

# TCW4 CANopen

## CANOPEN ABSOLUTE MULTI-TURN MODULAR SENSOR

Sensata-BEI Sensors' TCW4 sensors provide absolute multi-turn measurement with a CANopen output in an over-molded, modular package that offers design flexibility and protection from the environment.



### Features

- With its two-part design, the TCW4 CANopen absolute multi-turn offers maximum flexibility for installation
- Rugged and excellent resistant to shock and vibration
- Robust, proven magnetic technology
- Environmentally resistant, IP 67 standard (IP69K option)
- Extended operating range from -30° C to 85° C
- Uses universal supply 5 to 30 VDC – CAN open output
- Available resolution 12 bits per turn by 16 bits of turns counting
- Variety of magnet holders available
- Standard PVC cable with SUBD9 connector

### Applications

- Factory Automation
- Process Automation



## SPECIFICATIONS

### Mechanical

<b>Terminations</b>	PVC Cable with SUBD9 connector
<b>Housing</b>	Macromelt PA638
<b>Weight</b>	0,150 kg

### Electrical

<b>Output Function</b>	CANopen
<b>Minimal Cycle Time</b>	< 400µs
<b>Resolution</b>	Multi-turn 12 bits per turn and up to 16 bits of turns counting
<b>Accuracy</b>	+/-0.3% on 360°
<b>Repeatability</b>	+/-0.1% on 360°
<b>Supply Voltage</b>	5 to 30 Vdc
<b>Start-up</b>	< 1 s
<b>Current Requirements</b>	< 40mA
<b>Protection</b>	Overvoltage Protection: Yes Reverse Polarity Protection: Yes Short Circuit Protection: Yes
<b>EMC</b>	IEC 61000-4-2 Electrostatic discharge (ESD) 4 kV, 8 kV IEC 61000-4-3 Electromagnetic fields 10 V/m (80MHz - 1GHz), 3V/m (1.4GHz - 2GHz), 1V/m (2GHz - 2.7GHz) IEC 61000-4-4 Electrical fast transients (burst) 1 kV IEC 61000-4-6 Conducted disturbances, induced by RF-fields 10 Veff.

## Programmable Parameters

**Resolution:** Defines the resolution per revolution (0 to 4 096).

**Transmission Speed:** Programmable from 10kbaud (1 000m) to 1 Mbaud (25 m) ; value per default : 20 Kbaud.

**Address:** Defines the software address of the encoder on the bus (1 to 127, Value per default : id = 1).

**Direction:** Defines the direction of count of the sensor.

**RAX:** Defines the value of the current position (with the shaft held stationary)

## Communication Modes

**Sensor configuration :** Reading/Writing of the sensor objects dictionary (SDO mode).

3 modes are available to interrogate the encoder position/speed:

**CYCLIC Mode:** The sensor transmits its position in an asynchronous manner. The frequency of the transmission is defined by the programmable cyclic timer register from 0 to 65 535 ms,

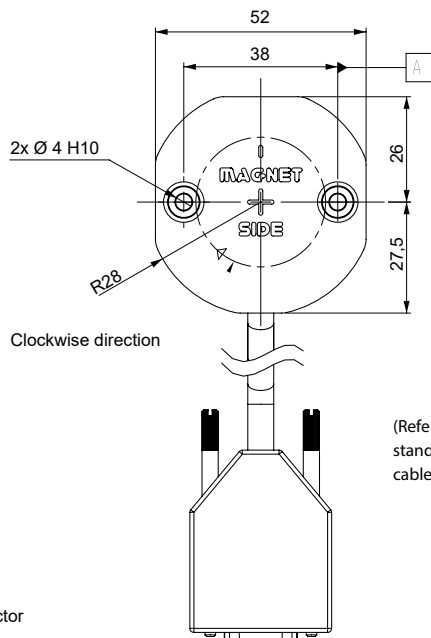
**SYNCHRO Mode:** The Sensor transmits its position on a synchronous demand by the master.



## DIMENSIONS

All Dimensions are in millimeters.

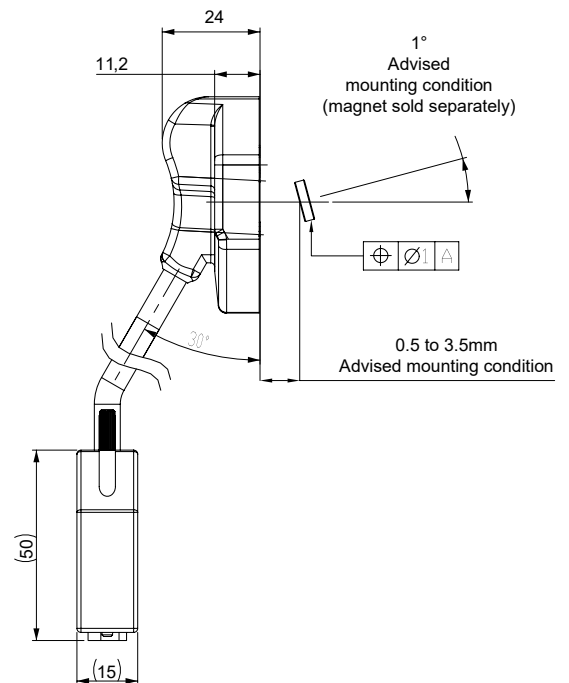
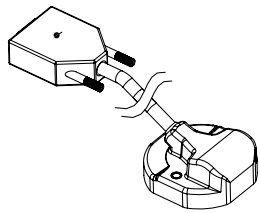
Shaft system with magnet to be ordered separately (see Accessories).



Clockwise direction

(Refer to the bus standards for max. cable length)

D-Sub 9 Connector



1°  
Advised mounting condition (magnet sold separately)

0.5 to 3.5mm  
Advised mounting condition



## CONNECTIONS

	N.C	CAN LOW	CAN GND / 0V	N.C.	N.C.	0V	CAN HIGH	N.C.	5/30Vdc	Ground
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## NOTES

Stray magnetic fields can interfere with accuracy and repeatability of the signal.



## ORDERING OPTIONS

Example : TCW4\_00//PBBB//12B16//BBD020

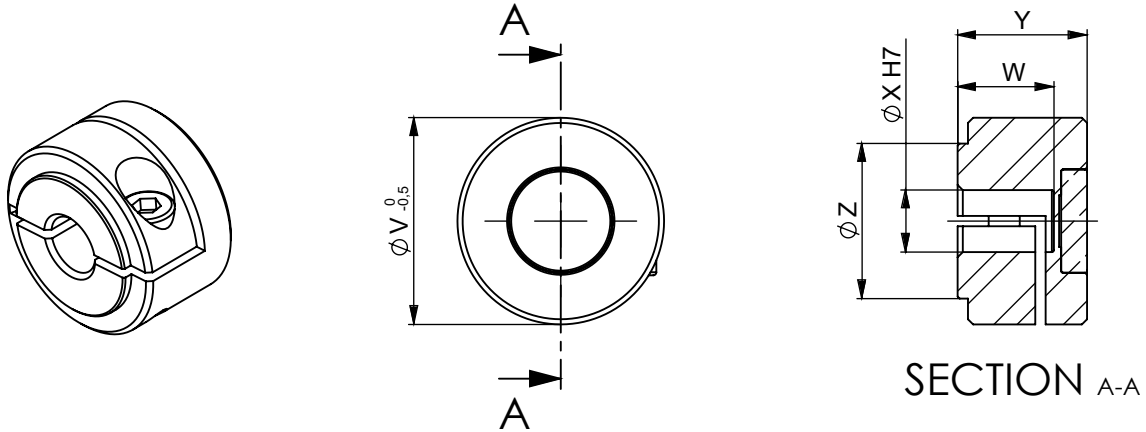
(Contact the factory for special versions, ex : dimensions, connections... )

	<b>TCW4</b>	-	<b>00</b>	//	<b>P</b>		<b>BB</b>		<b>B</b>	//	<b>12B16</b>	//	<b>BB</b>		<b>D</b>		<b>020</b>	
<b>Family</b>	TCW4: Absolute Multi-turn Sensor																	
<b>Shaft Ø</b>	00: Modular																	
<b>Supply</b>	P: 5 to 30 Vdc																	
<b>Output Stage</b>	BB: CANopen																	
<b>Code</b>	B: Binary																	
<b>Resolution</b>	12B16: 12 bits by 16 bits of turns																	
<b>Connection</b>	BB: PVC cable																	
<b>Connection Orientation</b>	D: SUBD9 Connector																	
<b>Cable Length</b>	020: 2 meters of cable																	

**Female magnet support + Magnet 8810/013**

Ordering p/n : **M9105/Kxx**

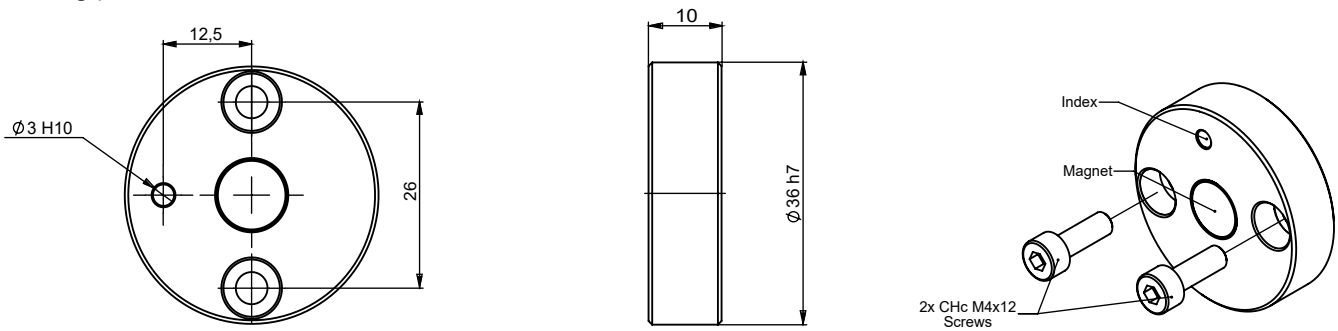
KXX: Where XX is the shaft mounting diameter in mm. Standards are 06, 08, 10, 11, and 14 mm. i.e M9105/K10 mounts to a 10 mm shaft.



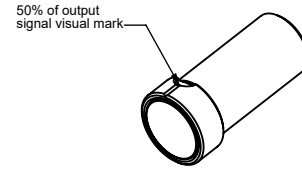
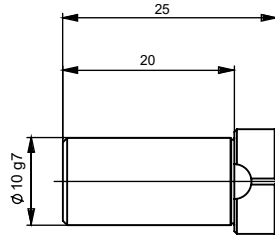
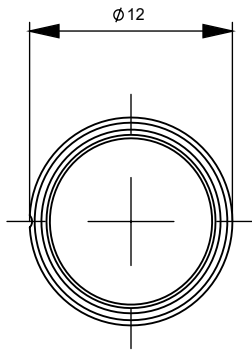
	<b>M9105/K06</b>	<b>M9105/K08</b>	<b>M9105/K10</b>	<b>M9105/K11</b>	<b>M9105/K14</b>
<b>X</b>	06 H7	08 H7	10 H7	11 H7	14 H7
<b>V</b>	20	20	26	26	29
<b>W</b>	9,3	9,3	10	10	10
<b>Y</b>	12,5	12,5	14	14	14
<b>Z</b>	15	15	15	15	18

**Frontal magnet support + Magnet 8810/013**

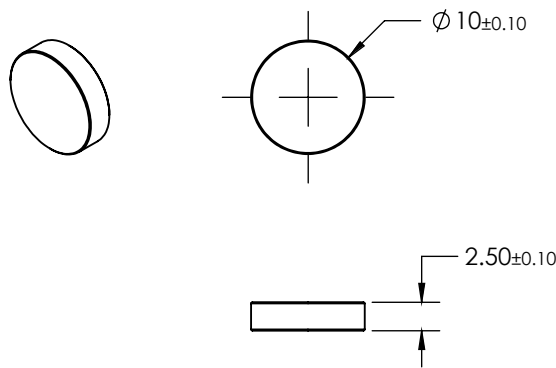
Ordering p/n : **M9105/F26**



**Male magnet support + Magnet 8810/013**  
 Ordering p/n : **M9105/M10-01**



**Magnet**  
 Ordering p/n : **8810/013**



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