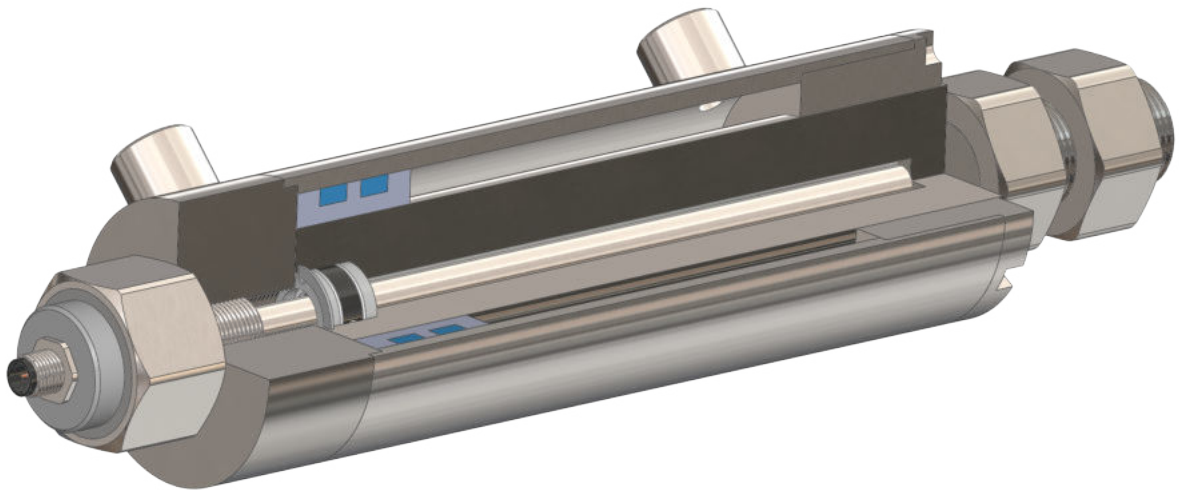


## MSPF

Non-Contact Magnetostrictive Position Sensor  
In Cylinder Applications

ANALOG mA



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Please note: The specifications and information in this datasheet may not cover all special demands arising from specific applications. Therefore, they do not constitute a comprehensive description of the product properties. OPKON accepts no responsibility for damages resulting from the improper application of our products. The user is responsible for ensuring that the products used are suitable for their own application.

# 1.PRODUCT DESCRIPTION AND TECHNOLOGY

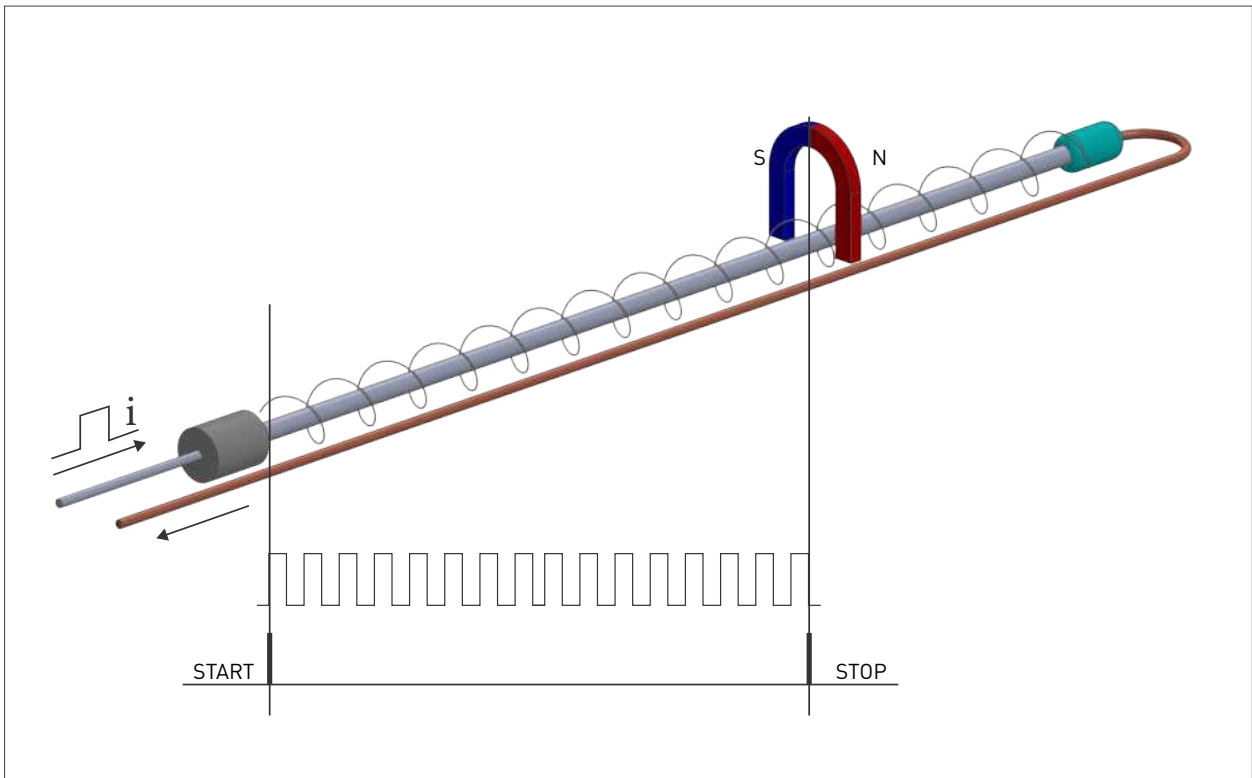


## 1.1 Non-Contact Magnetostrictive Position Sensor In Cylinder Applications

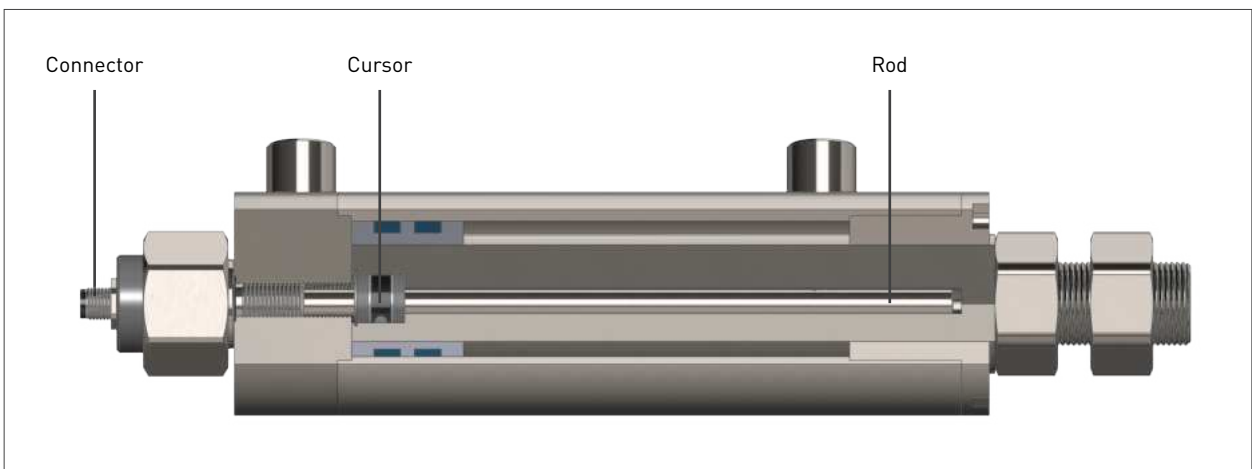
In-Cylinder linear position sensors are designed for integration inside a hydraulic cylinder. Absolute displacement transducer in rod design for installation in cylinders especially for mobile applications; contactless magnetostrictive measuring principle; non-contact position measurement with unlimited mechanical life and robust design.

## 1.2 Measurement Principle

A mechanical strain pulse is triggered by the cursor containing the magnet. The operating time of this magnetic wave is precisely measured and converted into standard electronic output signals.



## 1.3 Mechanical Installation

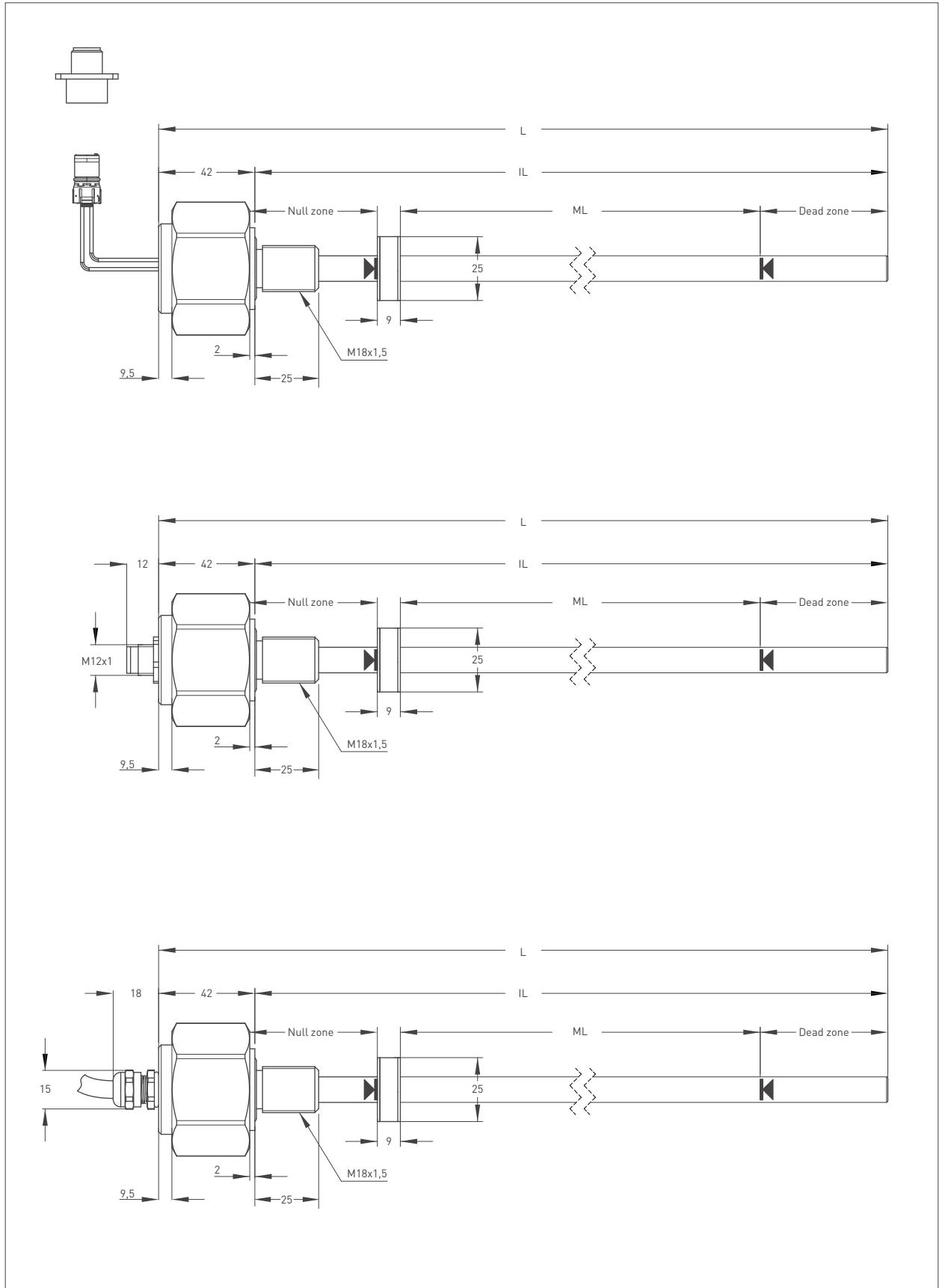


## 2. TECHNICAL SPECIFICATIONS



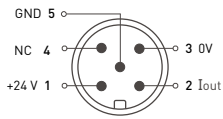
Technical specifications	
Measurement stroke	50 - 1.500 mm
Pressure rating	<500 bar
Output	0-20mA, 20-0mA, 4-20mA, 20-4mA
Resolution	15 bit DAC output
Update time	0-600 mm, 0.5 ms 600-1.500 mm, 1 ms
Accuracy	
Linearity	50 - 100 mm <1% 100 - 300 mm <0.2% 300 - 500 mm <0.1% 500 - 1.500 mm <0.05%
Electrical installation	
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
Environmental testing	
Vibration	EN 60068-2-6, 5-200 Hz 200 m/s <sup>2</sup> (20g), 2h 30min each axis (x,y,z)
Shock	EN 60068-2-2:2007 500 m/s <sup>2</sup> (50g) 11ms (x,y,z axis)
Materials and dimensions	
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 conditions	
Operating temperature	-10°C ... +70°C
Storage temperature	-30°C ... +90°C

### 3.MECHANICAL DRAWING

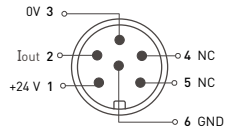


MSPF (mm)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500
ML (Measuring Length)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500
IL (Installation Length)	157	207	257	307	357	407	457	507	557	607	657	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																							

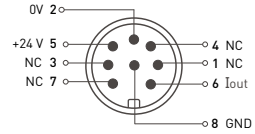
5 pin Connector  
Configuration  
**CN5** M12 (A) / M16 (B)  
5 pin



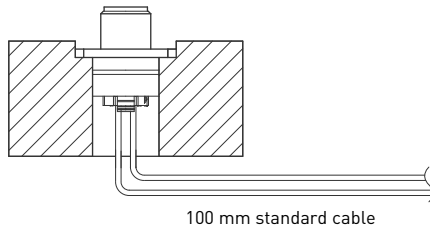
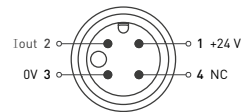
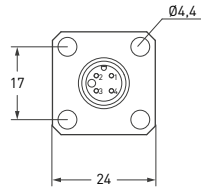
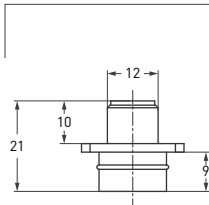
6 pin Connector  
Configuration  
**CN6** M12 (A) / M16 (B)  
6 pin

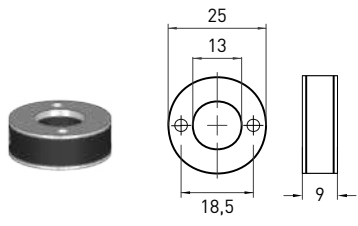
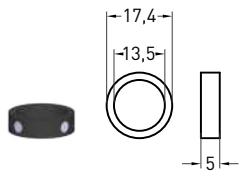
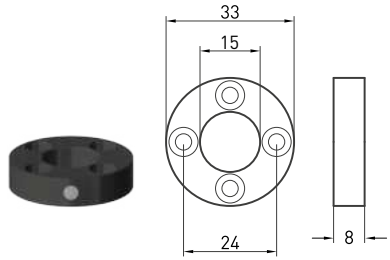
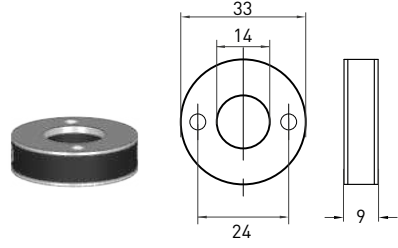
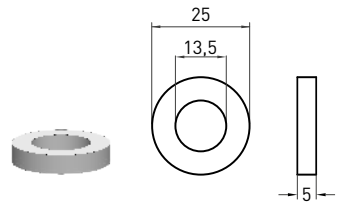
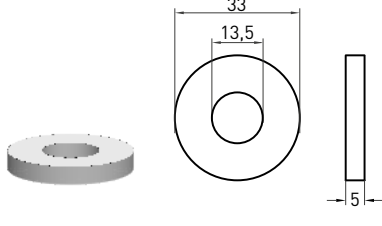


8 pin Connector  
Configuration  
**CN8** M12 (A) / M16 (B)  
8 pin



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



<p style="text-align: center;">Cursor R05T</p> 	<p style="text-align: center;">Cursor R06T</p> 
<p style="text-align: center;">Cursor R09T</p> 	<p style="text-align: center;">Cursor R10T</p> 
<p style="text-align: center;">Non-magnetic spacer S01</p> 	<p style="text-align: center;">Non-magnetic spacer S02</p> 

## 6. ORDERING PROCEDURE

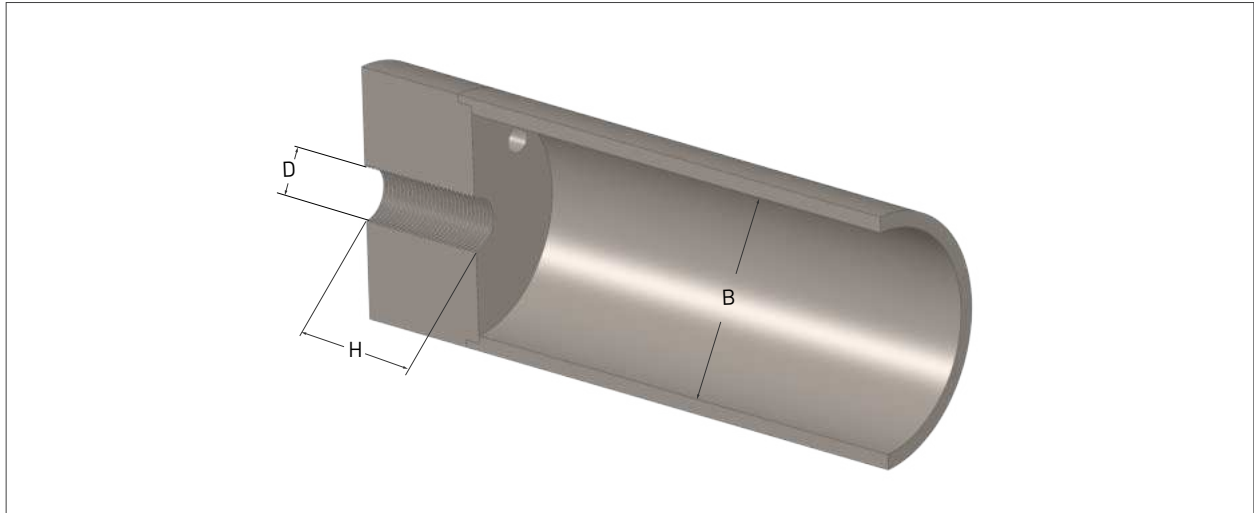
<b>1</b>	<b>Model</b> MSPF : Non-Contact Magnetostrictive Position Sensor In Cylinder Applications
<b>2</b>	<b>Measuring range</b> 50 - 3.000 mm
<b>3</b>	<b>Rod &amp; Thread</b> E10 : Ø10 M18x1,5 U10 : Ø10 3/4" 16 UNF E12 : Ø12 M8x1,5 U12 : Ø12 3/4" 16 UNF
<b>4</b>	<b>Sealing surface</b> S : O - ring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

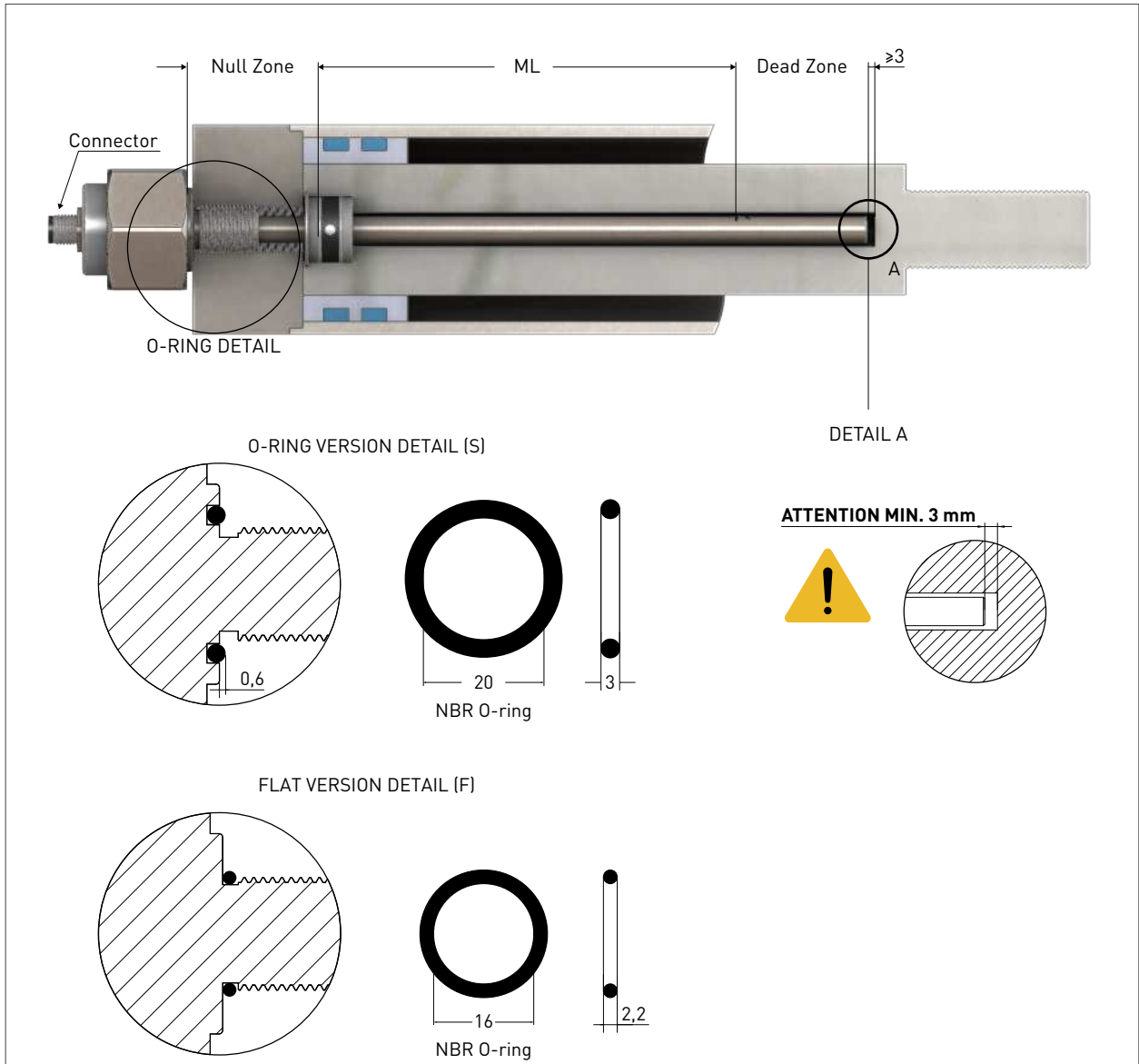


## 7. SPACE REQUIREMENTS

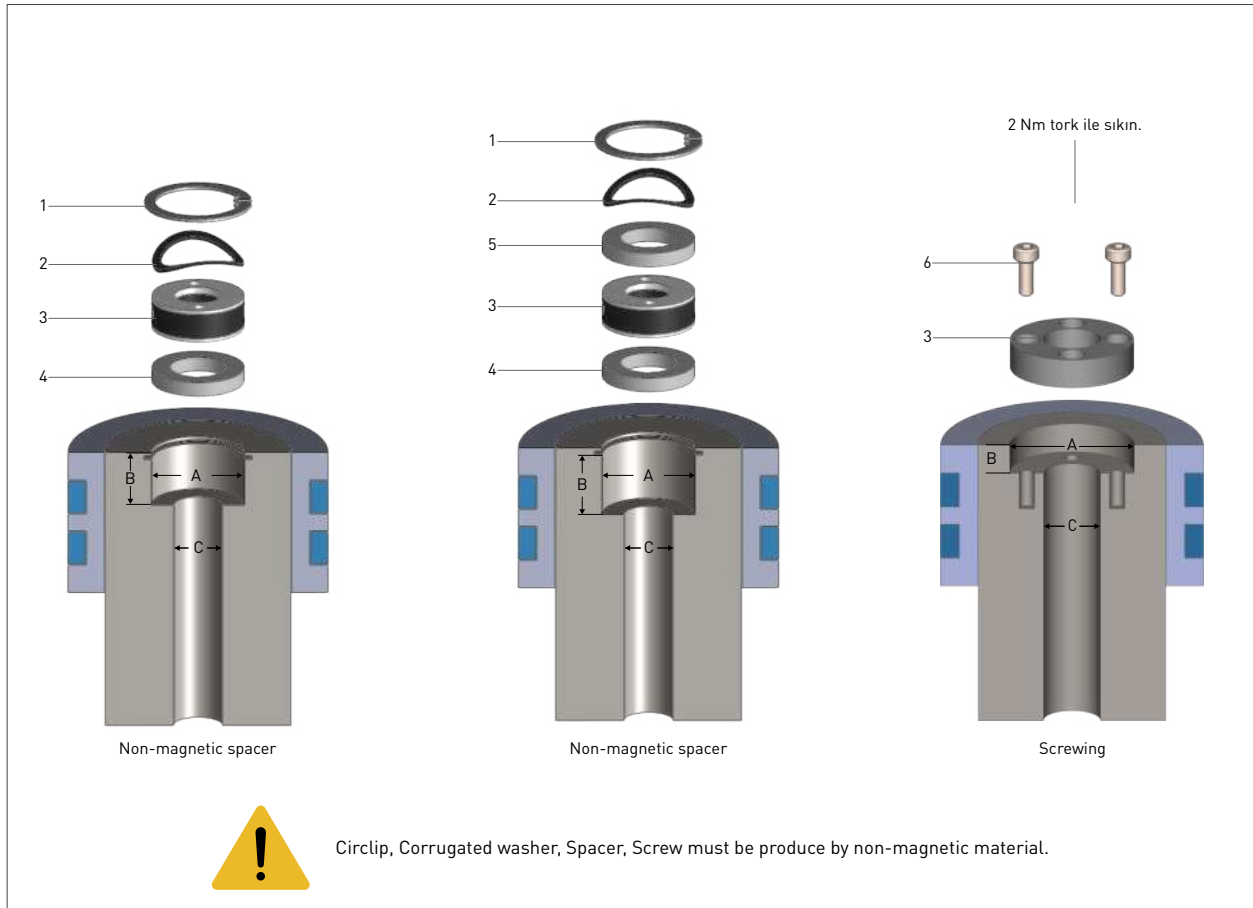


Type	B Ø Cylinder	D Ø min.	H Depth
MSPF	≥ 70 mm	M18 x 1,5	42 mm

## 8. PISTON ROD BORE AND DEPTH

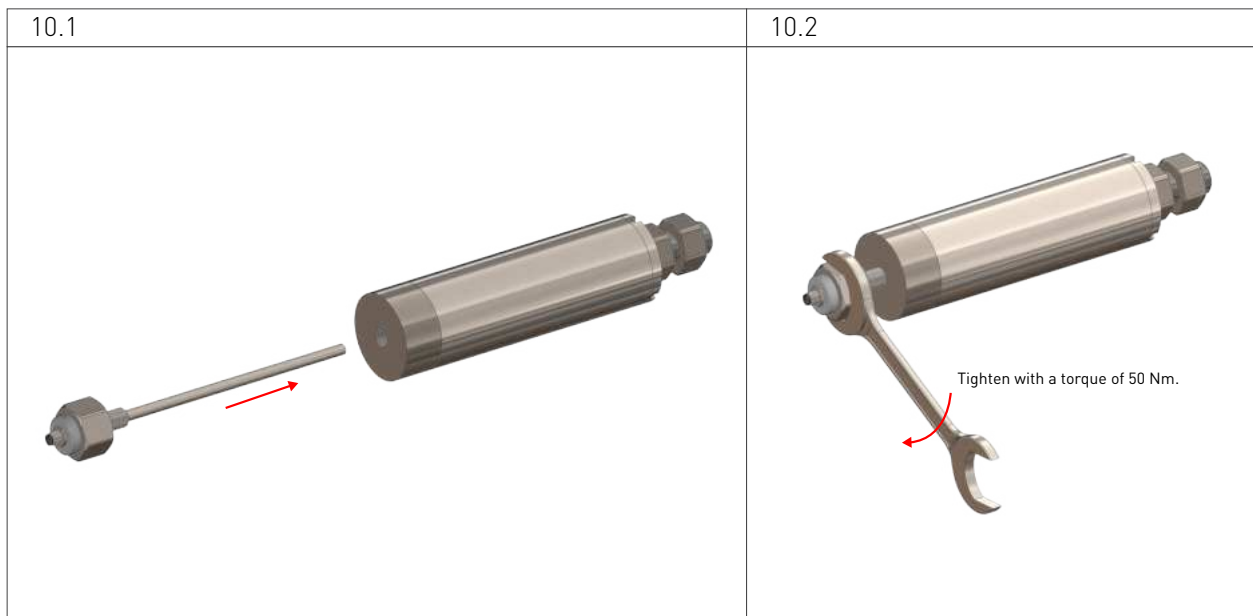


## 9. INSTALLING THE MAGNET

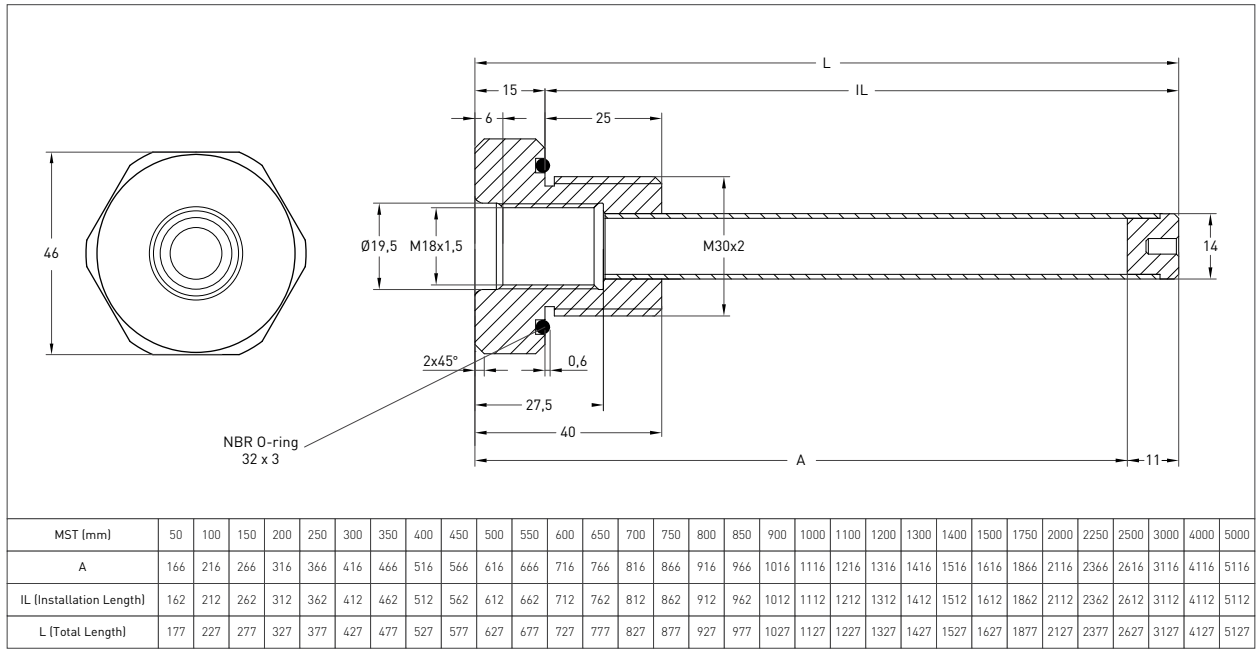


Non-magnetic spacer	Circlip	Corrugated washer	Cursor (R05T)	Non-magnetic spacer	-	-	Ø25 mm	≥14 mm	Ø10 mm rod for Ø13 mm
Non-magnetic spacer	Circlip	Corrugated washer	Cursor (R05T)	Non-magnetic spacer	Non-magnetic spacer	-	Ø25 mm	≥19 mm	Ø10 mm rod for Ø13 mm
Screwing	-	-	Cursor (R09T)	-	-	Screw	Ø33 mm	≥8 mm	Ø10 mm rod for Ø13 mm

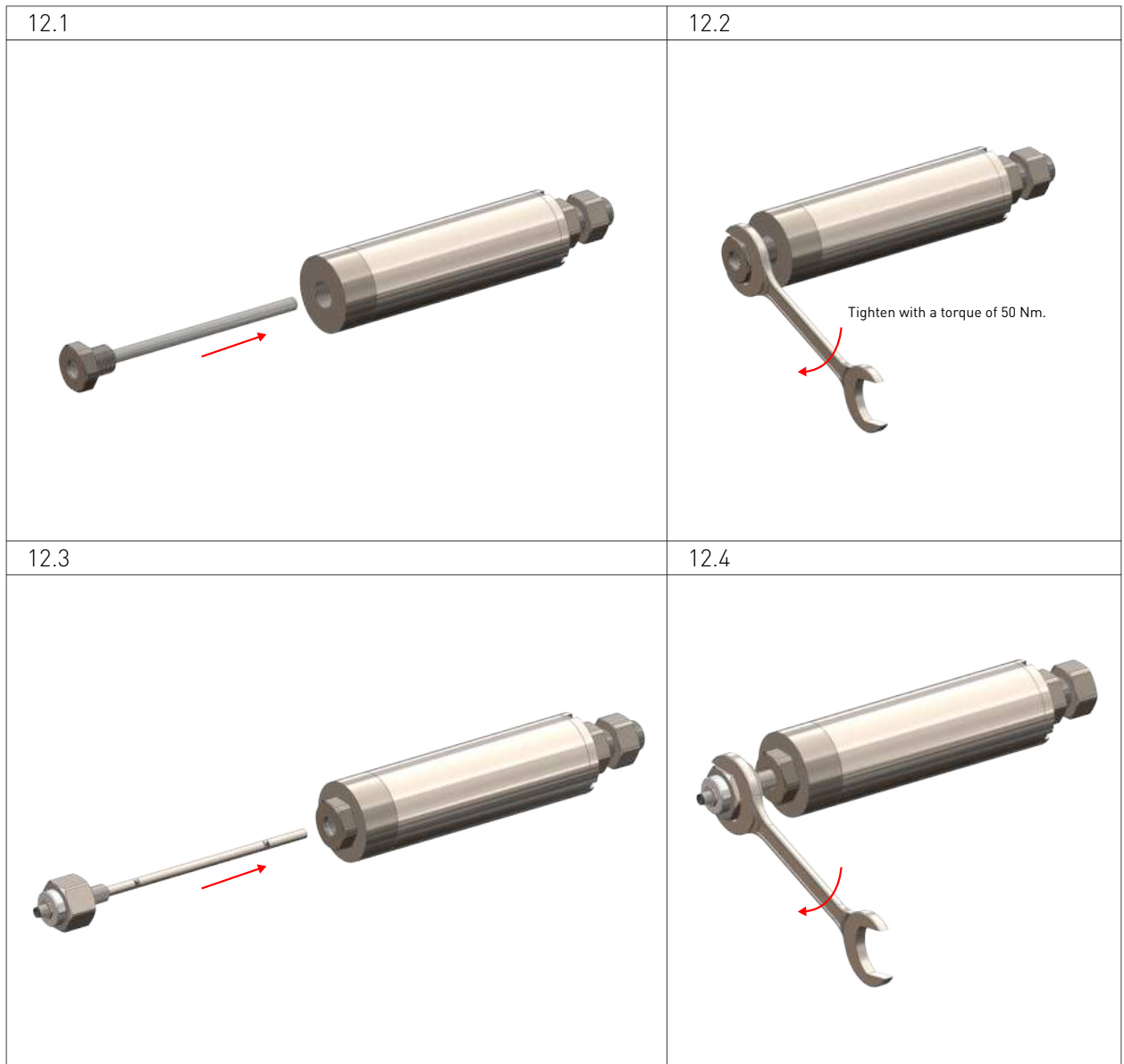
## 10. ASSEMBLY DIRECTLY



## 11.SLEEVE MECHANICAL DRAWING



## 12.ASSEMBLY WITH SLEEVE



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