

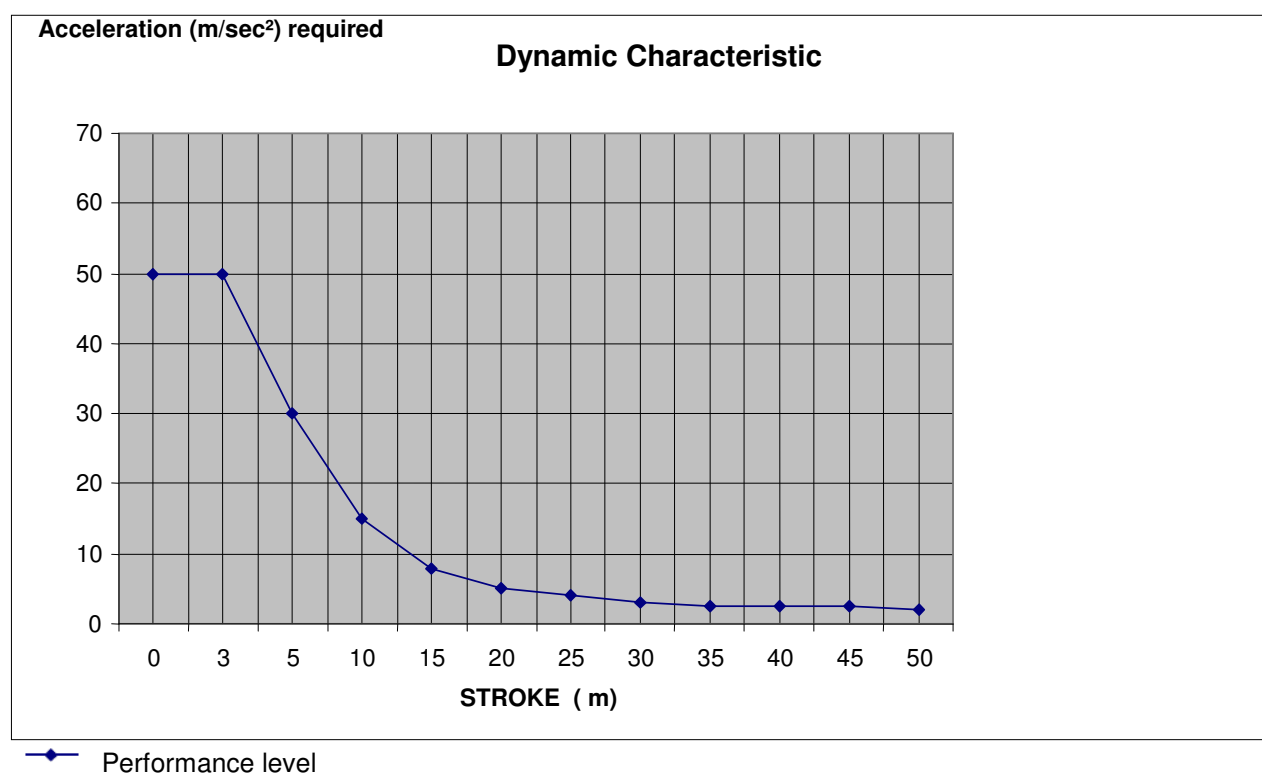
U.I. Lapp GmbH	DATA SHEET	
	SERVO LK SMS FX8PLUS SIGNAL	DB 00277101EN valid from: 19.09.2013

Application

LAPP servo cables according to Siemens®* (see footnote) Standard **FX8008 PLUS SIGNAL** are a new generation of very highly flexible screened signal (encoder and resolver)- cables (P/Ns **00277101** to **00277171**), with PUR outer sheath and UL/CSA approvals. They are suitable in **very high dynamically operating power chain applications** under accelerations up to **50m/s²** as well as for static use. Lapp FX8PLUS Signal cables are made in accordance to Siemens Motion Connect* typically used for interconnection in between encoders, resolvers and similar devices and servo drive controllers of Siemens SINAMICS* drive systems. Typical kind of application: In power chains of **modern high speed/high efficient machine tools**, production plants, car body presses, transfer lines...

USA: According NFPA 79 Ed. 2007 AWM is accepted only, when part of a listed assembly. Cables can be used in dry and damp areas and also outdoor provided the recommended temperatures of use are respected. Usage of these cables in moving cable carriers, respectively on motor drum guidance or under a strain of more than 20 N/mm² is not allowed. LK SMS-FX8PLUS cables are increased oil-resistant, halogen-free and free of lacquer destructive substances ("free of silicones").

Table A LK SMS FX8PLUS Signal



Common data of all signal cables:

Conductors:	stranded tinned copper wires,
Insulation:	PP Polypropylene
Conductor ID code	see P/N's individual Add-on datas
Jacket	TMPU Polyurethane EN 50363-10-2. Green (~RAL6018)
Rated voltage	UL AWM & CSA AWM: U = 30V
Temperature range	Operating: - 20 °C up to +60 °C

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Static / storage. - 50 °C up to +80 °C
Max allowable on conductors: +80 °C

Dynamic performance

Pulling force (Dynamic)	≤ 20 N/mm ²
Pulling force (Static)	≤ 50 N/mm ²
Max. Acceleration	See Table A
Max. Length horizontal of Signal cables	See Table A
Max. Speed	5m/s respectively 300m/min
Min. bending radii	Dynamic applications: 8 x cables outer diameter Static applications: 4 x cables outer diameter
Max torsion load	+/- 30°/m
Bends	10.000.000
Oil resistance	DIN EN 50363-10-2
Halogen free	VDE0472-815
Flame resistance	IEC/ EN 60332-1-2 IEC/EN 60332-1-3; FT1, VW-1
Approvals	USA: UL AWM rec. Style 20236 80 °C 30V VW-1 Canada: CSA AWM I/II A/B 80 °C 30V FT1
Conformities	DESINA, RoHS,

Add-on data of P/N **00277101** **8 x 2 x 0.18 C**

0.18mm² ID code	Pairs: white/yellow + white/green; white/red + white/orange; white/black + white/brown; grey + white. blue + violet; yellow + green; red + orange; black + brown.
Overall screen	Tinned copper braid, optical coverage ≥ 80%
Outer diameter	Approx. 7.8mm

Electrical characteristics (at 20 °C)

Conductor resistance	≤ 117 Ohm/km
Test voltage	500V rms x 1min, C/C & C/S
Insulation resistance	≥ 1000 MOhm x km, resp. 10MOhm x km at 80 °C
Capacitance (800-1200Hz)	per pair 60 +/- 20pF/m

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Impedance (3MHz) per pair: 100 Ohm +/- 10%

Shield transfer impedance: 0.01 MHz to 4 MHz: $\leq 20 \text{ mOhm/m}$
10 MHz: $\leq 50 \text{ mOhm/m}$
30 MHz: $\leq 150 \text{ mOhm/m}$

Add-on for P/N **00277111** **4 x 2 x 0.38 + 4 x 0.5** **C**

Element 1 4 x 2 x 0.38mm²

Pair ID code Brown + black, red + orange, yellow + green, blue + violet

Element 2 4 x 0.5mm²

Cond. ID code White/blue, white/black, white/red, white/yellow

Overall screen Tinned copper braid, optical coverage $\geq 80\%$

Outer diameter Approx. 8.9mm

Electrical characteristics (at 20°C):

Conductor resistance: 0.38mm²: $\leq 58.6 \text{ Ohm/km}$
0.5mm²: $\leq 43.3 \text{ Ohm/km}$

Test voltage: 500Vrms x 1min, C/C & C/S

Insulation resistance $\geq 1000 \text{ M Ohm x km}$, resp. 10 MOhm x km at 80°C

Capacitance (800-1200Hz): pairs 0.38mm²: 70 +/- 20pF/m

Impedance (3MHz): pairs 0.38mm²: 90 Ohm +/-10%

Shield transfer impedance 0.01 MHz to 4 MHz: $\leq 20 \text{ mOhm/m}$
10 MHz: $\leq 50 \text{ mOhm/m}$
30 MHz: $\leq 150 \text{ mOhm/m}$

Add-on for P/N **00277121** **3 x (2 x 0.14) + 2 x (0.5)** **C**

Element 1 3 x (2 x 0.14mm²)D:

Pair ID code Yellow + green, black + brown, red + orange

Pair shield: Spiral/wrap made of tinned cooper wires – Covering $\geq 90\%$
Stranded drain wire

Pair jacket: Polyolefine, black

Element 2 2 x (0.5mm²)D conductors:

0.5mm² cond. ID code Black, red

0.5mm² cond. screen Spiral/Wrap made of tinned copper wire – Covering $> 90\%$

0.5mm² single jacket: Polyolefine, black

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Overall screen Tinned copper braid, optical coverage $\geq 80\%$

Outer diameter Approx. 8.9mm

Electrical characteristics (at 20°C)

Conductor resistance 0.14mm²: ≤ 148.9 Ohm/km
0.5mm²: ≤ 43.3 Ohm/km

Test voltage 500Vrms x 1min, C/C & C/common S

Insulation resistance ≥ 1000 M Ohm x km, resp. 10MOhm x km at 80°C

Capacitance (800-1200Hz) pairs 0.14mm²: 80 +/- 20pF/m

Impedance (3MHz) pairs 0.14mm²: 80 Ohm +/- 5%

Shield transfer impedance 0.01 MHz to 4 MHz: ≤ 20 mOhm/m
10 MHz: ≤ 50 mOhm/m
30 MHz: ≤ 150 mOhm/m

Add-on for P/N **00277131** **3 x (2 x 0.14) + 4 x 0.14 + 2 x 0.5** **C**

Element 1 3 x (2 x 0.14mm²)D

Pair ID code Yellow + green, black + brown, red + orange

Pair screen Spiral/wrap made of tinned cooper wires – Covering $\geq 90\%$

Pair jacket Polyolefine, black

Element 2 2 x 0.5mm²

Con. ID code Pair: brown/red, brown/blue

Element 3 4 x 0.14mm²

Cond. ID code Grey, blue, white/yellow, white/black

Overall screen Tinned copper braid, optical coverage $\geq 80\%$

Outer diameter Approx. 8.8mm

Electrical characteristics (at 20°C)

Conductor resistance: 0.14mm²: ≤ 148.9 Ohm/km
0.5mm²: ≤ 43.3 Ohm/km

Test voltage: 500Vrms x 1min, C/C & C/common S

Insulation resistance ≥ 1000 M Ohm x km, resp. 10MOhm x km at 80°C

Capacitance (800-1200Hz) pairs 0.14mm²: 80 +/- 20pF/m

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Impedance (3MHz) pairs 0.14mm²: 80 Ohm +/- 10%

Shield transfer impedance 0.01 MHz to 4 MHz: ≤ 20 mOhm/m
10 MHz: ≤ 50 mOhm/m
30 MHz: ≤ 150 mOhm/m

Add-on for P/N **00277141** **3 x (2 x 0.14)D + 2 x 0.5 + 4 x 0.14 + 4 x 0.22 C**

Element 1 3 x (2 x 0.14mm²)D

Pair ID code Yellow + green, black + brown, red+ orange

Pair screen Spiral made of tinned copper wires, covering > 90%

Element 2 2 x 0.5mm²:

Cond. ID code Brown/red, brown/blue

Element 3 4 x 0.14mm²

Cond. ID code Grey, blue, white/yellow, white/black

Element 4 4 x 0.22mm²

Cond. ID code Brown/yellow, brown/grey, green/black, green/red

Overall screen Tinned copper braid, optical coverage ≥ 80%

Outer diameter Approx. 9.4mm

Electrical characteristics (at 20°C)

Conductor resistance 0.14mm²: ≤ 148.9 Ohm/km
0.22mm²: ≤ 95.0 Ohm/km
0.5mm²: ≤ 43.3 Ohm/km

Test voltage 500Vrms x 1min, C/C & C/common S

Insulation resistance ≥ 1000 M Ohm x km, resp. 10M Ohm x km at 80°C

Capacitance (800-1200Hz) pairs 0.14mm²: 80 +/- 20pF/m

Impedance (3MHz) pairs 0.14mm²: 80 Ohm +/- 10%

Shield transfer impedance 0.01 MHz to 4 MHz: ≤ 20 mOhm/m
10 MHz: ≤ 50 mOhm/m
30 MHz: ≤ 150 mOhm/m

Add-on for P/N **00277151** **4 x 2 x 0.18 C**

Element 4 x 2 x 0.18mm²

Pair ID code Black + brown, red + orange, yellow + green, blue + violet

Overall screen Tinned copper braid, optical coverage ≥ 80%

Outer diameter Approx. 6.4mm

Electrical characteristics (at 20°C)

Conductor resistance 0.18mm²: ≤ 117 Ohm/km

Test voltage 500Vrms x 1min, C/C & C/common S

Insulation resistance ≥ 1000 M Ohm x km, resp. 10MOhm x km at 80°C

Capacitance (800-1200Hz) pairs 0.18mm²: 70 +/- 20pF/m

Impedance (3MHz) pairs 0.18mm²: 100 Ohm +/- 10%

Shield transfer impedance
0.01 MHz to 4 MHz: ≤ 20 mOhm/m
10 MHz: ≤ 50 mOhm/m
30 MHz: ≤ 150 mOhm/m

Add-on for P/N **00277161** **2 x 2 x 0.18** **C**

Element 2 x 2 x 0.18mm²:

Pair ID code (Star Quad): Red + orange, black + brown

Overall screen Tinned copper braid, optical coverage ≥ 80%

Outer diameter Approx. 5.0mm

Electrical characteristics (at 20°C)

Conductor resistance 0.18mm²: ≤ 117 Ohm/km

Test voltage 500Vrms x 1min, C/C & C/common S

Insulation resistance ≥ 1000 M Ohm x km, resp. 10MOhm x km at 80°C

Capacitance (800-1200Hz) pairs 0.18mm²: 70 +/- 20pF/m

Impedance (3MHz) pairs 0.18mm²: 100 Ohm +/- 10%

Shield transfer impedance
0.01 MHz to 4 MHz: ≤ 20 mOhm/m
10 MHz: ≤ 50 mOhm/m
30 MHz: ≤ 150 mOhm/m

Add-on for P/N **00277171** **12 x 0.22** **C**

Element 12 x 0.22mm²:

Cond. ID code Black, brown, red, orange, yellow, green, blue, violet, grey, white, white/black, white/brown

Overall screen Tinned copper braid, optical coverage ≥ 80%

Outer diameter Approx. 6.9mm

Electrical characteristics (at 20°C)

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Conductor resistance	0.22mm ² : ≤ 95 Ohm/km
Test voltage	500Vrms x 1min, C/C & C/common S
Insulation resistance	≥ 1000 M Ohm x km, resp. 10MOhm x km at 80 °C
Shield transfer impedance	0.01 MHz to 4 MHz: ≤ 20 mOhm/m 10 MHz: ≤ 50 mOhm/m 30 MHz: ≤ 150 mOhm/m

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