

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

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Sensor/actuator cable, 3-position, Variable cable type, shielded, Plug angled 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          | 3                             |
| Insulation resistance        | ≥ 100 MΩ                      |
| Coding                       | A - standard                  |
| Standards/regulations        | M12 connector IEC 61076-2-101 |
| Status display               | No                            |
| Protective circuit/component | unwired                       |
| Overvoltage category         | II                            |
| Degree of pollution          | 3                             |
| Insertion/withdrawal cycles  | ≥ 100                         |

# Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

## Technical data

### General

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

### PUR/PVC shielded, gray [100]

|   |                                |
|---|--------------------------------|
| Cable type                                    | PUR/PVC shielded, gray         |
| Cable type (abbreviation)                     | 100                            |
| Cable abbreviation                            | LiYV1CY11Y                     |
| 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            | 1.5 mm ±0.05 mm                |
| Thickness, insulation                         | ≥ 0.23 mm (Core insulation)    |
|   | ≥ 0.38 mm (Outer cable sheath) |
|   | approx. 0.3 mm (Inner sheath)  |
| Wire colors                                   | brown, blue, black             |
| Overall twist                                 | 3 wires, twisted               |
| Shielding                                     | Braided copper wires           |
| Optical shield covering                       | 85 %                           |
| External sheath, color                        | gray RAL 7001                  |
| External cable diameter D                     | 5.2 mm ±0.2 mm                 |
| Smallest bending radius, fixed installation   | 52 mm                          |
| Smallest bending radius, movable installation | 52 mm                          |
| Number of bending cycles                      | 2000000                        |
| Bending radius                                | 52 mm                          |
| Traversing path                               | 5 m                            |
| Traversing rate                               | 3 m/s                          |
| Cable weight                                  | 38 kg/km                       |
| Outer sheath, material                        | PUR                            |

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

### Technical data

#### PUR/PVC shielded, gray [100]

|                                 |   |
|---------------------------------|---|
| Material, inner sheath          | PVC   |
| Material conductor insulation   | PVC   |
| Conductor material              | Bare Cu litz wires                                    |
| Insulation resistance           | $\geq 100 \text{ M}\Omega \cdot \text{km}$ (at 20 °C) |
| Conductor resistance            | max. 58 $\Omega/\text{km}$ (at 20 °C)                 |
| Nominal voltage, cable          | $\leq 300 \text{ V}$                                  |
| Test voltage, cable             | $\geq 3000 \text{ V}$                                 |
| Test voltage Core/Shield        | $\geq 2000 \text{ V}$                                 |
| 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 $\pm 0.02$ mm                                |
| Thickness, insulation              | $\geq 0.23$ mm (Core insulation)                    |
|                                    | $\geq 0.76$ mm (Outer cable sheath)                 |
| Wire colors                        | brown, blue, black                                  |
| Overall twist                      | 3 wires, twisted                                    |
| Shielding                          | Tinned copper braided shield                        |
| Optical shield covering            | 85 %  |
| External sheath, color             | gray RAL 7001                                       |
| External cable diameter D          | 5.2 mm $\pm 0.2$ mm                                 |
| Cable weight                       | 40 kg/km  |
| Outer sheath, material             | PVC   |
| Material conductor insulation      | PVC   |
| Conductor material                 | Bare Cu litz wires                                  |
| Insulation resistance              | $\geq 1 \text{ G}\Omega \cdot \text{km}$ (at 20 °C) |
| Conductor resistance               | max. 58 $\Omega/\text{km}$ (at 20 °C)               |
| Nominal voltage, cable             | $\leq 300 \text{ V}$                                |
| Test voltage, cable                | $\geq 3000 \text{ V}$                               |
| Ambient temperature (operation)    | -25 °C ... 80 °C (cable, fixed installation)        |
|                                    | -5 °C ... 80 °C (cable, flexible installation)      |

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

|                           |                        |
|---------------------------|------------------------|
| Cable type                | PUR halogen-free black |
| Cable type (abbreviation) | PUR                    |
| Cable abbreviation        | Li9Y-VI-C-VI-11Y       |
| UL AWM style              | 20549                  |

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

### Technical data

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

|   |   |
|---|---|
| Conductor cross section                       | 3x 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 (Core insulation)   |
|   | approx. 0.5 mm (Outer cable sheath)                                 |
| Wire colors                                   | brown, blue, black  |
| Overall twist                                 | 3 wires, twisted  |
| Shielding                                     | Braided copper wires  |
| Optical shield covering                       | 80 %  |
| External sheath, color                        | black-gray RAL 7021   |
| External cable diameter D                     | 4.65 mm ±0.15 mm  |
| Smallest bending radius, fixed installation   | 23 mm   |
| Smallest bending radius, movable installation | 47 mm   |
| Number of bending cycles                      | 10000000  |
| Bending radius                                | 47 mm   |
| Traversing path                               | 10 m  |
| Traversing rate                               | 3 m/s   |
| Acceleration                                  | 10 m/s <sup>2</sup>   |
| Cable weight                                  | 31 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)   |
| 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 |
| Other resistance                              | Highly resistant to acids, alkaline solutions and solvents          |
|   | hydrolysis and microbe resistant                                    |
|   | partly UV-resistant in accordance with DIN EN ISO 4892-2-A          |
| 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                            |
| 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 shielded black [PVC]

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

### Technical data

#### PVC shielded black [PVC]

|                                    |  |
|------------------------------------|--|
| Cable type                         | PVC shielded black                             |
| Cable type (abbreviation)          | PVC  |
| Conductor cross section            | 3x 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)                    |
|                                    | ≥ 0.76 mm (Outer cable sheath)                 |
| Wire colors                        | brown, blue, black                             |
| Overall twist                      | 3 wires, twisted                               |
| Shielding                          | Tinned copper braided shield                   |
| Optical shield covering            | 85 %   |
| External sheath, color             | black RAL 9005                                 |
| External cable diameter D          | 5.2 mm ±0.2 mm                                 |
| Cable weight                       | 40 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                                       |
| Flame resistance                   | As per UL-Style 2464                           |
| Ambient temperature (operation)    | -25 °C ... 80 °C (cable, fixed installation)   |
|                                    | -5 °C ... 80 °C (cable, flexible installation) |

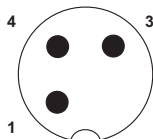
#### Environmental Product Compliance

|            |   |
|------------|---|
| REACH SVHC | Lead 7439-92-1  |
| China RoHS | Environmentally Friendly Use Period = 50 years  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

### Drawings

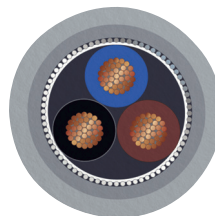
# Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

Schematic diagram



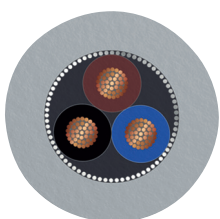
Pin assignment M12 plug, 3-pos., A-coded, view male side

Cable cross section



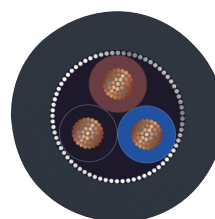
PUR/PVC shielded, gray [100]

Cable cross section



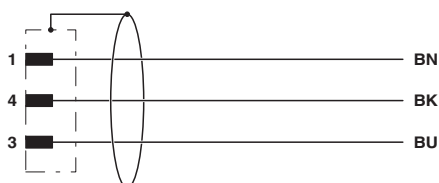
PVC gray [500]

Cable cross section



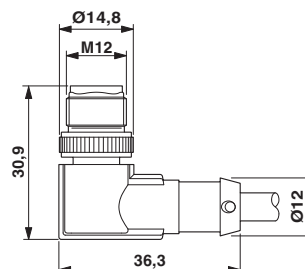
PVC shielded black [PVC]

Circuit diagram



Contact assignment of the M12 plugs

Dimensional drawing



M12 x 1 male plug, angled, shielded

## 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 |

# Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

## Classifications

### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC000830 |
| 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-3P-M12MR SH/.../... - 1697438

## 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-3P-M12MR SH/.../... - 1697438

### 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

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### 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

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### 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

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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

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

### 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

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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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#### 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

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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

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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

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#### Torque tool

## Sensor/actuator cable - SAC-3P-M12MR SH/.../... - 1697438

### 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

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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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