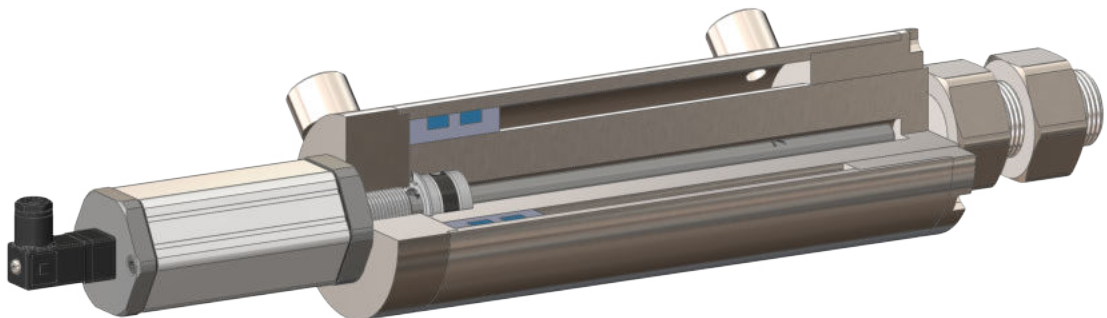


MST

Non-Contact Magnetostrictive Position Sensor
In Cylinder Applications

ANALOG mA/V

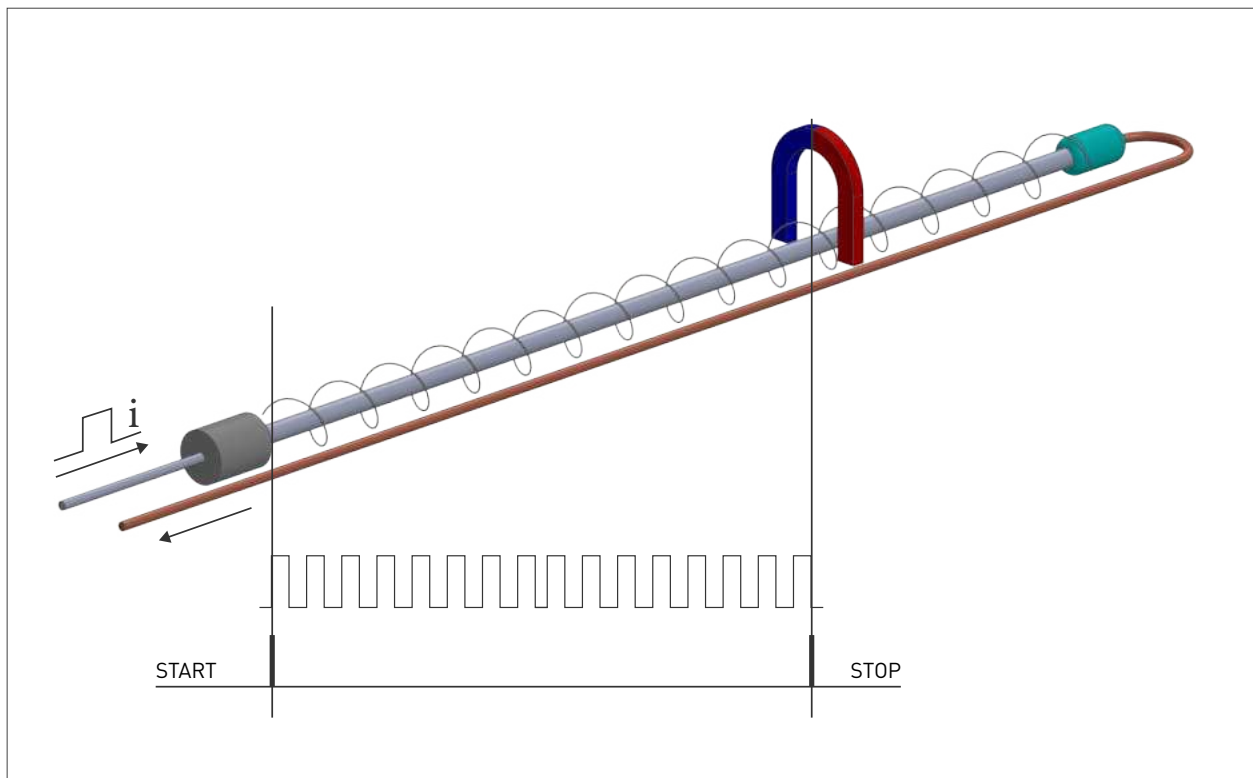


1.1 Non-Contact Magnetostrictive Position Sensor In Cylinder Applications

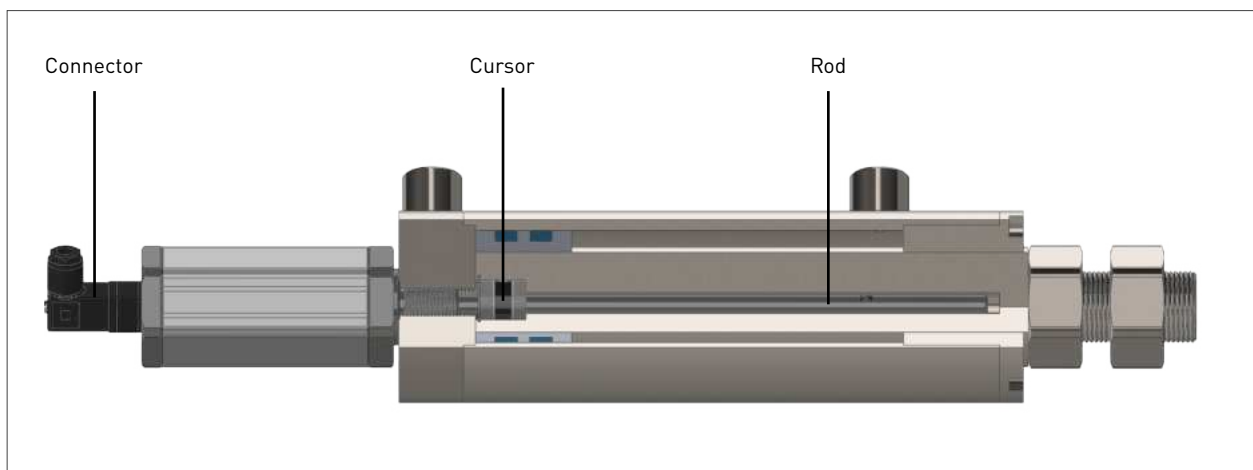
Contactless magnetostrictive position sensors inside the piston are designed to measure the position of hydraulic pistons precisely and reliably. These sensors are resistant to high pressure, can operate in hydraulic oil, have high accuracy, and an unlimited mechanical lifespan, providing absolute position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



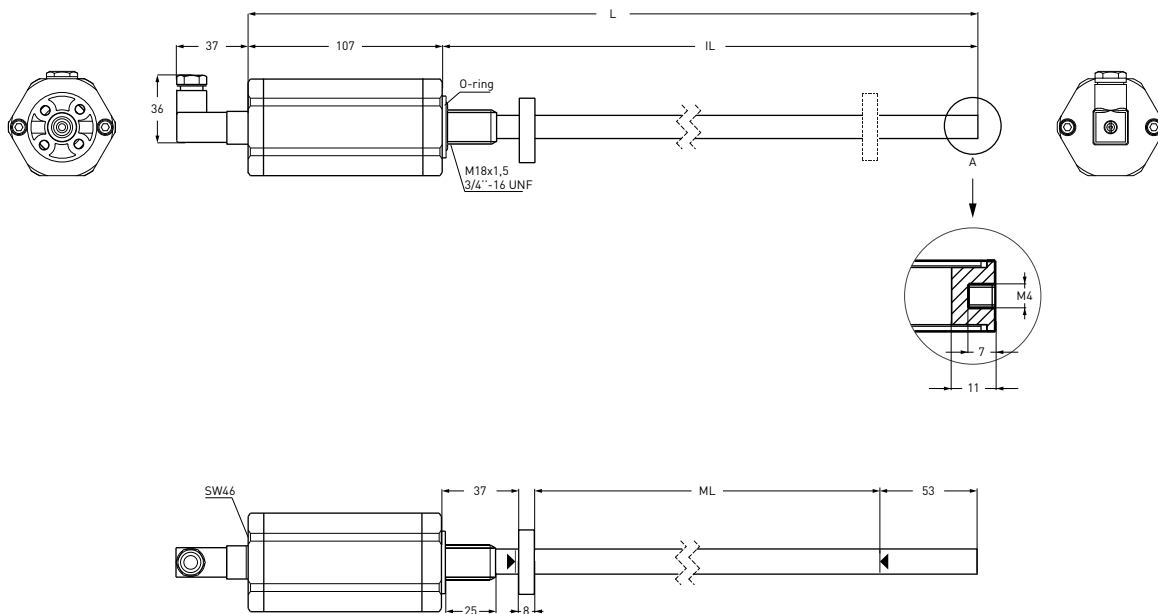
2. TECHNICAL SPECIFICATIONS



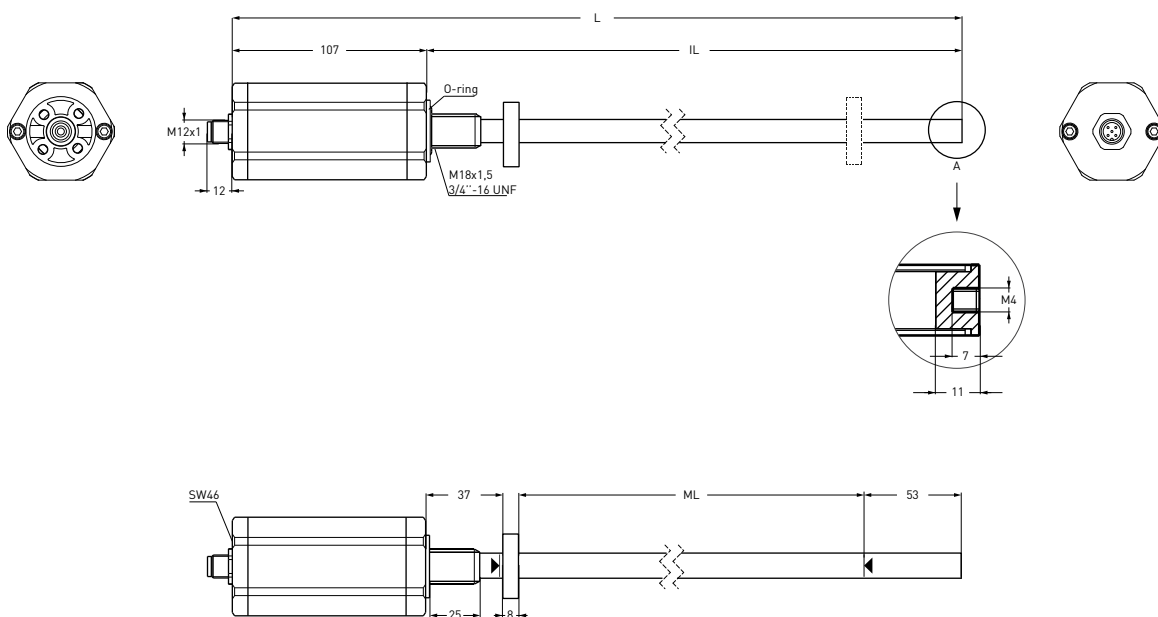
Measurement stroke	50 - 5.000 mm
Pressure rating	<500 bar
Output	0-10V, 10-0V, 0-20 mA, 20-0 mA, 4-20 mA, 20-4 mA (Speed information can be provided optionally.)
Resolution	12 - 16 bit DAC output
Update time	0-600 mm, 0.5 ms 600-1.500 mm, 1 ms 1.501-3.000 mm, 2 ms 3.001-5.000 mm, 3 ms
Linearity	50-100 mm < %0.5 100-500 mm < %0.2 500-1.000 mm < %0.1 1.000-5.000 mm < %0.05
Repeatability	100 µm
Power supply	24 VDC (22-26 VDC)
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
Protection level	IP 65 - EN 60529
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)
Mounting	M18 x 1.5 or 3/4" - 16 UNF O-ring or Flat
Case material	Profile : Anodized aluminium Body : Stainless steel Caps : Stainless steel
Operating temperature	-10°C ... +70°C
Storage temperature	-30°C ... +90°C

3.MECHANICAL DRAWING

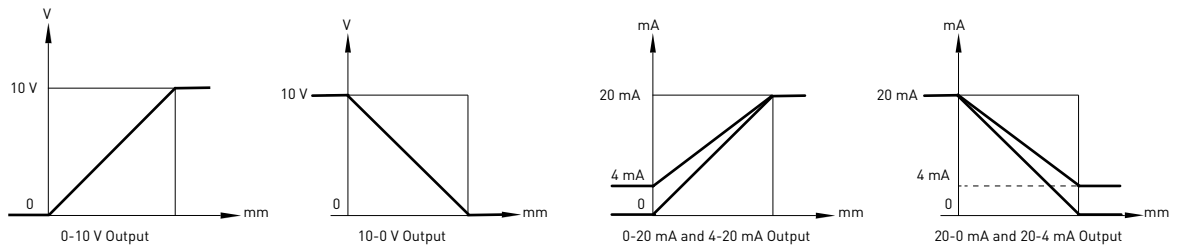
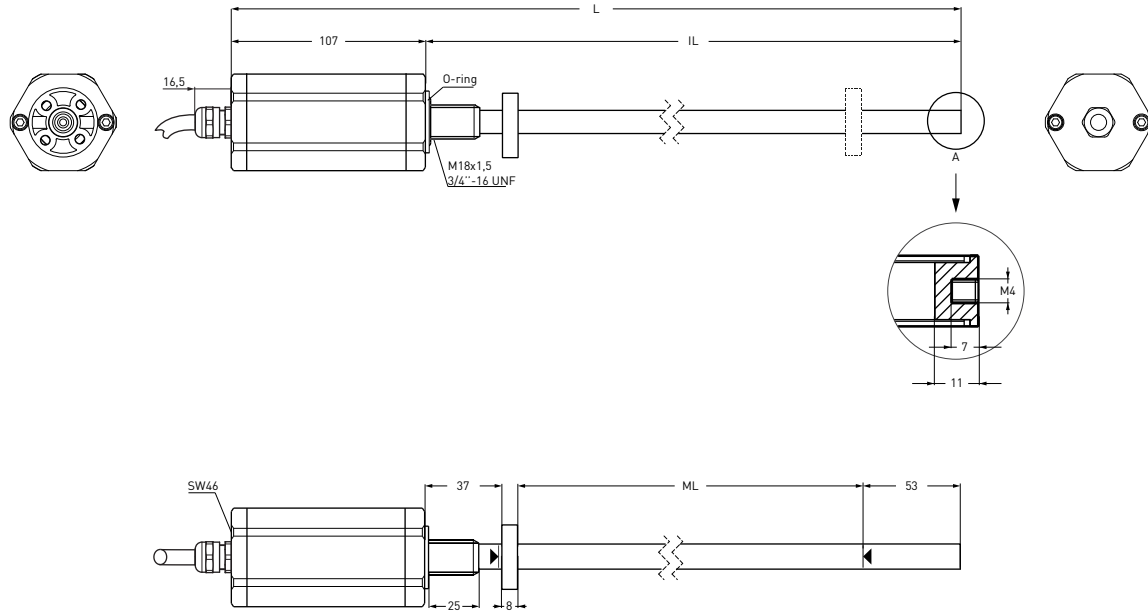
CH2: Hydraulic type, 4 pin connector output (standard)



CN5A (M12) or CN5B (M16), 5 pin connector output (optional)



Cable output (optional)



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
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	1750	2000	2250	2500	3000	4000	5000
IL (Installation Length)	148	198	248	298	348	398	448	498	548	598	648	698	748	798	848	898	948	998	1098	1198	1298	1398	1498	1598	1848	2098	2348	2598	3098	4098	5098
L (Total Length)	255	305	355	405	455	505	555	605	655	705	755	805	855	905	955	1005	1055	1105	1205	1305	1405	1505	1605	1705	1955	2205	2455	2705	3205	4205	5205
Dead Zone Calculation	37/53																														

4.CONNECTORS AND CABLE



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

+V	Brown
0V	Blue
0V Sense	Black
Output1	White (0-10V)
Output2	Orange (10-0V)
Earth	Shield

+V	Brown
0V	Blue
0V Sense	Black
Output1	White (Iout1)
Output2	Orange (Iout2)
Earth	Shield

1M	1 meter (standard) (Different cable length optional.)

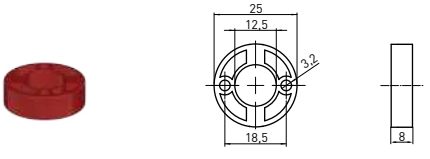
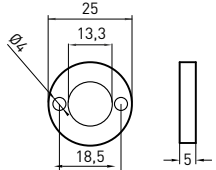
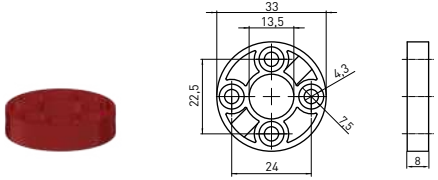
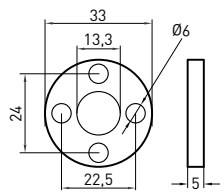
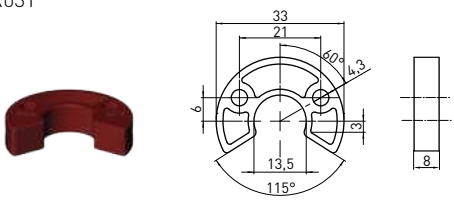
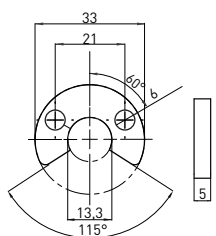
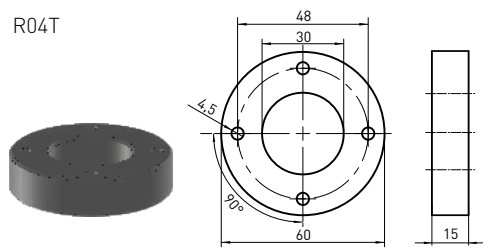
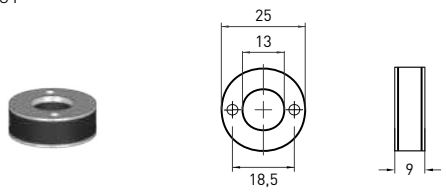
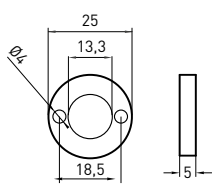
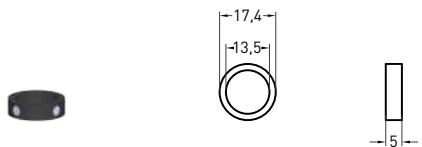
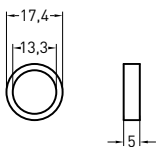
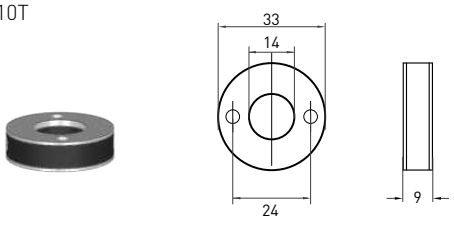
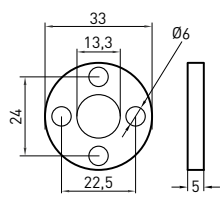
5.HYDRAULIC TYPE CONNECTOR

0-10V or 10-0V Output

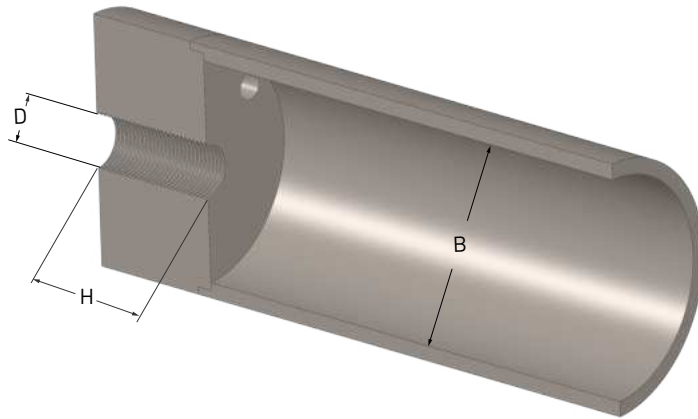
0-10V and 10-0V Output

0-20mA or 4-20mA Output

0-20mA and 4-20mA Output

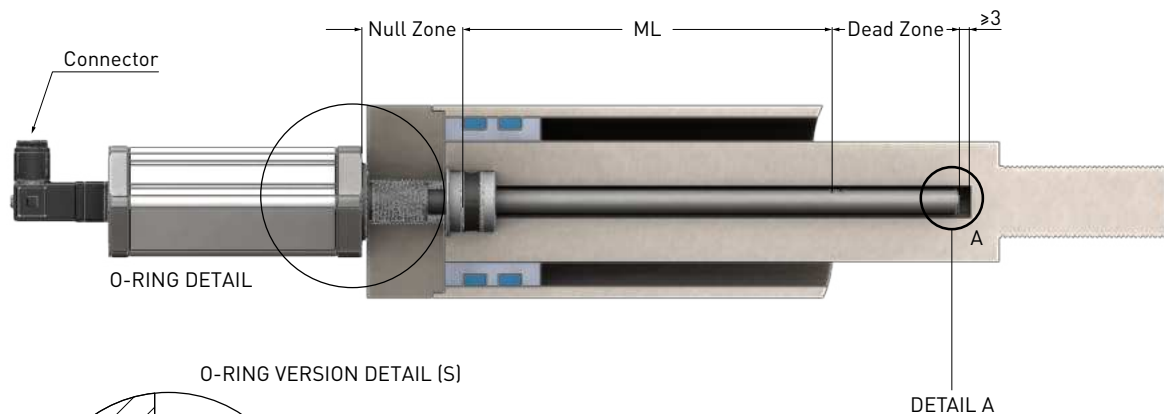
Cursor	Spacer	Screw
R01T 	S01 	M3x20 Stainless steel 316L screw 2 units
R02T 	S02 	M3x20 Stainless steel 316L screw 2 units
R03T 	S02 	M4x20 Stainless steel 316L screw 2 units
R04T 	-	M4x20 Stainless steel 316L screw 4 units
R05T 	S01 	M3x20 Stainless steel 316L screw 2 units
R06T 	S03 	-
R10T 	S02 	M4x20 Stainless steel 316L screw 2 units

7.SPACE REQUIREMENTS

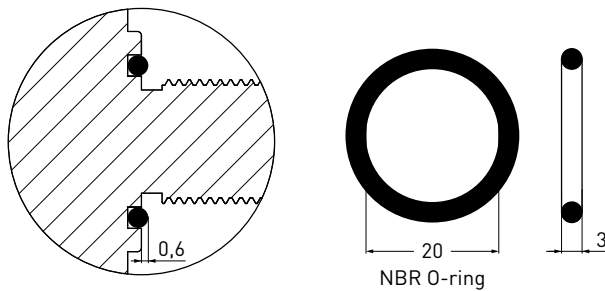


Type	B Ø Cylinder	D Ø min.	H Depth
MST	≥ 70 mm	M18 x 1,5	28 mm

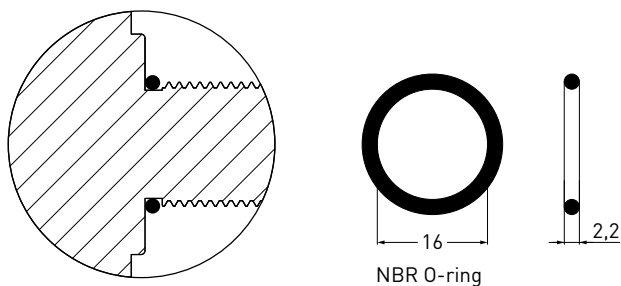
8.PISTON ROD BORE AND DEPTH



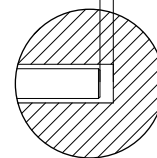
O-RING VERSION DETAIL (S)



FLAT VERSION DETAIL (F)

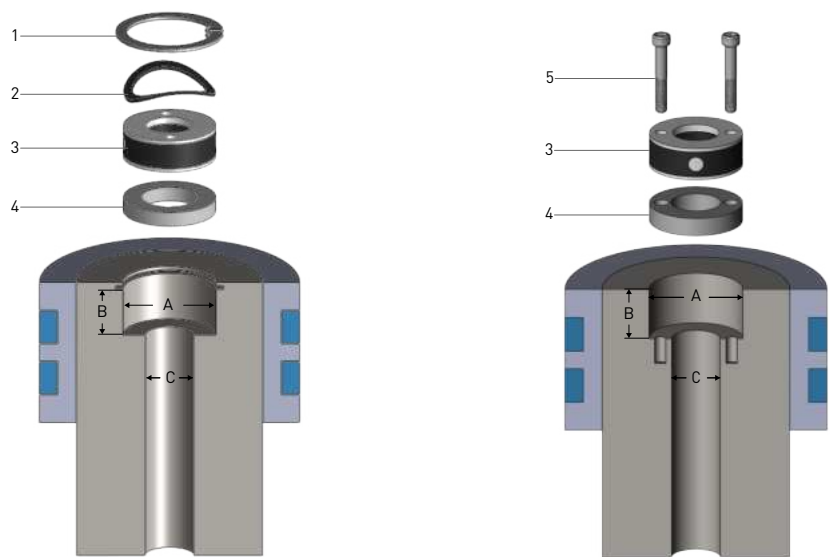


ATTENTION MIN. 3 mm



The sensor rod could be damaged when piston closing position, in case of piston bore is too short.

9.INSTALLING THE MAGNET

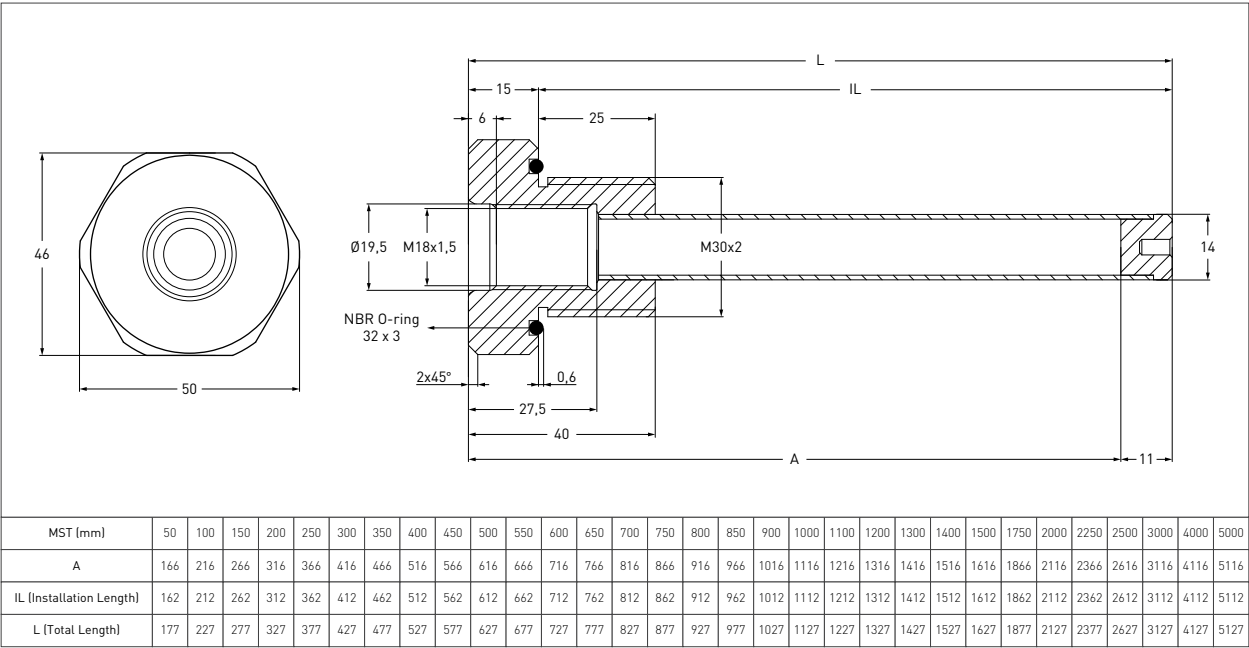


SPACER MUST BE USED!

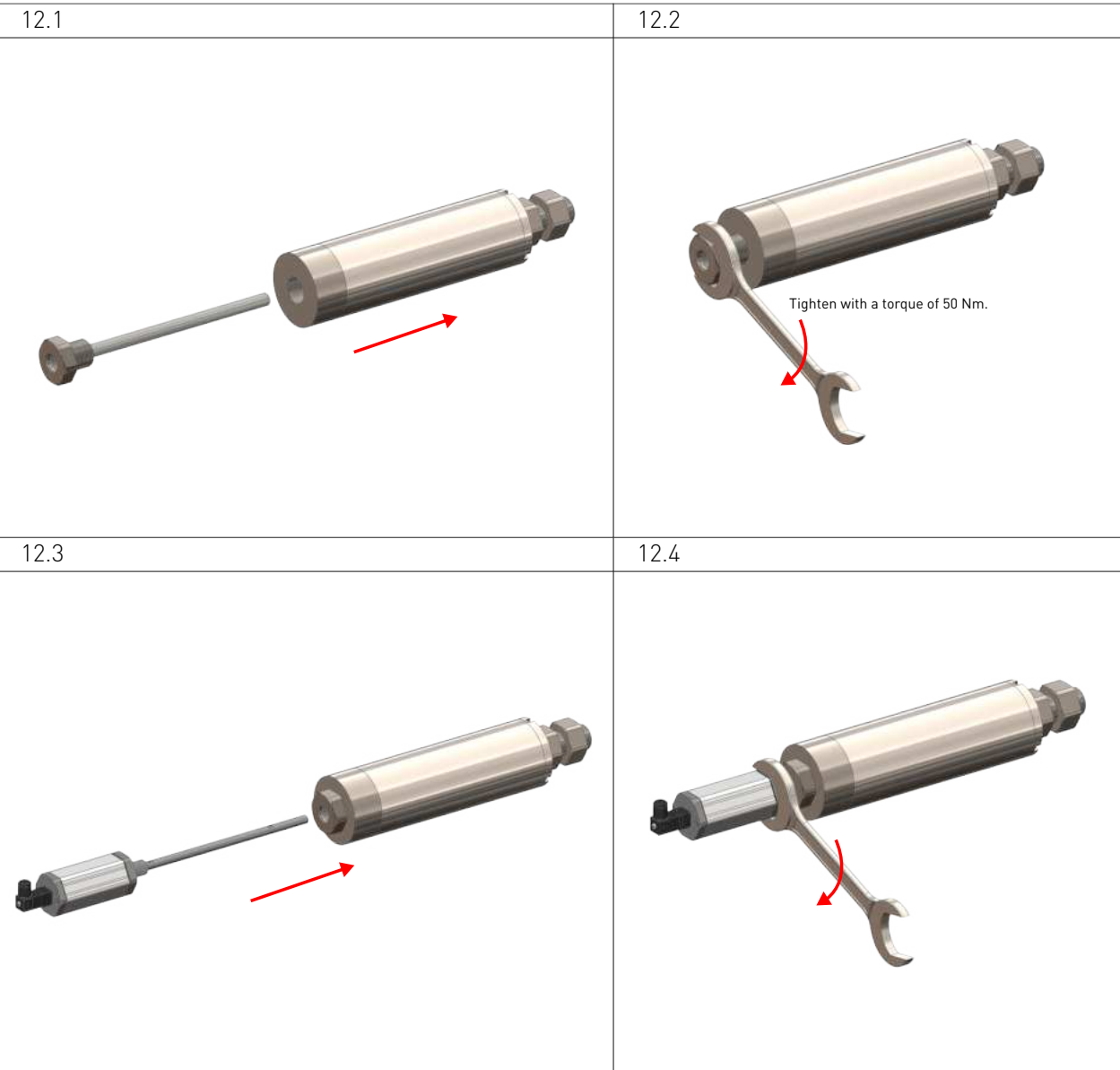
	1	2	3	4	5	A	B	C
Non-magnetic spacer	Circlip	Corrugated washer	Cursor (R05T)	Non-magnetic spacer	-	Ø25 mm	≥14 mm	Ø10 mm rod for Ø13 mm
Screwing	-	-	Cursor (R05T)	Non-magnetic spacer	Screw	Ø25 mm	≥14 mm	Ø10 mm rod for Ø13 mm

10.ASSEMBLY DIRECTLY

10.1	10.2



12.ASSEMBLY WITH SLEEVE



13.ORDERING PROCEDURE



1	Model
	MST: Non-Contact Magnetostrictive Position Sensor In Cylinder Applications
2	Measuring range
	50 - 5.000 mm
3	Rod & Thread
	E10 : Ø10, M18x1,5 E12 : Ø12, M18x1,5 U10 : Ø10, 3/4"-16 UNF U12 : Ø12, 3/4"-16 UNF
4	Sealing surface
	S : O - ring F : Flat
5	Resolution
	A : 16 bit B : 15 bit C : 14 bit D : 13 bit E : 12 bit
6	Cursor and Spacer (T- coded sensors are used with T-coded cursors)
	1R01T: 25 mm (S01: 25 mm) 1R05T: 25 mm (S01: 25 mm) S02: 33 mm 1R02T: 33 mm (S02: 33 mm) 1R06T: 17.4 mm (S03: 17.4 mm) S03: 17.4 mm 1R03T: 33 mm (S02: 33 mm) 1R10T: 33 mm (S02: 33 mm) 1R01T: 1 cursor 1R04T: 48 mm S01: 25 mm 2R01T: 2 cursor
7	Output
	V10: 0-10V 2V10: 0-10V/0-10V V01: 10-0V 2V01: 10-0V/10-0V V11: 0-10V/10-0V V50: 0-5V V05: 5-0V 2V05: 5-0V/5-0V V51: 0-5V/5-0V I40: 4-20mA 2I40: 4-20mA/4-20mA I04: 20-4mA 2I04: 20-4mA/20-4mA I41: 4-20mA/20-4mA I20: 0-20mA 2I20: 0-20mA/0-20mA I02: 20-0mA 2I02: 20-0mA/20-0mA I21: 0-20mA/20-0mA I02: 20-0mA
8	Output2 (optional)
	Sxxx → S: Hz, xxx: max. speed (mm/s)
9	Connector / Cable
	CH2 : 4 pin, hydraulic type connector (standard) CN5A : 5 pin, M12 connector CN5B : 5 pin, M16 connector CN6A : 6 pin, M12 connector CN6B : 6 pin, M16 connector CN8A : 8 pin, M12 connector CN8B : 8 pin, M16 connector 1M : 1 meter cable (standard), Different cable lengths available (optional)
10	Dead zone
	≤ 2.000 mm : 30/53, 37/53, 47/53, 57/53, 67/53, 77/53, 30/60, 51/63 > 2.000 - 3.000 mm : 130/53 mm > 3.000 - 5.000 mm : 150/53 mm

For example:

MST	750	E10	S	B	1R05T	I40	Sxxx	CN5A	30/53
1	2	3	4	5	6	7	8	9	10

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