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**Amphenol**
Amphenol-Tuchel Electronics GmbH

# eco | mate$^{m}$

## Circular Connectors




www.industrial-amphenol.com

# Note from the CEO



**Ladies and Gentlemen,**

For over 75 years Amphenol has enjoyed success as the interconnection technology provider of choice to industry-leading companies around the world. One of our key strategic areas of focus has been and is the Industrial market. Our organization works with leading manufacturers across a wide range of applications - including Energy Generation & Distribution, Transportation, Heavy Equipment, Factory Automation, Wireless Outdoor, ChipCard Readers - enabling smarter, faster and better technologies to connect products to customer solutions.

The Industrial market footprint of Amphenol covers over facilities in more than 12 different European countries and more than 30 countries worldwide. Our successful expansion into new regions as well as new industrial applications is a direct reflection of our agile, entrepreneurial management team and our unwavering commitment to execute Amphenol's strategies for the benefit of our customers, shareholders and employees.

Thank you for partnering with Amphenol. Our entire organization is at your service.



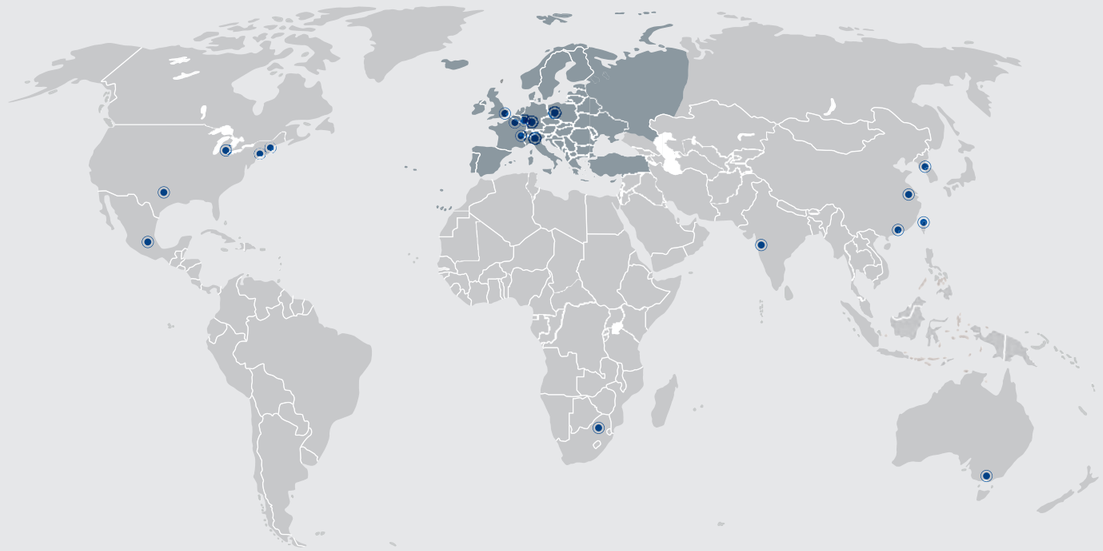
R. Adam Norwitt
President and CEO, Amphenol Corporation

# Make use of the best
# Use our global resources

"Think global, act local!" Independently from where you are in Europe, we offer you our global expertise and great variety of products and technologies. And in comfort with your personal contact. Our numerous European offices are your access to our global resources.

**OUR OFFICES IN EUROPE AND WORLDWIDE**

| | | | |
|---|---|---|---|
| FRANCE | CHINA | AUSTRALIA | SOUTH AFRICA |
| GERMANY | KOREA | MEXICO | INDIA |
| UNITED KINGDOM | TAIWAN | USA | ITALY |





SECURITY, RELIABILITY AND COMFORTABLE SERVICE FROM ONE SOURCE.

# More time for important things: benefit from our service and diversity

Enjoy security, reliability and comfortable service from one source. INDUSTRIAL@AMPHENOL offers one of the most individual and most diversified service programmes in the market – exclusively for industrial customers. Access all possibilities of the Amphenol group through your personal expert adviser.

## WIDE PRODUCT RANGE

Take advantage of a choice of Amphenol products. Our broad product portfolio offers individual solutions from more than 85 member companies in the global Amphenol group.

## EXCLUSIVENESS AND FLEXIBILITY

One face to the customer: every inquiry is handled on an individual service level by your personal key account service partner. This ensures maximum transparency and best-in-class flexibility in the whole process.

## QUALITY

Interconnect systems need reliability, speed and flawless data transmission. We continuously test and guarantee the required standard in our products – and also in our personal services.

## INDIVIDUAL SOLUTIONS

Your project requires an individual solution that is not available off-the-shelf? As your think tank and discussion partner we provide engineering support and solution-oriented development for your tailor-made Amphenol product.

## SPEED AND AVAILABILITY

Smart and intelligent processes are the secret behind our service programme. Flexible planning and distribution, perfect logistics and highest availability are our key factors for best customer service.

## GLOBAL KEY ACCOUNT SERVICE

Our key account service is your individual entrance to global know-how, products and services. More than 85 Amphenol companies around the world offer an extensive range of technologies and products. We offer access to our worldwide resources through one individual contact person.

# eco|mate[m] Content


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## eco|mate$^{m}$ Brief Information








| Approvals, Testhouse | Characteristics | Approval Numbers |
|---|---|---|
| VDE | 3+PE, 400 V, 16 A<br>6+PE, 250 V, 10 A (solder version)<br>6+PE, 250 V, 13 A (crimp version) | 56 79 ÜG |
| SEV | 3+PE, 400 V, 16 A<br>6+PE, 250 V, 10 A (solder version)<br>6+PE, 250 V, 13 A (crimp version) | |
| UL [1)] | 3+PE, 400V, 16A<br>6+PE, 250V, 13A<br>3+PE, 600 V, 13 A at AWG 16 (High Voltage)<br>3+PE, 600 V, 5 A at AWG 26 (High Voltage)<br>6+PE, 600 V, 13 A at AWG 16 (High Voltage)<br>6+PE, 600 V, 5 A at AWG 26 (High Voltage) | E 63093 |
| CSA | 3+PE, 250 V, 12 A<br>6+PE, 250 V, 8 A<br>3+PE, 600 V, 10,5 A at AWG 16 (High Voltage)<br>6+PE, 600 V, 10,5 A at AWG 16 (High Voltage) | 48932 |

In general approvals refer to versions of the connector series. Test report upon request.



[1)] Please refer to „conditions of acceptability“



## eco|mate$^{m}$ General Information

### General Remarks

In design and conception eco|mate$^{m}$ the program meets the high requirements for applications in industrial technology. Easy operation, reduced dimensions and a more robust design are only a few of the features of the series.

The connector’s main area of application is in the fields of plant construction and machine building. The connector is used for measuring and controlling applications as well as for power supply. technology. The series is comprised of a large selection of housings and shapes and offers models with screw, solder and crimp termination.

### Features

- Circular Connectors with 3+PE and 6+PE contacts
- Housing components made from premium molding material
- Cable housing straight or angled
- Protection class IP 65/67 in mated condition in accordance with DIN EN 60526
- Clamping ring or internal strain relief

### Advantages

- Quick and easy assembly
- Screwed cable gland with clamping ring
- Strain relief and mounted gasket all in one component
- Cable housing, straight or angled, for the cable diameter 6 - 12,5 mm
- Robust thread for the screwed cable gland
- Ergonomically designed product range for safe handling
- Pre-loaded ground contact
- Fastening for the protective covers on the housing of the receptacles
- The eco|mate$^{m}$ program is compatible with the C16-1 series

### Additional standards

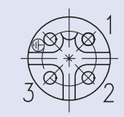
The 6+PE model corresponds to DIN 9684-1 interface to the signal transmission on inside cabin applications for agricultural machines and tractors



# eco | mate^m

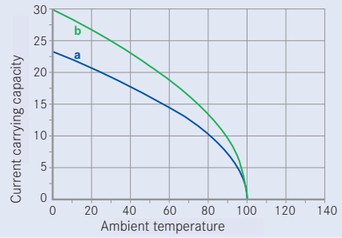
## Standard

## eco | mate^m Standard | Technical Data

| General Characteristics | Standard | Characteristics | | |
|---|---|---|---|---|
| Number of contacts | | 3 + PE | 6 + PE | |
| Termination technique | | screw type | solder type | crimp type |
| Wire gauge / AWG | | 0,75 - 2,5 mm² AWG 18-14 | max. 0,75 mm² AWG 18 | 0,14 - 1,5 mm² AWG 26 - 16 |
| Flammability | UL 94 | VO | | |
| Locking system | | round thread | | |
| View on termination side of male contact insert | |  |  | |
| **Electrical Characteristics** | | | | |
| Rated voltage | IEC 60664-1 [1] | 400 V | 250 V | |
| Pollution degree | IEC 60664-1 [1] | 3 | | |
| Installation category | IEC 60664-1 [1] | III | | |
| Insulation group | IEC 60664-1 [1] | II | | |
| Rated impulse withstand voltage | IEC 60664-1 [1] | 6000 V | 4000 V | |
| Current rating | IEC 60512-5-2 | 16 A / + 55°C | 12 A / + 55°C | 13 A / + 55°C |
| Contact resistance | IEC 60512-2-1 | ≤ 5 m Ω | | |
| Insulation resistance | IEC 60512-3-1 | ≥ $10^8$ Ω | | |
| **Climatic Characteristics** | | | | |
| Climatic category | IEC 60068-1 | 40 / 100 /56 | 40 / 125 / 56 | |
| Operating temperature | | -40°C ... +100°C | -40°C ... +125°C | |
| **Mechanical Characteristics** | | | | |
| IP-degree | IEC 60529 | IP 65 / IP 67 | | |
| Insertion and withdrawal forces | IEC 60512-13-2 | ≤ 15 N | ≤ 30 N | |
| Mechanical operation | IEC 60512-9-1 | ≥ 500 mating cycles | | |
| **Materials** | | | | |
| Housing material | | PA 6.6 / PA 6 | | |
| Dielectric material | | PA 6.6 / PA 6 | | |
| Gasket material | | Neopren | | |
| Material lace for protective cover | | TPE | | |
| Contact plating | | silver plating / gold plating | | |

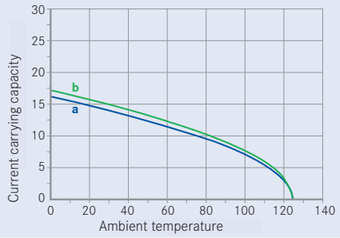
**Derating-Curves [2]**

3 + PE




| Curve | Wire gauge |
|---|---|
| a | 1,5 mm² |
| b | 2,5 mm² |

6 + PE




| Curve | Wire gauge |
|---|---|
| a | 0,75 mm² stamped solder contacts |
| b | 1,5 mm² stamped crimp contacts |

**Remark**

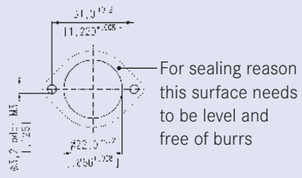
The stated technical values refer to the use as connector without breaking capacity (COC). If these components are used as plug and socket device a reduced current carrying capacity has to be considered.
The characteristics have to be requested from the manufacturer.



[1] DIN EN 60664-1 ≙ VDE 0110-1 ≙ IEC 60664-1
[2] All contacts under load

| Description | No. of contacts | Part number Silver plating | Part number Gold plating | Drawing | Figure |
|---|---|---|---|---|---|
| **Male cable connector straight \| strain relief with clamping ring 6 -12,5 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20H003 100 10 | C016 20H003 200 10 | | |
| black | 3 + PE | C016 20H003 100 12 | C016 20H003 200 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30H006 100 10 | C016 30H006 200 10 | | |
| black | 6 + PE | C016 30H006 100 12 | C016 30H006 200 12 | | |
| Crimp [1] | | | | | |
| blue | 6 + PE | C016 10H006 000 10 | C016 10H006 000 10 | | |
| black | 6 + PE | C016 10H006 000 12 | C016 10H006 000 12 | | |
| **Male cable connector straight \| with internal cable clamping and clamping ring 6 - 10,0 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20H003 110 10 | C016 20H003 210 10 | | |
| black | 3 + PE | C016 20H003 110 12 | C016 20H003 210 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30H006 110 10 | C016 30H006 210 10 | | |
| black | 6 + PE | C016 30H006 110 12 | C016 30H006 210 12 | | |
| Crimp [1] | | | | | |
| blue | 6 + PE | C016 10H006 010 10 | C016 10H006 010 10 | | |
| black | 6 + PE | C016 10H006 010 12 | C016 10H006 010 12 | | |
| **Male cable connector angled\| strain relief with clamping ring 6 -12,5 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20K003 100 10 | C016 20K003 200 10 | | |
| black | 3 + PE | C016 20K003 100 12 | C016 20K003 200 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30K006 100 10 | C016 30K006 200 10 | | |
| black | 6 + PE | C016 30K006 100 12 | C016 30K006 200 12 | | |
| Crimp[1] | | | | | |
| blue | 6 + PE | C016 10K006 000 10 | C016 10K006 000 10 | | |
| black | 6 + PE | C016 10K006 000 12 | C016 10K006 000 12 | | |
| **Male Receptacle** | | | | | |
| Screw | | | | A | |
| black | 3 + PE | C016 20C003 100 12 | C016 20C003 200 12 | 14,0 | |
| Solder | | | | | |
| black | 6 + PE | C016 30C006 100 12 | C016 30C006 200 12 | 12,0 | |
| Crimp [1] | | | | | |
| black | 6 + PE | C016 10C006 000 12 | C016 10C006 000 12 | 16,5 | |

**Mounting Instruction [2]**





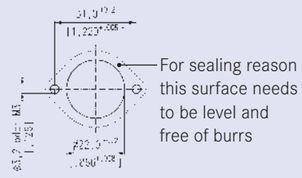

[1] Crimp contacts see page 20 [2] Mounting hole Ø 22 without chamfer, suitable sealing for screws is necessary. Tightening torque 0,8Nm





| Description | No. of contacts | Part number Silver plating | Part number Gold plating | Drawing | Figure |
|---|---|---|---|---|---|
| **Female cable connector straight \| strain relief with clamping ring 6 -12,5 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20D003 100 10 | C016 20D003 200 10 | | |
| black | 3 + PE | C016 20D003 100 12 | C016 20D003 200 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30D006 100 10 | C016 30D006 200 10 | | |
| black | 6 + PE | C016 30D006 100 12 | C016 30D006 200 12 | | |
| Crimp [1] | | | | | |
| blue | 6 + PE | C016 10D006 000 10 | C016 10D006 000 10 | | |
| black | 6 + PE | C016 10D006 000 12 | C016 10D006 000 12 | | |
| **Female cable connector straight \| with internal cable clamping and clamping ring 6 - 10,0 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20D003 110 10 | C016 20D003 210 10 | | |
| black | 3 + PE | C016 20D003 110 12 | C016 20D003 210 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30D006 110 10 | C016 30D006 210 10 | | |
| black | 6 + PE | C016 30D006 110 12 | C016 30D006 210 12 | | |
| Crimp [1] | | | | | |
| blue | 6 + PE | C016 10D006 010 10 | C016 10D006 010 10 | | |
| black | 6 + PE | C016 10D006 010 12 | C016 10D006 010 12 | | |
| **Female cable connector angled\| strain relief with clamping ring 6 -12,5 mm** | | | | | |
| Screw | | | | | |
| blue | 3 + PE | C016 20F003 100 10 | C016 20F003 200 10 | | |
| black | 3 + PE | C016 20F003 100 12 | C016 20F003 200 12 | | |
| Solder | | | | | |
| blue | 6 + PE | C016 30F006 100 10 | C016 30F006 200 10 | | |
| black | 6 + PE | C016 30F006 100 12 | C016 30F006 200 12 | | |
| Crimp[1] | | | | | |
| blue | 6 + PE | C016 10F006 000 10 | C016 10F006 000 10 | | |
| black | 6 + PE | C016 10F006 000 12 | C016 10F006 000 12 | | |
| **Female Receptacle** | | | | | |
| Screw | | | | A | |
| black | 3 + PE | C016 20G003 100 12 | C016 20G003 200 12 | 13,5 | |
| Solder | | | | | |
| black | 6 + PE | C016 30G006 100 12 | C016 30G006 200 12 | 14,2 | |
| Crimp [1] | | | | | |
| black | 6 + PE | C016 10G006 000 12 | C016 10G006 000 12 | 16,5 | |

**Mounting Instruction [2]**





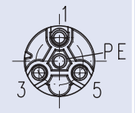
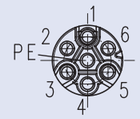

[1] Crimp contacts see page 20 [2] Mounting hole Ø 22 without chamfer, suitable sealing for screws is necessary. Tightening torque 0,8Nm



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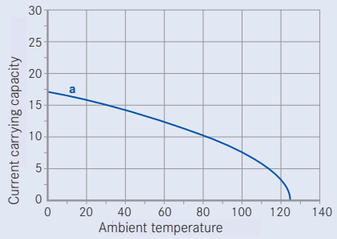
## High Voltage

## eco | mate^m High Voltage | Technical Data

| General Characteristics | Standard | Characteristics | |
|---|---|---|---|
| Number of contacts | | 3 + PE | 6 + PE |
| Termination technique | | crimp type | |
| Wire gauge / AWG | | 0,14 - 1,5 mm² | |
| | | AWG 26 - 16 | |
| Flammability | UL 94 | VO | |
| Locking system | | round thread | |
| View on termination side of male contact insert | |   |   |
| **Electrical Characteristics** | | | |
| Rated voltage | IEC 60664-1 [1)] | 600 V | |
| Pollution degree | IEC 60664-1 [1)] | 3 (mated) | |
| Installation (overvoltage) category | IEC 60664-1 [1)] | III | |
| Material group | IEC 60664-1 [1)] | II | |
| Rated impulse withstand voltage | IEC 60664-1 [1)] | 6000 V | |
| Current carrying capacity | IEC 60512-5-2 | 14 A / + 40°C | |
| Contact resistance | IEC 60512-2-1 | ≤ 5 m Ω | |
| Insulation resistance | IEC 60512-3-1 | ≥ $10^8$ Ω | |
| **Climatic Characteristics** | | | |
| Climatic category | IEC 60068-1 | 40 / 125 / 56 | |
| Operating temperature | | -40°C ... +125°C | |
| **Mechanical Characteristics** | | | |
| Degree of protection | IEC 60529 | IP 65 | |
| Insertion and withdrawal force | IEC 60512-13-2 | ≤ 35 N | |
| Mechanical operation | IEC 60512-9-1 | ≥ 500 mating cycles | |
| **Materials** | | | |
| Housing material | | PA 6.6 / PA 6 | |
| Dielectric material | | PA 6.6 / PA 6 | |
| Gasket material | | Neopren | |
| Contact plating | | silver plating / gold plating | |

**Derating-Curves [2)]**

6 + PE




| Curve | Wire gauge |
|---|---|
| a | 1,5 mm² stamped crimp contacts |

| Prüfstelle | Kennwert |
|---|---|
| UL * | 3+PE, 600 V, 13 A at AWG 16<br>3+PE, 600 V, 5 A at AWG 26<br>6+PE, 600 V, 13 A at AWG 16<br>6+PE, 600 V, 5 A at AWG 26 |
| CSA | 3+PE, 600 V, 10,5 A at AWG 16<br>6+PE, 600 V, 10,5 A at AWG 16 |

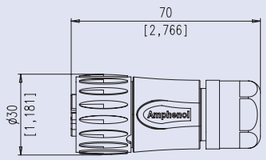
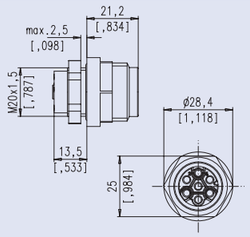
In general approvals refer to versions of the connector series. Test report upon request.
* Please refer to „conditions of acceptability“

**Remark**

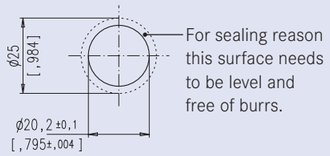
The stated technical values refer to the use as connector without breaking capacity (COC). If these components are used as plug and socket device a reduced current carrying capacity has to be considered.
The characteristics have to be requested from the manufacturer.



[1)] DIN EN 60664-1 ≙ VDE 0110-1 ≙ IEC 60664-1
[2)] All contacts under load

| Description | No. of contacts | Part number | Drawing | Figure |
|---|---|---|---|---|
| **Female cable connector straight \| with clamping ring, cable diameter 6 -12,5 mm** | | | | |
| Crimp [1]<br>black | 3 + PE<br>6 + PE | C016 10D003 806 12<br>C016 10D006 806 12 |  |  |
| **Male receptacle** | | | | |
| Crimp[1]<br>black | 3 + PE<br>6 + PE | C016 10P003 806 12<br>C016 10P006 806 12 |  |  |

**Mounting Instruction [2]**




**Remark**

- Standard dust cups don't fi t on high voltage versions special caps upon request.
- Thread size M20 x 1,5
- If turn protection is required, we recommend to glue receptacles.



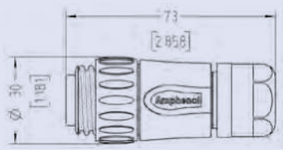
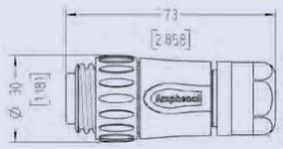
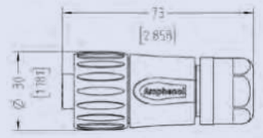
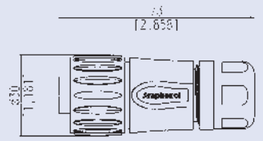
[1] Crimp contacts see page 20
[2] Tightening torque 4 -5 Nm





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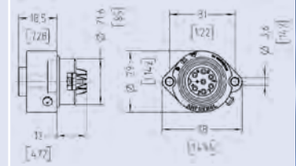
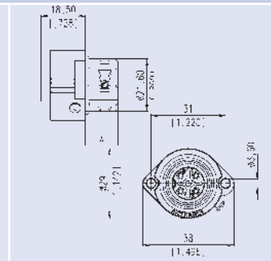
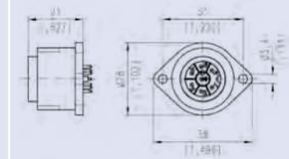
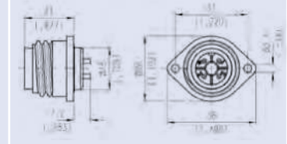
## Special Types

| Description | No. of contacts | Part number Silver plating | Drawing | Figure |
|---|---|---|---|---|
| **Male cable connector straight \| with 4 pressure plates** | | | | |
| Screw black [1)] | 3 + PE | C016 20H003 804 12 |  |  |
| **Male cable connector straight \| 1 pressure plate at PE** | | | | |
| Screw black [1)] | 3 + PE | C016 20H003 803 12 |  |  |
| **Female cable connector straight \| with 4 pressure plates** | | | | |
| Screw black [1)] | 3 + PE | C016 20D003 806 12 |  |  |
| **Female cable connector straight \| with turned contacts** | | | | |
| Screw black [1)] | 6 + PE | C016 30D006 800 12 |  |  |

[*] Further specifications upon request
[1)] More backshell colors upon request

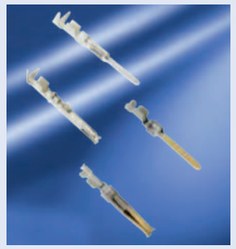
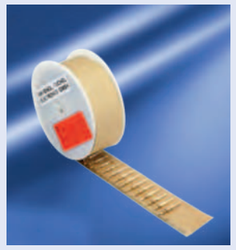




| Description | No. of contacts | Part number | Drawing | Figure |
|---|---|---|---|---|
| **Female receptacle \| solder with turned contacts** | | | | |
| black | 6 + PE | C016 30G006 800 12 |  |  |
| **Female receptacle colored \| 6 + PE crimp[1)]** | | | | |
| yellow<br>blue | 6 + PE<br>6 + PE | T 3107 800<br>T 3107 802 |  |  |
| **Male receptacle \| straight dip solder** | | | | |
| black | 3+ PE<br>6 + PE | T 3110 010<br>T 3106 010 |  |  |
| **Male receptacle \| 3 + PE solder with turned contacts** | | | | |
| black | 3+ PE | T 3110 100 |  |  |

[*] Further specifications upon request
[1)] Crimp contacts see page 20/ Crimp tooling

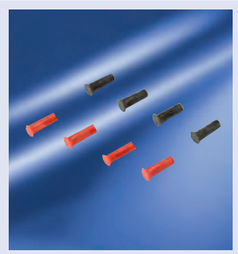
## eco | mate$^{m}$ Crimp Contacts

| Supplied as | for wire gauge | Insulation ∅ in mm | Pieces | Part number Male contact | Part number Female contact | Figure |
|---|---|---|---|---|---|---|
| **Stamped single contacts 1,6 mm \| 6+PE** | | | | | | |
| silver plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 100 | VN 01 016 0011 1 | VN 02 016 0003 1 |  |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 100 | VN 01 016 0004 1 | VN 02 016 0002 1 | |
| silver plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 100 | VN 01 016 0003 1 | VN 02 016 0003 1 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 100 | VN 01 016 0002 1 | VN 02 016 0002 1 | |
| gold plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 100 | VN 01 016 0011 2 | VN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 100 | VN 01 016 0004 2 | VN 02 016 0002 2 | |
| gold plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 100 | VN 01 016 0003 2 | VN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 100 | VN 01 016 0002 2 | VN 02 016 0002 2 | |
| **Stamped contact on reel for hand crimping tools 1,6 mm \| 6+PE** | | | | | | |
| silver plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 200 | ZN 01 016 0011 1 | ZN 02 016 0003 1 |  |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 200 | ZN 01 016 0004 1 | ZN 02 016 0002 1 | |
| silver plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 200 | ZN 01 016 0003 1 | ZN 02 016 0003 1 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 200 | ZN 01 016 0002 1 | ZN 02 016 0002 1 | |
| gold plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 200 | ZN 01 016 0011 2 | ZN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 200 | ZN 01 016 0004 2 | ZN 02 016 0002 2 | |
| gold plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 200 | ZN 01 016 0003 2 | ZN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 200 | ZN 01 016 0002 2 | ZN 02 016 0002 2 | |
| **Stamped contact on reel for crimping machines contact feeding right hand side1,6 mm \| 6+PE** | | | | | | |
| silver plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | HN 01 016 0011 1 | HN 02 016 0003 1 |  |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | HN 01 016 0004 1 | HN 02 016 0002 1 | |
| silver plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | HN 01 016 0003 1 | HN 02 016 0003 1 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | HN 01 016 0002 1 | HN 02 016 0002 1 | |
| gold plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | HN 01 016 0011 2 | HN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | HN 01 016 0004 2 | HN 02 016 0002 2 | |
| gold plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | HN 01 016 0003 2 | HN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | HN 01 016 0002 2 | HN 02 016 0002 2 | |
| **Stamped contact on reel for crimping machines contact feeding left hand side1,6 mm \| 6+PE** | | | | | | |
| silver plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | TN 01 016 0011 1 | TN 02 016 0003 1 |  |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | TN 01 016 0004 1 | TN 02 016 0002 1 | |
| silver plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | TN 01 016 0003 1 | TN 02 016 0003 1 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | TN 01 016 0002 1 | TN 02 016 0002 1 | |
| gold plating Standard | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | TN 01 016 0011 2 | TN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | TN 01 016 0004 2 | TN 02 016 0002 2 | |
| gold plating High voltage | 0,14 - 0,5 mm² | 1,0 - 2,0 | 2000 | TN 01 016 0003 2 | TN 02 016 0003 2 | |
| | 0,5 - 1,5 mm² | 1,8 - 2,8 | 2000 | TN 01 016 0002 2 | TN 02 016 0002 2 | |



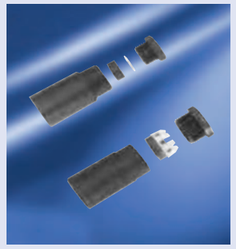
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## eco | mate$^{m}$ Accessories

| Description | Part number | | Figure |
|---|---|---|---|
| **Back shell right angled (Packaging units 10 pieces)** | | | |
| right angled with clamping ring | | |  |
| blue | C016 G09 042 G10 X | | |
| black | C016 G09 041 G10 X | | |
| **Back shell straight (Packaging units 5 pieces)** | | | |
| colored back shells | | |  |
| blue | C016 G11 042 E1 V | | |
| black | C016 G11 041 E10 V | | |
| red | C016 G11 043 E10 V | | |
| white | C016 G11 044 E10 V | | |
| green | C016 G11 045 E10 V | | |
| yellow | C016 G11 046 E10 V | | |
| orange | C016 G11 048 E10 V | | |
| violet | C016 G11 060 E10 V | | |
| brown | C016 G11 061 E10 V | | |
| **Cable clamp (Packaging units 10 pieces)** | | | |
| for all straight cable connectors<br>Cable clamp diameter<br>Ø 6 - 10 mm | N 16 110 2000 X | |  |
| **Plugs brass** | | | |
| for 3+PE<br>red | N 17 021 0001 | |  |
| für 6+PE<br>red | N 17 17 0001 | | |
| black | N 17 17 0001 1 | | |

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## eco|mate[m] Accessories

| Description | Part number | | Figure |
|---|---|---|---|
| **Back shells (Packaging units 10 pieces)** | | | |
| Back shell PG 9<br>with thrust collar | T 3102 003 7 X | |  |
| Back shell PG 11<br>with thrust collar | T 3102 004 7 X | | |
| Back shell PG 13.5<br>with clamping ring | T 3102 005 7 X | | |
| **Rubber gasket** | | | |
| for cable diameter 4-6mm² | N 06 007 0004 | While mounting the rubber gasket for 4-6mm², the cable clamp shall be bolted with the convex section face-down in order to ensure the strain relief. | |

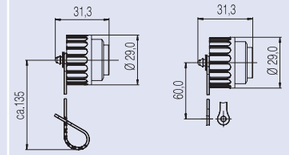
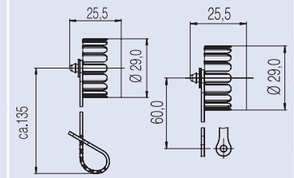
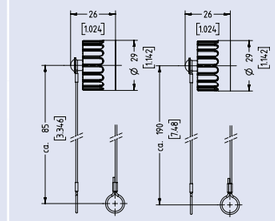
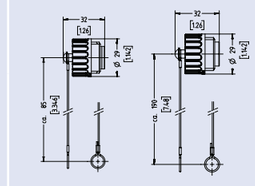
## eco|mate[m] Tools

| Description | Wire gauge | Part number | | |
|---|---|---|---|---|
| | | Contact locator | Crimping dies | Tool |
| Removal tool for<br>crimp contacts | - | - | - | FG 0300 146 1 |
| Hand crimp tools for<br>single contacts | 0,14 - 0,5 mm²<br>0,5 - 1,5 mm² | TA 0002 146 0001<br>TA 0002 146 0001 | TA 0000 202<br>TA 0000 163 | TA 0500<br>TA 0500 |
| Hand crimp tools for<br>contacts on reel | 0,14 - 0,5 mm²<br>0,5 - 1,5 mm² | -<br>- | -<br>- | TA 0700 203<br>TA 0700 309 |

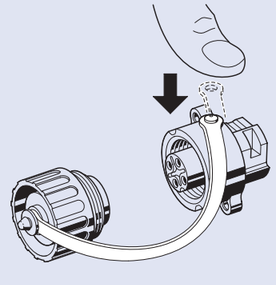




## eco|mate[m] Protective Covers

| Description | Part number | Drawing | Figure |
|---|---|---|---|
| **Protective covers for cable and receptacle housings** | | | |
| for male cable connector<br>round cord | C016 00U000 010 12 |  |  |
| for male receptacle<br>round cord | C016 00U000 000 12 | | |
| for female cable connector<br>round cord | C016 00V000 010 12 |  |  |
| for female receptacle<br>round cord | C016 00V000 000 12 | | |
| for male cable connector<br>nylon cord | T 6482 000 |  |  |
| für male receptacle<br>nylon cord | T 6482 001 | | |
| stainless steel cord | T 6482 008 | | |
| für female cable connector<br>nylon cord | T 6483 000 |  |  |
| for female receptacle<br>nylon cordr | T 6483 001 | | |

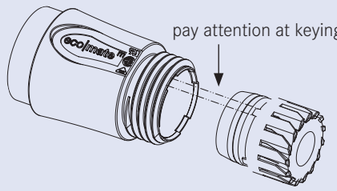
**Mounting of the protective covers on the back shell, male or female receptacles**

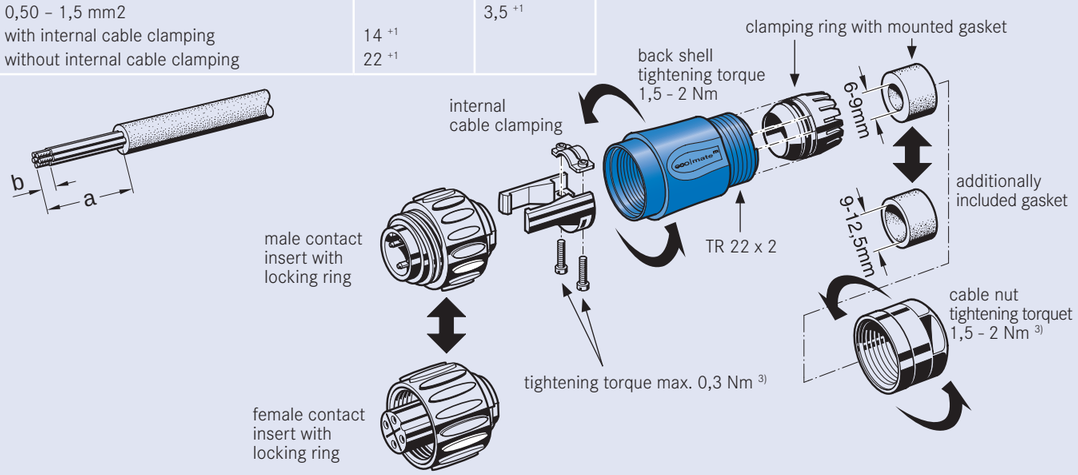


Protective covers for 600V version upon request

## Mounting instruction, straight cable connector

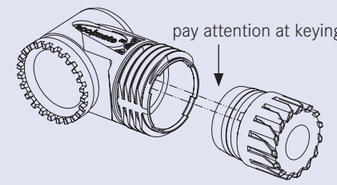
| Stripping lengths | Measure a [1] | Measure b |
|---|---|---|
| Screw contacts | | |
| with internal cable clamping | 18 +1 | 7 +1 [2] |
| without internal cable clamping | 25 +1 | 7 +1 [2] |
| Solder contacts | | |
| with internal cable clamping | 14 +1 | 4 +1 |
| without internal cable clamping | 22 +1 | 4 +1 |
| Crimp contacts | | |
| 0,14 – 0,50 mm2 | | 3 +0,5 |
| 0,50 – 1,5 mm2 | | 3,5 +1 |
| with internal cable clamping | 14 +1 | |
| without internal cable clamping | 22 +1 | |

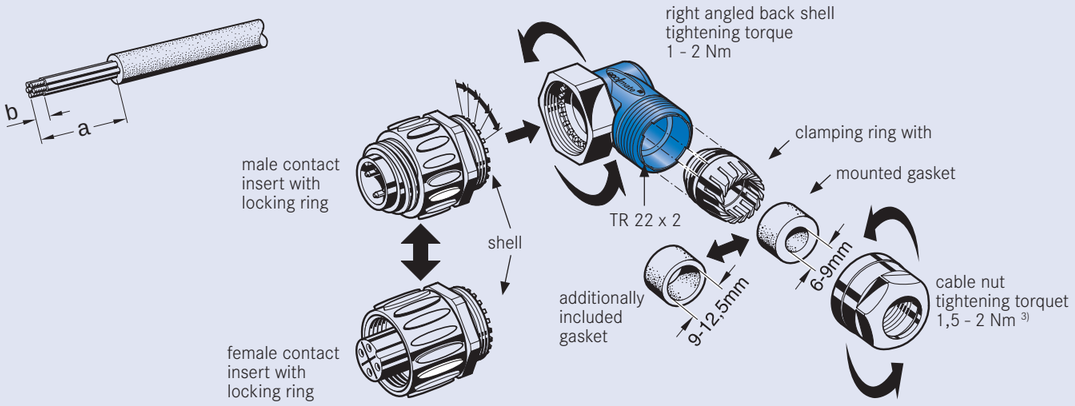



## Mounting instruction, right angled cable connector

| Stripping lengths | Measure a [1] | Measure b |
|---|---|---|
| Screw contacts | | |
| without internal cable clamping | 35 +1 | 7 +1 [2] |
| Solder contacts | | |
| without internal cable clamping | 32 +1 | 4 +1 |
| Crimp contacts | | |
| 0,14 – 0,5 mm2 | | 3 +0,5 |
| 0,50 – 1,5 mm2 | | 3,5 +1 |
| without internal cable clamping | 32 +1 | |




[1] PE + 2mm [2] End splice recommended
[3] The tightening torque figures cand vary depending on the cable you use





## Order Information

| Color coding | Crimp version |
|---|---|
| Backshells of cable connectors are available in diff erent colors upon request. Min order quantity = 1000 pcs. per type. | Order number do not include crimp contacts. Please order separately (see page 20). |
| **Mechanical coding** | **Crimp tooling** |
| Achieved by special coding pins which are inserted into contact cavities. Min. order quantitiy = 1000 pcs. per type. | Ask for our catalogue “Tools”. |

## Structure of part number

| C016 | 30 | D | 006 | 1 | 00 | 10 |
|---|---|---|---|---|---|---|
| Series | Termination technique<br>10 = Crimp (6 + PE)<br>20 = Screw (3 + PE)<br>30 = Solder (6 + PE) | Style<br>H = Male cable connector<br>D = Female cable connector<br>K = Right angled male cable connector<br>F = Right angled female cable connector<br>C = Male receptacle<br>G = Female receptacle<br>P = Male receptacle | No. of Poles<br>003 = 3 + PE<br>006 = 6 + PE | Contact Plating<br>1 = silver plating<br>2 = gold plating<br>0 = without contacts | Strain relief<br>00 = receptacle or cable connector with clamping ring<br>10 = cable connector with internal cable clamp | Version<br>10 = cable connector in blue/ black<br>12 = cable or receptacle connector in blue |

## Screw termination

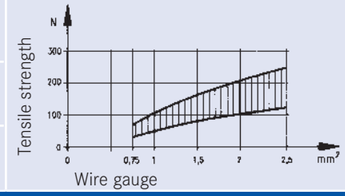
Screw clamps are designed acc. to EN 60999-1/VDE 06095.1. Chart 1 below shows the screw size depending on wire size and the required clamping and testing torque.

Diagram 1 below shows the range of tensile strength for a screw connection with a clamp screw M3, fastened with a torque of 50 Ncm, depending on the wire size.

### Chart 1

| Wire size (mm²) | 1,5 | 2,5 |
|---|---|---|
| Screw size | M 3 | M 3 |
| Test torque (Ncm) | max. 50 | max. 50 |

### Diagramm 1




## Conversion AWG - mm²

The comparison chart 2 below allows a cross reference between American Wire Gauge (AWG) and metric wire sizes (mm2).

### Chart 2

| AWG | Wire composition | Wire diameter | Wire size | AWG | Wire composition | Wire diameter | Wire size |
|---|---|---|---|---|---|---|---|
| 30 | 1 x 0,25 | 0,25 mm | 0,05 mm² | 20 | 1 x 0,81 | 0,81 mm | 0,52 mm² |
| | 7 x 0,10 | 0,36 mm | 0,06 mm² | | 7 x 0,32 | 0,97 mm | 0,56 mm² |
| 28 | 1 x 0,32 | 0,32 mm | 0,08 mm² | | 19 x 0,20 | 1,02 mm | 0,62 mm² |
| | 7 x 0,13 | 0,38 mm | 0,09 mm² | 18 | 1 x 1,02 | 1,02 mm | 0,79 mm² |
| 26 | 1 x 0,40 | 0,40 mm | 0,13 mm² | | 19 x 0,25 | 1,27 mm | 0,96 mm² |
| | 7 x 0,16 | 0,48 mm | 0,14 mm² | 16 | 19 x 0,29 | 1,44 mm | 1,23 mm² |
| | 19 x 0,10 | 0,51 mm | 0,15 mm² | 14 | 19 x 0,36 | 1,80 mm | 1,95 mm² |
| 24 | 1 x 0,51 | 0,51 mm | 0,21 mm² | 12 | 19 x 0,46 | 2,29 mm | 3,09 mm² |
| | 7 x 0,20 | 0,61 mm | 0,23 mm² | 10 | 37 x 0,40 | 3,10 mm | 4,60 mm² |
| | 19 x 0,13 | 0,64 mm | 0,24 mm² | 8 | 133 x 0,29 | 4,0 mm | 8,80 mm² |
| 22 | 1 x 0,64 | 0,64 mm | 0,33 mm² | 6 | 133 x 0,36 | 5,5 mm | 13,5 mm² |
| | 7 x 0,25 | 0,76 mm | 0,36 mm² | | | | |
| | 19 x 0,16 | 0,81 mm | 0,38 mm² | | | | |

It is to be noted that wires of the same AWG number but with different composition have slightly different mm².

## Crimp Termination

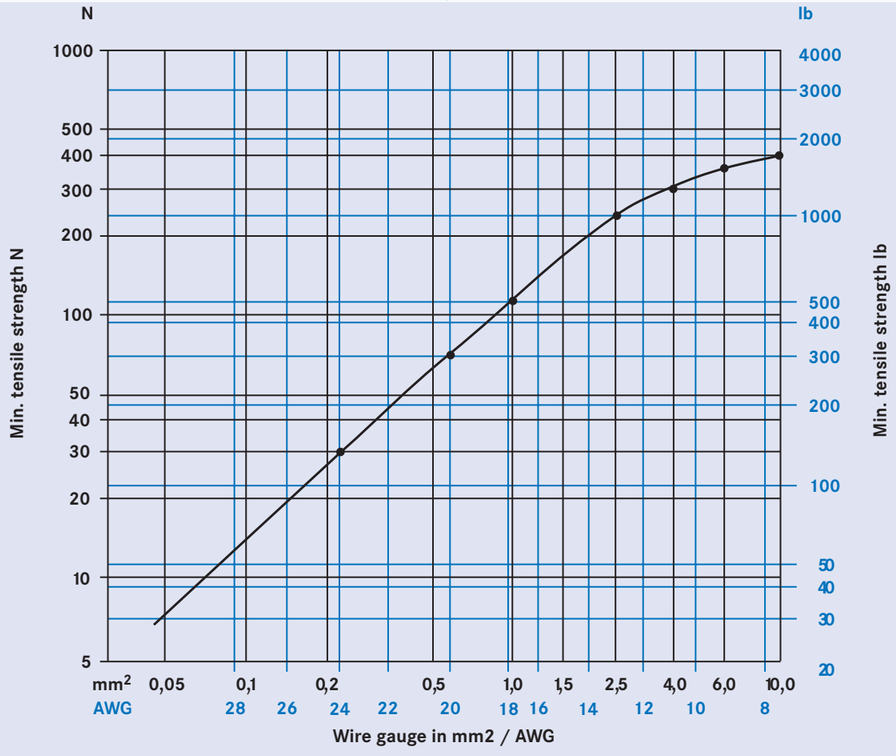
A crimp connection is a non-detachable electrical connection between a wire and a crimp contact produced with the crimp technology.
Precise crimping dies which are matched to the crimp barrel and the wire size and a defined deformation result in a reliable electrical connection.
There are open crimp barrels (stamped contacts) and closed crimp barrels (turned contacts).
The main advantages of crimp connections are:
- Efficient termination of contacts
- Reproducible terminations achieve consistent electrical and mechanical results

The requirements for crimp connections are defined in IEC 60352 Part 2 / DIN EN 60352 Part 2.
An important point of the quality of a crimp connection is the achieved tensile strength of the termination.
Easily measured, the tensile strength is a practible means for quality control purposes.
Diagram 2 below shows the required minimum tensile strength for open and closed barrels depending on the wire size

## Assembly Instructions

For crimp contacts use the released crimp tool.
The insertion and extraction of crimp contacts shall only be approved with the corresponding insertion/extraction tool.
A detailed description of the crimp technology can be found in our crimp tooling catalogues.
Crimp contacts are in this catalogue on page 20

## Diagramm 2








eco | mate^m Technical Information

## Degree of Protection

Electrical devices to which connectors belong to have to be protected for safety reasons from outside influences like dust, foreign objects, direct contact, moisture and water. This protection is provided on industrial connectors by its housings with their latching devices and sealed cable entries. The degree of protection can be selected depending on the type of intended use. The standard IEC 60529 and/or DIN EN 60529/VDE 0470 Part 1 has specified the degree of protection and divided into several classes.

The degree of protection is indicated in the following way:

IP65
Code letters (Internat. Protection)
1st charact. numeral (degree of protection against access to hazardous parts and against solid foreign objects)
2nd charact. numeral (degree of protection against ingress of water)

The following charts 3 an 4 give an overview about all protection degrees.

## Chart 3

| 1st charact. numeral | Brief description | Definition |
|---|---|---|
| 0 | Non-protected | – |
| 1 | Protected against access to hazardous parts with the back of a hand. Protected against solid foreign objects of ≥ 50mm Ø. | The probe, sphere of 50mm Ø, shall not fully penetrate and shall have adequate clearance from hazardous parts. |
| 2 | Protected against access to hazardous parts with a finger. Protected against solid foreign objects of ≥ 12,5mm Ø. | The jointed test finger of 12mm Ø, 80mm length, shall have adequate clearance from hazardous parts. The probe, sphere of 12,5mm Ø, shall not fully penetrate. |
| 3 | Protected against access to hazardous parts with a tool. Protected against solid foreign objects of ≥ 2,5mm Ø. | The probe of 2,5mm Ø shall not penetrate at all. |
| 4 | Protected against access to hazardous parts with a wire. Protected against solid foreign objects of ≥ 1mm Ø. | The probe of 1mm Ø shall not penetrate at all. |
| 5 | Protected against access to hazardous parts with a wire. Dust-protected. | The probe of 1mm Ø shall not penetrate. Intrusion of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the device or to impair safety. |
| 6 | Protected against access to hazardous parts with a wire Dust-tight. | The probe of 1mm Ø shall not penetrate. No intrussion of dust. |

## Chart 4

| 2nd charact. numeral | Brief description | Definition |
|---|---|---|
| 0 | Non-protected | – |
| 1 | Protected against vertically falling water drops | Vertically falling drops shall have no harmful effects. |
| 2 | Protected against vertically falling water drops when enclosure tilted up to 15° | Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angel up to 15° on either side of the vertical. |
| 3 | Protected against spraying water | Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects |
| 4 | Protected against splashing water | Water splashed against the enclosure from any direction shall have no harmful effects. |
| 5 | Protected against water jets | Water projected in jets against the enclosure from any direction shall have no harmful effects. |
| 6 | Protected against powerful water jets | Water projected in powerful jets against the enclosure from any direction shall have no harmful effects. |
| 7 | Protected against the effects of temporary immersion in water | Intrusion of water in quantities causing harmful effects shall not be possible when the enclosure is temporaliy immersed in water for 30 min. in 1m depth. |
| 8 | Protected against the effects of continous immersion in water | Intrusion of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7. |
| 9K[1)] | Protected against water during high pressure/steam jet cleaning | Water projected in powerful jets with high pressure against the enclosure from any direction shall have no harmful effects. |

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[1)] Remark: Numeral acc. to DIN 40050 part 9, vehicles IP code

## 1. General Remarks

These connectors are designed and produced in conformity with the low voltage directive (73/23/EWG) respectively Gerätesicherheitsgesetz (German law) and are especially in accordance with the standards DIN EN 61984 / IEC 61984 (VDE 0627); IEC 60664-1 (VDE 0110-1) and IEC 60529.

The connectors may be used only within the technical ratings.
All technical data refer to mated connectors under live conditions.
The safety of the connector system depends on the correct selection of products, proper assembly of the connector device and a precise fit of the connectors

## 2. Application Remarks

Connectors with / without breaking capacity must be used according to specified technical ratings.
The technical data represents the initial value of mated parts under predetermined conditions and length of time.These values could change with different test parameters or product requirements.
The connectors of the series are designed for the areas of application including the construction and installation of controlling and electrical devices.
The product has been tested for the intended purposes only. If the connection is used other than originally intended, or in another manner that we have not previously tested, the consumer assumes full responsibility.

All rated data for the connectors listed in this catalogue are based on overvoltage
category III and pollution degree 3 for electronic applications if not stated differently. Connectors were completely mated according to their respective safety locking mechanism. Selection and testing of connectors with / without breaking capacity to meet specific product or industrial requirements such as rated voltage and the related clearances and creepage distances are the responsibility of the user.

## 3. Assembling Remarks

Protection against electrical shock of the termination of the connectors shall be secured by correct mounting. Connectors of the same or different series being mounted side by side may be protected against incorrect mating by the use of coding options. Care must be taken to ensure the parts are correctly mated and screws are tightened with the proper torque.

## 4. Termination Remarks

Cable connectors are eff ectively secured when using the strain relief (internal clamping ring). All cable properties or specifi cations must becompatible with the connector design and materials.
Please make sure that the usability of the cable in conjunction with the clamping ring is given.
Designated wire conductors must be terminated to the correct poles in the connector.

Crimp contacts must be fully inserted into the plastic housing and strain relief assured with a slight tug on the wire.
Wire should be stripped correctly according to printed specifi cations to insure no electrical contact can be made between the conductors.
There should be no nicked or cut strains during the stripping action.






| Bestellnummer | Seite | Bestellnummer | Seite | Bestellnummer | Seite | Bestellnummer | Seite |
|---|---|---|---|---|---|---|---|
| C016 00U000 000 12 | 23 | C016 20H003 804 12 | 18 | HN 02 016 0003 2 | 20 | ZN 01 016 0003 2 | 20 |
| C016 00U000 010 12 | 23 | C016 20K003 100 10 | 12 | N 06 007 0004 | 22 | ZN 01 016 0004 1 | 20 |
| C016 00V000 000 12 | 23 | C016 20K003 100 12 | 12 | N 16 110 2000 X | 21 | ZN 01 016 0004 2 | 20 |
| C016 00V000 010 12 | 23 | C016 20K003 200 10 | 12 | N 17 17 0001 | 21 | ZN 01 016 0011 1 | 20 |
| C016 10C006 000 12 | 12 | C016 20K003 200 12 | 12 | N 17 17 0001 1 | 21 | ZN 01 016 0011 2 | 20 |
| C016 10C006 000 12 | 12 | C016 30C006 100 12 | 12 | N 17 021 0001 | 21 | ZN 02 016 0002 1 | 20 |
| C016 10D003 806 12 | 16 | C016 30C006 200 12 | 12 | T 3102 003 7 X | 22 | ZN 02 016 0002 1 | 20 |
| C016 10D006 000 10 | 13 | C016 30D006 100 10 | 13 | T 3102 004 7 X | 22 | ZN 02 016 0002 2 | 20 |
| C016 10D006 000 10 | 13 | C016 30D006 100 12 | 13 | T 3102 005 7 X | 22 | ZN 02 016 0002 2 | 20 |
| C016 10D006 000 12 | 13 | C016 30D006 110 10 | 13 | T 3106 010 | 19 | ZN 02 016 0003 1 | 20 |
| C016 10D006 000 12 | 13 | C016 30D006 110 12 | 13 | T 3107 800 | 19 | ZN 02 016 0003 1 | 20 |
| C016 10D006 010 10 | 13 | C016 30D006 200 10 | 13 | T 3107 802 | 19 | ZN 02 016 0003 2 | 20 |
| C016 10D006 010 10 | 13 | C016 30D006 200 12 | 13 | T 3110 010 | 19 | ZN 02 016 0003 2 | 20 |
| C016 10D006 010 12 | 13 | C016 30D006 210 10 | 13 | T 3110 100 | 19 | | |
| C016 10D006 010 12 | 13 | C016 30D006 210 12 | 13 | T 6482 000 | 23 | | |
| C016 10D006 806 12 | 16 | C016 30D006 800 12 | 18 | T 6482 001 | 23 | | |
| C016 10F006 000 10 | 13 | C016 30F006 100 10 | 13 | T 6482 008 | 23 | | |
| C016 10F006 000 10 | 13 | C016 30F006 100 12 | 13 | T 6483 000 | 23 | | |
| C016 10F006 000 12 | 13 | C016 30F006 200 10 | 13 | T 6483 001 | 23 | | |
| C016 10F006 000 12 | 13 | C016 30F006 200 12 | 13 | TA 0000 163 | 22 | | |
| C016 10G006 000 12 | 13 | C016 30G006 100 12 | 13 | TA 0000 202 | 22 | | |
| C016 10G006 000 12 | 13 | C016 30G006 200 12 | 13 | TA 0002 146 0001 | 22 | | |
| C016 10H006 000 10 | 12 | C016 30G006 800 12 | 19 | TA 0002 146 0001 | 22 | | |
| C016 10H006 000 10 | 12 | C016 30H006 100 10 | 12 | TA 0500 | 22 | | |
| C016 10H006 000 12 | 12 | C016 30H006 100 12 | 12 | TA 0500 | 22 | | |
| C016 10H006 000 12 | 12 | C016 30H006 110 10 | 12 | TA 0700 203 | 22 | | |
| C016 10H006 010 10 | 12 | C016 30H006 110 12 | 12 | TA 0700 309 | 22 | | |
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| C016 10K006 000 10 | 12 | C016 30H006 210 12 | 12 | TN 01 016 0003 2 | 20 | | |
| C016 10K006 000 10 | 12 | C016 30K006 100 10 | 12 | TN 01 016 0004 1 | 20 | | |
| C016 10K006 000 12 | 12 | C016 30K006 100 12 | 12 | TN 01 016 0004 2 | 20 | | |
| C016 10K006 000 12 | 12 | C016 30K006 200 10 | 12 | TN 01 016 0011 1 | 20 | | |
| C016 10P003 806 12 | 16 | C016 30K006 200 12 | 12 | TN 01 016 0011 2 | 20 | | |
| C016 10P006 806 12 | 16 | C016 G09 041 G10 X | 21 | TN 02 016 0002 1 | 20 | | |
| C016 20C003 100 12 | 12 | C016 G09 042 G10 X | 21 | TN 02 016 0002 1 | 20 | | |
| C016 20C003 200 12 | 12 | C016 G11 041 E10 V | 21 | TN 02 016 0002 2 | 20 | | |
| C016 20D003 100 10 | 13 | C016 G11 042 E1 V | 21 | TN 02 016 0002 2 | 20 | | |
| C016 20D003 100 12 | 13 | C016 G11 043 E10 V | 21 | TN 02 016 0003 1 | 20 | | |
| C016 20D003 110 10 | 13 | C016 G11 044 E10 V | 21 | TN 02 016 0003 1 | 20 | | |
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| C016 20D003 210 10 | 13 | C016 G11 060 E10 V | 21 | VN 01 016 0002 2 | 20 | | |
| C016 20D003 210 12 | 13 | C016 G11 061 E10 V | 21 | VN 01 016 0003 1 | 20 | | |
| C016 20D003 806 12 | 18 | FG 0300 146 1 | 22 | VN 01 016 0003 2 | 20 | | |
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| C016 20F003 100 12 | 13 | HN 01 016 0002 2 | 20 | VN 01 016 0004 2 | 20 | | |
| C016 20F003 200 10 | 13 | HN 01 016 0003 1 | 20 | VN 01 016 0011 1 | 20 | | |
| C016 20F003 200 12 | 13 | HN 01 016 0003 2 | 20 | VN 01 016 0011 2 | 20 | | |
| C016 20G003 100 12 | 13 | HN 01 016 0004 1 | 20 | VN 02 016 0002 1 | 20 | | |
| C016 20G003 200 12 | 13 | HN 01 016 0004 2 | 20 | VN 02 016 0002 1 | 20 | | |
| C016 20H003 100 10 | 12 | HN 01 016 0011 1 | 20 | VN 02 016 0002 2 | 20 | | |
| C016 20H003 100 12 | 12 | HN 01 016 0011 2 | 20 | VN 02 016 0002 2 | 20 | | |
| C016 20H003 110 10 | 12 | HN 02 016 0002 1 | 20 | VN 02 016 0003 1 | 20 | | |
| C016 20H003 110 12 | 12 | HN 02 016 0002 1 | 20 | VN 02 016 0003 1 | 20 | | |
| C016 20H003 200 10 | 12 | HN 02 016 0002 2 | 20 | VN 02 016 0003 2 | 20 | | |
| C016 20H003 200 12 | 12 | HN 02 016 0002 2 | 20 | VN 02 016 0003 2 | 20 | | |
| C016 20H003 210 10 | 12 | HN 02 016 0003 1 | 20 | ZN 01 016 0002 1 | 20 | | |
| C016 20H003 210 12 | 12 | HN 02 016 0003 1 | 20 | ZN 01 016 0002 2 | 20 | | |
| C016 20H003 803 12 | 18 | HN 02 016 0003 2 | 20 | ZN 01 016 0003 1 | 20 | | |

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