

# NBC-M12MSD/15,0-93E/R4AC US - Network cable



1409862

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Network cable, Ethernet CAT5 (100 Mbps), 4-position, PUR halogen-free, water blue RAL 5021, shielded, Plug straight M12, coding: D / IP67, on Plug straight RJ45 / IP20, cable length: 15 m

## Commercial data

|                                      |                                |
|--------------------------------------|--------------------------------|
| Item number                          | 1409862                        |
| Packing unit                         | 1 pc                           |
| Minimum order quantity               | 1 pc                           |
| Note                                 | Made to order (non-returnable) |
| Sales key                            | BF15                           |
| Product key                          | AF1IHA                         |
| GTIN                                 | 4046356993029                  |
| Weight per piece (including packing) | 638.8 g                        |
| Weight per piece (excluding packing) | 630 g                          |
| Customs tariff number                | 85444290                       |
| Country of origin                    | DE                             |

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## Technical data

### Product properties

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

### Interfaces

|                      |                         |
|----------------------|-------------------------|
| Bus system           | Ethernet                |
| Signal type/category | Ethernet CAT5, 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

|                          |   |
|--------------------------|---|
| 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 straight M12 / IP67                                |
| Coding type          | D (Data)  |
| 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)         |
| Degree of protection | IP67  |

#### Connection 2

# NBC-M12MSD/15,0-93E/R4AC US - Network cable



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|                      |                           |
|----------------------|---------------------------|
| Type                 | Plug straight RJ45 / IP20 |
| Material             | CuSn (Contact)            |
|                      | Ni/Au (Contact surface)   |
|                      | PA (Contact carrier)      |
|                      | PA (Housing)              |
| Degree of protection | IP20                      |

## Cable/line

|              |      |
|--------------|------|
| Cable length | 15 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   |
| Coupling resistance             | ≤ 100.00 mΩ/m (at 10 MHz)   |
| Loop resistance                 | ≤ 290.00 Ω/km   |

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|  |  |
|--|--|
| Wave impedance   | 100 $\Omega$ $\pm$ 5 $\Omega$ (at 100 MHz)                 |
| Cable capacity   | approx. 45 nF/km (at 1 kHz)                                |
| Nominal voltage, cable                                 | $\leq$ 100 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 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)                                      |
|  | 32 dB (at 100 MHz)   |
| Halogen-free   | according to IEC 60754-1                                   |

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|                                    |   |
|------------------------------------|---|
| 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 (M12 connector)              |
|   | IP67 (M12 connector)              |
|   | IP20 (RJ45 connector)             |
|   | IP67/IP20                         |
| Ambient temperature (operation) (male connector/female connector) | -25 °C ... 85 °C (M12 connector)  |
|   | -25 °C ... 60 °C (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

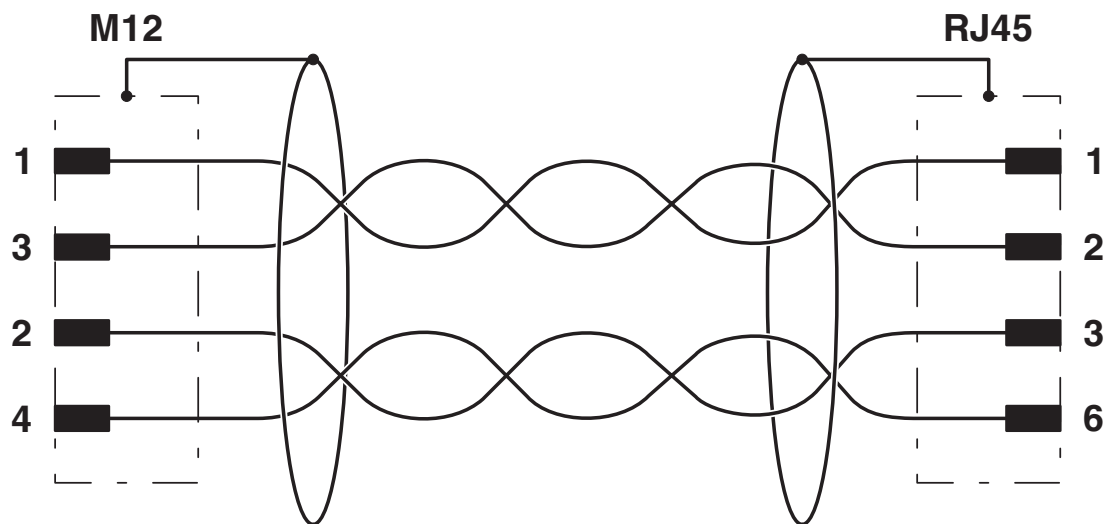


Connector pin assignment plug RJ45

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Circuit diagram



Contact assignment of the M12 and RJ45 plug

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1409862>

|  <b>UL Listed</b><br>Approval ID: FILE E 335024 |                       |                       |                   |                      |
|--|-----------------------|-----------------------|-------------------|----------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
| keine  |                       |                       |                   |                      |
|  | 30 V                  | 0.5 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 $mm^2$ |
| keine   |                       |                       |                   |                      |
|   | 30 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-50   |
|  | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

### EU REACH SVHC

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

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