

# NBC-M12MRD/ 0,5-93E/M12MRD US - Network cable



1408741

<https://www.phoenixcontact.com/us/products/1408741>

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Network cable, Ethernet CAT5 (100 Mbps), 4-position, PUR halogen-free, water blue RAL 5021, shielded, Plug angled M12, coding: D / IP67, on Plug angled M12, coding: D / IP67, cable length: 0.5 m

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1408741       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | BF15          |
| Product key                          | AF1IHA        |
| GTIN                                 | 4046356828659 |
| Weight per piece (including packing) | 50.5 g        |
| Weight per piece (excluding packing) | 22.22 g       |
| Customs tariff number                | 85444290      |
| Country of origin                    | US            |

## Technical data

### Product properties

|                     |                         |
|---------------------|-------------------------|
| Product type        | Data cable preassembled |
| Application         | Standard, U.S. cables   |
| Sensor type         | Ethernet                |
| Number of positions | 4                       |
| Shielded            | yes                     |
| Coding              | D                       |

### Interfaces

|                      |                                     |
|----------------------|-------------------------------------|
| Bus system           | Ethernet                            |
| Signal type/category | Ethernet 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 (Plug/socket in accordance with IEC 61076-2-101, cable technical data is to be observed) |
| Transmission medium                     | Copper                                                                                       |
| Transmission speed                      | 100 Mbps                                                                                     |
| Transmission characteristics (category) | CAT5 (IEC 11801:2002)                                                                        |

### Connector

#### Connection 1

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| Type                 | Plug angled M12 / IP67                                  |
| Coding type          | D (Data)                                                |
| Handle color         | black                                                   |
| Material             | CuSn (Contact)                                          |
|                      | Ni/Au (Contact surface)                                 |
|                      | PA (Contact carrier)                                    |
|                      | TPU, hardly inflammable, self-extinguishing (Grip body) |
|                      | Zinc die-cast, nickel-plated (Screw connection)         |
|                      | FKM (Seal)                                              |
| Degree of protection | IP67                                                    |

#### Connection 2

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

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|                      | Zinc die-cast, nickel-plated (Screw connection)         |
| Degree of protection | FKM (Seal)                                              |
|                      | IP67                                                    |

## Cable/line

|              |       |
|--------------|-------|
| Cable length | 0.5 m |
|--------------|-------|

### Ethernet flexible CAT5, 2-pair [93E]

|                                 |                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------|
| Dimensional drawing             |  |
| Cable weight                    | 42 kg/km                                                                            |
| UL AWM Style                    | 20963 (80°C/30 V)                                                                   |
| Wiring standards/regulations    | Electrical requirements EN 50288-2-2                                                |
| Number of positions             | 4                                                                                   |
| Shielded                        | yes                                                                                 |
| Cable type                      | Ethernet flexible CAT5, 2-pair [93E]                                                |
| Conductor structure             | 2x2xAWG26/7, SF/UTP                                                                 |
| Signal runtime                  | 5.3 ns/m                                                                            |
| Conductor structure signal line | 7x 0.16 mm                                                                          |
| AWG signal line                 | 26                                                                                  |
| Conductor cross section         | 2x 2x 0.14 mm <sup>2</sup>                                                          |
| Wire diameter incl. insulation  | 0.98 mm                                                                             |
| External cable diameter         | 6.40 mm ±0.2 mm                                                                     |
| Outer sheath, material          | PUR                                                                                 |
| External sheath, color          | water blue RAL 5021                                                                 |
| Conductor material              | Bare Cu litz wires                                                                  |
| Material wire insulation        | Foamed PE                                                                           |
| Single wire, color              | white/orange-orange, white/green-green                                              |
| Thickness, outer sheath         | 1.20 mm                                                                             |
| Twisted pairs                   | 2 cores to the pair                                                                 |
| Overall twist                   | Two pairs with two fillers to the core                                              |
| Optical shield covering         | 70 %                                                                                |
| Insulation resistance           | ≥ 500 MΩ*km                                                                         |

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|                                                        |                                                                    |
|--------------------------------------------------------|--------------------------------------------------------------------|
| Coupling resistance                                    | $\leq 100.00 \text{ m}\Omega/\text{m}$ (at 10 MHz)                 |
| Loop resistance                                        | $\leq 290.00 \text{ }\Omega/\text{km}$                             |
| Wave impedance                                         | $100 \text{ }\Omega \pm 5 \text{ }\Omega$ (at 100 MHz)             |
| Cable capacity                                         | approx. $45 \text{ nF/km}$ (at 1 kHz)                              |
| Nominal voltage, cable                                 | $\leq 100 \text{ V}$ (Peak value, not for high-power applications) |
| Test voltage Core/Core                                 | 700 V (50 Hz, 1 min.)                                              |
| Test voltage Core/Shield                               | 700.00 V (50 Hz, 1 min.)                                           |
| Current carrying capacity of cable                     | 2.00 A (according to DIN VDE 0891-1)                               |
| Minimum bending radius, fixed installation             | 4 x D                                                              |
| Minimum bending radius, flexible installation          | 8 x D                                                              |
| Smallest bending radius, fixed installation            | 26 mm                                                              |
| Smallest bending radius, movable installation          | 52 mm                                                              |
| Tensile strength                                       | $\leq 80 \text{ N}$                                                |
| Near end crosstalk attenuation (NEXT)                  | 65.3 dB (with 1 MHz)                                               |
|                                                        | 56.3 dB (at 4 MHz)                                                 |
|                                                        | 50.3 dB (at 10 MHz)                                                |
|                                                        | 47.2 dB (at 16 MHz)                                                |
|                                                        | 45.8 dB (at 20 MHz)                                                |
|                                                        | 42.9 dB (at 31.25 MHz)                                             |
|                                                        | 38.4 dB (at 62.5 MHz)                                              |
|                                                        | 35.3 dB (at 100 MHz)                                               |
| Power-summated near end crosstalk attenuation (PSNEXT) | 62.3 dB (with 1 MHz)                                               |
|                                                        | 53.3 dB (at 4 MHz)                                                 |
|                                                        | 47.3 dB (at 10 MHz)                                                |
|                                                        | 44.2 dB (at 16 MHz)                                                |
|                                                        | 42.8 dB (at 20 MHz)                                                |
|                                                        | 39.9 dB (at 31.25 MHz)                                             |
|                                                        | 35.4 dB (at 62.5 MHz)                                              |
|                                                        | 32.3 dB (at 100 MHz)                                               |
| Return attenuation (RL)                                | 23 dB (at 4 MHz)                                                   |
|                                                        | 24.1 dB (at 8 MHz)                                                 |
|                                                        | 25 dB (at 10 MHz)                                                  |
|                                                        | 25 dB (at 16 MHz)                                                  |
|                                                        | 25 dB (at 20 MHz)                                                  |
|                                                        | 23.6 dB (at 31.25 MHz)                                             |
|                                                        | 21.5 dB (at 62.5 MHz)                                              |
|                                                        | 20.1 dB (at 100 MHz)                                               |
| Shield attenuation                                     | 3.2 dB (with 1 MHz)                                                |
|                                                        | 6 dB (at 4 MHz)                                                    |
|                                                        | 9.5 dB (at 10 MHz)                                                 |
|                                                        | 12.1 dB (at 16 MHz)                                                |
|                                                        | 13.6 dB (at 20 MHz)                                                |
|                                                        | 17.1 dB (at 31.25 MHz)                                             |
|                                                        | 24.8 dB (at 62.5 MHz)                                              |

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|                                    |                                                 |
|------------------------------------|-------------------------------------------------|
|                                    | 32 dB (at 100 MHz)                              |
| Halogen-free                       | according to IEC 60754-1                        |
| Flame resistance                   | according to IEC 60332-1-2                      |
|                                    | in acc. to UL VW1                               |
|                                    | in accordance with UN ECE-R 118.03              |
| Resistance to oil                  | in accordance with EN 60811-2-1                 |
| Ambient temperature (operation)    | -40 °C ... 80 °C (cable, fixed installation)    |
|                                    | -20 °C ... 80 °C (Cable, flexible installation) |
| Ambient temperature (installation) | -20 °C ... 80 °C                                |

## Environmental and real-life conditions

### Ambient conditions

|                                                                   |                                  |
|-------------------------------------------------------------------|----------------------------------|
| Degree of protection                                              | IP65                             |
|                                                                   | IP67                             |
|                                                                   | IP65/IP67                        |
| Ambient temperature (operation) (male connector/female connector) | -25 °C ... 85 °C (M12 connector) |

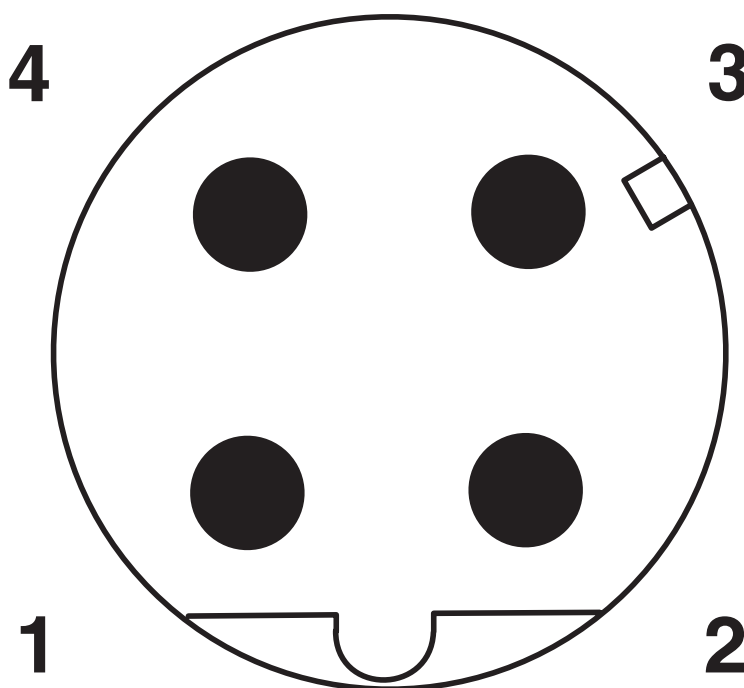
## Standards and regulations

### M12

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

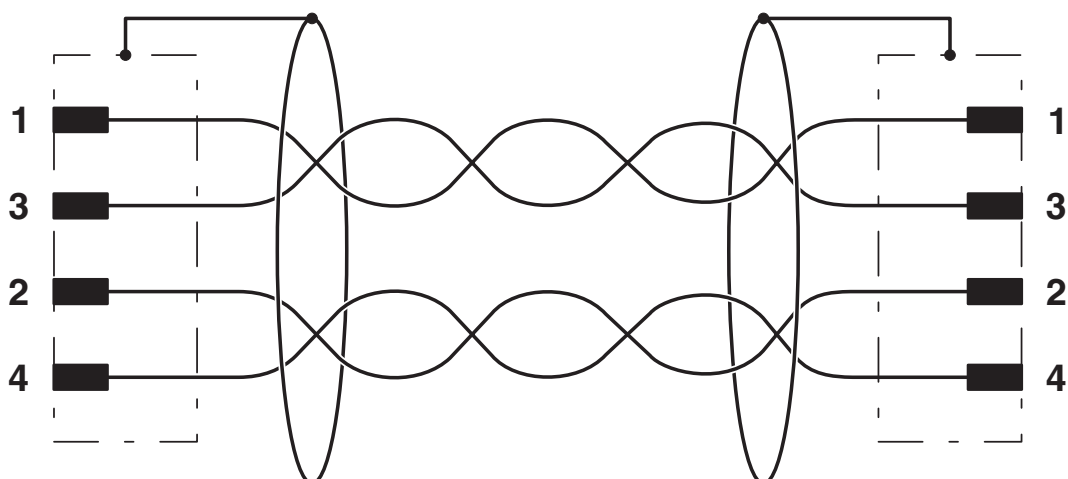
## Drawings

Schematic diagram



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

Circuit diagram



Contact assignment of the M12 plugs

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1408741>



### UL Listed

Approval ID: FILE E 335024

|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | 30 V                  | 4 A                   | -                 | -                           |



### EAC-RoHS

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



### cUL Listed

Approval ID: FILE E 335024

|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | 30 V                  | 4 A                   | -                 | -                           |

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## Classifications

### ECLASS

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

### ETIM

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

### UNSPSC

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

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%               |