

## Rotational Absolute Magnetic Kit Encoder Version 27 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](http://www.vishay.com/doc?99912)



### LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA	
Sensor type	ROTATIONAL, magnetic technology
Output type	Wires
Market appliance	Industrial
Dimensions	Diameter 27.3 mm

ELECTRICAL SPECIFICATIONS	
PARAMETER	
Voltage supply	5 V ± 0.25 V
Current supply	≤ 130 mA at 5 V
Output	SSI
Connection	Ultra-flex AWG32 wires (shielded cable and connector on request)
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	Rotor: 6.7 g ± 0.5 g; stator: 7 g ± 1 g
Coating	On the two sides of PCB



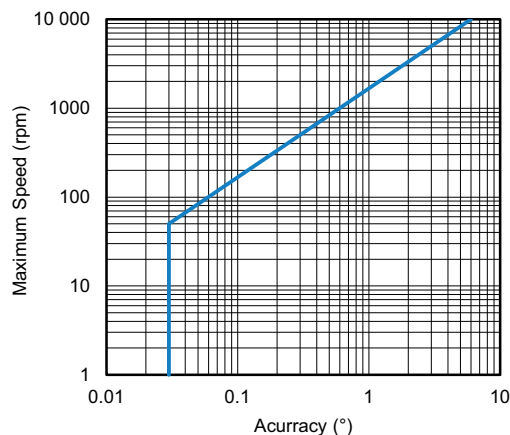
SAP PART NUMBERING GUIDELINES										
TYPE	MODEL	DESIGN	SIZE (mm)	TYPE	FUNCTION	ACCURACY (BITS)	RESOLUTION (BITS)	OUTPUT	PACKAGING	3 DIGITS
R = rotational	AM	K = kit	027	M	1	13	16	U	B = box	To consult Vishay for dedicated 3 digits

PERFORMANCE	
PARAMETER	
Operating temperature range	-40 °C to +105 °C
Storage temperature range	-45 °C to +105 °C
Acceleration	100 g for 1 s
Vibration	0.05 g <sup>2</sup> /Hz, 20 Hz to 2000 Hz for 1 h along the three major axis
Shock	180 g, 14 ms, 1/2 sine
EMC	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 <sup>(1)</sup> - 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	HR ≤ 88 % (non-condensing) operating 48 hours

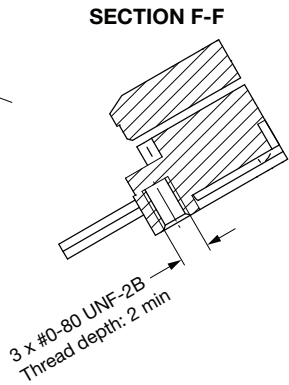
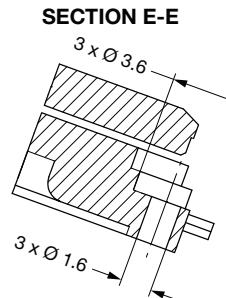
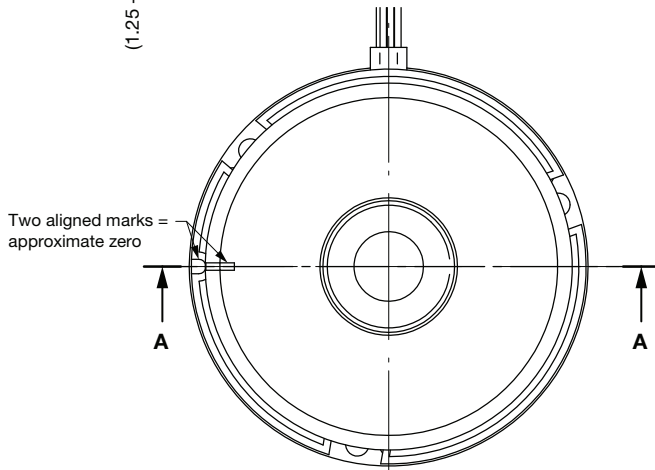
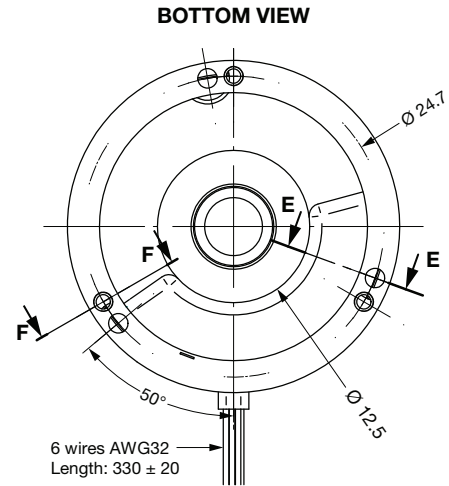
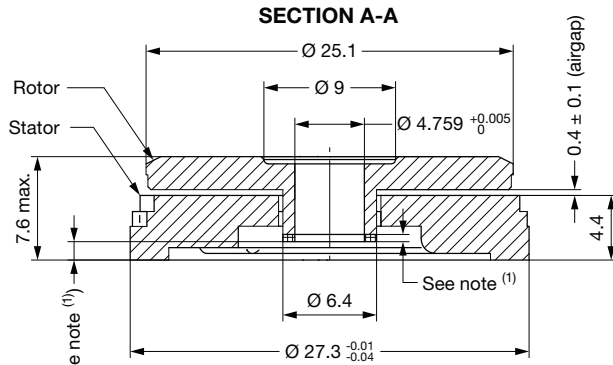
**Note**

<sup>(1)</sup> For the test setup, the RAMK027 metallic support for the stator is directly bonded with a braid to the ground plane and additional connection of the cable shielding to the ground plane

**MAXIMUM SPEED VS. ACCURACY CHART (latency time excluded)**



**DIMENSIONS** in millimeters



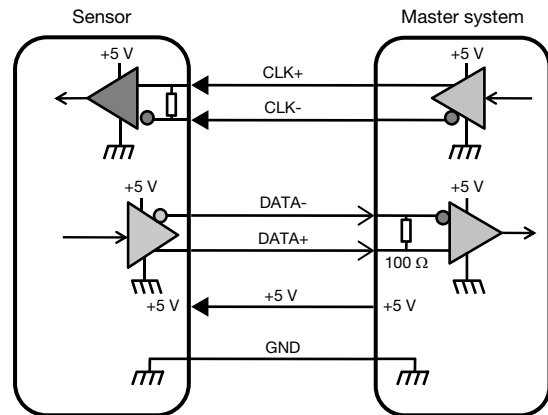
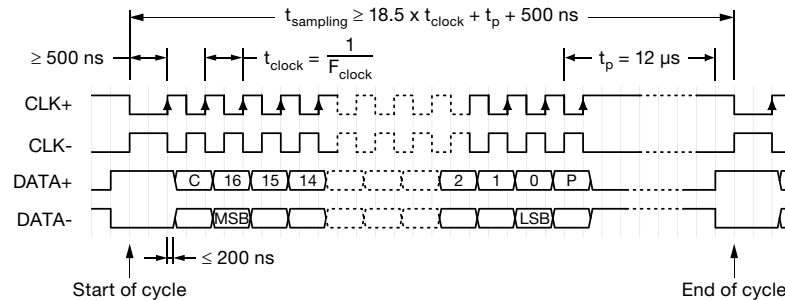
**Note**

(1) The washer to set the airgap with respect to distance between stator and rotor reference of 1.25 is not the supplied. Only its thickness is supplied with the encoder

**ELECTRICAL INTERFACE DESCRIPTION - SSI INTERFACE**

6 WIRES CONNECTIONS	
NAME	WIRE COLOR
GND	Black
+5 V	Red
CLK+	White
CLK-	Clear
DATA+	Yellow
DATA-	Green

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, ...)



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