Application

ÖLFLEX® SERVO FD 7OCS cables for one cable systems are highly flexible, screened, oil resistant, halogen free and low capacitive servo motor cables with polyurethane outer sheath for use on European and North American market. All of the motor's feedback signals are transmitted by integrated signal cores, pairs or star quads. Additional control pairs can be optionally used to connect e.g. the electromagnetic break.
They are designed for use in high-dynamic applications (Extended-Line performance class) in power chains or permanent machine parts as well as for fixed installation subject to medium mechanical load conditions. They are among others designed for use in dry, damp and wet conditions. They are suitable for outdoor use if the indicated temperature range is observed. The cables are increased oil resistant and at room temperature widely resistant to acids and alkaline solutions. The outer sheath is resistant to high mechanical load, particularly to abrasion and rubbing, is cut resistant, microbe-proof and hydrolysis resistant.
The maximum tensile load is 15 N/mm^2 of conductor cross-section during installation and operation. Compulsory guidance is not permitted. The screening braid protects against interference from electrical fields, the control or signal pairs, star quads or signal cores are individually screened.

Application range:
Connecting cable between servo controller and motor, in power chains or moving machine parts, for use in assembling- & pick-and –place machines, machine tools and transfer lines, for assembly lines, production lines in all kind of machines.

USE acc. to : Internal or external wiring.
USE acc. to : Cables for internal wiring or external interconnection with or without mechanical abuse

Design

Design	acc. to UL AWM 758, Style 21209, CSA C22.2 No. 210-15 and in compliance to EN 50525-2-51
Approvals	AWM 758, Style 21209 (File No. E63634) AWM I A/B II A/B (File No. E63634)
Conductor	Details see below
Core insulation	Polypropylen-based compound
Core identification	Details see below
Pair-, quad-, element- resp. core screen	Details see below
Stranding	4 power cores stranded together with respective control pairs and signal pairs, cores, elements or star quads as well as filler cords
Screen	Braid of tinned copper wires, coverage = 85 % (nominal value)
Outer sheath	Polyurethane compound TMPU acc. to EN 50363-10-2 UL AWM 758, CSA AWM C22.2 No. 210-15 colour: orange, similar RAL 2003

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Electrical properties at 20 °C

Nominal voltage	Power cores and control pairs EN U_0/U: Details see below UL/CSA: Details see below Signal pairs, elements, star quads or cores EN: Details see below UL/CSA: Details see below	
Test voltage	Power cores and control pairs: Signal pairs, elements, star quads or cores:	Details see below Details see below

Mechanical, thermal and chemical properties

Temperature range	flexing (EN): flexing (UL/CSA): fixed installation (EN): fixed installation (UL/CSA):	-40 °C up to +80 °C max. conductor temp. up to +90 °C max. conductor temp. -50 °C up to +80 °C max. conductor temp. up to +90 °C max. conductor temp.
Min. bending radius	flexing: fixed installation:	up from 7,5 x outer diameter 5 x outer diameter
Max. torsion load	max. torsion angle:	± 30 °/m
Flammability	acc. to IEC 60332-1-2 resp. EN 60332-1-2 UL VW-1 acc. to UL 1581 § 1080 CSA FT1 acc. to CSA C22.2 No. 2256 § 9.3	
Halogen-free	acc. to VDE 0472 part 815	
UV resistance	acc. to ASTM-D-2565-16	
Ozone resistance	acc. to EN 50396 method B	
Oil resistance	acc. to EN 50363-10-2	
Tests	acc. to IEC 60811 resp. EN 60811, EN 50395, EN 50396, UL 1581 and CSA C22.2	
EU Directives	These cables are conform to the EU-Directive 2014/35/EU (Low Voltage Directive)	
Environmental information	These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).	

Dynamic performance in power chains

Max. pulling force	≤ 15 N/mm²	
Max. acceleration	50 m/s² 30 m/s²	(Hengstler ACURO® link, SIEMENS SINAMICS® S210, B&R ACOPOS® P3, Bosch Rexroth ctrlX DRIVE®) (SEW EURODRIVE MOVILINK® DDI)
Max. velocity	5 m/s	
Max. travel (horizontal)	20 m	
Bending cycles and power chain operation parameters	See selection table A2-1 in online catalogue appendix For use in power chains: Please comply with assembly guideline appendix T3	

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Details for ÖLFLEX® SERVO FD 7OCS for drive system Hengstler ACURO® link

Art. 1023375 (4 G 1.5 + (2 x 0.75) + (4 x 24 AWG))

Power cores	conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, class 6
	Core colours:	black with numbers 1-3 + GN/YE
Pair 0.75 mm²	conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, class 6
	Core colours:	black with numbers 5-6
	Pair screen:	Braid of tinned copper wires
Quad 24 AWG	conductor:	fine wire bare copper strand
	Core colours:	white, yellow, blue, orange
	Qaud screen:	Braid of tinned copper wires Aluminium metallized textile tape sheath: Polyolefin, black
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)

Nominal voltage	Power cores & Pair 0.75 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Quad 24 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test voltage	Power cores & Pair 0.75 mm²	A/A 4000 V AC A/S 2000 V AC
	Quad 24 AWG	A/A 3000 V AC A/S 1500 V AC

Details for ÖLFLEX® SERVO FD 7OCS for drive system SIEMENS SINAMICS® S210

Art. 1023378 (4 G 22 AWG + (2 x 22 AWG) + (4 x 26 AWG))
Art. 1023385 (4 G 22 AWG + (2 x 22 AWG) + (4 x 0.20))

Power cores	conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, class 6
	Core colours:	brown U/L1/C/L+, black V/L2, grey W/L3/D/L/- and GN/YE
Pair 22 AWG	conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, class 6
	Core colours:	black, white
	Pair screen:	Braid of tinned copper wires
Quad 26 AWG and 0.20 mm²	conductor:	fine wire bare copper strand
	Core colours:	yellow, blue, green, pink
	Screen:	Aluminium metallized textile tape Braid of tinned copper wires sheath: Polyolefin, black
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)

Nominal voltage	Power cores & Pair 22 AWG	EN U_0/U 300 V / 300 V UL/CSA 300 V
	Quad 26 AWG and 0.20 mm²	EN U_0/U 300 V / 300 V UL/CSA 300 V

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Test voltage	Power cores & Pair 22 AWG	A/A 4000 V AC A/S 2000 V AC
	Quad 26 AWG and 0.20 mm²	A/A 3000 V AC A/S 1500 V AC

Art. 1023379 (4 G 19 AWG + (2 x 21 AWG) + (4 x 26 AWG))
Art. 1023386 (4 G 19 AWG + (2 x 21 AWG) + (4 x 0.20))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	brown U/L1/C/L+, black V/L2, grey W/L3/D/L/- und GN/GE
Pair 21 AWG	Conductor:	extra-fine wire strand of bare copper
	Core colours:	black, white
	Pair screen:	Braid of tinned copper wires
Quad 26 AWG & 0.20 mm²	Conductor:	fine wire bare copper strand
	Core colours:	white, yellow, blue, orange
	Screen:	Braid of tinned copper wires Aluminium metallized textile tape Sheath: Polyolefin, black
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)

Nominal Voltage	Power cores & Pair 21 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V
	Quad 26 AWG & 0.20 mm²	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test Voltage	Power cores & Pair 21 AWG	A/A 2000 V AC A/S 1000 V AC
	Quad 26 AWG & 0.20 mm²	A/A 3000 V AC A/S 1500 V AC

Art. 1023380 (4 G 1.5 AWG + (2 x 1.5) + (4 x 0.20))
Art. 1023381 (4 G 2.5 AWG + (2 x 1.5) + (4 x 0.20))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	brown U/L1/C/L+, black V/L2, grey W/L3/D/L/- and GN/GE
Pair 1.5 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black/blue, white/blue
	Pair screen:	Braid of tinned copper wires
Quad 0.20 mm²	Conductor:	fine wire bare copper strand
	Core colours:	yellow, blue, green, rosa
	Quad screen:	Aluminium metallized textile tape Braid of tinned copper wires Sheath: Polyolefin, black
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)

Nominal Voltage	Power cores & Pair 1.5 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Quad 0.20 mm²	EN U_0/U 300 V / 300 V UL/CSA 1000 V

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Test Voltage	Power cores & Pair 1.5 mm²	A/A 4000 V AC A/S 2000 V AC
	Quad 0.20 mm²	A/A 3000 V AC A/S 1500 V AC

Details for ÖLFLEX® SERVO FD 7OCS for drive system B&R ACOPOS® P3

Art. 1023371 4 G 2.5 + (2 x 1) + (2 x 24 AWG + 2 x 2 x 26 AWG))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black, brown, blue and GN/GE
Pair 1 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	white/blue, white/green
	Pair screen:	Braid of tinned copper wires
2 x 24 AWG	Conductor:	fine wire bare copper strand
	Core colours:	brown/green, white/green
2 x 2 x 26 AWG	Conductor:	fine wire bare copper strand
	Core colours:	rosa-grey, yellow-violet
	Characteristic impedance:	nom. 120 ± 12 Ω (@ 10MHz)
2 x 24 AWG + 2 x 2 x 26 AWG	Assembly	Three pairs assembled in bundles
	Bundle screen:	Braid of tinned copper wires Sheath: Polyolefin, black

Nominal Voltage	Power cores & Pair 1 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	2 x 24 AWG + 2 x 2 x 26 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test Voltage	Power cores & Pair 1 mm²	A/A 4000 V AC A/S 2000 V AC
	2 x 24 AWG + 2 x 2 x 26 AWG	A/A 3000 V AC A/S 1500 V AC

Art. 1023373 (4 G 1.5 + (2 x 0.75) + (2 x 0.30 + 2 x 2 x 0.15))
Art. 1023374 (4 G 2.5 + (2 x 1.0) + (2 x 0.30 + 2 x 2 x 0.15))
Art. 1023376 (4 G 4 + (2 x 1.0) + (2 x 0.30 + 2 x 2 x 0.15))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black, brown, blue and GN/GE
Pair 0.75 mm² & 1 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	white/blue, white/green
	Pair screen:	Braid of tinned copper wires
2x0.30	Conductor:	fine wire bare copper strand
	Core colours:	brown/green, white/green

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2x2x0.15	Conductor:	fine wire bare copper strand
	Core colours:	rosa-grey, yellow-violet
	Characteristic impedance:	nom. 120 ± 12 Ω (@ 10MHz)
2x0.30+2x2x0.15	Assembly	Three pairs assembled in bundles
	Bundle screen:	Aluminium metallized textile tape Braid of tinned copper wires Sheath: Polyolefin, black

Nominal Voltage	Power cores & Pair 0.75 & 1 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	2x0.30+2x2x0.15	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test Voltage	Power cores & Pair 0.75 & 1 mm²	A/A 4000 V AC A/S 2000 V AC
	2x0.30+2x2x0.15	A/A 3000 V AC A/S 1500 V AC

Details for ÖLFLEX® SERVO FD 7OCS for drive system SEW EURODRIVE MOVILINK® DDI

Art. 1023387 (4 G 1.5 + (1 x Z50) + 2 x (2 x 1.0))
Art. 1023388 (4 G 2.5 + (1 x Z50) + 2 x (2 x 1.0))
Art. 1023389 (4 G 4 + (1 x Z50) + 2 x (2 x 1.0))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black with marking U/L1/C/L+; V/L2; W/L3/D/L- and GN/GE
Pair 1 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	yellow/A – orange/B, rosa/C – violet/D
	Pair screen:	Braid of tinned copper wires
Coax 21 AWG (Z50)	Inner conductor:	fine wire bare copper strand
	Dielectric:	Polyolefin, nature
	Shield:	Braid of tinned copper wires Sheath: Polyolefin, violet
	Characteristic impedance:	nom. 50 Ω

Nominal Voltage	Power cores & Pair 1 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Coax 21 AWG (Z50)	UL/CSA 1000 V
Test Voltage	Power cores & Pair 0.75 mm²	A/A 4000 V AC A/S 2000 V AC
	Coax 21 AWG (Z50)	A/A 3000 V AC A/S 1500 V AC

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Details for ÖLFLEX® SERVO FD 7OCS for drive system Bosch Rexroth ctrlX DRIVE®

Art. 1023394 (4 G 0.75 + (2 x 0.5) + (4 x 24 AWG))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	brown, black, grey and GN/GE
Pair 0.5 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	red, blue
	Pair screen:	Braid of tinned copper wires
Quad 24 AWG	Conductor:	fine wire bare copper strand
	Core colours:	white, yellow, blue, orange
	Quad screen:	Braid of tinned copper wires Aluminium metallized textile tape Sheath: Polyolefin, black
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)
Nominal Voltage	Power cores & Pair 0.5 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Quad 24 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test Voltage	Power cores & Pair 0.5 mm²	A/A 4000 V AC A/S 2000 V AC
	Quad 24 AWG	A/A 3000 V AC A/S 1500 V AC

Art. 1023395 (4 G 0.75 + (2 x 0.5) + ((4 x 24 AWG)))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	brown, black, grey and GN/GE
Pair 0.5 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	red, blue
	Pair screen:	Braid of tinned copper wires
Quad 24 AWG	Conductor:	fine wire bare copper strand
	Core colours:	white, yellow, blue, orange
	Quad screen:	Braid of tinned copper wires Aluminium metallized textile tape Sheath: Polyolefin, black Braid of tinned copper wires Aluminium metallized textile tape
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)
Nominal Voltage	Power cores & Pair 0.5 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Quad 24 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V

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Test Voltage	Power cores & Pair 0.5 mm²	A/A 4000 V AC A/S 2000 V AC
	Quad 24 AWG	A/A 3000 V AC A/S 1500 V AC

Art. 1023396 (4 G 1.5 + (2 x 0.75) + ((4 x 24 AWG)))

Power cores	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black with white Nr. 1-3 and GN/GE
Pair 0.75 mm²	Conductor:	extra-fine wire strand of bare copper acc. to IEC 60228 resp. EN IEC 60228, Class 6
	Core colours:	black with white Nr. 7+8
	Pair screen:	Braid of tinned copper wires
Quad 24 AWG	Conductor:	fine wire bare copper strand
	Core colours:	white, yellow, blue, orange
	Quad screen:	Braid of tinned copper wires Aluminium metallized textile tape Sheath: Polyolefin, black Braid of tinned copper wires Aluminium metallized textile tape
	Characteristic impedance:	nom. 100 ± 15 Ω (@ 10MHz)

Nominal Voltage	Power cores & Pair 0.75 mm²	EN U_0/U 600 V / 1000 V UL/CSA 1000 V
	Quad 24 AWG	EN U_0/U 300 V / 300 V UL/CSA 1000 V
Test Voltage	Power cores & Pair 0.75 mm²	A/A 4000 V AC A/S 2000 V AC
	Quad 24 AWG	A/A 3000 V AC A/S 1500 V AC

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