

# NBC-M12MSD/ 5,0-93C/R4AC - Network cable



1038731

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, PUR halogen-free, green RAL 6018, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Plug straight RJ45 / IP20, cable length: 5 m

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1038731       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | BF04          |
| Product key                          | AF1CJN        |
| GTIN                                 | 4055626593029 |
| Weight per piece (including packing) | 346.2 g       |
| Weight per piece (excluding packing) | 414.1 g       |
| Customs tariff number                | 85444290      |
| Country of origin                    | PL            |

1038731

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## Technical data

### Product properties

|                     |                         |
|---------------------|-------------------------|
| Product type        | Data cable preassembled |
| Application         | Standard                |
| Number of positions | 4                       |
| Shielded            | yes                     |

### Insulation characteristics

|                      |   |
|----------------------|---|
| Overvoltage category | I |
| Degree of pollution  | 2 |

### Interfaces

|                      |   |
|----------------------|---|
| Bus system           | PROFINET  |
| Signal type/category | PROFINET CAT5 (IEC 11801), 100 Mbps<br>EtherCAT® CAT5 (IEC 11801), 100 Mbps |

### Signaling

|                        |    |
|------------------------|----|
| Status display         | no |
| Status display present | no |

### Electrical properties

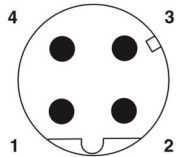
|   |                       |
|---|-----------------------|
| Nominal voltage $U_N$                   | 48 V AC               |
|   | 60 V DC               |
| Nominal current $I_N$                   | 1 A                   |
| Transmission medium                     | Copper                |
| Transmission speed                      | 100 Mbps              |
| Transmission characteristics (category) | CAT5 (IEC 11801:2002) |

### Material specifications

|  |    |
|--|----|
| Flammability rating according to UL 94 | V2 |
|--|----|

### Connector

#### Connection 1

|                     |   |
|---------------------|---|
| Dimensional drawing |  <p>Pin assignment M12 male connector, 4-pos., D-coded, male side</p> |
| Type                | M12 Plug, straight, 4-position, shielded (Advanced Shielding Technology), Keying: D   |
| Number of positions | 4   |

# NBC-M12MSD/ 5,0-93C/R4AC - Network cable

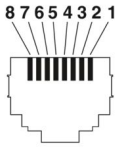


1038731

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|  |   |
|--|---|
| Shielded                               | yes   |
| Shielding                              | Advanced Shielding Technology                                     |
| Signal type/category                   | EtherCAT® CAT5 (IEC 11801), 100 Mbps<br>PROFINET CAT5 (IEC 11801) |
| Insertion/withdrawal cycles            | ≥ 100   |
| Insulation resistance                  | ≥ 100 MΩ  |
| Overvoltage category                   | II  |
| Degree of pollution                    | 3   |
| Tightening torque                      | 0.4 Nm  |
| Material Contact                       | CuSn  |
| Material Contact surface               | Ni/Au   |
| Material Contact carrier               | PA 6.6  |
| Material Screw connection              | Die-cast zinc, nickel-plated                                      |
| Material Grip body                     | TPU, hardly inflammable, self-extinguishing                       |
| Material Seal                          | FKM   |
| Flammability rating according to UL 94 | V0  |
| Degree of protection                   | IP65<br>IP67  |
| Ambient temperature (operation)        | -25 °C ... 85 °C  |
| Standard designation                   | M12 connector   |
| Standards/regulations                  | IEC 61076-2-101   |

## Connection 2

|                             |   |
|-----------------------------|---|
| Dimensional drawing         |  <p>Connector pin assignment plug RJ45</p> |
| Type                        | RJ45, straight  |
| Signal type/category        | PROFINET CAT5 (IEC 11801), 100 Mbps<br>EtherCAT® CAT5 (IEC 11801)   |
| Insertion/withdrawal cycles | ≥ 750   |
| Insulation resistance       | ≥ 100 MΩ  |
| Overvoltage category        | I   |
| Degree of pollution         | 2   |
| Material Contact            | CuSn  |
| Material Contact surface    | Ni/Au   |
| Material Contact carrier    | PA  |
| Material Housing            | PA  |
| Color (Housing)             | black   |

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1038731


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|  |                  |
|--|------------------|
| Flammability rating according to UL 94 | V2               |
| Degree of protection                   | IP20             |
| Ambient temperature (operation)        | -25 °C ... 80 °C |

## Cable/line

|              |     |
|--------------|-----|
| Cable length | 5 m |
|--------------|-----|

### PROFINET drag chain CAT5 [93C]

|   |   |
|---|---|
| Dimensional drawing                           |   |
| UL AWM Style                                  | 20233 (80°C/300 V)  |
| Number of positions                           | 4   |
| Shielded                                      | yes   |
| Cable type                                    | PROFINET drag chain CAT5 [93C]  |
| Conductor structure                           | 1x4xAWG22/7, SF/TQ  |
| AWG signal line                               | 22  |
| Conductor cross-section                       | 4x 0.34 mm <sup>2</sup>   |
| Wire diameter incl. insulation                | 1.5 mm ±0.05 mm   |
| External cable diameter                       | 6.50 mm ±0.2 mm   |
| Outer sheath, material                        | PUR   |
| External sheath, color                        | green RAL 6018  |
| Conductor material                            | Tin-plated Cu litz wires  |
| Material wire insulation                      | PE  |
| Single wire, color                            | white, yellow, blue, orange   |
| Overall twist                                 | Star quad   |
| Optical shield covering                       | 85 %  |
| Insulation resistance                         | ≥ 500 MΩ*km   |
| Loop resistance                               | ≤ 120.00 Ω/km   |
| Wave impedance                                | 100 Ω ±15 Ω (at 1 ... 100 MHz)  |
| Nominal voltage, cable                        | ≤ 300 V   |
| Test voltage Core/Core                        | 2000 V (50 Hz, 1 min.)  |
| Test voltage Core/Shield                      | 2000.00 V (50 Hz, 1 min.)   |
| Minimum bending radius, fixed installation    | 5 x D   |
| Minimum bending radius, flexible installation | 7.5 x D   |
| Dynamic load capacity (bending)               | Max. bending cycles: 3000000, Bending radius: 200 mm, Traversing path: 10 m, Traversing rate: 4 m/s, Acceleration: 4 m/s <sup>2</sup> |
| Dynamic load capacity (torsion)               | Torsion: ±30 °/m  |
| Halogen-free                                  | according to IEC 60754-1  |

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1038731

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|                                 |   |
|---------------------------------|---|
| Flame resistance                | according to IEC 60332-1-2                      |
|                                 | in accordance with UN ECE-R 118.03              |
|                                 | according to CSA C 22.2 No. 210-FT1             |
| Resistance to oil               | in accordance with DIN EN 60811-404             |
| Other resistance                | UV resistant                                    |
| Special properties              | Flexible cable conduit capable                  |
| Ambient temperature (operation) | -40 °C ... 70 °C (cable, fixed installation)    |
|                                 | -40 °C ... 70 °C (Cable, flexible installation) |

## Environmental and real-life conditions

### Ambient conditions

|                      |                       |
|----------------------|-----------------------|
| Degree of protection | IP65 (M12 connector)  |
|                      | IP67 (M12 connector)  |
|                      | IP20 (RJ45 connector) |

## Standards and regulations

### M12

|                          |                 |
|--------------------------|-----------------|
| Standard designation     | M12 connector   |
| Standards/specifications | IEC 61076-2-101 |

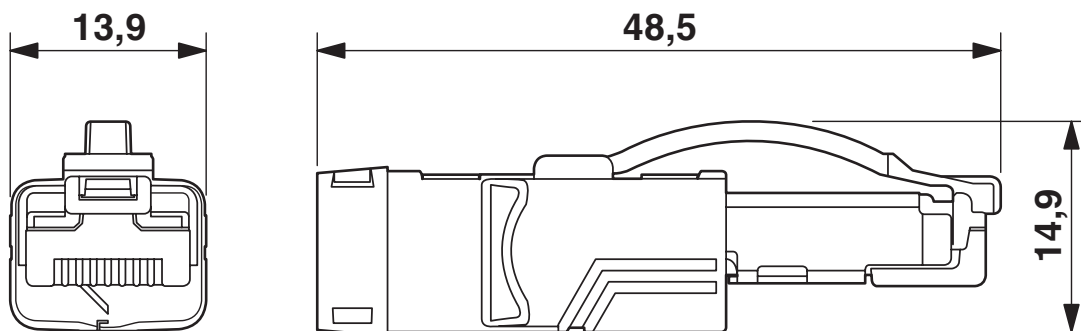
Drawings

Dimensional drawing



Plug, M12 x 1, straight, shielded

Dimensional drawing



RJ45 connector, IP20

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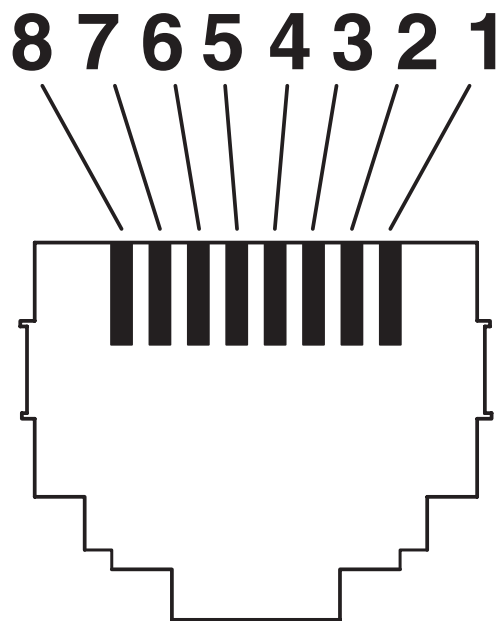


Schematic diagram



Pin assignment M12 male connector, 4-pos., D-coded, male side

Schematic diagram



Connector pin assignment plug RJ45

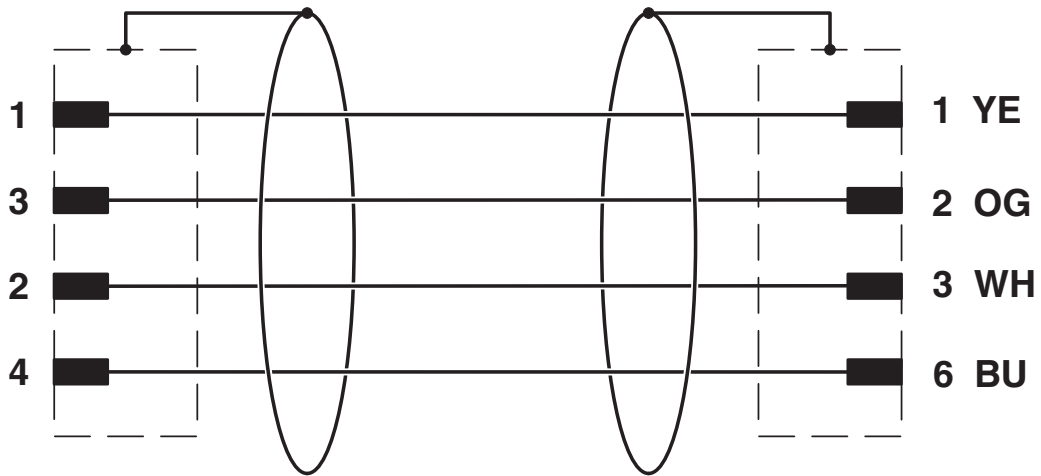
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Circuit diagram



Contact assignment of the M12 and RJ45 plug

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## Approvals

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|  <b>cULus Listed</b><br>Approval ID: E335024 |                       |                       |                   |                             |
|---|-----------------------|-----------------------|-------------------|-----------------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine   |                       |                       |                   |                             |
|   | 60 V                  | 0.5 A                 | -                 | -                           |

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27060307 |
| ECLASS-15.0 | 27060307 |

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 26121600 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |                    |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes, No exemptions |
|---|--------------------|

### China RoHS

|  |  |
|--|--|
| Environment friendly use period (EFUP) | EFUP-E                                   |
|  | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |                            |
|-------------------------------------|----------------------------|
| REACH candidate substance (CAS No.) | No substance above 0.1 wt% |
|-------------------------------------|----------------------------|

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