

1697580

https://www.phoenixcontact.com/in/products/1697580

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Sensor/actuator cable, 3-position, Variable cable type, free cable end, on Socket straight M8, cable length: Free input  $(0.2 \dots 40.0 \text{ m})$ 

## Your advantages

• Easy and safe: 100% electrically tested plug-in components

#### **Commercial Data**

Item number	1697580
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to Order (non-returnable)
Sales Key	BF1
Product Key	BF1BBA
Catalog Page	Page 188 (C-2-2019)
Customs tariff number	85444290
Country of origin	PL



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## **Technical Data**

## Product properties

Product type	Sensor/actuator cable
Number of positions	3
Application	Standard
	Robots and drag chains
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	НВ
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	≤ 5 mΩ
Insulation resistance	≥ 100 MΩ
Nominal voltage U <sub>N</sub>	48 V AC
	60 V DC
Nominal current I <sub>N</sub>	4 A
Protective circuit	unwired

### Mechanical properties

#### Mechanical data

Insertion/withdrawal cycles	> 100
insertion/withdrawar cycles	≥ 100

## Signaling

Status display	No
Status display present	No

### Connection data

#### Conductor connection

Tightening torque	0.2 Nm (M8 connectors)
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### Connector

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Coding type	A

#### Cable/line

Cable length	Free input (0.2 40.0 m)

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

Dimensional drawing



Shielded	no
UL AWM Style	20549 / 10493 (80°C/300 V)
Cable weight	18 kg/km
Cable type	PUR halogen-free gray
Short symbol	Li9Y11Y-HF
Cable type (abbreviation)	280
External cable diameter	3.6 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Thickness, outer sheath	approx. 0.5 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm²
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm (Core insulation)
Wire diameter incl. insulation	1.17 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Length of twist, overall twist	40 mm
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	≤ 78 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 GΩ*km (at 20 °C)
Smallest bending radius, fixed installation	18 mm
Smallest bending radius, movable installation	36 mm
Number of bending cycles	10000000



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Bending radius	44 mm
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Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s²
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	hydrolysis and microbe resistant
	Highly resistant to acids, alkaline solutions and solvents
	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
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)

### PUR halogen-free yellow [240]

Dimensional d	rawing
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Shielded	no
UL AWM Style	20549
Cable weight	24 kg/km
Cable type	PUR halogen-free yellow
Short symbol	Li9Y11Y
Cable type (abbreviation)	240
External cable diameter	4.4 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	yellow
Thickness, outer sheath	approx. 0.9 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm



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Wire diameter incl. insulation	1.17 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Length of twist, overall twist	40 mm
Nominal voltage, cable	≤ 300 V AC
Test voltage, cable	≥ 3000 V AC (Spark test)
Cable resistance	78 Ω/km (at 20 °C)
Cable insulation resistance	≥ 1 GΩ*km (at 20 °C)
Minimum bending radius, fixed installation	5 x D
Minimum bending radius, flexible installation	10 x D
Number of bending cycles	4000000
Minimum bending radius, drag chain applications	10 x D
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s²
Halogen-free	in accordance with DIN VDE 0472 part 815
	in accordance with EN 50267-2-1
Resistance to oil	According to DIN EN 60811-2-1, 168 h at 100°C
	According to UL 758, 168 h at 60°C
Flame resistance	in accordance with UL 758/1581 FT2
Other resistance	hydrolysis and microbe resistant
	Resistant to salt water
	abrasion-resistant
	Low adhesion
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)

#### PUR halogen-free orange [180]

Dimensional drawing



Shielded	no
UL AWM Style	20549
Cable weight	24 kg/km
Cable type	PUR halogen-free orange
Short symbol	Li9Y-11Y
Cable type (abbreviation)	180
External cable diameter	4.4 mm ±0.15 mm
Outer sheath, material	PUR



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External sheath, color	orange RAL 2003
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm (Core insulation)
Wire diameter incl. insulation	1.17 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
Cable resistance	max. 78 Ω/km (at 20 °C)
Cable insulation resistance	≥ 10 GΩ*km (at 20 °C)
Smallest bending radius, fixed installation	22 mm
Smallest bending radius, movable installation	44 mm
Number of bending cycles	4000000
Bending radius	44 mm
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s²
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 DIN UL-Style 20549
	in accordance with UL 758/1581 FT2
Other resistance	hydrolysis and microbe resistant
	Resistant to salt water
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)

### PUR halogen-free gray [280]

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Shielded	no
UL AWM Style	20549 / 10493 (80°C/300 V)
Cable weight	18 kg/km
Cable type	PUR halogen-free gray
Short symbol	Li9Y11Y-HF



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Cable type (abbreviation)	280
External cable diameter	3.6 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Thickness, outer sheath	approx. 0.5 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm²
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm (Core insulation)
Wire diameter incl. insulation	1.17 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Length of twist, overall twist	40 mm
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V
Cable resistance	≤ 78 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 GΩ*km (at 20 °C)
Smallest bending radius, fixed installation	18 mm
Smallest bending radius, movable installation	36 mm
Number of bending cycles	10000000
Bending radius	44 mm
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s²
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	hydrolysis and microbe resistant
	Highly resistant to acids, alkaline solutions and solvents
	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
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)



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Dimensional drawing	
Shielded	no
Cable weight	29 kg/km
Cable type	PVC gray
Short symbol	LiYY
Cable type (abbreviation)	500
Cable type	Assembled shielded round cable
External cable diameter	4.2 mm ±0.15 mm
Outer sheath, material	PVC
External sheath, color	gray RAL 7001
Thickness, outer sheath	≥ 0.76 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	14x 0.15 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.17 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. 79 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 MΩ*km (at 20 °C)
Smallest bending radius, fixed installation	13 mm
Halogen-free	no
Resistance to oil	in accordance with DIN EN 60811-2-1
Flame resistance	As per UL-Style 2464
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)



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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	24 kg/km
Cable type	Gray, highly flexible PUR
Short symbol	LiF9Y11Y
Cable type (abbreviation)	800
External cable diameter	4.3 mm ±0.2 mm
Outer sheath, material	PUR
External sheath, color	gray RAL 7001
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PP
Wire diameter incl. insulation	1.2 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. 76 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/s²
Number of bending cycles	15000000
Traversing path	0.9 m
Traversing rate	5 m/s
Acceleration	30 m/s²
Torsion force	± 360 °/m
Torsion cycles	1000000



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in accordance with DIN VDE 0472 part 815
in accordance with DIN EN 60811-2-1
in accordance with UL 758/1581 FT2
Highly resistant to acids, alkaline solutions and solvents
Silicone-free
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
-25 °C 80 °C (Cable, flexible installation)
-40 °C 80 °C (cable, fixed installation)

### PUR halogen-free black [PUR]

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Dimensional	arawina



Shielded	no
UL AWM Style	20549 / 10493 (80°C/300 V)
Cable weight	18 kg/km
Cable type	PUR halogen-free black
Short symbol	Li9Y11Y-HF
Cable type (abbreviation)	PUR
External cable diameter	3.6 mm ±0.15 mm
Outer sheath, material	PUR
External sheath, color	black-gray RAL 7021
Thickness, outer sheath	approx. 0.5 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	32x 0.10 mm
AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PP
Thickness, insulation	≥ 0.21 mm (Core insulation)
Wire diameter incl. insulation	1.17 mm ±0.02 mm
Single wire, color	brown, blue, black
Overall twist	3 wires, twisted
Length of twist, overall twist	40 mm
Nominal voltage, cable	≤ 300 V
Test voltage, cable	≥ 3000 V



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Cable resistance	≤ 78 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 GΩ*km (at 20 °C)
Smallest bending radius, fixed installation	18 mm
Smallest bending radius, movable installation	36 mm
Number of bending cycles	10000000
Bending radius	44 mm
Traversing path	10 m
Traversing rate	3 m/s
Acceleration	10 m/s²
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	hydrolysis and microbe resistant
	Highly resistant to acids, alkaline solutions and solvents
	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
Ambient temperature (operation)	-25 °C 80 °C (Cable, flexible installation)
	-40 °C 80 °C (cable, fixed installation)

### PVC black [PVC]

Dimensional drawing



Shielded	no
Cable weight	29 kg/km
Cable type	PVC black
Short symbol	LiYY
Cable type (abbreviation)	PVC
External cable diameter	4.2 mm ±0.15 mm
Outer sheath, material	PVC
External sheath, color	black RAL 9005
Thickness, outer sheath	≥ 0.76 mm
Conductor material	Bare Cu litz wires
Conductor structure signal line	14x 0.15 mm



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AWG signal line	24
Conductor cross section	3x 0.25 mm² (Signal line)
Material wire insulation	PVC
Thickness, insulation	≥ 0.23 mm (Core insulation)
Wire diameter incl. insulation	1.17 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. 79 Ω/km (at 20 °C)
Cable insulation resistance	≥ 100 MΩ*km (at 20 °C)
Smallest bending radius, fixed installation	13 mm
Resistance to oil	EN 60811-2-1
Flame resistance	As per UL-Style 2464
Ambient temperature (operation)	-10 °C 80 °C (Cable, flexible installation)
	-25 °C 80 °C (cable, fixed installation)

### Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP65
	IP67
	IP68
Ambient temperature (operation)	-25 °C 90 °C (Plug / socket)

## Standards and regulations

Standards/specifications IEC 61076-2-104
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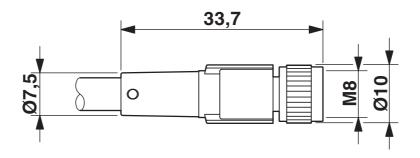


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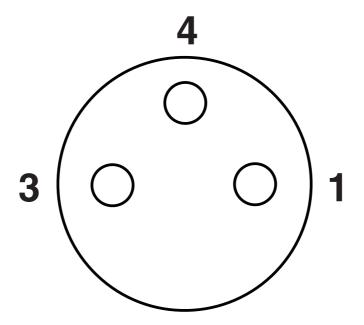
## Drawings

### Dimensional drawing



Socket M8 x 1, straight

Schematic diagram



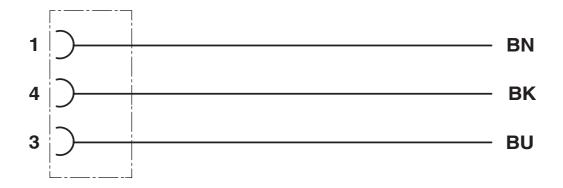
Pin assignment M8 socket, 3-pos., view female side



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## Circuit diagram





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# Approvals

<b>®</b>	<b>UL Listed</b> Approval ID: FILE E 221474	ŀ			
		Nominal Voltage $U_N$	Nominal Current I <sub>N</sub>	Cross Section AWG	Cross Section mm <sup>2</sup>
		60 V	4 A	-	-

• <u>®</u>	CUL Listed Approval ID: FILE E 221474				
		Nominal Voltage $U_N$	Nominal Current I <sub>N</sub>	Cross Section AWG	Cross Section mm <sup>2</sup>
		60 V	4 A	-	-

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



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## Classifications

UNSPSC 21.0

### **ECLASS**

ECLASS-11.0	27060311
ECLASS-12.0	27060311
ECLASS-13.0	27060311
ETIM	
ETIM 8.0	EC001855
UNSPSC	

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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#### Accessories

### PABA WH/23 - Insert label

1013779

https://www.phoenixcontact.com/in/products/1013779



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

### PABA YE/23 - Insert label

1013782

https://www.phoenixcontact.com/in/products/1013782



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



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### B-STIFT - Marker pen

1051993

https://www.phoenixcontact.com/in/products/1051993



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

### CUTFOX-S VDE - Diagonal cutter

1212207

https://www.phoenixcontact.com/in/products/1212207



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



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### WIREFOX SAC-1 - Stripping tool

1212757

https://www.phoenixcontact.com/in/products/1212757



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

### WIREFOX SAC - Stripping tool

1212623

https://www.phoenixcontact.com/in/products/1212623



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



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### WIREFOX 10 - Stripping tool

1212150

https://www.phoenixcontact.com/in/products/1212150



Stripping tool, for cables and conductors from 0.02 -  $10~\text{mm}^2$ , self-adjusting, stripping length of up to 18 mm, cutting capacity of up to 10 mm $^2$  stranded/1.5 mm $^2$  solid, replaceable stripping blade

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

1422884

https://www.phoenixcontact.com/in/products/1422884



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



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

3240681

https://www.phoenixcontact.com/in/products/3240681



Protective hose, material: PA 6, UV-resistant: yes, flexible, degree of protection: IP68, color: black, flammability rating in acc. with UL 94: V0, inner diameter: 10 mm, Total length: 50 m

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

3240839

https://www.phoenixcontact.com/in/products/3240839



Protective hose, material: PA 6, UV-resistant: yes, flexible, degree of protection: IP68, color: black, flammability rating in acc. with UL 94: HB, inner diameter: 10 mm, Total length: 50 m



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### PROT-M 8 MS-PA-CHAIN - Screw plug

1430860

https://www.phoenixcontact.com/in/products/1430860

 $\ensuremath{\mathsf{M8}}$  sealing cap made of plastic with fixing band for sensor cables, for  $\ensuremath{\mathsf{M8}}$  sockets



### TSD 02 SAC - Torque screwdriver

1208487

https://www.phoenixcontact.com/in/products/1208487



Torque screwdriver, with preset torque of 0.2 Nm and 4 mm hexagonal drive for M8 connectors



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#### SAC BIT M8-D10 - Tool

1208461

https://www.phoenixcontact.com/in/products/1208461



Nut for assembling M8 connectors with longitudinal knurl and a knurl diameter of 10 mm, for 4 mm hexagonal drive

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