

## Network cable - NBC-M12MSD/ 2,0-93E/M12MSD US - 1406128

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Network cable, Ethernet CAT5 (100 Mbps), 4-position, PUR halogen-free, water blue RAL 5021, shielded, Plug straight M12 / IP67, coding: D, on Plug straight M12 / IP67, coding: D, cable length: 2 m



### Key Commercial Data

|                        |                                                                                                         |
|------------------------|---------------------------------------------------------------------------------------------------------|
| Packing unit           | 1 pc                                                                                                    |
| Minimum order quantity | 50 pc                                                                                                   |
| GTIN                   | <br>4 046356 799218 |
| GTIN                   | 4046356799218                                                                                           |

### Technical data

#### Dimensions

|                 |     |
|-----------------|-----|
| Length of cable | 2 m |
|-----------------|-----|

#### Ambient conditions

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

#### General data

|                          |                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------|
| Rated current at 40°C    | 4 A (Plug/socket in accordance with IEC 61076-2-101, cable technical data is to be observed) |
| Rated voltage            | 48 V AC                                                                                      |
|                          | 60 V DC                                                                                      |
| Number of positions      | 4                                                                                            |
| Signal type/category     | Ethernet CAT5 (IEC 11801), 100 Mbps                                                          |
| Standards/regulations    | M12 connector IEC 61076-2-101                                                                |
| Contact material         | CuSn                                                                                         |
| Contact carrier material | TPU GF                                                                                       |
| Contact surface material | Ni/Au                                                                                        |

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## Technical data

### General data

|                                         |          |
|-----------------------------------------|----------|
| Transmission characteristics (category) | CAT5     |
| Transmission speed                      | 100 Mbps |

### Characteristics head 1

|           |                          |
|-----------|--------------------------|
| Head type | Plug straight M12 / IP67 |
| Coding    | D (Data)                 |

### Characteristics head 2

|           |                          |
|-----------|--------------------------|
| Head type | Plug straight M12 / IP67 |
| Coding    | D (Data)                 |

### Standards and Regulations

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

### Cable

|                                               |                                                    |
|-----------------------------------------------|----------------------------------------------------|
| Cable type                                    | Ethernet flexible CAT5, 2-pair                     |
| Cable type (abbreviation)                     | 93E                                                |
| UL AWM style                                  | 20963 (80°C/30 V)                                  |
| Signal type/category                          | Ethernet CAT5 (IEC 11801), 100 Mbps                |
| Cable structure                               | 2x2xAWG26/7; SF/UTP                                |
| Conductor cross section                       | 2x 2x 0.14 mm <sup>2</sup>                         |
| AWG signal line                               | 26                                                 |
| Conductor structure signal line               | 7x 0.16 mm                                         |
| Core diameter including insulation            | 0.98 mm                                            |
| Wire colors                                   | white/orange-orange, white/green-green             |
| Twisted pairs                                 | 2 cores to the pair                                |
| Overall twist                                 | Two pairs with two fillers to the core             |
| Shielding                                     | Aluminum-coated foil, tinned copper braided shield |
| Optical shield covering                       | 70 %                                               |
| External sheath, color                        | water blue RAL 5021                                |
| Outer sheath thickness                        | 1.2 mm                                             |
| External cable diameter D                     | 6.4 mm ±0.2 mm                                     |
| Minimum bending radius, fixed installation    | 4 x D                                              |
| Minimum bending radius, flexible installation | 8 x D                                              |
| Tensile strength GRP                          | ≤ 80 N                                             |
| Cable weight                                  | 42 kg/km                                           |
| Outer sheath, material                        | PUR                                                |
| Material conductor insulation                 | Foamed PE                                          |
| Conductor material                            | Bare Cu litz wires                                 |
| Standards/specifications                      | Electrical requirements EN 50288-2-2               |
| Insulation resistance                         | ≥ 500 MΩ*km                                        |
| Loop resistance                               | ≤ 290.00 Ω/km                                      |
| Cable capacity                                | approx. 45 nF/km (at 1 kHz)                        |

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## Technical data

### Cable

|                                                      |                                                            |
|------------------------------------------------------|------------------------------------------------------------|
| Wave impedance                                       | 100 $\Omega$ $\pm$ 5 $\Omega$ (at 100 MHz)                 |
| 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-summed 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)                                       |
| 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)                                         |
| Return loss (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)                                       |
| Signal runtime                                       | 5.3 ns/m                                                   |
| Coupling resistance                                  | $\leq$ 100.00 m $\Omega$ /m (at 10 MHz)                    |
| 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 V (50 Hz, 1 min.)                                      |
| Current carrying capacity of cable                   | 2 A (according to DIN VDE 0891-1)                          |
| Flame resistance                                     | according to IEC 60332-1-2                                 |

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## Technical data

### Cable

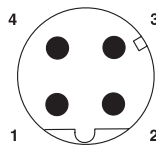
|                                         |                                                 |
|-----------------------------------------|-------------------------------------------------|
|                                         | in acc. to UL VW1                               |
| Halogen-free                            | according to IEC 60754-1                        |
| Resistance to oil                       | according to 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                                |
| Ambient temperature (storage/transport) | -20 °C ... 80 °C                                |
| Shielded                                | yes                                             |

### Environmental Product Compliance

|            |                                                                                                              |
|------------|--------------------------------------------------------------------------------------------------------------|
| REACH SVHC | Lead 7439-92-1                                                                                               |
| China RoHS | Environmentally Friendly Use Period = 50 years                                                               |
|            | For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads" |

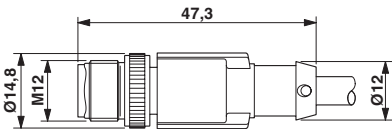
## Drawings

Schematic diagram



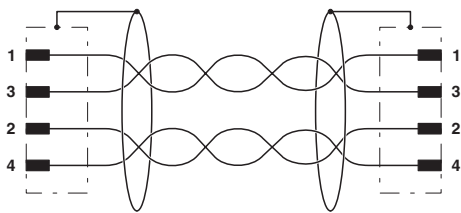
Pin assignment M12 male connector, 4-pos., D-coded, male side

Dimensional drawing



Plug, M12 x 1, straight, shielded

Circuit diagram



Contact assignment of the M12 plugs

## Network cable - NBC-M12MSD/ 2,0-93E/M12MSD US - 1406128

Cable cross section



Ethernet flexible CAT5, 2-pair [93E]

### Classifications

eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27060308 |
| eCl@ss 11.0   | 27060307 |
| eCl@ss 4.0    | 24010400 |
| eCl@ss 4.1    | 24010400 |
| eCl@ss 5.0    | 19030300 |
| eCl@ss 5.1    | 19030300 |
| eCl@ss 6.0    | 27061800 |
| eCl@ss 7.0    | 27061801 |
| eCl@ss 9.0    | 27060308 |

## Network cable - NBC-M12MSD/ 2,0-93E/M12MSD US - 1406128

### Classifications

#### ETIM

|          |          |
|----------|----------|
| ETIM 3.0 | EC001855 |
| ETIM 4.0 | EC001855 |
| ETIM 6.0 | EC000830 |
| ETIM 7.0 | EC001855 |

#### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 31251501 |
| UNSPSC 7.0901 | 31251501 |
| UNSPSC 11     | 31251501 |
| UNSPSC 12.01  | 31251501 |
| UNSPSC 13.2   | 31251501 |
| UNSPSC 18.0   | 26121604 |
| UNSPSC 19.0   | 26121604 |
| UNSPSC 20.0   | 26121604 |
| UNSPSC 21.0   | 26121600 |

### Approvals

#### Approvals

#### Approvals

EAC-RoHS / UL Listed

#### Ex Approvals

#### Approval details

|          |                                                                                     |                          |
|----------|-------------------------------------------------------------------------------------|--------------------------|
| EAC-RoHS |  | RU D-<br>DE.HB35.B.00387 |
|----------|-------------------------------------------------------------------------------------|--------------------------|

|                                |                                                                                     |                                                                                                                                                       |               |
|--------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| UL Listed                      |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 335024 |
| Nominal current I <sub>N</sub> | 4 A                                                                                 |                                                                                                                                                       |               |

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