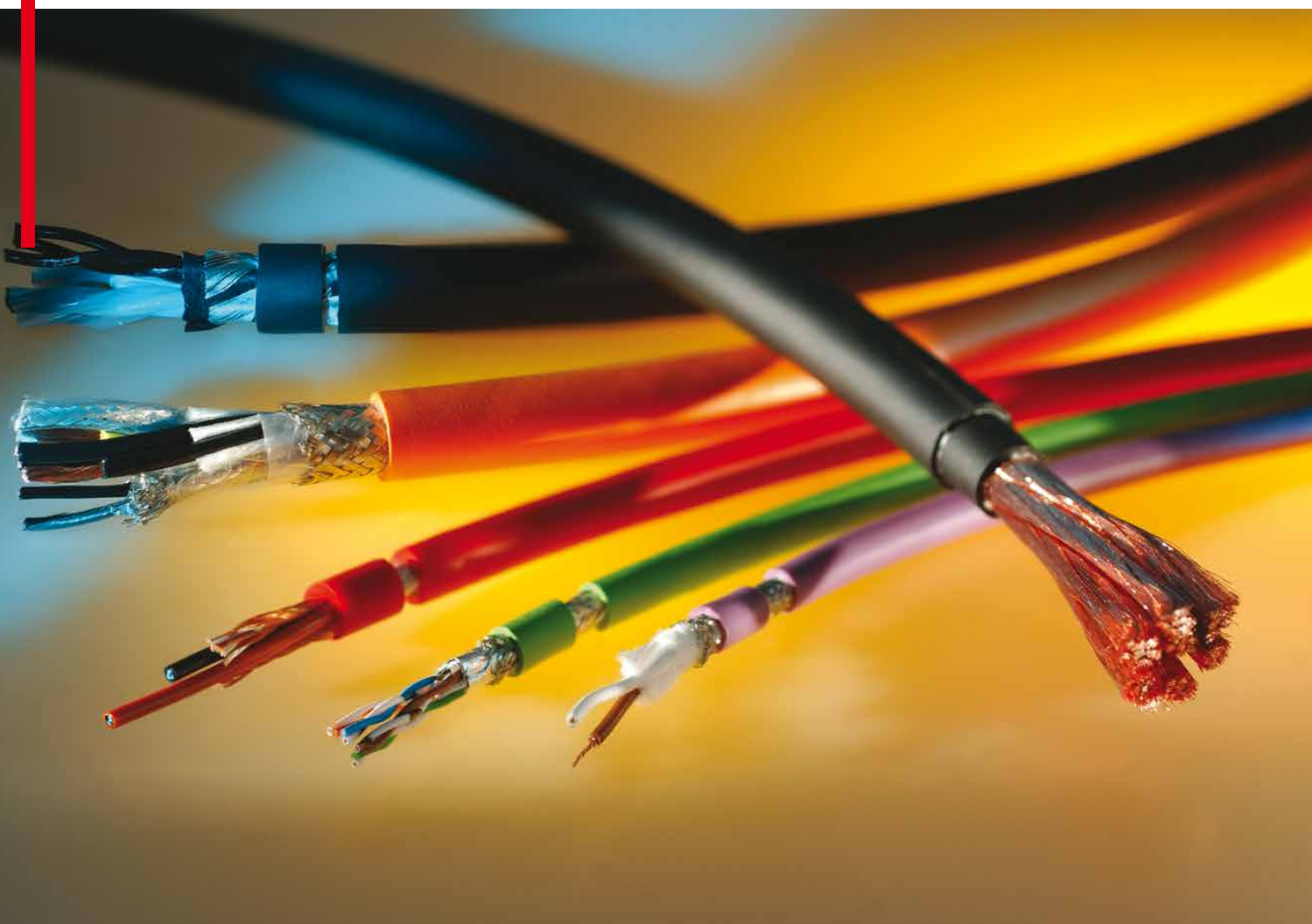


## Cables for robot applications



## Robot primary cable



### Cable design

#### Internal conductor

- Special conductor
- Strand class VI (super-fine wire)
- Highly flexible

#### Core insulation

- TPM or PUR

#### Core identification

- Black cores with continuous white numbering
- PE conductor green/yellow

#### Core stranding

- With very short lay length, reeled around a filler element in one layer for design reasons.

#### Outer sheath

- Special PUR

### Cable properties

#### PUR self-extinguishing and flame retardant

- according to IEC 60332-1 / EN 50265-2-1

#### Oil-resistant

- acc. to VDE 0472

#### Halogen-free

- Based on EN 50267-2-1

#### Silicone-free

- The materials used in manufacture are free of silicone and cadmium, as well as of substances that impair paint wetting

#### Lead-free

- Based on EU Directive (RoHS) 2002/95/EC

### Advantages

- Extremely high resilience to mechanical loads
- For extreme loadings
- High flexibility, even at very low temperatures

### Application

Primary cables for the most extreme applications.

These robot cables are absolutely torsion-loadable and are highly resistant to flexural stresses. They are particularly suitable for automated production processes with 3D movements, such as occur in the automotive industry, general engineering and plant construction.



RoHS  
compliant

## Robot primary cable

### Technical data

**Nominal voltage:**

$U_0/U$ : 600 V/1,00 V

**Insulation resistance:**

min. 100 M $\Omega$  x km

**Temperature range when moving:**

-40 °C to +80 °C max. conductor temp.

**Temperature range static:**

-50 °C to +80 °C max. conductor temp.

**Minimum bending radius flexing:**

10 x Cable diameter

**Minimum bending radius static:**

5 x Cable diameter

Designation:	Order no.	Colour	$\varnothing$ in mm:	CU kg/km:	Weight kg/km:	Minimum bending radius (mm):	Remarks
Primary cable 1x25 mm <sup>2</sup>	82854001	Black	10.8	238.0	278.0	108.0	
Primary cable 1x25 mm <sup>2</sup>	82854002	bk/gnye	10.8	238.0	278.0	108.0	
Primary cable 1x35 mm <sup>2</sup>	82854003	Black	11.8	332.0	371.0	118.0	
Primary cable 3x16 mm <sup>2</sup>	82851010	Orange	21.4	460.8	721.0	214.0	
Primary cable 3x25 mm <sup>2</sup>	82854005	Yellow	22.3	720.0	965.0	223.0	
Primary cable 3x35 mm <sup>2</sup>	82854006	Orange	24.7	1008.0	1229.0	247.0	
Primary cable 3x50 mm <sup>2</sup>	82854007	Orange	32.6	1344.0	1680.0	326.0	

Dimensions and specifications may be changed without prior notice.

## Robot control cable / motor cable / sensor cable / EMZ cable



### Cable design

#### Internal conductor

- Special conductor
- Strand class VI (super-fine wire)
- Highly flexible

#### Core insulation

- TPM or PUR

#### Core identification

- for design reasons

#### Core stranding

- Wires stranded with optimum lay lengths, low-torsion stranding with matching short lay lengths by one filling element

#### Innen sheath

- TPM

#### Screening

- Tin-plated copper braid
- Optical covering > 80%

#### Outer sheath

- Special PUR

### Cable properties

#### PUR self-extinguishing and flame retardant

- according to IEC 60332-1 / EN 50265-2-1

#### Oil-resistant

- acc. to VDE 0472

#### Halogen-free

- Based on EN 50267-2-1

#### Silicone-free

- The materials used in manufacture are free of silicone and cadmium, as well as of substances that impair paint wetting

#### Lead-free

- Based on EU Directive (RoHS) 2002/95/EG

### Advantages

- Extremely high resilience to mechanical loads
- For extreme loadings
- High flexibility, even at very low temperatures

### Application

Robot cables for the most extreme applications.

These robot cables are absolutely torsion-loadable and are highly resistant to flexural stresses. They are particularly suitable for automated production processes with 3D movements, such as occur in the automotive industry, general engineering and plant construction.



## Robot control cable / motor cable / sensor cable / EMZ cable

### Technical data

**Nominal voltage:**

$U_0/U$ : 300 V/500 V

**Test voltage:**

3,000 V

**Insulation resistance:**

min. 100 MΩ x km

**Temperature range when moving:**

-30 °C to +80 °C max. conductor temp.

**Temperature range static:**

-40 °C to +80 °C max. conductor temp.

**Minimum bending radius flexing:**

10 x Cable diameter

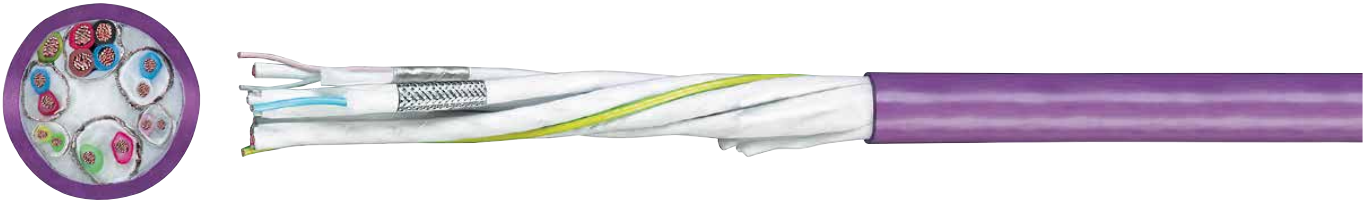
**Minimum bending radius static:**

5 x Cable diameter

Designation:	Art no.:	Ø in mm:	CU kg/km:	Weight kg/km:	Minimum bending radius (mm):	Remarks
Control cable 2x0.5+(2x0.5) mm <sup>2</sup>	82851001	8.0	32.0	72.0	80.0	
Control cable 13x0.5+3x1.0+(2x0.5) mm <sup>2</sup>	82851002	12.7	102.0	186.0	127.0	
Control cable 6x0.75+(3x0.75) mm <sup>2</sup>	82851003	10.0	188.1	307.0	100.0	
Control cable 5x1.0+(2x1.0) mm <sup>2</sup>	82851004	10.2	91.0	132.0	102.0	
Control cable 7x1.0+(2x1.0) mm <sup>2</sup>	82851005	10.6	92.0	138.0	106.0	
Control cable 16x1.0+(2x1.0) mm <sup>2</sup>	82853006	14.6	179.0	301.0	146.0	
Control cable 17x1.0+(2x1.0) mm <sup>2</sup>	82851007	14.8	188.0	309.0	148.0	
Control cable 23x1.0+(2x1.0) mm <sup>2</sup>	82851008	13.5	254.0	348.0	135.0	
Control cable 24x1.0+(2x1.0) mm <sup>2</sup>	82851009	15.7	249.0	385.0	157.0	
Control cable 3x(2x0.75)+17x0.75 mm <sup>2</sup>	82851019	15.8	185.0	333.0	158.0	
Control cable 2x(3x0.5)+3x0.5+2x4x0.5+2x0.5 mm <sup>2</sup>	82853010	11.4	108.0	91.6	114.0	
Control cable 22x0.75+5x(2x0.75) mm <sup>2</sup>	82851013	17.0	265.0	430.0	170.0	
Control cable (2x2x0.5)+3x3x0.5+5x3x1.0 mm <sup>2</sup>	82851020	13.6	126.0	253.0	136.0	
Control cable (2x1.0)+(3x1.0)+1x1.0 mm <sup>2</sup>	82853007	10.2	89.0	145.0	102.0	
Motor cable (4x2.5+(2x2x0.75)) mm <sup>2</sup>	82859009	13.0	197.0	275.0	104.0	
Motor cable (4x2.5+2x1.0) mm <sup>2</sup>	82859019	12.3	147.0	250.0	123.0	
Sensor cable 4x(2x0.25) mm <sup>2</sup>	82859010	11.6	86.0	190.0	116.0	
Sensor cable 8x(2x0.25) mm <sup>2</sup>	82859018	12.0	90.0	220.0	120.0	
EMZ cable [(4x2x0.25)+(5x1.5)+2x(2x0.5)+(5x0.5)] mm <sup>2</sup>	82852002	16.3	274.0	456.0	163.0	
EMZ cable [(4x0.75)+(5x0.5)+2x(2x0.5)+(4x2x0.25)] mm <sup>2</sup>	82852003	17.4	221.0	388.0	174.0	
EMZ cable [(4x2x0.25)+2x(2x0.5)+(5x2.5)+(5x0.5)] mm <sup>2</sup>	82852004	20.0	328.0	547.0	200.0	Wire colour spiralled
EMZ cable [(4x2x0.25)+2x(2x0.5)+(5x2.5)+(5x0.5)] mm <sup>2</sup>	82852005	20.0	328.0	546.0	200.0	Wire colour plain

Dimensions and specifications may be changed without prior notice.

## Robot bus cables



### Cable design

#### Internal conductor

- Special conductor
- Strand class VI (super-fine wire)
- Highly flexible

#### Core insulation

- TPM or PUR

#### Core identification

- Coloured wires
- PE conductor green/yellow

#### Core stranding

- Wires stranded with optimum lay lengths, low-torsion stranding with matching short lay lengths by one filling element

#### Screening

- Tin-plated copper braid
- Optical covering > 90%

#### Outer sheath

- Special PUR

### Cable properties

#### Flame-retardant

- acc. to HD 405.1 or IEC 332-1 and VW1/FT1 acc. to C-UL

#### Oil-resistant

- acc. to VDE 0472

#### Halogen-free

- in accordance with DIN VDE 0475 Part 815

#### Silicone-free

- The materials used in manufacture are free of silicone and cadmium, as well as of substances that impair paint wetting

#### Lead-free

- Based on EU Directive (RoHS) 2002/95/EC

### Advantages

- Extremely high resilience to mechanical loads
- For extreme loadings
- High flexibility, even at very low temperatures

### Application

Robot bus cables for the most extreme applications.

These robot cables are absolutely torsion-loadable and are highly resistant to flexural stresses. They are particularly suitable for automated production processes with 3D movements, such as occur in the automotive industry, general engineering and plant construction.



## Robot bus cables

### Technical data

**Nominal voltage:**

1.0 mm<sup>2</sup>: U<sub>y</sub>/U: 450 V/750 V

**Test voltage:**

0.25 mm<sup>2</sup>: 1.5 kV, 1.0 mm<sup>2</sup>: 2.5 kV

**Insulation resistance:**

min. 100 MΩ x km

**Temperature range when moving:**

-20 °C to +60 °C max. conductor temp.

**Temperature range static:**

-40 °C to +70 °C max. conductor temp.

**Minimum bending radius flexing:**

10 x Cable diameter

**Minimum bending radius static:**

5 x Cable diameter

Type	Order no.	Ø in mm:	CU kg/km:	Weight kg/km:	Minimum bending radius (mm):	Remarks
Interbus cable 5x(2x0.25)+2x(2x1.0)+1.0 mm <sup>2</sup>	82853001	13.6	120.0	220.0	136.0	
Multibus cable 1x(2x0.34)+2x(2x0.25)+2x(2x0.34)+2x(2x1.0)+1.0 mm <sup>2</sup>	82853003	14.7	139.0	258.0	147.0	

Dimensions and specifications may be changed without prior notice.

### FO data cable and FO supply cables

Type	Order no.	Ø in mm:	CU kg/km:	Weight kg/km:	Minimum bending radius (mm):	Remarks
FO data cable 2P 980/1000	82859015	8.0	-	55.0	40.0	
Profinet-FO	82859032	8.0	-	51.0	40.0	
Supply cable 5x1.5 mm <sup>2</sup>	82859013	9.9	68.2	133.2	148.5	

Dimensions and specifications may be changed without prior notice.

## ROBOFLEX recycle

### Technical data

- Approval: UL/cUL approved
- Manufacture based on VDE
- Temperature range:  
fixed installation: -40 °C to +120 °C  
flexible: -30 °C to +120 °C
- Nominal voltage: 300 V
- Test voltage: 2000 V
- Minimum bending radius:  
approx. 7.5 cable diameters  
(for flexible application)
- Traversing speed:  
max. 3.3 m/s for 5 m of horizontal  
traverse path length
- Acceleration: max. 5 m/s<sup>2</sup>
- Flexing and torsion cycles:  
min. 10 million
- Torsional stress: +/- 360 °/m

### Structure

- Bare copper stranded wire, 42 x 0.10 mm
- Core insulation polyester, bk, bu, bn
- Cores stranded in layers
- Sheath, special mix
- Weld spatter resistant, matt, low-adhesion,  
flame retardant and self-extinguishing (acc. to  
VDE 0472 Part 804 test type B, IEC 60332-1)
- Sheath colour: black
- Design (3-pin)**  
Wire colours bn, bu, bk  
OD 5.2 +/- 0.2 mm
- Design (4-pin)**  
Wire colours bn, bu, bk, wh  
OD 5.5 +/- 0.2 mm
- Design (5-pin)**  
Wire colours bn, bu, bk, wh, gy  
OD 6.0 +/- 0.2 mm

### Properties

- Highly oil resistant
- In accordance with VDE 0473 Part 811-2-1
- Good resistance to acids, alkalis and solvents
- Not cross-linked
- Weld spatter resistant
- Recyclable
- Halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion
- Very high mechanical load capacity
- Abrasion-resistant
- Wear-resistant
- Highly flexible
- UV-resistant
- ROHS-compliant
- CE-compliant



For more information, refer to [www.robotec-systems.de/roboflex](http://www.robotec-systems.de/roboflex)

### Notes

- IP67
- A-coded

### ROBOFLEX recycle

### Pre-assembled special cables

ROBOFLEX recycle	M12 socket pre-assembled on one side 3-pin, 4-pin and 5-pin
ROBOFLEX recycle	M12 4-pin + PE pre-assembled on one side
ROBOFLEX recycle	M12 pre-assembled on both sides 3-pin, 4-pin and 5-pin
ROBOFLEX recycle	M12 4-pin + PE pre-assembled on both sides
ROBOFLEX recycle	M12 plug pre-assembled on one side 3-pin, 4-pin and 5-pin
ROBOFLEX recycle	M8 socket pre-assembled on one side 3-pin and 4-pin
ROBOFLEX recycle	M8 pre-assembled on both sides 3-pin and 4-pin
ROBOFLEX recycle	M8 plug pre-assembled on one side 3-pin and 4-pin
ROBOFLEX recycle	M12 shielded pre-assembled on one side 3-pin, 4-pin and 5-pin
ROBOFLEX recycle	M12 shielded pre-assembled on both sides 3-pin, 4-pin and 5-pin
ROBOFLEX recycle	M12 on M12 twin cables pre-assembled on one side 3-pin
ROBOFLEX recycle	M12 on M12 twin cables pre-assembled on both sides 3-pin
ROBOFLEX recycle	3x0.34 mm <sup>2</sup> , 4x0.34 mm <sup>2</sup> , 5x0.34 mm <sup>2</sup> shielded and unshielded per metre length

Dimensions and specifications may be changed without prior notice.