Rotational Absolute Magnetic Encoder Version 30 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
- Not sensitive to moisture and pollution
- Plug and play
- Protected design, patent EP 2711663
- 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	Cable
Market appliance	Industrial
Dimensions	Diameter 30 mm

ELECTRICAL SPECIFICATIONS	
PARAMETER	
Voltage supply	5 V ± 0.25 V
Current supply	≤ 130 mA at 5 V
Output	SSI
Connection	Shielded cable
Useful electrical angle	360°
Absolute accuracy at 25 °C	± 0.03° > 13 bits
Absolute accuracy at -40 °C to +105 °C	± 0.05° ~ 13 bits
Resolution	≈ 0.0028° (17 bits, 131 072 points) over 360°
Startup time	≤ 20 ms
Refresh time	≤ 110 µs
Latency time	100 µs ≤ latency time ≤ 200 µs
Sampling rate	10 kHz ± 5 %

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical angle	360°
Maximum speed rotation	50 rpm (up to 1000 rpm with decreasing of accuracy, see “Maximum Speed vs. Accuracy” chart)
Weight	51 g ± 5 g

SAP PART NUMBERING GUIDELINES									
TYPE	MODEL	DESIGN	SIZE (mm)	TYPE	FUNCTION	ACCURACY (BITS)	RESOLUTION (BITS)	OUTPUT	PACKAGING
R = rotational	AM	E = encoder with housing	030	M	1	13	17	J = SSI CCW	B = box

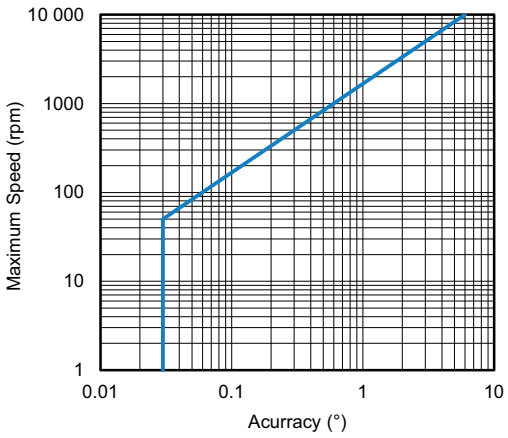
PERFORMANCE	
PARAMETER	
Operating temperature range	-40 °C to +105 °C
Storage temperature range	-45 °C to +105 °C
Acceleration (2)	100 *g* for 1 s
Vibration (three major axis) (2)	Vibration profile 1: 0.05 g^2/Hz, 20 Hz to 2000 Hz for 1 h along Vibration profile 2: see figure 1 - tested according "Endurance" profile Vibration profile 3: see figure 2 - tested according "Endurance" profile Vibration profile 4: see figure 3 - tested according "Endurance" profile Vibration profile 5: see figure 4 - tested according "Endurance" profile
Shock (2)	180 *g*, 14 ms, 1/2 sine
EMC (2)	According to MIL-STD-461F: - RE101: radiated emissions, magnetic field, 30 Hz to 100 kHz - limit for all navy applications to figure RE101-2 - RE102: radiated emissions, electric field, (10 kHz to 18 GHz) - curve for fixed wing external and helicopters at 2 MHz to 18 GHz, according to figure RE102-3 (1) - RS101: radiated susceptibility, magnetic field, 30 Hz to 100 kHz - limit for all navy applications according to figure RS101-1 - RS103: radiated susceptibility, electric field, (2 MHz to 40 GHz) - 200 V/m, according to Table XI, aircraft external
Humidity (2)	HR ≤ 88 % (non-condensing) operating 48 hours

Notes

(1) For the test setup, the metallic support of the electronic support is directly bonded with a braid to the ground plane and additional connection of the cable shielding to the ground plane

(2) Tests have been performed on electronic board and magnet without the mechanical housing of the encoder

MAXIMUM SPEED VS. ACCURACY CHART (latency time excluded)



VIBRATION PROFILES

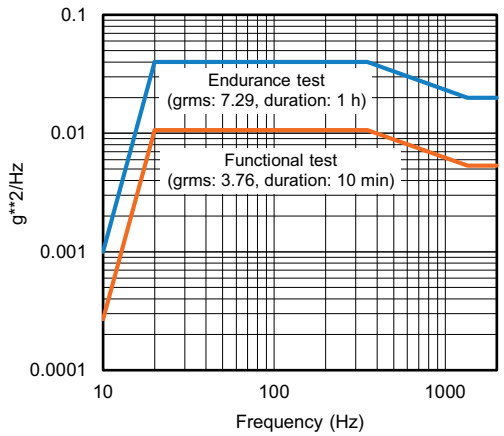


Fig. 1 - Vibration Profile 2

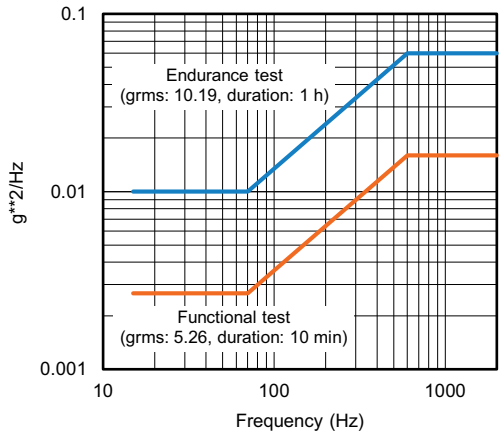


Fig. 2 - Vibration Profile 3

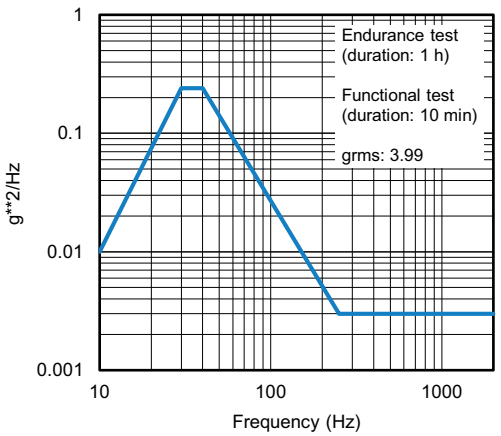


Fig. 3 - Vibration Profile 4

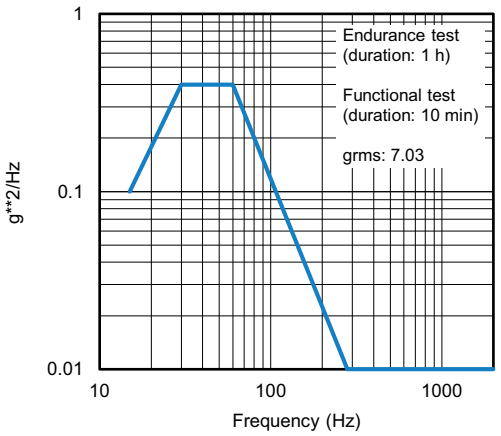
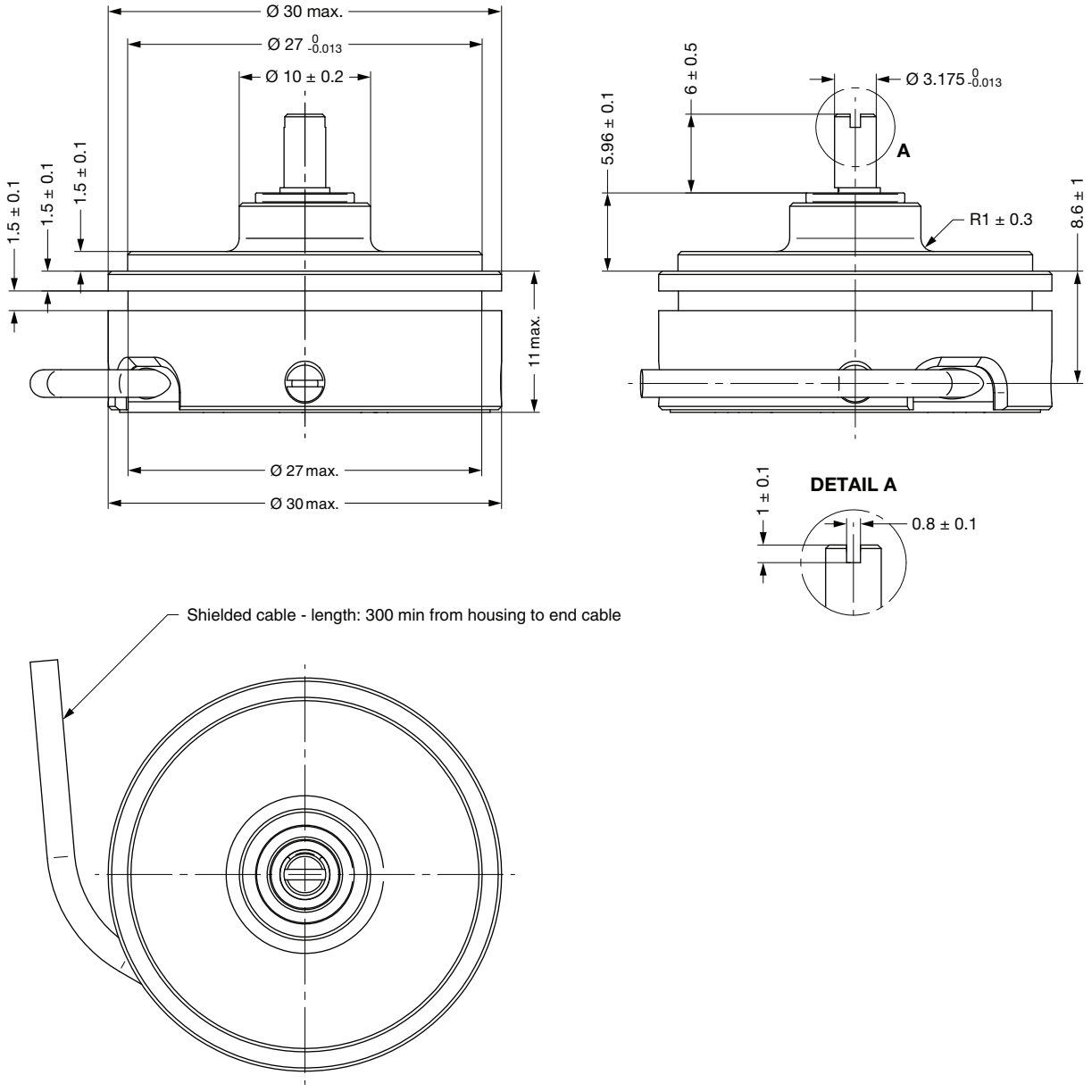


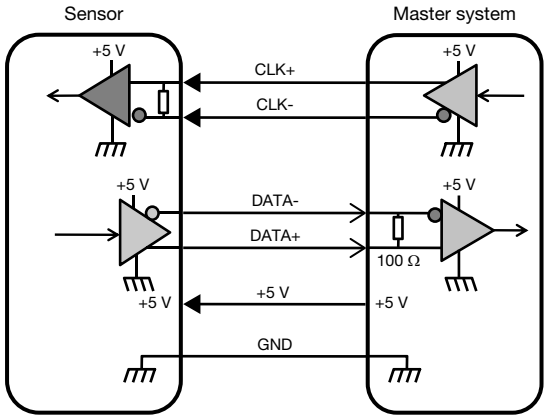
Fig. 4 - Vibration Profile 5

DIMENSIONS in millimeters



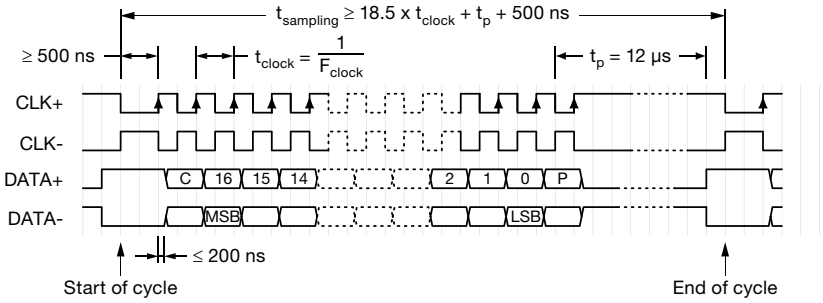
ELECTRICAL INTERFACE DESCRIPTION - SSI INTERFACE

6 WIRES CONNECTION		
NAME	WIRE COLOR	WIRE SIZE
GND	Black	32 AWG
+5 V	Red	32 AWG
CLK+	White	32 AWG
CLK-	Blue	32 AWG
DATA+	Yellow	32 AWG
DATA-	Green	32 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	300 kHz
Maximum clock frequency	4 MHz
Data bit (n)	19 bits
C: consistency of all internal magnetic cells outputs	Bit “C”: 0 → compliant / 1 → not compliant
16-0: angle	Bit “16-0”: angle value
P: parity of this bits “C” to “16”	Bit “P”: 0 → pair sum / 1 → impair sum

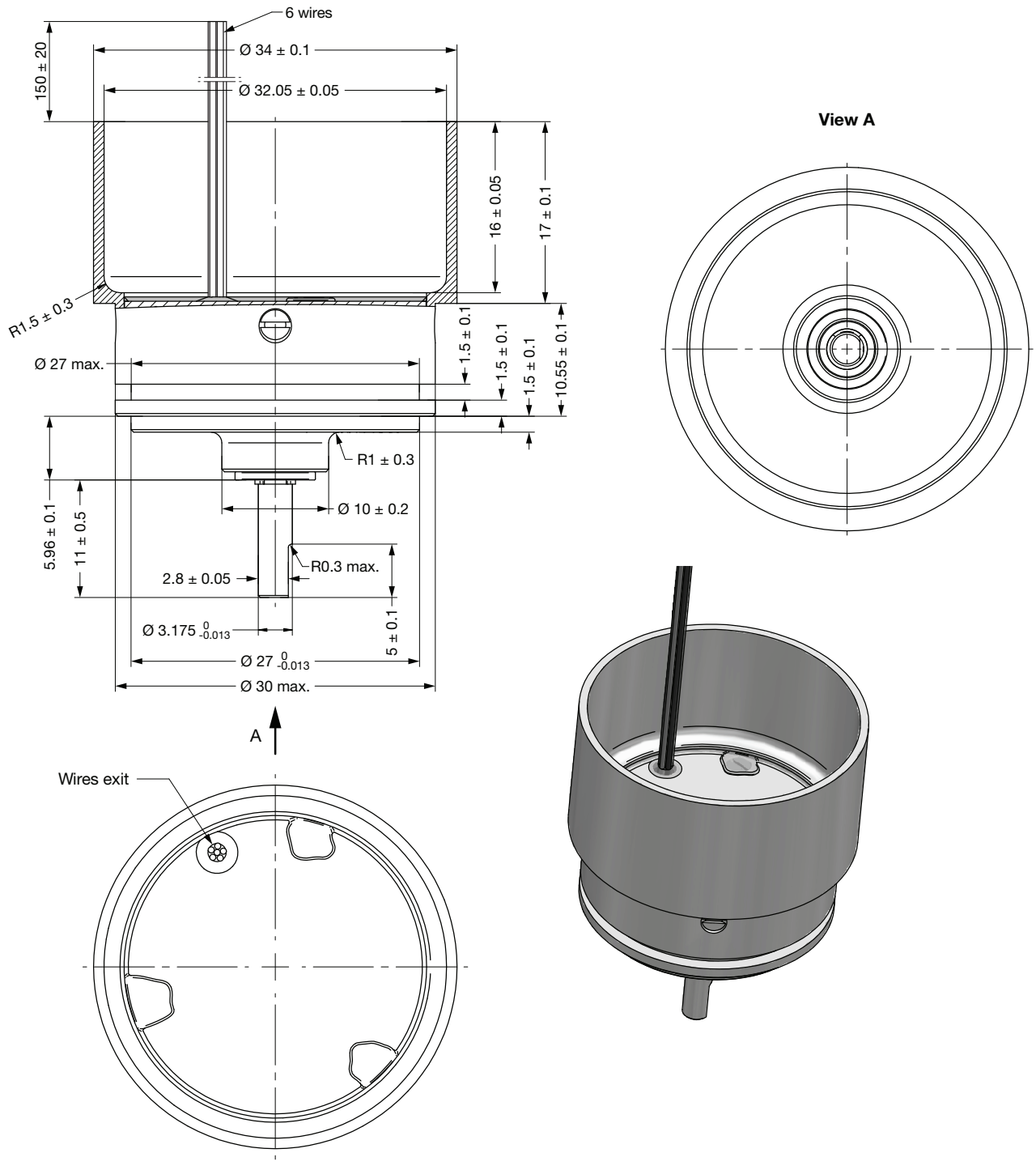
Timing Diagram



OPTIONS

- Other design on request (mechanical interfaces, electrical interfaces, ...)
- On request: axial output wires (see upcoming Dimensions table for details)

DIMENSIONS in millimeters



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