

## IK4S (with ONDA technology)

CONTACTLESS MAGNETOSTRICTIVE LINEAR POSITION  
TRANSDUCER (SYNCHRONOUS SERIAL OUTPUT)



### Main characteristics

- ONDA technology
- Optimized mechanical structure
- Strokes from 50 to 4000 mm
- Wide range of connectors for the electrical connection
- Rod, nipple, exagonal flange AISI 316
- Power supply 10...32 Vdc
- Resistance to vibration (DIN IEC68T2/6 12g)
- Protection IP67
- Work temperature: -30°...+90°C
- Synchronous Serial Interface direct to controllers
- Output data resolution available from 1 to 40µm
- Data format: binary or Gray code; incremental/decremental

Contactless linear position transducer with ONDA magnetostrictive technology with RS422-SSI digital output interface.

The absence of electrical contact on the cursor eliminates all wear and guarantees almost unlimited life.

The IK4 line's new mechanical structure offers improved features for in-cylinder use, including a series of new multi-connector models, free rotation of the connector head, and replacement of internal electronics without removal of the transducer.

### TECHNICAL DATA

Model	from 50 to 4000 mm
Measurement taken	Displacement
Position read sampling time (typical)	1 ms
Shock test DIN IEC68T2-27	100g - 11ms - single shock
Vibrations DIN IEC68T2-6	12g / 10...2000Hz
Displacement speed	≤ 10 m/s
Max acceleration	≤ 100 m/s <sup>2</sup> displacement
Output data resolution available	1,2,5,10,20,40 µm
Cursor (see note)	Floating magnet
Working temperature	-30...+90°C
Storage temperature	-40...+100°C
Coefficient of temperature	20ppm F.S./°C
Protection	IP67
Operative pressure	350 bar (pic max. 500 bar)

### ELECTRICAL DATA

Output signal	Synchronous Serial (SSI); Binary/Gray; Incremental/Decremental
Data length	24 - 25 bit
Nominal power supply	10... 32 Vdc
Max. power ripple	1Vpp
Max. input	50mA
Output load	RS422/485 standard
Electrical isolation	500 V (*) (D.C. supply / earth)
Protection against polarity inversion	Yes
Protection against overvoltage	Yes
Self-resetting internal fuse	Yes

(\*) it includes a 50V 2J voltage suppressor

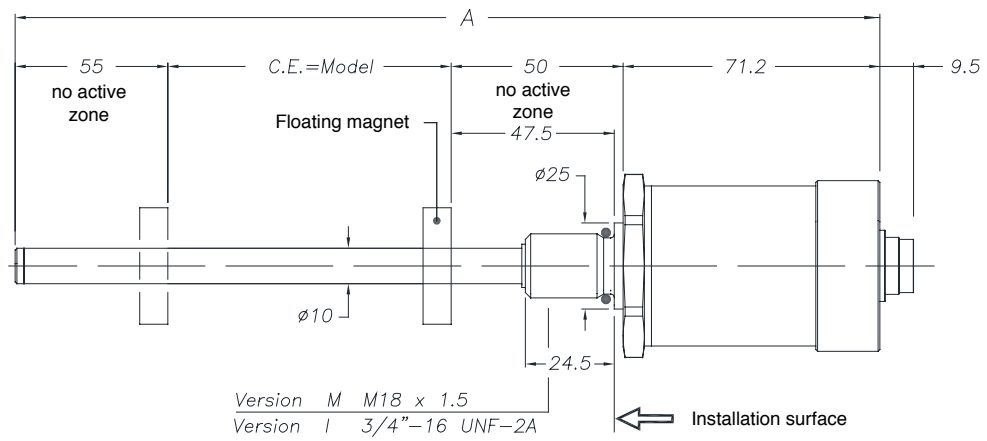
Note: For multi-cursor versions, the cursors have to work under the same distance and temperature conditions

### ELECTRICAL / MECHANICAL DATA

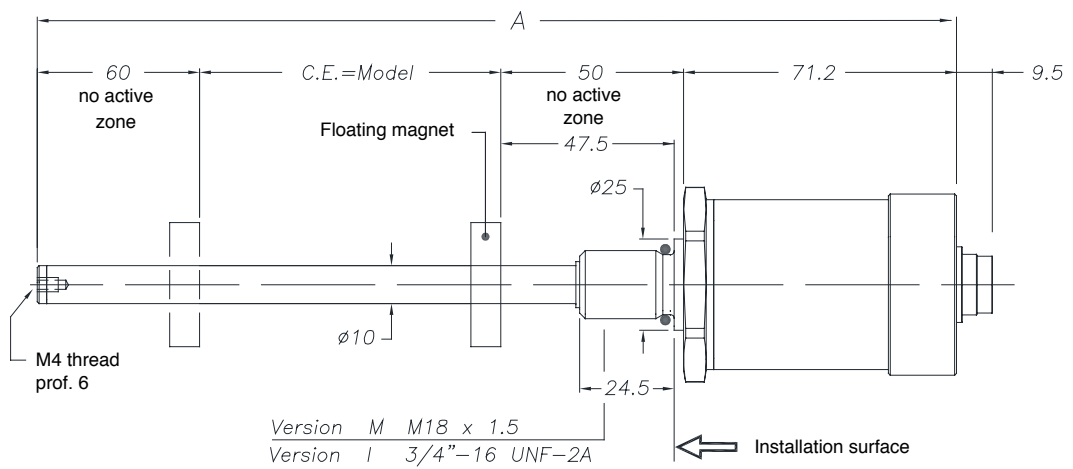
Model		50	75	100	130	150	175	200	225	250	300	350	360	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200	1250	1300	1400	1500			
																						1750	2000	2250	2500	2750	3000	3250	3500	3750	4000				
Electrical stroke (E.S)	mm	Model																																	
Independent linearity	± %F.S.	≤ ± 0,02 %FS (min ± 0,060mm)																																	
Max. dimensions (A)	mm	Model + 154 mm																																	
Repeatability	mm	< 0,01 (limited by the resolution of the output value)																																	
Hysteresis		< ± 0,005% FS (min 0,010 mm)																																	
Sampling time	ms	1 (for stroke from 1000) 2 (for stroke from 1100 to 2000) 4 (for stroke >2000)																																	

## MECHANICAL DIMENSIONS

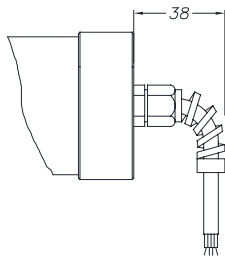
Strokes from 50 to 1000 mm



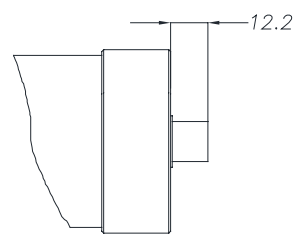
Strokes from 1250 to 4000 mm



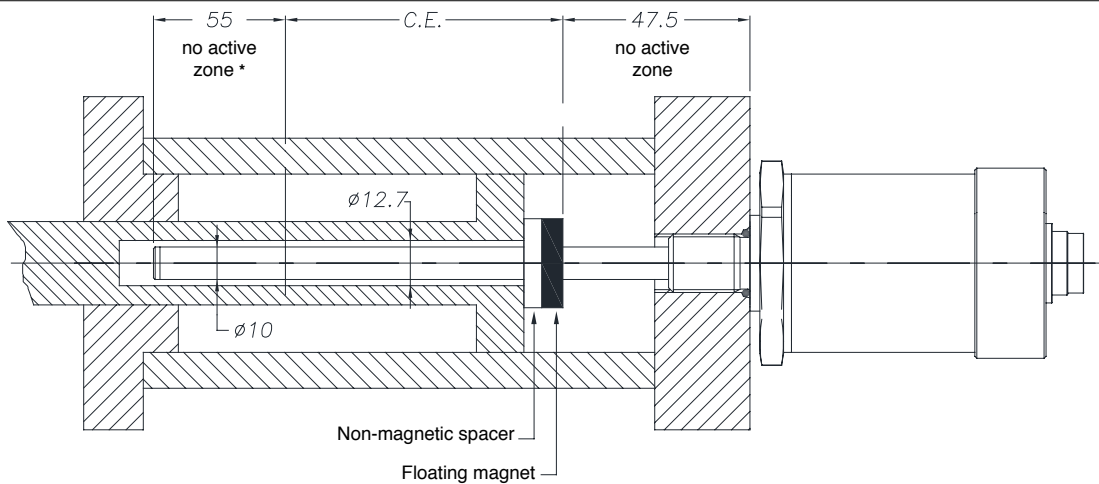
IK4-S-F/R cable output



IK4-S-B/D connector output

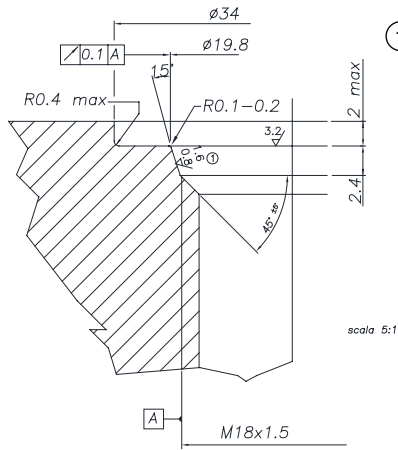


## MOUNTING INSIDE A CYLINDER



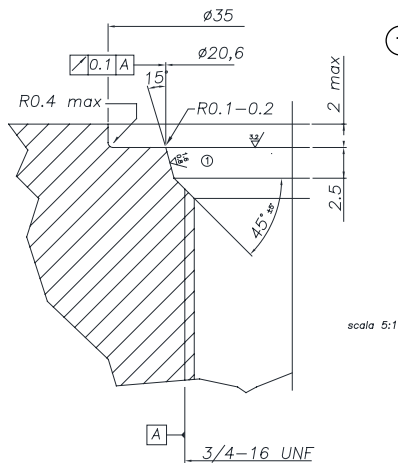
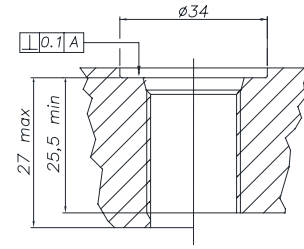
\* for stroke up to 1000 mm (included) – over 1000 mm, the non-active zone becomes 60 mm because the tip includes a M4 threaded hole

## INSTALLATION INSIDE A CYLINDER



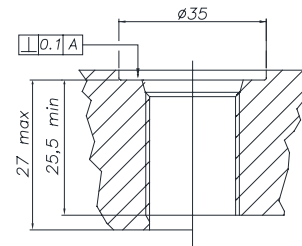
- ① **THREAD M18x1,5**  
 The sealing surface must be free from scratches longitudinal or spiral  
 Ro 1.6  $\mu\text{m}$  for sealing with NON-pulsating pressure  
 Ro 0.8  $\mu\text{m}$  for seals with pulsating pressure

**Suggested o-ring:**  
 PARKER 6-349 15,4x2,1  
 Material: Viton 90° Shore-A  
 Mixes: PARKER N552-90



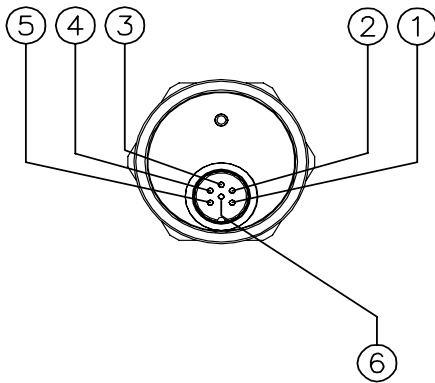
- ① **THREAD 3/4"-16UNF**  
 The sealing surface must be free from scratches longitudinal or spiral  
 Ro 1.6  $\mu\text{m}$  for sealing with NON-pulsating pressure  
 Ro 0.8  $\mu\text{m}$  for seals with pulsating pressure

**Suggested o-ring:**  
 PARKER 3-908 16,36x2,21  
 Material: Viton 90° Shore-A  
 Mixes: PARKER N552-90

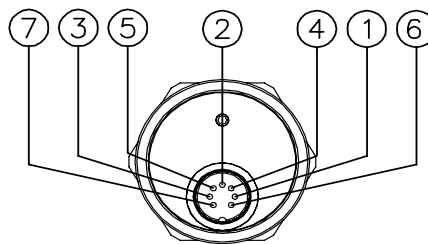


## ELECTRICAL CONNECTIONS

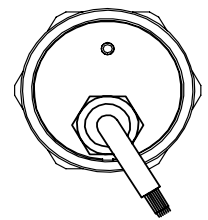
OUTPUT IK4S B



OUTPUT IK4S D

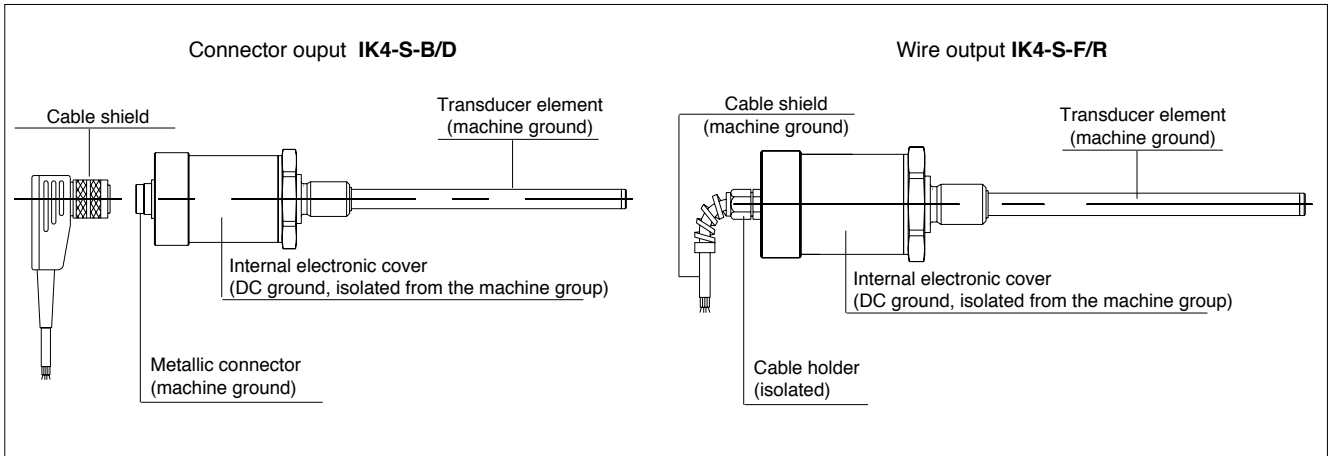


OUTPUT IK4S F/R



Function	IK4S B	IK4S D	IK4S F	IK4S R
	6-pin M16	7-pin M16	Cable output	PUR cable output
Data -	1	1	Orange	Pink
Data +	2	2	Orange / White	Blue
Clock +	3	3	Green / White	Gray
Clock -	4	4	Green	Yellow
Power supply +	5	5	Blue / White	Green
Power supply GND	6	6	Blue	Brown
n.c.	-	7	-	-
n.c.	-	-	-	-

# GROUNDING IK4



# ORDER CODE

**Position transducer** I K 4 S B            

SSI digital output	<b>S</b>
--------------------	----------

Connector	
DIN45322 6-pin connector output	<b>B</b>
DIN45322 7-pin connector output	<b>D</b>
<i>Available on request</i>	
Cable output PVC 6-pin (1 meter)	<b>F</b>
Cable output PUR high flexibility 7-pin 7x0,14	<b>R</b>

Model	
-------	--

Output	
Binary data code output	<b>B</b>
Gray data code output	<b>G</b>

Data length	
Data length 24 bit	<b>3</b>
Data length 25 bit	<b>4</b>
Data length 21+1 bit (FM357)	<b>5</b>

Data resolution	
0.002 mm	<b>0</b>
0.005 mm (standard)	<b>1</b>
0.010 mm	<b>2</b>
0.020 mm	<b>3</b>
0.040 mm	<b>4</b>
0.001 mm	<b>5</b>

Scale orientation	
Ascending (standard)	<b>1</b>
Descending	<b>2</b>
Ascending (over sampling refresh output 4 KHz)	<b>4</b>

Thread	
M18x1,5 (standard)	<b>M</b>
3/4" 16UNF	<b>I</b>

Outputs	
Output B	<b>00</b>
F-R outputs cables length	
1 meter (standard)	<b>00</b>
2 meters	<b>02</b>
3 meters	<b>03</b>
4 meters	<b>04</b>
5 meters	<b>05</b>
10 meters	<b>10</b>
15 meters	<b>15</b>

Mechanical and/or electrical characteristics differing from those in the standard version may be arranged on request

- ▶ **Included in the supply**
  - Series IK position transducer
  - OR 15.4x2.1 thread M18x1.5 code: **GUA064**
  - OR 16.36x2.21 thread 3/4" - 16 UNF code: **GUA065**

▶ **Magnetic cursors must be ordered separately**

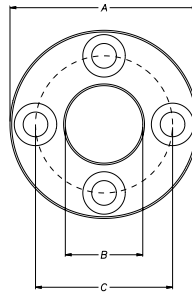
**Ex.: IK4-S-B-0400-B-3 000011XXX00M0XX**  
 Transducer model IK4, SSI output, connector B, model 400mm, thread M18x1,5, binary data code output, data length 24 bit, system resolution 0.005mm, scale orientation ascending.

## FLOATING CURSOR

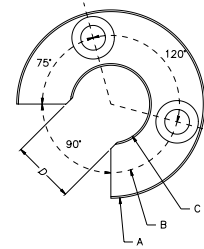


Cursors	
Cursor Diameter 32.8	<b>022</b>
Cursor Diameter 32.8 with 90° slit	<b>023</b>
Cursor Diameter 25.4	<b>024</b>
Floating cursor for liquids with hole diameter 12	<b>026</b>
Floating cursor for liquids with hole diameter 15	<b>027</b>

**PCUR022**



**PCUR023**

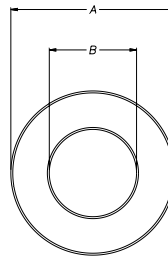


The **PCUR022** is supplied with: The **PCUR023** is supplied with:

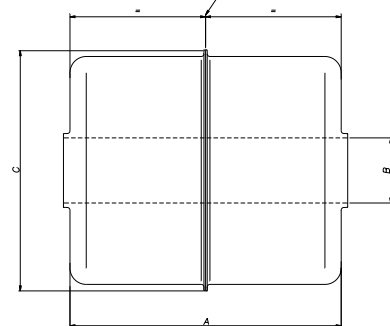
N° 8 Brass nuts M4                      N° 4 Brass nuts M4  
 N° 8 Brass washers D4                N° 4 Brass washers D4  
 N° 4 Brass screws M4x25              N° 2 Brass screws M4x25

Dimensions	A	B	C	Thickness
PCUR022	32.8	13.5	23.9	7.9
PCUR023				
PCUR024	25.4	13.5	-	

**PCUR024**



HEIGHT DETECTION POSITION



Model		PCUR026	PCUR027
Length A	mm	52.4	
Diameter B (hole)	mm	12	15
Diameter C	mm	42	
Material		AISI 316	

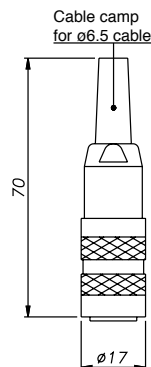
**Note:**  
**PCUR026** and **PCUR027** is supplied with kit **PKIT036** for Floating cursor for liquids.

## OPTIONAL CONNECTORS

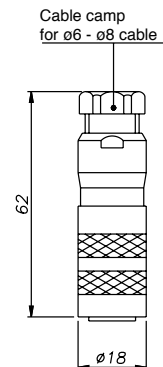
For **IK4-S-B** M16 thread connector

Codes: **CON021** 6-pin  
**CON022** 6-pin  
**CON023** 6-pin

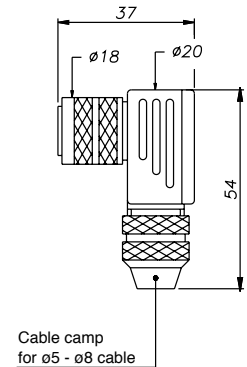
Connector extraction length: 10mm



**CON021**  
 IP40 - EMC



**CON022**  
 IP67 - EMC



**CON023**  
 IP67 - EMC

Sensors are manufactured in compliance with:

- EMC 2004/108/CE compatibility directive
- RoHS 2002/95/CE directive

Electrical installation requirements and Conformity certificate are available on our web site: [www.gefran.com](http://www.gefran.com)

**GEFRAN spa** reserves the right to make aesthetic or functional changes at any time and without notice

**GEFRAN**

**GEFRAN spa**  
 via Sebina, 74  
 25050 PROVAGLIO D'ISEO (BS) - ITALIA  
 ph. 0309888.1 - fax. 0309839063  
<http://www.gefran.com>

DTS\_IK4S-ONDA\_09-2013\_ENG