










# Torsional Robotic Cable

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# Torsional Robotic Cable

	<b>OLFLEX® ROBOT 900 P/ 900 DP</b> Robotic Cable for Continuous Twisting Motion	CE 	<b>109</b>
	<b>OLFLEX® ROBOT F1</b> Robotic Cable for Continuous Twisting Motion	 CE 	<b>111</b>
<b>NEW</b>	<b>ETHERLINE® TORSION CAT.5</b> Halogen-Free Industrial Grade Ethernet Cable for Torsion Applications	    	<b>113</b>
<b>NEW</b>	<b>OLFLEX® H07BN4-F</b> Torsional Rubber Cable for use in Wind Energy	<HAR> CE 	<b>114</b>

## QUICK SELECT CHART

Product	Temperature Range	Nominal Voltage Rating	Jacket Material	Max. Torsion Twist	Torsion Cycles	Page #
OLFLEX® ROBOT 900 P/ 900 DP	-40°C to +80°C	500V	PUR	+/- 360°/M	2 million	109
OLFLEX® ROBOT F1	-40°C to +80°C	600V	PUR	+/-180°/M	2 million	111
ETHERLINE® TORSION UL (AWM) CAT.5	-40°C to +80°C	100V	PUR	+/-180°/M	2 million	113
OLFLEX® H07BN4-F	Flexible: -15°C to +90°C Stationary: -35°C to +90°C	Uo/u 450/750V Uo/u 600/1000V	Polychloroprene	+/-150/M	Wind Turbine Application	114

# OLFLEX® ROBOT 900 P/ 900 DP



## Robotic Cable for Continuous Twisting Motion

OLFLEX® ROBOT 900 P is a multi-conductor cable that transmits control and monitoring signals as well as power. Its high quality insulation with smooth surface and low friction wraps increases cable life expectancy under extreme twisting and bending stresses. The outer jacket of specially formulated polyurethane is highly resistant to abrasion, oil, notching, microbes and hydrolysis. In addition, the surface quality prevents adhesion to adjacently installed cables. The OLFLEX® ROBOT 900 DP with a tinned copper spiral shield is used for applications where EMI emissions need to be suppressed.

### Recommended Applications:

Where combined twisting and bending stresses occur on end-of-arm tooling of assembly and welding robots and automated handling equipment

### Application Advantage:

- The smooth elastomeric core insulation and low friction tape improves service life in applications where combined twisting and bending occur
- The specially formulated PUR jacket provides protection in the most harsh industrial plant environments preventing unplanned downtime and associated costs
- Maximum torsion twist of +/- 360° per meter is suitable for a wide variety of robot applications

### OLFLEX® ROBOT 900 P Construction:

Finely stranded bare copper conductors; special elastomeric insulation; low friction core wrap; specially formulated UV resistant black polyurethane jacket with matte finish.



### OLFLEX® ROBOT 900 DP Construction:

Finely stranded bare copper conductors; special elastomeric insulation; low friction core wrap; tinned copper spiral shield, specially formulated UV resistant black polyurethane jacket with matte finish.



Cable Attributes, See Page 653		Availability:	Complete the installation with:	
Oil Resistance: OR-05	Flame Resistance: FR-02	Standard put-ups are 164ft, 328ft, 1640ft, and 3280ft. Bulk reels can be cut to length.	SKINTOP® Strain Relief: Page 486	EPIC® Connectors: Page 251
Motion Type: T-01	Mechanical Properties: MP-05		OLFLEX® Tubing: Page 546	OLFLEX® ROBOT Track: Page 616

### Technical Data:

Minimum Bending Radius for continuous flexing:	15 x cable diameter	Color Code:	- up to 0.34 mm <sup>2</sup> - 0.5 mm <sup>2</sup> and larger	Cores according to DIN 47100 Black with white numbers, plus green/yellow ground
Max. Torsion (twist): - without shield: - with shield (DP):	+/- 360° per meter +/- 180° per meter	Nominal Capacitance:	Cond./ cond. approx. 30.5 pF/Ft Cond./ cond./ shield approx. 36.6 pF/Ft	
Temperature Range:	-40°C to +80°C	Rated Voltage:	300/500V	
Test Voltage: - from 0.5 mm <sup>2</sup> - up to 0.34 mm <sup>2</sup>	3000V 1500V	Conductor Stranding:	Flexible Fine Wire	

# OLFLEX® ROBOT 900 P/ 900 DP



Robotic Cable for Continuous Twisting Motion

## OLFLEX® ROBOT 900 P: Robotic Cable for Continuous Twisting Motion

Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight		Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight	
		inches	mm	lbs/mft	lbs/mft	kg/km			inches	mm	lbs/mft	lbs/mft	kg/km
24 AWG (14/34) 0.25 mm <sup>2</sup>							16 AWG (30/30) 1.50 mm <sup>2</sup>						
0028116	25	.402	10.2	40	95	141	0028198	18	.622	15.8	174	300	446
21 AWG (16/32) 0.50 mm <sup>2</sup>							0028200	25	.776	19.7	242	429	638
0028145	18	.441	11.2	58	81	120	14 AWG (50/30) 2.50 mm <sup>2</sup>						
0028146	25	.524	13.3	81	171	254	0028181	3	.366	9.3	48	91	136
19 AWG (24/32) 0.75 mm <sup>2</sup>							0028182	4	.398	10.1	65	115	171
0028160	4	.260	6.6	19	42	63	12 AWG (50/28) 4 mm <sup>2</sup>						
0028164	14	.449	11.4	68	134	199	0028184	3	.484	12.3	78	152	226
18 AWG (32/32) 1.00 mm <sup>2</sup>							8 AWG (80/26) 10 mm <sup>2</sup>						
0028170	2	.244	6.2	13	32	47	0028300	3	.720	18.3	194	347	517
0028171	3	.256	6.5	19	41	61	6 AWG (128/26) 16 mm <sup>2</sup>						
0028172	4	.283	7.2	26	51	76	0028400	3	.843	21.4	310	484	721
0028174	7	.366	9.3	45	88	131	4 AWG (200/26) 25 mm <sup>2</sup>						
0028176	12	.453	11.5	77	145	216	0028187	3	1.031	26.2	484	791	1178
0028185	18	.650	16.5	131	253	376	2 AWG (280/26) 35 mm <sup>2</sup>						
0028178	18	.520	13.2	116	204	304	0028189	3	1.134	28.8	677	1047	1559
0028186	25	.681	17.3	176	316	470							
0028180	25	.646	16.4	161	291	433							
0028190	34	.783	19.9	219	380	565							
0028191	41	.843	22.3	264	468	696							

## OLFLEX® ROBOT 900 DP: Shielded Robotic Cable for Continuous Twisting Motion

Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight		Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight	
		inches	mm	lbs/mft	lbs/mft	kg/km			inches	mm	lbs/mft	lbs/mft	kg/km
26 AWG (18/38) 0.14 mm <sup>2</sup>							16 AWG (30/30) 1.50 mm <sup>2</sup>						
0028100	12	.264	6.7	29	46	69	0028195	12	.551	14.0	174	265	395
0028105	3 pairs	.232	5.9	11	30	44	0028199	18	.665	16.9	263	396	590
24 AWG (14/34) 0.25 mm <sup>2</sup>													
0028126	25	.437	11.1	70	123	183							
22 AWG (19/34) 0.34 mm <sup>2</sup>													
0028135	4	.224	5.7	14	31	46							
0028136	5 pairs	.358	9.1	43	77	114							

# OLFLEX® ROBOT F1



## Robotic Cable for Continuous Twisting Motion

OLFLEX® ROBOT F1 is designed to transmit control and monitoring signals as well as power supply in installations where combined twisting and bending stresses occur. The special polyurethane jacket compound is resistant against oils, microbes, hydrolysis and abrasion. OLFLEX® ROBOT F1 is also available in a shielded version.

### Recommended Applications:

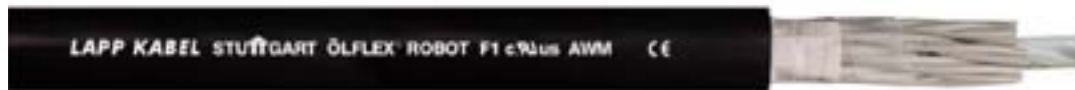
For connecting handling tools of assembly and polyarticulated robots, also to connect rotations on tilting tables





### Application Advantage:

- UL AWM approval for USA and Canada
- The smooth TPE core insulation and low friction tape improves service life in applications where combined twisting and bending occur
- The specially formulated PUR provides protection in the most harsh industrial plant environments preventing unplanned downtime and associated costs








### OLFLEX® ROBOT F1 Construction:

Highly flexible tinned copper conductors; special polymer insulation cores (or core pairs) twisted in bundles or layers; low friction tape wrapping; tinned copper shield; polyurethane elastomer jacket.



<b>Cable Attributes, See Page 653</b>  Oil Resistance: OR-04  Flame Resistance: FR-02  Motion Type: TCF-01  Mechanical Properties: MP-05		<b>Availability:</b>  Standard put-ups are 164ft, 328ft, 1640ft, and 3280ft. Bulk reels can be cut to length.	<b>Complete the installation with:</b>  SKINTOP® Strain Relief: Page 486  EPIC® Connectors: Page 251  OLFLEX® Tubing: Page 546  OLFLEX® ROBOT Track Page 616	
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### Technical Data:

 Minimum Bending Radius for continuous flexing: 10 x cable diameter	 Conductor Stranding: Flexible Fine Wire
 Max. Torsion (twist): without shield: +/- 360° per Meter with shield (DP): +/- 180° per Meter	 Color Code: - up to 0.34 mm <sup>2</sup> - 0.5 mm <sup>2</sup> and larger Cores according to DIN 47100 White with black numbers, plus green/yellow ground
 Temperature Range: -40°C to +80°C	 Approvals: UL: - UL AWM Style 20940 VW1 CSA: - cUL AWM I/IIA/B FT1
 Rated Voltage: UL/CSA: - up to 1.5 mm <sup>2</sup> 600V - 2.5 mm <sup>2</sup> and larger 1000V IEC: - up to 0.34 mm <sup>2</sup> 250V - 0.5 - 2.5 mm <sup>2</sup> 300/500V	

# OLFLEX® ROBOT F1

## Robotic Cable for Continuous Twisting Motion



### OLFLEX® ROBOT F1: Robotic Cable for Continuous Twisting Motion

Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight		Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight	
		inches	mm	lbs/mft	lbs/mft	kg/km			inches	mm	lbs/mft	lbs/mft	kg/km
<b>24 AWG (0.25 mm<sup>2</sup>)</b>							<b>0029614</b>						
0029590	7	.264	6.7	11	42	62	0029615	12	.488	12.4	74	159	237
0029591	12	.354	9.0	20	82	122	0029616	14	.520	13.2	86	173	257
0029592	18	.417	10.6	30	105	156	0029617	16	.606	15.4	128	233	346
0029593	25	.492	12.5	40	138	205	0029618	18	.634	16.1	114	235	349
<b>22 AWG (0.34 mm<sup>2</sup>)</b>							<b>0029619</b>						
0029594	2	.181	4.6	5	26	38	0029620	23	.709	18.0	168	310	461
0029595	3	.189	4.8	7	27	40	0029621	25	.701	17.8	161	273	407
0029596	4	.205	5.2	10	32	48	0029622	34	.831	21.1	215	403	600
0029599	12	.370	9.4	27	87	130	0029622	41	.929	23.6	262	506	753
0029600	18	.441	11.2	40	114	170	<b>16 AWG (1.50 mm<sup>2</sup>)</b>						
0029601	25	.516	13.1	56	148	220	0029624	4	.323	8.2	38	77	114
<b>20 AWG (0.50 mm<sup>2</sup>)</b>							<b>0029625</b>						
0029608	18	.484	12.3	56	136	202	0029627	7	.413	10.5	68	126	187
0029609	25	.599	15.2	81	191	284	0029629	12	.563	14.3	114	198	294
<b>18 AWG (1.00 mm<sup>2</sup>)</b>							<b>0029630</b>						
0029610	2	.248	6.3	13	40	60	0029631	18	.689	17.5	174	302	450
0029611	3	.260	6.6	19	48	71	<b>14 AWG (2.50 mm<sup>2</sup>)</b>						
0029612	4	.283	7.2	26	58	87	0029632	3	.358	9.1	48	91	136
							<b>0029641</b>						
							4						
							.524						
							13.3						
							148						
							222						
							330						

### OLFLEX® ROBOT F1: Shielded Robotic Cable for Continuous Twisting Motion

Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight		Part Number	Number of Conductors includes ground	Nominal Outer Diameter		Copper Weight	Approx. Weight	
		inches	mm	lbs/mft	lbs/mft	kg/km			inches	mm	lbs/mft	lbs/mft	kg/km
<b>24 AWG (0.25 mm<sup>2</sup>)</b>							<b>16 AWG (1.50 mm<sup>2</sup>)</b>						
0029653	3 pr	.315	8.0	26	67	100	0029689	12	.606	15.4	155	255	380
0029654	25	.543	13.8	77	188	280	0029690	18	.728	18.5	228	370	550
<b>22 AWG (0.34 mm<sup>2</sup>)</b>													
0029655	2	.205	5.2	12	36	54							
0029656	3	.213	5.4	13	38	56							
0029657	4	.260	6.6	19	48	72							
0029658	5 pr	.402	10.2	46	106	158							

24 & 22 AWG cables have a tinned copper spiral shield; 16 AWG cables have a tinned copper braid shield.

# ETHERLINE® TORSION CAT.5

Halogen-Free Industrial Grade Ethernet Cable  
for Torsion Applications



ETHERLINE® TORSION CAT.5 is a 2 pair industrial Ethernet cable. It is tested to more than 1 million bending cycles and a right/left movement of 180° a meter.

**Recommended Applications:**

Robotic applications where torsion twisting is required

**Application Advantage:**

- Highly abrasion resistant polyurethane jacket to withstand industrial automation applications
- Halogen-free and RoHS compliant meeting environmental considerations
- Flame retardant in acc. with IEC 60332-1-2

**ETHERLINE® TORSION CAT. 5 Construction:**

Finely stranded tinned copper conductors; foam-skin polyethylene insulation; star quad arrangement; halogen-free flame retardant green polyurethane jacket.



**Cable Attributes, See Page 653**

	Oil Resistance: OR-05		Flame Resistance: FR-01
	Motion Type: T-01		Mechanical Properties: MP-05

**Availability:**

Standard put-ups are 164ft, 328ft, 1640ft, and 3280ft. Bulk reels can be cut to length.

**Complete the installation with:**

	SKINTOP® Strain Relief: Page 486		EPIC® Connectors: Page 251
	OLFLEX® Tubing: Page 546		OLFLEX® ROBOT Track Page 612

Minimums may apply.

**Technical Data:**

- |  |                    |                      |                             |
|--|--------------------|----------------------|-----------------------------|
| Minimum Bending Radius for continuous flexing: | 5 x cable diameter | Character Impedance: | 1 - 100 MHz: 100 +/- 15 OHM |
| Max. Torsion (Robot Twist):                    | +/- 180°           | Color Code:          | White, Yellow, Blue, Orange |
| Temperature Range:                             | -40°C to +80°C     | Approvals: UL:       | AWM Style 21161             |
| Rated Voltage:                                 | 100V               |                      |                             |
| Test Voltage:                                  | 700V               |                      |                             |

Part Number	Description	Nominal Outer Diameter		Copper Weight lbs/mt	Approx. Weight	
		inches	mm		lbs/mt	kg/km
2170888 (19 wire)	22/2pr	.256	6.5	21	35	52

# OLFLEX® H07BN4-F

## Torsional Rubber Cable for use in Wind Energy

OLFLEX® H07BN4-F is a single conductor rubber cable designed for torsion applications in the wind industry. Suitable for dry and damp interiors as well as outdoor use.

### Recommended Applications:

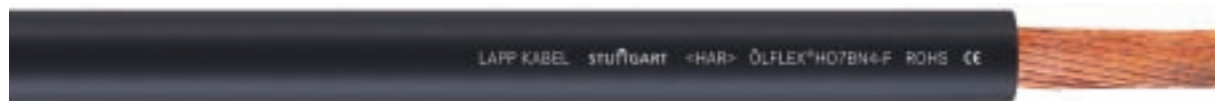
For mobile use as well as fixed installations such as power cable for the wind energy industry

### Application Advantage:





- Torsion resistant up to +/- 150°/meter
- Abrasion resistant jacket
- Cold flexible down to -15°C
- Conductor temperature +90°C
- Flame retardant in acc. with IEC 60332.1 (UL VW-1)

### OLFLEX® H07BN4-F Construction:

Highly flexible bare copper conductors; rubber base (EPR) insulation; special polychloroprene black jacket

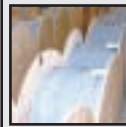


#### Cable Attributes, See Page 653

	Oil Resistance: OR-01		Flame Resistance: FR-01
	Motion Type: T-01A*		Mechanical Properties: MP-01

\* 20,000 cycles +/- 150

#### Availability:










Standard put-ups are 1640ft, and 3280ft. Bulk reels can be cut to length.

#### Complete the installation with:

	SKINTOP® Strain Relief: Page 486		EPIC® Connectors: Page 251
	OLFLEX® Tubing: Page 546		OLFLEX® ROBOT Track Page 616

### Technical Data:

	Minimum Bending Radius			Test Voltage:	2500V
	- for flexible:	6 x cable diameter		Conductor Stranding:	Extra fine wire in acc. to VDE 0295, Cl.6/IEC 288 Cl.6
	- for stationary:	5 x cable diameter		Approvals:	VDE 0282 Part 12/ HD 22.12
	Max Torson (Twist):	+/- 150°/meter			
	Temperature Range:				
	- Wind Energy:	-35°C to +90°C			
	- Flexible:	-15°C to +90°C			
	- Stationary:	-35°C to +90°C			
	Rated Voltage:				
	- U <sub>0</sub> /u:	450/750V			
	- U <sub>0</sub> /u:	600/1000V			

Part Number	Description	Outer Diameter		Copper Weight lbs/mft	Approx. Weight	
		inches	mm		lbs/mft	kg/km
1600715	95 mm <sup>2</sup>	0.882	22.4	613	827	1230
1600716	120 mm <sup>2</sup>	0.957	24.3	774	1001	1490
1600717	150 mm <sup>2</sup>	1.071	27.2	968	1260	1875
1600718	185 mm <sup>2</sup>	1.154	29.3	1193	1472	2190
1600719	240 mm <sup>2</sup>	1.283	32.6	1548	1949	2900
1600720	300 mm <sup>2</sup>	1.417	36.0	1935	2285	3400
1600721	400 mm <sup>2</sup>	1.575	40.0	2580	2957	4400