Data Sheet for Linear Sensors

Potentiometric Linear Transducer (Conductive Plastic) — Series MMS33

IP60 / IP65

IP67

MMS33 linear transducers are used in high vibration applications requiring a long life, high accuracy displacement sensor with a front guided push rod in measurement lengths from 50 to 900 mm.

- Rugged design with up to IP67 protection
- Measurement lengths from 50 to 900mm
- Front guided push rod
- Easy coupling with ball joints (not supplied)
- For high vibration applications

The rugged design is particularly suitable for high vibration applications and is available in IP60 (optional IP65/IP67) protection as well as connector and cable versions.

Electrical Data	
Effective electrical travel (+3/-0 mm) 1.)	50 / 75 / 100 / 130 / 150 / 175 / 200 / 225 / 275 / 300 / 350 / 375 / 400 / 450 / 500 / 600 / 650 / 750 / 900
Total electrical travel (±1 mm) 1.)	53 / 78 / 103 / 133 / 153 / 178 / 204 / 229 / 279 / 304 / 355 / 380 / 406 / 457 / 508 / 609 / 660 / 762 / 914
Total resistance 1.)	5 kOhm (50..650 mm) / 10 kOhm (750...900 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 (mm) 1.)	59 / 84 / 109 / 139 / 159 / 184 / 210 / 235 / 285 / 310 / 361 / 386 / 412 / 463 / 518 / 619 / 670 / 772 / 924
Lifetime (90 % effective electrical travel) 2.)	> 25 million meters or 100 million movements (the smaller value applies)
Max. operational speed	≤ 10 m/s (IP60) / ≤ 5 m/s (IP65/IP67)
Max. acceleration	≤ 200 m/s²
Operational force @ RT 1.) 2.)	< 3.5 N (IP60) / < 15 N (IP65) / < 20 N (IP67)
Operational temperature	-30 °C up to +100 °C
Storage temperature	-50 °C up to +120 °C
Protection grade (IEC60529)	IP60 (optional IP65/IP67)
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 IP60/IP65 (±1 mm)	113 / 138 / 163 / 193 / 218 / 238 / 264 / 289 / 339 / 364 / 415 / 440 / 466 / 517 / 572 / 673 / 725 / 826 / 978
Housing length IP67 (±1 mm)	121.5 / 155.5 / 171.5 / 201.5 / 221.5 / 246.5 / 272.5 / 297.5 / 347.5 / 372.5 / 423.5 / 448.5 / 474.5 / 525.5 / 580.5 / 681.5 / 733.5 / 834.5 / 986.5

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Mechanical Data, Environmental Conditions, Miscellaneous	
Mounting parts (included in delivery)	1 set mounting clamps, screws
Material housing	Aluminium, Nylon 66 G 25
Material cursor	Stainless steel AISI 303 IP60/IP65 / C45 chrome steel 20µm IP67
Connection type	Cable 3-pole (Ø Leads: 3 x 0.20 mm²), valve connector 4-pole DIN43650, M16 connector 5-pole DIN43322, M12 connector 4-pole
Sensor mounting method	Mounting clamps and with screw M5 ISO4017 DIN933 (screw M5 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/italic*						
Series:	**MMS33**						
Electrical connection:							
4-pole valve connector (3 + PE)		**SV**					
5-pole connector		**P**					
Cable 1 m		**K**					
Option cable length in m		*Kxx*					
Option 4-pole connector M12 (IP67)		*L*					
Effective electrical travel:							
50 mm			**50**	**R5K**			
75 mm			**75**	**R5K**			
100 mm			**100**	**R5K**			
130 mm			**130**	**R5K**			
150 mm			**150**	**R5K**			
175 mm			**175**	**R5K**			
200 mm			**200**	**R5K**			
225 mm			**225**	**R5K**			
275 mm			**275**	**R5K**			
300 mm			**300**	**R5K**			
350 mm			**350**	**R5K**			
375 mm			**375**	**R5K**			
400 mm			**400**	**R5K**			
450 mm			**450**	**R5K**			
500 mm			**500**	**R5K**			
600 mm			**600**	**R5K**			
650 mm			**650**	**R5K**			
750 mm			**750**	**R10K**			
900 mm			**900**	**R10K**			
Total resistance depends on electrical travel (e.g. R5K means 5 kOhm)				**see above**			
Resistance tolerance:							
±20 %					**W20%**		
Independent linearity:							
Standard 0.05 %						**L0,05%**	
Protection class:							
IP60							**IP60**
Option IP65							*IP65*
Option IP67 (only with 4-pole M12 connector)							*IP67*

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 4 pole connector M12:

- Series STEM12 (connector without cable) or STKM12 (connector with cable) IP67 versions

For 5 pole connector M16:

- 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)

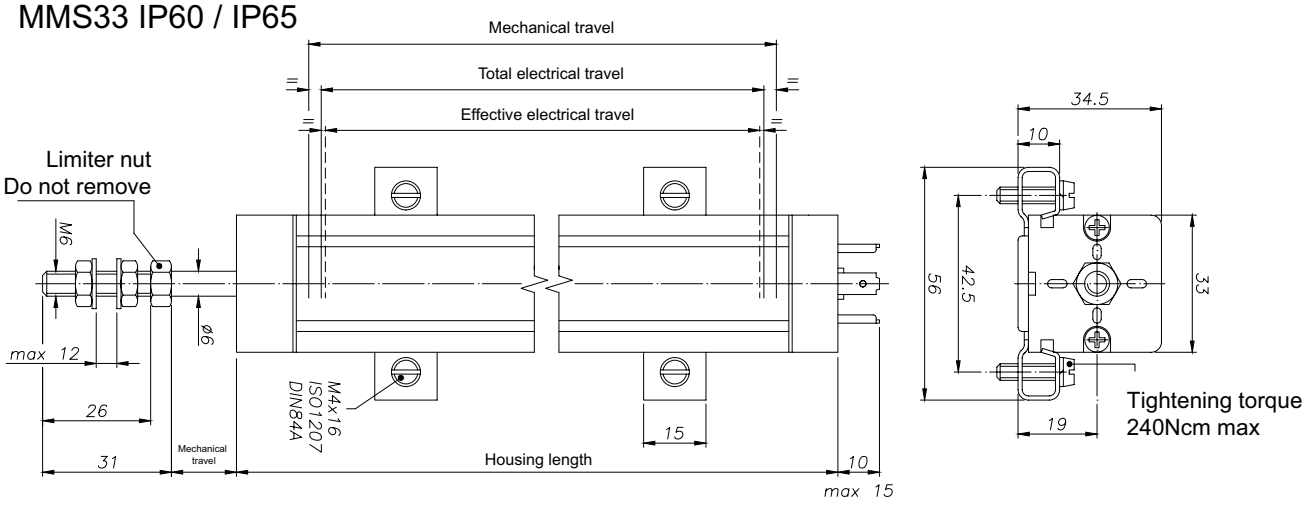
More connectors with cable on request. Take a look at data sheet STEM for connector without cable, STKM for connector with cable.

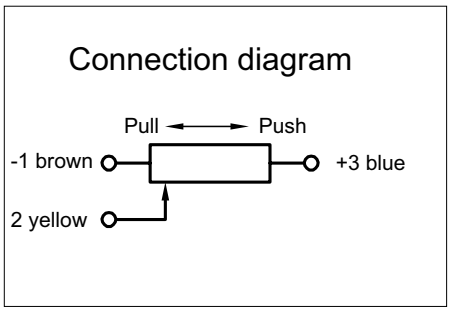
Note: When calibrating the linear transducer, be careful to set the stroke so that the output does not drop below 1 % or rise beyond 99 % of the supply voltage.

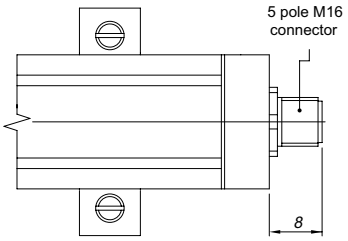
Potentiometric Linear Transducer (Conductive Plastic) — Series MMS33

Drawing

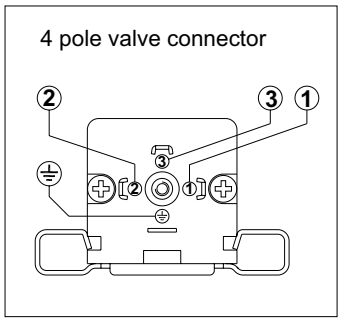
MMS33 IP60 / IP65

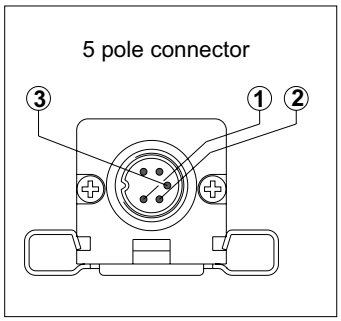


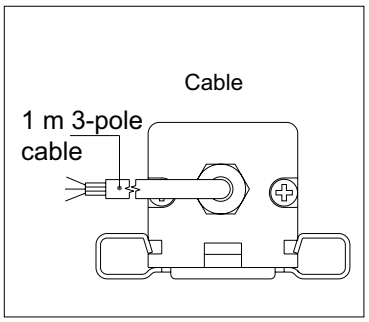


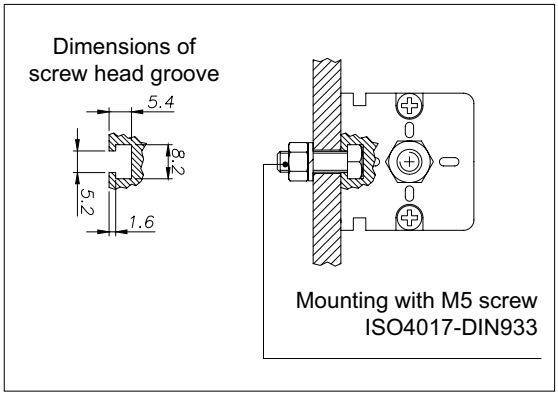


Dimensions in mm









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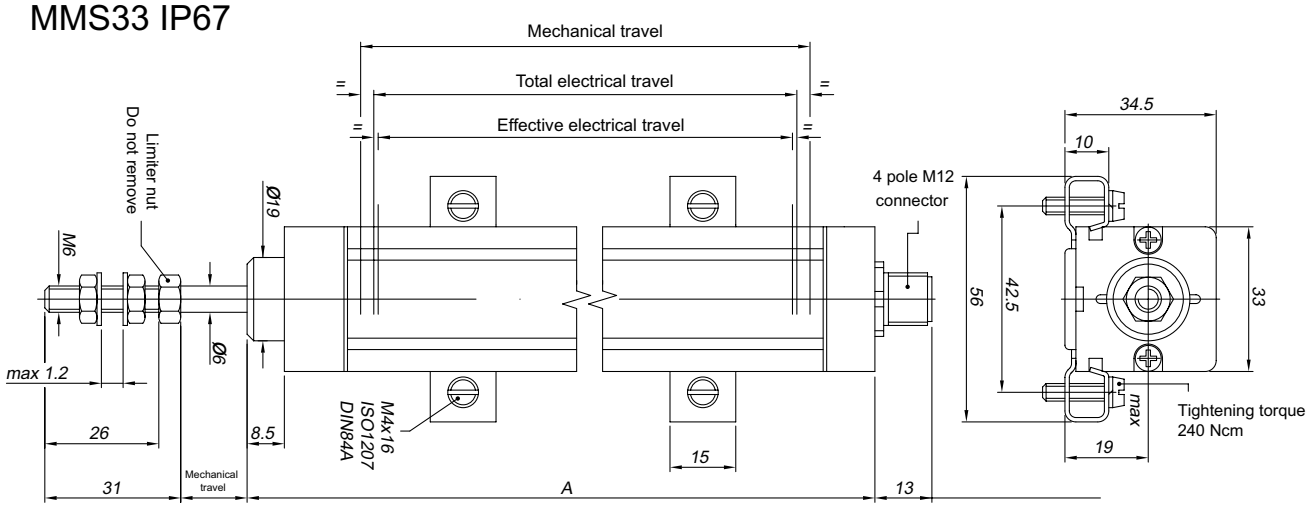
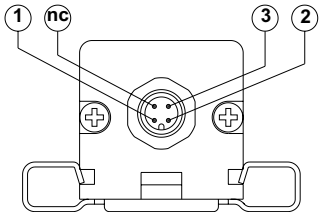
Drawing

Dimensions in mm

MMS33 IP67



4 pole connector (only IP67 version)



Connection diagram