

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable



1696808

<https://www.phoenixcontact.com/us/products/1696808>

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Sensor/actuator cable, 3-position, Variable cable type, Plug straight M12, coding: A, on Socket angled M12, coding: A, with 2 LEDs, PIN 2+4 bridged, 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	1696808
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to order (non-returnable)
Sales key	BF17
Product key	BF1CBA
Catalog page	Page 188 (C-2-2019)
Customs tariff number	85444290
Country of origin	PL

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable



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## Technical data

### Product properties

Product type	Sensor/actuator cable
Number of positions	3
Application	Robots and drag chains
	Standard
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

Contact resistance	$\leq 5 \text{ m}\Omega$
Insulation resistance	$\geq 100 \text{ M}\Omega$
Nominal voltage $U_N$	24 V DC
Nominal current $I_N$	4 A
Protective circuit	unwired

### Mechanical properties

#### Mechanical data

Insertion/withdrawal cycles	$\geq 100$
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### Signaling

Status display	2 LEDs
Status display present	Yes

### Connection data

#### Conductor connection

Tightening torque	0.4 Nm (M12 connector)
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## Connector

### Connection 1

Type	Plug straight M12
Coding type	A
Ambient temperature (operation)	-25 °C ... 90 °C

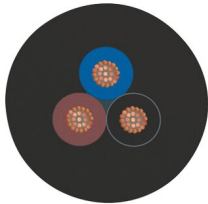
### Connection 2

Type	Socket angled M12
Coding type	A
Ambient temperature (operation)	-25 °C ... 85 °C

## Cable/line

Cable length	Free input (0.2 ... 40.0 m)
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### PUR halogen-free black [PUR]

Dimensional drawing	
Shielded	no
UL AWM Style	20549
Cable weight	23 kg/km
Cable type	PUR halogen-free black
Short symbol	Li9Y11Y
Cable type (abbreviation)	PUR
External cable diameter	3.85 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	black-gray RAL 7021
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm (Core insulation)
Wire diameter incl. insulation	1.27 mm ±0.02 mm (Signal line)
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable

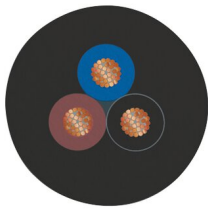


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Cable resistance	max. 58 $\Omega$ /km (at 20 °C)
Cable insulation resistance	$\geq 100 \text{ G}\Omega \cdot \text{km}$ (at 20 °C)
Smallest bending radius, fixed installation	19 mm
Smallest bending radius, movable installation	38 mm
Number of bending cycles	10000000
Bending radius	38 mm
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s <sup>2</sup>
Halogen-free	in accordance with DIN VDE 0472 part 815
Resistance to oil	in accordance with DIN EN 60811-2-1
Flame resistance	in accordance with UL 758/1581 FT2 DIN EN 60332-2-2 (20 s)
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
Special properties	Flexible cable conduit capable Silicone-free Free of substances which would hinder coating with paint or varnish
Ambient temperature (operation)	-25 °C ... 80 °C (Cable, flexible installation) -40 °C ... 80 °C (cable, fixed installation)

## PVC black [PVC]

Dimensional drawing	
Shielded	no
UL AWM Style	2464 / 1729 (80°C/300 V)
Cable weight	40 kg/km
Cable type	PVC black
Short symbol	LiYY
Cable type (abbreviation)	PVC
External cable diameter	5.2 mm $\pm 0.2$ mm
Outer sheath, material	PVC
External sheath, color	black RAL 9005
Thickness, outer sheath	$\geq 0.76$ mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable

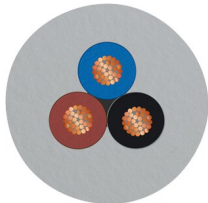


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AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.45 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 2500 V
Cable resistance	max. 58 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 MΩ*km (at 20 °C)
Minimum bending radius, fixed installation	5 x D
Minimum bending radius, flexible installation	10 x D
Resistance to oil	according to DIN EN 60811-2-1, 168 h at 90 °C
Flame resistance	As per UL-Style 2464
Ambient temperature (operation)	-25 °C ... 80 °C (Cable, flexible installation)
	-40 °C ... 80 °C (cable, fixed installation)

PUR halogen-free gray [280]

Dimensional drawing	
Shielded	no
UL AWM Style	20549 / 10493 (80°C/300 V)
Cable weight	23.42 kg/km
Cable type	PUR halogen-free gray
Short symbol	Li9Y-11Y
Cable type (abbreviation)	280
External cable diameter	3.95 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Thickness, outer sheath	approx. 0.4 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PP
Thickness, insulation	≥ 0.203 mm
Wire diameter incl. insulation	1.27 mm ±0.05 mm

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable

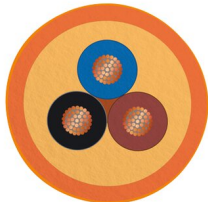


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Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	≤ 58 Ω/km
Cable insulation resistance	≥ 20 MΩ*km
Minimum bending radius, fixed installation	5 x D
Minimum bending radius, flexible installation	10 x D
Number of bending cycles	10000000
Minimum bending radius, drag chain applications	10 x D
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s <sup>2</sup>
Halogen-free	in accordance with DIN VDE 0472 part 815 EN 50267-2-1
Resistance to oil	in accordance with DIN EN 60811-2-1
Flame resistance	in accordance with UL 758/1581 FT2 DIN EN 60332-2-2 (20 s)
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 Low adhesion abrasion-resistant
Special properties	Flexible cable conduit capable Silicone-free Free of substances which would hinder coating with paint or varnish flexible
Ambient temperature (operation)	-25 °C ... 80 °C (Cable, flexible installation) -40 °C ... 80 °C (cable, fixed installation)

PUR/PVC orange [110]

Dimensional drawing	
Shielded	no
Cable weight	37 kg/km
Cable type	PUR/PVC orange
Short symbol	LiYY-11Y

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable

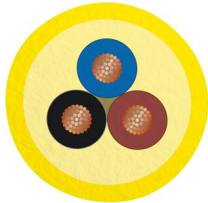


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Cable type (abbreviation)	110
External cable diameter	5.2 mm
Outer sheath, material	PUR
External sheath, color	orange RAL 2003
Material, inner sheath	PVC
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	0.34 mm <sup>2</sup>
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.52 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	300 V
Test voltage, cable	2500 V
Cable resistance	max. 57.3 Ω/km
Cable insulation resistance	≥ 100 MΩ*km
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
Ambient temperature (operation)	-5 °C ... 80 °C (Cable, flexible installation)
	-25 °C ... 80 °C (cable, fixed installation)

PUR/PVC yellow [140]

Dimensional drawing	
Shielded	no
Cable weight	37 kg/km
Cable type	PUR/PVC yellow
Short symbol	LiYY-11Y
Cable type (abbreviation)	140
External cable diameter	5.2 mm ±0.2 mm
Outer sheath, material	PUR
External sheath, color	yellow

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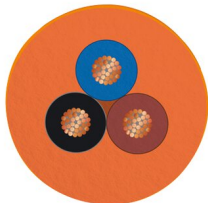


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Material, inner sheath	PVC
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	0.34 mm <sup>2</sup>
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.52 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	300 V
Test voltage, cable	2500 V
Cable resistance	max. 57.3 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 MΩ*km (at 20 °C)
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
Ambient temperature (operation)	-5 °C ... 80 °C (Cable, flexible installation) -25 °C ... 80 °C (cable, fixed installation)

## PUR irradiated halogen-free orange [150]

Dimensional drawing	
Shielded	no
Cable type	PUR irradiated halogen-free orange
Short symbol	D12YSL11X-OB
Cable type (abbreviation)	150
External cable diameter	4.4 mm ±0.2 mm
Outer sheath, material	PUR
External sheath, color	orange RAL 2003
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PE



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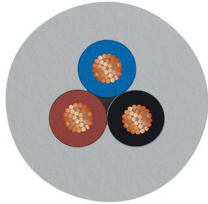


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Wire diameter incl. insulation	1.05 mm $\pm$ 0.05 mm (Signal line)
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	250 V (AC)
Test voltage, cable	2000 V (50 Hz, 5 minutes)
Cable resistance	max. 57 $\Omega$ /km
Smallest bending radius, fixed installation	13.5 mm
Smallest bending radius, movable installation	53 mm
Number of bending cycles	5000000
Bending radius	44 mm
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s <sup>2</sup>
Flame resistance	according to DIN VDE 0472 Part 804
Other resistance	UV resistant
Special properties	Silicone-free
	Irradiated
Ambient temperature (operation)	-40 °C ... 105 °C (Cable, flexible installation)
	-50 °C ... 105 °C (cable, fixed installation)

## PUR halogen-free gray [280]

Dimensional drawing	
Shielded	no
UL AWM Style	20549 / 10493 (80°C/300 V)
Cable weight	23.42 kg/km
Cable type	PUR halogen-free gray
Short symbol	Li9Y-11Y
Cable type (abbreviation)	280
External cable diameter	3.95 mm $\pm$ 0.15 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Thickness, outer sheath	approx. 0.4 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PP

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Thickness, insulation	≥ 0.203 mm
Wire diameter incl. insulation	1.27 mm ±0.05 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	≤ 58 Ω/km
Cable insulation resistance	≥ 20 MΩ*km
Minimum bending radius, fixed installation	5 x D
Minimum bending radius, flexible installation	10 x D
Number of bending cycles	10000000
Minimum bending radius, drag chain applications	10 x D
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s <sup>2</sup>
Halogen-free	in accordance with DIN VDE 0472 part 815 EN 50267-2-1
Resistance to oil	in accordance with DIN EN 60811-2-1
Flame resistance	in accordance with UL 758/1581 FT2 DIN EN 60332-2-2 (20 s)
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 Low adhesion abrasion-resistant
Special properties	Flexible cable conduit capable Silicone-free Free of substances which would hinder coating with paint or varnish flexible
Ambient temperature (operation)	-25 °C ... 80 °C (Cable, flexible installation) -40 °C ... 80 °C (cable, fixed installation)

PVC gray [500]

Dimensional drawing	
Shielded	no
Cable weight	40 kg/km

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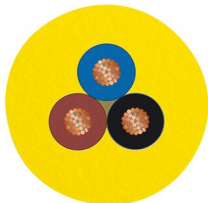


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Cable type	PVC gray
Short symbol	LiYY
Cable type (abbreviation)	500
External cable diameter	5.2 mm ±0.2 mm
Outer sheath, material	PVC
External sheath, color	gray RAL 7001
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	0.34 mm²
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.45 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	max. 58 Ω/km (at 20 °C)
Cable insulation resistance	≥ 1 GΩ*km (at 20 °C)
Flame resistance	As per UL-Style 2464
Ambient temperature (operation)	-5 °C ... 80 °C (Cable, flexible installation)
	-25 °C ... 80 °C (cable, fixed installation)

## PVC yellow [540]

Dimensional drawing	
Shielded	no
Cable weight	40 kg/km
Cable type	PVC yellow
Short symbol	LiYY
Cable type (abbreviation)	540
External cable diameter	5.2 mm ±0.2 mm
Outer sheath, material	PVC
External sheath, color	yellow
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	0.34 mm²

# SAC-3P-M12MS-M12FR-2LB/.../... - Sensor/actuator cable

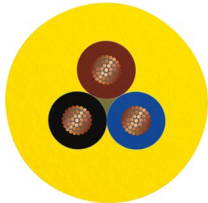


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Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.45 mm ±0.05 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	max. 58 Ω/km (at 20 °C)
Cable insulation resistance	≥ 1 GΩ*km (at 20 °C)
Flame resistance	As per UL-Style 2464
Ambient temperature (operation)	-5 °C ... 80 °C (Cable, flexible installation)
	-25 °C ... 80 °C (cable, fixed installation)

PVC yellow 105 °C [542]

Dimensional drawing	
Shielded	no
Cable weight	38 kg/km
Cable type	PVC yellow 105 °C
Cable type (abbreviation)	542
External cable diameter	5.2 mm ±0.2 mm
Outer sheath, material	PVC
External sheath, color	yellow
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	0.34 mm²
Material wire insulation	PVC
Thickness, insulation	≥ 0.38 mm (Core insulation)
Wire diameter incl. insulation	1.55 mm ±0.05 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	300 V
Test voltage, cable	4000 V
Cable resistance	max. 58 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 MΩ*km (at 20 °C)
Flame resistance	according to DIN 50265-2-1

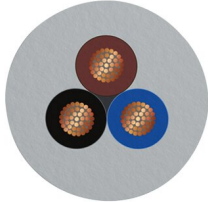
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Gray, highly flexible PUR [800]

Dimensional drawing	
Note	Due to the extremely robust outer sheath, this cable should only be stripped in 5 cm increments.
Shielded	no
UL AWM Style	20549
Cable weight	28.3 kg/km
Cable type	Gray, highly flexible PUR
Short symbol	LiF9Y11Y
Cable type (abbreviation)	800
External cable diameter	4.5 mm ±0.2 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Conductor material	Bare Cu litz wires
Conductor structure signal line	42x 0.10 mm
AWG signal line	22
Conductor cross section	3x 0.34 mm <sup>2</sup> (Signal line)
Material wire insulation	PP
Wire diameter incl. insulation	1.3 mm ±0.05 mm (Signal line)
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Nominal voltage, cable	300 V
Test voltage, cable	2000 V
Cable resistance	approx. 53 Ω/km
Cable insulation resistance	≥ 20 MΩ*km
Minimum bending radius, fixed installation	4 x D
Minimum bending radius, flexible installation	7.5 x D
Number of bending cycles	10000000
Minimum bending radius, drag chain applications	7,5 x D
Traversing path	5 m
Traversing rate	3.3 m/s
Acceleration	5 m/s <sup>2</sup>
Number of bending cycles	15000000
Traversing path	0.9 m
Traversing rate	5 m/s
Acceleration	30 m/s <sup>2</sup>

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Torsion force	± 360 °/m
Torsion cycles	1000000
Halogen-free	in accordance with DIN VDE 0472 part 815
Resistance to oil	in accordance with DIN EN 60811-2-1
Flame resistance	in accordance with UL 758/1581 FT2
Other resistance	Highly resistant to acids, alkaline solutions and solvents
	Silicone-free
Special properties	Cable jacket is welding spark-resistant, recyclable, matt, low-adhesion, abrasion-resistant, flame-retardant, and self-extinguishing
	Free from silicone and cadmium
	Free of substances which would hinder coating with paint or varnish
Ambient temperature (operation)	-25 °C ... 80 °C (Cable, flexible installation)
	-40 °C ... 80 °C (cable, fixed installation)

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP65
	IP67
	IP68

## Standards and regulations

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

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## Approvals

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### UL Listed

Approval ID: FILE E 221474

	Nominal voltage $U_N$	Nominal current $I_N$	Cross section AWG	Cross section $\text{mm}^2$
	24 V	4 A	-	-



### cUL Listed

Approval ID: FILE E 221474

	Nominal voltage $U_N$	Nominal current $I_N$	Cross section AWG	Cross section $\text{mm}^2$
	24 V	4 A	-	-



### EAC-RoHS

Approval ID: RU D-DE.HB35.B.00387

### cULus Listed

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## Classifications

### ECLASS

ECLASS-11.0	27060311
ECLASS-12.0	27060311
ECLASS-13.0	27060311

### ETIM

ETIM 8.0	EC001855
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### UNSPSC

UNSPSC 21.0	26121600
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Environmental product compliance

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

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