULES



	Modules	Description	Units/width	Features		Page
Power		3 contacts for turned contacts  Contact Ø: 3 mm	3 units (7.62 mm)	Operating voltage <sup>1</sup> 500 V Rated impulse voltage <sup>1</sup> 3,000 V Max. continuous current <sup>2</sup> 58 A at 6 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">90</a>
		3 contacts for turned contacts  Contact Ø: 3 mm	4 units (10.16 mm)	<b>High voltage</b> Operating voltage <sup>1</sup> 2,500 V Rated impulse voltage <sup>1</sup> 10,000 V Max. continuous current <sup>2</sup> 58 A at 6 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">92</a>
		2 contacts for turned contacts  Contact Ø: 5 mm	5 units (12.7 mm)	Operating voltage <sup>1</sup> 1,000 V Rated impulse voltage <sup>1</sup> 4,000 V Max. continuous current <sup>2</sup> 119 A at 16 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">94</a>
High current		2 contacts for turned contacts with ODU SPRINGTAC <sup>3</sup>  Contact Ø: 8 mm	6 units (15.24 mm)	Operating voltage <sup>1</sup> 500 V Rated impulse voltage <sup>1</sup> 3,000 V Max. continuous current <sup>2</sup> 142 A at 25 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000		<a href="#">96</a>
		2 contacts for turned contacts with ODU LAMTAC <sup>4</sup>  Contact Ø: 8 mm	6 units (15.24 mm)	Operating voltage <sup>1</sup> 500 V Rated impulse voltage <sup>1</sup> 3,000 V Max. continuous current <sup>2</sup> 154 A at 25 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 10,000		<a href="#">98</a>
		1 contact for turned contacts with ODU LAMTAC <sup>4</sup>  Contact Ø: 10 mm or Contact Ø: 12 mm	7 units (17.78 mm) at both versions	<b>Highest current</b> Model 10 mm 12 mm Operating voltage <sup>1</sup> 250 V 200 V Rated impulse voltage <sup>1</sup> 4,000 V 3,000 V Max. continuous current <sup>2</sup> 179 A 220 A at 35 mm² at 50 mm² Degree of pollution 2 2 Mating cycles min. 10,000 min. 10,000		<a href="#">100</a>

<sup>1</sup>Acc. to IEC 60664-1:2007 (VDE 0110-1:2008). <sup>2</sup>Definition max. continuous current see page 165. <sup>3</sup>Contact with springwire technology. <sup>4</sup>Contact with lamella technology.



OVERVIEW OF ALL MODULES



	Modules	Description	Units / width	Features	Page
High voltage		4 contacts for turned contacts  Contact Ø: 1.5 mm	3 units (7.62 mm)	<b>High contact density high voltage</b> Operating voltage <sup>1</sup> 2,500 V Rated impulse voltage <sup>1</sup> 10,000 V Max. continuous current <sup>2</sup> 27 A at 1.5 mm² Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000	<a href="#">102</a>
		1 contact	8 units (20.32 mm)	<b>High voltage</b> Operating voltage <sup>1</sup> 6,300 V Rated impulse voltage <sup>1</sup> 20,000 V Degree of pollution <sup>1</sup> 2 Mating cycles minimum 100,000	<a href="#">104</a>
Coax		4 contacts for 50 Ω coax contacts	3 units (7.62 mm)	<b>High contact density</b> Frequency range 0 to 1.3 GHz Mating cycles minimum 60,000	<a href="#">106</a>
		2 contacts for 50 Ω coax contacts  SMA termination	5 units (12.7 mm)	<b>9.0 GHz</b> Frequency range 0 to 9.0 GHz Mating cycles minimum 100,000	<a href="#">108</a>
		2 contacts for 50 Ω coax contacts	5 units (12.7 mm)	Frequency range 0 to 2,4 GHz Mating cycles minimum 100,000	<a href="#">110</a>
		2 contacts for 50 Ω coax contacts	5 units (12.7 mm)	<b>High voltage</b> Frequency range 0 to 2.8 GHz Mating cycles minimum 100,000	<a href="#">112</a>

<sup>1</sup>Acc. to IEC 60664-1:2007 (VDE 0110-1:2008) for degree of pollution 2. <sup>2</sup>Definition max. continuous current see page 165.

OVERVIEW OF ALL MODULES



	Modules	Description	Units / width	Features	Page
Coax		2 contacts for 75 Ω coax contacts	5 units (12.7 mm)	Frequency range 0 to 3.0 GHz Mating cycles minimum 100,000	<a href="#">114</a>
Pneumatic and fluid model		2 contacts for pneumatic valves	5 units (12.7 mm)	<b>20 bar</b> Tube diameter max. 4 mm Mating cycles minimum 100,000	<a href="#">116</a>
		2 contacts for pneumatic valves	16 units (40.64 mm)	<b>12 bar</b> Tube diameter max. 6 mm Mating cycles minimum 100,000	<a href="#">118</a>
		1 contact for pneumatic valve	8 units (20.32 mm)	<b>12 bar</b> Tube diameter max. 6 mm Mating cycles minimum 100,000	<a href="#">120</a>
		2 contacts for fluid coupling plug	5 units (12.7 mm)	<b>10 bar</b> Tube diameter M5 internal thread Mating cycles minimum 100,000	<a href="#">122</a>
Fibre-optic		5 contacts for fibre-optic contacts for plastic fibre (POF)	2 units (5.08 mm)	<b>High contact density</b> Insertion loss typical 1.5 dB at 670 nm Mating cycles minimum 40,000	<a href="#">126</a>

OVERVIEW OF ALL MODULES



	Modules	Description	Units / width	Features	Page
Fibre-optic		2 contacts for fibre-optic contacts for plastic fibre (POF)	5 units (12.7 mm)	Mating cycles minimum 100,000 Insertion loss typical 1.5 dB at 670 nm	<a href="#">128</a>
		3 contacts for fibre-optic contacts for fibre glass (GOF)	4 units (10.16 mm)	Mating cycles minimum 100,000 Insertion loss typical 1 dB at 670 nm	<a href="#">130</a>
Shielded implementation/high-speed connector		2 to 10 contacts for inserts size 0	5 units (12.7 mm)	Mating cycles minimum 5,000 Suitable for all common bus systems 	<a href="#">132</a>
		2 to 14 contacts for inserts size 1	6 units (15.24 mm)	Mating cycles minimum 5,000 With springwire minimum 60,000 Suitable for all common bus systems 	<a href="#">134</a>
		4 to 16 contacts for inserts size 2	7 units (17.78 mm)	Mating cycles minimum 5,000 With springwire minimum 60,000 Suitable for all common bus systems 	<a href="#">136</a>
		10 to 30 contacts for inserts size 3	8 units (20.32 mm)	Mating cycles minimum 5,000 Suitable for all common bus systems 	<a href="#">138</a>

OVERVIEW OF ALL MODULES

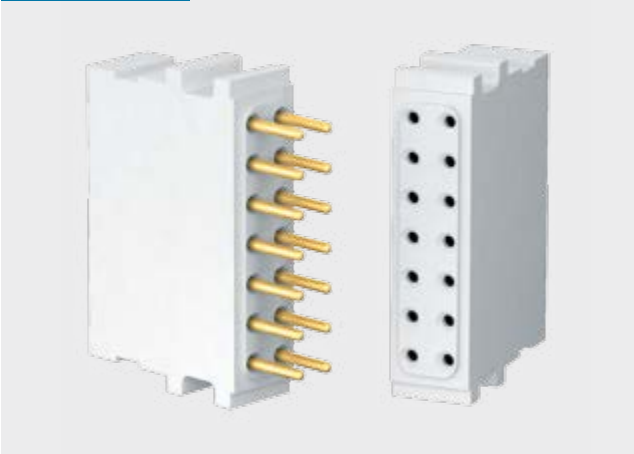


	Modules	Description	Units / width	Features	Page
Blank modules / spacer modules / coding modules / pin protection modules		Blank modules	1 unit (2.54 mm) 3 units (7.62 mm) 5 units (12.7 mm)	Used to restock not completely equipped frames.	<a href="#">140</a>
		Spacer module	1 unit (2.54 mm) 2 units (5.08 mm) 3 units (7.62 mm) 5 units (12.7 mm)	Not equipped, enable the pluggability despite different contact equipment in the pin piece. For information on the individual spacer modules please look at the corresponding modules.	<a href="#">141</a>
		Coding modules	1 unit (2.54 mm)	Arranged between the modules to create keyed guiding system.	<a href="#">142</a>
		Pin protection modules	1 unit (2.54 mm)	Used to protect the pins in conjunction with small pin diameters.	<a href="#">143</a>

MODULES 14 CONTACTS



SIGNAL



Contact diameter: 1.02 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 13.5 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Contacts and insulators up to 200 °C on request.
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	320 V	100 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

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	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact processing	Au over Ni

REMOVAL TOOL I (ANGLED)



Removal of the already assembled contact (incl. cable).  
PART NUMBER: 087.170.362.000.000

REMOVAL TOOL II



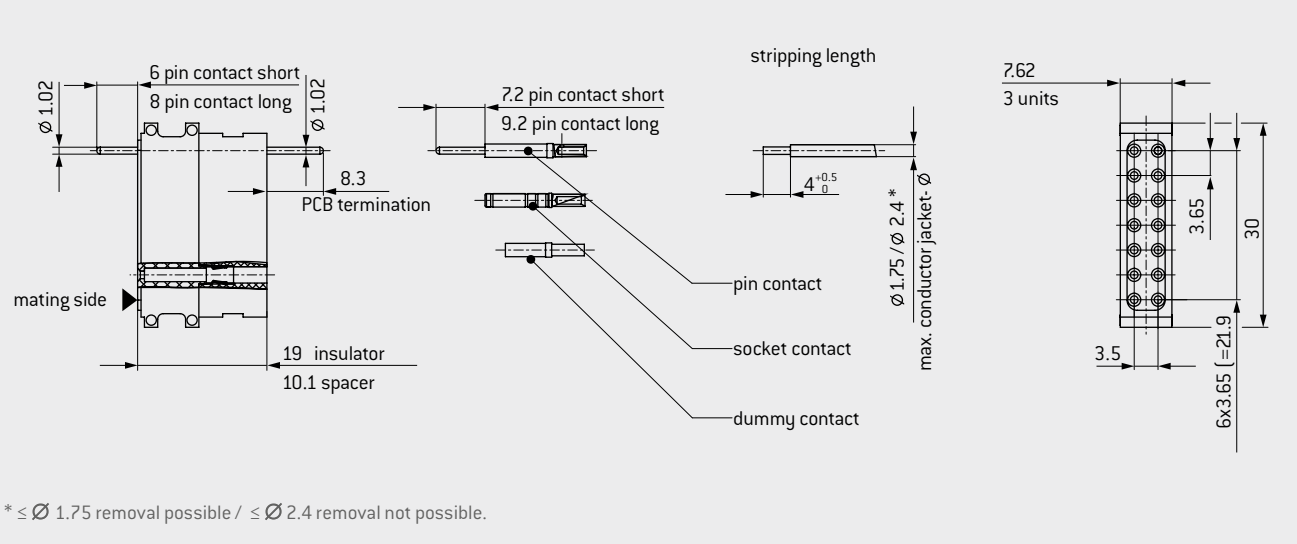
Removal of the unassembled contact  
(with cable – wire may have removed)  
PART NUMBER: 087.611.001.001.000

For an overview of all tools please see from page 152.

<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



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

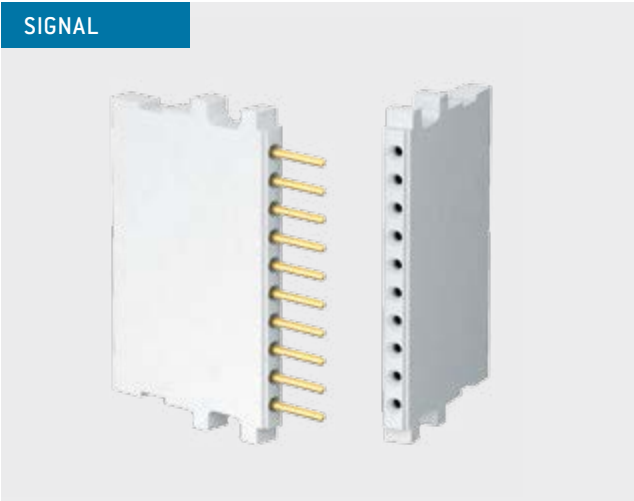
Description	Part number	Conductor cross-section mm <sup>2</sup>	Termination AWG/mm	Nominal current <sup>2</sup>		Max. continuous current <sup>3</sup> Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short <sup>1</sup>	180.362.000.307.000	0.50 / 0.38	20 / 22	9	7	13.5	2.1
Pin contact long <sup>1</sup>	180.382.000.307.000						
Socket contact	170.362.700.207.000						
Pin contact short <sup>1</sup>	180.544.000.307.000	0.25 / 0.08	24 / 28	6	5	9	2.1
Pin contact long <sup>1</sup>	180.574.000.307.000						
Socket contact	170.544.700.207.000						
Pin contact short <sup>1</sup>	180.818.000.307.000		PCB termination Ø 1.02 mm	9	7	13.5	2.1
Pin contact long <sup>1</sup>	180.819.000.307.000						
Socket contact	170.818.700.207.000						



<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K.  
<sup>3</sup> Definition max. continuous current see page 165.



# MODULE 10 CONTACTS FOR TURNED CONTACTS



SIGNAL

Contact diameter: 0.76 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 11 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- The 10 contacts modules with turned contacts are not compatible with stamped contacts or modules.
- Contacts and insulators up to 200 °C on request.
- Crimp information see page 146.



REMOVAL TOOL I (ANGLED)

Removal of the already assembled contact (incl. cable).  
PART NUMBER: 087.170.361.000.000



REMOVAL TOOL II

Removal of the unassembled contact (with cable – wire may have removed)  
PART NUMBER: 087.611.001.001.000

For an overview of all tools please see from page 152.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	250 V	32 V
Rated impulse voltage	1,500 V	1,500 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

Operating voltage	500 V
Test voltage	1,500 V

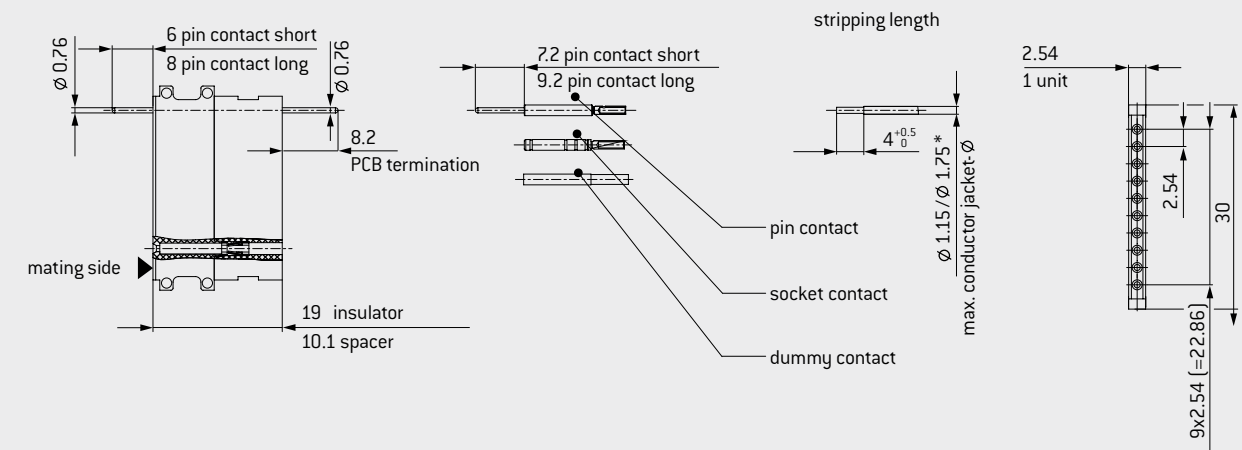
Mechanical data

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 acc. to UL 1977, Second edition, max. 75 °C
Mating cycles	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact processing	Au over Ni

INSULATOR PIN AND SOCKET



\* ≤ Ø 1.15 removal possible / ≤ Ø 1.75 removal not possible.

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

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

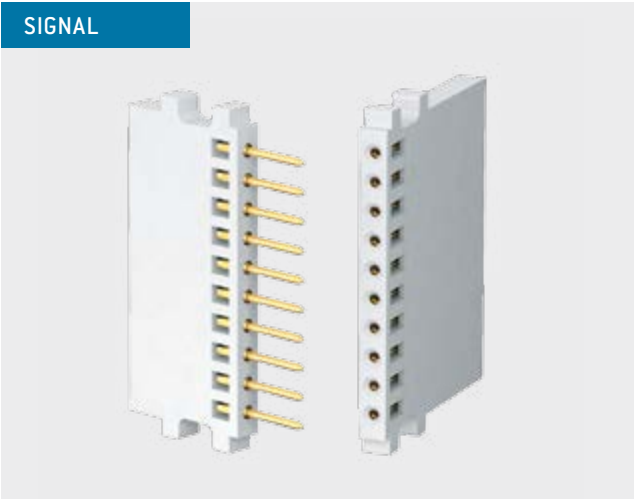
<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>3</sup> Definition max. continuous current see page 165.



MODULE 10 CONTACTS FOR STAMPED CONTACTS



SIGNAL

Contact diameter: 0.7 mm  
Mating cycles: minimum 5,000  
Current-carrying capacity<sup>1</sup>: 6 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- The 10 contacts modules with turned contacts are not compatible with stamped contacts or modules.
- Contacts are not removable.
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	32 V	10 V
Rated impulse voltage	1,500 V	1,500 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

Operating voltage	450 V
Test voltage	1,350 V

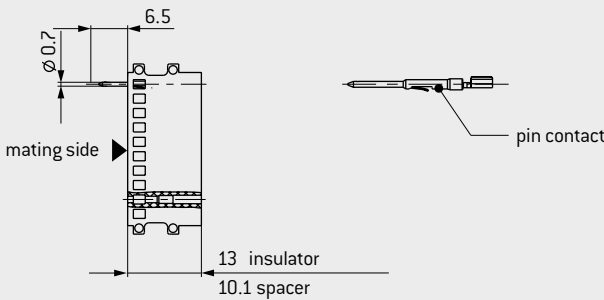
Mechanical data

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

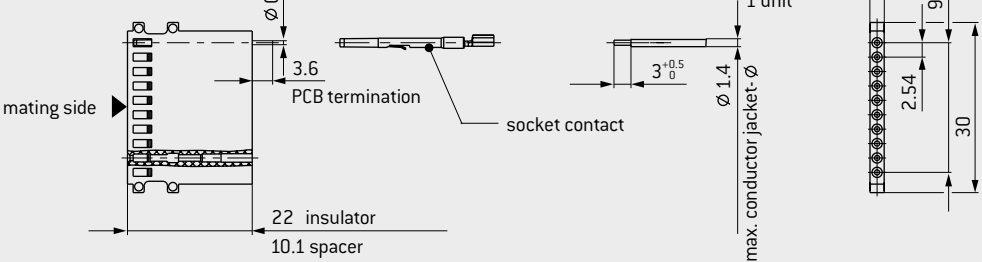
Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact	CuSn6 alloy
Contact finish	
in termination area	Sn over Ni
in contact area	Au over Ni

INSULATOR PIN



INSULATOR SOCKET



Module 10 contacts	Part number
Insulator socket (crimp)	610.158.110.923.000
Insulator pin (crimp)	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 <sup>2</sup>	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> 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

<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.

<sup>1</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>2</sup> Definition max. continuous current see page 165.



MODULE 6 CONTACTS



Removal of the already assembled contact (incl. cable).  
**PART NUMBER: 087.170.362.000.000**



Removal of the unassembled contact (with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**

For an overview of all tools please see from page 152.

Contact diameter: 1.02 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 13.5 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Contacts and insulators up to 200 °C on request.
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	400 V	160 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

Operating voltage	850 V
Test voltage	2,550 V

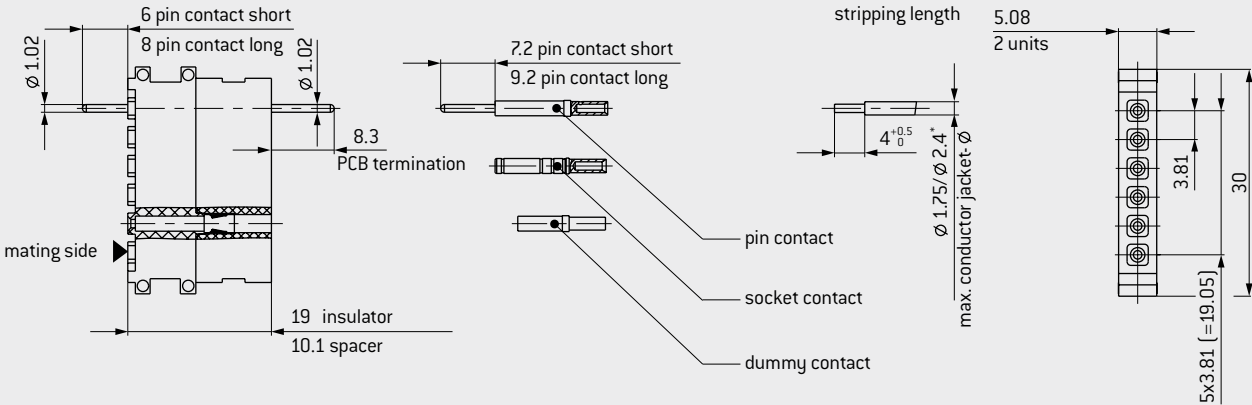
Mechanical data

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	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuBe alloy
Contact processing	Au over Ni

INSULATOR PIN AND SOCKET



\* ≤ Ø 1.75 removal possible / ≤ Ø 2.4 removal not possible.

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

Description	Part number	Conductor cross-section mm²	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short <sup>1</sup>	180.362.000.307.000	0.50 / 0.38	20 / 22	9	8	13.5	2.1
Pin contact long <sup>1</sup>	180.382.000.307.000						
Socket contact <sup>1</sup>	170.362.700.207.000						
Pin contact short <sup>1</sup>	180.544.000.307.000	0.25 / 0.08	24 / 28	6	6	9	2.1
Pin contact long <sup>1</sup>	180.574.000.307.000						
Socket contact <sup>1</sup>	170.544.700.207.000						
Pin contact short <sup>1</sup>	180.818.000.307.000	PCB termination Ø 1.02 mm	9	8	13.5	2.1	
Pin contact long <sup>1</sup>	180.819.000.307.000						
Socket contact <sup>1</sup>	170.818.700.207.000						

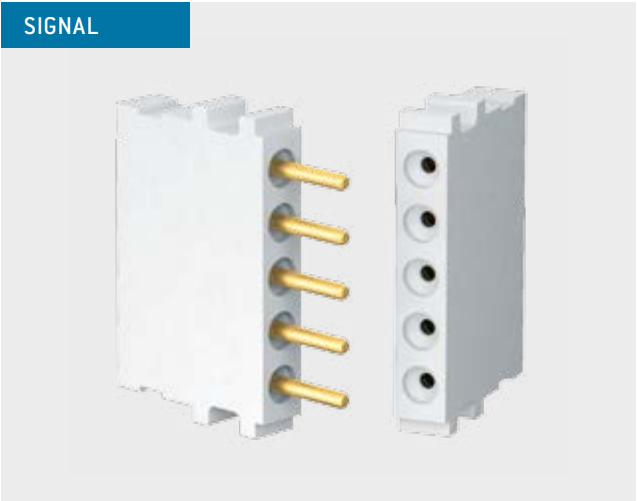
<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K.  
<sup>3</sup> Definition max. continuous current see page 165.



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 unassembled contact  
(with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**

For an overview of all tools please see from page 152.

Contact diameter: 1.5 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 27 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Contacts and insulators up to 200 °C on request.
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	500 V	200 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

Operating voltage	750 V
Test voltage	2,250 V

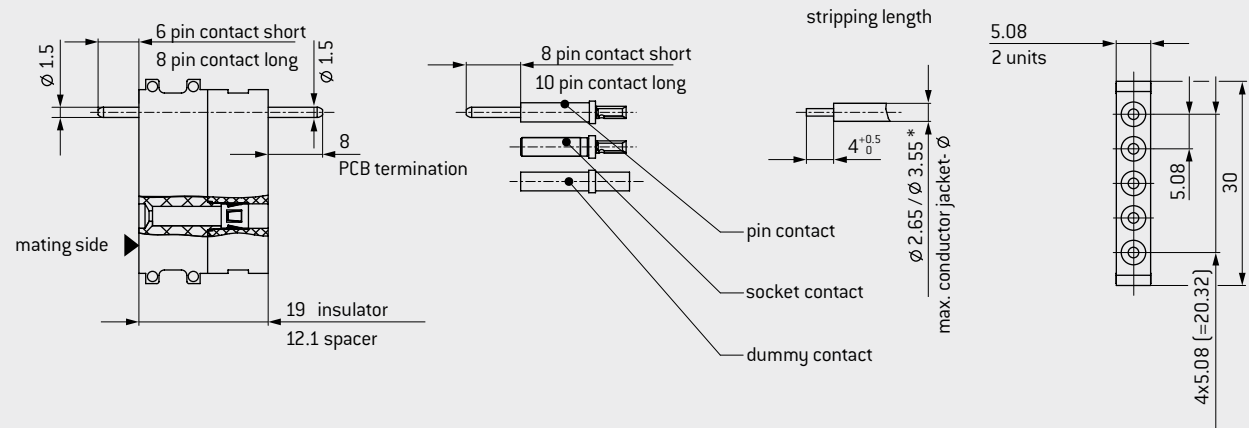
Mechanical data

Total mating force (average)	22.5 N / Module
Total sliding force (average)	15 N / Module
Contact diameter	1.5 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 100,000

Materials

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

INSULATOR PIN AND SOCKET



\* ≤ Ø 2.65 removal possible / ≤ Ø 3.55 removal not possible.

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

Description	Part number	Conductor cross-section mm²	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short <sup>1</sup>	180.363.000.307.000	1.5	14	18	14.5	27	0.95
Pin contact long <sup>1</sup>	180.383.000.307.000						
Socket contact <sup>1</sup>	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 <sup>1</sup>	180.545.000.307.000	1 / 0.75	18	16	13	22.5	0.95
Pin contact long <sup>1</sup>	180.575.000.307.000						
Socket contact <sup>1</sup>	170.545.700.201.000						
Pin contact short <sup>1</sup>	180.541.000.307.000	0.5 / 0.38	20 / 22	10	8	15	0.95
Pin contact long <sup>1</sup>	180.571.000.307.000						
Socket contact <sup>1</sup>	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						

<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K.  
<sup>3</sup> Definition max. continuous current see page 165.



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 unassembled contact  
(with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**

For an overview of all tools please see from page 152.

Contact diameter: 2.41 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 41 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

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

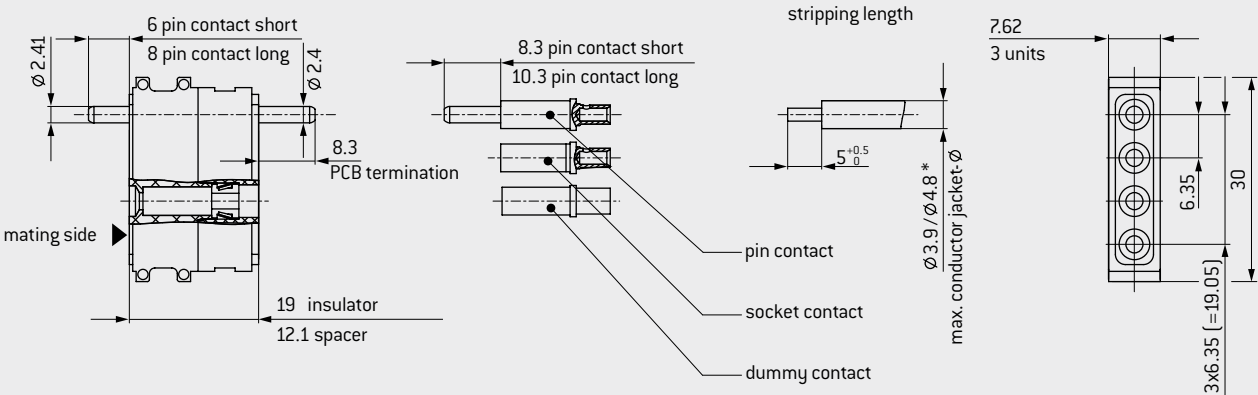
Mechanical data

Total mating force (average)	27 N / Module
Total sliding force (average)	21 N / Module
Contact diameter	2.41 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact finish	Ag

INSULATOR PIN AND SOCKET



\* ≤ Ø 3.9 removal possible / ≤ Ø 4.8 removal not possible.

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 mm²	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	180.365.000.301.000	2.5	12	28	25	41	0.45
Pin contact long	180.385.000.301.000						
Socket contact	170.365.100.201.000						
Pin contact short <sup>1</sup>	180.910.000.301.000	2.5		24	19	33.5	0.45
Pin contact long <sup>1</sup>	180.911.000.301.000						
Socket contact <sup>1</sup>	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						

<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K.  
<sup>3</sup> Definition max. continuous current see page 165.



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 unassembled contact  
(with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**

For an overview of all tools please see from page 152.

Contact diameter: 3 mm  
Mating cycles: minimum 100,000  
Termination cross-section: from 0.38 to 6 mm<sup>2</sup>

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>1</sup>

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>2</sup>

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

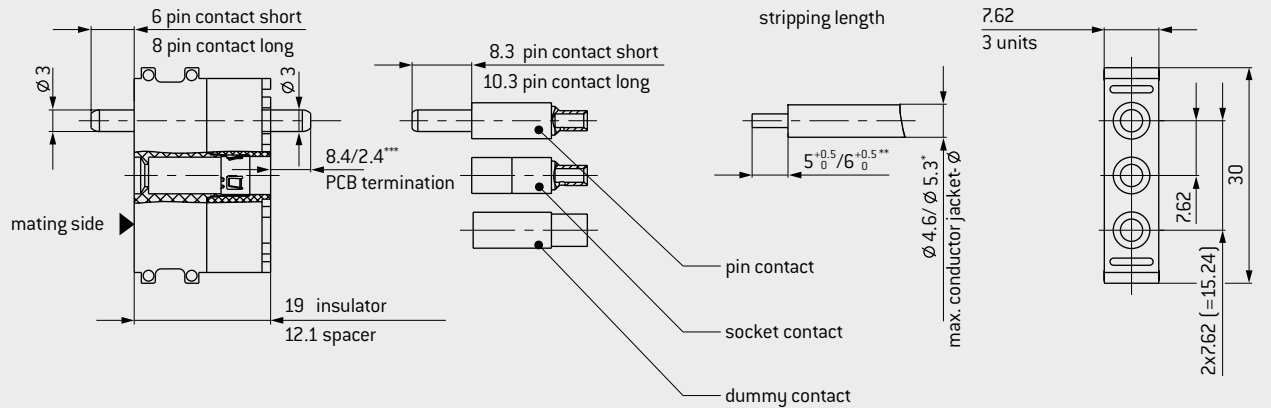
Mechanical data

Total mating force (average)	33.8 N / Module
Total sliding force (average)	20.3 N / Module
Contact diameter	3.0 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact finish	Ag

INSULATOR PIN AND SOCKET



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

\* ≤ Ø 4.6 removal possible / ≤ Ø 5.3 removal not possible.

\*\* 5<sup>+0.5</sup>/<sub>0</sub> : AWG 22 – 14; 0.38 – 4 mm<sup>2</sup>

6<sup>+0.5</sup>/<sub>0</sub> : 6 mm<sup>2</sup>.

\*\*\* PCB termination / crimp termination at 6 mm<sup>2</sup>, protection against contact in the termination area recommended, e. g. heat-shrink tubing.

Description	Part number	Conductor cross-section mm <sup>2</sup>	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> 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 <sup>1</sup>	180.366.000.301.000	4		39	30	58	0.3
Pin contact long <sup>1</sup>	180.386.000.301.000						
Socket contact <sup>1</sup>	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 <sup>1</sup>	182.582.000.301.000	1.5	14	19	16	28	0.3
Pin contact long	182.583.000.301.000						
Socket contact <sup>1</sup>	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 <sup>1</sup>	182.585.000.301.000						
Socket contact <sup>1</sup>	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	182.843.100.201.000						



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

<sup>3</sup> Definition max. continuous current see page 165.





MODULE 3 CONTACTS



Removal of the already assembled contact (incl. cable).  
**PART NUMBER: 087.170.136.000.000**



Removal of the unassembled contact  
(with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**

For an overview of all tools please see from page 152.

Contact diameter: 3 mm  
Mating cycles: minimum 100,000  
Current-carrying capacity<sup>1</sup>: 58 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- Crimp information see page 146.

TECHNICAL DATA

Voltage information<sup>2</sup>

Operating voltage	2,500 V	1,000 V
Rated impulse voltage	10,000 V	8,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>3</sup>

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

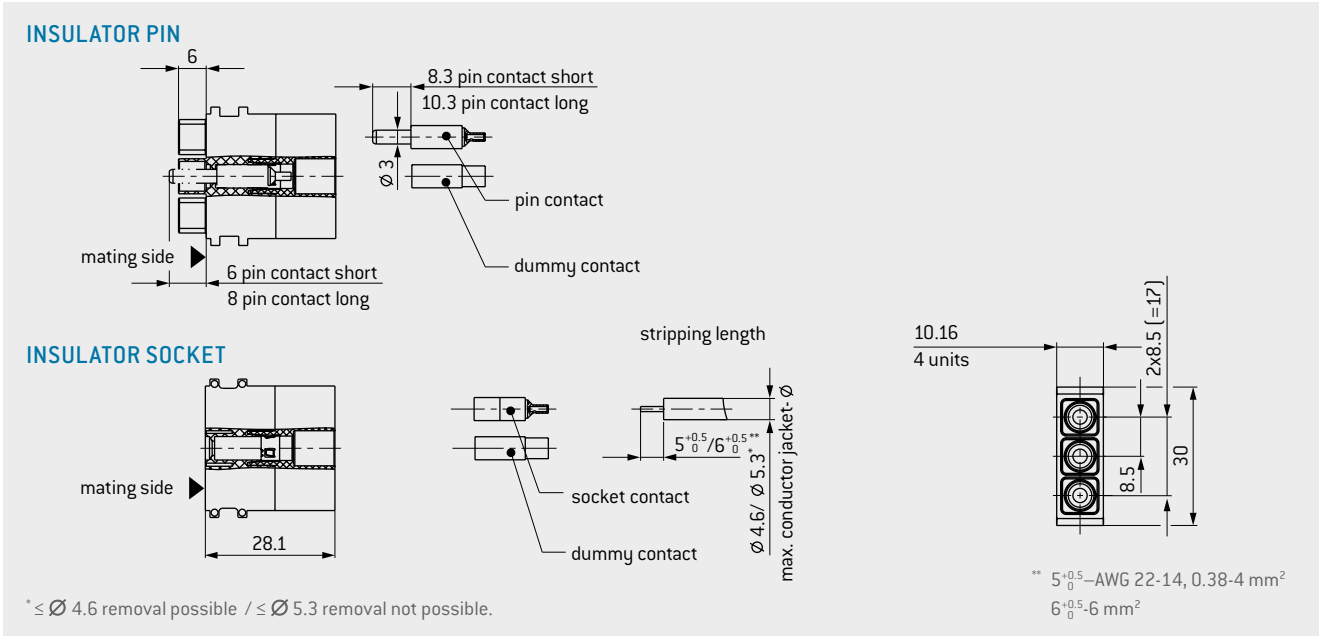
Mechanical data

Total mating force (average)	33.8 N / Module
Total sliding force (average)	20.3 N / Module
Contact diameter	3 mm
Operating temperature	–40 °C to +125 °C acc. to UL 1977, Second Edition, max. 75 °C
Mating cycles	minimum 100,000

Materials

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact finish	Ag

<sup>1</sup> Definition max. continuous current see page 165. <sup>2</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup> See page 163.



Module 3 contacts	Part number
Insulator socket	610.162.103.923.000
Insulator pin	611.162.103.923.000
Dummy contact	021.341.128.923.000

Description	Part number	Conductor cross-section mm <sup>2</sup>	Termination AWG	Nominal current <sup>1</sup>		Max. continuous current <sup>2</sup> 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 <sup>1</sup>	180.366.000.301.000	4		39	30	58	0.3
Pin contact long <sup>1</sup>	180.386.000.301.000						
Socket contact <sup>1</sup>	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 <sup>1</sup>	182.582.000.301.000	1.5	14	19	16	28	1
Pin contact long	182.583.000.301.000						
Socket contact <sup>1</sup>	172.582.100.201.000						
Pin contact short	182.584.000.301.000	1 / 0.75	18	16.5	14	24.5	1
Pin contact long <sup>1</sup>	182.585.000.301.000						
Socket contact <sup>1</sup>	172.584.100.201.000						
Pin contact short	182.586.000.301.000	0.5 / 0.38	20 / 22	11.5	9.5	17	1
Pin contact long	182.587.000.301.000						
Socket contact	172.586.100.201.000						

<sup>1</sup> Non-magnetic version on request. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>3</sup> Definition max. continuous current see page 165.

MODULE 2 CONTACTS



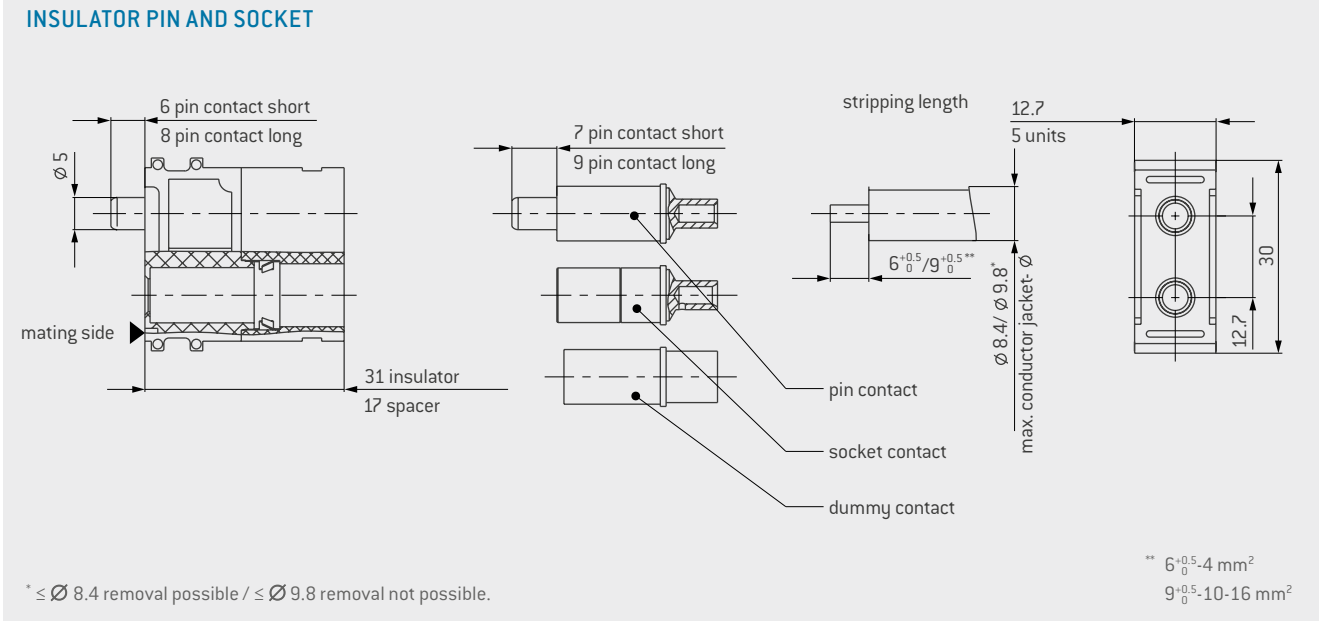
Removal of the already assembled contact (incl. cable).  
**PART NUMBER: 087.170.391.000.000**  
For an overview of all tools please see from page 152.

Contact diameter: 5 mm  
Mating cycles: minimum 100.000  
Current-carrying capacity<sup>1</sup>: 119 A

- TECHNICAL DATA**
- 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 VDE 0298-4:2013 (see page 168).
  - When automatic docking due to the high mating forces and the high cable cross sections we recommend the assembly in the ODU-MAC P (Power) frame (see page 39).
  - Crimp information see page 146.
  - Contacts and insulators up to 200 °C on request.

TECHNICAL DATA			
Voltage information <sup>2</sup>			
Operating voltage	1,000 V	250 V	
Rated impulse voltage	4,000 V	4,000 V	
Degree of pollution	2	3	
Voltage information acc. to MIL <sup>3</sup>			
Operating voltage	1,250 V		
Test voltage	3,750 V		
Mechanical data			
Total mating force (average)	45 N / Module		
Total sliding force (average)	36 N / Module		
Contact diameter	5 mm		
Operating temperature	−40 °C to +125 °C		
Mating cycles	minimum 100,000		
Materials			
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94		
Contact body	Cu alloy		
Contact spring	CuSn alloy		
Contact finish	Ag		

<sup>1</sup>Definition max. continuous current see page 165. <sup>2</sup>IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>3</sup>See page 163.



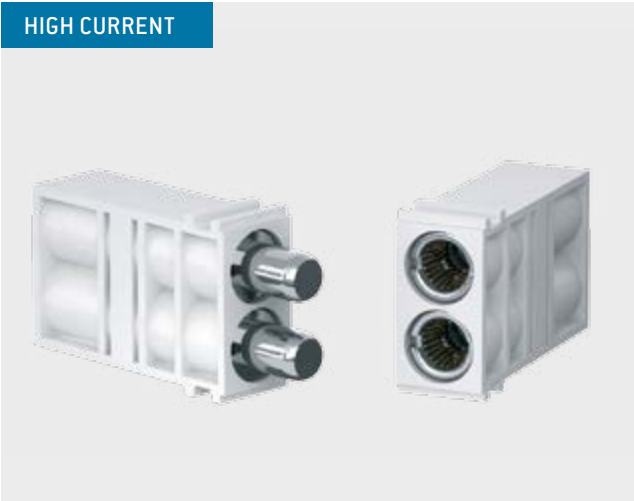
Module 2 contacts	Part number
Insulator	611.129.102.923.000
Spacer	611.129.111.923.000
Dummy contact	021.341.130.923.000

Description	Part number	Conductor cross-section mm <sup>2</sup>	Nennstrom <sup>1</sup>		Max. continuous current <sup>2</sup> 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	180.369.000.301.000	4	39	34	58	0.21
Pin contact long	180.389.000.301.000					
Socket contact	170.369.100.201.000					

<sup>1</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>2</sup> Definition max. continuous current see page 165.

# MODULE 2 CONTACTS FOR HIGH CURRENT CONTACTS

ODU SPRINGTAC® (contacts with springwire technology).

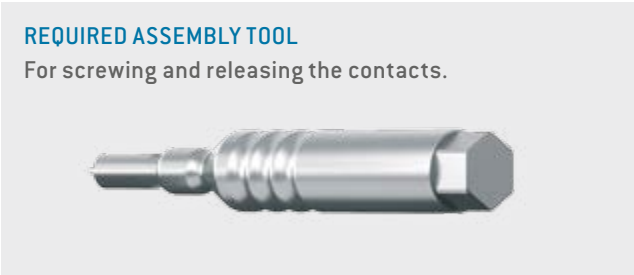


HIGH CURRENT

Contact diameter: 8 mm  
Mating cycles<sup>1</sup>: minimum 100,000  
Current-carrying capacity<sup>2</sup>: 142 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- When automatic docking due to the high mating forces and the high cable cross sections we recommend the assembly in the ODU-MAC P (Power) frame (see page 39).
- Crimp information see page 146.



REQUIRED ASSEMBLY TOOL  
For screwing and releasing the contacts.

PART NUMBER: 087.611.002.001.000

Locking torque: 3.5 Nm ± 0.5 Nm

For an overview of all tools please see from page 152.

TECHNICAL DATA

Voltage information<sup>3</sup>

Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>4</sup>

Operating voltage	700 V
Test voltage	2,100 V

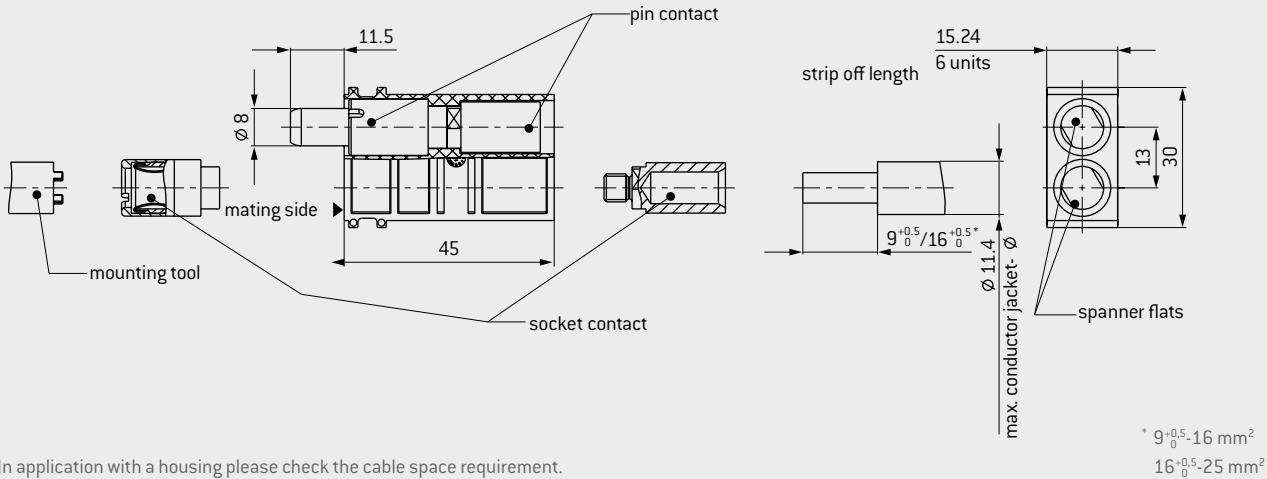
Mechanical data

Total mating force (average)	54 N / Module
Total sliding force (average)	39 N / Module
Contact diameter	8 mm
Operating temperature	−40 °C to +125 °C
Mating cycles <sup>1</sup>	minimum 100,000

Materials

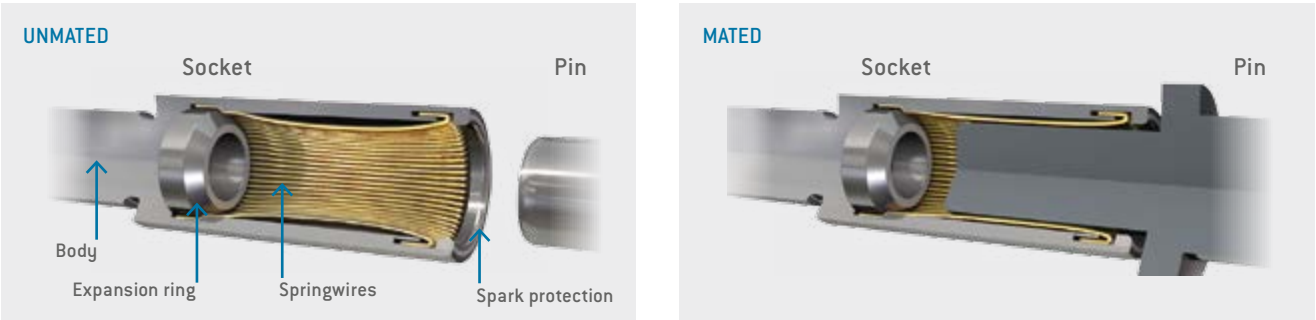
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact finish	Ag

INSULATOR PIN AND SOCKET



ODU SPRINGTAC® (CONTACTS WITH SPRINGWIRE TECHNOLOGY)

ODU SPRINGTAC offers a large number of contact surfaces. The wires are mounted individually and connected with a lathe-turned body. The springwires contact and flex independently from one another (see also page 24).



Module 2 contacts	Part number
Insulator	611.173.102.923.000

Description	Part number	Conductor cross-section <sup>1</sup> mm <sup>2</sup>	Nominal current <sup>2</sup>		Max. continuous current <sup>3</sup> Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	181.873.100.200.000	25	100	95	142	0.2
Socket contact	170.045.100.201.000					
Pin contact	181.872.100.200.000	16	75	70	111	0.2
Socket contact	171.045.100.201.000					

<sup>1</sup> 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.  
<sup>2</sup> Definition max. continuous current see page 165. <sup>3</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>4</sup> See page 163.

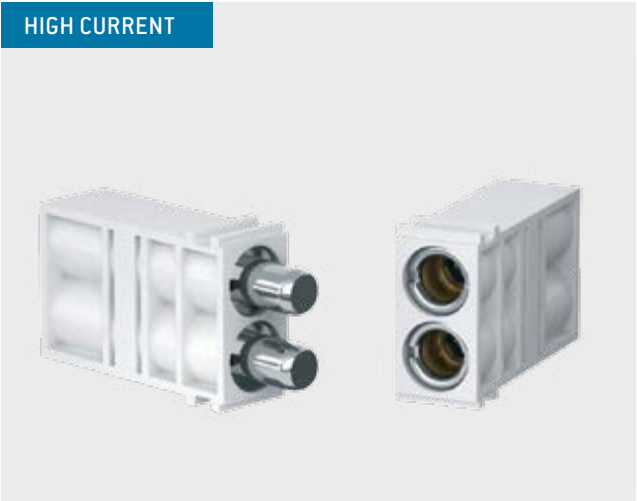


<sup>1</sup> Extra fine wire acc. to IEC 60228:2004 (VDE 0295:2005; class 5), class 5. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>3</sup> Definition max. continuous current see page 165.



# MODULE 2 CONTACTS

ODU LAMTAC® (contacts with lamella technology).

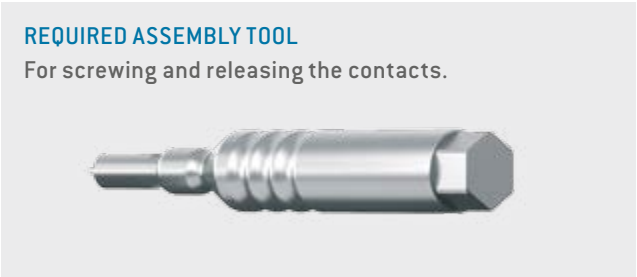


HIGH CURRENT

Contact diameter: 8 mm  
Mating cycles<sup>1</sup>: minimum 10,000  
Current-carrying capacity<sup>2</sup>: 154 A

TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- When automatic docking due to the high mating forces and the high cable cross sections we recommend the assembly in the ODU-MAC P (Power) frame (see page 39).
- Crimp information see page 146.



REQUIRED ASSEMBLY TOOL  
For screwing and releasing the contacts.

PART NUMBER: 087.611.002.001.000  
Locking torque: 3.5 Nm ± 0.5 Nm  
For an overview of all tools please see from page 152.

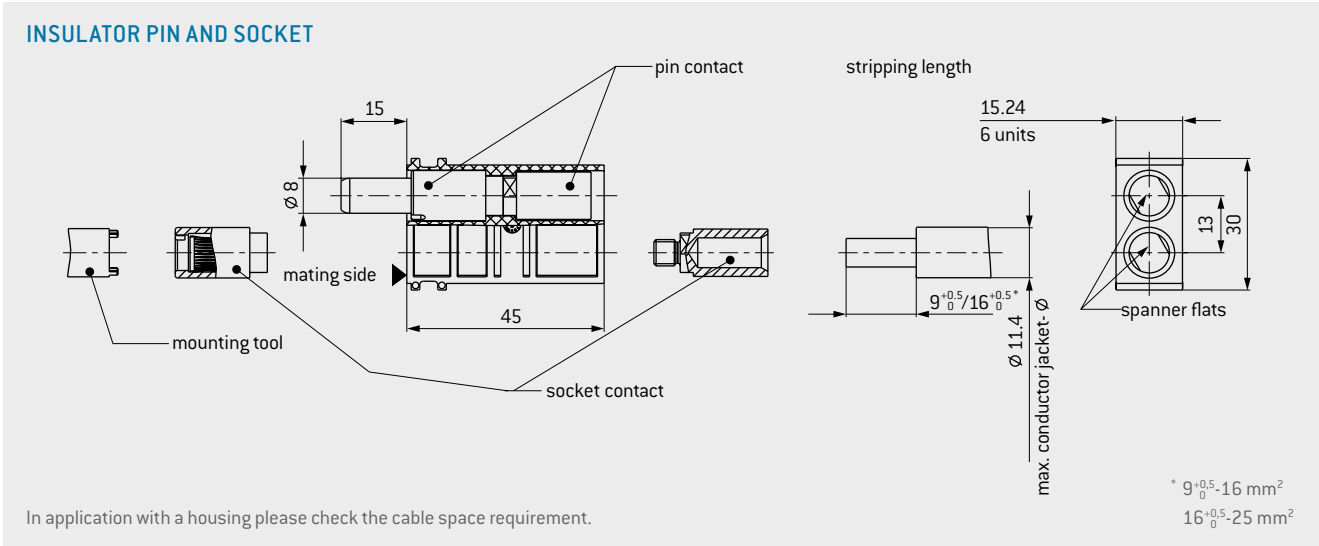
TECHNICAL DATA

Voltage information <sup>3</sup>		
Operating voltage	500 V	200 V
Rated impulse voltage	3,000 V	3,000 V
Degree of pollution	2	3

Voltage information acc. to MIL <sup>4</sup>		
Operating voltage	900 V	
Test voltage	2,700 V	

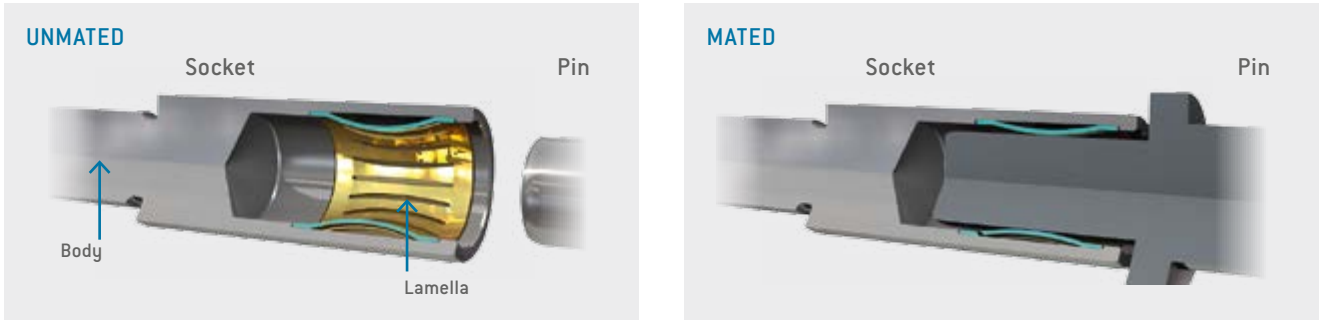
Mechanical data		
Total mating force (average)	60 N / Module	
Total sliding force (average)	45 N / Module	
Contact diameter	8 mm	
Operating temperature	−40 °C to +125 °C	
Mating cycles	minimum 10,000	

Materials		
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94	
Contact body	Cu alloy	
Contact lamella	CuBe alloy	
Contact finish	Ag	



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 lathe-turned body (see also page 25).



Module 2 contacts	Part number
Insulator	611.161.102.923.000

Description	Part number	Conductor cross-section <sup>1</sup> mm <sup>2</sup>	Nominal current <sup>2</sup>		Max. continuous current <sup>3</sup> Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	181.874.100.200.000	25	105	100	154	0.2
Socket contact	178.874.100.201.000					
Pin contact	181.875.100.200.000	16	90	85	133	0.2
Socket contact	178.875.100.201.000					

<sup>1</sup> 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.  
<sup>2</sup> Definition max. continuous current see page 165. <sup>3</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>4</sup> See page 163.

<sup>1</sup> Extra fine wire acc. to IEC 60228:2004 (VDE 0295:2005; class 5), class 5. <sup>2</sup> Determined acc. to IEC 60512-5-1:2002 (DIN EN 60512-5-1:2003) at a temperature increase of 45 K. <sup>3</sup> Definition max. continuous current see page 165.

# MODULE 1 CONTACT

ODU LAMTAC® (Contacts with lamella technology).



For contact diameter 10 mm.  
**PART NUMBER: 087.611.003.001.000**  
Locking torque: 3.5 Nm ± 0.5 Nm

For contact diameter 12 mm.  
**PART NUMBER: 087.611.004.001.000**  
Locking torque: 3.5 Nm ± 0.5 Nm

For an overview of all tools please see from page 152.

Contact diameter: 10 mm or 12 mm  
Mating cycles<sup>1</sup>: minimum 10,000  
Current-carrying capacity<sup>2</sup>: max. 220 A

### TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page 168).
- When automatic docking due to the high mating forces and the high cable cross sections we recommend the assembly in the ODU-MAC P (Power) frame (see page 39).
- Crimp information see page 146.

### TECHNICAL DATA

#### Voltage information<sup>3</sup>

Operating voltage		
Ø 10 mm	250 V	160 V
Ø 12 mm	200 V	63 V
Rated impulse voltage		
Ø 10 mm	4,000 V	4,000 V
Ø 12 mm	3,000 V	3,000 V
Degree of pollution		
Ø 10 mm and Ø 12 mm	2	3

#### Voltage information acc. to MIL<sup>4</sup>

Operating voltage	
Ø 10 mm	2,000 V
Ø 12 mm	1,500 V
Test voltage	
Ø 10 mm	6,000 V
Ø 12 mm	4,500 V

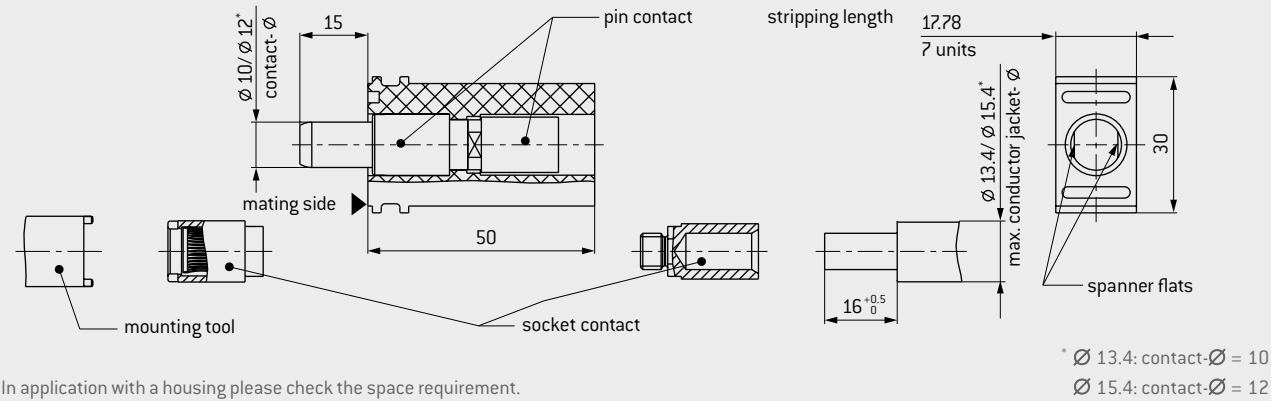
#### Mechanical data

Total mating force (average)	
Ø 10 mm	33 N / Module
Ø 12 mm	45 N / Module
Total sliding force (average)	
Ø 10 mm	24 N / Module
Ø 12 mm	30 N / Module
Contact diameter	10 mm or 12 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 10,000

#### Materials

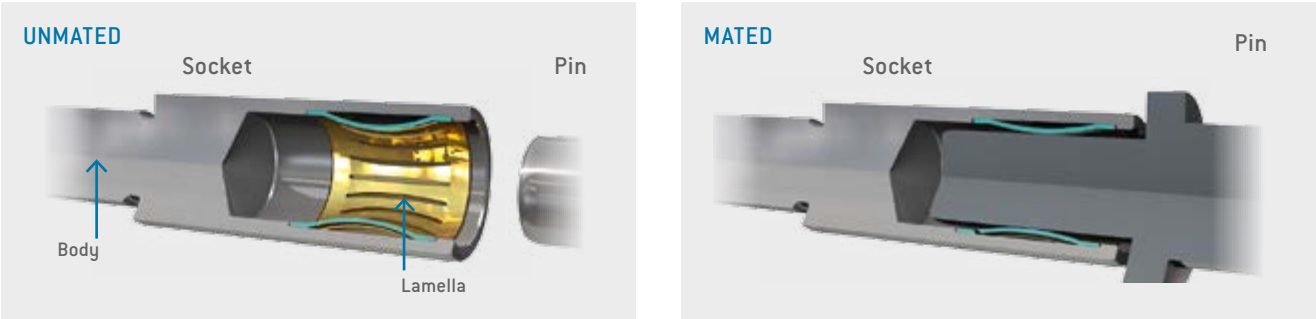
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact lamella	CuBe alloy
Contact finish	Ag

### INSULATOR PIN AND SOCKET



### 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 lathe-turned body (see also page 25).



Module 1 contact	Part number
Insulator for contact Ø 10 mm	611.169.101.923.000
Insulator for contact Ø 12 mm	611.172.101.923.000

Description	Part number	Conductor cross-section <sup>1</sup> mm²	Nominal current <sup>2</sup> Single contact A	Max. continuous current <sup>3</sup> Single contact A	Contact resistance mΩ
Pin contact Ø 10 mm	181.878.100.200.000	35	120	179	0.15
Socket contact Ø 10 mm	178.878.100.200.000				
Pin contact Ø 10 mm	181.946.100.200.000	25	110	163	0.15
Socket contact Ø 10 mm	178.954.100.201.000				
Pin contact Ø 12 mm	181.943.100.200.000	50	145	220	0.1
Socket contact Ø 12 mm	178.943.100.201.000				
Pin contact Ø 12 mm	181.945.100.200.000	35	135	200	0.1
Socket contact Ø 12 mm	178.953.100.201.000				
Pin contact Ø 12 mm	181.944.100.200.000	25	115	172	0.1
Socket contact Ø 12 mm	178.948.100.201.000				

<sup>1</sup> 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.  
<sup>2</sup> Definition max. continuous current see page 165. <sup>3</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159. <sup>4</sup> See page 163.



## MODULE 4 CONTACTS



## HIGH VOLTAGE



### REMOVAL TOOL I (STRAIGHT)



Removal of the already assembled contact (incl. cable).

PART NUMBER: 087.170.138.000.000

## REMOVAL TOOL II



Removal of the unassembled contact  
(with cable – wire may have removed)

PART NUMBER: 087.611.001.001.000

For an overview of all tools please see from page [152](#).

Contact diameter: 1.5 mm  
Mating cycles: minimum 100,000  
Operating voltage: 2,500 V

## TECHNICAL DATA

- 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 VDE 0298-4:2013 (see page [168](#)).
- Crimp information see page 146.

## TECHNICAL DATA

### Voltage information<sup>1</sup>

Operating voltage	2,500 V	1,000 V
Rated impulse voltage	10,000 V	8,000 V
Degree of pollution	2	3

Voltage information acc. to MIL<sup>2</sup>

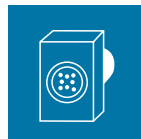
Operating voltage	2,500 V
Test voltage	7,500 V

## Mechanical data

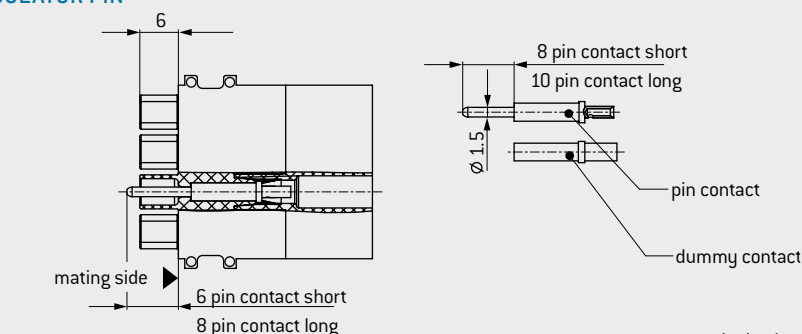
Total mating force [average]	18 N / Module
Total sliding force [average]	12 N / Module
Contact diameter	1.5 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	minimum 100,000

## Materials

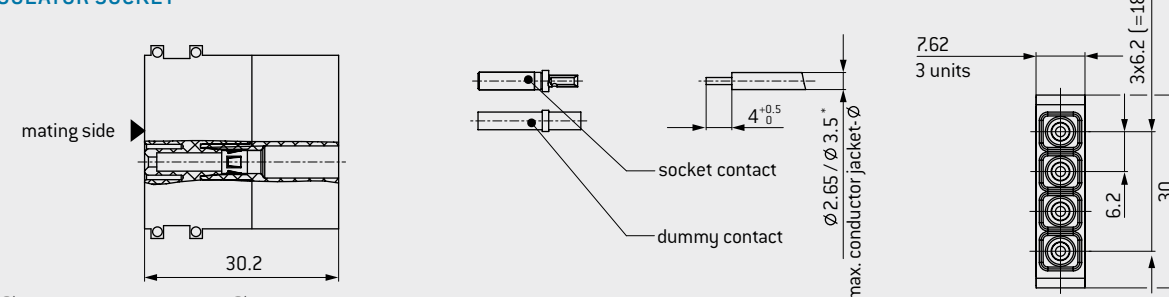
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body	Cu alloy
Contact spring	CuSn alloy
Contact finish	
Contact body	Au over Ni
Contact spring	Ag



## INSULATOR PIN



## INSULATOR SOCKET



\*  $\leq \emptyset 2.65$  removal possible /  $\leq \emptyset 3.5$  removal not possible.

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	Termination	Nominal current <sup>2</sup>		Max. continuous current <sup>3</sup>	Contact resistance
		mm <sup>2</sup>	AWG/mm	Single contact A	Module fully equipped A	Single contact A	mΩ
Pin contact short <sup>1</sup>	180.363.000.307.000	1.5	14	18	14.5	27	0.95
Pin contact long <sup>1</sup>	180.383.000.307.000						
Socket contact <sup>1</sup>	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 <sup>1</sup>	180.545.000.307.000	1	18	16	13	22.5	0.95
Pin contact long <sup>1</sup>	180.575.000.307.000						
Socket contact <sup>1</sup>	170.545.700.201.000						
Pin contact short <sup>1</sup>	180.541.000.307.000	0.5 / 0.38	20 / 22	10	8	15	0.95
Pin contact long <sup>1</sup>	180.571.000.307.000						
Socket contact <sup>1</sup>	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						



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

<sup>3</sup> Definition max. continuous current see page 165.

MODULE 1 CONTACT



HIGH VOLTAGE

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

TECHNICAL DATA

- 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 VDE 0298-4:2013 [see page 168].
- Center contact soldered.
- Outer contact crimped.
- Recommended cable construction see page 105.

TECHNICAL DATA

Voltage information<sup>1</sup>

Operating voltage	6,300 V	2,500 V
Rated impulse voltage	20,000 V	20,000 V
Degree of pollution	2	3
Clearance distance	> 32 mm	
Creepage distance	> 32 mm	

Test of the partial discharge voltage (PDV) acc. to VDE

PDV inception voltage	6.000 V
PDV extinction voltage	5.700 V

Mechanical data

Total mating force (average)	17 N / Module
Total sliding force (average)	15 N / Module
Contact diameter	2 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	minimum 10,000

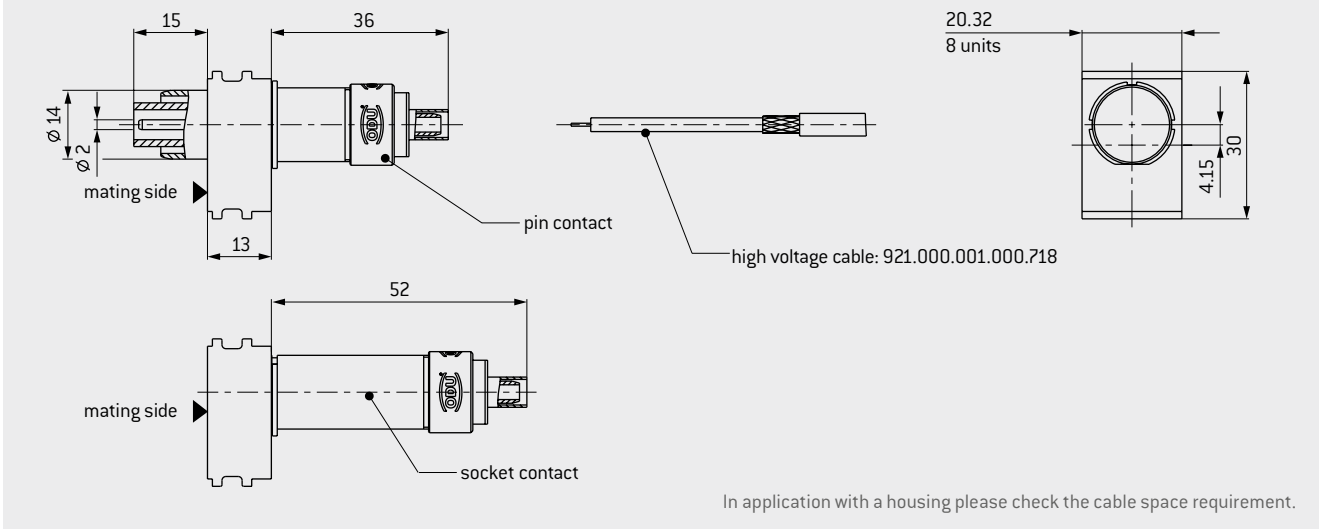
Materials

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

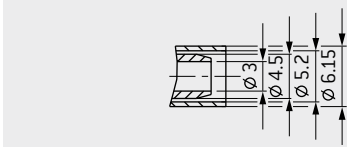
<sup>1</sup> IEC 60664-1:2007 (VDE 0110-1:2008) see page 159.



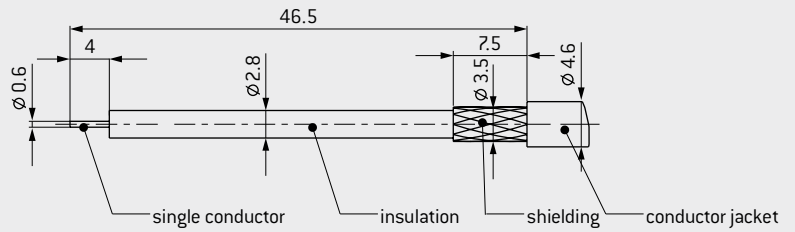
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 1 contact	Part number
Insulator	611.171.101.923.000

Description	Part number	Part number crimp insert	Conductor cross-section AWG / mm²	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				
High voltage line <sup>1</sup>	921.000.001.000.718		0.25		
Crimping tool for shielding sleeve	080.000.039.000.000				

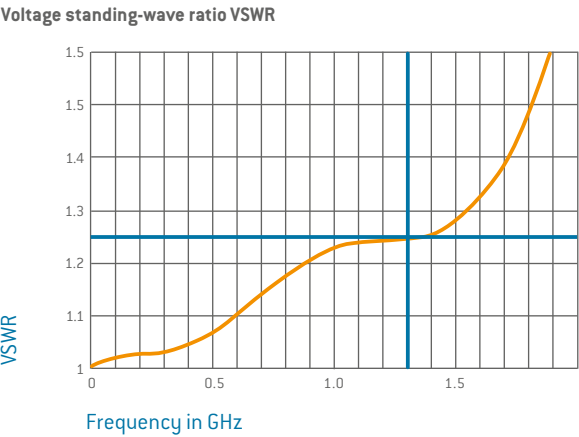
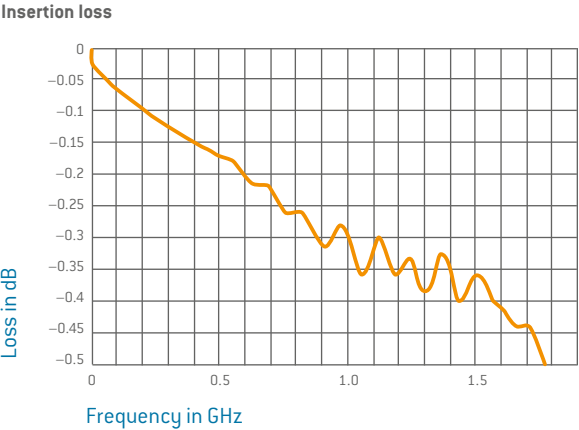
<sup>1</sup> Partial discharge test carried out with recommended cable construction.



MODULE 4 CONTACTS FOR 50 Ω



HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS<sup>1</sup>



<sup>1</sup> Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 x 5 cm conductor length. <sup>2</sup> See from page 163.

Mating cycles: minimum 60,000  
Non-magnetic  
Frequency range<sup>1</sup>: 0-1.3 GHz

TECHNICAL DATA

- Crimp information see page 146.

TECHNICAL DATA

<b>Voltage information</b>	
Frequency range	0-1.3 GHz <sup>1</sup>
Insulation resistance	> 100 GΩ
Voltage information acc. to MIL <sup>2</sup>	
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
Operating temperature	-40 °C to +125 °C
Mating cycles	minimum 60,000

<b>Materials</b>	
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Contact body / insulator	Cu alloy / PTFE
Contact spring	CuSn / CuBe alloy
Contact finish	Au over CuSnZn

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



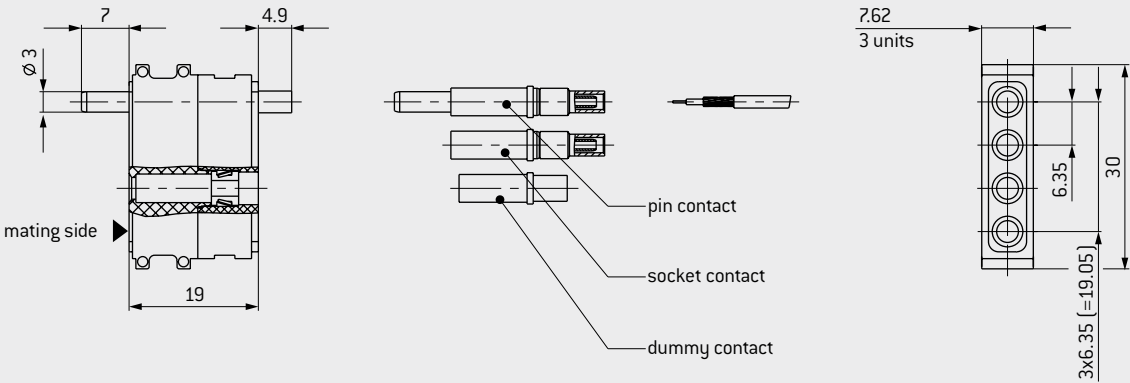
Removal of the not assembled contact (with cable – wire may have removed).

PART NUMBER: 087.611.001.001.000

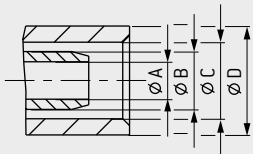
For an overview of all tools please see from page 152.



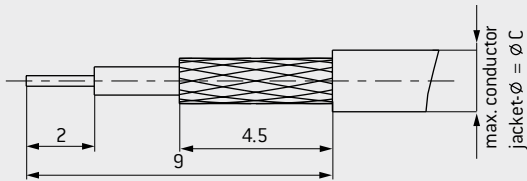
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 4 contacts	Part number
Insulator	611.149.104.923.000
Dummy contact	021.341.127.923.000

Description	Part number	Charac- teristic imped- ance Ω	Fre- quency range GHz	Cable <sup>1</sup>	A	B	C	D	Part number crimp inserts
Pin contact	122.120.001.257.000	50	1.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.120.003.257.000		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	122.120.011.257.000		0.85	G 02232 (H+S) <sup>2</sup>	1.75	2.7	3.5	4.3	082.000.039.103.000
Socket contact	122.120.002.257.000	50	1.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.120.004.257.000		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	122.120.012.257.000		0.85	G 02232 (H+S) <sup>2</sup>	1.75	2.7	3.5	4.3	082.000.039.103.000
Crimping tool for shielding sleeve	080.000.039.000.000								

<sup>1</sup> Special lines and alternative models on request. <sup>2</sup> Removal tool II is not possible due to the conductor diameter.

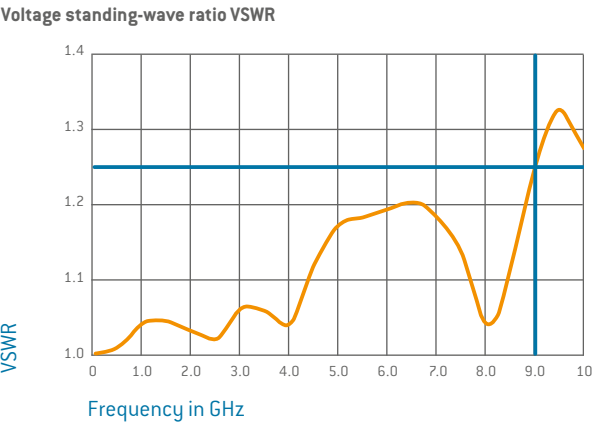
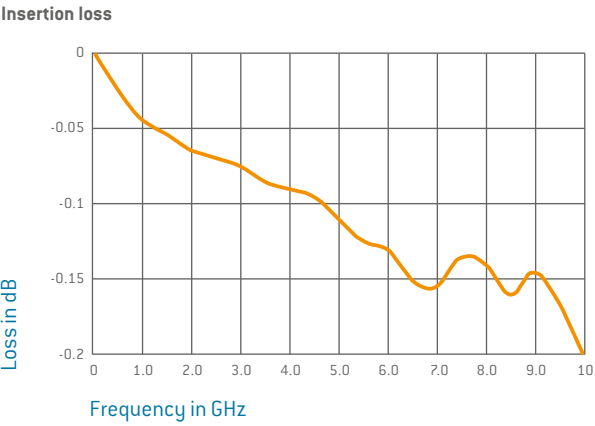
# MODULE 2 CONTACTS FOR 50 Ω WITH SMA TERMINATION



## COAX



### HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS<sup>1</sup>



Mating cycles: minimum 100,000  
Frequency range<sup>1</sup>: 0-9.0 GHz

#### TECHNICAL DATA

##### Voltage information

Frequency range<sup>1</sup> 0-9.0 GHz  
Insulation resistance > 100 GΩ

##### Voltage information acc. to MIL<sup>2</sup>

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 minimum 100,000

##### Materials

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

#### REMOVAL TOOL

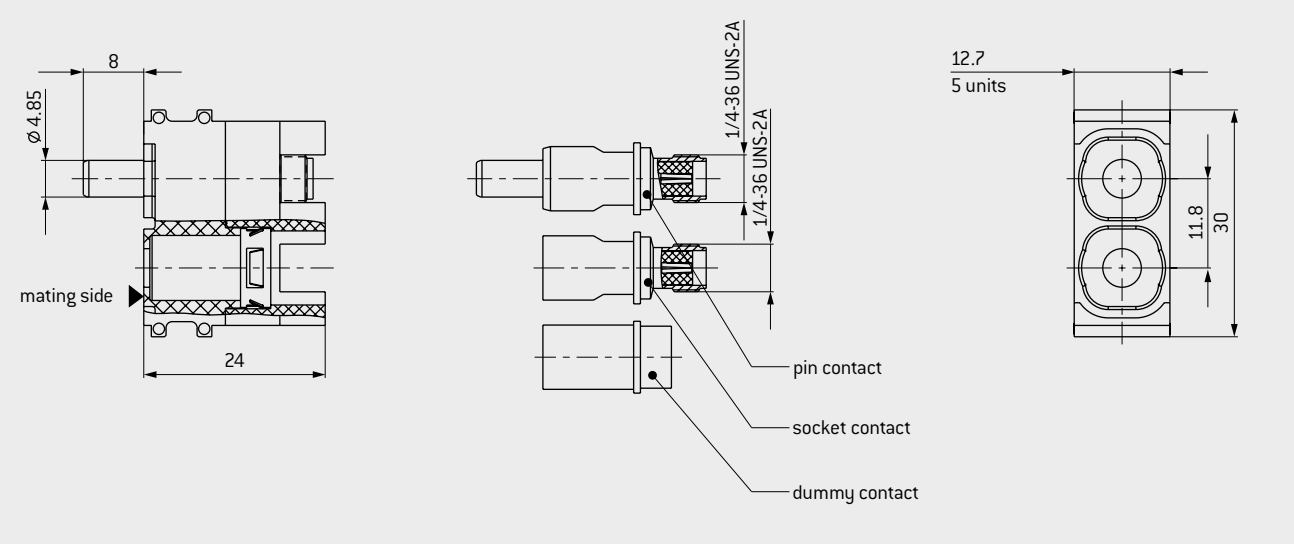


PART NUMBER: 087.170.391.000.000

For an overview of all tools please see from page 152.



## INSULATOR PIN AND SOCKET



Module 2 contacts	Part number
Insulator	611.152.102.923.000
Dummy contact	021.341.177.300.000

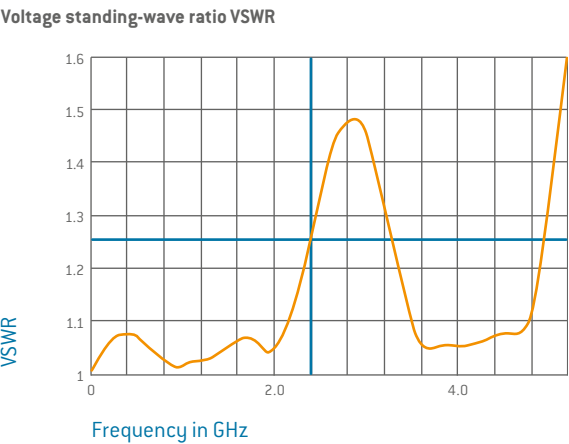
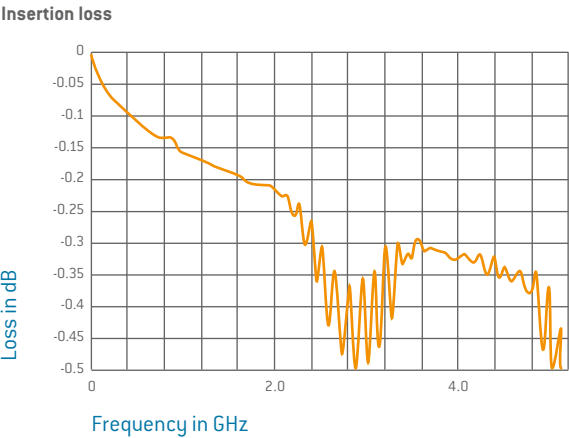
Description	Part number	Charac- teristic impedance Ω	Frequency range GHz
Pin contact	122.349.001.207.000	50	9.0
Socket contact	122.349.002.207.000		

<sup>1</sup> Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 x 5 cm conductor length. <sup>2</sup> See from page 163.

# MODULE 2 CONTACTS FOR 50 Ω



## HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS<sup>1</sup>



Mating cycles: minimum 100,000  
Frequency range<sup>1</sup>: 0-2.4 GHz

### TECHNICAL DATA

• Crimp information see page 146.

### TECHNICAL DATA

#### Voltage information

Frequency range<sup>1</sup> 0-2.4 GHz  
Insulation resistance > 100 GΩ

Voltage information acc. to MIL<sup>2</sup>

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 minimum 100,000

#### Materials

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

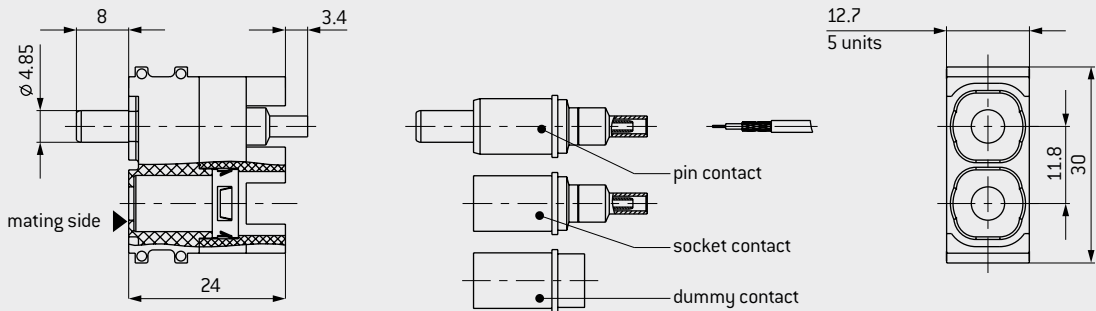
### REMOVAL TOOL



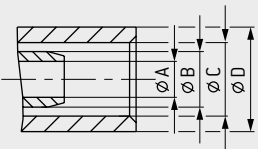
PART NUMBER: 087.170.391.000.000

For an overview of all tools please see from page 152.

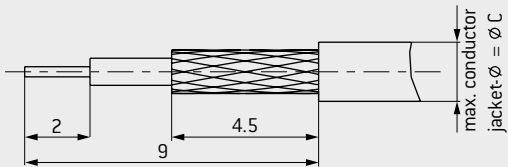
### INSULATOR FOR PIN AND SOCKET



### CABLE TERMINATION



### RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 2 contacts	Part number
Insulator	611.152.102.923.000
Dummy contact	021.341.177.300.000

Description	Part number	Charac-teristic impedance Ω	Fre-quency range GHz	Cable <sup>1</sup>	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
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 (2YCY 0.4/2.5-75 Ω)	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	3.15	4.5	5.5	6.15	082.000.039.108.000
Pin contact	122.346.011.207.000	50	2.1	G 02232 D (H+S)/RG 316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Socket contact	122.346.002.207.000		1.25	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
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 (2YCY 0.4/2.5-75 Ω)	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	3.15	4.5	5.5	6.15	082.000.039.108.000
Socket contact	122.346.012.207.000	50	2.1	G 02232 D (H+S)/RG 316 D	1.75	2.7	3.5	4.3	082.000.039.103.000
Crimping tool for shielding sleeve	080.000.039.000.000								

<sup>1</sup> Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2 x 5 cm conductor length. <sup>2</sup> See from page 163.

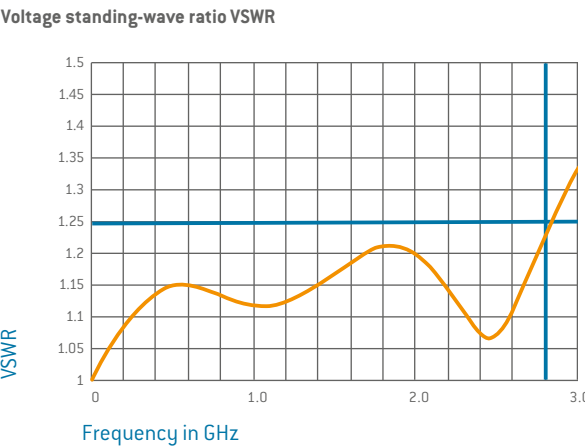
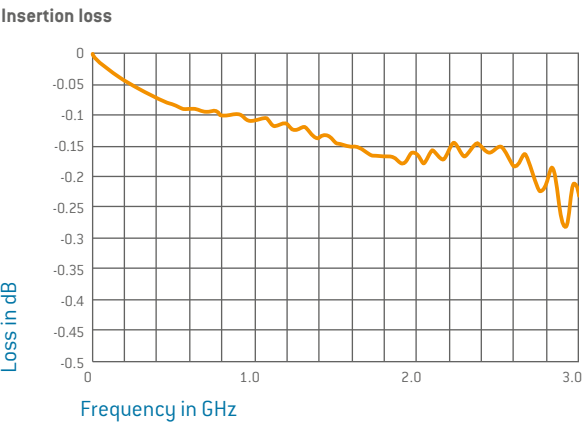
<sup>1</sup> Special lines on request.



# MODULE 2 CONTACTS FOR 50 Ω AND HIGH VOLTAGE



## HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS<sup>1</sup>



Mating cycles: minimum 100,000  
 Non-magnetic  
Frequency range<sup>1</sup>: 0-2.8 GHz

### TECHNICAL DATA

- Crimp information see page 146.

### TECHNICAL DATA

#### Voltage information

Frequency range<sup>1</sup> 0-2.8 GHz  
Insulation resistance > 100 GΩ

Voltage information acc. to MIL<sup>2</sup>

Operating voltage 850 V  
Test voltage 2,600 V

### Mechanical data

Total mating force (average) 13.9 N / Module  
Total sliding force (average) 9.9 N / Module  
Operating temperature -40 °C to +125 °C  
Mating cycles minimum 100,000

### Materials

Insulator Thermoplastic  
fibre glass reinforced  
acc. to UL-94  
Contact body Cu alloy / PTFE  
Contact spring CuSn / CuBe alloy  
Contact finish Au over CuSnZn

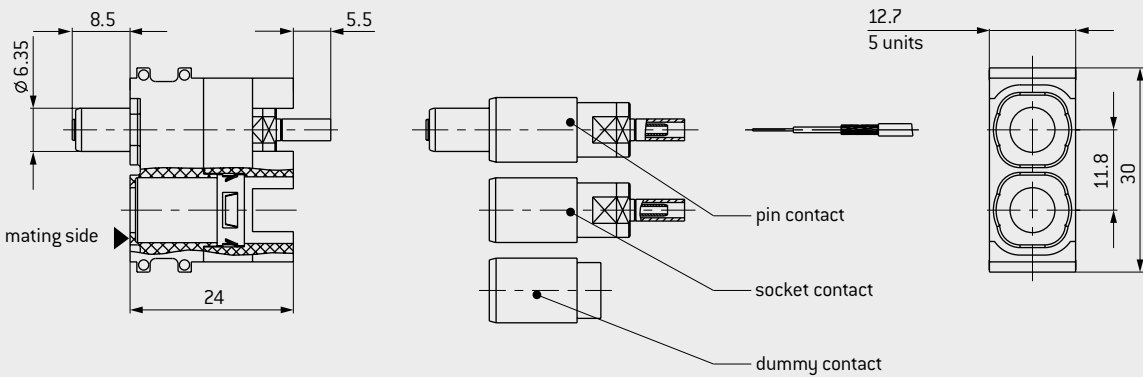
### REMOVAL TOOL



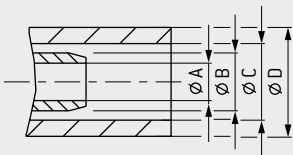
PART NUMBER: 087.170.391.000.000

For an overview of all tools please see from page 152.

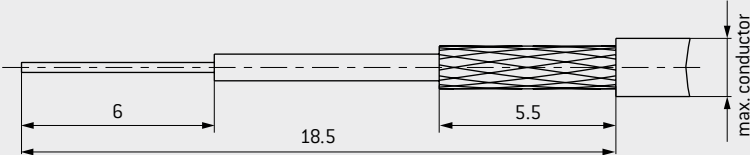
## INSULATOR FOR PIN AND SOCKET



## CABLE TERMINATION



## RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 2 contacts	Part number
Insulator	611.155.102.923.000
Dummy contact	021.341.179.923.000

Description	Part number	Charac- teristic impedance Ω	Fre- quency range GHz	Cable <sup>1</sup>	A	B	C	D	Part number crimp inserts
Pin contact	122.126.001.257.000	50	0.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.126.003.257.000		2.0	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.126.013.257.000		2.8	RG 223	3.15	4.5	5.9	6.75	082.000.039.106.000
Pin contact	122.126.007.257.000		2.6	RG 58	3.15	4.5	5.2	6.15	082.000.039.108.000
Socket contact	122.126.002.257.000	50	0.3	RG 178 / RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.126.004.257.000		2.0	RG 174 / RG 188 / RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.126.014.257.000		2.8	RG 223	3.15	4.5	5.9	6.75	082.000.039.108.000
Socket contact	122.126.008.257.000		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								

<sup>1</sup> Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2x 5 cm conductor length. <sup>2</sup> See from page 163.

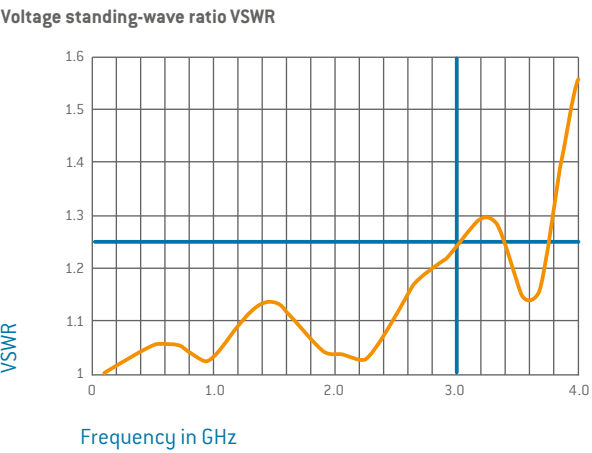
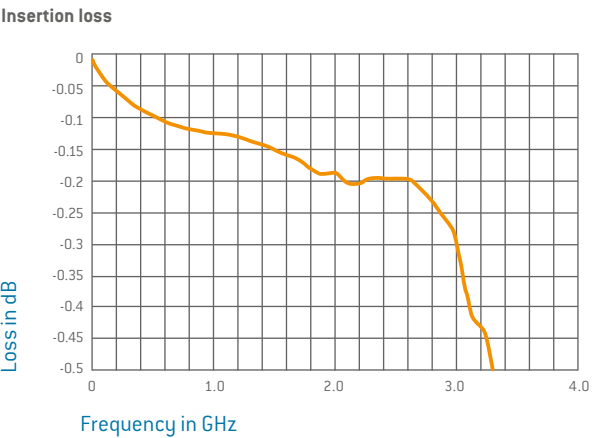




MODULE 2 CONTACTS FOR 75 Ω



HIGH FREQUENCY CHARACTERISTICS FOR 75 Ω COAX CONTACTS<sup>1</sup>



Mating cycles: minimum 100,000  
Frequency range<sup>1</sup>: 0-3.0 GHz

TECHNICAL DATA

- Crimp information see page 146.

TECHNICAL DATA

Voltage information

Frequency range<sup>1</sup> 0-3.0 GHz  
Insulation resistance > 100 GΩ

Voltage information acc. to MIL<sup>2</sup>

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 minimum 100,000

Materials

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

REMOVAL TOOL



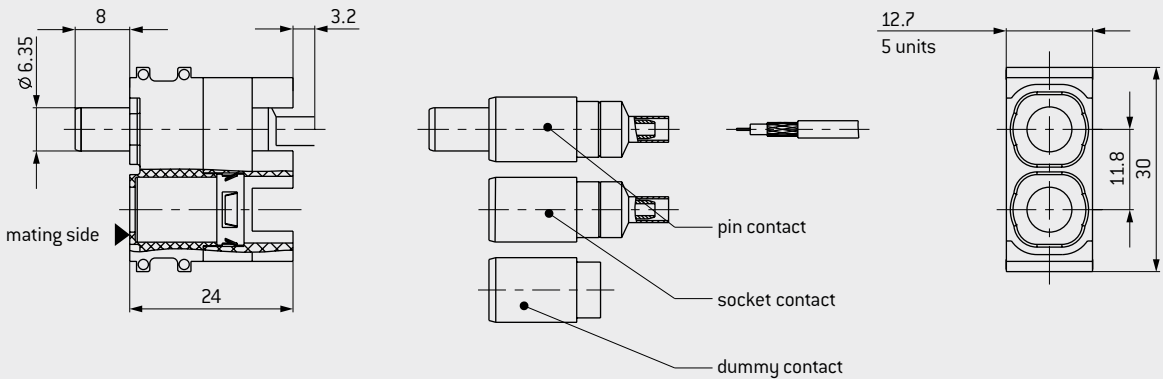
PART NUMBER: 087.170.391.000.000

For an overview of all tools please see from page 152.

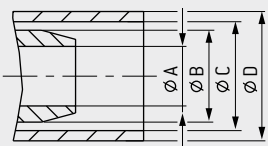
<sup>1</sup> Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with per 2x 5 cm conductor length. <sup>2</sup> See from page 163.



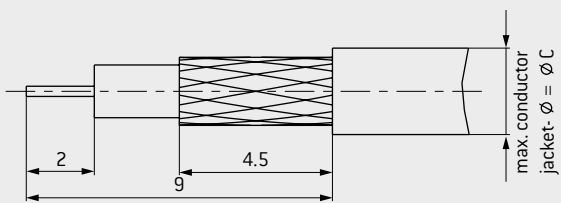
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



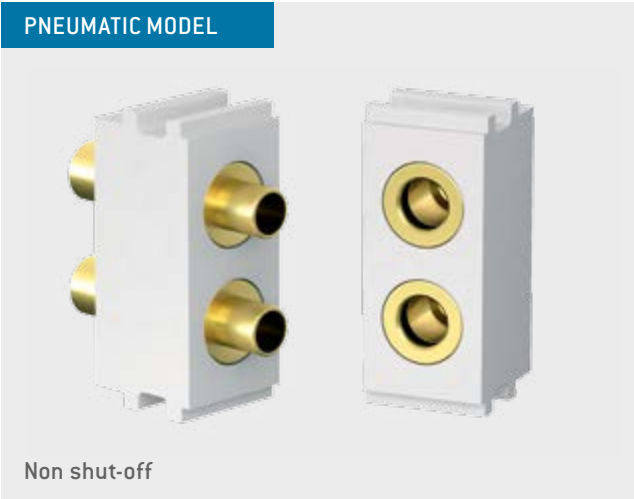
Module 2 contacts	Part number
Insulator	611.155.102.923.000
Dummy contact	021.341.179.923.000

Description	Part number	Charac- teristic impedance Ω	Fre- quency range GHz	Cable <sup>1</sup>	A	B	C	D	Part number crimp inserts
Pin contact	122.348.003.207.000	75	3.0	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	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	RG 59	4	5.4	6.3	7.2	082.000.039.109.000
Socket contact	122.348.004.207.000	75	3.0	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	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	RG 59	4	5.4	6.3	7.2	082.000.039.109.000
Crimping tool for shielding sleeve	080.000.039.000.000								

<sup>1</sup> Special lines on request.

# MODULE 2 CONTACTS FOR PNEUMATIC VALVES

## INNER DIAMETER OF TUBE MAX. 4 MM

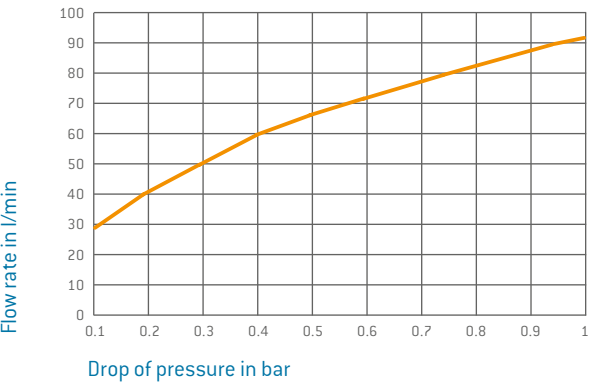


Non shut-off



Shut-off

### 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.

<sup>1</sup> Specified mating cycles through regular service intervals possible. <sup>2</sup> Not suitable for mixtures containing more than 25 % oxygen content and explosive gases.

Operating pressure: 20 bar  
Mating cycles<sup>1</sup>: minimum 100,000  
Inner diameter tube: max. 4 mm

### TECHNICAL DATA

- 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.
- No O<sub>2</sub> model<sup>2</sup>.

### TECHNICAL DATA

#### Mechanical data

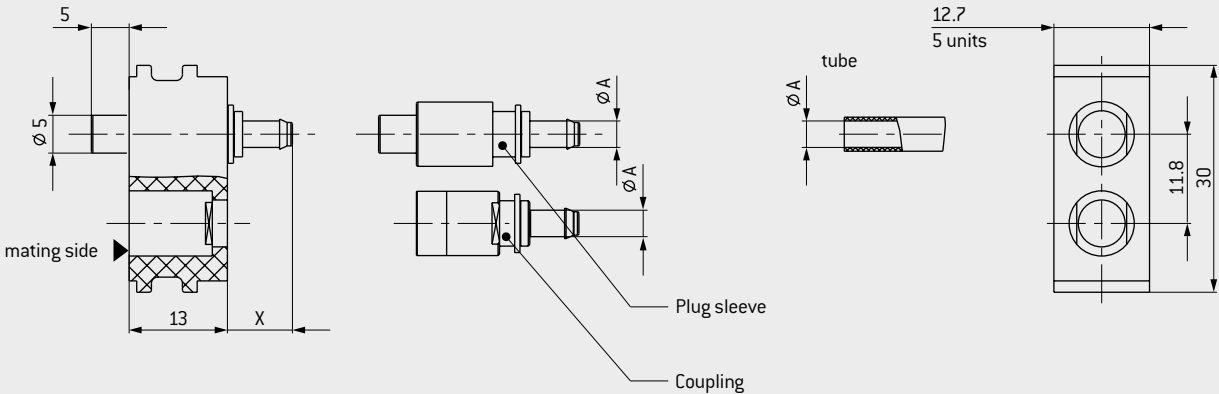
Valid max. operating pressure	20 bar
Total mating force (average)	
non shut-off	27 N / Module
one side shut-off	28 N / Module
both side shut-off	29 N / Module
Total sliding force (average)	
non shut-off	12.6 N / Module
one side shut-off	12.6 N / Module
both side shut-off	9.2 N / Module
Operating temperature	−40 °C to +125 °C
Mating cycles <sup>1</sup>	minimum 100,000

#### Materials

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

### INSULATOR PIN AND SOCKET

ACCESSORIES SEE PAGE 124



Module 2 contacts	Part number
Insulator	611.141.102.923.000

Description	Part number	Dim. A mm	Dim. X mm	Termination types see page 124	
				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) <sup>1,2</sup>	196.025.014.300.000	M5	—		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) <sup>2</sup>	196.025.012.300.000	M5	—		x

<sup>1</sup> Only pluggable on coupling plug 196.025.012.300.000. <sup>2</sup> Material sealing: FKM.



# MODULE 2 CONTACTS FOR PNEUMATIC VALVES

## INNER DIAMETER OF TUBE MAX. 6 MM



Operating pressure: 12 bar  
Mating cycles<sup>1</sup>: minimum 100,000  
Inner diameter tube: 6 mm

TECHNICAL DATA

- 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.
- No O<sub>2</sub> model<sup>2</sup>.

TECHNICAL DATA

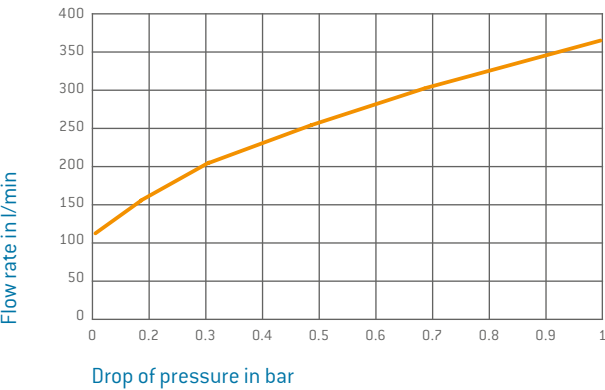
Mechanical data

Valid max. operating pressure	12 bar
Total mating force (average)	
non shut-off	10.8 N / Module
one side shut-off	12.8 N / Module
Total sliding force (average)	
non shut-off	6.8 N / Module
one side shut-off	6.8 N / Module
Operating temperature	−40 °C to +125 °C
Mating cycles <sup>1</sup>	minimum 100,000

Materials

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

FLOW RATE DIAGRAM

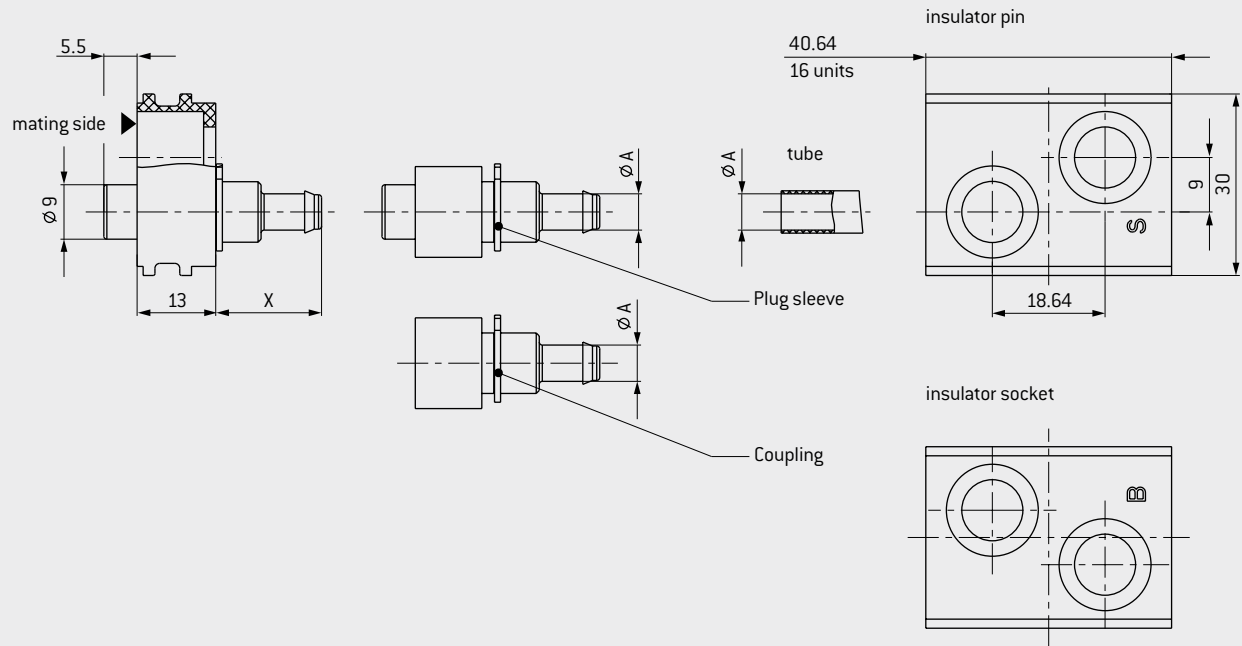


The flow diagram refers to the blocking variant with a maximum gap between socket and pin piece of ≤ 0.5 mm. The pressure reduction increases in the event of a changed gap measurement.

<sup>1</sup> Specified mating cycles through regular service intervals possible. <sup>2</sup> Not suitable for mixtures containing more than 25 % oxygen content and explosive gases.



INSULATOR PIN AND SOCKET



Module 2 contacts	Part number
Insulator socket	610.140.102.923.000
Insulator pin	611.140.102.923.000

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 1 CONTACT FOR PNEUMATIC VALVES

## INNER DIAMETER TUBE MAX. 6 MM



Operating pressure: 12 bar  
Mating cycles<sup>1</sup>: minimum 100,000  
Inner diameter tube: max. 6 mm

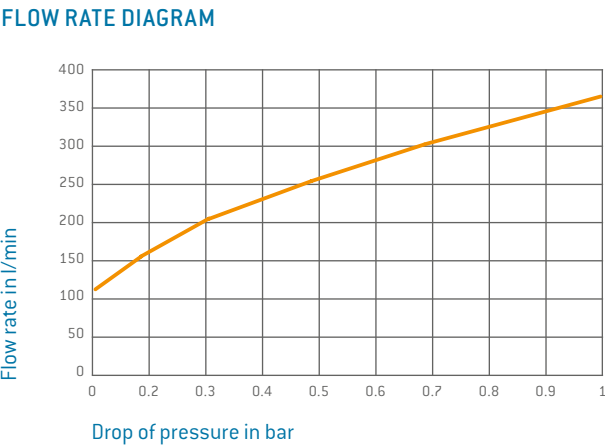
- TECHNICAL DATA
- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
  - Vacuum model and further termination types on request.
  - No O<sub>2</sub> model<sup>2</sup>.

TECHNICAL DATA

Mechanical data	
Valid max. operating pressure	12 bar
Total mating force (average)	
non shut-off	5.4 N / Module
one side shut-off	6.4 N / Module
Total sliding force (average)	
non shut-off	3.4 N / Module
one side shut-off	3.4 N / Module
Operating temperature	−40 °C to +125 °C
Mating cycles <sup>1</sup>	minimum 100,000

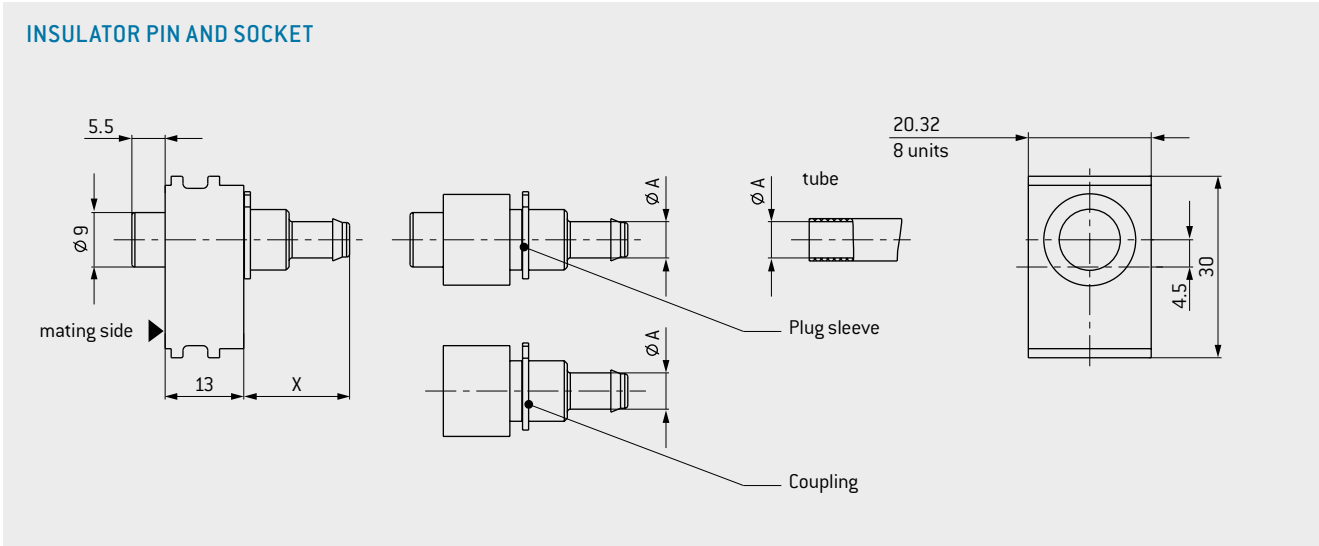
MATERIALS

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



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.

<sup>1</sup> Specified mating cycles through regular service intervals possible. <sup>2</sup> Not suitable for mixtures containing more than 25 % oxygen content and explosive gases.



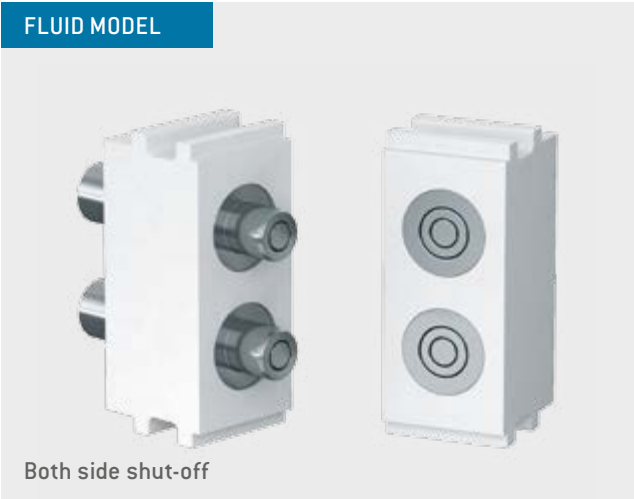
Module 1 contact	Part number
Insulator	611.142.101.923.000

Description	Part number	Dim. A	Dim. X
		mm	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

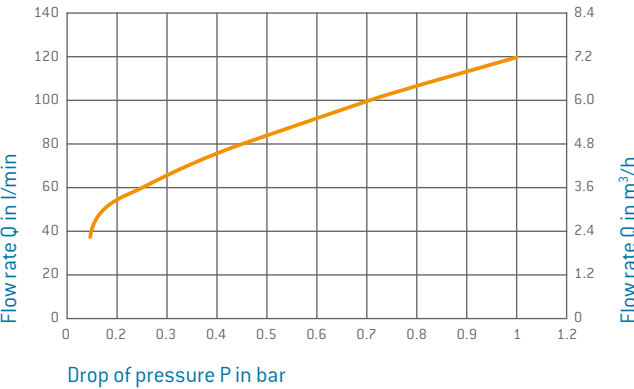


# MODULE 2 CONTACTS

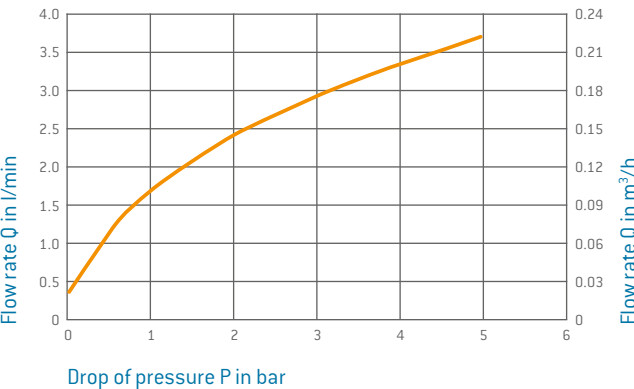
Suitable for conducting air, water and other fluids.



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.

<sup>1</sup> Specified mating cycles through regular service intervals possible. <sup>2</sup> Not suitable for mixtures containing more than 25 % oxygen content and explosive gases.

Operating pressure: 10 bar low-leakage model  
Mating cycles<sup>1</sup>: minimum 100,000

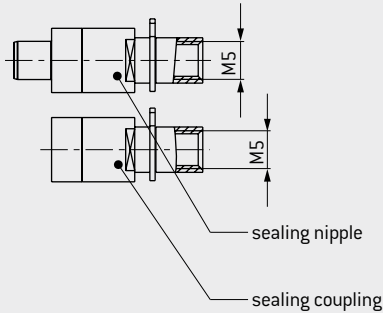
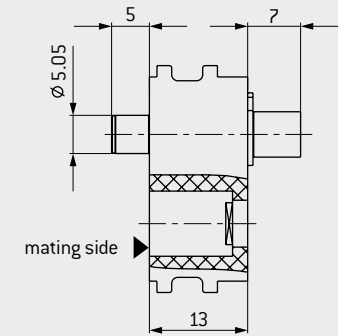
TECHNICAL DATA

- 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.
- No O<sub>2</sub> model<sup>2</sup>.

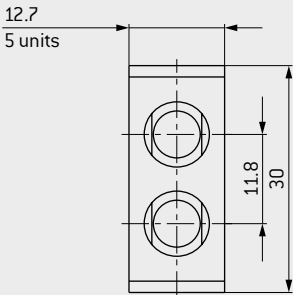
TECHNICAL DATA

Valid max. operating pressure	10 bar
Tube termination	M5 internal thread
commercial screwings	
Total mating force (average)	48 N / Module
Total sliding force (average)	4.6 N / Module
Operating temperature	−40 °C to +125 °C
Mating cycles <sup>1</sup>	minimum 100.000
Materials	
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Fluid model	Stainless steel (1.4305)
Sealing	NBR

INSULATOR PIN AND SOCKET



ACCESSORIES SEE PAGE 124



Module 2 contacts	Part number
Insulator	611.141.102.923.000

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



ACCESSORIES FOR FLUID MODEL



PNEUMATIC AND FLUID MODEL

TERMINATION TYPE I

Nipple fitting



TERMINATION TYPE II PUSH-IN

Push-in fitting



L connection



TECHNICAL DATA

- Tightening torque 1.5 Nm

TECHNICAL DATA

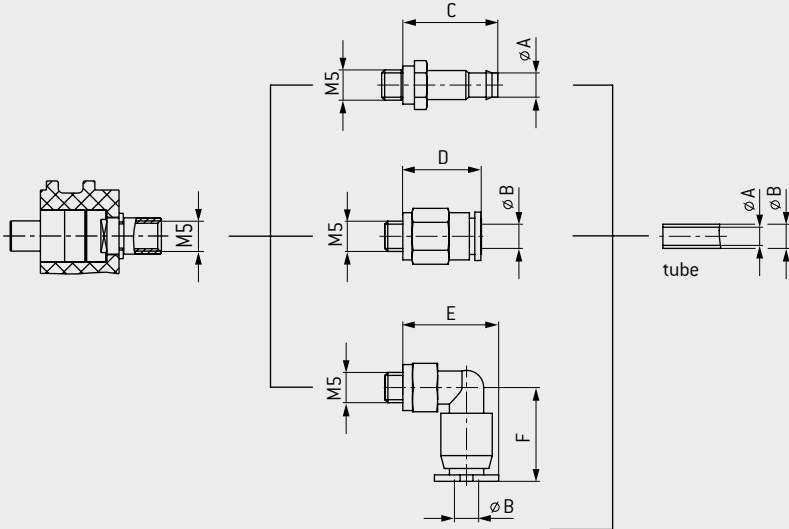
Mechanical data

Valid operating pressure (static) 0.95 to 14 bar  
Operating temperature -10 °C to +80 °C  
Thread termination M5

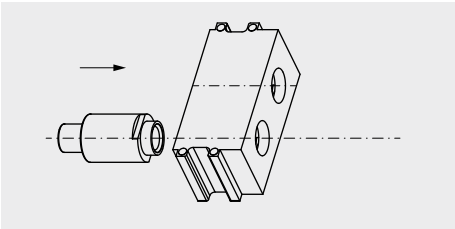
Description	Part number	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Dim. E mm	Dim. F mm
				incl. sealing washer			
Nipple fitting	945.000.001.000.123	2		10.2			
Nipple fitting	945.000.001.000.136	3		14.2			
Nipple fitting	945.000.001.000.137	4		15.8			
Push-in fitting push-in	945.000.001.000.138		3		13		
Push-in fitting push-in	945.000.001.000.139		4		13.2		
Push-in fitting push-in	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



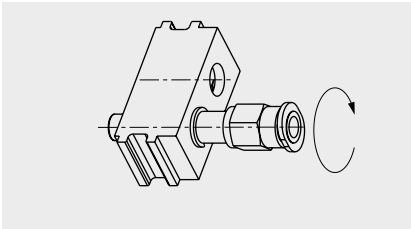
TERMINATION DIMENSIONS ACCESSORIES FLUID MODEL WITH RETAINING RING



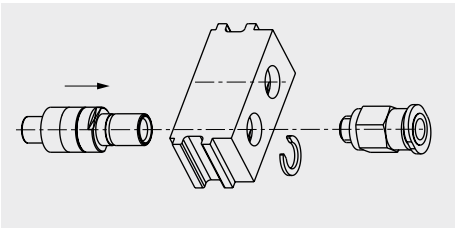
ASSEMBLY OF THE MODEL (DEPENDING ON MODEL)



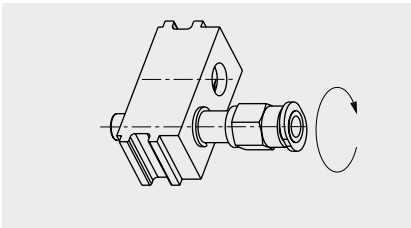
1. Insert model in insulator.



2. Screw termination accessories in model.  
Tightening torque 1.5 Nm.

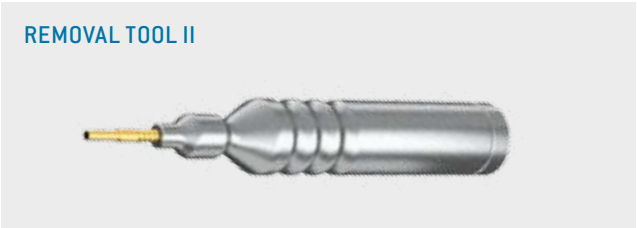


1. Insert model in insulator  
and assemble retaining ring.



2. Screw termination accessories in model.  
Tightening torque 1.5 Nm.

MODULE 5 CONTACTS FOR PLASTIC FIBRE POF



Removal from front, cutting-off not necessary.

**PART NUMBER: 087.611.001.002.000**

For an overview of all tools please see from page [152](#).

Ferrule

Mating cycles: minimum 40,000

Non-magnetic on request

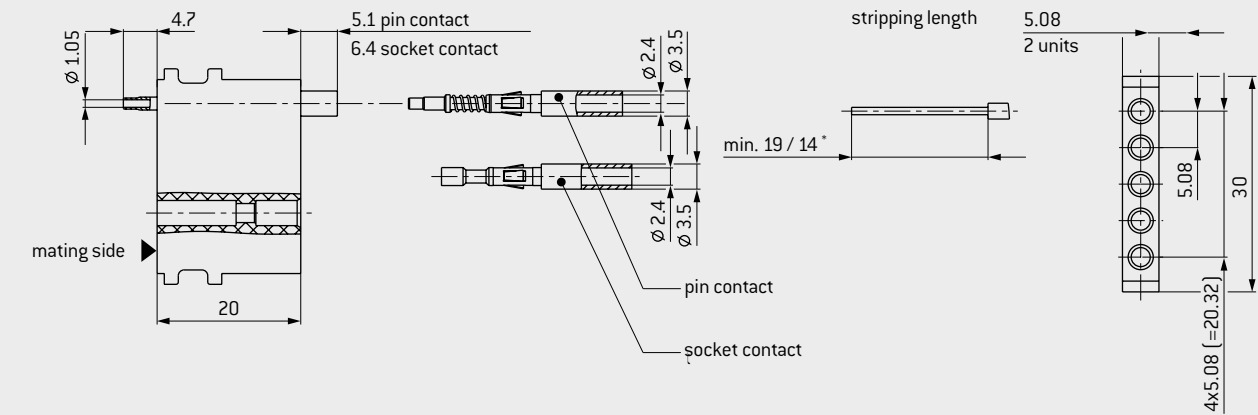
**TECHNICAL DATA**

- Conditional with the function, the contacts are pre-stressed in the mated state. This pre-stressing must be maintained by the frame via a holding device.

TECHNICAL DATA	
<b>Mechanical data</b>	
POF (Polymer Optical Fibre)	1 mm
Outer diameter	2.2 mm respectively 2.3 mm
Fibre fastening	Crimp
Insertion loss	
Typical	1.5 dB at 670 nm
During life-time	< 2 dB at 670 nm
Total mating force (average)	< 17,5 N
Operating temperature (depending on fibre)	
Standard fibre	−40 °C to +85 °C
High temperature fibre	−40 °C to +115 °C
Mating cycles	minimum 40,000

<b>Materials</b>	
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Fibre-optic contact	Cu alloy
Type of fibre	Plastic fibre 980/1.000 [POF]

INSULATOR PIN AND SOCKET



\* min. 19 pin contact / min. 14 socket contact

Module 5 contacts	Part number
Insulator	611.163.105.923.000

Description	Part number
Socket contact 980 / 1,000 µm	196.503.001.901.000
Pin contact 980 / 1,000 µm	196.503.002.901.000
Processing set (multi-purpose and crimping tool)	080.000.048.000.000
Cutting/stripping universal pliers	080.000.048.100.000
Crimping tool	080.000.048.200.000

For assembly instructions please refer to our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).



# MODULE 2 CONTACTS FOR PLASTIC FIBRE POF/MOST



Ferrule  
Mating cycles: minimum 100,000  
Type of plastic fibre: POF / MOST

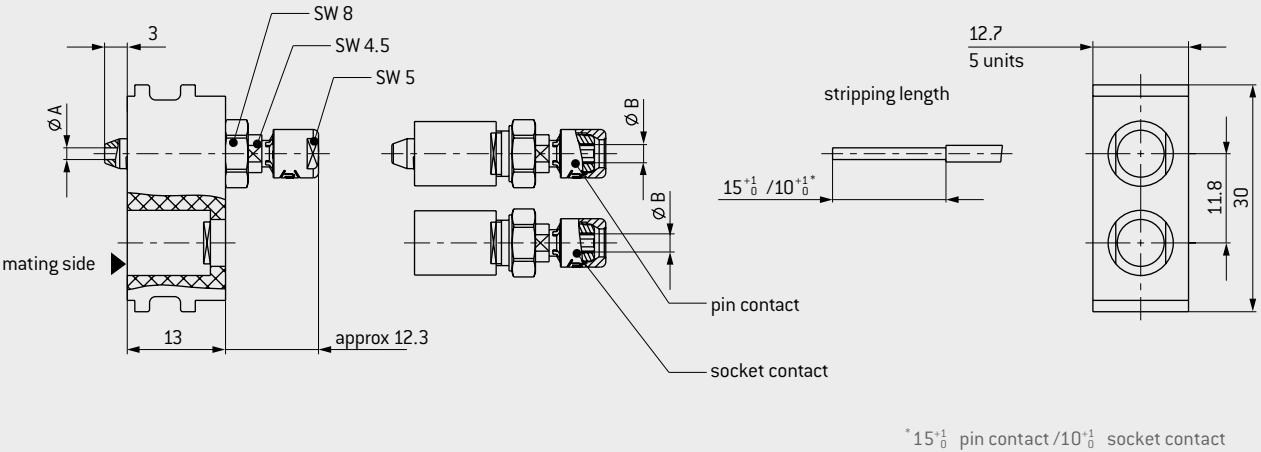
- TECHNICAL DATA
- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
  - Lens connector on request.

TECHNICAL DATA	
Mechanical data	
POF (Polymer Optical Fibre)	1 mm
Outer diameter	2.2 mm respectively 2.3 mm
Fibre fastening	Clamping
Insertion loss	
Typical	1.5 dB at 670 nm
During life-time	< 2 dB at 670 nm
Total mating force (average)	16.0 N
Operating temperature (depending on fibre)	
Standard fibre	−40 °C to +85 °C
High temperature fibre	−40 °C to +115 °C
Mating cycles	minimum 100,000

Materials	
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Fibre-optic contact	Cu alloy
Type of fibre	Plastic fibre 980/1.000 (POF) or 980/1.550 (MOST)



## INSULATOR PIN AND SOCKET



Module 2 contacts	Part number
Insulator	611.141.102.923.000

Description	Part number	Dim. A mm	Dim. B mm
Socket contact 980 / 1,000 µm	196.501.001.901.000	1.05	2.25
Pin contact 980 / 1,000 µm	196.501.002.901.000	1.05	2.25
Socket contact 980 / 1,550 µm (MOST standard)	196.502.001.901.000	1.6	2.35
Pin contact 980 / 1,550 µm (MOST standard)	196.502.002.901.000	1.6	2.35
Cable-stripping tool	598.501.001.000.000		
Spanner wrench 4.5 mm	598.501.002.000.000		
Spanner wrench 5 mm	598.700.001.016.000		
Nutdriver 8 mm	598.501.003.000.000		
Polish-device for socket	598.501.004.000.000		
Spare blades	598.501.006.000.000		
Polish-device for pin	598.501.007.000.000		
Lapp foils, 12 µm, 5 µm	598.501.010.000.000		

For assembly instructions please refer to our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).



# MODULE 3 CONTACTS FOR FIBRE GLASS GOF



Removal of the already assembled contact (incl. cable).  
**PART NUMBER: 087.170.136.000.000**



Removal of the unassembled contact  
(with cable – wire may have removed)  
**PART NUMBER: 087.611.001.001.000**  
For an overview of all tools please see page 152.

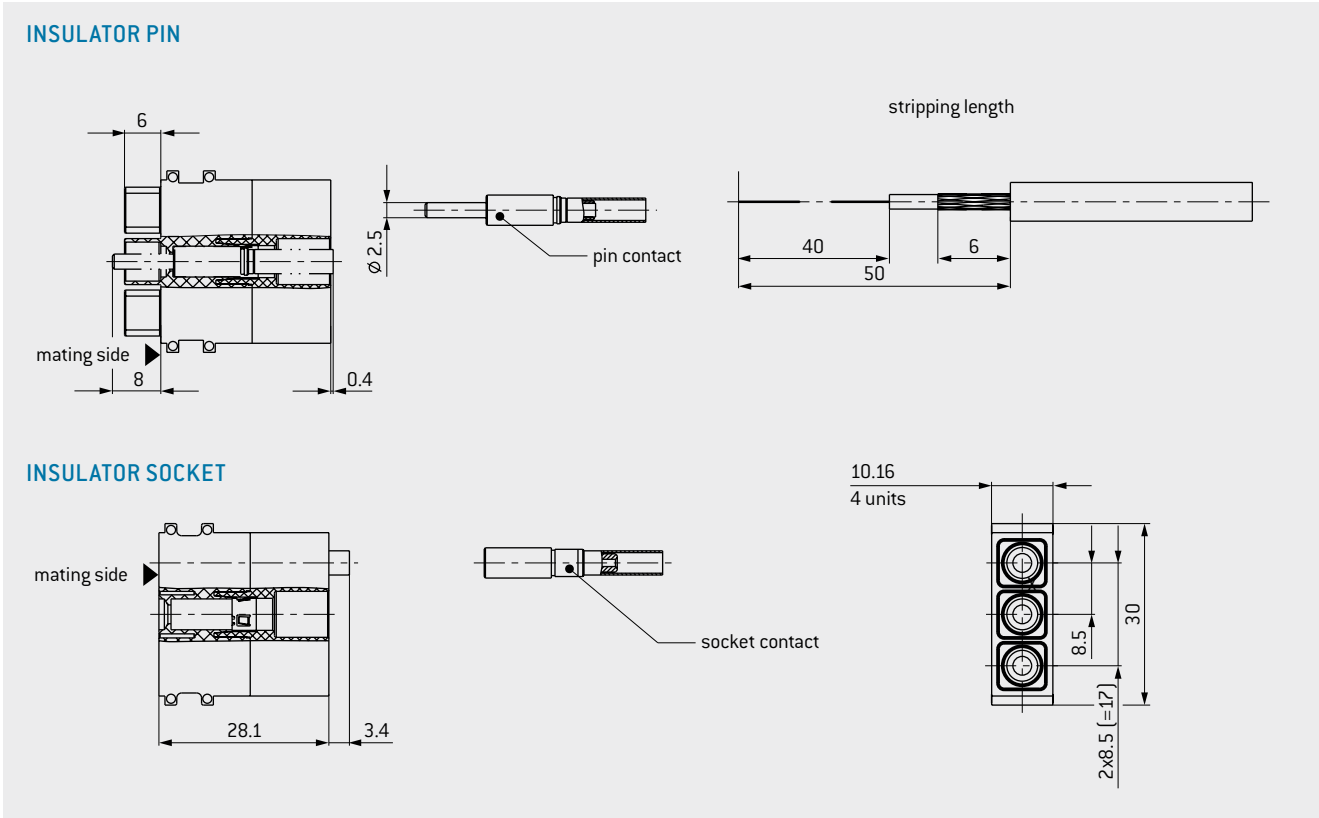
**Ferrule**  
Single-mode / multi-mode  
Mating cycles<sup>1</sup>: minimum 100,000

- TECHNICAL DATA**
- The contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
  - Lens connector on request.

TECHNICAL DATA	
Mechanical data	
Fibre glass	Single-mode – 9/125 µm Multi-mode – 50/125 µm Multi-mode – 62.5/125 µm Fibre-optic glued <sup>2</sup> Surface polished <sup>2</sup> Sheath crimped
Fibre fastening	< 1 dB ≤ 36 N 10 N to 12 N / contact –40 °C to +85 °C minimum 100,000
Insertion loss typical	
Total mating force (average)	
Assembly holding force	
Operating temperature	
Mating cycles <sup>1</sup>	

Materials	
Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
Ferrule holder	Nickel silver
Ferrule	Ceramic
Spring	CrNi steel

<sup>1</sup>Specified mating cycles through regular service intervals possible. <sup>2</sup>Fibre assembly (glue and polish) on request.



Module 3 contacts	Part number
Insulator pin piece	611.162.103.923.000
Insulator socket piece	610.162.103.923.000

Description	Part number	Part number crimp insert	Fibre-optic fibre
Pin contact	196.603.002.901.000	082.000.039.102.000	50 / 125 µm; 62.5 / 125 µm
Pin contact	196.603.004.901.000		9 / 125 µm
Socket contact	196.603.001.901.000		50 / 125 µm; 62.5 / 125 µm
Socket contact	196.603.003.901.000		9 / 125 µm
Crimping tool for shielding sleeve	080.000.039.000.000		

For assembly instructions please refer to our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).

## MODULE FOR MULTI-POSITION, SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR

Size 0 (e. g. insert in bus systems).



## SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR

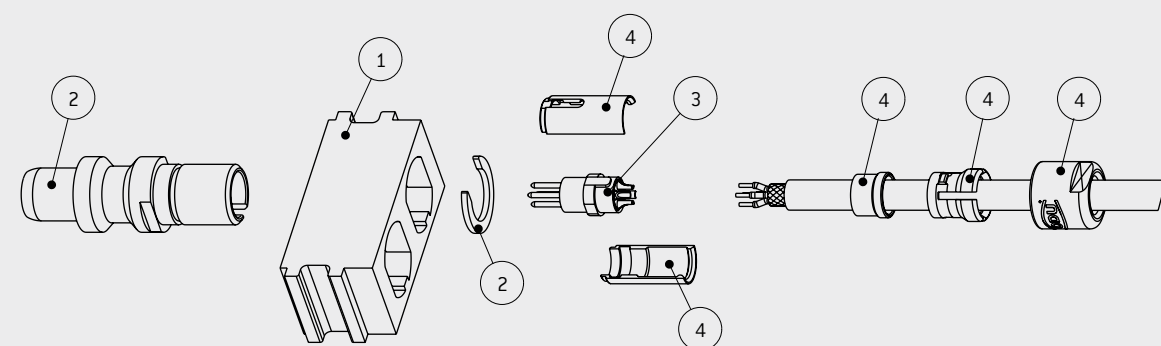


Mating cycles: minimum 5,000  
USB 2.0, USB 3.0, CAT 5  
2 to 10 contacts

## TECHNICAL DATA

- The inserts listed here for shielded implementations / high-speed connectors are optimally suitable for all common bus systems with transfer rates up to 10 MHz.  
For example, Profibus, USB 1.1, RS485, Flexray, CAN-Bus and RS232.
- Selected inserts are suitable and qualified for data rates up to 7.5 Gbits/s [USB 3.0]. For example, Fast-Ethernet, USB 2.0, USB 3.0, IEEE 1394.

## HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



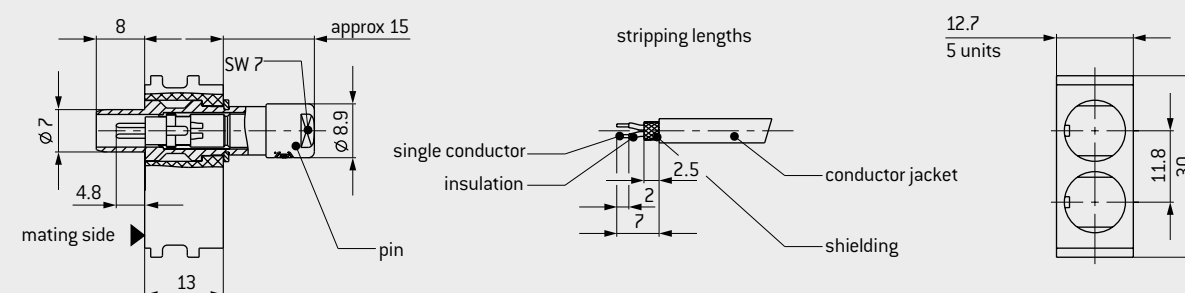
Order	Base parts	Part number
1	Insulator	611.148.102.923.000
2	Socket housing complete	653.001.001.304.000
2	Connector housing complete	653.001.002.304.000
	Dummy contact	021.341.182.300.000
3	Insert complete	see next page
4	Assembly set	see table on the right

## ASSEMBLY SET

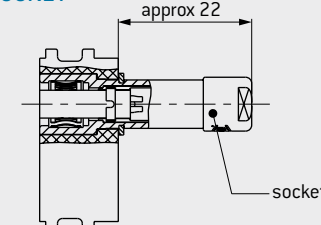
Cable Ø	Part number
mm	
1.5 to 2	653.001.001.304.020
2 to 2.5	653.001.001.304.025
2.5 to 3	653.001.001.304.030
3 to 3.5	653.001.001.304.035
3.5 to 4	653.001.001.304.040
4 to 4.5	653.001.001.304.045
4.5 to 5	653.001.001.304.050
5 to 6.1	653.001.001.304.061



## INSULATOR PIN

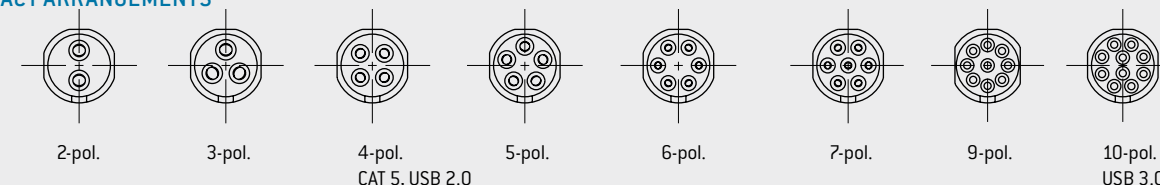


## INSULATOR SOCKET



In application with a housing please check the space requirement.

## CONTACT ARRANGEMENTS



Number of contacts	Contact diameter	Termination cross-section	Rated voltage <sup>1</sup>	Rated impulse voltage <sup>1</sup>	Degree of pollution <sup>1</sup>	Nominal voltage <sup>2</sup>	Model	Category <sup>3</sup>	Insert complete <sup>4</sup> Part number	Total mating force	Total sliding force
	mm	AWG	V	kV		V AC				N	N

INSERT WITH ODU TURNTAC® (MATING CYCLES MINIMUM 5,000)

2	0.9	22	10	2	3	500	Pin		700.849.724.002.200	20	15
			32	2	2		Socket		700.749.724.002.200		
3	0.9	22	32	1.5	2	400	Pin		700.849.724.003.200		
							Socket		700.749.724.003.200		
4	0.7	26	32	1.5	2	300	Pin	CAT 5	700.848.724.004.200	22	17
							Socket	CAT 5	700.748.724.004.200		
4	0.7	22	32	1.5	2	300	Pin	USB 2.0	700.848.724.404.221		
							Socket	USB 2.0	700.748.724.404.200		
5	0.7	26	32	1.5	2	366	Pin		700.848.724.005.200		
							Socket		700.748.724.005.200		
6	0.5	28	32	1.5	2	300	Pin		700.841.724.006.200		
							Socket		700.741.724.006.200		
7	0.5	28	32	1.5	2	300	Pin		700.841.724.007.200		
							Socket		700.741.724.007.200		
9	0.5	28	10	1.2	2	200	Pin		700.841.724.009.200	23.5	18
							Socket		700.741.724.009.200		
10	0.5	28	10	1.2	2	200	Pin		700.841.724.010.221		
							Socket		700.741.724.010.221		
10	6 × 0.3 4 × 0.5	28 24	10	1.2	2	100	Pin	USB 3.0	700.831.724.410.000	16	12
							Socket				

<sup>1</sup> Acc. to IEC 60664-1:2007 (VDE 0110-1:2008), see page 159. <sup>2</sup> Acc. to EIA-364-20D:2008, SAE AS 13441:2004 method 3001.1. <sup>3</sup> Classification acc. to ISO/IEC 11801:2002.

<sup>4</sup> Insert crimp model on request.

# MODULE FOR MULTI-POSITION, SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR



Size 1 (e. g. insert in bus systems).

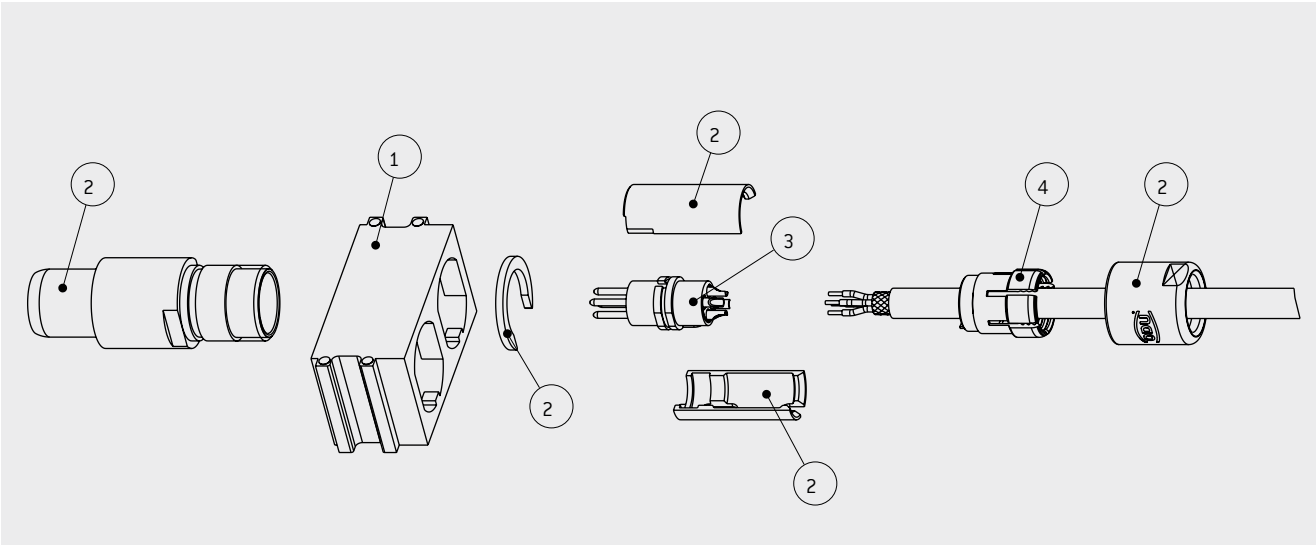


Mating cycles: minimum 5,000 / 60,000  
CAT 5  
2 to 14 contacts

TECHNICAL DATA

- The inserts listed here for shielded implementations / 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 1 GBit/s. For example, Gigabit-Ethernet, Fast-Ethernet, IEEE 1394, Fire-wire S400, Firewire S800.

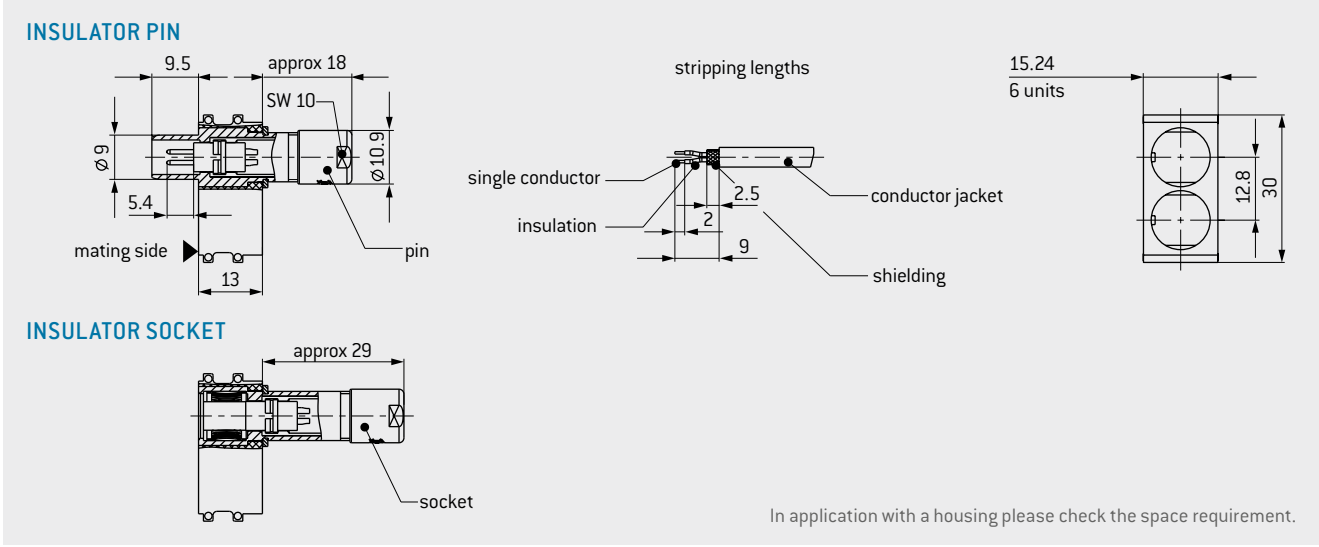
HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



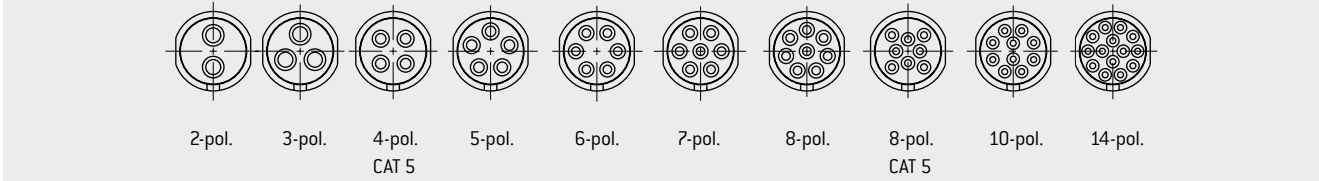
Order	Base parts	Part number
1	Insulator	611.167.102.923.000
2	Socket housing complete	653.002.001.304.000
2	Connector housing complete	653.002.002.304.000
	Dummy contact	021.341.186.300.000
3	Insert complete	see next page
4	Assembly set	see table on the right

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



CONTACT ARRANGEMENTS



Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage <sup>1</sup> V	Rated impulse voltage <sup>1</sup> kV	Degree of pollution <sup>1</sup>	Nominal voltage <sup>2</sup> V AC	Model	Category <sup>3</sup>	Insert complete <sup>4</sup> Part number	Total mating force N	Total sliding force N
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INSERT WITH ODU TURNAC® (MATING CYCLES MINIMUM 5,000)

2	1.3	20	32	2	3	550	Pin		701.844.724.002.200	8.5	7.5
			80		2		Socket		701.744.724.002.200		
3	1.3	20	16	2	3	500	Pin		701.844.724.003.200	8.5	7.5
			40		2		Socket		701.744.724.003.200		
4	0.9	22	10	2	3	500	Pin	CAT 5	701.849.724.004.200	10.5	9
			32		2		Socket		701.749.724.004.200		
5	0.9	22	32	1.5	2	450	Pin		701.849.724.005.200	10.5	9
							Socket		701.749.724.005.200		
6	0.7	22	32	1.5	2	400	Pin		701.848.724.406.200	13	10
							Socket		701.748.724.406.200		
7	0.7	22	32	1.5	2	400	Pin		701.848.724.407.200	13	10
							Socket		701.748.724.407.200		
8	0.7	22	32	1.5	2	333	Pin		701.848.724.408.200	13	10
							Socket		701.748.724.408.200		
8	0.5	26	32	1.5	2	333	Pin	CAT 5	701.841.724.408.000	13	10.5
							Socket		701.741.724.408.000		
10	0.5	28	25	1.5	2	333	Pin		701.841.724.010.400	15	12
							Socket		701.741.724.010.200		
14	0.5	28	25	1.5	2	300	Pin		701.841.724.014.400	15	12
							Socket		701.741.724.014.200		

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

4	0.76	22	25	2	3	450	Pin	CAT 5	701.842.724.004.700	7.5	7
			63		2		Socket		701.742.724.004.700		
5	0.76	22	25	1.5	3	400	Pin		701.842.724.005.700	8.5	8
			63		2		Socket		701.742.724.005.700		

<sup>1</sup> Acc. to IEC 60664-1:2007 (VDE 0110-1:2008), see page 159. <sup>2</sup> Acc. to EIA-364-20D:2008, SAE AS 13441:2004 method 3001.1. <sup>3</sup> Classification acc. to ISO/IEC 11801:2002. <sup>4</sup> Insert crimp model on request.

# MODULE FOR MULTI-POSITION, SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR



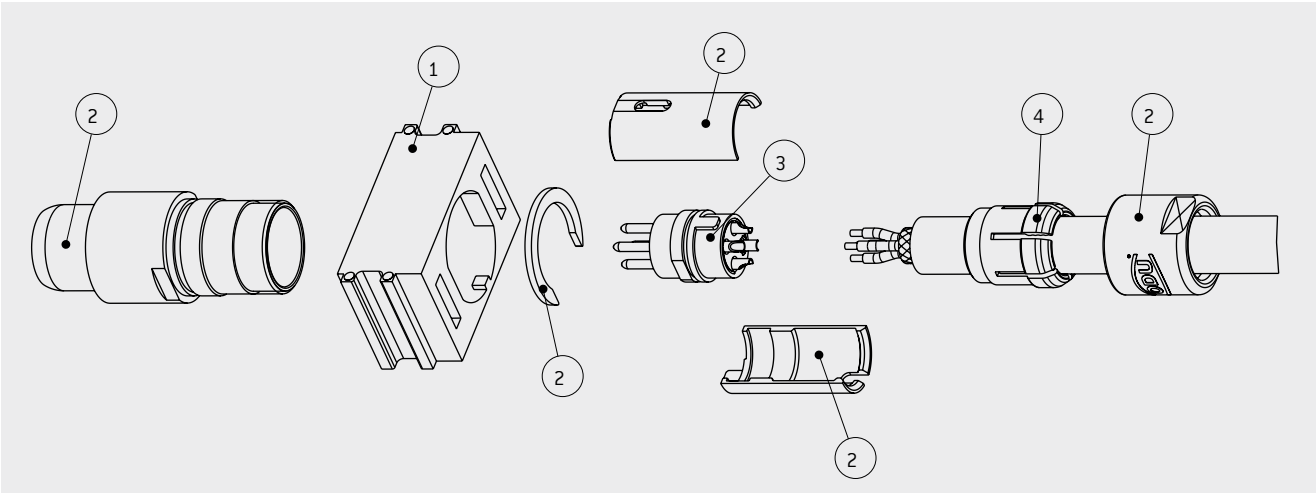
Size 2 (e. g. insert in bus systems).

SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR

Mating cycles: minimum 5,000 / 60,000  
CAT 5, CAT 6A, HDMI  
4, 8 and 16 contacts

- TECHNICAL DATA
- The inserts listed here for shielded implementations / 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 10 GBit/s. E. g. 10 Gigabit-Ethernet, Gigabit-Ethernet, Fast-Ethernet, IEEE 1394, Firewire S400, Firewire S800, HDMI.

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



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	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



INSULATOR PIN

INSULATOR SOCKET

In application with a housing please check the space requirement.

CONTACT ARRANGEMENTS

Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage <sup>1</sup> V	Rated im-pulse voltage <sup>1</sup> kV	Degree of pollution <sup>1</sup>	Nominal voltage <sup>2</sup> V AC	Model	Category <sup>2</sup>	Insert complete <sup>4</sup> Part number	Total mat-ing force N	Total sliding force N
--------------------	------------------------	----------------------------------	---------------------------------	---	----------------------------------	--------------------------------------	-------	-----------------------	---	--------------------------	--------------------------

INSERT WITH ODU TURNTAC® (MATING CYCLES MINIMUM 5,000)

4	1.3	20	40	2.5	3	650	Pin	CAT 5	702.844.724.004.200	8.5	8
			160				Socket		702.744.724.004.200		
8	0.9	22	20	2	3	500	Pin	CAT 6A	702.849.724.008.000	14.7	12.6
			50				Socket		702.749.724.008.000		
16	0.5	26	10	1.5	3	250	Pin	HDMI	702.841.724.416.000	30	23
			32				Socket		702.741.724.416.000		

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

8	0.76	22	16	2	3	550	Pin	CAT 5	702.842.724.008.000	11.5	10.5
			40				Socket		702.742.724.008.000		

<sup>1</sup> Acc. to IEC 60664-1:2007 (VDE 0110-1:2008), see page 159. <sup>2</sup> Acc. to EIA-364-20D:2008, SAE AS 13441:2004 method 3001.1. <sup>3</sup> Classification acc. to ISO/IEC 11801:2002. <sup>4</sup> Insert crimp model on request.



# MODULE FOR MULTI-POSITION, SHIELDED IMPLEMENTATION/HIGH-SPEED CONNECTOR



Size 3 (e. g. for use in bus systems).

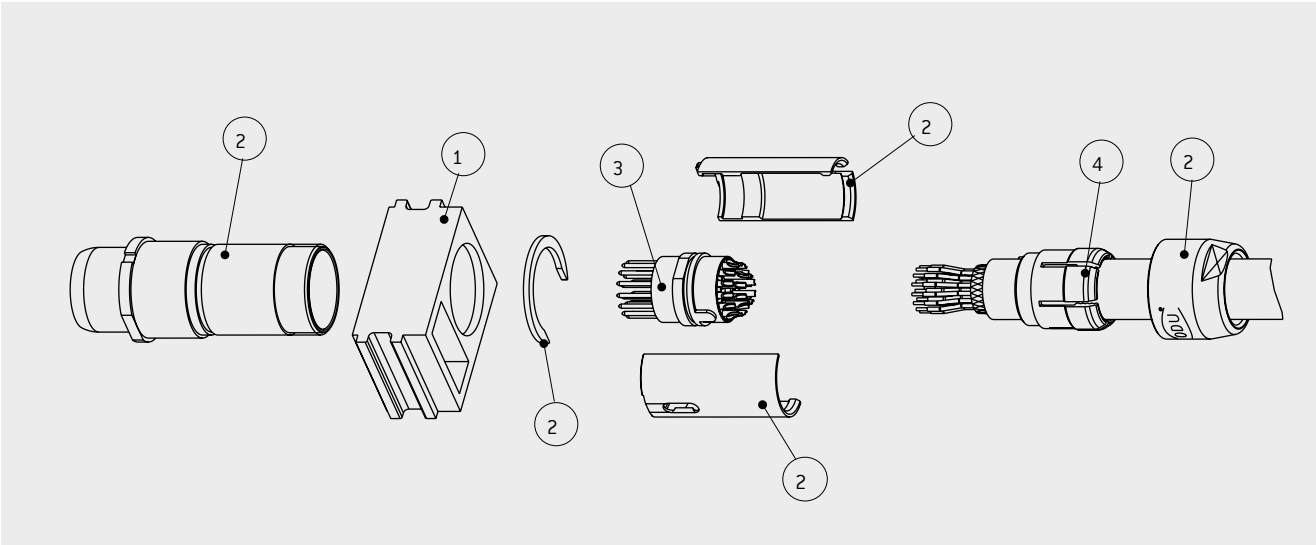


Mating cycles: minimum 5,000  
10 to 30 contacts

TECHNICAL DATA

- The inserts listed here for shielded implementations / 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 are suitable and qualified for data rates to 10 GBit/s. For example, 10 Gigabit-Ethernet, Gigabit-Ethernet, Fast-Ethernet, IEEE 1394, Firewire S400, Firewire S800.

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



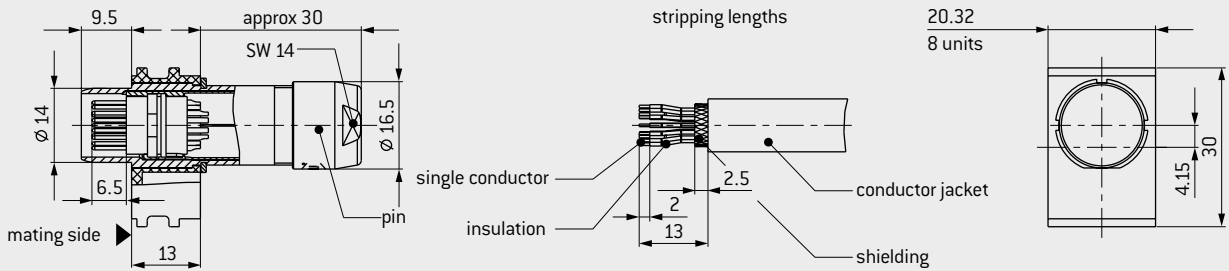
Order	Base parts	Part number
1	Insulator	611.171.101.923.000
2	Socket housing complete	653.004.001.304.000
2	Connector housing complete	653.004.002.304.000
3	Insert complete	see next page
4	Assembly set	see table on the right

ASSEMBLY SET

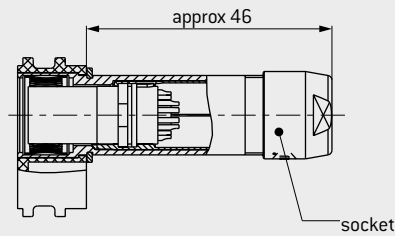
Cable Ø mm	Part number
3 to 4.2	753.020.188.304.042
4 to 5.2	753.020.188.304.052
5 to 6.2	753.020.188.304.062
6 to 7.2	753.020.188.304.072
7 to 8.2	753.020.188.304.082
8 to 9.2	753.020.188.304.092
9 to 10.2	753.020.188.304.102



INSULATOR PIN

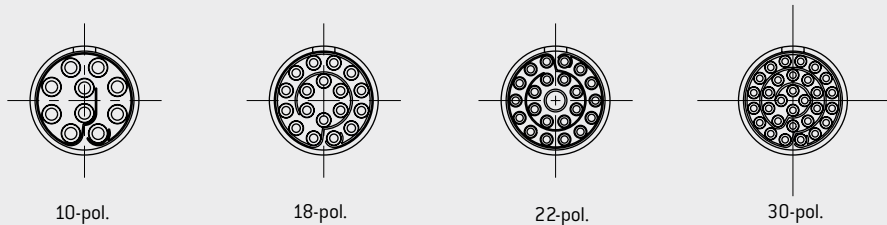


INSULATOR SOCKET



In application with a housing please check the space requirement.

CONTACT ARRANGEMENTS



Number of contacts	Contact diameter mm	Termination cross-section AWG	Rated voltage <sup>1</sup> V	Rated im-pulse voltage <sup>1</sup> kV	Degree of pollution <sup>1</sup>	Nominal voltage <sup>2</sup> V AC	Model	Category <sup>3</sup>	Insert complete <sup>4</sup> Part number	Total mating force N	Total sliding force N
--------------------	------------------------	----------------------------------	---------------------------------	---	----------------------------------	--------------------------------------	-------	-----------------------	---	-------------------------	--------------------------

INSERT WITH ODU TURNTAC® (MATING CYCLES MINIMUM 5,000)

10	1.3	20	20	2	3	450	Pin		703.844.724.010.200	21.6	19.1
			50	2	2		Socket		703.744.724.010.200		
18	0.9	22	10	2	3	450	Pin		703.849.724.018.200	23.3	20.8
			32	2	2		Socket		703.749.724.018.200		
22	0.7	26	32	1.5	2	366	Pin		703.848.724.022.200	21.7	19.7
							Socket		703.748.724.022.200		
30	0.7	26	32	1.5	2	300	Pin		703.848.724.030.200	28.1	24.5
							Socket		703.748.724.030.200		

<sup>1</sup> Acc. to IEC 60664-1:2007 (VDE 0110-1:2008), see page 159. <sup>2</sup> Acc. to EIA-364-20D:2008, SAE AS 13441:2004 method 3001.1. <sup>3</sup> Classification acc. to ISO/IEC 11801:2002. <sup>4</sup> Insert crimp model on request.

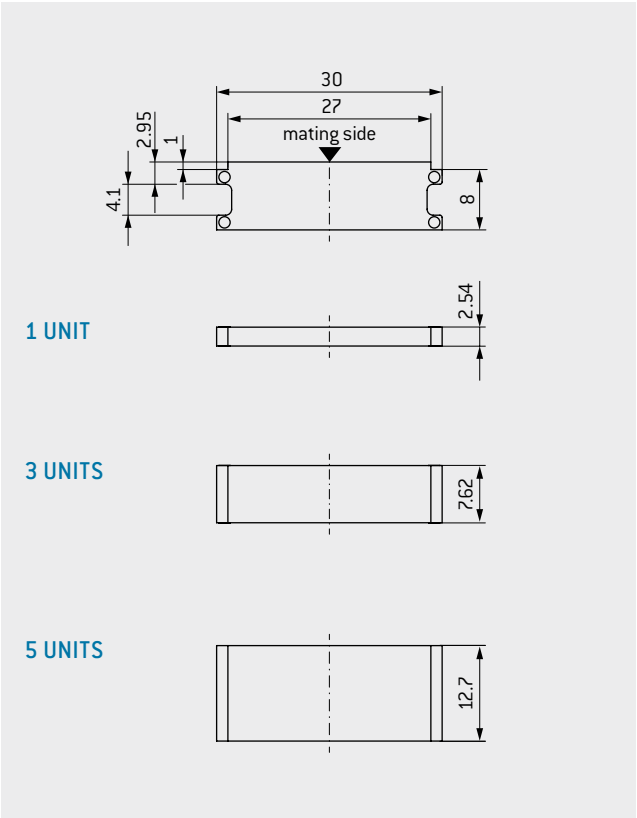
# BLANK MODULES



For filling up not completely mounted frame.  
The frame has to be fully mounted with insulators, spacers or blank modules.

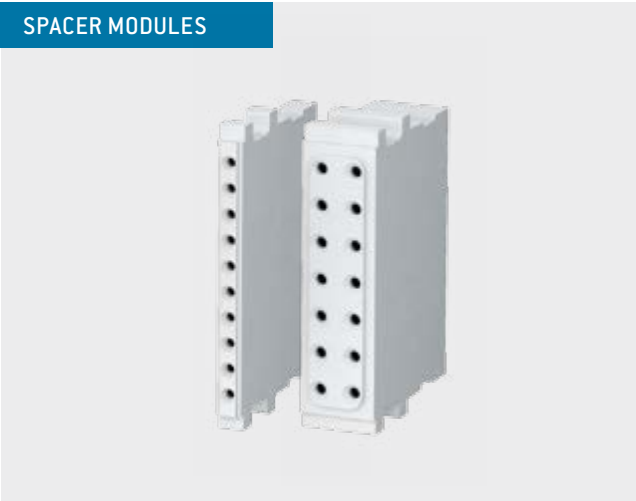
TECHNICAL DATA

Insulator                      Thermoplastic  
   fibre glass 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



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.

TECHNICAL DATA

Insulator                      Thermoplastic  
   fibre glass reinforced  
   acc. to UL-94

Cannot be retroactively equipped with contacts.  
Information on the availability of the individual intermediate pieces can be found with the respective modules.

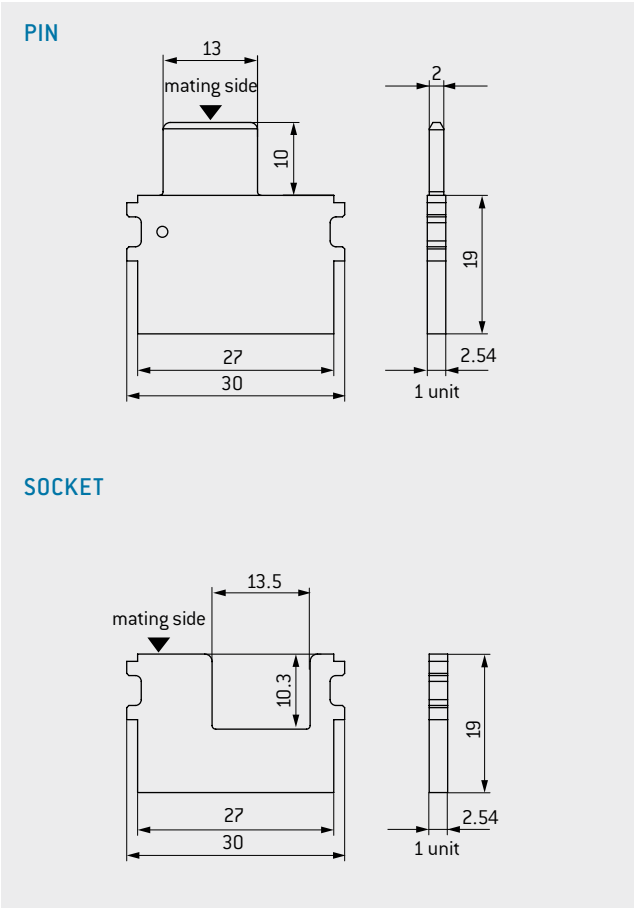
# CODING MODULES



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

TECHNICAL DATA

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
-----------	--



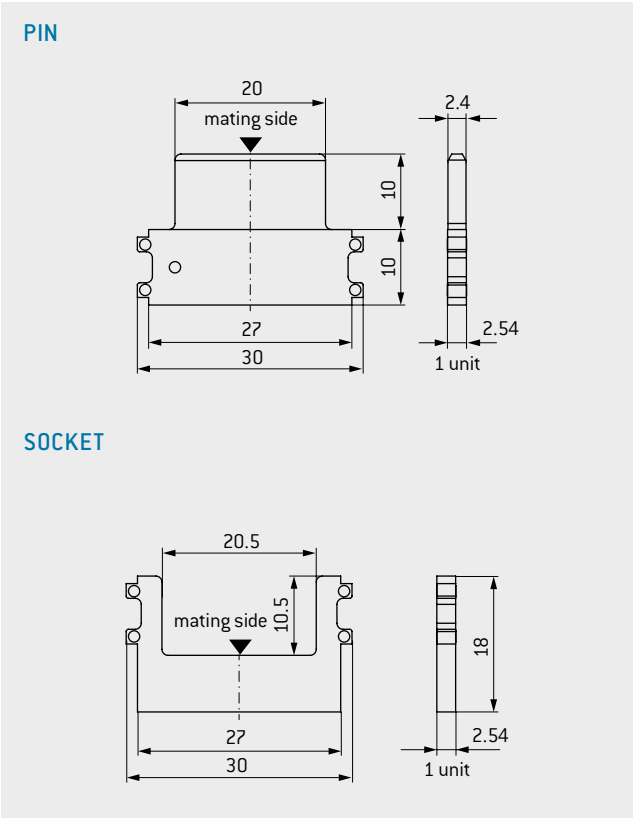
# PIN PROTECTION MODULES



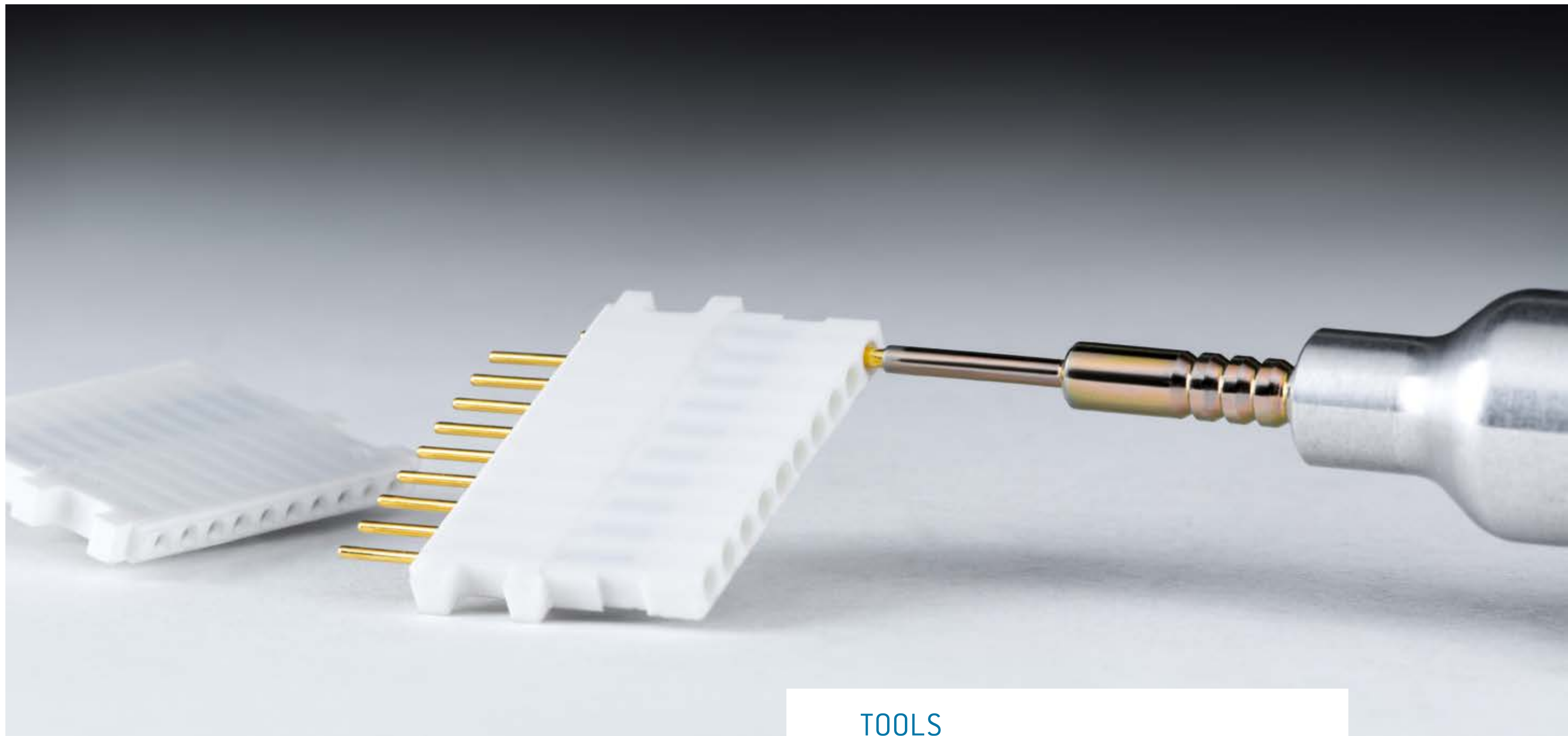
For connections with small pin diameters, these modules serve as protection for the pins. Especially in the case of small contact diameters ( $\varnothing 0.76 / 1.02 \text{ mm}$ ), pin protection modules provide additional protection against unintentional bending of the pins.

TECHNICAL DATA

Insulator	Thermoplastic fibre glass reinforced acc. to UL-94
-----------	--



Alternatively, these modules can be used to extend clearance and creepage distances.



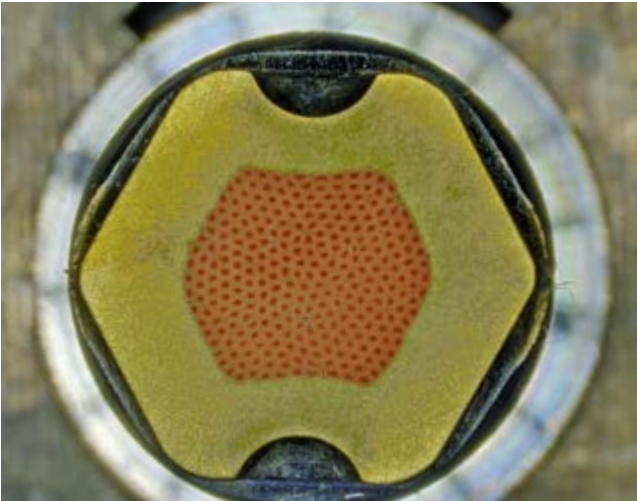
## TOOLS

Contact processing and crimping .....	<a href="#">146</a>
Crimping tools .....	<a href="#">147</a>
Tensile strength diagram for crimp terminations .....	<a href="#">149</a>
Crimp information .....	<a href="#">150</a>
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Removal contacts .....	<a href="#">154</a>
Maintenance kit .....	<a href="#">155</a>

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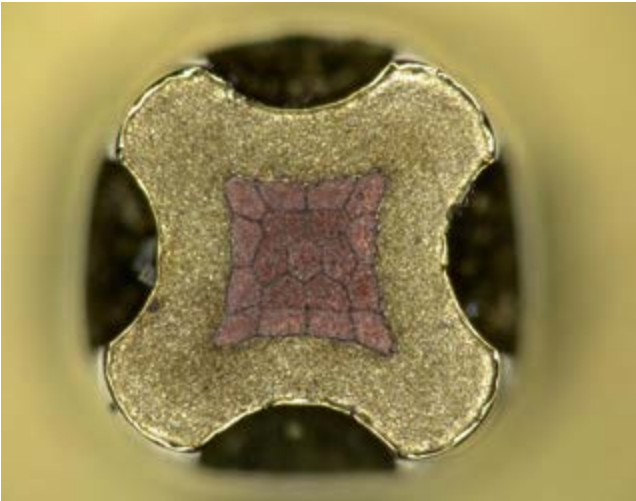
# CONTACT PROCESSING AND CRIMPING



Cross-section hexagonal crimping

Contact crimping creates a secure, durable and corrosion-free connection. It can also be carried out by a non-specialist and saves time.

Cold compaction (crimping) compresses the conductor and contact material at the press points so as to form a gas-tight connection with tensile strength appropriate for the conductor material. The crimp connection eliminates many of the drawbacks from soldering. Crimping can be carried out on the smallest and large cross-sections.



Cross-section 8-point crimping

For smaller cross-sections (0.08 mm² to 2.5 mm²), the 8-point crimping tools are used; the hexagonal pressing plants are chosen for larger cross-sections. When pressing larger cross-sections, step by step deformation adapted to the flowability of the material is necessary; this prevents brittle tearing.

## EXAMPLE: ADJUSTING THE HYDRAULIC HEXAGONAL CRIMPING TOOLS ACCORDING TO THE CABLE CROSS-SECTION

- 1ST STEP:** Select the right profil (see page 150). The appropriate pair of crimping jaws must be used prior to commissioning the hand press. The crimping jaw holder can be opened by applying pressure.
- 2ND STEP:** The insert halves are then inserted into the clamping jaw holder and pressed into the fixing bolts. The holder is then closed.
- 3RD STEP:** Hydraulic pressure is built up by the pumps.
- 4TH STEP:** The final pressure is reached with an audible “click”. The pressing procedure is completed and can be brought to its starting position with the reset lever. The crimp termination is released.

For assembly instructions please refer to our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).

# CRIMPING TOOLS



For further crimp information please refer to the table on page 150.

## 8-POINT CRIMPING TOOL FOR CONDUCTOR CONNECTIONS FROM 0.08 TO 2.5 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 1.5 TO 6 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), 2.5 TO 6.0 MM²



With blocking system.  
**PART NUMBER: 080.000.062.000.000**

## MECHANICAL HEXAGONAL HAND CRIMPING TOOL FROM 10 TO 50 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 151**  
Has to be ordered separately.

# CRIMPING TOOLS



For further crimp information please refer to the table on page 150.

## HEXAGONAL CRIMPING TOOL FOR COAX CONTACTS



With blocking system.  
**PART NUMBER PLIER: 080.000.039.000.000**

**CRIMPING JAWS PLEASE SEE PAGE 150**  
Has to be ordered separately.

## HAND CRIMPING TOOL FOR SINGLE CRIMP CONTACTS (STAMPED CONTACTS)



**PART NUMBER: 080.000.040.000.000**

Single contacts are positioned manual in the plier 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 get automatically isolated. The feed occurs by hand operation.

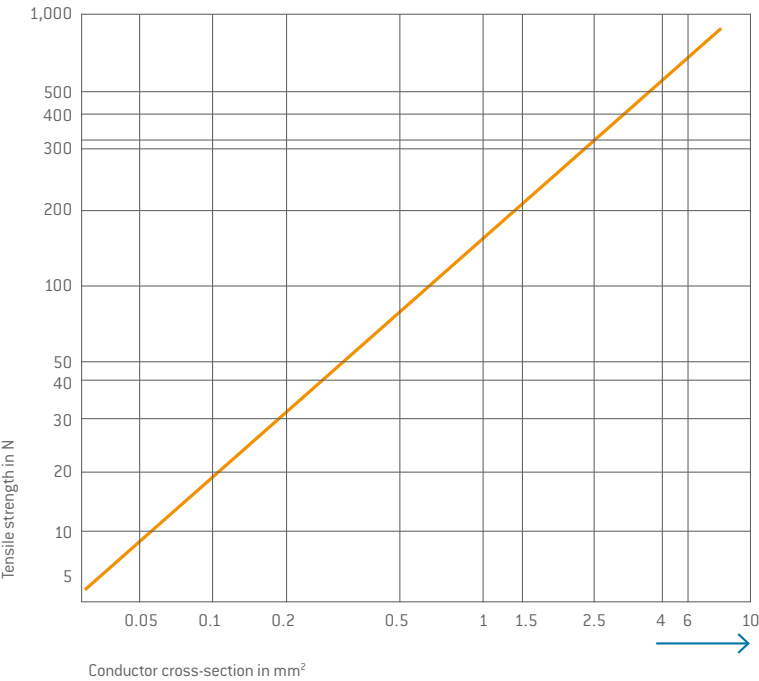
- Suitable for coil size: 115 mm. Therefore 500/900 contacts can be processed.
- Processing with automatic stripper crimper possible, further information on request.

# CRIMP CONNECTIONS



IEC 60352-2:2013 (DIN EN 60352-2:2014)

Tensile strength diagram of a crimp termination depending upon the conductor cross-section IEC 60352-2:2013 (DIN EN 60352-2:2014). **Example:** A 2.5 mm² conductor must achieve a minimum tensile strength of approx. 320 N.



**NOTE**  
Internal standards and guidelines are used for cross-sections (> 10 mm²), 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](http://www.odu-connectors.com/downloads/assembly-instructions)).

We recommend using suitable test adapters here.



CRIMP INFORMATION



Contact diameter	Termination cross-section		Stripping length	8-pt crimping tool 080.000.051.000.000 without positioner	8-pt crimping tool 080.000.057.000.000 without positioner	Crimping tool for coax 080.000.039.000.000	Hexagonal crimping tool 080.000.062.000.000
	mm	AWG		mm²	mm	Positioner 080.000.051.101.000 position / adjustment dim.	Positioner 080.000.057.101.000 position / adjustment dim.
0.76	24/28	0.25/ 0.08	4 <sup>+0.5</sup>	1 / 0.67			
1.02				2 / 0.67			
1.5				3 / 0.67			
0.7	26/28		3 <sup>+0.5</sup>				
0.7	22/24						
0.76	22	0.38	4 <sup>+0.5</sup>	1 / 0.62			
1.5				3 / 0.62			
1.02	20/22	0.5/ 0.38	4 <sup>+0.5</sup>	2 / 0.92			
1.5				3 / 0.92			
2.41			5 <sup>+0.5</sup>	4 / 0.92			
3				5 / 0.92			
1.5	18	1/0.75	4 <sup>+0.5</sup>	3 / 1.12			
2.41			5 <sup>+0.5</sup>	4 / 1.12			
3				5 / 1.12			
1.5	16		4 <sup>+0.5</sup>	3 / 1.42	10 / 1.42 <sup>1</sup>		
1.5		1.5	4 <sup>+0.5</sup>	3 / 1.32	10 / 1.42 <sup>1</sup>		
2.41			5 <sup>+0.5</sup>	4 / 1.32	9 / 1.42 <sup>1</sup>		
3			5 <sup>+0.5</sup>	5 / 1.32	6 / 1.42 <sup>1</sup>		
1.5	14		4 <sup>+0.5</sup>	3 / 1.42	10 / 1.42 <sup>1</sup>		
2.41			5 <sup>+0.5</sup>	4 / 1.42	9 / 1.42 <sup>1</sup>		
3			5 <sup>+0.5</sup>	5 / 1.42	6 / 1.42 <sup>1</sup>		
2.41		2.5	5 <sup>+0.5</sup>		9 / 1.67		Profile no. 2
3					6 / 1.67		
2.41	12		5 <sup>+0.5</sup>		9 / 2.12		Profile no. 2
3		4	5 <sup>+0.5</sup>		6 / 2.52		Profile no. 3
5			6 <sup>+0.5</sup>				
3		6	6 <sup>+0.5</sup>		6 / 2.52		Profile no. 3
5		10	9 <sup>+0.5</sup>				
8		16	9 <sup>+0.5</sup>				
8		25	16 <sup>+0.5</sup>				
10							
12							
10		35	16 <sup>+0.5</sup>				
12							
12		50	16 <sup>+0.5</sup>				
RG 178/RG 196			[9 / 4.5/18.5/21]			082.000.039.101.000	
RG174/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	

<sup>1</sup> Recommended from ODU as standard plier.

CRIMP INFORMATION



Contact diameter	Termination cross-section		Stripping length	Hexagonal crimping tool 080.000.064.000.000	Hand crimping tool stamped contacts	Hand crimping tool stamped contacts
	mm	mm <sup>2</sup>		Crimping jaws		Spool goods
0.76	24/28	0.08/ 0.25	4 <sup>+0.5</sup>			
1.02						
1.5						
0.7	26/28		3 <sup>+0.5</sup>		080.000.040.000.000	080.000.041.000.000
0.7	22/24				080.000.040.000.000	080.000.041.000.000
0.76	22	0.38	4 <sup>+0.5</sup>			
1.5						
1.02	20/22	0.38/ 0.5	4 <sup>+0.5</sup>			
1.5						
2.41			5 <sup>+0.5</sup>			
3						
1.5	18	1	4 <sup>+0.5</sup>			
2.41			5 <sup>+0.5</sup>			
3						
1.5	16		4 <sup>+0.5</sup>			
1.5	14	1.5	4 <sup>+0.5</sup>			
2.41			5 <sup>+0.5</sup>			
3						
2.41		2.5	5 <sup>+0.5</sup>			
3						
2.41	12		5 <sup>+0.5</sup>			
3		4	5 <sup>+0.5</sup>			
5			6 <sup>+0.5</sup>			
3		6	6 <sup>+0.5</sup>			
5		10	9 <sup>+0.5</sup>	080.000.064.110.000		
5		16	9 <sup>+0.5</sup>	080.000.064.101.000		
8		16	9 <sup>+0.5</sup>	080.000.064.116.000		
8		25	16 <sup>+0.5</sup>	080.000.064.125.000		
10						
12						
10		35	16 <sup>+0.5</sup>	080.000.064.135.000		
12						
12		50	16 <sup>+0.5</sup>	080.000.064.150.000		

ASSEMBLING AID



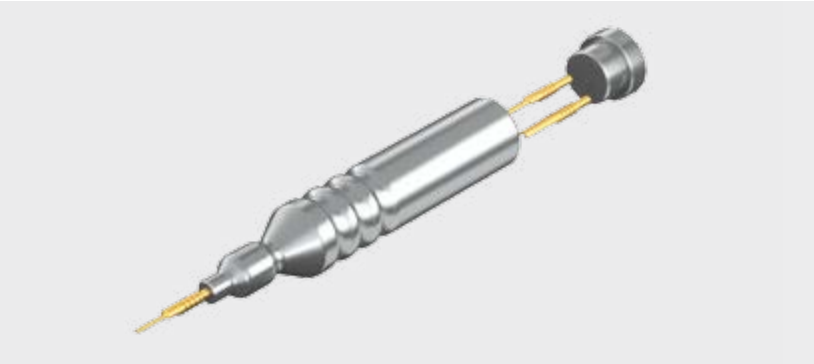
**TORQUE WRENCH**  
With cross handle, fixed, automatic release  
(for inner hexagonal bits with C6.3- or E6.3-  
shaft).  
Bit has to be ordered separately.

Description	For use in	Part number	Nm	Recommended tightening torque
Torque wrench		598.054.001.000.000	0.9	
Torque wrench		598.054.002.000.000	1.2	
Torque wrench		598.054.003.000.000	3	
Bit slot 3.5 (0.5/50)	Screwing of the rails in the T frame	598.054.108.000.000		0.9 Nm +/- 0.2 Nm
Bit slot 5.5 (0.8/50)	Screwing of the rails in the M and L frame	598.054.101.000.000		1.2 Nm +/- 0.2 Nm
Bit slot 6.25 (1.0/50)	Coding socket for frames in a housing	598.054.107.000.000		1.2 Nm +/- 0.2 Nm
Special bit	Coding pin for frame in 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	598.054.106.000.000		1.2 Nm +/- 0.2 Nm
Bit torx T × 8	Rails on frames in a housing	598.054.103.000.000		0.9 Nm +/- 0.2 Nm
Bit torx T × 10	Screwing of the rails in the S/ L/ M frame	598.054.104.000.000		1.2 Nm +/- 0.2 Nm
Bit torx T × 20	Screwing of the rails in the P frame	598.054.105.000.000		3.0 Nm +/- 0.3 Nm

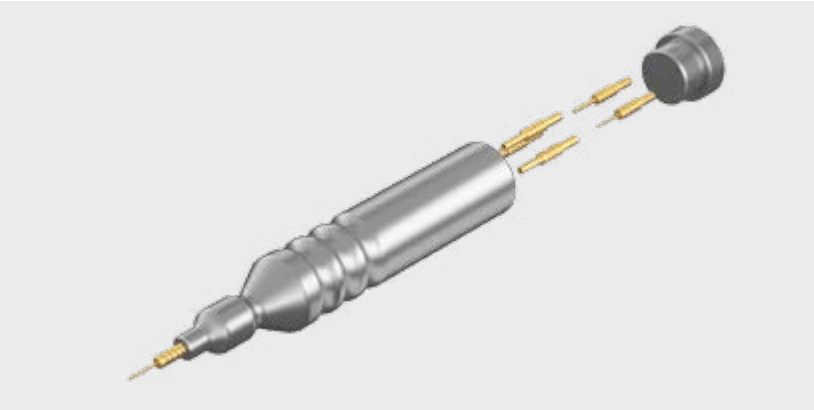
ASSEMBLING AID



**ASSEMBLY TOOL HIGH CURRENT**  
Necessary assembly tool for screwing and  
releasing of the contacts.  
Tightening torque: 3.5 Nm +/- 0.5 Nm  
**PART NUMBER: 087.611.00\_.001.000**  
With \_ please register the respective figure  
for contact diameter 8 to 12 mm.  
See table below.



**INSERTION TOOL Ø 0.76-1.5 MM**  
For assembling aid of contacts with flexible/  
thin conductors (pin and socket side).  
**PART NUMBER: 085.611.001.001.000**



**EXTRACTION TOOL Ø 0.76-1.5 MM**  
Extraction tool for sockets and pins by use of  
the removal tool.  
**PART NUMBER: 087.611.005.001.000**

Contact Ø	Assembly tool high current	Assembling aid insertion tool	Assembling aid extraction tool
0.76		085.611.001.001.000	087.611.005.001.000
1.02		085.611.001.001.000	087.611.005.001.000
1.5		085.611.001.001.000	087.611.005.001.000
8	087.611.002.001.000		
10	087.611.003.001.000		
12	087.611.004.001.000		

REMOVAL AND ASSEMBLY ONLY POSSIBLE WITH ODU TOOLS.



# REMOVAL OF CONTACTS



### 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 not yet assembled contact (with cable – wire may have removed): 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
0.76²		087.170.361.000.000	087.611.001.001.000		
1.02²		087.170.362.000.000	087.611.001.001.000		
1.5²	087.170.138.000.000	087.170.363.000.000¹	087.611.001.001.000		
2.41	087.170.139.000.000	087.170.365.000.000	087.611.001.001.000		
3	087.170.136.000.000	087.170.366.000.000	087.611.001.001.000		
5				087.170.391.000.000	
Coax 50Ω 4 contacts	087.170.139.000.000	087.170.365.000.000	087.611.001.001.000²		
Coax 50Ω 2 contacts				087.170.391.000.000	
Coax 50Ω 2 contacts SMA				087.122.349.000.000	
Coax 75Ω 2 contacts				087.170.391.000.000	
Fibre-optic 5 contacts					087.611.001.002.000
Fibre-optic 3 contacts	087.170.136.000.000		087.611.001.001.000		

¹ In use with high voltage module, 4 contacts, (see page 106) the angled version cannot be used. ² With cable (H+S) G02232 only removal tool I is usable.

# MAINTENANCE PACKAGE 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 minimised 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 maintenance package to 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 maintenance package can be used for all ODU contacts and connections.

PART NUMBER: 170.000.000.000.100

For technical properties of the maintenance package please refer our website: [www.odu-connectors.com/downloads](http://www.odu-connectors.com/downloads).

### CLEANING INFORMATION

Maintenance instruction 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 %.



## TECHNICAL INFORMATION

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# INTERNATIONAL PROTECTION CLASSES

Acc. IEC 60529:2013 (VDE 0470-1:2014).



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	Code number	Protection against harmful effects due to the ingress of water
0	No protection	0	No protection against contact / No protection against solid foreign objects	0	No protection against water
1	Protection against large foreign objects	1	Protection against contact with the back of the hand / Protection against solid foreign objects Ø ≥ 50 mm	1	Protection against dripping water
2	Protection against medium-sized foreign objects	2	Protection against contact with the fingers / Protection against solid foreign objects Ø ≥ 12.5 mm	2	Protection against dripping water (tilted)
3	Protection against small foreign objects	3	Protection against contact with tools / Protection against solid foreign objects Ø ≥ 2.5 mm	3	Protection against spray water
4	Protection against granular foreign objects	4	Protection against contact with a wire / Protection against solid foreign objects Ø ≥ 1.0 mm	4	Protection against splashing water
5	Dustproof	5	Protection against contact with a wire / Protection against uncontrolled ingress of dust	5	Protection against water jet
6	Dustproof	6	Protection against contact with a wire / Complete protection against ingress of dust	6	Protection against powerful water jet
		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 INSULATION COORDINATION



IEC 60664-1:2007 (VDE 0110-1:2008): TABLE F.1 – RATED SURGE VOLTAGE FOR OPERATING MEDIA FED DIRECTLY FROM THE LOW VOLTAGE MAINS.

Nominal voltage of the power supply system (network) acc. to IEC 60038:2009 (VDE 0175-1:2012)		Voltage conductor to neutral conductor derived from nominal voltages a.c. or d.c. up to and including V	Rated impulse voltage Overvoltage category			
Three-phase-system V	Single-phase-system V		I V	II V	III V	IV V
		50	330	500	800	1,500
		100	500	800	1,500	2,500
	120 to 240	160	800	1,500	2,500	4,000
230 / 400 277 / 480		300	1,500	2,500	4,000	5,000
400 / 692		600	2,500	4,000	6,000	8,000
1,000		1,000	4,000	6,000	8,000	12,000

## APPLICABLE STANDARDS

IEC 60664-1:2007 (VDE 0110-1:2008) and IEC 61984:2008 (VDE 0627:2009), original (IEC 60664-1:2007 VDE 0110-1:2008) and IEC 61984:2008 (VDE 0627:2009) remains definitive for all of the technical information named).

## GENERAL

The selection of a connector cannot only take functionality, number of contacts, current or voltage parameters into account. In fact, consideration of the place of use and the installation conditions prevailing there is indispensable. Depending upon the installation and ambient conditions, the connector can be used in accordance with the standards in a variety of voltage and current ranges. All of the voltage data listed in this catalogue refers to the use of insulators in the ODU-MAC solid frame for housings or in the ODU-MAC docking frame. All of the connectors shown here involve connectors without contact rating (COC) in accordance with IEC 61984:2008 (VDE 0627:2009).

The most important influence variables and the electrical parameters harmonised with these will be explained in more detail in the following. Our technicians would be happy to assist you with any further questions. The following texts and tables are excerpts from the indicated standards.

## OVERVOLTAGE CATEGORY

The necessary rated surge voltage is defined through the overvoltage category according to table F.1 together with the nominal voltage used. Depending upon the installation location, the respective overvoltage category is selected according to the criteria listed below for operating media that fed directly from the low voltage mains.

### Overvoltage category I

Operating media for connection to circuits in which measures for limiting the transient overvoltages to an appropriately low value have been taken. For example, connectors for the voltage supply of computer hardware permanently connected to a power supply with electronic overvoltage limitation.

### Overvoltage category II

Operating media fed by the fixed installation that consume energy. For example, household devices, portable tools and similar devices.

### Overvoltage category III

(= standard, when no special overvoltage category is indicated) Operating media in permanent installations and cases for which special requirements for reliability and availability of the operating media exist. For example, switches in permanent installations and operating media for industrial use with permanent connection to the permanent installation.

### Overvoltage category IV

Operating media for use at the termination point of the installation. For example, electricity meters and primary overcurrent protection devices.



# EXPLANATIONS AND INFORMATION ACCORDING TO VDE



### DEGREE OF POLLUTION

Potentially occurring pollution combined with moisture can influence the insulation capacity on the surface of the connector. In order to define various rating parameters, a degree of pollution according to the criteria listed below must be selected for the operating medium.

In the case of a connector with a degree of protection of minimum IP 54 IEC 60529:2013 (VDE 0470-1:2014), 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, when 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.  
Operating voltage (VDE : Rated voltage): Value of a voltage that is specified by the manufacturer for a component, device or operating medium and relates to the operating and performance features.

Depending upon the indicated degree of pollution, the rated voltage is dependent upon the insulating material group of the connector and the respective creepage distances between the individual contacts. The rated voltage may be significantly influenced by the use of blank modules and varying positioning of the contacts in the insulator. Operating media may have more than one value or one range for rated voltage (see table F.4 in IEC 60664-1:2007 (VDE 0110-1:2008)).

### NOMINAL VOLTAGE

A suitably rounded voltage value indicated by the manufacturer for the designation or identification of an operating medium. 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 upon the indicated degree of pollution, the rated surge voltage depends upon the clearance distance between the individual contacts. The rated surge voltage may be influenced significantly by the usage of blank modules and varied positioning of the contacts in the insulators, (see table F.2 in IEC 60664-1:2007 (VDE 0110-1:2008)).

In the most recent edition of IEC 60664-1:2007 (VDE 0110-1:2008), the minimum clearance distances for operating media 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.7 in IEC 60664-1:2007 (VDE 0110-1:2008)).



### IMPULSE TEST VOLTAGE / POWER FREQUENCY TEST VOLTAGE

Highest value of the surge voltage of a defined form and polarity that will not result in a dielectric breakdown or flashover of the insulation under defined conditions.

### 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 60664-1:2007 (VDE 0110-1:2008): table F.5 – 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
U <sub>i</sub> kV	U <sub>i</sub> kV	U <sub>i</sub> kV	U <sub>i</sub> 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	9.950
12	14.770	14.471	14.025



# CONVERSIONS / AWG (AMERICAN WIRE GAUGE)



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

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: Gore & Associates, Plainfeld

# OPERATING VOLTAGE



EIA-364-20D:2008 (SAE AS 13441:2004 method 3001.1).

The values specified in the catalogue correspond to SAE AS 13441:2004 method 3001.1. The table values were determined according to EIA 364-20D:2008. The inserts were tested while mated, and the test current was applied to the pin insert.

75 % of the dielectric withstanding voltage is used for the further calculation. The operating voltage is 1/3 of this value.

All tests were conducted at normal indoor climate and apply up to an altitude of 2,000 m. If there are any deviations, the derating factors are to be factored in according to the applicable standards.

Test voltage: Dielectric withstanding voltage × 0.75  
Operating voltage: Dielectric withstanding voltage × 0.75 × 0.33

**ATTENTION:**  
With certain applications, the safety requirements for electrical devices are very strict in terms of operating voltage. In such cases, the operating voltage is defined according to the clearance and creepage distances between parts which could be touched.

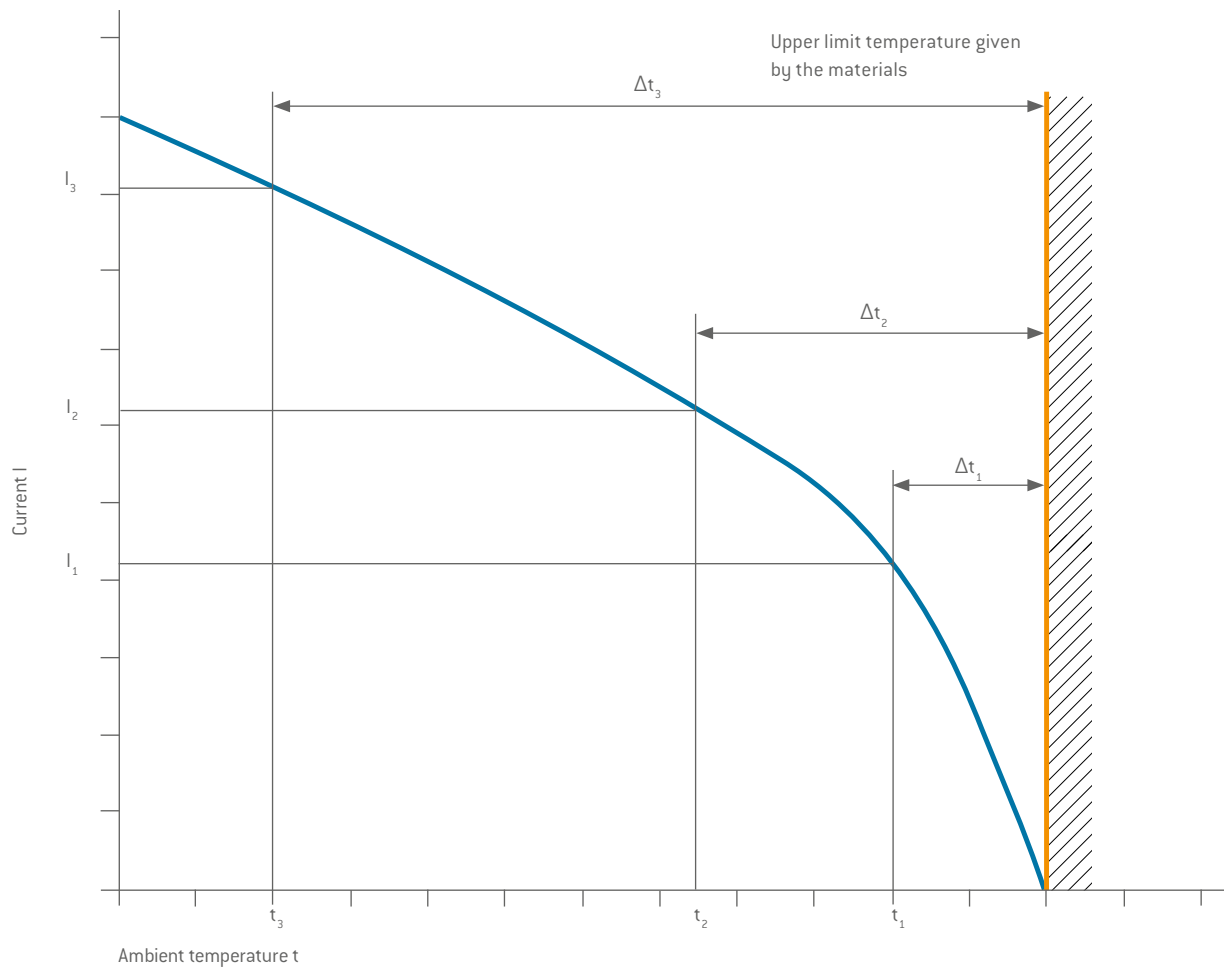
When selecting such a connector, please contact us and let us know the safety standard which the product must meet.

# BASE FOR CURRENT-CARRYING CAPACITY

Derating measurement procedure IEC 60512-5-2:2002 [DIN EN 60512-5-2:2003].



## STRUCTURE OF THE BASE CURRENT-CARRYING CAPACITY CURVE



A current-carrying capacity curve metrologically determined according to the method described in IEC 60512-5-2:2002 [DIN EN 60512-5-2:2003] depending on the permissible limit temperature of the materials.

The current-carrying capacity of a connector is determined by measurement. It is determined taking self-heating by Joule 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 Joule heat ( $\Delta t$ ) 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 VDE 0276-1000:1995].

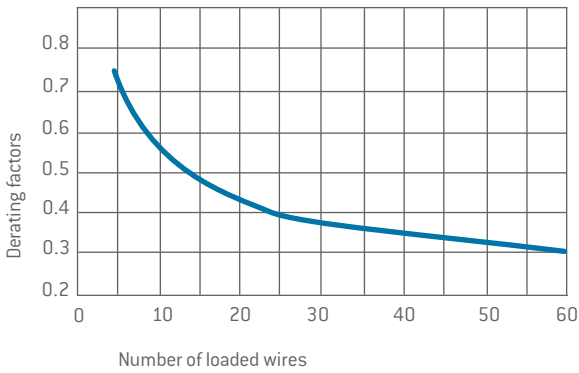


## RATED CURRENT (NOMINAL CURRENT)

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 [DIN EN 60512-5-2:2003] and derived from the derating curve. The values specified in the catalogue 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 VDE 0298-4:2013 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 upon 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 upon 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 catalogue 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	0.5
19	0.45
24	0.4
40	0.35
61	0.3

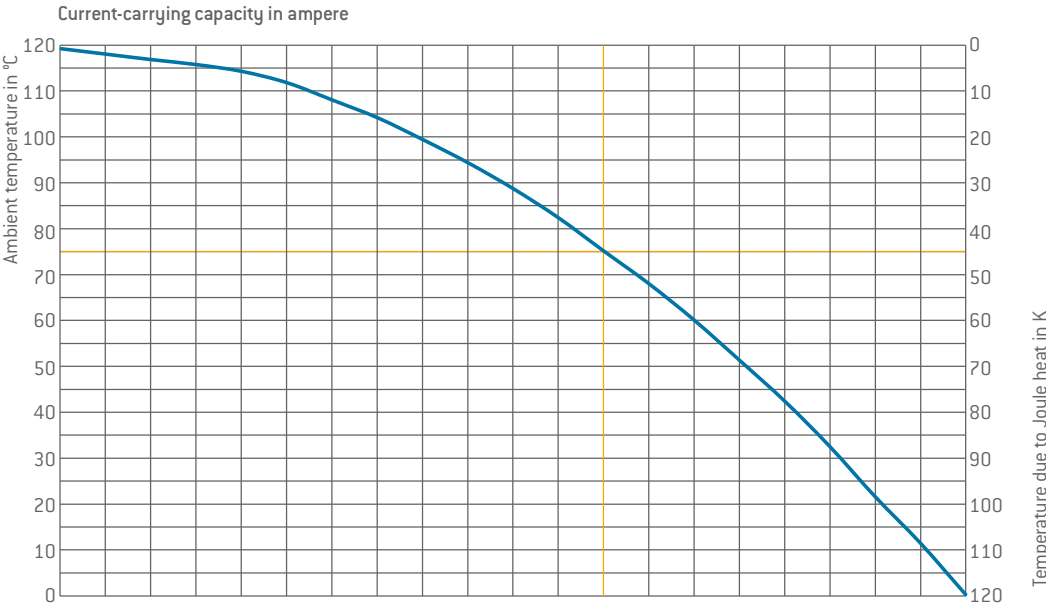
**Load and derating factors**  
Multi-core plastic cable with conductor cross-section of 1.5 to 10 mm² when installed in the open air.

CURRENT-CARRYING CAPACITY DIAGRAM



FOR SINGLE CONTACTS

Measurement made in acc. with IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) (derived base curve shown = 0.8 × Base curve).  
Upper limit temperature: +120 °C.  
Termination with nominal cross-section.



Contact	Contact Ø	Termination cross-section mm²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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# 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	Multi-wire highly flexible lines		Multi-wire movable lines
	PVC, PE, PUR, TPE heat resistant	for hand-held devices, wire/sheath cold-resistant, PVC insulated		PVC, PE, PUR, TPE standard program harmonised series
Number of loaded wires	1	2	3	4
Nominal cross-section copper conductor in mm <sup>2</sup>	Current load in A			
0.14 <sup>1</sup>	3			2
0.25 <sup>1</sup>	5			4
0.34 <sup>1</sup>	8			6
0.5 <sup>1</sup>	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.

<sup>1</sup>DIN VDE 0891-1:1990.

# TECHNICAL TERMS



## AMBIENT TEMPERATURE

Temperature of the air or other medium in which a piece of equipment is intended to be used in. (IEC 44/709/CDV:2014 [VDE 0113-1:2014]).

## AWG

American Wire Gauge – see page [162](#).

## BASE CURVE

See page [164](#).

## CHEMICAL RESISTANCE

Many secondary processing procedures use adhesives, cleaning agents or other chemicals on our products. Contact with unsuitable chemicals may have an adverse effect on the mechanical and electrical properties of the insulation and housing materials which specified properties may not be able to withstand. Please observe our processing suggestions and technical instructions in this catalogue.

## CLEARANCE DISTANCE

The insulation coordination is explained in detail from page [159](#).

## CONNECTORS

Also known as connectors without contact rating (COC): (IEC 61984:2008 [VDE 0627:2009]). An element which enables electrical conductors to be connected and is intended to create and/or separate connections with a suitable counterpart.

## CONTACT RESISTANCE

Total resistance value measured from terminal to terminal. In this case, the resistance is significantly lower than the contact 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.

## CREEPAGE DISTANCES

The insulation coordination is explained in detail from page [161](#).

## 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 [146](#)).

## 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.

## CURRENT-CARRYING CAPACITY (NOMINAL CURRENT AND MAXIMUM CONTINUOUS CURRENT)

The data relates to adequately dimensioned connection cable in accordance with IEC 60228:2004 [VDE 0295:2005; class 5], so that no significant temperature increase here. The indicated temperature increase takes place through the contact. The specifications are average values.

## DEGREE OF POLLUTION

The insulation coordination is explained in detail from page [159](#).

## DELIVERY FORM

Connectors can be delivered in assembled form or as individual parts.

## DERATING CURVE

See page [164](#).

## DERATING FACTOR

According to VDE 0298-4:2013, with connectors and cables over 5 contacts, the heating is greater than it is with individual contacts. For that reason, the aforementioned standard is calculated with a derating factor.



# TECHNICAL TERMS



## DERATING MEASUREMENT METHOD IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003)

See page [164](#).

## INSULATOR

Part of a connector which separates conductive parts with different potentials from one another; usually identical to the contact body.

## KEYING (ORIENTATION)

Arrangement with which differing polarization of otherwise identical connectors prevents interchangeability. This is a good idea if two or more identical connectors are attached to the same device (see also compatible connectors, see page [68](#)).

## MATERIALS (STANDARD DESIGN)

Pins and bodys of the sockets are manufactured from a CuZn alloy and silver or gold-plated. The lamellas consist of a CuBe alloy and are also silver or gold-plated. The springwire contact wires consist of a CuSn alloy and are also silver or gold-plated.

## MATING AND SLIDING FORCE (UNMATING FORCE)

The force required to fully insert or withdraw pluggable elements without the influence of a coupling or locking device. The higher value of the mating 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 ± 50 %.

## MATING CYCLES

Mechanical actuation of connectors by mating and sliding. A mating cycle consists of one mating and sliding action. 5,000 mating cycles are the standard value for ODU TURNTAC contacts; 10,000 mating cycles for lamella contacts; 50,000 mating cycles for flat sockets and 100,000 mating cycles for springwire contacts. These values only apply under the following circumstances: clean environment, appropriate radial guidance, impeccable counterpins.

## 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 catalogue apply to either individual contacts or completely assembled inserts / modules, as indicated.

## NOMINAL CURRENT IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003)

See rated current.

## NOMINAL SINGLE CONTACT CURRENT LOAD

The current-carrying capacity which each individual contact can be loaded with on its own (see from page [164](#)).

## NOMINAL VOLTAGE

The voltage which the manufacturer specifies for a connector and which the operating and performance features relate to.

## OPERATING TEMPERATURE FOR ODU-MAC®

See uppermost limit temperature (see page [170](#)).  
Single modules may differ from the indicated temperature values. Here you find the technical information on the appropriate pages.

## PCB TERMINATION

Production of a conductive connection between the PCB and an element in through-hole assembly, THT (through-hole technology).

## RATED CURRENT (NOMINAL CURRENT)

See page [165](#).

## RATED VOLTAGE

According to IEC 60664-1:2007 (VDE 0110-1:2008) standard “Value of a voltage which is specified by the manufacturer for a component, device or operating medium and relates to the operating and performance features.”

## SOLDER CONNECTION (SOLDER 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.

# TECHNICAL TERMS



## SOLDER TERMINATION

Termination technology, see solder connection.

## SPINDLE LOCKING

Locking of two halves of a connector pair by one or more screws, which are generally fluted or have a toggle for easier activation.

## TERMINATION CROSS-SECTION

The specified cross-sections correspond to a “fine-wire” conductor structure pursuant to IEC 60228:2004 (VDE 0295:2005; Class 5) or a “fine-wire” conductor structure (7/19 wire) according to AWG (ASTM B258-14).

## TERMINATION TECHNOLOGIES

Methods for connecting the leads to the electro-mechanical element, such as solder-free connections pursuant to IEC 60352 (DIN EN 60352): crimp, screw connection etc. or soldering connection (see page [146](#)).

## TIGHTNESS IEC 60529:2013 (VDE 0470-1:2014)

See protection types on page [158](#).

## UPPERMOST LIMIT TEMPERATURE

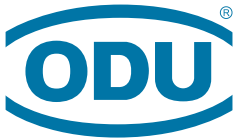
The maximum permissible temperature at which a connector may be operated. It includes contact heating through current-carrying capacity. With contacts with standard springwire, it amounts to +120° C, with contacts with standard lamella +150° C. Please consult ODU for high-temperature applications.

## WIRE

Wires (solid conductors) are available with an insulator sleeve and/or electrical shielding. Cables or conductors may be made up of one or more wires.

## GENERAL NOTE

The connectors listed in this catalogue are intended for use in high voltage and frequency ranges. 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 catalogue were thoroughly reviewed before printing. ODU reserves the right to make changes based on the current state of knowledge without prior notice without being obliged to provide replacement deliveries or refinements of older designs.



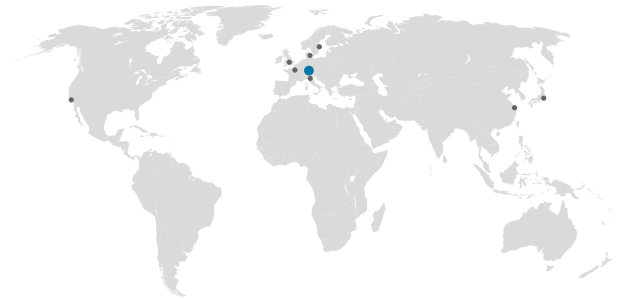
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