

NBC-MSX/ 5,0-94S/MSX SCO RAIL - Network cable



1415598

<https://www.phoenixcontact.com/in/products/1415598>

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Network cable, Ethernet CAT6_A (10 Gbps), 8-position halogen-free, shielded, Plug straight M12 SPEEDCON, coding: X / IP65, on Plug straight M12 SPEEDCON, coding: X / IP65, cable length: 5 m

Your advantages

- Easy and safe: 100 % electrically tested plug-in components
- Securely locked by special vibration brake
- Resistant to temperature influences – tested for an extended temperature range and for resistance to temperature shocks
- Reliable signal transmission – 360° shielding in environments with electromagnetic interference

Commercial data

| | |
|--------------------------------------|--------------------------------|
| Item number | 1415598 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Note | Made to order (non-returnable) |
| Sales key | BF1 |
| Product key | BF1CMJ |
| Catalog page | Page 404 (C-2-2019) |
| GTIN | 4055626047652 |
| Weight per piece (including packing) | 337.3 g |
| Weight per piece (excluding packing) | 313.2 g |
| Customs tariff number | 85444210 |
| Country of origin | PL |

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Technical data

Product properties

| | |
|----------------------|-------------------------|
| Product type | Data cable preassembled |
| Sensor type | Ethernet |
| Number of positions | 8 |
| Application | Railway applications |
| No. of cable outlets | 1 |
| Shielded | yes |
| Coding | X |

Interfaces

| | |
|----------------------|--------------------------------------|
| Bus system | Ethernet |
| Signal type/category | Ethernet CAT6 _A , 10 Gbps |

Signaling

| | |
|------------------------|----|
| Status display | No |
| Status display present | No |

Electrical properties

| | |
|---|-------------------|
| Nominal voltage U_N | 48 V AC |
| | 60 V DC |
| Nominal current I_N | 0.5 A |
| Transmission medium | Copper |
| Transmission characteristics (category) | CAT6 _A |

Connector

Connection 1

| | |
|-----------------------------|---|
| Type | Plug straight M12 SPEEDCON / IP65 |
| Number of positions | 8 |
| Locking type | SPEEDCON |
| Coding type | X (Data) |
| Handle color | black |
| Material | CuZn (Contact) |
| | Ni/Au (Contact surface) |
| | TPU (Contact carriers) |
| | PA 6.6 (Grip) |
| | Zinc die-cast, nickel-plated (Screw connection) |
| Standards/regulations | PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3) |
| Insertion/withdrawal cycles | ≥ 100 |
| Contact resistance | ≤ 5 mΩ |
| Insulation resistance | ≥ 100 MΩ |

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| | |
|---------------------------------|------------------|
| Tightening torque | 0.4 Nm |
| Degree of protection | IP65 |
| | IP67 |
| Ambient temperature (operation) | -25 °C ... 90 °C |

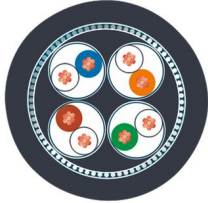
Connection 2

| | |
|---------------------------------|---|
| Type | Plug straight M12 SPEEDCON / IP65 |
| Number of positions | 8 |
| Locking type | SPEEDCON |
| Coding type | X (Data) |
| Handle color | black |
| Material | CuZn (Contact) Ni/Au (Contact surface) TPU (Contact carriers) PA 6.6 (Grip) Zinc die-cast, nickel-plated (Screw connection) |
| Standards/regulations | PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3) |
| Insertion/withdrawal cycles | ≥ 100 |
| Contact resistance | ≤ 5 mΩ |
| Insulation resistance | ≥ 100 MΩ |
| Tightening torque | 0.4 Nm |
| Degree of protection | IP65 |
| | IP65 |
| Ambient temperature (operation) | -25 °C ... 90 °C |

Cable/line

| | |
|--------------|-----|
| Cable length | 5 m |
|--------------|-----|

Ethernet BETAtrans[®] railway application CAT7 [94S]

| | |
|---------------------|--|
| Dimensional drawing |  |
| Cable weight | 59 kg/km |
| Copper weight | 28 kg/km |
| Number of positions | 8 |
| Shielded | yes |
| Cable type | Ethernet BETAtrans [®] railway application CAT7 [94S] |
| Conductor structure | 4x2xAWG26/7; S/FTP |
| Signal runtime | 4.4 ns/m |

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| | |
|--|---|
| Signal speed | 0.78 c |
| Conductor structure signal line | 7x 0.16 mm |
| AWG signal line | 26 |
| Conductor cross section | 4x 2x 0.14 mm ² |
| Wire diameter incl. insulation | 1.05 mm ±0.1 mm |
| External cable diameter | 6.6 mm ±0.2 mm |
| Outer sheath, material | PE-X |
| External sheath, color | black |
| Conductor material | Tin-plated Cu litz wires |
| Material wire insulation | Cell PE |
| Single wire, color | white-blue, white-orange, white-green, white-brown |
| Twisted pairs | 2 cores to the pair |
| Type of pair shielding | Aluminum-lined polyester foil |
| Overall twist | 4 pairs, twisted |
| Max. conductor resistance | ≤ 145 Ω/km |
| Insulation resistance | ≥ 5 GΩ*km |
| Coupling resistance | 5.00 mΩ/m (at 10 MHz) |
| Wave impedance | 100 Ω ±5 Ω (at 100 MHz) |
| Working capacitance | 44 nF (per kilometer) |
| Nominal voltage, cable | 125 V AC (U _o) |
| Test voltage Core/Core | 1000 V AC (50 Hz, 1 min.) |
| Test voltage Core/Shield | 1000 V AC (50 Hz, 1 min.) |
| Minimum bending radius, fixed installation | 6 x D |
| Smallest bending radius, fixed installation | 40 mm |
| Tensile strength | ≤ 60 N (temporary) ≤ 15 N (Permanent) |
| Near end crosstalk attenuation (NEXT) | 100 dB (with 1 MHz) 99 dB (at 10 MHz) 95 dB (at 100 MHz) 92 dB (at 200 MHz) 90 dB (at 250 MHz) 83 dB (at 500 MHz) 81 dB (at 600 MHz) 80 dB (at 700 MHz) 77 dB (at 800 MHz) 75 dB (at 900 MHz) 74 dB (at 1000 MHz) 72 dB (at 1100 MHz) 70 dB (at 1200 MHz) |
| Power-summated near end crosstalk attenuation (PSNEXT) | 97 dB (with 1 MHz) 96 dB (at 10 MHz) 92 dB (at 100 MHz) 89 dB (at 200 MHz) 87 dB (at 250 MHz) |

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| | |
|---|-----------------------|
| | 80 dB (at 500 MHz) |
| | 78 dB (at 600 MHz) |
| | 77 dB (at 700 MHz) |
| | 74 dB (at 800 MHz) |
| | 72 dB (at 900 MHz) |
| | 71 dB (at 1000 MHz) |
| | 69 dB (at 1100 MHz) |
| | 67 dB (at 1200 MHz) |
| Return attenuation (RL) | 24 dB (with 1 MHz) |
| | 33.9 dB (at 10 MHz) |
| | 38.3 dB (at 100 MHz) |
| | 35.3 dB (at 200 MHz) |
| | 32.9 dB (at 250 MHz) |
| | 29.7 dB (at 500 MHz) |
| | 30.6 dB (at 600 MHz) |
| | 31 dB (at 700 MHz) |
| | 26.7 dB (at 800 MHz) |
| | 28.6 dB (at 900 MHz) |
| | 27.5 dB (at 1000 MHz) |
| | 26.9 dB (at 1100 MHz) |
| | 26.3 dB (at 1200 MHz) |
| Crosstalk attenuation (ACR) | 100 dB (with 1 MHz) |
| | 99 dB (at 10 MHz) |
| | 93 dB (at 100 MHz) |
| | 88 dB (at 200 MHz) |
| | 86 dB (at 250 MHz) |
| | 78 dB (at 500 MHz) |
| | 74 dB (at 600 MHz) |
| | 72 dB (at 700 MHz) |
| | 69 dB (at 800 MHz) |
| | 67 dB (at 900 MHz) |
| | 65 dB (at 1000 MHz) |
| | 63 dB (at 1100 MHz) |
| | 61 dB (at 1200 MHz) |
| Power-summated crosstalk attenuation (PS-ACR) | 97 dB (with 1 MHz) |
| | 96 dB (at 10 MHz) |
| | 90 dB (at 100 MHz) |
| | 85 dB (at 200 MHz) |
| | 83 dB (at 250 MHz) |
| | 75 dB (at 500 MHz) |
| | 71 dB (at 600 MHz) |
| | 69 dB (at 700 MHz) |
| | 66 dB (at 800 MHz) |
| | 64 dB (at 900 MHz) |

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| | |
|----------------------------------|---|
| | 62 dB (at 1000 MHz) |
| | 60 dB (at 1100 MHz) |
| | 58 dB (at 1200 MHz) |
| Shield attenuation | 0.25 dB (with 1 MHz) |
| | 0.76 dB (at 10 MHz) |
| | 2.49 dB (at 100 MHz) |
| | 3.69 dB (at 200 MHz) |
| | 4.18 dB (at 250 MHz) |
| | 5.6 dB (at 500 MHz) |
| | 6.74 dB (at 600 MHz) |
| | 7.32 dB (at 700 MHz) |
| | 7.89 dB (at 800 MHz) |
| | 8.5 dB (at 900 MHz) |
| | 9.11 dB (at 1000 MHz) |
| | 9.5 dB (at 1100 MHz) |
| | 9.9 dB (at 1200 MHz) |
| | 60 dB (up to 1000 MHz) |
| Halogen-free | in accordance with EN 50267-2-1 |
| | in accordance with EN 60684-2 |
| Flame resistance | in accordance with EN 60332-1-2 |
| | EN 60332-3-25 |
| | in accordance with ISO 14572 5.21 (UN ECE-R 118.01) |
| Concentration of fumes | EN 61034-2 |
| Resistance to oil | in accordance with EN 50306-4, 72 hours at 100°C, IRM 902 |
| Fire protection in rail vehicles | BS 6853 (Internal cable Ia, Ib, II/external cable Ia, Ib, II) |
| | DIN 5510-2 (Fire protection level 1, 2, 3, 4) |
| | EN 45545-2 |
| | EN 50306-4 |
| | NF F16-101 (Classification C/F1) |
| | NF F16-101 (Internal cable A1, A2, B/external cable A1, A2, B) |
| | NFPA 130 |
| | PN-K-02511 (Class A) |
| | UIC 564-2 (Class A) |
| Other resistance | Resistant to fuel (in accordance with EN 50306-4, 168 hours at 70°C, IRM 903) |
| | Resistant to ozone (in accordance with EN 50306-4, 72 hours at 40°C, method B, volumetric concentration of 200×10^{-6}) |
| Special properties | HL1-HL3 |
| Ambient temperature (operation) | -40 °C ... 80 °C (cable, fixed installation) |

Environmental and real-life conditions

Ambient conditions

| | |
|----------------------|-----------|
| Degree of protection | IP65/IP67 |
|----------------------|-----------|

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Standards and regulations

M12

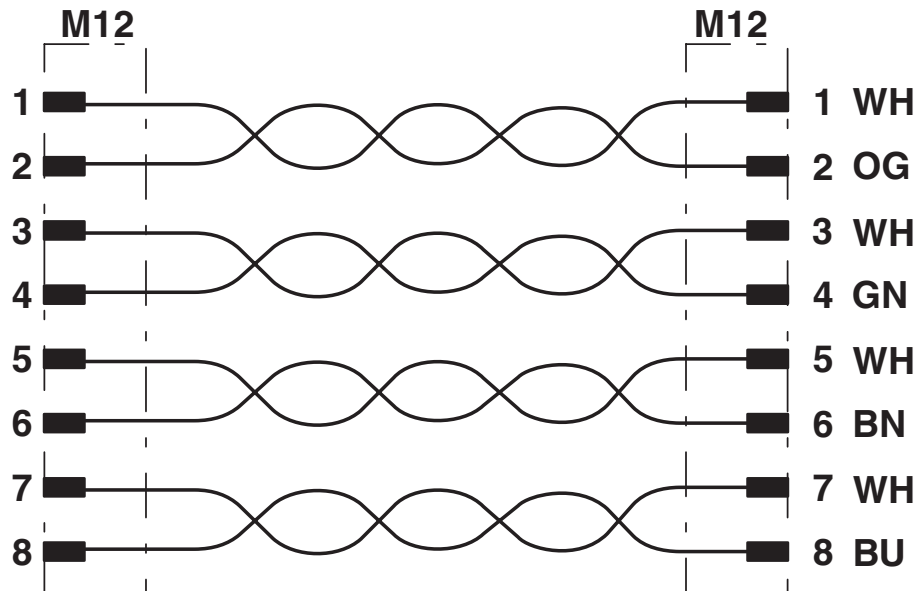
| | |
|--------------------------|------------------|
| Standard designation | M12 connector |
| Standards/specifications | IEC 61076-2-109 |
| Standard designation | Shock, vibration |
| Standards/specifications | EN 50155 |

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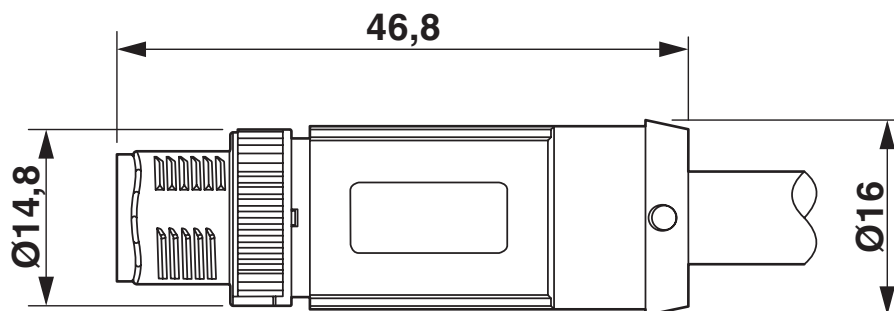
<https://www.phoenixcontact.com/in/products/1415598>

Drawings

Circuit diagram



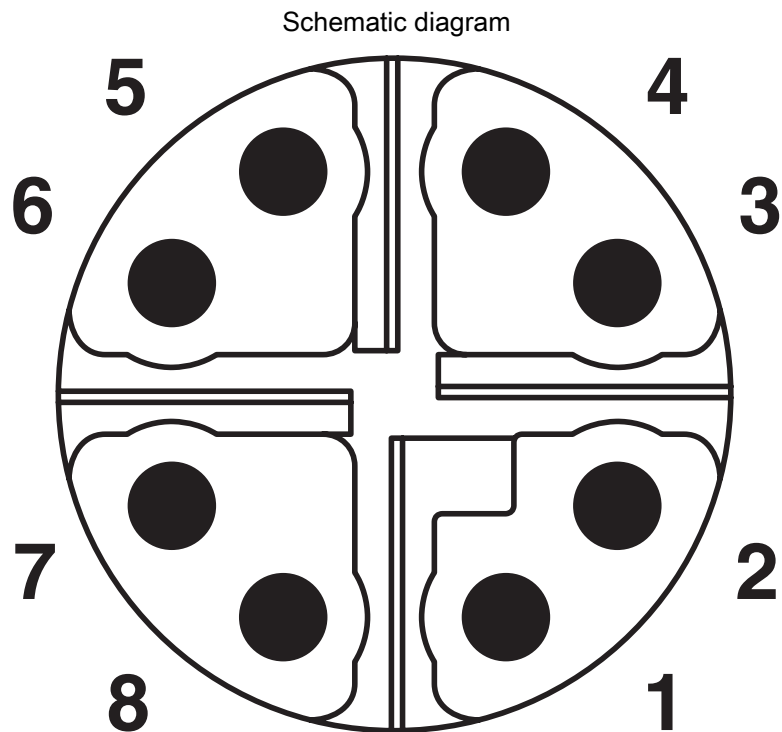
Dimensional drawing



M12 SPEEDCON plug, straight, shielded

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Pin assignment of M12 plug, 8-pos., X-coded, pin side view

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/in/products/1415598>



EAC-RoHS

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

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-11.0 | 27060307 |
| ECLASS-12.0 | 27060307 |
| ECLASS-13.0 | 27060307 |

ETIM

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

UNSPSC

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

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Environmental product compliance

| | |
|------------|---|
| REACH SVHC | Dechlorane Plus |
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
| | No hazardous substances above threshold values |

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Accessories

PROT-M12 FS-PA-CHAIN - Sealing cap

1430873

<https://www.phoenixcontact.com/in/products/1430873>

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



SAC-M12-EXCLIP-M - Locking clip

1558988

<https://www.phoenixcontact.com/in/products/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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TSD 04 SAC - Torque screwdriver

1208429

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

TSD-M 1,2NM - Torque screwdriver

1212224

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

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TSD-M SAC-BIT ADAPTER - Adapter insert

1212600

<https://www.phoenixcontact.com/in/products/1212600>



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

SAC BIT M12-D15 - Tool

1208432

<https://www.phoenixcontact.com/in/products/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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