

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



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            |

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## 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)  |

### Material specifications

|                          |   |
|--------------------------|---|
| Seal material            | NBR   |
| Material of grip body    | TPU, hardly inflammable, self-extinguishing |
| Contact material         | CuZn  |
| Contact surface material | Ni/Au                                       |
| Contact carrier material | TPU GF                                      |

### Connector

#### Connection 1

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

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|                      |            |
|----------------------|------------|
|                      | FKM (Seal) |
| Degree of protection | IP67       |


## Connection 2

|                      |   |
|----------------------|---|
| Type                 | Plug angled M12 / IP67  |
| Number of positions  | 4   |
| Coding type          | D (Data)  |
| Handle color         | black   |
| Material             | CuSn (Contact)<br>Ni/Au (Contact surface)<br>PA (Contact carrier)<br>TPU, hardly inflammable, self-extinguishing (Grip body)<br>Zinc die-cast, nickel-plated (Screw connection)<br>FKM (Seal) |
| Degree of protection | 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  |

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|  |  |
|--|--|
| 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                                  | $\geq 500 \text{ M}\Omega \cdot \text{km}$                         |
| 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 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)   |
|  | 3.2 dB (with 1 MHz)  |

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|                                    |   |
|------------------------------------|---|
| Shield attenuation                 | 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)                           |
|                                    | 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                                |

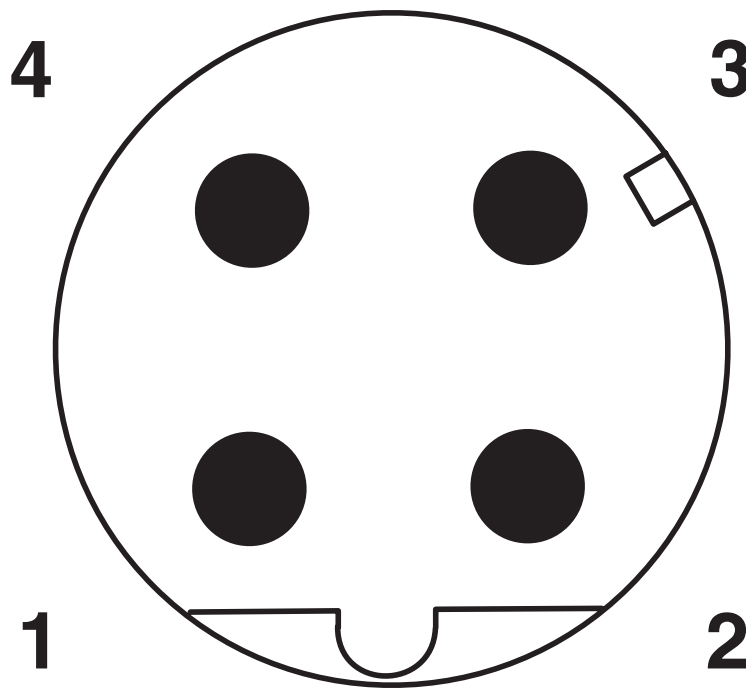
## Standards and regulations

### M12

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

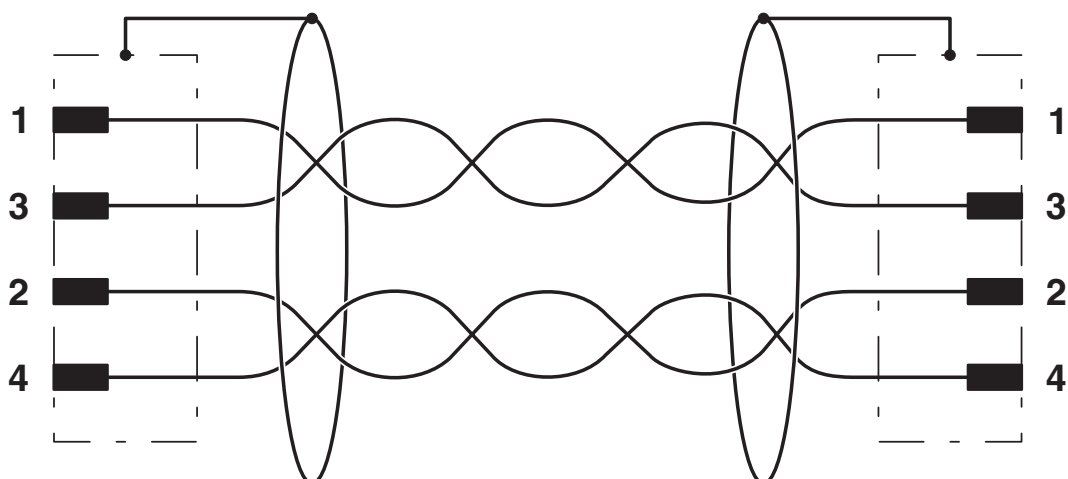
## Drawings

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>

|  <b>UL Listed</b><br>Approval ID: FILE E 335024 |                       |                       |                   |                             |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine  |                       |                       |                   |                             |
|  | 30 V                  | 4 A                   | -                 | -                           |

|  <b>EAC-RoHS</b><br>Approval ID: RU D-DE.HB35.B.00387 |  |  |  |  |
|--|--|--|--|--|
|--|--|--|--|--|

|  <b>cUL Listed</b><br>Approval ID: FILE E 335024 |                       |                       |                   |                             |
|---|-----------------------|-----------------------|-------------------|-----------------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine   |                       |                       |                   |                             |
|   | 30 V                  | 4 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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