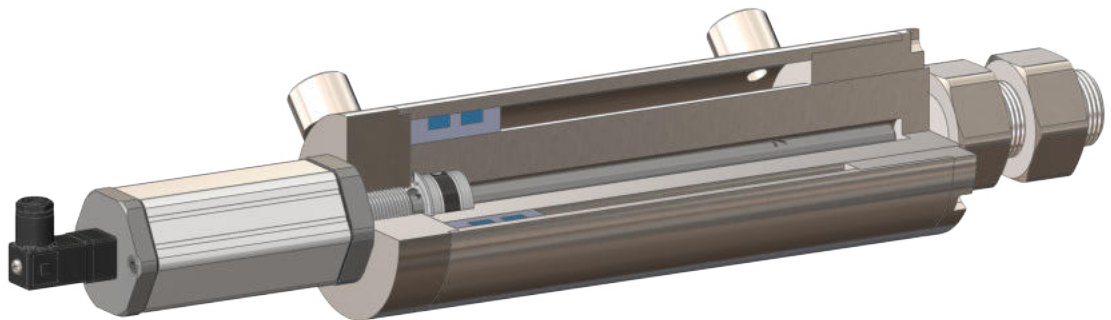


MST

Non-Contact Magnetostrictive Position Sensor
In Cylinder Applications

ANALOG mA/V



1.PRODUCT DESCRIPTION AND TECHNOLOGY

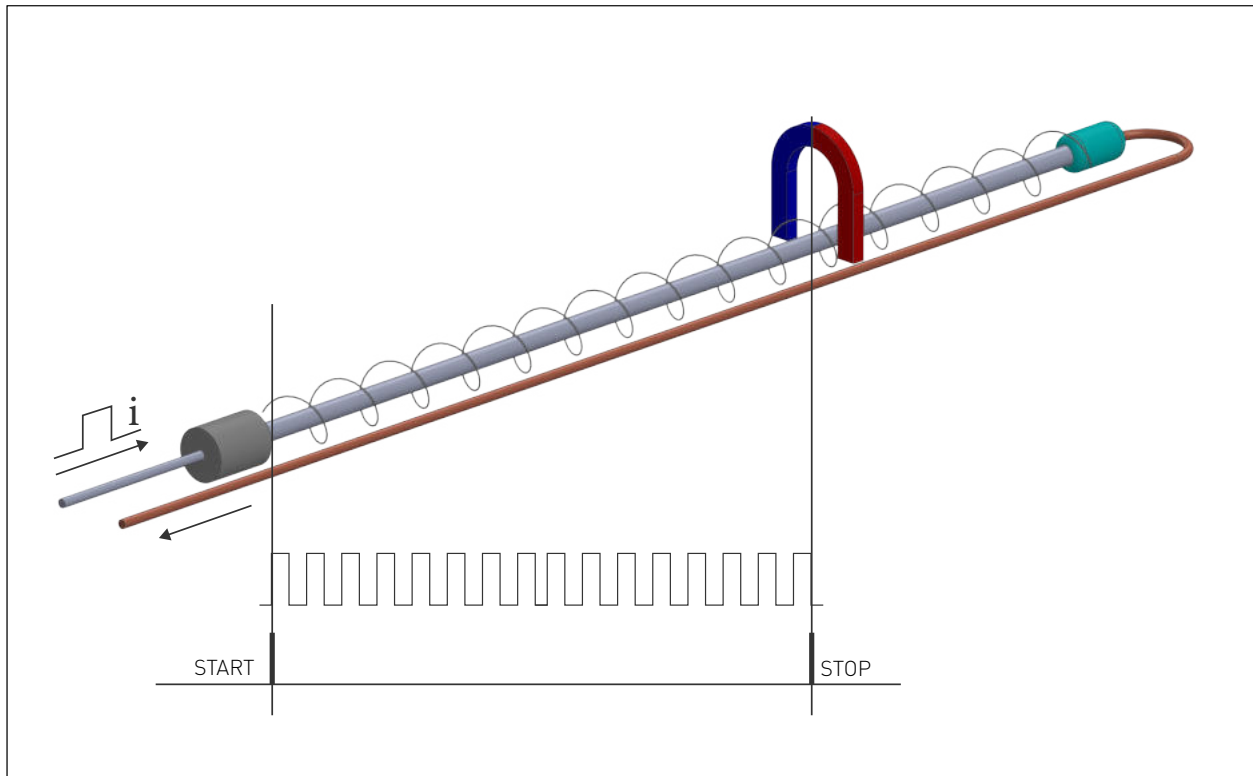


1.1 Non-Contact Magnetostrictive Position Sensor In Cylinder Applications

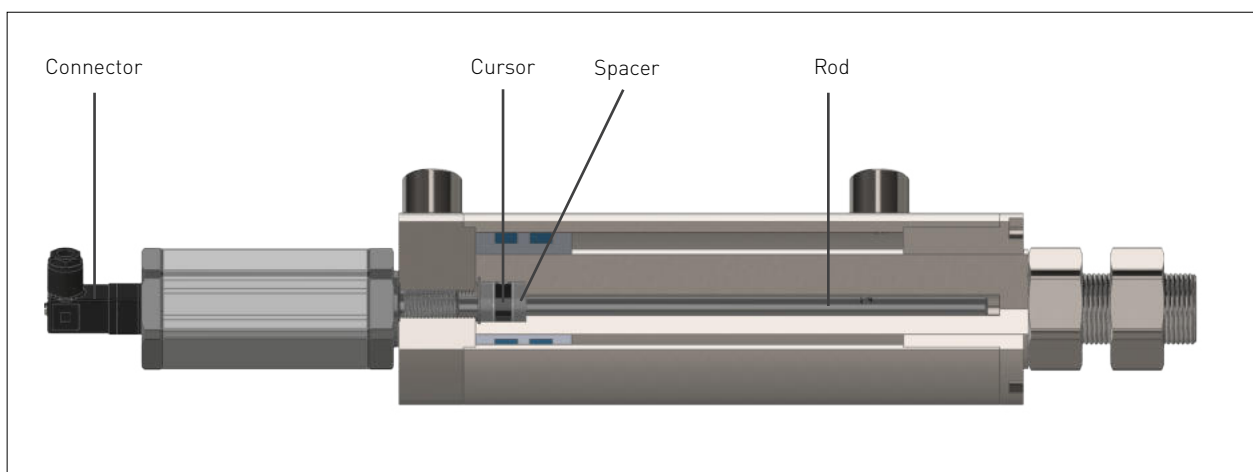
Contactless magnetostrictive position sensors inside the piston are designed to measure the position of hydraulic pistons precisely and reliably. These sensors are resistant to high pressure, can operate in hydraulic oil, have high accuracy, and an unlimited mechanical lifespan, providing absolute position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



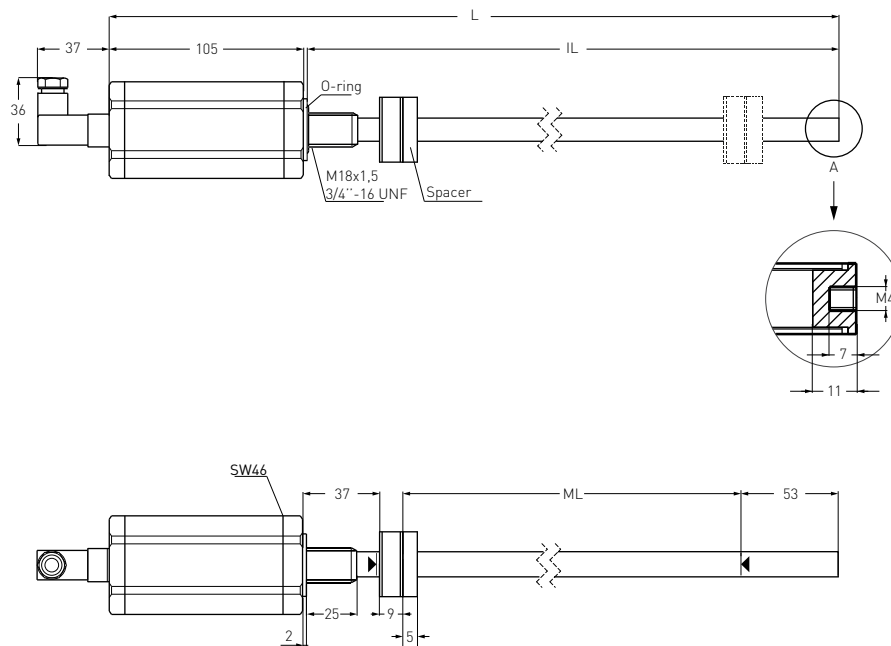
2. TECHNICAL SPECIFICATIONS



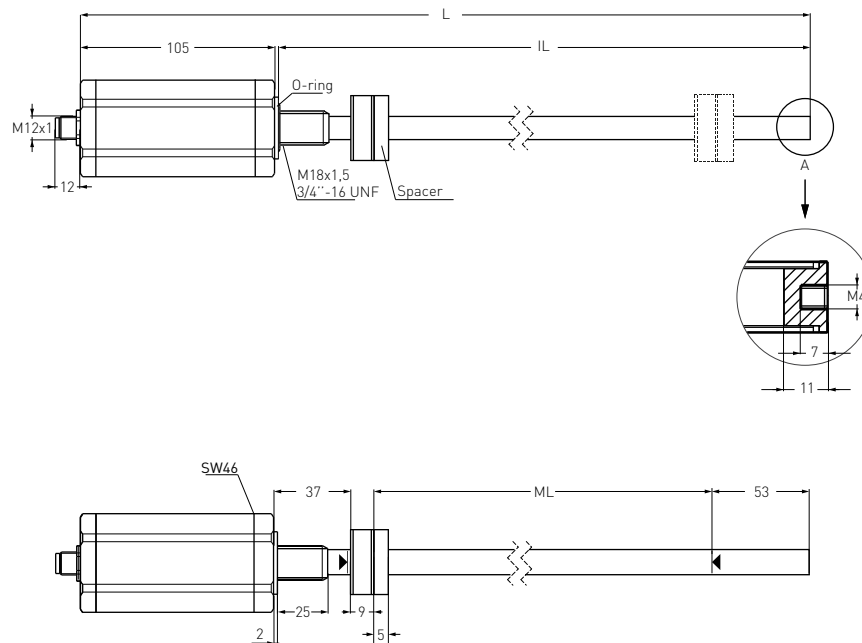
Measurement stroke	50 - 5.000 mm
Pressure rating	<500 bar
Output	0-10V, 10-0V, 0-20 mA, 20-0 mA, 4-20 mA, 20-4 mA (Speed information can be provided optionally.)
Resolution	12 - 16 bit DAC output
Update time	0-600 mm, 0.5 ms 600-1.500 mm, 1 ms 1.501-3.000 mm, 2 ms 3.001-5.000 mm, 3 ms
Linearity	50-100 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) EN 60068-2-2:2007 500 m/s ² (50g) 11ms (x,y,z aksen)
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

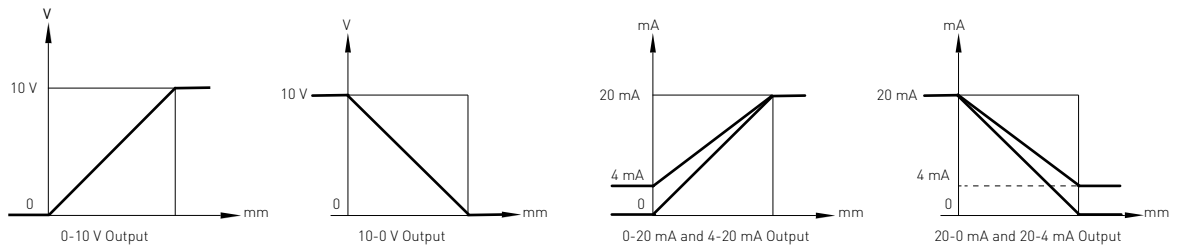
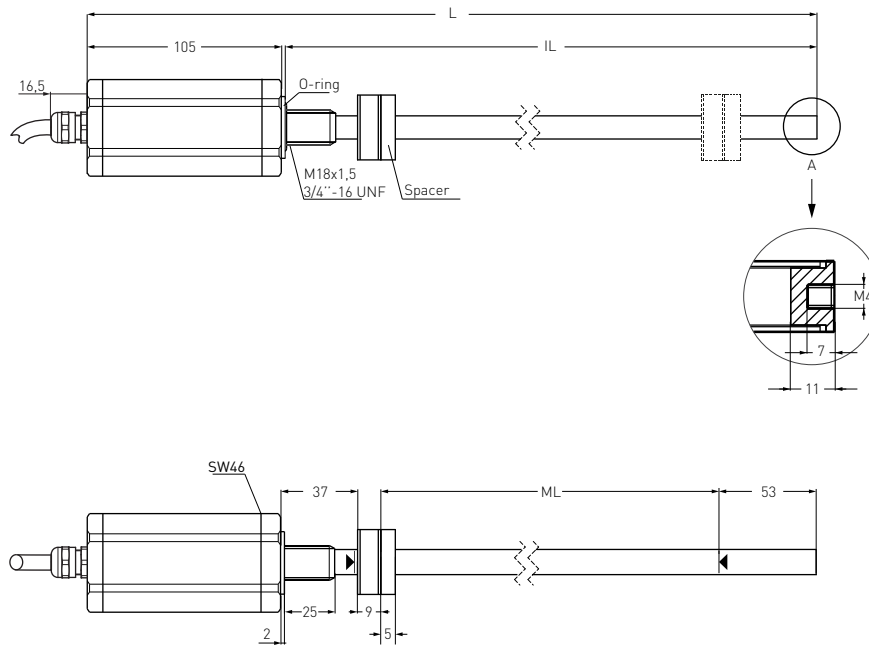
CH2: Hydraulic type, 4 pin connector output (standard)



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

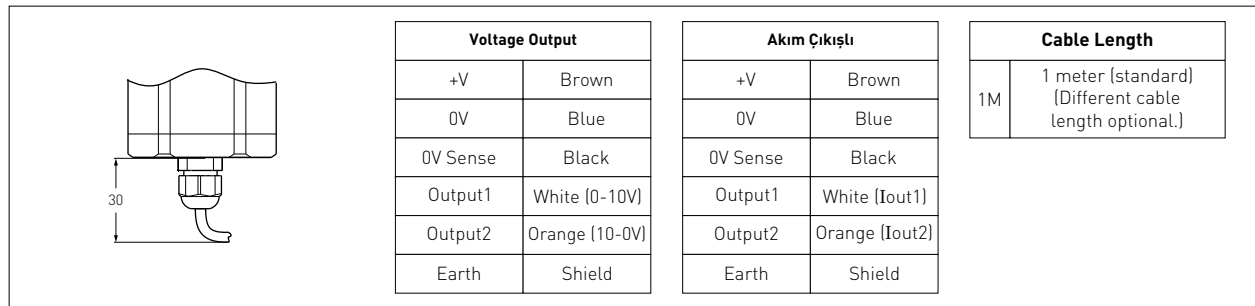
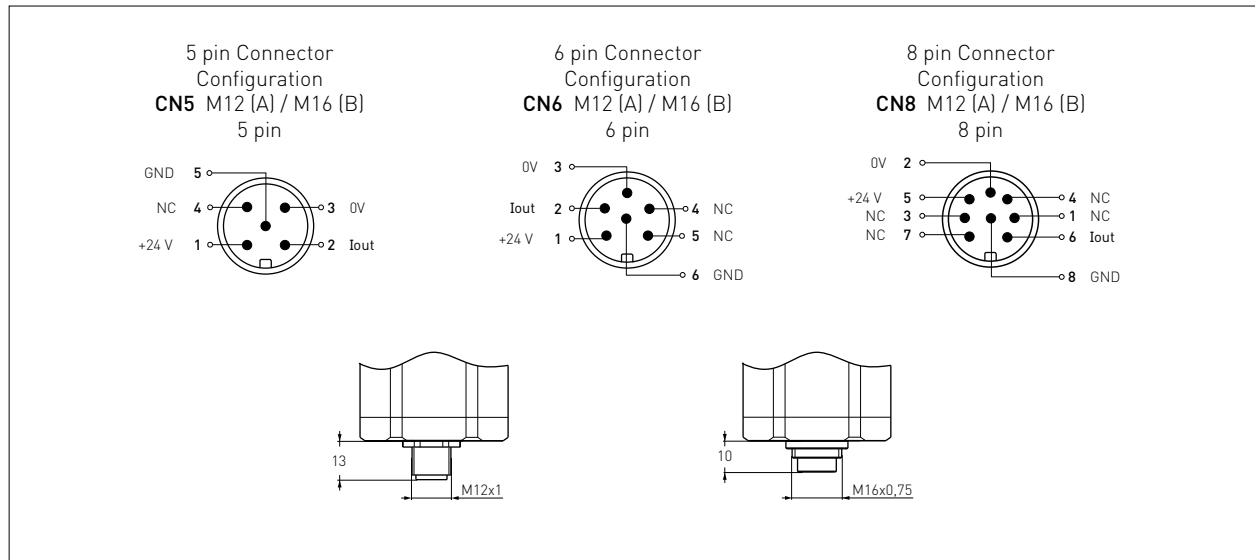


Cable output (optional)

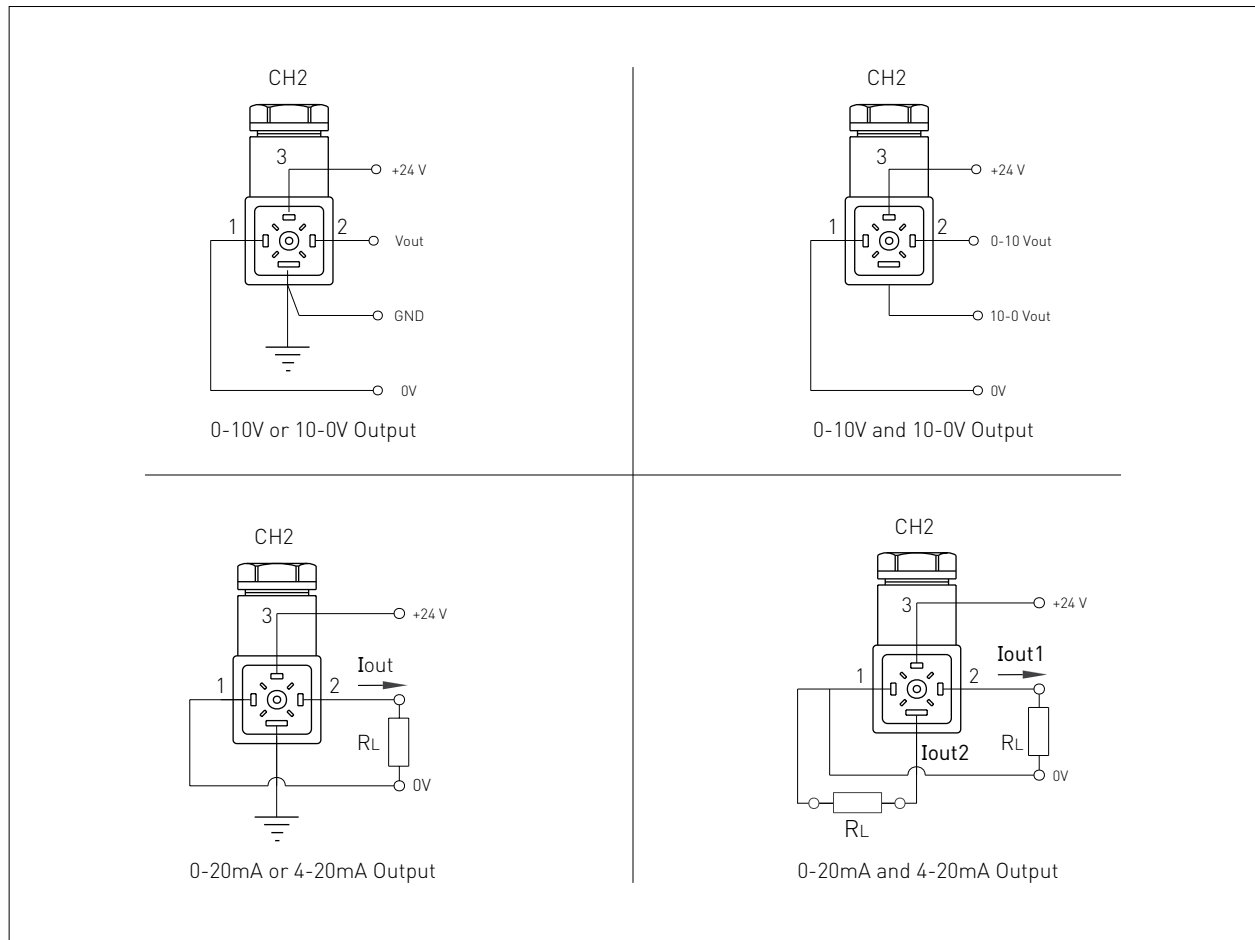


MST (mm)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500	1750	2000	2250	2500	3000	4000	5000
ML (Measuring Length)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500	1750	2000	2250	2500	3000	4000	5000
IL (Installation Length)	146	196	246	296	346	396	446	496	546	596	646	696	746	796	846	896	946	996	1096	1196	1296	1396	1496	1596	1846	2096	2346	2596	3096	4096	5096
L (Total Length)	254	304	354	404	454	504	554	604	654	704	754	804	854	904	954	1004	1054	1104	1204	1304	1404	1504	1605	1704	1954	2204	2454	2704	3204	4204	5204
Dead Zone Calculation	37/53																														

4.CONNECTORS AND CABLE

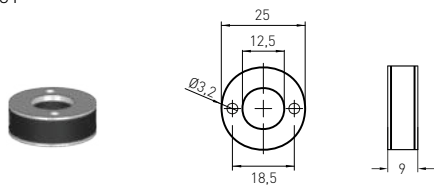
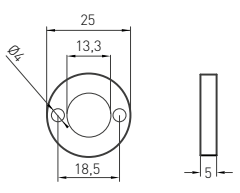
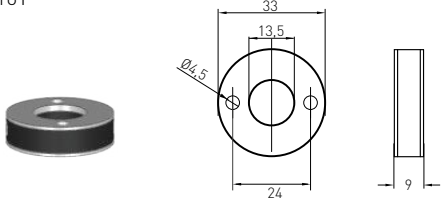
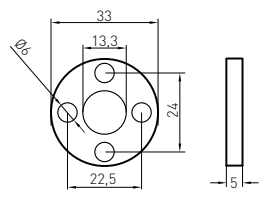


5.HYDRAULIC TYPE CONNECTOR

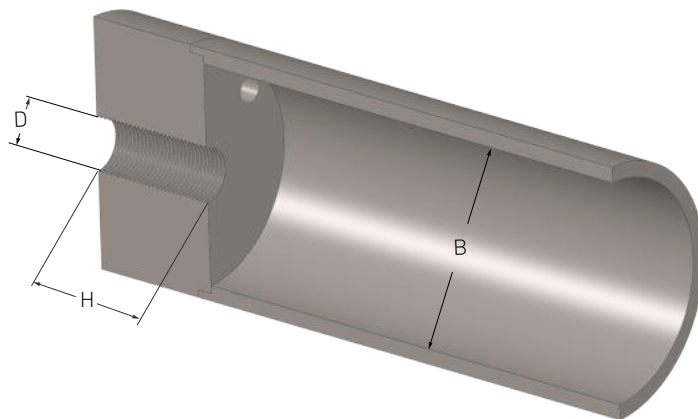


6.CURSORS AND ACCESSORIES



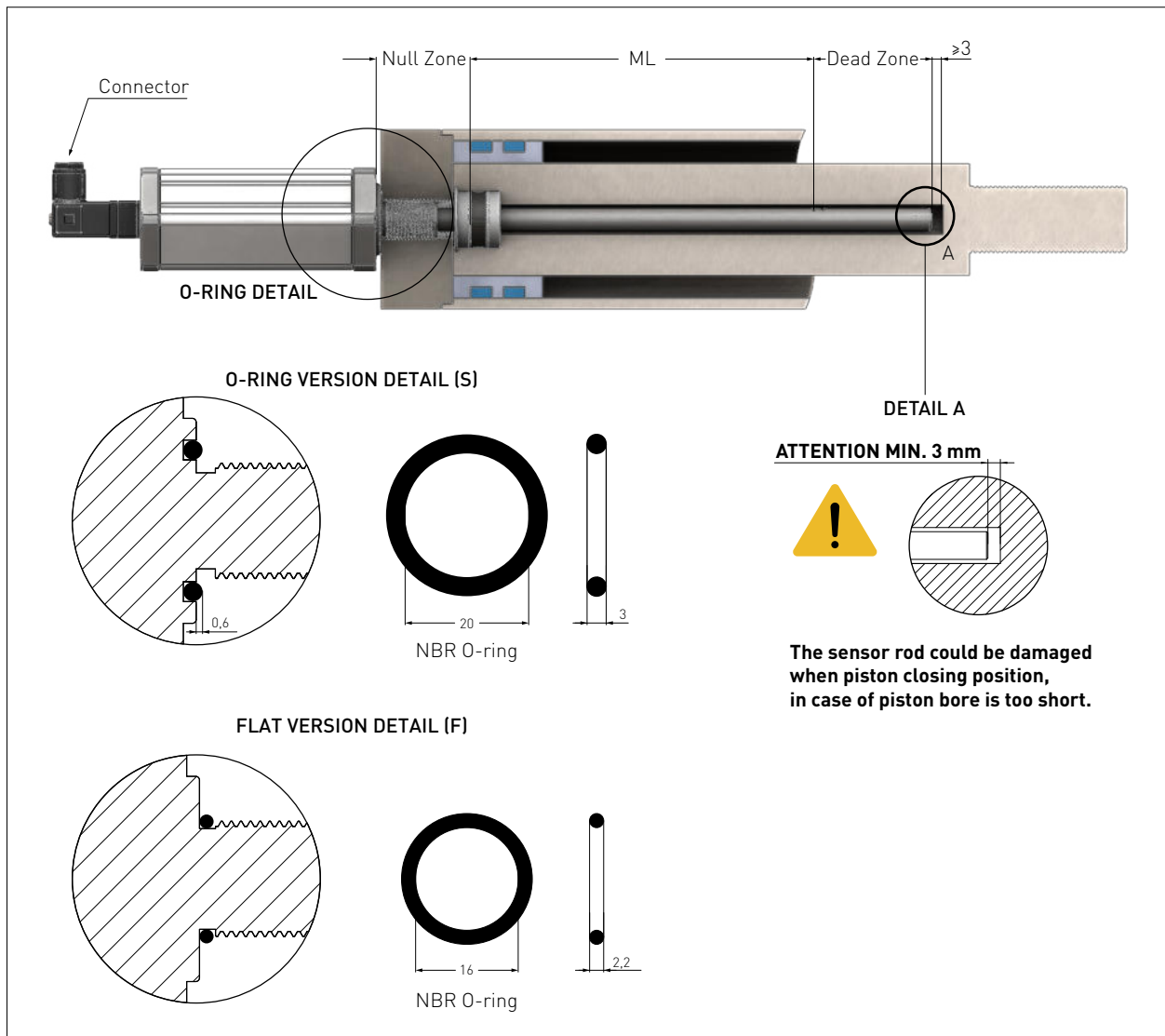
Cursor	Spacer	Screw
R05T  Technical drawing of R05T cursor and spacer. The cursor has an outer diameter of 25 mm, an inner diameter of 12.5 mm, and a width of 9 mm. The spacer has an outer diameter of 18.5 mm and a width of 5 mm.	S01  Technical drawing of S01 spacer. It has an outer diameter of 25 mm, an inner diameter of 13.3 mm, and a width of 5 mm.	M3x20 Stainless steel 316L screw 2 units
R10T  Technical drawing of R10T cursor and spacer. The cursor has an outer diameter of 33 mm, an inner diameter of 13.5 mm, and a width of 9 mm. The spacer has an outer diameter of 24 mm and a width of 5 mm.	S02  Technical drawing of S02 spacer. It has an outer diameter of 33 mm, an inner diameter of 13.3 mm, and a width of 5 mm.	M4x20 Stainless steel 316L screw 2 units

7.SPACE REQUIREMENTS

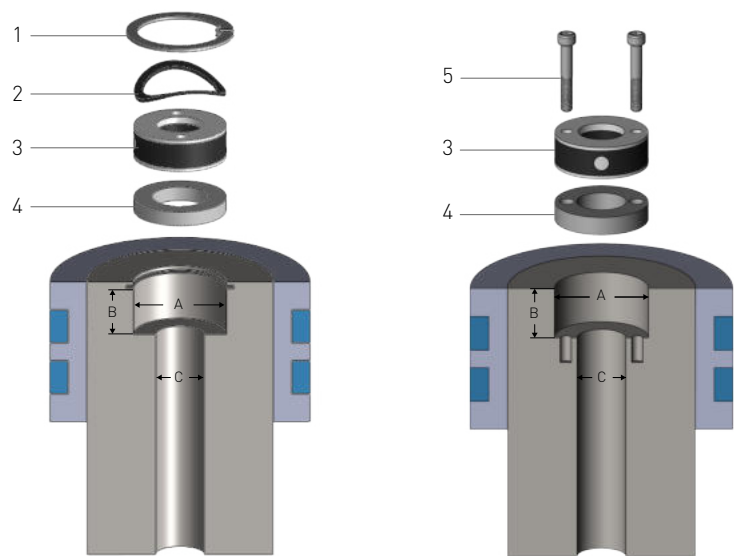


Type	B Ø Cylinder	D Ø min.	H Depth
MST	≥ 70 mm	M18 x 1,5	28 mm

8. PISTON ROD BORE AND DEPTH



9.INSTALLING THE MAGNET



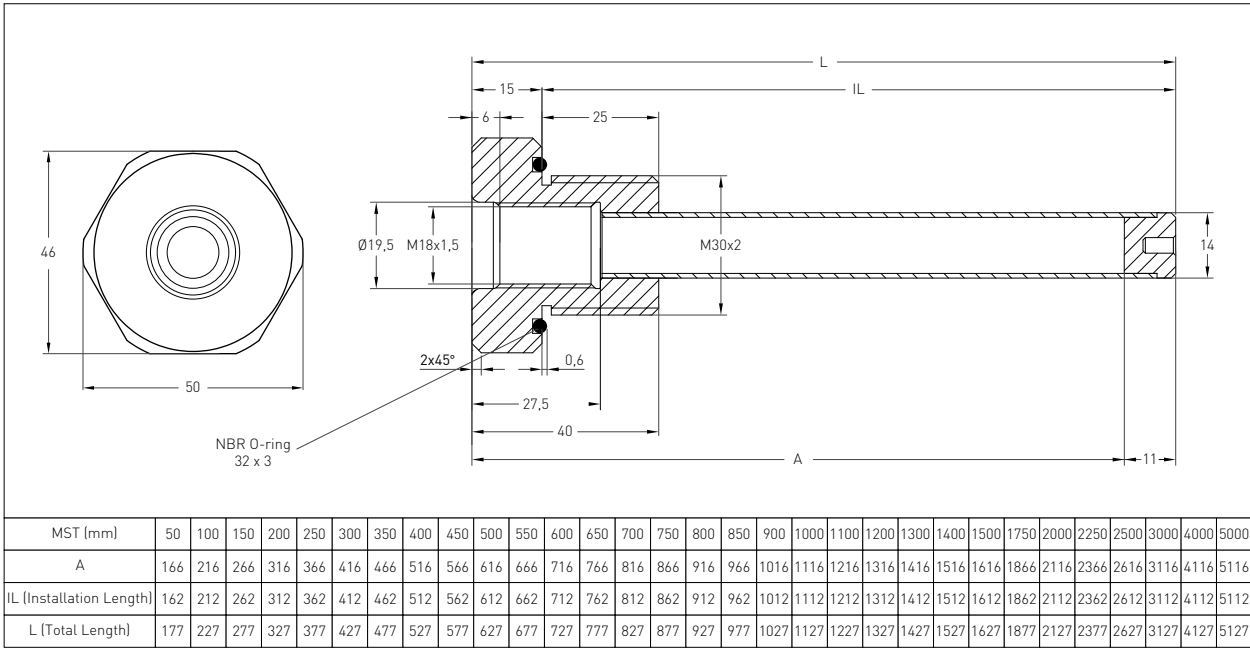
SPACER MUST BE USED!

	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	≥17 mm	Ø10 mm rod mil Ø13 mm

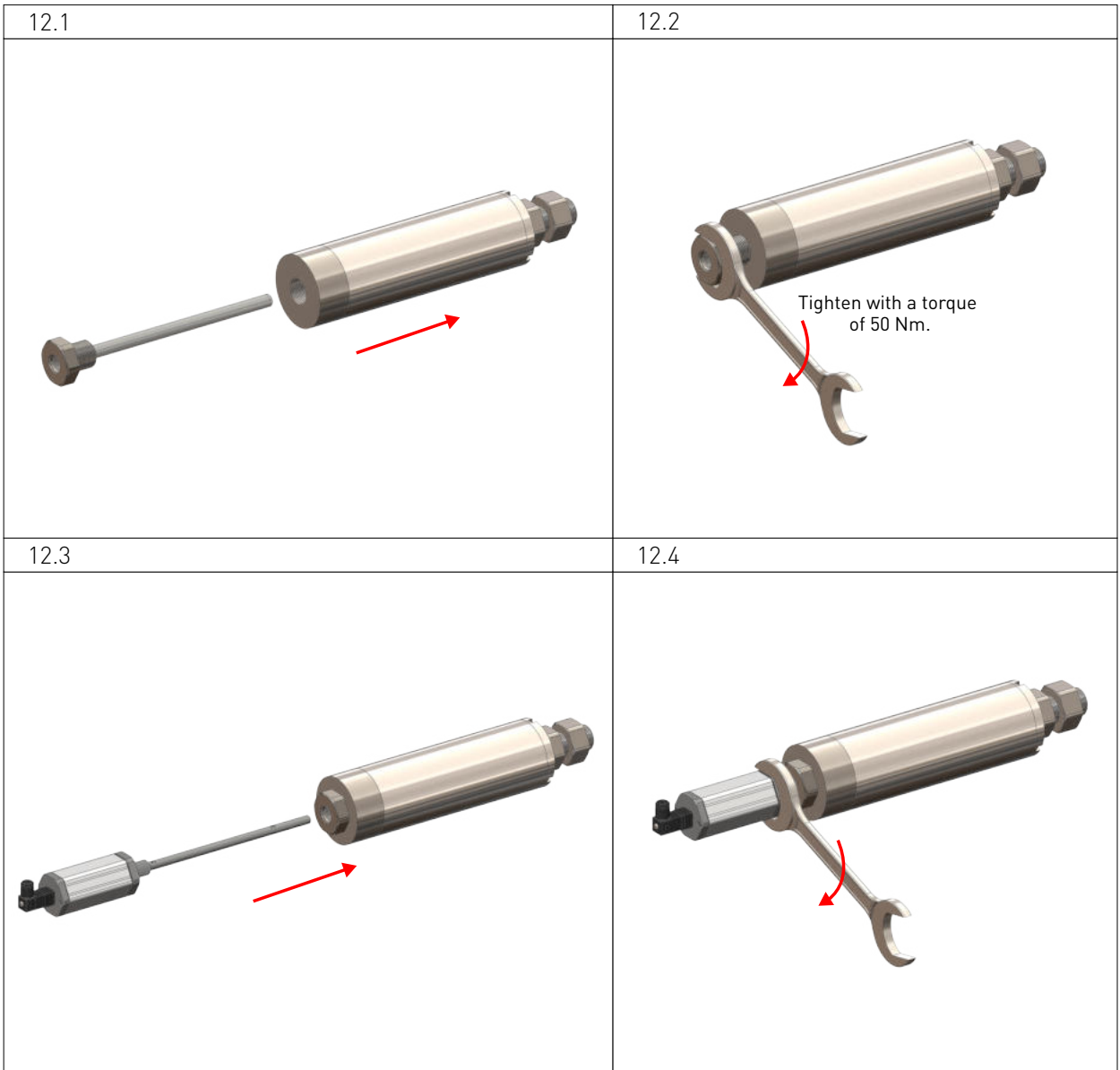
10.ASSEMBLY DIRECTLY

10.1	10.2

11.SLEEVE MECHANICAL DRAWING



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)
	1R05T: 25 mm 1R01T: 1 cursor 1R10T: 33 mm 2R01T: 2 cursor S01: 25 mm S02: 33 mm
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 (optional) CN5B : 5 pin, M16 connector (optional) CN6A : 6 pin, M12 connector (optional) CN6B : 6 pin, M16 connector (optional) CN8A : 8 pin, M12 connector (optional) CN8B : 8 pin, M16 connector (optional) 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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