

### MAIN CHARACTERISTICS

EMSSS is an absolute linear magnetostrictive transducer featuring a SSI output.

Main characteristics of magnetostrictive transducer is the absence of electric contact on the enclosure so there is no issue of wear and deterioration during working life guaranteeing high displacement speed and precision.

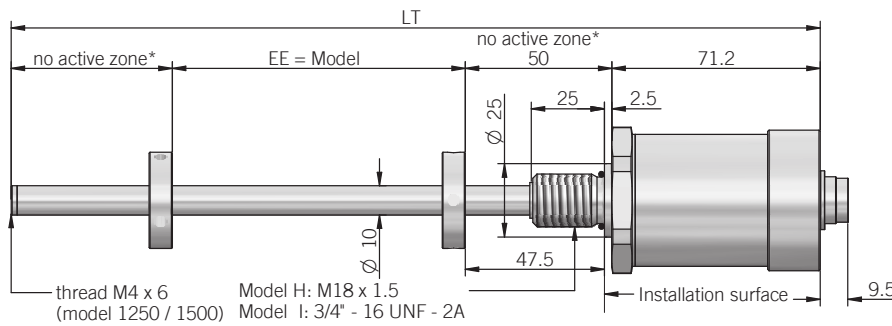
High reliability and simple installation even for applications with mechanical stresses, shocks or high contamination are assured by the compact size and the rugged enclosure.

This series has been designed for being mounted internally to high pressure (350 bar, 500 bar peak) such as hydraulic or pneumatic cylinders.



ORDERING CODE	EMSSS	500	S	24	G	H	10	R5	P	A
<p><b>SERIES</b> linear magnetostrictive transducer with SSI output <b>EMSSS</b></p> <p><b>STROKE</b> mm from <b>100</b> to <b>1500</b> see table for stroke availability</p> <p><b>ENCLOSURE RATING</b> IP 67 <b>S</b></p> <p><b>DATA LENGTH</b> (FM357) 21+1 bit <b>21</b> 24 bit <b>24</b> 25 bit <b>25</b></p> <p><b>CODE TYPE</b> binary <b>B</b> gray <b>G</b></p> <p><b>THREAD TYPE</b> M18 x 1,5 <b>H</b> 3/4" - 16 UNF <b>I</b></p> <p><b>DISPLACEMENT SPEED</b> max speed 10 m/s <b>10</b></p> <p><b>RESOLUTION</b> 0,005 mm <b>R5</b> 0,010 mm <b>R10</b> 0,020 mm <b>R20</b> 0,040 mm <b>R40</b></p> <p><b>OUTPUT TYPE</b> cable (standard length 1 m) <b>P</b> DIN 45322 M16 6 pin connector <b>C6</b></p> <p><b>OUTPUT DIRECTION</b> axial <b>A</b></p>										

EMSSS



\* = 55 mm up to stroke 1000 mm, from 1250 mm consider 60 mm due to M4 threaded hole

dimensions in mm

- OR 15,4 x 2,1 (mod.H) / OR 16,36 x 2,21 (mod.I) included
- Cursors and female connector not included, please refer to Accessories

ELECTRICAL SPECIFICATIONS	
Resolution	5 - 10 - 20 - 40 µm
Independent linearity	± 0,02 % FS (min ± 0,060 mm)
Repeatability	< 0,01 mm
Hysteresis	± 0,005 % FS (min 0,010 mm)
Sampling time	1 ms (mod. 100 ... 1000) 2 ms (mod. 1250 ... 1500)
Power supply <sup>1</sup>	10 ... 32 V DC
Power ripple	1 V <sub>pp</sub> max
Max load current	50 mA max
Electrical interface	RS-422
SSI output code	binary or gray
Clock frequency	50 kHz ... 1 MHz
SSI monostable time (T <sub>m</sub> )	16 µs
SSI frame	21 / 24 / 25 bit data length
Counting direction	increase
Protection against overvoltage	yes
Protection against polarity inversion	yes
Self-resetting internal fuse	yes
Electrical insulation	500 V DC (+V DC / earth)
Electromagnetic compatibility	according to 2014/30/EU directive
Electromagnetic	according to 2015/863/EU directive

MECHANICAL SPECIFICATIONS	
Stroke	100 - 150 - 200 - 300 - 400 - 450 - 500 - 600 - 700 - 800 - 900 - 1000 - 1250 - 1500 mm
Electric stroke (EE)	see model (mm)
Overall dimensions (LT)	EE + 176,2 mm (mod. 100 ... 1000) EE + 181,2 mm (mod. 1250 ... 1500)
Enclosure rating	IP 67 (IEC 60529)
Detected measurement	displacement
Travel speed	10 m/s max
Acceleration	100 m/s <sup>2</sup> max
Speed measurement range	min 0 ... 0,1 m/s max 0 ... 10 m/s
Speed accuracy	< 2 %
Shock	100 G, 11 ms, single shock (IEC 60068-2-27)
Vibration	12 G, 10 ... 2000 Hz (IEC 680068-2-6)
Rod / housing material	1.4401 / AISI 316 stainless steel
Operative pressure	350 bar (500 bar peak)
Cursor type	floating cursor
Temperature coefficient	20 ppm FS / °C
Operating temperature <sup>2,3</sup>	-30° ... +90°C (-22° ... +194°F)
Storage temperature <sup>3</sup>	-40° ... +100°C (-40° ... +212°F)

<sup>1</sup> as measured at the transducer without cable influences

<sup>3</sup> measured on transducer

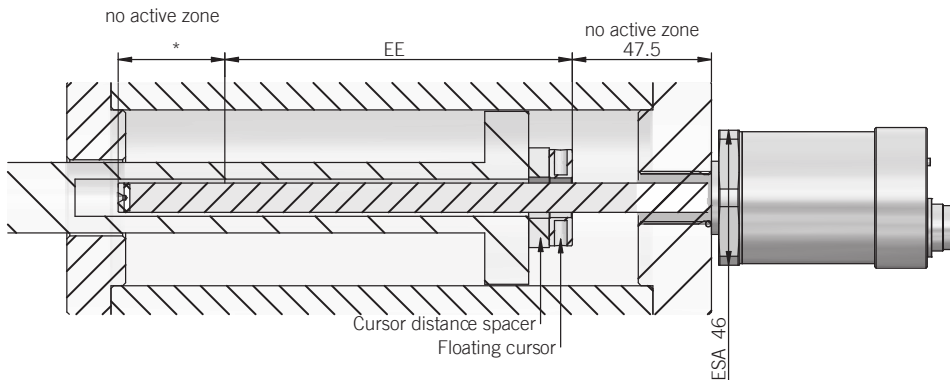
<sup>4</sup> condensation not allowed

CONNECTIONS		
Function	Cable P	6 pin M16 C6
+ V DC	blue / white	5
0 V	blue	6
DATA +	brown / white	2
DATA -	orange	1
CLOCK +	green / white	3
CLOCK -	green	4

C6 connector (6 pin)  
DIN 45322  
solder side view FV



**INSTALLATION EXAMPLE**



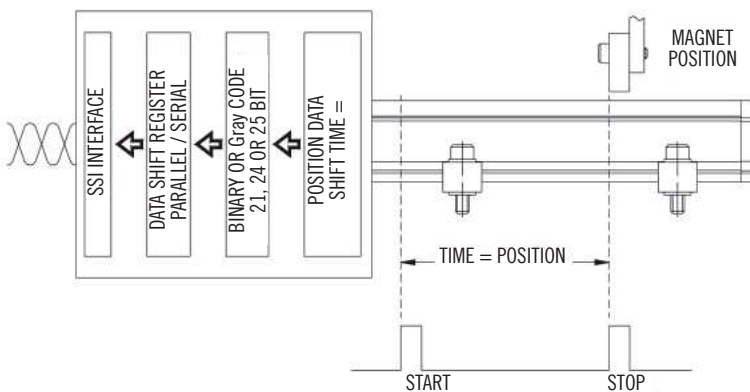
For the correct installation of rod-type magnetostrictive transducers in hydraulic cylinders, remember that the cylinder head must be made of non-magnetic material where the threaded hole will be drilled to install the transducer. If not, the residual magnetisation caused by drilling the threaded hole must be less than 4 Gauss. Sealing surface must be free from scratches longitudinal or spiral

Ro 1,6 µm for sealing with non pulsating pressure  
 Ro 0,8 µm for seals with pulsating pressure

Suggested o-ring (model H)  
 Parker 6-349 15,4 x 2,1  
 Material: Viton 90° Shore A  
 Mixes: Parker N552-90

Suggested o-ring (model I)  
 Parker 3-908 16,36 x 2,21  
 Material: Viton 90° Shore A  
 Mixes: Parker N552-90

**SSI BLOCK DIAGRAM**



SSI output goes to 0 if the echo is absent (magnet out of measurement range or internal device error)

**SSI CABLE LENGTH**

Cable length	< 3 m	< 50 m	< 100 m	< 200 m	< 400 m
Baud rate	1 Mbaud	400 kbaud	300 kbaud	200 kbaud	100 kbaud

**INSTALLATION NOTES**

The transducer must be installed away from sources of magnetic fields, both static and 50 Hz (electric motors, solenoids, etc.).

- with floating cursor assembly support must be made with nonmagnetic material
- the transducer connection cable must be wired separate from power cables and/or solenoid controls, drives, or remote switches
- power supply must be drawn from dedicated power supply and connected directly to power terminals as near as possible
- since the transducer cursor is a magnet, make sure there are no iron filings or small fragments of magnetic metal near the transducer. This could produce an accumulation of material on the cursor, with consequent sliding problems
- cable shield must be connected on both sides (PLC and transducer)
- if the transducer is installed in a cylinder isolated from the ground, the cable shielding on PLC side must be grounded.