

# SAC-3P-M 8MS-FS SCO/.../... - Sensor/actuator cable



1541911

<https://www.phoenixcontact.com/us/products/1541911>

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Sensor/actuator cable, 3-position, Variable cable type, Plug straight M8, coding: A, on Socket straight M12 SPEEDCON, coding: A, cable length: Free input (0.2 ... 40.0 m)

## Your advantages

- Easy and safe: 100 % electrically tested plug-in components
- Save time, thanks to installation with SPEEDCON fast locking system
- Flexible solutions - configurable materials with variable cable types and cable lengths

## Commercial data

|                       |                                |
|-----------------------|--------------------------------|
| Item number           | 1541911                        |
| Packing unit          | 1 pc                           |
| Note                  | Made to order (non-returnable) |
| Sales key             | BF01                           |
| Product key           | AF1BBA                         |
| Customs tariff number | 85444290                       |
| Country of origin     | PL                             |

## Technical data

### Product properties

|                      |                       |
|----------------------|-----------------------|
| Product type         | Sensor/actuator cable |
| Application          | Standard              |
| Number of positions  | 3                     |
| 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 | ≥ 100 MΩ |
| Nominal voltage $U_N$ | 48 V AC  |
|                       | 60 V DC  |
| Nominal current $I_N$ | 4 A      |
| Test voltage          | 1500 V   |

### Mechanical properties

#### Mechanical data

|                             |       |
|-----------------------------|-------|
| Insertion/withdrawal cycles | ≥ 100 |
|-----------------------------|-------|

### Signaling

|                        |    |
|------------------------|----|
| Status display         | no |
| Status display present | no |

### Connection data

#### Conductor connection

|                   |                        |
|-------------------|------------------------|
| Tightening torque | 0.4 Nm (M12 connector) |
|                   | 0.2 Nm (M8 connectors) |

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## Connector

### Connection 1

|                     |                  |
|---------------------|------------------|
| Type                | Plug straight M8 |
| Number of positions | 3                |
| Coding type         | A                |

### Connection 2

|                     |                              |
|---------------------|------------------------------|
| Type                | Socket straight M12 SPEEDCON |
| Number of positions | 3                            |
| Locking type        | SPEEDCON                     |
| Coding type         | A                            |

## Cable/line

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

### PUR halogen-free black [PUR]

|   |  |
|---|--|
| Cable weight                                  | 18 kg/km   |
| UL AWM Style                                  | 20549 / 10493 (80°C/300 V)   |
| Number of positions                           | 3  |
| Shielded                                      | no   |
| Cable type                                    | PUR halogen-free black [PUR]<br>PUR halogen-free black PUR   |
| Conductor structure signal line               | 32x 0.10 mm  |
| AWG signal line                               | 24   |
| Conductor cross-section                       | 3x 0.25 mm <sup>2</sup> (Signal line)  |
| Wire diameter incl. insulation                | 1.17 mm ±0.02 mm   |
| External cable diameter                       | 3.60 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, blue, black   |
| Thickness, insulation                         | ≥ 0.21 mm (Core insulation)  |
| Thickness, outer sheath                       | approx. 0.50 mm  |
| Overall twist                                 | 3 wires, twisted   |
| Length of twist, overall twist                | 40 mm  |
| Max. conductor resistance                     | ≤ 78 Ω/km (at 20 °C)   |
| Insulation resistance                         | ≥ 100 GΩ*km (at 20 °C)   |
| Nominal voltage, cable                        | ≤ 300 V  |
| Test voltage                                  | ≥ 3000 V   |
| Smallest bending radius, fixed installation   | 18 mm  |
| Smallest bending radius, movable installation | 36 mm  |
| Dynamic load capacity (bending)               | Max. bending cycles: 10000000, Bending radius: 44 mm,<br>Traversing path: 10 m, Traversing rate: 3 m/s, Acceleration: 10 |

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|                                 |   |
|---------------------------------|---|
|                                 | 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 UL 758/1581 FT2<br>DIN EN 60332-2-2 (20 s)   |
| Resistance to oil               | in accordance with DIN EN 60811-2-1   |
| Other resistance                | hydrolysis and microbe resistant<br>Highly resistant to acids, alkaline solutions and solvents<br>Resistant to salt water<br>partly UV-resistant (in accordance with DIN EN ISO 4892-2-A) |
| Special properties              | Flexible cable conduit capable<br>Silicone-free<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)   |

## PUR halogen-free yellow [240]

|   |  |
|---|--|
| Cable weight                                  | 24 kg/km   |
| UL AWM Style                                  | 20549  |
| Number of positions                           | 3  |
| Shielded                                      | no   |
| Cable type                                    | PUR halogen-free yellow [240]<br>PUR halogen-free yellow 240 |
| Conductor structure signal line               | 32x 0.10 mm  |
| AWG signal line                               | 24   |
| Conductor cross-section                       | 3x 0.25 mm <sup>2</sup> (Signal line)                        |
| Wire diameter incl. insulation                | 1.17 mm $\pm$ 0.02 mm  |
| External cable diameter                       | 4.40 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, blue, black   |
| Thickness, insulation                         | $\geq 0.21$ mm   |
| Thickness, outer sheath                       | approx. 0.90 mm  |
| Overall twist                                 | 3 wires, twisted   |
| Length of twist, overall twist                | 40 mm  |
| Max. conductor resistance                     | 78 $\Omega$ /km (at 20 °C)                                   |
| Insulation resistance                         | $\geq 1$ G $\Omega$ *km (at 20 °C)                           |
| Nominal voltage, cable                        | $\leq 300$ V AC  |
| Test voltage                                  | $\geq 3000$ V AC (Spark test)                                |
| Minimum bending radius, fixed installation    | 5 x D  |
| Minimum bending radius, flexible installation | 10 x D   |

# SAC-3P-M 8MS-FS SCO/.../... - Sensor/actuator cable



1541911

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|   |   |
|---|---|
| Smallest bending radius, fixed installation   | 22 mm   |
| Smallest bending radius, movable installation | 44 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: ±180 °/m, Torsion cycles: ≥5000000, Torsional frequency: 35 cycles/min.  |
| Halogen-free                                  | in accordance with DIN VDE 0472 part 815  |
|   | in accordance with EN 50267-2-1   |
| Flame resistance                              | in accordance with UL 758/1581 FT2  |
| Resistance to oil                             | According to DIN EN 60811-2-1, 168 h at 100°C   |
|   | according to UL 758, 168 h at 60 °C   |
| Other resistance                              | hydrolysis and microbe resistant  |
|   | Resistant to salt water   |
|   | abrasion-resistant  |
|   | Low adhesion  |
| Ambient temperature (operation)               | -40 °C ... 80 °C (cable, fixed installation)  |
|   | -25 °C ... 80 °C (Cable, flexible installation)   |

## PUR halogen-free orange [180]

|   |                                       |
|---|---------------------------------------|
| Cable weight                                  | 24 kg/km                              |
| UL AWM Style                                  | 20549                                 |
| Number of positions                           | 3                                     |
| Shielded                                      | no                                    |
| Cable type                                    | PUR halogen-free orange [180]         |
|   | PUR halogen-free orange 180           |
| Conductor structure signal line               | 32x 0.10 mm                           |
| AWG signal line                               | 24                                    |
| Conductor cross-section                       | 3x 0.25 mm <sup>2</sup> (Signal line) |
| Wire diameter incl. insulation                | 1.17 mm ±0.02 mm (Signal line)        |
| External cable diameter                       | 4.40 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, blue, black                    |
| Thickness, insulation                         | ≥ 0.21 mm (Core insulation)           |
|   | approx. 0.90 mm (Outer cable sheath)  |
| Overall twist                                 | 3 wires, twisted                      |
| Max. conductor resistance                     | max. 78 Ω/km (at 20 °C)               |
| Insulation resistance                         | ≥ 10 GΩ*km (at 20 °C)                 |
| Nominal voltage, cable                        | ≤ 300 V                               |
| Test voltage                                  | ≥ 3000 V                              |
| Smallest bending radius, fixed installation   | 22 mm                                 |
| Smallest bending radius, movable installation | 44 mm                                 |

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1541911

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|                                 |  |
|---------------------------------|--|
| Dynamic load capacity (bending) | Max. bending cycles: 10000000, Bending radius: 44 mm, 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: $\geq 50000000$ , 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                | hydrolysis and microbe resistant   |
|                                 | Resistant to salt water  |
| Ambient temperature (operation) | -40 °C ... 80 °C (cable, fixed installation)   |
|                                 | -25 °C ... 80 °C (Cable, flexible installation)  |

## PUR halogen-free gray [280]

|   |  |
|---|--|
| Cable weight                                  | 18 kg/km   |
| UL AWM Style                                  | 20549 / 10493 (80°C/300 V)   |
| Number of positions                           | 3  |
| Shielded                                      | no   |
| Cable type                                    | PUR halogen-free gray [280]  |
|   | PUR halogen-free gray 280  |
| Conductor structure signal line               | 32x 0.10 mm  |
| AWG signal line                               | 24   |
| Conductor cross-section                       | 3x 0.25 mm <sup>2</sup>  |
| Wire diameter incl. insulation                | 1.17 mm $\pm$ 0.02 mm  |
| External cable diameter                       | 3.60 mm $\pm$ 0.15 mm  |
| Outer sheath, material                        | PUR  |
| External sheath, color                        | gray RAL 7001  |
| Conductor material                            | Bare Cu litz wires   |
| Material wire insulation                      | PP   |
| Single wire, color                            | brown, blue, black   |
| Thickness, insulation                         | $\geq 0.21$ mm (Core insulation)   |
| Thickness, outer sheath                       | approx. 0.50 mm  |
| Overall twist                                 | 3 wires, twisted   |
| Length of twist, overall twist                | 40 mm  |
| Max. conductor resistance                     | $\leq 78$ $\Omega$ /km (at 20 °C)  |
| Insulation resistance                         | $\geq 100$ G $\Omega$ *km (at 20 °C)   |
| Nominal voltage, cable                        | $\leq 300$ V   |
| Test voltage                                  | $\geq 3000$ V  |
| Smallest bending radius, fixed installation   | 18 mm  |
| Smallest bending radius, movable installation | 36 mm  |
| Dynamic load capacity (bending)               | Max. bending cycles: 10000000, Bending radius: 44 mm, 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: $\geq 50000000$ , Torsional frequency: 35 cycles/min.  |

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|                                 |   |
|---------------------------------|---|
| 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   |
| Other resistance                | hydrolysis and microbe resistant<br>Highly resistant to acids, alkaline solutions and solvents<br>Resistant to salt water<br>partly UV-resistant (in accordance with DIN EN ISO 4892-2-A) |
| Special properties              | Flexible cable conduit capable<br>Silicone-free<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)   |

## PVC black [PVC]

|   |   |
|---|---|
| Cable weight                                | 29 kg/km  |
| Number of positions                         | 3   |
| Shielded                                    | no  |
| Cable type                                  | PVC black [PVC]<br>PVC black PVC  |
| Conductor structure signal line             | 14x 0.15 mm   |
| AWG signal line                             | 24  |
| Conductor cross-section                     | 3x 0.25 mm <sup>2</sup> (Signal line)   |
| Wire diameter incl. insulation              | 1.17 mm ±0.05 mm  |
| External cable diameter                     | 4.20 mm ±0.15 mm  |
| Outer sheath, material                      | PVC   |
| External sheath, color                      | black RAL 9005  |
| Conductor material                          | Bare Cu litz wires  |
| Material wire insulation                    | PVC   |
| Single wire, color                          | brown, blue, black  |
| Thickness, insulation                       | ≥ 0.23 mm (Core insulation)   |
| Thickness, outer sheath                     | ≥ 0.76 mm   |
| Overall twist                               | 3 wires, twisted  |
| Max. conductor resistance                   | max. 79 Ω/km (at 20 °C)   |
| Insulation resistance                       | ≥ 100 MΩ*km (at 20 °C)  |
| Nominal voltage, cable                      | ≥ 300 V   |
| Test voltage                                | ≤ 3000 V  |
| Smallest bending radius, fixed installation | 13 mm   |
| Flame resistance                            | As per UL-Style 2464  |
| Resistance to oil                           | 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]

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|   |   |
|---|---|
| Cable weight                                | 29 kg/km  |
| Number of positions                         | 3   |
| Shielded                                    | no  |
| Cable type                                  | PVC gray [500]<br>PVC gray 500  |
| Conductor type                              | Assembled shielded round cable  |
| Conductor structure signal line             | 14x 0.15 mm   |
| AWG signal line                             | 24  |
| Conductor cross-section                     | 3x 0.25 mm <sup>2</sup> (Signal line)   |
| Wire diameter incl. insulation              | 1.17 mm ±0.05 mm  |
| External cable diameter                     | 4.20 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, blue, black  |
| Thickness, insulation                       | ≥ 0.23 mm (Core insulation)   |
| Thickness, outer sheath                     | ≥ 0.76 mm   |
| Overall twist                               | 3 wires, twisted  |
| Max. conductor resistance                   | max. 79 Ω/km (at 20 °C)   |
| Insulation resistance                       | ≥ 100 MΩ*km (at 20 °C)  |
| Nominal voltage, cable                      | ≥ 300 V   |
| Test voltage                                | ≤ 3000 V  |
| Smallest bending radius, fixed installation | 13 mm   |
| Halogen-free                                | no  |
| Flame resistance                            | As per UL-Style 2464  |
| 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) |

## Gray, highly flexible PUR [800]

|                                 |  |
|---------------------------------|--|
| Note                            | Due to the extremely robust outer sheath, this cable should only be stripped in 5 cm increments. |
| Cable weight                    | 24 kg/km   |
| UL AWM Style                    | 20549  |
| Number of positions             | 3  |
| Shielded                        | no   |
| Cable type                      | Gray, highly flexible PUR [800]<br>Gray, highly flexible PUR 800                                 |
| Conductor structure signal line | 32x 0.10 mm  |
| AWG signal line                 | 24   |
| Conductor cross-section         | 3x 0.25 mm <sup>2</sup> (Signal line)  |
| Wire diameter incl. insulation  | 1.2 mm ±0.05 mm (Signal line)  |
| External cable diameter         | 4.30 mm ±0.2 mm  |

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|   |   |
|---|---|
| Outer sheath, material                        | PUR   |
| External sheath, color                        | gray RAL 7001   |
| Conductor material                            | Bare Cu litz wires  |
| Material wire insulation                      | PP  |
| Single wire, color                            | brown, blue, black  |
| Overall twist                                 | 3 wires, twisted  |
| Max. conductor resistance                     | approx. 76 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   | 18 mm   |
| Smallest bending radius, movable installation | 33 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, Torsional frequency: 35 cycles/min.   |
| 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)   |

## Environmental and real-life conditions

### Ambient conditions

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

## Standards and regulations

|                      |               |
|----------------------|---------------|
| Standard designation | M12 connector |
|----------------------|---------------|

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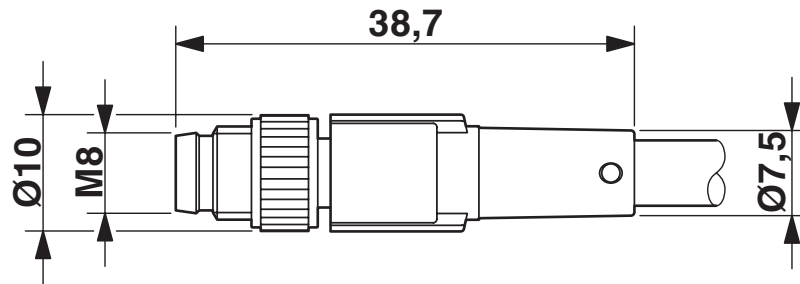
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|                          |                 |
|--------------------------|-----------------|
| Standards/specifications | IEC 61076-2-101 |
| Standard designation     | M8 connector    |
| Standards/specifications | IEC 61076-2-104 |

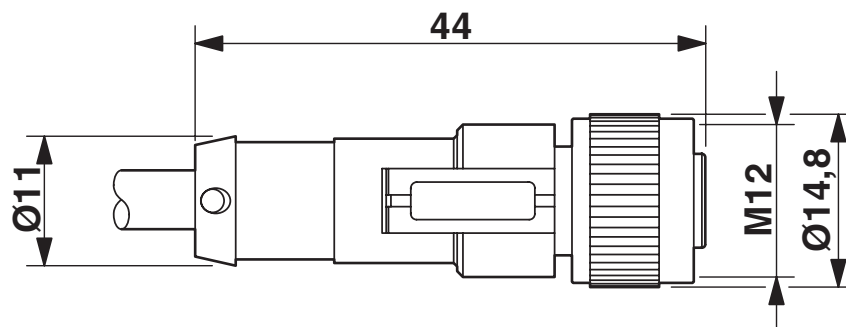
Drawings

Dimensional drawing



M8 x 1 male plug, straight version

Dimensional drawing



M12 x 1 socket, straight

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Schematic diagram



Pin assignment M8 plug, 3-pos., view male side

Schematic diagram

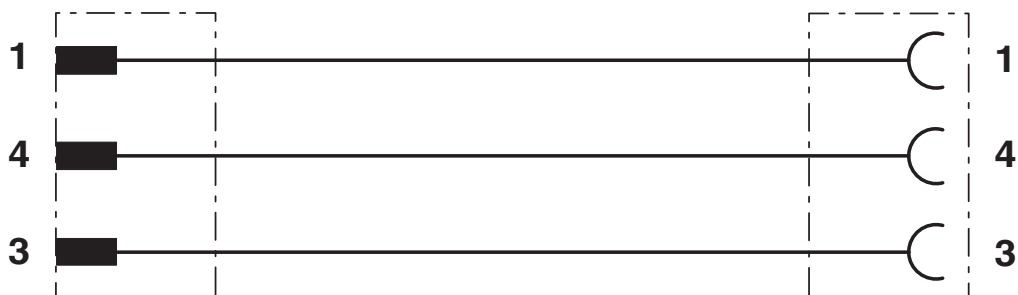


Pin assignment M12 socket, 3-pos., A-coded, view female side

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Circuit diagram



Contact assignment of M8 plugs / M12 sockets

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## Classifications

### ECLASS

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

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