

# NBC-M12MSD/ 2,0-93C/M12MSD - Network cable



1416200

<https://www.phoenixcontact.com/us/products/1416200>

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, PUR/FRNC halogen-free, green RAL 6018, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Plug straight M12, coding: D / IP67, cable length: 2 m

## Commercial data

Item number	1416200
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to order (non-returnable)
Product key	BF1CJI
Catalog page	Page 309 (PC-2011)
GTIN	4046356474719
Weight per piece (including packing)	164.2 g
Weight per piece (excluding packing)	155.77 g
Country of origin	PL

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## Technical data

### Notes

General	This product corresponds to the PROFINET Cabling and Interconnection Technology Guideline for PROFINET regulations, version 2.00, order no: 2.252, Chapter 10.1 Cord Sets for Balanced Cabling
General	Further products with variable cable type and variable cable length can be found in the accessories section

### Product properties

Product type	Data cable preassembled
Application	Standard
Sensor type	PROFINET
Number of positions	4
No. of cable outlets	1
Shielded	yes
Coding	D

### Insulation characteristics

Overvoltage category	II
Degree of pollution	3

### Interfaces

Bus system	PROFINET
Signal type/category	PROFINET CAT5 (IEC 11801), 100 Mbps EtherCAT® 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
Transmission medium	Copper
Transmission characteristics (category)	CAT5 (IEC 11801:2002)

### Material specifications

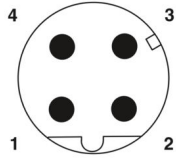
Flammability rating according to UL 94	V0
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### Connector

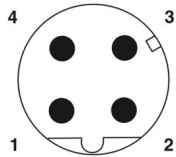
Connection 1

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Dimensional drawing	 <p>Pin assignment M12 male connector, 4-pos., D-coded, male side</p>
Type	M12 Plug, straight, 4-position, shielded (Advanced Shielding Technology), Keying: D
Number of positions	4
Shielded	yes
Shielding	Advanced Shielding Technology
Signal type/category	EtherCAT® CAT5 (IEC 11801), 100 Mbps PROFINET CAT5 (IEC 11801)
Insertion/withdrawal cycles	≥ 100
Insulation resistance	≥ 100 MΩ
Overvoltage category	II
Degree of pollution	3
Tightening torque	0.4 Nm
Contact material	CuSn
Contact surface material	Ni/Au
Contact carrier material	PA 6.6
Material for screw connection	Zinc die-cast, nickel-plated
Seal material	FKM
Flammability rating according to UL 94	V0
Degree of protection	IP65 IP67
Ambient temperature (operation)	-25 °C ... 85 °C
Standard designation	M12 connector
Standards/regulations	IEC 61076-2-101

## Connection 2

Dimensional drawing	 <p>Pin assignment M12 male connector, 4-pos., D-coded, male side</p>
Type	M12 Plug, straight, 4-position, shielded (Advanced Shielding Technology), Keying: D
Number of positions	4
Shielded	yes
Shielding	Advanced Shielding Technology
Signal type/category	EtherCAT® CAT5 (IEC 11801), 100 Mbps

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	PROFINET CAT5 (IEC 11801)
Insertion/withdrawal cycles	≥ 100
Insulation resistance	≥ 100 MΩ
Overvoltage category	II
Degree of pollution	3
Tightening torque	0.4 Nm
Contact material	CuSn
Contact surface material	Ni/Au
Contact carrier material	PA 6.6
Material for screw connection	Zinc die-cast, nickel-plated
Seal material	FKM
Flammability rating according to UL 94	V0
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Ambient temperature (operation)	-25 °C ... 85 °C
Standard designation	M12 connector
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## Cable/line

Cable length	2 m
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### PROFINET drag chain CAT5 [93C]

Dimensional drawing	
Cable weight	61 kg/km
Number of positions	4
Shielded	yes
Cable type	PROFINET drag chain CAT5 [93C]
Conductor structure	1x4xAWG22/7, SF/TQ
Signal runtime	5.3 ns/m
Signal speed	0.66 c
Conductor structure signal line	7x 0.25 mm
AWG signal line	22
Conductor cross section	4x 0.34 mm <sup>2</sup>
Wire diameter incl. insulation	1.5 mm
External cable diameter	6.50 mm ±0.2 mm
Outer sheath, material	PUR
External sheath, color	green RAL 6018

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Conductor material	Tin-plated Cu litz wires
Material wire insulation	PE
Single wire, color	white, yellow, blue, orange
Thickness, outer sheath	approx. 0.90 mm
Overall twist	Star quad
Optical shield covering	85 %
Insulation resistance	≥ 500 MΩ*km
Coupling resistance	≤ 20.00 mΩ/m (at 10 MHz)
Loop resistance	≤ 120.00 Ω/km
Wave impedance	100 Ω ±15 Ω (at 1 ... 100 MHz)
Nominal voltage, cable	600 V (UL rating)
Test voltage Core/Core	2000 V (50 Hz, 1 min.)
Test voltage Core/Shield	2000.00 V (50 Hz, 1 min.)
Minimum bending radius, fixed installation	5 x D
Minimum bending radius, flexible installation	7.5 x D
Smallest bending radius, fixed installation	33 mm
Smallest bending radius, movable installation	49 mm
Max. bending cycles	3000000
Bending radius	100 mm
Traversing path	10 m
Traversing rate	4 m/s
Acceleration	4 m/s <sup>2</sup>
Tensile strength	≤ 150 N
Torsion force	± 30 °/m
Near end crosstalk attenuation (NEXT)	80 dB (with 1 MHz)
	76 dB (at 4 MHz)
	70 dB (at 10 MHz)
	65 dB (at 16 MHz)
	63 dB (at 20 MHz)
	60 dB (at 31.25 MHz)
	55 dB (at 62.5 MHz)
	50 dB (at 100 MHz)
Shield attenuation	2.1 dB (with 1 MHz)
	4 dB (at 4 MHz)
	6.3 dB (at 10 MHz)
	8 dB (at 16 MHz)
	9 dB (at 20 MHz)
	11.4 dB (at 31.25 MHz)
	16.5 dB (at 62.5 MHz)
	21.3 dB (at 100 MHz)
Halogen-free	yes
Flame resistance	according to IEC 60332-1-2
Resistance to oil	in accordance with DIN EN 60811-2-1
Other resistance	UV resistant

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Special properties	Electrical properties in accordance with EN 50288-2-2
Ambient temperature (operation)	-40 °C ... 70 °C (cable, fixed installation)
	-40 °C ... 70 °C (Cable, flexible installation)
Ambient temperature (installation)	-20 °C ... 60 °C

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP65
	IP67

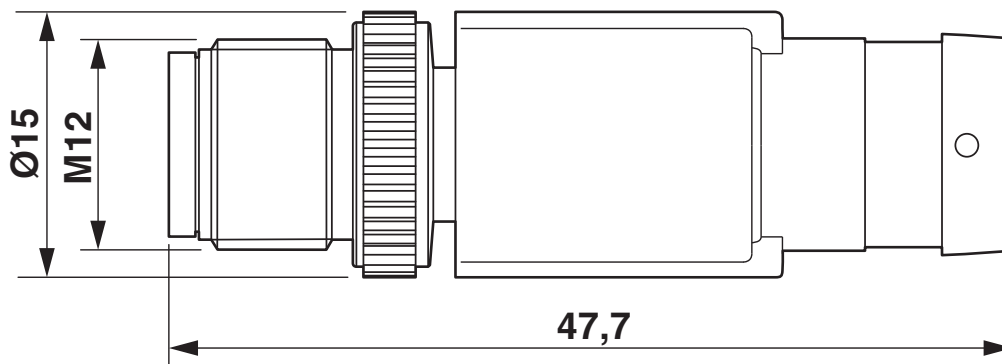
## Standards and regulations

### M12

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

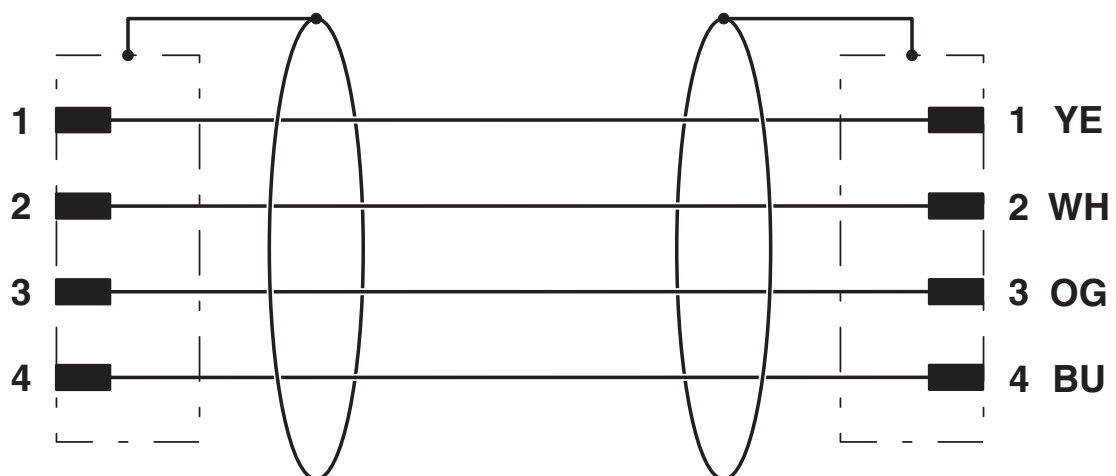
## Drawings

Dimensional drawing



Plug, M12 x 1, straight, shielded

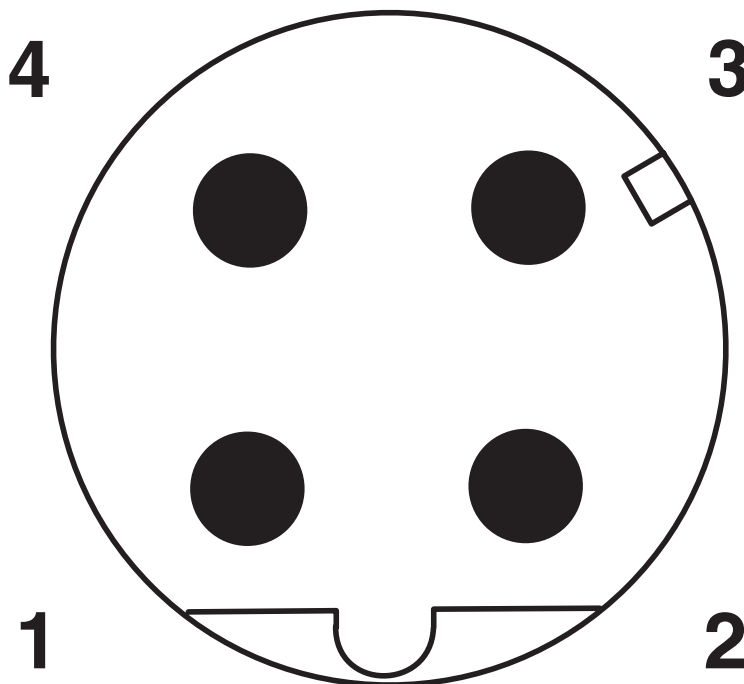
Circuit diagram



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Schematic diagram



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

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1416200>

 <b>cULus Listed</b> Approval ID: NBC-M12MSD Series				
	Nominal voltage $U_N$	Nominal current $I_N$	Cross section AWG	Cross section $\text{mm}^2$
	250 V	4 A	-	-

# NBC-M12MSD/ 2,0-93C/M12MSD - Network cable



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## Classifications

### ECLASS

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

### ETIM

ETIM 9.0	EC001855
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### UNSPSC

UNSPSC 21.0	26121600
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions
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### 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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## Accessories

### NBC-M12MSD-M12MSD-PN/.../... - Network cable

1408634

<https://www.phoenixcontact.com/us/products/1408634>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Plug straight M12, coding: D / IP67, cable length: Free input (0.2 ... 40.0 m)

### NBC-M12MSD-M12MRD-PN/.../... - Network cable

1408625

<https://www.phoenixcontact.com/us/products/1408625>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Plug angled M12, coding: D / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-M12MRD-M12MRD-PN/.../... - Network cable

1408624

<https://www.phoenixcontact.com/us/products/1408624>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug angled M12, coding: D / IP67, on Plug angled M12, coding: D / IP67, cable length: Free input (0.2 ... 40.0 m)

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## NBC-M12MSD-M12FSD-PN/.../... - Network cable

1408617

<https://www.phoenixcontact.com/us/products/1408617>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Socket straight M12, coding: D / IP67, cable length: Free input (0.2 .. 40.0 m)

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## NBC-M12MSD-M12FRD-PN/.../... - Network cable

1408608

<https://www.phoenixcontact.com/us/products/1408608>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug straight M12, coding: D / IP67, on Socket angled M12, coding: D / IP67, cable length: Free input (0.2 .. 40.0 m)

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## NBC-M12MRD-M12FSD-PN/.../... - Network cable

1408616

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Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug angled M12, coding: D / IP67, on Socket straight M12, coding: D / IP67, cable length: Free input (0.2 ... 40.0 m)

## NBC-M12MSD/ 2,0-93C/M12MSD - Network cable

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## NBC-M12MRD-M12FRD-PN/.../... - Network cable

1408607

<https://www.phoenixcontact.com/us/products/1408607>



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded, Plug angled M12 SPEEDCON, coding: D / IP67, on Socket angled M12 SPEEDCON, coding: D / IP67, cable length: Free input (0.2 ... 40.0 m)

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

1430873

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



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

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## SAC-M12-EXCLIP-M - Locking clip

1558988

<https://www.phoenixcontact.com/us/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

<https://www.phoenixcontact.com/us/products/1208429>



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

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

1212224

<https://www.phoenixcontact.com/us/products/1212224>



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/us/products/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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## SAC BIT M12-D15 - Tool

1208432

<https://www.phoenixcontact.com/us/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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