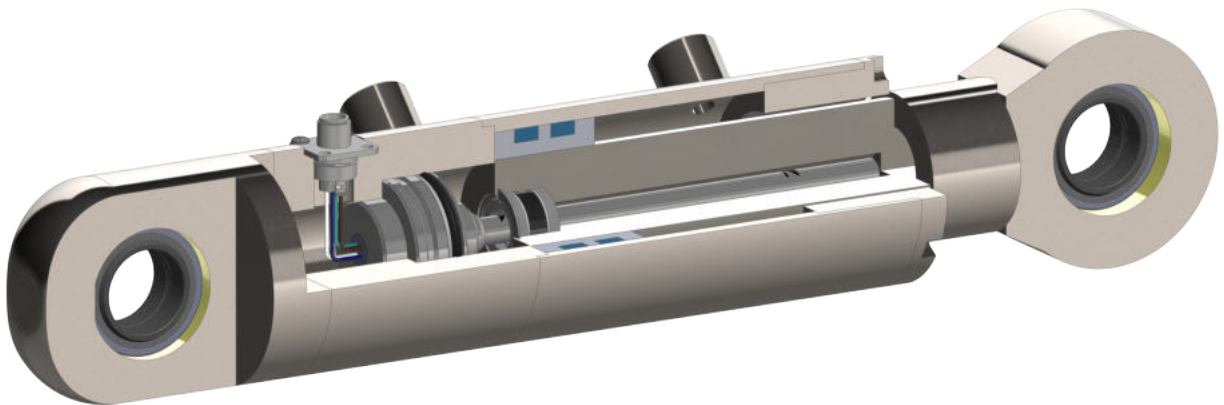


## MSP

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.

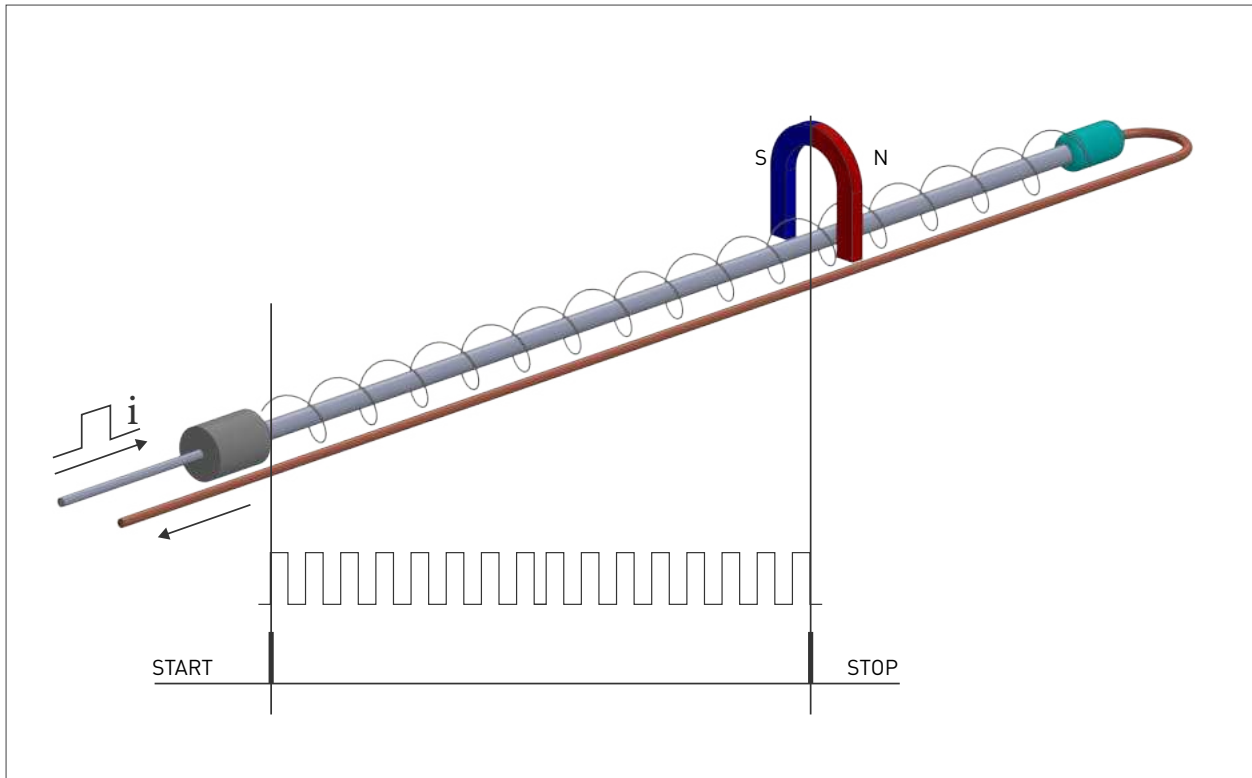
# 1.PRODUCT DESCRIPTION AND TECHNOLOGY

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

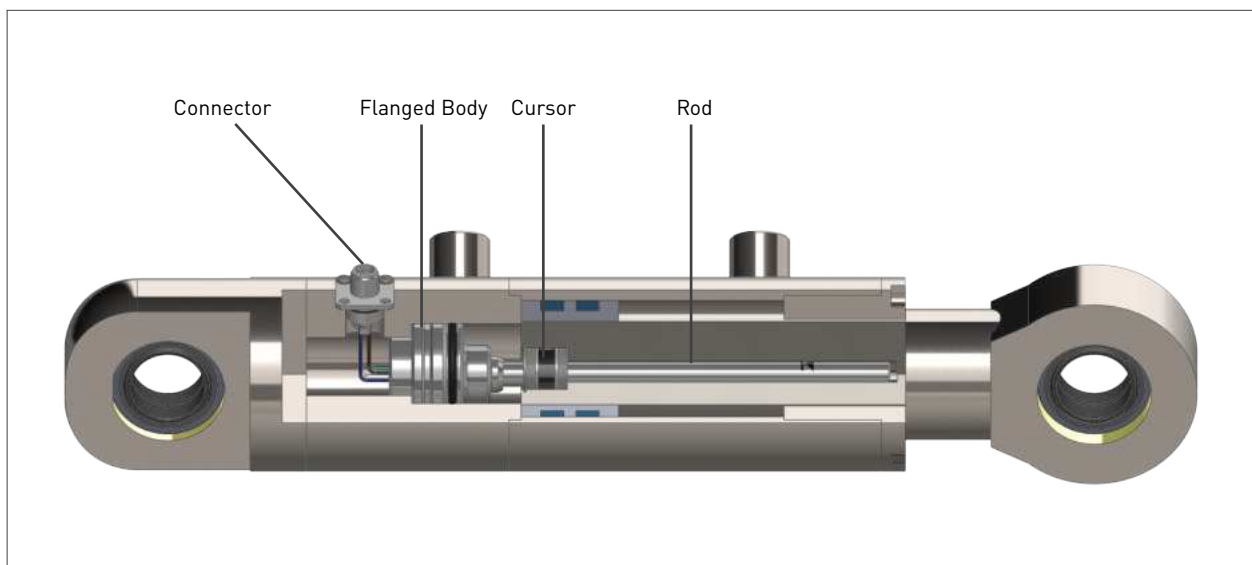
In-Cylinder linear position sensors are designed for integration inside a hydraulic cylinder. Absolute displacement transducer in rod design for installation in cylinders especially for mobile applications; contactless magnetostrictive measuring principle; non-contact position measurement with unlimited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

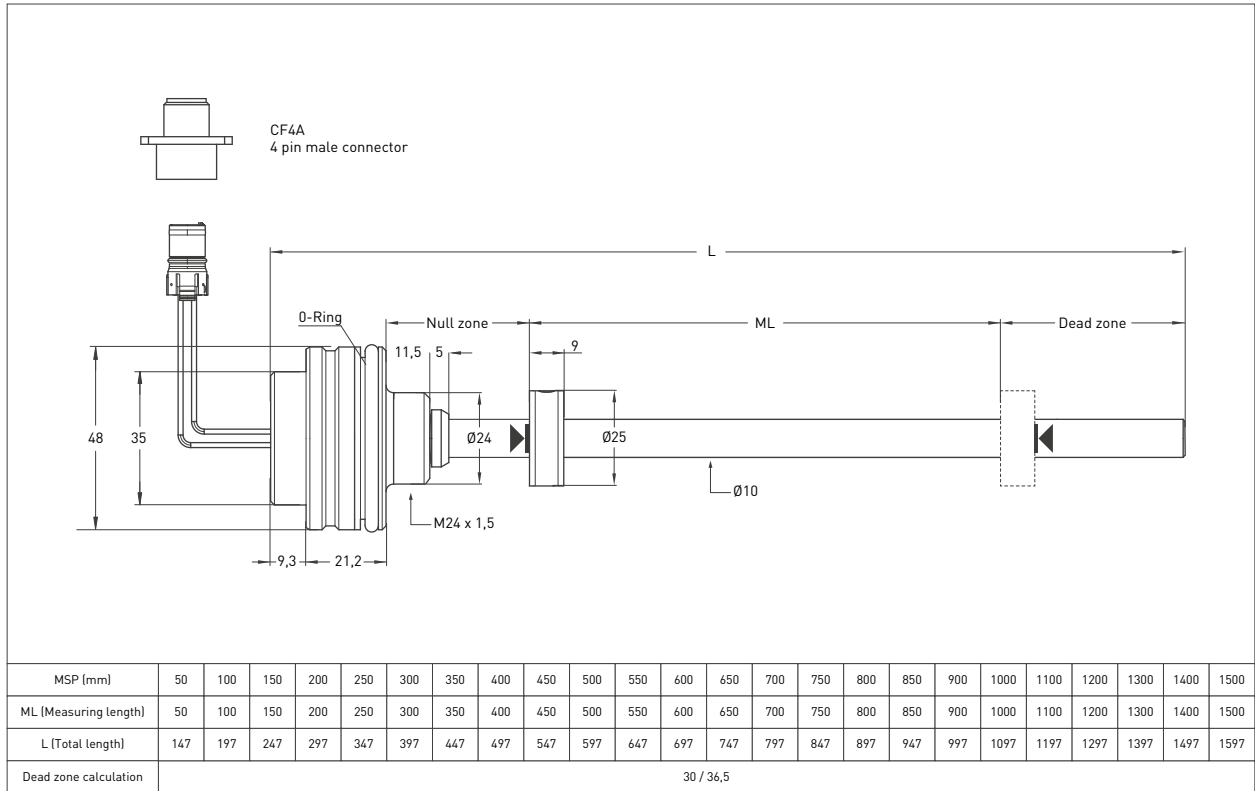


## 2. TECHNICAL SPECIFICATIONS

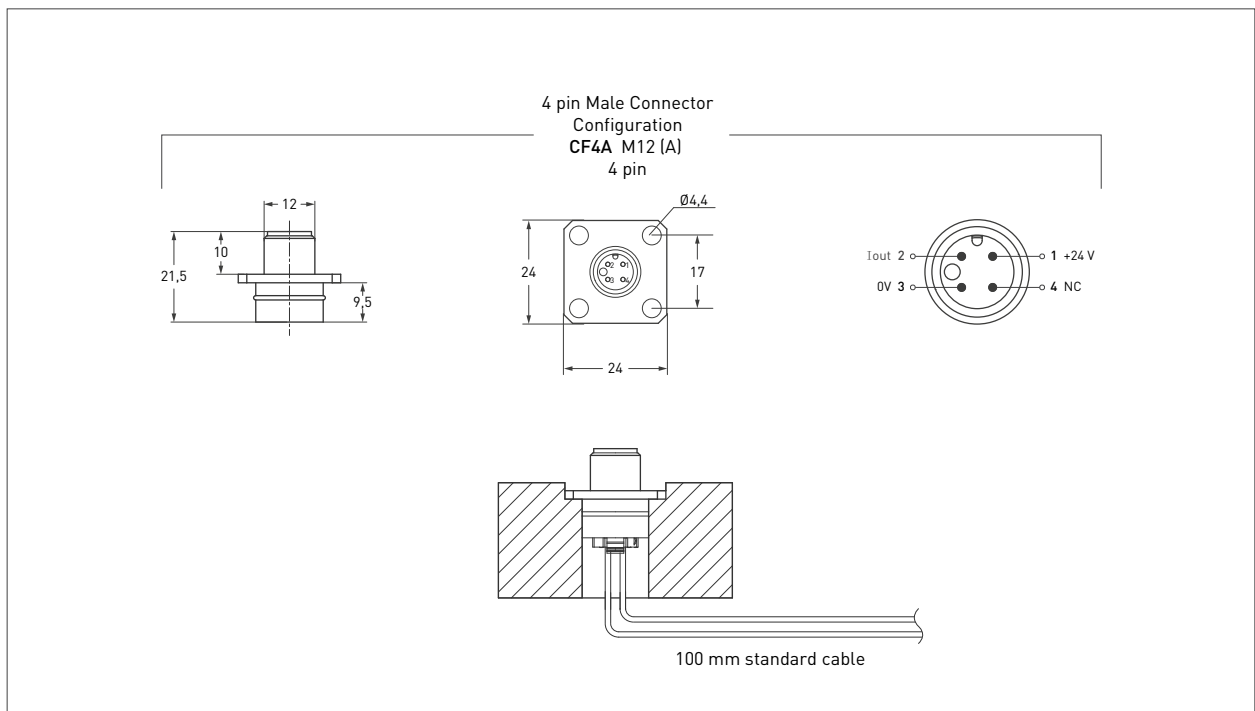


Technical specifications	
Measurement stroke	50 - 1.500 mm
Pressure rating	<500 bar
Output	0-20mA, 20-0mA, 4-20mA, 20-4mA
Resolution	15 bit DAC output
Update time	0-600 mm, 0.5 ms 600-1.500 mm, 1 ms
Accuracy	
Linearity	50 - 100 mm <1% 100 - 300 mm <0.2% 300 - 500 mm <0.1% 500 - 1.500 mm <0.05%
Electrical 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	M15 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

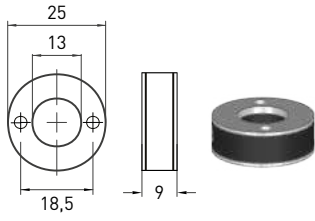
### 3.MECHANICAL DRAWING



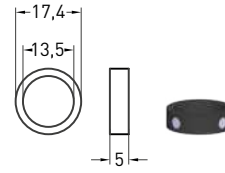
### 4.CONNECTORS



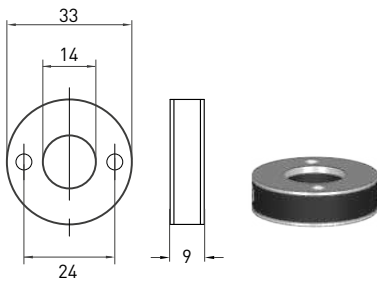
Cursor R05T



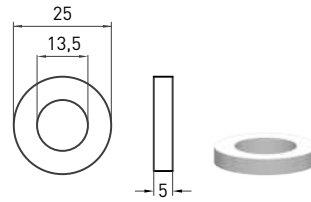
Cursor R06T



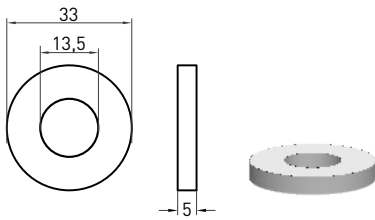
Cursor R10T



Non-magnetic spacer S01



Non-magnetic spacer S02

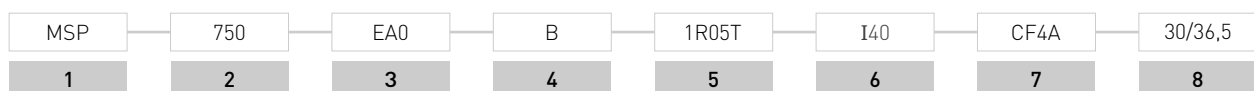


## 6. ORDERING PROCEDURE

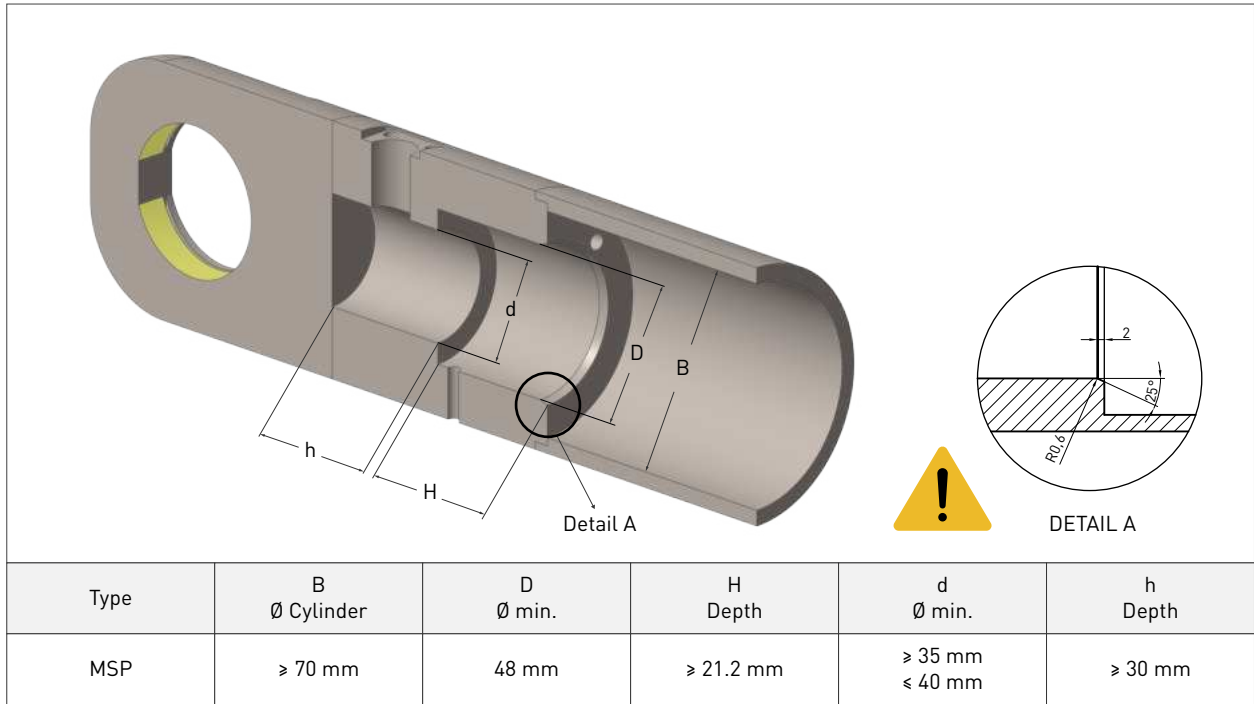
<b>1</b>	<b>Model</b>
	MSP: Non-Contact Magnetostrictive Position Sensor In Cylinder Applications
<b>2</b>	<b>Measuring range</b>
	50 - 1.500 mm
<b>3</b>	<b>Rod &amp; Thread</b>
	EA0 : Ø10 tube Ø24 flange
<b>4</b>	<b>Resolution</b>
	B : 15 bit
<b>5</b>	<b>Cursor</b>
	R05T : 25 mm R06T : 17.2 mm R10T : 33 mm
<b>6</b>	<b>Output</b>
	I40 : 4-20mA I04 : 20-4mA I20 : 0-20mA I02 : 20-0mA
<b>7</b>	<b>Connector / Cable</b>
	CF4A : M12 1M : 1 meter cable (standard)
<b>8</b>	<b>Dead zone</b>
	≤ 1.500 mm : 30 / 36,5 mm

\* T- coded sensors are used with T-coded cursors

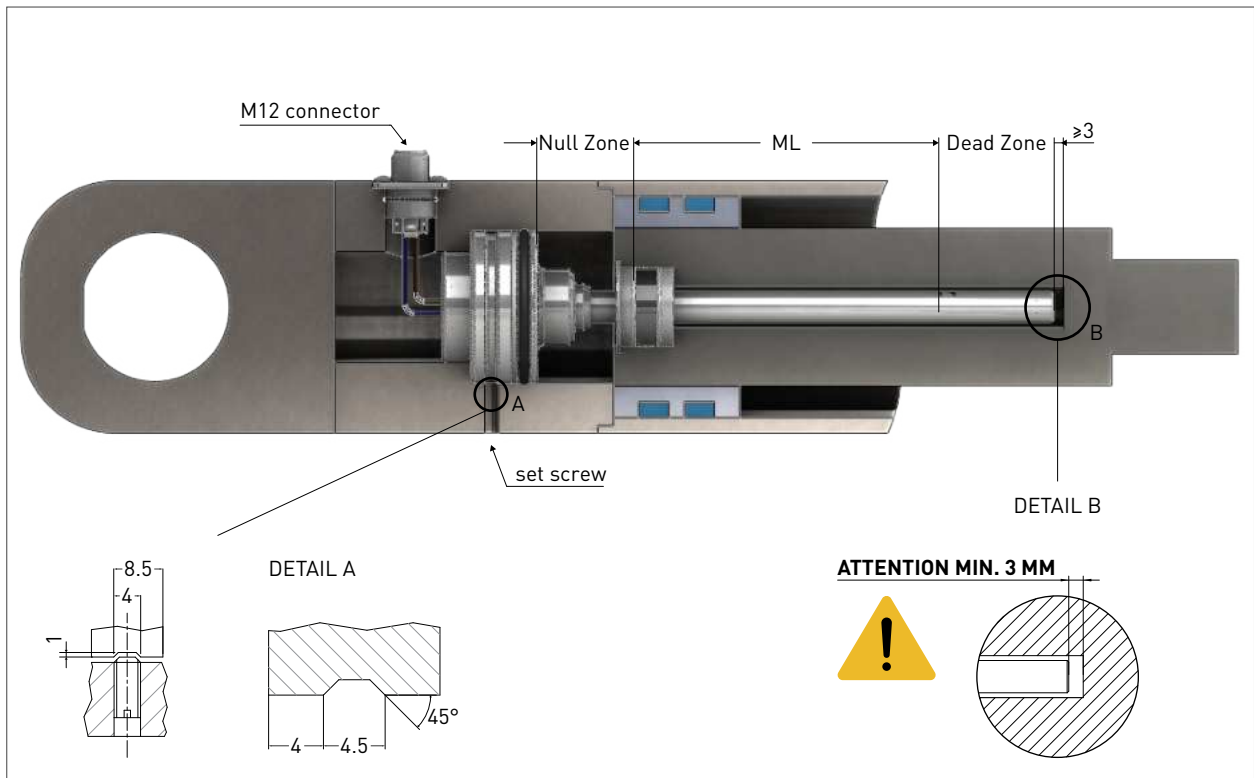
For example:



## 7. SPACE MECHANICAL MACHINING DETAILS

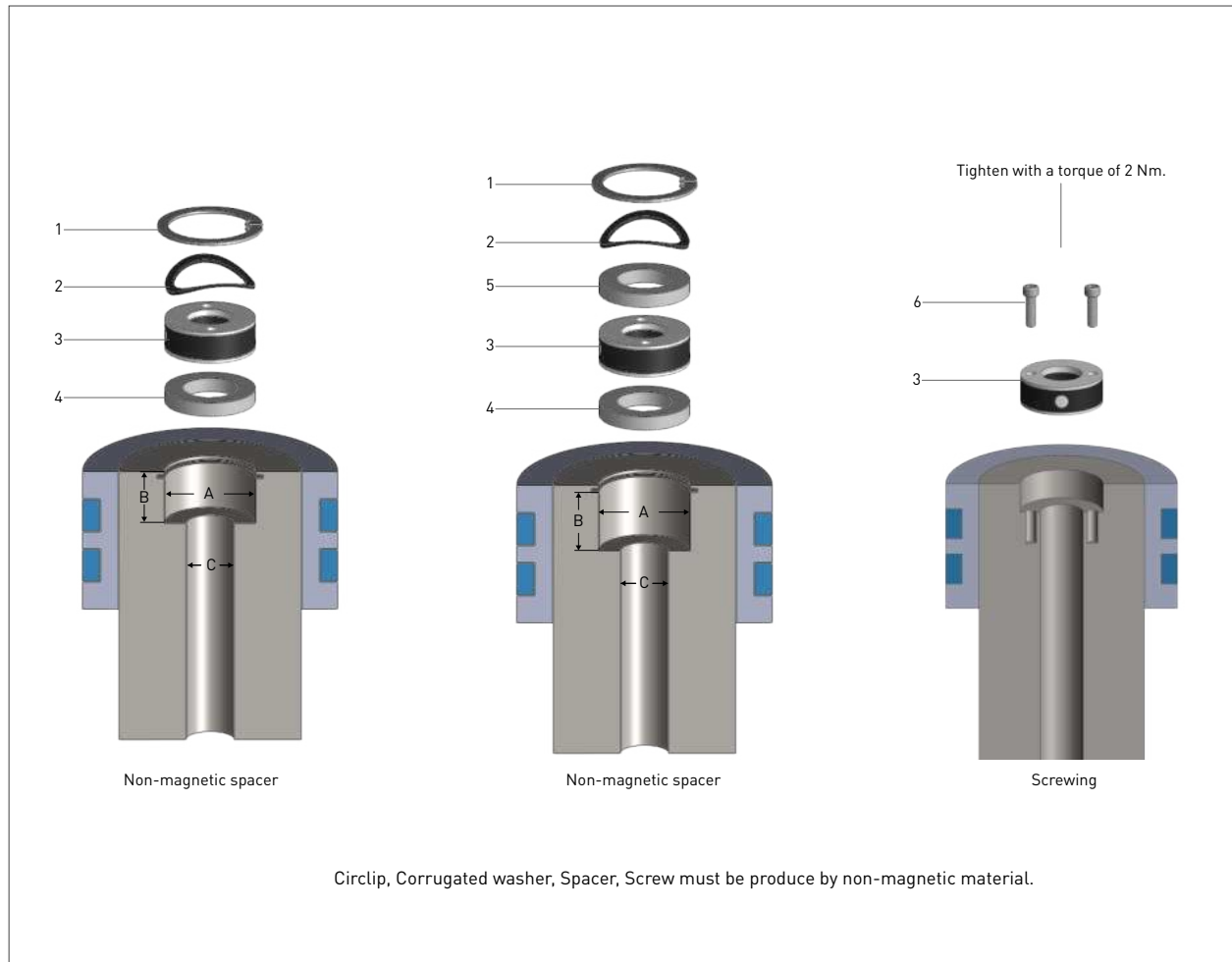


## 8. PISTON ROD BORE AND DEPTH





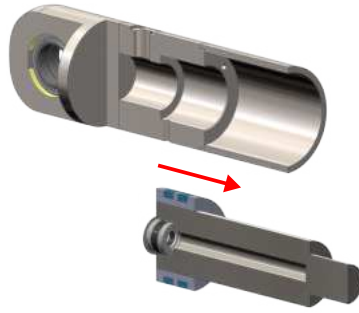
## 9. INSTALLING THE MAGNET



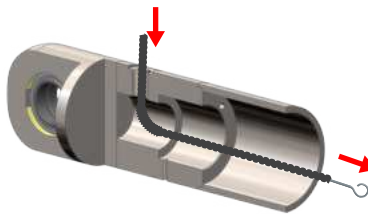
Circlip, Corrugated washer, Spacer, Screw must be produce by non-magnetic material.

	1	2	3	4	5	6	A	B	C
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	≥18 mm	Ø10 mm rod for Ø13 mm
Screwing	-	-	Cursor (R05T)	-	-	Screw	Ø25 mm	≥9 mm	Ø10 mm rod for Ø13 mm

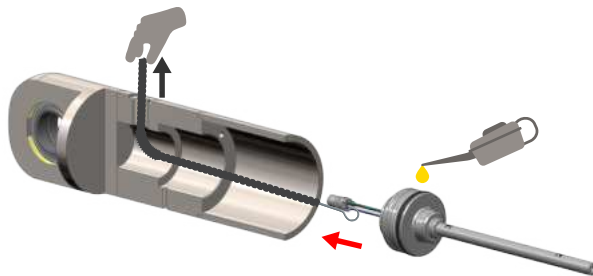
10.1



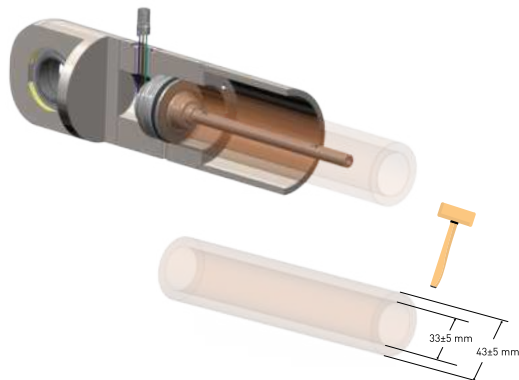
10.2



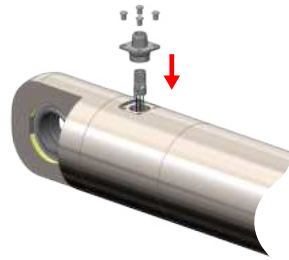
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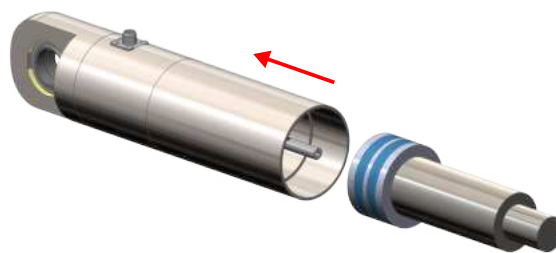
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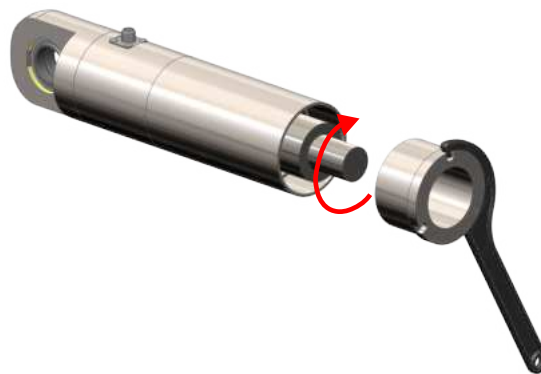
10.5



10.6



10.7



10.8



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