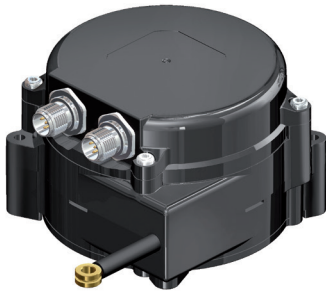


# 7D

## **DRAW WIRE SENSOR, FOR LINEAR MOVEMENT MEASUREMENT, CONTACTLESS, HALL EFFECT BASED**

The draw wire displacement sensors 7D measure linear movement unwinding a stainless steel flexible cable movement. A combination of gears converts the linear into a rotary movement that drive a magnet. The position of the magnet is detected by the electronic (Hall effect element) and converted into the output signal.



- **Contactless technology – no wear of the sensor element**
- **Height 65 mm.**
- **Measuring range up to 5.500 mm.**
- **Analogue and digital output**
- **Stainless steel flexible wire 1 mm.**
- **Flexible position mounting (left-right)**
- **Wire outlet up-down**
- **Dual channel version**
- **Angle sensor integrated version**
- **Certification SIL2 PLd EN61508 EN 13849-1 (pending)**
- **adjustable connectors / cables outlet**
- **Protection degree IP68**
- **Mechanical life > 500.000 cycles**

### **Main features**

- **Compact design – height 65 mm.**
- **PBT housing – high resistance to mechanical shocks and high temperatures.**
- **Measuring range up to 5.500 mm.**
- **Stainless steel flexible wire – 1 mm. diameter**
- **Hall effect electronic – contactless**
- **Analogue output (Voltage – current)**
- **Digital output CANopen – CAN SAE J 1939**
- **Protection degree IP68**
- **Integrated angle sensor version**
- **Redundant version**
- **Certification SIL2 PLd EN61508/EN 13849-1 (pending)**
- **Connection, M12 integrated connector or cable outlet Cable + connector (DEUTSCH-AMP...) on request**

### **Application fields**

- **Agriculture machines and equipments**
- **Construction machinery and equipment (Excavators, loaders, paving machines etc.)**
- **Handling machines (stationary cranes, truck mounted cranes, forklift, aerial platform etc.)**
- **Forestry equipments (harvesting heads, mobile saw etc.)**
- **Equipments and trucks for garbage recycling**



## DRAW WIRE SENSOR **7D**, FOR LINEAR MOVEMENT MEASUREMENT, CONTACTLESS, HALL EFFECT BASED

### Electrical specifications

**Power supply:** 5 Vdc +/- 10% (ratiometric only) for 5 Vdc power supply); 9-36 Vdc

**Typical consumption:** 20 mA / Channel

**Dielectric strength:** 500 Vdc (machine ground to power supply ground) R>20 Mohm /60 sec.

**Overvoltage protection:** yes

**Polarity protection:** yes

### Environmental and mechanical specifications

**Operating temperature:** -40+85 Dec C

**HR%:** up to 90% – no condensation (EN60068-2-30)

**Electrical connection:** M12 connector or 1.000 mm. PUR cable + connector, orientable 90°

**MTTFd (EN 13849-1):** >100 years

**Cable outlet:** up-down

**Right/left installation**

**Weight:** 600 g.

**Protection degree:** degree: IP 68 (electronic housing) – IP 54 wire inlet

**Shock:** IEC 60068-2-27 - 100g (11 ms) single shock, 50g (11 ms) at 1000 shocks per axis

**Vibrations:** IEC 60028-2-6 - 20 g (r.m.s) (10...2.000Hz) resonance points excluded

### EMC – Features

**EMC:** EU Directive 2014/30/EU CE marking

**Generic standards:** EN 61000-6-2

**Agriculture and Forestry machinery:** EN 14982

**Construction machinery:** EN 13309

**Transient pulses:** ISO 7637-2 pulse 5b - voltage 56Vdc

### Draw wire sensor – Technical features

**Measuring range:** 0-5.500 mm.

**Linearity:** 0.5% full scale

**Analogue output:** 0.5-4.5Vdc (Ratiometric only for 5 Vdc power supply); 0.5-4.5 Vdc, 4-20mA

**Digital output:** CANopen, CAN SAE J1939

**Load:** RL > 10 Kohm for voltage output, < 500 Ohm for current output

**Resolution:** 12 bit for analogue output; 14 bit for CANopen, CAN SAE J1939 output

**Stainless steel flexible coated wire:** 1 mm. diameter

**Wire fastening Eyelet:** ext. diam. 10 mm., internal diameter 5 mm.

**Wire extension force:** approx..3.8/7.0 N min./max.

**Mechanical life:** > 500.000 cycles

### Integrated angle sensor – Technical Features

**Triaxial MEMS:** technology based

**Mechanical angle:** 360° continuous

**Measuring angular range:** 0-360° configurable

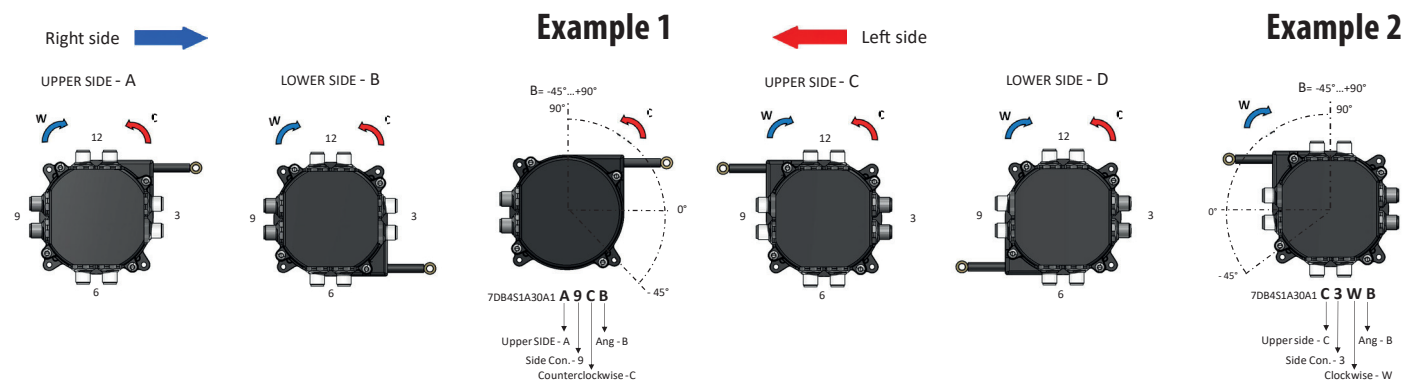
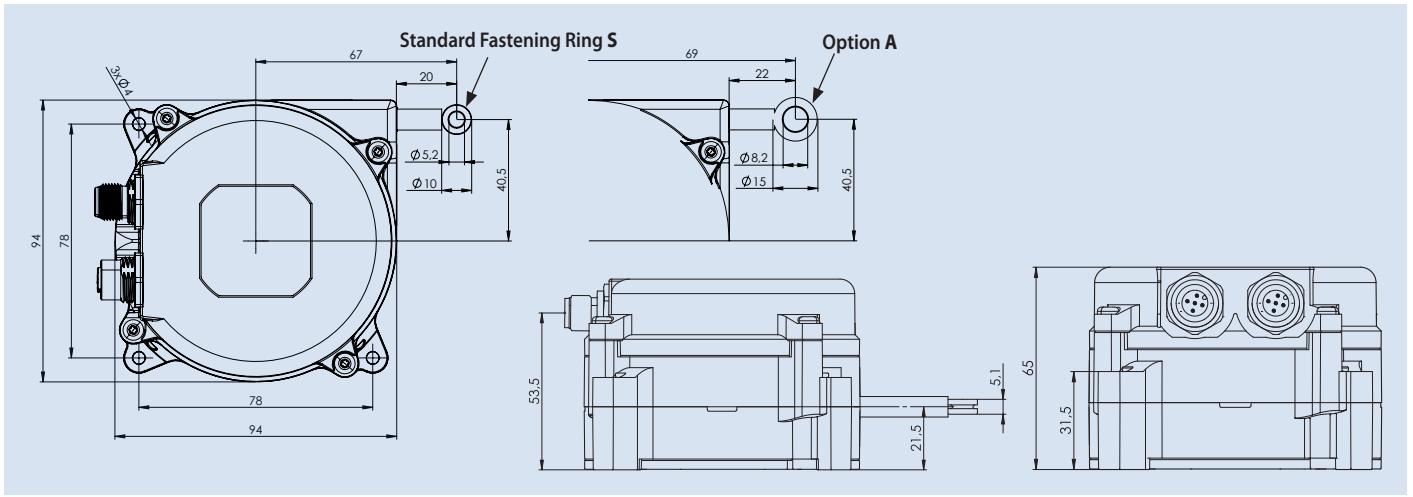
**Linearity:** 0.5% f.s.

**Repeatability:** 0.03% f.s.

**Resolution :** 0,1° for CANopen, CAN SAE J1939 output

**Temperature drift:** 0.01°/deg C

**Digital output:** CANopen, CAN SAE J1939



## WIRING DIAGRAMS

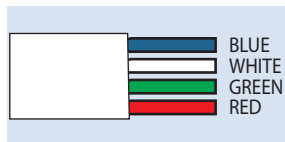
**A** = single M12 - M - 4 pin connector  
**G** = double M12 - M+M - 4 pin connector  
**L** = double M12 - M+F - 4 pin connector

PIN	Draw wire version			Draw wire version and angle / draw wire
	PINOUT 3	PINOUT 6	PINOUT 5	PINOUT 4
1	Vdc	Vdc	Vdc	Vdc
2	Signal	Gnd	Gnd	Gnd
3	Gnd	Signal	Signal 1	CAN_H
4	n.c.	n.c.	Signal 2	CAN_L
	<i>Single channel</i>		<i>Dual channel</i>	<i>Redundant</i>

**B** = single M12 - M - 5 pin connector  
**H** = double M12 - M+M - 5 pin connector  
**M** = double M12 - M+F - 5 pin connector

PIN	Draw wire version			Draw wire version and angle / draw wire
	PINOUT 5	PINOUT 4	PINOUT 6	PINOUT 3
1	Vdc	Gnd	Vdc	Shield
2	n.c.	Vdc	n.c.	Vdc
3	Gnd	Signal	Gnd	Gnd
4	Segnale	n.c.	Signal 1	CAN_H
5	n.c.	n.c.	Signal 2	CAN_L
	<i>Single channel</i>		<i>Dual channel</i>	<i>Redundant</i>

### W: PUR Cable output



Cable	CAN output PINOUT 2	Analogue output PINOUT 3	Analogue output PINOUT 4
Blue	Vdc	Vdc	Vdc
White	Gnd	Gnd	Gnd
Green	CAN_H	Signal 1	Signal 1
Red	CAN_L	Signal 2	Signal 2
	<i>Redundant</i>	<i>Single channel</i>	<i>Dual channel</i>

# Ordering code: DRAW WIRE SENSOR, FOR LINEAR MOVEMENT MEASUREMENT, CONTACTLESS, HALL EFFECT BASED

## MODEL 7D

### Version

- A** : draw wire for linear movement  
**B** : draw wire for linear movement + planarity detection

### Measuring range

- 1** : 1.500 mm. **2** : 2.500 mm. **3** : 4.000 mm. **4** : 5.500 mm.

### Fastening Ring

- S** : standard ext. diam. 10 mm **A** : ext. diam. 15 mm

### Channels number

- S** : Single **D** : Double **R** : redundant (only for CAN output)  
 for details see installation manual

### Power supply

- 1** : 9-36 Vdc **2** : 5 Vdc (+/- 10%) (solo per uscita Raziometrica)

### Electrical connection

- A\*** : single M12 - M - 4 pin connector (wiring diagram 3-4-5-6)  
**G\*** : double M12 - M+M - 4 pin connector (wiring diagram 3-4-5-6 dual channel)  
**L3** : double M12 - M+F - 4 pin connector (wiring diagram 3 - analogue output)  
**L4** : double M12 - M+F - 4 pin connector (wiring diagram 4 - CANopen IN-OUT)  
**B\*** : single M12 - M - 5 pin connector (wiring diagram 3-4-5-6)  
**H\*** : double M12 - M+M - 5 pin connector (wiring diagram 3-4-5-6 dual channel)  
**M3** : double M12 - M+F - 5 pin connector (wiring diagram 3 - CANopen IN-OUT)  
**W2** : Pigtailed PUR cable – CANopen  
**W3** : Pigtailed PUR cable – analogue single channel  
**W4** : Pigtailed PUR cable – analogue dual channel  
 \* : to specified the number of the wiring diagram

### Cable lenght for option W4-W2 electrical connetions

- Q** : M12 integrated connector **R** : Standard : 1.000 mm. **\*V** : 3.000 mm. **\*W** : 5.000 mm.  
 \* = minimum batch 20 pcs./order

### Output signal

#### Current:

- V3** = 0.5 – 4.5 Vdc  
**V6** = 4.5 – 0.5 Vdc  
**V8** = 0.5 – 4.5 Vdc ratiometric  
**V9** = 4.5 – 0.5 Vdc ratiometric  
**Current:**  
**A1** = 4 – 20 mA.  
**A2** = 20 – 4 mA.

#### CANopen

- C1** : CANopen baud rate 50 Kbit  
**C2** : CANopen baud rate 125 Kbit  
**C3** : CANopen baud rate 250 Kbit (factory default value)  
**C4** : CANopen baud rate 500 Kbit  
**C5** : CANopen baud rate 800 Kbit  
**C6** : CANopen baud rate 1000 Kbit

#### Digitale CAN SAE J1939

- J3** : CAN SAE J 1939 baud rate 250 Kbit  
 (factory default value)  
**J4** : CAN SAE J 1939 baud rate 500 Kbit

### Node ID (only for digital output)

#### Channel 1

- Default value for CANopen = **7D** • Value for CAN SAE J1939 = **FC** • Value for Analog Output = **00**

#### Channel 2 (only for Model D)

- for single channel version the default value is 00

### Steel wire outlet

- A** : right side up **B** : right side low **C** : left side up **D** : left side low

### Connector orientation

- 0** : 12 o'clock **3** : 3 o'clock **6** : o'clock **9** : o'clock

### Option 7D version B (position + angle)

#### Angle measurement direction

- W** : Clockwise **C** : Counterclockwise

#### Angle 1 + Angle 2 (measuring angular range)

- R** : -180° + 180° (configuration standard-default)  
**A** : -45° + 45° **E** : -90° + 45° **J** : -135° + 45° **N** : -180° + 45°  
**B** : -45° + 90° **F** : -90° + 90° **K** : -135° + 90° **P** : -180° + 90°  
**C** : -45° + 135° **G** : -90° + 135° **L** : -135° + 135° **Q** : -180° + 135°  
**D** : -45° + 180° **H** : -90° + 180° **M** : -135° + 180°



**O.M.F.B.** S.p.A. Hydraulic Components

Via Cave, 7/9 - 25050 Provaglio d'Iseo (Bs) – ITALIA  
 Telefono: (+39) 030.98.30.611 – FAX: (+39) 030.98.39.207/208  
 E-Mail: [contatti@omfb.it](mailto:contatti@omfb.it)  
<https://www.omfb.com>

OMFB reserves the right to change the information within this document, to change the features of the product without notice.  
 Any errors or omissions are subject to correction. For the latest product information please visit [www.omfb.com](http://www.omfb.com)