

Vishay MCB

Rotational Absolute Magnetic Encoder Version 12 mm HP Position Sensor



LINKS TO ADDITIONAL RESOURCES



FEATURES



- · Hall effect principle
- High precision (HP), high resolution
- Especially dedicated to harsh conditions (vibrations, shocks, CEM, ...)
- Not sensitive to external magnetic fields and temperature
- Plug and play
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

QUICK REFERENCE DATA				
Sensor type	ROTATIONAL, magnetic technology			
Output type	Wires			
Market appliance	Industrial			
Dimensions	Diameter 12.7 mm			

ELECTRICAL SPECIFICATIONS			
PARAMETER			
Voltage supply	5 V ± 0.25 V		
Current supply	≤ 100 mA at 5 V		
Output	SSI		
Connection	Twisted wires AWG 28		
Useful electrical angle	360°		
Absolute accuracy at 25 °C	± 0.15° (11.23 bits)		
Absolute accuracy at -40 °C to +105 °C	± 0.30° (10.23 bits)		
Resolution	≈ 0.022° (14 bits, 16 384 points)		
Startup time	≤ 20 ms		
Refresh time	≤ 100 µs		
Latency time	≤ 200 µs		
Sampling rate	2.5 kHz ± 10 %		

MECHANICAL SPECIFICATIONS		
PARAMETER		
Mechanical angle	360°	
Maximum speed rotation	See "Speed vs. Accuracy" chart	
Weight	About 11 g without wires	
Endurance life	50 x 10 ⁶ rotations	
Starting / running torque	≤ 10 cNcm	
Axial and radial play	≤ 50 µm under ± 2.5 N on shaft	
Axial and radial customer load at the end of the shaft	< 5 N	

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SAP PART NUMBERING GUIDELINES									
TYPE	MODEL	DESIGN	SIZE (mm)	TYPE	FUNCTION	ACCURACY (BITS)	RESOLUTION (BITS)	OUTPUT	PACKAGING
R = rotational	AM	E = encoder with housing	012	М	1	11	14	J = SSI CCW	B = box

PERFORMANCE	
PARAMETER	
Operating temperature range	-40 °C to +105 °C
Storage temperature range	-45 °C to +125 °C
Acceleration	Constant acceleration: Axis X: 6.3 g (2 min in each direction) Axis Y: 2.65 g (2 min in each direction) Axis Z: 2.65 g (2 min in each direction)
Vibration (three major axis)	Vibration 1: Frequency range: 5 Hz to 500 Hz Axis X: 0.95 $g_{\rm RMS}$, specific PSD ⁽¹⁾ , 75 min at each axis Axis Y: 2.32 $g_{\rm RMS}$, specific PSD ⁽¹⁾ , 75 min at each axis Axis Z: 2.32 $g_{\rm RMS}$, specific PSD ⁽¹⁾ , 75 min at each axis
	$\frac{\text{Vibration 2:}}{\text{Frequency range: 5 Hz to 2000 Hz}}\\ \text{Axis X: 3.01 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Y: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, \text{ specific PSD }^{(1)}, 1 \text{ min at each axis}\\ \text{Axis Z: 2.50 } g_{\text{RMS}}, speci$
Mechanical shock	Non-functional test conditions: half sine pulse: 20 g_{peak} x 5 ms, 3 shocks in every direction
Humidity	95 % HR, 20 days, temperature cycling (total time at 60 °C: 120 h and at 30 °C: 160 h)

Note

⁽¹⁾ To contact Vishay for details

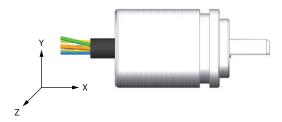
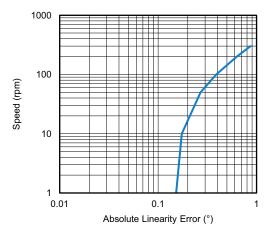


Fig. 1 - Encoder Axis System

SPEED VS. ABSOLUTE LINEARITY ERROR (at 2500 sample/s at room temperature)

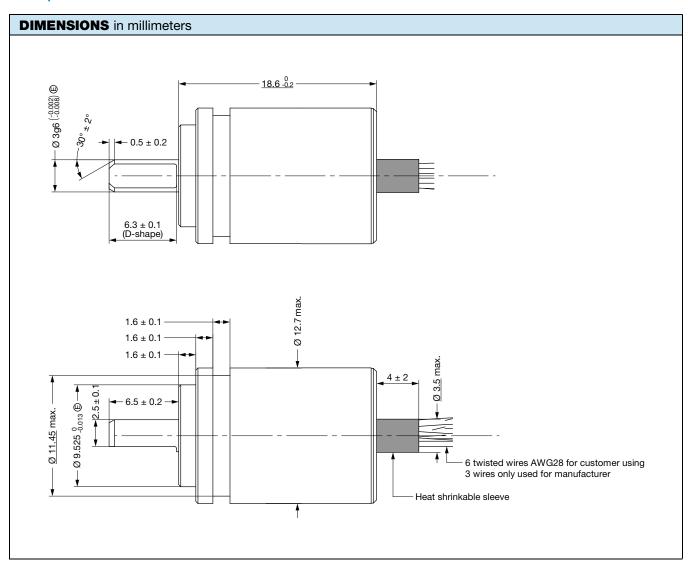


Note

· Latency time excluded



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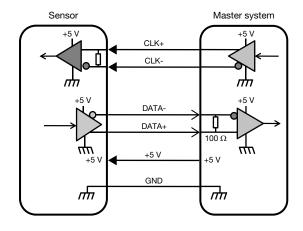




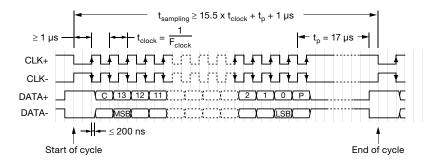
ELECTRICAL INTERFACE DESCRIPTION - SSI INTERFACE

6 WIRES CONNECTION (according to MIL-22759/32)				
NAME	WIRE COLOR	WIRE SIZE		
GND	Black	28 AWG		
+5 V	Red	28 AWG		
CLK-	Orange	28 AWG		
CLK+	White	28 AWG		
DATA+	Yellow	28 AWG		
DATA-	Green	28 AWG		

SSI PARAMETERS				
Output code	Binary			
Data differential interface	RS422 according to EIA-RS422			
CLK differential interface	RS422 according to EIA-RS422			
Minimum clock frequency	100 kHz			
Maximum clock frequency	4 MHz			
Data bit (n)	16 bits			
C: consistency of magnetic cell output	Bit "C": $0 \rightarrow \text{compliant} / 1 \rightarrow \text{not compliant}$			
13-0: angle	Bit "13-0": angle value			
P: parity of this bits "C" to "0"	Bit "P": 0 → pair sum / 1 → impair sum			



Timing Diagram



OTHER INFORMATION



OPTIONS

• Other design on request (mechanical interfaces, electrical interfaces, ...)



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