

# NBC-M12MRD/ 2,0-93C/M12MRD - Network cable



1416746

<https://www.phoenixcontact.com/us/products/1416746>

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug angled M12, coding: D / IP67, on Plug angled M12, coding: D / IP67, cable length: 2 m

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1416746       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | BF04          |
| Product key                          | BF1CJN        |
| GTIN                                 | 4055626076348 |
| Weight per piece (including packing) | 169.4 g       |
| Weight per piece (excluding packing) | 158.44 g      |
| Customs tariff number                | 85444290      |
| 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 |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Product properties

|                      |                         |
|----------------------|-------------------------|
| Product type         | Data cable preassembled |
| Sensor type          | PROFINET                |
| Number of positions  | 4                       |
| Application          | Standard                |
| No. of cable outlets | 1                       |
| Shielded             | yes                     |
| Coding               | D                       |

### Insulation characteristics

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Degree of pollution  | 3  |

### 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 $I_N$                   | 4 A                   |
| Transmission medium                     | Copper                |
| Transmission characteristics (category) | CAT5 (IEC 11801:2002) |

### Material specifications

|                                        |    |
|----------------------------------------|----|
| Flammability rating according to UL 94 | V0 |
|----------------------------------------|----|

### Connector

#### Connection 1

|                     |                        |
|---------------------|------------------------|
| Type                | Plug angled M12 / IP67 |
| Number of positions | 4                      |
| Coding type         | D (Data)               |

# NBC-M12MRD/ 2,0-93C/M12MRD - Network cable



1416746

<https://www.phoenixcontact.com/us/products/1416746>

|                                 |                                                    |
|---------------------------------|----------------------------------------------------|
| 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                                   |
| Number of positions             | 4                                                  |
| Insertion/withdrawal cycles     | 100                                                |

## Connection 2

|                                 |                                                    |
|---------------------------------|----------------------------------------------------|
| Type                            | Plug angled M12 / IP67                             |
| Number of positions             | 4                                                  |
| 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                                             |
| Ambient temperature (operation) | -25 °C ... 90 °C                                   |
| Number of positions             | 4                                                  |
| Degree of protection            | IP67                                               |

## Cable/line

|              |     |
|--------------|-----|
| Cable length | 2 m |
|--------------|-----|

PROFINET drag chain CAT5 [93C]

# NBC-M12MRD/ 2,0-93C/M12MRD - Network cable



1416746

<https://www.phoenixcontact.com/us/products/1416746>

|                                               |                                                                                    |
|-----------------------------------------------|------------------------------------------------------------------------------------|
| Dimensional drawing                           |  |
| Cable weight                                  | 61 kg/km                                                                           |
| Number of positions                           | 4                                                                                  |
| Shielded                                      | yes                                                                                |
| Cable type                                    | PROFINET drag chain CAT5 [93C]                                                     |
| 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                | 1.5 mm                                                                             |
| External cable diameter                       | 6.5 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                                                        |
| 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 1 ... 100 MHz)                                                     |
| Nominal voltage, cable                        | 600 V (UL rating)                                                                  |
| 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    | 5 x D                                                                              |
| Minimum bending radius, flexible installation | 7.5 x D                                                                            |
| Max. bending cycles                           | 3000000                                                                            |
| Tensile strength                              | ≤ 150 N                                                                            |
| Torsion force                                 | ± 30 °/m                                                                           |
| 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)                                                                  |

1416746

<https://www.phoenixcontact.com/us/products/1416746>

|                                    |                                                       |
|------------------------------------|-------------------------------------------------------|
|                                    | 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)                                  |
| Halogen-free                       | yes                                                   |
| Flame resistance                   | according to IEC 60332-1-2                            |
| Resistance to oil                  | in accordance with DIN EN 60811-2-1                   |
| Other resistance                   | UV resistant                                          |
| Special properties                 | Electrical properties in accordance with EN 50288-2-2 |
| Ambient temperature (operation)    | -40 °C ... 70 °C (cable, fixed installation)          |
|                                    | -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 |
|                      | IP67 |

## Standards and regulations

### M12

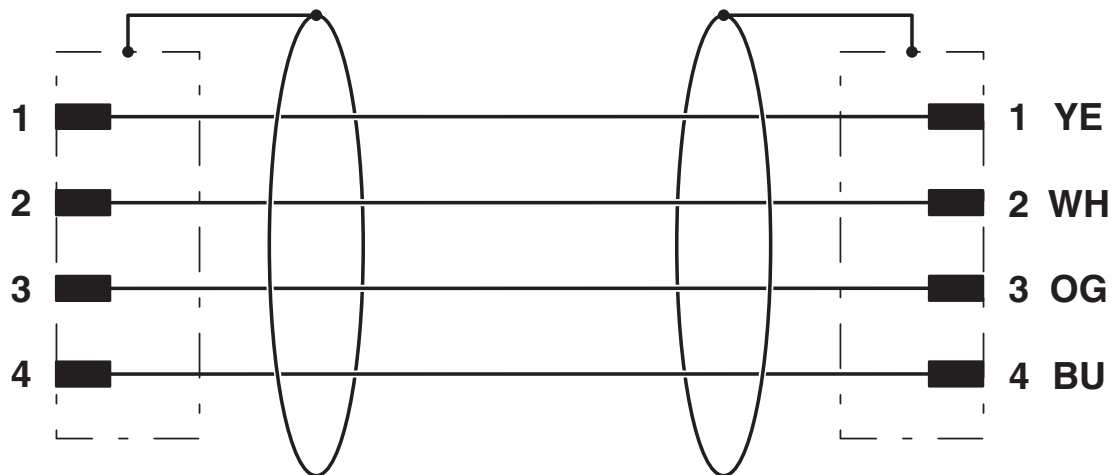
|                          |                 |
|--------------------------|-----------------|
| Standard designation     | M12 connector   |
| Standards/specifications | IEC 61076-2-101 |

1416746

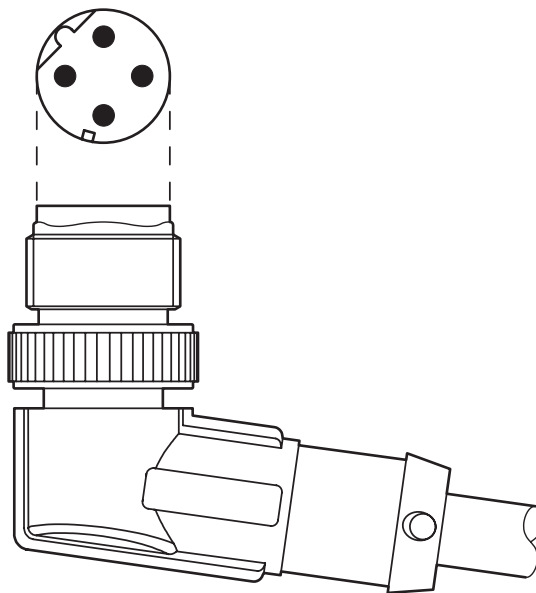
<https://www.phoenixcontact.com/us/products/1416746>

## Drawings

Circuit diagram



Schematic diagram

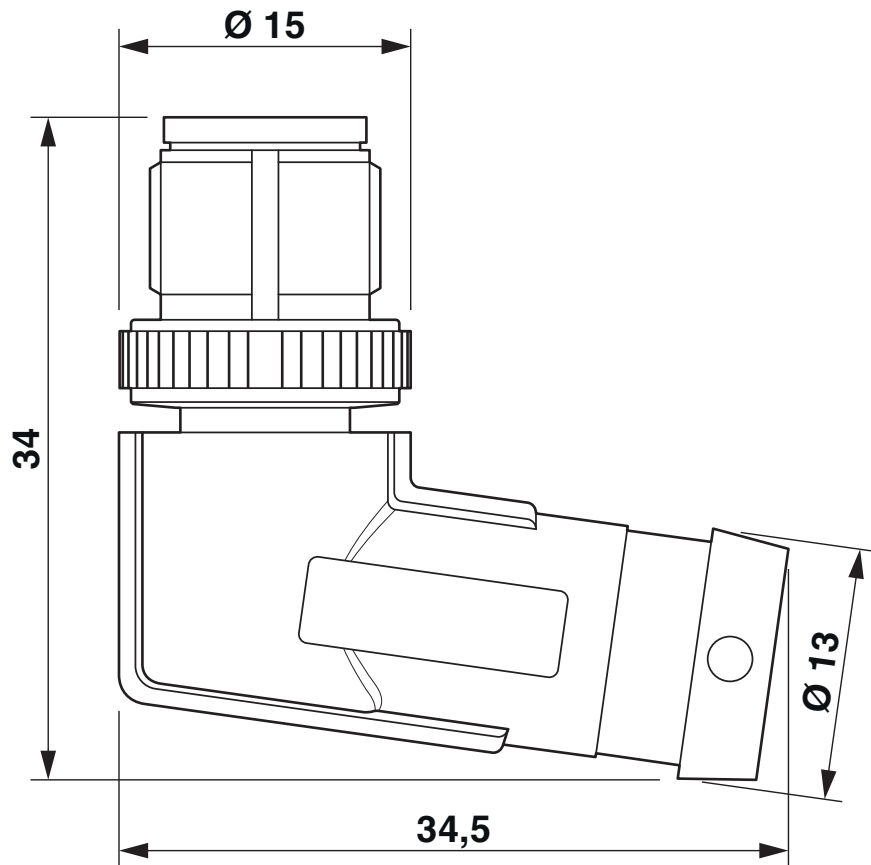


Arrangement of the pin assignment, M12 plug, angled

1416746

<https://www.phoenixcontact.com/us/products/1416746>

Dimensional drawing

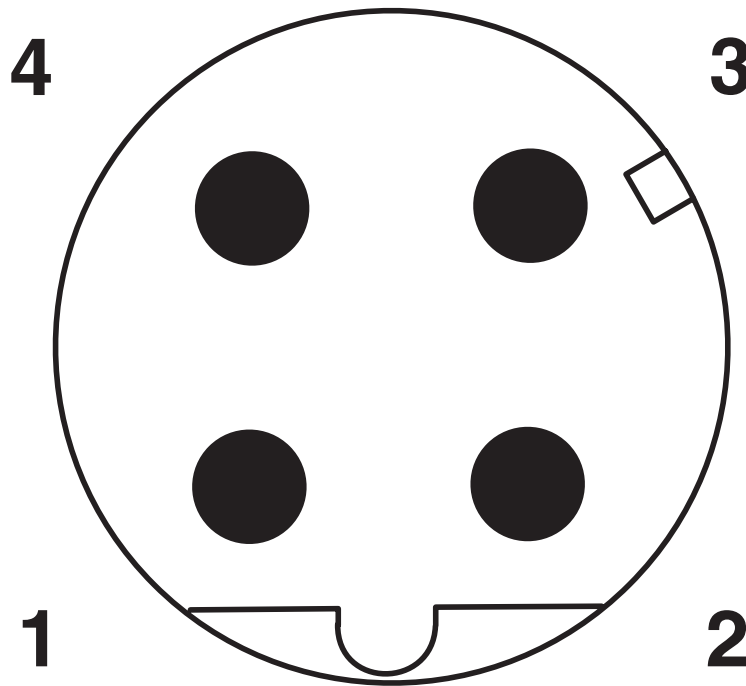


M12 x 1 male plug, angled, shielded

1416746

<https://www.phoenixcontact.com/us/products/1416746>

Schematic diagram



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

# NBC-M12MRD/ 2,0-93C/M12MRD - Network cable



1416746

<https://www.phoenixcontact.com/us/products/1416746>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1416746>



### EAC-RoHS

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



### UL Listed

Approval ID: FILE E 335024

|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | 60 V                  | 1.5 A                 | -                 | -                           |



### cUL Listed

Approval ID: File E335024

|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | 60 V                  | 1.5 A                 | -                 | -                           |

### cULus Listed

# NBC-M12MRD/ 2,0-93C/M12MRD - Network cable



1416746

<https://www.phoenixcontact.com/us/products/1416746>

## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 8.0 | EC001855 |
|----------|----------|

### UNSPSC

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

Environmental product compliance

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

1416746

<https://www.phoenixcontact.com/us/products/1416746>

## Accessories

### 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

---

### 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

## NBC-M12MRD/ 2,0-93C/M12MRD - Network cable

1416746

<https://www.phoenixcontact.com/us/products/1416746>



## 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

## NBC-M12MRD/ 2,0-93C/M12MRD - Network cable

1416746

<https://www.phoenixcontact.com/us/products/1416746>



## 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



## 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



Phoenix Contact 2023 © - all rights reserved  
<https://www.phoenixcontact.com>

Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)