

Code CST50	Project B25-D	Release C	TECHNICAL DATASHEET
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MAGNETIC SENSOR CSM - 5 Series

GENERAL CHARACTERISTICS

- Magnetic sensor for linear and angular reading.
- Resolutions up to 1 μm .
- Contactless reading.
- Extremely easy and fast mounting of the entire measuring system, with wide alignment tolerances.
- Small size, to allow installation in narrow spaces.
- Magnetic band composed by a magnetized plastoferrite tape, with pole pitch 5+5 mm. The plastoferrite is supported by a stainless steel tape, already provided with the adhesive tape, for an easy application on the machine.
- To be used with magnetic band CP500 or CP500Z (with reference indexes positioned upon request).



MECHANICAL AND ELECTRICAL CHARACTERISTICS

<p>MECHANICAL</p> <ul style="list-style-type: none"> • Magnetic sensor with die-cast body. • Possibility to fix the magnetic sensor with M4 screws or with through M3 screws. • Wide alignment tolerances. <p>ELECTRICAL</p> <ul style="list-style-type: none"> • Very flexible power cable. • Reading through positioning sensor based on magneto resistance, with AMR effect (Magnetic Anisotropy). • High signal stability. • Electrical protection against inversion of power supply polarity and short circuits on output port. • For applications where the maximum speed exceeds 1 m/s, it is necessary to use a cable suited for continuous movements. <p>• CABLE: As a standard, the sensor is supplied with the following cable: - 8-wire shielded cable $\varnothing = 6.1$ mm, PVC external sheath, with low friction coefficient, oil resistant; - Conductors section: power supply 0.35 mm²; signals 0.14 mm².</p> <p>PUR cable or cable with reduced section on request.</p> <p>The cable's bending radius should not be lower than 60 mm.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>LINE DRIVER</th> <th>PUSH-PULL</th> <th>CONDUCTOR COLOR</th> </tr> </thead> <tbody> <tr><td>A</td><td>A</td><td>Green</td></tr> <tr><td>\bar{A}</td><td></td><td>Yellow</td></tr> <tr><td>B</td><td>B</td><td>Grey</td></tr> <tr><td>\bar{B}</td><td></td><td>Pink</td></tr> <tr><td>I_0</td><td>I_0</td><td>Blue</td></tr> <tr><td>\bar{I}_0</td><td></td><td>Red</td></tr> <tr><td>+ V</td><td>+ V</td><td>Brown</td></tr> <tr><td>0 V</td><td>0 V</td><td>White</td></tr> <tr><td>SCH</td><td>SCH</td><td>Shield</td></tr> </tbody> </table> <p>As a standard, the sensor is supplied with a 2-m cable. Longer lengths are available, with the following limits: L_{max} = 10 m sensor cable L_{max} = 100 m 2 m sensor cable + cable extension *</p>	LINE DRIVER	PUSH-PULL	CONDUCTOR COLOR	A	A	Green	\bar{A}		Yellow	B	B	Grey	\bar{B}		Pink	I_0	I_0	Blue	\bar{I}_0		Red	+ V	+ V	Brown	0 V	0 V	White	SCH	SCH	Shield	<table border="1" style="width: 100%;"> <tr> <td>Model. CSM</td> <td>5</td> </tr> <tr> <td>Pole pitch</td> <td>5+5 mm</td> </tr> <tr> <td>Reference indexes</td> <td>C = constant step (every 5 mm) ** E = external Z = positioned on the magnetic band</td> </tr> <tr> <td>Resolution (μm)</td> <td>250 100 50 25 10 5 1</td> </tr> <tr> <td>Accuracy ***</td> <td>$\pm 50 \mu\text{m}$ $\pm 30 \mu\text{m}$</td> </tr> <tr> <td>Max. traversing speed ****</td> <td>1.2 m/s (res. 1 μm) 30 m/s (res. 25 μm)</td> </tr> <tr> <td>Max. frequency</td> <td>300 kHz (up to 500 kHz on request)</td> </tr> <tr> <td>Repeatability</td> <td>± 1 increment</td> </tr> <tr> <td>A, B and I_0 output signals</td> <td>LINE DRIVER / PUSH-PULL</td> </tr> <tr> <td>Vibration resistance (EN 60068-2-6)</td> <td>300 m/s² [55 ÷ 2,000 Hz]</td> </tr> <tr> <td>Shock resistance (EN 60068-2-27)</td> <td>1,000 m/s² (11 ms)</td> </tr> <tr> <td>Protection class (EN 60529)</td> <td>IP 67</td> </tr> <tr> <td>Operating temperature</td> <td>0 °C ÷ 50° C</td> </tr> <tr> <td>Storage temperature</td> <td>-20 °C ÷ 80° C</td> </tr> <tr> <td>Relative humidity</td> <td>100%</td> </tr> <tr> <td>Power supply</td> <td>5 ÷ 28 Vdc \pm 5%</td> </tr> <tr> <td>Current consumption without load</td> <td>60 mA_{MAX}</td> </tr> <tr> <td>Current consumption with load</td> <td>140 mA_{MAX} (with 5 V and R = 120 Ω) 90 mA_{MAX} (with 28 V and R = 1.2 kΩ)</td> </tr> <tr> <td>Electrical connections</td> <td>see related table</td> </tr> <tr> <td>Electrical protections</td> <td>inversion of polarity and short circuits</td> </tr> <tr> <td>Weight</td> <td>45 g</td> </tr> </table>	Model. CSM	5	Pole pitch	5+5 mm	Reference indexes	C = constant step (every 5 mm) ** E = external Z = positioned on the magnetic band	Resolution (μm)	250 100 50 25 10 5 1	Accuracy ***	$\pm 50 \mu\text{m}$ $\pm 30 \mu\text{m}$	Max. traversing speed ****	1.2 m/s (res. 1 μm) 30 m/s (res. 25 μm)	Max. frequency	300 kHz (up to 500 kHz on request)	Repeatability	± 1 increment	A, B and I_0 output signals	LINE DRIVER / PUSH-PULL	Vibration resistance (EN 60068-2-6)	300 m/s ² [55 ÷ 2,000 Hz]	Shock resistance (EN 60068-2-27)	1,000 m/s ² (11 ms)	Protection class (EN 60529)	IP 67	Operating temperature	0 °C ÷ 50° C	Storage temperature	-20 °C ÷ 80° C	Relative humidity	100%	Power supply	5 ÷ 28 Vdc \pm 5%	Current consumption without load	60 mA _{MAX}	Current consumption with load	140 mA _{MAX} (with 5 V and R = 120 Ω) 90 mA _{MAX} (with 28 V and R = 1.2 k Ω)	Electrical connections	see related table	Electrical protections	inversion of polarity and short circuits	Weight	45 g
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* Cable extensions need to have a 0.5 mm² section for power supply conductors.

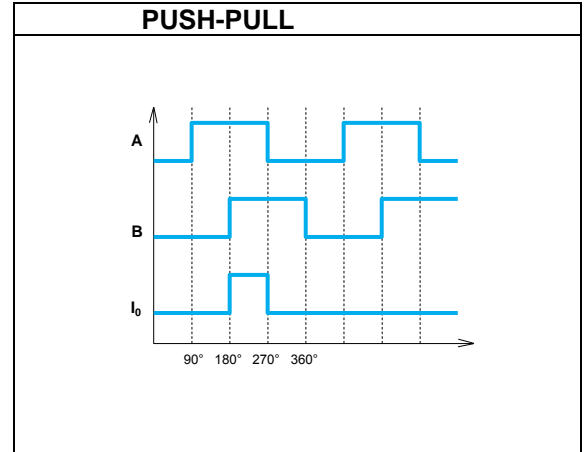
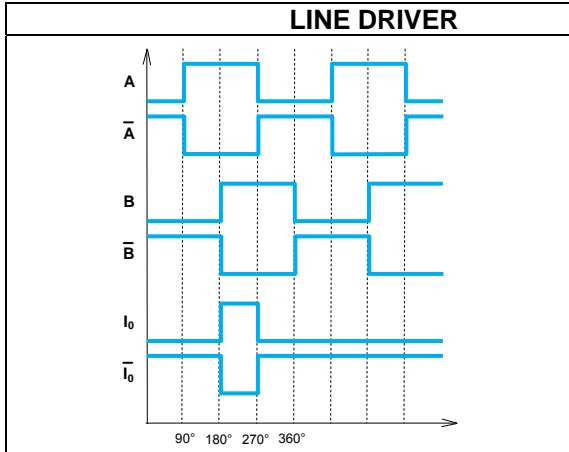
** With 100 μm resolution, the constant step is 10 mm.

*** To obtain the declared accuracy values, it is necessary to respect the alignment tolerances prescribed by the Manufacturer. Better accuracy can be obtained by reducing the gap between the sensor and the magnetic band.

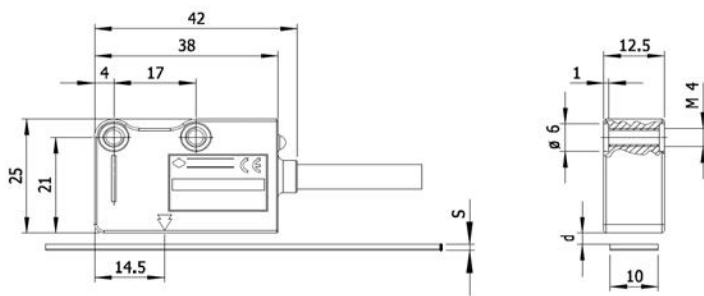
**** The indicated speeds are referred to a maximum frequency of 300 kHz.

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OUTPUT SIGNALS



SENSOR DIMENSIONS

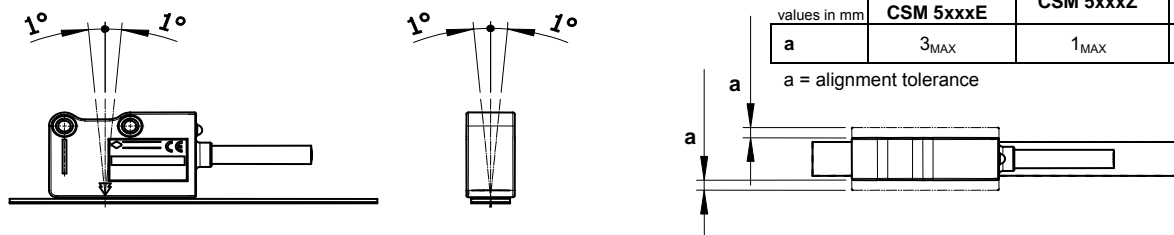


values in mm	CP500	CP500 + CV103	CP500 + SP202	CP500 + GVS 100
s	1.3	1.6	2.1	7.6
d	0.3 ÷ 4	3.7 _{MAX}	3.2 _{MAX}	0.3 ÷ 1

values in mm	CP500Z	CP500Z + CV103	CP500Z + SP202
s	1.3	1.6	2.1
d	0.35 ÷ 2	1.7 _{MAX}	1.2 _{MAX}

s = thickness
d = distance to be maintained between sensor and surface of the magnetic band (or eventual cover/support)

SENSOR ALIGNMENT TOLERANCES



values in mm	CSM 5xxxC CSM 5xxxE	CSM 5xxxZ	CSM 5 for GVS 1002
a	3 _{MAX}	1 _{MAX}	1 _{MAX}

a = alignment tolerance

ORDERING CODE

MODEL	POLE PITCH	RESOLUTION	REFERENCE INDEXES	POWER SUPPLY	OUTPUT SIGNALS	CABLE	CONNECTION	PROGRAMMING	SPECIAL
CSM	5	1	C	528V	L	M02 / N	SC	F	

5 = 5+5 mm 25 = 25 µm C = constant step 528V = 5+28 Vdc L = LINE DRIVER M01/N = 1 m SC = without connector F = fixed No cod = standard
5 = 5 µm E = external 5285 = 5+28 Vdc with 5 V output Q = PUSH-PULL M02/N = 2 m Cnn = progressive V = variable SNxx = special nn
1 = 1 µm Z = positioned on magnetic band M03/N = 3 m

Standard **MAGNETIC SENSOR CSM 5 25 C 528V L M02 / N SC F**