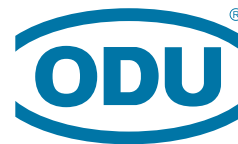


A PERFECT ALLIANCE.



ODU-MAC[®] Blue-Line

A new performance class.

Up to 2,500 V, 12 bar, 10 Gbit/s, > 10,000 mating cycles and 4.0 GHz.

MANUAL MATING
AUTOMATIC DOCKING



ODU-MAC[®] BLUE-LINE

ODU-MAC[®] SILVER-LINE

ODU-MAC[®] WHITE-LINE

FEATURES

- Economical, efficient solution
- Rugged version
- > 10,000 mating cycles
- Equipping of the modules flexibly and conveniently by using the clip principle
- Low contact resistances
- High reliability
- Highest packing density

APPLICATIONS

- Medical
- Industrial
- Measurement and testing
- Military and security
- Energy
- eMobility



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: 2017-01



USB 2.0



CAT 6_A



Network



FireWire

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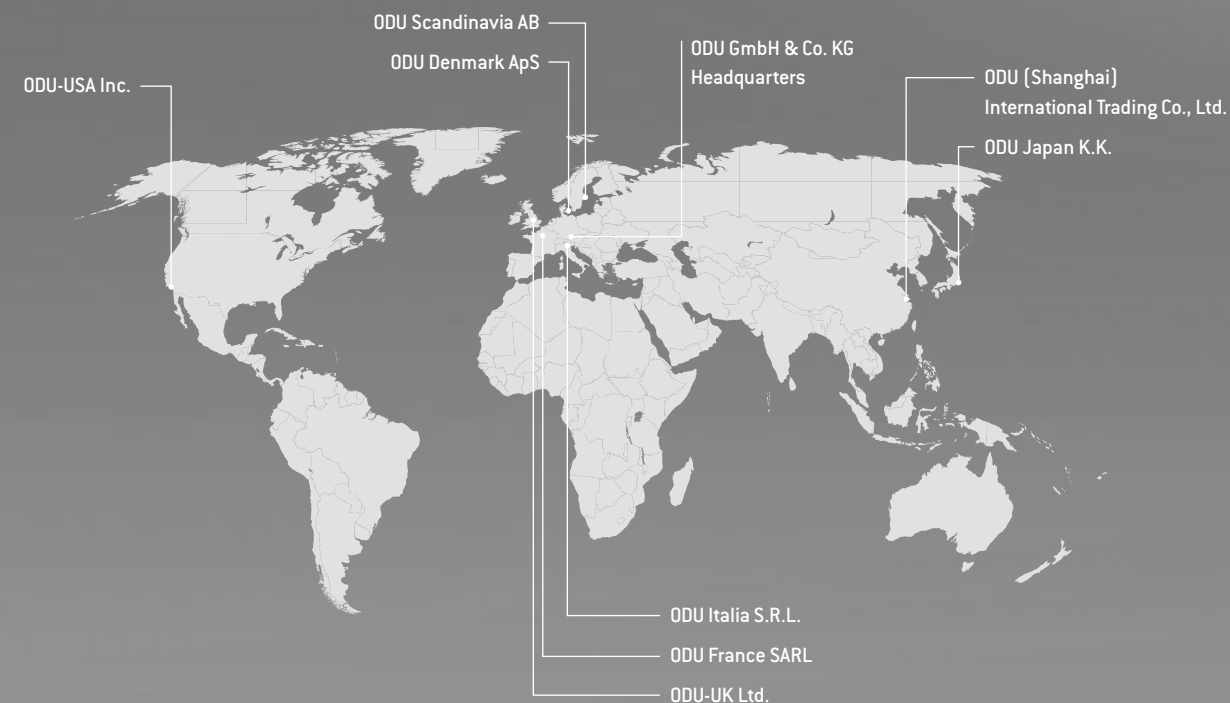
For assembly instructions please refer to our website: www.odu-connectors.com/downloads.

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.**



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
- 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.

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 SOLUTIONS

- Application-specific hybrid interface
- For manual mating and automatic docking
- The highest packing density
- Flexible modular construction
- Multitude of data transmission modules
- Variety of locking options available
- For the transmission of signals, power, high current, high voltage, coax, high-speed data, fiber optics and other media such as air or fluid.
- Mating cycles scalable as required from 10,000 to over 100,000 (1 million)



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
- Outstanding reliability, lifetime and durability
- Up to 1 million mating cycles
- Current-carrying capacity of up to 2,400 amperes and more
- Rugged contact systems, suitable even for harsh environment
- Economical solutions for automatic processing



HEAVY-DUTY & DOCKING AND ROBOTIC CONNECTOR SOLUTIONS

- Extremely durable even under extreme / harsh environments
- Interference-free and secure connection, even under vibration
- Up to 500 A (higher currents upon request)
- High contact security due to the springwire technology
- High pin density due to a minimum contact diameter
- Low contact 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

- Complete systems from a single source based on years of assembly expertise
- State-of-the-art production facilities with 100% end testing, high-voltage testing, component testing and pressure testing up to 100 bar
- Cleanroom production
- Hot-melt and high-pressure injection molding
- Customer-specific labeling
- Rapid prototyping of samples

THE ODU GROUP

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
Toleration to
DIN ISO 8015

2013

prep.

app.

norm.

date

11.06.

name

Unterblum

designation:

Break-A

coding: B
ng: red



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® BLUE-LINE.
SIMPLY ONLINE AT: WWW.ODU-MAC.COM

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ODU-MAC®

THE ODU-MAC® BLUE-LINE A NEW PERFORMANCE CLASS.

MANUAL MATING



AUTOMATIC DOCKING



VARIOUS MODULES



➤ ECONOMICAL

➤ ROBUST

➤ FLEXIBLE

➤ HIGH-PERFORMANCE

The ODU-MAC Blue-Line is a convenient, hybrid manual-connector solution comprising a stable frame, various modules and a housing. Its modular design enables it to combine many individual connections in one ODU-MAC Blue-Line. The proven ODU spindle locking in the new standard plastic housing provides the ODU-MAC Blue-Line with a truly unique selling point on the market.

The economical connector system is a modular all-around talent that can be configured for the smallest installation space – available in both a plastic and a metal housing. A multitude of data transmission modules enable a broad area of applica-

tion as a service and interface connector, such as in mechanical engineering, in measurement and testing, as well as in medical technology. The simple, exceptionally user-friendly assembly and removal of the crimp-clip contacts, even if they have already been assembled, distinguish the ODU-MAC Blue-Line as well; any installation error of the module is prevented via one mechanical and two optical coding functions. The cost-effective and proven ODU contact technology – turned and slotted contacts – with at least 10,000 mating cycles, as well as the simple processing of the contacts and modules, underscores the economic aspect of the system.

ECONOMICAL

- Easy assembly using crimp contacts that are clipped into the insulators
- Quick assembly and removal of the modules in the frame without using tools
- Removal of the contacts from the mating side

ROBUST

- Centering, guiding and grounding via guiding bushes and pins
- Numerous housing varieties in metal and plastic available with spindle and lever locking

FLEXIBLE

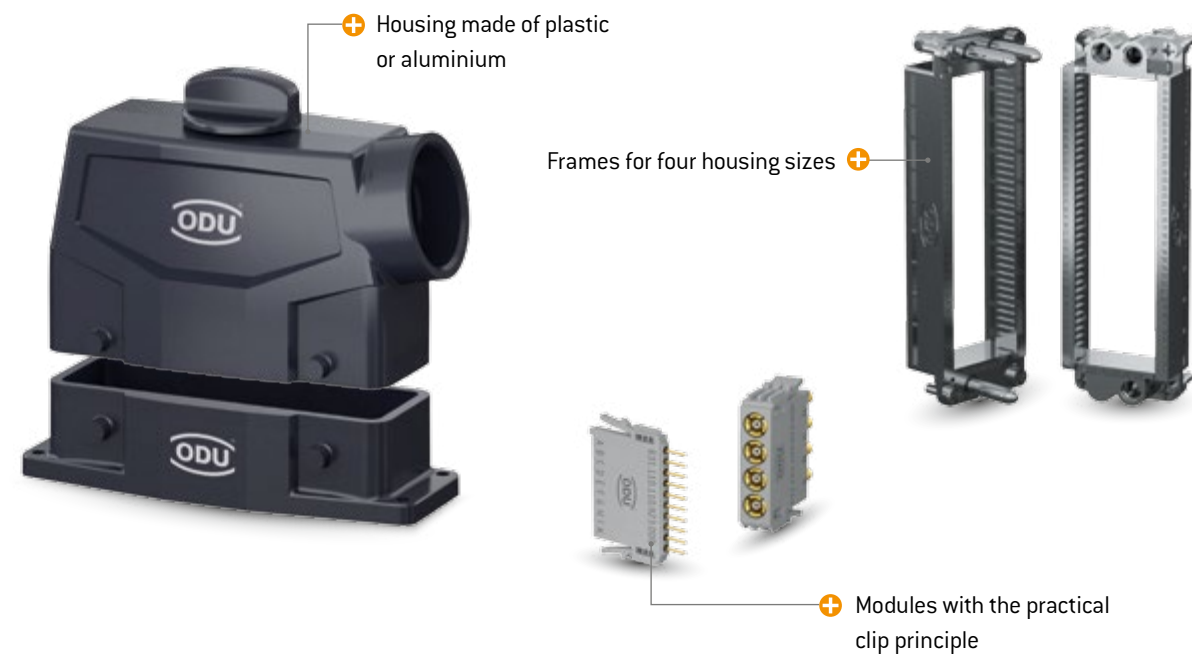
- 4 frame sizes (12, 18, 26, 37 units)
- Transmission of signals, power, high current, coax, compressed air, high-speed data transmission and fiber optic
- Additional option for the transmission of signals: separate PCB termination modules for an effective contact in the termination area
- Highest packing density via the 2.4 mm size (1 unit)

HIGH-PERFORMANCE

- > 10,000 mating cycles
- Up to 370 contacts per remove connector
- Proven ODU contact technology (turned/slotted contacts and contacts with lamella technology)

ALL-AROUND TALENT IN MODULAR DESIGN

The flexible modular design of the ODU-MAC Blue-Line enables the combination of the most varied types of transmission within a connector. Whether it is the transmission of signals, power, high current, coax, compressed air, high-speed data transmission or fiber optic – all of the contact inserts can be selected from the building-blocks and integrated into the individual connector solution. For the transmission of signals there is also the possibility of a simple contact using PCB-termination modules. The mating options are equally versatile.



THE INTELLIGENT WAY TO THE INDIVIDUAL CONNECTION

There are many possibilities available here for the most varied applications: For example, installed in a stable frame for rack-and-panel applications or automatic docking, or in one of the many housing varieties.

This results in an effective, compact and attractive overall connection with unparalleled functions. The confusion caused by many connections is a thing of the past – an ODU-MAC Blue-Line assembled according to your requirements is today's solution.

Learn more about individual configuration on the following pages or at: www.odu-mac.com

ODU-MAC® **Silver-Line** / **White-Line**

Our ODU-MAC Silver-Line and White-Line offer a more comprehensive portfolio – request our catalog to find out more.



ADDITIONAL INFORMATION PROVIDED IN VIDEOS
www.youtube.com/ODUSteckverbinder

THE MODULARITY AT A GLANCE:

2 possible areas of application:
manual mating or
automatic docking

40 cable hood varieties

3 types of locking: spindle,
lever or transverse locking

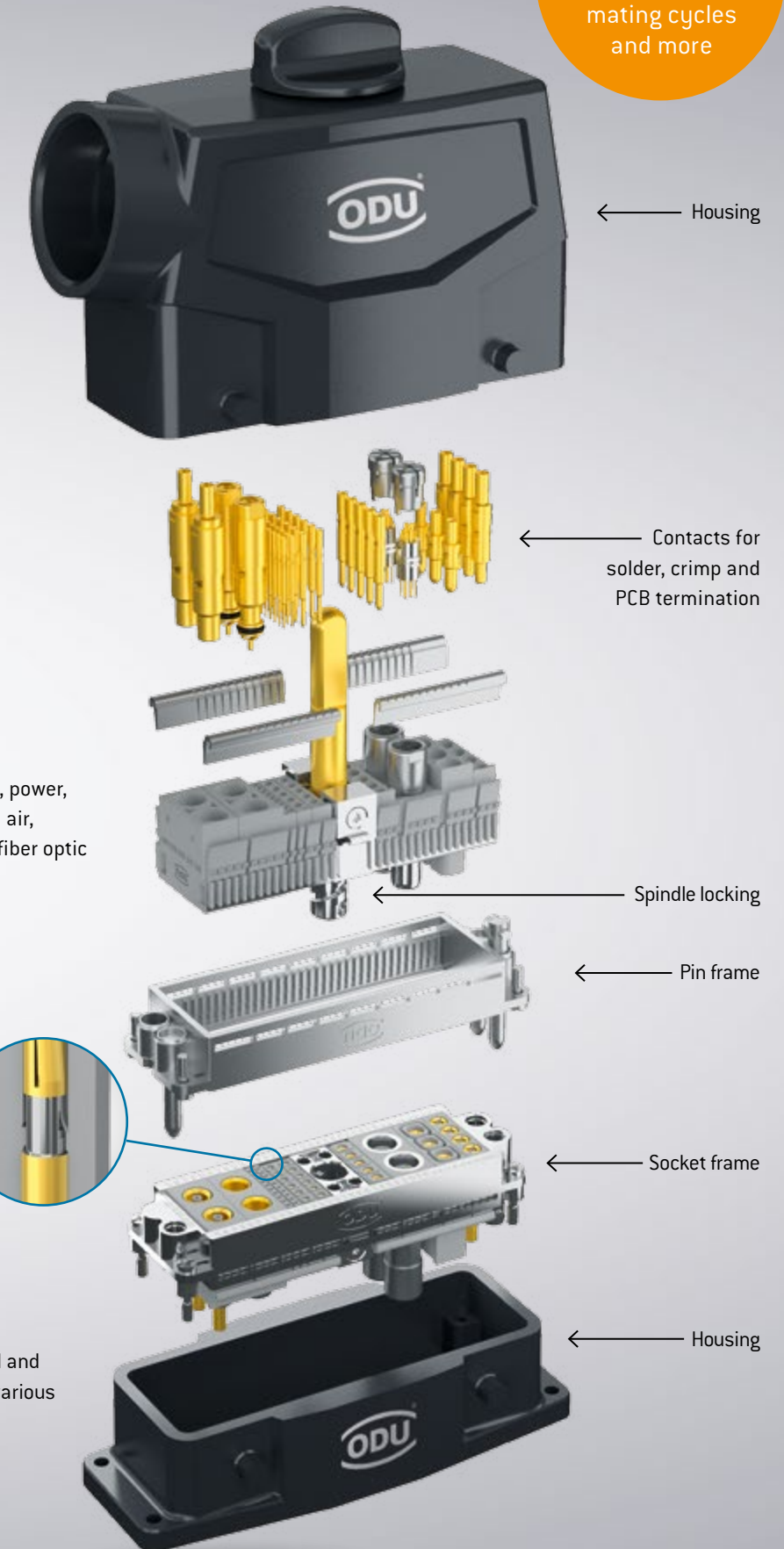
18 modules to choose from: signal, power,
high current, coax, compressed air,
high-speed data transmission, fiber optic
and PCB termination

3 different
spindle geometries

Contacts with the clip
principle that can be
dismantled
(see page 28)

8 variations of bulkhead mounted and
surface mounted housing and various
sizes of cable-to-cable-hoods

10,000
mating cycles
and more

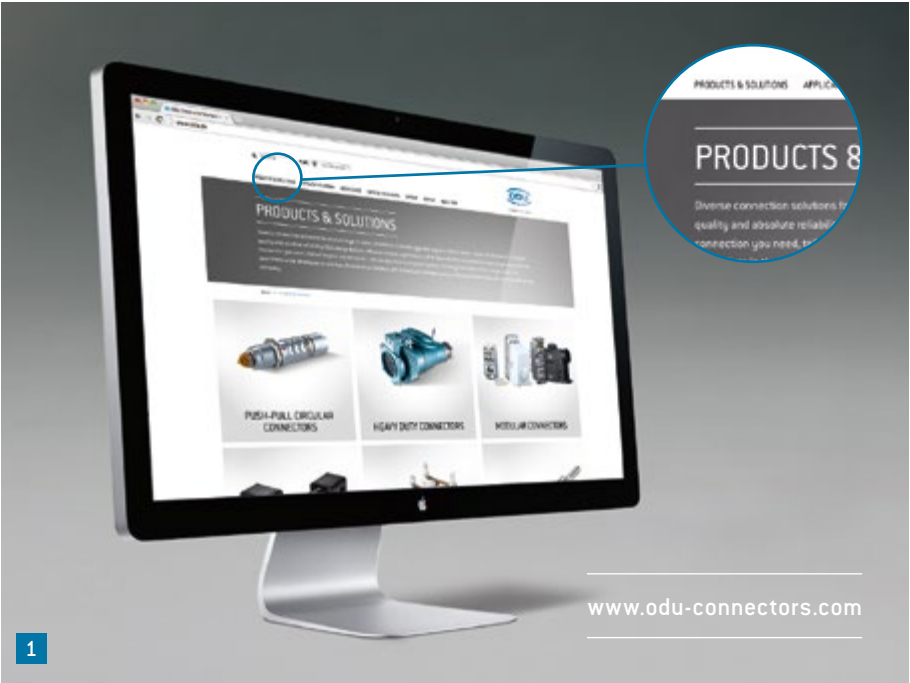


ODU-MAC® BLUE-LINE WEB CONFIGURATOR

The individual configuration of your ODU-MAC® Blue-Line connector.

The ODU-MAC Blue-Line Web-Configurator offers you the possibility of conveniently configuring your connector online according to your requirements. The Configurator guides you step-by-step through the various selection options and offers much additional information. There are two ways to access the ODU-MAC Blue-Line web configurator:

1. ACCESS: VIA WWW.ODU-CONNECTORS.COM



Entry via www.odu-connectors.com provides you with a great deal of product information and many application examples prior to configuration of your ODU-MAC Blue-Line.




Access to the configurator via the product category Modular Connectors.

2. ACCESS: DIRECTLY THROUGH WWW.ODU-MAC.COM



www.odu-mac.com takes you directly to the configuration interface, allowing you to start assembling your ODU-MAC immediately.

PRODUCT VIDEOS ON FUNCTIONALITY



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

YOUR WAY TO AN INDIVIDUAL CONNECTION

How to configure your ODU-MAC® Blue-Line.

INDIVIDUAL REQUIREMENTS – INDIVIDUAL CONFIGURATION

With ODU-MAC Blue-Line, 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. The frames, modules and contacts are delivered individually and can be easily assembled (clipped in) on site.

We ask you to enquire directly about customized versions not covered by the standard.

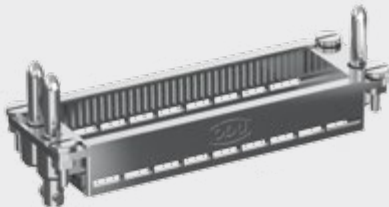


For information to the configuration of your connector please refer to our website: www.odu-mac.com

FOR AUTOMATIC DOCKING

1ST STEP: FRAME SELECTION

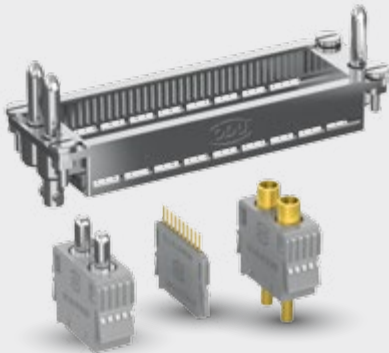
Depending upon your requirements, you can choose 4 different frame sizes as a base for automatic docking.



2ND STEP: MODULE SELECTION

Choose from 18 different modules for transferring signal, power, high current, coax, compressed air, high-speed data transmission, fiber optic or PCB termination and assemble your ODU-MAC Blue-Line individually.

Module	
Signal	Shielded implementation/ high-speed connector
Power	Fiber optic
High current	PCB termination
Coax	Blank modules
Compressed air	



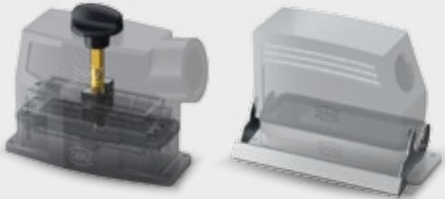
FOR MANUAL MATING

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*
-----------------	----------------

Transverse locking available on request.



* Lever locking only in metal housing; spindle locking possible in plastic and metal housing.

2ND STEP: CONNECTOR HOUSING SELECTION

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

For spindle locking	For lever locking
Cable hood Plastic/metal housing	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 Plastic/metal housing	Bulkhead mounted housing
Surface mounted housing Plastic/metal 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 18 different modules for transferring signal, power, high current, coax, compressed air, high-speed data transmission, fiber optic or PCB termination and assemble your ODU-MAC Blue-Line individually.

Modules
See page 80



BEST CONNECTIONS FOR MANUAL MATING

Overview of housing with spindle locking.




In the case of spindle locking of the ODU-MAC Blue-Line, 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 more than 10,000 locking cycles.

ADVANTAGES OF SPINDLE LOCKING

- **Low profile** – less space for operation than lever locking
- **Ease of use** – one-hand operation
- **Ergonomic design** – easy single spindle knob
- **Tested reliability** – developed for high locking cycles
- **Fully enclosed** – internal mechanism prevents damage
- **Replaceability** – can be replaced without removal of the hood or frame
- **User friendly** – little force required for operation
- **Precision** – material, design and tolerances assist service life of the overall system

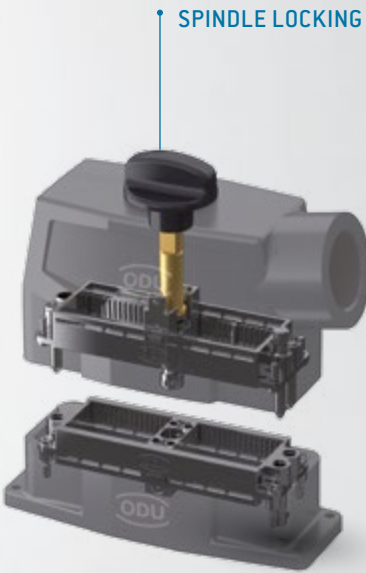
Size	Units ¹	
2	18	
3	26	
4	37	

CABLE HOOD XXL²:

4	37	
---	----	---

FURTHER INFORMATION FROM PAGE 30.

¹ 5 units of space required for spindle. ² XXL housing only possible in metall version.







BEST CONNECTIONS FOR MANUAL MATING


Overview of housing with lever locking.

ODU-MAC Blue-Line with lever locking offers a wide variety of combination possibilities for manual mating. With the exception of the cable hood wide, 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 37 modules with a module width of 2.4 mm (1 unit), meaning that a total of 37 modules (37 units), or 370 contacts in the case of 10 contacts, can be accommodated. Size 6 of the cable hood wide can even accommodate up to 740 contacts.

Size	Units	
1	12	
2	18	
3	26	
4	37	

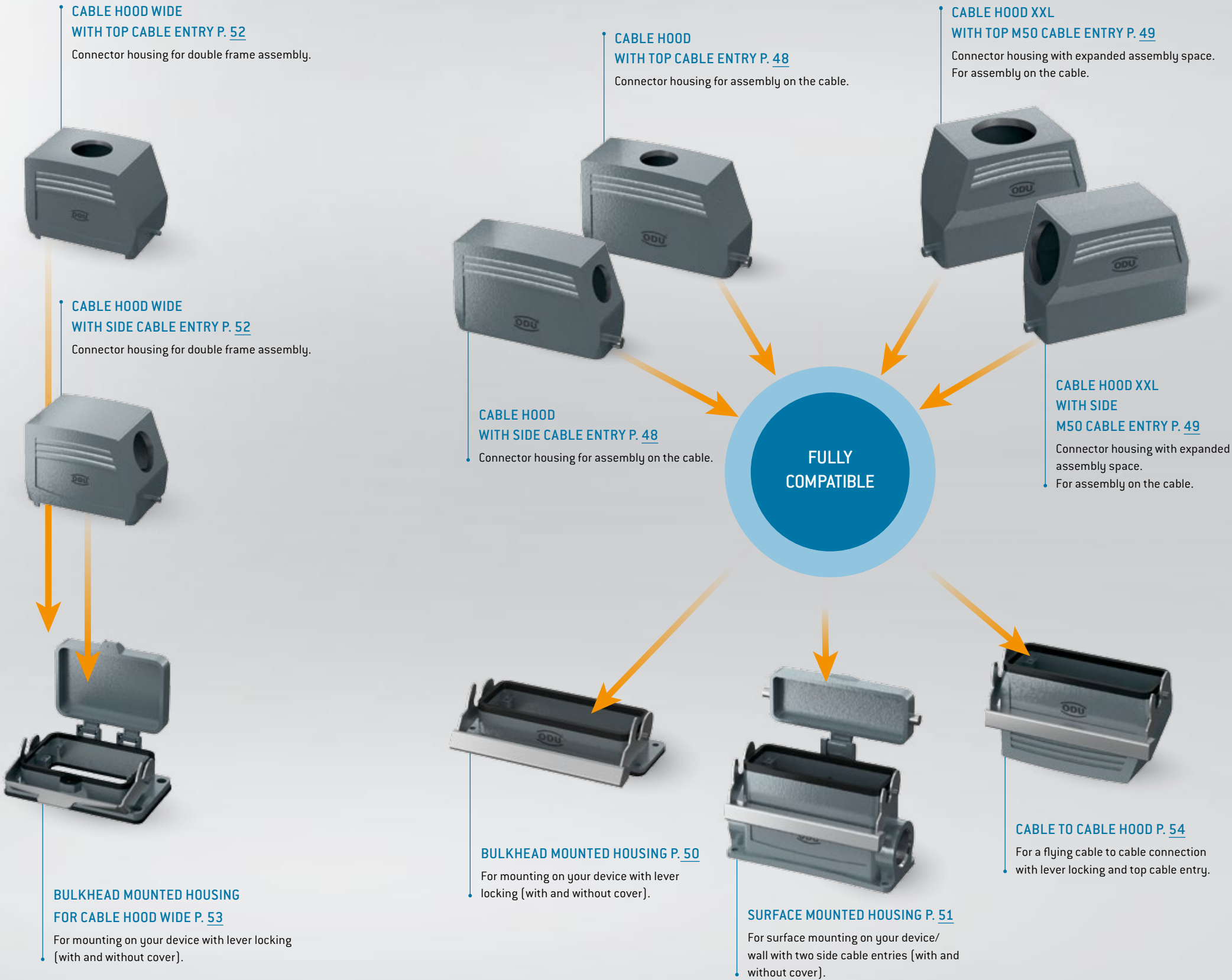
CABLE HOOD XXL:

4	37	
---	----	---

CABLE HOOD WIDE:

5	52	
6	74	

FURTHER INFORMATION FROM PAGE 48.



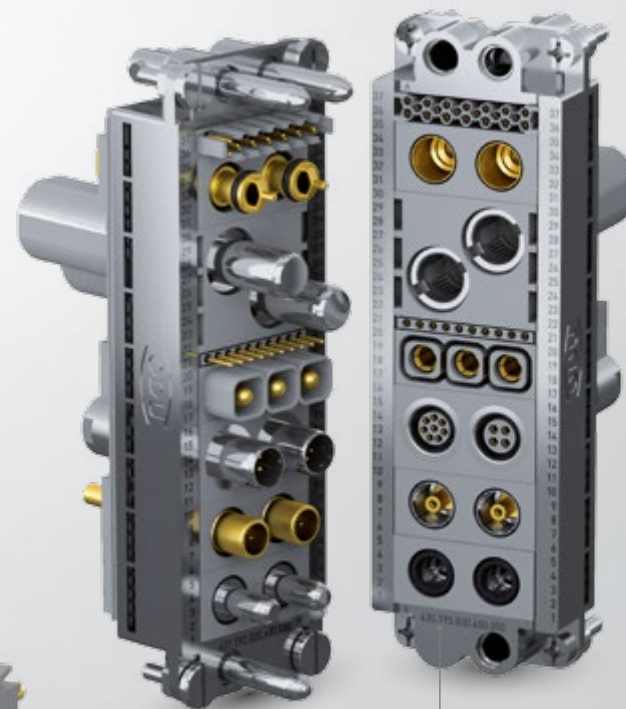
FRAMES FOR AUTOMATIC DOCKING

Overview of docking frames.

Depending on your requirements, you can choose between 4 different sizes and equip the frame with modules. There is always a perfect solution with the ODU-MAC Blue-Line.

If your requirements for a connector are not covered by the standard solutions, we also offer special customer-specific solutions.

The ODU-MAC Blue-Line is designed for 12 to 37 units (more upon request), meaning that 370 contacts can be installed if the 10 contacts module with a module width of 2.4 mm (1 unit) is used.



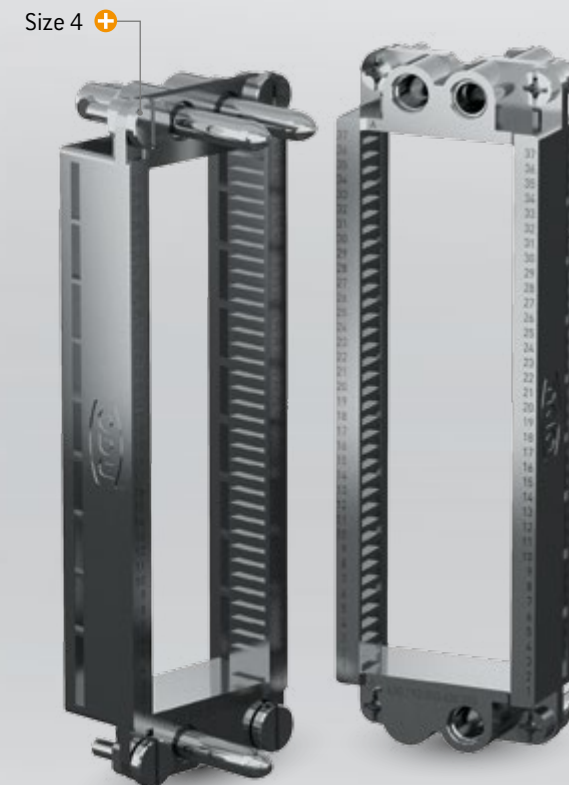
Size 4 +
assembled

ADVANTAGES OF THE ODU-MAC BLUE-LINE FRAMES

- **Economical**
Quick assembly and removal of the modules in the frame without using tools
- **Flexible**
4 frame sizes (12, 18, 26, 37 units)
18 different modules: signal, power, high current, coax, compressed air, high-speed data transmission, fiber optic or PCB termination
- **High packing density** the 2.4 mm (1 unit) size
- **High performance**
> 10,000 mating cycles
Up to 370 contacts per connector

PIN FRAMES – FLOATING MOUNTING

The frame is suitable for automatic docking. Tolerance compensation ± 0.6 mm radial, min. 0.1 mm axial.



[FURTHER INFORMATION FROM PAGE 72.](#)

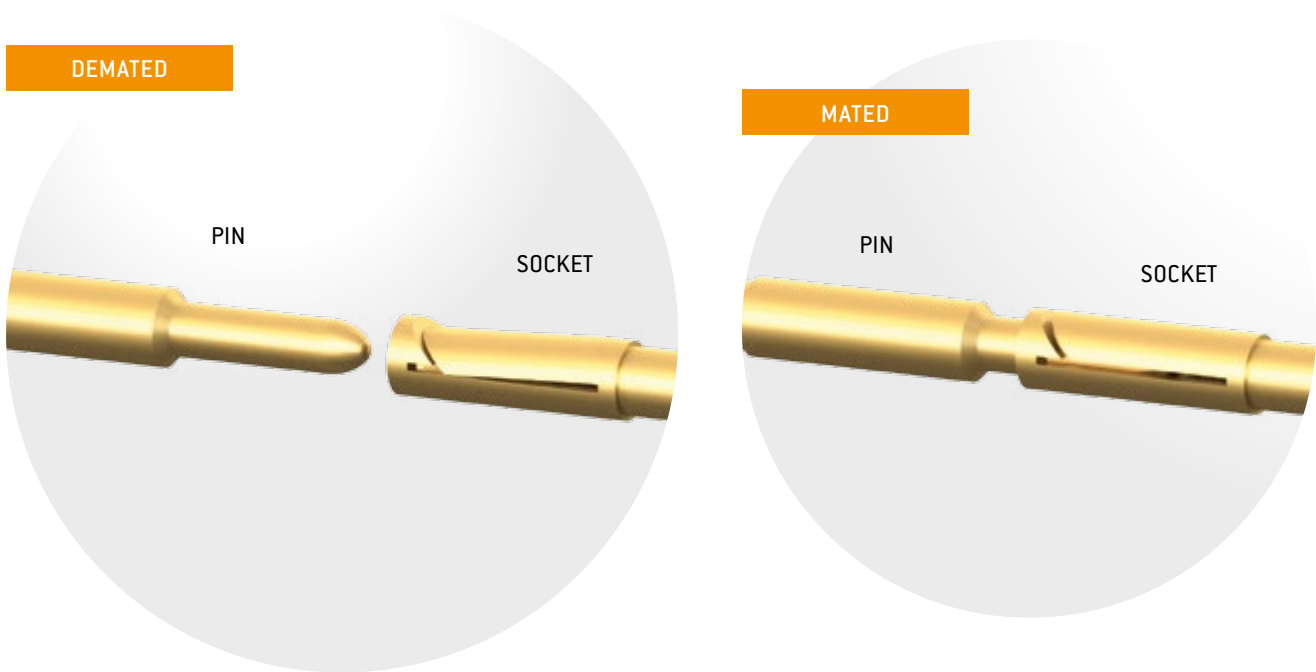
BEST CONNECTIONS – THE CONTACT PRINCIPLE

ODU contacts meets the highest quality standards and enable safe and reliable connections. ODU provides highest performance contact technologies. In the turned contact category, we essentially distinguish between lamella and slotted contacts. The socket parts differ, but the pins are always the same and always solid.

ODU TURNTAC® Contacts in slotted version.

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

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

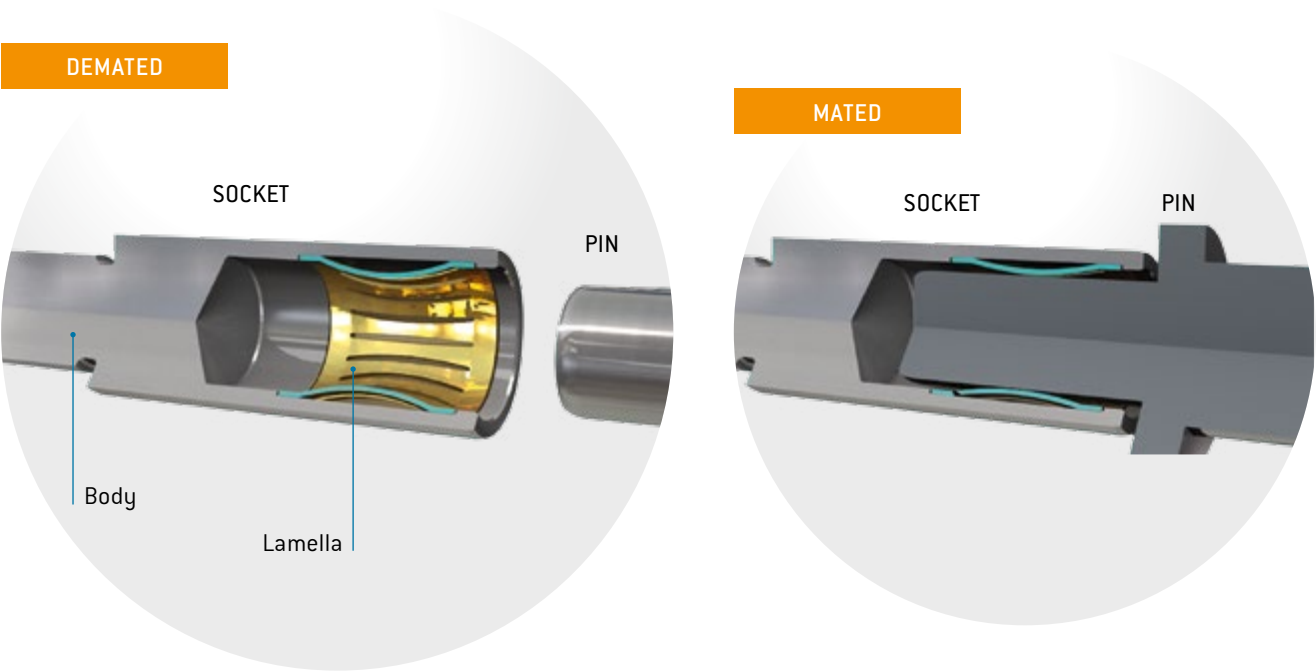


- ADVANTAGES**
- > 10,000 mating cycles
 - Economical solution
 - The smallest dimensions are possible
 - Individual contacts upon request

Standard contact principle for:	
Signal contacts	Ø 0.7–2 mm
Power contact	Ø 3.5 mm
Coax	2 and 4 contacs
Shielded implementation	Signal contacts

ODU LAMTAC® Contacts with lamella technology.

The ODU LAMTAC consists of a turned carrier containing one or several stamped lamella belts fully automat- ed process. The lamella's individual slats make for a multitude of contact points, thereby guaranteeing a high level of contact security and ease of connecting. The adapted contact force ensures low mating and demating forces, and a long service life with low wear. The mating cycles here are minimum 10,000.



- ADVANTAGES**
- > 10,000 mating cycles
 - High current-carrying capacity – surge current capacity
 - Low contact resistances
 - Low mating and unmating forces
 - High vibration and shock resistance
 - Individual contacts upon request

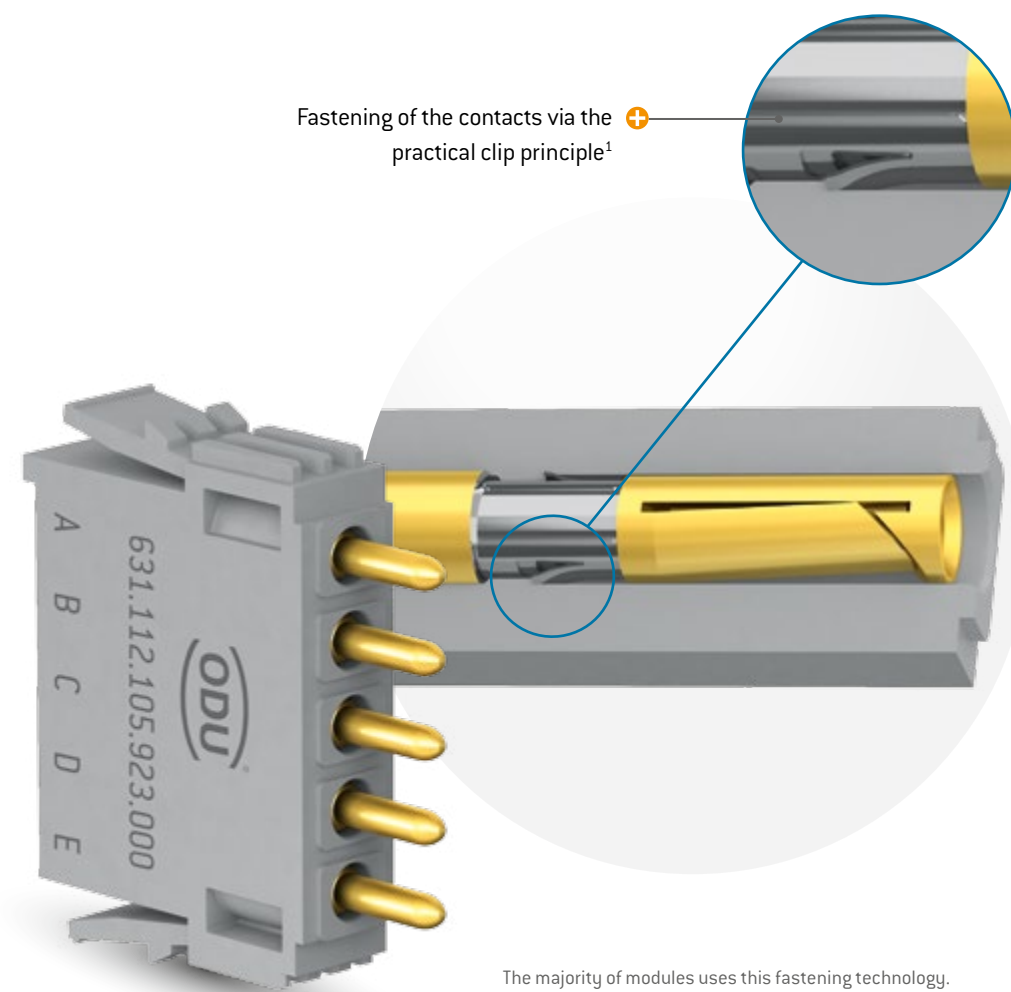
Standard contact principle for:	
High-current contact	Ø 5–8 mm
Shielded implementation	Shielded transmission

CONTACT RETENTION WITH THE CLIP PRINCIPLE (STANDARD)

The photo below 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.

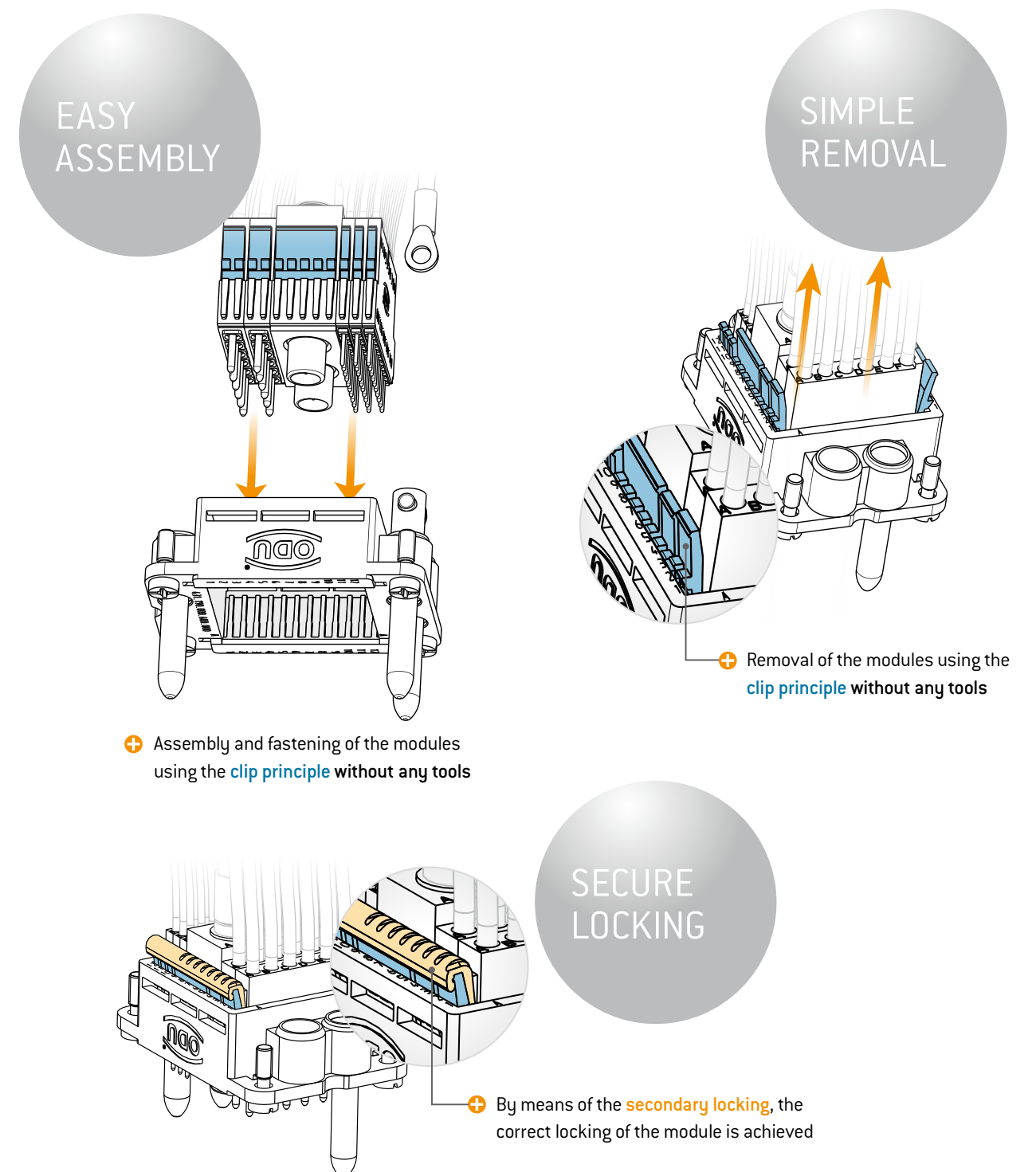
Not all modules are equipped with the clip principle, but removal is possible.



¹ After clipping a new contact in three times, the module must be renewed.

PERFECTLY ASSEMBLED EASE IN HANDLING

One mechanical and two optical coding functions of the modules simplify the assembly. Modules can be assembled equipped or unequipped (contact assembly is possible at any process step).



Please find detailed information in the ODU-MAC Blue-Line assembly instructions. Further information is available in the download area of our website.



CONFIGURE THE ODU-MAC® BLUE-LINE.
SIMPLY ONLINE AT: WWW.ODU-MAC.COM

MANUAL MATING

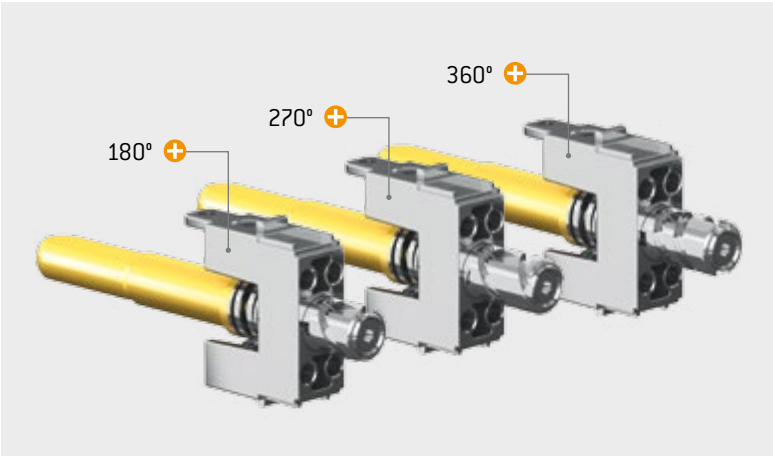
Spindle locking	32
Plastic housing	36
Metal housing	44
Lever locking	48
Transverse locking	55
Housing with IP 68/IP 69 and EMC	56
Frame for housing	60
Accessories	61
Coding possibilities	66

SPINDLE LOCKING (VERSION 1)

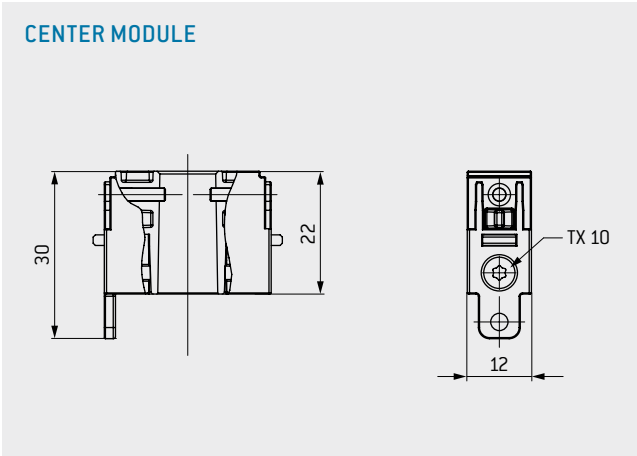
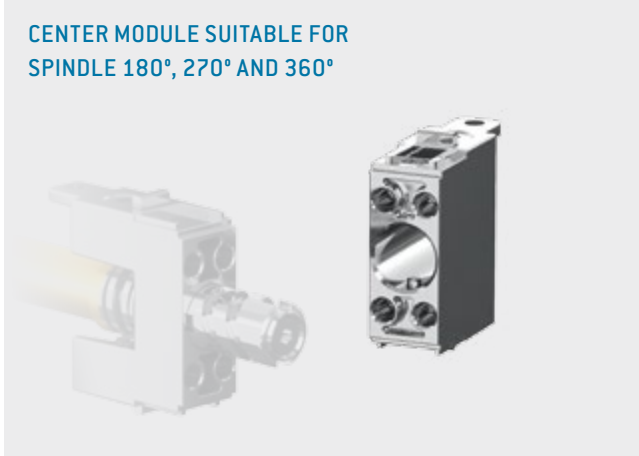
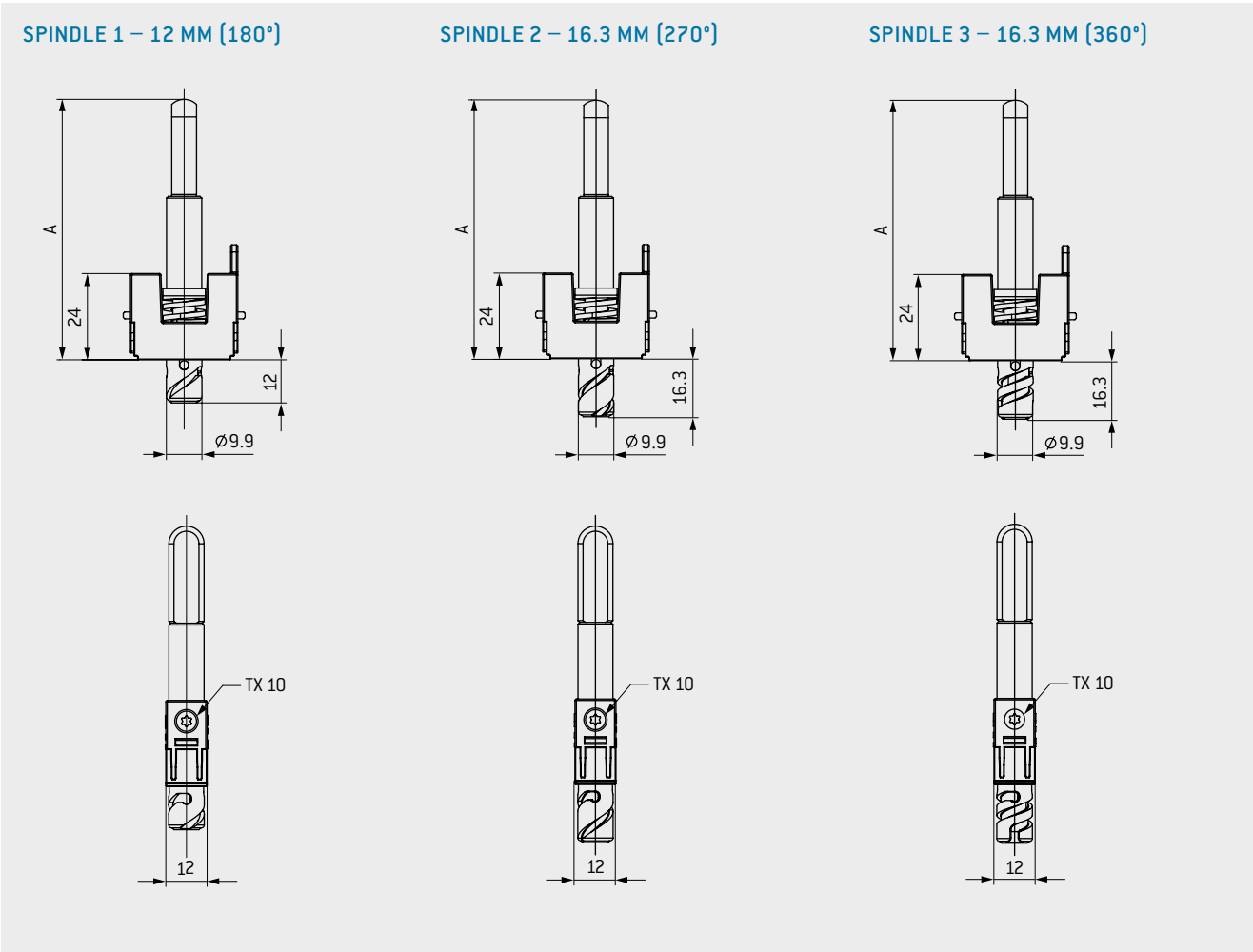
Module for installation in ODU-MAC Blue-Line frames for housing. Quick-action locking system with over 10,000 locking cycles. Easy replacement of the front (replacement spindle set) enables a simple adjustment of the spindle geometry.



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



- TECHNICAL NOTES**
- Min. of 10,000 locking cycles
 - Space requirement 5 units (5 × 2.4 mm)
 - Easy one-hand insertion/connection
 - Force benefit by the insertion/connection
 - Replaceable spindle screws
 - Direct PE contact (fast-on)



Size	Part number WITHOUT CODING		Part number WITH CODING ¹		Angle of rotation	Dim. A mm
	Center module for bulkhead mounted, surface mounted housing and cable-to-cable-hoods	Spindle locking for cable hoods	Center module for bulkhead mounted, surface mounted housing and cable-to-cable-hoods	Spindle locking for cable hoods		
2 (52 mm high)	634.090.001.304.000	635.091.003.200.000	634.090.001.304.010	635.091.003.200.010	180°	46.5
2 (72 mm high)	634.090.001.304.000	635.091.001.200.000	634.090.001.304.010	635.091.001.200.010	180°	66.5
3/4	634.090.001.304.000	635.092.011.200.000	634.090.001.304.010	635.092.011.200.010	270°	72.5
3/4	634.090.001.304.000	635.092.011.200.003	634.090.001.304.010	635.092.011.200.013	360°	72.5
XXL	634.090.001.304.000	635.093.011.200.000	634.090.001.304.010	635.093.011.200.010	270°	90.5
XXL	634.090.001.304.000	635.093.011.200.003	634.090.001.304.010	635.093.011.200.013	360°	90.5

¹ Coding pins are included in the standard scope of delivery.

REPLACEMENT SPINDLE SET 180°, 270° AND 360°



Part number replacement spindle set	Angle of rotation	Dimension mm
615.090.104.249.000	180°	12
615.090.104.249.004	270°	16.3
615.090.104.249.005	360°	16.3

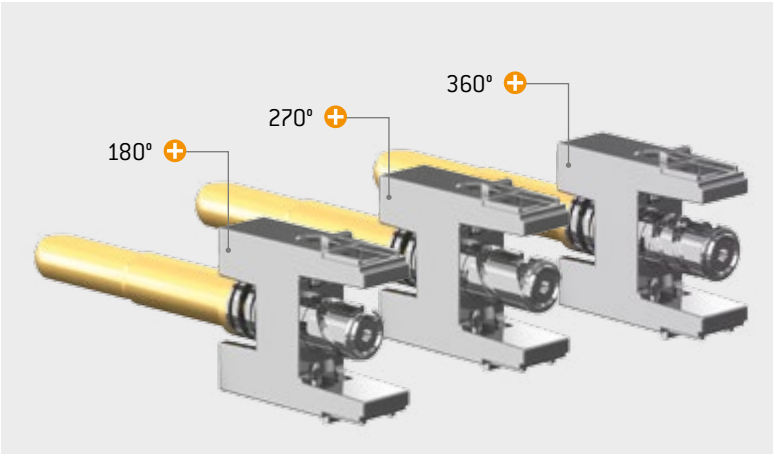
Depending on the case of application, a simple adjustment of the spindle geometry is possible using the replacement spindle set.

SPINDLE LOCKING (VERSION 2)

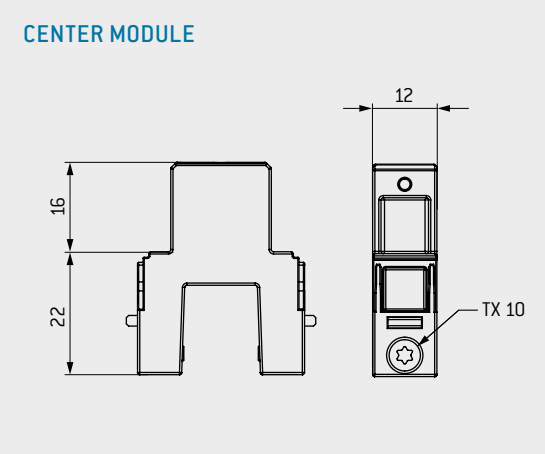
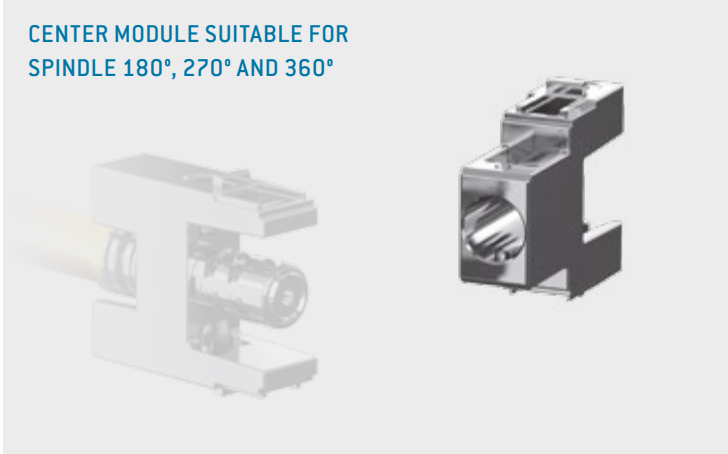
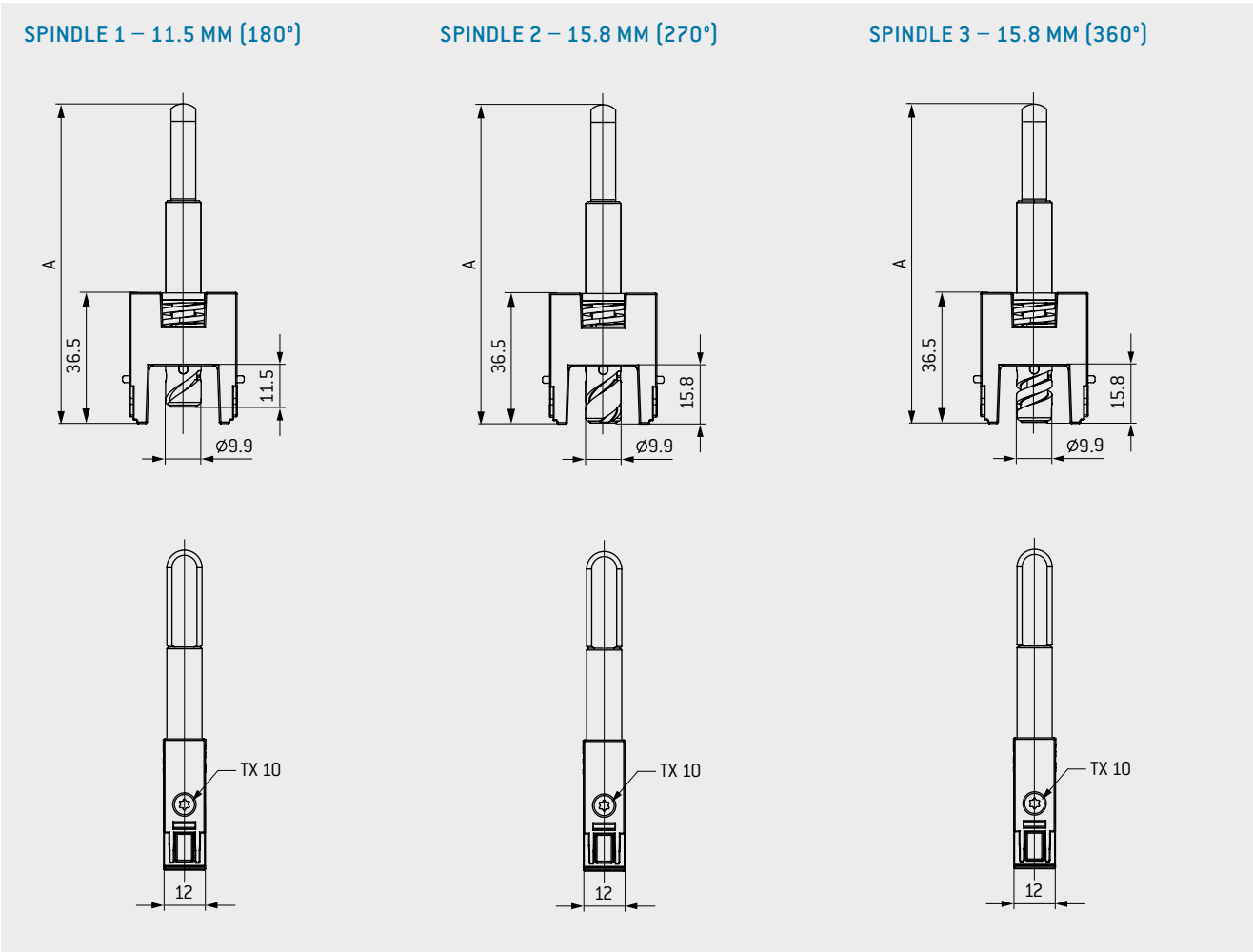
Module for installation in ODU-MAC Blue-Line frames for housing. Quick-action locking system with over 10,000 locking cycles. Easy replacement of the front (replacement spindle set) enables a simple adjustment of the spindle geometry.



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



- TECHNICAL NOTES**
- Min. of 10,000 locking cycles
 - Space requirement 5 units (5 × 2.4 mm)
 - Easy one-hand insertion/connection
 - Force benefit by the insertion/connection
 - Replaceable spindle screws
 - Spindle with coding function available upon request



Size	Part number WITHOUT CODING		Angle of rotation	Dim. A mm
	Center module for bulkhead mounted, surface mounted housing and cable-to-cable-hoods	Spindle locking for cable hoods		
2 (52 mm high)	634.090.002.304.000	635.091.004.200.000	180°	63.5
2 (72 mm high)	634.090.002.304.000	635.091.002.200.000	180°	83
3/4	634.090.002.304.000	635.092.012.200.000	270°	89.1
3/4	634.090.002.304.000	635.092.012.200.003	360°	89.1
XXL	634.090.002.304.000	635.093.012.200.000	270°	107.1
XXL	634.090.002.304.000	635.093.012.200.003	360°	107.1

REPLACEMENT SPINDLE SET 180°, 270° AND 360°



Part number replacement spindle set	Angle of rotation	Dimension mm
615.090.104.249.000	180°	12
615.090.104.249.004	270°	16.3
615.090.104.249.005	360°	16.3

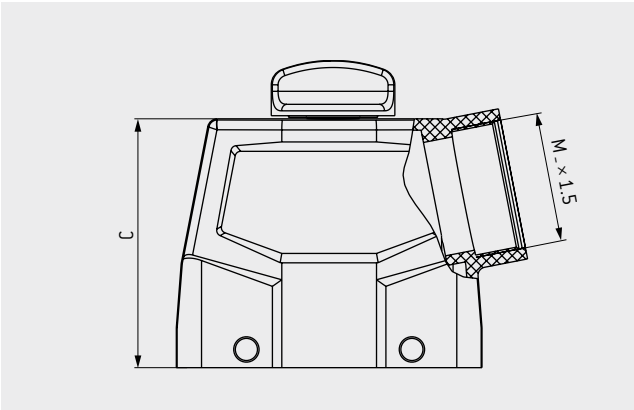
Depending on the case of application, a simple adjustment of the spindle geometry is possible using the replacement spindle set.

PLASTIC CABLE HOOD



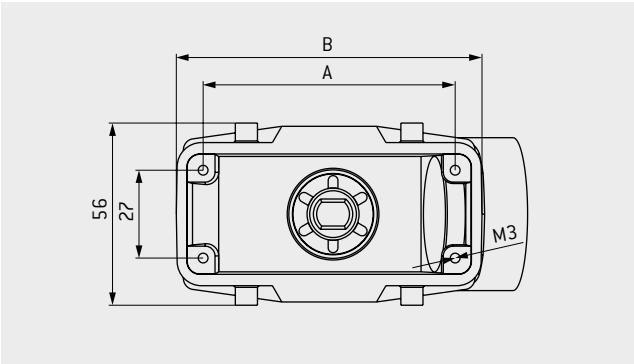
Plastic cable hood for assembly on cable and side cable entry.

SPINDLE LOCKING



TECHNICAL DATA

Color of housing Black (RAL 9005)
Material Plastic PA6 GF
Protection class¹ IP 50
 IP 65 on request
Operating temperature –40 °C to +125 °C
Cable clamp see page 61
Number of locking cycles see from page 32



Size	Part number	Dim. A	Dim. B	Dim. C	Dim. M	Part number protective cover
		mm	mm	mm	cable entry	[see page 40]
2	613.091.514.908.308	57	74	72.5	M32	491.097.613.908.001
3	613.092.514.908.308	77.5	94	76.5	M40	492.097.613.908.001
4	613.093.514.908.308	104	121	76.5	M40	493.097.613.908.001

REDUCTION OF M40 TO M32; SEE PAGE 61.

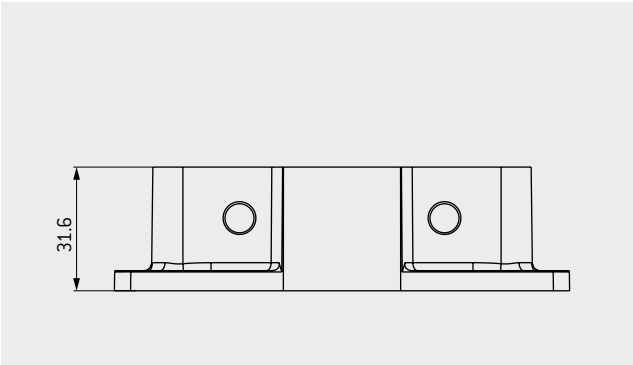
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) and spindle type used).

PLASTIC BULKHEAD MOUNTED HOUSING



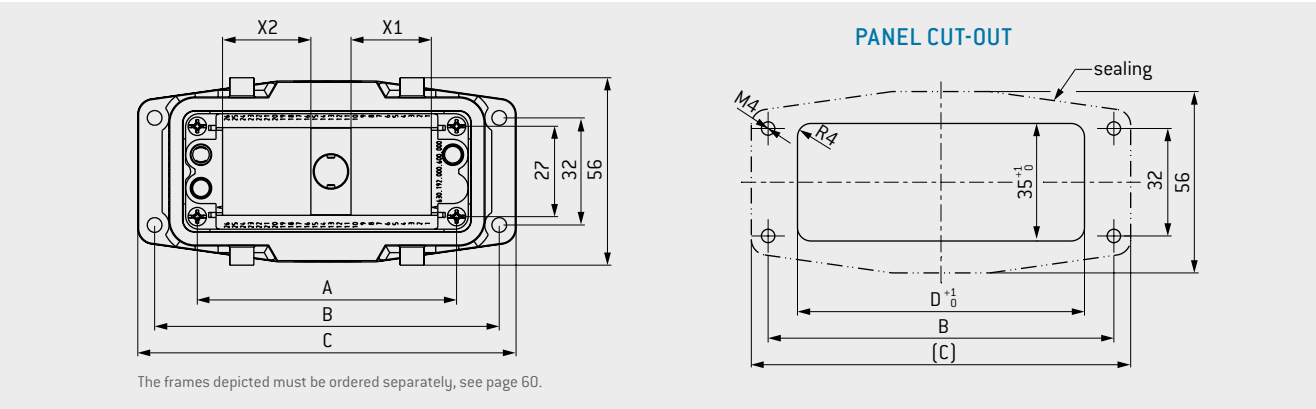
For assembly of your device with spindle locking.

SPINDLE LOCKING



TECHNICAL DATA

Color of housing Black (RAL 9005)
Material Plastic PA6 GF
Protection class¹ IP 50
 IP 65 on request
Operating temperature –40 °C to +125 °C
Sealing NBR; sealing material



Size	Part number	Dim. A	Dim. B	Dim. C	Dim. D	X1	X2	Part number protective cover
		mm	mm	mm	panel cut-out mm	Units 2.4 mm	Units 2.4 mm	[see page 39]
2	612.091.010.908.000	57	83	93	67	6	7	491.097.612.908.001
3	612.092.010.908.000	77.5	103	114	87	10	11	492.097.612.908.001
4	612.093.010.908.000	104	130	140	114	16	16	493.097.612.908.001

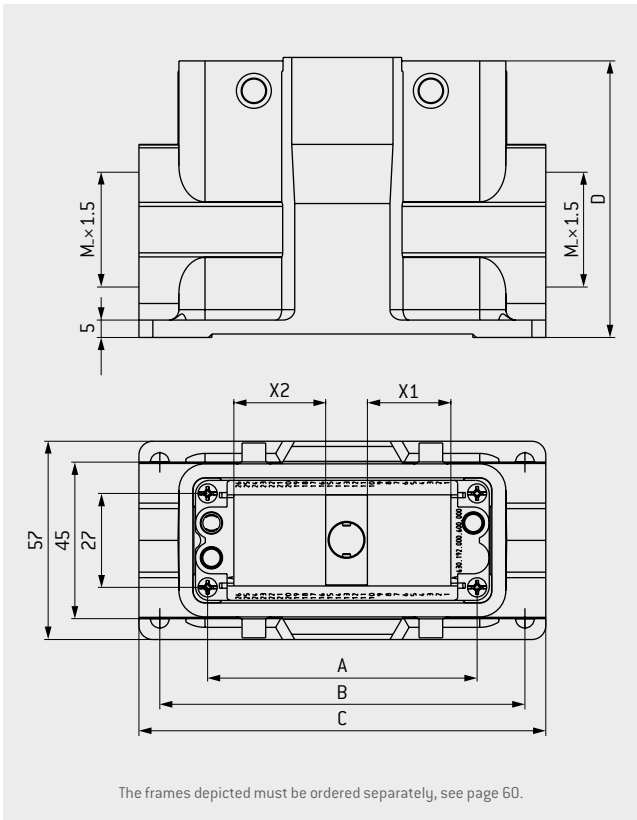
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the spindle type used).

PLASTIC SURFACE MOUNTED HOUSING



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

SPINDLE LOCKING



TECHNICAL DATA

Color of housing	Black (RAL 9005)
Material	Plastic PA6 GF
Protection class ¹	IP 50
	IP 65 on request
Operating temperature	−40 °C to +125 °C
Sealing	NBR; sealing material
Cable clamp	see page 61

Size	Part number	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	X1 Units 2.4 mm	X2 Units 2.4 mm	Dim. M Cable entry	Part number protective cover [see page 39]
2	612.091.020.908.000	57	82	94	81.5	6	7	M32	491.097.612.908.001
3	612.092.020.908.000	77.5	105	117	81.5	10	11	M40	492.097.612.908.001
4	612.093.020.908.000	104	132	144	81.5	16	16	M40	493.097.612.908.001

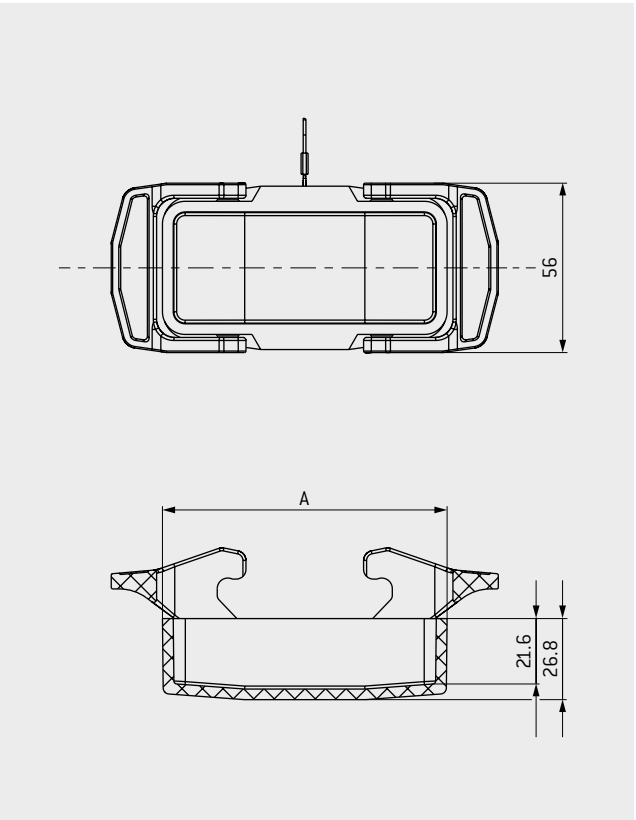
REDUCTION OF M40 TO M32; SEE PAGE 61.

¹ IEC 60529:2013 (VDE 0470-1:2014) [Depends on the cable clamp(s) and spindle type used].

PLASTIC PROTECTIVE COVER



For bulkhead and surface mounted housing with lanyard.



TECHNICAL DATA

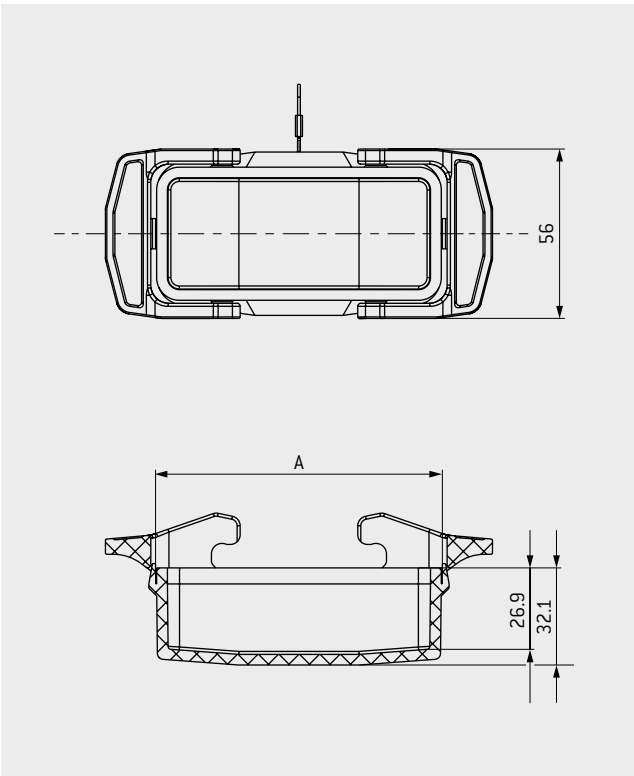
Color of housing	Black (RAL 9005)
Material	Plastic PA6 GF
Protection class ¹	IP 65
Operating temperature	−40 °C to +125 °C
Locking	via the side-bar locking included in the delivery

Size	Part number	Dim. A mm
2	491.097.612.908.001	74
3	492.097.612.908.001	94
4	493.097.612.908.001	121

¹ IEC 60529:2013 (VDE 0470-1:2014)

PLASTIC PROTECTIVE COVER

For cable hood with lanyard.

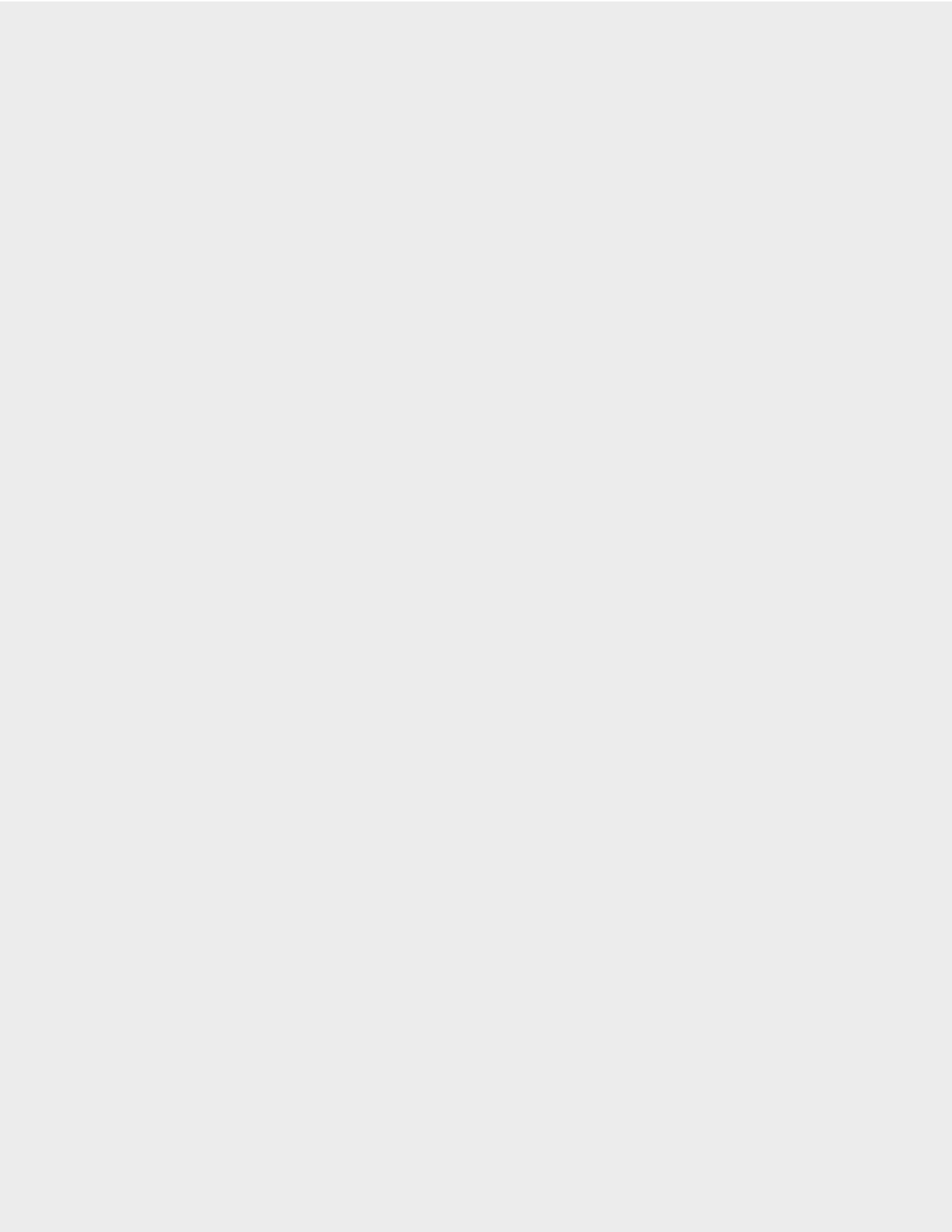


TECHNICAL DATA	
Color of housing	Black (RAL 9005)
Material	Plastic PA6 GF
Protection class ¹	IP 65
Operating temperature	−40 °C to +125 °C
Sealing	NBR; sealing material
Locking	via the side-bar locking included in the delivery

Size	Part number	Dim. A mm
2	491.097.613.908.001	74
3	492.097.613.908.001	94
4	493.097.613.908.001	121

¹ IEC 60529:2013 (VDE 0470-1:2014)

FOR YOUR NOTES



INFORMATION ON PLASTIC HOUSING

Plastic housing is primarily used for applications in which a high degree of chemical resistance is required. The glass-fiber reinforced plastic housing reduces the weight and impresses in mechanical robustness.

In the case of plastic housings in the ODU-MAC Blue-Line, the proven ODU spindle technology with a minimum of 10,000 locking cycles is used, having good ergonomic properties and thereby greatly simplifying the mating for the user. An additional grounding of the plastic housing is unnecessary, due to the antistatic, thermoplastic housing.

The plastic housing thereby represents a technological and economical enhancement of the housing varieties.



Medium	Material PA6 + GF	
	Resistant	With limited resistance
Ammonia, 10% aqueous solution	•	
Ammonia gas	At room temperature	At 100 °C
Ammonium carbonate	•	
Ammonium chloride	•	
Aniline		•
Asphalt	•	
Beer	•	
Butane gas	•	
Cooking salt, aqueous solution	•	
Copper sulphate, 10% aqueous solution	•	
Cresol solution		•
Cresylic acid		•
Cyclohexane	•	
Diesel	•	
Diluted glycerol	•	
Diluted glycol	•	
Diluted phenol		•
Dioctylphthalate	•	
Ethyl alcohol, not denatured	•	
Fruit juices	•	
Glycerol	•	
Heptane	•	
Hexane	•	
Hydrogen sulphide	Gaseous	Diluted solution
Ink	•	
Isopropyl + ethanol	•	
Isopropyl alcohol	•	
Lactic acid	•	
Linseed oil	•	
Lubricating oil	•	
Mercury	•	
Methyl alcohol, diluted 50%	•	
Mineral oil	•	
Mineral-based oil	•	
Moth balls	•	
Motor oil	•	
n-Butanol	•	
Naphthalene	•	
Octane	•	

Medium	Material PA6 + GF	
	Resistant	With limited resistance
Oleic acid	•	
Paraffin oil	•	
Petroleum	•	
Potassium carbonate	•	
Potassium chloride	•	
Potassium iodide	•	
Potassium nitrate	•	
Potassium sulphate	•	
Regular grade petrol	•	
Seawater	•	
Silicone oil	•	> 100 °C
Soap solution	•	
Sodium bicarbonate	•	
Sodium bisulfate, aqueous solution	•	
Sodium carbonate	•	
Sodium chlorate	•	
Sodium chloride	•	
Sodium hydroxide 12.5%	At room temperature	
Sodium nitrate	•	
Sodium nitrite		•
Sodium perborate	•	
Sodium phosphate	•	
Sodium silicate	•	
Sodium sulphate	•	
Sodium sulphide	•	
Sodium thiosulphate	•	
Solution for developing photos	•	
stearic acid	•	
Stearic acids	•	
Sulphur	•	
Sulphur dioxide		•
Tallow	•	
Tar	•	
Tartaric acid	•	
Transformer oil	•	
Urea, diluted	•	
Urine	•	
Vegetable oil	•	
Water	•	

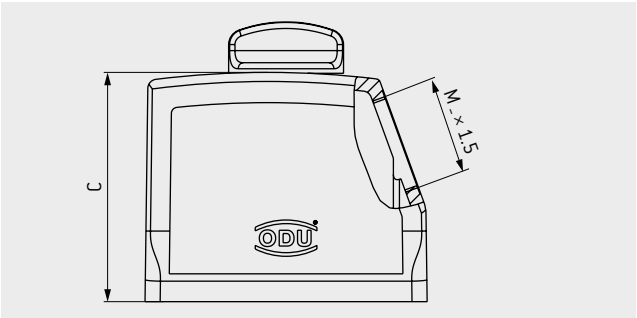
This list represents an abstract of the chemical resistance of the plastic housing. Please contact the ODU team if you have any further questions. They will happy to assist you.

CABLE HOOD

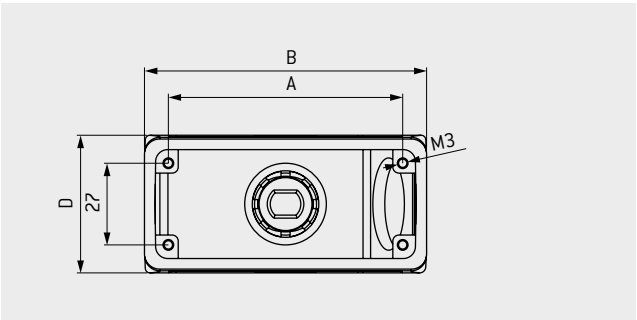


Connector housing for assembly on the cable with side cable entry.

SPINDLE LOCKING



TECHNICAL DATA	
Color of housing	Gray (standard, similar to RAL 7001) or white (similar to RAL 9010)
Material	Aluminium die casting
Protection class ¹	IP 50 IP 65 on request
Operating temperature	–40 °C to +125 °C
Cable clamp	see page 61
Number of locking cycles	see from page 32
Adapter	for PG clamp see page 62



Size	Part number A Color of housing gray/ spindle knob black	Part number B Color of housing white spindle knob white	Part number C Color of housing white spindle knob black	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	613.091.514.653.208	57	73	72	43		
3	613.092.514.644.208	613.092.514.653.203	613.092.514.653.208	77.5	93.5	76	45.5	M32	492.097.613.644.000
4	613.093.514.644.208	613.093.514.653.203	613.093.514.653.208	104	120	76	45.5		493.097.613.644.000
	On request	On request	613.093.515.653.008	104	120	76	45.5	M40	493.097.613.644.000

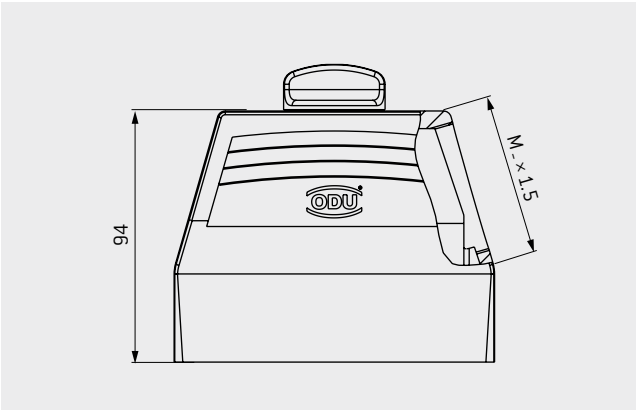
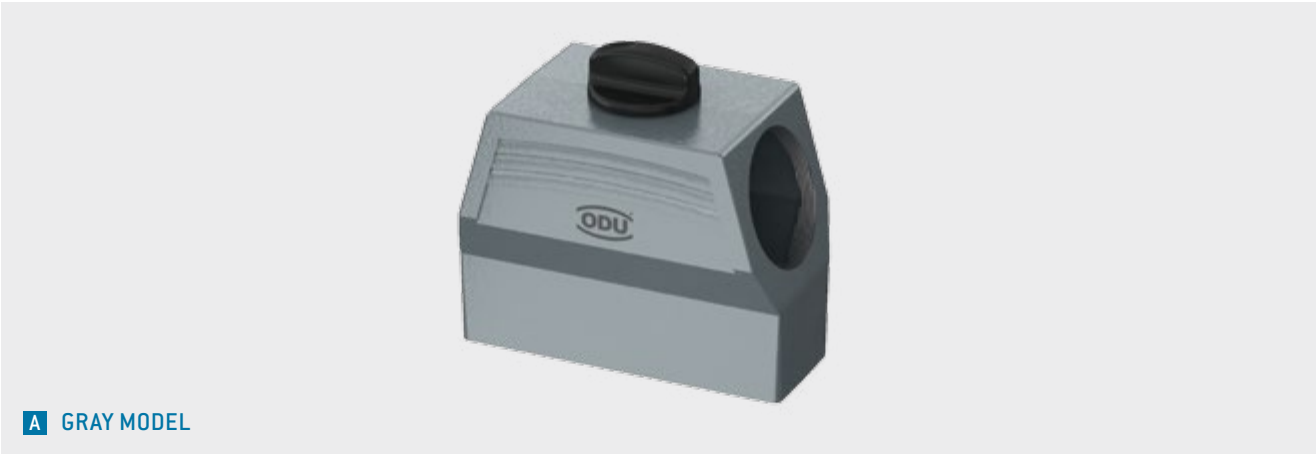
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) and spindle type used).

CABLE HOOD XXL

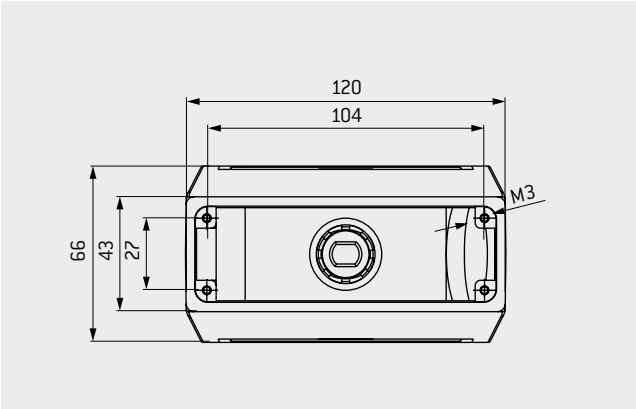


Connector housing for assembly on the cable. With expanded assembly space and side M50 cable entry.

SPINDLE LOCKING



TECHNICAL DATA	
Color of housing	Gray (similar to RAL 7001) or white (similar to RAL 9010)
Material	Aluminium die casting
Protection class ¹	IP 50 IP 65 on request
Operating temperature	–40 °C to +125 °C
Cable clamp	see page 61
Number of locking cycles	see from page 32



Size	Part number Color of housing gray/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

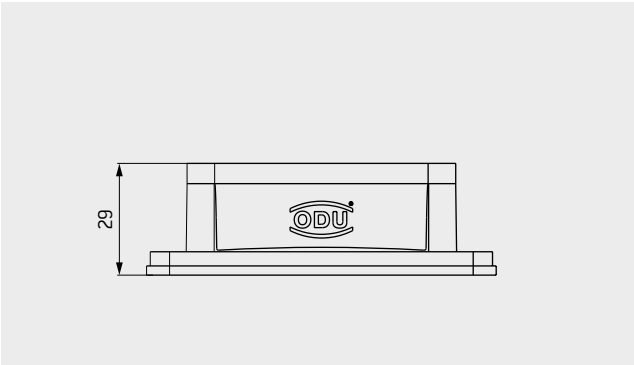
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) and spindle type used).

BULKHEAD MOUNTED HOUSING

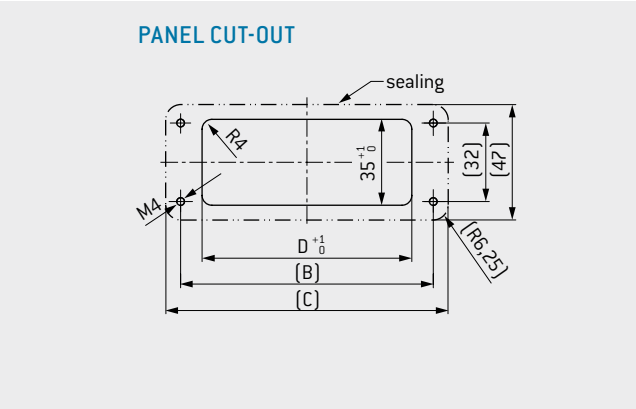
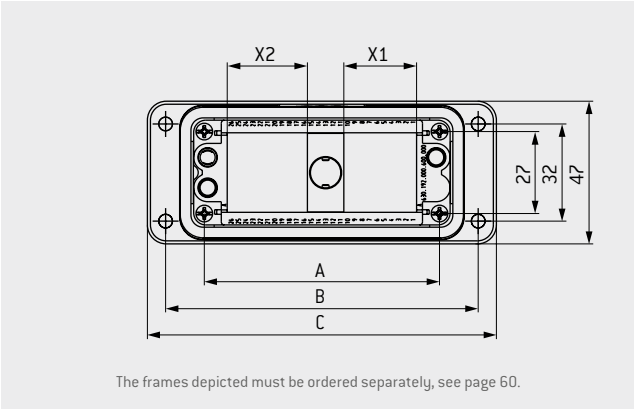


For mounting on the device.

SPINDLE LOCKING



TECHNICAL DATA	
Color of housing	Gray (standard, similar to RAL 7001) or white (similar to RAL 9010)
Material	Aluminium die casting
Protection class ¹	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	Dim. C	Dim. D Panel cut-out	X1	X2
	Color of housing gray	Color of housing white	mm	mm	mm	mm	Units 2.4 mm	Units 2.4 mm
2	612.091.010.644.000	612.091.010.653.000	57	83	95	65.2	6	7
3	612.092.010.644.000	612.092.010.653.000	77.5	103	115	85.5	10	11
4	612.093.010.644.000	612.093.010.653.000	104	130	143	112.2	16	16

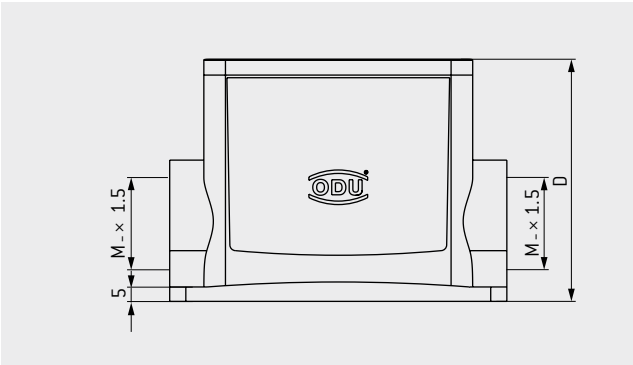
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the spindle type used).

SURFACE MOUNTED HOUSING

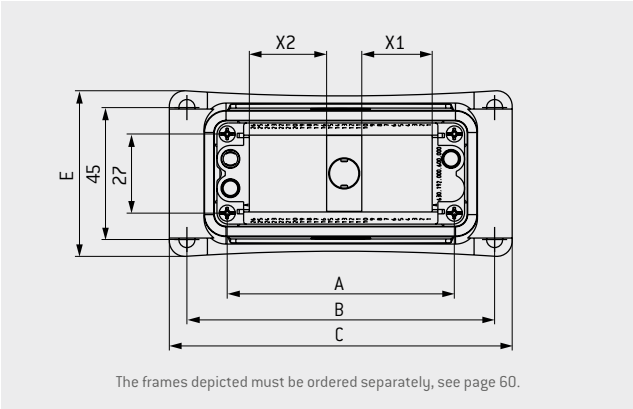


For surface mounting on your device/wall with two side cable entries.

SPINDLE LOCKING



TECHNICAL DATA	
Color of housing	Gray (standard, similar to RAL 7001) white on request
Material	Aluminium die casting
Protection class ¹	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	see page 61
Adapter	for PG clamp see page 62



Size	Part number A	Part number B	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	X1	X2	Dim. M
	Color of housing gray	Color of housing white	mm	mm	mm	mm	mm	Units 2.4 mm	Units 2.4 mm	Cable entry
2	612.091.025.644.102	612.091.025.653.102	57	82	92.5	74	55.5	6	7	M32
3	612.092.025.644.102	612.092.025.653.102	77.5	105	117	84	56.5	10	11	M32
4	612.093.025.644.102	612.093.025.653.102	104	132	144	84	57.5	16	16	M32

¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) and spindle type used).

CABLE HOOD

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

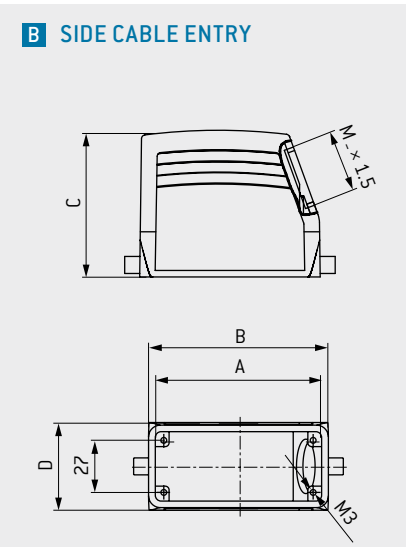
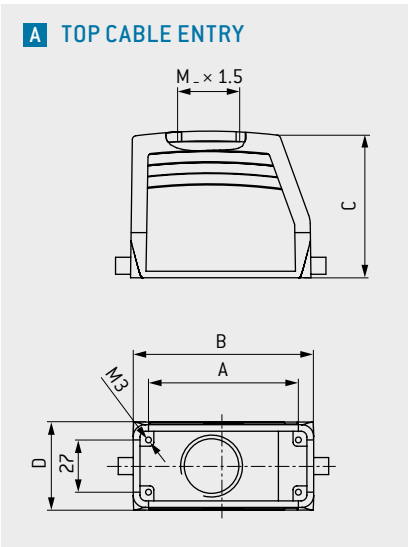
LEVER LOCKING



A TOP CABLE ENTRY



B SIDE CABLE ENTRY



TECHNICAL DATA

Color of housing Gray (standard similar to RAL 7001)

Material Aluminium die casting

Protection class¹ IP 65

Operating temperature in mated condition
Cable clamp see page 61

Adapter for PG clamp
 see page 62

With lever a locking minimum of 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	

¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) used).

CABLE HOOD XXL

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

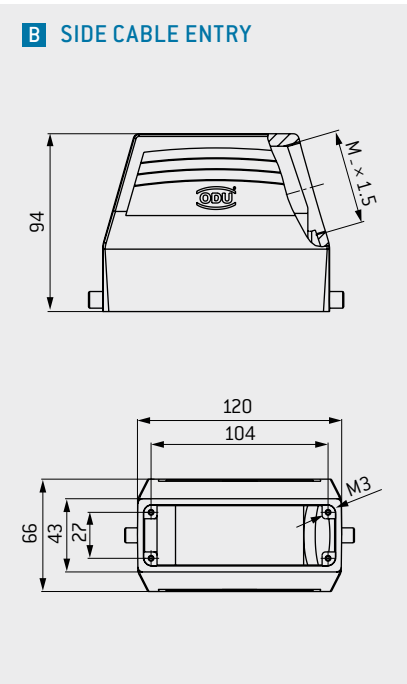
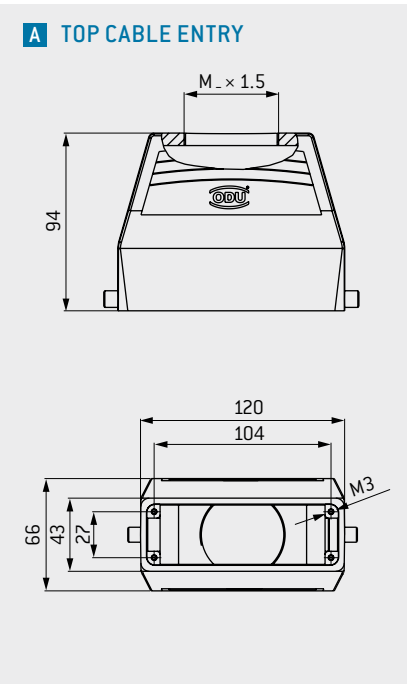
LEVER LOCKING



A TOP CABLE ENTRY



B SIDE CABLE ENTRY



TECHNICAL DATA

Color of housing Gray (standard similar to RAL 7001)

Material Aluminium die casting

Protection class¹ IP 65

Operating temperature in mated condition
Cable clamp see page 61

With lever a locking minimum of 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

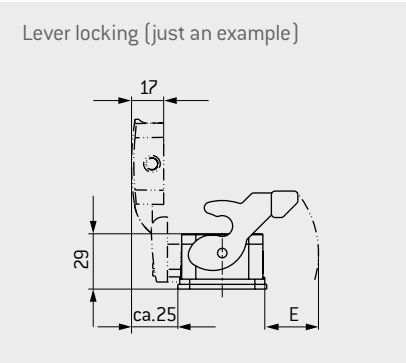
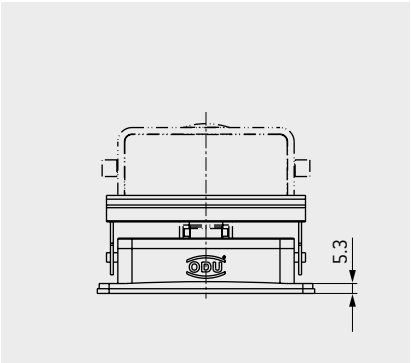
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) used).

BULKHEAD MOUNTED HOUSING



For mounting on the device.

LEVER LOCKING



TECHNICAL DATA

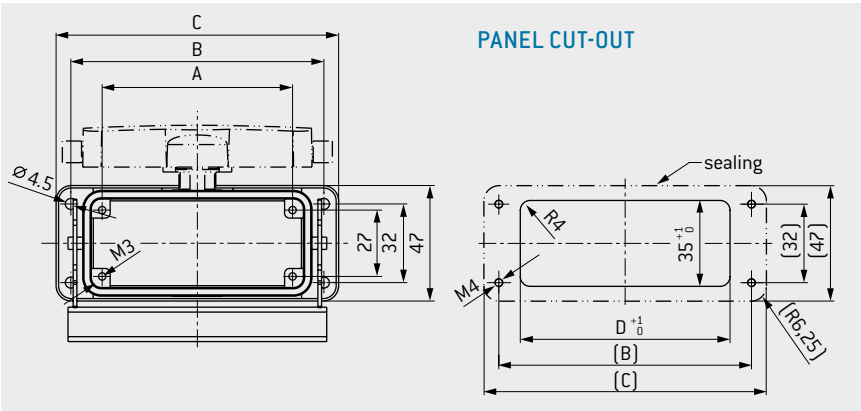
Color of housing Gray (standard similar to RAL 7001)

Material Aluminium die casting

Protection class¹ 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)



With lever a locking minimum of 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

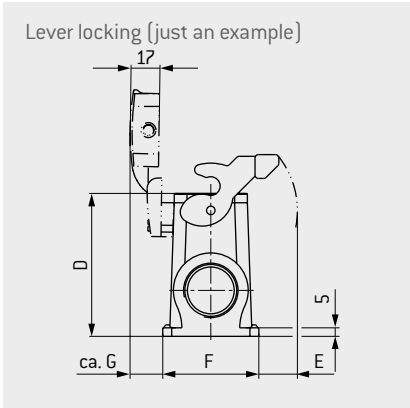
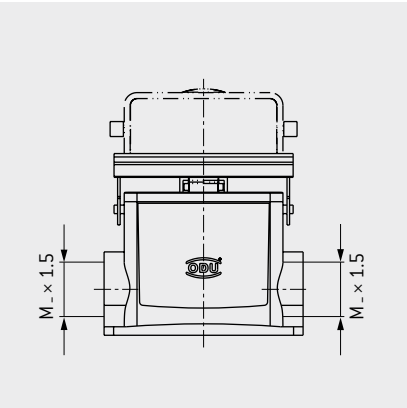
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the hood cable clamp(s) used).

SURFACE MOUNTED HOUSING



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

LEVER LOCKING



TECHNICAL DATA

Color of housing Gray (standard similar to RAL 7001)

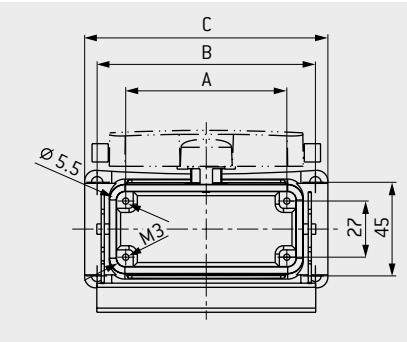
Material Aluminium die casting

Protection class¹ 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 62



With lever a locking minimum of 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 UPON REQUEST.

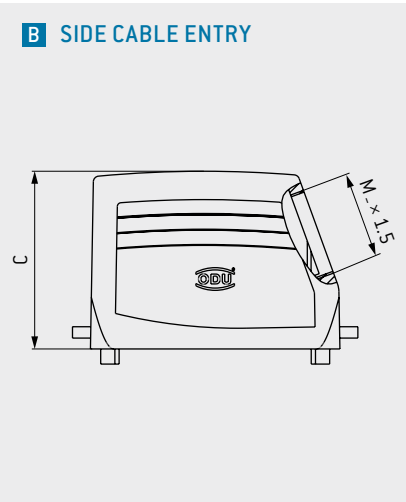
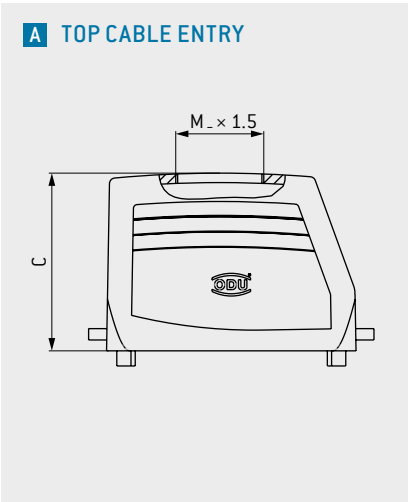
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the base and hood cable clamps used).

CABLE HOOD WIDE



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

LEVER LOCKING



TECHNICAL DATA

Color of housing Gray (standard, similar to RAL 7001)

Material Aluminium die casting

Protection class¹ IP 65

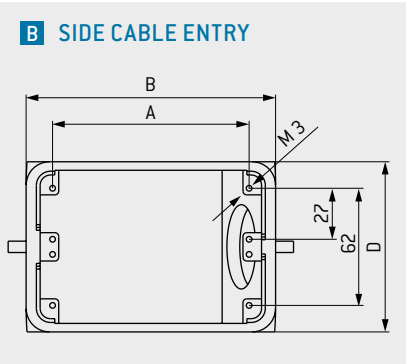
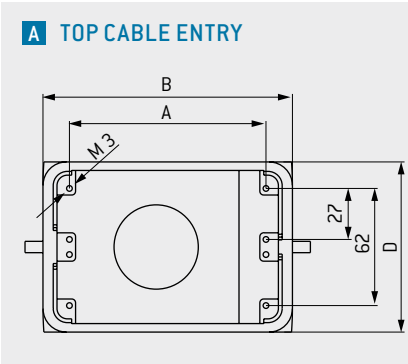
Operating temperature in mated condition
 without housing sealing:
 –40 °C to +125 °C

Housing suitable for two standard frames size 3 or 4.

2 × size 3 = size 5

2 × size 4 = size 6

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



Size	Part number A	Part number B	Dim. A	Dim. B	Dim. C	Dim. D	Dim. M
	Top cable entry	Side cable entry	mm	mm	mm	mm	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

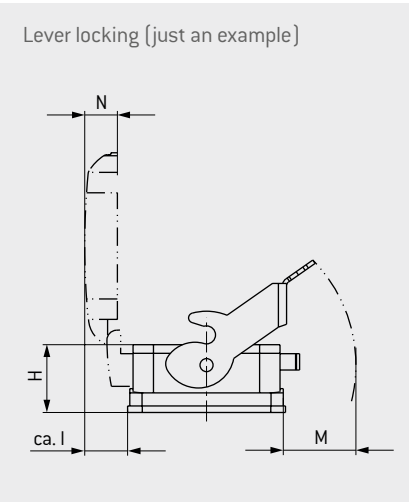
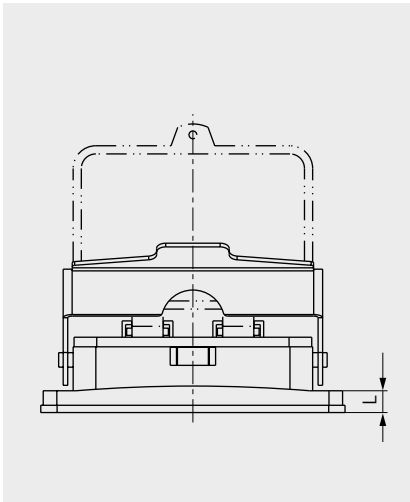
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the cable clamp(s) used).

BULKHEAD MOUNTED HOUSING FOR CABLE HOOD WIDE



For mounting on the device.

LEVER LOCKING



TECHNICAL DATA

Color of housing Gray (standard similar to RAL 7001)

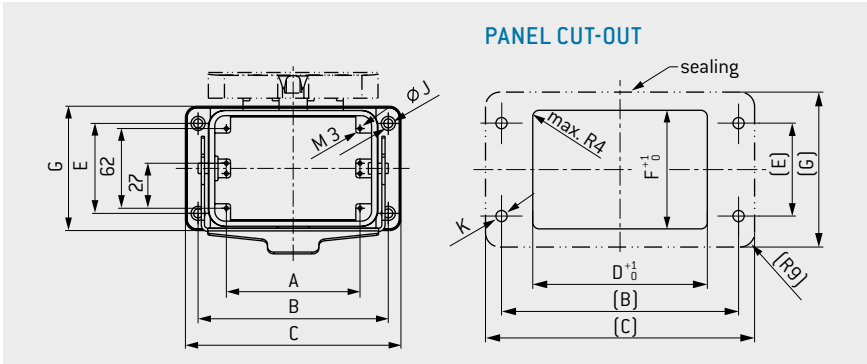
Material Aluminium die casting

Protection class¹ 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)

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



Size	Part number A	Part number B	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Dim. G	Dim. H	Dim. I	Dim. J	Dim. K	Dim. L	Dim. M	Dim. N
	Without protective cover	With protective cover	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	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

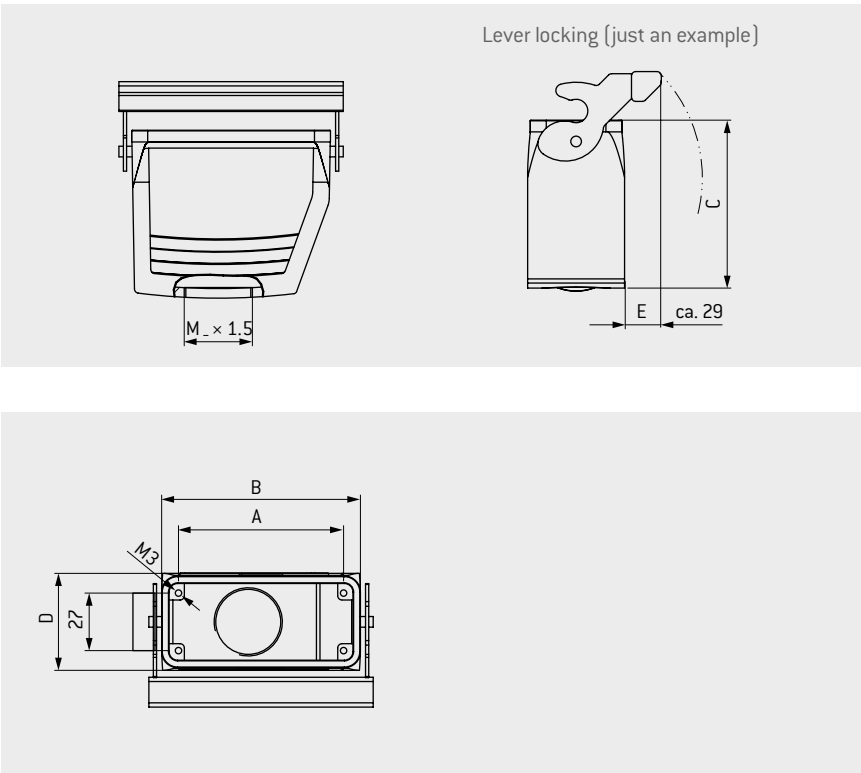
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the hood cable clamp(s) used).

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 for use with cable hoods (page 48).

Color of housing Gray (standard similar to RAL 7001)

Material Aluminium die casting

Protection class¹ 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 see page 61

Adapter for PG clamp see page 62

With lever a locking minimum of 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 gray (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 UPON REQUEST.

¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the hood cable clamp(s) used).

TRANSVERSE LOCKING



Housing with side lockings. On request.



TECHNICAL DATA

Color of housing Gray (standard similar to RAL 7001)

Material Aluminium die casting

Protection class¹ IP 65 in mated condition

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

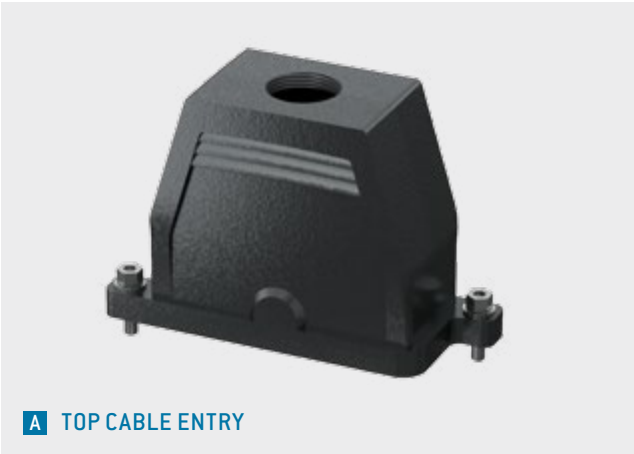
Sealing NBR; sealing material

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

¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the hood cable clamp(s) used).

CABLE HOOD IN IP 68/IP 69

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

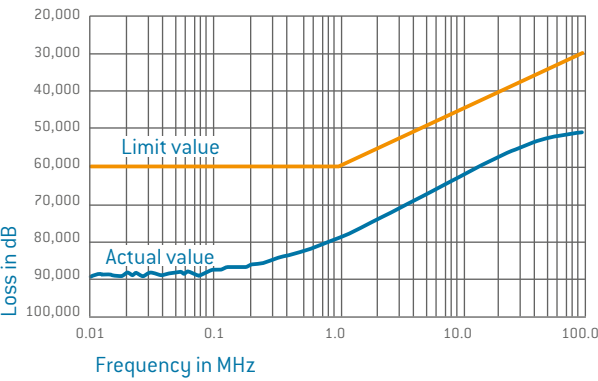


A TOP CABLE ENTRY



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
Color	Black (similar to RAL 9002)
Protection class ¹	IP 68, IEC 60529:2013 (VDE 0470-1:2014) IP 69, IEC 60529:2013 (VDE 0470-1:2014)

Screw locking

Application areas

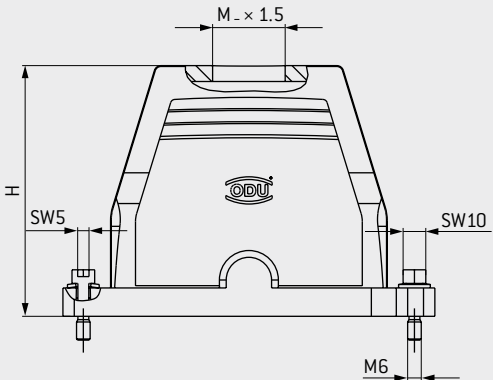
Used in EMC shielded applications.
Housing construction according to IEC 61373:2010 (VDE 0115-106:2011)
Cat. 2 (bogie) from rail engineering.

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

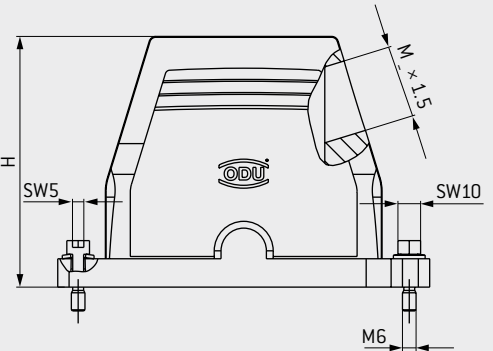
¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the hood cable clamp(s) used).



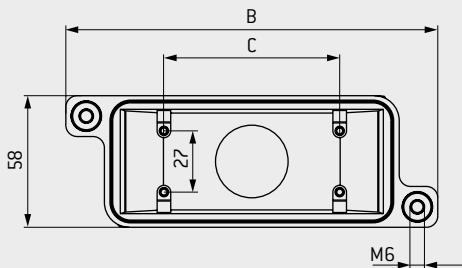
A TOP CABLE ENTRY



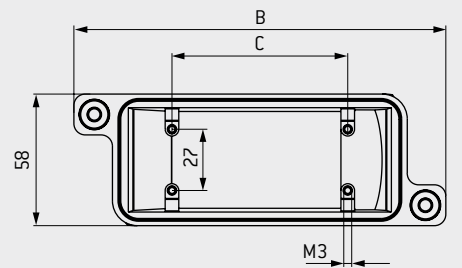
B SIDE CABLE ENTRY



A



B



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

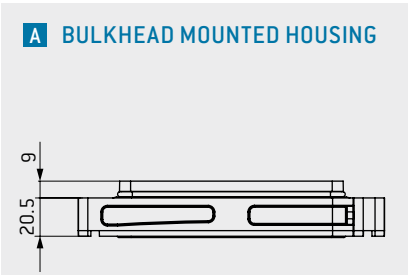
For applications with extreme requirements. With 360° EMC shielding according to VG 95373-41:1997.
On request.



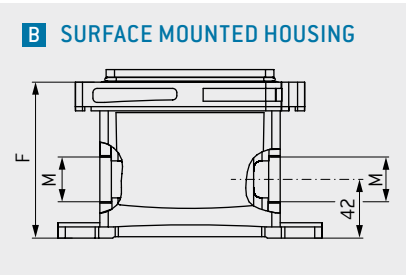
A BULKHEAD MOUNTED HOUSING



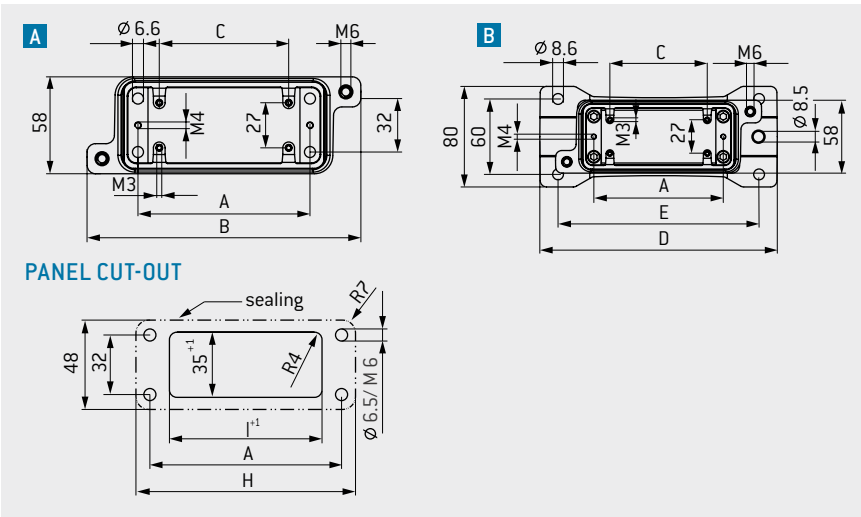
B SURFACE MOUNTED HOUSING



A BULKHEAD MOUNTED HOUSING



B SURFACE MOUNTED HOUSING



PANEL CUT-OUT

TECHNICAL DATA

EMC model
Surface Electrically conductible
Sealing Inside protected
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
Color Black (similar to RAL 9002)
Protection class¹ IP 68, IEC 60529:2013 (VDE 0470-1:2014)
IP 69, IEC 60529:2013 (VDE 0470-1:2014)
Sealing Conductive silicone

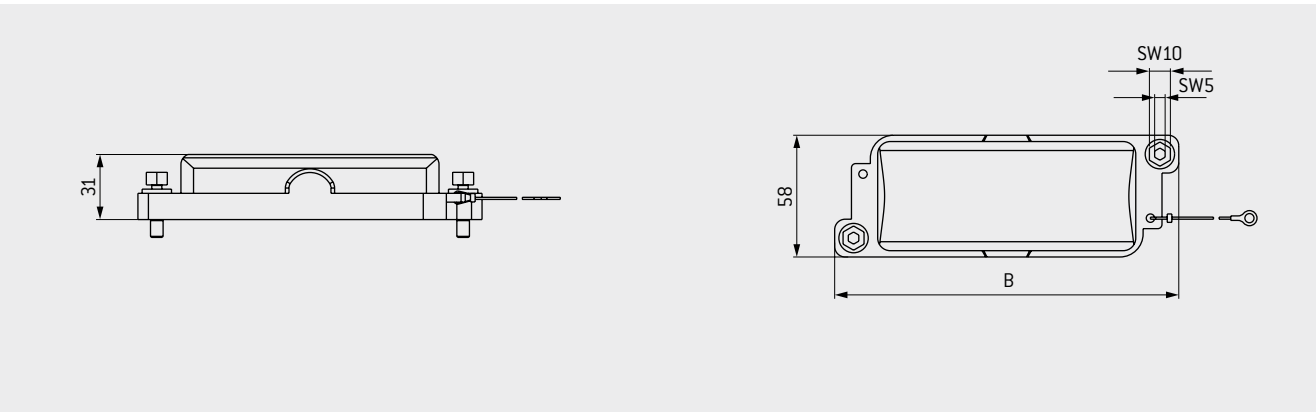
Application areas
Used in EMC shielded applications.
Housing construction according to IEC 61373:2010 (VDE 0115-106:2011, bogie) from rail engineering.

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

¹ IEC 60529:2013 (VDE 0470-1:2014) (Depends on the base and hood cable clamps used).

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® BLUE-LINE FRAMES FOR HOUSING



With grounding for housing.

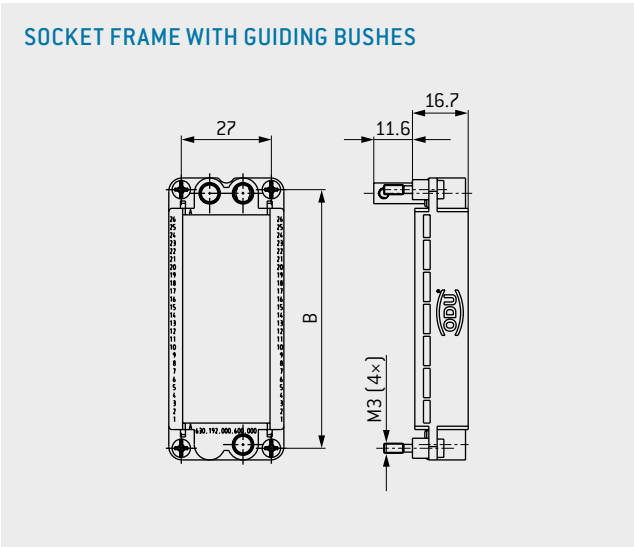


TECHNICAL DATA

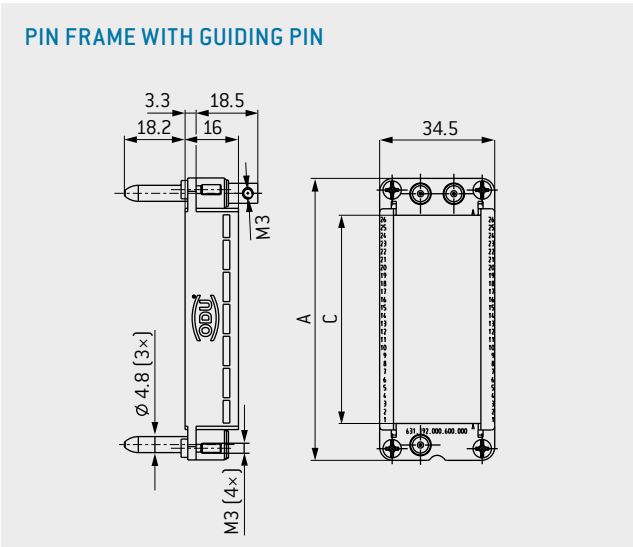
- zinc diecasting, nickel-plated
- 1 unit = 2.4 mm

Included in the scope of delivery: secondary locking

Use and assembly, see p. 29.



Sockets in bulkhead and surface mounted housing and cable to cable hoods. Pins in the cable hood. Modules are not assembled, contacts are included as loose parts. See the options for coding from page 66.



The same dimensions apply to the height of the contact pins as to the corresponding modules that are described.

Size	Part number	Part number	Max. Units	Dim. A	Dim. B	Dim. C
	Socket frame	Pin frame	2.4 mm ¹	mm	mm	mm
1	630.190.000.600.000	631.190.000.600.000	12	51	44	12 × 2.4 = 28.8
2	630.191.000.600.000	631.191.000.600.000	18	64	57	18 × 2.4 = 43.2
3	630.192.000.600.000	631.192.000.600.000	26	84.5	77.5	26 × 2.4 = 62.4
4	630.193.000.600.000	631.193.000.600.000	37	111	104	37 × 2.4 = 88.8

Please note that when equipping size 5 and 6 housings two frames are required.

¹ If the configuration frame is not completely filled, use the blank modules (see page 124).

CABLE CLAMP AND REDUCING RING



CABLE CLAMP¹ FOR HOUSINGS ACCORDING TO IEC 62444:2010 (VDE 0619:2014)



TECHNICAL DATA

Material Körper PA
Sealing NBR; sealing material
Protection class IP 68 to 5 bar
Temperature range −40 °C to +100 °C

EMC clamp on request.

Part number	Thread	Color	Width across flats	Tight- ening torque	Cable diameter mm	
					min.	max.
027.825.060.130.007	M25 × 1.5	Gray	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
027.832.070.150.008	M32 × 1.5		Black	36	10	7
027.832.110.210.008	M32 × 1.5	11				21
027.840.190.280.008	M40 × 1.5	19				28

REDUCING RING FOR PLASTIC HOUSING



TECHNICAL DATA

Color Black (RAL 9005)
Material Plastic PA6 GF20
Protection class IP65
Temperature range −40 °C to +125 °C
Sealing NBR; sealing material

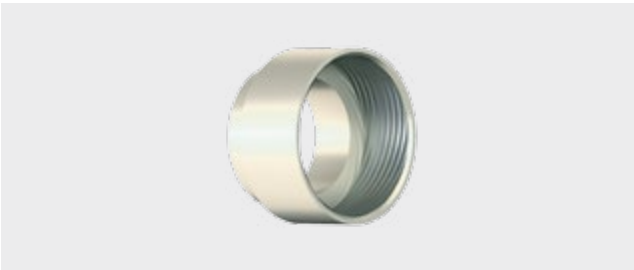
Part number	External thread	Internal thread
921.000.006.000.356	M40 × 1.5	M32 × 1.5

¹ Delivery doesn't contain cable clamp, but o-ring is enclosed with the housing.

ADAPTER RING, BLIND GROMMET AND LOCKNUT



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	M25 × 1.5	PG 21
921.000.006.000.255	M32 × 1.5	PG 29
921.000.006.000.267	M32 × 1.5	M40 × 1.5

BLIND GROMMET FOR SURFACE MOUNTED HOUSING



TECHNICAL DATA

Color Gray
Material PA fiber glass reinforced
Protection class IP68
Temperature range −40 °C to +125 °C
Sealing NBR; sealing material

Part number	Thread
921.000.006.000.279	M25 × 1.5
921.000.006.000.268	M32 × 1.5
On request	M40 × 1.5
On request	M50 × 1.5

LOCKNUT FOR CABLE CLAMP



TECHNICAL DATA

Material Nickel-plated brass

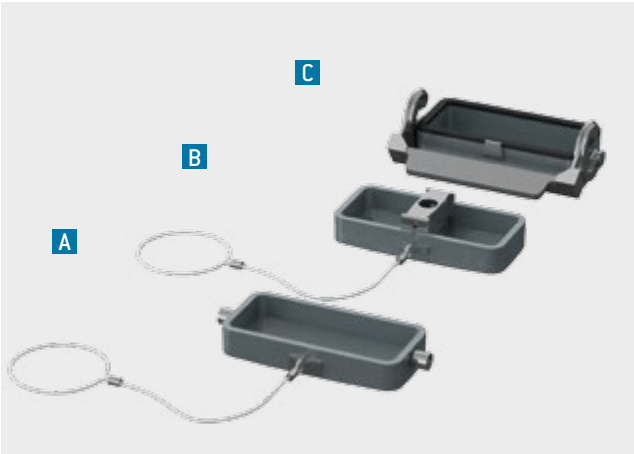
Part number	Thread
931.000.003.000.112	M32 × 1.5
931.000.003.000.113	M40 × 1.5

For fixing the cable clamp in the ODU-MAC strain relief housing .

FOR YOUR NOTES

PROTECTIVE COVER

For metal housing.



TECHNICAL DATA	
Color	Gray (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 [B]	
Material	Aluminium die casting (body)
Temperature range	−40 °C to +125 °C
Sealing	NBR; sealing material

A METAL PROTECTIVE COVER
for bulkhead mounted, surface mounted housing and cable-to-cable-hoods

A VIEW WITHOUT LANYARD

B METAL PROTECTIVE COVER
for cable hood and cable hood XXL for spindle locking

B VIEW WITHOUT LANYARD

C METAL PROTECTIVE COVER
for cable hood and cable hood XXL for lever locking

C VIEW WITHOUT LOCKING LATCH

Lever locking just an example.

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	491.097.613.644.001	491.097.212.644.000	73
3	492.097.133.644.000	492.097.613.644.001	492.097.214.644.000	93.5
4/XXL	493.097.133.644.000	493.097.613.644.001	493.097.214.644.000	120

PROTECTIVE TRANSPORT COVER AND SECONDARY LOCKING



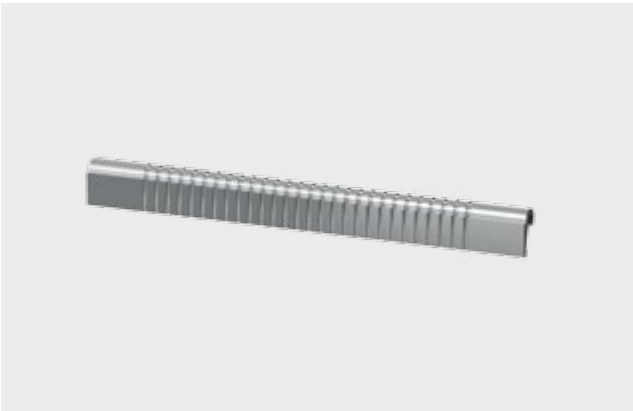
TRANSPORT PROTECTIVE COVER FOR METAL HOUSING – for the protection of the assembled cable hood during transport.



TECHNICAL DATA	
Material	Plastic PP / antistatic
Color	Black (similar to RAL 9002)

Size	Part number With carry lanyard	Part number With carry 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

SECONDARY LOCKING FOR MODULES



TECHNICAL DATA	
Material	Thermoplastic, glass-fiber reinforced

Size	Part number — Only if a replacement is required ¹
1	631.000.001.923.190
2	631.000.001.923.191
3	631.000.001.923.192
4	631.000.001.923.000

¹ The secondary locking is included in the standard scope of delivery

CODING OPTIONS FOR LEVER LOCKING



To prevent mismatching.

In order to prevent mismatching, it is in some cases useful to provide the connection systems with a coding system.

Instead of cylinder screws, coding pins and coding sockets can be used in the ODU-MAC Blue-Line in the housing. ODU offers 16 different coding options. Standard frames do not include additional coding upon delivery. If several adjacent connectors are used, this can prevent mismatching.



CODING OPTIONS

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 pin
○ = Coding socket



CODING EXAMPLE



Frame	Part number matching the frame no.	Coding	
		● Part number pin	○ Part number socket
Pin	631.19X.000.600.000	631.090.301.700.000 	630.090.302.700.000
Socket	630.19X.000.600.000	631.090.302.700.000 	630.090.301.700.000

PART NUMBER BASIC TOOL, TORQUE SCREWDRIVER/1.2 NM: 598.054.002.000.000
PART NUMBER TOOL INSERT FOR CODING PIN: 598.054.203.000.000
PART NUMBER TOOL INSERT FOR CODING SOCKET: 598.054.107.000.000

An overview of all tools is on page 132.

CODING OPTIONS FOR HOUSING WITH SPINDLE LOCKING



To prevent mismating.

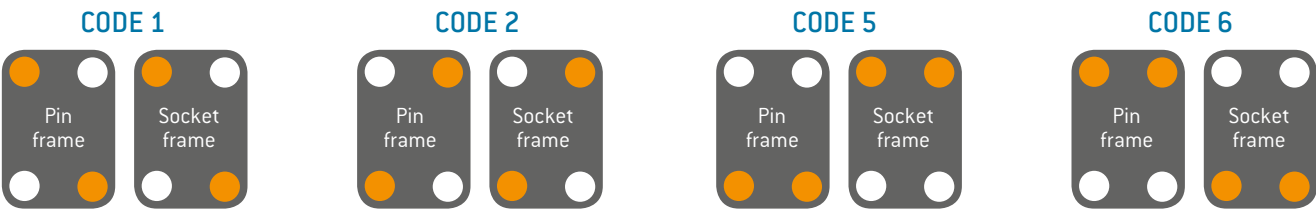
In order to prevent mismating, it is in some cases useful to provide the connection systems with a coding system.

Instead of cylinder screws, coding pins and coding sockets can be used in the ODU-MAC Blue-Line in the housing. ODU offers 4 coding variations with these coding options in combination with spindle locking. Standard frames do not include additional coding upon delivery. If several adjacent connectors are used, this can prevent mismating.



Alternatively, if additional coding options are required, ODU offers an innovative option with the coded spindle of pages 70–71.

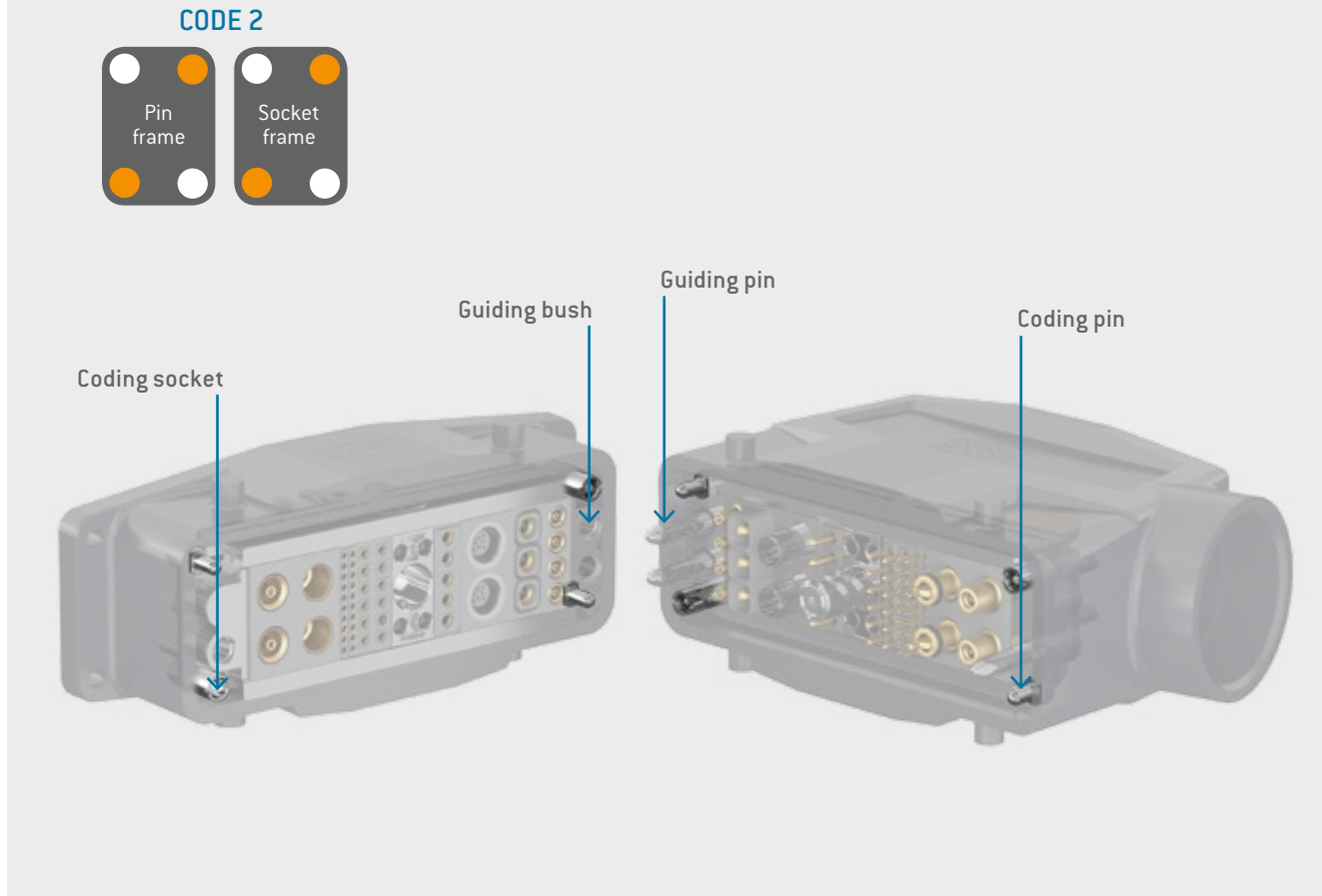
CODING OPTIONS



● = Coding pin
○ = Coding socket



CODING EXAMPLE



Frame	Part number matching the frame no.	Coding	
		● Part number pin	○ Part number socket
Pin	631.19X.000.600.000	631.090.301.700.000 	630.090.302.700.000
		631.090.302.700.000 	630.090.301.700.000
Socket	630.19X.000.600.000		

PART NUMBER BASIC TOOL, TORQUE SCREWDRIVER/1.2 NM: 598.054.002.000.000
PART NUMBER TOOL INSERT FOR CODING PIN: 598.054.203.000.000
PART NUMBER TOOL INSERT FOR CODING SOCKET: 598.054.107.000.000

An overview of all tools is on page 132.

CODING OPTIONS FOR CODED SPINDLE



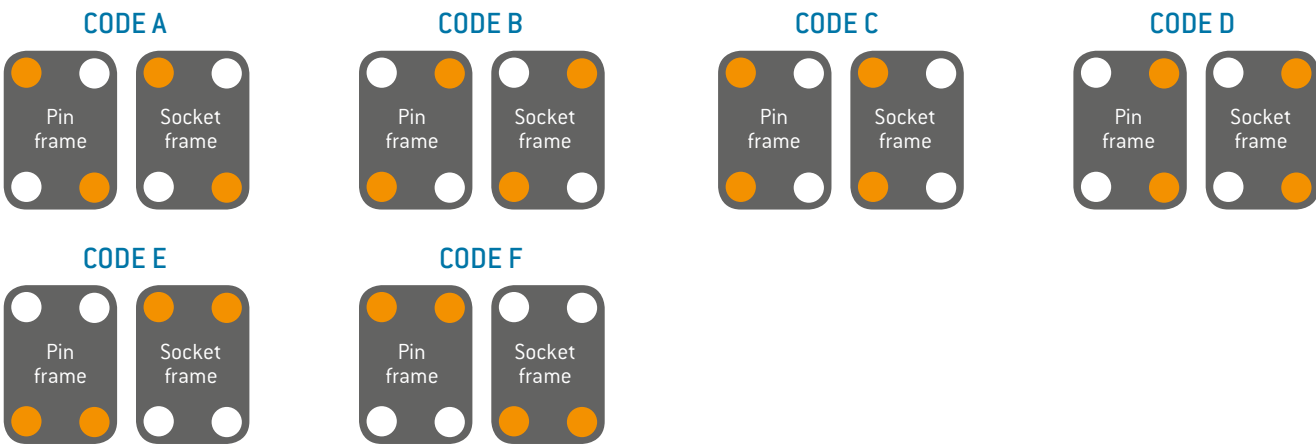
To prevent mismating.

In order to prevent mismating, it is in some cases useful to provide the connection systems with a coding system.

For this purpose, ODU has developed innovative coding to provide housing variation that is directly integrated into the spindle of the ODU-MAC. ODU provides up to six different coding options with the installation of 2 keying pins in the spindle locking and 2 closure plugs in the center module. If several adjacent connectors are used, this can prevent mismating.



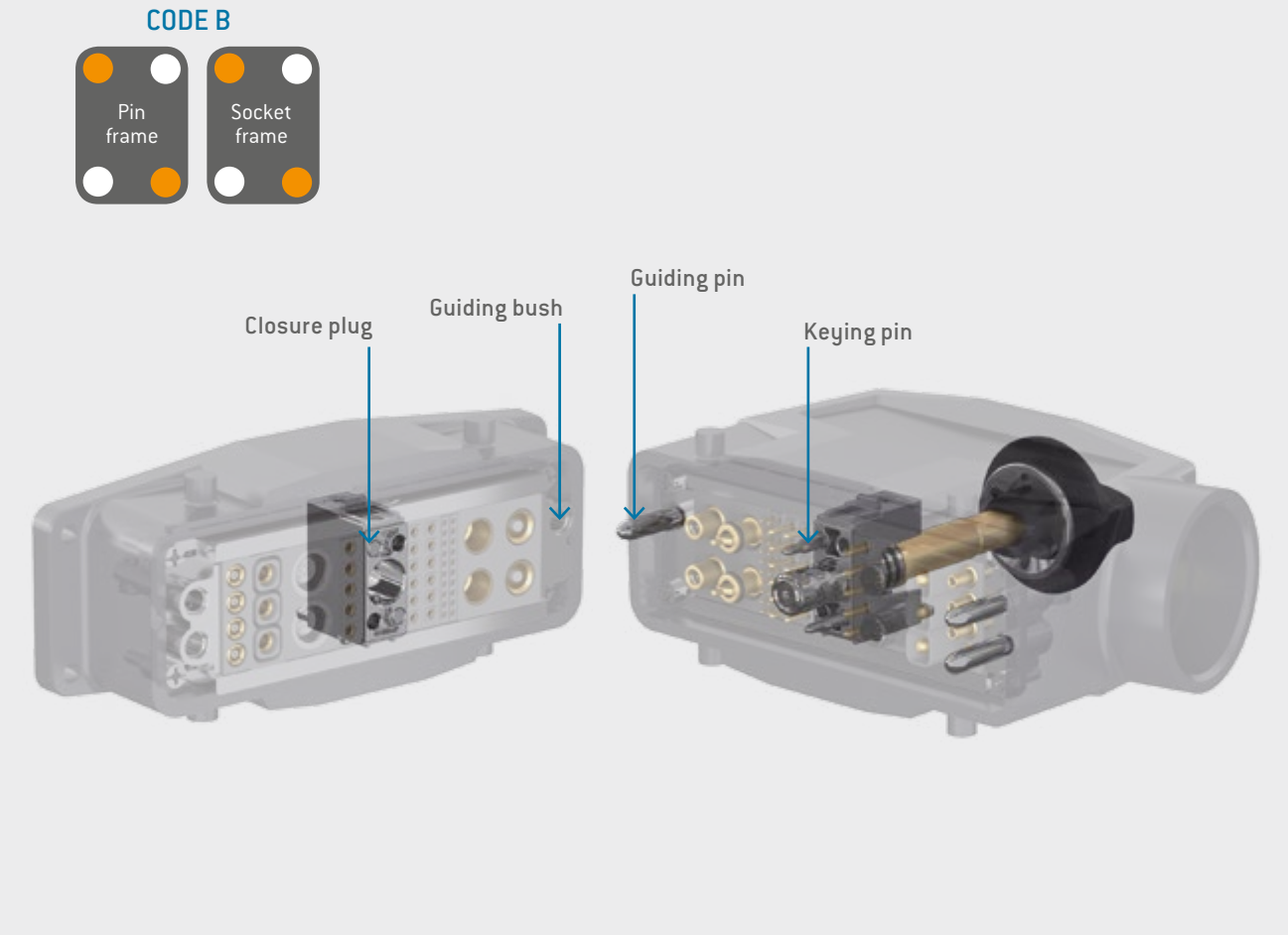
CODING OPTIONS



● = Keying pin
○ = closure plug





CODING EXAMPLE



Size	WITH CODING ¹		Angle of rotation
	Part number Center module for bulkhead mounted, surface mounted housing and cable-to-cable-hoods	Part number Spindle locking for cable hoods	
2 (52 mm high)	634.090.001.304.010	635.091.003.200.010	180°
2 (72 mm high)	634.090.001.304.010	635.091.001.200.010	180°
3/4	634.090.001.304.010	635.092.011.200.010	270°
3/4	634.090.001.304.010	635.092.011.200.013	360°
XXL	634.090.001.304.010	635.093.011.200.010	270°
XXL	634.090.001.304.010	635.093.011.200.013	360°

¹ Keying pins and closure plugs are included as loose parts.

ONLY IF A REPLACEMENT IS REQUIRED ²	
Part number keying pin	Part number closure plug
	
635.090.105.902.000	634.090.106.902.000

² They are included in the standard scope of delivery.

TORQUE SCREWDRIVER/0.9 NM FOR LEFT-HAND THREAD
PART NUMBER BIT SLOT FOR THE ASSEMBLY OF THE SPINDLE CODING: 598.054.109.000.000

An overview of all tools is on page 132.

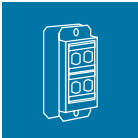


CONFIGURE THE ODU-MAC® BLUE-LINE.
SIMPLY ONLINE AT: WWW.ODU-MAC.COM

AUTOMATIC DOCKING

Requirements on the complete system	74
ODU-MAC® Blue-Line docking frames	76
ODU strain relief housing	77

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.

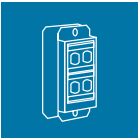
MAXIMUM PERMISSIBLE OFFSET + STANDARD GAP MEASURE IN MATED CONDITION (RADIAL PLAY)

Frame	Toleranz
Docking frame	$\pm 0,6\text{ mm}$

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.



YOU REQUIRE GREATER VARIETY? A MORE COMPREHENSIVE OFFER IS PROVIDED BY OUR ODU MAC® SILVER-LINE – THE SPECIALIST FOR AUTOMATIC DOCKING SOLUTIONS.

EXAMPLE SYSTEM (MECHANICAL NECESSITY)

Strain relief for cables/braids must be provided by the customer. Draw your attention to our strain relief housing page 77.

- 1 ODU-MAC Blue-Line socket piece (fixed) (screwed tight without play to wall B)
- 2 Fastening screw
- 3 Tolerance compensation: Axial play: 0.1 mm Radial play: $\pm 0.6\text{ mm}$
- 4 Pins for self-centering of ODU-MAC Blue-Line
- 5 ODU-MAC Blue-Line pin piece (floating) (with play via centering socket; screwed tight to wall)
- 6 Pin for guiding walls B and S (customer performance)

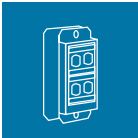
The values for the connected condition (pin S in B) result from the axial play of the centering sockets.

NOTE: AUTOMATIC DOCKING SYSTEMS

- The pin piece of the ODU-MAC Blue-Line is to be fixed with the accompanying centering sockets and has mounted floating
- The guiding system of the ODU-MAC Blue-Line provides no guiding hardware for the overall plug-in.
- The maximum permissible gap between socket and pin pieces is 0.5 mm as standard. Extension with long contact pins is possible.
- An alignment system (e.g. guide rails, etc.) is necessary to achieve high mating cycles. The max. permissible alignment error is, for example, less than $\pm 0.6\text{ mm}$ radial for the ODU-MAC Blue-Line docking frame.
- Strain relief for the cables/braids must be provided by the customer or use our strain relief housing see page 77.

FAILURE TO OBSERVE THESE SPECIFICATIONS MAY RESULT IN DAMAGE.

ODU-MAC® BLUE-LINE DOCKING FRAMES



Standard solutions for docking applications (such as rack & panel).



TECHNICAL DATA

- Tolerance compensation:
Axial play: 0.1 mm
Radial play: +/-0.6 mm
- Pin piece (floating)

In the scope of delivery: secondary locking

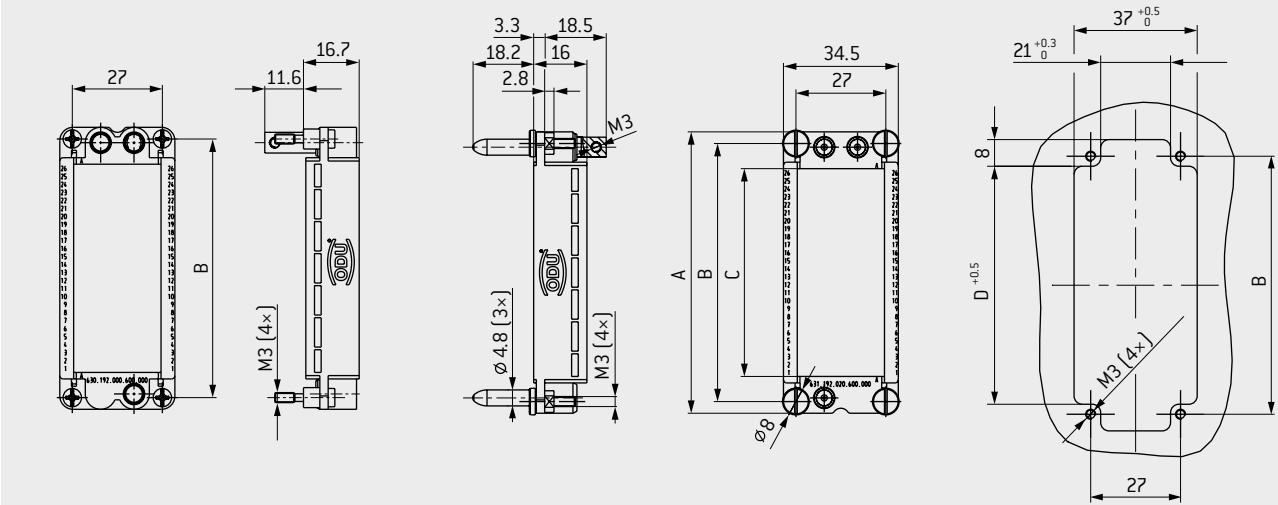
Use and assembly, see p. 29.



SOCKET FRAME WITH GUIDING BUSH

PIN FRAME WITH GUIDING PIN

PANEL CUT-OUT



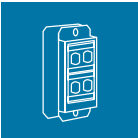
Modules are not mounted, contacts are not fixed enclosed.

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

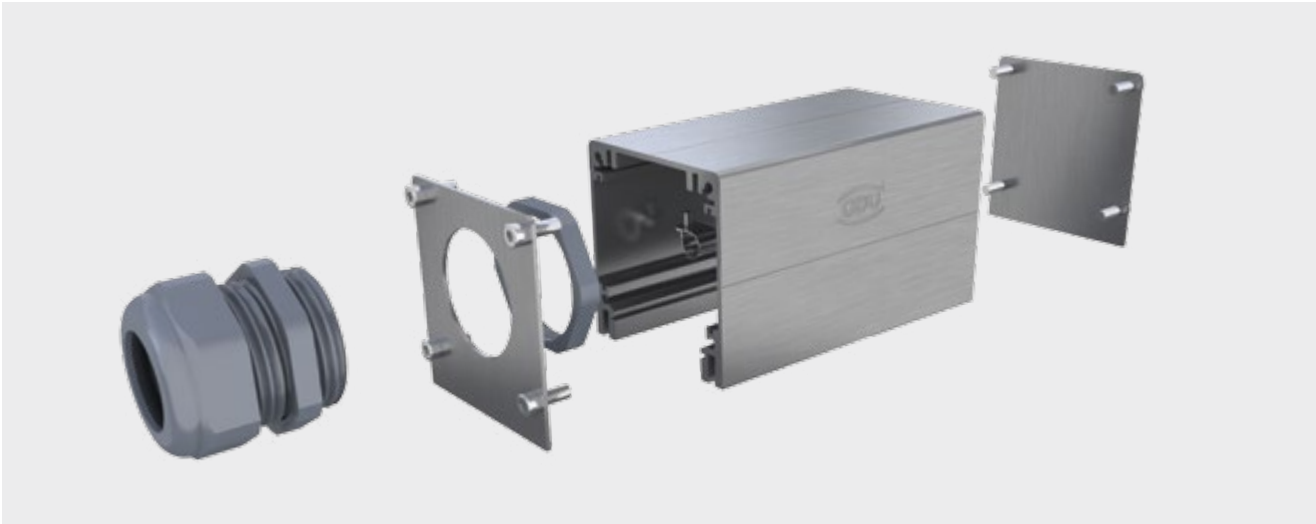
Size	Part number Socket frame	Part number Pin frame	Max. Units 2.4 mm ¹	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm
1	630.190.000.600.000	631.190.020.600.000	12	51	44	12 × 2.4 = 28.8	38
2	630.191.000.600.000	631.191.020.600.000	18	64	57	18 × 2.4 = 43.2	51
3	630.192.000.600.000	631.192.020.600.000	26	84.5	77.5	26 × 2.4 = 62.4	71.5
4	630.193.000.600.000	631.193.020.600.000	37	111	104	37 × 2.4 = 88.8	98

¹ If the configuration doesn't fill the frame completely, please use blank modules (see page 124).

ODU-MAC® BLUE-LINE STRAIN RELIEF HOUSING



The accessories for docking solutions.



APPLICATION EXAMPLE



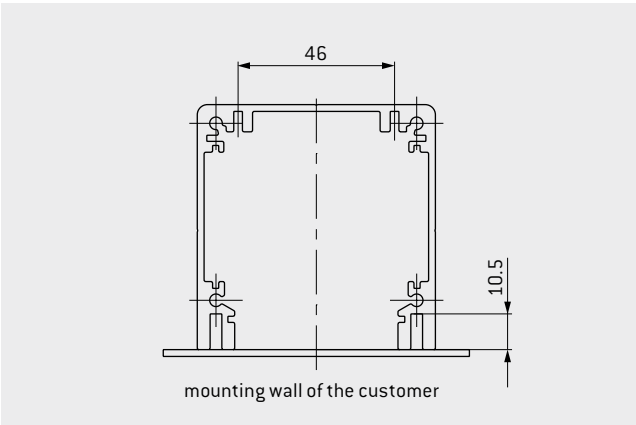
Additional M32 cable clamps can be placed by the customer.

TECHNICAL DATA

- Material: aluminium
- Operating temperature: -40 °C to +125 °C
- Protection class¹ can be adjusted individually
- Cable clamps, see page 61
- Locknut for cable clamp see page 62

CHARACTERISTICS

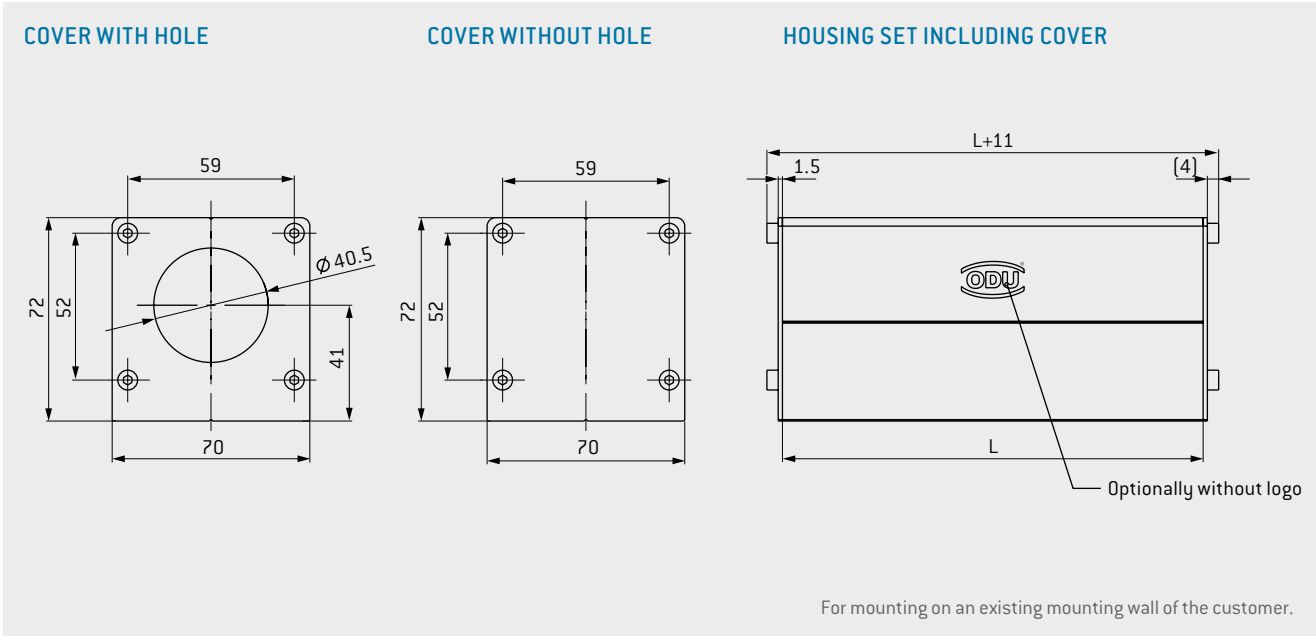
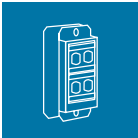
- Resistant and compact
- Protection of the termination area
- Individual strain-relief variations, cable entries as well as grounding connections
- Suitable for all ODU-MAC docking frames (additional lengths available on request)
- Optional fixing of the PCBs and components in the protected interior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



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

ODU-MAC® BLUE-LINE STRAIN RELIEF HOUSING

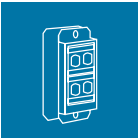
The accessories for docking solutions.

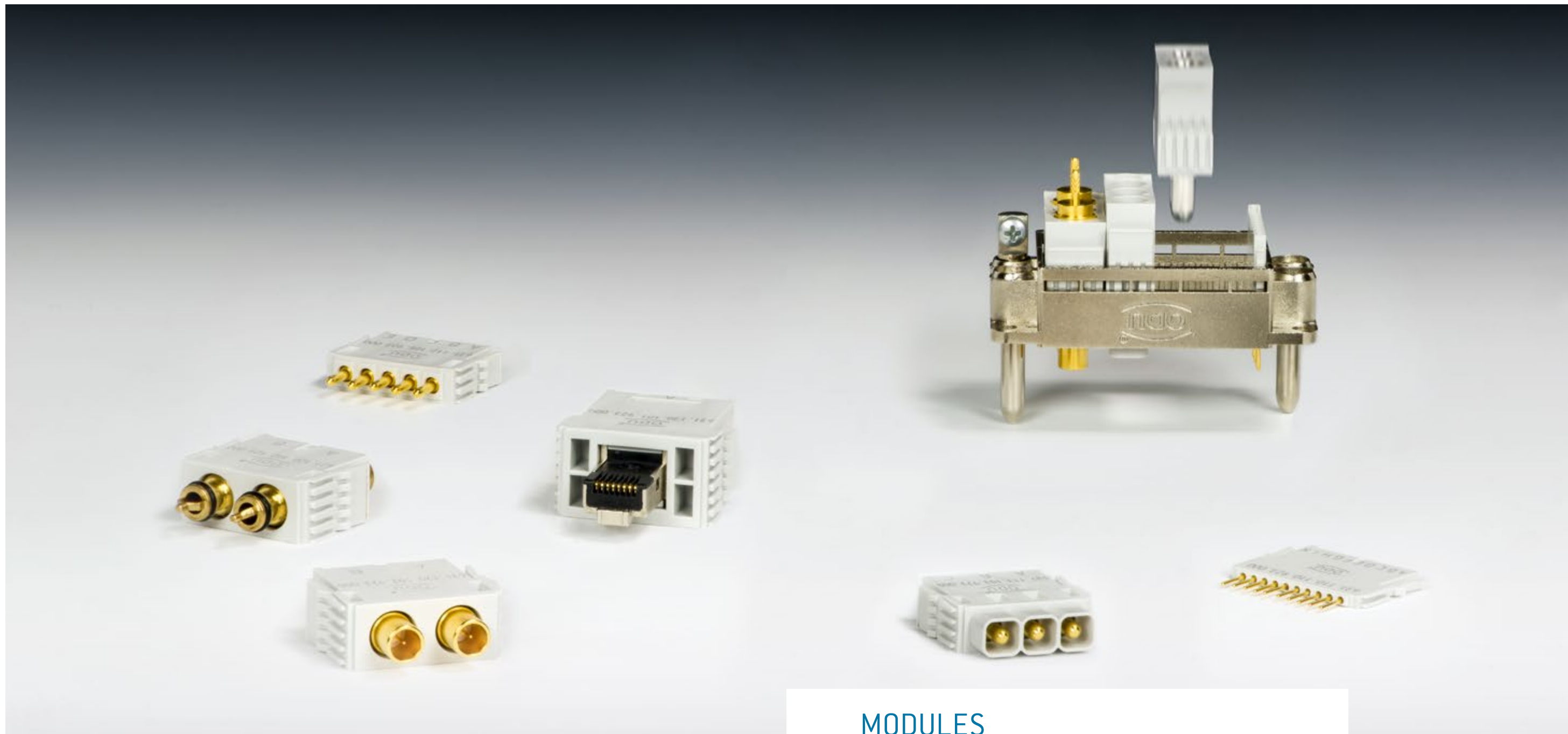


The set comprises a housing profile including 2 covers and corresponding fastening screws for assembly of the included cover. Fastening material for an existing mounting wall of the customer is not included in the scope of delivery.

Part number 2 × cover without hole	Part number 1 × cover with/1 × cover without hole	Part number 2 × cover with hole	Frame size	Dim. L mm
616.010.100.600.000	616.010.114.600.000	616.010.144.600.000	1–3	97
616.020.100.600.000	616.020.114.600.000	616.020.144.600.000	4	123

FOR YOUR NOTES





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ODU-MAC®

MODULES

Overview	82
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Blank modules	124

OVERVIEW OF ALL MODULES



	Modules	Description	Units/width	Features	Page
Signal		20 contacts Contact Ø: 0.7 mm	<div>2 Units</div> 4.8 mm	Highest packing density and pin protection Operating voltage ¹ 250 V Rated impulse voltage ¹ 2,000 V Max. continuous current ² 11 A for 0.38 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	86
		10 contacts Contact Ø: 0.7 mm	<div>1 Unit</div> 2.4 mm	Highest packing density Operating voltage ¹ 320 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 11 A for 0.38 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	88
		6 contacts Contact Ø: 1.3 mm	<div>2 Units</div> 4.8 mm	Operating voltage ¹ 400 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 19.5 A for 1 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	90
		5 contacts Contact Ø: 2 mm	<div>3 Units</div> 7.2 mm	Operating voltage ¹ 630 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 33 A for 2.5 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	92
Power		3 contacts Contact Ø: 3.5 mm	<div>4 Units</div> 9.6 mm	High voltage Operating voltage ¹ 2,500 V Rated impulse voltage ¹ 10,000 V Max. continuous current ² 58 A for 6 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	94
High current		2 contacts for turned contacts with ODU LAMTAC® ³ Contact Ø: 5 mm	<div>5 Units</div> 12 mm	Operating voltage ¹ 400 V Rated impulse voltage 4,000 V Max. continuous current ² 108 A for 16 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	96

¹Acc. to IEC 60664-1:2007 (VDE 0110-1:2008) for degree of pollution 2. ²Definition max. continuous current, see page 145. ³Contact with lamella technology.

OVERVIEW OF ALL MODULES



	Modules	Description	Units/width	Features	Page
High current		2 contacts for turned contacts with ODU LAMTAC® ³ Contact Ø: 8 mm	<div>9 Units</div> 21.6 mm	Highest current Operating voltage ¹ 400 V Rated impulse voltage ¹ 3,000 V Max. continuous current ² 150 A for 25 mm² Degree of pollution ¹ 2 Mating cycles minimum 10,000	98
Coax		4 contacts for 50 Ω coax contacts	<div>3 Units</div> 7.2 mm	High packing density Frequency range 0–2.8 GHz Mating cycles minimum 10,000	100
		2 contacts for 50 Ω coax contacts	<div>5 Units</div> 12 mm	Frequency range 0–4 GHz Mating cycles minimum 10,000	102
		2 contacts for 75 Ω coax contacts	<div>5 Units</div> 12 mm	Frequency range 0–2.7 GHz Mating cycles minimum 10,000	104
Compressed air		2 contacts	<div>5 Units</div> 12 mm	12 bar Tube diameter inner Ø: max. 4 mm outer Ø Push-in: max. 6 mm Mating cycles minimum 10,000	106
Shielded-implementation/ high-speed connector		2 contacts	<div>6 Units</div> 14.4 mm	Mating cycles minimum 10,000 Suitable for all common bus systems 	110
		1 contact	<div>6 Units</div> 14.4 mm	Mating cycles minimum 10,000 Suitable for all common bus systems 	112

¹Acc. to IEC 60664-1:2007 (VDE 0110-1:2008) for degree of pollution 2. ²Definition max. continuous current, see page 145. ³Contact with lamella technology.

OVERVIEW OF ALL MODULES



	Modules	Description	Units/width	Features	Page
Shielded-implementation/ high-speed connector		1 contact RJ45 insert	 Units 16.8 mm	Mating cycles min. 5,000 10 gigabit Ethernet in accordance with IEEE 802.3 an-2006 CAT 5, CAT 6 _A in accordance with ANSI/TIA IEIA-568-32-10 	114
		2 contacts for SC insert	 Units 16.8 mm	Single mode (SM) Multi mode (MM) Mating cycles minimum 10,000	116
Fiber optic (on request)		2 contacts for LC insert	 Units 16.8 mm		
PCB termination modules		10 contacts Contact Ø: 0.7 mm	 Unit 2.4 mm	Highest packing density Operating voltage ¹ 250 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 7 A Degree of pollution ¹ 2 Mating cycles minimum 10,000	118
		6 contacts Contact Ø: 1.3 mm	 Units 4.8 mm	Operating voltage ¹ 400 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 13 A Degree of pollution ¹ 2 Mating cycles minimum 10,000	120
		5 contacts Contact Ø: 2 mm	 Units 7.2 mm	Operating voltage ¹ 630 V Rated impulse voltage ¹ 2,500 V Max. continuous current ² 25 A Degree of pollution ¹ 2 Mating cycles minimum 10,000	122
Blank modules		Blank Modules	 2.4 mm 7.2 mm 12 mm	Used to fill incomplete frames.	124

¹Acc. to IEC 60664-1:2007 (VDE 0110-1:2008) for degree of pollution 2. ² Definition max. continuous current, see page 145.

THE PCB TERMINATION MODULES



Connector technology with ease of use for single mode via PCB contact.

LONG SERVICE LIFE – ECONOMICAL – EASY HANDLING

Convenient exchange +

Quick-change system possible for parts subject to wear

+ Economical solution

No cables due to the PCB termination

+ Long service life

PCB termination modules are manufactured from temperature-resistant PA (soldering temperature 260 °C, 30 seconds)

Additional grounding +

Upon request, additional grounding is possible using grounding pin and socket

A

B

THE ADVANTAGES OF THE PCB TERMINATION ASSEMBLY

The PCB termination modules (A) are firmly mounted to the board and are connected via an interface to the module (B) that is plugged into the frame. If a module needs to be replaced, then only the module (B) installed in the frame must be replaced. Module (A) that is mounted on the PCB is not affected by this. An effective installation or quick-change function, as the case may be, is thereby achieved.

MODULES

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MODULE 20 CONTACTS

Pin protection against mechanical damage.



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.070.002.000

For an overview of all tools please see from page 133.

Contact diameter: 0.7 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 11 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²

Operating voltage	250 V	80 V
Rated impulse voltage	2,000 V	2,000 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	475 V
Test voltage	1,425 V

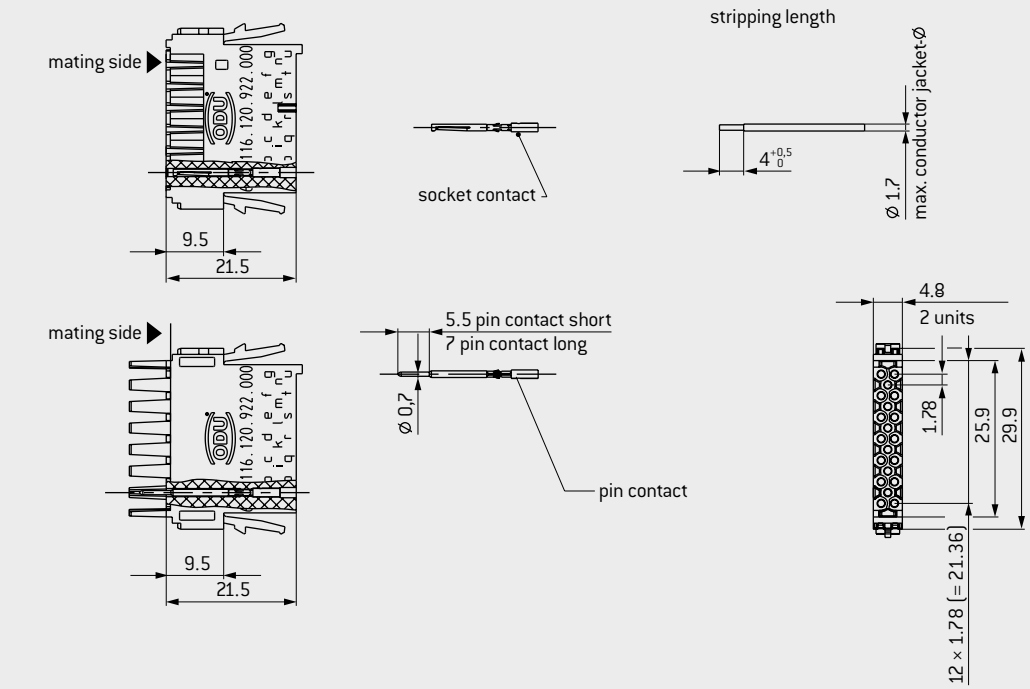
Mechanical data

Total mating force (average)	16 N / Modul
Total sliding force (average)	12 N / Modul
Contact diameter	0.7 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	minimum 10,000

Materials

Insulator	Thermoplastic acc. to UL-94
Contact	Cu alloy
Contact finish	gold-plated

INSULATOR PIN AND SOCKET



Module 20 contacts	Part number
Insulator socket	630.116.120.922.000
Insulator pin	631.116.120.922.000

Description	Part number	Conductor cross-section mm ²	Termination AWG / mm	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	185.431.000.270.000	0.14–0.38	22 / 26	7	5.5	11	3.5
Pin contact long	185.423.000.270.000						
Socket contact	175.581.000.270.000						

¹ Definition of max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.



¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 10 CONTACTS



Contact diameter: 0.7 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 11 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²

Operating voltage	320 V	125 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	475 V
Test voltage	1.425 V

Mechanical data

Total mating force (average)	8 N / Module
Total sliding force (average)	6 N / Module
Contact diameter	0.7 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	minimum 10,000

Materials

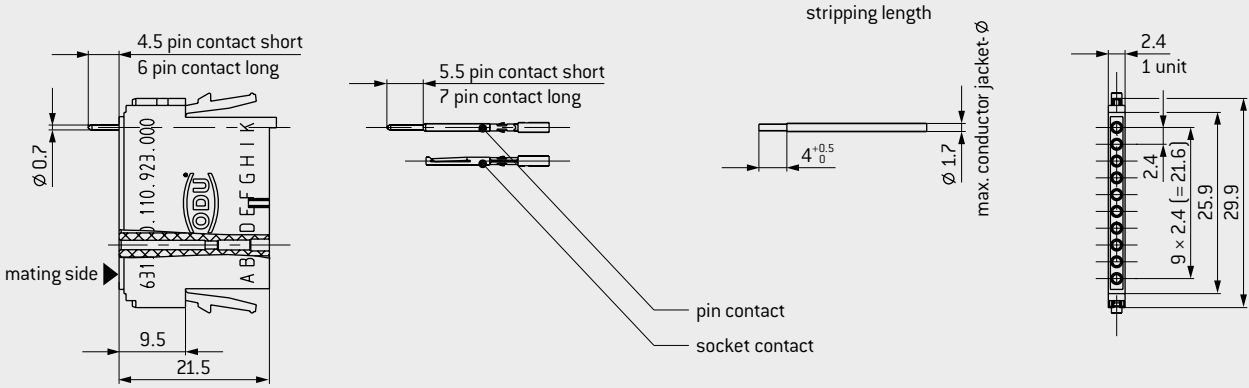
Insulator	Thermoplastic acc. to UL-94
Contact	Cu alloy
Contact finish	gold-plated



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.070.002.000

For an overview of all tools please see from page 133.

INSULATOR PIN AND SOCKET



Module 10 contacts	Part number
Insulator	631.110.110.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG/mm	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	185.431.000.270.000	0.14–0.38	22/26	7	5.5	11	3.5
Pin contact long	185.423.000.270.000						
Socket contact	175.581.000.270.000						

Suitable PCB termination modules can be found on page 118.

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.



¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 6 CONTACTS



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.130.004.000

For an overview of all tools please see from page [133](#).

Contact diameter: 1.3 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 19.5 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page [148](#)).
- Crimp information see page [128](#).

TECHNICAL DATA

Voltage information²

Operating voltage	400 V	160 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	775 V
Test voltage	2,325 V

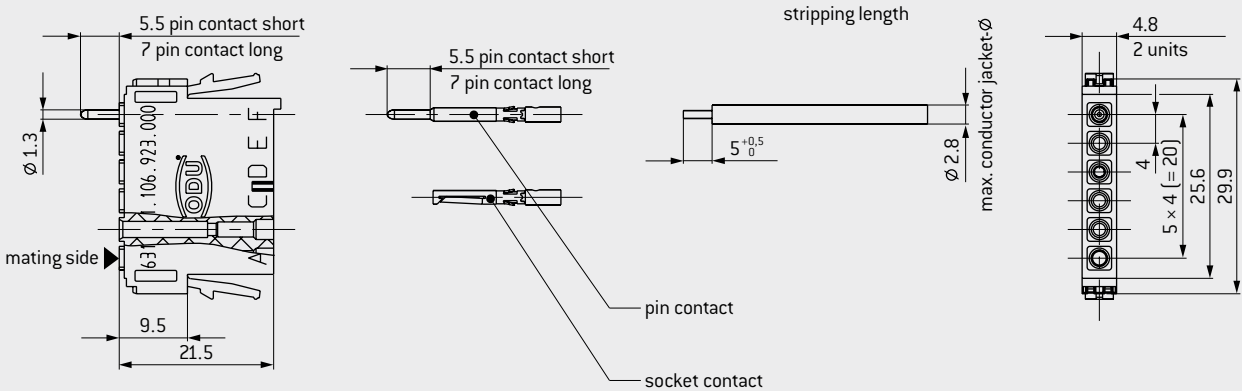
Mechanical data

Total mating force (average)	8.4 N / Module
Total sliding force (average)	7.2 N / Module
Contact diameter	1.3 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	minimum 10,000

Materials

Insulator	Thermoplastic acc. to UL-94
Contact	Cu alloy
Contact finish	gold-plated

INSULATOR PIN AND SOCKET



Module 6 contacts	Part number
Insulator	631.111.106.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG/mm	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	185.432.000.270.000	0.5–1	18/20	12.5	11.5	19.5	1.8
Pin contact long	185.424.000.270.000						
Socket contact	175.535.000.270.000						

Suitable PCB termination modules can be found on page [120](#).

¹ Definition max. continuous current, see page [145](#). ² IEC 60664-1:2007 (VDE 0110-1:2008) see page [139](#). ³ See page [143](#).



¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page [145](#).

MODULE 5 CONTACTS



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.200.003.000
For an overview of all tools please see from page 133.

Contact diameter: 2 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 33 A

TECHNICAL NOTES

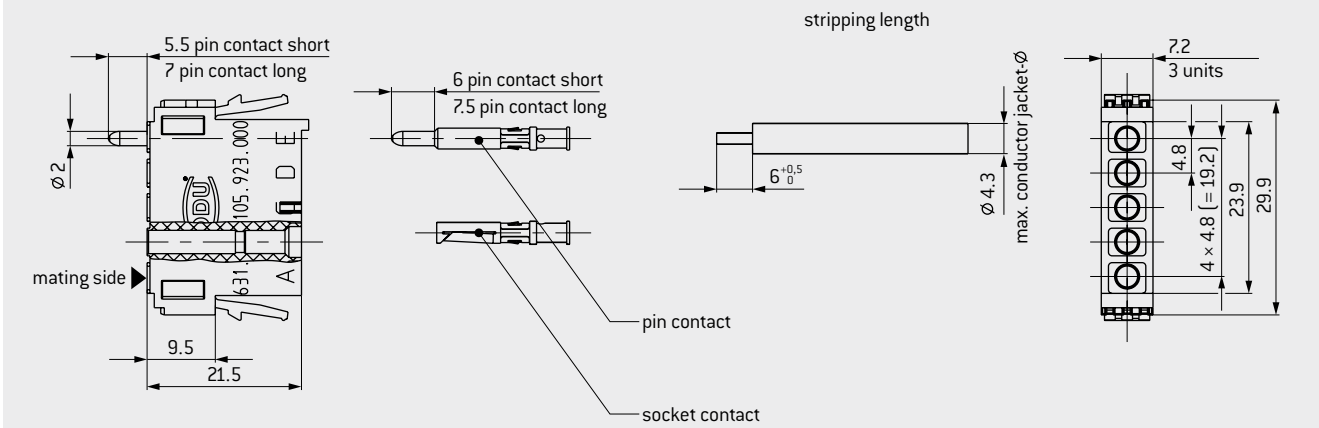
- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²		
Operating voltage	630 V	250 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3
Voltage information acc. to MIL³		
Operating voltage	1,025 V	
Test voltage	3,075 V	
Mechanical data		
Total mating force (average)	13.5 N / Module	
Total sliding force (average)	9 N / Module	
Contact diameter	2 mm	
Operating temperature	−40 °C to +125 °C	
Mating cycles	minimum 10,000	
Materials		
Insulator	Thermoplastic acc. to UL-94	
Contact	Cu alloy	
Contact finish	gold-plated	



INSULATOR PIN AND SOCKET



Module 5 contacts	Part number
Insulator	631.112.105.923.000

Description	Part number	Conductor cross-section mm ²	Termination AWG/mm	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	185.437.000.270.000	1–1.5	16/18	18	15	27	1
Pin contact long	185.436.000.270.000						
Socket contact	175.567.000.270.000						
Pin contact short	185.441.000.270.000	2.5	14	24	19	33	1
Pin contact long	185.440.000.270.000						
Socket contact	175.570.000.270.000						

Suitable PCB termination modules can be found on page 122.

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.

¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 3 CONTACTS



POWER



Contact diameter: 3.5 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 58 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²

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

Voltage information acc. to MIL³

Operating voltage	3,750 V
Test voltage	11,250 V

Mechanical data

Total mating force (average)	12 N / Module
Total sliding force (average)	10 N / Module
Contact diameter	3.5 mm
Operating temperature	−40 °C to +125 °C
Mating cycles	minimum 10,000

Materials

Insulator	Thermoplastic acc. to UL-94
Contact	Cu alloy
Contact finish	gold-plated

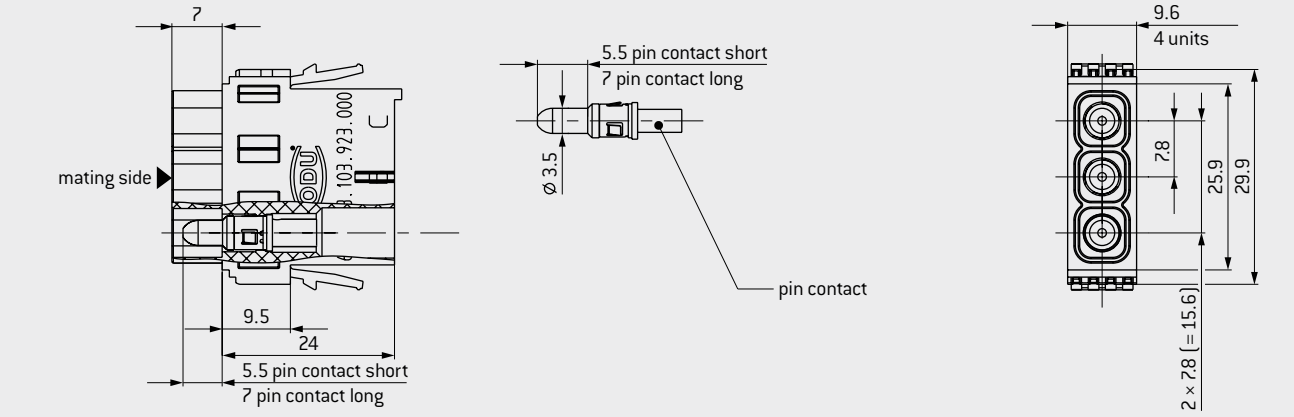


Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.350.001.000

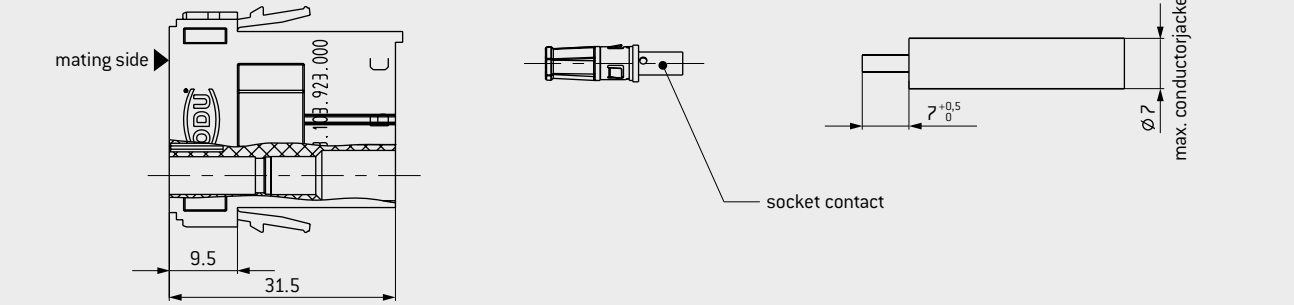
For an overview of all tools please see from page 133.



INSULATOR PIN AND SOCKET



INSULATOR SOCKET



Module 3 contacts	Part number
Insulator socket	630.113.103.923.000
Insulator pin	631.113.103.923.000

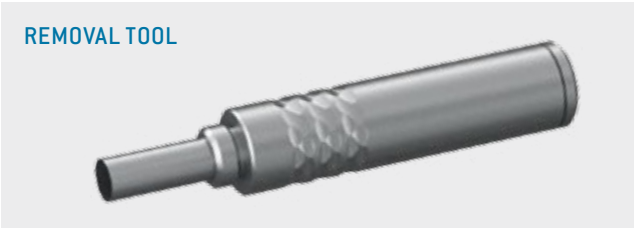
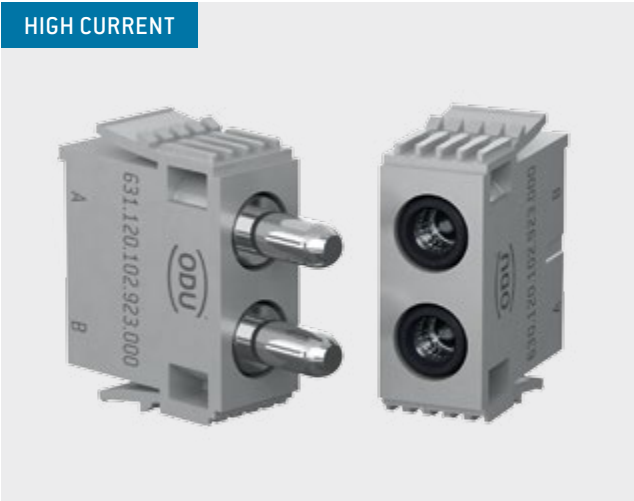
Description	Part number	Conductor cross-section mm ²	Termination AWG/mm	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
				Single contact A	Module fully equipped A		
Pin contact short	185.463.000.270.000	2.5	14	25	21	37	0.4
Pin contact long	185.462.000.270.000						
Socket contact	177.060.000.270.000						
Pin contact short	185.461.000.270.000	4	12	39	30	58	0.4
Pin contact long	185.460.000.270.000						
Socket contact	177.059.000.270.000						
Pin contact short	185.443.000.270.000	6	10	39	30	58	0.4
Pin contact long	185.442.000.270.000						
Socket contact	177.058.000.270.000						

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.

¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 2 CONTACTS

ODU LAMTAC® (contacts with lamella technology) .



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.680.001.000

For an overview of all tools please see from page 133.

Contact diameter: 5 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 108 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²

Operating voltage	400 V	160 V
Rated impulse voltage	4 kV	3 kV
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	975 V
Test voltage	2,925 V

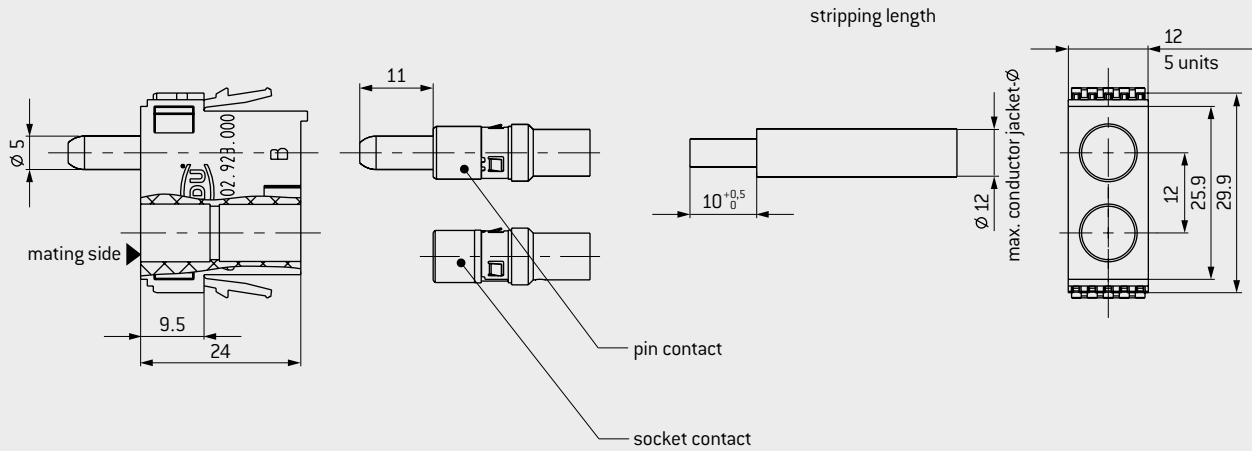
Mechanical data

Total mating force (average)	34 N / Module
Total sliding force (average)	28 N / Module
Contact diameter	5 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 10,000

Materials

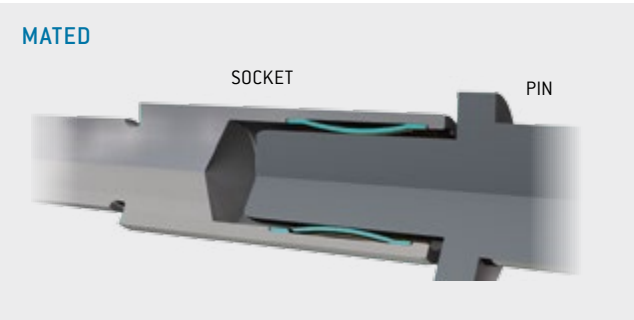
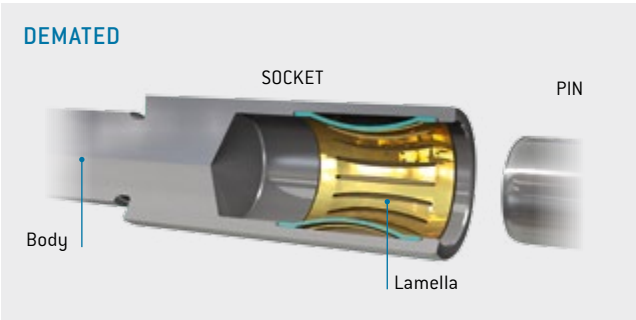
Insulator	Thermoplastic acc. to UL-94
Contact body	Cu alloy
Contact lamella	CuBe alloy
Contact finish	silver-plated

INSULATOR PIN AND SOCKET



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

ODU LAMTAC® (CONTACTS WITH LAMELLA TECHNOLOGY)



Module 2 contacts	Part number
Insulator	631.120.102.923.000

Description	Part number	Conductor cross-section mm²	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	185.484.000.201.000	10	56	56	90	0.2
Socket contact	178.879.100.201.000					
Pin contact	185.485.000.201.000	16	68	68	108	0.2
Socket contact	178.880.100.201.000					

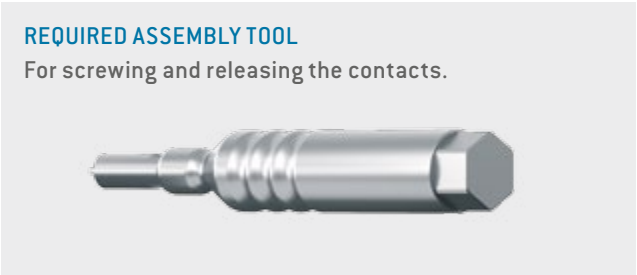
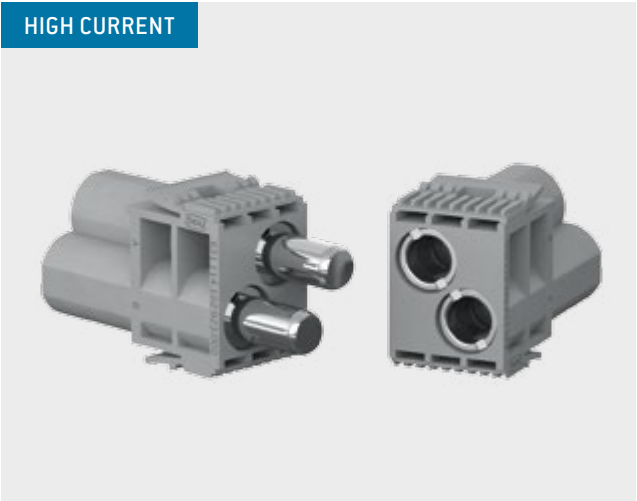
¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.



¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 2 CONTACTS

ODU LAMTAC® (contacts with lamella technology) .



Locking torque: 2.7 Nm ± 0.1 Nm
PART NUMBER: 087.611.002.001.000
For an overview of all tools please see from page 133.

Contact diameter: 8 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 150 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Crimp information see page 128.

TECHNICAL DATA

Voltage information²

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

Voltage information acc. to MIL³

Operating voltage	700 V
Test voltage	2,100 V

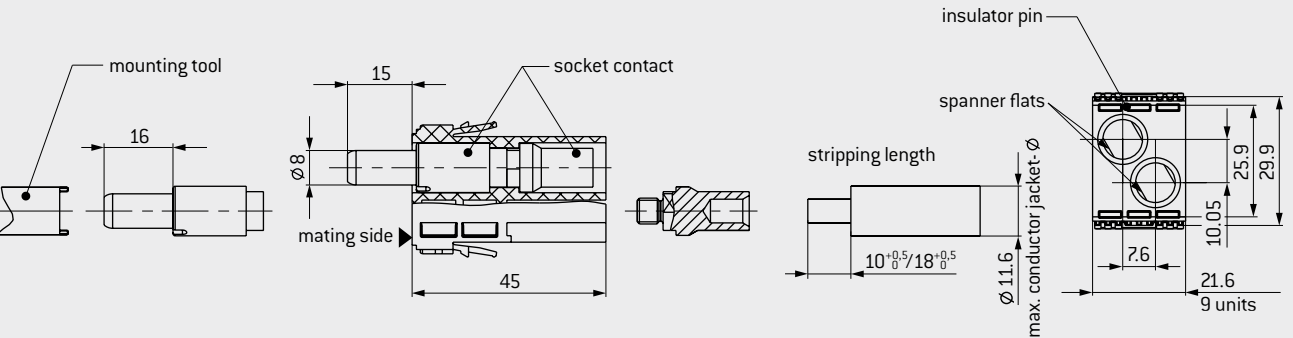
Mechanical data

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

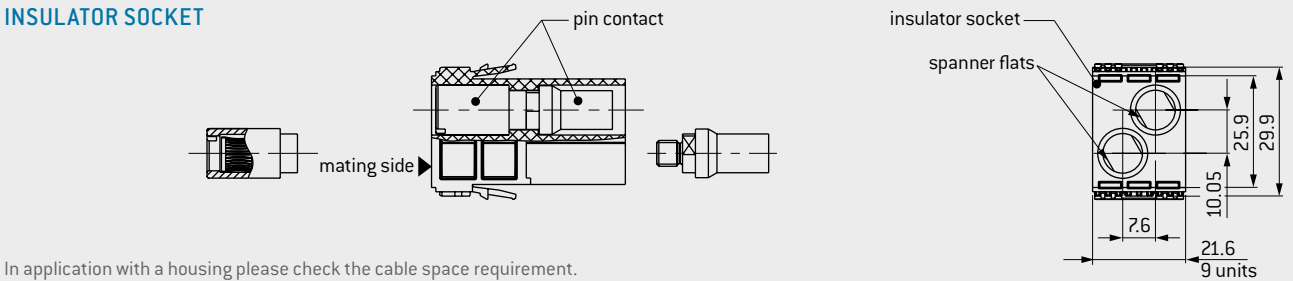
Materials

Insulator	Thermoplastic acc. to UL-94
Contact body	Cu alloy
Contact lamella	CuBe alloy
Contact finish	silver-plated

INSULATOR PIN



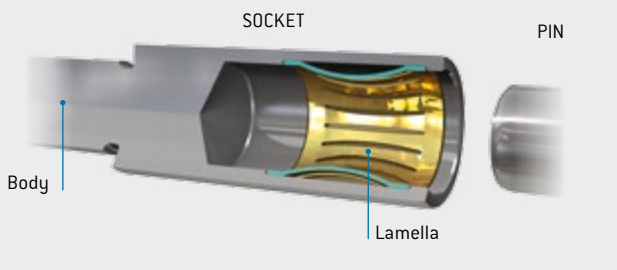
INSULATOR SOCKET



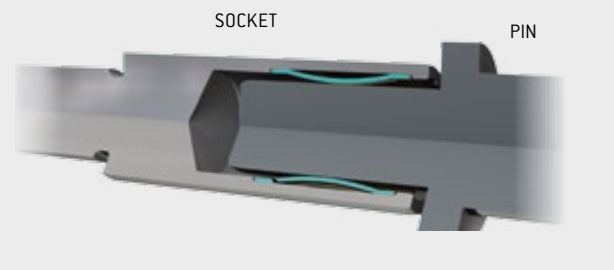
In application with a housing please check the cable space requirement.

ODU LAMTAC® (CONTACTS WITH LAMELLA TECHNOLOGY)

DEMATED



MATED



Module 2 contacts	Part number
Insulator socket	630.114.102.923.000
Insulator pin	631.114.102.923.000

Description	Part number	Conductor cross-section mm²	Nominal current ¹		Max. continuous current ² Single contact A	Contact resistance mΩ
			Single contact A	Module fully equipped A		
Pin contact	181.875.100.200.000	16	76	75	123	0.2
Socket contact	178.875.100.201.000					
Pin contact	181.874.100.200.000	25	103	100	150	0.2
Socket contact	178.874.100.201.000					

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.

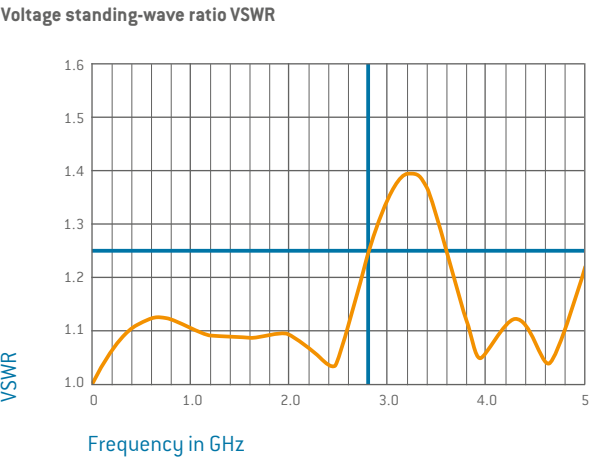
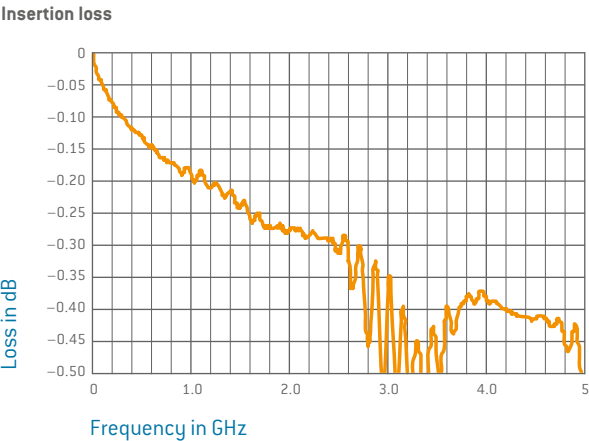


¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

MODULE 4 CONTACTS FOR 50 Ω



HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS¹



Mating cycles: minimum 10,000
Frequency range¹: 0–2.8 GHz

TECHNICAL NOTES

- Crimp information see page 128.

TECHNICAL DATA

Voltage information

Frequency range¹ 0–2.8 GHz
Insulation resistance > 100 GΩ

Voltage information acc. to MIL²

Operating voltage 525 V
Test voltage 1,575 V

Mechanical data

Total mating force (average) 10.6 N / Modul
Total sliding force (average) 7.6 N / Modul
Operating temperature –40 °C to +125 °C
Mating cycles minimum 10,000

Materials

Insulator Thermoplastic acc. to UL-94
Contact/Insulator Cu alloy/PTFE
Contact finish gold-plated

REMOVAL TOOL

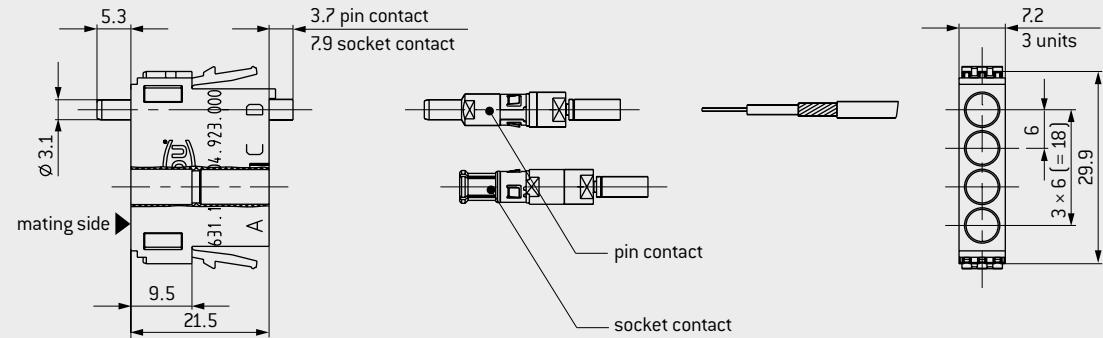


Removal of the assembled contact from the mating side.

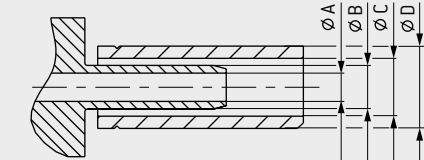
PART NUMBER: 087.7CC.310.001.000

For an overview of all tools please see from page 133.

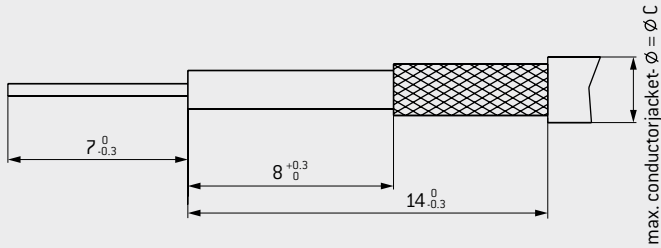
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 4 contacts	Part number
Insulator	631.121.104.923.000

Description	Part number	Charac-teristic impedance Ω	Fre-quency range GHz	Cable ¹	A	B	C	D	Part number Crimp inserts
Pin contact	122.133.001.270.000	50	0.5	RG 178, RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.133.003.270.000		2.8	RG 174, RG 188, RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.133.002.270.000	50	0.5	RG 178, RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.133.004.270.000		2.8	RG 174, RG 188, RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000

¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with conductor length of each 2 × 5 cm. ² See from page 143.

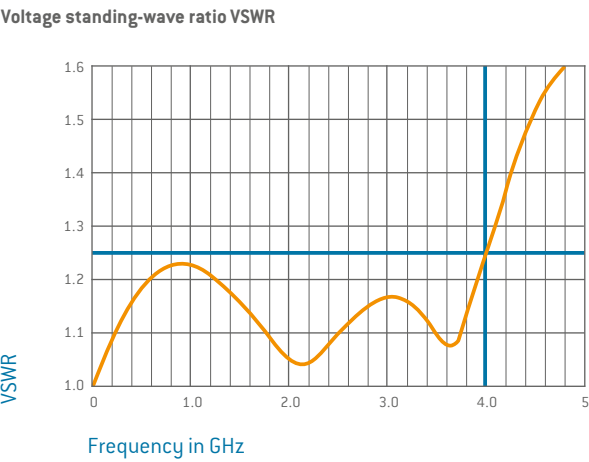
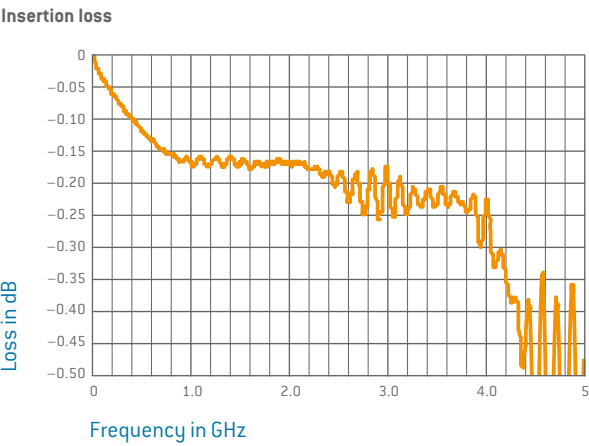


¹ Special lines and alternative models on request.

MODULE 2 CONTACTS FOR 50 Ω



HIGH FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS¹



Mating cycles: minimum 10,000
Frequency range¹: 0–4 GHz

TECHNICAL NOTES

- Crimp information see page 128.

TECHNICAL DATA

Voltage information

Frequency range¹ 0–4 GHz
Insulation resistance > 100 GΩ

Voltage information acc. to MIL²

Operating voltage 800 V
Test voltage 2,400 V

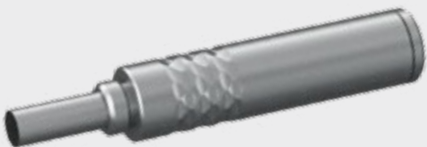
Mechanical data

Total mating force (average) 8.1 N / Modul
Total sliding force (average) 5.8 N / Modul
Operating temperature –40 °C to +125 °C
Mating cycles minimum 10,000

Materials

Insulator Thermoplastic acc. to UL-94
Contact/Insulator Cu alloy/PTFE
Contact finish gold-plated

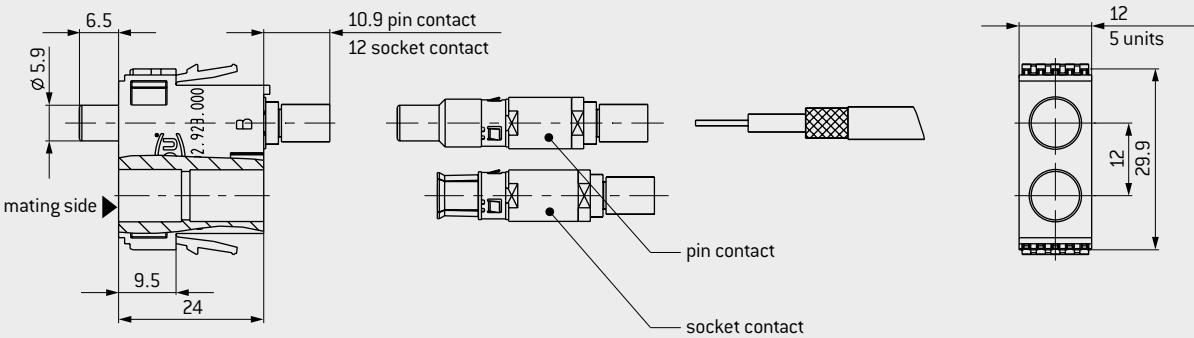
REMOVAL TOOL



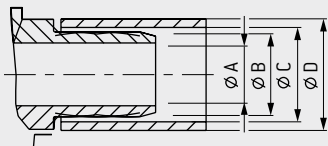
Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.690.001.000

For an overview of all tools please see from page 133.

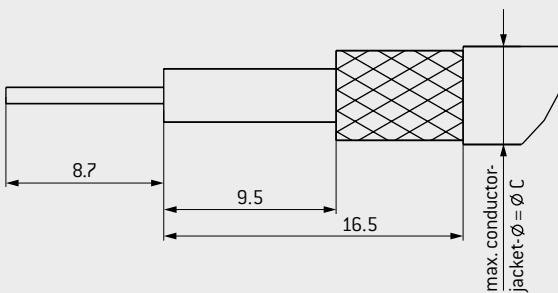
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 2 contacts	Part number
Insulator	631.120.102.923.000

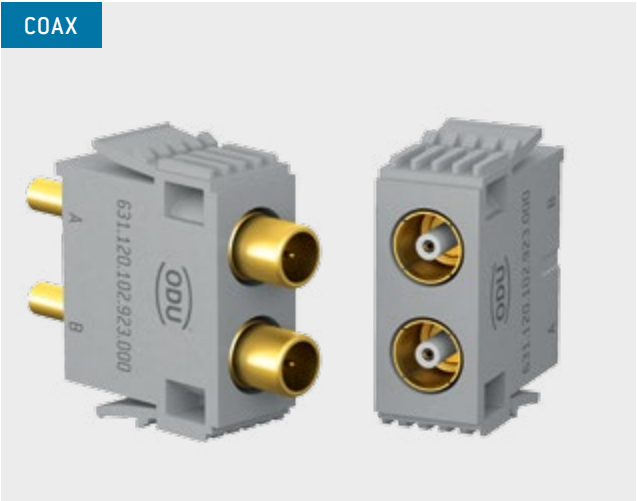
Description	Part number	Charac- teristic impedance Ω	Fre- quency range GHz	Cable ¹	A	B	C	D	Part number Crimp inserts
Pin contact	122.132.001.270.000	50	0.2	RG 178, RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Pin contact	122.132.003.270.000		0.4	RG 174, RG 188, RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.132.007.270.000		3.5	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Pin contact	122.132.013.270.000		4	RG 223	3.15	4.5	5.9	6.75	082.000.039.108.000
Socket contact	122.132.002.270.000	50	0.2	RG 178, RG 196	1.1	1.7	2.25	3.2	082.000.039.101.000
Socket contact	122.132.004.270.000		0.4	RG 174, RG 188, RG 316	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.132.008.270.000		3.5	RG 58	3.15	4.5	5.2	6.15	082.000.039.106.000
Socket contact	122.132.014.270.000		4	RG 223	3.15	4.5	5.9	6.75	082.000.039.108.000

¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with conductor length of each 2 × 5 cm.² See from page 143.

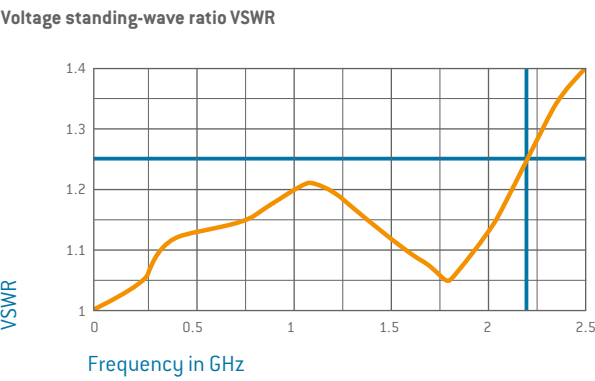
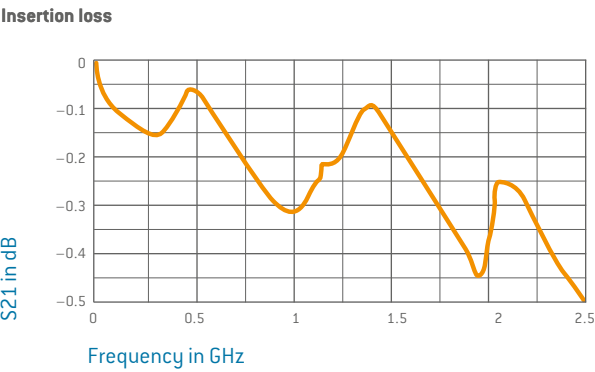


¹ Special lines and alternative models on request.

MODULE 2 CONTACTS FOR 75 Ω



HIGH FREQUENCY CHARACTERISTICS FOR 75 Ω COAX CONTACTS¹



Mating cycles: minimum 10,000
Frequency range¹: 0–2.7 GHz

TECHNICAL NOTES

- Crimp information see page 128.

TECHNICAL DATA

Voltage information

Frequency range¹ 0–2.7 GHz
Insulation resistance > 100 GΩ

Voltage information acc. to MIL²

Operating voltage 930 V
Test voltage 2,790 V

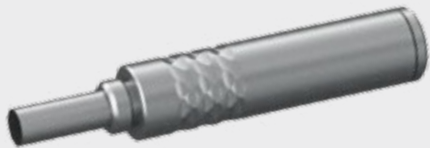
Mechanical data

Total mating force (average) 8.1 N / Modul
Total sliding force (average) 5.8 N / Modul
Operating temperature –40 °C to +125 °C
Mating cycles minimum 10,000

Materials

Insulator Thermoplastic acc. to UL-94
Contact/Insulator Cu alloy/PTFE
Contact finish gold-plated

REMOVAL TOOL



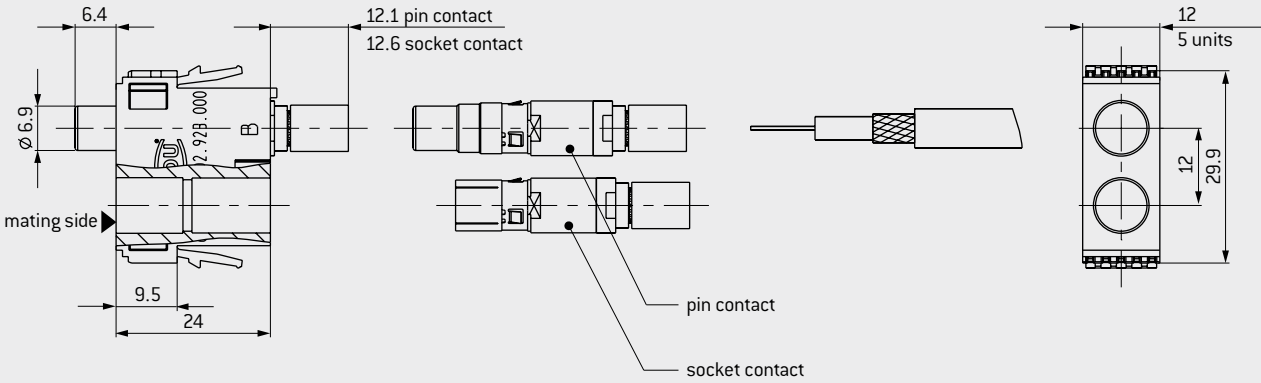
Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.690.001.000

For an overview of all tools please see from page 133.

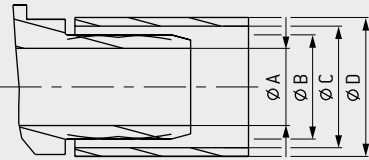
¹ Loss levels depend on used conductor type at a VSWR of 1.25. Further are available on request. Tested with conductor length of each 2 × 5 cm.² See from page 143.



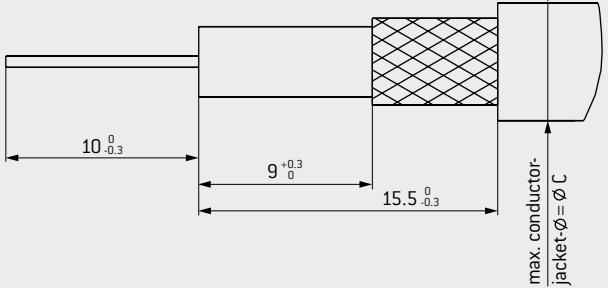
INSULATOR FOR PIN AND SOCKET



CABLE TERMINATION



RECOMMENDED CABLE CONSTRUCTION / STRIPPING LENGTH



Module 2 contacts	Part number
Insulator	631.120.102.923.000

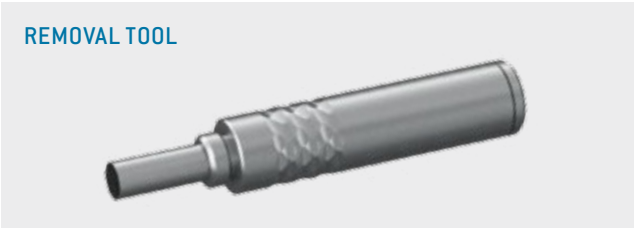
Description	Part number	Charac- teristic impedance Ω	Fre- quency range GHz	Cable ¹	A	B	C	D	Part number Crimp inserts
Pin contact	122.131.003.270.000	75	1.2	RG 179, RG 187	1.75	2.7	3.2	3.8	082.000.039.102.000
Pin contact	122.131.009.270.000		2.7	RG 59	4	5.4	6.3	7.2	082.000.039.109.000
Socket contact	122.131.004.270.000	75	1.2	RG 179, RG 187	1.75	2.7	3.2	3.8	082.000.039.102.000
Socket contact	122.131.010.270.000		2.7	RG 59	4	5.4	6.3	7.2	082.000.039.109.000

¹ Special lines and alternative models on request.

MODULE 2 CONTACTS FOR COMPRESSED AIR



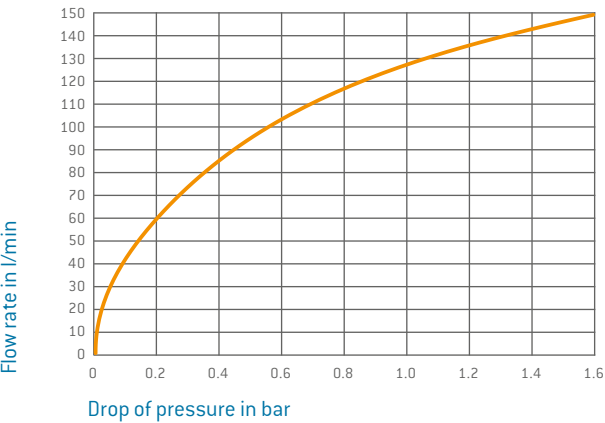
Inner diameter of tube max. 4 mm, Push-in diameter max. 6 mm



Removal of the assembled contact from the mating side.
PART NUMBER: 087.7CC.680.001.000

For an overview of all tools please see from page 133.

FLOW RATE DIAGRAM



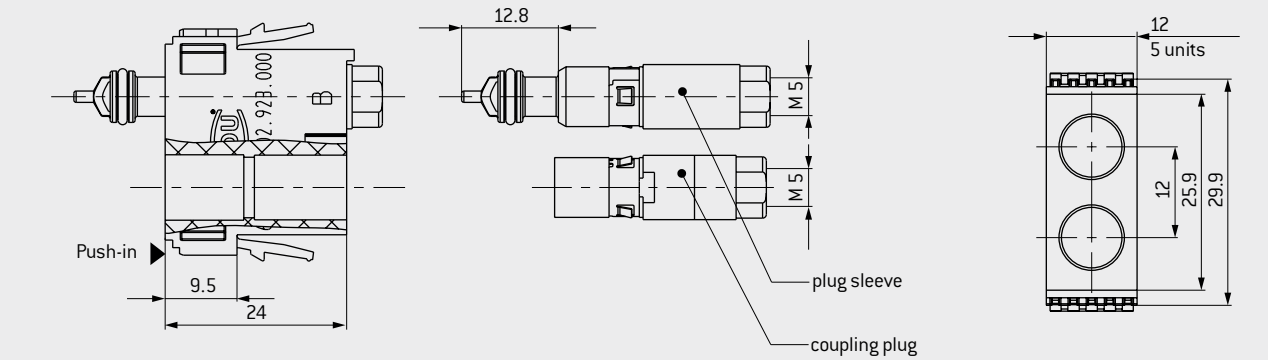
The FLOW RATE DIAGRAM refers to the locking version with a maximum gap between socket and pin piece of ≤ 0.5 mm. If the clearance is modified, the drop of pressure increases.

¹ Burst pressure min. 40 bar. ² The stated mating cycles are possible via regular maintenance intervals. ³ Not suitable for mixture with over 25% portion of oxygen and explosive gases.



INSULATOR PIN AND SOCKET

TERMINATION ACCESSORIES SEE PAGE 108



Module 2 contacts	Part number
Insulator	631.120.102.923.000

Description	Part number	Termination
Plug sleeve (non shut-off)	196.035.001.300.000	M5
Coupling plug (non shut-off)	196.035.003.300.000	
Coupling plug (shut-off)	196.035.002.300.000	

ACCESSORIES FOR TERMINATION



COMPRESSED AIR

TERMINATION TYPE I

Nipple fitting



TERMINATION TYPE II PUSH-IN

Push-in fitting



L connection



TECHNICAL DATA

- Tightening torque 1.5 Nm

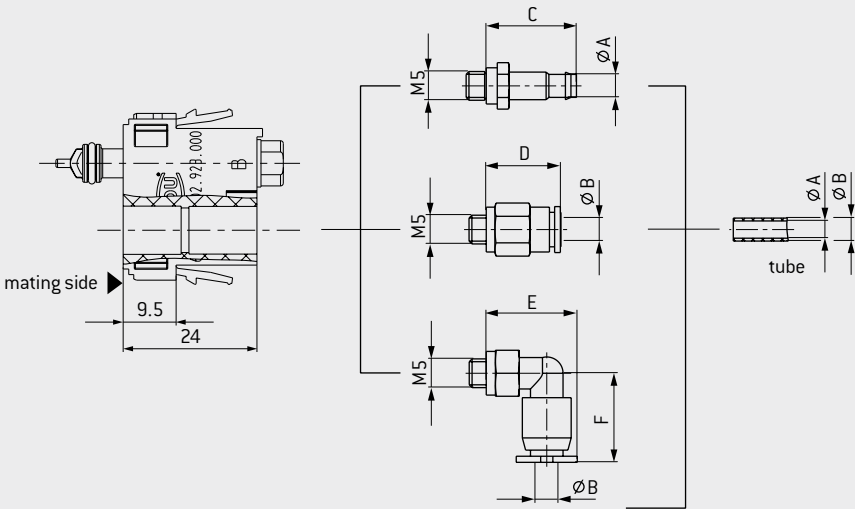
TECHNICAL DATA

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

TERMINATION DIMENSIONS ACCESSORIES COMPRESSED AIR



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

Size 1 (e. g. for use in bus systems). 2 inserts.



SHIELDED-IMPLEMENTATION/HIGH-SPEED CONNECTOR

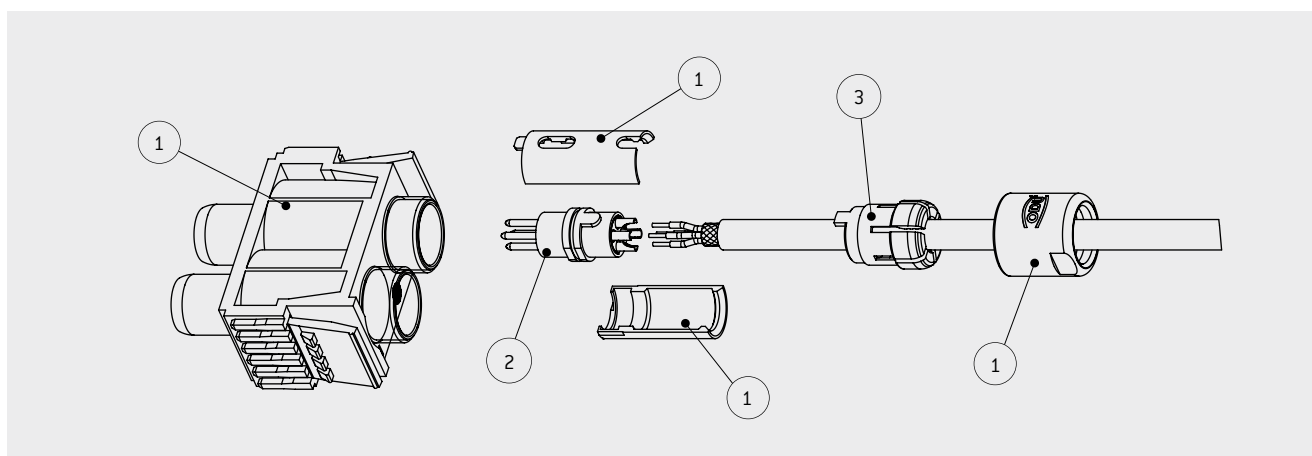


Mating cycles: minimum 10,000
CAT 5, USB 2.0
2 to 14 contacts

TECHNICAL NOTES

- 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, USB 2.0, FireWire S400 [on request].

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



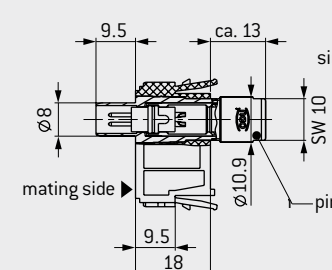
ASSEMBLY SET

Order	Base parts	Part number
1	Insulator socket incl. socket housing	630.131.102.923.000
1	Insulator pin incl. pin housing	631.131.102.923.000
2	Insert cpl. solder contacts ¹	See next page
3	Assembly set	See table on the right

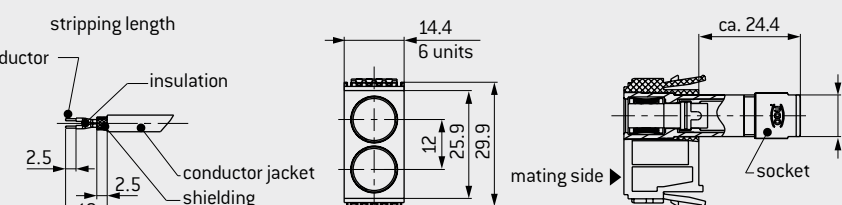
Cable Ø mm	Part number
1.5 to 2.1	751.020.188.304.022
2 to 3.2	751.020.188.304.032
3 to 4.2	751.020.188.304.042
4 to 5.2	751.020.188.304.052
5 to 6.2	751.020.188.304.062
6 to 7.2	751.020.188.304.072
7 to 7.7	751.020.188.304.077



INSULATOR PIN

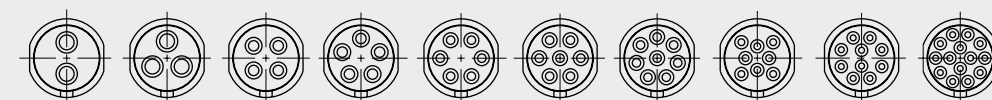


INSULATOR SOCKET



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

CONTACT ARRANGEMENTS



2 contacts	3 contacts	4 contacts	5 contacts	6 contacts	7 contacts	8 contacts	8 contacts	10 contacts	14 contacts
		CAT 5					CAT 5		
		USB 2.0							

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

INSERT WITH ODU TURNTAC® (MATING CYCLES MINIMUM 10,000)

2	1.3	20	32 80	2	3 2	550	Pin Socket		701.844.724.002.200 701.744.724.002.200	8.5	7.5
3	1.3	20	16 40	2	3 2	500	Pin Socket		701.844.724.003.200 701.744.724.003.200	8.5	7.5
4	0.9	22	10 32	2	3 2	500	Pin Socket	CAT 5	701.849.724.004.200 701.749.724.004.200	10.5	9
4	0.9	22	10 32	2	3 2	500	Pin Socket	USB 2.0	701.849.724.004.000 701.749.724.004.000	10.5	9
5	0.9	22	32	1.5	2	450	Pin Socket		701.849.724.005.200 701.749.724.005.200	10.5	9
6	0.7	22	32	1.5	2	400	Pin Socket		701.848.724.406.200 701.748.724.406.200	13	10
7	0.7	22	32	1.5	2	400	Pin Socket		701.848.724.407.200 701.748.724.407.200	13	10
8	0.7	22	32	1.5	2	333	Pin Socket		701.848.724.408.200 701.748.724.408.200	13	10
8	0.5	26	32	1.5	2	333	Pin Socket	CAT 5	701.841.724.408.000 701.741.724.408.000	13	10
10	0.5	28	25	1.5	2	333	Pin Socket		701.841.724.010.400 701.741.724.010.200	15	12
14	0.5	28	25	1.5	2	300	Pin Socket		701.841.724.014.400 701.741.724.014.200	15	12

If required, selected inserts with 60,000 mating cycles (ODU SPRINGTAC) available upon request.

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



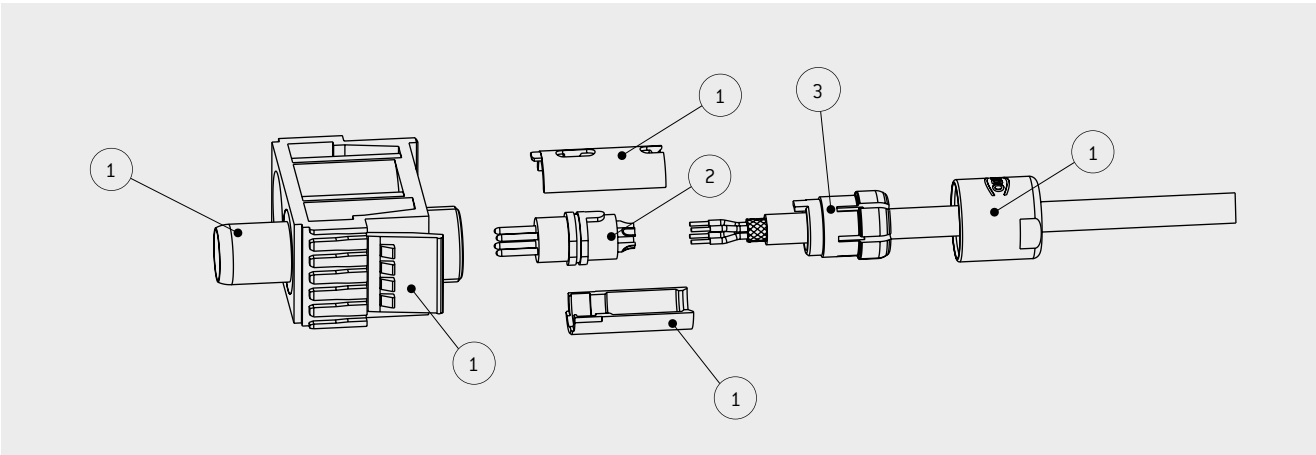
Size 1 (e. g. for use in bus systems). 1 insert.

SHIELDED-IMPLEMENTATION/HIGH-SPEED CONNECTOR

Mating cycles: minimum 10,000
CAT 5, USB 2.0
2 to 14 contacts

- TECHNICAL NOTES
- 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, USB 2.0, FireWire S400 (on request).

HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR



Order	Base parts	Part number
1	Insulator socket incl. socket housing	630.131.101.923.000
1	Insulator pin incl. pin housing	631.131.101.923.000
2	Insert cpl. solder contacts ¹	See next page
3	Assembly set	See table on the right

¹ Available with crimp contact upon request.



INSULATOR PIN

INSULATOR SOCKET

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

CONTACT ARRANGEMENTS

2 contacts 3 contacts 4 contacts 5 contacts 6 contacts 7 contacts 8 contacts 8 contacts 10 contacts 14 contacts
CAT 5 USB 2.0 CAT 5

Number of contacts	Contact diameter	Termination cross-section	Rated voltage ¹	Rated impulse voltage ¹	Degree of pollution ¹	Nominal voltage ²	Model	Category ³	Insert complete ⁴	Total mating force	Total sliding force
	mm	AWG	V	kV		V AC			part number	N	N
INSERT WITH ODU TURNAC® (MATING CYCLES MINIMUM 10,000)											
2	1.3	20	32	2	3	550	Pin		701.844.724.002.200	8.5	7.5
			80				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				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				Socket		701.749.724.004.200		
4	0.9	22	10	2	3	500	Pin	USB 2.0	701.849.724.004.000	10.5	9
			32				Socket		701.749.724.004.000		
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
							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		

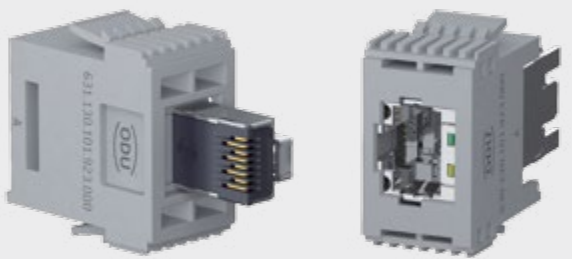
If required, selected inserts with 60,000 mating cycles (ODU SPRINGTAC) available upon request.

¹ According to IEC 60664-1:2007 (VDE 0110-1:2008), see page 139. ² According to EIA-364-20D:2008, SAE AS 13441:2004 method 3001.1. ³ Classification according to ISO/IEC 11801:2002. ⁴ Use of crimp version.

MODULE FOR INDUSTRIAL ETHERNET RJ45 / 10 GBIT/S

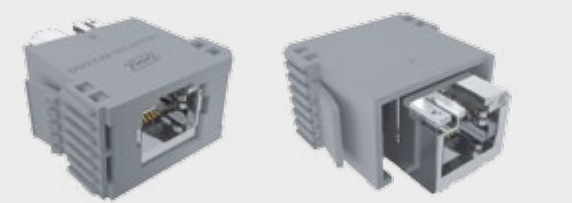
STEADYTEC® Technology

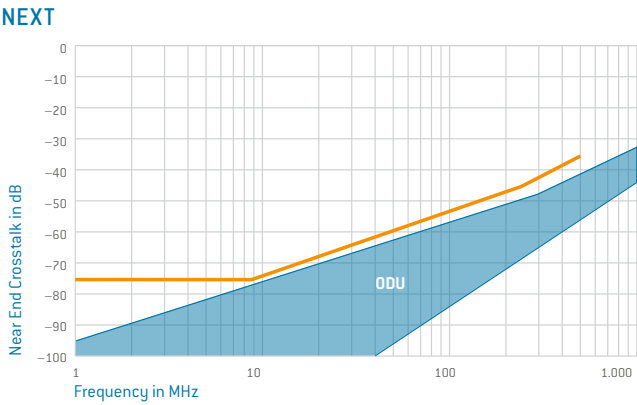
HIGH-SPEED CONNECTOR





COUPLING FOR RJ45 CONNECTION
ON THE SOCKET SIDE





Mating cycles: min. 5,000
TIAA/TIAB/Profinet/CAT 5/CAT 6_A
8 contacts

TECHNICAL NOTES

- Data transmission
- This module is suitable for the transmission data according to CAT 6_A TIA/EIA-568-B.2-10, Class EA according to ISO/IEC 11801-Am 1.2 (draft) and IN EN 50173-1 and are certified by GHMT and 3P. Suitable for the transmission of 10 Gbit/s according to IEEE 802.3.
- 8-way RJ45 field plug and RJ45 plug insert CAT 6_A (assembly w/o special tools) for stranded and solid wire cables
- Improved vibration and shock resistance by e.g. the use of four springs at the shroud in the RJ45 jack Cat.6A and RJ45 coupler CAT 6_A
- Multi-port capable

TECHNICAL DATA

Contact resistance	< 20 mΩ
Insulation resistance	> 500 MΩ
Mating cycles	min. 5,000

Dielectric strength

Contact – contact	> 1,000 V, DC
Contact – shielding	> 1,500 V, DC
Current-carrying capacity	1 A

Transfer impedance

at 1 MHz	< 100 mΩ
at 10 MHz	< 200 mΩ
at 80 MHz	< 1,600 mΩ

Materials

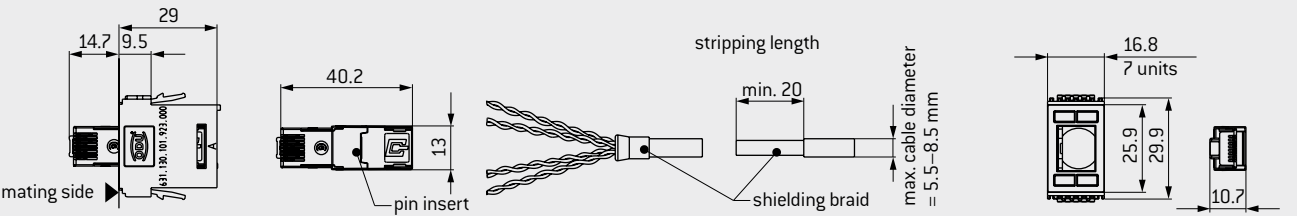
Surface	Sn
---------	----

Temperature range

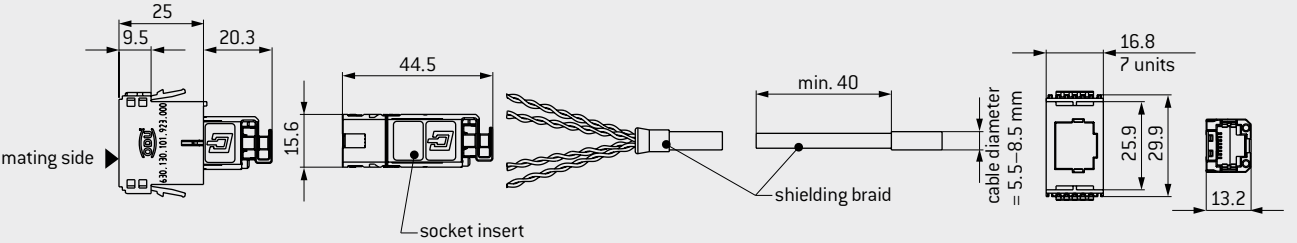
–40 °C to +70 °C



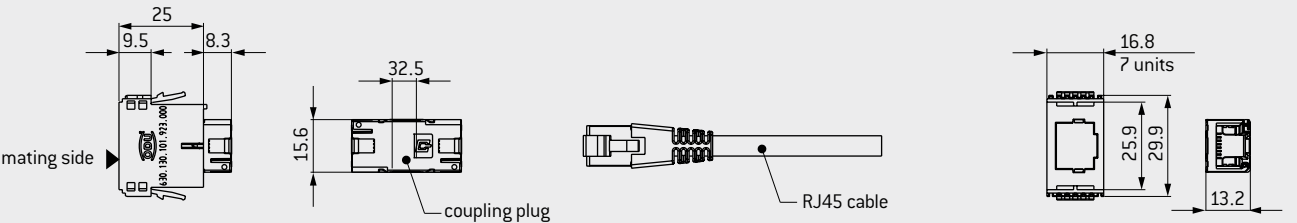
INSULATOR PIN



INSULATOR SOCKET



COUPLING



Module protection of the ethernet insert not ensured by means of guiding pins alone.
In application with a housing please check the cable space requirement.

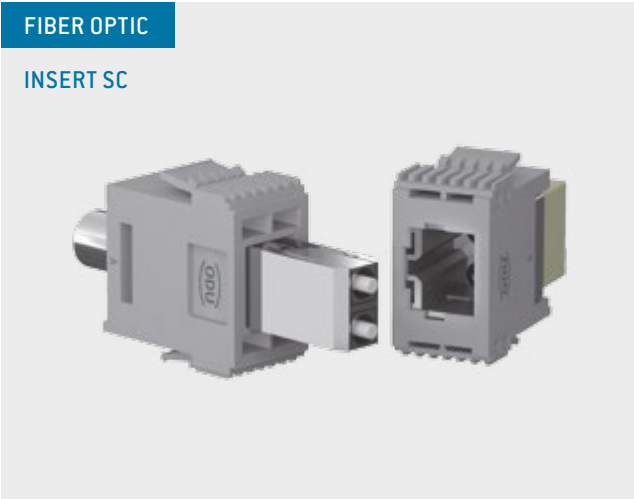
Modules for multi-position	Part number
Insulator socket	630.130.101.923.000
Insulator pin	631.130.101.923.000

Description	Part number	Category	Termination AWG/mm
Coupling for RJ45	923.000.005.000.145		RJ45, 8 contacts
Socket insert	923.000.005.000.146	TIA A	22 – 26
Socket insert	923.000.005.000.147	TIA B	22 – 26
Socket insert	923.000.005.000.148	Profinet	22 – 26
Pin insert	923.000.005.000.149	TIAA/TIAB/Profinet	22 – 26

MODULE 2 CONTACTS FOR FIBER OPTIC CONTACTS GOF



On request.



Ferrule
Single mode/Multi mode
Mating cycles¹: minimum 10,000

TECHNICAL NOTES

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

TECHNICAL DATA

Mating cycles ¹	minimum 10,000
----------------------------	----------------

INSERTS SC

Ferrule	Zirconia SM: 125,5 µm + 1 µm MM: 127 µm + 4 µm
Optical features	
Insertion loss	SM: max. 0.5 dB MM: max. 0.4 dB
Return loss	SM: min. 40 dB MM: min. 30 dB
Temperature range	-40 °C to +70 °C
Cable outer diameter	5 mm to 8 mm

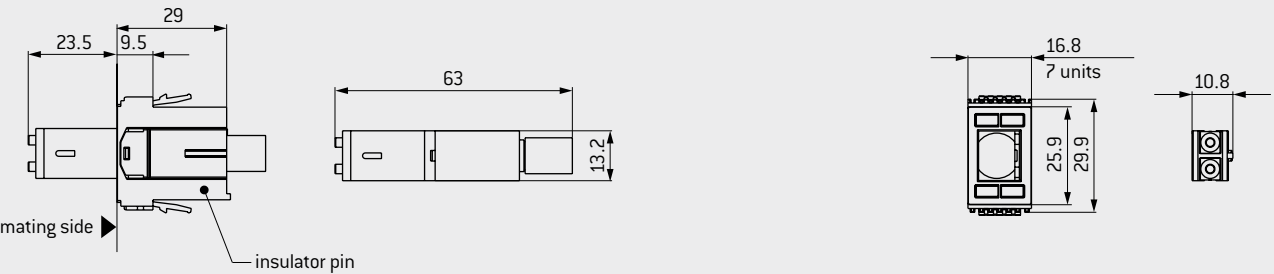
INSERTS LC

Ferrule	Zirconia SM: 125.5 µm + 1 µm MM: 127 µm + 4 µm
Optical features	
Insertion loss	SM: max. 0.5 dB MM: max. 0.4 dB
Return loss	SM: min. 40 dB MM: min. 30 dB
Temperature range	-40 °C to +70 °C
Cable outer diameter	5 mm to 8 mm

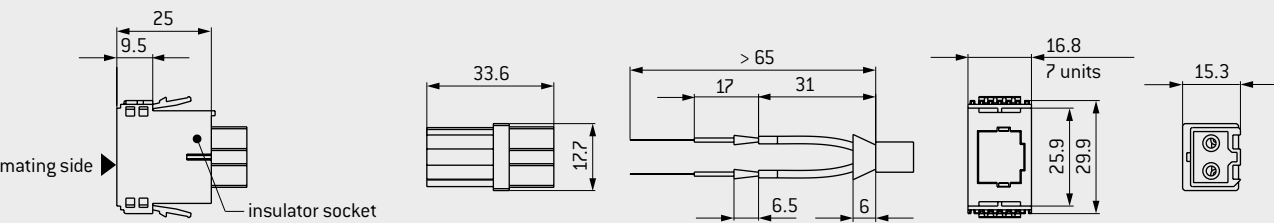
¹ The stated mating cycles are possible via regular maintenance intervals.



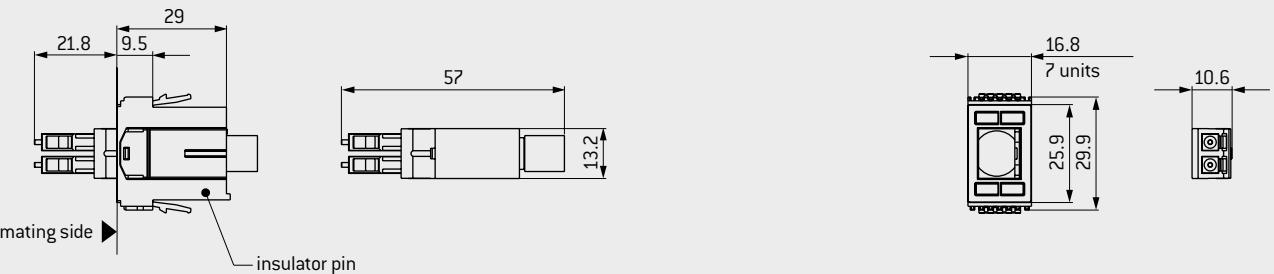
SC – INSULATOR PIN



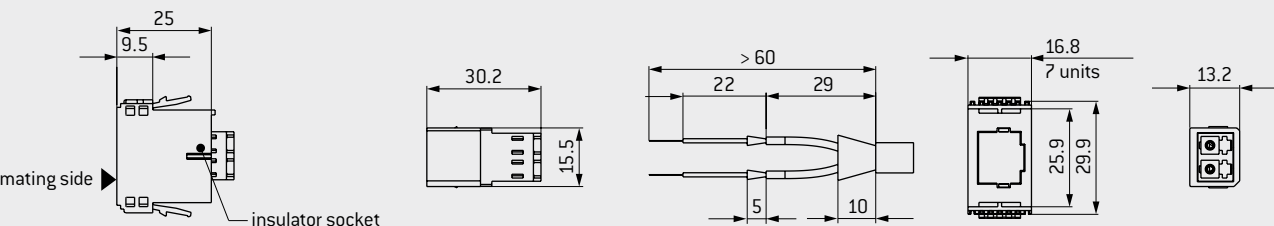
SC – INSULATOR SOCKET



LC – INSULATOR PIN



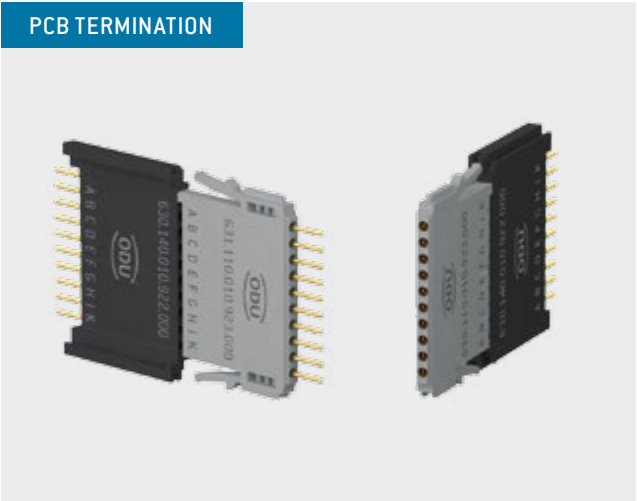
LC – INSULATOR SOCKET



Module protection of the fiber optic insert not ensured by means of guiding pins alone.
In application with a housing please check the cable space requirement.

MODULE 10 CONTACTS

For the effective PCB contact with quick-change function.



COMPATIBLE WITH MODULE 10 CONTACTS ON P. 88

Contact diameter: 0.7 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 7 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Solder temperature for PCB-termination module (black PA) 260 °C for 30 seconds.
- Maximum adjacent arrangement of 10 modules.

TECHNICAL DATA

Voltage information²

Operating voltage	250 V	50 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	475 V
Test voltage	1.475 V

Mechanical data

Total mating force (average)	8 N / Module
Total sliding force (average)	6 N / Module
Contact diameter	0.7 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	minimum 10,000

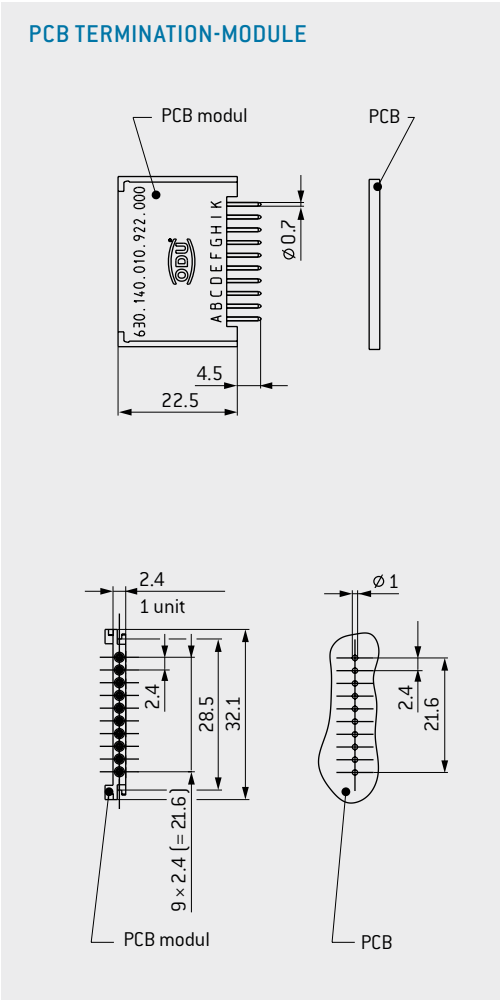
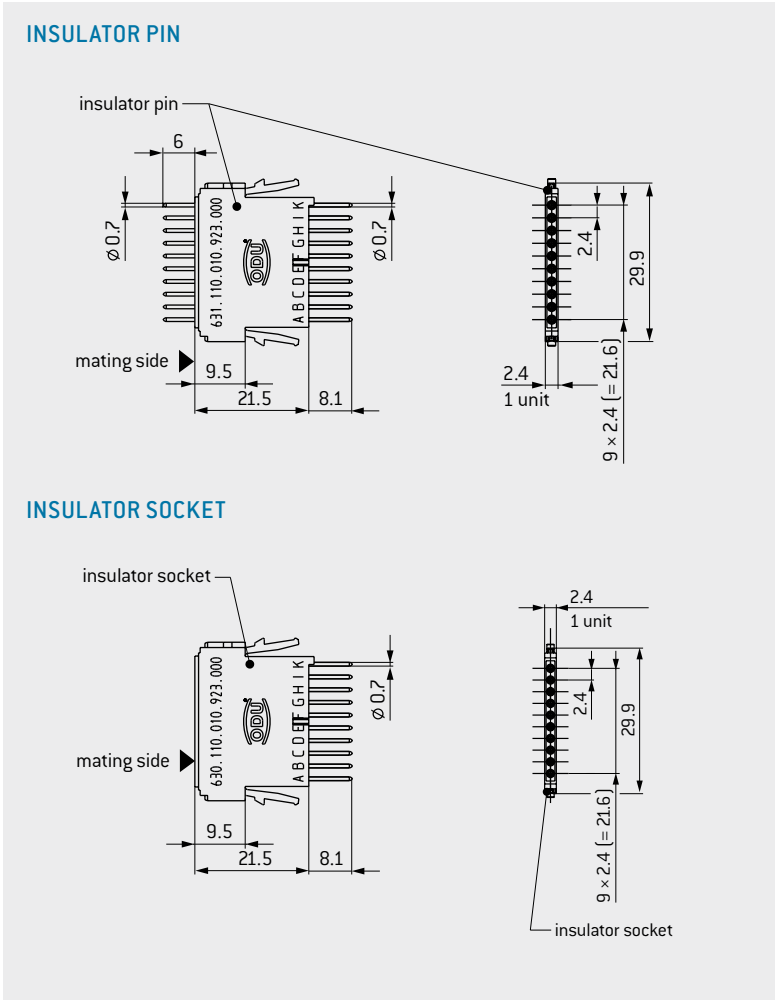
Materials

Insulator pin-/socket frame	Thermoplastic acc. to UL-94 (Gray)
Insulator PCB	Thermoplastic acc. to UL-94 (Black)
Contact body	Cu alloy
Contact finish	gold-plated

NOTE

- Frame for the transfer of grounding to the board and corresponding grounding socket upon request.
- Explanations of the structure on p. 85.

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.

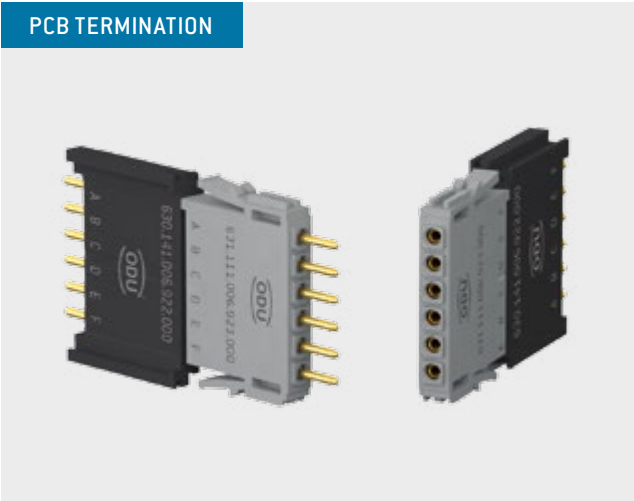


Description	Part number	Nominal current ¹ A	Max. continuous current ² A	Contact resistance ³ mΩ
Insulator socket incl. contacts	630.110.010.923.000	4.5	7	7
Insulator pin incl. contacts	631.110.010.923.000	4.5	7	7
Insulator PCB incl. injected contacts ⁴	630.140.010.922.000	4.5	7	7

¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145. ³ Due to the double transfer between the modules and the PCB-termination modules, the contact resistance is twice as high as with a normal signal module. ⁴ Print contacts injected are not removable.

MODULE 6 CONTACTS

For the effective PCB contact with quick-change function.



COMPATIBLE WITH MODULE 6 CONTACTS ON P. 90

Contact diameter: 1.3 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 13 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Solder temperature for PCB-termination module (black PA) 260 °C for 30 seconds.
- Maximum adjacent arrangement of 10 modules.

TECHNICAL DATA

Voltage information²

Operating voltage	400 V	160 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	775 V
Test voltage	2,325 V

Mechanical data

Total mating force (average)	8.4 N / Modul
Total sliding force (average)	7.2 N / Modul
Contact diameter	1.3 mm
Operating temperature	-40 °C to +125 °C
Mating cycles	minimum 10,000

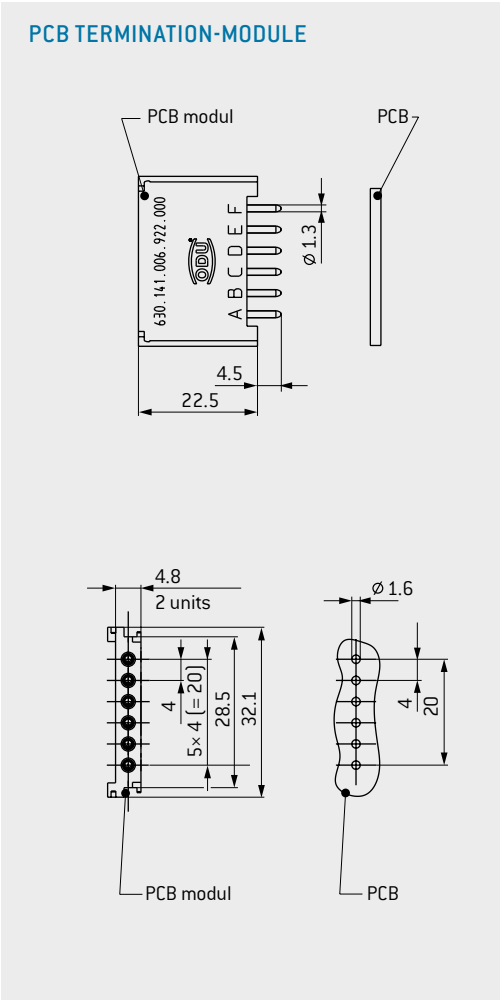
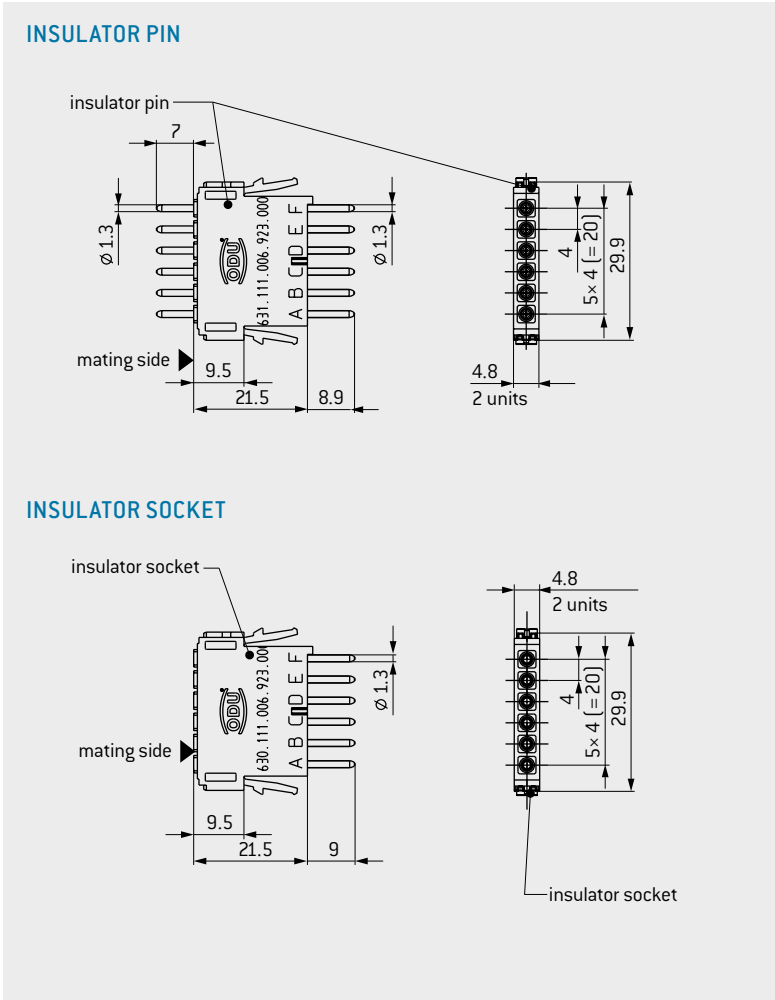
Materials

Insulator pin/socket frame	Thermoplastic acc. to UL-94 (Gray)
Insulator PCB	Thermoplastic acc. to UL-94 (Black)
Contact body	Cu alloy
Contact finish	gold-plated

NOTE

- Frame for the transfer of grounding to the board and corresponding grounding socket upon request.
- Explanations of the structure on p. 85.

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.



Description	Part number	Nominal current ¹	Max. continuous current ²	Contact resistance ³
		A	A	mΩ
Insulator socket incl. contacts	630.111.006.923.000	8	13	3.6
Insulator pin incl. contacts	631.111.006.923.000	8	13	3.6
Insulator PCB incl. injected contacts ⁴	630.141.006.922.000	8	13	3.6

¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

³ Due to the double transfer between the modules and the PCB-termination modules, the contact resistance is twice as high as with a normal signal module.

⁴ Print contacts injected are not removable.

MODULE 5 CONTACTS

For the effective PCB contact with quick-change function.



COMPATIBLE WITH MODULE 5 CONTACTS ON P. 92

Contact diameter: 2 mm
Mating cycles: minimum 10,000
Current-carrying capacity¹: 25 A

TECHNICAL NOTES

- The current load information is valid for single contacts or fully equipped modules. For use in connector systems, the load should be reduced according to VDE 0298-4:2013 (see page 148).
- Solder temperature for PCB-termination module (black PA) 260 °C for 30 seconds.
- Maximum adjacent arrangement of 10 modules.

TECHNICAL DATA

Voltage information²

Operating voltage	630 V	250 V
Rated impulse voltage	2,500 V	2,500 V
Degree of pollution	2	3

Voltage information acc. to MIL³

Operating voltage	1.025 V
Test voltage	3.075 V

Mechanical data

Total mating force (average)	13,5 N / Modul
Total sliding force (average)	9 N / Modul
Contact diameter	2 mm
Operating temperature	–40 °C to +125 °C
Mating cycles	minimum 10,000

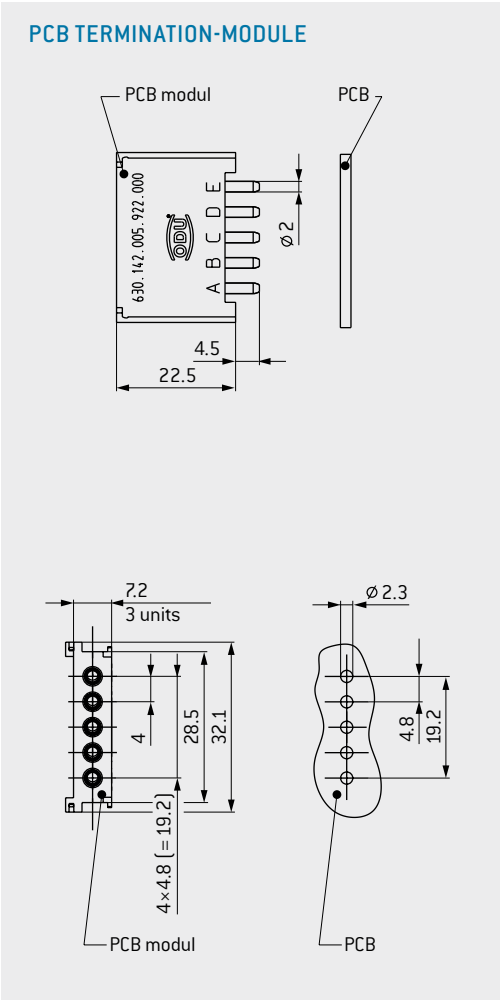
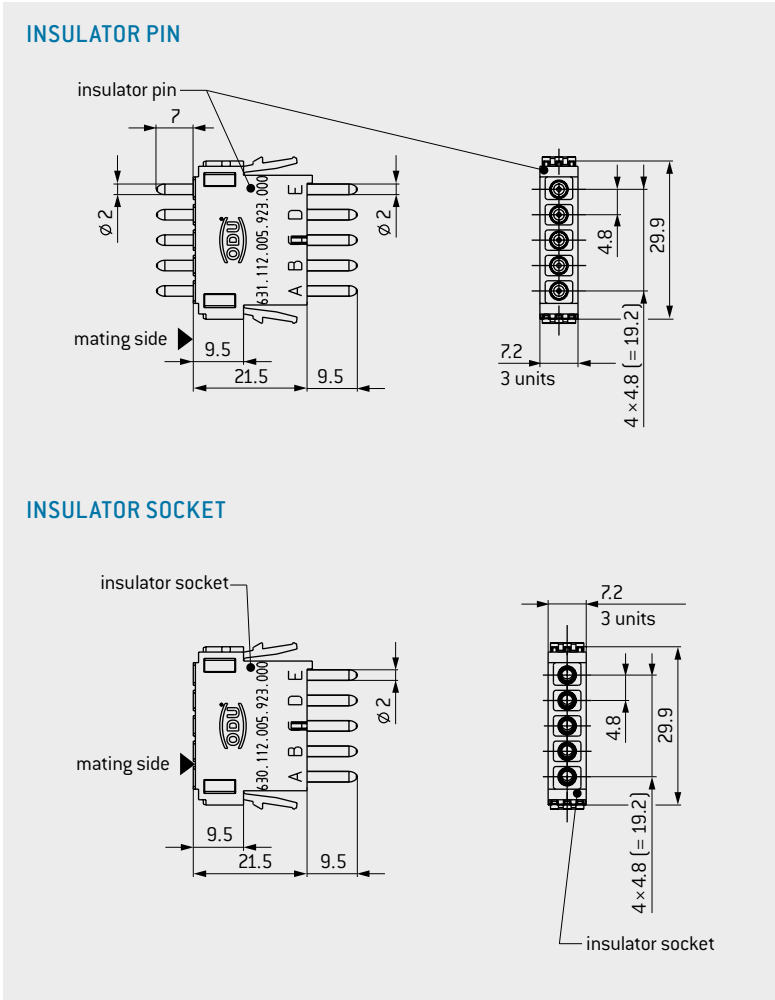
Materials

Insulator pin-/socket frame	Thermoplastic acc. to UL-94 (Gray)
Insulator PCB	Thermoplastic acc. to UL-94 (Black)
Contact body	Cu alloy
Contact finish	gold-plated

NOTE

- Frame for the transfer of grounding to the board and corresponding grounding socket upon request.
- Explanations of the structure on p. 85.

¹ Definition max. continuous current, see page 145. ² IEC 60664-1:2007 (VDE 0110-1:2008) see page 139. ³ See page 143.



Description	Part number	Nominal current ¹	Max. continuous current ²	Contact resistance ³
		A	A	mΩ
Insulator socket incl. contacts	630.112.005.923.000	16	25	2
Insulator pin incl. contacts	631.112.005.923.000	16	25	2
Insulator PCB incl. injected contacts ⁴	630.142.005.922.000	16	25	2

¹ Determines according to IEC 60512-5-1:2002 (din en 60512-5-1:2003) at increased temperature 45 K. ² Definition max. continuous current, see page 145.

³ Due to the double transfer between the modules and the PCB-termination modules, the contact resistance is twice as high as with a normal signal module.

⁴ Print contacts injected are not removable.

BLANK MODULES



BLANK MODULES

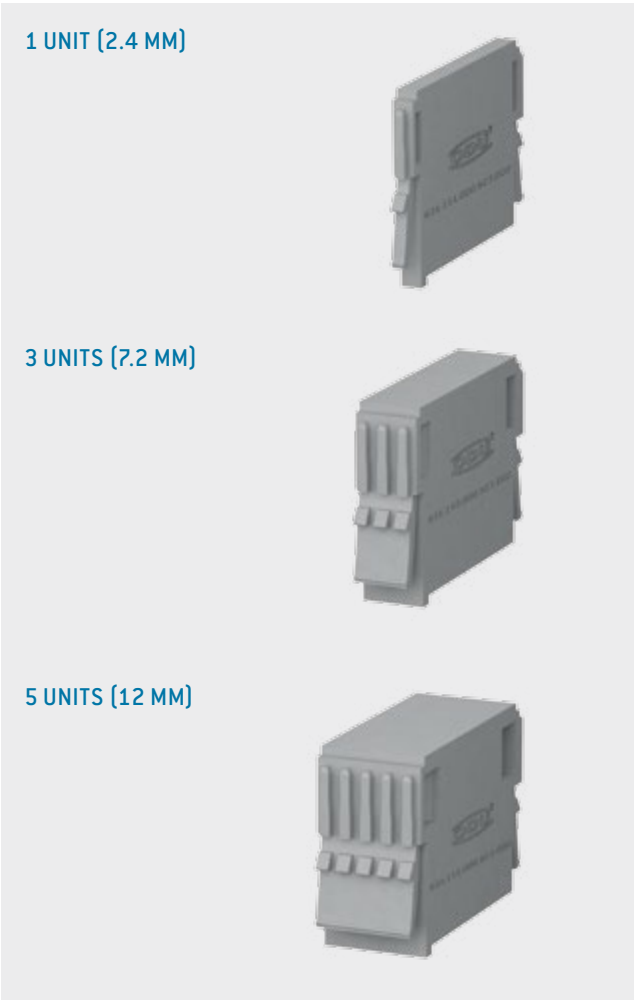


Used to fill any gaps, in incomplete frames. The frames must be fully equipped with insulators or blank modules.

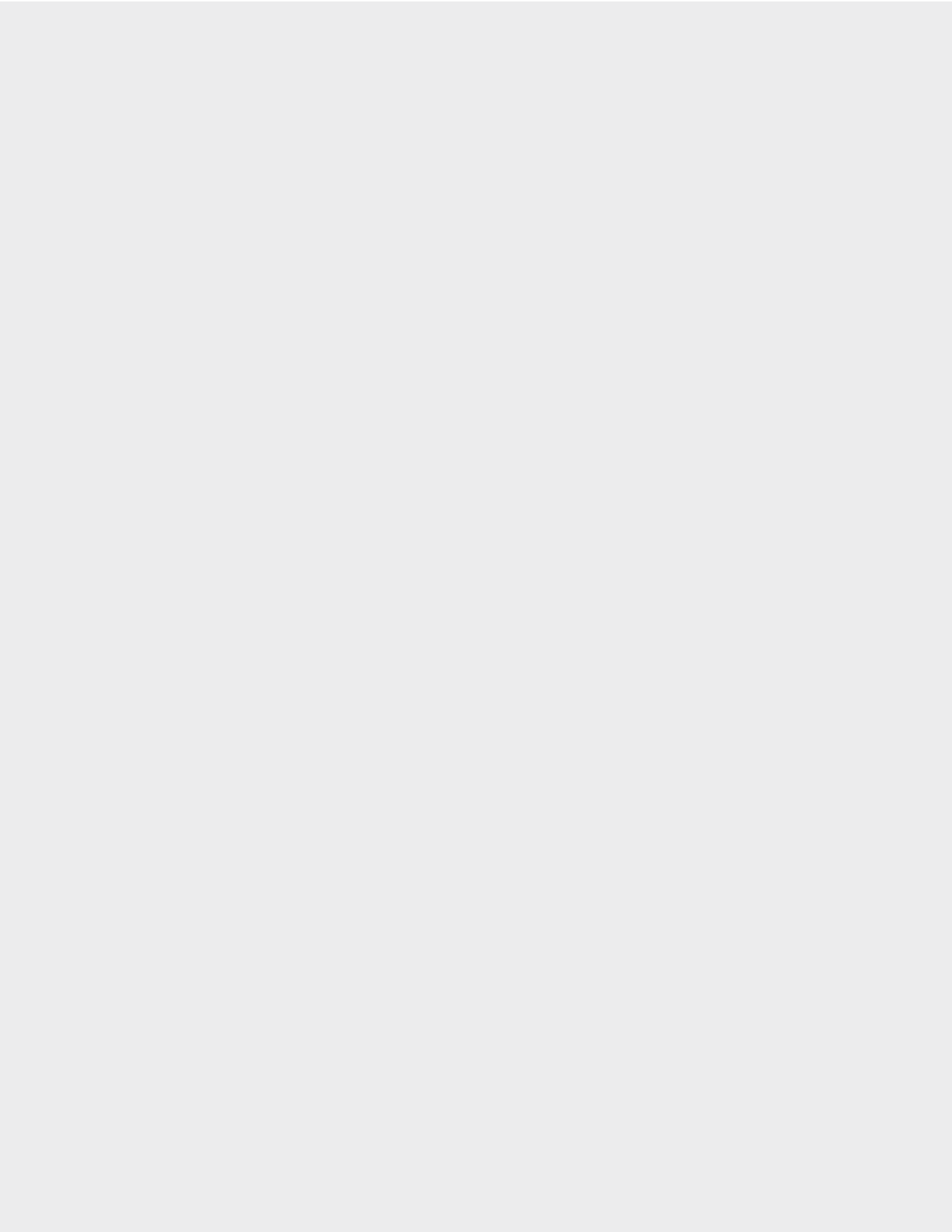
TECHNICAL DATA

Insulator Thermoplastic acc. to UL-94

Units	Part number
1	631.151.000.923.000
3	631.153.000.923.000
5	631.155.000.923.000



FOR YOUR NOTES





TOOLS

Termination technology	128
Crimping tools	129
Tensile strength diagram for crimp connections	130
Crimp information	131
Assembly aid	132
Removal of contacts	134
Maintenance package	135

TERMINATION TECHNOLOGY



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

- Crimp
- Solder
- PCB

CRIMP TERMINATION

Using contacts to establish connecting lines through crimping creates a permanent, secure and corrosion-free connection. For most people, crimping is easy and quick to carry out.

Through crimping, the conductor and contact materials in the compressed areas become so dense as to create a connection which is nearly gas-tight, and with a tensile strength befitting the conductor material.

Crimping can be carried out on the tiniest of diameters as well as in larger diameters. For small diameters (0.14 – 2.5 mm²), eight-point crimp tools are used; six-point crimp tools are used for larger dimensions. The corner measurement of the crimping is never larger than the original diameter. The cable insulation is not damaged in the process and can be directly attached to the connector end.

For error-free crimping, the bore diameter must be perfectly fitted to the cable. Such error-free crimping is only guaranteed if using ODU-recommended crimping tools. In order to correctly advise you, we need to know your cable type and profile, preferably by means of a sample and corresponding data sheet.

HEXAGONAL CRIMPING



8-POINT CRIMPING



FOR ASSEMBLY INSTRUCTIONS PLEASE REFER TO OUR WEBSITE: WWW.ODU-CONNECTORS.COM.

CRIMPING TOOLS



For further crimp information please refer to the table on page [131](#).

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), FROM 4 TO 6 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 8 MM SEE PAGE [131](#).
Has to be ordered separately.

HEXAGONAL CRIMPING TOOL FOR COAX CONTACTS



With blocking system.
PART NUMBER RANGE: 080.000.039.000.000

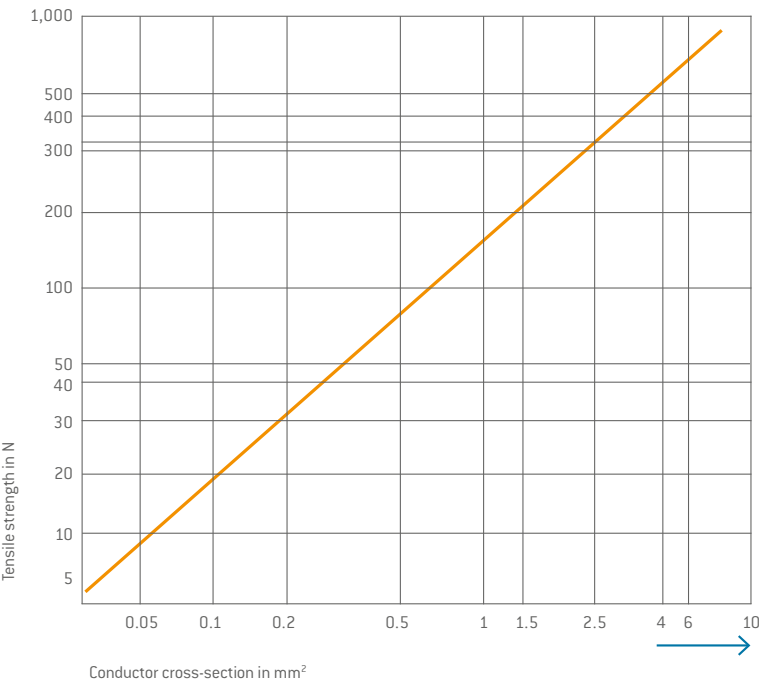
CRIMPING JAWS SEE PAGE [131](#).
Has to be ordered separately.

TENSILE STRENGTH FOR 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).

We recommend using suitable test adapters here.



CRIMP INFORMATION



Contact diameter mm	Termination cross-section		Strip-ping length mm	8-pt crimping tool 080.000.051.000.000 without positioner	8-pt crimping tool 080.000.057.000.000 without positioner	Hexagonal crimping tool 080.000.062.000.000	Hexagonal crimping tool 080.000.064.000.000	Crimping tool for coax 080.000.039.000.000
	AWG 7 wire 19 wire	mm² Class 5		Positioner 080.000.051.101.000 position / adjustment	Positioner 080.000.057.101.000 position / adjustment		Crimping jaws	Crimping jaws
0.7	26		4 ^{+0.5}	0.62 / 9				
	24							
	22							
		0.14						
		0.25						
1.3		0.38						
	20		5 ^{+0.5}	0.92 / 10				
	18							
		0.5						
		0.75						
		1						
2	18		6 ^{+0.5}	1.02 / 10				
	16			1.22 / 11				
	14			1.27 / 11				
		1		1.22 / 11	1.67 / 3			
		1.5			1.27 / 3			
		2.5			1.67 / 3			
3.5	14		7 ^{+0.5}		1.67			
	12					Profile no. 3		
	10					Profile no. 3		
		2.5			1.67 / 1, 2			
		4				Profile no. 3		
		6				Profile no. 3		
5		10	10 ^{+0.5}				080.000.064.110.000	
		16					080.000.064.101.000	
8		16	10 ^{+0.5}				080.000.064.116.000	
		25	18 ^{+0.5}				080.000.064.125.000	

COAX CRIMP INFORMATION

RG 178 / RG 196	See module description					082.000.039.101.000
RG 174 / RG 179 / RG 187 / RG 188 / RG 316						082.000.039.102.000
RG 58						082.000.039.106.000
RG 223						082.000.039.108.000
RG 59						082.000.039.109.000

ASSEMBLY 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 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 frames in a housing	598.054.203.000.000		1.2 Nm +/- 0.2 Nm
Bit combi slot size 1	Mounting screw for 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 TX 10	Screws of the angle bracket in the spindle locking	598.054.104.000.000		1.2 Nm +/- 0.2 Nm
Assembly tool collet nut size 1	Collet nut for shielded implementation size 1	598.055.001.000.000		1 Nm +/- 0.2 Nm
Bit for coded spindle	Assembly of the spindle coding	598.054.109.000.000		0.9 Nm +/- 0.2 Nm

REMOVAL TOOLS

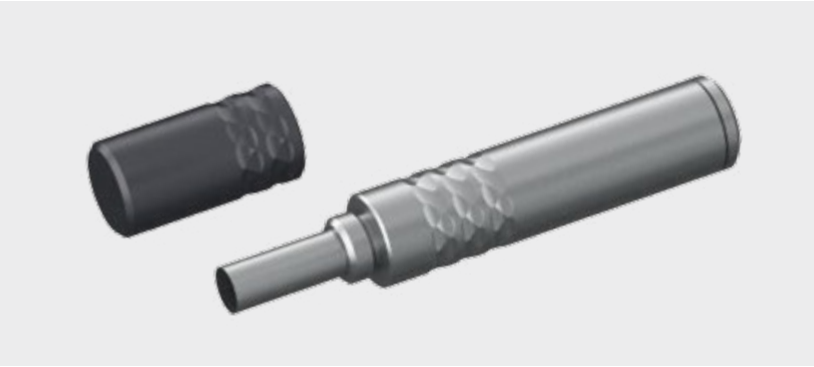


**ASSEMBLY TOOL HIGH CURRENT
CONTACT Ø 8 MM**
Required assembly tool For screwing and
releasing the contacts.
Locking torque: 2.7 Nm +/- 0.1 Nm
PART NUMBER: 087.611.002.001.000



**REMOVAL TOOL FOR CONTACTS
Ø 0.7 TO 5 MM**
Removal of the contact from the front. In
the case of already assembled contacts, the
cable does **not** have to be disconnected.

Contact Ø mm	Part number
0.7	087.7CC.070.002.000
1.3	087.7CC.130.004.000
2	087.7CC.200.003.000
3.5	087.7CC.350.001.000
5	087.7CC.680.001.000



**REMOVAL TOOL FOR COAX AND
COMPRESSED-AIR CONTACTS**
Removal of the contact from the front. In
the case of already assembled contacts, the
cable does **not** have to be disconnected.

Contact	Part number
Coax 4 contacts	087.7CC.310.001.000
Coax 2 contacts	087.7CC.690.001.000
Compressed air	087.7CC.680.001.000

REMOVAL AND ASSEMBLY OF CONTACTS IS ONLY POSSIBLE WITH
ODU TOOLS.

REMOVAL OF CONTACTS



REMOVAL OF THE ASSEMBLED CONTACTS

Push the contact to be removed to the front using the cable, in order to make the unlocking easier. The removal tool is pushed forward over the contact into the insulator until there is an audible click. By lightly pulling on the cable, the contact can be pulled from the rear of the insulator. The ODU-MAC Blue-Line has the advantage that the contacts can also be clipped out of the module in an assembled condition without separation of the assembly

DISMANTLING ONLY POSSIBLE USING ODU TOOLS.

MAINTENANCE PACKAGE FOR ODU LAMTAC® / ODU TURNTAC® 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.

CLEANING INFORMATION

Maintenance instruction 003.170.000.000.000

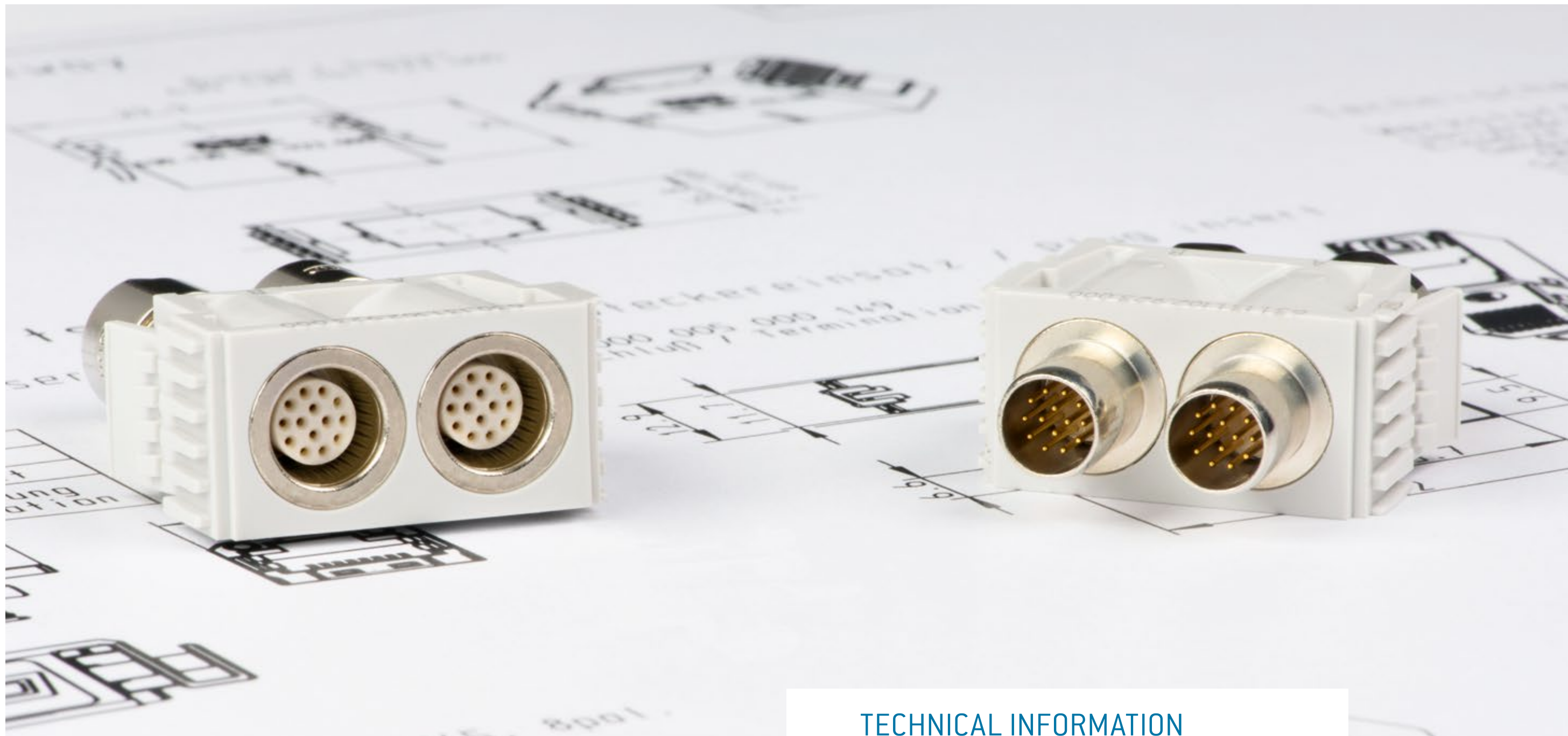
FURTHER INFORMATION

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 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 is 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 _i kV	U _i kV	U _i kV	U _i kV
0.33	0.357	0.355	0.35
0.5	0.541	0.537	0.531
0.8	0.934	0.92	0.899
1.5	1.751	1.725	1.685
2.5	2.92	2.874	2.808
4	4.923	4.874	4.675
6	7.385	7.236	7.013
8	9.847	9.648	9.95
12	14.77	14.471	14.025

CONVERSIONS/AWG (AMERICAN WIRE GAUGE)



Circular wire					
AWG	Diameter		Cross-section	Weight	Max. resist-ance
	Inch	mm			
10 (1)	0.1020	2.5900	5.2700	47.000	3.45
10 (37/26)	0.1109	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.

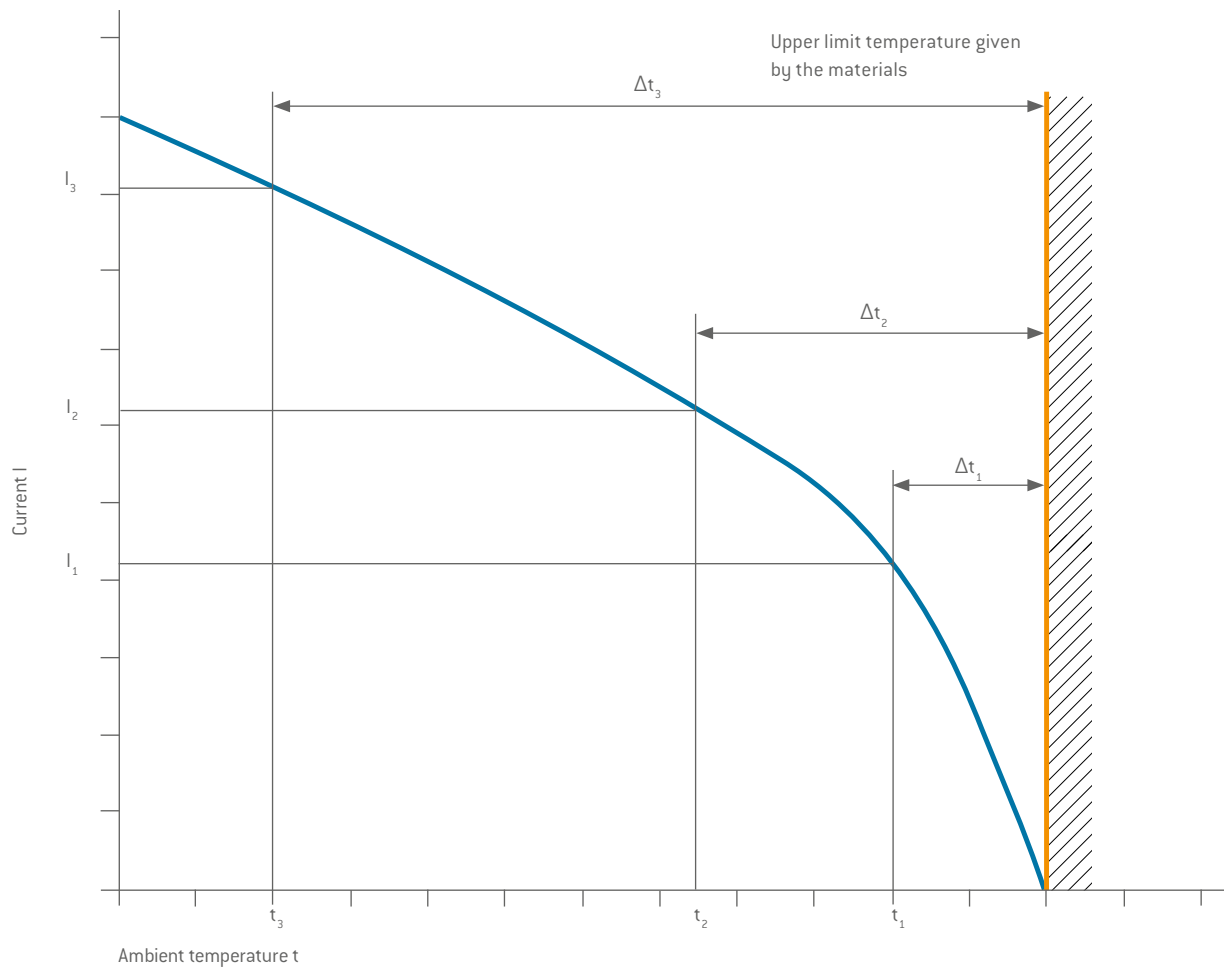
When selecting such a connector, please contact us and let us know the safety standard which the product must meet.

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 (Δt) is measured respectively for different currents on minimum three connectors, and the resulting values are joined to produce the parabolic basic curve. The basic curve is then used to derive the corrected current-carrying capacity curve [derating curve]. The safety factor ($0.8 \times I_n$) also makes allowance for factors such as manufacturing tolerances and uncertainties in temperature measurement or the measuring arrangement.

CURRENT LOAD

[In dependence on VDE 0276-1000:1995].

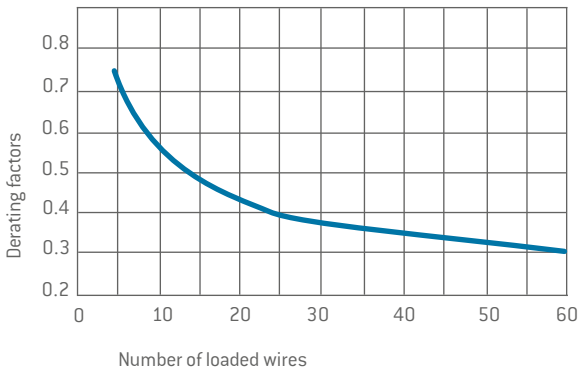


RATED CURRENT (NOMINAL CURRENT)

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.



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.

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.

CURRENT-CARRYING CAPACITY DIAGRAM

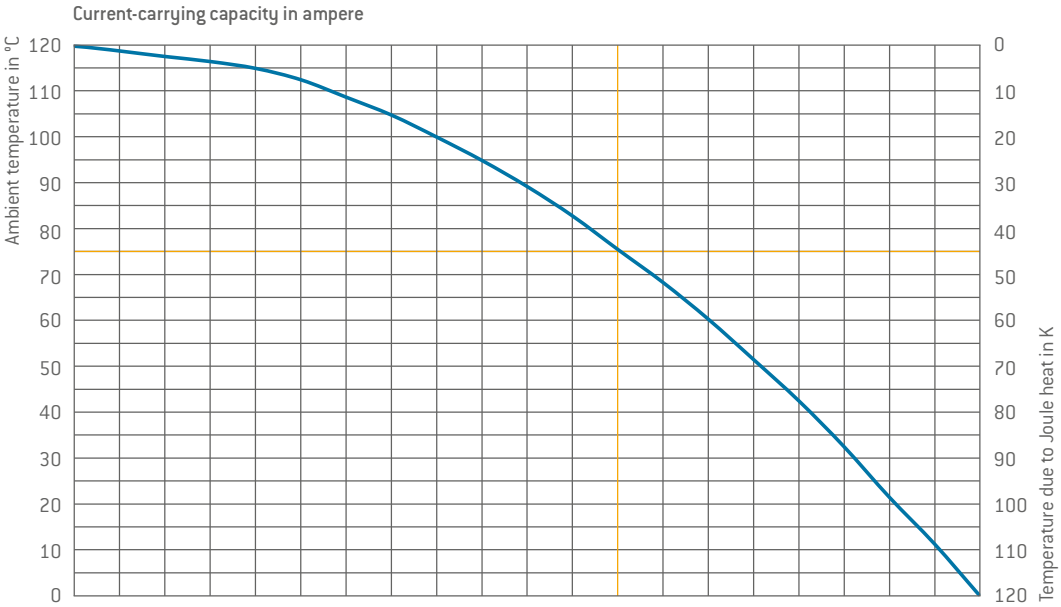


FOR SINGLE CONTACTS

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	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I			
ODU TURNTAC®	0.7	0.38	0	1	2.5	3.5	5	6	7	8.5	9.5	11	12										
	1.3	1	0	I	2	I	4	I	6.5	I	8.5	I	10.5	I	12.5	I	15	I	17	I	19.5	I	21.5
	2	1.5	0	3	6	9	12	15	18	21	24	27	30										
		2.5	0	I	4	I	8	I	12	I	16	I	20	I	24	I	27	I	30	I	33	I	37
	3.5	2.5	0	4	8	12.5	16.5	20.5	25	29	33	37	41										
		4	0	I	6.5	I	13	I	19.5	I	26	I	32.5	I	39	I	45	I	51.5	I	58	I	64
		6	0	6.5	13	19.5	26	32.5	39	45	51.5	58	64										
ODU LAMTAC®	5	10	0	I	10	I	20	I	29	I	38	I	47	I	56	I	67	I	78	I	90	I	99
		16	0	11	22	33	44	56	68	81	94	108	119										
	8	16	0	I	12	I	24	I	37	I	50	I	63	I	76	I	92	I	108	I	123	I	135
		25	0	16	33	50	67	85	103	118	135	150	165										
			Nominal current										Max. continuous current										

CURRENT-CARRYING CAPACITY DIAGRAM

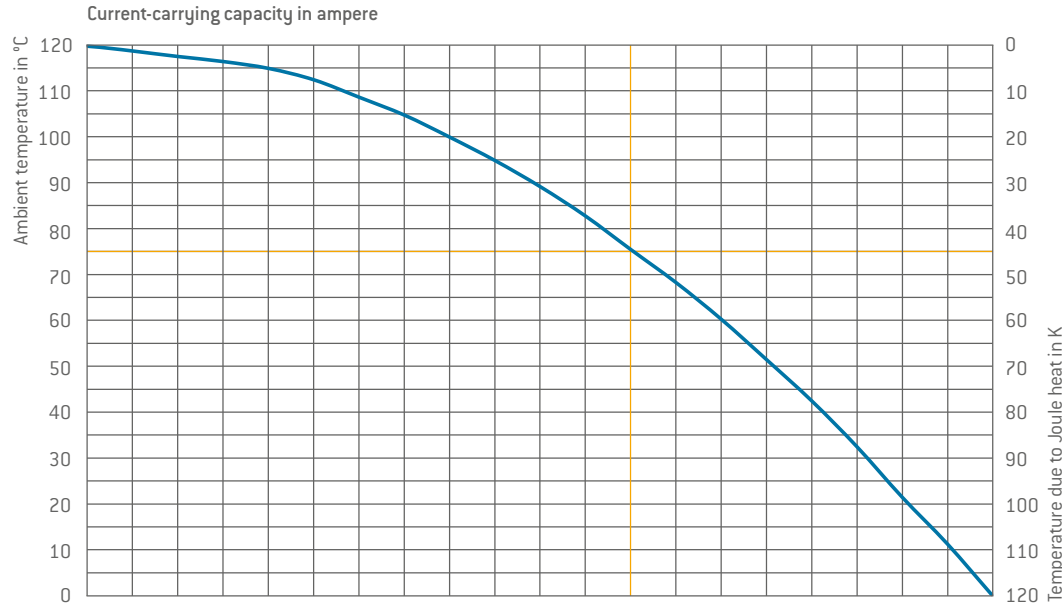


FOR FULLY EQUIPPED MODULES

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	Module	Contact Ø	Termination cross-section mm²	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I									
ODU TURNTAC®	20-pol.	0.7	0.38	0	1	2	3	4	5	5.5	6.5	7.5	8.5	9.5																				
	10-pol.	0.7	0.38	0	I	1	I	2	I	3	I	4	I	5	I	5.5	I	6.5	I	7.5	I	8.5	I	9.5										
			PCB	0	1	1.5	2.5	3	4	4.5	5.5	6	7	7.5																				
	6-pol.	1.3	1	0	I	1.5	I	3.5	I	5.5	I	7.5	I	9.5	I	11.5	I	14	I	16.5	I	19	I	20.5										
			PCB	0	1.5	2.5	4	5	6.5	8	9.5	11	12.5	14																				
	5-pol.	2	1.5	0	I	2.5	I	5	I	7.5	I	10	I	12.5	I	15	I	17.5	I	20	I	22	I	24										
			2.5	0	3	6	9	12	15	19	22	25	28	31																				
			PCB	0	I	3	I	5.5	I	8	I	11	I	13.5	I	16	I	19	I	22	I	25	I	27.5										
			2.5	0	3.5	7	10.5	14	17.5	21	24	27.5	31	34.5																				
	3-pol.	3.5	4	0	I	5	I	10	I	15	I	20	I	25	I	30	I	34	I	39	I	44	I	49										
			6	0	5	10	15	20	25	30	34	39	44	49																				
			10	0	I	9	I	18	I	27	I	37	I	46	I	56	I	65	I	74	I	83	I	92										
ODU LAMTAC®	2-pol.	5	16	0	11	22	33	45	56	68	79	90	101	112																				
			16	0	I	13	I	25	I	38	I	50	I	63	I	75	I	88	I	100	I	113	I	125										
		8	25	0	17	34	50	66	83	100	116	132	149	166																				
Nominal current																									Max. continuous current									

LINE CURRENT LOAD



The current-carrying capacity of the individual conductors is frequently lower than that of the individual contacts used. When determining the maximum current-carrying capacity, the lowest value is always to be taken into account.

Laying procedure	Exposed in air	or on surfaces		
	Single-wire lines	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 ²	Current load in A			
0.14 ¹	3			2
0.25 ¹	5			4
0.34 ¹	8			6
0.5 ¹	12	3	3	9
0.75	15	6	6	12
1	19	10	10	15
1.5	24	16	16	18
2.5	32	25	20	26
4	42	32	25	34
6	54	40		44
10	73	63		61
16	98			82
25	129			108
35	158			135
50	198			168
Current load acc. to:	VDE 0298-4:2013 table 11			

Carrying capacity of cables with a rated voltage of up to 1,000 V and of heat resistant cables. The specification of data does not release one from the need to conduct the test. The original standards remain authoritative for all of the listed technical specifications.

¹DIN 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 142.

BASE CURVE

See page 144.

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 notes in this catalogue as well as the special information for the plastic housings.

CLEARANCE DISTANCE

The insulation coordination is explained in detail starting on page 141.

CODING (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 66).

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 shortest distance between two conductive parts along the surface of a solid insulation material. This factors in all elevations and recesses in the insulator, as long as defined minimum dimensions are on hand. The insulation coordination is explained in detail from page 141.

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 128).

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 139.

TECHNICAL TERMS



DELIVERY FORM

The delivery of the connector is carried out in the form of individual parts.

DERATING CURVE

See page [144](#).

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.

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

See page [144](#).

INSULATOR

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

LUBRICATION

All standard contacts are lubricated at the factory. We recommend the ODU maintenance package for subsequent lubrication (<http://www.odu.de/downloads>.)

MATERIALS (STANDARD DESIGN)

Pins and bodies 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. The data refers to contacts in a lubricated condition (status at delivery) and after approx. 30 mating cycles. The forces are/ may be higher in new condition (lubricated). The data represents average values with a potential fluctuation of $\pm 50\%$.

MATING CYCLES

Mechanical actuation of connectors by mating and sliding. A mating cycle consists of one mating and sliding action. 10,000 mating cycles are the standard value for ODU TURNTAC and ODU LAMTAC 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 [144](#)).

NOMINAL VOLTAGE

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

OPERATING TEMPERATURE

See uppermost limit temperature (p. [151](#)). Single modules may differ from the indicated temperature values. Here you find the technical information on the appropriate pages.

PCB (A.K.A. “PRINTED CIRCUIT BOARD”)

A PCB is a carrier for electronic components. It serves the purposes of mechanical mounting and electrical connection.

PCB TERMINATION

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

TECHNICAL TERMS



RATED CURRENT (NOMINAL CURRENT)

See page [145](#).

RATED VOLTAGE

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.

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.

TEST VOLTAGE

The voltage which a conductor can withstand under defined conditions without dielectric breakdown or flashover.

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 [128](#)).

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

See protection types on page [138](#).

UPPERMOST LIMIT TEMPERATURE

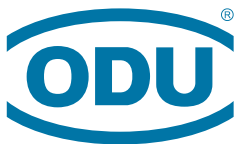
The highest permissible temperature at which the connector may still be operated. This includes the self-heating via the current carrying capacity. In the case of standard contacts (ODU TURNTAC), this amounts to +120 °C.

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.



A PERFECT ALLIANCE.

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Mexico ODU Mexico Manufacturing S.R.L. de C.V.

Romania ODU Romania Manufacturing S.R.L.

USA ODU-USA Inc.



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