

# NBC-M12MSD/ 5,0-93C/M12MSD - Network cable



1038749

<https://www.phoenixcontact.com/in/products/1038749>

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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: 5 m

## Commercial data

|                                      |                                |
|--------------------------------------|--------------------------------|
| Item number                          | 1038749                        |
| Packing unit                         | 1 pc                           |
| Minimum order quantity               | 1 pc                           |
| Note                                 | Made to order (non-returnable) |
| Sales key                            | BF1                            |
| Product key                          | AF1CJN                         |
| GTIN                                 | 4055626592930                  |
| Weight per piece (including packing) | 350 g                          |
| Weight per piece (excluding packing) | 428.1 g                        |
| Customs tariff number                | 85444290                       |
| Country of origin                    | PL                             |

## 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

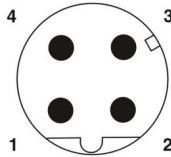
|                                         |                       |
|-----------------------------------------|-----------------------|
| Nominal voltage $U_N$                   | 48 V AC               |
|                                         | 60 V DC               |
| Nominal current $I_N$                   | 4 A                   |
| Transmission medium                     | Copper                |
| Transmission characteristics (category) | CAT5 (IEC 11801:2002) |

### Material specifications

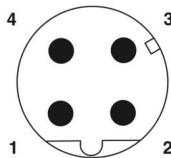
|                                        |    |
|----------------------------------------|----|
| Flammability rating according to UL 94 | V0 |
|----------------------------------------|----|

### Connector

|              |  |
|--------------|--|
| Connection 1 |  |
|--------------|--|

|                                        |                                                                                                                                                         |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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<br>PROFINET CAT5 (IEC 11801)                                                                                       |
| Insertion/withdrawal cycles            | ≥ 100                                                                                                                                                   |
| Insulation resistance                  | ≥ 100 MΩ                                                                                                                                                |
| Overvoltage category                   | II                                                                                                                                                      |
| Degree of pollution                    | 3                                                                                                                                                       |
| Tightening torque                      | 0.4 Nm                                                                                                                                                  |
| Material Contact                       | CuSn                                                                                                                                                    |
| Material Contact surface               | Ni/Au                                                                                                                                                   |
| Material Contact carrier               | PA 6.6                                                                                                                                                  |
| Material Screw connection              | Die-cast zinc, nickel-plated                                                                                                                            |
| Material Grip body                     | TPU, hardly inflammable, self-extinguishing                                                                                                             |
| Material Seal                          | FKM                                                                                                                                                     |
| Flammability rating according to UL 94 | V0                                                                                                                                                      |
| Degree of protection                   | IP65<br>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                                                                                                                             |

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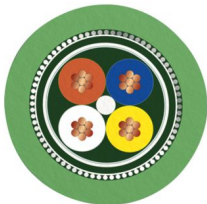
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|                                        |                                                                   |
|----------------------------------------|-------------------------------------------------------------------|
| Signal type/category                   | EtherCAT® CAT5 (IEC 11801), 100 Mbps<br>PROFINET CAT5 (IEC 11801) |
| Insertion/withdrawal cycles            | ≥ 100                                                             |
| Insulation resistance                  | ≥ 100 MΩ                                                          |
| Overvoltage category                   | II                                                                |
| Degree of pollution                    | 3                                                                 |
| Tightening torque                      | 0.4 Nm                                                            |
| Material Contact                       | CuSn                                                              |
| Material Contact surface               | Ni/Au                                                             |
| Material Contact carrier               | PA 6.6                                                            |
| Material Screw connection              | Die-cast zinc, nickel-plated                                      |
| Material Grip body                     | TPU, hardly inflammable, self-extinguishing                       |
| Material Seal                          | FKM                                                               |
| Flammability rating according to UL 94 | V0                                                                |
| Degree of protection                   | IP65<br>IP67                                                      |
| Ambient temperature (operation)        | -25 °C ... 85 °C                                                  |
| Standard designation                   | M12 connector                                                     |
| Standards/regulations                  | IEC 61076-2-101                                                   |

## Cable/line

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

### PROFINET drag chain CAT5 [93C]

|                                 |                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------|
| Dimensional drawing             |  |
| Cable weight                    | 61 kg/km                                                                             |
| 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 mm²                                                                          |
| Wire diameter incl. insulation  | 1.5 mm                                                                               |
| External cable diameter         | 6.50 mm ±0.2 mm                                                                      |
| Outer sheath, material          | PUR                                                                                  |

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|                                               |                                                                                                                                       |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| External sheath, color                        | green RAL 6018                                                                                                                        |
| 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                         | $\geq 500 \text{ M}\Omega \cdot \text{km}$                                                                                            |
| Coupling resistance                           | $\leq 20.00 \text{ m}\Omega/\text{m}$ (at 10 MHz)                                                                                     |
| Loop resistance                               | $\leq 120.00 \text{ }\Omega/\text{km}$                                                                                                |
| Wave impedance                                | $100 \text{ }\Omega \pm 15 \text{ }\Omega$ (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                                                                                                                                 |
| Dynamic load capacity (bending)               | 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                              | $\leq 150 \text{ N}$                                                                                                                  |
| Dynamic load capacity (torsion)               | Torsion: $\pm 30 \text{ }^\circ/\text{m}$                                                                                             |
| 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                                                                                                            |
|                                               | in accordance with UN ECE-R 118.03                                                                                                    |
| 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 |

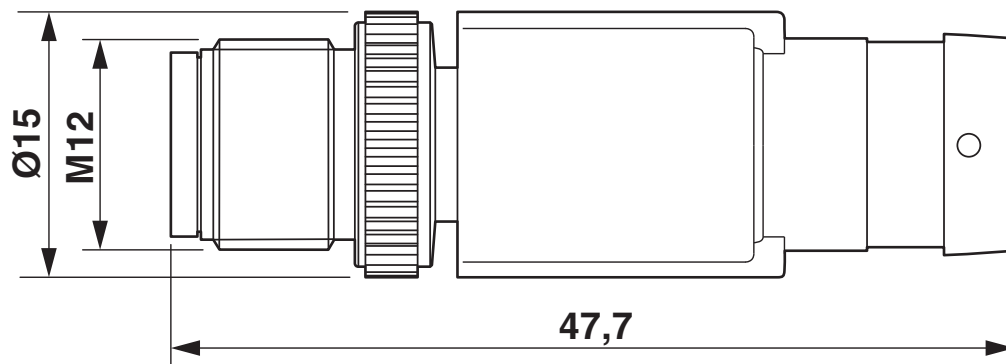
## Standards and regulations

### M12

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

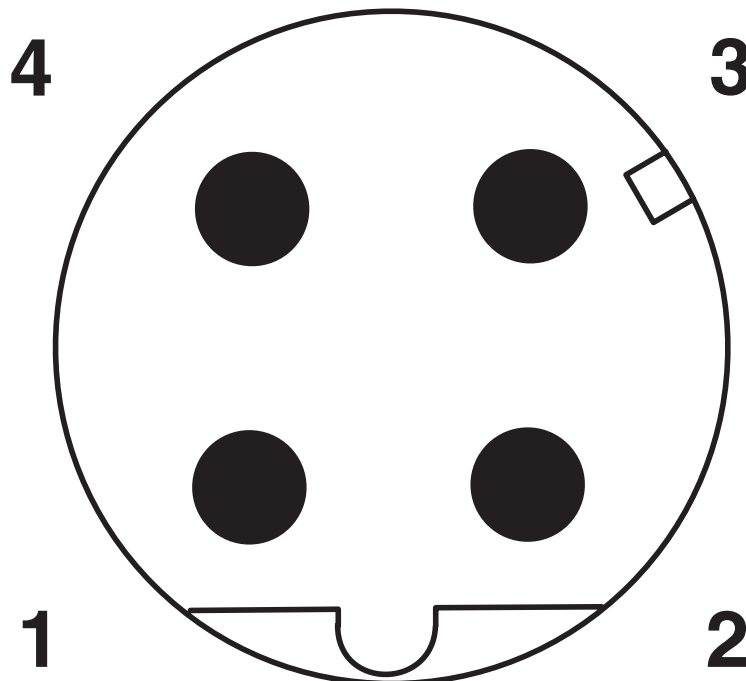
## Drawings

Dimensional drawing



Plug, M12 x 1, straight, shielded

Schematic diagram

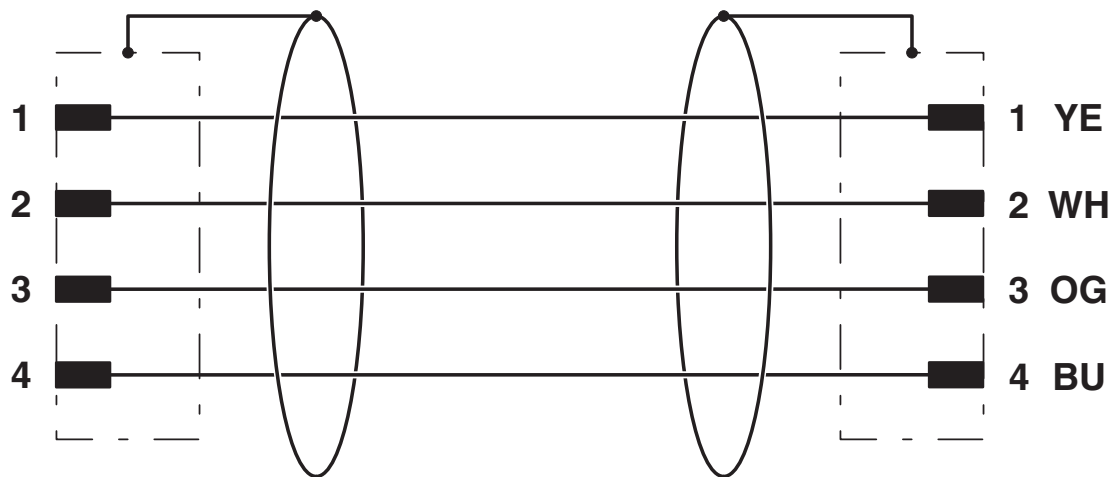


Pin assignment M12 male connector, 4-pos., D-coded, male side

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Circuit diagram



Contact assignment of the M12 plugs

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/in/products/1038749>

|  <b>cULus Listed</b><br>Approval ID: E335024 | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                               | 250 V                 | 4 A                   | -                 | -                           |

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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 |
|-------------|----------|

Environmental product compliance

|                                         |                                          |
|-----------------------------------------|------------------------------------------|
| EU RoHS                                 |                                          |
| Fulfills EU RoHS substance requirements | Yes, No exemptions                       |
| 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/in/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 m .. 85.0 m)

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

1408625

<https://www.phoenixcontact.com/in/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 / IP67, cable length: Free input (0.2 m ... 85.0 m)

## NBC-M12MSD/ 5,0-93C/M12MSD - Network cable

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

1408624

<https://www.phoenixcontact.com/in/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 m ... 85.0 m)

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

1408617

<https://www.phoenixcontact.com/in/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 m ... 85.0 m)

## NBC-M12MSD/ 5,0-93C/M12MSD - Network cable

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

1408608

<https://www.phoenixcontact.com/in/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 / IP67, cable length: Free input (0.2 m ... 85.0 m)

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

1408616

<https://www.phoenixcontact.com/in/products/1408616>



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 m .. 85.0 m)

## NBC-M12MSD/ 5,0-93C/M12MSD - Network cable

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

1408607

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



Network cable, PROFINET CAT5 (100 Mbps), EtherCAT® CAT5 (100 Mbps), 4-position, shielded (Advanced Shielding Technology), Plug angled M12, coding: D / IP67, on Socket angled M12, coding: D / IP67, cable length: Free input (0.2 m .. . 85.0 m)

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## 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

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## 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

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



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

## NBC-M12MSD/ 5,0-93C/M12MSD - Network cable

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

1212224

<https://www.phoenixcontact.com/in/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/in/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/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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PHOENIX CONTACT (I) Pvt. Ltd.

A-58/2, Okhla Industrial Area, Phase - II, New Delhi-110 020

+91.1275.71420

[info@phoenixcontact.co.in](mailto:info@phoenixcontact.co.in)