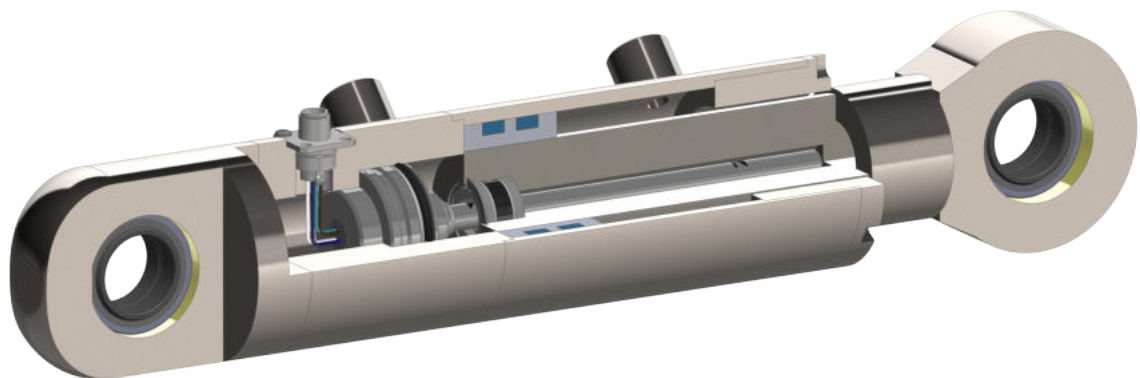


MSP

Non-Contact Magnetostrictive Position Sensor
In Cylinder Applications

ANALOG mA/V



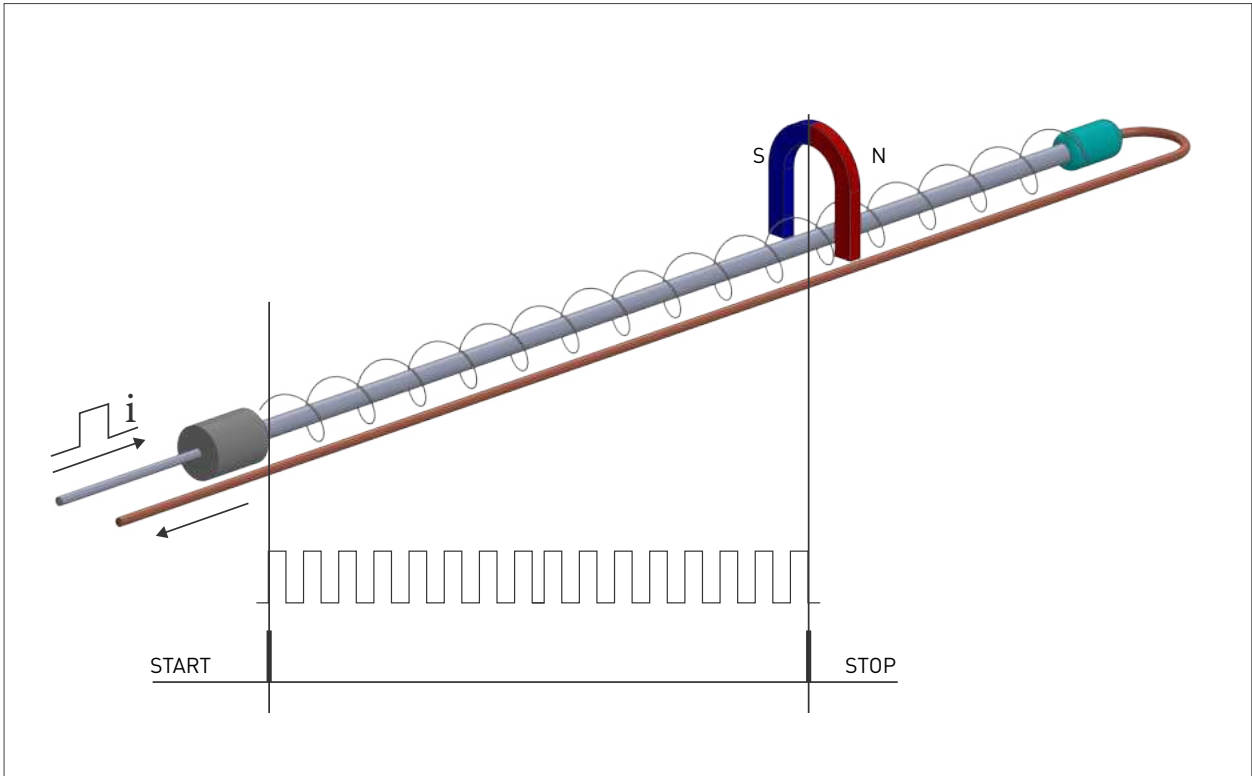
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1.1 Non-Contact Magnetostrictive Position Sensor In Cylinder Applications

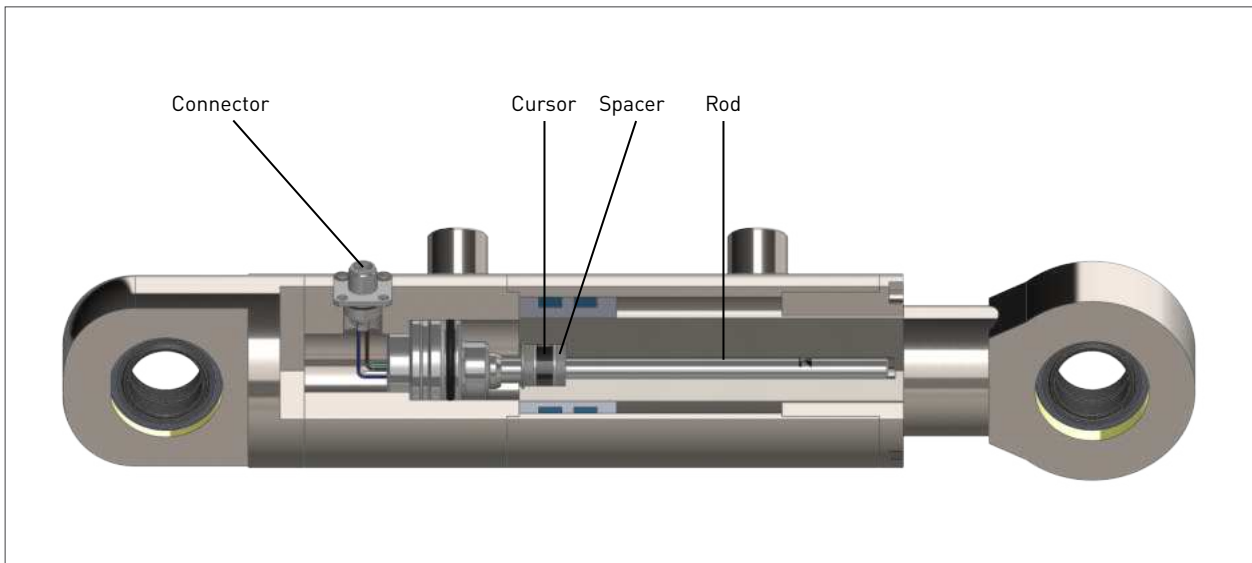
Contactless magnetostrictive position sensors inside the piston are designed to measure the position of hydraulic pistons precisely and reliably. These sensors are resistant to high pressure, can operate in hydraulic oil, have high accuracy, and an unlimited mechanical lifespan, providing absolute position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



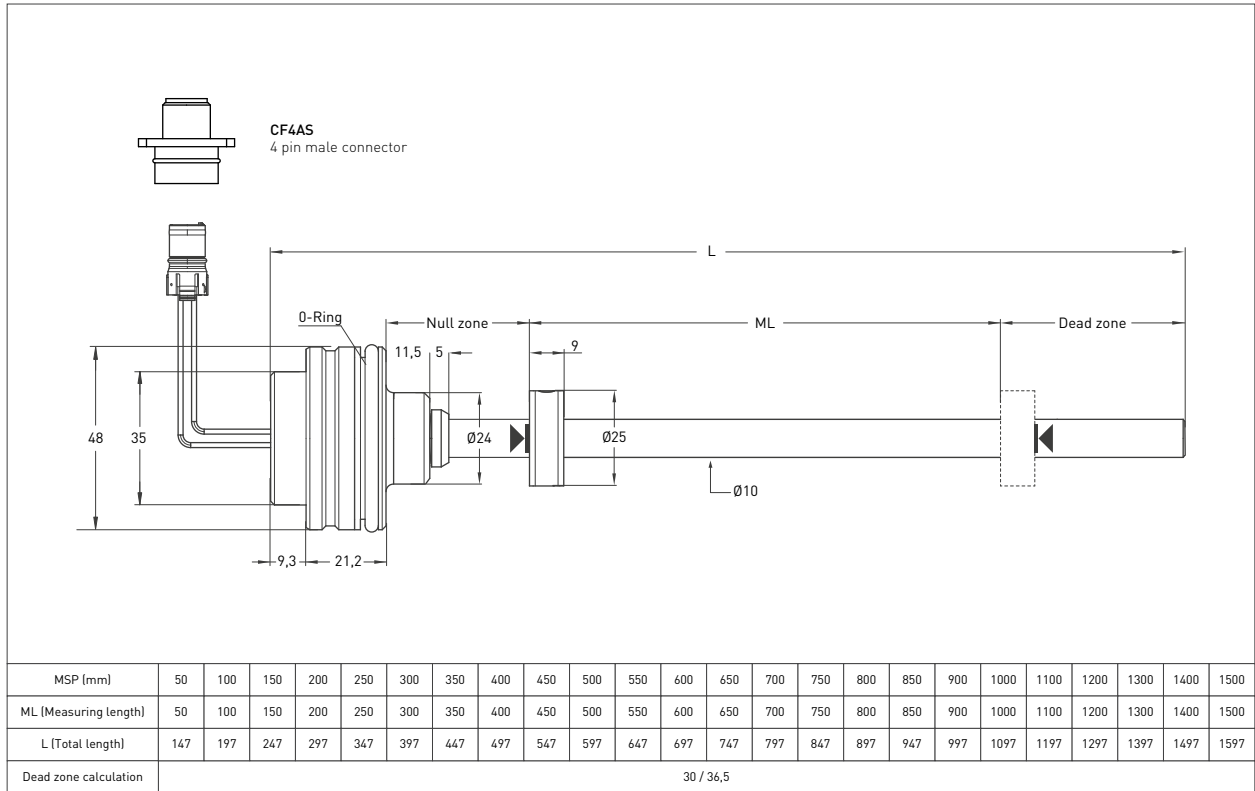
1.3 Mechanical Installation



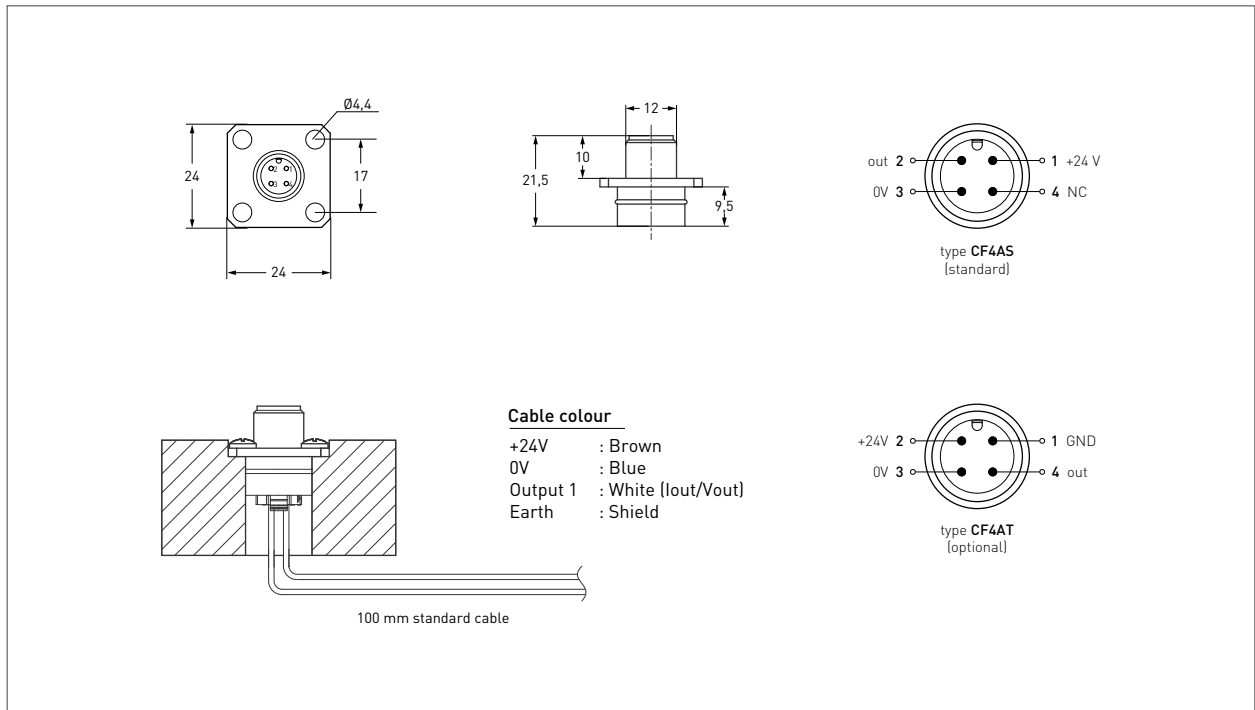
2. TECHNICAL SPECIFICATIONS

Measurement stroke	50 - 1.500 mm
Pressure rating	<500 bar
Output	0-20 mA, 20-0 mA, 4-20 mA, 20-4 mA 0-10 V, 10-0 V
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	M15 x 1.5 or 3/4" - 16 UNF Backup or Flat
Case material	Tube : Stainless steel AISI 316 Body : Stainless steel AISI 303 Caps : Anodized aluminium
Operating temperature	-10°C ... +70°C
Storage temperature	-30°C ... +90°C
Temperature coefficient	60 ppm / °K

3.MECHANICAL DRAWING



4.CONNECTORS AND CABLE



5. CURSORS AND ACCESSORIES



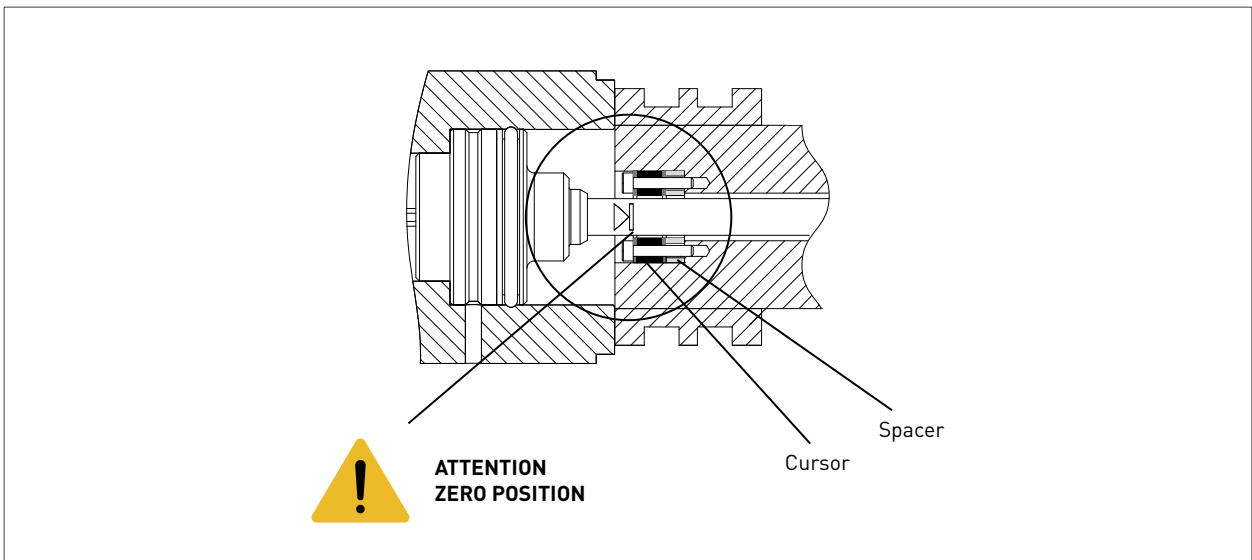
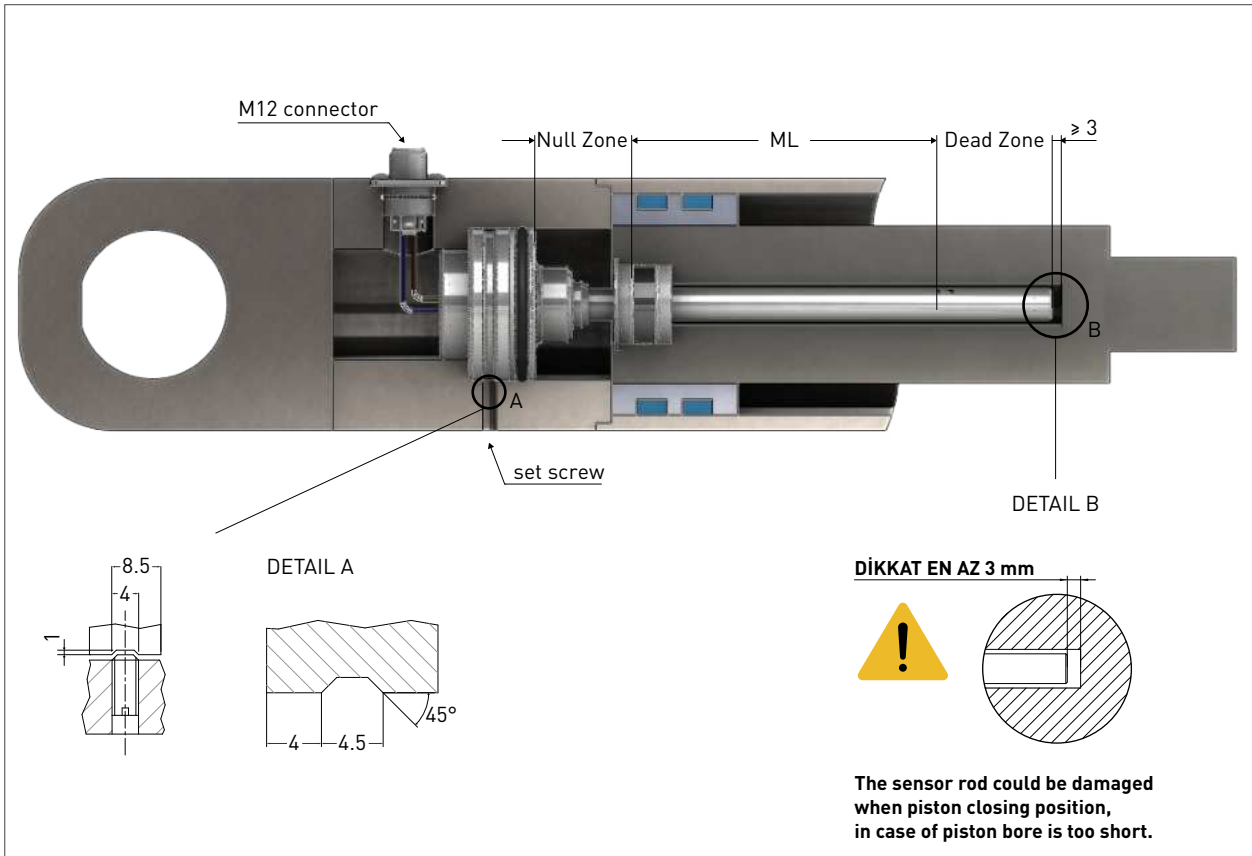
Cursor	Spacer	Screw
<p>R05T</p>	<p>S01</p>	<p>M3x20</p> <p>Stainless steel 316L screw</p> <p>2 units</p>
<p>R06T</p>	<p>S03</p>	-
<p>R10T</p>	<p>S02</p>	<p>M4x20</p> <p>Stainless steel 316L screw</p> <p>2 units</p>

6. SPACE MECHANICAL MACHINING DETAILS

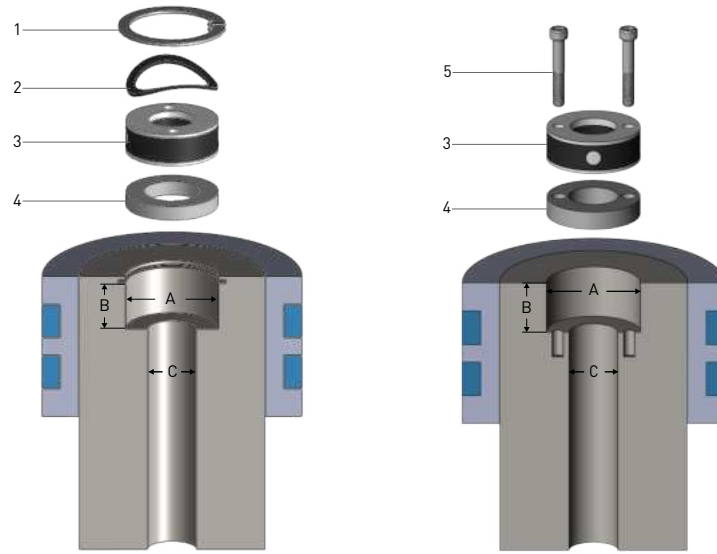
DETAIL A

Type	B Ø Cylinder	D Ø min.	H Depth	d Ø min.	h Depth
MSP	≥ 70 mm	48 mm	≥ 21.2 mm	≥ 35 mm ≤ 40 mm	≥ 30 mm

7. PISTON ROD BORE AND DEPTH



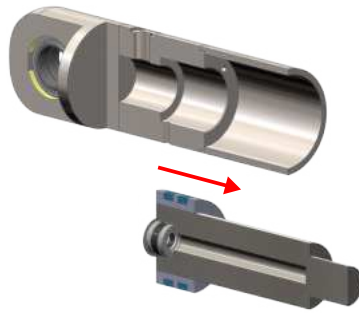
8.INSTALLING THE MAGNET



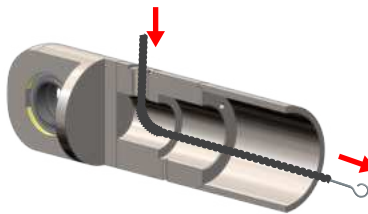
SPACER MUST BE USED!

	1	2	3	4	5	A	B	C
Non-magnetic spacer	Circlip	Corrugated washer	Cursor (R05T)	Non-magnetic spacer	-	Ø 25 mm	≥ 14 mm	Ø 10 mm rod for Ø 13 mm
Screwing	-	-	Cursor (R05T)	Non-magnetic spacer	Screw	Ø 25 mm	≥ 17 mm	Ø 10 mm rod for Ø 13 mm

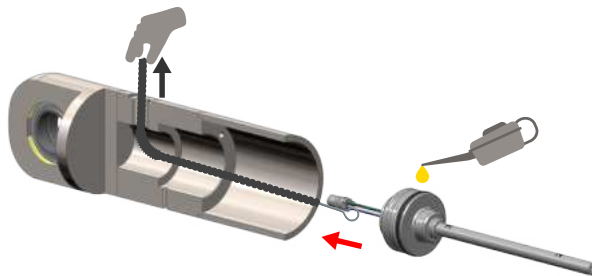
9.1



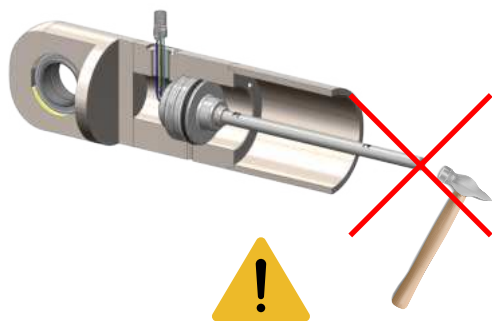
9.2



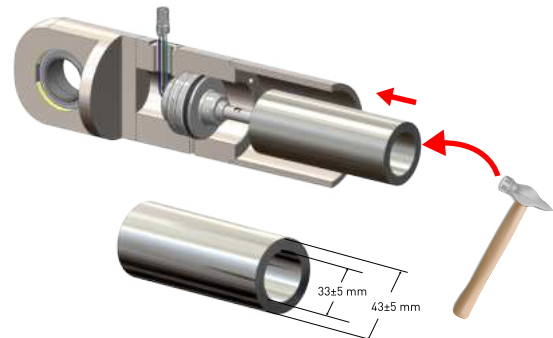
9.3



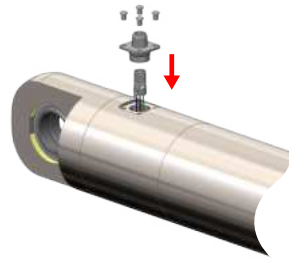
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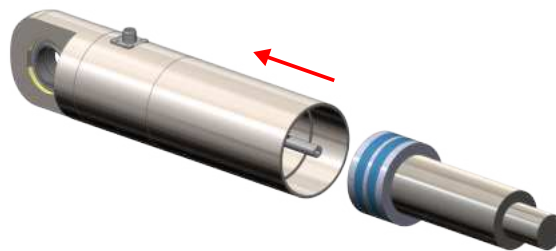
9.5



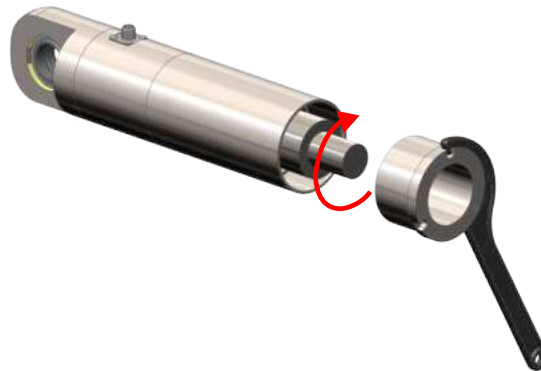
9.6



9.7



9.8



9.9



10. ORDERING PROCEDURE

1	Model MSP: Non-Contact Magnetostrictive Position Sensor In Cylinder Applications
2	Measuring range 50 - 1.500 mm
3	Rod & Thread EA0 : Ø10 tube Ø24 flange
4	Resolution B : 15 bit
5	Cursor (T- coded sensors are used with T-coded cursors) R05T : 25 mm R06T : 17.2 mm R10T : 33 mm
6	Output I40 : 4-20 mA I20 : 0-20 mA I04 : 20-4 mA I02 : 20-0 mA
7	Connector / Cable CF4AS : CF4AT : 4-pin configuration (optional). For detailed information, see section 4. CF4AT : CF4AT : 4-pin configuration (optional). For detailed information, see section 4. 1M : 1 meter cable (standard)
8	Dead zone ≤ 1.500 mm : 30 / 36,5 mm

For example:

MSP	750	EA0	B	1R05T	I40	CF4AS	30/36,5
1	2	3	4	5	6	7	8

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