

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



Sensor/actuator cable, 5-position, Variable cable type, Plug straight M12, coding: A, with 3 LEDs, on Socket angled M12, coding: A, with 3 LEDs, cable length: Free input (0.2 ... 40.0 m)

## Your advantages

- Easy and safe: 100 % electrically tested plug-in components
- Convenient: increased machine availability thanks to quick and easy diagnostics

## Commercial data

|                        |                                |
|------------------------|--------------------------------|
| Item number            | 1697166                        |
| Packing unit           | 1 pc                           |
| Minimum order quantity | 1 pc                           |
| Note                   | Made to order (non-returnable) |
| Sales key              | BF17                           |
| Product key            | AF1CDA                         |
| Customs tariff number  | 85444290                       |
| Country of origin      | PL                             |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

## Technical data

### Product properties

|                      |                        |
|----------------------|------------------------|
| Product type         | Sensor/actuator cable  |
| Application          | Standard               |
|                      | Robots and drag chains |
| Number of positions  | 5                      |
| No. of cable outlets | 1                      |
| Shielded             | no                     |
| Coding               | A                      |

### Insulation characteristics

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Degree of pollution  | 3  |

### Material specifications

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

### Electrical properties

|                       |                            |
|-----------------------|----------------------------|
| Insulation resistance | $\geq 100 \text{ M}\Omega$ |
| Nominal voltage $U_N$ | 24 V DC                    |
| Nominal current $I_N$ | 4 A                        |

### Mechanical properties

#### Mechanical data

|                             |            |
|-----------------------------|------------|
| Insertion/withdrawal cycles | $\geq 100$ |
|-----------------------------|------------|

### Signaling

|                        |        |
|------------------------|--------|
| Status display         | 3 LEDs |
| Status display present | yes    |

### Connection data

#### Conductor connection

|                   |                        |
|-------------------|------------------------|
| Tightening torque | 0.4 Nm (M12 connector) |
|-------------------|------------------------|

### Connector

#### Connection 1

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                     |                   |
|---------------------|-------------------|
| Type                | Plug straight M12 |
| Number of positions | 5                 |
| Coding type         | A                 |

## Connection 2

|                     |                   |
|---------------------|-------------------|
| Type                | Socket angled M12 |
| Number of positions | 5                 |
| Coding type         | A                 |

## Cable/line

|              |                             |
|--------------|-----------------------------|
| Cable length | Free input (0.2 ... 40.0 m) |
|--------------|-----------------------------|

### PUR halogen-free black [PUR]

|   |  |
|---|--|
| Cable weight                                  | 33 kg/km   |
| UL AWM Style                                  | 20549  |
| Number of positions                           | 5  |
| Shielded                                      | no   |
| Cable type                                    | PUR halogen-free black [PUR]<br>PUR halogen-free black PUR   |
| Conductor structure signal line               | 42x 0.10 mm  |
| AWG signal line                               | 22   |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup> (Signal line)  |
| Wire diameter incl. insulation                | 1.27 mm 0.05 mm (Signal line)  |
| External cable diameter                       | 4.55 mm ±0.15 mm   |
| Outer sheath, material                        | PUR  |
| External sheath, color                        | black-gray RAL 7021  |
| Conductor material                            | Bare Cu litz wires   |
| Material wire insulation                      | PP   |
| Single wire, color                            | brown, white, blue, black, green-yellow  |
| Thickness, insulation                         | approx. 0.50 mm  |
| Max. conductor resistance                     | max. 58 Ω/km (at 20 °C)  |
| Insulation resistance                         | ≥ 16 GΩ*km (at 20 °C)  |
| Nominal voltage, cable                        | 300 V  |
| Test voltage                                  | 3000 V   |
| Smallest bending radius, fixed installation   | 23 mm  |
| Smallest bending radius, movable installation | 46 mm  |
| Dynamic load capacity (bending)               | Max. bending cycles: 10000000, Bending radius: 46 mm, Bending radius: 10 x D, Traversing path: 10 m, Traversing rate: 3 m/s, Acceleration: 10 m/s <sup>2</sup> |
| Dynamic load capacity (torsion)               | Torsion: ±180 °/m, Torsion cycles: ≥5000000, Torsional frequency: 35 cycles/min.   |
| Halogen-free                                  | in accordance with DIN VDE 0472 part 815   |
| Flame resistance                              | in accordance with UL 758/1581 FT2<br>DIN EN 60332-2-2 (20 s)  |
| Resistance to oil                             | in accordance with DIN EN 60811-2-1  |
|   | Highly resistant to acids, alkaline solutions and solvents   |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                                 |   |
|---------------------------------|---|
| Other resistance                | hydrolysis and microbe resistant                                    |
|                                 | Resistant to salt water   |
|                                 | partly UV-resistant (in accordance with DIN EN ISO 4892-2-A)        |
| Special properties              | Flexible cable conduit capable                                      |
|                                 | Silicone-free   |
|                                 | Free of substances which would hinder coating with paint or varnish |
|                                 | flexible  |
| Ambient temperature (operation) | -40 °C ... 80 °C (cable, fixed installation)                        |
|                                 | -25 °C ... 80 °C (Cable, flexible installation)                     |

## PUR halogen-free gray [280]

|                         |                             |
|-------------------------|-----------------------------|
| Shielded                | no                          |
| Cable type              | PUR halogen-free gray [280] |
|                         | PUR halogen-free gray 280   |
| External cable diameter | 4.60 mm                     |

## PUR, black, 5th conductor gray [115]

|   |                                      |
|---|--------------------------------------|
| Cable weight                                  | 35 kg/km                             |
| UL AWM Style                                  | 20549 / 10493 (80°C/300 V)           |
| Number of positions                           | 5                                    |
| Shielded                                      | no                                   |
| Cable type                                    | PUR, black, 5th conductor gray [115] |
|   | PUR, black, 5th conductor gray 115   |
| Conductor structure signal line               | 42x 0.10 mm                          |
| AWG signal line                               | 22                                   |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup>              |
| Wire diameter incl. insulation                | 1.27 mm ±0.02 mm                     |
| External cable diameter                       | 5.00 mm ±0.15 mm                     |
| Outer sheath, material                        | PUR                                  |
| External sheath, color                        | black-gray RAL 7021                  |
| Conductor material                            | Bare Cu litz wires                   |
| Material, filler                              | PP                                   |
| Material wire insulation                      | PP                                   |
| Single wire, color                            | brown, white, blue, black, gray      |
| Thickness, insulation                         | ≥ 0.21 mm                            |
| Thickness, outer sheath                       | approx. 0.70 mm                      |
| Overall twist                                 | 5 cores, twisted                     |
| Max. conductor resistance                     | ≤ 58 Ω/km                            |
| Nominal voltage, cable                        | ≤ 300 V                              |
| Test voltage                                  | ≥ 3000 V                             |
| Minimum bending radius, fixed installation    | 5 x D                                |
| Minimum bending radius, flexible installation | 10 x D                               |
| Smallest bending radius, fixed installation   | 25 mm                                |
| Smallest bending radius, movable installation | 50 mm                                |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                                 |  |
|---------------------------------|--|
| Dynamic load capacity (bending) | Max. bending cycles: 10000000, Bending radius: 50 mm, Traversing path: 10 m, Traversing rate: 3 m/s, Acceleration: 10 m/s <sup>2</sup> |
| Dynamic load capacity (torsion) | Torsion: ±180 °/m, Torsion cycles: ≥5000000, Torsional frequency: 35 cycles/min.   |
| Halogen-free                    | in accordance with DIN VDE 0472 part 815   |
| Flame resistance                | in accordance with DIN UL-Style 20549  |
|                                 | in accordance with UL 758/1581 FT2   |
| Resistance to oil               | in accordance with DIN EN 60811-2-1  |
| Other resistance                | partly UV-resistant (in accordance with DIN EN ISO 4892-2-A)   |
|                                 | hydrolysis and microbe resistant   |
|                                 | Resistant to salt water  |
|                                 | Low adhesion   |
| Special properties              | abrasion-resistant   |
|                                 | Flexible cable conduit capable   |
|                                 | Silicone-free  |
|                                 | Free of substances which would hinder coating with paint or varnish  |
| Ambient temperature (operation) | flexible   |
|                                 | -40 °C ... 80 °C (cable, fixed installation)   |
|                                 | -25 °C ... 80 °C (Cable, flexible installation)  |

## PUR irradiated halogen-free orange [150]

|   |   |
|---|---|
| Number of positions                         | 5   |
| Shielded                                    | no  |
| Cable type                                  | PUR irradiated halogen-free orange [150]                        |
|   | PUR irradiated halogen-free orange 150                          |
| Conductor structure signal line             | 42x 0.10 mm   |
| AWG signal line                             | 22  |
| Conductor structure, voltage supply         | 24x 0.15 mm   |
| AWG power supply                            | 20  |
| Conductor cross-section                     | 4x 0.34 mm <sup>2</sup> (Signal line)                           |
|   | 1x 0.5 mm <sup>2</sup> (PE connection)                          |
| External cable diameter                     | 5.20 mm ±0.2 mm   |
| Outer sheath, material                      | PUR   |
| External sheath, color                      | orange RAL 2003   |
| Conductor material                          | Bare Cu litz wires  |
| Material wire insulation                    | PE  |
| Single wire, color                          | brown, white, blue, black, green-yellow                         |
| Overall twist                               | 5 cores, twisted  |
| Max. conductor resistance                   | ≤ 57.5 Ω/km (with 0.34 mm <sup>2</sup> conductor cross-section) |
|   | ≤ 39 Ω/km (with 0.5 mm <sup>2</sup> conductor cross-section)    |
| Nominal voltage, cable                      | 250 V (AC)  |
| Test voltage                                | 2000 V (50 Hz, 5 minutes)                                       |
| Smallest bending radius, fixed installation | 20 mm   |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|   |  |
|---|--|
| Smallest bending radius, movable installation | 30 mm  |
| Dynamic load capacity (bending)               | Max. bending cycles: 5000000, Bending radius: 52 mm, Traversing path: 10 m, Traversing rate: 3 m/s |
| Halogen-free                                  | The cable is halogen-free  |
| Flame resistance                              | DIN VDE 0472 part 804, test type B   |
| Other resistance                              | hydrolysis and microbe resistant   |
|   | UV resistant   |
|   | Resistant to welding splashes  |
| Special properties                            | Silicone-free  |
|   | Irradiated   |
| Ambient temperature (operation)               | -50 °C ... 105 °C (cable, fixed installation)  |
|   | -40 °C ... 105 °C (Cable, flexible installation)   |

## PUR halogen-free orange [180]

|                                     |   |
|-------------------------------------|---|
| Cable weight                        | 36 kg/km                                |
| UL AWM Style                        | 20549                                   |
| Number of positions                 | 5                                       |
| Shielded                            | no                                      |
| Cable type                          | PUR halogen-free orange [180]           |
|                                     | PUR halogen-free orange 180             |
| Conductor structure signal line     | 42x 0.10 mm                             |
| AWG signal line                     | 22                                      |
| Conductor structure, voltage supply | 28x 0.15 mm                             |
| AWG power supply                    | 20                                      |
| Conductor cross-section             | 4x 0.34 mm <sup>2</sup> (Signal line)   |
|                                     | 1x 0.5 mm <sup>2</sup> (PE connection)  |
| Wire diameter incl. insulation      | 1.27 mm ±0.02 mm (Signal line)          |
|                                     | 1.46 mm ±0.02 mm (PE connection)        |
| External cable diameter             | 5.00 mm ±0.15 mm                        |
| Outer sheath, material              | PUR                                     |
| External sheath, color              | orange RAL 2003                         |
| Conductor material                  | Bare Cu litz wires                      |
| Material wire insulation            | PP                                      |
| Single wire, color                  | brown, white, blue, black, green-yellow |
| Thickness, insulation               | ≥ 0.21 mm (Signal line)                 |
|                                     | ≥ 0.21 mm (PE connection)               |
|                                     | approx. 0.65 mm (Outer cable sheath)    |
| Overall twist                       | 5 wires around filler to the core       |
| Max. conductor resistance           | ≤ 58 Ω/km (Signal line)                 |
|                                     | ≤ 39 Ω/km (PE connection)               |
| Insulation resistance               | ≥ 10 GΩ*km (at 20 °C)                   |
| Nominal voltage, cable              | ≤ 300 V                                 |
| Test voltage                        | ≥ 3000 V                                |
| Dynamic load capacity (bending)     | Max. bending cycles: 10000000           |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                                 |  |
|---------------------------------|--|
| Dynamic load capacity (torsion) | Torsion: $\pm 180$ °/m, Torsion cycles: $\geq 5000000$ , Torsional frequency: 35 cycles/min. |
| Halogen-free                    | in accordance with DIN VDE 0472 part 815   |
| Flame resistance                | in accordance with DIN UL-Style 20549  |
| Ambient temperature (operation) | -25 °C ... 80 °C (Cable)   |

## PUR halogen-free yellow [240]

|   |   |
|---|---|
| Cable weight                                  | 35 kg/km  |
| UL AWM Style                                  | 20549 / 10493 (80°C/300 V)  |
| Number of positions                           | 5   |
| Shielded                                      | no  |
| Cable type                                    | PUR halogen-free yellow [240]<br>PUR halogen-free yellow 240  |
| Conductor structure signal line               | 42x 0.10 mm   |
| AWG signal line                               | 22  |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup>   |
| Wire diameter incl. insulation                | 1.27 mm $\pm$ 0.02 mm   |
| External cable diameter                       | 5.00 mm $\pm$ 0.15 mm   |
| Outer sheath, material                        | PUR   |
| External sheath, color                        | yellow  |
| Conductor material                            | Bare Cu litz wires  |
| Material wire insulation                      | PP  |
| Single wire, color                            | brown, white, blue, black, green-yellow   |
| Thickness, insulation                         | $\geq$ 0.21 mm  |
| Thickness, outer sheath                       | approx. 0.70 mm   |
| Overall twist                                 | 5 wires around filler to the core   |
| Length of twist, overall twist                | 55 mm   |
| Max. conductor resistance                     | $\leq$ 58 $\Omega$ /km (at 20 °C)   |
| Nominal voltage, cable                        | $\leq$ 300 V  |
| Test voltage                                  | $\geq$ 3000 V   |
| Minimum bending radius, fixed installation    | 5 x D   |
| Minimum bending radius, flexible installation | 10 x D  |
| Smallest bending radius, fixed installation   | 25 mm   |
| Smallest bending radius, movable installation | 50 mm   |
| Dynamic load capacity (bending)               | Max. bending cycles: 10000000, Bending radius: 10 x D, Traversing path: 10 m, Traversing rate: 3 m/s, Acceleration: 10 m/s <sup>2</sup> |
| Dynamic load capacity (torsion)               | Torsion: $\pm 180$ °/m, Torsion cycles: $\geq 5000000$ , Torsional frequency: 35 cycles/min.  |
| Halogen-free                                  | in accordance with DIN VDE 0472 part 815  |
| Flame resistance                              | in accordance with DIN UL-Style 20549<br>in accordance with UL 758/1581 FT2   |
| Resistance to oil                             | in accordance with DIN EN 60811-2-1   |
| Other resistance                              | hydrolysis and microbe resistant<br>Resistant to salt water   |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                                 |   |
|---------------------------------|---|
| Ambient temperature (operation) | -40 °C ... 80 °C (cable, fixed installation)    |
|                                 | -25 °C ... 80 °C (Cable, flexible installation) |

## PUR halogen-free gray [280]

|                                     |  |
|-------------------------------------|--|
| Number of positions                 | 5  |
| Shielded                            | no   |
| Cable type                          | PUR halogen-free gray [280]                    |
|                                     | PUR halogen-free gray 280                      |
| Conductor structure signal line     | 42x 0.10 mm                                    |
| AWG signal line                     | 22   |
| Conductor structure, voltage supply | 28x 0.15 mm                                    |
| AWG power supply                    | 20   |
| Conductor cross-section             | 0.34 mm <sup>2</sup>                           |
| Wire diameter incl. insulation      | 1.55 mm (Signal line)                          |
|                                     | 1.65 mm (Protective conductor)                 |
| External cable diameter             | 5.2 mm   |
|                                     | 5.20 mm  |
| Outer sheath, material              | PUR  |
| External sheath, color              | gray RAL 7001                                  |
| Conductor material                  | Bare Cu litz wires                             |
| Material, filler                    | Fiberglass                                     |
| Material wire insulation            | TPE  |
| Single wire, color                  | brown, white, blue, black, green-yellow        |
| Thickness, insulation               | 0.39 mm (Signal line)                          |
|                                     | 0.37 mm (Protective conductor)                 |
|                                     | 0.65 mm (Outer cable sheath)                   |
| Overall twist                       | 5 wires around filler to the core              |
| Ambient temperature (operation)     | -40 °C ... 80 °C (cable, fixed installation)   |
|                                     | -5 °C ... 80 °C (Cable, flexible installation) |

## PVC black [PVC]

|                                 |                                       |
|---------------------------------|---------------------------------------|
| Cable weight                    | 51 kg/km                              |
| UL AWM Style                    | 2464 / 1729 (80°C/300 V)              |
| Number of positions             | 5                                     |
| Shielded                        | no                                    |
| Cable type                      | PVC black [PVC]                       |
|                                 | PVC black PVC                         |
| Conductor structure signal line | 19x 0.15 mm                           |
| AWG signal line                 | 22                                    |
| Conductor cross-section         | 5x 0.34 mm <sup>2</sup> (Signal line) |
| Wire diameter incl. insulation  | 1.26 mm ±0.05 mm                      |
| External cable diameter         | 5.00 mm ±0.15 mm                      |
| Outer sheath, material          | PVC                                   |
| External sheath, color          | black RAL 9005                        |
| Conductor material              | Bare Cu litz wires                    |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|   |   |
|---|---|
| Material wire insulation                      | PVC   |
| Single wire, color                            | brown, white, blue, black, green-yellow   |
| Thickness, insulation                         | ≥ 0.23 mm (Core insulation)   |
| Thickness, outer sheath                       | ≥ 0.76 mm   |
| Overall twist                                 | 5 wires around filler to the core   |
| Max. conductor resistance                     | max. 57 Ω/km (at 20 °C)   |
| Insulation resistance                         | ≥ 200 MΩ*km (at 20 °C)  |
| Nominal voltage, cable                        | ≤ 300 V   |
| Test voltage                                  | ≥ 3000 V  |
| Minimum bending radius, fixed installation    | 5 x D   |
| Minimum bending radius, flexible installation | 10 x D  |
| Smallest bending radius, fixed installation   | 25 mm   |
| Smallest bending radius, movable installation | 50 mm   |
| Flame resistance                              | UL VW-1   |
| Resistance to oil                             | in accordance with DIN EN 60811-2-1   |
| Ambient temperature (operation)               | -25 °C ... 80 °C (cable, fixed installation)<br>-10 °C ... 80 °C (Cable, flexible installation) |

## PVC gray [500]

|   |   |
|---|---|
| Cable weight                                  | 51 kg/km                                |
| UL AWM Style                                  | 2464 / 1729 (80°C/300 V)                |
| Number of positions                           | 5                                       |
| Shielded                                      | no                                      |
| Cable type                                    | PVC gray [500]<br>PVC gray 500          |
| Conductor structure signal line               | 19x 0.15 mm                             |
| AWG signal line                               | 22                                      |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup> (Signal line)   |
| Wire diameter incl. insulation                | 1.26 mm ±0.05 mm                        |
| External cable diameter                       | 5.00 mm ±0.15 mm                        |
| Outer sheath, material                        | PVC                                     |
| External sheath, color                        | gray RAL 7001                           |
| Conductor material                            | Bare Cu litz wires                      |
| Material wire insulation                      | PVC                                     |
| Single wire, color                            | brown, white, blue, black, green-yellow |
| Thickness, insulation                         | ≥ 0.23 mm (Core insulation)             |
| Thickness, outer sheath                       | ≥ 0.76 mm                               |
| Overall twist                                 | 5 wires around filler to the core       |
| Max. conductor resistance                     | max. 57 Ω/km (at 20 °C)                 |
| Insulation resistance                         | ≥ 200 MΩ*km (at 20 °C)                  |
| Nominal voltage, cable                        | ≤ 300 V                                 |
| Test voltage                                  | ≥ 3000 V                                |
| Minimum bending radius, fixed installation    | 5 x D                                   |
| Minimum bending radius, flexible installation | 10 x D                                  |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|   |   |
|---|---|
| Smallest bending radius, fixed installation   | 25 mm   |
| Smallest bending radius, movable installation | 50 mm   |
| Flame resistance                              | As per UL-Style 2464                            |
| Ambient temperature (operation)               | -40 °C ... 80 °C (cable, fixed installation)    |
|   | -25 °C ... 80 °C (Cable, flexible installation) |

## PVC black 5th conductor gray [515]

|   |   |
|---|---|
| Cable weight                                  | 52 kg/km  |
| UL AWM Style                                  | 2464 / 1729 (80°C/300 V)                        |
| Number of positions                           | 5   |
| Shielded                                      | no  |
| Cable type                                    | PVC black 5th conductor gray [515]              |
|   | PVC black 5th conductor gray 515                |
| Conductor structure signal line               | 42x 0.10 mm                                     |
| AWG signal line                               | 22  |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup> (Signal line)           |
| Wire diameter incl. insulation                | 1.45 mm ±0.02 mm                                |
| External cable diameter                       | 5.90 mm ±0.15 mm                                |
| Outer sheath, material                        | PVC   |
| External sheath, color                        | black RAL 9005                                  |
| Conductor material                            | Bare Cu litz wires                              |
| Material, filler                              | PP yarn   |
| Material wire insulation                      | PVC   |
| Single wire, color                            | brown, white, blue, black, gray                 |
| Thickness, insulation                         | ≥ 0.23 mm (Core insulation)                     |
|   | ≥ 0.76 mm (Outer cable sheath)                  |
| Overall twist                                 | 5 wires around filler to the core               |
| Length of twist, overall twist                | 60 mm   |
| Max. conductor resistance                     | ≤ 58 Ω/km (at 20 °C)                            |
| Insulation resistance                         | ≥ 100 MΩ*km (at 20 °C)                          |
| Nominal voltage, cable                        | ≤ 300 V AC                                      |
| Test voltage                                  | ≥ 3000 V AC                                     |
| Minimum bending radius, fixed installation    | 5 x D   |
| Minimum bending radius, flexible installation | 10 x D  |
| Smallest bending radius, fixed installation   | 30 mm   |
| Smallest bending radius, movable installation | 59 mm   |
| Flame resistance                              | According to UL 758/1581 (Cable Flame)          |
|   | according to UL 758/1581 FT1                    |
|   | According to DIN EN 60332-1-2 (60 s)            |
| Resistance to oil                             | according to DIN EN 60811-2-1, 168 h at 60 °C   |
| Ambient temperature (operation)               | -40 °C ... 80 °C (cable, fixed installation)    |
|   | -25 °C ... 80 °C (Cable, flexible installation) |

## PVC gray 5th conductor gray [520]

|              |          |
|--------------|----------|
| Cable weight | 54 kg/km |
|--------------|----------|

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|                                 |  |
|---------------------------------|--|
| Number of positions             | 5  |
| Shielded                        | no   |
| Cable type                      | PVC gray 5th conductor gray [520]              |
|                                 | PVC gray 5th conductor gray 520                |
| Conductor structure signal line | 42x 0.10 mm                                    |
| AWG signal line                 | 22   |
| Conductor cross-section         | 0.34 mm <sup>2</sup>                           |
| Wire diameter incl. insulation  | 1.45 mm ±0.02 mm                               |
| External cable diameter         | 5.90 mm ±0.15 mm                               |
| Outer sheath, material          | PVC  |
| External sheath, color          | gray RAL 7001                                  |
| Conductor material              | Bare Cu litz wires                             |
| Material, filler                | PVC  |
| Material wire insulation        | PVC  |
| Single wire, color              | brown, white, blue, black, gray                |
| Thickness, insulation           | ≥ 0.23 mm (Core insulation)                    |
|                                 | ≥ 0.76 mm (Outer cable sheath)                 |
| Overall twist                   | 5 wires around filler to the core              |
| Length of twist, overall twist  | 55 mm  |
| Max. conductor resistance       | max. 58 Ω/km (at 20 °C)                        |
| Insulation resistance           | ≥ 1 GΩ*km (at 20 °C)                           |
| Nominal voltage, cable          | ≤ 300 V  |
| Test voltage                    | ≥ 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) |

## PVC yellow [540]

|                                 |   |
|---------------------------------|---|
| Number of positions             | 5                                       |
| Shielded                        | no                                      |
| Cable type                      | PVC yellow [540]                        |
|                                 | PVC yellow 540                          |
| Conductor structure signal line | 43x 0.10 mm                             |
| AWG signal line                 | 22                                      |
| Conductor cross-section         | 0.34 mm <sup>2</sup>                    |
| Wire diameter incl. insulation  | 1.45 mm ±0.02 mm                        |
| External cable diameter         | 5.90 mm ±0.15 mm                        |
| Outer sheath, material          | PVC                                     |
| External sheath, color          | yellow                                  |
| Conductor material              | Bare Cu litz wires                      |
| Material, filler                | PVC                                     |
| Material wire insulation        | PVC                                     |
| Single wire, color              | brown, white, blue, black, green-yellow |
| Thickness, insulation           | approx. 0.23 mm (Core insulation)       |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|   |   |
|---|---|
|   | approx. 0.76 mm (Outer cable sheath)  |
| Overall twist                                 | 5 wires around filler to the core   |
| Length of twist, overall twist                | 70 mm   |
| Max. conductor resistance                     | max. 58 Ω/km (at 20 °C)   |
| Insulation resistance                         | ≥ 1 MΩ*km (at 20 °C)  |
| Nominal voltage, cable                        | ≤ 300 V (AC)  |
| Test voltage                                  | 3000 V  |
| Smallest bending radius, fixed installation   | 29.5 mm   |
| Smallest bending radius, movable installation | 59 mm   |
| Flame resistance                              | As per UL-Style 2464<br>according to UL 758/1581 FT1  |
| Resistance to oil                             | in accordance with DIN EN 60811-2-1   |
| Ambient temperature (operation)               | -40 °C ... 80 °C (cable, fixed installation)<br>-25 °C ... 80 °C (Cable, flexible installation) |

## PVC yellow 105 °C [542]

|                                 |  |
|---------------------------------|--|
| Cable weight                    | 50 kg/km   |
| Number of positions             | 5  |
| Shielded                        | no   |
| Cable type                      | PVC yellow 105 °C [542]<br>PVC yellow 105 °C 542   |
| Conductor structure signal line | 42x 0.10 mm  |
| AWG signal line                 | 22   |
| Conductor cross-section         | 0.34 mm <sup>2</sup>   |
| Wire diameter incl. insulation  | 1.55 mm ±0.05 mm   |
| External cable diameter         | 5.90 mm ±0.2 mm  |
| Outer sheath, material          | PVC  |
| External sheath, color          | yellow   |
| Conductor material              | Bare Cu litz wires   |
| Material wire insulation        | PVC  |
| Single wire, color              | brown, white, blue, black, gray  |
| Thickness, insulation           | ≥ 0.38 mm (Core insulation)<br>≥ 0.76 mm (Outer cable sheath)                                    |
| Overall twist                   | 5 wires around filler to the core  |
| Max. conductor resistance       | max. 58 Ω/km (at 20 °C)  |
| Insulation resistance           | ≥ 100 MΩ*km (at 20 °C)   |
| Nominal voltage, cable          | ≤ 300 V  |
| Test voltage                    | ≥ 3000 V   |
| Flame resistance                | in accordance with UL-Style 2517   |
| Ambient temperature (operation) | -25 °C ... 105 °C (cable, fixed installation)<br>-25 °C ... 80 °C (Cable, flexible installation) |

## Gray, highly flexible PUR [800]

|      |  |
|------|--|
| Note | Due to the extremely robust outer sheath, this cable should only be stripped in 5 cm increments. |
|------|--|

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

|   |   |
|---|---|
| Cable weight                                  | 38 kg/km  |
| UL AWM Style                                  | 20549   |
| Number of positions                           | 5   |
| Shielded                                      | no  |
| Cable type                                    | Gray, highly flexible PUR [800]<br>Gray, highly flexible PUR 800  |
| Conductor structure signal line               | 42x 0.10 mm   |
| AWG signal line                               | 22  |
| Conductor cross-section                       | 5x 0.34 mm <sup>2</sup> (Signal line)   |
| Wire diameter incl. insulation                | 1.3 mm ±0.05 mm (Signal line)   |
| External cable diameter                       | 5.10 mm ±0.2 mm   |
| Outer sheath, material                        | PUR   |
| External sheath, color                        | gray RAL 7001   |
| Conductor material                            | Bare Cu litz wires  |
| Material, filler                              | PE  |
| Material wire insulation                      | PP  |
| Single wire, color                            | black, brown, blue, white, gray   |
| Overall twist                                 | 5 wires around filler to the core   |
| Max. conductor resistance                     | approx. 53 Ω/km   |
| Insulation resistance                         | ≥ 20 MΩ*km  |
| Nominal voltage, cable                        | 300 V   |
| Test voltage                                  | 2000 V  |
| Minimum bending radius, fixed installation    | 4 x D   |
| Minimum bending radius, flexible installation | 7.5 x D   |
| Smallest bending radius, fixed installation   | 21 mm   |
| Smallest bending radius, movable installation | 39 mm   |
| Dynamic load capacity (bending)               | Max. bending cycles: 10000000, Bending radius: 7,5 x D, Traversing path: 5 m, Traversing rate: 3.3 m/s, Acceleration: 5 m/s <sup>2</sup><br>Max. bending cycles: 15000000, Bending radius: 50 mm, Traversing path: 0.9 m, Traversing rate: 5 m/s, Acceleration: 30 m/s <sup>2</sup> |
| Dynamic load capacity (torsion)               | Torsion: ±360 °/m, Torsion cycles: 1000000  |
| Halogen-free                                  | in accordance with DIN VDE 0472 part 815  |
| Flame resistance                              | in accordance with UL 758/1581 FT2  |
| Resistance to oil                             | in accordance with DIN EN 60811-2-1   |
| Other resistance                              | Highly resistant to acids, alkaline solutions and solvents<br>Silicone-free   |
| Special properties                            | Cable jacket is welding spark-resistant, recyclable, matt, low-adhesion, abrasion-resistant, flame-retardant, and self-extinguishing<br>Free from silicone and cadmium<br>Free of substances which would hinder coating with paint or varnish                                       |
| Ambient temperature (operation)               | -40 °C ... 80 °C (cable, fixed installation)<br>-25 °C ... 80 °C (Cable, flexible installation)   |

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

## Environmental and real-life conditions

### Ambient conditions

|   |                                  |
|---|----------------------------------|
| Degree of protection  | IP65                             |
|   | IP67                             |
|   | IP68                             |
| Ambient temperature (operation) (male connector/female connector) | -25 °C ... 90 °C (Plug / socket) |

## Standards and regulations

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

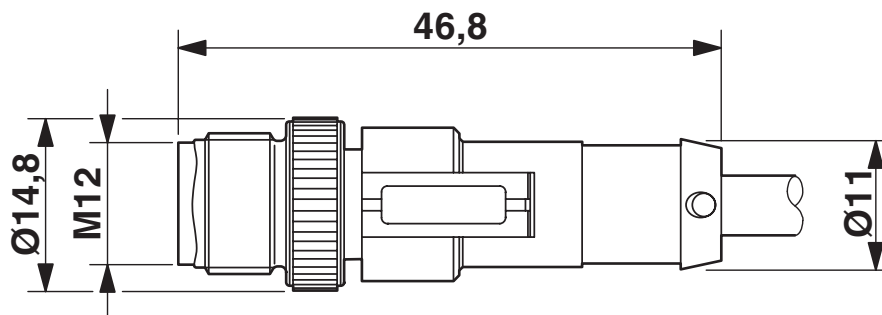
# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable

1697166

<https://www.phoenixcontact.com/us/products/1697166>

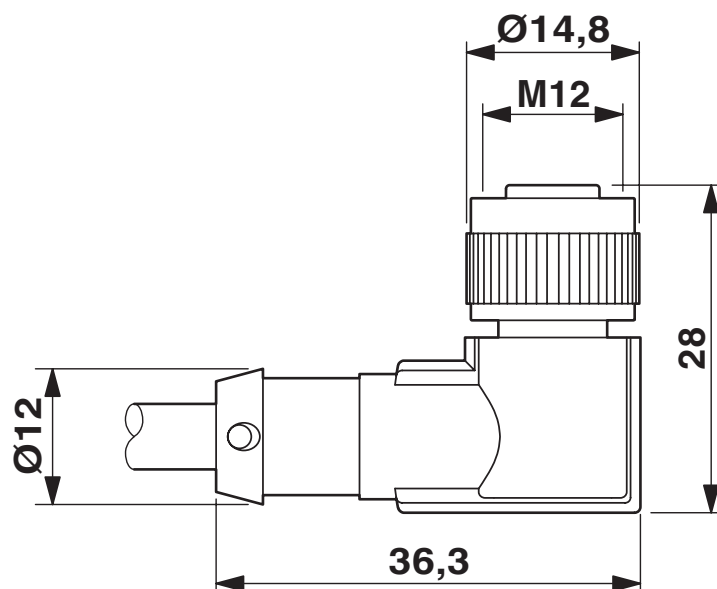
## Drawings

Dimensional drawing



Plug, M12 x 1, straight, shielded

Dimensional drawing



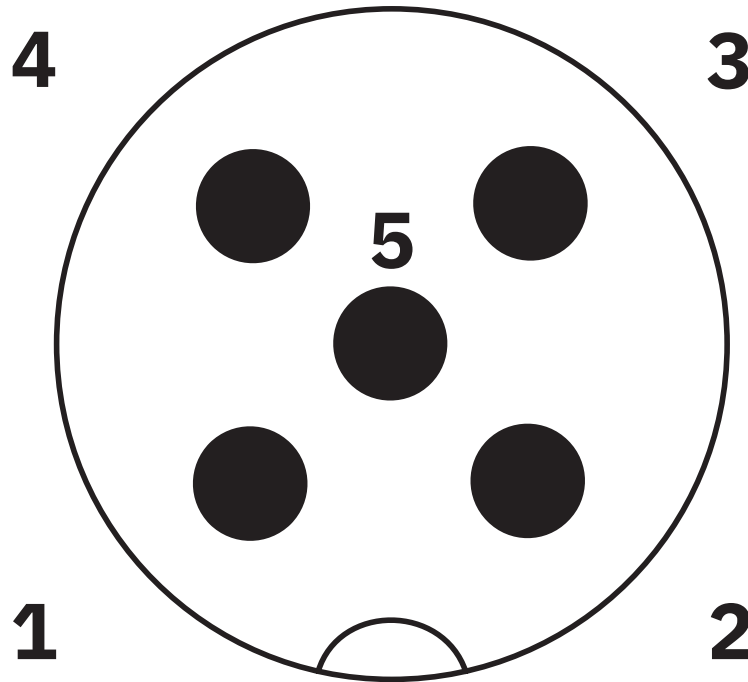
M12 x 1 socket, angled

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable

1697166

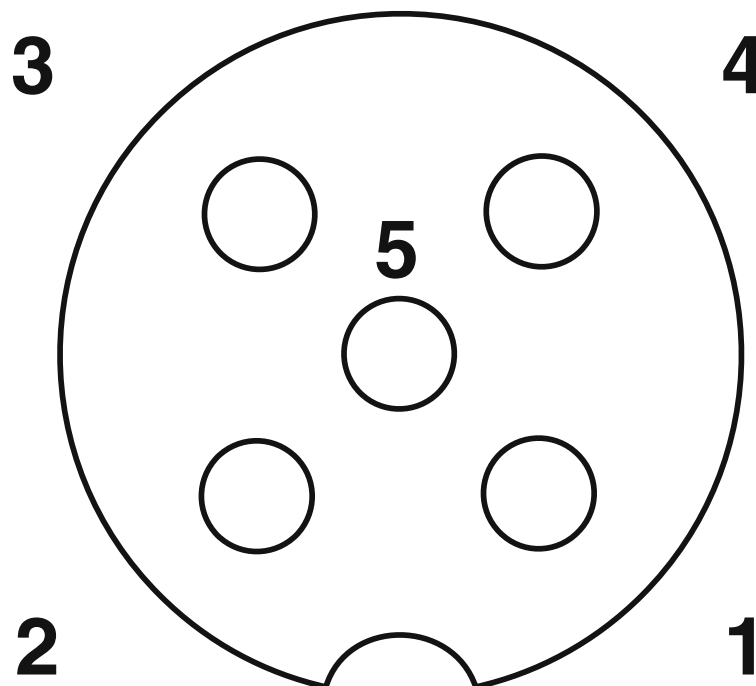
<https://www.phoenixcontact.com/us/products/1697166>

Schematic diagram



Pin assignment M12 male connector, 5-pos., A-coded, male side

Schematic diagram



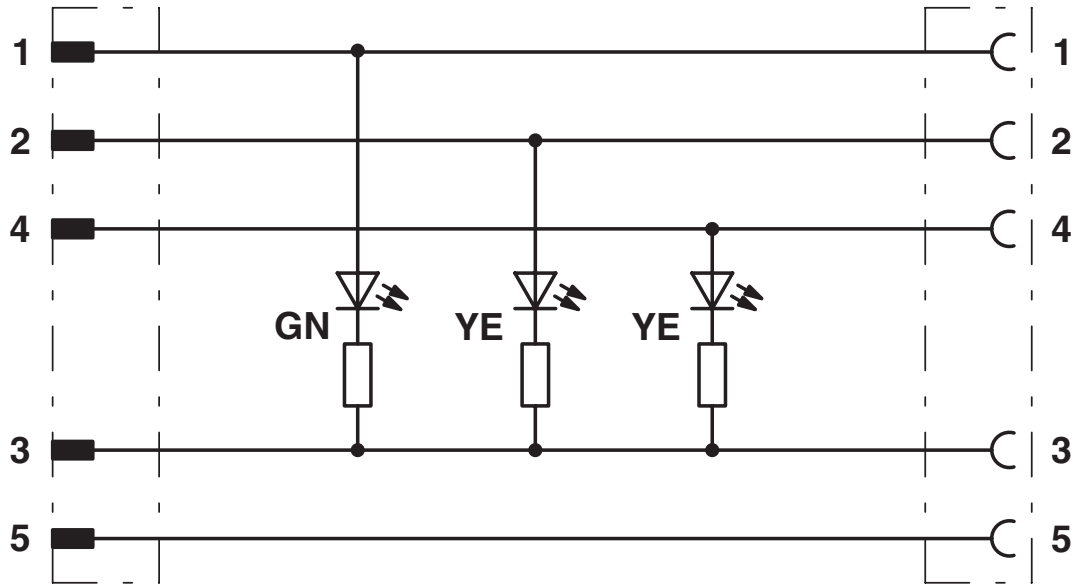
Pin assignment M12 socket, 5-pos., A-coded, socket side view

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable

1697166

<https://www.phoenixcontact.com/us/products/1697166>

Circuit diagram



Contact assignment of M12 plugs / sockets with 3 LEDs

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable





1697166

<https://www.phoenixcontact.com/us/products/1697166>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1697166>

|  <b>UL Listed</b><br>Approval ID: FILE E 221474 |                       |                       |                   |                             |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine  |                       |                       |                   |                             |
|  | 24 V                  | 4 A                   | -                 | -                           |

|  <b>cUL Listed</b><br>Approval ID: FILE E 221474 |                       |                       |                   |                             |
|---|-----------------------|-----------------------|-------------------|-----------------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine   |                       |                       |                   |                             |
|   | 24 V                  | 4 A                   | -                 | -                           |

|  <b>EAC-RoHS</b><br>Approval ID: RU D-DE.HB35.B.00387 |  |
|--|--|
|--|--|

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27060311 |
| ECLASS-15.0 | 27060311 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC001855 |
|-----------|----------|

### UNSPSC

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

# SAC-5P-M12MS-M12FR-3L/.../... - Sensor/actuator cable



1697166

<https://www.phoenixcontact.com/us/products/1697166>

## 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% |
|-------------------------------------|----------------------------|

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 6.419 kg CO2e |
|---------|---------------|

Phoenix Contact 2026 © - all rights reserved  
<https://www.phoenixcontact.com>

Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)