

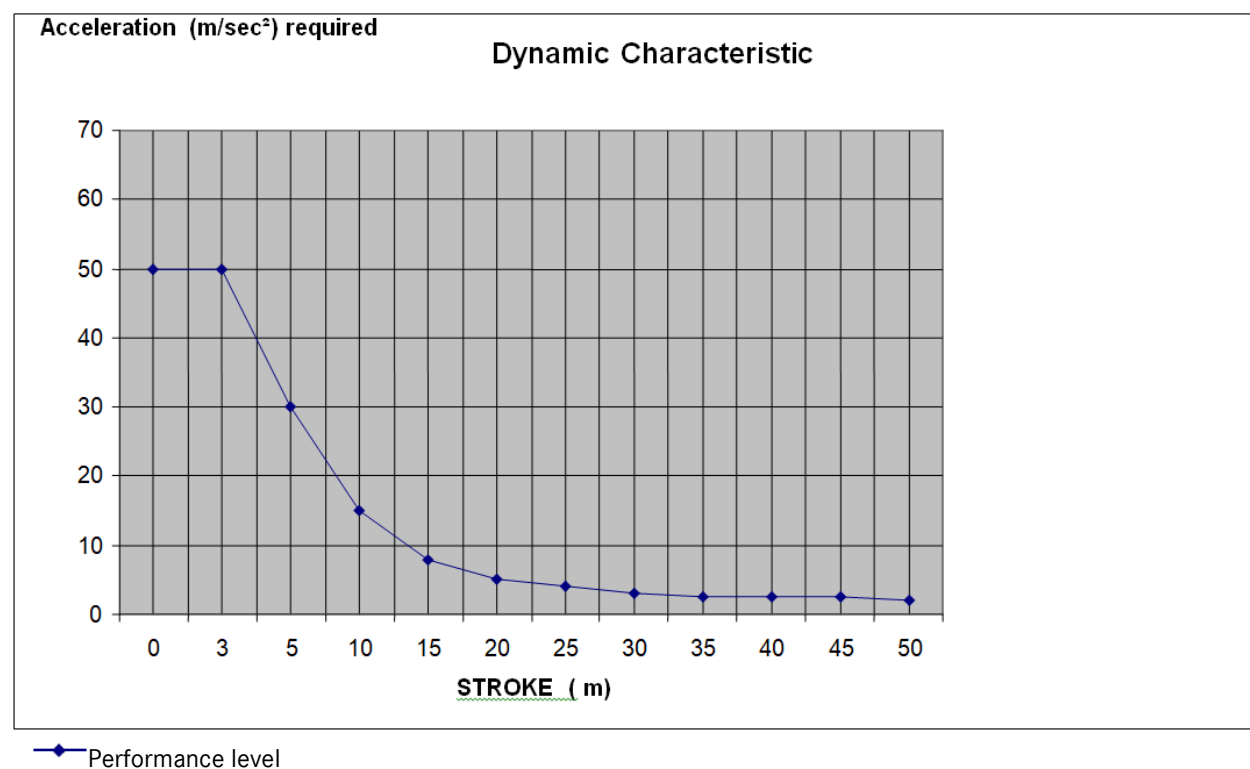
00277 101	DATA SHEET	
Valid from: 01.04.2019	SERVO LK SMS FX8PLUS SIGNAL	

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** thru **00277171**), with PUR outer sheath and UL/CSA approvals. They are suitable in **very highly dynamically operating power chain applications** under accelerations up to **50 m/s²** as well as for static use. Lapp FX8PLUS Signal cables are made in accordance with 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/highly efficient machine tools**, production plants, car body presses, transfer lines...

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 oil-resistant to larger extent, halogen-free and free of PWIS – Paint-Wetting Impairment 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 data
Jacket:	TMPU Polyurethane EN 50363-10-2 green (similar to RAL 6018)

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Rated voltage:	UL AWM & CSA AWM:	U = 30 V
Temperature range:	operating:	-20 °C up to +60 °C
	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:	5 m/s, respectively 300 m/min	
Min. bending radii:	dynamic applications:	8 x outer cable diameter
	static applications:	4 x outer cable diameter
Max. torsion load:	+/-30 °/m	
Bends:	10.000.000	
Oil resistance:	DIN EN 50363-10-2	
Freedom from halogens:	VDE0 472-815	
Flame resistance:	IEC/EN 60332-1-2	
	IEC/EN 60332-1-3	
	FT1	
	VW-1	
Approvals:	USA: UL AWM Style 20236 80°C 30V VW-1	
	Canada: CSA AWM I/II A/B 80°C 30V FT1	
Conformities:	DESINA	
	RoHS	

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Add-on data of P/N 00277 101:
8 x 2 x 0.18 C
Element
0.18 mm²
Pair ID code:

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. 7.8 mm

Electrical characteristics (at 20 °C)
Conductor resistance:

≤117 Ohm/km

AC RMS test voltage:

500 V x 1 min, C/C & C/S

Insulation resistance:

≥1000 MOhm x km, resp. 10 MOhm x km at 80 °C

Capacitance (800 – 1200 Hz):

per pair: 60 +/-20 pF/m

Impedance (3 MHz):

per pair: 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 data of P/N 00277 111:
4 x 2 x 0.38 + 4 x 0.5 C
Element 1
4 x 2 x 0.38 mm²
Pair ID code:

brown + black
red + orange
yellow + green
blue + violet

Element 2
4 x 0.5 mm²
Conductor ID code:

white/blue
white/black
white/red
white/yellow

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Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 8.9 mm

Electrical characteristics (at 20 °C)

Conductor resistance: 0.38 mm²: ≤58.6 Ohm/km
0.5 mm²: ≤43.3 Ohm/km

AC RMS test voltage: 500 V x 1 min, C/C & C/S

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

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

Impedance (3 MHz): pairs 0.38 mm²: 90 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 data of P/N 00277 121: **3 x (2 x 0.14) + 2 x (0.5) C**

Element 1 3 x (2 x 0.14 mm²)D

Pair ID code: yellow + green
black + brown
red + orange

Pair shield: spiral / wrap made of tinned cooper wires
covering ≥90 %
stranded drain wire

Pair jacket: polyolefin, black

Element 2 2 x (0.5 mm²)D

0.5 mm² conductor ID code: black
red

0.5 mm² conductor screen: spiral / wrap made of tinned copper wire
covering >90 %

0.5 mm² single jacket: polyolefin, black

Overall screen: tinned copper braid
optical coverage ≥80 %

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Outer diameter: approx. 8.9 mm

Electrical characteristics (at 20 °C)

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

AC RMS test voltage: 500 V x 1 min, C/C & C/common S

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

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

Impedance (3 MHz): pairs 0.14 mm²: 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 data of P/N 00277 131: **3 x (2 x 0.14) + 4 x 0.14 + 2 x 0.5 C**

Element 1 3 x (2 x 0.14 mm²)D

Pair ID code: yellow + green
black + brown
red + orange

Pair screen: spiral / wrap made of tinned cooper wires
covering ≥90 %

Pair jacket: polyolefin, black

Element 2 2 x 0.5 mm²

Conductor ID code: Pair: brown/red;
brown/blue

Element 3 4 x 0.14 mm²

Conductor ID code: grey
blue
white/yellow
white/black

Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 8.8 mm

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Electrical characteristics (at 20 °C)

Conductor resistance:	0.14 mm ² :	≤148.9 Ohm/km
	0.5 mm ² :	≤43.3 Ohm/km
AC RMS test voltage:	500 V x 1 min, C/C & C/common S	
Insulation resistance:	≥1000 MOhm x km, resp. 10 MOhm x km at 80 °C	
Capacitance (800 – 1200 Hz):	pairs 0.14 mm ² :	80 +/-20 pF/m
Impedance (3 MHz):	pairs 0.14 mm ² :	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 data of 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 0.14 mm²)D**

Pair ID code: yellow + green
black + brown
red+ orange

Pair screen: spiral made of tinned copper wires
covering >90 %

Element 2 **2 x 0.5 mm²:**

Conductor ID code: brown/red
brown/blue

Element 3 **4 x 0.14 mm²**

Conductor ID code: grey
blue
white/yellow
white/black

Element 4 **4 x 0.22 mm²**

Conductor ID code: brown/yellow
brown/grey
green/black
green/red

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Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 9.4 mm

Electrical characteristics (at 20 °C)

Conductor resistance:

0.14 mm ² :	≤148.9 Ohm/km
0.22 mm ² :	≤95.0 Ohm/km
0.5 mm ² :	≤43.3 Ohm/km

AC RMS test voltage: 500 V x 1 min, C/C & C/common S

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

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

Impedance (3 MHz): pairs 0.14 mm²: 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 data of P/N 00277151: **4 x 2 x 0.18 C**

Element 4 x **2 x 0.18 mm²**

Pair ID code:

- black + brown
- red + orange
- yellow + green
- blue + violet

Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 6.4 mm

Electrical characteristics (at 20 °C)

Conductor resistance: 0.18 mm²: ≤117 Ohm/km

AC RMS test voltage: 500 V x 1 min, C/C & C/common S

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

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

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

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

Add-on data of P/N 00277161: **2 x 2 x 0.18 C**

Element 2 x **2 x 0.18 mm²**

Pair ID code (star quad): red + orange
black + brown

Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 5.0 mm

Electrical characteristics (at 20 °C)

Conductor resistance: 0.18 mm²: ≤117 Ohm/km

AC RMS test voltage: 500 V x 1 min, C/C & C/common S

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

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

Impedance (3 MHz): pairs 0.18 mm²: 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 data of P/N 00277171: **12 x 0.22 C**

Element 12 x **0.22 mm²**

Conductor ID code: black
brown
red
orange
yellow
green
blue
violet
grey
white
white/black
white/brown

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Overall screen: tinned copper braid
optical coverage ≥80 %

Outer diameter: approx. 6.9 mm

Electrical characteristics (at 20°C)

Conductor resistance: 0.22 mm²: ≤95 Ohm/km

AC RMS test voltage: 500 V x 1 min, C/C & C/common S

Insulation resistance: ≥1000 MOhm x km, resp. 10 MOhm 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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