Rotational Absolute Magnetic Encoder Version 12 mm HP Position Sensor

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

LINKS TO ADDITIONAL RESOURCES

3D Models

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

For technical questions, contact: mcbprecisionpot@vishay.com

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	M	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)	<u>Vibration 1:</u> Frequency range: 5 Hz to 500 Hz Axis X: 0.95 g_{RMS}, specific PSD (1), 75 min at each axis Axis Y: 2.32 g_{RMS}, specific PSD (1), 75 min at each axis Axis Z: 2.32 g_{RMS}, specific PSD (1), 75 min at each axis
	<u>Vibration 2:</u> Frequency range: 5 Hz to 2000 Hz Axis X: 3.01 g_{RMS}, specific PSD (1), 1 min at each axis Axis Y: 2.50 g_{RMS}, specific PSD (1), 1 min at each axis Axis Z: 2.50 g_{RMS}, specific PSD (1), 1 min at each axis
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

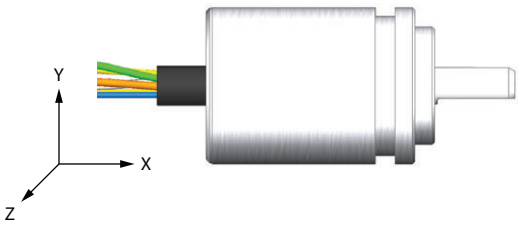
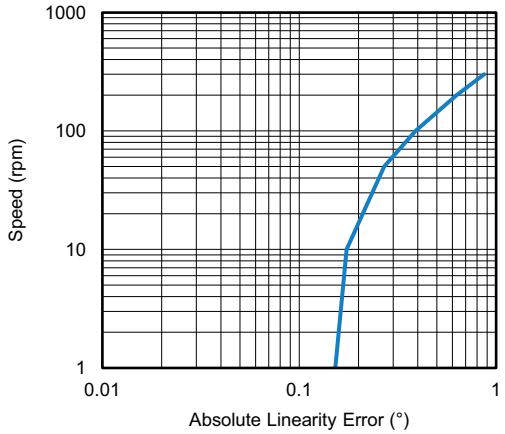


Fig. 1 - Encoder Axis System

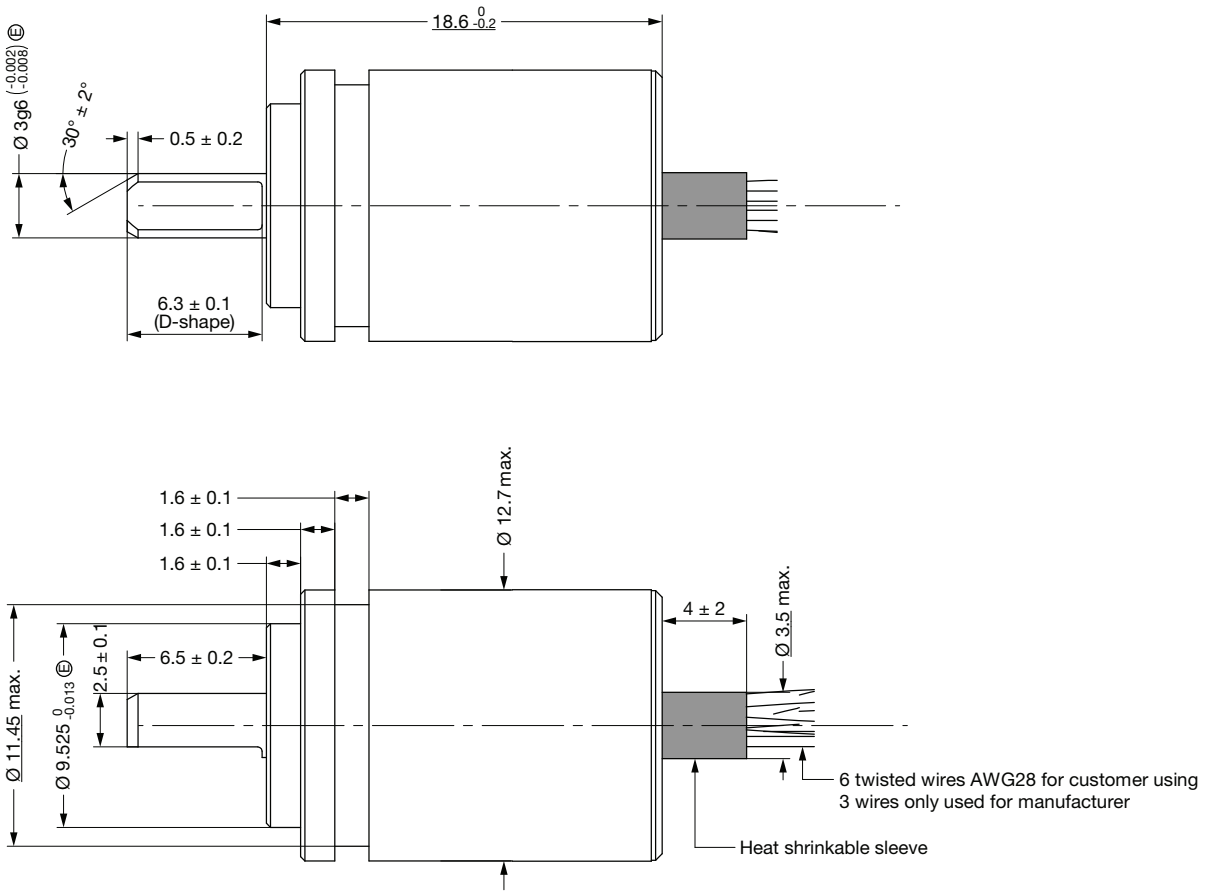
SPEED VS. ABSOLUTE LINEARITY ERROR (at 2500 sample/s at room temperature)



Note

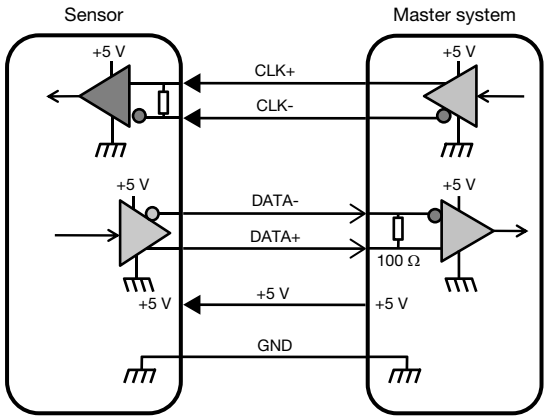
- Latency time excluded

DIMENSIONS in millimeters



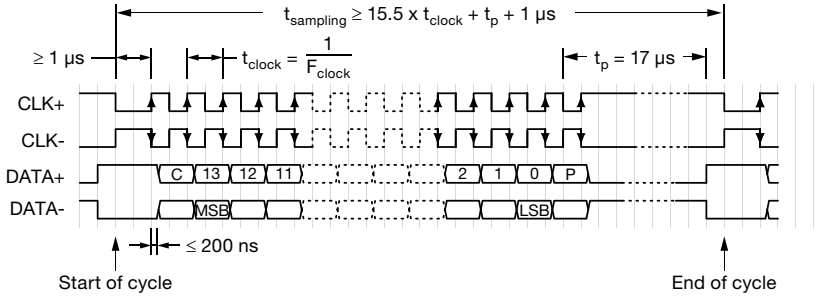
ELECTRICAL INTERFACE DESCRIPTION - SSI INTERFACE

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 → compliant / 1 → 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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