



### Main characteristics

- Optimized mechanical structure
- Strokes from 50 to 4000 mm
- Wide range of connectors for the electrical connection
- Rod, nipple, exagonal flange AISI 316
- Work temperature: -30°...+85°C
- Resistance to vibrations (DIN IEC68T2/6 15g)
- Power supply 24Vdc ± 20%
- Protection IP67
- Electromagnetic compatibility EMC 2014/30/EU
- Compliant to the directive RoHS 2011/65/EU

Contactless linear position transducer with HYPERWAVE magnetostriuctive technology.

The analog interface, available with various output ranges in voltage or in current, guarantees simpler installation and easier adaptation to existing systems.

Housing closure with removable ring nut to allow the whole electronics and sensing element replacement.

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

High accuracy of the measurement with reference to the non linearity, repeatability and hysteresis. High resistance to vibrations, mechanical shocks for use in a harsh industrial environment.



This symbol present on the product label stands for further indications on product manual. For correct and safe installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual.

The complete manual is available for download from the website [www.gefran.com](http://www.gefran.com)  
UL file number E216851

### TECHNICAL DATA

|                                       |   |
|---------------------------------------|---|
| Model                                 | from 50 to 4000 mm                        |
| Measurements                          | displacement                              |
| Position read sampling time (typical) | From 0,5 ms to 3 ms (depending on stroke) |
| Shock test DIN IEC68T2-27             | 100g - 11ms - single shock                |
| Vibration DIN IEC68T2-6               | 15g / 10...2000Hz                         |
| Displacement speed                    | ≤ 10 m/s                                  |
| Max. acceleration                     | ≤ 100 m/s <sup>2</sup> displacement       |
| Resolution                            | 16 bit (max noise 5 mVpp)                 |
| Cursor                                | Floating separate cursor                  |
| Working temperature (*)               | -30...+85°C                               |
| Storage temperature                   | -40...+100°C                              |
| Coefficient of temperature            | ≤ 0,01% F.S./°C                           |
| Protection                            | IP67                                      |
| Operative pressure                    | 350 bar (peak max. 500 bar)               |

(\*) see possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

### ELECTRICAL DATA

|   |             |                              |
|---|-------------|------------------------------|
| Output signal                             | 0...10V (A) | 4...20mA (E)<br>0...20mA (G) |
| Nominal power supply                      | 24 Vdc ±20% | 24 Vdc ±20%                  |
| Max. power ripple                         | 1Vpp        | 1Vpp                         |
| Max. consumption (**)                     | 70mA        | 90mA                         |
| Load on output                            | 5kΩ         | < 500Ω                       |
| Max. output noise                         | < 5mVpp     | < 5mVpp                      |
| Max. output value                         | 12V         | 30mA                         |
| Alarm output value                        | 10.5V       | 21mA                         |
| Electrical isolation                      | 500V (*)    | 500V (*)                     |
| Protection against polarity inversion     | Yes         | Yes                          |
| Protection against overvoltage            | Yes         | Yes                          |
| Protection against power supply on output | Yes         | Yes                          |

(\*) Using voltage suppressor 30V 0,4J

(\*\*) The devices must be supplied with a Class 2 Power Supply (as for NEC) or LPS Power Supply (as for EN 60950).

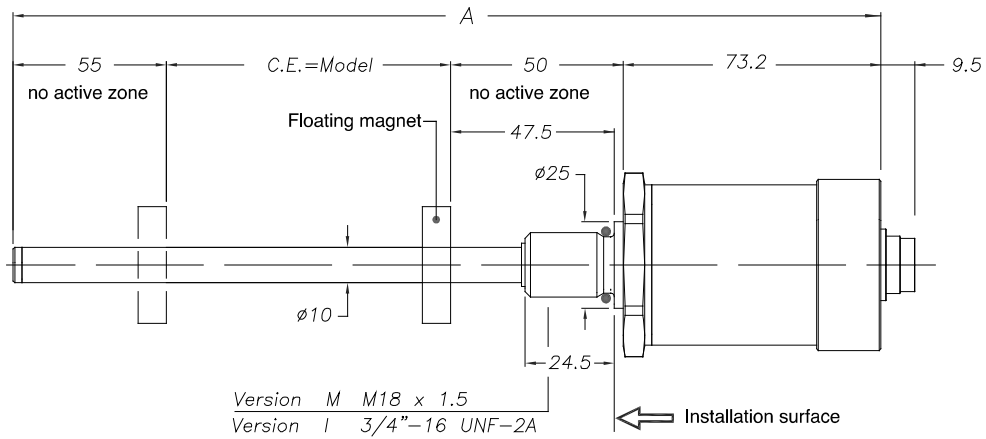
If devices are permanently connected to the machine it's requested an external switch or circuit breaker and external overcurrent protection.

### ELECTRICAL / MECHANICAL DATA

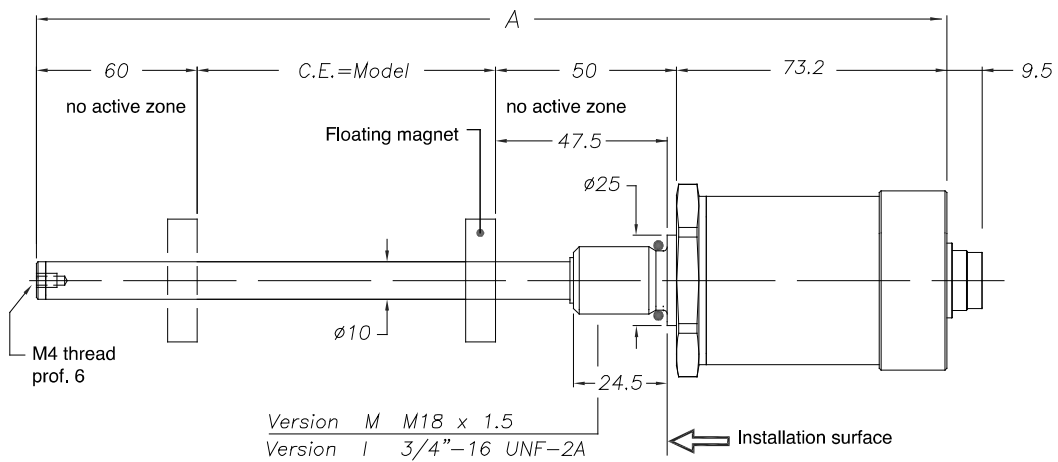
|                       |    |                               |     |     |     |     |      |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      |      |      |  |  |
|-----------------------|----|-------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|--------------|------|------|------|------|------|------|------|------|------|------|--|--|
| Model                 |    | 50                            | 100 | 130 | 150 | 200 | 400  | 450 | 500 | 600 | 700 | 750 | 800 | 900          | 1250 | 1500 | 1750 | 2000 | 2250 | 2500 | 2750 | 3000 | 3250 | 3500 |  |  |
|                       |    | 225                           | 300 |     |     |     | 1000 |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      | 3750 | 4000 |  |  |
| Sampling time         | ms | 0,5                           |     |     |     |     | 1    |     |     |     |     |     |     | 1,5          |      |      | 2    |      |      | 3    |      |      |      |      |  |  |
| Dimensions Max. (A)   | mm | Model +178,2                  |     |     |     |     |      |     |     |     |     |     |     | Model +183,2 |      |      |      |      |      |      |      |      |      |      |  |  |
| Electrical stroke     | mm | Model                         |     |     |     |     |      |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      |      |      |  |  |
| Independent linearity |    | ≤ ± 0,01% FS (min ± 0,060 mm) |     |     |     |     |      |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      |      |      |  |  |
| Repeatability         | mm | < 0,01                        |     |     |     |     |      |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      |      |      |  |  |
| Hysteresis            | mm | < 0,01                        |     |     |     |     |      |     |     |     |     |     |     |              |      |      |      |      |      |      |      |      |      |      |  |  |

## MECHANICAL DIMENSIONS

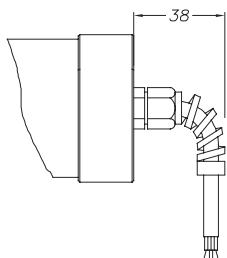
Strokes from 50 to 1000 mm



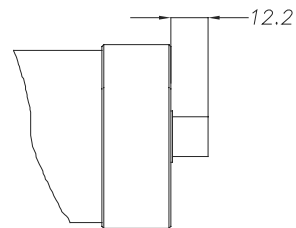
Strokes from 1100 to 4000 mm



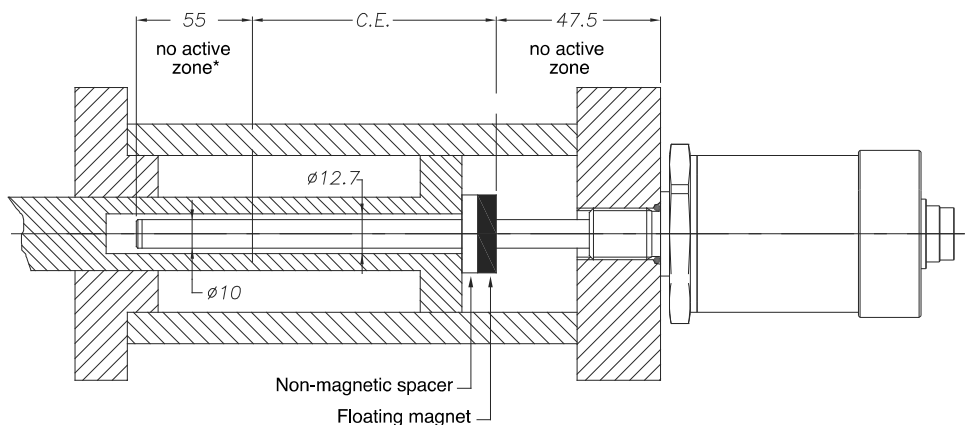
**WRA-A-F/R cable output**



**WRA-A-A/B/C/H connector output**

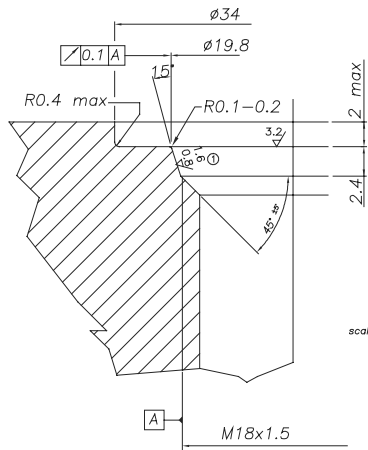


## MOUNTING INSIDE A CYLINDER



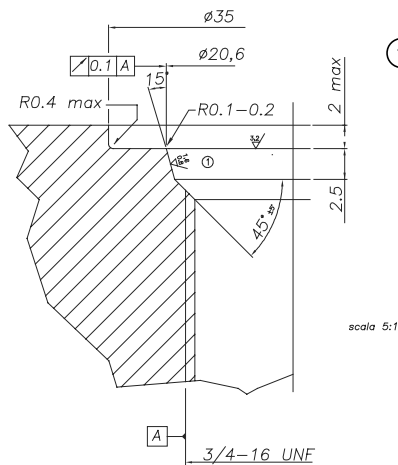
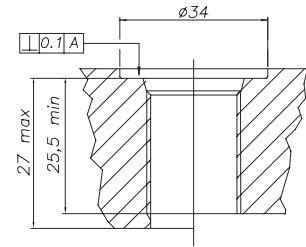
\* for stroke up to 1000 mm (included) – over 1000 mm, the non-active zone becomes 60 mm because the tip includes a M4 threaded hole

## INSTALLATION INSIDE A CYLINDER



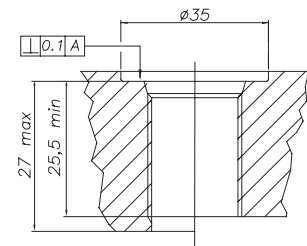
- ① **THREAD M18x1,5**  
 The sealing surface must be free from scratches longitudinal or spiral  
 Ro 1.6  $\mu\text{m}$  for sealing with NON-pulsating pressure  
 Ro 0.8  $\mu\text{m}$  for seals with pulsating pressure

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

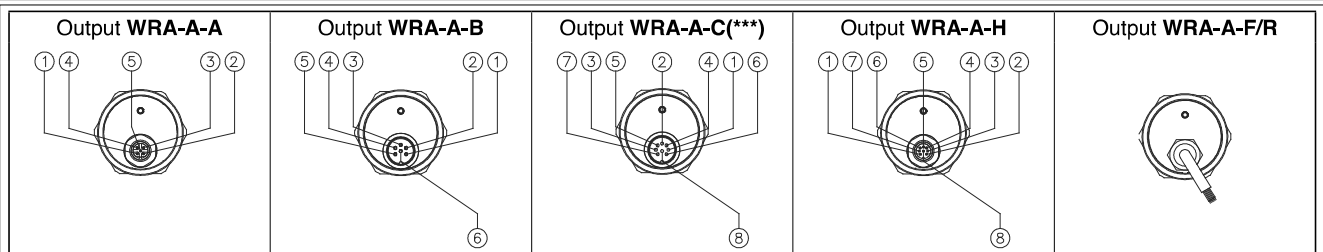


- ① **THREAD 3/4"-16UNF**  
 The sealing surface must be free from scratches longitudinal or spiral  
 Ro 1.6  $\mu\text{m}$  for sealing with NON-pulsating pressure  
 Ro 0.8  $\mu\text{m}$  for seals with pulsating pressure

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



## ELECTRICAL CONNECTIONS



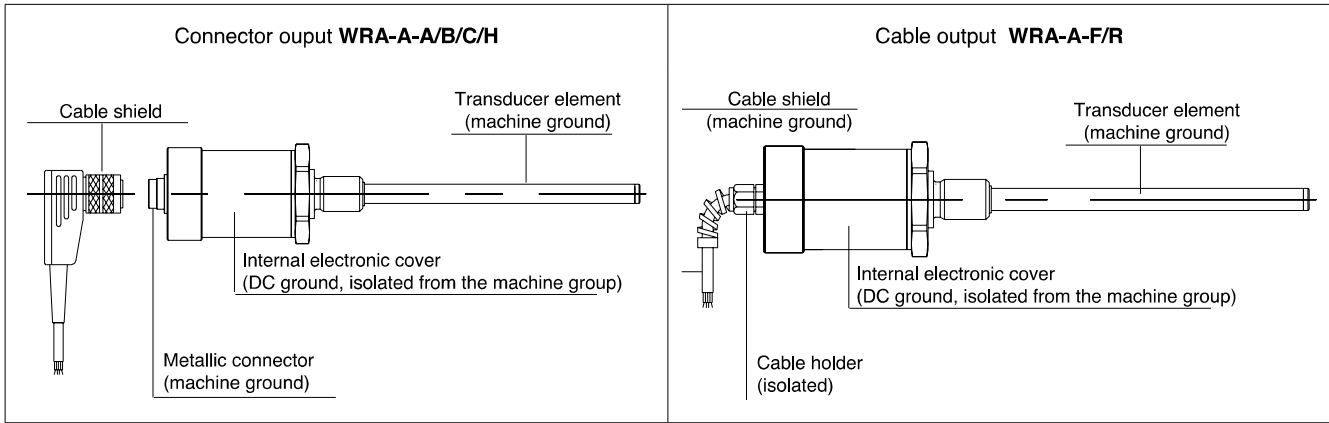
| Function  | CONNECTORS |           |           |           | CABLES                   | OPTIONAL CABLES                   |                                   |
|---|------------|-----------|-----------|-----------|--------------------------|-----------------------------------|-----------------------------------|
|   | WRA-A-A    | WRA-A-B   | WRA-A-C   | WRA-A-H   | WRA-A-F/R                | CAV00_                            | CAV01_/CAV02_                     |
|   | 5 pin M12  | 6 pin M16 | 8 pin M16 | 8 pin M12 | Standard cables          | Pre-assembled cable 8 pin WRA-A-H | Pre-assembled cable 5 pin WRA-A-A |
| <b>Output 1 (position)</b><br>0...10V<br>4...20mA<br>0...20mA         | 1          | 1         | 5 (1*)    | 5         | Grey                     | Green                             | Brown                             |
| <b>GND Output 1 (0V)</b>  | 2          | 2         | 2         | 1         | Pink                     | Yellow                            | White                             |
| <b>Output 2 (inverse position)</b><br>10...0V<br>20...4mA<br>20...0mA | 3          | 3         | 3         | 3         | Yellow                   | Pink                              | Blue                              |
| <b>GND Output 2 (0V)</b>  | 2          | 4         | 6         | 2         | Green                    | Grey                              | White                             |
| <b>Power supply +</b>   | 5          | 5         | 7         | 7         | Brown                    | Brown                             | Grey                              |
| <b>Power supply GND</b>   | 4          | 6         | 8         | 6         | White                    | Blue                              | Black                             |
| <b>n.c.</b>   | -          | -         | 4         | 4         | -                        | Red                               | -                                 |
| <b>n.c.</b>   | -          | -         | 1 (*5)    | 8         | -                        | White                             | -                                 |
| <b>Temperatura ratings **</b>   | -25+80 °C  | -30+85 °C | -30+85 °C | -30+85 °C | -30+80 °C /<br>-30+75 °C | -25+80 °C                         | -25+80 °C                         |

(\*) = per versione 4...20mA / 0...20mA

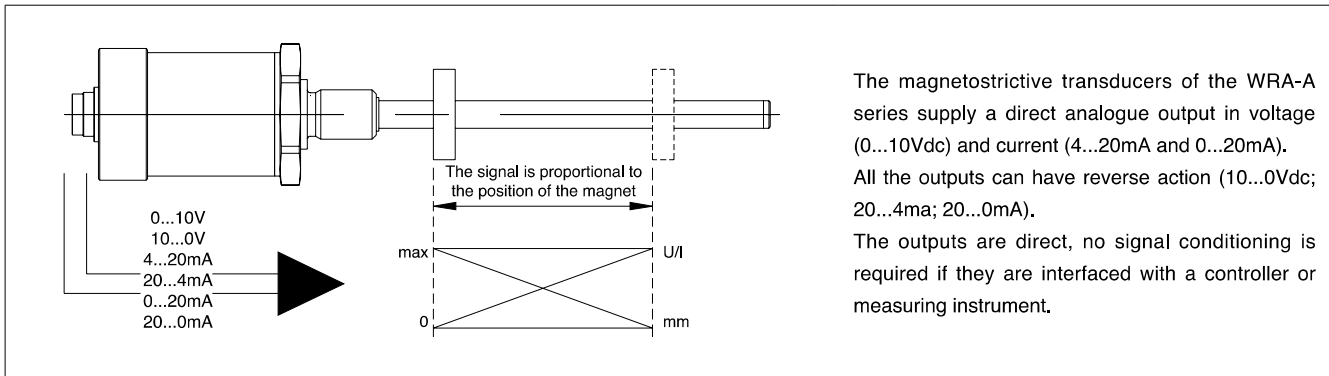
(\*\*) The operating temperature ranges, except where expressly indicated, are also applicable in the UL scope.

(\*\*\*) Not available with UL certification.

## GROUNDING WRA-A



## ANALOG OUTPUT



## ORDER CODE

**Position transducer**      W R A A      1      0 0 0 0 X X X X S      0 X X

**Output Connector**

|                                   |   |
|-----------------------------------|---|
| M12 5 pin output connector        | A |
| 6 pin DIN 45322 output connector  | B |
| 8 pin DIN 45326 output connector  | C |
| M12 8 pin output connector        | H |
| PVC output cable                  | F |
| PUR output cable high flexibility | R |

**MODEL**

**Output**

|                    |   |
|--------------------|---|
| 0...10, 10...0 Vcc | A |
| 4...20, 20...4 mA  | E |
| 0...20, 20...0 mA  | G |

**Cable lengths**

|                 |    |
|-----------------|----|
| Output F/R 1 mt | 00 |
| 2 mt            | 02 |
| 3 mt            | 03 |
| 4 mt            | 04 |
| 5 mt            | 05 |
| 10 mt           | 10 |
| 15 mt           | 15 |
| Output A/B/C/H  | 00 |

**Thread**

|                     |   |
|---------------------|---|
| M 18x1,5 (standard) | M |
| 3/4" - 16UNF        | I |

► **Included in the supply**

- Series WR position transducer
- OR 15,4 x 2,1 thread M18 x 1,5      cod: **GUA064**
- OR 16,36 x 2,21 thread 3/4" -16 UNF      cod: **GUA065**

► **Magnetic cursors must be ordered separately**

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

Ex.: **WRA-A-B-0400-A-1 0000XXXXS00M0XX**  
 Transducer model WRA-A, analog output, B connector, model 400mm, 0...10Vdc output, thread M18x1,5

## FLOATING CURSOR



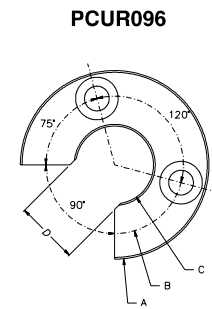
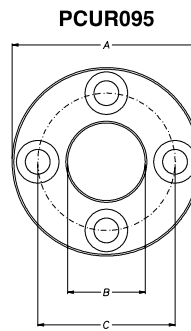
| Cursors   |            |
|---|------------|
| Cursor Diameter 32.8                              | <b>095</b> |
| Cursor Diameter 32.8 with 90° slit                | <b>096</b> |
| Cursor Diameter 25.4                              | <b>097</b> |
| Floating cursor for liquids with hole diameter 12 | <b>098</b> |

The **PCUR095** is supplied with:  
 N° 8 Brass nuts M4  
 N° 8 Brass washers D4  
 N° 4 Brass screws M4x25

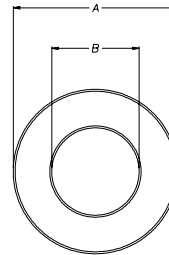
The **PCUR096** is supplied with:  
 N° 4 Brass nuts M4  
 N° 4 Brass washers D4  
 N° 2 Brass screws M4x25

| Dimensions | A    | B    | C    | D  | Thickness |
|------------|------|------|------|----|-----------|
| PCUR095    | 32.8 | 13.5 | 23.9 | -  | 7.9       |
| PCUR096    |      |      |      | 11 |           |
| PCUR097    | 25.4 | 13.5 |      | -  |           |

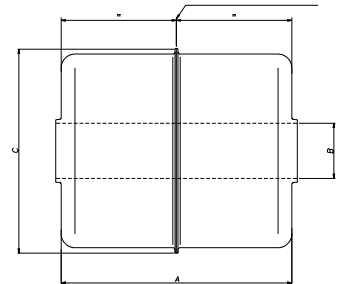
| Model             | PCUR098  |      |
|-------------------|----------|------|
| Length A          | mm       | 52.4 |
| Diameter B (hole) | mm       | 12   |
| Diameter C        | mm       | 44   |
| Material          | AISI 316 |      |



**PCUR097**



**HEIGHT DETECTION POSITION**



**Note:** PCUR098 is supplied with kit PKIT036 for floating cursor for liquids.

## OPTIONAL CONNECTORS

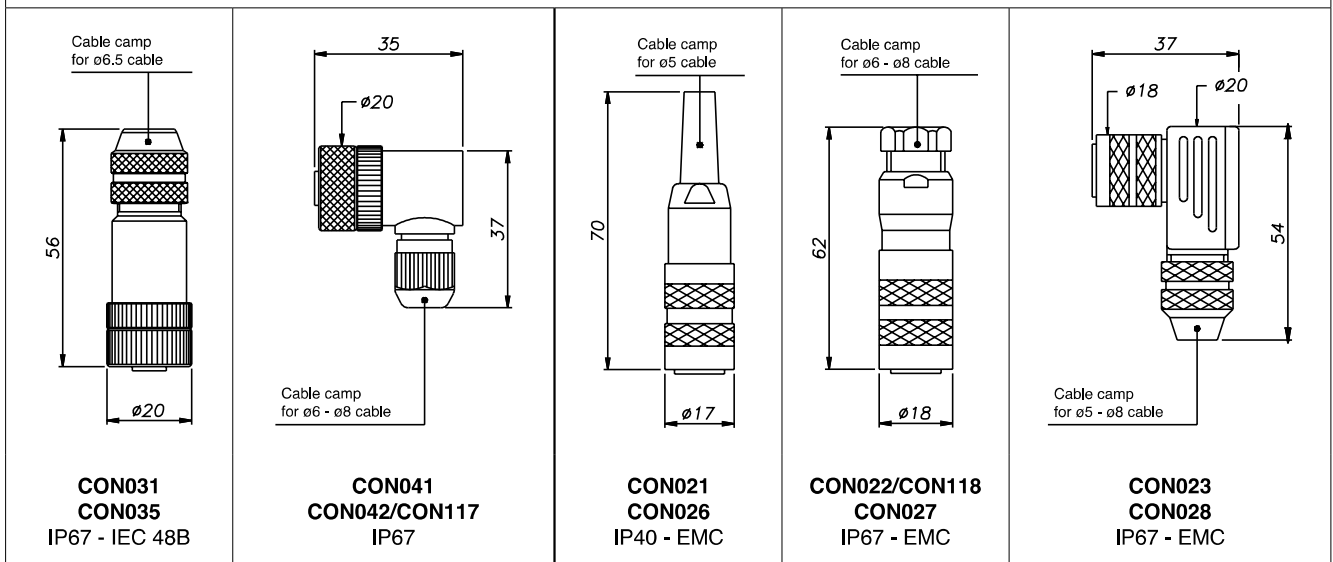
For **WRA-A-A** and **WRA-A-H**, M12 thread connector

CON031 and CON041 for 5 pin output (WRA-A-A)  
 CON035 and CON042\* for 8 pin output (WRA-A-H)  
 CON117 for 8 pin output (WRA-A-H)

For **WRA-A-B** and **WRA-A-C**, M16 thread connector

CON021, CON022\* and CON023 for 6 pin output (WRA-A-B)  
 CON026, CON027 and CON028 for 8 pin output (WRA-A-C)  
 CON118 for 6 pin output (WRA-A-B)

Connector extraction length 10mm



### Temperatura ratings

| CON031/CON035 | CON041    | CON042/CON117 | CON021/CON026 | CON022/CON018/CON027 | CON023/CON028 |
|---------------|-----------|---------------|---------------|----------------------|---------------|
| -30+85 °C     | -25+85 °C | -30+85 °C     | -30+85 °C     | -30+85 °C            | -30+85 °C     |

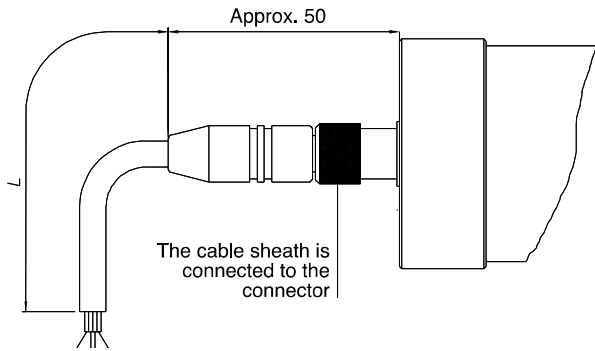
\* Not available with UL certification.

Note:

- The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
- I valori nominali di temperatura, eccetto dove espressamente indicato, sono da ritenersi applicabili anche in ambito UL
- Per i cavi di estensione delle applicazioni cULus, si consiglia l'utilizzo di un cavo a 6 poli 26AWG Style 2464.

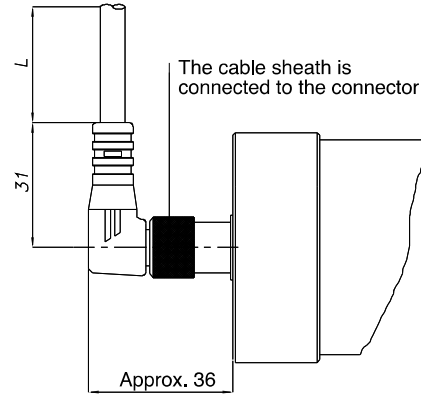
## OPTIONAL OUTPUT CABLES

### PRE-ASSEMBLED CABLE WITH STRAIGHT CONNECTOR



| 5-pin cable code |    | WRA-A-A        |                       |
|------------------|----|----------------|-----------------------|
| Lenght "L"       |    | CODE           |                       |
|                  |    | Straight cable | Cable to 90°          |
| 2                | mt | <b>CAV011</b>  | <b>CAV021</b>         |
| 5                | mt | <b>CAV012</b>  | <b>CAV022</b>         |
| 10               | mt | <b>CAV013</b>  | <b>CAV023</b>         |
| 15               | mt | <b>CAV015</b>  | <b>CAV024*/CAV280</b> |

### PRE-ASSEMBLED CABLE WITH 90° CONNECTOR



| 8-pin cable code |    | WRA-A-H               |               |
|------------------|----|-----------------------|---------------|
| Lenght "L"       |    | CODE                  |               |
|                  |    | Straight cable        | Cable to 90°  |
| 2                | mt | <b>CAV002</b>         | <b>CAV005</b> |
| 5                | mt | <b>CAV003</b>         | <b>CAV006</b> |
| 10               | mt | <b>CAV004*/CAV281</b> | <b>CAV007</b> |
| 15               | mt | <b>CAV009*/CAV282</b> | <b>CAV008</b> |

\* Not available with UL certification.

## ACCESSORIES

Non-magnetic spacer for mounting PCUR022 cursor

**CUR022**

Sensors are manufactured in compliance with:

- EMC 2014/30/EU compatibility directive
- RoHS 2011/65/EU directive

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

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