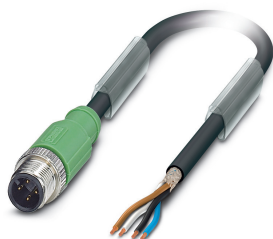


## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

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Sensor/actuator cable, 4-position, Variable cable type, shielded, Plug straight M12, coding: A, on free cable end, cable length: Free input (0.2 ... 40.0 m)

### Your advantages

- ✓ Easy and safe: 100% electrically tested plug-in components
- ✓ Flexible solutions - configurable materials with variable cable types and cable lengths
- ✓ Reliable signal transmission – 360° shielding in environments with electromagnetic interference



### Key Commercial Data

|              |      |
|--------------|------|
| Packing unit | 1 pc |
|--------------|------|

### Technical data

#### Dimensions

|  |                             |
|--|-----------------------------|
| Length of cable                            | Free input (0.2 ... 40.0 m) |
| Stripping length of the free conductor end | 50 mm                       |

#### Ambient conditions

|                                 |                                  |
|---------------------------------|----------------------------------|
| Ambient temperature (operation) | -25 °C ... 90 °C (Plug / socket) |
|                                 | -25 °C ... 90 °C (Plug / socket) |
| Degree of protection            | IP65                             |
|                                 | IP67                             |

#### General

|                       |                               |
|-----------------------|-------------------------------|
| Rated current at 40°C | 4 A                           |
| Rated voltage         | 48 V AC                       |
|                       | 60 V DC                       |
| Number of positions   | 4                             |
| Insulation resistance | ≥ 100 MΩ                      |
| Coding                | A - standard                  |
| Standards/regulations | M12 connector IEC 61076-2-101 |
| Status display        | No                            |

# Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

## Technical data

### General

|                              |                        |
|------------------------------|------------------------|
| Protective circuit/component | unwired                |
| Overvoltage category         | II                     |
| Degree of pollution          | 3                      |
| Insertion/withdrawal cycles  | ≥ 100                  |
| Torque                       | 0.4 Nm (M12 connector) |

### Material

|  |   |
|--|---|
| Flammability rating according to UL 94 | HB  |
| Contact material                       | CuSn  |
| Contact surface material               | Ni/Au                                       |
| Contact carrier material               | TPU GF                                      |
| Material of grip body                  | TPU, hardly inflammable, self-extinguishing |
| Material, knurls                       | Zinc die-cast, nickel-plated                |

### Line characteristics

|      |   |
|------|---|
| Note | This item is a sensor/actuator cable with a freely selectable cable type. The technical data for all possible cable types is listed in the table below. |
|------|---|

### Standards and Regulations

|  |                               |
|--|-------------------------------|
| Standards/specifications               | M12 connector IEC 61076-2-101 |
| Flammability rating according to UL 94 | HB                            |
| Standards/specifications               | M12 connector IEC 61076-2-101 |

### PUR halogen-free black [PUR]

|   |                                       |
|---|---------------------------------------|
| Cable type                                    | PUR halogen-free black                |
| Cable type (abbreviation)                     | PUR                                   |
| Cable abbreviation                            | Li9Y-V1-C-V1-11Y                      |
| UL AWM style                                  | 20549 / 10493 (80°C/300 V)            |
| Conductor cross section                       | 4x 0.34 mm <sup>2</sup> (Signal line) |
| AWG signal line                               | 22                                    |
| Conductor structure signal line               | 42x 0.10 mm                           |
| Core diameter including insulation            | 1.27 mm ±0.02 mm (Signal line)        |
| Thickness, insulation                         | ≥ 0.21 mm                             |
| Wire colors                                   | brown, white, blue, black             |
| Overall twist                                 | 4 wires, twisted                      |
| Shielding                                     | Tinned copper braided shield          |
| Optical shield covering                       | 80 %                                  |
| External sheath, color                        | black-gray RAL 7021                   |
| Outer sheath thickness                        | approx. 0.5 mm                        |
| External cable diameter D                     | 4.95 mm ±0.2 mm                       |
| Minimum bending radius, fixed installation    | 5 x D                                 |
| Minimum bending radius, flexible installation | 10 x D                                |
| Number of bending cycles                      | 10000000                              |

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Technical data

#### PUR halogen-free black [PUR]

|   |   |
|---|---|
| Minimum bending radius, drag chain applications | 10 x D  |
| Traversing path                                 | 10 m  |
| Traversing rate                                 | 3 m/s   |
| Acceleration                                    | 10 m/s <sup>2</sup>   |
| Cable weight                                    | 36 kg/km  |
| Outer sheath, material                          | PUR   |
| Material conductor insulation                   | PP  |
| Conductor material                              | Bare Cu litz wires  |
| Insulation resistance                           | ≥ 100 GΩ*km (at 20 °C)  |
| Conductor resistance                            | max. 58 Ω/km (at 20 °C)   |
| Cable capacity                                  | ≤ 80 pF/m (Conductor-Conductor)                                     |
|   | ≤ 135 pF/m (Wire/shield)  |
| Wave impedance                                  | ≥ 62 Ω (f = 10 MHz)   |
| Conductor inductance                            | approx. 0.75 mH/km (f = 1 kHz)                                      |
| Nominal voltage, cable                          | ≤ 300 V   |
| Test voltage, cable                             | ≥ 3000 V  |
| Special properties                              | Flexible cable conduit capable                                      |
|   | Silicone-free   |
|   | Free of substances which would hinder coating with paint or varnish |
|   | Low adhesion surface  |
| Other resistance                                | Highly resistant to acids, alkaline solutions and solvents          |
|   | hydrolysis and microbe resistant                                    |
|   | Resistant to salt water   |
|   | partly UV-resistant in accordance with DIN EN ISO 4892-2-A          |
|   | abrasion-resistant  |
| Flame resistance                                | in accordance with UL 758/1581 FT2                                  |
|   | DIN EN 60332-2-2 (20 s)   |
| Halogen-free                                    | in accordance with DIN VDE 0472 part 815                            |
|   | in accordance with DIN EN 50267-2-1                                 |
| Resistance to oil                               | in accordance with DIN EN 60811-2-1                                 |
| Ambient temperature (operation)                 | -40 °C ... 80 °C (cable, fixed installation)                        |
|   | -25 °C ... 80 °C (Cable, flexible installation)                     |

#### PUR halogen-free gray [280]

|                                 |                                       |
|---------------------------------|---------------------------------------|
| Cable type                      | PUR halogen-free gray                 |
| Cable type (abbreviation)       | 280                                   |
| Cable abbreviation              | Li9Y-V1-C-V1-11Y                      |
| UL AWM style                    | 20549 / 10493 (80°C/300 V)            |
| Conductor cross section         | 4x 0.34 mm <sup>2</sup> (Signal line) |
| AWG signal line                 | 22                                    |
| Conductor structure signal line | 42x 0.10 mm                           |

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Technical data

PUR halogen-free gray [280]

|   |   |
|---|---|
| Core diameter including insulation              | 1.27 mm ±0.02 mm (Signal line)                                      |
| Thickness, insulation                           | ≥ 0.21 mm   |
| Wire colors                                     | brown, white, blue, black   |
| Overall twist                                   | 4 wires, twisted  |
| Shielding                                       | Tinned copper braided shield  |
| Optical shield covering                         | 80 %  |
| External sheath, color                          | gray RAL 7001   |
| Outer sheath thickness                          | approx. 0.5 mm  |
| External cable diameter D                       | 4.95 mm ±0.2 mm   |
| Minimum bending radius, fixed installation      | 5 x D   |
| Minimum bending radius, flexible installation   | 10 x D  |
| Number of bending cycles                        | 10000000  |
| Minimum bending radius, drag chain applications | 10 x D  |
| Traversing path                                 | 10 m  |
| Traversing rate                                 | 3 m/s   |
| Acceleration                                    | 10 m/s <sup>2</sup>   |
| Cable weight                                    | 36 kg/km  |
| Outer sheath, material                          | PUR   |
| Material conductor insulation                   | PP  |
| Conductor material                              | Bare Cu litz wires  |
| Insulation resistance                           | ≥ 100 GΩ*km (at 20 °C)  |
| Conductor resistance                            | max. 58 Ω/km (at 20 °C)   |
| Cable capacity                                  | ≤ 80 pF/m (Conductor-Conductor)                                     |
|   | ≤ 135 pF/m (Wire/shield)  |
| Wave impedance                                  | ≥ 62 Ω (f = 10 MHz)   |
| Conductor inductance                            | approx. 0.75 mH/km (f = 1 kHz)                                      |
| Nominal voltage, cable                          | ≤ 300 V   |
| Test voltage, cable                             | ≥ 3000 V  |
| Special properties                              | Flexible cable conduit capable                                      |
|   | Silicone-free   |
|   | Free of substances which would hinder coating with paint or varnish |
|   | Low adhesion surface  |
| Other resistance                                | Highly resistant to acids, alkaline solutions and solvents          |
|   | hydrolysis and microbe resistant                                    |
|   | Resistant to salt water   |
|   | partly UV-resistant in accordance with DIN EN ISO 4892-2-A          |
|   | abrasion-resistant  |
| Flame resistance                                | in accordance with UL 758/1581 FT2                                  |
|   | DIN EN 60332-2-2 (20 s)   |
| Halogen-free                                    | in accordance with DIN VDE 0472 part 815                            |

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Technical data

#### PUR halogen-free gray [280]

|                                 |   |
|---------------------------------|---|
|                                 | in accordance with DIN EN 50267-2-1             |
| Resistance to oil               | in accordance with DIN EN 60811-2-1             |
| Ambient temperature (operation) | -40 °C ... 80 °C (cable, fixed installation)    |
|                                 | -25 °C ... 80 °C (Cable, flexible installation) |

#### PVC black [PVC]

|                                    |   |
|------------------------------------|---|
| Cable type                         | PVC black   |
| Cable type (abbreviation)          | PVC   |
| Conductor cross section            | 4x 0.34 mm <sup>2</sup> (Signal line)                               |
| AWG signal line                    | 22  |
| Conductor structure signal line    | 42x 0.10 mm   |
| Core diameter including insulation | 1.4 mm ±0.02 mm   |
| Thickness, insulation              | ≥ 0.23 mm (Core insulation)   |
|                                    | ≥ 0.76 mm (Outer cable sheath)                                      |
| Wire colors                        | brown, white, blue, black   |
| Overall twist                      | 4 wires, twisted  |
| Shielding                          | Tinned copper braided shield  |
| Optical shield covering            | 85 %  |
| External sheath, color             | black RAL 9005  |
| External cable diameter D          | 5.9 mm ±0.2 mm  |
| Cable weight                       | 52 kg/km  |
| Outer sheath, material             | PVC   |
| Material conductor insulation      | PVC   |
| Conductor material                 | Bare Cu litz wires  |
| Insulation resistance              | ≥ 100 MΩ*km (at 20 °C)  |
| Conductor resistance               | max. 58 Ω/km (at 20 °C)   |
| Nominal voltage, cable             | ≤ 300 V   |
| Test voltage, cable                | ≥ 3000 V  |
| Special properties                 | Free of substances which would hinder coating with paint or varnish |
|                                    | Silicone-free   |
| Flame resistance                   | As per UL-Style 2464  |
| Ambient temperature (operation)    | -25 °C ... 80 °C (cable, fixed installation)                        |
|                                    | -5 °C ... 80 °C (Cable, flexible installation)                      |

#### PVC gray [500]

|                                    |                             |
|------------------------------------|-----------------------------|
| Cable type                         | PVC gray                    |
| Cable type (abbreviation)          | 500                         |
| Conductor cross section            | 0.34 mm <sup>2</sup>        |
| AWG signal line                    | 22                          |
| Conductor structure signal line    | 42x 0.10 mm                 |
| Core diameter including insulation | 1.4 mm ±0.02 mm             |
| Thickness, insulation              | ≥ 0.23 mm (Core insulation) |

# Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

## Technical data

PVC gray [500]

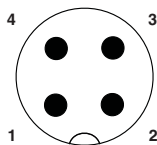
|                                 |   |
|---------------------------------|---|
|                                 | ≥ 0.76 mm (Outer cable sheath)                                      |
| Wire colors                     | brown, white, blue, black   |
| Overall twist                   | 4 wires, twisted  |
| Shielding                       | Tinned copper braided shield  |
| Optical shield covering         | 85 %  |
| External sheath, color          | gray RAL 7001   |
| External cable diameter         | 5.90 mm   |
| Cable weight                    | 57 kg/km  |
| Outer sheath, material          | PVC   |
| Material conductor insulation   | PVC   |
| Conductor material              | Bare Cu litz wires  |
| Insulation resistance           | ≥ 1 GΩ*km   |
| Conductor resistance            | max. 58 Ω/km  |
| Nominal voltage, cable          | 300 V   |
| Test voltage, cable             | 3000 V  |
| Special properties              | Free of substances which would hinder coating with paint or varnish |
|                                 | Silicone-free   |
| Ambient temperature (operation) | -25 °C ... 80 °C (cable, fixed installation)                        |
|                                 | -5 °C ... 80 °C (Cable, flexible installation)                      |

## Environmental Product Compliance

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

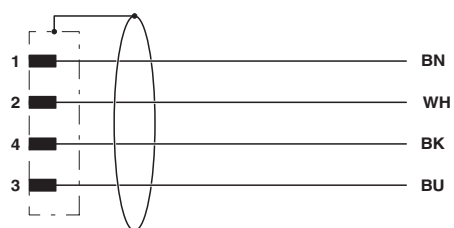
## Drawings

Schematic diagram



Pin assignment M12 plug, 4-pos., A-coded, view plug side

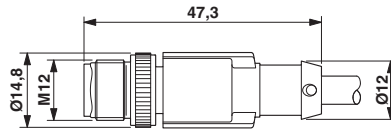
Circuit diagram



Contact assignment of the M12 plug

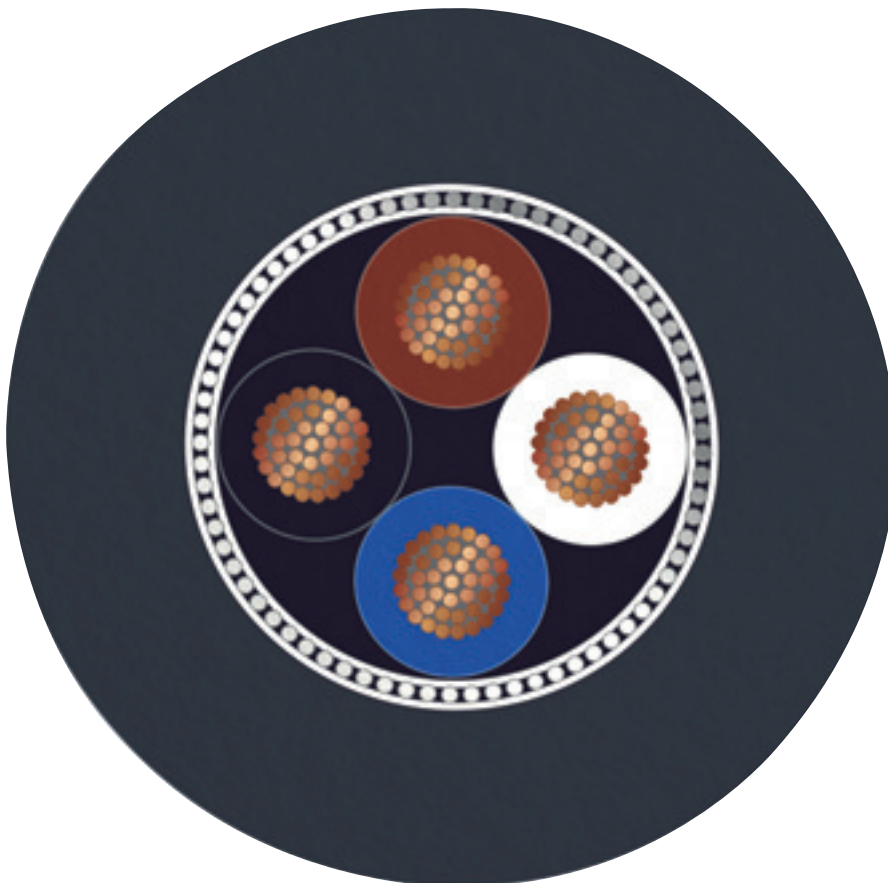
## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

Dimensional drawing



Plug, M12 x 1, straight, shielded

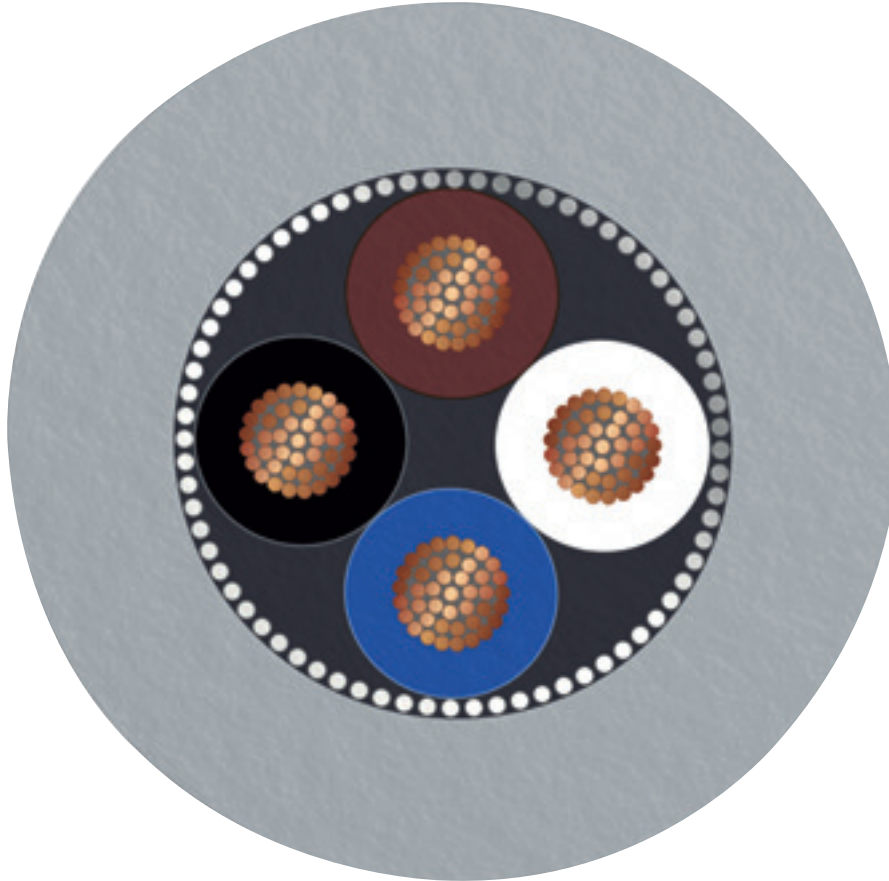
Cable cross section



PUR halogen-free black [PUR]

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

Cable cross section

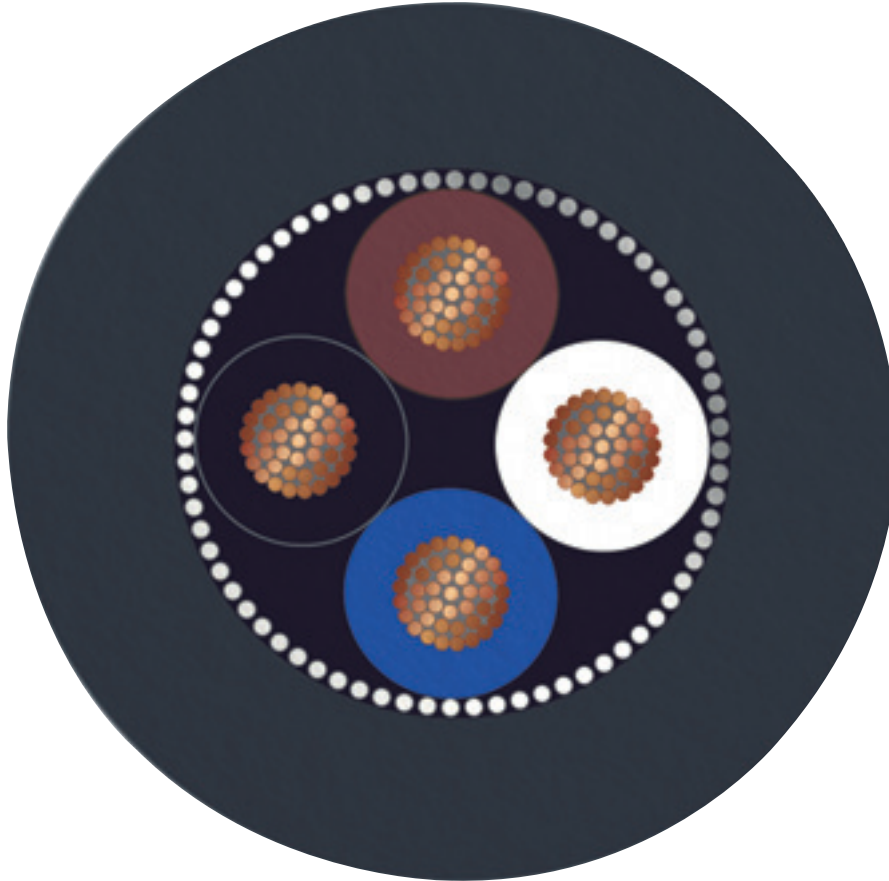


PUR halogen-free gray [280]



## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

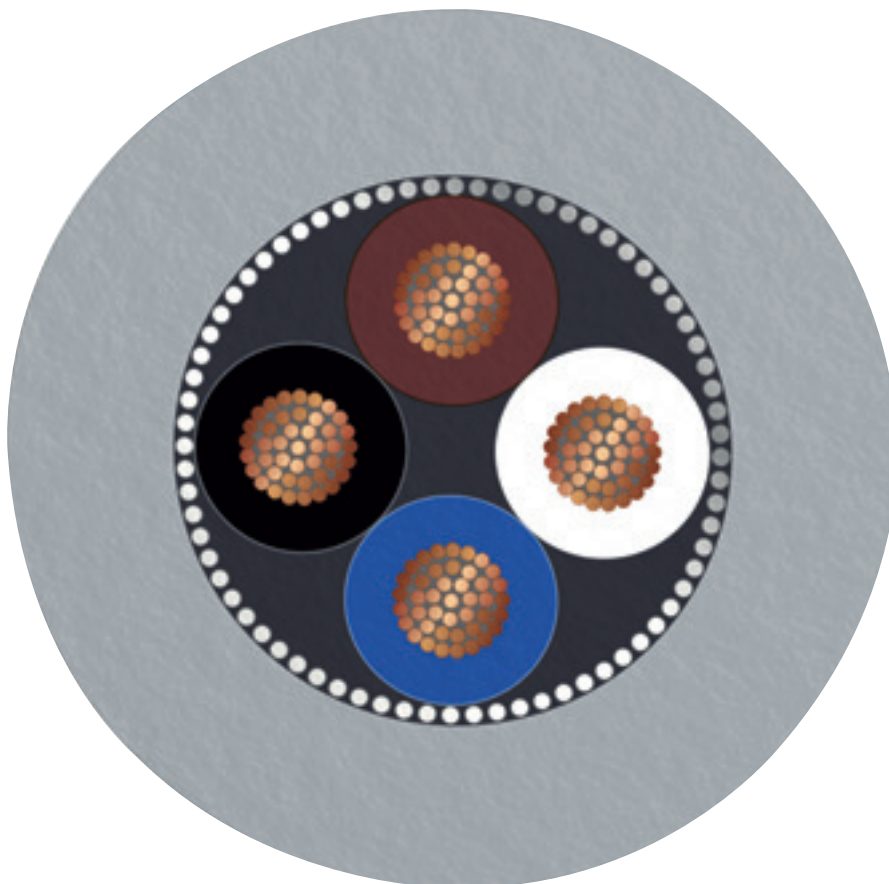
Cable cross section



PVC black [PVC]

# Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

Cable cross section



PVC gray [500]

## Classifications

eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27060311 |
| eCl@ss 11.0   | 27060311 |
| eCl@ss 4.0    | 27060300 |
| eCl@ss 4.1    | 27060300 |
| eCl@ss 5.0    | 27061800 |
| eCl@ss 5.1    | 27061800 |
| eCl@ss 6.0    | 27279200 |
| eCl@ss 7.0    | 27279218 |
| eCl@ss 9.0    | 27060311 |

ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC000830 |
|----------|----------|

# Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

## Classifications

### ETIM

|          |          |
|----------|----------|
| ETIM 3.0 | EC001855 |
| ETIM 4.0 | EC001855 |
| ETIM 6.0 | EC001855 |
| 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 19.0   | 31251501 |
| UNSPSC 20.0   | 31251501 |
| UNSPSC 21.0   | 31251501 |

## Approvals

### Approvals

#### Approvals

UL Listed / cUL Listed / EAC-RoHS / EAC / cULus Listed

#### Ex Approvals

### Approval details

|                    |  |   |               |
|--------------------|--|---|---------------|
| 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 221474 |
| Nominal voltage UN |  | 300 V   |               |
| Nominal current IN |  | 4 A   |               |

|                    |  |   |               |
|--------------------|--|---|---------------|
| cUL 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 221474 |
| Nominal voltage UN |  | 300 V   |               |
| Nominal current IN |  | 4 A   |               |

# Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

## Approvals

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

|     |  |                          |
|-----|--|--------------------------|
| EAC |  | RU C-<br>DE.BL08.B.00286 |
|-----|--|--------------------------|

|              |  |  |
|--------------|--|--|
| cULus Listed |  |  |
|--------------|--|--|

## Accessories

### Accessories

#### Conductor marking

Insert label - PABA WH/23 - 1013779



Insert label, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, mounting type: thread on, cable diameter range: 1.5 ... 35 mm, lettering field size: 23 x 4 mm, Number of individual labels: 20

Insert label - PABA YE/23 - 1013782



Insert label, Strip, yellow, unlabeled, can be labeled with: CMS-P1-PLOTTER, mounting type: thread on, cable diameter range: 1.5 ... 35 mm, lettering field size: 23 x 4 mm, Number of individual labels: 20

#### Corrugated pipe

Protective hose - WP-PA HF 13,0 BK - 3240681



Polyamide protective hose, inflammability class V0, UV resistant

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Accessories

Protective hose - WP-PA HF-HB 13,0 BK - 3240839



Polyamide protective hose, inflammability class HB, UV resistant

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### Cutting tools

Diagonal cutter - CUTFOX-S VDE - 1212207



Diagonal cutter for hard (piano wire) and soft wires, VDE 1000 V AC/1500 V DC tested

---

### Marker pen

Marker pen - B-STIFT - 1051993



Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm

---

### 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 plugs

---

### 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

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Accessories

#### Screwdriver tools

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

---

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

#### Stripping tool

Stripping tool - WIREFOX SAC-1 - 1212757



Stripping pliers, for halogen-free sensor/actuator cables (SAC cables), with PUR and PVC insulation, from  $\varnothing$  of 3.2 to 4.4 mm, any stripping length

---

Stripping tool - WIREFOX SAC - 1212623



Stripping pliers, for halogen-free sensor/actuator cables (SAC cables), with PUR and PVC insulation, from  $\varnothing$  of 4.4 to 7 mm, any stripping length

---

Stripping tool - WIREFOX 10 - 1212150



Stripping tool, for cables and conductors from 0.02 - 10 mm<sup>2</sup>, self-adjusting, stripping length of up to 18 mm, cutting capacity of up to 10 mm<sup>2</sup> stranded/1.5 mm<sup>2</sup> solid, replaceable stripping blade

#### Torque tool

## Sensor/actuator cable - SAC-4P-M12MS SH/.../... - 1697467

### Accessories

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

---

Protective hose adapter - WP-CTA POM 13,0 BK - 1422884



Protective hose adapter, for corrugated hoses with a nominal size of 13 (10 x 13), corrugated in parallel

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