Displacement encoders

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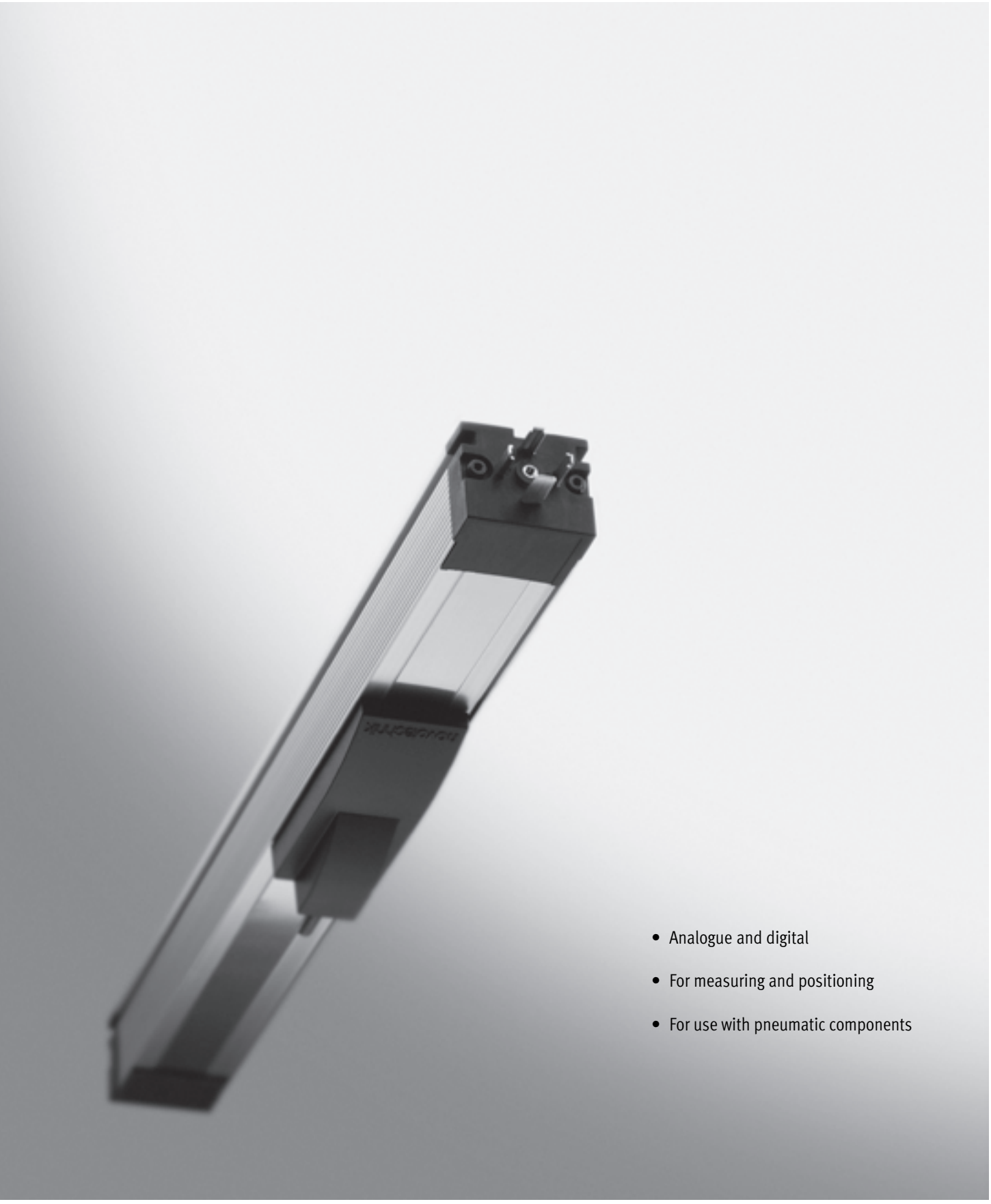

- Analogue and digital
- For measuring and positioning
- For use with pneumatic components

Displacement encoders

Key features

Analogue displacement encoders

MLO-POT-...-TLF

- Conductive plastic potentiometer
- Absolute measurements with high resolution
- High speeds of travel and long service life
- Plug-in connections
- Stroke: 225 ... 2000 mm

MLO-POT-...-LWG

- Connecting rod potentiometer
- Absolute measurements with high resolution
- Long service life
- High degree of protection
- Plug-in connections
- Stroke: 100 ... 750 mm

Digital displacement encoders

MME-MTS-...-AIF

- Magnetostrictive measuring principle
- Contactless with absolute measurements
- High speeds of travel
- Long service life
- High degree of protection
- Several mounting options on pneumatic linear drives DGPL
- Plug-in connections
- Stroke: 225 ... 2000 mm

Displacement encoders

Selection aid

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Recommended combinations of displacement encoder, drive and controller

Function	Version	Linear drive DGC-K	Standard cylinder DSBC	End position controller CPX-CMPX	End position controller SPC11	Axis controller CPX-CMAX	Axis controller CPX-CMIX	→ Page/ Internet
								
Analogue	MLO-POT-TLF 	■	–	■	■	■	■	4
	MLO-POT-LWG 	–	■	■	■	■	■	6
Digital	MME-MTS-AIF 	■	–	■	■	■	■	8

- Note

The displacement encoders can be combined with any linear drive provided that the installation conditions are adhered to and the customer uses the appropriate mounting.

Type code

MLO – POT – 225 – TLF

Type	
MLO	Analogue displacement encoder
MME	Digital displacement encoder

Measuring principle	
POT	Potentiometric
MTS	Magnetostrictive

Stroke [mm]

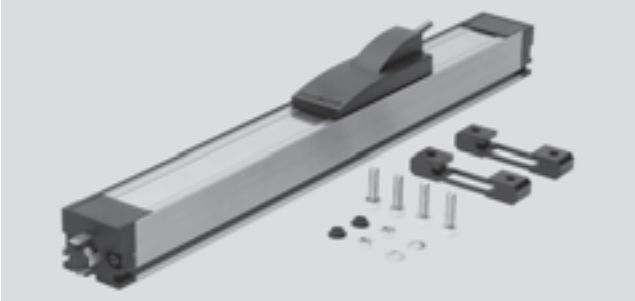
Version	
TLF	Profile
LWG	Connecting rod
AIF	Integrated AIF interface

Displacement encoders MLO-POT, analogue

Technical data

MLO-POT-...-TLF

- **l** - Stroke length
  225 ... 2000 mm



General technical data													
Stroke			225	300	360	450	500	600	750	1000	1250	1500	1750	2000
Constructional design			Open profile with cover strip and sliding cartridge											
Measuring principle			Analogue displacement encoder, with contact and absolute measurement											
Resolution		[mm]	0.01											
Max. speed of travel		[m/s]	10											
Max. acceleration		[m/s^2]	200											
Mounting position			Any											
Driver,	Angle offset	[°]	±1											
ball coupling	Parallel offset	[mm]	±1.5											
Service life	Strokes	[10^6]	Typical 100											
Connection			4-pin plug, type A DIN 43 650											
Product weight		[g]	900	1000	1100	1200	1300	1500	1800	2200	2500	3000	3500	3900

General electrical data													
Stroke			225	300	360	450	500	600	750	1000	1250	1500	1750	2000
Power supply		[V DC]	10[1]											
Max. current consumption		[mA]	4											
Wiper current	recommended	[µA]	< 1											
	maximum	[mA]	10[2]											
Connection resistance		[kΩ]	5	5	5	5	5	5	10	10	10	20	20	20
Connection resistance tolerance		[%]	±20											
Independent linearity		[%]	0.07	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.02
Temperature coefficient		[ppm/°K]	5											
Interface			Analogue											

1) Stabilised power supply is recommended, max. 42 V DC permissible.
2) Only permissible in the short-term in the event of a fault.

Operating and environmental conditions													
Stroke			225	300	360	450	500	600	750	1000	1250	1500	1750	2000
Ambient temperature		[°C]	–30 ... +100[1]											
Protection class	top		IP40 to IEC 60529											
	bottom		IP42 to IEC 60529[2]											
Vibration resistance			To DIN/IEC 68 Parts 2 – 6, severity level 2											
Continuous shock resistance			To DIN/IEC 68 Parts 2 – 27, severity level 2											
CE marking symbol (see conformity declaration)			As per EU EMC directive											

1) Please note temperature ranges of individual components used in a complete system solution.
2) The encoder slide points downwards in the inverted mounting position.

Materials		
Housing		Anodised aluminium
Cover		Plastic
Moving slide	Housing	Aluminium, plastic
	Connection	Steel ball, carbide plate
Cover		Steel band
Mounting clip		Polyetherimide

Displacement encoders MLO-POT, analogue

Technical data and accessories

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Dimensions

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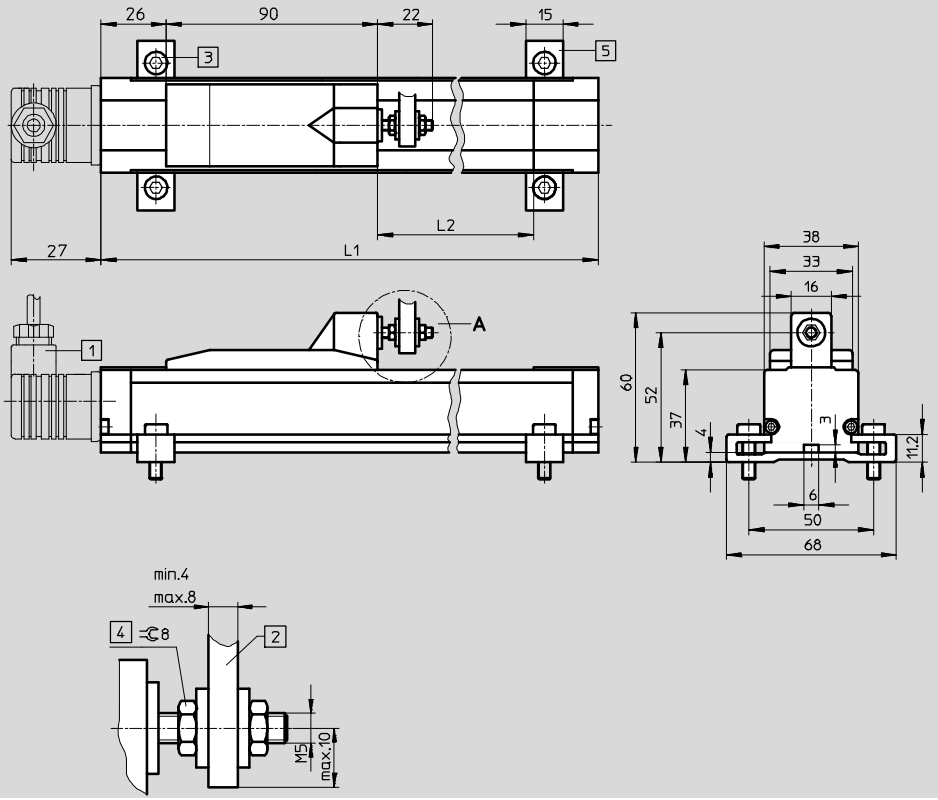


1 Plug socket, 4-pin to DIN 43 650
Insert 90° rotatable
(not included in scope of delivery)

2 Driver
(not included in scope of delivery)

3 Mounting screw M5x18

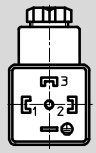
4 Hex nut M5

5 Adjustable mounting clips are included

Dimensions and ordering data

Stroke [mm]	L1	L2 (effective mechanical/electrical displacement)	Part No.	Type
225	376	234/228	**152 625**	**MLO-POT-225-TLF**
300	452	310/304	**152 626**	**MLO-POT-300-TLF**
360	514	372/366	**152 627**	**MLO-POT-360-TLF**
450	605	463/457	**152 628**	**MLO-POT-450-TLF**
500	656	514/508	**152 629**	**MLO-POT-500-TLF**
600	758	616/610	**152 630**	**MLO-POT-600-TLF**
750	910	768/762	**152 631**	**MLO-POT-750-TLF**
1000	1164	1022/1016	**152 632**	**MLO-POT-1000-TLF**
1250	1418	1276/1270	**152 633**	**MLO-POT-1250-TLF**
1500	1668	1526/1520	**152 634**	**MLO-POT-1500-TLF**
1750	1918	1776/1770	**152 635**	**MLO-POT-1750-TLF**
2000	2168	2026/2020	**152 636**	**MLO-POT-2000-TLF**

Ordering data – Accessories



PIN	Pin allocation	Designation	Part No.	Type
1	Power supply	Connector plug	**171 157**	**MSSD-C-4P**
2	Signal			
3	0 V			
PE	PE (yellow), screen			

Displacement encoders MLO-POT, analogue

Technical data

MLO-POT-...-LWG

- l - Stroke length
  100 ... 750 mm

General technical data										
Stroke			100	150	225	300	360	450	500	600	750
Constructional design			Round profile with connecting rod								
Measuring principle			Analogue displacement encoder, with contact and absolute measurement								
Resolution		[mm]	0.01								
Max. speed of travel		[m/s]	5								
Max. acceleration		[m/s^2]	200								
Mounting position			Any								
Driver,	Angle offset	[°]	±12.5								
ball coupling	Parallel offset	[mm]	–								
Service life	Strokes	[10^6]	Typical 50								
Connection			4-pin square plug								
Product weight		[g]									

General electrical data										
Stroke			100	150	225	300	360	450	500	600	750
Power supply		[V DC]	10[1]								
Max. current consumption		[mA]	4								
Wiper current	recommended	[µA]	< 1								
	maximum	[mA]	10[2]								
Connection resistance		[kΩ]	3	5	5	5	5	5	5	5	10
Connection resistance tolerance		[%]	±20								
Independent linearity		[%]	0.1	0.08	0.07	0.06	0.05	0.05	0.05	0.05	0.04
Temperature coefficient		[ppm/°K]	5								
Interface			Analogue								

1) Stabilised power supply is recommended, max. 42 V DC permissible.
2) Only permissible in the short-term in the event of a fault.

Operating and environmental conditions										
Stroke			100	150	225	300	360	450	500	600	750
Ambient temperature		[°C]	–30 ... +100[1]								
Protection class			IP65								
Vibration resistance			To DIN/IEC 68 Parts 2 – 6, severity level 2								
Continuous shock resistance			To DIN/IEC 68 Parts 2 – 27, severity level 2								
CE marking symbol (see conformity declaration)			As per EU EMC directive								

1) Please note temperature ranges of individual components used in a complete system solution.

Materials		
Housing		Anodised aluminium
Bearing cap		Reinforced polyester
Bearing seal		Nitrile rubber
Connecting rod		Corrosion resistant steel
Wiper	Contact	Stainless steel
	Silencer	Elastomer

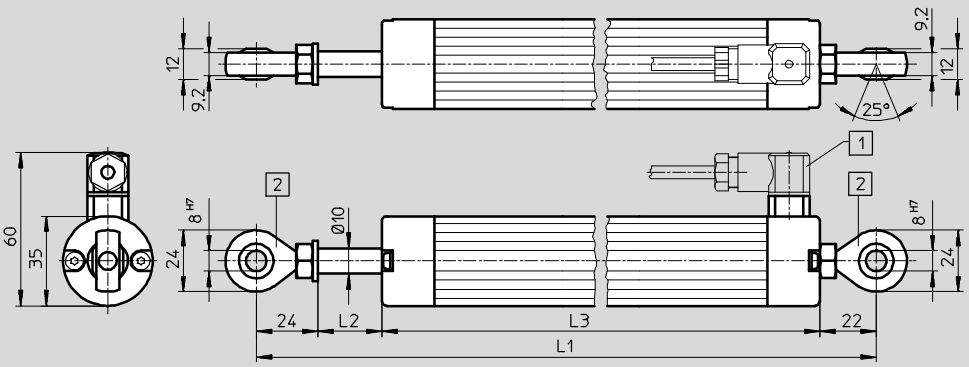
- Note

The mechanical vibrations of the piston rod must not be transmitted to the displacement encoder.
The displacement encoder is earthed to a screw on the end cap using a cable lug or earthing strap that must be connected to the earthing screw of the SPC11-...-LWG housing.
The earthing cable should not be longer than the encoder cable of the SPC11-...-LWG. The connection must be designed to be low-resistance.
The conductor cross-section must be at least 1.5 mm^2.
An earthing strap (braided) should be used instead of a round cable as earthing straps are considerably more effective at dissipating interference.

MLO-POT-...-LWG		
Housing		Anodised aluminium
Bearing cap		Reinforced polyester
Bearing seal		Nitrile rubber
Connecting rod		Corrosion resistant steel
Rod seal		Polytetraflouroethylene
Lubricant		ISOFLEX Topas MB52
Resistor element		Conductive plastic
Wiper	Contact	Stainless steel
	Silencer	Elastomer

Dimensions

Download CAD data ➔ **www.festo.com**



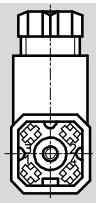
1 Plug socket, 4-pin
Type: SD-4-WD-7
Insert 90° rotatable
(not included in scope of delivery)

2 Rod eye, backlash-free

Dimensions and ordering data

Stroke [mm]	L1	L2 (effective mechanical/electrical displacement)	L3	Part No.	Type
100	273	105/102	227	**192 213**	**MLO-POT-100-LWG**
150	323	155/152	277	**192 214**	**MLO-POT-150-LWG**
225	400	231/228	354	**152 645**	**MLO-POT-225-LWG**
300	476	307/304	430	**152 646**	**MLO-POT-300-LWG**
360	551	368/366	505	**152 647**	**MLO-POT-360-LWG**
450	665	460/457	619	**152 648**	**MLO-POT-450-LWG**
500	730	510/508	684	**152 649**	**MLO-POT-500-LWG**
600	856	612/610	810	**152 650**	**MLO-POT-600-LWG**
750	1040	764/762	994	**152 651**	**MLO-POT-750-LWG**

Ordering data – Accessories



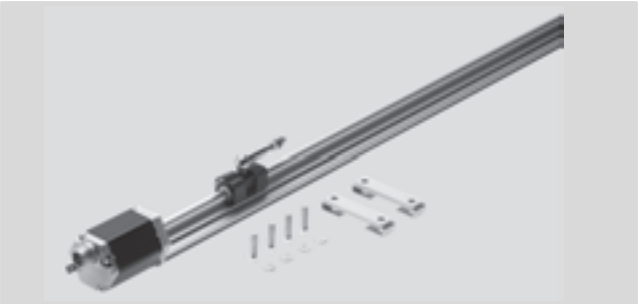
PIN	Pin allocation	Designation	Part No.	Type
1	Power supply	Plug socket	**194 332**	**SD-4-WD-7**
2	Signal			
3	0 V			
4	PE (yellow), screen			

Displacement encoders MME-MTS, digital

Technical data

MME-MTS-...-AIF

- I - Stroke length
225 ... 2000 mm



General technical data														
Stroke			225	300	360	450	500	600	750	1000	1250	1500	1750	2000
Constructional design			Closed profile with outer slide											
Measuring principle			Digital, magnetostrictive, non-contacting and absolute measurement											
Resolution		[mm]	< 0.01											
Max. speed of travel		[m/s]	10											
Max. acceleration		[m/s^2]	200											
Mounting position			Any											
Driver,	Angle offset	[°]	±1											
ball coupling	Parallel offset	[mm]	±1.5											
Service life	MTBF	[10^6/h]	> 4[1]											
Connection			6-pin round plug to DIN 45 322											
Product weight		[g]	620	710	780	890	950	1070	1250	1550	1850	2150	2450	2750

1) For the waveguide

General electrical data		
Power supply	[V DC]	24 (–15/+20%)
Max. current consumption	[mA]	90
Independent linearity	[%]	0.02[1]
Temperature coefficient	[ppm/°K]	15
Interface		Digital, CAN with protocol: SPC-AIF

1) Min. ±50 µm

Operating and environmental conditions		
Ambient temperature	[°C]	–40 ... +75[1]
Protection class		IP65
Vibration resistance		To DIN/IEC 68 Parts 2 – 6, severity level 1
Continuous shock resistance		To DIN/IEC 68 Parts 2 – 27, severity level 1
CE marking symbol (see conformity declaration)		As per EU EMC directive

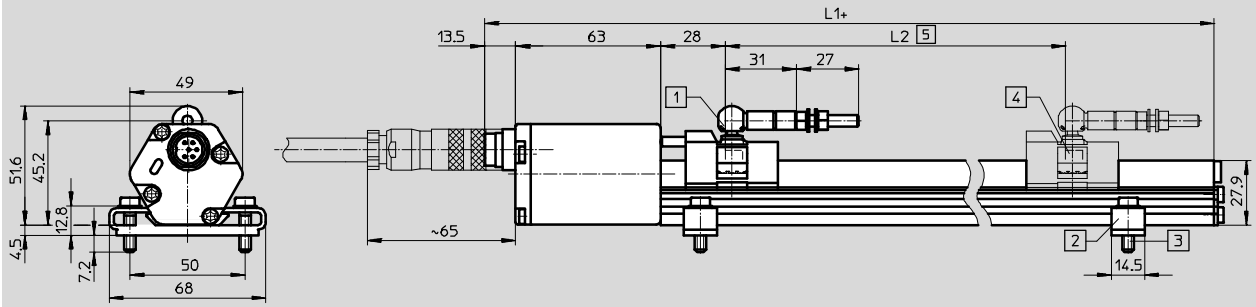
1) Please note temperature ranges of individual components used in a complete system solution

Materials		
Housing		Wrought aluminium alloy, anodised
Cover		Die-cast aluminium, painted
Moving slide	Housing	Reinforced polyester, permanent magnet
	Connection	Steel ball, hard metal plate
Mounting clip		Polyetherimide

Displacement encoders MME-MTS, digital

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Slide positions
2 Adjustable mounting clips are included
3 Socket head screw M5x20
4 Magnet
5 Effective displacement
6 Plug is a component of the axis interface SPC-AIF-MTS and Soft Stop SPC11-MTS-AIF

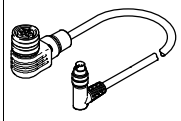
Dimensions and ordering data

Stroke [mm]	L1	L2 (effective path)	Part No.	Type
225	395	225	**178 310**	**MME-MTS-225-TLF-AIF**
300	470	300	**178 309**	**MME-MTS-300-TLF-AIF**
360	530	360	**178 308**	**MME-MTS-360-TLF-AIF**
450	620	450	**178 307**	**MME-MTS-450-TLF-AIF**
500	670	500	**178 306**	**MME-MTS-500-TLF-AIF**
600	770	600	**178 305**	**MME-MTS-600-TLF-AIF**
750	920	750	**178 304**	**MME-MTS-750-TLF-AIF**
1000	1170	1000	**178 303**	**MME-MTS-1000-TLF-AIF**
1250	1420	1250	**178 302**	**MME-MTS-1250-TLF-AIF**
1500	1670	1500	**178 301**	**MME-MTS-1500-TLF-AIF**
1750	1920	1750	**178 300**	**MME-MTS-1750-TLF-AIF**
2000	2170	2000	**178 299**	**MME-MTS-2000-TLF-AIF**

Pin allocation

PIN	
1	CAN LOW
2	CAN HIGH
3	Unused
4	Unused
5	+24 V
6	0 V
PE	Screen

Ordering data – Connecting cables and plugs

	Description	Cable length [m]	Part No.	Type
Connection between displacement encoder MME-MTS and proportional directional control valve VPWP				
	For displacement encoder MME-MTS	2	**575898**	**NEBP-M16W6-K-2-M9W5**

Product Range and Company Overview

A Complete Suite and Company Overview

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To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

9001:CERTCS-16248-2006-AQ-ESN-TGA
ISO 9001
ISO 14001
DNV
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14001:CERTCS-16248A-2006-AQ-ESN-TGA

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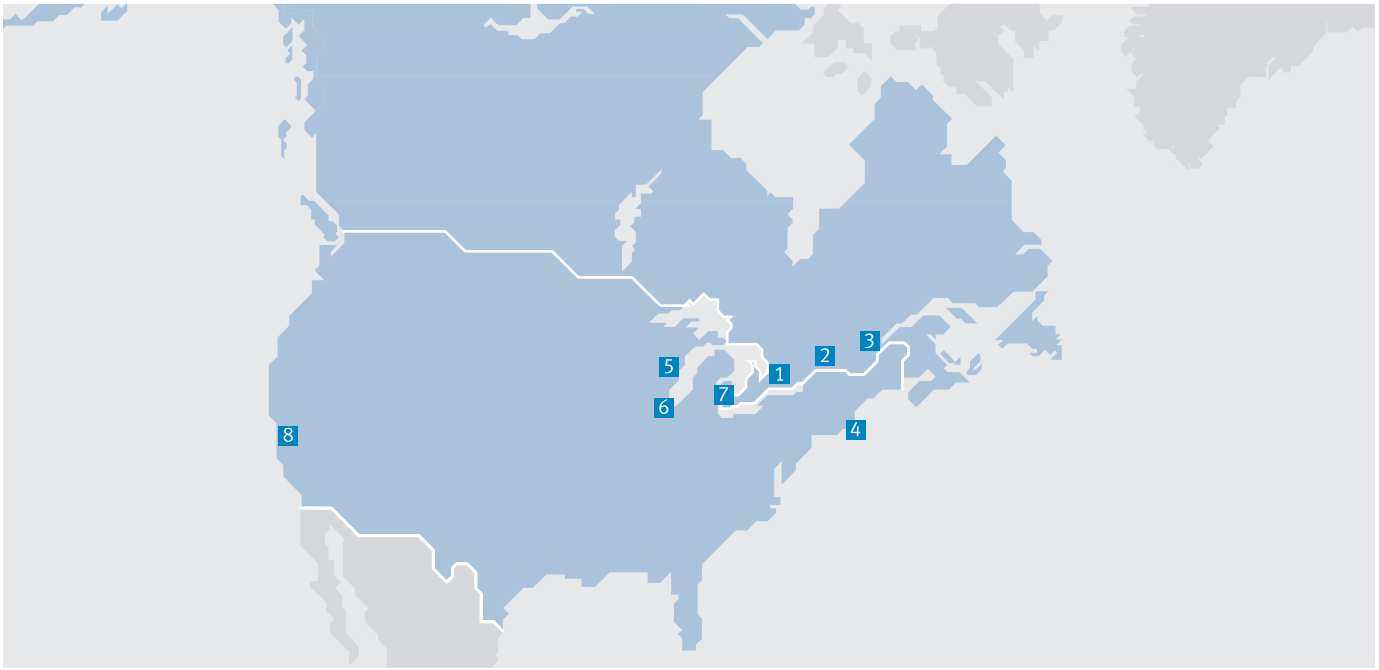

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