

# NBC-M12MSD/ 1,0-93B/R4QC - Network cable



1407520

<https://www.phoenixcontact.com/us/products/1407520>

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: 1 m

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 1407520             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | BF04                |
| Product key                          | BF1CJN              |
| Catalog page                         | Page 397 (C-2-2019) |
| GTIN                                 | 4046356778251       |
| Weight per piece (including packing) | 117.19 g            |
| Weight per piece (excluding packing) | 92.389 g            |
| Customs tariff number                | 85444210            |
| Country of origin                    | PL                  |

## Technical data

### Notes

|         |  |
|---------|--|
| General | This product corresponds to the PROFINET Cabling and Interconnection Technology Guideline for PROFINET regulations, version 2.00, order no: 2.252, Chapter 10.1 Cord Sets for Balanced Cabling |
| General | Further products with variable cable type and variable cable length can be found in the accessories section  |

### Product properties

|                     |                         |
|---------------------|-------------------------|
| Product type        | Data cable preassembled |
| Sensor type         | PROFINET                |
| Number of positions | 4                       |
| Application         | Standard                |
| Shielded            | yes                     |
| Coding              | D                       |

### Insulation characteristics

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

### Interfaces

|                      |   |
|----------------------|---|
| Bus system           | PROFINET  |
| Signal type/category | PROFINET CAT5 (IEC 11801), 100 Mbps<br>EtherCAT <sup>®</sup> 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 characteristics (category) | CAT5 (IEC 11801:2002) |

### Material specifications

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

### Connector

#### Connection 1

|                     |                          |
|---------------------|--------------------------|
| Type                | Plug straight M12 / IP67 |
| Number of positions | 4                        |

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|                                 |  |
|---------------------------------|--|
| Coding type                     | D (Data)   |
| Handle color                    | black  |
| Material                        | CuSn (Contact)                                     |
|                                 | Ni/Au (Contact surface)                            |
|                                 | PA (Contact carriers)                              |
|                                 | TPU, hardly inflammable, self-extinguishing (Grip) |
|                                 | Zinc die-cast, nickel-plated (Screw connection)    |
|                                 | FKM (Seal)   |
| Insertion/withdrawal cycles     | ≥ 100  |
| Contact resistance              | ≤ 5 mΩ   |
| Insulation resistance           | ≥ 100 MΩ   |
| Tightening torque               | 0.4 Nm   |
| Degree of protection            | IP67   |
| Ambient temperature (operation) | -25 °C ... 90 °C                                   |


## Connection 2

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Type                            | Plug straight RJ45 Push Pull / IP67 |
| Number of positions             | 4 (8)                               |
| Locking type                    | Push Pull                           |
| Handle color                    | black                               |
| Material                        | CuSn (Contact)                      |
|                                 | Ni/Au (Contact surface)             |
|                                 | PC (Contact carriers)               |
|                                 | PA GF (Housing)                     |
| Insertion/withdrawal cycles     | ≥ 750                               |
| Degree of protection            | IP67                                |
| Ambient temperature (operation) | -40 °C ... 70 °C                    |

## Cable/line

|              |     |
|--------------|-----|
| Cable length | 1 m |
|--------------|-----|

## PROFINET PVC stranded CAT5 [93B]

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Cable weight        | 67 kg/km   |
| UL AWM Style        | 21694  |
| Number of positions | 4  |
| Shielded            | yes  |
| Cable type          | PROFINET PVC stranded CAT5 [93B]   |

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|   |                                 |
|---|---------------------------------|
| Conductor structure                           | 1x4xAWG22/7, SF/TQ              |
| Signal runtime                                | 5.3 ns/m                        |
| Signal speed                                  | 0.66 c                          |
| Conductor structure signal line               | 7x 0.25 mm                      |
| AWG signal line                               | 22                              |
| Conductor cross section                       | 4x 0.34 mm <sup>2</sup>         |
| Wire diameter incl. insulation                | 1.55 mm                         |
| External cable diameter                       | 6.5 mm ±0.2 mm                  |
| Outer sheath, material                        | PVC                             |
| External sheath, color                        | green RAL 6018                  |
| Conductor material                            | Tin-plated Cu litz wires        |
| Material wire insulation                      | PE                              |
| Single wire, color                            | white, yellow, blue, orange     |
| Thickness, outer sheath                       | approx. 0.9 mm                  |
| Overall twist                                 | Star quad                       |
| Optical shield covering                       | 85 %                            |
| Insulation resistance                         | ≥ 500 MΩ*km                     |
| Coupling resistance                           | ≤ 20.00 mΩ/m (at 10 MHz)        |
| Loop resistance                               | ≤ 120.00 Ω/km                   |
| Wave impedance                                | 100 Ω ±15 Ω (at 100 MHz)        |
| Nominal voltage, cable                        | 600 V                           |
| Test voltage Core/Core                        | 2000 V (50 Hz, 1 min.)          |
| Test voltage Core/Shield                      | 2000 V (50 Hz, 1 min.)          |
| Minimum bending radius, fixed installation    | 3 x D                           |
| Minimum bending radius, flexible installation | 7 x D                           |
| Smallest bending radius, fixed installation   | 20 mm                           |
| Smallest bending radius, movable installation | 46 mm                           |
| Near end crosstalk attenuation (NEXT)         | 80 dB (with 1 MHz)              |
|   | 76 dB (at 4 MHz)                |
|   | 70 dB (at 10 MHz)               |
|   | 65 dB (at 16 MHz)               |
|   | 63 dB (at 20 MHz)               |
|   | 60 dB (at 31.25 MHz)            |
|   | 55 dB (at 62.5 MHz)             |
|   | 50 dB (at 100 MHz)              |
| Shield attenuation                            | 2.1 dB (with 1 MHz)             |
|   | 4 dB (at 4 MHz)                 |
|   | 6.3 dB (at 10 MHz)              |
|   | 8 dB (at 16 MHz)                |
|   | 9 dB (at 20 MHz)                |
|   | 11.4 dB (at 31.25 MHz)          |
|   | 16.5 dB (at 62.5 MHz)           |
|   | 21.3 dB (at 100 MHz)            |
| Flame resistance                              | according to UL 1685 (CSA FT 4) |

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|                                    |   |
|------------------------------------|---|
| Resistance to oil                  | Resistant to oil to a limited extent  |
| Other resistance                   | UV resistant (According to UL 1581, Section 1200)   |
| Ambient temperature (operation)    | -40 °C ... 70 °C (cable, fixed installation)<br>-40 °C ... 70 °C (Cable, flexible installation) |
| Ambient temperature (installation) | -20 °C ... 60 °C  |

## Environmental and real-life conditions

### Ambient conditions

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

## Standards and regulations

### M12

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

# NBC-M12MSD/ 1,0-93B/R4QC - Network cable

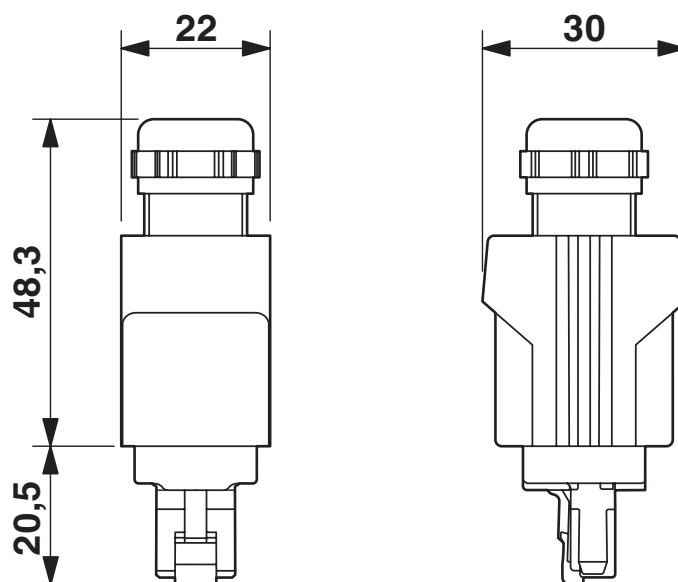
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## Drawings

Dimensional drawing



RJ45 Push-Pull connector, IP67

Schematic diagram



Connector pin assignment plug RJ45

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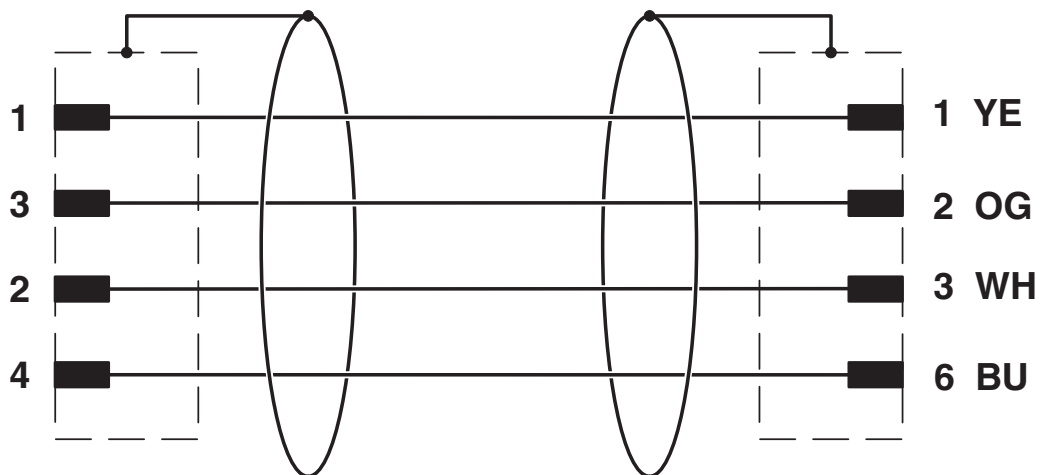
<https://www.phoenixcontact.com/us/products/1407520>

Schematic diagram

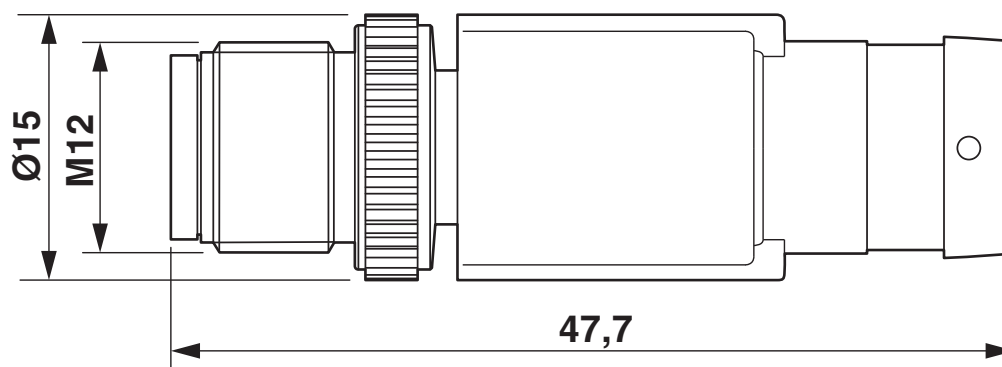


Pin assignment M12 male connector, 4-pos., D-coded, male side

Circuit diagram



Dimensional drawing



Plug, M12 x 1, straight, shielded

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1407520>



**EAC-RoHS**

Approval ID: RU D-DE.HB35.B.00387

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27060307 |
| ECLASS-12.0 | 27060307 |
| ECLASS-13.0 | 27060307 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC001855 |
|----------|----------|

### UNSPSC

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

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## Environmental product compliance

|            |   |
|------------|---|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
|            | No hazardous substances above threshold values          |

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## Accessories

### NBC-MSD-R4RC SCO-PN/.../... - Network cable

1408636

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

### NBC-MRD-R4RC SCO-PN/.../... - Network cable

1408628

<https://www.phoenixcontact.com/us/products/1408628>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug angled M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-MSD-R4QC SCO-PN/.../... - Network cable

1408635

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-MRD-R4QC SCO-PN/.../... - Network cable

1408626

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug angled M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-FSD-R4RC SCO-PN/.../... - Network cable

1408619

<https://www.phoenixcontact.com/us/products/1408619>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Socket straight M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-FRD-R4RC SCO-PN/.../... - Network cable

1408610

<https://www.phoenixcontact.com/us/products/1408610>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Socket angled M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-FSD-R4QC SCO-PN/.../... - Network cable

1408618

<https://www.phoenixcontact.com/us/products/1408618>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Socket straight M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-FRD-R4QC SCO-PN/.../... - Network cable

1408609

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT<sup>®</sup> CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Socket angled M12 SPEEDCON, coding: D / IP67, on Plug straight RJ45 Push Pull / IP67, cable length: Free input (0.2 ... 40.0 m)

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## PROT-M12 FS-PA-CHAIN - Sealing cap

1430873

<https://www.phoenixcontact.com/us/products/1430873>

M12 sealing cap made of plastic with fixing band, for sensor cables, for free M12 plugs



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## SAC-M12-EXCLIP-M - Locking clip

1558988

<https://www.phoenixcontact.com/us/products/1558988>

Locking clip for the pin side of sensor/actuator cables with M12 connector and M12 connectors for assembly, for knurl diameter: 15 mm or for Allen key with a wrench size of 14 mm, prevents the disconnection of plug-in connections without tools



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## TSD 04 SAC - Torque screwdriver

1208429

<https://www.phoenixcontact.com/us/products/1208429>



Torque screwdriver, with preset torque of 0.4 Nm and 4 mm hexagonal drive for M12 connectors

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## TSD-M 1,2NM - Torque screwdriver

1212224

<https://www.phoenixcontact.com/us/products/1212224>



Torque screw driver, accuracy as per EN ISO 6789 standard, adjustable from 0.3 - 1.2 Nm

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## TSD-M SAC-BIT ADAPTER - Adapter insert

1212600

<https://www.phoenixcontact.com/us/products/1212600>



Adapter bit for TSD-M...torque tools, E6.3-1/4" drive with 4 mm hexagon to accommodate SAC bits

## SAC BIT M12-D15 - Tool

1208432

<https://www.phoenixcontact.com/us/products/1208432>



Nut for assembling sensor/actuator cables with M12 connector and M12 connectors for assembly, with a knurl diameter of 15 mm, for 4 mm hexagonal drive

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