

# Torsion Cables



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**Also suitable  
for applications  
on robots!**

## Applications

### ■ Torsion able data cables

Torsion able data cables are designed for applications as connection cables in various industrial areas, e.g. construction of industrial robots or plants as well as machine tool construction. These cables are suitable for medium mechanical stress, particularly abrasive and scrubbing stress, for continuously flexible torsion stress with, at the same time, continuously flexible bending stress at free movement without any tensile load. The cables can be used wherever due to the construction the application of cable tracks is impossible, also applicable in dry, wet and damp rooms, in ex-proofed areas as well as at low temperatures.

### ■ Torsion able control cables

Torsion able control cables are designed for applications as connection cables in various industrial areas, e.g. construction of industrial robots or plants as well as machine tool construction. These cables are suitable for medium mechanical stress, particularly abrasive and scrubbing stress, for continuously flexible torsion stress with, at the same time, continuously flexible bending stress at free movement without any tensile load. The cables can be used wherever due to the construction the application of cable tracks is impossible, also applicable in dry, wet and damp rooms, in ex-proofed areas as well as at low temperatures.

#### Exemplary applications:

RT 123	Packaging, wood working, textile, welding and cutting machine construction, car manufacturing industry,
RT 123 D	industrial robot construction, electrical drive, control, and measurement technology,
RT 113	construction of industrial plants and machine tooling construction
RT 113 D	

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■ You will find further information about the safe application of cables on pages N/28-38

## Selection table

		Cable type	RT 123	RT 123 D	RT 113	RT 113 D
Applica- tion	Screened			x		x
	Torsion angle 450°		x	x		
	Torsion angle 270°				x	x
Temperature range fixed laying*	+ 90 °C					
	+ 70 °C					
	- 40 °C					
	- 50 °C					
Voltage	Control and connection cable Nominal voltage U <sub>0</sub> /U 300/500 V Testing voltage 3000 V		x	x	x	
	Voltage 300 V (UL)				x	x
	Voltage 300 V (UL/CSA) up to 0,34 mm <sup>2</sup> Voltage 600 V (UL/CSA) from 0,50 mm <sup>2</sup>		x	x		
	Data cable peak operating voltage max. 350 V/Testing voltage 1500 V		x	x	x	x
Standard	Fire performance: flame retardant and self-extinguishing acc. to IEC 60332-1-2 and EN 60332-1-2		x	x	x	x
	UL acc. to AWM Style up to 0,34 mm <sup>2</sup>		x	x	x	x
	CSA acc. to AWM Style up to 0,34 mm <sup>2</sup>			x		
	UL/CSA acc. to AWM Style from 0,50 mm <sup>2</sup>		x	x	x	
	Halogen-free		x	x		
Charac- teristic	Very good oil resistance acc. to DIN VDE		x	x	x	x



\*The temperature range for flexible application is mentioned on the corresponding catalogue page



## RT 123 PUR torsion cable, torsion angle up to $\pm 450^\circ$ over 0.5 m



AWM Style 21060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE

Marking for RT 123 07951815:

SAB BRÖCKSKES · D-VIERSEN · 07951815 18 x 1.5 mm<sup>2</sup> RT 123 16 AWG/18 c 07951618 AWM Style 21060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE

### Construction:

<b>Conductor</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	bare copper strands, extra fine wires
<b>Conductor</b> from 0,50 mm <sup>2</sup> :	bare copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 6
<b>Insulation:</b>	TPE
<b>Colour code</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	acc. to colour code US 2 see page N/11
<b>Colour code</b> from 0,50 mm <sup>2</sup> :	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
<b>Stranding:</b>	specially adjusted layering with netting tape over each layer and one additional non-woven tape over the outer layer
<b>Sheath material:</b>	PUR, TPU acc. to DIN VDE 0282 part 10 + HD 22.10
<b>Sheath colour:</b>	black (RAL 9005)

### Outstanding features:

- rugged and reliable
- torsion angle up to  $\pm 450^\circ$  over 0,5 m

### Technical data:

<b>Voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	<b>UL/CSA:</b> 300 V		
<b>Voltage from 0,50 mm<sup>2</sup>:</b>	<b>UL/CSA:</b> max. 600 V		
<b>Peak operating voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	max. 350 V		
<b>Nominal voltage U<sub>0</sub>/U</b> from 0,50 mm <sup>2</sup> :	<b>DIN VDE:</b> 300/500 V		
<b>Testing voltage U</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	1500 V acc. to DIN VDE 0472 part 509		
<b>Testing voltage U</b> from 0,50 mm <sup>2</sup> :	3000 V acc. to DIN VDE 0281 part 2 + HD 21.2		
<b>Torsion angle:</b>	up to $\pm 450^\circ/0,5$ m (tested)		
<b>Min. bending radius:</b>	continuously flexible 12 x d / from 34 cores 20 x d		
<b>Radiation resistance:</b>	5 x 10 <sup>7</sup> cJ/kg		
<b>Temperature range</b> <i>fixed laying:</i> <i>flexible application:</i>	<b>UL</b> up to +80°C up to +80°C	<b>CSA</b> up to +80°C up to +80°C	<b>DIN VDE</b> -50/+90°C -40/+90°C
<b>Halogen-free:</b>	acc. to IEC 60754-1 and DIN VDE 0472 part 815		
<b>Fire performance:</b>	UL VW-1 + CSA FT1 and FT2, IEC 60332-1-2 and EN 60332-1-2		
<b>Oil resistance:</b>	very good - PUR TPU acc. to DIN VDE 0282 part 10 + HD 22.10		
<b>Chem. resistance:</b>	good against acids, alkalines, solvents, hydraulic liquids etc.		
<b>Continuous flexibility:</b>	very good		
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union see page N/14		

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item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
07950301	3 x 0,14	0,11	5,5	4,0	31
07950401	4 x 0,14	0,11	5,7	5,4	34
07950302	3 x 0,25	0,11	5,8	7,2	37
07950402	4 x 0,25	0,11	6,1	9,6	41
07950702	7 x 0,25	0,11	7,2	16,8	60
07952502	25 x 0,25	0,11	10,7	60,0	144
07950203	2 x 0,34	0,11	5,8	6,5	38

item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
07951805	18 x 0,50	0,16	12,5	95,0	205
07952505	25 x 0,50	0,16	14,7	132,0	287
07950407	4 x 0,75	0,16	8,0	28,8	79
07951407	14 x 0,75	0,16	12,6	100,8	204
07950210	2 x 1,00	0,16	7,5	19,2	68
07950310	3 x 1,00	0,16	7,8	28,8	78
07950410	4 x 1,00	0,16	8,4	38,4	93
07950610	6 x 1,00	0,16	9,7	57,6	129
07950710	7 x 1,00	0,16	10,3	67,2	147
07951210	12 x 1,00	0,16	12,6	115,2	217
07951810	18 x 1,00	0,16	14,9	172,8	318
07952510	25 x 1,00	0,16	17,2	240,0	437
07953410	34 x 1,00	0,16	20,0	326,4	564
07954010	40 x 1,00	0,16	21,4	384,0	661
07954110	41 x 1,00	0,16	21,4	393,6	673
07950715	7 x 1,50	0,16	11,7	100,8	200
07951215	12 x 1,50	0,16	14,7	172,8	307
07951815	18 x 1,50	0,16	17,1	259,2	442
07952515	25 x 1,50	0,16	20,0	360,0	618
07950325	3 x 2,50	0,16	10,4	72,0	151
07950425	4 x 2,50	0,16	11,2	96,0	182
07950340	3 x 4,00	0,16	12,1	115,2	211
07950361	3 x 10,0	0,21	18,0	288,0	475
07950362	3 x 16,0	0,21	20,4	460,8	698
07950363	3 x 25,0	0,21	25,6	720,0	1066
07950364	3 x 35,0	0,21	28,4	1008,0	1386



Also suitable  
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on robots!

Other dimensions and colours are possible on request.



## RT 123 D PUR torsion cable with overall copper screen, torsion angle up to $\pm 450^\circ$ over 0.5 m

21060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 CE



Marking for RT 123 D 07961815:

SAB BRÖCKSKES · D-VIERSEN · 07961815 18 x 1.5 mm<sup>2</sup> RT 123 D 16 AWG/18c 07961815 AWM Style 21060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE

### Construction:

<b>Conductor</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	bare copper strands, extra fine wires
<b>Conductor</b> from 0,50 mm <sup>2</sup> :	bare copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 6
<b>Insulation:</b>	TPE
<b>Colour code</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	acc. to colour code US 2 see page N/11
<b>Colour code</b> from 0,50 mm <sup>2</sup> :	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
<b>Stranding:</b>	specially adjusted layering with netting tape over each layer and one additional non-woven tape over the outer layer
<b>Screen:</b>	wrapped with bare copper wires
<b>Wrapping:</b>	non-woven tape
<b>Sheath material:</b>	PUR, TMPU acc. to DIN VDE 0282 part 10 + HD 22.10
<b>Sheath colour:</b>	black (RAL 9005)

### Outstanding features:

- rugged and reliable
- torsion angle up to  $\pm 450^\circ$  over 0,5 m

### Technical data:

<b>Voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	<b>UL/CSA:</b> 300 V		
<b>Voltage</b> from 0,50 mm <sup>2</sup> :	<b>UL/CSA:</b> 600 V		
<b>Peak operating voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	max. 350 V		
<b>Nominal voltage U<sub>0</sub>/U</b> from 0,50 mm <sup>2</sup> :	<b>DIN VDE:</b> 300/500 V		
<b>Testing voltage U</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	1500 V acc. to DIN VDE 0472 part 509 core/screen 1200 V		
<b>Testing voltage U</b> from 0,50 mm <sup>2</sup> :	3000 V acc. to DIN VDE 0281 part 2 + HD 21.2, core/screen 2000 V		
<b>Torsion angle:</b>	up to $\pm 450^\circ/0,5$ m (tested)		
<b>Min. bending radius:</b>	continuously flexible 12 x d / from 34 cores 20 x d		
<b>Radiation resistance:</b>	5 x 10 <sup>7</sup> cJ/kg		
<b>Temperature range</b> <i>fixed laying:</i>	<b>UL</b> up to +80°C	<b>CSA</b> up to +80°C	<b>DIN VDE</b> -50/+90°C
<i>flexible application:</i>	up to +80°C	up to +80°C	-40/+90°C
<b>Halogen-free:</b>	acc. to IEC 60754-1 and DIN VDE 0472 part 815		
<b>Fire performance:</b>	UL VW-1 + CSA FT1 and FT2, IEC 60332-1-2 and EN 60332-1-2		
<b>Oil resistance:</b>	very good - PUR TMPU acc. to DIN VDE 0282 part 10 + HD 22.10		
<b>Chem. resistance:</b>	good against acids, alkalines, solvents, hydraulic liquids etc.		
<b>Continuous flexibility:</b>	very good		
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union see page N/14		

item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire Ø mm	outer-Ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
07961201	12 x 0,14	0,11	8,5	30,2	79
07962502	25 x 0,25	0,11	11,3	90,9	171
07960505	5 x 0,50	0,16	8,7	40,5	95
07960710	7 x 1,00	0,16	11,1	108,5	177
07961215	12 x 1,50	0,16	15,3	214,7	344
07961815	18 x 1,50	0,16	17,8	326,0	499

Other dimensions and colours are possible on request.



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## RT 113 PVC torsion cable, torsion angle up to $\pm 270^\circ$ over 0.5 m



21216 90°C Oil 60°C 600V CSA AWM I/II A/B 90°C F 600V FT1 FT2

07971815 18 x 1.5 mm<sup>2</sup> RT 113 16 AWG/18 c 07961618 AWM Style 21216 90°C Oil 60°C 600V CSA AWM I/II A/B 90°C F 600V FT1 FT2

### Construction:

<b>Conductor</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	bare copper strands, extra fine wires
<b>Conductor</b> from 0,50 mm <sup>2</sup> :	bare copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 6
<b>Insulation:</b>	PVC, TI2 acc. to DIN VDE 0281 part 1 + HD 21.1
<b>Colour code</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	acc. to colour code US 2 see page N/11
<b>Colour code</b> from 0,50 mm <sup>2</sup> :	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
<b>Stranding:</b>	specially adjusted layering with netting tape over each layer and one additional non-woven tape over the outer layer
<b>Sheath material:</b>	PVC, TM5 acc. to DIN VDE 0281 part 1 HD 21.1
<b>Sheath colour:</b>	black (RAL 9005)

### Outstanding features:

- rugged and reliable
- torsion angle up to  $\pm 270^\circ$  over 0,5 m

### Technical data:

<b>Voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	<b>UL:</b> 300 V	
<b>Voltage</b> from 0,50 mm <sup>2</sup> :	<b>UL/CSA:</b> 600 V	
<b>Peak operating voltage</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	max. 350 V	
<b>Nominal voltage U<sub>0</sub>/U</b> from 0,50 mm <sup>2</sup> :	<b>DIN VDE:</b> 300/500 V	
<b>Testing voltage U</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	1500 V acc. to DIN VDE 0472 part 509	
<b>Testing voltage U</b> from 0,50 mm <sup>2</sup> :	2000 V acc. to DIN VDE 0281 part 2 + HD 21.2	
<b>Torsion angle:</b>	up to $\pm 270^\circ/0,5$ m (tested)	
<b>Min. bending radius:</b>	continuously flexible 12 x d / from 34 cores 20 x d	
<b>Temperature range</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> <i>fixed laying:</i> <i>flexible application:</i>	<b>UL</b> up to +80°C up to +80°C	<b>DIN VDE</b> -40/+70°C + 5/+70°C
<b>Temperature range</b> from 0,50 mm <sup>2</sup> <i>fixed laying:</i> <i>flexible application:</i>	<b>UL/CSA</b> up to +90°C up to +90°C	<b>DIN VDE</b> -40/+70°C + 5/+70°C
<b>Fire performance</b> 0,14 mm <sup>2</sup> - 0,34 mm <sup>2</sup> :	UL VW1, IEC 60332-1-2 and EN 60332-1-2	
<b>Fire performance</b> from 0,50 mm <sup>2</sup> :	UL VW1 + CSA FT1 + FT2 and IEC 60332-1	
<b>Oil resistance:</b>	very good - TM5 acc. to DIN VDE 0281 part 1 + HD 21.1, oilrating 60°C acc. to UL 758, Fuel-Oil acc. to CSA C22.2 No. 210.2-M90	
<b>Continuous flexibility:</b>	very good	
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union see page N/14	

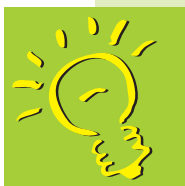
#### UL / CE

item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
07970301	3 x 0,14	0,11	5,2	4,0	32
07970401	4 x 0,14	0,11	5,6	5,4	36
07970302	3 x 0,25	0,11	5,6	7,2	38
07970402	4 x 0,25	0,11	5,9	9,6	43
07970702	7 x 0,25	0,11	7,3	16,8	66
07972502	25 x 0,25	0,11	11,4	60,0	172
07970203	2 x 0,34	0,11	5,5	6,5	39

#### UL / CSA / CE

item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
07972505	25 x 0,50	0,16	14,8	132,0	318
07970407	4 x 0,75	0,16	7,5	28,8	79
07970707	7 x 0,75	0,16	10,2	67,2	157
07971407	14 x 0,75	0,16	12,7	100,8	225
07970210	2 x 1,00	0,16	6,8	19,2	65
07970310	3 x 1,00	0,16	7,2	28,8	77
07970410	4 x 1,00	0,16	7,9	38,4	93
07971210	12 x 1,00	0,16	12,6	115,2	234
07971810	18 x 1,00	0,16	14,8	172,8	340
07972510	25 x 1,00	0,16	17,2	240,0	473
07973410	34 x 1,00	0,16	20,2	326,4	616
07974110	41 x 1,00	0,16	21,6	393,6	735
07971815	18 x 1,50	0,16	16,5	259,2	456
07972515	25 x 1,50	0,16	19,3	360,0	638
07970325	3 x 2,50	0,16	10,2	72,0	160
07970425	4 x 2,50	0,16	11,1	96,0	194
07970340	3 x 4,00	0,16	12,3	115,2	234
07970361	3 x 10,0	0,21	18,5	288,0	548
07970362	3 x 16,0	0,21	21,1	460,8	794
07970363	3 x 25,0	0,21	23,9	720,0	1128
07970364	3 x 35,0	0,21	28,9	1008,0	1555

Other dimensions and colours are possible on request.



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## RT 113 D PVC torsion cable with overall copper screen, torsion angle up to $\pm 270^\circ$ over 0.5 m



Marking for RT 113 D 07981201:

SAB BRÖCKSKES · D-VIERSEN · 07981201 12 x 0.14 mm<sup>2</sup> RT 113 D 26 AWG/12c 07982612 RJ AWM Style 2464 80°C 300V CE

### Construction:

<b>Conductor:</b>	bare copper strands, extra fine wires
<b>Insulation:</b>	PVC, T12 acc. to DIN VDE 0281 part 1 + HD 21.1
<b>Colour code:</b>	acc. to colour code US 2 see page N/11
<b>Stranding:</b>	specialy adjusted layering with netting tape over each layer and one additional non-woven tape over the outer layer
<b>Screen:</b>	wrapped with bare copper wires
<b>Wrapping:</b>	non-woven tape
<b>Sheath material:</b>	PVC, TM5 acc. to DIN VDE 0281 part 1 HD 21.1
<b>Sheath colour:</b>	black (RAL 9005)

### Outstanding features:

- rugged and reliable
- torsion angle up to  $\pm 270^\circ$  over 0,5 m

### Technical data:

<b>Voltage:</b>	<b>UL:</b> 300 V	
<b>Peak operating voltage:</b>	max. 350 V	
<b>Testing voltage U:</b>	1500 V acc. to DIN VDE 0472 part 509 core/screen 1200 V	
<b>Torsion angle:</b>	up to $\pm 270^\circ/0,5$ m (tested)	
<b>Min. bending radius:</b>	continuously flexible 12 x d / from 34 cores 20 x d	
<b>Temperature range</b>	<b>UL</b>	<b>DIN VDE</b>
<i>fixed laying:</i>	up to +80°C	-40/+70°C
<i>flexible application:</i>	up to +80°C	+ 5/+70°C
<b>Fire performance:</b>	UL VW1, IEC 60332-1-2 and EN 60332-1-2	
<b>Oil resistance:</b>	very good - TM5 acc. to DIN VDE 0281 part 1 + HD 21.1	
<b>Continuous flexibility:</b>	very good	
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union see page N/14	

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Art.-Nr.	Aderzahl x Querschnitt n x mm <sup>2</sup>	Größter Einzeldraht ø mm	Außen-ø ± 5% mm	Cu-Zahl kg/km	Leitungsgewicht ≈ kg/km
07981201	12 x 0,14	0,11	8,8	32,2	85
07982502	25 x 0,25	0,11	12,0	96,7	187

Other dimensions and colours are possible on request.



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