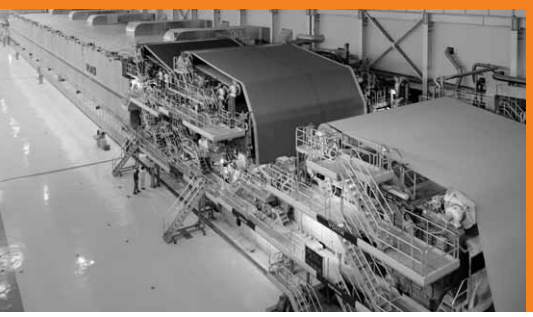
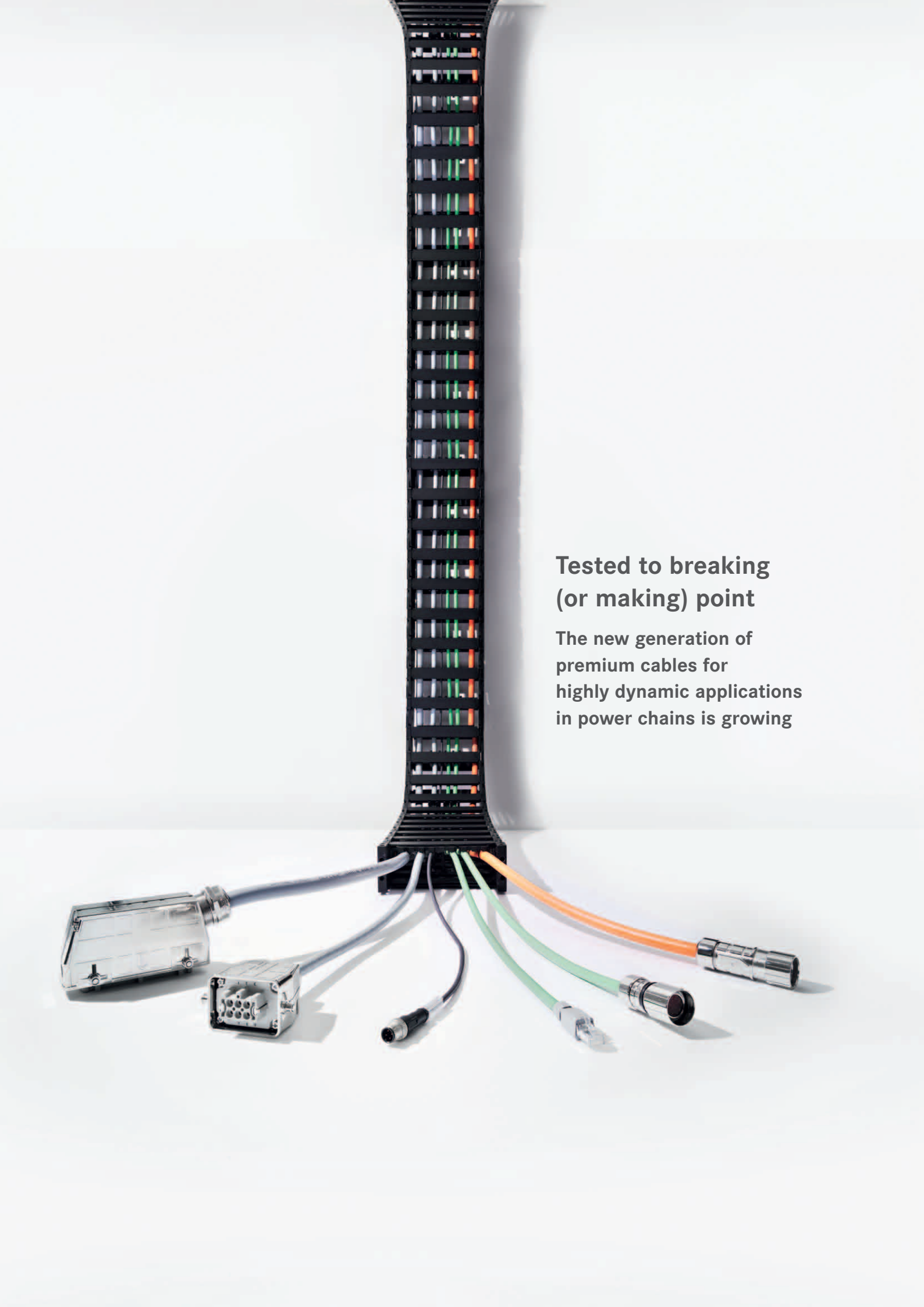
THE WORLD OF LAPP

Cables for power chains



LAPP GROUP



Tested to breaking (or making) point

The new generation of premium cables for highly dynamic applications in power chains is growing

ÖLFLEX® SERVO FD/CHAIN

- **New premium cables for servo and power chain applications replace eight ÖLFLEX® servo cables**
- **Fewer articles, lower storage costs, better performance, more dynamic**
- **Attractive price and, and, and...**

The family is growing

As an accompaniment to the established ÖLFLEX® SERVO FD 796 CP servo cable, Lapp now presents the unshielded version ÖLFLEX® SERVO FD 796 P, the 4 and 5-core connecting cable ÖLFLEX® CHAIN 896 P, and the resolver & encoder cable ÖLFLEX® SERVO FD 798 CP.

These new family members steal the show thanks to their ability to make fast position changes in power chains with acceleration capability of up to 50 m/s², speeds of up to 5 m/s and travel distances of up to 100 metres. This means that they work noticeably faster and more efficiently than the power chain cables that have been in use up to now. They are the perfect addition to complete the range of highly dynamic servo and connecting cables. The proportional run-up and braking times of this family of cables can be reduced by up to 96% thanks to their excellent acceleration capability.

In short, the new premium cables save time and enable facilities to operate with improved productivity, as well as offering longer service life, taking up less space and weighing less. The new premium cables were developed by the Lapp Group in Stuttgart. Thanks to low-capacitance polyolefin insulation, they offer lower EMC-effective leakage currents while simultaneously providing extremely high dielectric and electrical strength. 796 P and 798 CP are halogen-free, completely flame-retardant and have been granted key approvals such as UL and CSA. VDE registration for the power cables is currently in progress.

Some time ago, Lapp invested in new power chain cable testing facilities at its in-house test centre, so that it could permanently guarantee the required quality standards. At these facilities, cables are subjected to highly dynamic alternate bending loads. Not only that, but the new testing facilities enable travel speeds of up to 10 m/s and acceleration rates of up to 100 m/s².

Further information (including ordering information) and support for placing product orders can be found at:
www.lappkabel.de

Power and control cables

Power chain applications · SERVO applications - power drive systems, approved

New

ÖLFLEX® SERVO FD 796 P

Info

- **New high-end version! For very dynamic motion sequences**
- **Slim = less space required**
- **Unshielded version of ÖLFLEX® SERVO FD 796 CP with control pair(s)**

Benefits

- Allows much faster speed and accelerations which increases the economic efficiency of the machines
- Multi-standard = fewer part varieties = cost savings
- The advantage: the modified design of the control core pairs means the longitudinal voltage drop is lower; it also permits considerably higher operating voltages in the auxiliary circuits
- To substitute 3 ÖLFLEX® SERVO FD product lines: -750P/-755P/-795P (with control pair)

Application range

- Power drive systems in automation engineering
- Connecting cable between servo controller and motor
- In power chains or moving machine parts
- For use in assembling & pick-and-place machinery
- Particularly in wet areas of machine tools and transfer lines

Product features

- Dynamic performance in power chains:
  Acceleration up to 50 m/s².
  Travel speeds up to 5 m/s.
  Travel distances up to 100 m.
- Low-capacitance design
- Halogen-free materials (as from 4 G 1,5 mm²)
- Flame retardancy:
  UL/CSA: VW-1, FT1
  IEC/EN: 60332-1-2
- Oil-resistant

Approvals (Norm references)

- For use in power chains: Please comply with the assembly guidelines listed in Appendix T3
- Minimum bending radius for flexible use:
  After consulting, in particular cases, usage at bending factor smaller 7,5 x outer diameter is possible.

Design

- Extra-fine wire strand made of bare copper wires (class 6)
- Core insulation: polypropylene (PP)
- According to P/N individual design: Power cores with one or with two control pair(s), twisted together in short lay length
- Non-woven wrapping
- PUR outer sheath, black (RAL 9005)

Technical data

Core identification code
Power: black cores with marking U/L1/C/L+; V/L2; W/L3/D /L- and 1 green-yellow core
Designs with
one pair of control cores: black; white
two pairs of control cores: black with white numbers: 5, 6, 7, 8
0,34 mm²: WH/BN/GN/YE

Approvals
VDE - reg submitted
UL AWM Style 20234
CSA AWM I/II, A/B 1000 V 80° FT 1

Specific insulation resistance
> 20 GOhm x cm

Conductor stranding
Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6

Minimum bending radius
For flexible use:
7.5 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
IEC U_0/U: 600/1000V
UL & CSA: 1000 V

Test voltage
Core/Core: 4 kV
Core/Screen: 4 kV

Protective conductor
G = with GN-YE protective conductor

Temperature range
Flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® SERVO FD 796 P				
0025319	4 G 1,5 + (2 x 1,5)	11.7	99.0	217
0025320	4 G 2,5 + (2 x 1,5)	13.1	134.0	270
0025321	4 G 4 + (2 x 1,5)	14.2	195.0	333
0025322	4 G 6 +(2 x 1,5)	16.0	272.0	403
0025323	4 G 10 + (2x 1,5)	18.4	425.0	581
0025324	4 G 16 + (2 x 1,5)	22.1	656.0	887
0025326	4 G 0,75 + 2 x (2 x 0,34)	10.9	54.0	143
0025327	4 G 1,5 + 2 x (2 x 0,75)	12.3	103.0	209
0025328	4 G 2,5 + 2 x (2 x 1,0)	14.3	152.0	306
0025312	4 G 4 + 2 x (2 x 1,0)	15.4	218.0	381
0025329	4 G 4 + (2 x 1,0) + (2 x 1,5)	15.6	231.0	388
0025330	4 G 6 + (2 x 1,0) + (2 x 1,5)	17.1	308.0	460

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® SERVO FD 796 CP

Accessories

- Protective Cable Conduit Systems and Cable Carrier Systems
- Circular connectors

At a glance – Comparison of product features

ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I Lapp GmbH Stuttgart Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)					ÖLFLEX® SERVO FD/CHAIN Substitute
..750 P	..755 P	..785 P	..795 P DESINA®	Product features	..796 P/..896 P
		■		Nominal voltage 0.6/1 kV (AC) for power cores and control cores	● ■
		■		Increased cross-sections for control cores	● ■
	●	●	●	Low-capacitance core insulation	●
			●	UL/CSA AWM certification	●
				VDE registration/certification*	●
●	●	●	●	Polyurethane sheath	●
				Hi.Dyn. version	●
	●	●	●	Travel distance of up to 100 m	●
	●	●	●	Flexible at temperatures as low as -40	●
	●	●		Halogen-free	●
●	●	●	●	Flame-retardant	●
●	●	●	●	Oil-resistant	●

● = fulfilled, ■ = without control cores, *applied for

Article numbers for re-coding

	ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I Lapp GmbH Stuttgart Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)				ÖLFLEX® SERVO FD/CHAIN			Substitute	
	..750 P	..755 P	..785 P	..795 P DESINA®	Control unit, pair(s), number of cores x mm²	Power, number of cores x mm²	Control unit, pair(s), number of cores x mm²	..796 P/ ..896 P	
	Art. no.	Art. no.	Art. no.	Art. no.				Art. no.	
Product range ..796 P		0036601		3028268	2x1.0	4G1.5	2x1.5	0025319	Increase in cross-section of control core pair
		0036602		3028269	2x1.0	4G2.5	2x1.5	0025320	
		0036603		3028270	2x1.0	4G4	2x1.5	0025321	
		0036604		3028271	2x1.0	4G6	2x1.5	0025322	
		0036605		3028272	2x1.0	4G10	2x1.5	0025323	
		0036606			2x1.5	4G16	2x1.5	0025324	
	0036240				2x2x0.34	4G0.75	2x2x0.34	0025326	
	0036245	0036350			2x2x0.75	4G1.5	2x2x0.75	0025327	
	0036250	0036351			2x2x0.75	4G2.5	2x2x1.0	0025328	Increase in cross-section of control core pairs
						4G4	2x2x1.0	0025312	
	0036251				2x0.75+2x1.0	4G4	2x1+2x1.5	0025329	
	0036252	0036353			2x0.75+2x1.0	4G6	2x1+2x1.5	0025330	

The following articles have been removed from the range: 0036253 (4G10+2x0.75+2x1.0), 0036608 (4G35+2x1.5)

Power and control cables

Power chain applications · Harsh conditions, approved

New

ÖLFLEX® CHAIN 896 P

Benefits

- Allows much faster speed and accelerations which increases the economic efficiency of the machines
- Multi-standard = fewer part varieties = cost savings
- Various applications
- Also suitable for mobile outdoor use
- To substitute 2 ÖLFLEX® SERVO FD product lines: -785P/-795P (without control pair)

Approvals (Norm references)

- Applications in automation engineering
- Power circuits in industrial machines
- In power chains or moving machine parts
- For use in assembling & pick-and-place machinery
- Particularly in wet areas of machine tools and transfer lines

Product features

- Dynamic performance in power chains:
  Acceleration up to 50 m/s².
  Travel speeds up to 5 m/s.
  Travel distances up to 100 m.
- Low-capacitance design
- Flame retardancy:
  UL/CSA: VW-1, FT1
  IEC/EN: 60332-1-2
- Oil-resistant

Approvals (Norm references)

- For travel distances up to 100 m (horizontal)
- For use in power chains: Please comply with the assembly guidelines listed in Appendix T3
- Minimum bending radius for flexible use:
  After consulting, in particular cases, usage at bending factor smaller 7,5 x outer diameter is possible.

Design

- Extra-fine wire strand made of bare copper wires (class 6)
- Core insulation: polypropylene (PP)
- Non-woven wrapping
- PUR outer sheath, black (RAL 9005)

Info

- **New high-end version! For very dynamic motion sequences**
- **Multiple certifications**
- **MUD res. according to IEC61892-4 Annex D**

Technical data

Core identification code
Black with white numbers acc. to VDE 0293

Approvals
VDE - reg submitted
UL AWM Style 20234
CSA AWM I/II, A/B 1000 V 80° FT 1

Specific insulation resistance
> 20 GOhm x cm

Conductor stranding
Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6

Minimum bending radius
For flexible use:
7.5 x outer diameter (≤16 mm²)
10 x outer diameter (>16 mm²)
Fixed installation:
4 x outer diameter

Nominal voltage
IEC U_0/U: 600/1000V
UL & CSA: 1000 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CHAIN 896 P				
1023229	4 G 1.5	9.2	58.0	120
1023230	5 G 1.5	10.0	72.0	143
1023238	4 G 2.5	11.0	96.0	174
1023239	5 G 2.5	12.0	120.0	210
1023245	4 G 4	12.5	154.0	242
1023246	5 G 4	13.7	192.0	316
1023248	4 G 6	14.3	231.0	335
1023249	5 G 6	15.7	288.0	439
1023250	4 G 10	17.0	384.0	503
1023251	5 G 10	18.9	480.0	663
1023252	4 G 16	21.2	615.0	810
1023253	5 G 16	23.8	768.0	1065
1023254	4 G 25	25.9	960.0	1254
1023255	5 G 25	29.0	1,200.0	1582

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100kg. Refer to Appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® FD 855 P
- ÖLFLEX® CHAIN 879
- ÖLFLEX® SERVO FD 796 P

Accessories

- Protective Cable Conduit Systems and Cable Carrier Systems

At a glance – Comparison of product features

ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I Lapp GmbH Stuttgart Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)				→ ÖLFLEX® SERVO FD/CHAIN Substitute	
..750 P	..755 P	..785 P	..795 P DESINA®	Product features	..796 P/..896 P
		■		Nominal voltage 0.6/1 kV (AC) for power cores and control cores	● ■
		■		Increased cross-sections for control cores	● ■
	●	●	●	Low-capacitance core insulation	●
			●	UL/CSA AWM certification	●
				VDE registration/certification*	●
●	●	●	●	Polyurethane sheath	●
				Hi.Dyn. version	●
	●	●	●	Travel distance of up to 100 m	●
	●	●	●	Flexible at temperatures as low as -40	●
	●	●		Halogen-free	●
●	●	●	●	Flame-retardant	●
●	●	●	●	Oil-resistant	●

● = fulfilled, ■ = without control cores, *applied for

Article numbers for re-coding

	ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I Lapp GmbH Stuttgart Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)				→ ÖLFLEX® SERVO FD/CHAIN			Substitute
	..750 P	..755 P	..785 P	..795 P DESINA®	Control unit, pair(s), number of cores x mm²	Power, number of cores x mm²	Control unit, pair(s), number of cores x mm²	..796 P/ ..896 P
	Art. no.	Art. no.	Art. no.	Art. no.				Art. no.
Product range ..896 P			0036380			4G1.5		1023229
			0036650			5G1.5		1023230
			0036381	3028277		4G2.5		1023238
			0036651			5G2.5		1023239
			0036382	3028278		4G4		1023245
			0036652			5G4		1023246
			0036383	3028279		4G6		1023248
			0036653			5G6		1023249
			0036384			4G10		1023250
						5G10		1023251
			0036385	3028281		4G16		1023252
			0036655			5G16		1023253
				3028282		4G25		1023254
			0036656			5G25		1023255

The following article has been removed from the range: 3028283 (4G35)

Power and control cables

Power chain applications · SERVO applications - power drive systems, approved

New

ÖLFLEX® SERVO FD 798 CP

Encoder and resolver cables, DESINA® green

Info

- **New high-end version! For very dynamic motion sequences**
- **Multiple certifications**
- **MUD res. according to IEC61892-4 Annex D**

Benefits

- Thin, optimised for weight and volume
- Total screening prevents/reduces interference from neighbouring cables
- Also suitable for mobile outdoor use
- Suitable for use with encoders & resolvers from leading manufacturers
- To substitute 4 ÖLFLEX® SERVO FD product lines: -760CP/-760CP DESINA/-770CP, -770CP DESINA

Application range

- Connecting cable between servo controller and encoder/resolver
- Connecting cable between servo controller and speed generators
- In power chains or moving machine parts
- Particularly in wet areas of machine tools and transfer lines
- Assembly lines, production lines, in all kinds of machines

Product features

- Dynamic performance in power chains:
  Acceleration up to 50 m/s².
  Travel speeds up to 5 m/s.
  Travel distances up to 100 m.
- Abrasion and cut-resistant
- Halogen-free materials
- Flame retardancy:
  UL/CSA: VW-1, FT1
  IEC/EN: 60332-1-2
- Oil-resistant

Approvals (Norm references)

- For travel distances up to 100 m (horizontal)
- For use in power chains: Please comply with the assembly guidelines listed in Appendix T3
- DESINA®-compliant

Design

- Fine-wire or extra-fine wire, tinned-copper conductor
- Core insulation: polypropylene (PP)
- Cores (or core pairs) twisted in layers or bundles
- Refer to data sheet for more details
- Non-woven wrapping
- PUR outer sheath, green (RAL 6018)

Technical data

Core identification code
Details see datasheet ÖLFLEX® SERVO FD 798 CP

Approvals
UL AWM Style 20236
CSA AWM IA/B; IIA/B FT 1, C22.2 No. 210-05

Specific insulation resistance
> 20 GOhm x cm

Conductor stranding
Fine wire or extra-fine wire

Minimum bending radius
Flexible use: 7.5 x outer diameter
Fixed installation:
4 x outer diameter

Nominal voltage
IEC: 30 V
UL & CSA: 30 V

Test voltage
Core/core: 1500 V rms
Core/screen: 750 V rms

Temperature range
Flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® SERVO FD 798 CP				
0036910	4x2x0,34+4x0,5	8.9	79.0	125
0036911	3x(2x0,14)+2x(0,5)	8.9	70.0	120
0036912	3x(2x0,14)+4x0,14+2x0,5	8.8	68.0	110
0036913	3x(2x0,14)+4x0,14+2x0,5+4x0,22	9.4	80.0	130
0036914	9x0,5	8.8	71.0	110
0036915	4x2x0,25+2x1,0	8.8	63.0	109
0036916	6x2x0,25+2x0,5	10.3	67.0	121
0036917	10x0,14+2x0,5	7.7	41.0	82
0036918	10x0,14+4x0,5	8.1	54.0	98
0036920	4x2x0,14+4x0,5	8.2	51.0	95
0036921	4x2x0,25	7.6	38.0	75
0036923	8x2x0,18	7.8	51.0	85
0036924	4x2x0,18	6.4	30.0	52
0036926	12x0,22	6.9	44.0	73
0036927	4x2x0,25+2x0,5	8.5	62.0	98
0036928	2x2x0,14+2x(2x0,14)+4x0,5+(4x0,14)	9.1	79.0	135
0036929	2x(2x0,25)+2x0,5	8.7	46.0	98
0036930	2x2x0,25+2x0,5	7.3	38.0	72

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100kg. Refer to Appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
DESINA® is a registered trademark of the German Machine Tool Builders' Association
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- SERVO cables in acc. to SIEMENS® Standard 6FX 8PLUS

Accessories

- Circular connectors
- SILVYN® CHAIN cable protection and guiding systems

At a glance – Comparison of product features

ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I. Lapp GmbH Stgt. Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)				ÖLFLEX® SERVO FD...	Substitute
..760 CP	..760 CP DESINA®	..770 CP	..770 CP DESINA®	Product features	..798 CP
				Tinned stranded copper wire	●
				Low-capacitance, low-attenuation core insulation	●
●	●	●	●	Minimum bending radius for dynamic use 12 x D	●
				Minimum bending radius for dynamic use 7.5 x D	●
				UL/CSA AWM certification	●
●	●	●	●	Polyurethane sheath	●
				Hi. Dyn. version	●
●	●	●	●	Travel distance of up to 100 m	●
	●		●	DESINA®-compliant	●
●	●	●	●	Halogen-free	●
●	●	●	●	Flame-retardant	●
●	●	●	●	Oil-resistant	●
	●		●	Sheath colour: Green (RAL 6018)	●
●		●		Sheath colour: Grey (RAL 7001)	on request

● = fulfilled

Article numbers for re-coding

ÖLFLEX® SERVO FD .. < > .. Discontinued products/article numbers U.I Lapp GmbH Stgt. Main catalogue 2012/13 Catalogue no. 91120006 (German); 9112007 (international)					ÖLFLEX® SERVO FD ..	Substitute	In addition: High Dyn. alternative to: signal cables for rotary encoders, resolvers, etc.			
..760 CP	..760 CP DESINA®	..770 CP	..770 CP DESINA®	Structure, number of cores and nominal conductor cross-sections	..798 CP		Servo cable in acc. with Siemens® FX8PLUS standard	Servo cable in acc. with Bosch Rexroth® INK (Indramat) standard	Servoca-ble in acc. with Lenze® standard	Special encoder/ resolver cables
Art. no.	Art. no.	Art. no.	Art. no.		Art. no.		Art. no.	Art. no.	Art. no.	Art. no.
			0036642	4x2x0.34+4x0.5	0037910		00277111			
		0036268		3x(2x0.14)+2x(0.5)	0037911		00277121*		7072516*	70388719*
				3x(2x0.14)+4x0.14+2x0.5	0037912		00277131			
		0036269	0036641	3x(2x0.14)+4x0.14+2x0.5+4x0.22	0037913		00277141			
0036260	0036760			9x0.5	0037914			7072402		
		0036270		4x2x0.25+2x1	0037915			7072400		
		0036280		6x2x0.25+2x0.5	0037916					
		0036275		10x0.14+2x0.5	0037917					
		0036277		10x0.14+4x0.5	0037918					
		0036281		4x2x0.14+4x0.5	0037920					70388718
			0036901	4x2x0.25	0037921					
				8x2x0.18	0037923		00277101			
				4x2x0.18	0037924		00277151			
				12x0.22	0037926		00277171			
				4x2x0.25+2x0.5	0037927			7072401		70388731*
			0036640	2x2x0.14+2x(2x0.14)+4x0.5+(4x0.14)	0037928			7072414*		70388721*
				2x(2x0.25)+2x0.5	0037929			7072415		
				2x2x0.25+2x0.5	0037930			7072416		

The following product has been removed from the range: 0036278 (15x0.14+4x0.5); additional variants in preparation. Siemens®, Bosch Rexroth® and Lenze® are registered trademarks and are used here for comparison purposes only. *Minor differences in core identification code & design

ÖLFLEX®

UNITRONIC®

ETHERLINE®

HITRONIC®

EPIC®

SKINTOP®

SILVYN®

FLEXIMARK®

11/12.1.000.91110988

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