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## Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

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Network cable, Sercos III CAT5 (100 Mbps), 4-position, PVC/PVC, signal red RAL 3020, shielded, Plug straight M12 SPEEDCON / IP67, Coding: D, on Socket straight M12 SPEEDCON / IP67, Coding: D, Cable length: 2 m



### Key Commercial Data

|                      |          |
|----------------------|----------|
| Packing unit         | 1 STK    |
| Custom tariff number | 85444210 |
| Country of origin    | Poland   |

### Technical data

#### Dimensions

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

#### Ambient conditions

|                      |                      |
|----------------------|----------------------|
| Degree of protection | IP65 (M12 connector) |
|                      | IP67 (M12 connector) |

#### General data

|                       |                                       |
|-----------------------|---------------------------------------|
| Rated current at 40°C | 4 A                                   |
| Rated voltage         | 250 V                                 |
| Number of positions   | 4                                     |
| Signal type/category  | Sercos III CAT5 (IEC 11801), 100 Mbps |
| Standards/regulations | M12 connector IEC 61076-2-101         |

#### Characteristics head 1

|                                          |                                   |
|------------------------------------------|-----------------------------------|
| Head type                                | Plug straight M12 SPEEDCON / IP67 |
| No. of positions (pin connector pattern) | 4                                 |

# Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

## Technical data

### Characteristics head 1

|                                 |                                                    |
|---------------------------------|----------------------------------------------------|
| Coding                          | D (Data)                                           |
| Color                           | black                                              |
| Material (component)            | CuSn (Contact)                                     |
|                                 | Ni/Au (Contact surface)                            |
|                                 | PA (Contact carriers)                              |
|                                 | TPU, hardly inflammable, self-extinguishing (Grip) |
|                                 | Zinc die-cast, nickel-plated (Screw connection)    |
| Insulation resistance           | $\geq 100 \text{ M}\Omega$                         |
| Insertion/withdrawal cycles     | $\geq 100$                                         |
| Torque                          | 0.4 Nm                                             |
| Ambient temperature (operation) | -25 °C ... 90 °C                                   |

### Characteristics head 2

|                                          |                                                    |
|------------------------------------------|----------------------------------------------------|
| Head type                                | Socket straight M12 SPEEDCON / IP67                |
| No. of positions (pin connector pattern) | 4                                                  |
| Coding                                   | D (Data)                                           |
| Color                                    | black                                              |
| Material (component)                     | CuSn (Contact)                                     |
|                                          | Ni/Au (Contact surface)                            |
|                                          | TPU GF (Contact carriers)                          |
|                                          | TPU, hardly inflammable, self-extinguishing (Grip) |
|                                          | Zinc die-cast, nickel-plated (Screw connection)    |
| Insulation resistance                    | $\geq 100 \text{ M}\Omega$                         |
| Insertion/withdrawal cycles              | $\geq 100$                                         |
| Torque                                   | 0.4 Nm                                             |
| Ambient temperature (operation)          | -25 °C ... 90 °C                                   |

## Standards and Regulations

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

## Cable

|                           |                                       |
|---------------------------|---------------------------------------|
| Cable type                | Sercos III                            |
| Cable type (abbreviation) | 93K                                   |
| UL AWM style              | 21694 (60°C / 600 V)                  |
| Signal type/category      | Sercos III CAT5 (IEC 11801), 100 Mbps |
| Cable structure           | 1x4xAWG22/7; SF/TQ                    |
| Conductor cross section   | 4x 0.34 mm <sup>2</sup>               |
| AWG signal line           | 22                                    |

# Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

## Technical data

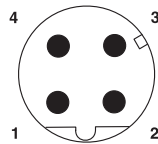
### Cable

|                                               |                                                         |
|-----------------------------------------------|---------------------------------------------------------|
| Conductor structure signal line               | 7x 0.25 mm                                              |
| Core diameter including insulation            | approx. 1.55 mm                                         |
| Wire colors                                   | White, yellow, blue, orange                             |
| Type of pair shielding                        | Aluminum-lined polyester foil                           |
| Overall twist                                 | Star quad                                               |
| Shielding                                     | Tinned copper braided shield                            |
| External sheath, color                        | signal red RAL 3020                                     |
| Outer sheath thickness                        | approx. 0.9 mm                                          |
| External cable diameter D                     | 6.5 mm $\pm$ 0.2 mm                                     |
| Minimum bending radius, fixed installation    | 3 x D                                                   |
| Minimum bending radius, flexible installation | 7 x D                                                   |
| Cable weight                                  | 68 kg/km                                                |
| Outer sheath, material                        | PVC                                                     |
| Material, inner sheath                        | PVC                                                     |
| Material conductor insulation                 | PE                                                      |
| Conductor material                            | Tin-plated Cu litz wires                                |
| Insulation resistance                         | $\geq 0.5 \text{ G}\Omega \cdot \text{km}$              |
| Conductor resistance                          | $\leq 120 \text{ }\Omega/\text{km}$                     |
| Wave impedance                                | $100 \text{ }\Omega \pm 15 \text{ }\Omega$ (at 100 MHz) |
| Signal runtime                                | 5.3 ns/m                                                |
| Coupling resistance                           | $\leq 20.00 \text{ m}\Omega/\text{m}$ (at 10 Hz)        |
| Test voltage Core/Core                        | 2000 V (50 Hz, 1 min.)                                  |
| Test voltage Core/Shield                      | 2000 V (50 Hz, 1 min.)                                  |
| Flame resistance                              | According to UL 1685 (CSA FT 4)                         |
| Resistance to oil                             | Resistant to oil to a limited extent                    |
| Other resistance                              | UV resistant According to UL 1581, Section 1200         |
| Ambient temperature (operation)               | -40 °C ... 70 °C (cable, fixed installation)            |
|                                               | -40 °C ... 70 °C (cable, flexible installation)         |
| Ambient temperature (installation)            | -20 °C ... 60 °C                                        |
| Ambient temperature (storage/transport)       | -50 °C ... 70 °C                                        |

## Drawings

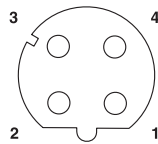
Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

Schematic diagram



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

Schematic diagram



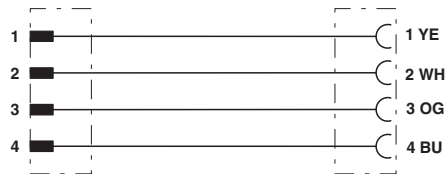
Pin assignment M12 socket, 4-pos., D-coded, female side

Cable cross section



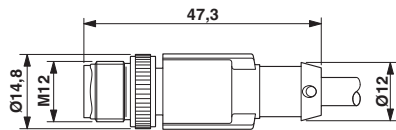
Sercos III [93K]

Circuit diagram



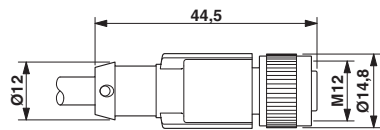
Contact assignment of the M12 connector and the M12 socket

Dimensional drawing



Plug, M12 x 1, straight, shielded

Dimensional drawing



M12 x 1 socket, straight, shielded

Classifications

eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.1 | 27060306 |
| eCl@ss 5.1 | 27060307 |
| eCl@ss 6.0 | 27060390 |
| eCl@ss 8.0 | 27279218 |
| eCl@ss 9.0 | 27060311 |

ETIM

|          |          |
|----------|----------|
| ETIM 4.0 | EC002599 |
| ETIM 5.0 | EC001855 |

## Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

### Accessories

#### Accessories

#### Protective cap

Sealing cap - PROT-M12 FS-PA-CHAIN - 1430873

M12 sealing cap made of plastic with fixing band, for sensor cables, for free M12 sockets



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Screw plug - PROT-M12 MS-PA-CHAIN - 1430899

M12 sealing cap with fixing band, for sensor cables, for free M12 sockets



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### Safety locking

Locking clip - SAC-M12-EXCLIP-M - 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

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Locking clip - SAC-M12-EXCLIP-F - 1558991



Locking clip for the socket 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

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### Screwdriver tools

## Network cable - NBC-MSD/ 2,0-93K/FSD SCO - 1411545

### Accessories

Adapter insert - TSD-M SAC-BIT ADAPTER - 1212600



Adapter bit for TSD-M...torque tools, E6.3-1/4" drive with 4 mm hexagon to accommodate SAC bits

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Tool - SAC BIT M12-D15 - 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

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### Torque tool

Torque screwdriver - TSD 04 SAC - 1208429



Torque screwdriver, with preset torque of 0.4 Nm and 4 mm hexagonal drive for M12 connectors

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Torque screwdriver - TSD-M 1,2NM - 1212224



Torque screw driver, accuracy as per EN ISO 6789 standard, adjustable from 0.3 - 1.2 Nm