

Code ST04	Project A40-B	Release A	TECHNICAL DATASHEET
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MAGNETIC SENSOR MTV M

GENERAL CHARACTERISTICS

- Magnetic sensor for linear and angular reading.
- Resolutions up to 0.5 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 2+2 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 MP200.



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:</p> <ul style="list-style-type: none"> - 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>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>SIGNALS</th> <th>CONDUCTOR COLOR</th> </tr> </thead> <tbody> <tr><td>A</td><td>Green</td></tr> <tr><td>\bar{A}</td><td>Orange</td></tr> <tr><td>B</td><td>White</td></tr> <tr><td>\bar{B}</td><td>Light-blue</td></tr> <tr><td>I₀</td><td>Brown</td></tr> <tr><td>\bar{I}_0</td><td>Yellow</td></tr> <tr><td>+ V</td><td>Red</td></tr> <tr><td>0 V</td><td>Blue</td></tr> <tr><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>	SIGNALS	CONDUCTOR COLOR	A	Green	\bar{A}	Orange	B	White	\bar{B}	Light-blue	I ₀	Brown	\bar{I}_0	Yellow	+ V	Red	0 V	Blue	SCH	Shield	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Cod. MTV</th> <th style="text-align: left;">M</th> </tr> </thead> <tbody> <tr> <td>Pole pitch</td> <td>2+2 mm</td> </tr> <tr> <td>Reference indexes</td> <td>C = constant step (every 2 mm) E = external</td> </tr> <tr> <td>Resolution</td> <td>up to 0.5 μm **</td> </tr> <tr> <td>Accuracy</td> <td>$\pm 8 \mu\text{m}$ ***</td> </tr> <tr> <td>Max. traversing speed</td> <td>12 m/s</td> </tr> <tr> <td>Max. frequency</td> <td>6 kHz</td> </tr> <tr> <td>Repeatability</td> <td>± 1 increment</td> </tr> <tr> <td>A, B and I₀ output signals</td> <td>sine wave 1 Vpp</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>90 mA_{MAX}</td> </tr> <tr> <td>Current consumption with load</td> <td>110 mA_{MAX} (with 5 V and R = 120 Ω) 70 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>40 g</td> </tr> </tbody> </table>	Cod. MTV	M	Pole pitch	2+2 mm	Reference indexes	C = constant step (every 2 mm) E = external	Resolution	up to 0.5 μm **	Accuracy	$\pm 8 \mu\text{m}$ ***	Max. traversing speed	12 m/s	Max. frequency	6 kHz	Repeatability	± 1 increment	A, B and I₀ output signals	sine wave 1 Vpp	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	90 mA _{MAX}	Current consumption with load	110 mA _{MAX} (with 5 V and R = 120 Ω) 70 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	40 g
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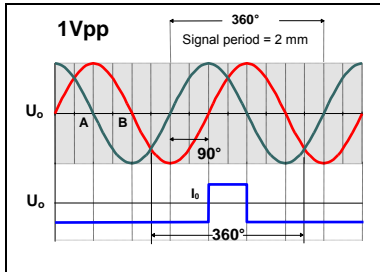
* Cable extensions need to have a 0.5 mm² section for power supply conductors.

** Depending on CNC division factor.

*** 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.

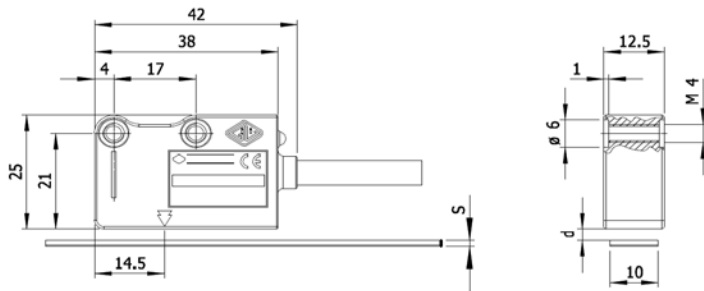
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OUTPUT SIGNALS



A and B amplitude	0.6 Vpp ± 1.2 Vpp typical 1 Vpp
I ₀ amplitude	0.25 V ± 0.6 V (usable component)
A and B phase displacement	90° ± 10° electrical
Reference voltage U ₀	≈ 2.5 V
Signal amplitude is referred to a differential measurement made with 120 Ω impedance and a minimum power supply voltage of 5 V to the sensor.	

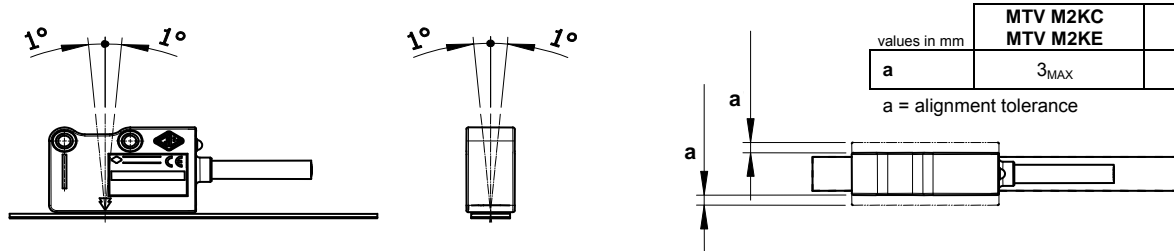
SENSOR DIMENSIONS



values in mm	MP200	MP200 + CV103	MP200 + SP202	MP200 + GVS 100
s	1.3	1.6	2.1	7.6
d	0.1 ÷ 1	0.7 _{MAX}	0.2 _{MAX}	0.3 ÷ 0.6

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	MTV M2KC MTV M2KE	MTV M for GVS 100
a	3 _{MAX}	1 _{MAX}

a = alignment tolerance

ORDERING CODE

MODEL	POLE PITCH	PERIOD	REFERENCE INDEXES	POWER SUPPLY	OUTPUT SIGNALS	CABLE	CONNECTION	SPECIAL
MTV	M	2K	C	528V	S	M02 / N	SC	

M = 2+2 mm 2K = 2 mm C = constant step
E = external 528V = 5+28 Vdc S = sine wave M01/N = 1 m
M02/N = 2 m M03/N = 3 m SC = without connector
Cnn = progressive No cod = standard
SPnn = special nn

Example  **MAGNETIC SENSOR MTV M 2K C 528V S M02 / N SC**