Data Sheet for Linear Sensors

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Potentiometric Linear Transducer (Conductive Plastic)

Series MSL38

The series MSL38 is used in industrial applications, which require a robust displacement sensor without push rod.

- Mechanical connection with link ball for compensation of angle offset
- Space saving cursor construction - no push rod
- Independent linearity ±0.05 %
- Conductive plastic element with almost infinite resolution
- Measuring length from 100 mm to 2000 mm
- Long life span (100 million movements)

The robust aluminium housing allows use in harsh industrial applications.

Electrical Data	
Effective electrical travel (+3/-0 mm) 1.)	100 / 130 / 150 / 175 / 200 / 225 / 250 / 300 / 350 / 360 / 400 / 450 / 500 / 600 / 700 / 750 / 850 / 900 / 1000 / 1250 / 1500 / 1750 / 2000
Total electrical travel (±1 mm) 1.)	103 / 133 / 153 / 178 / 204 / 229 / 254 / 305 / 355 / 365 / 406 / 458 / 509 / 611 / 713 / 763 / 865 / 915 / 1017 / 1271 / 1521 / 1771 / 2021
Total resistance 1.)	5 kOhm (100..300 mm) / 10 kOhm (350...1000 mm) / 20 kOhm (1250..2000 mm)
Resistance tolerance	±20 %
Independent linearity (best straight line) 1.)	±0.05 %
Theoretical resolution 1.)	Almost infinite
Repeatability 1.)	≤ 0.01 mm
Max. / recommended wiper current 1.)	10 mA (@40 °C, 1 min in case of failure) / < 1 µA
Power rating @40 °C (0 W @120 °C)	≤ 3 W
Isolation voltage 1.)	< 100 µA@500 VAC, 1bar, 2s
Isolation resistance 1.)	100 MOhm@500 VDC, 1bar, 2s

Mechanical Data, Environmental Conditions, Miscellaneous	
Mechanical stroke (+10 mm) 1.)	103 / 133 / 153 / 178 / 204 / 229 / 254 / 305 / 355 / 365 / 406 / 458 / 509 / 611 / 713 / 763 / 865 / 915 / 1017 / 1271 / 1521 / 1771 / 2021
Lifetime (90 % effective electrical travel) 2.)	> 25 million meters or 100 million movements (the smaller value applies)
Max. operational speed	≤ 10 m/s
Operational force @ RT 1.) 2.)	< 1.2 N
Operational temperature	-30..+100 °C
Storage temperature	-50..+120 °C
Protection grade (IEC60529)	IP40
Vibration (IEC 68-2-6, Test Fc)	20 g (5..2000 Hz, 0.75 mm)
Shock (IEC 68-2-27, Test Ea)	50 g, halfsine, 11 ms
Housing length (mm)	253 / 283 / 303 / 328 / 354 / 379 / 404 / 455 / 505 / 515 / 556 / 608 / 659 / 761 / 863 / 913 / 1015 / 1065 / 1167 / 1421 / 1671 / 1921 / 2171
Mounting parts (included in delivery)	Mounting clamps, screws, spring washer (100..900 mm: 2 x clamps + 4 x screws + 4 x spring washer, 1000..2000 mm: 3 x clamps + 6 x screws + 6 x spring washer)
Cursor	Included in delivery

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Mechanical Data, Environmental Conditions, Miscellaneous	
Material housing	Aluminium, Nylon 66 G 25
Material cursor	Nylon 66 GF 40, Latilub 73/13
Connection type	Valve connector 4-pole DIN43650 (optional 5-pole connector DIN43322)
Sensor mounting method	Mounting clamps, screws, spring washer (included in delivery) and for screw M6 ISO4017 DIN933 (screw not included in delivery)

1.) According IEC 60393
2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives
Please note: Max. permissible supply voltage <75 VDC respectively <50 VAC in addition the max. power rating must be observed

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Order Code

Description	Selection: standard=black/bold, possible options=grey/cursive					
Series:	**MSL38**					
Effective electrical travel:						
100 mm		**100**		**R5K**		
130 mm		**130**		**R5K**		
150 mm		**150**		**R5K**		
175 mm		**175**		**R5K**		
200 mm		**200**		**R5K**		
225 mm		**225**		**R5K**		
250 mm		**250**		**R5K**		
300 mm		**300**		**R5K**		
350 mm		**350**		**R10K**		
360 mm		**360**		**R10K**		
400 mm		**400**		**R10K**		
450 mm		**450**		**R10K**		
500 mm		**500**		**R10K**		
600 mm		**600**		**R10K**		
700 mm		**700**		**R10K**		
750 mm		**750**		**R10K**		
850 mm		**850**		**R10K**		
900 mm		**900**		**R10K**		
1000 mm		**1000**		**R10K**		
1250 mm		**1250**		**R20K**		
1500 mm		**1500**		**R20K**		
1750 mm		**1750**		**R20K**		
2000 mm		**2000**		**R20K**		
Electrical connection:						
4-pole valve connector (3+PE) DIN43650-ISO4400			**-**			
Option 5-pole connector DIN43322			*A*			
Total resistance:						
Standard depends on electrical travel				**see above**		
Resistance tolerance:						
±20 %					**W20%**	
Independent linearity:						
Standard 0.05 %						**L0,05%**

Accessories (not included in delivery):

For 4 pole valve connector:

- Mating connector (STV) #110767: angled, without cable, 3-pole + PE, IP65, not shielded (STV E 3POLPE IP65 NS)
- Mating connector with cable (STV): angled, with cable 3 meters, 3-pole + PE, IP67, not shielded (STV K3M 3POLPE IP67 NS)

For 5 pole connector M16:

- Mating connector (STEM16) #130964: M16 thread, 5-pole, IP40, angled, not shielded (STE M16 5POL IP40 W NS)
- Mating connector (STEM16) #110906: M16 thread, 5-pole, IP67, straight, shieldable (STE M16 5POL IP67 G S)
- Mating connector (STEM16) #114462: M16 thread, 5-pole, IP67, angled, shieldable (STE M16 5POL IP67 W S)
- Mating connector with cable (STKM16) #127664: M16 thread, 5-pole, IP67, straight, shielded, 2 m (STK M16 5POL IP67 G GS 2M AWG24)
- Mating connector with cable (STKM16) #127665: M16 thread, 5-pole, IP67, angled, shielded, 2 m (STK M16 5POL IP67 W GS 2M AWG24)

More connectors with cable on request. Take a look at data sheet STEM for connector without cable, STKM for connector with cable.

Note: When calibrating the linear transducer, be careful to set the stroke so that the output does not drop below 1 % or rise beyond 99 % of the supply voltage.

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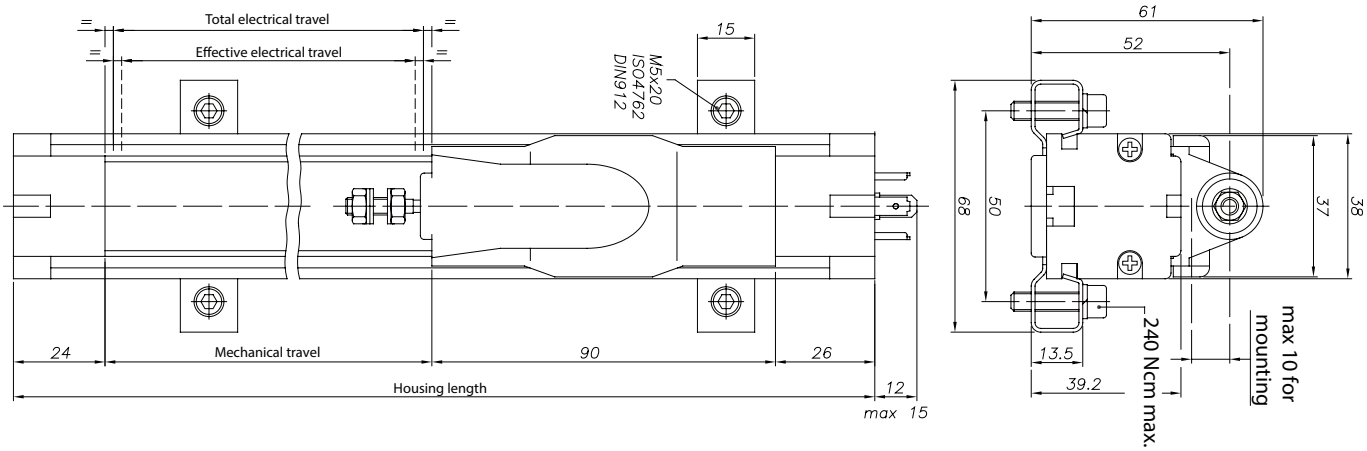
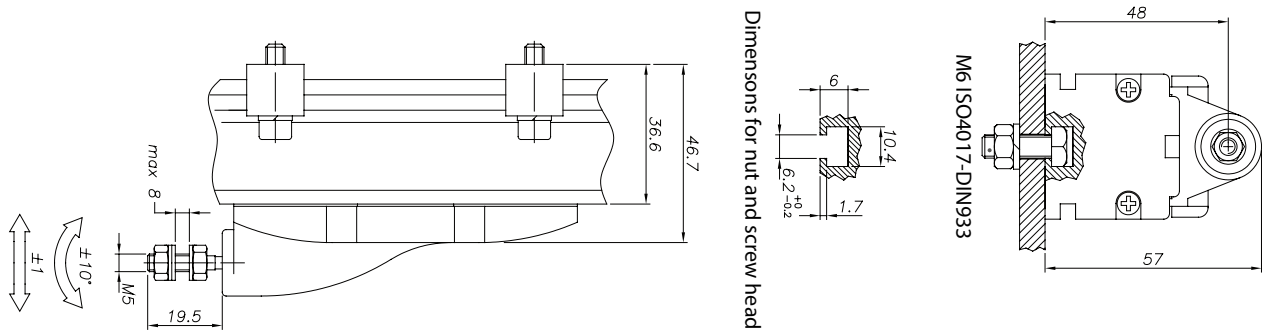
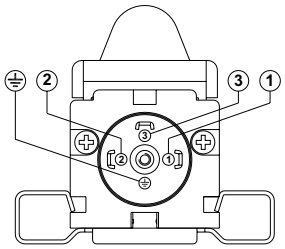
Drawing



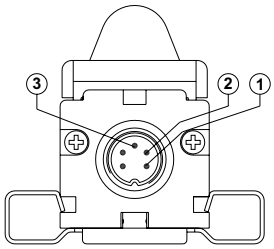


Dimensions in mm

4 pin connector



5 pin connector



Connection diagram