

Data Sheet for Linear Sensors

Magnetic (magnetostrictive) linear transducer with analogue output

Series HMA



With float - accessories!
Not included in the
delivery

The displacement transducers of the HMA series are designed for hydraulic applications.

- High protection class IP67 and 350 bar operating pressure
- With external cursor - encapsulation of the sensor element
- Mounting via external flange
- Measuring strokes from 50 mm to 4000 mm

The sensors are designed for an operating pressure of 350 bar with peak values of 500 bar. The distance measurement takes place via an external cursor.

Electrical Data

Effective electrical travel 1.)	50 / 100 / 130 / 150 / 200 / 225 / 300 / 400 / 450 / 500 / 600 / 700 / 750 / 800 / 900 / 1000 / 1250 / 1500 / 1750 / 2000 / 2250 / 2500 / 2750 / 3000 / 3250 / 3500 / 3750 / 4000	
Independent linearity (best straight line) 1.)	≤ ±0,02% (Min. ± 0,060 mm)	
Output signal	0..10 V	4..20 mA / 0..20 mA
Theoretical resolution 1.)	16 bit (max. 5 mVpp)	
Backlash (Hysteresis) 1.)	< 0,01 mm	
Update rate	0,5 ms (50..300 mm) / 1 ms (400..1000 mm) / 1,5 ms (1250..2000 mm) / 2 ms (2250..3000 mm) / 3 ms (3250..4000 mm)	
Supply voltage	24 V ±20 %	
Power consumption (no load)	≤70 mA	≤90 mA
Output load	≥ 5 kOhm	< 500 Ohm
Power ripple	< 5mVpp	
Output value	≤ 12 V	≤ 30 mA
Alarm output value	10,5 V	21 mA
Insulation voltage 1.)	500 V (Suppressor diode 30V 0,4J mounted against voltage spikes)	
Reverse polarity protection / overvoltage protection / protection against power supply at the output:	Yes	

Mechanical Data, Environmental Conditions, Miscellaneous

Mechanical stroke 1.)	50 / 100 / 130 / 150 / 200 / 225 / 300 / 400 / 450 / 500 / 600 / 700 / 750 / 800 / 900 / 1000 / 1250 / 1500 / 1750 / 2000 / 2250 / 2500 / 2750 / 3000 / 3250 / 3500 / 3750 / 4000
Lifetime (90% effective electrical travel) 2.)	Mechanically almost unlimited
Max. operational speed	< 10 m/s
Max. acceleration	≤ 100 m/s ²
Operational temperature	-30..+75°C
Storage temperature	-40..+100°C
Protection grade (IEC60529)	IP67

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Mechanical Data, Environmental Conditions, Miscellaneous

Vibration (IEC 68-2-6, Test Fc)	12 g
Shock (IEC 68-2-27, Test Ea)	100 g, halvesine, 11 ms
Housing length:	50 / 100 / 130 / 150 / 200 / 225 / 300 / 400 / 450 / 500 / 600 / 700 / 750 / 800 / 900 /
Versions ≤ 1000 mm +178,2 mm	1000 / 1250 / 1500 / 1750 / 2000 / 2250 / 2500 / 2750 / 3000 / 3250 / 3500 / 3750 /
Versions > 1000 mm +183,2 mm	4000
Mounting parts (included in delivery)	None
Cursor	Not included in delivery
Material housing	Stainless steel AISI 316
Material push rod	Plastic (optional stainless steel AISI 316)
Electrical connection	5 pole plug / 6 pole plug
Sensor mounting	External flange

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

Accessories (not included in delivery):

For 5 pole connector M12:

- Mating connector (STEM12) #125482: M12 thread, 5-pole, IP67, straight, shieldable (IP67 STE M12 5POL IP67 G S)
- Mating connector (STEM12) #125483: M12 thread, 5-pole, IP67, angled, shielded (STE M12 5POL IP67 W GS)
- Mating connector with cable (STKM12) #127287: M12 thread, 5-pole, IP67, straight, shielded, 2 m (STK M12 5POL IP67 G GS 2M AWG24)
- Mating connector with cable (STKM12) #127665: M12 thread, 5-pole, IP67, angled, shielded, 5 m (STK M12 5POL IP67 W GS 5M AWG24)

For 6 pole connector M16:

- Mating connector (STEM16) #118645: M16 thread, 6-pole, IP67, straight, shieldable (STE M16 6POL IP67 G S)
- Mating connector (STEM16) #118646: M16 thread, 6-pole, IP67, angled, shieldable (STE M16 6POL IP67 W S)

More connectors with cable on request. Take a look at data sheet STEM for connector without cable, STKM for connector with cable.

Additional accessories:

- Free cursor type 22P closed #118647: Take a look at drawing
- Free cursor type 23P open #118648: Take a look at drawing
- Free cursor type 24P without mounting holes #118649: Take a look at drawing
- Float type PS42 #125484: Take a look at drawing
- Float type PS43 on request: Take a look at drawing

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Order Code

Description		Selection: standard=black/bold, possible options=grey/cursive					
Series:	HMA						
Operating mode analog		A					
Effective electrical travel:							
<i>Option 50 mm</i>			<i>50</i>				
100 mm			100				
<i>Option 130 mm</i>			<i>130</i>				
150 mm			150				
200 mm			200				
<i>Option 225 mm</i>			<i>225</i>				
<i>Option 300 mm</i>			<i>300</i>				
<i>Option 400 mm</i>			<i>400</i>				
<i>Option 450 mm</i>			<i>450</i>				
500 mm			500				
<i>Option 600 mm</i>			<i>600</i>				
<i>Option 700 mm</i>			<i>700</i>				
<i>Option 750 mm</i>			<i>750</i>				
<i>Option 800 mm</i>			<i>800</i>				
<i>Option 900 mm</i>			<i>900</i>				
1000 mm			1000				
<i>Option 1250 mm</i>			<i>1250</i>				
<i>Option 1500 mm</i>			<i>1500</i>				
<i>Option 1750 mm</i>			<i>1750</i>				
<i>Option 2000 mm</i>			<i>2000</i>				
<i>Option 2250 mm</i>			<i>2250</i>				
<i>Option 2500 mm</i>			<i>2500</i>				
<i>Option 2750 mm</i>			<i>2750</i>				
<i>Option 3000 mm</i>			<i>3000</i>				
<i>Option 3250 mm</i>			<i>3250</i>				
<i>Option 3500 mm</i>			<i>3500</i>				
<i>Option 3750 mm</i>			<i>3750</i>				
<i>Option 4000 mm</i>			<i>4000</i>				
Electrical connection:							
5 pole plug				S5			
6 pole plug				S6			
Round cable 1 m				K			
<i>Option cable length in m (x,xx)</i>				<i>Kx,xx</i>			
Output signal:							
0..10 V					2410		
0..20 mA					2420		
4..20 mA					2442		
Design flange:							
M18x1,5						M	
3/4"						I	

Data Sheet for Linear Sensors

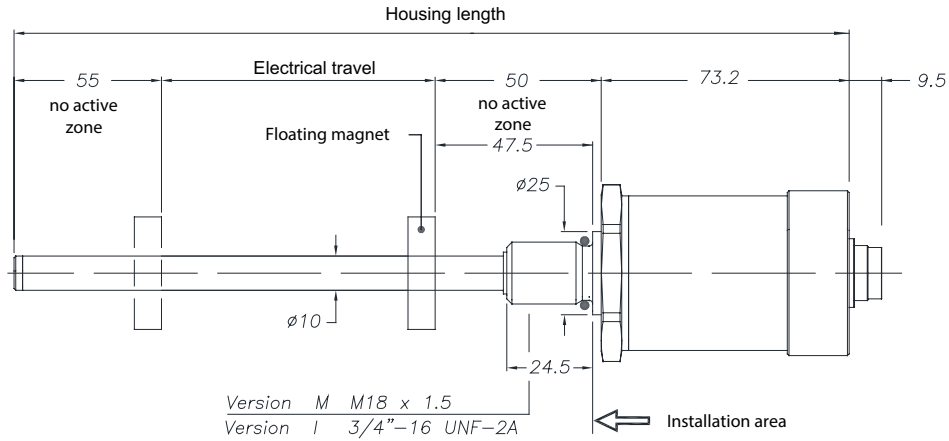


Magnetic (magnetostrictive) linear transducer with analogue output

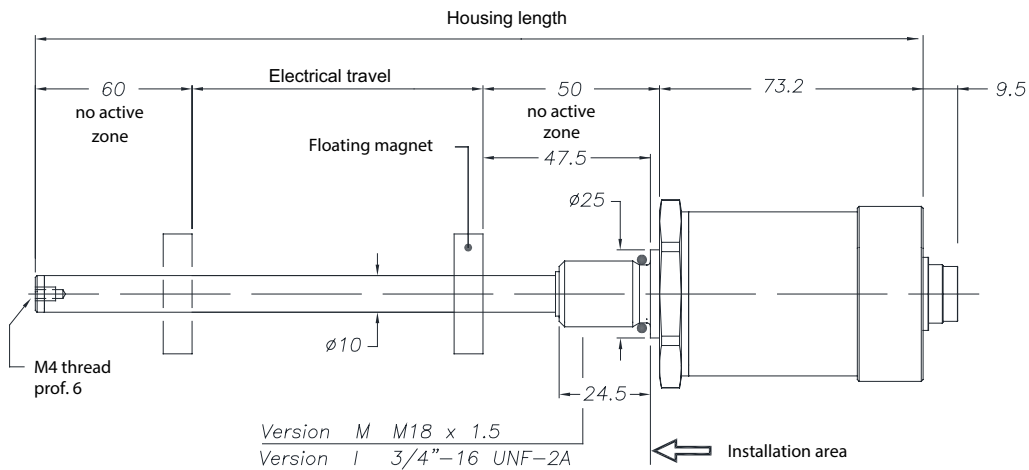
Series HMA

Drawing

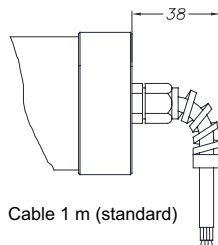
Strokes from 50 to 1000 mm



Strokes from 1250 to 4000 mm

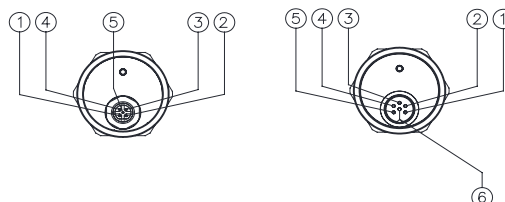
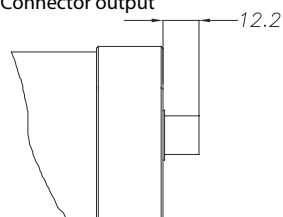


Cable output



Connection			
Color of cable	5 pole connector	6 pole connector	Function
Grey	1	1	Output 1 position (0..10 V / 4..20 mA / 0..20 mA)
Pink	2	2	Output 1 GND
Yellow	3	3	Output 2 inverse position (10..0 V / 20..4 mA / 20..0 mA)
Green	2	4	Output 2 GND
Brown	5	5	Power supply +
White	4	6	Power supply GND

Connector output



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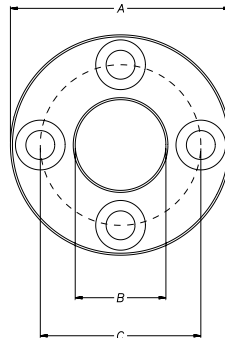
Drawing Cursor

Magnetic cursor P22, P23, P24

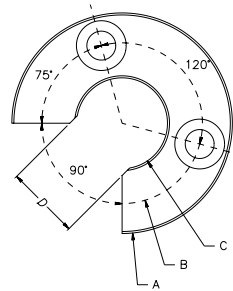
Dimensions	P22	P23	P24
A	32,8	32,8	25,4
B	13,5	13,5	13,5
C	23,9	23,9	-
D	-	11	-
Thickness	7,9	32,8	32,8

Included in order of cursor P22/23:
 Brass nuts M4
 Brass washers D4
 Brass screws M4x25

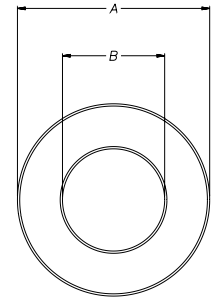
P22 closed type



P23 open type

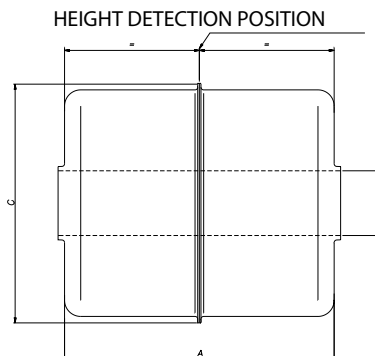


P24 without mounting holes

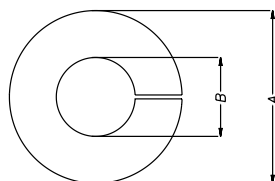
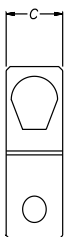


Magnetic cursor type for liquids PS42, PS43

Dimensions	PS42	PS43
Length A	52,4	52,4
Ø B	12	15
Ø C	44	44
Material	AISI 316	



Stopper included in order for liquid cursor PS42/43:

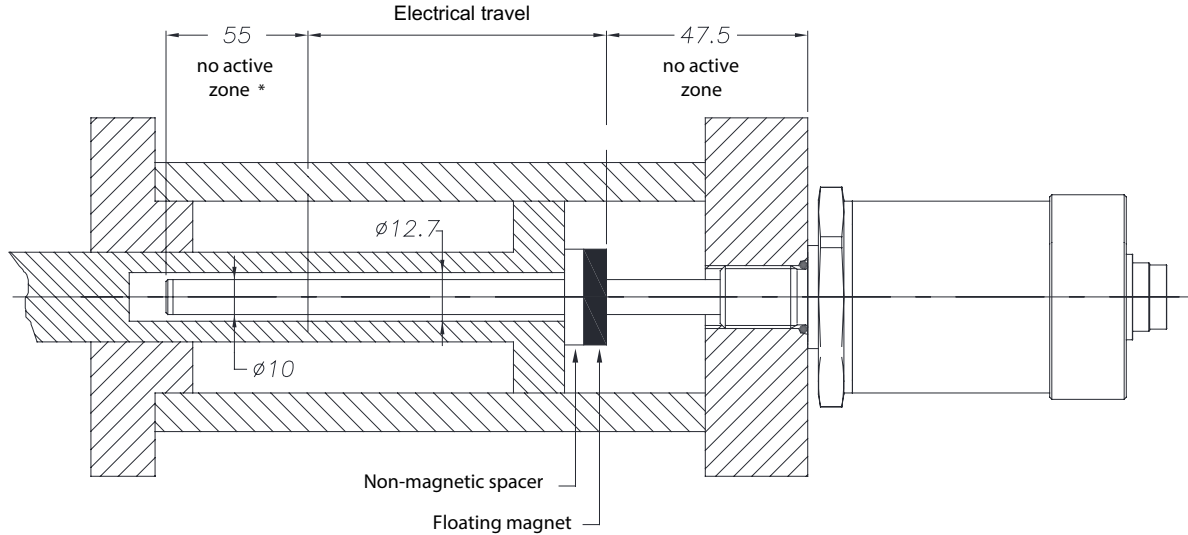


Dimensions
 Ø A = 22 mm
 Ø B = 10.5 mm
 C = 7.2 mm
 Height = 7.9 mm

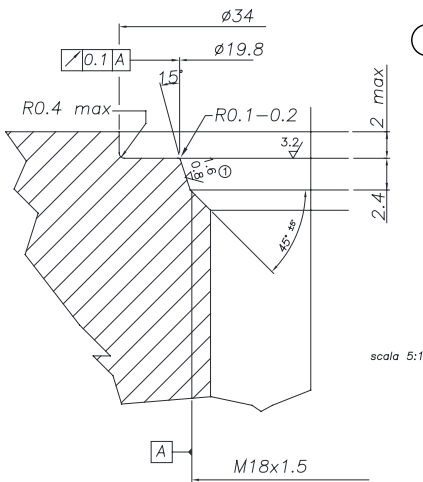
MATERIAL
 AISI 316

Delivery scope
 1 x Washer AISI316 D3
 1 x Screw AISI316 M3x8

Mounting

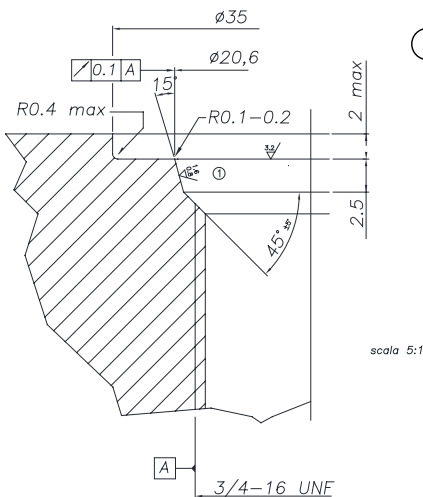
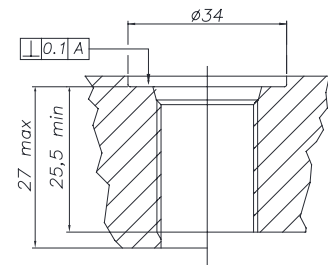


* for stroke up to 1000 mm (included) – over 1000 mm, the non-active zone becomes 60 mm because the tip includes a M4 threaded hole



- ① **THREAD M18x1,5**
 The 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:
 PARKER 6-349 15,4x2,1
 Material: Viton 90° Shore-A
 Mixes: PARKER N552-90



- ① **THREAD 3/4"-16UNF**
 The 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:
 PARKER 3-908 16,36x2,21
 Material: Viton 90° Shore-A
 Mixes: PARKER N552-90

