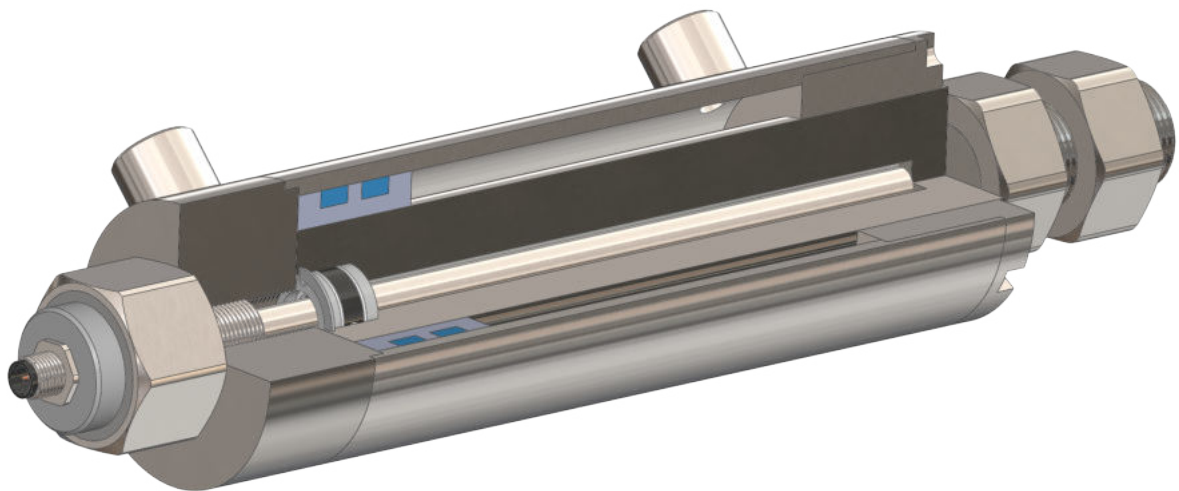


MSPF

Non-Contact Magnetostrictive Position Sensor
In Cylinder Applications

ANALOG mA/V



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1.PRODUCT DESCRIPTION AND TECHNOLOGY

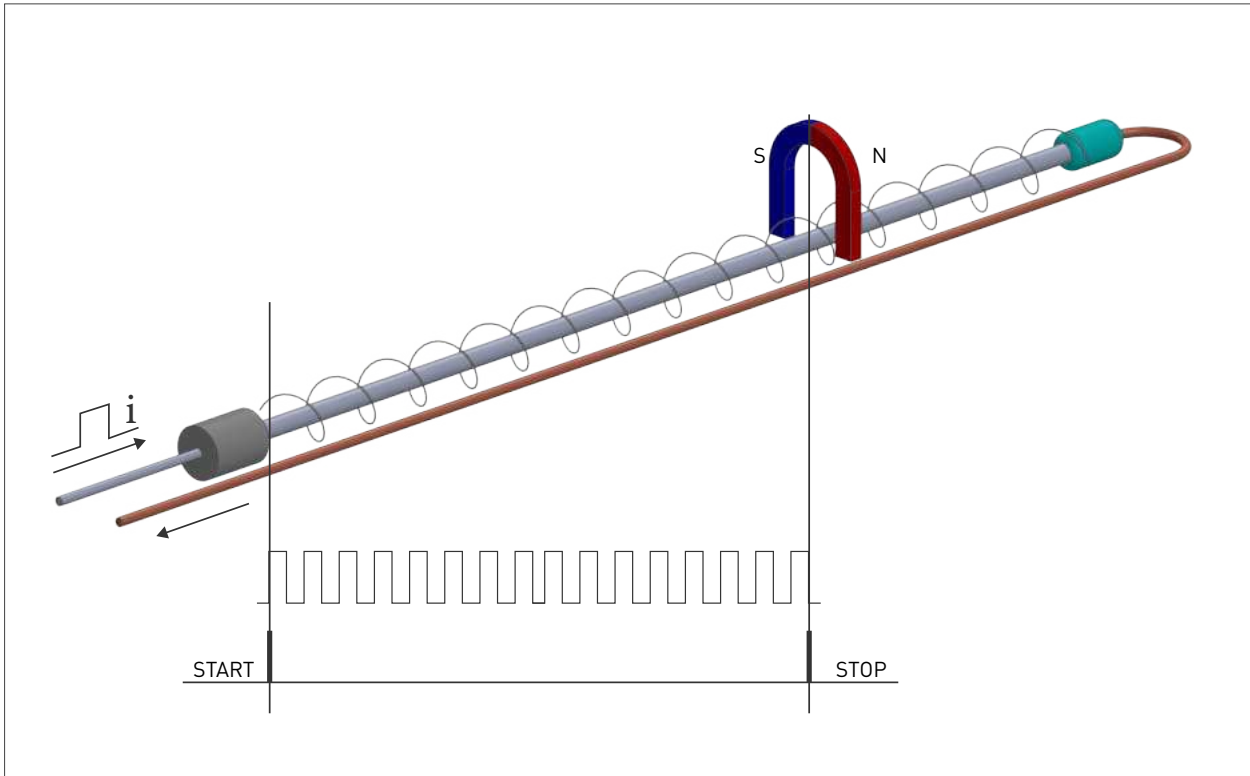


1.1 Non-Contact Magnetostrictive Position Sensor In Cylinder Applications

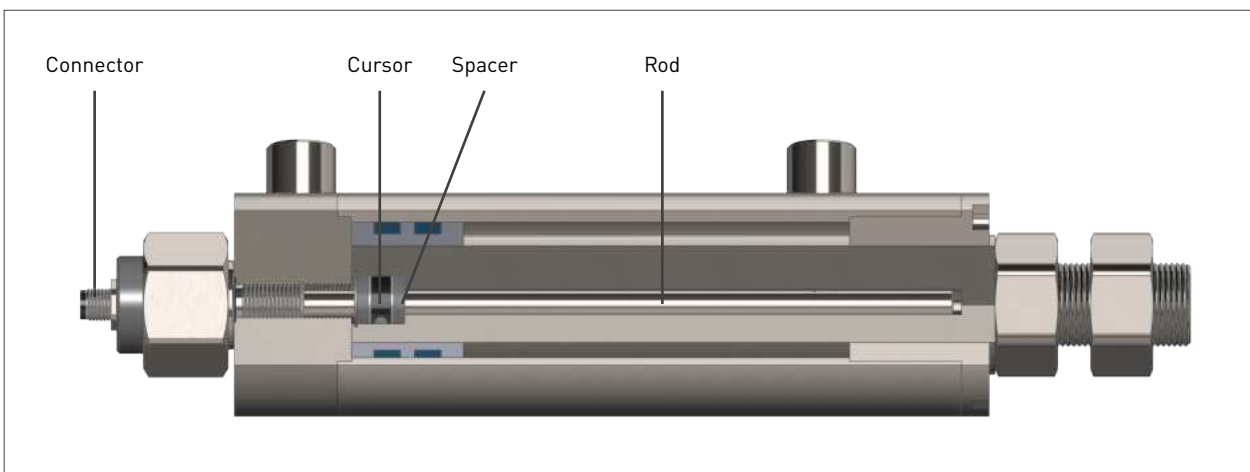
Contactless magnetostrictive position sensors inside the piston are designed to measure the position of hydraulic pistons precisely and reliably. These sensors are resistant to high pressure, can operate in hydraulic oil, have high accuracy, and an unlimited mechanical lifespan, providing absolute position measurement.

1.2 Measurement Principle

The working principle of magnetostrictive position sensors involves an electronic circuit sending an initial pulse to the magnetostrictive measurement wire. This electric pulse creates an electromagnetic wave traveling along the magnetostrictive wire. A magnet, which moves based on the changing mechanical position outside the sensor, generates a stop signal at the point where it meets the electromagnetic wave. The duration between the initial pulse signal and the stop signal contains the position information of the sensor.



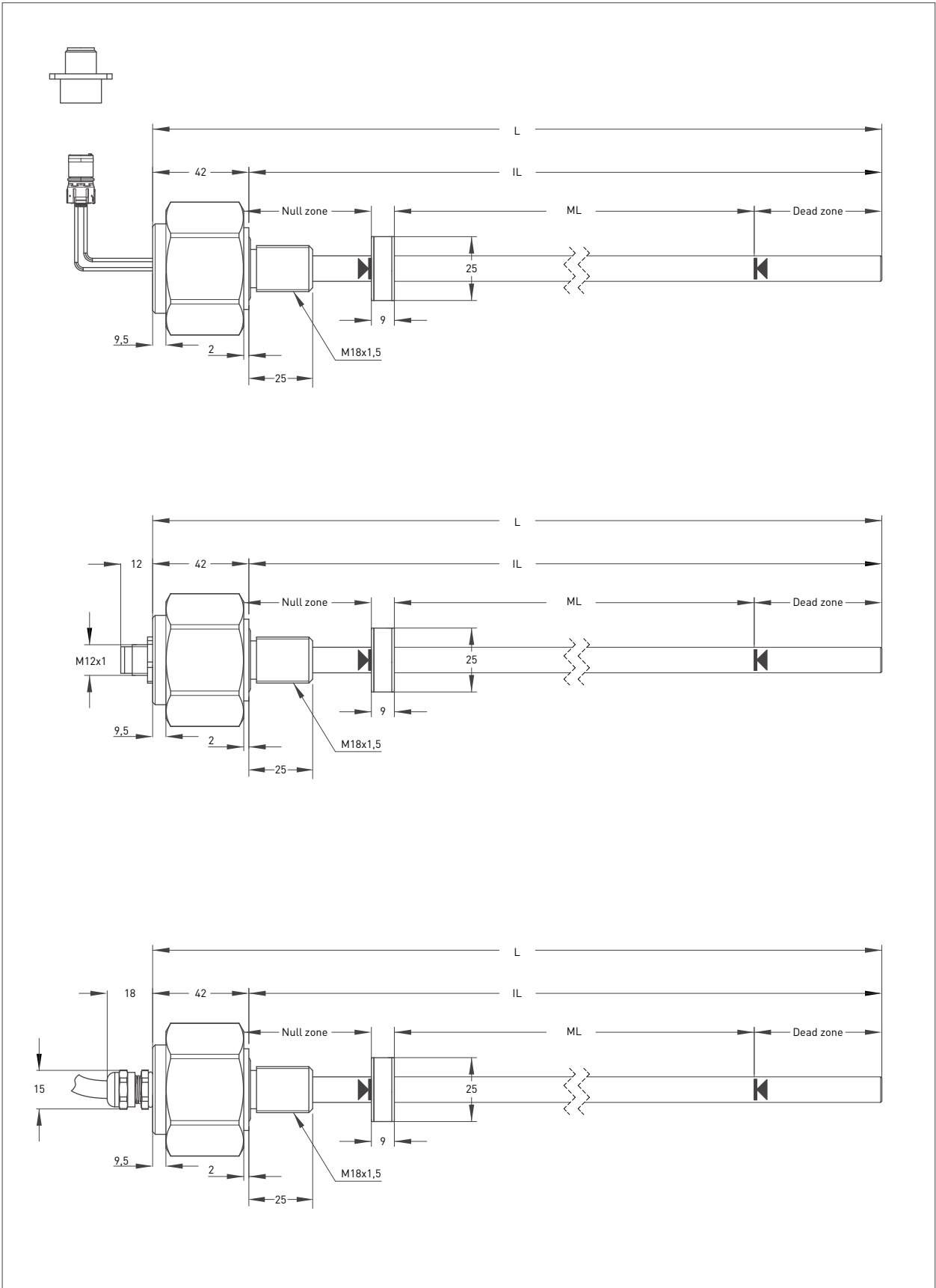
1.3 Mechanical Installation



2. TECHNICAL SPECIFICATIONS

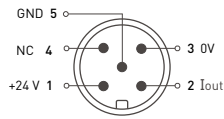
Measurement stroke	50 - 1.500 mm
Pressure rating	<500 bar
Output	0-20mA, 20-0mA, 4-20mA, 20-4mA 0-10V, 10-0V
Resolution	15 bit DAC output
Update time	0-600 mm, 0.5 ms 600-1.500 mm, 1 ms
Linearity	50 - 100 mm <1% 100 - 300 mm <0.2% 300 - 500 mm <0.1% 500 - 1.500 mm <0.05%
Repeatability	100 µm
Power supply	24 VDC ±10%
Displacement speed	max. <5 m/s
Sampling rate	Up to 2 kHz (depending on stroke length)
Reverse polarity protection	Up to -30 VDC
Overvoltage protection	Up to +30 VDC
Max. consumption	<50 mA - 90 mA (depending on stroke length)
Max. output noise	<5 mVpp
Load resistance	max. 500 Ohm
Protection level	IP 67
Vibration	EN 60068-2-6, 5-200 Hz 200 m/s ² (20g), 2h 30min each axis (x,y,z)
Shock	EN 60068-2-2:2007 500 m/s ² (50g) 11ms (x,y,z axis)
Sealing	O-ring : NBR Backup Ring : PTFE
Mounting	M18 x 1.5 or 3/4" - 16 UNF Backup or Flat
Case material	Tube : Stainless steel AISI316L Body : Stainless steel AISI303 Caps : Anodized aluminium
Operating temperature	-10°C ... +70°C
Storage temperature	-30°C ... +90°C

3.MECHANICAL DRAWING

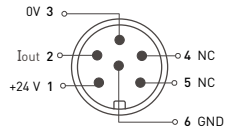


MSPF (mm)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500
ML (Measuring Length)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500
IL (Installation Length)	157	207	257	307	357	407	457	507	557	607	657	707	757	807	857	907	957	1007	1107	1207	1307	1407	1507	1607
L (Total Length)	199	249	299	349	399	449	499	549	599	649	699	749	799	849	899	949	999	1049	1149	1249	1349	1449	1549	1649
Dead Zone Calculation	50 / 50																							

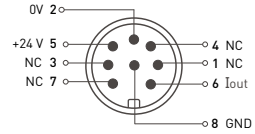
5 pin Connector
Configuration
CN5 M12 (A) / M16 (B)
5 pin



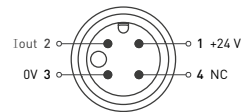
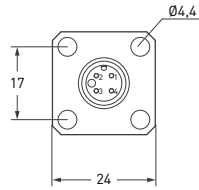
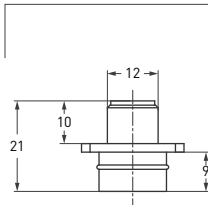
6 pin Connector
Configuration
CN6 M12 (A) / M16 (B)
6 pin



8 pin Connector
Configuration
CN8 M12 (A) / M16 (B)
8 pin

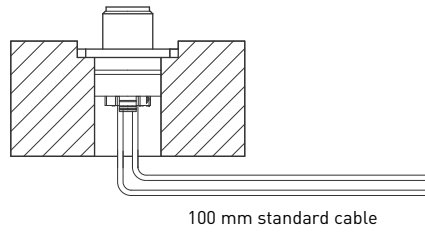


4 pin Male Connector
Configuration
CF4A M12 (A)
4 pin



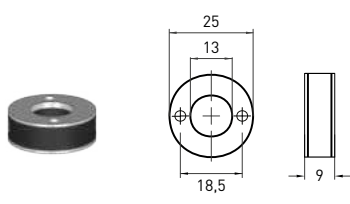
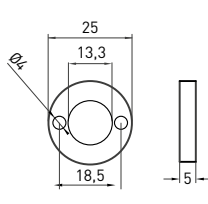
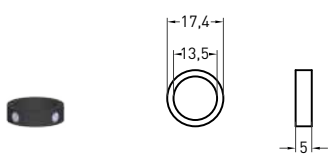
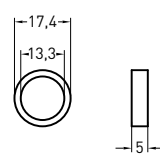
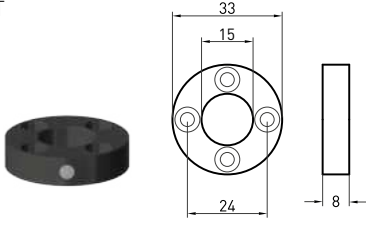
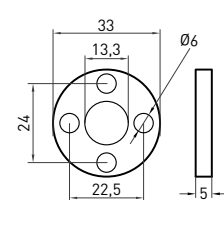
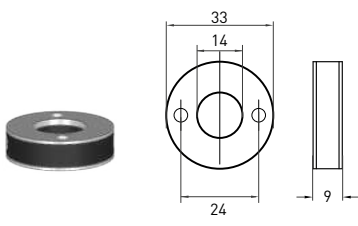
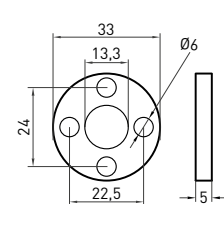
Cable colour

- +V : Brown
- 0V : Blue
- 0V sense : Black
- Output 1 : White (Iout)
- Earth : Shield

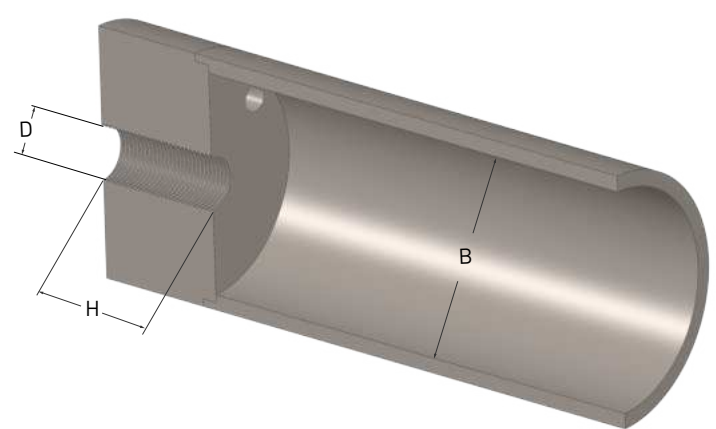


5. CURSORS AND ACCESSORIES



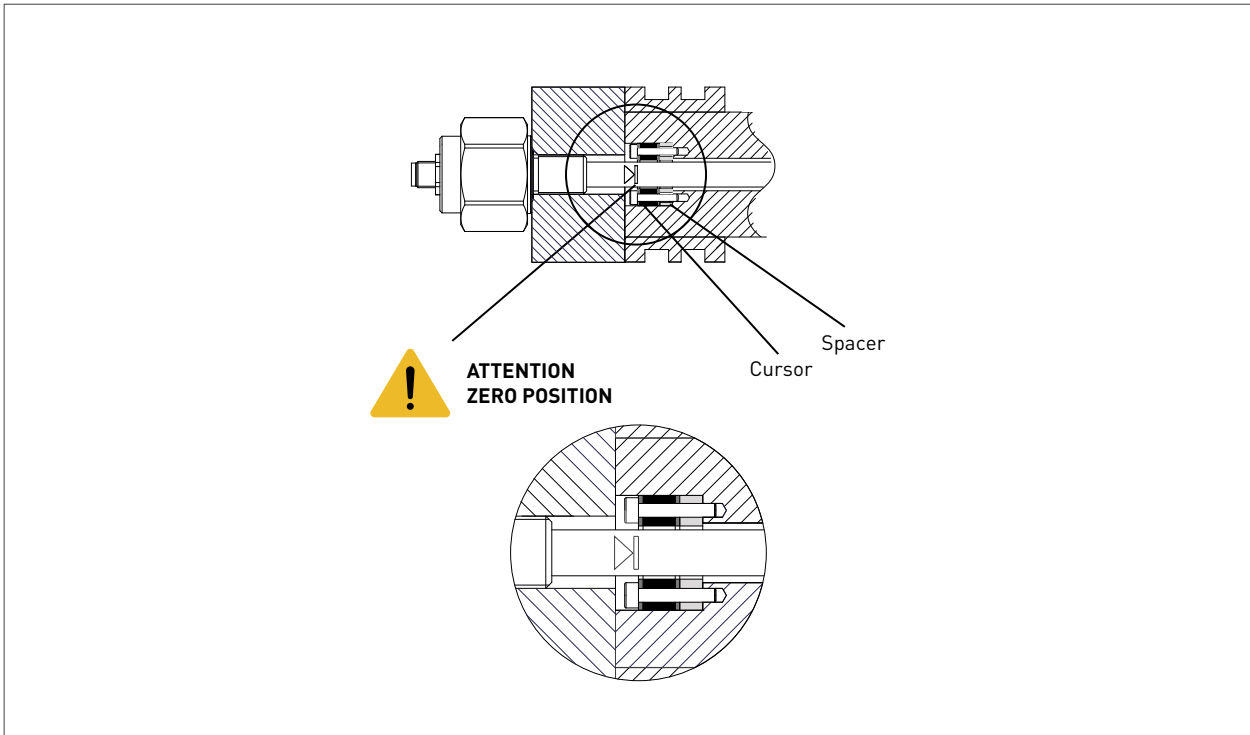
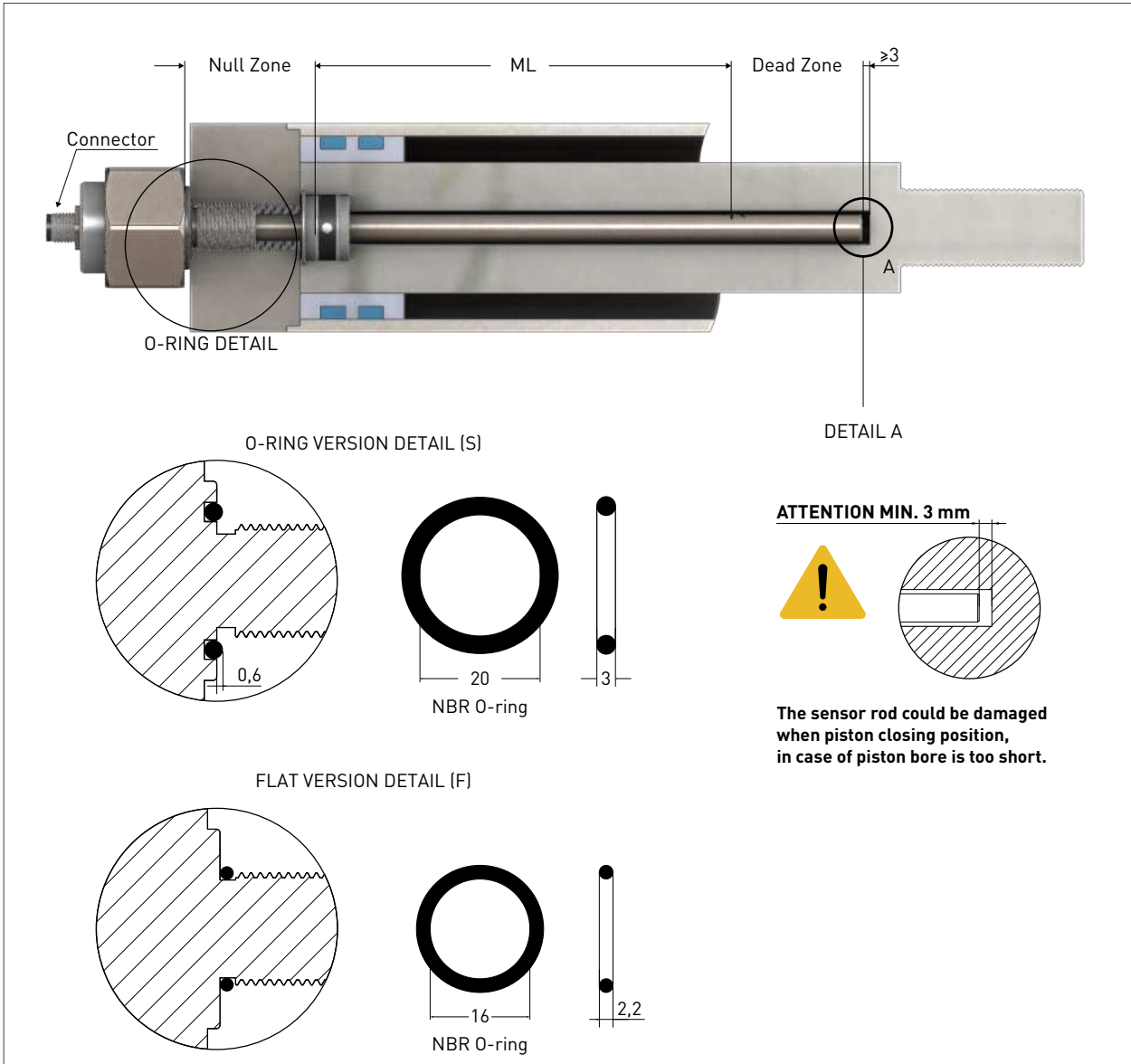
Cursor	Spacer	Screw
<p>R05T</p> 	<p>S01</p> 	<p>M3x20</p> <p>Stainless steel 316L screw</p> <p>2 units</p>
<p>R06T</p> 	<p>S03</p> 	-
<p>R09T</p> 	<p>S02</p> 	<p>M4x15</p> <p>Stainless steel 316L screw</p> <p>2 units</p>
<p>R10T</p> 	<p>S02</p> 	<p>M4x20</p> <p>Stainless steel 316L screw</p> <p>2 units</p>

7. SPACE REQUIREMENTS / DETAILS OF MECHANICAL PROCESSING

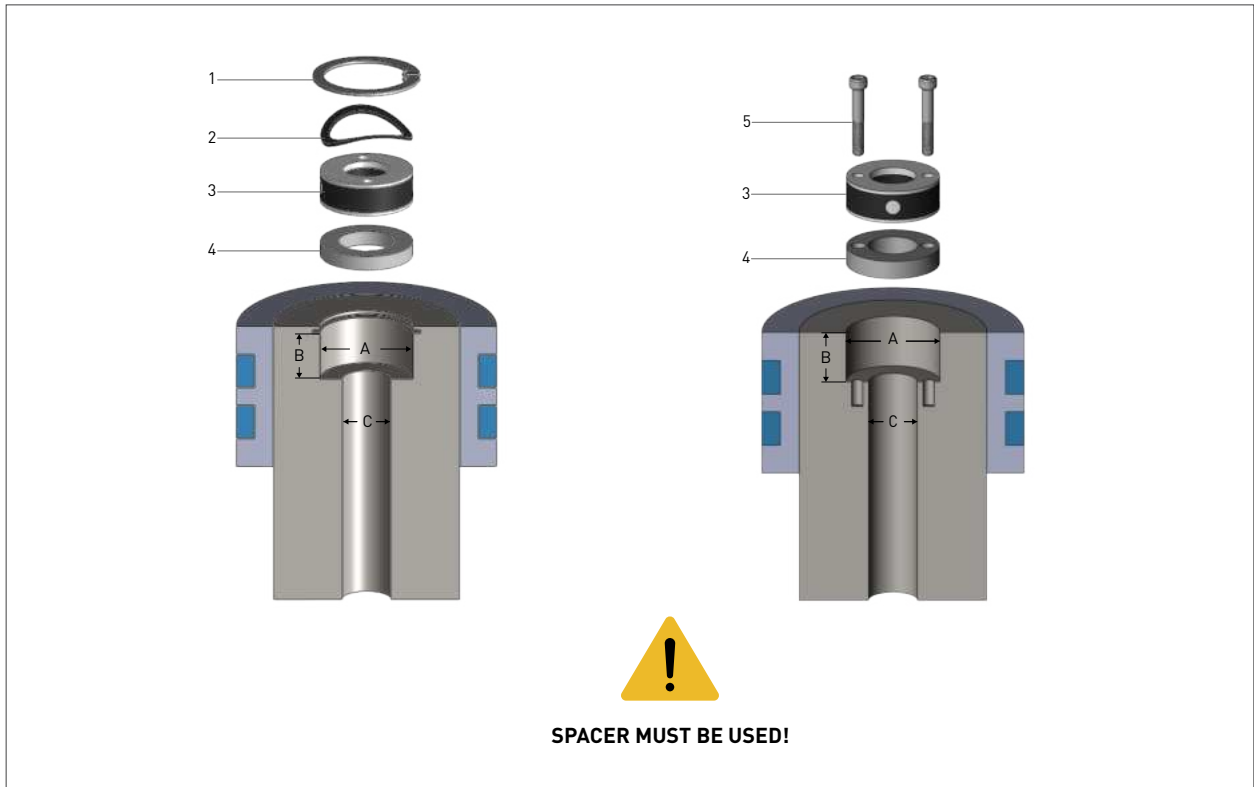


Type	B Ø Cylinder	D Ø min.	H Depth
MSPF	≥ 70 mm	M18 x 1,5	42 mm

8. PISTON ROD BORE AND DEPTH

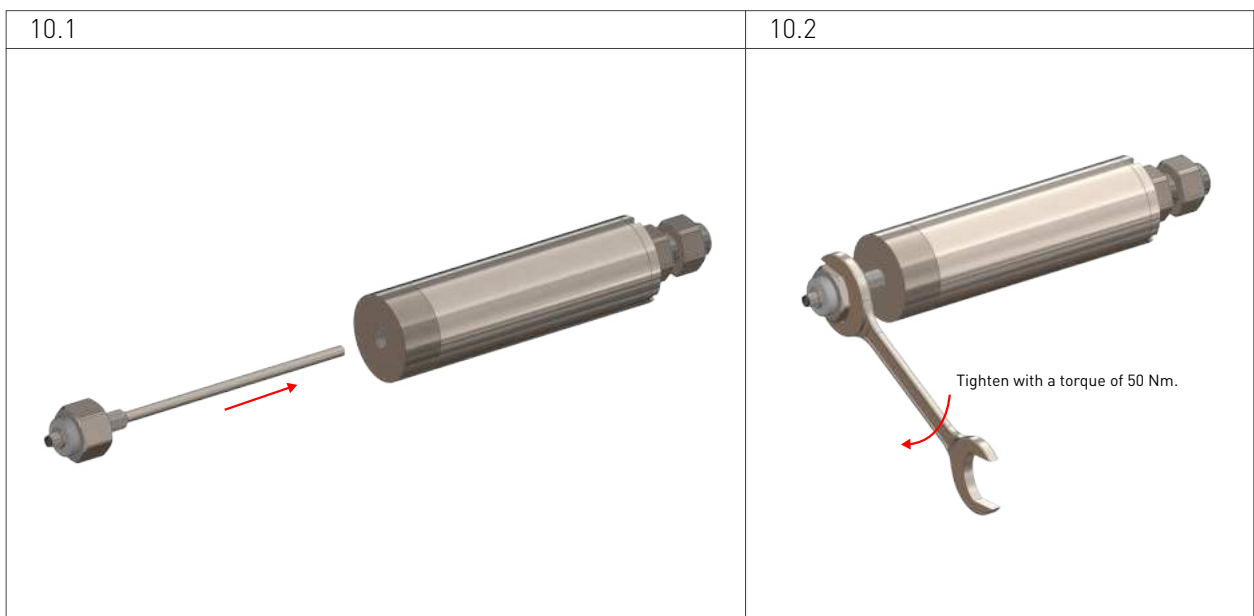


9. INSTALLING THE MAGNET

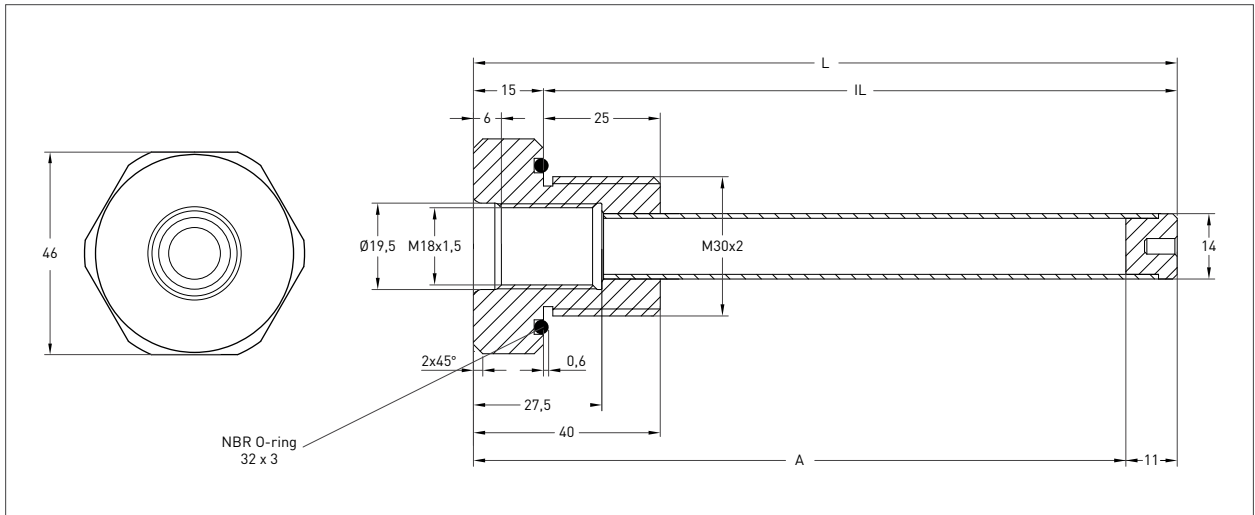


	1	2	3	4	5	A	B	C
Non-magnetic spacer	Circlip	Corrugated washer	Cursor (R05T)	Non-magnetic spacer	-	Ø25 mm	≥14 mm	Ø10 mm rod for Ø13 mm
Screwing	-	-	Cursor (R05T)	Non-magnetic spacer	Screw	Ø25 mm	≥14 mm	Ø10 mm rod for Ø13 mm

10. ASSEMBLY DIRECTLY



11.SLEEVE MECHANICAL DRAWING



MST (mm)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500	1750	2000	2250	2500	3000	4000	5000
A	166	216	266	316	366	416	466	516	566	616	666	716	766	816	866	916	966	1016	1116	1216	1316	1416	1516	1616	1866	2116	2366	2616	3116	4116	5116
IL (Installation Length)	162	212	262	312	362	412	462	512	562	612	662	712	762	812	862	912	962	1012	1112	1212	1312	1412	1512	1612	1862	2112	2362	2612	3112	4112	5112
L (Total Length)	177	227	277	327	377	427	477	527	577	627	677	727	777	827	877	927	977	1027	1127	1227	1327	1427	1527	1627	1877	2127	2377	2627	3127	4127	5127

12.ASSEMBLY WITH SLEEVE

<p>12.1</p>	<p>12.2</p>
<p>12.3</p>	<p>12.4</p>

6. ORDERING PROCEDURE

1	Model MSPF : Non-Contact Magnetostrictive Position Sensor In Cylinder Applications
2	Measuring range 50 - 3.000 mm
3	Rod & Thread E10 : Ø10 M18x1,5 U10 : Ø10 3/4" 16 UNF E12 : Ø12 M8x1,5 U12 : Ø12 3/4" 16 UNF
4	Sealing surface S : O - ring F : Flat
5	Resolution B : 15 bit
6	Cursor 1R05T : 25 mm 1R06T : 17.4 mm 1R09T : 33 mm 1R10T : 33 mm S01 : 25 mm S02 : 33 mm
7	Output I40 : 4-20mA I04 : 20-4mA I20 : 0-20mA I02 : 20-0mA
8	Connector / Cable CN5A : M12 CN5B : M16 CN6A : M12 CN6B : M16 CN8A : M12 CN8B : M16 CF4A : M12 1M : 1 meter cable (standard)
9	Dead zone ≤ 1.500 mm : 50 / 50 mm > 1.750-3.000 mm : 80 / 50 mm

For example:

MSPF	750	E10	S	B	1R05	I40	CN5A	50/50
1	2	3	4	5	6	7	8	9

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