

# Rotational Absolute Magnetic Kit Encoder Version 33 LP and HP Displacement Sensor



## FEATURES

- Hall effect principle
- 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
- Small error due to misalignment
- Two versions:  
High Precision (HP) and Low Precision (LP)
- Protected design, patent EP 2711663
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

## DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

## QUICK REFERENCE DATA

Sensor type	ROTATIONAL, magnetic technology
Output type	Wires or cables
Market appliance	Industrial
Dimensions	Diameter 33 mm

## ELECTRICAL SPECIFICATIONS

PARAMETER	
Voltage supply	5 V $\pm$ 0.25 V
Current supply	110 mA max. at 5 V
Output	SSI
Connection	Connector (wires on request)
Useful electrical angle	360° (single turn)
Absolute accuracy at 25 °C	Version HP: $\pm$ 0.03° > 13 bits Version LP: $\pm$ 0.25°
Absolute accuracy at -40 °C to +105 °C	Version HP: $\pm$ 0.05° ~ 13 bits Version LP: $\pm$ 0.5°
Resolution	Version HP: $\approx$ 0.004° ( $\approx$ 16.52 bits) 94 208 points over 360° Version LP: $\approx$ 0.022° ( $\approx$ 14 bits) 16 384 points over 360°
Startup time	$\leq$ 20 ms
Refresh time	$\leq$ 100 $\mu$ s
Latency time	$\leq$ 200 $\mu$ s
Sampling rate	10 kHz $\pm$ 5 %

## MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical angle	360°
Maximum speed rotation (HP version)	50 rpm (up to 700 rpm with decreasing of accuracy, see "Maximum Speed vs. Accuracy" chart)
Maximum speed rotation (LP version)	100 rpm (up to 1000 rpm with decreasing of accuracy, see "Maximum Speed vs. Accuracy" chart)
Weight	Version HP: rotor: 6.9 g $\pm$ 1 g; stator: 6.5 g $\pm$ 1 g Version LP: rotor: 2 g $\pm$ 1 g; stator: 2 g $\pm$ 1 g

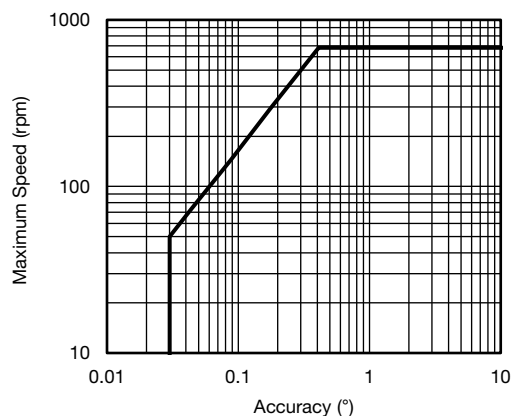
## SAP PART NUMBERING GUIDELINES

TYPE	MODEL	DESIGN	SIZE (mm)	TYPE	FUNCTION	ACCURACY (BITS)	RESOLUTION (BITS)	OUTPUT	PACKAGING
R = rotational	AM	K = kit	033	M	1	13	17	J = SSI CCW	B = box
						09	14		

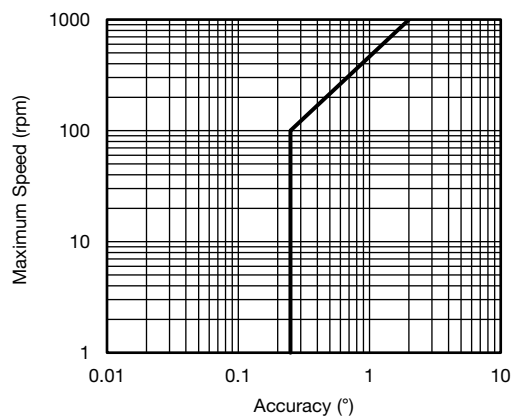


PERFORMANCE	
PARAMETER	
Operating temperature range	-40 °C to +105 °C (-55 °C to +105 °C on request)
Storage temperature range	-45 °C to +105 °C (-55 °C to +105 °C on request)
Acceleration	70 g for 1 s
Vibration	0.05 g <sup>2</sup> /Hz, 20 Hz to 2000 Hz for 1 h along the three major axis
Shock	180 g, 14 ms, 1/2 sine
EMC	MIL-STD-461F - CS114: conducted susceptibility, bulk cable injection, 10 kHz to 200 MHz table VI army ground level common mode injection and differential mode on positive - RS101: magnetic susceptibility, magnetic field, fig. RS101-2 from 30 Hz to 100 kHz - RS103: radiated susceptibility, electric field, 2 MHz to 18 GHz (level: 50 V/m) - RE102: radiated emissions, electric field, fig. RE102-4 - navy mobile and army - 10 kHz to 16 MHz
Humidity	HR ≤ 80 % (non-condensing)
Magnetic protection	Version HP: no influence up to 30 mT Version LP: no protection

**MAXIMUM SPEED VS. ACCURACY CHART** (for High Precision Version)

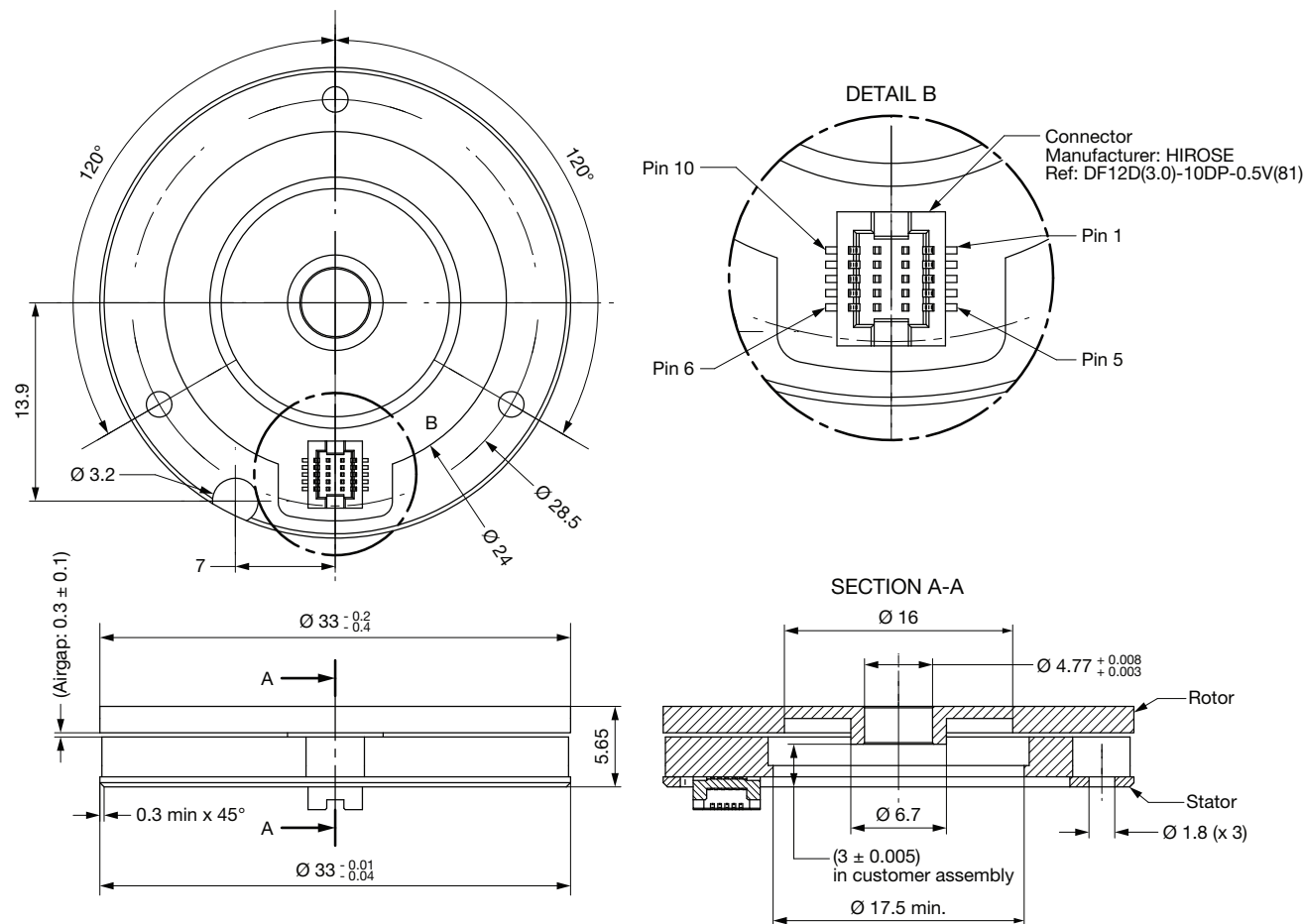


**MAXIMUM SPEED VS. ACCURACY CHART** (for Low Precision Version)

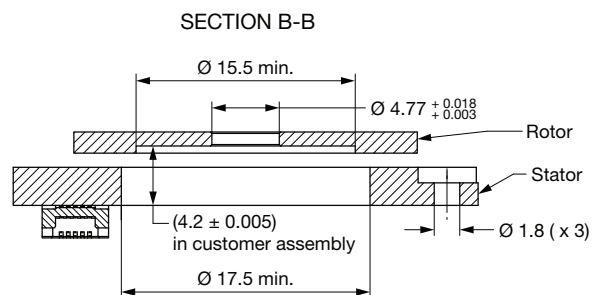
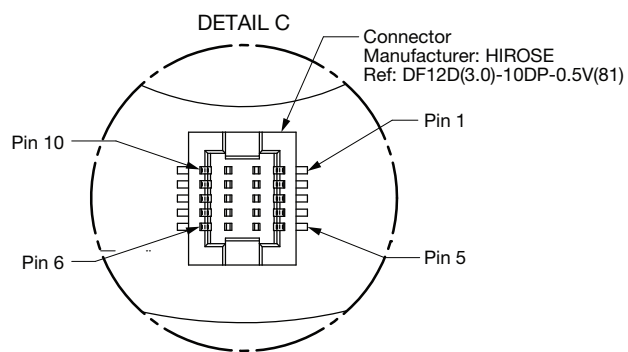
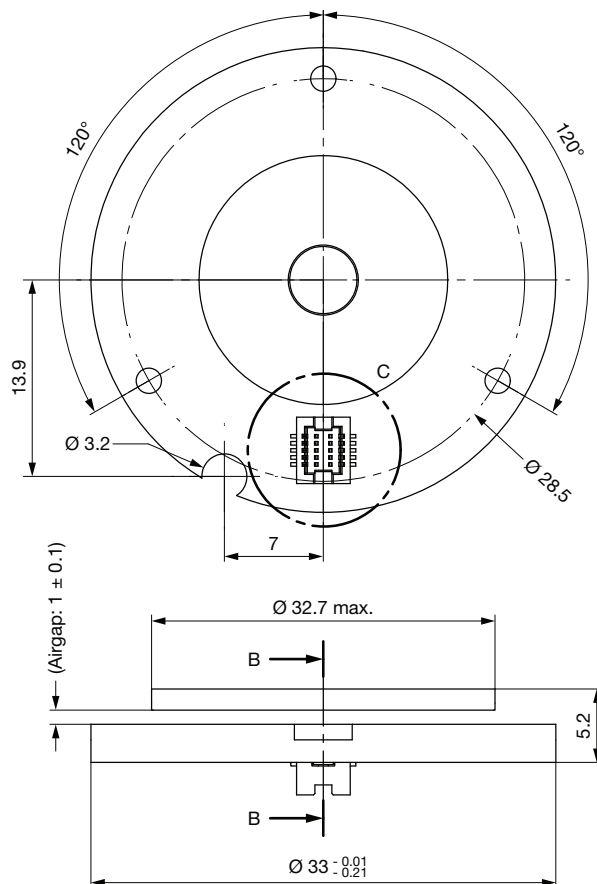


**DIMENSIONS** in millimeters

**VERSION HP**



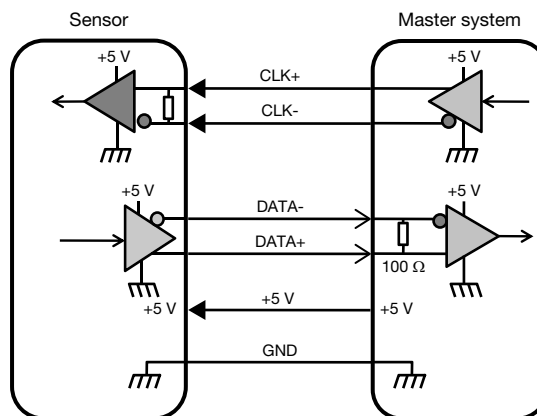
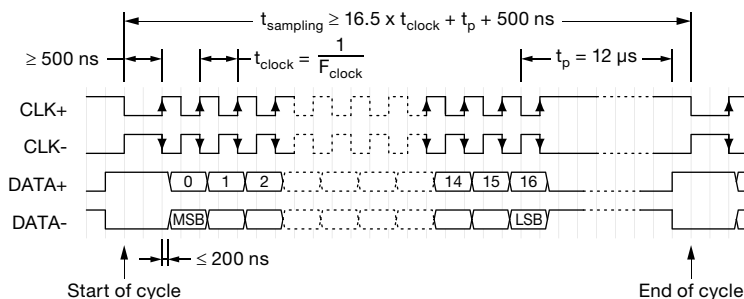
**DIMENSIONS** in millimeters

**VERSION LP**


**ELECTRICAL INTERFACE DESCRIPTION - VERSION HP**

6 WIRES CONNECTION	
PIN	NAME
1	Data-
2	Data+
3	CLK-
4	CLK+
5	GND
6	+5 V
7	Reserved for Vishay MCB Industrie production
8	Reserved for Vishay MCB Industrie production
9	Reserved for Vishay MCB Industrie production
10	Reserved for Vishay MCB Industrie production

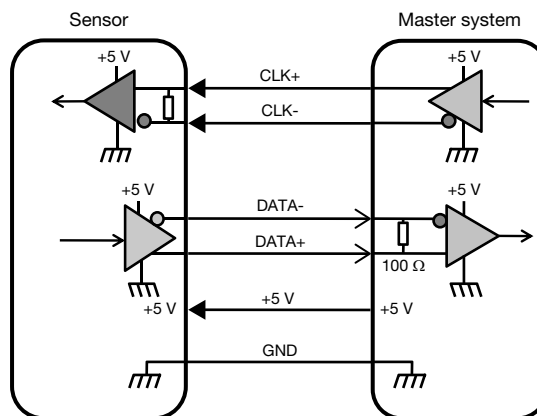
SSI PARAMETERS	
Output code	Binary
Data differential interface	RS422 according to EIA-RS422
CLK differential interface	RS422 according to EIA-RS422
Minimum clock frequency	300 kHz
Maximum clock frequency	4 MHz
Data bit (n)	17 bits


**Timing Diagram**


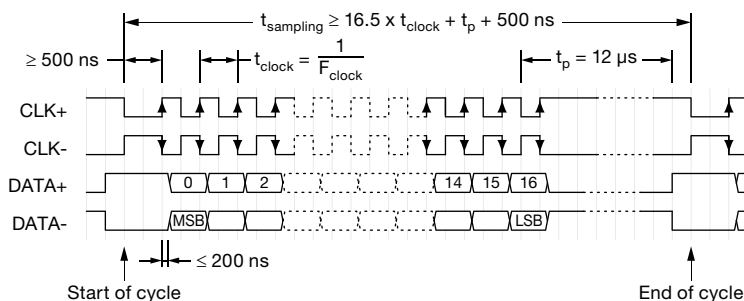
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SSI PARAMETERS	
Output code	Binary
Data differential interface	RS422 according to EIA-RS422
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Minimum clock frequency	300 kHz
Maximum clock frequency	4 MHz
Data frame	17 bits
Data bit (n)	14 bits



## Timing Diagram



## OPTIONS

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



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