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 12.0 GHz

MANUAL MATING
AUTOMATIC DOCKING

ODU-MAC® SILVER-LINE ODU-MAC® WHITE-LINE

www.odu-usa.com
FEATURES

- Economical, efficient solution
- Rugged version
- > 10,000 mating cycles
- Modules assembled flexibly and conveniently using the clip principle
- Low contact resistances
- High reliability
- Maximum packing density

APPLICATIONS

- Medical
- Industrial
- Test and measurement
- Military and security
- Energy
- eMobility

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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 to achieve superb results. This goal drives our work. Perfect connections that inspire and deliver on the promises.

WORLDWIDE CUSTOMER PROXIMITY

ODU GROUP OVERVIEW

- More than 75 years of experience in connector technology
- A turnover of € 200 million
- Over 2,300 employees worldwide
- Sales subsidiaries in China, Denmark, France, Germany, Italy, Japan, Korea, Sweden, UK and the US as well as five production and logistics sites
- 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 2019

CERTIFICATES & APPROVALS

- ISO 9001
- IATF 16949
- ISO 13485
- ISO 14001
- ISO 50001
- Wide range of UL, CSA, VG and VDE approvals
- UL Wiring Harnesses certified

For a complete list of our certifications and approvals, please visit our website.
INGENIOUS IDEAS
PERFECT SOLUTIONS

Product portfolio of ODU

VERSATILE CONNECTOR SOLUTIONS
FOR A WIDE RANGE OF APPLICATIONS

ELECTRICAL CONTACTS
- Versatile connector technologies
- Outstanding reliability, lifetime and durability
- Up to 1 million mating cycles
- Current-carrying capacity of up to 2,400 A
- Rugged contact systems, suitable even for harsh environments
- Economical solutions for automatic processing
- Including cable assembly – complete solution

CIRCULAR CONNECTORS
- Circular connector series in robust metal or plastic housing
- Contacts for soldering, crimping and PCB termination
- Optional selectable Push-Pull locking or screw locking technology ensuring a secure connection at all times as easy to release Break-Away function
- 2 up to 55 contacts
- IP50 to IP69
- Autoclavable for medical applications
- Hybrid inserts for combined transmission
- Including cable assembly – complete solution

MODULAR CONNECTORS
- Application-specific hybrid interface
- For manual mating and automatic docking
- The highest packing density
- Flexible modular construction
- Multitude of data transmission modules
- For the transmission of signals, power, high current, high voltage, RF signals (coax), media, high-speed data and fiber optics
- Variety of locking options available
- Extremely durable – even under extreme conditions
- Mating cycles available as required from 10,000 to over 100,000 (1 million)
- Including cable assembly – complete solution

HEAVY DUTY CONNECTORS
- Extremely durable even under extreme / harsh environments
- High vibration resistance
- Up to 400 A (higher currents upon request)

PRINTED CIRCUIT BOARDS CONNECTORS
- Maximum flexibility in application designs
- High resilience and outstanding quality
- Including cable assembly – complete solution

APPLICATION AND CUSTOMER-SPECIFIC SOLUTIONS
- Contacts, connectors and cable assemblies for the highest technical requirements as well as special applications
- First-class implementation expertise
- High level of vertical manufacturing – all competencies and key technologies under one roof
- Expert advice based on mutual partnership
- Short development and production paths

CABLE ASSEMBLY
- Complete systems from a single source based on years of expertise
- State-of-the-art production facilities with 100 % end testing
- Cleanroom production
- Overmolding in silicone, hot-melt and high-pressure procedures
- Custom-specific labeling
- Prototype, small series and high volume production
- Rapid prototyping
MORE THAN A CONNECTION

Our Know-How for your success

MORE THAN A CONNECTION

Our Know-How for your success

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 our products also stand for dynamics, reliability, safety, precision, efficiency and sustainability.

ODU – A PERFECT ALLIANCE.

CONNECTIONS THAT LIVE UP TO ANY REQUIREMENT

Contacts, connectors and integrated cable assembly solutions meeting the most demanding technical market requirements – ODU’s connector solutions and value-added services are characterized by their exclusive focus on meeting the customer’s needs.

• Precise implementation of application-specific requirements regarding design, functionality, cost and exclusivity
• Modified connector solutions derived from standard products
• One-to-one local expertise and fair, friendly consulting
• Short development and production paths

DEVELOPMENT OF CUSTOM 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 impressive, custom-fit final end products.

ODU – A PERFECT ALLIANCE.

CROSS-INDUSTRY KNOW-HOW

MEDICAL

TEST AND MEASUREMENT

MILITARY AND SECURITY

ENERGY

EMOBILITY
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EASILY CONFIGURE THE ODU-MAC® BLUE-LINE ONLINE AT: WWW.ODU-MAC.COM/EN/
THE ODU-MAC® BLUE-LINE — A NEW PERFORMANCE CLASS

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 solution that can be configured for the smallest installation space — available in both a plastic and a metal housing. A multitude of data transmission modules allow for a broad area of application 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, distinguishes the ODU-MAC® Blue-Line as well; any module installation errors are 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 economical nature of the system.

ECONOMICAL
- Easy assembly using crimp contacts, which 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 sockets and pins
- Numerous housing versions in metal and plastic available with spindle or lever locking

FLEXIBLE
- 5 frame sizes (7, 12, 18, 26, 37 units)
- Transmission of signals, power, high current, coax, compressed air, fluid, data, and fiber optics
- Additional option for the transmission of signals: separate PCB termination modules for effective contacting in the termination area
- Maximum packing density via the 2.4 mm grid (1 unit)

HIGH-PERFORMANCE
- > 10,000 mating cycles
- Up to 370 contacts per single-row connector
- Proven ODU contact technology (turned/slotted contacts and contacts with lamella technology)
A MODULAR ALL-ROUNDER

The flexible modular design of the ODU-MAC® Blue Line enables the combination of the most varied types of transmission within a connector. Whether signal, power, high current, coax, compressed air, fluid, data or fiber optics are being transmitted – all of the contact inserts can be selected from the modular system and integrated into the individual connector solution.

For signal transmission, there is also a simple contacting option using PCB termination modules. The mating options are equally versatile.

THE INTELLIGENT WAY TO AN 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 in one of the many housing versions.

This results in an effective, compact, and attractive overall connection that cannot be beaten in terms of functionality. The confusion caused by many connections is a thing of the past – an ODU-MAC® Blue Line customized to meet your requirements is today’s solution.

Learn more about custom configurations on the following pages or at: www.odu-mac.com/en/

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

FIND OUT MORE IN THE VIDEOS AT www.youtube.com/ODUSteckverbinder
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 3 ways to access the ODU-MAC® Blue-Line Web Configurator:

1. ACCESS: THROUGH 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.

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

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

3. ACCESS: THROUGH WWW.ODU-CONNECTORS.COM/BLUE-LINE/

Click the "Configurator" button on the www.odu-connectors.com/blue-line/ landing page to go to the Web Configurator.

You access the Configurator via the Modular Connectors product category.
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 exact requirements. This means that you always receive the appropriate hybrid connection for a perfect interface.

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 product.

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 28 different modules for signals, power, high current, coax, compressed air, fluid, data transmission, fiber optics or PCB termination and assemble your ODU-MAC® Blue-Line individually.

FOR MANUAL MATING

1ST STEP: LOCKING
Select the type of lock in this first step. You have the choice between lever, spindle, and push-pull locking.

2ND STEP: CONNECTOR HOUSING SELECTION
Depending upon the locking system, choose the housing suited to your requirements. The following housings are available:

3RD STEP: RECEPTACLE SELECTION
Depending upon the requirements for the receptacle and the selected connector housing, a wide variety of styles is available.

4TH STEP: MODULE SELECTION
Choose from 28 different modules for signals, power, high current, coax HF signals, compressed air, fluid, data transmission, fiber optics or PCB termination and assemble your ODU-MAC® Blue-Line individually.

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See page 90
ODU-MAC® PUSH-LOCK

Maximum packing density in the smallest installation space

We offer a compact, sealed housing with push-pull locking based on the ODU-MAC® Blue-Line. In terms of ergonomics, modularity, and user-friendliness, it is in no way inferior to its "big brother" with spindle locking. Seven units can be custom-fitted with hybrid connector configurations offering International Protection class IP67.

With push-pull locking

The compact, sealed ODU-MAC® PUSH-LOCK housing with push-pull locking is based on the ODU-MAC® Blue-Line. Seven units can be custom-fitted with hybrid connector configurations offering International Protection class IP67. The ergonomic one-handed operation, modular design, and user-friendliness of the PUSH-LOCK housing are what set it apart. A total of six optional coding functions and the tried-and-tested push-pull locking principle ensure mating is reliable and secure. This modular rectangular connector benefits from the decades of experience obtained through ODU push-pull circular connectors.

BENEFITS OF THE PUSH-LOCK HOUSING

- Easy and secure push-pull locking
- 7 units
- Modules: signal, power, HF signals (coax), compressed air, fluid coupling, data transmission
- > 5,000 mating cycles
- IP67
- M25 cable outlet
- Protective cover

FURTHER INFORMATION FROM PAGE 42.
THE BEST CONNECTIONS FOR MANUAL MATING

Housings with spindle locking at a glance.

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.

BENEFITS OF SPINDLE LOCKING

- **Low profile** – requires less space for operation than lever locking
- **Easy to use** – one-handed operation
- **Ergonomic design** – elegant spindle knob
- **Tested reliability** – developed for high numbers of locking cycles
- **Fully enclosed** – internal mechanism protects against injury
- **Replaceability** – can be replaced without removing the hood or frame
- **User-friendly** – little force required for operation
- **Precision** – materials, design, and tolerances help to prolong the service life of the complete system

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<tr>
<th>Size</th>
<th>Units</th>
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<tbody>
<tr>
<td>2</td>
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<td>3</td>
<td>26</td>
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<td>4</td>
<td>37</td>
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</table>

CABLE HOOD XXL |

<table>
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<tr>
<th>Size</th>
<th>Units</th>
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<tbody>
<tr>
<td>4</td>
<td>37</td>
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</table>

FULLY COMPATIBLE

PLASTIC CABLE HOOD WITH SIDE CABLE OUTLET, PAGE 56
Connector housing for assembly on the cable

METAL CABLE HOOD WITH SIDE CABLE OUTLET, PAGE 49
Connector housing for assembly on the cable

METAL CABLE HOOD XXL WITH SIDE M50 CABLE OUTLET, PAGE 49
Connector housing with expanded assembly space and side M50 cable outlet

METAL SURFACE-MOUNTED HOUSING, PAGE 51
For surface mounting on your device/wall with spindle locking and two side cable outlets

PLASTIC SURFACE-MOUNTED HOUSING, PAGE 58
For surface mounting on your device/wall with spindle locking and two side cable outlets

PLASTIC BULKHEAD HOUSING, PAGE 57
For mounting on your device with spindle locking

METAL BULKHEAD HOUSING, PAGE 50
For mounting on your device with spindle locking

FURTHER INFORMATION FROM PAGE 48.

1 S units of space required for spindle 2 Cable hood XXL only possible in metal version
THE BEST CONNECTIONS FOR MANUAL MATING

ODU-MAC® RAPID housings with spindle locking at a glance

TWICE AS FAST THANKS TO THE HALF-SHELL PRINCIPLE
Our new housing meets all major challenges, including high contact density, flush mounting of the receptacle, and easy adaptability when user requirements change quickly. Special protective covers for both housing parts round out the series.

BENEFITS OF THE RAPID HOUSING
- Up to 50% in time savings through easy assembly and maintenance
- Flexible cable outlet – can be adapted to cable or tube assemblies as necessary
- Optional lattice plates – enable bundling and strain relief of single strands
- Half-shell principle – practical structure as well as fitting and assembly of components in the housing
- New recessed receptacle version
- Available for ODU-MAC® White-Line and Blue-Line in size 4 with the proven ODU spindle locking system
- Coding enabled through the guiding pins on the frame; six further coding functions are optional via the spindle module

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<tr>
<th>Size</th>
<th>Units¹</th>
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<tbody>
<tr>
<td>4</td>
<td>37</td>
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</tbody>
</table>

¹ 5 units of space required for spindle

FURTHER INFORMATION FROM PAGE 52.
THE BEST CONNECTIONS FOR MANUAL MATING

Housings with transverse locking at a glance.

The efficient and robust plastic housings with transverse locking are available in size 1 to 4 with IP65 as standard.

A space-saving locking type for two-handed safety operation with over 5,000 possible mating cycles, which complements our multi-faceted housing range. It makes manual mating as easy as it is safe.

FURTHER INFORMATION FROM PAGE 59.

- Locking latch can be changed easily
- Light and robust housing model
- Space-saving locking, stackable sidewise
- Two-handed safety operation
- Protection class IP65
- > 5,000 locking cycles

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<tr>
<td>4</td>
<td>37</td>
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</tbody>
</table>

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PLASTIC CABLE HOOD WITH SIDE CABLE OUTLET, PAGE 59
Connector housing for assembly on the cable

FULLY COMPATIBLE

PLASTIC BULKHEAD HOUSING, PAGE 60
For assembly on your device with transverse locking

PLASTIC SURFACE-MOUNTED HOUSING, PAGE 61
For surface mounting on your device/wall with transverse locking and two side cable outlets
THE BEST CONNECTIONS 
FOR MANUAL MATING

Housings with lever locking at a glance.

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.

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<th>Units</th>
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<td>3</td>
<td>26</td>
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<tr>
<td>4</td>
<td>37</td>
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**CABLE HOOD XXL:**

<table>
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</table>

**CABLE HOOD WIDE:**

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<tr>
<td>6</td>
<td>74</td>
</tr>
</tbody>
</table>

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**FURTHER INFORMATION FROM PAGE 64.**
Plastic housings are 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.

The plastic housings of ODU-MAC® Blue-Line either use the proven ODU spindle locking technology with a minimum of 10,000 locking cycles, which has excellent ergonomic features, or the customer can choose the efficient transverse locking version instead. An additional grounding of the plastic housing is unnecessary, due to the antistatic, thermoplastic housing. Hence manual mating becomes as easy as it is safe.

### CHEMICAL RESISTANCE

<table>
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<th>Medium</th>
<th>Material PA6 + GF</th>
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<tbody>
<tr>
<td>Ammonia, 10% aqueous solution</td>
<td>Resistant</td>
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<tr>
<td>Ammonia gas</td>
<td>With limited resistance</td>
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<tr>
<td>Ammonium carbonate</td>
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</tr>
<tr>
<td>Ammonium chloride</td>
<td>•</td>
</tr>
<tr>
<td>Ammonia gas at room temperature</td>
<td>•</td>
</tr>
<tr>
<td>Ammonia gas at 100 °C</td>
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</tr>
<tr>
<td>Ammonium carbonate</td>
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<tr>
<td>Ammonium chloride</td>
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</tr>
<tr>
<td>Aniline</td>
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<tr>
<td>Asphalt</td>
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<tr>
<td>Beer</td>
<td>•</td>
</tr>
<tr>
<td>Butane gas</td>
<td>•</td>
</tr>
<tr>
<td>Copper sulfate, 10% aqueous solution</td>
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<tr>
<td>Cresol solution</td>
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<td>Cresylic acid</td>
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<td>Hydrogen sulfide, aqueous solution</td>
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<td>Ink</td>
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<td>Isopropyl + ethanol</td>
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<td>Methyl alcohol, diluted 50%</td>
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</tr>
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<td>Potassium sulfate</td>
<td>•</td>
</tr>
<tr>
<td>Regular grade petrol</td>
<td>•</td>
</tr>
<tr>
<td>Seawater</td>
<td>•</td>
</tr>
<tr>
<td>Silicone oil</td>
<td>•</td>
</tr>
<tr>
<td>Soap solution</td>
<td>•</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium bisulfate, aqueous solution</td>
<td>•</td>
</tr>
<tr>
<td>Sodium carbonate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>•</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>•</td>
</tr>
<tr>
<td>Sodium hydroxide 12.5%</td>
<td>•</td>
</tr>
<tr>
<td>Sodium nitrate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium nitrite</td>
<td>•</td>
</tr>
<tr>
<td>Sodium nitrite</td>
<td>•</td>
</tr>
<tr>
<td>Sodium perborate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium phosphate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium silicate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>•</td>
</tr>
<tr>
<td>Sodium Sulphite</td>
<td>•</td>
</tr>
<tr>
<td>Sodium thiosulfate</td>
<td>•</td>
</tr>
<tr>
<td>Solution for developing photos</td>
<td>•</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>•</td>
</tr>
<tr>
<td>Stearic acids</td>
<td>•</td>
</tr>
<tr>
<td>Sulfur</td>
<td>•</td>
</tr>
<tr>
<td>Sulfolane</td>
<td>•</td>
</tr>
<tr>
<td>Tallow</td>
<td>•</td>
</tr>
<tr>
<td>Tar</td>
<td>•</td>
</tr>
<tr>
<td>Tartaric acid</td>
<td>•</td>
</tr>
<tr>
<td>Transformer oil</td>
<td>•</td>
</tr>
<tr>
<td>Urea, diluted</td>
<td>•</td>
</tr>
<tr>
<td>Urine</td>
<td>•</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>•</td>
</tr>
<tr>
<td>Water</td>
<td>•</td>
</tr>
</tbody>
</table>

This list gives a non-exhaustive indication of the chemical resistance offered by the plastic housing. Please contact the ODU team if you have any further questions. They will be happy to assist you.
FRAMES FOR AUTOMATIC DOCKING

Docking frames at a glance

Depending on your requirements, you can choose between 4 different sizes and fit 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 grid units (more on request), meaning that 370 contacts can be installed if the 10-contact module with a module width of 2.4 mm (1 unit) is used.

BENEFITS 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)
  28 different modules: signal, power, high current, coax, compressed air, fluid, data transmission, fiber optic or PCB termination
- **Maximum packing density** via the 2.4 mm grid (1 unit)
- **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 meet the highest quality standards and enable safe and reliable connections. In order to achieve this, ODU relies on high-performance contact technologies. In the turned contact category, we essentially distinguish between lamella and slotted contacts. The socket pieces 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 economical prices. By means of optimum guidance and assembly in the ODU-MAC® system, the longevity of 10,000 mating cycles and more can be achieved.

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

ODU LAMTAC®

Contacts with lamella technology.

The ODU LAMTAC® consists of a turned carrier in which one or several stamped lamella strips are mounted in a fully automated process. The lamella’s individual slats make for a multitude of contact points, thereby guaranteeing a high level of contact safety 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.

<table>
<thead>
<tr>
<th>Standard contact principle for:</th>
<th>Signal contact</th>
<th>Ø 0.7–2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power contact</td>
<td>Ø 3.5 mm</td>
<td></td>
</tr>
<tr>
<td>Coax</td>
<td>2 and 4 contacts</td>
<td></td>
</tr>
<tr>
<td>Shielded feedthrough</td>
<td>Signal contacts</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard contact principle for:</th>
<th>Power contact</th>
<th>Ø 5–12 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded feedthrough</td>
<td>Shielded transmission</td>
<td></td>
</tr>
</tbody>
</table>
CONTACT RETENTION WITH THE CLIP PRINCIPLE (STANDARD)

The graphic below shows how the contact is fixed in the insulator. The contact is pushed from the termination side (rear insertion) into the insulator and locked in by a metal clip (barbed hook) snapping in the insulator. The contacts can be easily removed again from the front at any time with a removal tool.

Compared with permanent connections, crimp technology allows for the 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 always possible.

**The majority of modules use this fastening technology.**

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

PERFECTLY ASSEMBLED – EASY TO HANDLE

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 refer to the ODU-MAC® Blue-Line assembly instructions for detailed information. Further information is available in the download area of our website.
PCB TERMINATION MODULES

Easy-to-use termination technology for signal modules via PCB contacting

THE BENEFITS OF THE PCB TERMINATION ASSEMBLY
The PCB termination modules \(A\) are permanently mounted on 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.

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

THE ODU-MAC® BLUE-LINE – FOR THE MOST VARIED APPLICATIONS

MAIN APPLICATION AREAS FOR THE ODU-MAC® BLUE-LINE
- Test and measurement
- Medical
- Industrial
- Special machine construction

ODU-MAC® BLUE-LINE FOR X-RAY MACHINES
The modular ODU-MAC® connector acts as an interface between a mobile X-ray machine and a monitor cart. It transmits high current, data, and signals.

ODU-MAC® BLUE-LINE FOR AUTOMOTIVE TESTING
The ODU-MAC® Blue-Line in a housing with spindle locking provides a reliable interface between the test device and the measured-data receiver.

ODU-MAC® BLUE-LINE FOR MEASURING AND TESTING TECHNOLOGY
ODU-MAC® Blue-Line customized power and signal transmission solution for a HIL testing system.
EASILY CONFIGURE THE ODU-MAC® BLUE-LINE ONLINE AT: WWW.ODU-MAC.COM/EN/

MANUAL MATING

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Spindle locking ................................................................. 44
  Metal housing .................................................................. 44
  Plastic housing ............................................................ 45
Transverse locking, plastic housing ............................................. 49
Lever locking, metal housing ..................................................... 50
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ODU-MAC® PUSH-LOCK

Connector housing for assembly on the cable

PUSH-PULL LOCKING

TECHNICAL DATA

- Color of housing: Black (RAL 9005), White on request
- Material housing shell: Lexan PC
- Material protective cover: Lexan PC
- Number of locking cycles: 1 5,000 units
- International Protection class: 3 IP67
- Operating temperature: −40 °C to +125 °C
- Cable diameter: 7–20.5 mm
- More mechanical versions as options

Assembly set for cable Ø ≥ 7 mm (has to be ordered separately)

<table>
<thead>
<tr>
<th>Color</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 to 10.5 Green</td>
<td>921 000 006 999 001</td>
</tr>
<tr>
<td>9 to 13 Red</td>
<td>921 000 006 999 002</td>
</tr>
<tr>
<td>14 to 18 Blue</td>
<td>921 000 006 999 003</td>
</tr>
<tr>
<td>17 to 20.5 Brown</td>
<td>921 000 006 999 004</td>
</tr>
</tbody>
</table>

SUITABLE MODULES ARE MARKED.

ODU-MAC® PUSH-LOCK

Receptacle for integration in your device

PUSH-PULL LOCKING

TECHNICAL DATA

- Material receptacle: Zn alloy, nickel-plated
- Material protective cover: Lexan PC
- Number of locking cycles: 1 5,000 units
- International Protection class: 3 IP67
- Operating temperature: −40 °C to +125 °C

PANEL CUT-OUT

<table>
<thead>
<tr>
<th>Receptacle coding</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding A</td>
<td>1 ± IV</td>
</tr>
<tr>
<td>Coding B</td>
<td>2 ± III</td>
</tr>
<tr>
<td>Coding C</td>
<td>1 ± II</td>
</tr>
<tr>
<td>Coding D</td>
<td>3 ± IV</td>
</tr>
<tr>
<td>Coding E</td>
<td>1 ± III</td>
</tr>
<tr>
<td>Coding F</td>
<td>2 ± IV</td>
</tr>
</tbody>
</table>

SUITABLE MODULES ARE MARKED.

1 At maximum mating force for all contacts of 40 N. 2 The frame is already permanently integrated and consists of seven units. 3 IEC 60529:2013 (VDE 0470-1:2014)
SPINDLE LOCKING (VERSION 1)

Module for installation in ODU-MAC® Blue-Line frame 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 OR SURFACE-MOUNTED HOUSING AND PINS IN CABLE HOOD

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

CENTER MODULE SUITABLE FOR SPINDLE 180°, 270°, AND 360°

<table>
<thead>
<tr>
<th>Size</th>
<th>Part number WITHOUT CODING</th>
<th>Part number WITH CODING</th>
<th>Angle of rotation</th>
<th>Dim. A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (52 mm high)</td>
<td>634.090.001.304.000</td>
<td>635.091.003.200.000</td>
<td>180°</td>
<td>46.5</td>
</tr>
<tr>
<td>2 (72 mm high)</td>
<td>634.090.001.304.000</td>
<td>635.091.001.200.000</td>
<td>180°</td>
<td>66.5</td>
</tr>
<tr>
<td>3/4</td>
<td>634.090.001.304.000</td>
<td>635.092.011.200.000</td>
<td>270°</td>
<td>72.5</td>
</tr>
<tr>
<td>XXL</td>
<td>634.090.001.304.000</td>
<td>635.093.011.200.000</td>
<td>270°</td>
<td>90.5</td>
</tr>
<tr>
<td>XXL</td>
<td>634.090.001.304.000</td>
<td>635.093.011.200.003</td>
<td>360°</td>
<td>90.5</td>
</tr>
</tbody>
</table>

REPLACEMENT SPINDLE SETS 180°, 270°, AND 360°

<table>
<thead>
<tr>
<th>Part number replacement spindle set</th>
<th>Angle of rotation</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>615.090.104.249.000</td>
<td>180°</td>
<td>12</td>
</tr>
<tr>
<td>615.090.104.249.004</td>
<td>270°</td>
<td>16.3</td>
</tr>
<tr>
<td>615.090.104.249.005</td>
<td>360°</td>
<td>16.3</td>
</tr>
</tbody>
</table>

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

FOR THE REQUIRED ASSEMBLY AIDS, SEE PAGE 158

¹ Coding pins are included in the standard scope of delivery. For an explanation of spindle coding, see from page 80.
SPINDLE LOCKING (VERSION 2)

Module for installation in ODU-MAC® Blue-Line frame 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 OR SURFACE-MOUNTED HOUSING AND SOCKETS IN CABLE HOOD (REVERSED GENDER)

CENTER MODULE SUITABLE FOR SPINDLE 180°, 270°, AND 360°

CENTER MODULE FOR SPINDLE LOCKING

TECHNICAL NOTES
- Min. 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

REPLACEMENT SPINDLE SETS 180°, 270°, AND 360°

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

FOR THE REQUIRED ASSEMBLY AIDS, SEE PAGE 159.
METAL CABLE HOOD

Connector housing for assembly on the cable with side cable outlet

SPINDLE LOCKING

---

GRAY MODEL [STANDARD]

WHITE MODEL

---

TECHNICAL DATA

- Color of housing: Gray (standard, similar to RAL 7001) or White (similar to RAL 9010)
- Material: Aluminum die-casting
- International Protection class: IP50 or IP65
- Operating temperature: -40 °C to +125 °C
- Cable clamp: See page 73
- Number of locking cycles: See page 44
- Adapter: For PG clamp—see page 74

---

METAL CABLE HOOD XXL

Connector housing for assembly on the cable with expanded assembly space and side M50 cable outlet

SPINDLE LOCKING

---

GRAY MODEL

---

TECHNICAL DATA

- Color of housing: Gray (similar to RAL 7001) or White on request
- Material: Aluminum die-casting
- Operating temperature: -40 °C to +125 °C
- Cable clamp: See page 73
- Number of locking cycles: See page 44

---

1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable clamp(s) and spindle knob used)
### METAL BULKHEAD HOUSING

For mounting on your device

**SPINDLE LOCKING**

#### TECHNICAL DATA

- **Color of housing**: Gray (standard, similar to RAL 7001) or White (similar to RAL 9010)
- **Material**: Aluminum die casting
- **International Protection class**: IP65
- **Operating temperature**: −40 °C to +125 °C (short duration), −40 °C to +85 °C (continuous)
- **Sealing**: NBR; sealing material, FKM on request (to extend the temperature range)

#### PANEL CUT-OUT

The frames depicted must be ordered separately, see page 72.

#### Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>612 091 010 644 000</td>
<td>612 091 010 653 000</td>
<td>57</td>
<td>83</td>
<td>95</td>
<td>65.2</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>612 092 010 644 000</td>
<td>612 092 010 653 000</td>
<td>77.5</td>
<td>103</td>
<td>115</td>
<td>85.5</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>612 093 010 644 000</td>
<td>612 093 010 653 000</td>
<td>104</td>
<td>130</td>
<td>143</td>
<td>112.2</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable hood with spindle locking used)

### METAL SURFACE-MOUNTED HOUSING

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

**SPINDLE LOCKING**

#### TECHNICAL DATA

- **Color of housing**: Gray (standard, similar to RAL 7001)
- **Material**: Aluminum die casting
- **International Protection class**: IP65
- **Operating temperature**: −40 °C to +125 °C (short duration), −40 °C to +85 °C (continuous)
- **Sealing**: NBR; sealing material, FKM on request (to extend the temperature range)
- **Cable clamp**: see page 73
- **Adapter**: for PG clamp see page 74

#### PANEL CUT-OUT

The frames depicted must be ordered separately, see page 72.

#### Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>612 091 025 644 102</td>
<td>612 091 025 653 102</td>
<td>57</td>
<td>82</td>
<td>92.5</td>
<td>74</td>
<td>55.5</td>
<td>6</td>
<td>7</td>
<td>M32</td>
</tr>
<tr>
<td>3</td>
<td>612 092 025 644 102</td>
<td>612 092 025 653 102</td>
<td>77.5</td>
<td>105</td>
<td>117</td>
<td>84</td>
<td>56.5</td>
<td>10</td>
<td>11</td>
<td>M32</td>
</tr>
<tr>
<td>4</td>
<td>612 093 025 644 102</td>
<td>612 093 025 653 102</td>
<td>104</td>
<td>132</td>
<td>144</td>
<td>84</td>
<td>57.5</td>
<td>16</td>
<td>16</td>
<td>M40</td>
</tr>
</tbody>
</table>

1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable clamp(s) and cable hood with spindle locking used)
### ODU-MAC® RAPID PLASTIC HOUSING

Half-shell principle with individually adjustable side cable outlet

**SPINDLE LOCKING**

#### TECHNICAL DATA
- Color of housing: Black (RAL 9005), White on request
- Material: Lexan PC, UL 94-V0
- International Protection class: IP4X
- Operating temperature: −40 °C to +125 °C
- Grommet: Silicone (RAL 7035), UL 94-V0
- Number of locking cycles: See from page 44
- Coding: Spindle coding from page 80 (6 options)

<table>
<thead>
<tr>
<th>Size</th>
<th>Part number</th>
<th>Description</th>
<th>Cable outlet</th>
<th>Part number protective cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>656.563.012.008.000</td>
<td>RAPID housing</td>
<td>Max. 32 × 42 mm</td>
<td>656.563.012.018.000</td>
</tr>
<tr>
<td>4</td>
<td>635.093.011.200.000</td>
<td>Spindle locking 270° without coding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>635.093.011.200.003</td>
<td>Spindle locking 360° without coding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>635.093.011.200.010</td>
<td>Spindle locking 270° with coding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>635.093.011.200.013</td>
<td>Spindle locking 360° with coding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>631.193.000.600.001</td>
<td>Housing frame, pin side</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PANEL CUT-OUT A: RECESSED STYLE

For mounting on your device or as a recessed plastic style

**SPINDLE LOCKING**

#### TECHNICAL DATA
- Color of housing: Black (RAL 9005), (recessed style) White on request
- Material: Lexan PC, UL 94-V0
- International Protection class: IP4X
- Operating temperature: −40 °C to +125 °C

#### PANEL CUT-OUT B: DIRECT ASSEMBLY

For mounting on your device or as a direct assembly

**SPINDLE LOCKING**

#### PANEL CUT-OUT A: RECESSED STYLE

**Panel Cut-Out B: Direct Assembly**
PLASTIC PROTECTIVE COVER

For ODU-MAC® RAPID housing and recessed-style receptacle

HOUSING A

RECESSED-STYLE RECEPTACLE B

TECHNICAL DATA

Color of housing  Black (RAL 9005), White on request
Material  plastic Lexan PC, UL 94-V0
International Protection class  IP4X
Operating temperature  −40 °C to +125 °C

Size Part number Included accessories

<table>
<thead>
<tr>
<th>Size</th>
<th>Part number A protective cover for housing</th>
<th>Part number B protective cover for recessed-style receptacle</th>
<th>Lanyard length A</th>
<th>Lanyard length B</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>665.563.012.018.000</td>
<td>665.563.011.018.000</td>
<td>300</td>
<td>150</td>
</tr>
</tbody>
</table>

STRAIN-RELIEF SET

For ODU-MAC® RAPID housing, the option for bundling and additional strain relief of single strands

TECHNICAL DATA

Material  stainless steel
Operating temperature  −40 °C to +125 °C

Optional lattice plates for strand bundling can also be retrofitted.

Size Part number Included accessories

<table>
<thead>
<tr>
<th>Size</th>
<th>Part number A protective cover for housing</th>
<th>Part number B protective cover for recessed-style receptacle</th>
<th>Lanyard length A</th>
<th>Lanyard length B</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>665.563.002.050.000</td>
<td>2 × strain-relief plate including fastening screws</td>
<td>4 × S3 × 13.5 TX10</td>
<td></td>
</tr>
</tbody>
</table>
PLASTIC CABLE HOOD

For mounting on your device with spindle locking

SPINDLE LOCKING

TECHNICAL DATA

Color of housing: Black (RAL 9005)
Material: Plastic PA6 GF, UL 94-V0
International Protection class: IP50
IP65 on request
Operating temperature: −40 °C to +125 °C
Sealing: NBR; sealing material

M3 (4×)

FOR A REDUCTION FROM M40 TO M32, SEE PAGE 73

Table of contents

Size | Part number | Dim. A | Dim. B | Dim. C | Dim. M | Cable outlet | Part number protective cover
--- | --- | --- | --- | --- | --- | --- | ---
2 | 613.091.514.908.308 | 57 | 74 | 72.5 | M32 | 491.097.13 908.001
3 | 613.092.514.908.308 | 77.5 | 94 | 76.5 | M40 | 492.097.13 908.001
4 | 613.093.514.908.308 | 104 | 121 | 76.5 | M40 | 493.097.13 908.001

PLASTIC BULKHEAD HOUSING

For mounting on your device with spindle locking

SPINDLE LOCKING

TECHNICAL DATA

Color of housing: Black (RAL 9005)
Material: Plastic PA6 GF, UL 94-V0
International Protection class: IP50
IP65 on request
Operating temperature: −40 °C to +125 °C
Sealing: NBR; sealing material

M4

FOR A REDUCTION FROM M40 TO M32, SEE PAGE 73

Table of contents

Size | Part number | Dim. A | Dim. B | Dim. C | Dim. D | Cable outlet | X1 | X2 | Part number protective cover
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
2 | 612.091.010.908.000 | 57 | 83 | 93 | 67 | 6 | 7 | 491.097.13 908.001
3 | 612.092.010.908.000 | 77.5 | 103 | 114 | 87 | 10 | 11 | 492.097.13 908.001
4 | 612.093.010.908.000 | 104 | 130 | 140 | 114 | 16 | 16 | 493.097.13 908.001
PLASTIC SURFACE-MOUNTED HOUSING

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

**SPINDLE LOCKING**

**TECHNICAL DATA**

- Color of housing: Black (RAL 9005)
- Material: Plastic PA6 GF, UL 94-V0
- International Protection class: 1 (IP50)
- IP65 on request
- Operating temperature: −40 °C to +125 °C
- Sealing: NBR; sealing material
- Cable clamp: see page 73

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<th>Size</th>
<th>Part number</th>
<th>Dim. A</th>
<th>Dim. B</th>
<th>Dim. C</th>
<th>Dim. D</th>
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<th>X2</th>
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For a reduction from M40 to M32, see page 73

1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable clamp(s) and cable hood with spindle locking used)

PLASTIC CABLE HOOD

Plastic cable hood for assembly on the cable with side cable outlet

**TRANSVERSE LOCKING**

**TECHNICAL DATA**

- Color of housing: Black (RAL 9005)
- Material: Plastic PA6 GF, UL 94-V0
- International Protection class: 1 (IP65)
- Operating temperature: −40 °C to +125 °C
- Cable clamp: see page 73
- Number of locking cycles: 5,000

**TABLE OF CONTENTS**

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<th>Size</th>
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<th>Dim. A</th>
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<th>Dim. C</th>
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For a reduction from M40 to M32 and from M32 to M25, see page 73

1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable clamp(s) used)
PLASTIC BULKHEAD HOUSING

For assembly on your device with transverse locking

TRANSVERSE LOCKING

TECHNICAL DATA
Color of housing Black (RAL 9005)
Material plastic PA6 GF, UL 94-V0
International Protection class 1 IP65
Operating temperature −40 °C to +125 °C
Sealing NBR; sealing material

PLASTIC SURFACE-MOUNTED HOUSING

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

TRANSVERSE LOCKING

TECHNICAL DATA
Color of housing Black (RAL 9005)
Material plastic PA6 GF, UL 94-V0
International Protection class 1 IP65
Operating temperature −40 °C to +125 °C
Sealing NBR; sealing material

Panel cut-out

Table of contents

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<th>Dim. C (mm)</th>
<th>Dim. D (mm)</th>
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FOR A REDUCTION FROM M40 TO M32 AND FROM M32 TO M25, SEE PAGE 73

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### PLASTIC PROTECTIVE COVER

**For bulkhead and surface-mounted housing with lanyard**

#### SPINDLE LOCKING

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**TECHNICAL DATA**

- Color of housing: Black (RAL 9005)
- Material: Plastic PA6 GF, UL 94-V0
- International Protection class: 1 IP65
- Operating temperature: −40 °C to +125 °C

---

### PLASTIC PROTECTIVE COVER

**For cable hood with lanyard**

#### SPINDLE AND TRANSVERSE LOCKING

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<td>155</td>
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#### TECHNICAL DATA

- Color of housing: Black (RAL 9005)
- Material: Plastic PA6 GF, UL 94-V0
- International Protection class: 1 IP65
- Operating temperature: −40 °C to +125 °C
- Sealing: NBR, sealing material via the transverse locking included in the delivery

---

1 IEC 60529:2013 (VDE 0470-1:2014)
METAL CABLE HOOD

Connector housing for assembly on the cable with top and side cable outlet

LEVER LOCKING

A TOP CABLE OUTLET

B SIDE CABLE OUTLET

TECHNICAL DATA

- Color of housing: Gray (standard similar to RAL 7001)
- Material: Aluminum die-casting
- International Protection class 1: IP65 in mated condition
- Operating temperature: −40 °C to +125 °C
- Cable clamp: see page 73
- Adapter: see page 74

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

METAL CABLE HOOD XXL

Connector housing for assembly on the cable with expanded assembly space and side and top M50 cable outlet

LEVER LOCKING

A TOP CABLE OUTLET

B SIDE CABLE OUTLET

TECHNICAL DATA

- Color of housing: Gray (standard similar to RAL 7001)
- Material: Aluminum die-casting
- International Protection class 1: IP65 in mated condition
- Operating temperature: −40 °C to +125 °C
- Cable clamp: see page 73
- Adapter: see page 74

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

Size | Part number A | Part number B | Dim. A | Dim. B | Dim. C | Dim. M | Part number protective cover [see page 72]
--- | --- | --- | --- | --- | --- | --- | ---
1 | 490.214.450.644.102 | 490.414.450.644.102 | 44 | 60 | 52 | 43 | M25 490.097.500.644.000
2 | 491.214.450.644.102 | 491.414.450.644.102 | 57 | 73 | 52 | 43 | M32 491.097.512.644.000
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 | M40 493.097.214.644.000

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

Size | Part number A | Part number B | Dim. M | Part number protective cover [see page 72]
--- | --- | --- | --- | ---
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)
**METAL BULKHEAD HOUSING**

For mounting on your device

**LEVER LOCKING**

1. **WITHOUT COVER**
2. **WITH COVER**

**TECHNICAL DATA**
- Color of housing: Gray (standard similar to RAL 7001)
- Material: Aluminum die casting
- International Protection class: IP65 in mated condition
- Operating temperature:
  - Short duration: −40°C to +125°C
  - Continuous: −40°C to +85°C
- Sealing: NBR; sealing material FKM on request (to extend the temperature range)
- With lever locking, a minimum of 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles, no lubrication is required.

**Panel Cut-Out**

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

**Table of contents**

<table>
<thead>
<tr>
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**METAL SURFACE-MOUNTED HOUSING**

For surface mounting on your device/wall with two side outlets

**LEVER LOCKING**

1. **WITHOUT COVER**
2. **WITH COVER**

**TECHNICAL DATA**
- Color of housing: Gray (standard similar to RAL 7001)
- Material: Aluminum die casting
- International Protection class: IP65 in mated condition
- Operating temperature:
  - Short duration: −40°C to +125°C
  - Continuous: −40°C to +85°C
- Sealing: NBR; sealing material FKM on request (to extend the temperature range)
- With lever locking, a minimum of 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles, no lubrication is required.

**M40 Cable Outlet Available on Request**

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

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1. IEC 60529:2013 (VDE 0470-1:2014) (depends on the cable clamp(s) and cable hood used)
METAL CABLE HOOD WIDE

With top and side cable outlet for double frame assembly

LEVER LOCKING

A  TOP CABLE OUTLET
B  SIDE CABLE OUTLET

METAL BULKHEAD HOUSING FOR CABLE HOOD WIDE

For mounting on your device

LEVER LOCKING

A  WITHOUT COVER
B  WITH COVER

A  TOP CABLE OUTLET
B  SIDE CABLE OUTLET

TECHNICAL DATA

Color of housing: Gray (standard similar to RAL 7001)
Material: Aluminum die casting
International Protection class: IP65 in mated condition
Operating temperature: Without housing sealing: 
−40°C to +125°C
Cable clamp: See page 23
Housing suitable for two standard frames size 3 or 4.
2 × size 3 = size 5
2 × size 4 = size 6
With lever locking, a minimum of 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles, no lubrication is required.

TECHNICAL DATA

Color of housing: Gray (standard similar to RAL 7001)
Material: Aluminum die casting
International Protection class: IP65 in mated condition
Operating temperature: 
−40°C to +125°C [short duration]
−40°C to +85°C [continuous]
Sealing: NBR, sealing material FKM on request (to extend the temperature range)
With lever locking, a minimum of 5,000 locking cycles are possible with lubrication. Up to 500 mating cycles, no lubrication is required.

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1  IEC 60529:2013 (VDE 0470-1:2014) [depends on the cable clamp(s) used]
METAL CABLE-TO-CABLE HOOD

With top cable outlet for a flying cable-to-cable connection

LEVER LOCKING

METAL PROTECTIVE COVER

For metal housing

TECHNICAL DATA

Color: Gray (standard, similar to RAL 7001)

International Protection class
IP65 in locked condition
- Metal protective cover with locking latch [C]
- Metal protective cover with bolt and lanyard [A]

International Protection class
IP54 in locked condition
- Metal protective cover with center module for spindle locking and lanyard [B]

Material: Aluminum die casting

Temperature range:
- −40 °C to +125 °C (short duration)
- −40 °C to +85 °C (continuous)

Sealing: NBR; sealing material on request (to extend the temperature range)

Cable clamp: see page 73

Adapter: for PG clamp see page 74

Lever locking:
- A minimum of 5,000 locking cycles are possible with lubrication.
- Up to 500 mating cycles, no lubrication is required.

TECHNICAL DATA

To build a cable-to-cable connection.

Suitable for use with cable hoods (page 64).

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

Material: Aluminum die casting

International Protection class: IP65 in mated condition

Operating temperature:
- −40 °C to +125 °C (short duration)
- −40 °C to +85 °C (continuous)

Sealing: NBR; sealing material on request (to extend the temperature range)

Cable clamp: see page 73

Adapter: for PG clamp see page 74

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

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<table>
<thead>
<tr>
<th>Size</th>
<th>Part number</th>
<th>Dim. A (mm)</th>
<th>Dim. B (mm)</th>
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M40 CABLE OUTLET AVAILABLE ON REQUEST

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

2 This cover cannot be used in conjunction with a coded spindle.
ODU-MAC® BLUE-LINE FRAME FOR HOUSING

With grounding for housing

TECHNICAL DATA
- Material: nickel-plated zinc die casting
- 1 unit = 2.4 mm

Included in the scope of delivery: secondary locking part
For use and assembly, see page 27

SOCKET FRAME WITH GUIDE BUSHING
PIN FRAME WITH GUIDING PIN

Sockets in bulkhead and surface-mounted housing or cable-to-cable hood. Pins in the cable hood. Modules are not mounted, contacts are supplied loose. See the options for coding from page 72.

For the height of the contact pins, the same dimensions as described for the respective modules apply.

CABLE CLAMP AND REDUCING RING

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

Part number Thread Color Width across flats Tightening torque Cable-Ø
mm mm mm mm
027.825.060.130.007 M25 × 1.5 Gray 30 8 6 13
027.825.090.170.007 M32 × 1.5 36 10 7 15
027.832.070.150.007 M40 × 1.5 46 13 19 28
027.832.270.350.007 M50 × 1.5 55 15 27 35
027.825.060.130.003 M25 × 1.5 White (RAL 9005) 30 8 6 13
027.825.090.170.003 M32 × 1.5 36 10 7 15
027.832.070.150.003 M40 × 1.5 46 13 19 28
027.832.270.350.003 M50 × 1.5 55 15 27 35
027.825.060.130.008 M25 × 1.5 Black 36 10 7 15
027.825.090.170.008 M32 × 1.5 36 10 11 21
027.832.070.150.008 M40 × 1.5 46 13 19 28
027.832.270.350.008 M50 × 1.5 55 15 27 35

TECHNICAL DATA
- Material: PA
- Sealing: NBR; sealing material
- International Protection class: IP68 to 5 bar
- Temperature range: −40 °C to +100 °C
- EMC and metal clamps available on request

REDUCING RING FOR PLASTIC HOUSING

Color: Black (RAL 9005)
Material: plastic PA6 GF20, UL 94-V0
Protection class: IP65
Temperature range: −40 °C to 125 °C
Sealing: NBR; sealing material
Tightening torque: 4 ± 0.5 Nm

Part number Outside thread Inside thread
921.000.006.000.360 M32 × 1.5 M25 × 1.5
921.000.006.000.356 M40 × 1.5 M32 × 1.5

TECHNICAL DATA
- Color: Black (RAL 9005)
- Material: plastic PA6 GF20, UL 94-V0
- Protection class: IP65
- Temperature range: −40 °C to 125 °C
- Sealing: NBR; sealing material
- Tightening torque: 4 ± 0.5 Nm

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Table of contents
### ADAPTER RING, BLIND PLUG, AND LOCKNUT

#### ADAPTER RING FOR CABLE CLAMP WITH PG THREAD

**TECHNICAL DATA**

- **Material:** nickel-plated brass

<table>
<thead>
<tr>
<th>Part number</th>
<th>Outside thread</th>
<th>Inside thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>921.000.006.000.254</td>
<td>M25 × 1.5</td>
<td>PG 21</td>
</tr>
<tr>
<td>921.000.006.000.255</td>
<td>M32 × 1.5</td>
<td>PG 29</td>
</tr>
<tr>
<td>921.000.006.000.267</td>
<td>M32 × 1.5</td>
<td>M40 × 1.5</td>
</tr>
</tbody>
</table>

#### BLIND PLUG FOR SURFACE-MOUNTED HOUSING

**TECHNICAL DATA**

- **Color:** Gray
- **Material:** PA glass-fiber reinforced
- **International Protection class:** IP68
- **Temperature range:** –40 °C to +125 °C
- **Sealing:** NBR; sealing material

<table>
<thead>
<tr>
<th>Part number</th>
<th>Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>921.000.006.000.279</td>
<td>M25 × 1.5</td>
</tr>
<tr>
<td>921.000.006.000.268</td>
<td>M32 × 1.5</td>
</tr>
</tbody>
</table>

#### LOCKNUT FOR CABLE CLAMP

**TECHNICAL DATA**

- **Material:** nickel-plated brass

<table>
<thead>
<tr>
<th>Part number</th>
<th>Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>931.000.003.000.112</td>
<td>M32 × 1.5</td>
</tr>
<tr>
<td>931.000.003.000.113</td>
<td>M40 × 1.5</td>
</tr>
</tbody>
</table>

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

### PROTECTIVE TRANSPORT COVER AND SECONDARY LOCKING PART

#### PROTECTIVE TRANSPORT COVER FOR METAL HOUSING – for protecting the assembled cable hood during transport

**TECHNICAL DATA**

- **Material:** plastic PP
- **Color:** Black (similar to RAL 9002)

<table>
<thead>
<tr>
<th>Size</th>
<th>Dim. B in mm</th>
<th>Part number with holding rope</th>
<th>Part number without holding rope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
<td>490.097.900.924.000</td>
<td>490.097.900.924.101</td>
</tr>
<tr>
<td>2</td>
<td>76</td>
<td>491.097.900.924.000</td>
<td>491.097.900.924.101</td>
</tr>
<tr>
<td>3</td>
<td>96.5</td>
<td>492.097.900.924.000</td>
<td>492.097.900.924.101</td>
</tr>
<tr>
<td>4/XXL</td>
<td>123</td>
<td>493.097.900.924.000</td>
<td>493.097.900.924.101</td>
</tr>
</tbody>
</table>

**SECONDARY LOCKING FOR MODULES**

**TECHNICAL DATA**

- **Material:** thermoplastic, glass-fiber reinforced

**Part number – only if a replacement is required**

| Part number | 631.000.001.923.000 |

1 The secondary locking part is included in the standard scope of delivery.
CODING OPTIONS FOR HOUSINGS WITH LEVER 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 housing of the ODU-MAC® Blue-Line. ODU offers 16 different coding options. Standard frames do not include additional coding upon delivery. If several adjacent connectors are used, this can prevent mismating.

CODING OPTIONS

<table>
<thead>
<tr>
<th>CODE 1</th>
<th>CODE 2</th>
<th>CODE 3</th>
<th>CODE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE 5</th>
<th>CODE 6</th>
<th>CODE 7</th>
<th>CODE 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE 9</th>
<th>CODE 10</th>
<th>CODE 11</th>
<th>CODE 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE 13</th>
<th>CODE 14</th>
<th>CODE 15</th>
<th>CODE 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
<tr>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
<td>![Pin frame]</td>
<td>![Socket frame]</td>
</tr>
</tbody>
</table>

Part number pin 631.090.301.700.000
Part number socket 630.090.301.700.000

Guiding pin

Guiding bushing

Pin

Socket

**CODE EXAMPLE**

<table>
<thead>
<tr>
<th>Frame</th>
<th>Part number matching the frame no.</th>
<th>Part number pin</th>
<th>Coding</th>
<th>Part number socket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td>631.19X.000.600.000</td>
<td>631.090.301.700.000</td>
<td>![12]</td>
<td>630.090.302.700.000</td>
</tr>
<tr>
<td>Socket</td>
<td>630.19X.000.600.000</td>
<td>631.090.302.700.000</td>
<td>18</td>
<td>630.090.301.700.000</td>
</tr>
</tbody>
</table>

PART NUMBER BASIC TOOL, TORQUE WRENCH: 1.2 Nm: 598.054.002.000.000
PART NUMBER TOOL INSERT FOR ASSEMBLY OF CODING PIN: 598.054.203.000.000
PART NUMBER TOOL INSERT FOR ASSEMBLY OF CODING SOCKET: 598.054.110.000.000

An overview of all tools, see from page 173.
CODING OPTIONS FOR HOUSINGS 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 housing of the ODU-MAC® Blue-Line. 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, or if additional coding options are required, ODU offers an innovative option with the coded spindle on pages 80 and 81.

CODING OPTIONS

<table>
<thead>
<tr>
<th>CODE 1</th>
<th>CODE 2</th>
<th>CODE 5</th>
<th>CODE 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td>Pin</td>
<td>Pin</td>
<td>Pin</td>
</tr>
<tr>
<td>frame</td>
<td>frame</td>
<td>frame</td>
<td>frame</td>
</tr>
<tr>
<td>Socket</td>
<td>Socket</td>
<td>Socket</td>
<td>Socket</td>
</tr>
</tbody>
</table>

- Coding pin
- Coding socket

CODING EXAMPLE

<table>
<thead>
<tr>
<th>Frame</th>
<th>Part number matching the frame no.</th>
<th>Part number pin</th>
<th>Coding</th>
<th>Part number socket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td>631.19k.000.600.000</td>
<td>631.090.301.700.000</td>
<td>2</td>
<td>630.090.302.700.000</td>
</tr>
<tr>
<td>Socket</td>
<td>630.19k.000.600.000</td>
<td>631.090.302.700.000</td>
<td>18</td>
<td>630.090.301.700.000</td>
</tr>
</tbody>
</table>

PART NUMBER BASIC TOOL, TORQUE WRENCH/1.2 Nm: 598.054.002.000.000
PART NUMBER TOOL INSERT FOR ASSEMBLY OF CODING PIN: 598.054.203.000.000
PART NUMBER TOOL INSERT FOR ASSEMBLY OF CODING SOCKET: 598.054.110.000.000

An overview of all tools, see from page 153.
CODING OPTIONS FOR CODED SPINDLES

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 that is directly integrated into the spindle for the ODU MAC® Blue-Line housing versions. ODU provides up to 6 different coding options by installing 2 coding 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

<table>
<thead>
<tr>
<th>CODE A</th>
<th>CODE B</th>
<th>CODE C</th>
<th>CODE D</th>
<th>CODE E</th>
<th>CODE F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
</tr>
<tr>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
</tr>
<tr>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
<td>Pin frame</td>
<td>Socket frame</td>
</tr>
</tbody>
</table>

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

2 They are included in the standard scope of delivery.

An overview of all tools, see from page 153.

TORQUE WRENCH / 0.9 Nm FOR LEFT-HAND THREAD
PART NUMBER BIT SLOT FOR THE ASSEMBLY OF THE SPINDLE CODING: 598.054.109.000.000
EASILY CONFIGURE THE ODU-MAC® BLUE-LINE ONLINE AT: WWW.ODU-MAC.COM/EN/

AUTOMATIC DOCKING

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ODU-MAC® Blue-Line docking frame ........................................... 85
ODU-MAC® Blue-Line strain-relief housing ................................... 87
REQUIREMENTS OF THE COMPLETE SYSTEM

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)

<table>
<thead>
<tr>
<th>Frame</th>
<th>Clearance max 0–0.5 mm</th>
<th>Tolerance ± 0.6 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docking frame</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

MAXIMUM PERMISSIBLE ANGLE DEVIATION WHEN MATING

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

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

ALIGNMENT SYSTEM (MECHANICAL NECESSITY)

Strain relief for the cables/strands must be provided by the customer. Please see our strain-relief housing page 87.

NOTE: AUTOMATIC DOCKING SYSTEMS

• The pin piece of the ODU-MAC® Blue-Line is to be fixed with the centering bushings supplied and so that the frame can float.
• 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) must be provided through the plug-in unit. The maximum permissible alignment error is, for example, less than ±/–0.6 mm radial for the ODU-MAC® Blue-Line docking frame.
• Strain relief for the cables/strands must be provided by the customer, or use our strain-relief housing, see page 87.

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

FAILURE TO OBSERVE THESE SPECIFICATIONS MAY RESULT IN DAMAGE.
ODU-MAC® BLUE-LINE DOCKING FRAME

Standard solution for docking applications (such as rack & panel)

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

Included in the scope of delivery: secondary locking part
For use and assembly, see page 27

Socket frame with guide bushing
Pin frame with guiding pin
Panel cut-out

Modules are not mounted; contacts are supplied loose.
For the height of the contact pins, the same dimensions as described for the respective modules apply.

<table>
<thead>
<tr>
<th>Size</th>
<th>Part number</th>
<th>Part number</th>
<th>Max. units</th>
<th>Dim. A (mm)</th>
<th>Dim. B (mm)</th>
<th>Dim. C (mm)</th>
<th>Dim. D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>630.190.000.600.000</td>
<td>631.190.020.600.000</td>
<td>12 2.4 mm</td>
<td>51</td>
<td>44</td>
<td>12 + 2.4 + 28.8</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>630.191.000.600.000</td>
<td>631.191.020.600.000</td>
<td>18</td>
<td>64</td>
<td>57</td>
<td>18 + 2.4 + 43.2</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>630.192.000.600.000</td>
<td>631.192.020.600.000</td>
<td>26</td>
<td>84.5</td>
<td>77.5</td>
<td>26 + 2.4 + 62.4</td>
<td>71.5</td>
</tr>
<tr>
<td>4</td>
<td>630.193.000.600.000</td>
<td>631.193.020.600.000</td>
<td>37</td>
<td>111</td>
<td>104</td>
<td>37 + 2.4 + 88.8</td>
<td>98</td>
</tr>
</tbody>
</table>

1 If the configuration doesn't fill the frame completely, please use blank modules (see page 150).

ODU-MAC® BLUE-LINE STRAIN-RELIEF HOUSING

Accessories for docking solutions

APPLICATION EXAMPLE

• Material: aluminum
• Operating temperature: −40 °C to +125 °C
• International Protection class can be adjusted individually
• Cable clamps, see page 73
• Locknut for cable clamp, see page 74

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

Graphic shows optional cable clamp, it is not automatically included in the scope of delivery.

APPLICATION EXAMPLE

Material: aluminum
Operating temperature: −40 °C to +125 °C
International Protection class can be adjusted individually
Cable clamps, see page 73
Locknut for cable clamp, see page 74

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

Graphic shows optional cable clamp, it is not automatically included in the scope of delivery.

TECHNICAL DATA
- Material: aluminum
- Operating temperature: −40 °C to +125 °C
- International Protection class can be adjusted individually
- Cable clamps, see page 73
- Locknut for cable clamp, see page 74

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

Graphic shows optional cable clamp, it is not automatically included in the scope of delivery.

1 A higher International Protection class is possible for additional sealing of the housing

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ODU-MAC® BLUE-LINE STRAIN-RELIEF HOUSING

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.

<table>
<thead>
<tr>
<th>Part number 2 × cover without hole</th>
<th>1 × cover with/1 × cover without hole</th>
<th>Part number 2 × cover with hole</th>
<th>Frame size</th>
<th>Dim. L mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>616.010.100.600.000</td>
<td>616.010.114.600.000</td>
<td>616.010.144.600.000</td>
<td>1–3</td>
<td>97</td>
</tr>
<tr>
<td>616.020.100.600.000</td>
<td>616.020.114.600.000</td>
<td>616.020.144.600.000</td>
<td>4</td>
<td>123</td>
</tr>
</tbody>
</table>
### OVERVIEW OF ALL MODULES

**Modules marked with this symbol can be used in the PUSH-LOCK; note the space requirements.**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
<th>Units/width</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal</td>
<td>20 contacts</td>
<td></td>
<td>Maximum packing density and pin protection</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 0.7 mm</td>
<td>2</td>
<td>Operating voltage 1: 250 V Rated surge voltage 1: 2,000 V Max. continuous current 1: 11 A for 0.38 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 contacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 0.7 mm</td>
<td>1</td>
<td>Operating voltage 1: 320 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 19.5 A for 1 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>2.4 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 contacts</td>
<td></td>
<td>Operating voltage 1: 400 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 11 A for 1 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 1.3 mm</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 contacts</td>
<td></td>
<td>Operating voltage 1: 630 V Rated surge voltage 1: 3,000 V Max. continuous current 1: 33 A for 2.5 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 2 mm</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.2 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 contacts</td>
<td></td>
<td>Operating voltage 1: 250 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 7 A Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 0.7 mm</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 contacts</td>
<td></td>
<td>Operating voltage 1: 320 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 7 A Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 0.7 mm</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.4 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum packing density</td>
<td></td>
<td>Operating voltage 1: 320 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 7 A Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 2.4 mm</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.2 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. According to IEC 60664-1:2007 (VDE 0110-1:2008) for pollution degree 2
2. For a definition of max. continuous current, see page 172
3. Contact with lamella technology

---

### OVERVIEW OF ALL MODULES

**Modules marked with this symbol can be used in the PUSH-LOCK; note the space requirements.**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
<th>Units/width</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>6 contacts</td>
<td></td>
<td>Operating voltage 1: 400 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 13 A Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 1.3 mm</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 contacts</td>
<td></td>
<td>Operating voltage 1: 630 V Rated surge voltage 1: 2,500 V Max. continuous current 1: 25 A Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 2 mm</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.2 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 contacts</td>
<td></td>
<td>Operating voltage 1: 2,500 V Rated surge voltage 1: 10,000 V Max. continuous current 1: 58 A for 6 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 3.5 mm</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.6 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 contacts for turned contacts with ODU LAMTAC&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
<td>Operating voltage 1: 400 V Rated surge voltage 1: 10,800 V Max. continuous current 1: 108 A for 16 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 5 mm</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 contacts for turned contacts with ODU LAMTAC&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
<td>Operating voltage 1: 400 V Rated surge voltage 1: 3,000 V Max. continuous current 1: 150 A for 25 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 8 mm</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.6 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 contact for turned contacts with ODU LAMTAC&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
<td>Operating voltage 1: 2,500 V Rated surge voltage 1: 10,000 V Max. continuous current 1: 225 A for 50 mm² Pollution degree 1: 2 Mating cycles min. 10,000</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Contact: Φ 12 mm</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.2 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. According to IEC 60664-1:2007 (VDE 0110-1:2008) for pollution degree 2
2. For a definition of max. continuous current, see page 172
3. Contact with lamella technology
### OVERVIEW OF ALL MODULES

Modules marked with this symbol can be used in the PUSH-LOCK, note the space requirements.

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
<th>Units/width</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 contacts for 50 Ω coax contacts</td>
<td>5</td>
<td>High packing density</td>
<td>Frequency range: 0–2.8 GHz</td>
<td>Mating cycles min. 10,000</td>
</tr>
<tr>
<td>2 contacts for 50 Ω coax contacts</td>
<td>5</td>
<td>Frequency range: 0–4 GHz</td>
<td>Mating cycles min. 10,000</td>
<td>124</td>
</tr>
<tr>
<td>2 contacts for 75 Ω coax contacts SMA termination</td>
<td>5</td>
<td>Frequency range: 0–2.7 GHz</td>
<td>Mating cycles min. 10,000</td>
<td>128</td>
</tr>
<tr>
<td>2 contacts</td>
<td>5</td>
<td>12 bar Tube-Ø inner: max. 4 mm outer: Ø Push-in: max. 6 mm</td>
<td>Mating cycles min. 10,000</td>
<td>130</td>
</tr>
<tr>
<td>2 contacts</td>
<td>5</td>
<td>S0 bar Tube-Ø</td>
<td>MS to max. 4 mm</td>
<td>Mating cycles min. 10,000</td>
</tr>
<tr>
<td>Compressed air and fluid coupling</td>
<td>2 contacts</td>
<td>10 bar Tube-Ø</td>
<td>MS inside thread</td>
<td>Mating cycles min. 10,000</td>
</tr>
<tr>
<td>Shielded feedthrough/ high-speed connector 2 contacts</td>
<td>6</td>
<td>Mating cycles min. 10,000</td>
<td>Suitable for all common bus systems CAT 5, USB® 2.0</td>
<td>138</td>
</tr>
<tr>
<td>1 contact</td>
<td>6</td>
<td>Mating cycles min. 10,000</td>
<td>Suitable for all common bus systems CAT 5, USB® 2.0</td>
<td>140</td>
</tr>
<tr>
<td>1 contact RJ45 insert</td>
<td>7</td>
<td>Mating cycles min. 5,000</td>
<td>5 gigabit Ethernet1 according to IEEE 802.3 an-2006 CAT 5, CAT 6A</td>
<td>142</td>
</tr>
</tbody>
</table>

1 Concerning data transmission protocols, please note page 2.

...
<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
<th>Units/width</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber optic (on request)</td>
<td>2 contacts for SC insert</td>
<td>7 16.8 mm</td>
<td>Single mode (SM) Multi mode (MM) Mating cycles min. 5,000</td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>2 contacts for LC insert</td>
<td>7 16.8 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 contacts for fiber-optic contact for plastic fiber (POF)</td>
<td>5 12 mm</td>
<td>Mating cycles Insertion loss typical min. 10,000 1.5 dB for 670 nm</td>
<td>149</td>
</tr>
<tr>
<td>Blank modules</td>
<td>Blank modules</td>
<td>3 7.2 mm</td>
<td>Used to fill incomplete frames.</td>
<td>150</td>
</tr>
</tbody>
</table>

Modules marked with this symbol can be used in the PUSH-LOCK, note the space requirements.
**MODULES**

**MODULE 20 CONTACTS**

Pin protection against mechanical damage

**SIGNAL**

Contact diameter: 0.7 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 172).
- For crimp information, see from page 154.

**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>230 V</td>
</tr>
<tr>
<td>Rated surge voltage</td>
<td>2,000 V</td>
</tr>
<tr>
<td>Clearance distance</td>
<td>1.0 mm</td>
</tr>
<tr>
<td>Creepage distance</td>
<td>1.0 mm</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
</tbody>
</table>

**Output data according to MIL 4**

| Operating voltage | 475 V |
| Text voltage | 1,425 V |

**Mechanical data**

| Total mating force (average) | 16 N/module |
| Total sliding force (average) | 12 N/module |
| Contact diameter | 0.7 mm |
| Operating temperature | -40°C to +125°C |
| Mating cycles | min. 10,000 |

**Materials**

- Insulator: thermoplastic acc. to UL 94
- Contact: Cu alloy
- Contact finishing: gold-plated

**Removal Tool**

Removal of the assembled contact from the mating side

**PART NUMBER:** 0877CC070005000

For an overview of all tools, please see from page 153.

**Table of contents**

- **Removal of the assembled contact from the mating side**
- **PART NUMBER:** 0877CC070005000
- **For an overview of all tools, please see from page 153.**

---

1 For a definition of max. continuous current, see page 122. 2 For a definition of max. continuous current, see page 172.

---

**INSULATOR PIN AND SOCKET**

**Description**

<table>
<thead>
<tr>
<th>Module 20 contacts</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket</td>
<td>630.119.120.922.000</td>
</tr>
<tr>
<td>Insulator pin</td>
<td>631.119.120.922.000</td>
</tr>
</tbody>
</table>

**PCB CONTACTS AVAILABLE ON REQUEST**

For suitable PCB termination modules, please see page 156.
MODULE 10 CONTACTS

Contact diameter: 0.7 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 0198-4:2013 (see page 172).
- For crimp information, see from page 150.

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Conductor cross-section</th>
<th>Termination</th>
<th>Nominal current</th>
<th>Max. continuous current</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket</td>
<td>630.118.110.922.000</td>
<td>mm²</td>
<td>AWG/mm</td>
<td>Single contact A</td>
<td>Module fully equipped A</td>
<td>Single contact A</td>
</tr>
<tr>
<td>Pin contact short</td>
<td>185.710.000.270.000</td>
<td>0.08–0.38</td>
<td>22–28</td>
<td>7</td>
<td>5.5</td>
<td>11</td>
</tr>
<tr>
<td>Pin contact long</td>
<td>185.711.000.270.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socket contact</td>
<td>175.581.000.270.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For suitable PCB termination modules, please see page 108.

Removal of the assembled contact from the mating side:
PART NUMBER: 0877CC.070.005.000
For an overview of all tools, please see from page 153.

PCB CONTACTS AVAILABLE ON REQUEST

For a definition of max. continuous current, see page 122.

1 For a definition of max. continuous current, see page 122
2 For a definition of max. continuous current, see page 172
3 IEC 60664-1:2007 (VDE 0110-1:2008) see page 165
4 See page 168
MODULE 6 CONTACTS

Contact diameter: 1.3 mm
Mating cycles: min. 10,000
Current-carrying capacity\(^1\): 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 172].
- For crimp information, see from page 154.

TECHNICAL DATA

Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)\(^2\)

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>631.111.106.923.000</td>
<td></td>
</tr>
</tbody>
</table>

Insulator pin and socket

Removal of the assembled contact from the mating side
PART NUMBER: 087.7CC.130.004.000
For an overview of all tools, see from page 153.

REMOVAL TOOL

Removal of the assembled contact from the mating side
PART NUMBER: 087.7CC.130.004.000
For an overview of all tools, see from page 153.

Removal of the assembled contact from the mating side

1 For a definition of max. continuous current, see page 122.  2 For a definition of max. continuous current, see page 122.

1 Determined according to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) at increased temperature 45 K.

2 For a definition of max. continuous current, see page 122.

3 See page 168.

4 See page 169.
Contact diameter: 2 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 172).
- For crimp information, see page 154.

**TECHNICAL DATA**

**Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)**
- Operating voltage: 630 V / 250 V
- Rated surge voltage: 3,000 V / 3,000 V
- Clearance distance: 2.5 mm / 2.5 mm
- Creepage distance: 3.4 mm / 3.4 mm
- Pollution degree: 2 / 3

**Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010)**
- Supply voltage from grid supply circuit (CAT 2): 150 V < $U_{\text{rms}}$ ≤ 300 V
- Operating voltage: 672 V / 267 V
- Text voltage: 1,959 V AC / 1,959 V AC
- Pollution degree: 2 / 3

**Voltage data according to MSL**
- Operating voltage: 1,025 V
- Text voltage: 3,075 V

**Mechanical data**
- Total mating force (average): 13.5 N/module
- Total sliding force (average): 10 N/module
- Contact diameter: 2 mm
- Operating temperature: −40°C to +125°C
- Mating cycles: min. 10,000

**Materials**
- Insulator: thermoplastic acc. to UL 94
- Contact: Cu alloy
- Contact finishing: gold-plated

**Removal Tool**
Removal of the assembled contact from the mating side
**Part number:** 087.7CC.200.003.000
For an overview of all tools, see page 153.

**Removal Tool**

**Module 5 contacts**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Conductor cross-section</th>
<th>Termination</th>
<th>Nominal current</th>
<th>Max. continuous current</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pin contact short</strong></td>
<td>185.437.000.270.000</td>
<td>1-1.5</td>
<td></td>
<td>18</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td><strong>Pin contact long</strong></td>
<td>185.436.000.270.000</td>
<td>1-1.5</td>
<td>16/18</td>
<td>18</td>
<td>15</td>
<td>27</td>
</tr>
<tr>
<td><strong>Socket contact</strong></td>
<td>175.567.000.270.000</td>
<td>14</td>
<td></td>
<td>18</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td><strong>Pin contact short</strong></td>
<td>185.441.000.270.000</td>
<td>2.5</td>
<td></td>
<td>24</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td><strong>Pin contact long</strong></td>
<td>185.440.000.270.000</td>
<td>2.5</td>
<td></td>
<td>24</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td><strong>Socket contact</strong></td>
<td>175.570.000.270.000</td>
<td>2.5</td>
<td></td>
<td>24</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td><strong>PCB contacts available on request</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For suitable PCB termination modules, please see page 112.
For effective PCB contacting with quick-change function

Contact diameter: 0.7 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 0411-1:2010 (see page 172).
- Solder temperature for PCB termination module (black PA) 260 °C
- Maximum adjacent arrangement of 10 modules

COMPATIBLE WITH MODULE 20 CONTACTS ON PAGE 98

NOTE
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38
- Mating cycles: min. 10,000
- Operating temperature: −40 °C to +125 °C
- Contact diameter: 0.7 mm
- Total sliding force (average): 12 N/module
- Total mating force (average): 16 N/module
- Contact body: Cu alloy
- Contact finishing: gold-plated

TECHNICAL DATA
Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)²
- Operating voltage: 250 V
- Rated voltage: 250 V
- Clearance distance: 1.0 mm
- Creepage distance: 1.0 mm
- Pollution degree: 2
- Contact resistance: 1 mΩ

Voltage data according to standard
IEC 61010-1:2010 (VDE 0411-1:2010)³
- Supply voltage from grid supply circuit (CAT 2)
- Test voltage: 1,076 V AC
- Test voltage: 2,500 V
- Test voltage: 1,076 V AC
- Test voltage: 3,560 V

Voltage data according to MIL ⁴
- Operating voltage: 475 V
- Test voltage: 1,425 V
- Total mating force (average): 16 N/module
- Total sliding force (average): 12 N/module
- Operating temperature: −40 °C to +125 °C
- Mating cycles: min. 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 finishing: gold-plated

Table of contents
- Voltage data according to MIL ⁴
- Mechanical data
- Total mating force (average): 16 N/module
- Total sliding force (average): 12 N/module
- Contact diameter: 0.7 mm
- Operating temperature: −40 °C to +125 °C
- Mating cycles: min. 10,000

Contact body: Cu alloy
Contact finishing: gold-plated

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Nominal current¹</th>
<th>Max. continuous current²</th>
<th>Contact resistance³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket incl. contacts</td>
<td>630.117.020.923.000</td>
<td>4.5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Insulator pin incl. contacts</td>
<td>631.117.020.923.000</td>
<td>4.5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Insulator PCB incl. injected contacts</td>
<td>630.143.020.922.000</td>
<td>4.5</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

¹ For a definition of max. continuous current, see page 123. ² See page 55. ³ See page 188. ⁴ See page 350.

¹ Determined according to IEC 60512-5-1:2003 (VDE EN 60512-5-1:2003) at increased temperature 45 K. ² For a definition of max. continuous current, see page 123.
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 PCB contacts are injected in the insulator, so cannot be removed.
For effective PCB contacting with quick-change function

**COMPATIBLE WITH MODULE 10 CONTACTS ON PAGE 100**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38

**MODULE 10 CONTACTS**

**PCB TERMINATION**

Contact diameter: 0.7 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 0110-4-2013 or page 172
- Solder temperature for PCB termination module (black PA), 260°C

**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Nominal current</th>
<th>Max. continuous current</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket incl. contacts</td>
<td>630 110 010 923 000</td>
<td>4.5</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Insulator pin incl. contacts</td>
<td>630 110 010 923 000</td>
<td>4.5</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Insulator PCB incl. injected contacts</td>
<td>630 140 010 922 000</td>
<td>4.5</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

1 For a definition of max. continuous current, see page 172
2 IEC 60664-1:2007 (VDE 0110-4:2008) see page 165
3 See page 168
4 See page 169

For a definition of max. continuous current, see page 172

1 Determined according to IEC 61010-1:2010, MIL 4

Pollution degree 2 3
Test voltage 1,320 V AC 1,320 V AC
Operating voltage 320 V 63 V
Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008) 2
Rated surge voltage 2,500 V 2,500 V
Operating voltage 320 V 80 V
Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010) 3
Creepage distance 1.6 mm 1.6 mm
Clearance distance 1.4 mm 1.4 mm
Rated surge voltage 2,500 V 2,500 V
Operating voltage 320 V 80 V
Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008) 2

For a definition of max. continuous current, see page 172

1 Determined according to IEC 60512-5-2:2002, (DIN EN 60512-5-2:2003) at increased temperature 45 K

1 For a definition of max. continuous current, see page 172

1 Determined according to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) at increased temperature 45 K

1 Determined according to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) at increased temperature 45 K

1 Determined according to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) at increased temperature 45 K
MODULE 6 CONTACTS
For effective PCB contacting with quick-change function

Contact diameter: 1.3 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 175).
- Solder temperature for PCB termination module (black PA) 260 °C
- 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 175).

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

**MODULES**

**PCB TERMINATION**

**COMPATIBLE WITH MODULE 6 CONTACTS ON PAGE 102**

**NOTE**
- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.
NOTE

- Frame for the transfer of grounding to the board and corresponding grounding socket on request
- Explanations of the structure on page 38.

CONTACTS

• Explanations of the structure on page 38.

MODULES

•  Frame for the transfer of grounding to the board and corresponding grounding socket on request

MODULES

For effective PCB contacting with quick-change function

Contact diameter: 2 mm
Mating cycles: min. 10,000
Current-carrying capacity: 25 A

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Nominal current</th>
<th>Max. continuous current</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket incl. contacts</td>
<td>630 112.005.923.000</td>
<td>16</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Insulator pin incl. contacts</td>
<td>631 112.005.923.000</td>
<td>16</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Insulator PCB incl. injected contacts</td>
<td>630 142.005.922.000</td>
<td>16</td>
<td>25</td>
<td>2</td>
</tr>
</tbody>
</table>

1 Determined according to IEC 60512-5-2:2002 [EN 60512-5-2:2003] at increased temperature 45 K

Mating cycles: min. 10,000
Contact diameter: 2 mm
Contact finishing: gold-plated

For a definition of max. continuous current, see page 172
1 For a definition of max. continuous current, see page 172
2 For a definition of max. continuous current, see page 172
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 PCB contacts are injected in the insulator, so cannot be removed.
MODULE 3 CONTACTS

Contact diameter: 3.5 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 0110-1-2008 (see page 172).
• For crimp information, see page 154.

TECHNICAL DATA
Voltage data according to IEC 60664-1:2007 (VDE 0110-1-2008)\(^1\)
Operating voltage 2,500 V 1,000 V
Rated surge voltage 10 kV 8 kV
Clearance distance 16.3 mm 16.3 mm
Creepage distance 16.3 mm 16.3 mm
Pollution degree 2 3

Voltage data according to IEC 61010-1:2010 (VDE 0411-1:2010)\(^2\)
Supply voltage from grid supply circuit (CAT II) \(150 V < U_{\text{rms}} \leq 300 V\)
Operating voltage 2,260 V 1,275 V
Test voltage 7,514 V AC 7,514 V AC
Pollution degree 2 3

Voltage data according to MIL\(^3\)
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 min. 10,000

Materials
Insulator thermoplastic acc. to UL 94
Contact Cu alloy
Contact finishing 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 153.

\(^1\) Determined according to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) at increased temperature 45 K
\(^2\) IEC 60664-1:2007 (VDE 0110-1:2008) see page 165
\(^3\) See page 168
MODULE 2 CONTACTS

ODU LAMTAC® (contact with lamella technology)

**Module 2 contacts**

### Contact diameter: 5 mm

- Mating cycles: min. 10,000
- Current-carrying capacity: 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.[1]
- For crimp information, see from page 154.[2]

### TECHNICAL DATA

#### Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)[3]

- Operating voltage: 400 V
- Rated surge voltage: 4 kV
- Clearance distance: 3.1 mm
- Creepage distance: 3.1 mm
- Pollution degree: 2

- Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010)

- Operating voltage: 611 V
- Test voltage: 2,251 V AC
- Pollution degree: 2

#### 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: min. 10,000

#### Materials

- Insulator: thermoplastic acc. to UL 94
- Contact body: Cu alloy
- Contact lamella: CuBe alloy
- Contact finishing: silver-plated

### REMOVAL TOOL

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 153.

### INSULATOR PIN AND SOCKET

For use in a housing, check the necessary space requirements

- Stripping length: 12

**Recommended dummy contact disassembling tools: Ø 5 mm – 7 mm**

### Table of contents

- Module 2 contacts: Part number
  - Insulator: 631.120.102.923.000
  - Dummy contact: 021.341.202.946.000

### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Conductor cross-section</th>
<th>Nominal current</th>
<th>Max. continuous current</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin contact</td>
<td>185.484.000.201.000</td>
<td>10</td>
<td>56</td>
<td>56</td>
<td>90</td>
</tr>
<tr>
<td>Socket contact</td>
<td>178.879.100.201.000</td>
<td>16</td>
<td>68</td>
<td>68</td>
<td>108</td>
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<tr>
<td>Pin contact</td>
<td>185.485.000.201.000</td>
<td>16</td>
<td>68</td>
<td>68</td>
<td>108</td>
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<tr>
<td>Socket contact</td>
<td>178.880.100.201.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MODULE 2 CONTACTS

ODU LAMTAC® (contact with lamella technology)

HIGH CURRENT

Contact diameter: 8 mm
Mating cycles: min. 10,000
Current-carrying capacity: 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 172).
• For crimp information, see page 154.

TECHNICAL DATA

Voltage data according to IEC 60664-1:2007 (VDE 0101-1:2008)
Operating voltage 400 V 160 V
Rated surge voltage 3 kV 3 kV
Clearance distance 2.3 mm 2.3 mm
Creepage distance 2.4 mm 2.4 mm
Pollution degree 2 3

Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010)
Supply voltage from grid supply circuit (CAT 2) 1 150 V ≤ U ≤ 300 V
Operating voltage 537 V 428 V
Test voltage 1,844 V AC 1,844 V AC
Pollution degree 2 3

Voltage data according to MIL
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 min. 10,000

Materials
Insulator thermoplastic acc. to UL 94
Contact body Cu alloy
Contact lamella CuBe alloy
Contact finishing silver-plated

Recommended assembly tool
For screwing and releasing the contacts.

Tightening torque 2.7 Nm ± 0.1 Nm
PART NUMBER: 087.611.002.001.000

For an overview of all tools, please see from page 153.

1 For a definition of max. continuous current, see page 123. 2 IEC 60664-1:2007 (VDE 0110-1:2008) see page 165. 3 See page 168. 4 See page 169.

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MODULE 1 CONTACT

ODU LAMTAC® (contact with lamella technology)

Contact diameter: 12 mm
Mating cycles: min. 10,000
Current-carrying capacity¹: 225 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 172].
• For crimp information, see from page 154

TECHNICAL DATA
Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)²
Operating voltage 2,500 V 1,000 V
Rated surge voltage 10 kV 10 kV
Clearance distance 13.5 mm 13.5 mm
Creepage distance 13.5 mm 13.5 mm
Pollution degree 2 3
Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010)³
Supply voltage from grid supply circuit [CAT 2] 150 V < U,<csub>i < 300 V
Operating voltage 2,700 V 1,071 V
Text voltage 6,388 V AC 6,389 V AC
Pollution degree 2 3
Voltage data according to MIL ⁴
Operating voltage 859 V
Text voltage 2,550 V

Mating force (average) 45 N/module
Total sliding force (average) 30 N/module
Contact diameter 12 mm
Operating temperature -40°C to +125°C
Mating cycles min. 10,000

Materials
Insulator thermoplastic acc. to UL 94
Contact body Cu alloy
Contact lamella CuBe alloy
Contact finishing silver-plated

For use in a housing, check the necessary space requirements

Table of contents
1 For a definition of max. continuous current, see page 122. ² For crimp information, see page 154. ³ For a definition of max. continuous current, see page 122.
MATING CYCLES: MIN. 10,000

FREQUENCY RANGE: 0 – 2.8 GHz

TECHNICAL NOTES
- For crimp information, see page 154.

TECHNICAL DATA
- Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)¹

Voltage range: 0 – 2.8 GHz
- Insulation resistance: > 100 GΩ
- Clearance distance: 1.5 mm, 1.5 mm
- Creepage distance: 1.5 mm, 1.5 mm
- Pollution degree: 2, 3

Voltage data according to MIL-STD-1866-1:2010 (VDE 0110-1:2008)
- Operating voltage: 525 V
- Test voltage: 1,575 V

Voltage data according to standard IEC 61010-1:2010 (VDE 0411-1:2010)²
- Supply voltage from grid supply circuit (CAT 2): 150 V < Uₘₐₓ < 300 V
- Operating voltage: 300 V, 50 V
- Test voltage: 1,383 V AC
- Pollution degree: 2

MECHANICAL DATA
- Total mating force (average): 10.6 N/module
- Total sliding force (average): 7.6 N/module
- Temperature range: −40 °C to +125 °C
- Mating cycles: min. 10,000

MATERIALS
- Insulator: thermoplastic acc. to UL 94
- Contact/insulator: Cu alloy/PTFE
- Contact finishing: 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 page 153.

HIGH-FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS

Insertion loss

Voltage standing-wave ratio VSWR

CABLE TERMINATION
- Inner conductor crimped, outer conductor crimped

RECOMMENDED CABLE CONSTRUCTION/STRIPPING LENGTH

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Characteristic impedance Ω</th>
<th>Frequency range GHz</th>
<th>Cable¹</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Part number Comp dies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin contact</td>
<td>122.133.003.270.000</td>
<td>0.5</td>
<td>0.5</td>
<td>RG-174, RG-196</td>
<td>1.7</td>
<td>1.7</td>
<td>2.25</td>
<td>3.2</td>
<td>082.000.039.101.000</td>
</tr>
<tr>
<td>Pin contact</td>
<td>122.133.001.270.000</td>
<td>2.8</td>
<td>2.8</td>
<td>RG-174, RG-188, RG-316</td>
<td>1.75</td>
<td>2.7</td>
<td>3.2</td>
<td>3.8</td>
<td>082.000.039.102.000</td>
</tr>
<tr>
<td>Socket contact</td>
<td>122.133.004.270.000</td>
<td>0.5</td>
<td>0.5</td>
<td>RG-174, RG-196</td>
<td>1.7</td>
<td>1.7</td>
<td>2.25</td>
<td>3.2</td>
<td>082.000.039.101.000</td>
</tr>
<tr>
<td>Socket contact</td>
<td>122.133.002.270.000</td>
<td>2.8</td>
<td>2.8</td>
<td>RG-174, RG-188, RG-316</td>
<td>1.75</td>
<td>2.7</td>
<td>3.2</td>
<td>3.8</td>
<td>082.000.039.102.000</td>
</tr>
</tbody>
</table>

¹ Loss levels depend on used conductor type at a VSWR of 1.25. More are available on request. Each test was performed with a conductor length of 2 × 5 cm.
² IEC 60664-1:2007 (VDE 0110-1:2008) see page 165
³ See page 169
⁴ See page 168

special lines and alternative models on request

MODULE 4 CONTACTS FOR 50 Ω

COAX

INSULATOR FOR PIN AND SOCKET

CABLE TERMINATION

REMOVAL TOOL

HIGH-FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS

COAX

INSULATOR FOR PIN AND SOCKET

CABLE TERMINATION

REMOVAL TOOL
**MODULES**

**MODULE 2 CONTACTS FOR 50 Ω**

![Image of module 2 contacts]

**COAX**

**HIGH-FREQUENCY CHARACTERISTICS FOR 50 Ω COAX CONTACTS**

<table>
<thead>
<tr>
<th>Insertion loss</th>
<th>Frequency in GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.05</td>
<td>0</td>
</tr>
<tr>
<td>-0.10</td>
<td>1</td>
</tr>
<tr>
<td>-0.15</td>
<td>2</td>
</tr>
<tr>
<td>-0.20</td>
<td>3</td>
</tr>
<tr>
<td>-0.25</td>
<td>4</td>
</tr>
<tr>
<td>-0.30</td>
<td>5</td>
</tr>
</tbody>
</table>

**Voltage standing-wave ratio VSWR**

<table>
<thead>
<tr>
<th>Frequency in GHz</th>
<th>VSWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>3.0</td>
<td>1.0</td>
</tr>
<tr>
<td>4.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**TECHNICAL NOTES**

- For comp information, see from page 154.

**TECHNICAL DATA**

**Voltage data according to IEC 60664-1:2007 (VDE 0110-1:2008)**

- **Frequency range**: 0–4 GHz
- **Insulation resistance**: >100 GΩ
- **Clearance distance**: 2.2 mm
- **Creepage distance**: 3.1 mm
- **Pollution degree**: 2

**Voltage data according to MIL-**

- **Operating voltage**: 800 V
- **Test voltage**: 2,400 V

**Voltage data according to standard DIN EN 61010-1:2010**

- **Supply voltage from grid supply circuit (CAT II)**: 150 V ≤ U_{max} ≤ 300 V
- **Operating voltage**: 612 V
- **Test voltage**: 2,388 V

**Mechanical data**

- **Total mating force (average)**: 8.1 N/module
- **Total sliding force (average)**: 5.8 N/module
- **Operating temperature**: -40 °C to +125 °C
- **Mating cycles**: min. 10,000

**Materials**

- **Insulator**: Thermoplastic acc. to UL 94
- **Contact/insulator**: Cu alloy / PTFE
- **Contact finishing**: gold-plated

**Removal tool**

Removal of the assembled contact from the mating side

**PART NUMBER**: 087.7 CC.601.001.000

For an overview of all tools, please see from page 153.

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**INSULATOR FOR PIN AND SOCKET**

- **10 9 pin contact**
- **12 10 pin contact**
- **Socket contact**
- **Dummy contact**

**RECOMMENDED CABLE CONSTRUCTION/STRIPPING LENGTH**

- Inner conductor crimped, outer conductor crimped

**CABLE TERMINATION**

**Module 2 contacts**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>631.120.102.923.000</td>
</tr>
<tr>
<td>Dummy contact</td>
<td>021.341.202.946.000</td>
</tr>
</tbody>
</table>

**Table of contents**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Characteristic impedance</th>
<th>Frequency range GHz</th>
<th>Cable</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin contact</td>
<td>122.132.001.270.000</td>
<td>50</td>
<td>0.2</td>
<td>RG 178, RG 196</td>
<td>1.1</td>
<td>1.7</td>
<td>2.25</td>
<td>3.2</td>
<td>082.000.039.101.000</td>
</tr>
<tr>
<td>Pin contact</td>
<td>122.132.003.270.000</td>
<td>0.4</td>
<td>0.174, RG 188, RG 316, RG 58</td>
<td>3.15</td>
<td>4.5</td>
<td>5.2</td>
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<tr>
<td>Pin contact</td>
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<td>RG 223</td>
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<td>4.5</td>
<td>5.9</td>
<td>6.75</td>
<td>082.000.039.108.000</td>
</tr>
<tr>
<td>Pin contact</td>
<td>122.132.013.270.000</td>
<td>0.35</td>
<td>4</td>
<td>RG 223</td>
<td>3.15</td>
<td>4.5</td>
<td>5.9</td>
<td>6.75</td>
<td>082.000.039.108.000</td>
</tr>
<tr>
<td>Socket contact</td>
<td>122.132.002.270.000</td>
<td>50</td>
<td>0.2</td>
<td>RG 178, RG 196</td>
<td>1.1</td>
<td>1.7</td>
<td>2.25</td>
<td>3.2</td>
<td>082.000.039.101.000</td>
</tr>
<tr>
<td>Socket contact</td>
<td>122.132.004.270.000</td>
<td>0.4</td>
<td>0.174, RG 188, RG 316</td>
<td>3.15</td>
<td>4.5</td>
<td>5.2</td>
<td>6.15</td>
<td>082.000.039.106.000</td>
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<tr>
<td>Socket contact</td>
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<td>3.5</td>
<td>58</td>
<td>RG 58</td>
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<td>4.5</td>
<td>5.2</td>
<td>6.15</td>
<td>082.000.039.106.000</td>
</tr>
<tr>
<td>Socket contact</td>
<td>122.132.014.270.000</td>
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<td>RG 223</td>
<td>3.15</td>
<td>4.5</td>
<td>5.9</td>
<td>6.75</td>
<td>082.000.039.108.000</td>
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</tr>
</tbody>
</table>

1 Special lines and alternative models on request

---

1 Loss levels depend on used conductor type at a VSWR of 1.25. More are available on request. Each test was performed with a conductor length of 2 × 5 cm.

2 IEC 60664-1:2007 (VDE 0110-1:2008) see page 165

3 See page 169

4 See page 168

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MODULE 2 CONTACTS FOR 50 Ω
WITH SMA TERMINATION

Mating cycles: min. 10,000
Frequency range:\(^1\) 0–12 GHz\(^2\)

**TECHNICAL DATA**

Voltage data according to IEC 60664-1:2007 [VDE 0110-1:2008]\(^3\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>0–12 GHz</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>&gt; 100 GΩ</td>
</tr>
<tr>
<td>Clearance distance</td>
<td>1.6 mm, 1.6 mm</td>
</tr>
<tr>
<td>Creepage distance</td>
<td>1.6 mm, 1.6 mm</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2, 3</td>
</tr>
</tbody>
</table>

Voltage data according to MIL\(^4\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>565 V</td>
</tr>
<tr>
<td>Test voltage</td>
<td>1,700 V</td>
</tr>
</tbody>
</table>

Voltage data according to standard IEC 61010-1:2010 [VDE 0411-1:2010]\(^5\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>0–16 GHz, if gap between pin and socket frame is &lt; 0.2 mm and particular coax cables are used. Example: docking application</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>&gt; 100 GΩ</td>
</tr>
<tr>
<td>Clearance distance</td>
<td>1.6 mm, 1.6 mm</td>
</tr>
<tr>
<td>Creepage distance</td>
<td>1.6 mm, 1.6 mm</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2, 3</td>
</tr>
</tbody>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total mating force (average)</td>
<td>8.1 N/module</td>
</tr>
<tr>
<td>Total sliding force (average)</td>
<td>E.B N/module</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C to +125°C</td>
</tr>
<tr>
<td>Mating cycles</td>
<td>min. 10,000</td>
</tr>
</tbody>
</table>

**Materials**

- Insulator: thermoplastic acc. to UL 94
- Contact/insulator: Cu alloy/PTFE
- Contact finishing: gold-plated

**Removal Tool**

Removal of the assembled contact from the mating side
PART NUMBER: 087 7CO 650 001 000

For an overview of all tools, please see from page 153.

\(^1\) Loss levels depend on used conductor type at a VSWR of 1.25. More are available on request. Each test was performed with a conductor length of 2 × 5 cm.

\(^2\) Frequency range 0–16 GHz, if gap between pin and socket frame is < 0.2 mm and particular coax cables are used. Example: docking application.

\(^3\) IEC 60664-1:2007 [VDE 0110-1:2008] see page 165, 168

\(^4\) See from page 168

\(^5\) See page 169
MODULE 2 CONTACTS FOR 75 Ω

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

TECHNICAL NOTES

• For crimp information, see from page 154

TECHNICAL DATA

Description Part number Characteristic Impedance Ω Frequency range GHz

Cable Crimp dies
Pin contact 122.131.003.270.000 75 1.2 RG 179, RG 187 1.75 2.7 3.2 3.8 082.000.039.102.001
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 1.2 RG 179, RG 187 1.75 2.7 3.2 3.8 082.000.039.102.001
Socket contact 122.131.010.270.000 2.7 RG 59 4 5.4 6.3 7.2 082.000.039.109.000

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 153.

1 Special lines and alternative models on request
MODULE 2 CONTACTS FOR PNEUMATIC VALVES

Operating pressure\(^1\): 12 bar
Mating cycles\(^2\): minimum 10,000
Tube termination: M5

---

**TECHNICAL NOTES**
- The function dictates that contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
- Vacuum modules and further termination types on request.
- No \(O_2\) model\(^3\).

---

**TECHNICAL DATA**

**Mechanical data**
- Permissible max. operating pressure: 12 bar
- Operating force: 10.4 N/module
- Operating temperature: \(-40^\circ\text{C}\) to \(+125^\circ\text{C}\)
- Mating cycles: min. 10,000
- Tube termination: M5 inside thread for commercially available Push-in terminations

**Materials**
- Insulator: thermoplastic acc. to UL 94
- Valve body: Cu alloy, blank
- Sealing: NBR, sealing material

---

**FLOW RATE DIAGRAM**

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

\(^1\) Burst pressure: min. 40 bar \(^2\) The stated mating cycles are possible if regular maintenance intervals are observed \(^3\) Not suitable for mixtures with over 25% oxygen content or explosive gases.
MODULE 2 CONTACTS FOR PNEUMATIC VALVES

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

COMPRESSED AIR

Operating pressure: 10 bar
Mating cycles: min. 10,000
Tube termination: M5 or max. 4 mm

TECHNICAL NOTES
• The function dictates that contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
• Vacuum modules and further termination types on request
• No O² model

TECHNICAL DATA
Mechanical data
Permissible max. operating pressure 10 bar
Operating force
Non shut-off: 27 N/module
One-sided shut-off: 28 N/module
Two-sided shut-off: 29 N/module
Total sliding force (average)
Non shut-off: 12.6 N/module
One-sided shut-off: 12.6 N/module
Two-sided shut-off: 9.2 N/module
Operating temperature
-40 °C to +125 °C
Mating cycles: min. 10,000
Tube termination
M5 thread for commercially available Push-in terminations

Materials
Insulator: thermoplastic glass-fiber reinforced acc. to UL 94
Valve body: Cu alloy, blank
Sealing: NBR; sealing material/FKM

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.

Module 2 contacts
Part number
Insulator: 631.132.102.923.000
Dummy contact: 021.341.205.946.000

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Dim. A (mm)</th>
<th>Dim. X (mm)</th>
<th>Termination types see page 136</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug sleeve (non shut-off)</td>
<td>196.023.001.300.000</td>
<td>3</td>
<td>8.5</td>
<td>x</td>
</tr>
<tr>
<td>Plug sleeve (non shut-off)</td>
<td>196.024.001.300.000</td>
<td>4</td>
<td>10.5</td>
<td>x</td>
</tr>
<tr>
<td>Coupling (non shut-off)</td>
<td>196.023.003.300.000</td>
<td>3</td>
<td>8.5</td>
<td>x</td>
</tr>
<tr>
<td>Coupling (non shut-off)</td>
<td>196.024.003.300.000</td>
<td>4</td>
<td>10.5</td>
<td>x</td>
</tr>
<tr>
<td>Plug sleeve (shut-off)</td>
<td>196.025.014.300.000</td>
<td>M5</td>
<td>–</td>
<td>x</td>
</tr>
<tr>
<td>Coupling (shut-off)</td>
<td>196.023.002.300.000</td>
<td>3</td>
<td>8.5</td>
<td>x</td>
</tr>
<tr>
<td>Coupling (shut-off)</td>
<td>196.024.002.300.000</td>
<td>4</td>
<td>10.5</td>
<td>x</td>
</tr>
<tr>
<td>Coupling (shut-off)</td>
<td>196.025.012.300.000</td>
<td>M5</td>
<td>–</td>
<td>x</td>
</tr>
</tbody>
</table>

Recommended dummy contact disassembling tools:
Ø 3 mm – 4.5 mm
MODULE 2 CONTACTS FOR FLUID COUPLING

Suitable for conducting air, water, and other fluids

OPERATING PRESSURE: 10 bar low-leakage model
Mating cycles: min. 10,000
Tube termination: M5

TECHNICAL NOTES
- The function dictates that contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
- The use of flammable or explosive liquids or gases is not permitted.
- No I2 model

TECHNICAL DATA
Mechanical data
- Permissible max. operating pressure: 10 bar
- Tube termination: M5 inside thread for commercially available Push-in terminations
- Operating force: 48 N/module
- Operating temperature: −40 °C to +125 °C
- Mating cycles: min. 10,000
- Materials:
  - Insulator: thermoplastic glass-fiber reinforced acc. to UL 94
  - Fluid coupling: Cu alloy/nickel-plated
  - Sealing: sealing material/FKM

FLUID COUPLING

FLOW RATE DIAGRAM AIR

FLOW RATE DIAGRAM WATER

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 The stated mating cycles are possible if regular maintenance intervals are observed
2 Not suitable for mixtures with over 25% oxygen content or explosive gases

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M5 TERMINATION ACCESSORIES

COMPRESSED AIR

TERMINATION TYPE I
Plug nipple

TERMINATION TYPE II PUSH-IN
Push-in fitting
L connection

TECHNICAL NOTES
• Tightening torque 0.9 ± 0.2 Nm

TECHNICAL DATA
Mechanical data
Permissible operating pressure [static] 0.95–14 bar
Operating temperature for Push-in –10 °C to +80 °C
Thread termination M5

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Dim. A (inner-Ø of tube) mm</th>
<th>Dim. B (outer-Ø of tube) mm</th>
<th>Dim. C (incl. sealing washer) mm</th>
<th>Dim. D mm</th>
<th>Dim. E mm</th>
<th>Dim. F mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug nipple</td>
<td>945.000.001.000.123</td>
<td>2</td>
<td>10.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug nipple</td>
<td>945.000.001.000.136</td>
<td>3</td>
<td>14.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug nipple</td>
<td>945.000.001.000.137</td>
<td>4</td>
<td>15.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push-in fitting</td>
<td>945.000.001.000.138</td>
<td>3</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push-in fitting</td>
<td>945.000.001.000.139</td>
<td>4</td>
<td>13.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push-in fitting</td>
<td>945.000.001.000.140</td>
<td>6</td>
<td>14.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L connection Push-in</td>
<td>945.000.001.000.141</td>
<td>3</td>
<td>14</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L connection Push-in</td>
<td>945.000.001.000.142</td>
<td>4</td>
<td>14.9</td>
<td>15.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L connection Push-in</td>
<td>945.000.001.000.143</td>
<td>6</td>
<td>17.2</td>
<td>16.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TERMINATION DIMENSIONS ACCESSORIES PNEUMATIC VALVES

TIGHTENING TORQUE 0.9 ± 0.2 Nm

PERMISSIBLE OPERATING PRESSURE [STATIC] 0.95–14 BAR

OPERATING TEMPERATURE FOR PUSH-IN –10 °C TO +80 °C

THREAD TERMINATION M5
MATING CYCLES: MIN. 10,000
CAT 5® USB® 2.0®
2 to 14 contacts

TECHNICAL NOTES
- The inserts listed here for shielded feedthroughs/high-speed connectors are ideal for all common bus systems with transfer rates up to 10.0 MHz, e.g., Profibus®, RS485, FlexRay®, CAN-Bus® and RS232.
- Selected inserts are suitable and qualified for data rates up to 1 Gbit/s, e.g., Gigabit-Ethernet®, Fast-Ethernet®, IEEE 1394, USB® 2.0®, FireWire® S400® (on request).
- According to EIA-364-20F:2009
- Classification according to ISO/IEC 11801:2017-1
- Insert for crimp version on request
- Concerning data transmission protocols, please note page 2.
- For use in a housing, check the necessary space requirements.
- If required, selected inserts with 60,000 mating cycles (ODU SPRINGTAC®) available on request.
- Insert for crimp contacts on request.

**ASSEMBLY SET**

<table>
<thead>
<tr>
<th>Order</th>
<th>Base parts</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulator socket incl. socket housing</td>
<td>630.131.102.923.000</td>
</tr>
<tr>
<td>2</td>
<td>Insulator pin incl. connector housing</td>
<td>631.131.102.923.000</td>
</tr>
<tr>
<td>3</td>
<td>Insert cpl. solder contacts</td>
<td>See next page</td>
</tr>
<tr>
<td>3</td>
<td>Assembly set</td>
<td>See table on the right</td>
</tr>
</tbody>
</table>

**CABLE - Ø mm**

<table>
<thead>
<tr>
<th>Cable - Ø mm</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 to 2.1</td>
<td>751.020.188.304.022</td>
</tr>
<tr>
<td>2 to 3.2</td>
<td>751.020.188.304.032</td>
</tr>
<tr>
<td>3 to 4.2</td>
<td>751.020.188.304.042</td>
</tr>
<tr>
<td>4 to 5.2</td>
<td>751.020.188.304.052</td>
</tr>
<tr>
<td>5 to 6.2</td>
<td>751.020.188.304.062</td>
</tr>
<tr>
<td>6 to 7.2</td>
<td>751.020.188.304.072</td>
</tr>
<tr>
<td>7 to 7.7</td>
<td>751.020.188.304.077</td>
</tr>
</tbody>
</table>

**INSERT WITH ODU TURNTAC® (MATING CYCLES MIN. 10,000)**

<table>
<thead>
<tr>
<th>Number of contacts</th>
<th>Contact Ø mm</th>
<th>Rated surge voltage2 kV</th>
<th>Polarity degree2</th>
<th>Insert part number</th>
<th>Total mating cycles N</th>
<th>Terminal sliding force N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.0</td>
<td>32</td>
<td>80</td>
<td>550</td>
<td>8.5</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>2.0</td>
<td>26</td>
<td>60</td>
<td>550</td>
<td>8.5</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>2.0</td>
<td>22</td>
<td>80</td>
<td>550</td>
<td>10.5</td>
<td>9</td>
</tr>
</tbody>
</table>

1 According to EIA-364-20F:2009
2 According to IEC 60664-1:2007 (VDE 0110-1:2008), see page 165
3 Concerning data transmission protocols, please note page 2
4 Classification according to ISO/IEC 11801:2017-1
5 Insert for crimp version on request
6 Concerning data transmission protocols, please note page 2
7 According to IEC 60664-1:2007 (VDE 0110-1:2008), see page 165
8 According to EN 346-20F:2009. Classification according to EN 13841:2017-1
9 Insert for crimp version on request
10 Insert for crimp version on request
11 Insert for crimp version on request
12 Insert for crimp version on request
13 Insert for crimp version on request
14 Insert for crimp version on request
15 Insert for crimp version on request
16 Insert for crimp version on request
17 Insert for crimp version on request
18 Insert for crimp version on request
**MODULE FOR MULTI-POSITION SHIELDED FEEDTHROUGH/HIGH-SPEED CONNECTOR**

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

---

### Mating cycles: min. 10,000

- **CAT 5**
- **USB® 2.0**
- 2 to 14 contacts

---

### TECHNICAL NOTES

- The inserts listed here for shielded feedthroughs/high-speed connectors are ideal for all common bus systems with transfer rates up to 10.0 MHz, e.g., Profibus®, FlexRay®, CAN-Bus, and RS232.
- Selected inserts are suitable and qualified for data rates up to 1 Gbit/s, e.g., Gigabit-Ethernet, Fast-Ethernet, IEEE 1394, USB® 2.0, FireWire® S400 (on request).

---

### HOW TO CONFIGURE YOUR HIGH-SPEED CONNECTOR

![High-Speed Connector Diagram](image)

---

### ASSEMBLY SET

<table>
<thead>
<tr>
<th>Order</th>
<th>Base parts</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulator socket incl. socket housing</td>
<td>630.131.101.923.000</td>
</tr>
<tr>
<td>1</td>
<td>Insulator pin incl. connector housing</td>
<td>631.131.101.923.000</td>
</tr>
<tr>
<td>2</td>
<td>Insert cpl. solder contacts¹</td>
<td>See next page</td>
</tr>
<tr>
<td>3</td>
<td>Assembly set</td>
<td>See table on the right</td>
</tr>
<tr>
<td></td>
<td>Dummy contact</td>
<td>021.341.204.946.000</td>
</tr>
</tbody>
</table>

---

### CABLE ∅ mm

<table>
<thead>
<tr>
<th>Cable ∅ mm</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 to 2.1</td>
<td>751.020.188.304.022</td>
</tr>
<tr>
<td>2 to 3.2</td>
<td>751.020.188.304.032</td>
</tr>
<tr>
<td>3 to 4.2</td>
<td>751.020.188.304.042</td>
</tr>
<tr>
<td>4 to 5.2</td>
<td>751.020.188.304.052</td>
</tr>
<tr>
<td>5 to 6.2</td>
<td>751.020.188.304.062</td>
</tr>
<tr>
<td>6 to 7.2</td>
<td>751.020.188.304.072</td>
</tr>
<tr>
<td>7 to 7.7</td>
<td>751.020.188.304.077</td>
</tr>
</tbody>
</table>

---

### INSERT WITH ODU TURNTAC® (MATING CYCLES MIN. 10,000)

<table>
<thead>
<tr>
<th>Number of contacts</th>
<th>Contact Ø mm</th>
<th>Insulation termination connection Ø mm</th>
<th>Rated voltage2 V</th>
<th>Handshake voltage2 V</th>
<th>Pollution degree2</th>
<th>Nominal voltage3 V AC</th>
<th>Model</th>
<th>Category4</th>
<th>Insert part number</th>
<th>Total mating force N</th>
<th>Total sliding force N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.3</td>
<td>20</td>
<td>32</td>
<td>2</td>
<td>2</td>
<td>550</td>
<td>Pin</td>
<td>CAT 5</td>
<td>701.844.724.002.200</td>
<td>8.5</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Socket</td>
<td></td>
<td>701.744.724.002.200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1.3</td>
<td>20</td>
<td>16</td>
<td>2</td>
<td>3</td>
<td>500</td>
<td>Pin</td>
<td>CAT 5</td>
<td>701.844.724.003.200</td>
<td>8.5</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Socket</td>
<td></td>
<td>701.744.724.003.200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.9</td>
<td>22</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>500</td>
<td>Pin</td>
<td>CAT 5</td>
<td>701.849.724.004.200</td>
<td>10.9</td>
<td>9</td>
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<td>2</td>
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<td>CAT 5</td>
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<td>701.741.724.408.000</td>
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<td>1.5</td>
<td>2</td>
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<td>Pin</td>
<td>CAT 5</td>
<td>701.841.724.010.400</td>
<td>15.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Socket</td>
<td></td>
<td>701.741.724.010.400</td>
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<td>8 × 0.5</td>
<td>28</td>
<td>10</td>
<td>1.2</td>
<td>200</td>
<td>Pin</td>
<td>USB® 3.1 Gen1</td>
<td>701.831.724.410.000</td>
<td>16.0</td>
<td>12</td>
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<td></td>
<td>Socket</td>
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<td>701.731.724.410.000</td>
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<td>25</td>
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<td>Pin</td>
<td>CAT 5</td>
<td>701.841.724.014.000</td>
<td>15.0</td>
<td>12</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Socket</td>
<td></td>
<td>701.741.724.014.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Concerning data transmission protocols, please note page 2. ² Insert for crimp contacts on request

---

**Order Base parts Part number**

<table>
<thead>
<tr>
<th>Order</th>
<th>Base parts</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulator socket incl. socket housing</td>
<td>630.131.101.923.000</td>
</tr>
<tr>
<td>1</td>
<td>Insulator pin incl. connector housing</td>
<td>631.131.101.923.000</td>
</tr>
<tr>
<td>2</td>
<td>Insert cpl. solder contacts¹</td>
<td>See next page</td>
</tr>
<tr>
<td>3</td>
<td>Assembly set</td>
<td>See table on the right</td>
</tr>
<tr>
<td></td>
<td>Dummy contact</td>
<td>021.341.204.946.000</td>
</tr>
</tbody>
</table>

---

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

¹ Concerning data transmission protocols, please note page 2. ² According to IEC 60664-1:2007 (VDE 0110-1:2008), see page 165

² According to EN 364-20F:2009 ⁴ Classification according to ISO/IEC 11801:2017-1 ¹¹ Insert for crimp version on request
**MODULE FOR INDUSTRIAL ETHERNET**

**RJ45 / 10 GBIT/S**

STEADYTEC Technology

---

### High-Speed Connector

- **Mating cycles:** min. 5,000
- **TIAA/TIAB/Profinet®/CAT 5e/CAT 6a**
- **8 contacts**

#### TECHNICAL NOTES

- Data transmission
- This module is suitable for transmitting data according to CAT 6a, TIA/EIA-568-B.2-10 ISO/IEC 11801:2007. Suitable for the transmission of 10 Gbit/s according to IEEE 802.3.
- 8-way RJ45 field connector and RJ45 connector insert CAT 6a.
- Multi-port capable

#### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Transfer impedance</th>
<th>At 1 MHz</th>
<th>&gt; 100 mΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 10 MHz</td>
<td>&gt; 200 mΩ</td>
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</tr>
<tr>
<td>At 80 MHz</td>
<td>&gt; 1,600 mΩ</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Surface</th>
<th>Sn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>-40 °C to +70 °C</td>
<td></td>
</tr>
</tbody>
</table>

---

### COUPLING for RJ45 connection on the socket side

---

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- 1.000
- **Data transmission**
- **Technical Notes**
- **Technical Data**
- **Multi-position module**
- **Termination**
- **Description**
- **Part number**
- **Category**
- **RJ45 / 10 GBIT/S**

---

### Module Protection of the Ethernet Insert

- Inserted with special tools.
- Suitable for the transmission of 10 Gbit/s according to IEEE 802.3.

---

### Table

<table>
<thead>
<tr>
<th>Multi-position module</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator socket</td>
<td>630.130.101.923.000</td>
</tr>
<tr>
<td>Insulator pin</td>
<td>631.130.101.923.000</td>
</tr>
</tbody>
</table>

---

### Description

- **Coupling for RJ45**
- **Socket insert**
- **Connector insert**

---

**Concerning data transmission protocols, please note page 2.**
COMBINATION MODULE FOR HIGH-SPEED AND COAX 50 Ω/75 Ω

Size 1

Mating cycles: min. 10,000
Frequency range: 0–4 GHz
USB® 2.0, USB® 3.1 Gen1, FireWire®, Ethernet

TECHNICAL NOTES
- Note for high-speed module, see page 139–141
- For crimp information for coax modules, see from page 154

HOW TO CONFIGURE YOUR COMBINATION MODULE

ASSEMBLY SET

<table>
<thead>
<tr>
<th>Order</th>
<th>Base parts</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulator incl. housing and coax contact 50 Ω/75 Ω</td>
<td>See next page</td>
</tr>
<tr>
<td>2</td>
<td>Insert for shielded feedthrough cap. solder contacts</td>
<td>See page 139–141</td>
</tr>
<tr>
<td>3</td>
<td>Assembly set</td>
<td>See table on the right</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable (Ø) mm</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 to 2.1</td>
<td>751.020.188.304.022</td>
</tr>
<tr>
<td>2 to 3.2</td>
<td>751.020.188.304.032</td>
</tr>
<tr>
<td>3 to 4.2</td>
<td>751.020.188.304.042</td>
</tr>
<tr>
<td>4 to 5.2</td>
<td>751.020.188.304.052</td>
</tr>
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<td>5 to 6.2</td>
<td>751.020.188.304.062</td>
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<td>6 to 7.2</td>
<td>751.020.188.304.072</td>
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<tr>
<td>7 to 7.7</td>
<td>751.020.188.304.077</td>
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</table>

COAX 50 Ω

INSULATOR SOCKET

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Characteristic impedance Ω</th>
<th>Frequency range GHz</th>
<th>Cable</th>
<th>Cable termination</th>
<th>Part number Crimp dies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket side</td>
<td>630.131.102.923.321</td>
<td>50</td>
<td>0.2</td>
<td>RG 179, RG 196</td>
<td>1.1</td>
<td>1.7</td>
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<tr>
<td>Pin side</td>
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<td>50</td>
<td>0.2</td>
<td>RG 174, RG 188, RG 316</td>
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<td>2.7</td>
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<td>Socket side</td>
<td>630.131.102.923.322</td>
<td>50</td>
<td>0.4</td>
<td>RG 174, RG 188, RG 316</td>
<td>1.75</td>
<td>2.7</td>
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<tr>
<td>Pin side</td>
<td>631.131.102.923.322</td>
<td>50</td>
<td>0.4</td>
<td>RG 174, RG 188, RG 316</td>
<td>1.75</td>
<td>2.7</td>
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<td>3.5</td>
<td>RG 58</td>
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<td>4.5</td>
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COAX 75 Ω

INSULATOR SOCKET

<table>
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<th>Part number</th>
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<th>Frequency range GHz</th>
<th>Cable</th>
<th>Cable termination</th>
<th>Part number Crimp dies</th>
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<td>RG 179, RG 187</td>
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<tr>
<td>Pin contact</td>
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<td>75</td>
<td>1.2</td>
<td>RG 179, RG 187</td>
<td>1.75</td>
<td>2.7</td>
</tr>
<tr>
<td>Socket contact</td>
<td>630.131.102.923.312</td>
<td>75</td>
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<td>RG 59</td>
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<td>5.4</td>
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<td>2.7</td>
<td>RG 59</td>
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<td>5.4</td>
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</tbody>
</table>

1 Concerning data transmission protocols, please note page 2
2 Insert for crimp contacts on request
COMBINATION MODULE FOR HIGH-SPEED AND COMPRESSED AIR/EASILY INTERCHANGEABLE

Mating cycles\(^1\): min. 10,000
USB\(^2\) 2.0\(^\text{D}\), USB\(^2\) 3.1 Gen1\(^2\), FireWire\(^2\), Ethernet\(^2\)
12 bar or 0–4 GHz

**TECHNICAL NOTES**
- Note for high-speed module, see page 138–141

**COMBINATION MODULE FOR HIGH-SPEED AND COMPRESSED AIR**
- The function dictates that contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
- Vacuum modules and further termination types on request
- No \(\text{O}_2\) model\(^3\)
- Termination accessories, see page 136

**COMBINATION MODULE CAN BE EASILY INTERCHANGEABLE**
- Can be retrofitted with 75 \(\Omega\) coax contact, see page 128–129

**ASSEMBLY SET**

<table>
<thead>
<tr>
<th>Order</th>
<th>Base parts</th>
<th>Part number</th>
<th>Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulator incl. housing and compressed air/easily interchangeable</td>
<td>See next page</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insert for shielded feedthrough cpl. solder contacts(^4)</td>
<td>See page 138–141</td>
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</tr>
<tr>
<td>3</td>
<td>Assembly set</td>
<td>See table on the right</td>
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**Table of contents**

**COMBINATION MODULE FOR HIGH-SPEED AND COMPRESSED AIR**

**INSULATOR SOCKET**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Termination</th>
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<tbody>
<tr>
<td>Socket side (non shut-off)</td>
<td>630.131.102.923.191</td>
<td>MS</td>
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<tr>
<td>Pin side (non shut-off)</td>
<td>631.131.102.923.191</td>
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<tr>
<td>Socket side (shut-off)</td>
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**INSULATOR PIN**

<table>
<thead>
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<tr>
<td>Socket side</td>
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</tr>
<tr>
<td>Pin side</td>
<td>631.131.102.923.190</td>
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</tbody>
</table>

\(\text{O}_2\) model: Not suitable for mixtures with over 25% oxygen content or explosive gases.

Insert for crimp contacts on request

1. The stated mating cycles for compressed air module are possible via regular maintenance intervals
2. Concerning data transmission protocols, please note page 2
3. Not suitable for mixtures with over 25% oxygen content or explosive gases. Insert for crimp contacts on request

---

**COMBINATION MODULE CAN BE EASILY INTERCHANGEABLE**

**INSULATOR SOCKET**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket side</td>
<td>630.131.102.923.000</td>
<td></td>
</tr>
<tr>
<td>Pin side</td>
<td>631.131.102.923.000</td>
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</tr>
<tr>
<td>Dummy contact</td>
<td>021.341.204.946.000</td>
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</tr>
</tbody>
</table>

**INSULATOR PIN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket side</td>
<td>630.131.102.923.001</td>
</tr>
<tr>
<td>Pin side</td>
<td>631.131.102.923.001</td>
</tr>
<tr>
<td>Dummy contact</td>
<td>021.341.204.946.000</td>
</tr>
</tbody>
</table>

\(\text{O}_2\) model: Not suitable for mixtures with over 25% oxygen content or explosive gases. Insert for crimp contacts on request

1. The stated mating cycles for compressed air module are possible via regular maintenance intervals
2. Concerning data transmission protocols, please note page 2
**TECHNICAL NOTES**

- The function dictates that contacts are pre-stressed in the mated state. The frame must maintain this pre-stress with a holding device.
- Please note that the polished surface of the contact must not be touched. When in an unmated condition, the contact must also be protected from dust and dirt.

**TECHNICAL DATA**

**Mating cycles**: min. 10,000

**INSERTS SC**
- **Ferrule**: zirconia
- **Optical features - Insertion loss**: SM: max. 0.5 dB, MM: max. 0.4 dB
- **Optical features - 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
- **Optical features - Insertion loss**: SM: max. 0.5 dB, MM: max. 0.4 dB
- **Optical features - 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 if regular maintenance intervals are observed.
BLANK MODULES

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

TECHNICAL DATA
Insulator: thermoplastic acc. to UL 94

<table>
<thead>
<tr>
<th>Units</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>631.151.000.923.000</td>
</tr>
<tr>
<td>3</td>
<td>631.153.000.923.000</td>
</tr>
<tr>
<td>5</td>
<td>631.155.000.923.000</td>
</tr>
</tbody>
</table>

FOR YOUR NOTES
Tools

- Termination technology .................................................. 154
- Crimping tools .............................................................. 155
- Tensile strength diagram for crimp terminations ................ 156
- Crimp information .......................................................... 157
- Assembly aids ............................................................... 158
- Removal tools ............................................................... 159
- Removal of contacts ....................................................... 160
- Service kit for ODU SPRINGTAC® and ODU LAMTAC® contacts .............................. 161
TERMINATION TECHNOLOGY

ODU offers three different termination technologies for the single contacts:

- Crimp
- Solder
- PCB

CRIMP TERMINATION

The contact processing for the production of connecting cables via crimping creates a secure, durable, and corrosion-free contact. For most people, crimping is easy and quick to carry out.

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

Crimping can be carried out on the tiniest of crosssections as well as on larger crosssections. For small crosssections (0.14–2.5 mm²), 8-point crimping tools are used; hexagonal crimping tools are used for larger crosssections. The corner measurement of the crimping is never larger than the original diameter. The cable insulation is not damaged in the process and can be directly attached to the connector end.

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

For further crimp information, please refer to the table on page 157.

FOR ASSEMBLY INSTRUCTIONS, PLEASE REFER TO OUR WEBSITE: WWW.ODU-CONECTORS.COM
TENSILE STRENGTH FOR CRIMP TERMINATIONS


Tensile strength diagram of a crimp termination depending on the conductor crosssection 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 crosssections (> 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 testing systems (e.g., test pin) or processing methods (e.g., test speed) following assembly 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.

<table>
<thead>
<tr>
<th>Contact no.</th>
<th>AWG / mm²</th>
<th>Conductor crosssection in mm²</th>
<th>Crimping jaws</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>0.08</td>
<td>0.60/9</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>20</td>
<td>0.5</td>
<td>10/0.92</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>11/1.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>11/1.27</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>2.00</td>
<td>3/1.67</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>11/1.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>11/1.27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>3/1.67</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>14</td>
<td>7.00</td>
<td>1,2/1.67</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Profile no. 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Profile no. 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1,2/1.67</td>
<td>Profile no. 3</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>1/0.57</td>
<td>Profile no. 3</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>10/0.92</td>
<td>082.000.064.110.000</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>082.000.064.101.000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>10/0.92</td>
<td>082.000.064.116.000</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>18/0.92</td>
<td>082.000.064.125.000</td>
</tr>
</tbody>
</table>

COAX CRIMP INFORMATION

<table>
<thead>
<tr>
<th>Contact no.</th>
<th>Termination crosssection</th>
<th>Stripping height</th>
<th>8-point crimping tool 080.000.031.000 without positioner</th>
<th>Hexagonal crimping tool 080.000.064.000 without positioner</th>
</tr>
</thead>
</table>
|             | Awg / mm²                | Strip.
|             | 28                       | 0.08            | 0.60/9                                                      |                                                            |
|             | 26                       | 0.14            |                                                             |                                                            |
|             | 24                       | 0.25            |                                                             |                                                            |
|             | 22                       | 0.38            |                                                             |                                                            |
| 1.3         | 20                       | 0.5             | 10/0.92                                                     |                                                            |
|             | 18                       | 0.75            |                                                             |                                                            |
|             | 1                        | 1.00            |                                                             |                                                            |
|             | 18                       | 11/1.22         |                                                             |                                                            |
|             | 16                       | 11/1.27         |                                                             |                                                            |
| 2           | 14                       | 2.00            | 3/1.67                                                      |                                                            |
|             | 1                        | 11/1.22         |                                                             |                                                            |
|             | 1.5                      | 11/1.27         |                                                             |                                                            |
|             | 2.5                      | 3/1.67          |                                                             |                                                            |
| 3.5         | 14                       | 7.00            | 1,2/1.67                                                   |                                                            |
|             | 12                       | Profile no. 3   |                                                             |                                                            |
|             | 10                       | Profile no. 3   |                                                             |                                                            |
|             | 4                        | 1,2/1.67        | Profile no. 3                                             |                                                            |
|             | 6                        | 1/0.57          | Profile no. 3                                             |                                                            |

CRIMP INFORMATION

| Contact no. | AWG / mm² | Strip.
|-------------|-----------|-----------------
|             | 28        | 0.08            |
|             | 26        | 0.14            |
|             | 24        | 0.25            |
|             | 22        | 0.38            |
| 1.3         | 20        | 0.5             |
|             | 18        | 0.75            |
|             | 1         | 1.00            |
|             | 18        | 11/1.22         |
|             | 16        | 11/1.27         |
| 2           | 14        | 2.00            |
|             | 1         | 11/1.22         |
|             | 1.5       | 11/1.27         |
|             | 2.5       | 3/1.67          |
| 3.5         | 14        | 7.00            |
|             | 12        | 1,2/1.67        |
|             | 10        | Profile no. 3   |
|             | 4         | 1,2/1.67        |
|             | 6         | 1/0.57          |

NOTE

The tinservice strength diagram of a crimp termination depending on the conductor crosssection IEC 60352-2:2013 (DIN EN 60352-2:2014) is shown.

Example: A 2.5 mm² conductor must achieve a minimum tensile strength of approx. 320 N.

Contact no. 080.000.051.000 without positioner

Position/adjusting dimension 080.000.051.101.000

Positioner 080.000.057.101.000

Positioner 080.000.064.101.000

Positioner 080.000.064.110.000

Positioner 080.000.064.116.000

Positioner 080.000.064.125.000

COAX CRIMP INFORMATION

Table of contents
ASSEMBLY AIDS

**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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Usage for</th>
<th>Part number</th>
<th>Nm</th>
<th>Recommended tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque wrench</td>
<td></td>
<td>598.054.001.000.000</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Torque wrench</td>
<td></td>
<td>598.054.002.000.000</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Torque wrench</td>
<td></td>
<td>598.054.006.000.000</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Torque wrench</td>
<td></td>
<td>598.054.003.000.000</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Bit combination, slot size 2</td>
<td>Coding socket (DIN frame)</td>
<td>598.054.110.000.000</td>
<td>1.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Special bit</td>
<td>Coding pin for frames in a housing</td>
<td>598.054.203.000.000</td>
<td>1.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Bit combination, slot size 1</td>
<td>Fastening screw on frames in a housing</td>
<td>598.054.102.000.000</td>
<td>1.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Phillips bit, cross slot size 1</td>
<td>Oval-head screw of grounding pin on frame</td>
<td>598.054.106.000.000</td>
<td>1.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Torx bit TX 10</td>
<td>Screws of the securing bracket in the spindle locking and spare spindle knob</td>
<td>598.054.104.000.000</td>
<td>1.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Torx bit TX 20</td>
<td>Screw for power contact 12 mm contact diameter</td>
<td>598.054.105.000.000</td>
<td>2.2</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
<tr>
<td>Assembly tool, back nut size 1</td>
<td>Back nut for shielded feedthrough size 1</td>
<td>598.055.001.000.000</td>
<td>0.9</td>
<td>Nm +/- 0.2 Nm</td>
</tr>
</tbody>
</table>

**REMOVAL TOOLS**

**ASSEMBLY TOOL HIGH CURRENT CONTACT DIAMETER 8 mm**
Required assembly tool for screwing and releasing the contacts, tightening torque: 2.7 Nm +/- 0.1 Nm
PART NUMBER: 087.611.002.001.000

**REMOVAL TOOL FOR CONTACTS DIAMETER 0.7 mm**
The contact is removed from the front, in the case of already assembled contacts, the cable does not have to be disconnected.
PART NUMBER: 087.7CC.070.005.000

**REMOVAL TOOL FOR CONTACTS DIAMETER 1.3 TO 5 mm**
The contact is removed from the front, in the case of already assembled contacts, the cable does not have to be disconnected.

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

<table>
<thead>
<tr>
<th>Contact, mm</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>087.7CC.130.004.000</td>
</tr>
<tr>
<td>2</td>
<td>087.7CC.200.003.000</td>
</tr>
<tr>
<td>3.5</td>
<td>087.7CC.350.001.000</td>
</tr>
<tr>
<td>5</td>
<td>087.7CC.680.001.000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Usage for</th>
<th>Part number</th>
<th>Nm</th>
<th>Recommended tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coax 4 contacts</td>
<td></td>
<td>087.7CC.310.001.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coax 2 contacts</td>
<td></td>
<td>087.7CC.690.001.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressed air</td>
<td></td>
<td>087.7CC.680.001.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REMOVAL OF THE ASSEMBLED CONTACT
Use the conductor to push the contact to be removed to the front from behind, in order to make unlocking easier. The removal tool is pushed from the front over the contact and 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.

REMOVAL OF CONTACTS IS ONLY POSSIBLE WITH ODU TOOLS

Contact lubrication improves the mechanical properties of contact systems. Cleaning the contact surfaces prior to lubrication is also recommended in order to remove pollution. With appropriate care, wear due to high mating frequency can be significantly minimized and the mating and demating forces reduced. The cleaning and lubricating interval must be individually adapted to circumstances and should only be carried out with products recommended by the contact manufacturer.

ODU has put together a service kit for this purpose, so that lubrication can be carried out directly on site. A cleaning brush and a special cleaning cloth, as well as precise instructions, allow for optimal care of the contacts. In the absence of other specifications, the service kit can be used for all ODU contacts and connections.

PART NUMBER: 170.000.000.000.100

For technical properties of the service kit, please refer to our website: www.odu-connectors.com/downloads

CLEANING INFORMATION
Service manual 003.170.000.000.000

FURTHER INFORMATION
Never submerge the connector in liquid. The connector may only be put back into operation again when it has been assured that it is completely dry. Ensure that contact pins are not bent or otherwise damaged. The connector must no longer be used if 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

According to IEC 60529:2013 (VDE 0470-1:2014)

<table>
<thead>
<tr>
<th>Code number</th>
<th>First code number (degrees of protection against access to hazardous parts/Protection against ingress of solid foreign objects)</th>
<th>Second code number (degrees of protection against water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protection against contact to solid foreign objects</td>
<td>Protection against water drops falling at an angle (angle up to 15° either side of the vertical)</td>
</tr>
<tr>
<td>2</td>
<td>Protection against water dripping at an angle</td>
<td>Protection against water drops falling at an angle (angle up to 15° either side of the vertical)</td>
</tr>
<tr>
<td>3</td>
<td>Protection against water spraying (any angle up to 15° either side of the vertical)</td>
<td>Protection against water from any direction</td>
</tr>
<tr>
<td>4</td>
<td>Protection against water spraying from any direction</td>
<td>Protection against water from any direction</td>
</tr>
<tr>
<td>5</td>
<td>Protection against water from any direction</td>
<td>Protection against water from any direction</td>
</tr>
</tbody>
</table>

GENERAL

All the technical information listed in this catalog and the data sheets has been determined by drawing on various standards. Unless otherwise stated, standard IEC 61984-2008 (VDE 0627:2009) “Connectors – Safety requirements and tests” has been used to dimension and determine the values provided.

This international standard applies to connectors with rated voltages of 50 V to 1,000 V alternating and direct, and rated currents of up to 125 A per contact. Hence, they either have no type specification or which have a type specification whose safety requirements refer to this standard. The standard can be used as a guide for connectors with rated voltages up to 50 V in cases such as this, IEC 60664-1:2007 must be consulted when dimensioning the clearance and creepage distances. This standard can also serve as a guide for connectors with rated currents higher than 125 A per contact.

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

All of the voltage data listed in this catalog refers to the use of insulators, which have been installed according to assembly regulations in the ODU-MAC® frame for housings or in the ODU-MAC® docking frame. Customer-specific attachments, which may no longer apply; insulating clearances may need to be extended. The permissible overvoltage and the rated voltage may be significantly influenced by the use of blank modules and varying positioning of the contacts in the insulators.

The following general specifications have been defined for dimensioning:

- Isolation between electrical circuits (functional insulation between the contacts) or between an electrical circuit and local ground (contact with grounded frame) has been dimensioned as basic insulation. If “double insulation” or “reinforced insulation” is required, the voltage data provided may no longer apply, insulating clearances may need to be extended.
- Unless otherwise stated, all voltages are given as rms voltages.
- Overvoltage category III is used, along with the TT and TN system types, to dimension the rated surge voltage.
- Condition A is always used for the inhomogeneous field when dimensioning the clearance distances used.
- The inspections prescribed for solid insulation and for clearance distances (if necessary) are conducted as alternating voltage inspections according to Table F.5.
- The clearance and creepage distances are determined on the bases specified in IEC 60664-1:2007 (VDE 0610-1:2008).

The most important influence variables and the electrical parameters harmonized with these will be explained in more detail in the following. We would be happy to assist you with any further questions. The texts and tables given here are excerpts from the indicated standards. As a rule, product committees lay down application-specific safety requirements for various fields of use, these requirements also regulate the insulation coordination and inspection of connectors. In such cases, the product standards “take precedence and must be observed instead of the basic safety standards” stated here. However, since this catalog and the technical data sheets cannot take all product standards into consideration, we have restricted ourselves to the following standard in terms of voltage data.
features relate. Some standards use the term “rated voltage” or “working voltage” instead of “operating voltage”. In these explanations, the term “nominal voltage” is used for the value of the issued voltage indicated by the power supply company (PSC) or by the manufacturer of the voltage source for classification of the overvoltage category.

Equipment 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)).

RATED SURGE VOLTAGE
Value of an impulse withstand voltage that is indicated by the manufacturer for equipment or a part thereof, 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 pollution degree, the rated surge voltage depends upon the clearance distance between the individual contacts (see Table F.2 in IEC 60664-1:2007 (VDE 0110-1:2008)).

According to this standard, the minimum clearance distances for equipment not connected directly to the low voltage mains should be measured according to the possible permanent voltages, the temporary overvoltages, or periodic peak voltages (see Table F.7 in IEC 60664-1:2007 (VDE 0110-1:2008)).

If a “periodic peak voltage” is present for a long time over the service life (more than approximately 60 minutes), this is not an overvoltage as regards insulation dimensioning under the terms of the standard, but must be considered a continuous voltage instead. In such cases, the “periodic peak voltage” must be used as the operating voltage.

POLLUTION DEGREE
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 pollution degree according to the criteria listed below must be selected for the equipment.

In the case of a connector with a degree of protection of minimum IP54 IEC 60529:2013 (VDE 0470-1:2014), the insulating parts may be measured enclosed according to the standard for a low pollution degree. 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.

Pollution degree 1
No or only dry, non-conductive pollution is present. The pollution has no influence. For example, computer systems and measuring instruments in clean, dry or air-conditioned rooms.

Pollution degree 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.

Pollution degree 3
(= Standard, if no specific pollution degree is indicated)
Conductive pollution occurs or dry, non-conductive pollution that becomes conductive because of condensation must be expected. For example, devices in industrial, commercial, and agricultural operations, unheated storage areas and workshops.

Pollution degree 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 item of equipment and relates to the operating and performance features.

Depending upon the indicated pollution degree, the rated voltage is dependent upon the insulating material group of the connector and the respective creepage distances between the individual contacts.

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)

<table>
<thead>
<tr>
<th>Rated surge voltage</th>
<th>Test surge voltage at sea level</th>
<th>Test surge voltage at 200 m elevation</th>
<th>Test surge voltage at 500 m elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.33</td>
<td>0.357</td>
<td>0.355</td>
<td>0.350</td>
</tr>
<tr>
<td>0.5</td>
<td>0.541</td>
<td>0.537</td>
<td>0.531</td>
</tr>
<tr>
<td>0.8</td>
<td>0.934</td>
<td>0.920</td>
<td>0.899</td>
</tr>
<tr>
<td>1.5</td>
<td>1.751</td>
<td>1.725</td>
<td>1.685</td>
</tr>
<tr>
<td>2.5</td>
<td>2.920</td>
<td>2.874</td>
<td>2.808</td>
</tr>
<tr>
<td>4</td>
<td>4.923</td>
<td>4.874</td>
<td>4.675</td>
</tr>
<tr>
<td>6</td>
<td>7.385</td>
<td>7.236</td>
<td>7.013</td>
</tr>
</tbody>
</table>

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 pollution degree applied.

TEST VOLTAGES
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.
This is what is known as a type specification or product standard, which is universally applicable to all devices belonging to the application area covered by this standard. For particular types of device, these requirements are supplemented or modified by the specific requirements contained in one or more special additional parts of the standard (Part 2), which must be read in conjunction with the requirements contained in Part 1.

Devices belonging to the application area:

- Electrical test and measurement instruments: devices that test, measure, display or record electrical and/or physical variables (also applies to test instruments integrated in production processes)
- Electrical open and closed-loop control devices for industrial process control: devices that set one or more output variables to specific values
- Electrical laboratory equipment: devices that measure, display, monitor or analyze substances (may also be used outside of the laboratory)

Devices excluded from the application area:

- IEC 60065 (Audio, video and similar electronic apparatus)
- IEC 60204 (Electrical equipment of machines)
- IEC 60601 (Medical electrical equipment)

This standard defines some special cases, unlike IEC 60664-1:2007 (VDE 0110-1:2008):

Limit values for accessible parts (Section 6.3):

The voltages listed below are classed as dangerous and active, if certain currents (0.5 mA AC; 2.0 mA DC) are exceeded at the same time:

- Alternating voltage (AC): $U_{\text{rms}} = 33 \text{ V}$ ($U_{\text{peak}} = 46.7 \text{ V}$)
- Direct voltage (DC): $U = 70 \text{ V}$
- Wet environment $U_{\text{rms}} = 16 \text{ V AC}$ ($U_{\text{peak}} = 22.6 \text{ V}$); $U = 35 \text{ V DC}$

A general distinction is made between the supply circuit (primary circuit) and the secondary circuit, which have different values for the clearance and creepage distances.

A partial discharge test is not compulsory at voltages > 700 V here either, it is merely recommended.

1 See corresponding section in the DIN EN 61010-1:2010 (VDE 0411-1) safety standard

**VOLTAGE DATA ACCORDING TO “MIL”**

**EIA-364-20F:2019**

"Withstanding Voltage – Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts"

The withstanding voltage values stated in this catalog were determined according to the method described in EIA-364-20F:2019 "Withstanding Voltage – Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts". The inserts were tested while mated, and the test current was applied to the pin insert.

75% of the calculated dielectric withstanding voltage is used as the test voltage for further calculations. The operating voltage is 1/3 of this value.

This standard refers to IEC 60522-4-1:2003 “Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof”.

Test voltage: dielectric withstanding voltage $\times 0.75$

Operating voltage: dielectric withstanding voltage $\times 0.75 \times 0.33$

If there are any deviations, the derating factors are to be factored in according to the applicable standards. All tests were conducted at the prescribed indoor climate and apply up to an altitude of 2,000 m.
The American Wire Gauge (AWG) is based on the principle that the crosssection 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 crosssection to that of the stranded wire. In this case, the crosssection of the stranded wire refers to the sum of the copper crosssections of the individual wires.

Accordingly, strands with the same AWG number but different numbers of wires differ in crosssection. For instance, an AWG 20 strand of 7 AWG 28 wires has a crosssection of 0.563 mm², while an AWG 20 strand of 19 AWG 32 wires has a crosssection of 0.616 mm².

**CONVERSIONS/AWG (AMERICAN WIRE GAUGE)**

<table>
<thead>
<tr>
<th>AWG</th>
<th>Diameter</th>
<th>Cross-section</th>
<th>Weight</th>
<th>Max. resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/0</td>
<td>0.650</td>
<td>15.100</td>
<td>0.601</td>
<td>0.17</td>
</tr>
<tr>
<td>3/0</td>
<td>0.536</td>
<td>13.600</td>
<td>0.536</td>
<td>0.22</td>
</tr>
<tr>
<td>2/0</td>
<td>0.470</td>
<td>12.100</td>
<td>0.470</td>
<td>0.27</td>
</tr>
<tr>
<td>1/0</td>
<td>0.424</td>
<td>10.800</td>
<td>0.424</td>
<td>0.34</td>
</tr>
<tr>
<td>1</td>
<td>0.398</td>
<td>9.600</td>
<td>0.398</td>
<td>0.43</td>
</tr>
<tr>
<td>2</td>
<td>0.351</td>
<td>8.500</td>
<td>0.351</td>
<td>0.55</td>
</tr>
<tr>
<td>4</td>
<td>0.268</td>
<td>6.800</td>
<td>0.268</td>
<td>0.87</td>
</tr>
<tr>
<td>6</td>
<td>0.219</td>
<td>5.300</td>
<td>0.219</td>
<td>1.38</td>
</tr>
<tr>
<td>8</td>
<td>0.170</td>
<td>4.200</td>
<td>0.170</td>
<td>2.18</td>
</tr>
<tr>
<td>10</td>
<td>0.109</td>
<td>2.590</td>
<td>0.109</td>
<td>3.45</td>
</tr>
<tr>
<td>12</td>
<td>0.080</td>
<td>2.290</td>
<td>0.080</td>
<td>4.13</td>
</tr>
<tr>
<td>14</td>
<td>0.064</td>
<td>1.854</td>
<td>0.064</td>
<td>6.36</td>
</tr>
<tr>
<td>16</td>
<td>0.050</td>
<td>1.380</td>
<td>0.050</td>
<td>9.44</td>
</tr>
<tr>
<td>18</td>
<td>0.043</td>
<td>1.020</td>
<td>0.043</td>
<td>13.94</td>
</tr>
<tr>
<td>20</td>
<td>0.032</td>
<td>0.813</td>
<td>0.032</td>
<td>19.18</td>
</tr>
<tr>
<td>22</td>
<td>0.024</td>
<td>0.511</td>
<td>0.024</td>
<td>33.10</td>
</tr>
<tr>
<td>24</td>
<td>0.020</td>
<td>0.511</td>
<td>0.020</td>
<td>51.80</td>
</tr>
<tr>
<td>26</td>
<td>0.015</td>
<td>0.320</td>
<td>0.015</td>
<td>91.20</td>
</tr>
<tr>
<td>28</td>
<td>0.012</td>
<td>0.203</td>
<td>0.012</td>
<td>186.00</td>
</tr>
<tr>
<td>30</td>
<td>0.010</td>
<td>0.160</td>
<td>0.010</td>
<td>234.00</td>
</tr>
<tr>
<td>32</td>
<td>0.008</td>
<td>0.127</td>
<td>0.008</td>
<td>335.00</td>
</tr>
<tr>
<td>34</td>
<td>0.0063</td>
<td>0.093</td>
<td>0.0063</td>
<td>545.00</td>
</tr>
<tr>
<td>36</td>
<td>0.0060</td>
<td>0.064</td>
<td>0.0060</td>
<td>856.00</td>
</tr>
</tbody>
</table>

**BASIC PRINCIPLES OF CURRENT-CARRYING CAPACITY**

The current-carrying capacity of a connector is determined by measurement. It is determined taking self-heating by current heat and the ambient temperature into account, and is limited by the thermal properties of the contact materials used. Their upper limit temperature must 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 limit temperature forms the limit of the diagram.

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

Source: ASTM
CURRENT LOAD

[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 catalog apply to either single contacts or completely assembled inserts/modules, as indicated.

Derating Factors

In the case of multi-position connectors and cables, the heating is greater than it is with single 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 cores.

Example:

A 4kV cable with 24 cores is used [24 contacts]. The nominal cross-section of a core 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 cores. A 6 mm² Cu line (contact diameter 3.0 mm) can be used according to current-carrying capacity with 39 amperes. The 24 contacts connector can thus be loaded with a max. of 15.6 A/contact (0.4 × 39 A).

Max. Continuous Current

The measured amperage at room temperature (approx. 20 °C) which increases the contact temperature to the limit temperature. The values specified in the catalog apply to either single contacts or completely assembled inserts/modules, as indicated.

Current-Carrying Capacity Diagram

FOR SINGLE CONTACTS

Measurement made acc. with IEC 60512-5.2:2002 (DIN EN 60512-5-2:2003) (derating curve shown = 0.8 × base curve)

Upper limit temperature: +120 °C
Termination with nominal cross-section
### CURRENT-CARRYING CAPACITY DIAGRAM

**FOR FULLY EQUIPPED MODULES**

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

#### Strombelastbarkeit MA C Einzelkontakt S.146

**CURRENT-CARRYING CAPACITY DIAGRAM**

**Nominal Current Load of Lines**

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

<table>
<thead>
<tr>
<th>Laying procedure</th>
<th>Exposed in air</th>
<th>Dr on surfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-wire lines</td>
<td>Multi-wire highly flexible lines</td>
</tr>
<tr>
<td></td>
<td>PVC, PE, PUR, TPE heat-resistant</td>
<td>For hand-held devices, core/sheath cold-resistant, PVC-insulated</td>
</tr>
<tr>
<td></td>
<td>Multi-wire movable lines PVC, PE, PUR, TPE standard program harmonized series</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of live cores</th>
<th>Nominal crosssection copper conductor in mm²</th>
<th>Nominal current load in A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.14¹</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>0.25²</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>0.34³</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>0.5⁴</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>0.75</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>1.5</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>2.5</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>42</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>54</td>
</tr>
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<td>11</td>
<td>10</td>
<td>73</td>
</tr>
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<td>12</td>
<td>16</td>
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<td>13</td>
<td>25</td>
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<td>14</td>
<td>35</td>
<td>158</td>
</tr>
<tr>
<td>15</td>
<td>50</td>
<td>198</td>
</tr>
<tr>
<td>16</td>
<td>50</td>
<td>198</td>
</tr>
</tbody>
</table>

- Nominal current load acc. to VDE 0298-4:2013 Table 11

Nominal current load of lines with a nominal voltage of up to 1,000 V and of heat-resistant lines.

The specification of data does not release one from the need to conduct the test. The original standards remain authoritative for all of the listed technical specifications.

¹ DIN VDE 0891-1:1990
TECHNICAL TERMS

AMBIENT TEMPERATURE
Temperature of the air or other medium in which a piece of equipment is intended to be used.

AWG
American Wire Gauge see page 170

See page 171

CHEMICAL RESISTANCE
Many secondary processing procedures use glues, 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 note our processing suggestions and technical notes in this catalog as well as the special information for the plastic housings.

CLEARANCE DISTANCE
The shortest distance in the air between two conductive parts. The insulation coordination is explained in detail from page 165.

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 page 76).

CONNECTOR
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 a component in through-hole assembly, THT (through-hole technology).

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.

CORE
Electrical conductor, solid wire or multi-wire strand, with insulation as well as any conductive layers. Cables or lines may have one or more cores.

CREEPAGE DISTANCE
The shortest distance between two conductive parts along the surface of a solid insulation material. This factor 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 165.

CRIMP BARREL
A conductor barrel which can accommodate one or more conductors and be crimped by a crimping tool.

CRIMP TERMINATION
Termination technology, see crimp connection.

CRIMP CONNECTION
The permanent, non-detachable, and solder-free mounting of a contact to a conductor via shaping the crimp barrel around the conductor to make a good electrical and mechanical connection. Executed with crimping tool, press or automatic crimping machine (see page 156).

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 cables according to IEC 60228:2004 (VDE 0295-2005; Class 5), so that no significant temperature increase occurs here.

The indicated temperature increase takes place through the contact. The specifications are average values.

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

DERATING MEASUREMENT METHOD
See page 171

DERATING CURVE
See page 172

DERATING FACTOR
According to VDE 0298-4:2013, with connectors and cables with over 5 contacts, the heating is greater than it is with single contacts. For that reason, the aforementioned standard is calculated with a derating factor (see page 172).

See page 171

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 service kit for ODU SPRINTAC® and ODU LAMTAC® contacts for subsequent lubrication (see page 162).

MATERIALS [STANDARD DESIGN]
Pins and carriers 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.

MATING AND SLIDING FORCE (DEMATING 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 ± 50%.

MATING CYCLES
Mechanical actuation of connectors by mating and sliding. A mating cycle consists of one insertion and withdrawal 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 counterparts.

MAX. CONTINUOUS CURRENT
The metrologically determined amperage at room temperature [approx. 20 °C] which increases the contact temperature to the limit temperature. The values specified in the catalog apply to either single contacts or completely assembled inserts/modules, as indicated.

See page 172

NOMINAL SINGLE-CONTACT CURRENT LOAD
The current-carrying capacity which each individual contact can be loaded with continuously on its own (see from page 171).

NOMINAL VOLTAGE
The voltage which the manufacturer specifies for a connector and relates to the operating and performance features.

OPERATING TEMPERATURE
See upper limit temperature (see page 176). Single modules may differ from the indicated temperature values. Here you find the technical information on the appropriate pages.

OPERATING VOLTAGE
The nominal voltage of the power source for which the connector is being used. The operating voltage must not be higher than the nominal voltage of the connector.

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, TH1 (through-hole technology).

POLLUTION DEGREE
The insulation coordination is explained in detail from page 165.

RATED CURRENT (NOMINAL CURRENT)
See from page 172

RATED VOLTAGE
According to IEC 60512-5-2:2002 (DIN EN 60512-5-2:2003) standard “Value of a voltage which is specified by the manufacturer for a component, device or item of equipment and relates to the operating and performance features”. 

RATED VOLTAGE
TECHNICAL TERMS

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.

TERMINATION CROSSSECTION
The specified crosssections correspond to a "fine-wire" conductor structure according 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 lines to the electro-mechanical element, such as solder-free connections according to IEC 60352-2-2013 (DIN EN 60352-2-2014): crimp termination, screw connection, etc., or soldering connection (see from page 154).

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

TIGHTNESS IEC 60529:2013 (VDE 0470-1:2014)
See International Protection classes on page 164

UPPER LIMIT TEMPERATURE
The highest permissible temperature at which the connector may still be operated. It includes contact heating through current-carrying capacity. In the case of standard contacts (ODU TURNJack®), this amounts to +120 °C.

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

GENERAL NOTE
The connectors listed in this catalog are intended for use in high voltage and frequency ranges.

Suitable precautions must be taken to ensure people do not come into contact with live conductors during installation and operation.

All entries in this catalog were thoroughly reviewed before printing. ODU reserves the right to make changes based on the current state of knowledge without prior notice without being obliged to provide replacement deliveries or refinements of older designs.