LINEAR POTENTIOMETERS
MAGNETOSTRICTIVE
TRANSDUCERS

Index

Linear potentiometers

Magnetostrictive transducers

EPLA

LINEAR POTENTIOMETER

ISO 9001:2000

CE

Main characteristics

EPLA is an absolute linear potentiometer assuring great reliability even in tough applications with heavy vibrations and shocks. The groove on the enclosure of the transducer represents an excellent alternative to the usual system of fastening with brackets.
Installation is also made simpler by the absence of variations on the electrical output signal outside of the theoretical electrical stroke. EPLA represents a great solution in most machinery for material processing such as injection presses for plastic, rubber and so on.
This transducer is also suitable for being used in explosive environment or in presence of gas or inflammable powders.

Ordering Code

| EPLA | 200 | X | 5 | C5 | A |

Model of linear potentiometer EPLA

Stroke (mm)
50/100/150/200/300
350/400/450/500
N.B.: Please contact our offices for versions and range availability

Protection class
standard IP60 X
optional IP65 S

Output position
A axial

Output type
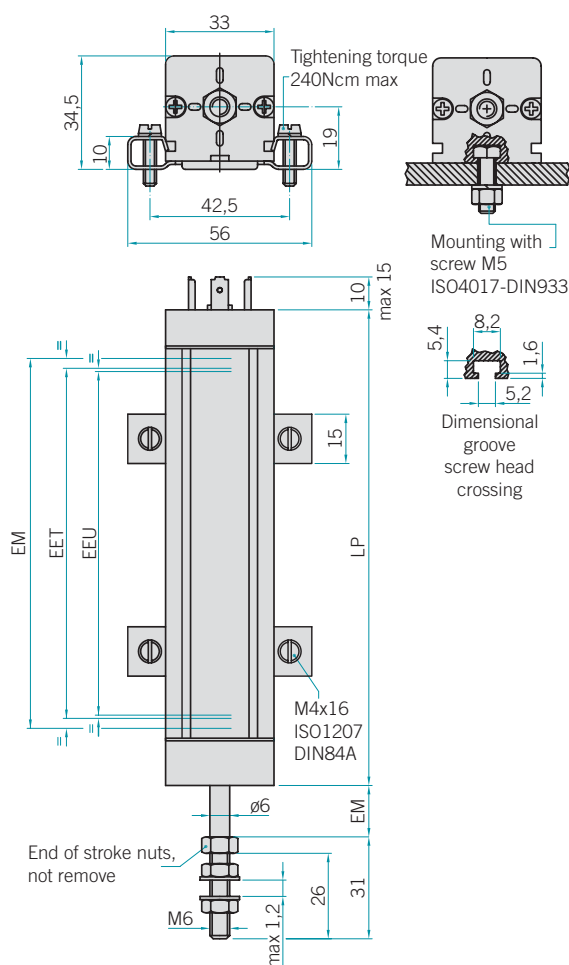P standard cable length 1 m
C3 3 contacts round connector (IP40)
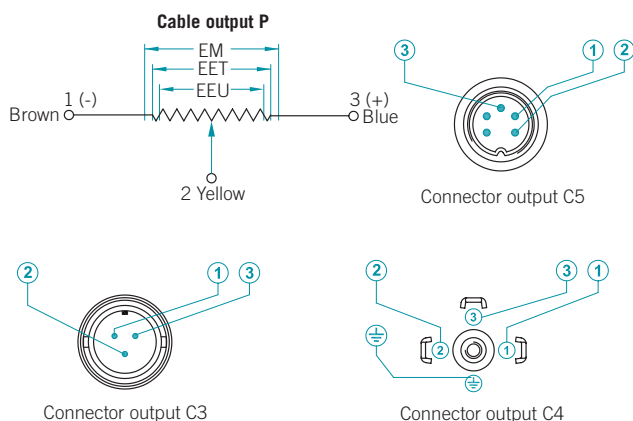C4 4 contacts round connector (IP65)
C5 5 contacts round connector (IP40)

Displacement speed
5 max speed 5 m/s

Mechanical dimensions

Tightening torque 240Ncm max

Mounting with screw M5 ISO4017-DIN933

Dimensional groove screw head crossing

M4x16 ISO1207 DIN84A

ø6

End of stroke nuts, not remove

M6

Technical characteristics

Independent linearity	±0,05%
Repeatability	0,01 mm
Displacement speed	5 m/s max
Displacement force	2 N max (IP60) 10 N max (IP65)
Applicable voltage	60 V max
Electrical insulation	100 MΩ, 500 VDC, 1 bar, 2 s
Dielectric rigidity	< 100 µA, 500 VAC, 50 Hz, 1bar, 2 s
Power dissipation	3 W, 40 °C 0 W, 120 °C
Protection class	IP60 (IP65 on request)
Explosion proof	According to ATEX CEI EN 50020 2003 (par. 5.4 a)
Life	>25x10^6 m strokes or >100x10^6 uses
Working temperature	-30÷100 °C
Storage temperature	-50÷120 °C
Thermal coefficient of the resistence	-200÷200 ppm/°C
Thermal coefficient of the output voltage	< 1,5 ppm/°C
Vibrations	20 G, 5÷2000 Hz
Shock rating	50 G for 11 ms
Acceleration	200 m/s² max (20 G)
Resistance tolerance	± 20%
Recommended cursor current	0,1 µA max
Max cursor current	10 mA max
Enclosure material	anodized aluminium Nylon 66 G 25
Rod material	stainless steel AISI 303
Mounting	brackets with variable interaxis or screw M5 ISO4017-DIN933

Important: these data are corrected if the transducer is used as voltage divisor with a maximum applicable voltage of 0,1µA.

Electrical connections

Cable output P

Brown 1 (-)   3 (+) Blue

2 Yellow

Connector output C5

Connector output C3

Connector output C4

Installation warning instructions:
- Connect the transducer according to the reported connections (don't use it as a variable resistance)
- The transducer calibration has to be done setting the stroke in order to have an output signal between the 1% and 99% of the value of operating voltage.

For optional accessories please refer to pg. 10

Electrical / mechanical data

Model*	50/100/150/200/300 350/400/450/500
Useful electric stroke(EEU) (+3/-0mm)	It corresponds to the model (mm)
Theoretical electric stroke (EET) (±1mm)	EEU+3 mm (50÷150), EEU+4 mm (200÷300), 355 mm (350), 406 mm (400), 457 mm (450), 508 mm (500)
Mechanical stroke (EM)	EEU+9 mm (50÷150), EEU+10 mm (200÷300), 361 mm (350), 412 mm (400), 463 mm (450), 518 mm (500)
Resistance (on the EET)	5 kΩ (50÷500)
Case length (LP)	EEU+62 mm (50÷150), EEU+63 mm (200÷300), 414 mm (350), 465 mm (400), 516 mm (450), 571 mm (500)

*N.B. For further versions and strokes please contact our offices

EPLA

EPLB

CYLINDRICAL LINEAR POTENTIOMETER

ISO 9001:2000

Main characteristics

EPLB is an absolute linear potentiometer transducer. Mechanical mounting is made simpler by the presence of two spherical joints on the two sides and by the enclosure's cylindrical shape. The main characteristic is the absence of variations on the electrical output signal outside of the theoretical electrical stroke. Thanks to its robustness and precision EPLB represents a great solution in most mechanical application for automation. This transducer is also suitable for being used in explosive environment or in presence of gas or inflammable powders.

Ordering code

EPLB	200	S	5	P	R

Model of linear potentiometer **EPLB**

Stroke (mm)
50/100/150/200/300
400/450/500
N.B.: Please contact our offices for versions and range availability

Protection class
standard IP65 **S**
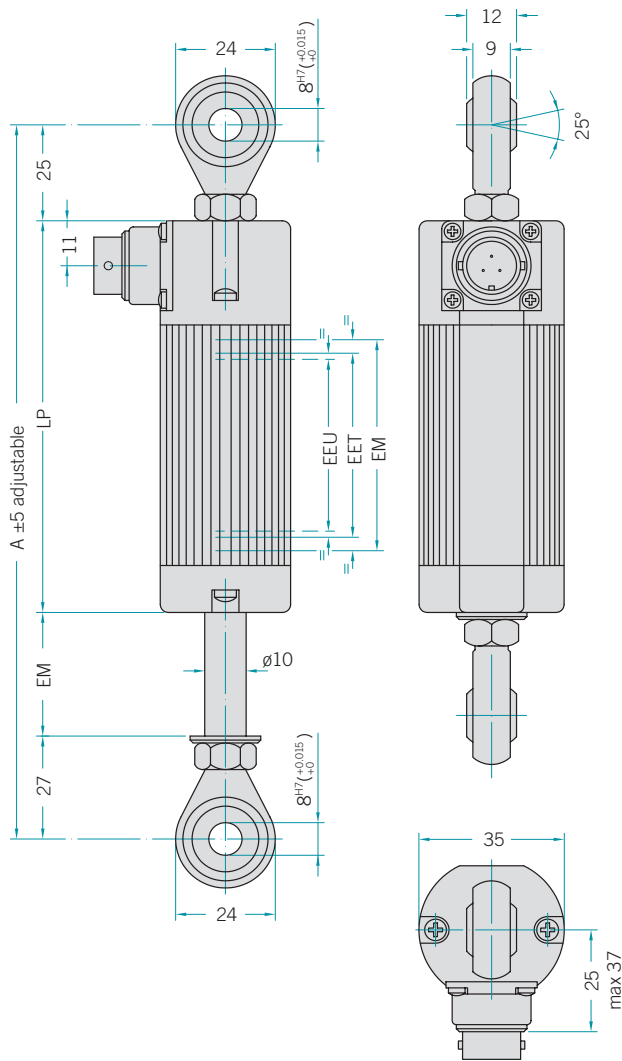
Displacement speed
5 max speed 5 m/s

Output type
P standard cable length 1 m
C3 3 contacts round connector (IP40)
C4 4 contacts round connector (IP65)
C5 5 contacts round connector (IP40)

Output position
R radial

Mechanical dimensions

Technical characteristics

Independent linearity	±0,05%
Displacement speed	5 m/s max
Displacement force	10 N max
Moving angle	±30° max
Applicable voltage	60 V max
Electrical insulation	>100 MΩ a 500 VDC, 1 bar, 2 s
Dielectric rigidity	<100 µA a 500 VAC, 50 Hz, 1 bar, 2 s
Power dissipation	3 W, 40 °C 0 W, 120 °C
Protection class	IP65 (IP67 on request)
Explosion proof	According to ATEX CEI EN 50020 2003 (par. 5.4 a)
Life	>25x10^6 m strokes or >100x10^6 uses
Working temperature	-30÷100 °C
Storage temperature	-50÷120 °C
Thermal coefficient of the output voltage	< 1,5 ppm/°C
Vibrations	20 G, 5÷2000 Hz
Shock rating	50 G for 11 ms
Acceleration	200 m/s² max (20 G)
Resistance tolerance	±20%
Recommended cursor current	0,1 µA max
Max cursor current	10 mA max
Enclosure material	anodized aluminium Nylon 66 G 25
Rod material	stainless steel AISI 303
Mounting	2 spherical joints

Important: these data are corrected if the transducer is used as voltage divisor with a maximum applicable voltage of 0,1µA.

Electrical connections
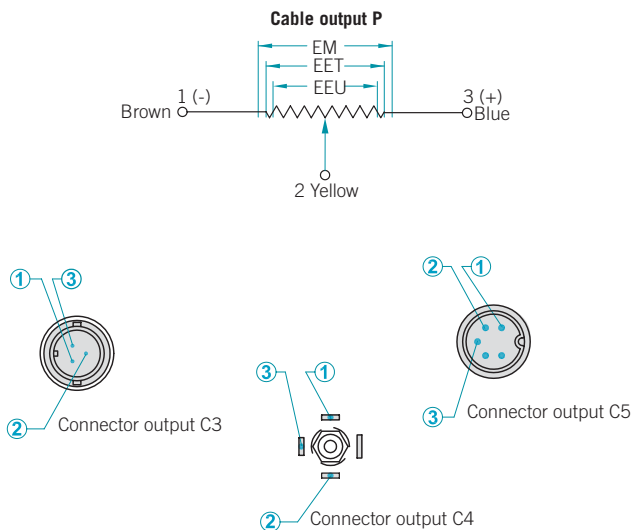
For optional accessories please refer to pg. 10

Electrical / mechanical data

Model*	50/100/150/200/300/400/450/500
Useful electric stroke (EEU) (+3/-0mm)	It corresponds to the model (mm)
Theoretical electric stroke (EET) (±1mm)	EEU+3 mm (50÷150), EEU+4 mm (200÷300),406 mm (400), 457 mm (450), 508 mm (500)
Mechanical stroke(EM)	EEU+9 mm (50÷150), EEU+10 mm (200÷300), 412 mm (400), 463 mm (450), 518 mm (500)
Resistance (on EET)	5 kΩ (50÷500)
Case length (LP)	EEU+129 mm (50÷150), EEU+130 mm (200÷300), 538 mm (400), 589 mm (450), 664 mm (500)
Minimum interaxis length (A)	EEU+181 mm (50÷150), EEU+182 mm (200÷300), 590 mm (400), 641 mm (450), 716 mm (500)

*N.B. For further versions and strokes please contact our offices

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EPLC

LINEAR POTENTIOMETER WITH CURSOR

ISO 9001:2000

Main characteristics

EPLC is an absolute linear potentiometer transducer without internal rod.
This transducer is characterized by a cursor with integrated coupling sliding on the axis. This system eliminates problems due to air compression generated from the insertion of the rod and longer strokes are reached. The main characteristic is the absence of variations on the electrical output signal outside of the theoretical electrical stroke. This transducer is also suitable for being used in explosive environment or in presence of gas or inflammable powders.

Ordering code

EPLC	500	X	4	C4	A

Model of linear potentiometer **EPLC**

Stroke (mm)
100/150/200/250/300/400/500
600/700/850/900/1000/1250
N.B.: Please contact our offices for versions and range availability

Protection class
standard IP40 **X**

Output position
A axial

Output type
C4 4 contacts round connector (IP65)
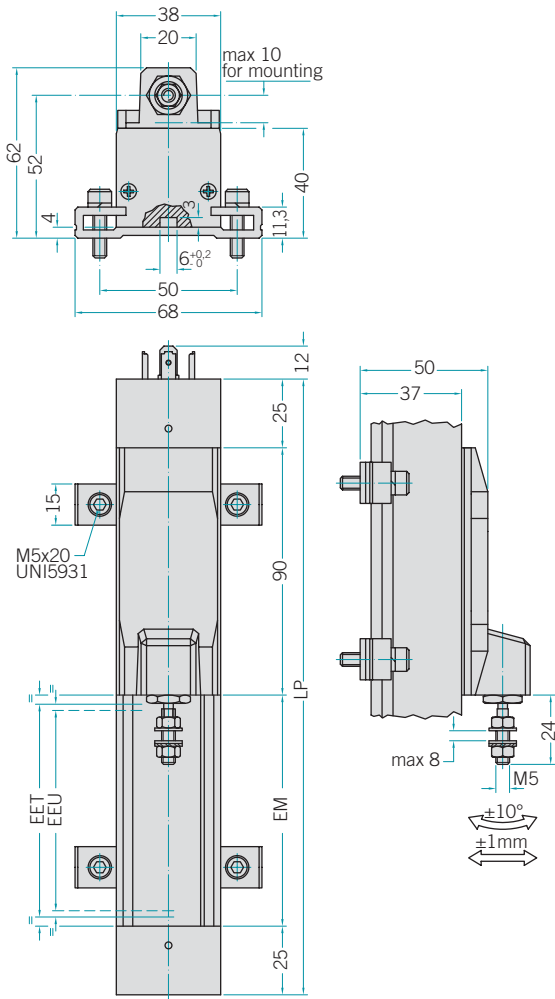**C5** 5 contacts round connector (IP40

Displacement speed
4 max speed 4 m/s
**10** max speed 10 m/s

Mechanical dimensions

Technical characteristics

Independent linearity	±0,1% (100÷400 mm) ±0,05% (450÷1250 mm)
Displacement speed	4 m/s max (10 m/s max, on request)
Displacement force	1,2 N max
Applicable voltage	60 V max
Electrical insulation	>100 MΩ, 500 VDC, 1 bar, 2 s
Dielectric rigidity	<100 µA , 500 VAC, 50 Hz, 1 bar, 2 s
Power dissipation	3 W, 40 °C 0 W, 120 °C
Protection class	IP40
Explosion proof	According to ATEX CEI EN 50020 2003 (par. 5.4 a)
Life	>25x10^6 m strokes or >100x10^6 uses
Working temperature	-30÷100 °C
Storage temperature	-50÷120 °C
Thermal coefficient of the output voltage	<1,5 ppm/°C
Vibrations	20 G, 5÷2000 Hz
Shock rating	50 G for 11 ms
Acceleration	200 m/s² max (20 G)
Resistance tolerance	±20%
Recommended cursor current	0,1 µA max
Max cursor current	10 mA max
Enclosure material	anodized aluminium Nylon 66 G 25
Rod material	Nylon 66 GF 40 Latilub 73/13
Mounting	brackets with variable interaxis

Important: these data are corrected if the transducer is used as voltage divisor with a maximum applicable voltage of 0,1µA.

Electrical connections

Connector output C4

Connector output C5
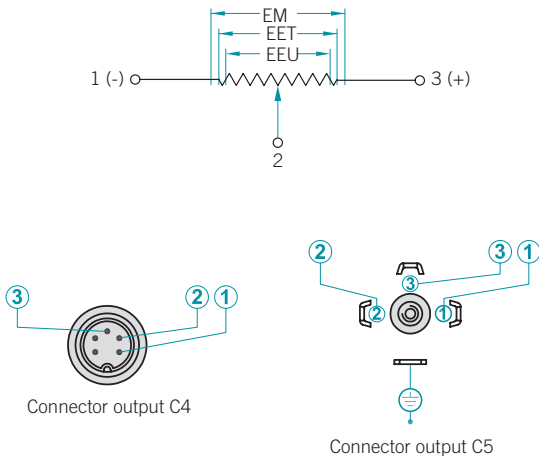
For optional accessories please refer to pg. 10

Electrical / mechanical data

Model*	100/150/200/250/300/400/500 600/700/850/900/1000/1250
Useful electric stroke (EEU) (+3/-0mm)	It corresponds to the model (mm)
Theoretical electric stroke(EET) (±1mm)	103 mm (100), 153 mm (150), 204 mm (200), 254 mm (250), 305 mm (300), 406 mm (400), 509 mm (500), 611 mm (600), 713 mm (700), 865 mm (850), 915 mm (900), 1017 mm (1000), 1271 mm (1250)
Mechanical stroke (EM)	EET+10 mm (100÷1250)
Resistance	5 kΩ (100÷300), 10 kΩ (350÷1000), 20 kΩ (1250)
Case length (LP)	EET+150 mm (100÷1250)

*N.B. For further versions and strokes please contact our offices

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Eltra®

EPLT
LINEAR POTENTIOMETER WITH SENSING SYSTEM

ese ISO 9001:2000

CE

Ex

Main characteristics

EPLT is an absolute linear potentiometer transducer. This model is characterized by the absence of cursor and the presence of a sensing system, composed by a moving rod, stainless steel sphere mounted on a threaded prod and a spring. This transducer is suitable for applications where short strokes are requested. Moreover, the connector output is disaligned respect to the axis of the device in order to allow the through rod structure and giving greater robustness.The presence of the spring assures an automatic head positioning making this device suitable for being used in precise applications on cams or on product outputs coming from automatic production lines. EPLT is also characterized by the absence of variations on the electrical output signal outside of the theoretical electrical stroke. This transducer is also suitable for being used in explosive environment or in presence of gas or inflammable powders.

Ordering code

EPLT   100   X   10   P   A

Model of linear potentiometer EPLT

Stroke (mm)
10/25/50/75/100
N.B.: Please contact our offices for versions and range availability

Protection class
standard IP40 X

Output position
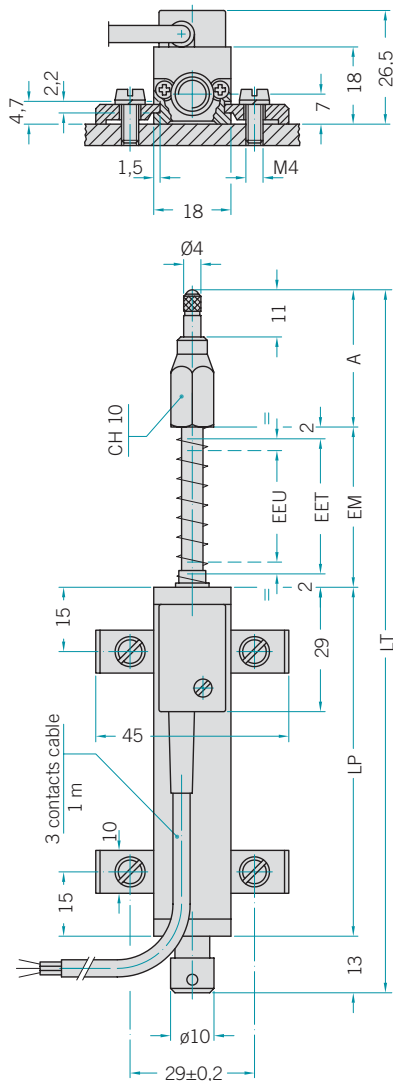A axial

Output type
P standard cable length 1 m
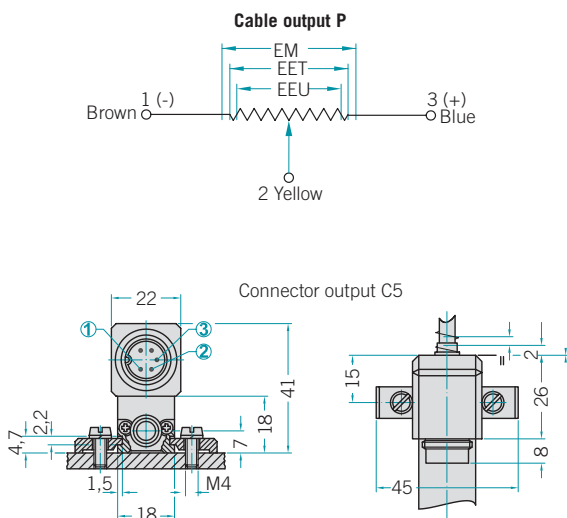C5 3 contacts round connector (IP40)

Displacement speed
10 max speed 10 m/s

Mechanical dimensions

Technical characteristics

|	
Displacement speed	10 m/s max
Displacement force	4 N max
Electrical insulation	>100 MΩ a 500 VDC, 1 bar, 2 s
Dielectric rigidity	<100 µA a 500 VAC, 50 Hz, 1 bar, 2 s
Protection class	IP40
Explosion proof	According to ATEX CEI EN 50020 2003 (par. 5.4 a)
Life	>100x10^6 uses
Working temperature	-30÷100 °C
Storage temperature	-50÷120 °C
Thermal coefficient of the output voltage	<1,5 ppm/°C
Vibrations	20 G, 5÷2000 Hz
Shock rating	50 G for 11 ms
Resistance tolerance	±20%
Recommended cursor current	0,1 µA max
Max cursor current	10 mA max
Enclosure material	anodized aluminium Nylon 66 G 25
Rod material	stainless steel AISI 303
Mounting	brackets with variable interaxis

Important: these data are corrected if the transducer is used as voltage divisor with a maximum applicable voltage of 0,1µA.

Electrical connections

Cable output P

Connector output C5

For optional accessories please refer to pg. 10

Electrical / mechanical data

Model	mm	10	25	50	75	100
Useful electric stroke (EEU) (+1/-0mm)	mm	10	25	50	76	101
Theoretical electric stroke (EET) ±1mm	mm	11	26	51	76	101
Mechanical stroke (EM)	mm	15	30	55	81	106
Case length (LP)	mm	48	63	88	114	139
Sensing probe length	mm	32	32	40	40	40
Total length (LT)	mm	108	138	196	221	246
Max applicable voltage	V	14	25	60	60	60
Independent linearity	%	±0,3	±0,2	±0,1	±0,1	±0,1
Resistance (on EET)	kΩ	1	1	5	5	5
Power dissipation 40 °C	W	0,2	0,6	1,2	1,8	2,4

*N.B. For further versions and strokes please contact our offices

Linear potentiometer

Connectors for EPLA
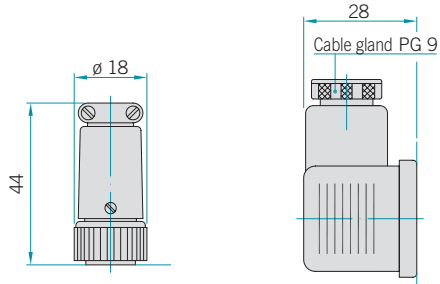
ø 18

44

28

Cable gland PG 9

EPL-C03FV (IP40)
3 contacts
female connector

EPL-C04FV 90° (IP65)
4 contacts
female connector

ø 18

Cable gland PG 7

57

35

ø 17   ø 20

64

EPL-C05FV (IP67)
5 contacts
female connector

EPL-C0590FV 90° (IP40)
5 contacts
female connector

Connectors for EPLB

ø 18

44

35

Cable gland PG 7

25

EPL-C03FV (IP40)
3 contacts
female connector

EPL-C04FV 90° (IP65)
4 contacts
female connector

ø 18

Cable gland PG 7

57

35

ø 17   ø 20

64
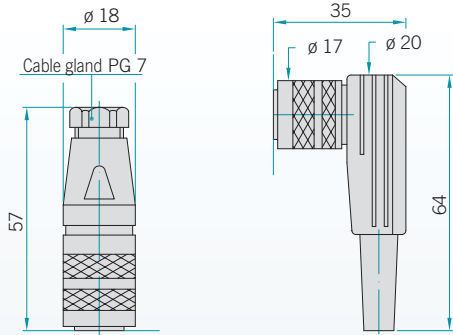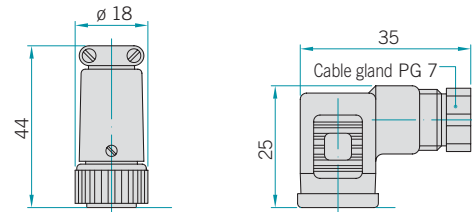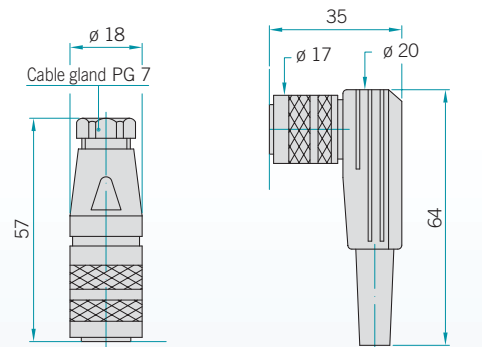
EPL-C05FV (IP67)
5 contacts
female connector

EPL-C0590FV 90° (IP40)
5 contacts
female connector

Joints for EPLA

9
6,75
26°
ø6H7
12
M6
CH11

20
30
5
ø10
ø13
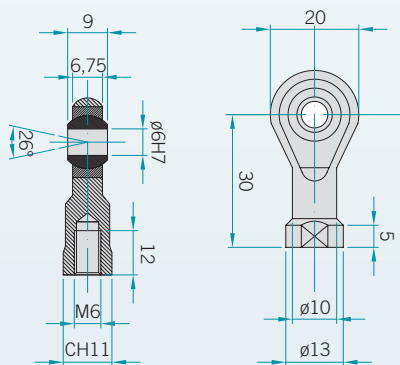
EPLA-SN01
Spherical joint

ACCESSORIES

ACCESSORIES

FOR LINEAR POTENTIOMETER

Connectors for EPLC
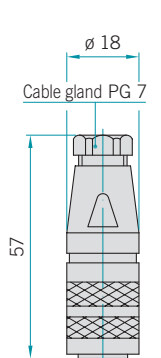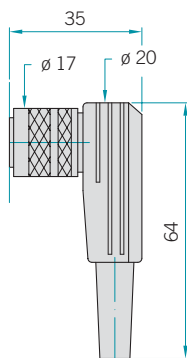
ø 18
Cable gland PG 7
57

35
ø 17   ø 20
64

PL-C05FV (IP67)
5 contacts
female connector

PL-C0590FV 90° (IP40)
5 contacts
female connector

28
Cable gland PG 9

PL-C04FV 90° (IP65)
4 contacts
female connector

Connectors for EPLT

ø 18
Cable gland PG 7
57

35
ø 17   ø 20
64
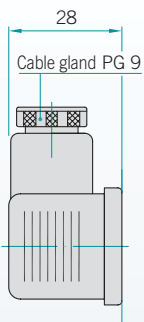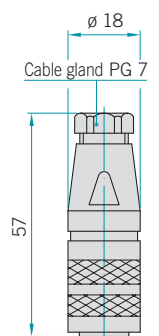
PL-C05FV (IP40)
5 contacts
female connector

PL-C0590FV 90° (IP40)
5 contacts
female connector
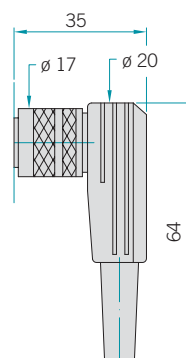
EMSPA

LINEAR MAGNETOSTRICTIVE TRANSDUCER WITH ANALOG OUTPUT

Main characteristics

EMSPA is an absolute linear magnetostrictive transducer with analog interface.Thanks to the absence of electric contact on the enclosure there is no issue of wear and deterioration during working life. Magnetostrictive technology guaranties great performances of 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.

Ordering code

EMSPA	1000	S	10S	10	P	A

Model of Linear magnetostrictive transducer EMSPA

Stroke (mm)
50/100/150/200/250/300/350/400
450/500/600/700/800/900/1000
1100/1200/1300/1400/1500
N.B.: Please contact our offices for versions and range availability

Output position
A axial

Protection class
standard IP67 S

Output type
P cable output length standard 1 m
S5 5 contacts connector M12
C6 6 contacts connector M16
C8 8 contacts connector M16
S8 8 contacts connector M12

Output signal
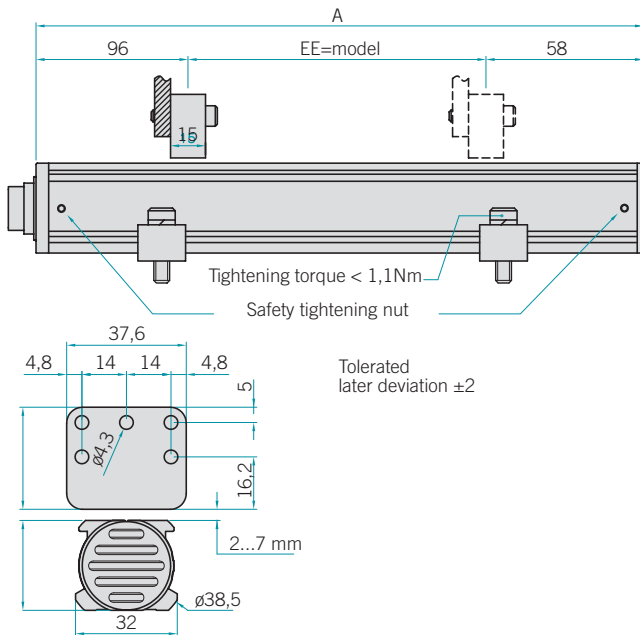
0÷10 Vdc	1 cursor (standard)	10S
0÷10 Vdc	1 cursor position / speed	10P
0÷10 Vdc	2 cursors (min. stroke 400 mm)	10D
4÷20 mA	1 cursor	20S
4÷20 mA	1 cursor position / speed	20P
4÷20 mA	2 cursors (min. stroke 400 mm)	20D

Displacement speed
10 max speed 10 m/s

Mechanical dimensions

EMSPA model with floating cursor
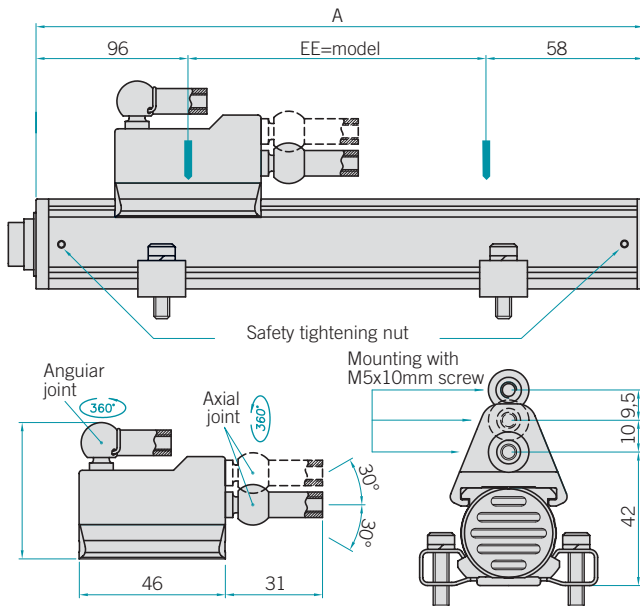
Tightening torque < 1,1Nm

Safety tightening nut

Tolerated
later deviation ±2

2...7 mm

EMSPA model with sliding cursor

Safety tightening nut

Anguiar joint 360°

Axial joint 360°

Mounting with M5x10mm screw

Electrical / mechanical data

Model*	50/100/150/200/250/300/350/400 450/500/600/700/800/900/1000 1100/1200/1300/1400/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,04% f.s. max
Overall dimension (A)	EE+154 mm
Repeatability	<0,01 mm
Hysteresis	<0,01 mm
Sampling time	0,5 ms (50÷250), 1 ms (300÷1100), 1,5 ms (1200÷1500)

*N.B. For further versions models and strokes please contact our offices

Technical characteristics

Stroke	50÷1500 mm
Protection class	IP67
Detected measurement	position/speed
Displacement speed	10 m/s max
Acceleration	100 m/s² max
Speed measurement range	min 0÷0,1 m/s max 0÷10 m/s
Speed accuracy	<2%
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, singol shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Cursor type	sliding cursor floating cursor
Working temperature	-30÷75 °C
Storage temperature	-40÷100 °C
Thermal coefficient	0,005% e.o.s./°C
Enclosure material	anodized aluminium Nylon 66 G 25

Notes: Use captive and floating cursors, max height of 4mm for strokes >2500mm.
For multi-cursor model, the cursors have to work in the same conditions of distance and temperature.

Electrical characteristics

|		
Output signal	0÷10 VDC	4÷20 mA
Power supply	24 VDC ±20%	24 VDC ±20%
Power ripple	1 Vpp max	1 Vpp max
Maximum current with load	70 mA max	90 mA max
Output load	2 kΩ	<500 Ω
Output ripple	<5 mVpp	<5 mVpp
Output value	10,6 V max	25 mA max
Electrical insulation	500 V	500 V
Protection against overvoltage	yes	yes
Protection against polarity inversion	yes	yes
Self-resetting internal fuse	yes	yes

For optional accessories please refer to pg 23

Electrical connections

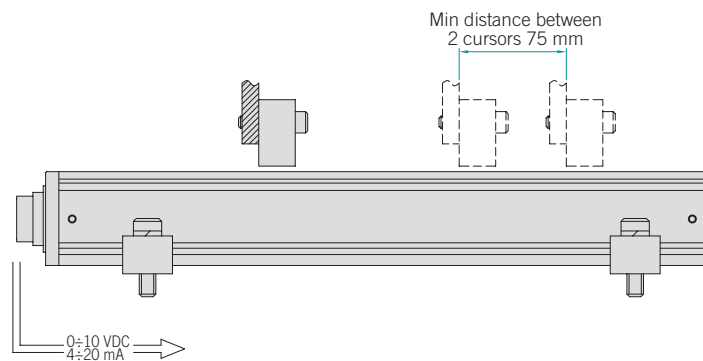| Output signal	Connector				Cable
Function	S5	C6	C8	S8	P
	5 cont. M12	6 cont. M16	8 cont. M16	8 cont. M12	output cable
Output cursor 1 0÷10 VDC 4÷20 mA	1	1	5 (1*)	5	grey
GND Output cursor 1 0 V	2	2	2	1	pink
Inverse output cursor 1 Output cursor 2 Output speed 0÷10 VDC 4÷20 mA	3	3	3	3	yellow
GND Output cursor 1 Output cursor 2 Output speed 0 V	2	4	6	2	pink
Power supply +	5	5	7	7	brown
GND	4	6	8	6	white
n.c.			4	4	
n.c.			1 (5*)	8	

(*)= for model 4÷20mA
The transducer enclosure has to be connected to ground only on the control system side by the shield.

Conn.output S5

Conn. output C6
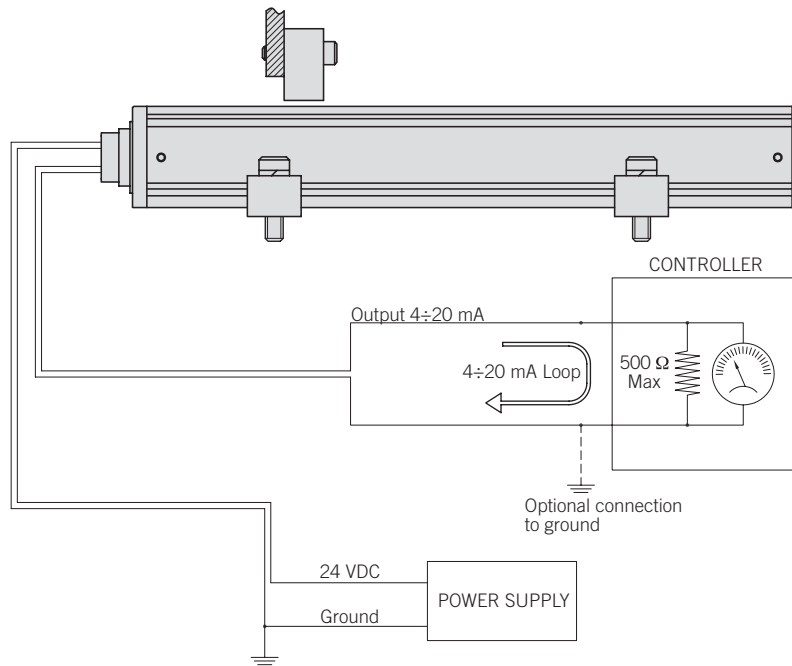
Conn. output C8

Conn. output S8

Cable output PA
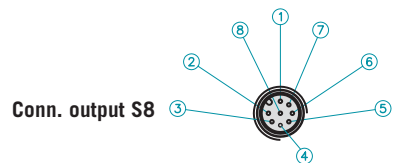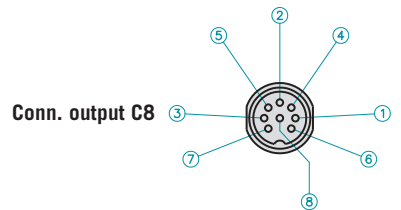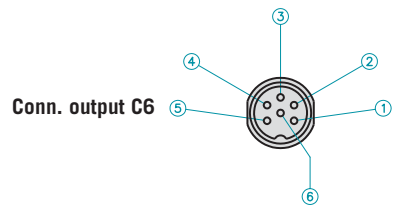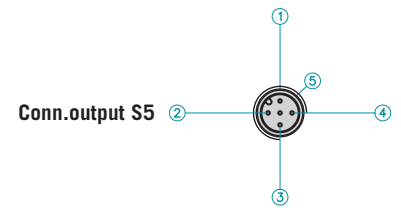
Analog output

Magnetostrictive transducers of EMSPA series supply a direct analog voltage or current output proportional to the position and the displacement speed of 1 or 2 magnetic cursors. If EMSPA is interfaced with controller or measurement instrument, no electronic signal processing is required thanks to the direct output.

Min distance between 2 cursors 75 mm

0÷10 VDC
4÷20 mA

Current output connection

CONTROLLER

Output 4÷20 mA

4÷20 mA Loop

500 Ω Max

Optional connection to ground

24 VDC

Ground

POWER SUPPLY

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Eltra®

EMSPS

LINEAR MAGNETOSTRICTIVE TRANSDUCER WITH SSI OUTPUT

ISO 9001:2000

CE

SSI

Main characteristics

EMSPS is an absolute linear magnetostrictive transducer featuring a digital RS422-SSI compliant output. The main characteristic of magnetostrictive transducers is the absence of electric contact on the enclosure 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.

Ordering code

| EMSPS | 1000 | S | 25 | G | 10 | R5 | P | A |

Model of Linear magnetostrictive transducer with SSI output EMSPS

Stroke (mm)
50/100/150/200/250/300/350/400
450/500/600/700/800/900/1000
1100/1200/1300/1400/1500
N.B. Please contact our offices for versions and range availability

Protection class
standard IP67 S

Data length
21+1 bit (FM 357) 21
24 bit 24
25 bit 25

Cursor Type
Binary B
Gray G

Output position
A axial

Output type
P Standard cable length 1 m
C6 6 contacts round connector M16
C8 8 contacts round connector M16
S8 68 contacts round connector M12

Resolution
R2 0,002 mm
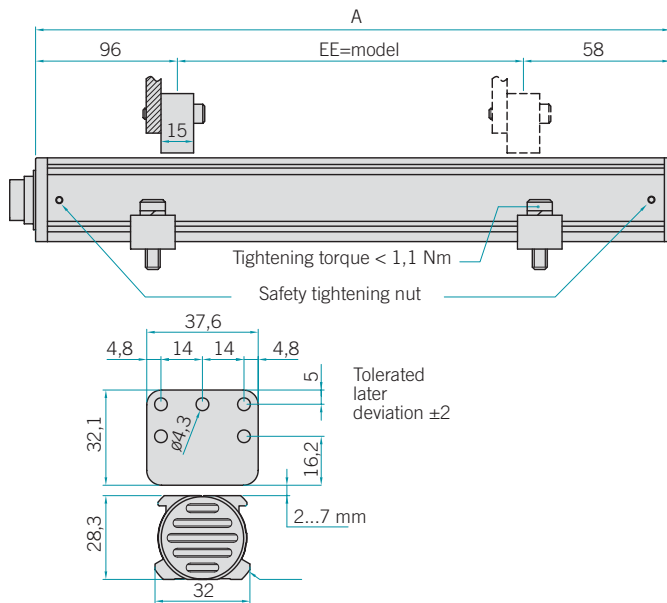R5 0,005 mm (standard)
R10 0,010 mm
R20 0,020 mm
R40 0,040 mm

Displacement speed
10 Max speed 10 m/s

Mechanical dimensions

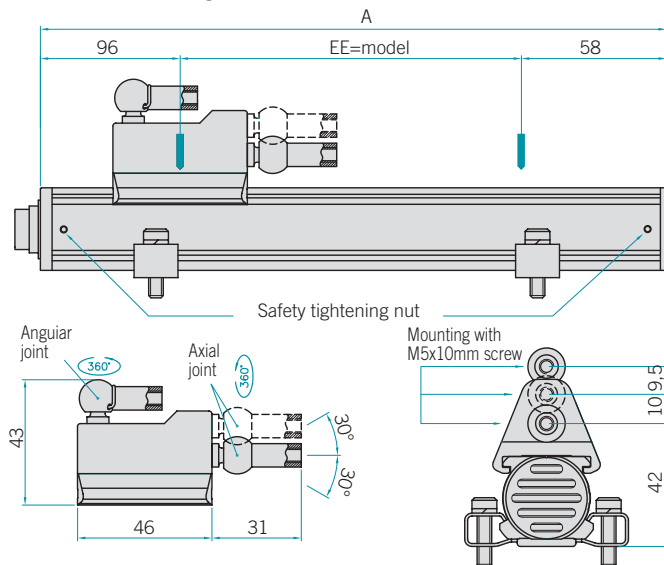EMSPS model with floating cursor

Tightening torque < 1,1 Nm

Safety tightening nut

Tolerated later deviation ±2

2...7 mm

EMSPS model with sliding cursor

Safety tightening nut

Anguiar joint

Axial joint

Mounting with M5x10mm screw

Electrical / mechanical data

Model*	50/100/150/200/250/300/350/400 450/500/600/700/800/900/1000 1100/1200/1300/1400/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,04% e.o.s. max
Overall dimension (A)	EE+154 mm
Repeatability	<0,01 mm
Hysteresis	<0,01 mm
Sampling time	0,5 ms (50÷250), 1 ms (300÷1100), 1,5 ms (1200÷1500)

*N.B. For further versions models and strokes please contact our offices

Technical characteristics

Stroke	50÷1500 mm
Detected measurement	position
Protection class	IP67
Resolution	2, 5, 10, 20, 40 µm
Displacement speed	10 m/s max
Speed measurement range	min 0÷0,1 m/s max 0÷10 m/s
Speed accuracy	<2%
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, one shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Acceleration	100 m/s² max
Cursor type	sliding cursor floating cursor
Working temperature	-30÷75 °C
Storage temperature	-40÷100 °C
Thermal coefficient	20 ppm e.o.s./°C
Enclosure material	anodized aluminium Nylon 66 G 25

Notes: Use captive and floating cursors, max height of 4mm for strokes >2500mm.
For multi-cursor model, cursors have to work in the same conditions of distance and temperature
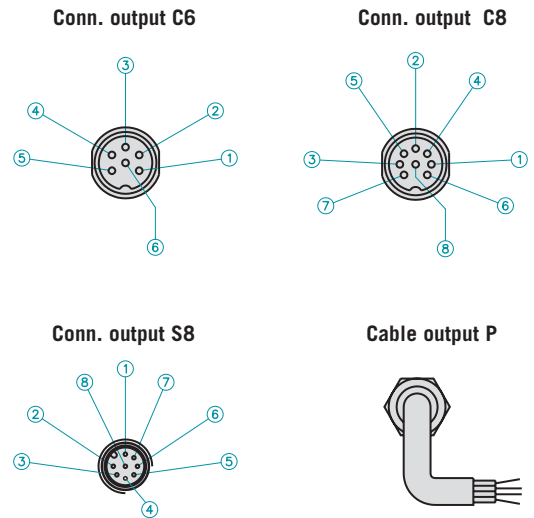
Electrical characteristics

Output signal	SSI, Binary/Gray, increase/decrease
Data length	24 or 25 bit
Power supply	24 VDC ±20%
Power ripple	1 Vpp max
Maximum current with load	100 mA max
Output load	RS 422/485 standard
Electrical insulation	500 V
Protection against overvoltage	yes
Protection against polarity inversion	yes
Self-resetting internal fuse	yes

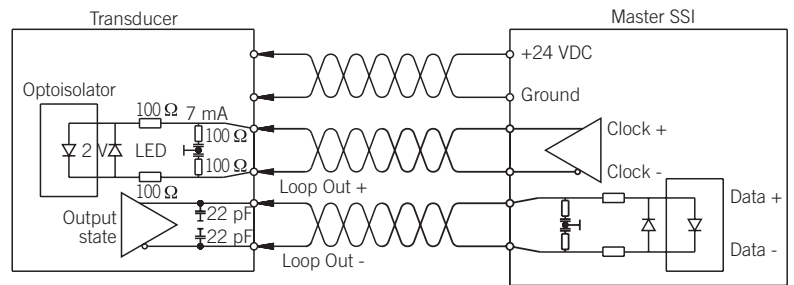For optional accessories please refer to pg 23

Electrical connections

Output signal	Connector			Cable
Function	C6	C8	S8	P
	6 contac. M16	8 contac M16	8 contac M12	output cable
Data +	2	2	2	orange/white
Data -	1	5	5	orange
Clock +	3	1	3	green/white
Clock -	4	3	1	green
Power supply +	5	7	7	blue/white
Power supply GND	6	6	6	blue
n.c.		8	8	
n.c.		4	4	

Conn. output C6

Conn. output C8

Conn. output S8

Cable output P

The transducer enclosure has to be connected to ground only on the control system side by the shield.

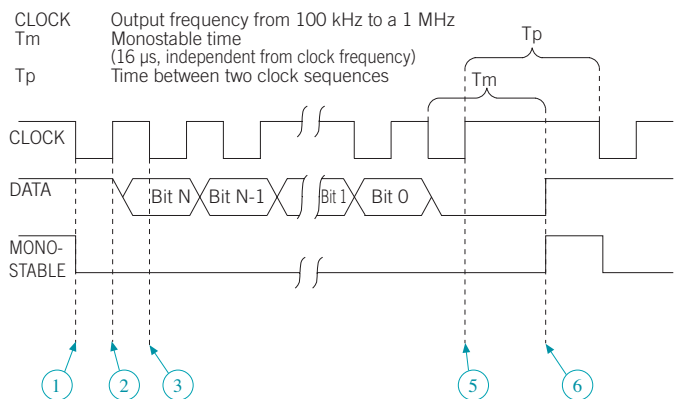## Synchronized serial output SSI

The SSI interface allows the transmission of the absolute position of the cursor respect to the transducer by a serial line synchronized by a clock. The displacement signal is available either in Gray or Binary code with 24 or 25 bit and sampling frequency up to 2000 (depending on the transducer's stroke).Due to the absolute type of output, data about cursor displacement are available immediately at the system start up.

Transducer

Master SSI

Optoisolator
100 Ω 7 mA
100 Ω
100 Ω
100 Ω
Output state
22 pF
22 pF
LED
2 V

+24 VDC
Ground
Clock +
Clock -
Loop Out +
Data +
Data -
Loop Out -

Cursor position

Cursor position	Bit N	Bit N-1...0
Outside detected measurement (1)	1	0
Outside detected measurement (1a)	0	0
Outside detected measurement (1b)	0	end of stroke
Inside detected measurement (2)	0	proportional to the distance
Without cursors (3)	1	0

Data format

CLOCK   Output frequency from 100 kHz to a 1 MHz
Tm   Monostable time
         (16 μs, independent from clock frequency)
Tp   Time between two clock sequences

Tp
Tm

CLOCK
DATA   Bit N Bit N-1   Bit 1 Bit 0
MONO-STABLE

① ② ③   ⑤ ⑥

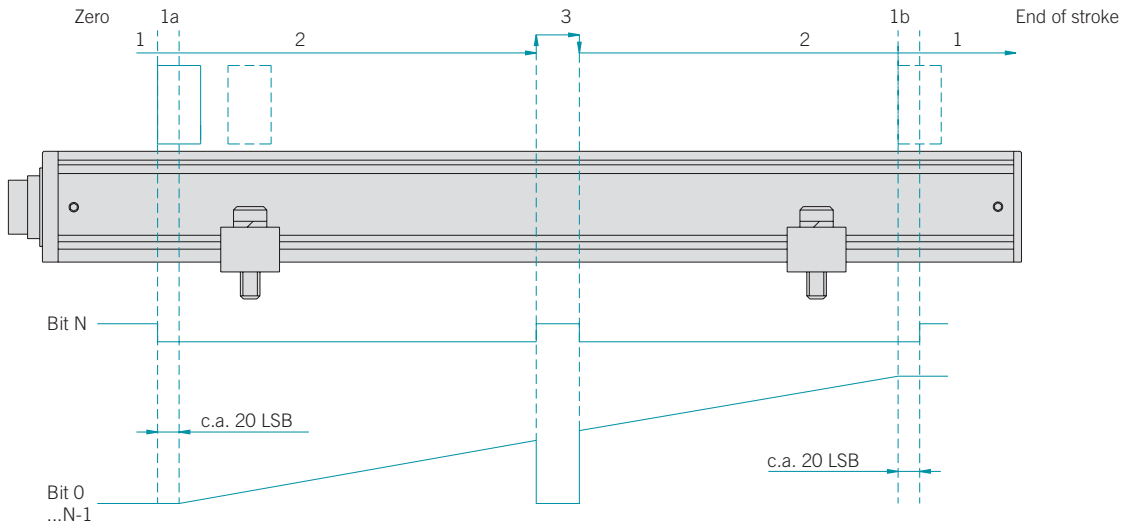## Synchronous serial output SSI (input/output synchronization)

Usually SSI interface is applied for transferring data from an absolute transducer of position to a controller. Following a sequence of pulses for initializing the transducer output, displacement data are continuously updated and available on the shift register. For preserving the synchronization between the clock signal and the internal request, the refreshing frequency can vary from 125 Hz (strokes <= 700 mm) up to 2 kHz.
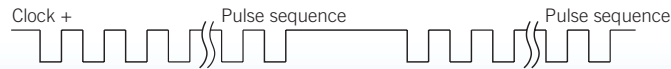Minimum interrogation time can be optimized for shorter strokes.
Data sent when the transducer receives the sequence of pulses from the controller are referred to the just acquired sample. If the cursor is not detected or a measurement error happens, all 24 bits of the output are set to zero.

Error message

Zero   1a   2   3   2   1b   End of stroke
1   2   1

Bit N

c.a. 20 LSB   c.a. 20 LSB

Bit 0
...N-1

SSI - Time diagram

Clock +   Pulse sequence   Pulse sequence

Cable length	<3 m	<50 m	<100 m
Baud rate	1.5 MBd	<400 kHz	<300 kHz
Cable length		**<200 m**	**<400 m**
Baud rate		<200 kHz	<100 kHz
Max frequency: 2 MHz		Min frequency: 50 kHz	

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EMSPP

LINEAR MAGNETOSTRICTIVE TRANSDUCER WITH PROFIBUS OUTPUT

ISO 9001:2000

CE

Main characteristics

EMSPP is an absolute linear magnetostrictive transducer featuring a PROFIBUS interface. This type of communication protocol supports a full integration with complex industrial network and long communication distances assuring performances and safety within the data transmission. The main characteristic of magnetostrictive transducers 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.
Nonetheless, EMSPP series can contemporaneously control up to 4 cursors.

Ordering code

EMSPP	1000	S	2	S3	A

Linear magnetostrictive transducer with PROFIBUS output **EMSPP**

Default node address = 125
Position resolution settable up to 5 µm

Stroke (mm)
50/100/150/200/250/300/350/400
450/500/600/700/800/900/1000
1100/1200/1300/1400/1500
N.B. Please contact our offices for versions and range availability

Protection class
standard IP67 **S**

Output position
A axial

Cursor number
1 cursor **1**
2 cursors **2**
4 cursors **4**

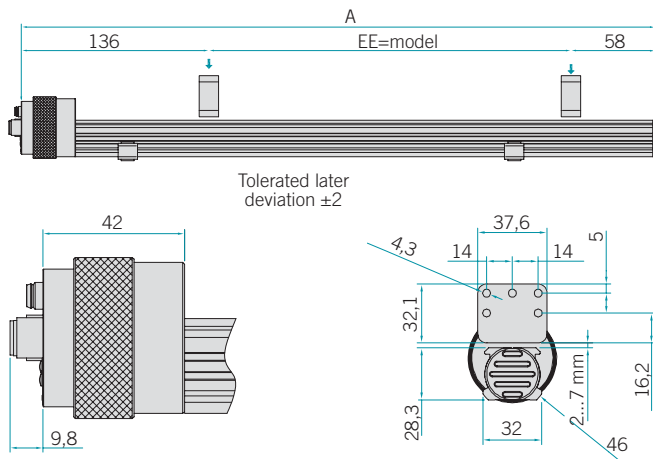**Output type**
S3 2 M12 connectors + 1 M8 connector

Mechanical dimensions

EMSPP model with floating cursor

Anguiar joint

Axial joint

Mounting with M5x10mm screw
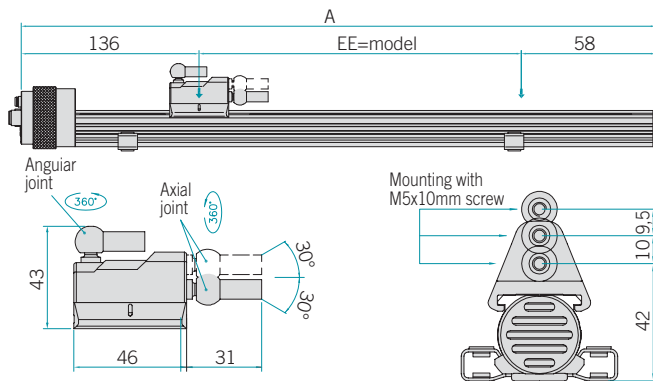
EMSPP model with sliding cursor

Tolerated later deviation ±2

Technical characteristics

Stroke	50÷1500 mm
Detected measurement	position
Protection class	IP67
Resolution	up to 5 μm
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, one shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Displacement speed	10 m/s max
Acceleration	100 m/s² max
Cursor type	floating cursor sliding cursor
Working temperature	-30÷75 °C
Storage temperature	-40÷100 °C
Thermal coefficient	20 ppm e.o.s. /°C
Enclosure material	anodized aluminium Nylon 66 G 25

Note: Use captive and floating cursors, max height of 4mm for strokes >2500mm.
For multi-cursor model, the cursors have to work in the same conditions of distance and temperature.

Electrical characteristics

Output signal	PROFIBUS DPVO on RS485
Power supply	24 VDC ±20%
Power ripple	1 Vpp max
Maximum current with load	100 mA max
Output load	RS485 standard
Electrical insulation	500 V
Protection against overvoltage	yes
Protection against polarity inversion	yes
Self-resetting internal fuse	yes

For optional accessories please refer to pg 23

Electrical / mechanical data

Model*	50/100/150/200/250/300/350/400 450/500/600/700/800/900/1000 1100/1200/1300/1400/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,04% e.o.s. max
Overall dimension (A)	EE+194 mm
Repeatability	<0,01 mm
Hysteresis	<0,01 mm
Sampling time	1 ms (50÷1200), 2 ms (1300÷1500)

* N.B. For further versions models and strokes please contact our offices

Electrical connections and led configurations

Output connector

GREEN LED (ON)	RED LED (System Fault) SF	RED LED (Bus Fault) BF	Meaning
off	off	off	- no power
on	on	on	- internal error (wrong initialization) - master not connected to the network
on	off	on	- inizialization - network error - master not connected to the network
on	on	off	- wrong number of cursors - cursor outside - measurement range - error inside the device
on	on/off	flashing (f=1 Hz)	- master not connecte network - wrong parametrization or configuration
on	off	off	- data exchange device

Female connector (A) M12
1 5VDC insulated
2 output A
3 GND insulated
4 output B
5 ground

Male connector (B) M8
1 24VDC
2 n.c.
3 0V
4 n.c.

Male connector (B) M12
1 5VDC insulated
2 output A
3 GND insulated
4 output B
5 ground

PROFIBUS structure network

PROFIBUS (Process Field Bus) is a serial communication standard for devices connected to automation networks (field Bus). This standard is capable to connect peripheral devices (Slaves, usually transducers) and central control units called Class 1 Masters (generally PCs). Class 2 Masters (usually PCs) are intended to configure and monitor network status, Moreover, they also contain GSD files of all the devices connected into the network. These files are necessary to configure parameters and making the network properly.

Class 1 Masters start the communication with peripheral devices according to the configuration received from Class 2 Masters. During this step existing Slaves are detected and configured according to information stored within GSD files.

Once this step is completed, the control of the application and the related data exchange with the network start.

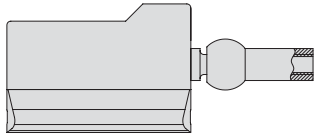Connection with 2 M12 connectors + 1 M8 connector:

- no T connection needed
- M12 and M8 standard connector
- separate supply line
(recommended to be used with the programmer)
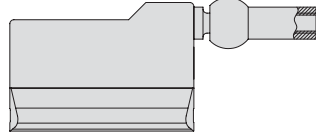
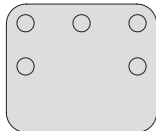* GSD's file available on **www.eltra.it**

ACCESSORIES

FOR MAGNETOSTRICTIVE TRANSDUCERS

Cursors

EMS-CSB

EMS-CSA

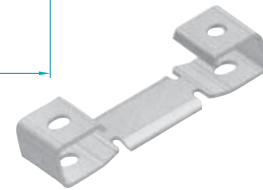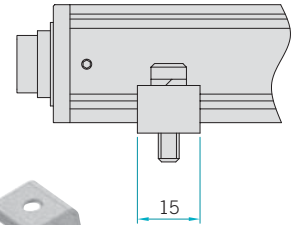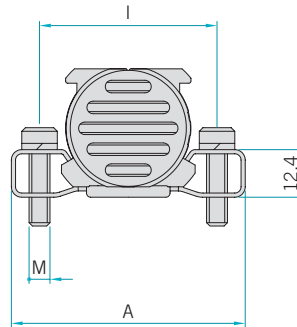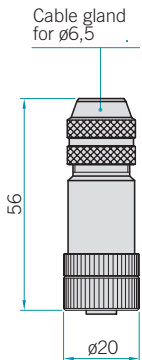EMS-CSF

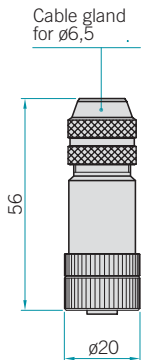| Model	
EMS-CSB	sliding cursor, axial joint (low) (standard)
EMS-CSA	sliding cursor, axial joint (high)
EMS-CSF	floating cursor

Brackets

Measure / Model	EMS-ST42	EMS-ST50
Interaxis (I)	42,5 mm	50 mm
Screw (M)	M4	M5
Overall dimension (A)	56 mm	63,5 mm

Connectors

Cable gland for ø6,5

56

ø20

EMS-S05FV (IP67)
5 contacts
female connector

Cable gland for ø6,5

56

ø20

EMS-S08FV (IP67)
8 contacts
female connector

Cable gland for ø6-ø8

62

ø18
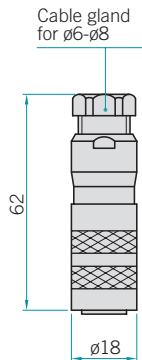
EMS-C06FV (IP67)
6 contacts
female connector

Cable gland for ø6-ø8

62

ø18
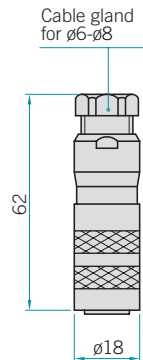
EMS-C08FV (IP67)
8 contacts
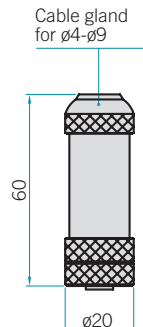female connector

Model	
EMS-S05FV	for 5 contacts output (M12)
EMS-S08FV	8 contacts output (M12)
EMS-C06FV	6 contacts output (M16)
EMS-C08FV	8 contacts output (M16)

Cable gland for ø3,5-ø5

ca. 36
ca. 32

ø11,6

EMS-M04FV (IP67)
4 contacts
female connector

Cable gland for ø4-ø9

65

M12x1
ø20
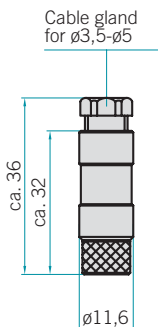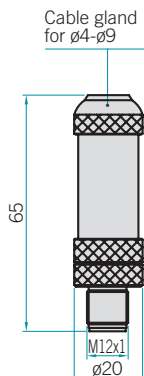
EMS-M05MV (IP67)
5 contacts male
connector B-Coding

Cable gland for ø4-ø9

60

ø20

EMS-M05FV (IP67)
5 contacts male
connector B-Coding

Only with EMSPP	
Model	
EMS-M04FV	for 4 contacts output (M8)
EMS-M05MV	for 5 contacts output (M12)
EMS-M05FV	for 5 contacts output (M12)

EMSSA

LINEAR MAGNETOSTRICTIVE ROD TRANSDUCER WITH ANALOG OUTPUT

ISO 9001:2000

CE

Main characteristics

EMSSA is an absolute linear magnetostrictive transducer featuring an analog interface. Main characteristics of magnetostrictive transducers is the absence of electric contact on the enclosure 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 applications (350 bar, 700 bar peak) such as hydraulic and pneumatic cylinders and so forth.

Ordering code

EMSSA   1000   S   10   H   10   C6   A

Linear magnetostrictive transducer with analog output **EMSSA**

Stroke (mm)
100/150/200/300/400
450/500/600/700/800
900/1000/1250/1500
N.B. Please contact our offices for versions and range availability

Protection class	**Output position**
standard IP67 **S**	**A** axial

Output signal	**Output type**
0÷10 VDC or 10÷0 VDC **10**	**P** Standard cable length (PUR) 1 m
4÷20 mA o r 20÷4 mA **20**	**C6** 6 contacts round connectror

Thread type	**Displacement speed**
M18 X 1,5 (standard) **H**	**10** max speed 10 m/s
3/4" - 16 UNF **I**	

Mechanical dimensions

A

63,5 not active zone
EE=Model
Floating cursor
50 not active zone
86,5
9
47,5
2,5
ø25,4
thread M4 deep 6
ø 10
Model H M18x1,5
Model I 3/4"-16 UNF-2A
25
installation surface

CH 46

63,5 not active zone
EE
47,5 not active zone
ø 12.7
ø 10
Cursor distance spacer
Floating cursor

Electrical connections

Conn. output C6

5 4 3 2 1

6
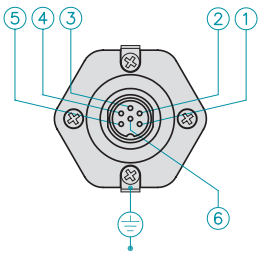
Cable output P
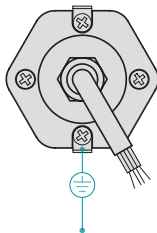
	Connector	Cable
Function	C6	P
	6 M16 connectors	output cable
0÷10VDC 4÷20mA	1	grey
GND pin1	2	pink
10÷0VDC 20÷4mA	3	yellow
GND pin3	4	green
+ Vdc	5	brown
GND	6	white
n.c.		blue

For optional accessories please refer to pg 33

Technical characteristics

Stroke	100÷1500 mm
Detected measurement	position
Protection class	IP67
Resolution	≤0,1 mV o ≤0,2 µA
Position measurement time	1 ms
Cursor applicable force	≤1 N
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, one shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Displacement speed	10 m/s max
Acceleration	100 m/s² max
Cursor type	floating cursor
Working temperature	-40÷70 °C
Storage temperature	-40÷100 °C
Thermal coefficient	≤0,01% e.o.s./°C
Output signal	0÷10 VDC o 10÷0 VDC 4÷20 mA o 20÷4 mA
Power supply	24 VDC ±20%
Power ripple	1 Vpp max
Maximum current with load	100 mA max
Output load	≥5 kΩ (tension output) ≤500 Ω (current output)
Electrical insulation	500 V (between alimentation and ground) 500 V (between alimentation and output on request)
Protection against overvoltage	varistor
Protection against polarity inversion	yes
Rod ,flange, connector material	stainless steel AISI 316

Electrical / mechanical data

Model*	100/150/200/300/400/450/500 600/700/800/900/1000/1250/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,03% e.o.s. max
Overall dimension (A)	EE + 200 mm
Repeatability	±0,001% of EE
Hysteresis	<0,01 mm

*N.B. For further versions models and strokes please contact our offices.

Eltra®

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EMSSS

LINEAR MAGNETOSTRICTIVE ROD TRANSDUCER WITH SSI OUTPUT ANALOG OUTPUT

ISO 9001:2000

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 preassure (350 bar, 700 bar peak) such as hydraulic and pneumatic cylinders and so forth.

Ordering code

| EMSSS | 1000 | S | 24 | B | H | 10 | R5 | C6 | A |

Linear magnetostrictive transducer with SSI output EMSSS

Stroke (mm)
100/150/200/300/400
450/500/600/700/800
900/1000/1250/1500
N.B. Please contact our offices for versions and range availability

Protection class
standard IP67 S

Data lenght
16 bit 16
21 bit 21
24 bit 24
25 bit 25

Code type
binary B
Gray G

Output position
A axial

Output type
P Standard cable length 1 m
C6 6 contacts round connectror

Resolution
R5 0,005 mm (standard)
R10 0,010 mm
R20 0,020 mm
R40 0,040 mm

Displacement speed
10 max speed 10 m/s

Thread type
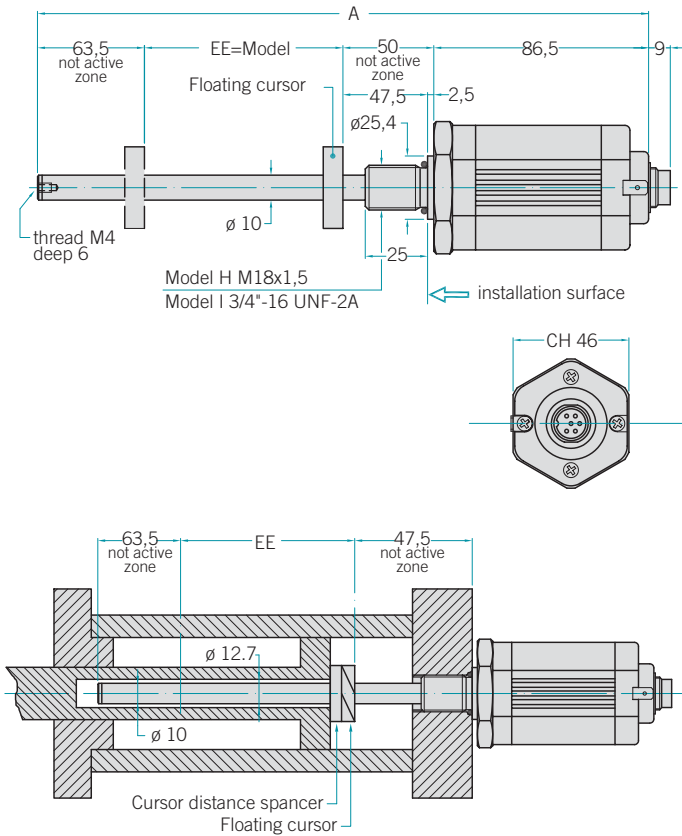H M18 X 1,5 (standard)
I 3/4" - 16UNF

Mechanical dimensions

A
- 63,5 not active zone
- EE=Model
- Floating cursor
- 50 not active zone
- 86,5
- 9
- 47,5
- 2,5
- ø25,4
- thread M4 deep 6
- ø 10
- 25
- Model H M18x1,5
- Model I 3/4"-16 UNF-2A
- installation surface

CH 46

- 63,5 not active zone
- EE
- 47,5 not active zone
- ø 12.7
- ø 10
- Cursor distance spancer
- Floating cursor

Electrical connections

Conn.output C6

5 4 3 2 1

6

Cable output P

	Connector	Cable
Function	C6	P
	6 M16 connectors	cable output
Data +	2	brown/white
Data -	1	orange
Clock +	3	green/white
Clock -	4	green
+ Vdc	5	blue / white
GND	6	blue

For optional accessories please refer to pg 33

Technical characteristics

Stroke	100÷1500 mm
Detected measurement	position
Protection class	IP67
Resolution	5, 10, 20, 40 µm
Position measurement time	0,5÷3 ms
Output signal	SSI, Binary/Gray, increase/decrease
Data length	16, 21, 24, 25 bit
Cursor applicable force	≤1N
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, one shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Displacement speed	10 m/s max
Acceleration	100 m/s² max
Cursor type	floating cursor
Working temperature	-40÷70 °C
Storage temperature	-40÷100 °C
Thermal coefficient	20 ppm e.o.s./°C
Power supply	24 VDC ±20%
Power ripple	1 Vpp max
Maximum current with load	100 mA max
Output signal	RS422/485 standard
Electrical insulation	500 V (between alimentation and earth)
Protection against overvoltage	varistor
Protection against polarity inversion	yes
Rod, flange, connector material	stainless steel AISI 316

Electrical / mechanical data

Model*	100/150/200/300/400/450/500 600/700/800/900/1000/1250/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,03% e.o.s. max
Overall dimension (A)	EE+200 mm
Repeatability	±0,001% of EE
Hysteresis	<0,01 mm

*N.B. For further versions models and strokes please contact our offices

Magnetostrictive transducer

EMSSS

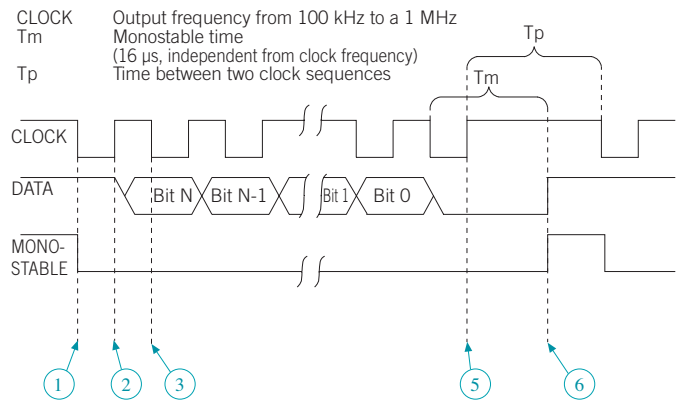## Synchronized serial output SSI

The SSI interface allows the transmission of the absolute position of the cursor respect to the transducer by a serial line synchronized by a clock. The displacement signal is available either in Gray or Binary code with 24 or 25 bit and sampling frequency up to 2000 (depending on the transducer's stroke).Due to the absolute type of output, data about cursor displacement are available immediately at the system start up.
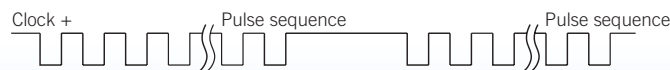

Cursor position

Cursor position	Bit N	Bit N-1...0
Outside detected measurement (1)	1	0
Outside detected measurement (1a)	0	0
Outside detected measurement (1b)	0	end of stroke
Inside detected measurement (2)	0	proportional to the distance
Without cursors (3)	1	0

Data format

CLOCK — Output frequency from 100 kHz to a 1 MHz
Tm — Monostable time (16 µs, independent from clock frequency)
Tp — Time between two clock sequences

SSI - Time diagram

Cable length	<3 m	<50 m	<100 m
Baud rate	1.5 MBd	<400 kHz	<300 kHz

Cable length		<200 m	<400 m
Baud rate		<200 kHz	<100 kHz

Max frequency: 2 MHz   Min frequency: 50 kHz

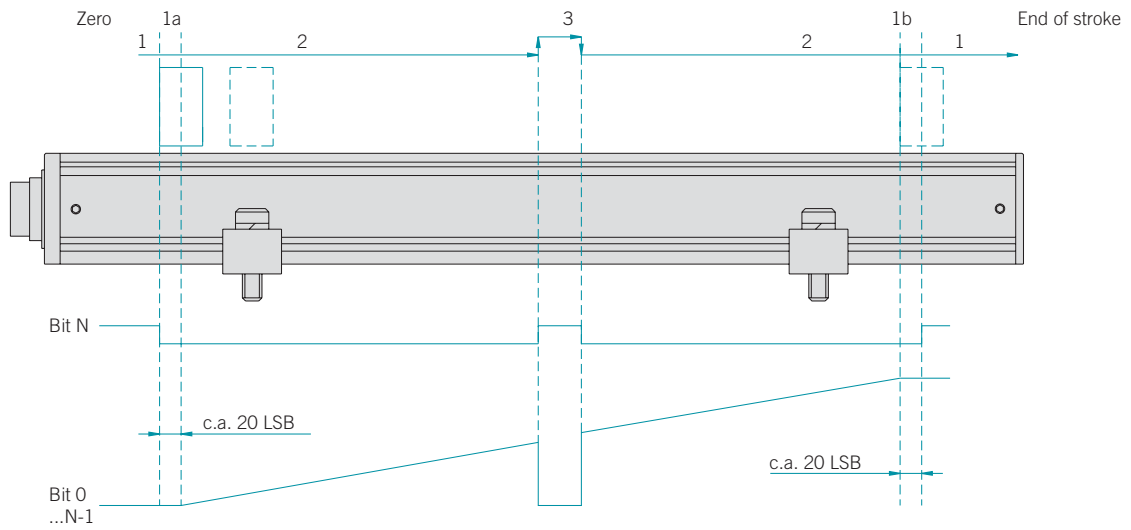## Synchronous serial output SSI (input/output synchronization)

Usually SSI interface is applied for transferring data from an absolute transducer of position to a controller. Following a sequence of pulses for initializing the transducer output, displacement data are continuously updated and available on the shift register. For preserving the synchronization between the clock signal and the internal request, the refreshing frequency can vary from 125 Hz (strokes <= 700 mm) up to 2 kHz.
Minimum interrogation time can be optimized for shorter strokes.
Data sent when the transducer receives the sequence of pulses from the controller are referred to the just acquired sample. If the cursor is not detected or a measurement error happens, all 24 bits of the output are set to zero.

Error message

EMSSP

LINEAR MAGNETOSTRICTIVE ROD TRANSDUCER WITH PROFIBUS OUTPUT

ISO 9001:2000

CE

Main characteristics

EMSSP is an absolute linear magnetostrictive transducer featuring a PROFIBUS output.
Main characteristics of magnetostrictive transducers 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 applications (350 bar, 700 bar peak) such as hydraulic and pneumatic cylinders and so forth.
Nonetheless, EMSSP series can contemporaneously control up to 4 cursors.

Ordering code

EMSSP	1000	S	2	H	S3	A

Linear magnetostrictive transducer with PROFIBUS output **EMSSP**

Default node address = 125
Position resolution settable up to 5 μm

Stroke (mm)
100/150/200/300/400
450/500/600/700/800
900/1000/1250/1500
N.B. Please contact our offices for versions and range availability

Protection class
standard IP67 **S**
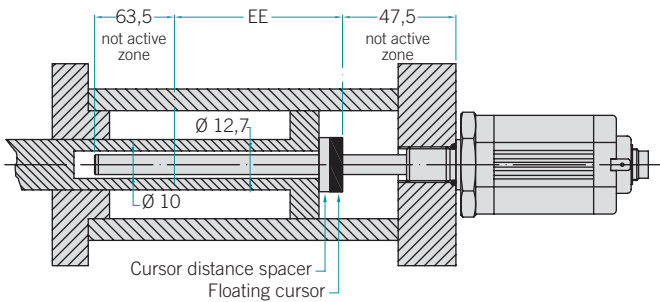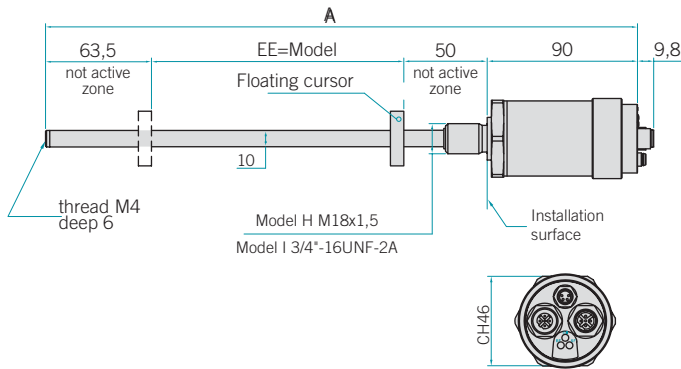
Output position
A axial

Cursor number
1 cursor **1**
2 cursors **2**
4 cursors **4**

Output type
S3 2 M12 connectors + 1 M8 connector

Thread type
M18 X 1,5 (standard) **H**
3/4" - 16UNF **I**

Mechanical dimensions

Tecnical characteristics

Stroke	50÷1500 mm
Detected measurement	position
Protection class	IP67
Resolution	up to 5 µm
Output signal	PROFIBUS DPV0 on RS485
Cursor applicable force	≤1 N
EMI CE compatibility	EN 50081-2, EN 50082-1
Shock rating	100 G, 11 ms, one shot (DIN IEC68T2-27)
Vibrations	12 G, 10÷2000 Hz (DIN IEC68T2-6)
Displacement speed	10 m/s max
Acceleration	100 m/s² max
Cursor type	floating cursor
Working temperature	-30÷75° C
Storage temperature	-40÷100° C
Thermal coefficient	20 ppm e.o.s./°C
Power supply	24 VDC ±20%
Power ripple	1 Vpp max
Maximum current with load	100 mA max
Output load	RS485 standard
Electrical insulation	500 V (between +Vdc and ground)
Protection against overvoltage	yes
Protection against polarity inversion	yes
Self-resetting internal fuse	yes
Rod ,flange, connector material	Stainless steel AISI 316

For optional accessories please refer to pg . 33

Electrical / mechanical data

Model*	50/100/150/200/250/300/350/400 450/500/600/700/800/900/1000 1100/1200/1300/1400/1500
Electric stroke (EE)	It corresponds to the model (mm)
Independent linearity	±0,04% e.o.s. max
Overall dimension (A)	EE+203,5 mm
Repeatability	<0,01 mm
Hysteresis	<0,01 mm
Sampling time	1 ms (50÷1200), 2 ms (1300÷1500)

*N.B.: For further versions models and strokes please contact our offices

EMSSP

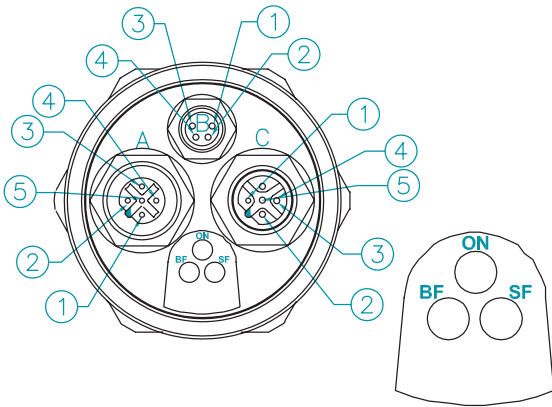# Electrical connections and led configurations

Output connector

GREEN LED (ON)	RED LED (System Fault) SF	RED LED (Bus Fault) BF	Meaning
off	off	off	- no power
on	on	on	- internal error (wrong initialization) - master not connected to the network
on	off	on	- inizialization - network error - master not connected to the network
on	on	off	- wrong number of cursors - cursor outside - measurement range - error inside the device
on	on/off	flashing (f=1 Hz)	- master not connecte network - wrong parametrization or configuration
on	off	off	- data exchange device

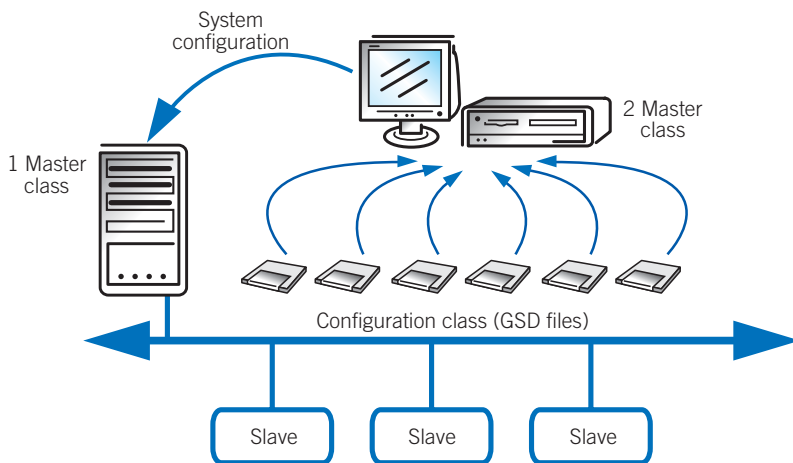| Female connector (A) M12	Male connector (B) M8	Male connector (B) M12
1 5VDC insulated	1 24VDC	1 5VDC insulated
2 output A	2 n.c.	2 output A
3 GND insulated	3 0V	3 GND insulated
4 output B	4 n.c.	4 output B
5 ground		5 ground

PROFIBUS structure network

PROFIBUS (Process Field Bus) is a serial communication standard for devices connected to automation networks (field Bus). This standard is capable to connect peripheral devices (Slaves, usually transducers) and central control units called Class 1 Masters (generally PCs). Class 2 Masters (usually PCs) are intended to configure and monitor network status, Moreover, they also contain GSD files of all the devices connected into the network. These files are necessary to configure parameters and making the network properly.

Class 1 Masters start the communication with peripheral devices according to the configuration received from Class 2 Masters. During this step existing Slaves are detected and configured according to information stored within GSD files.

Once this step is completed, the control of the application and the related data exchange with the network start.

Connection with 2 M12 connectors + 1 M8 connector:

- no T connection needed
- M12 and M8 standard connector
- separate supply line
(recommended to be used with the programmer)
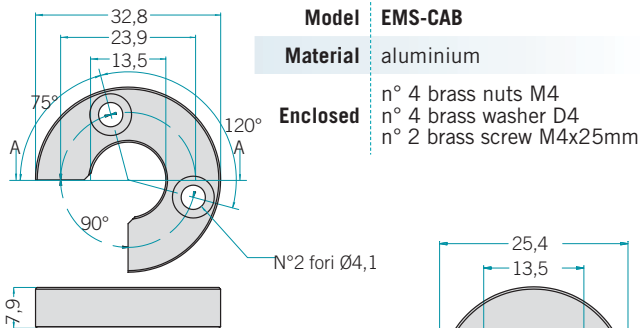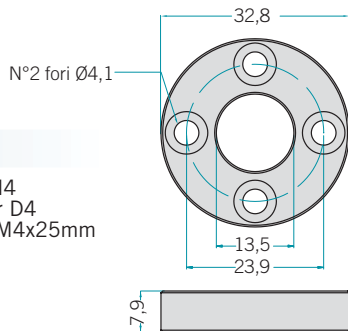
* GSD's file available on **www.eltra.it**

ACCESSORIES

FOR MAGNETOSTRICTIVE ROD TRANSDUCERS

Floating cursor
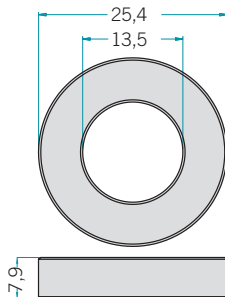
Model	EMS-CAA
Material	aluminium
Enclosed	n° 8 brass nuts M4 n° 8 brass washer D4 n° 4 brass screw M4x25mm

32,8
N°2 fori Ø4,1
13,5
23,9
7,9

Model	EMS-CAB
Material	aluminium
Enclosed	n° 4 brass nuts M4 n° 4 brass washer D4 n° 2 brass screw M4x25mm

32,8
23,9
13,5
75°
120°
A A
90°
N°2 fori Ø4,1
7,9

25,4
13,5
7,9

Model	EMS-CAC
Material	alluminium

Esagonal cable gland

CH 27
A
9
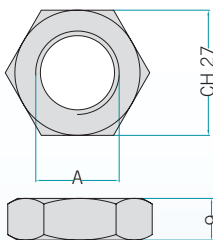
Model	EMS-CD01	EMS-CD02
Thread (A)	M18x1,5mm	3/4"-16UNF
Material	Steel AISI 316	Steel AISI 316

Nut for floating cursor

7,2
10,5
22
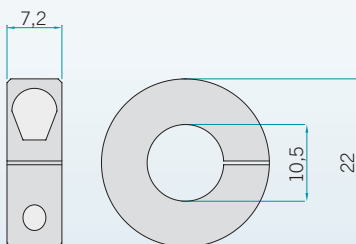
Model	EMS-FG01
Material	steel AISI 316
Enclosed	n° 1 washer AISI 316 D3 n° 1 screw AISI 316 M 3x8 mm

Connectors
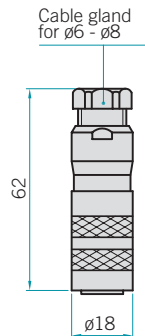
Cable gland for ø6 - ø8
62
ø18

EMS-CO6FV (IP67)
6 contacts
female floating connector

Cable gland for ø3,5 - ø5
ca. 36
ca. 32
ø11,6

M04FV (IP67)
4 contacts
female floating connector

Cable gland for ø4 - ø9
65
M12x1
ø20
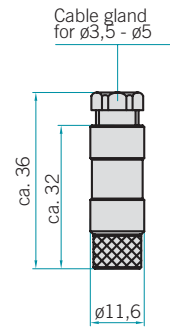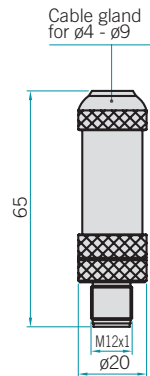
M05MV (IP67)
5 contacts male
floating connector B-Coding

Cable gland for ø4 - ø9
60
ø20
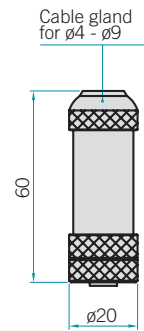
M05FV (IP67)
5 contacts female
floating connector B-Coding

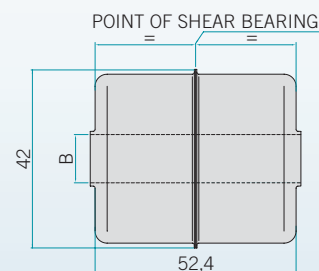| Model	
EMS-CO6FV	for 6 cont. output (M16)
Only for EMSSP	
EMS-M04FV	for 4 cont. output (M8)
EMS-M05MV	for 5 cont. output (M12)
EMS-M05FV	for 4 cont. output (M12)

Floating cursors

Model	EMS-CAG12	EMS-CAG15
Diam. (B)	12 mm	15 mm
Material	steel AISI 316	steel AISI 316

POINT OF SHEAR BEARING
=   =
42
B
52,4

Installation and operation precaution

The transducer must be used with respect to its specifications. Linear potentiometers and magnetostrictive transducers are measuring systems and not safety devices.

Assembling and installing personnel must be qualified and carefully follow instructions of technical manual.

Don't expose the device to stress or impacts in order to ensure the correct working otherwise the warranty expires.

Make sure that environment of use is free of corrosive agents (acids,etc...) or substances that are not compatible with the device.

Check the ground connection of the device if it is not possible to provide additional external connection.

Before putting it in operation, verify the voltage range applicable to the device and protect it from exceeding the stated technical specifications.

Connect power supply and signals cables in order to avoid capacitive or inductive interferences that may cause malfunction of the device.

Cable wiring must be carried out in a POWER-OFF condition.

For safety reasons, we strongly recommend to avoid any mechanical or electrical modification. In that case, they will void the warranty.

INSTALLATION PRECAUTION FOR MAGNETOSTRICTIVE TRANSDUCER

• For a correct installation of the transducer, please use brackets and insulated buckles supplied with the package. Installation of the transducer within areas with heavy magnetic fields is strongly not recommended.

• Please note these transducer are based on the magnetostrictive principle so they can be affected from external magnetic field.

• If the transducer is used vertically under water please install it with the connector side on the bottom.

Notes about warranty terms

Replacements or repairs whether under the warranty or at the customer's expense must be performed in the service departement of Eltra Spa or by explicitly authorized personnel. Before sending material for reparing, you must obtain an RMA number from our sales office. During the repair process in our service departement, Eltra Spa will authorized to remove all parts that the customer added to product. Any malfunction due to a failure to observe these usage and installation precautions will lead to the warranty voiding. Repairs will not extend the product warranty. We also exclude compensation for any type of damage or injiury due to the use, of the transducer. Note: for additional information, refer to the terms on our website, www.eltra.it, or call our office.

INSTALLATION AND OPERATION PRECAUTIONS

NOTES