

## Single Turn Bushing Mount Hall Effect Sensor in Size 09 (22.2 mm)



### FEATURES

- Accurate linearity down to:  $\pm 0.5\%$
- All electrical angles available up to:  $360^\circ$  (no dead band)
- Long life: greater than 10M cycles
- Non contacting technology: Hall effect
- Model dedicated to all applications in harsh environments



ELECTRICAL SPECIFICATIONS		
PARAMETER	STANDARD	SPECIAL
Electrical Angle	90°, 180°, 270°, 360°	Any other angle upon request
Linearity	$\pm 1\%$	$\pm 0.5\%$
Supply Voltage	5 V <sub>DC</sub> $\pm 10\%$	Other upon request
Supply Current	10 mA typical	16 mA for PWM output
Output Signal	Analog ratiometric 10 % to 90 % of V <sub>supply</sub> or PWM 10 % to 90 % duty cycle	Other upon request
Over Voltage Protection		+ 20 V <sub>DC</sub>
Reverse Voltage Protection		- 10 V <sub>DC</sub>
Load Resistance Recommended	Min. 1 k $\Omega$ for analog output and PWM output	
Hysteresis	< 0.2 %	

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical travel	360° continuous, stops upon request: $340^\circ \pm 3^\circ$
Bearing type	Sleeve bearing
Standard	IP 50; other on request
Weight	20 g $\pm 2$ g

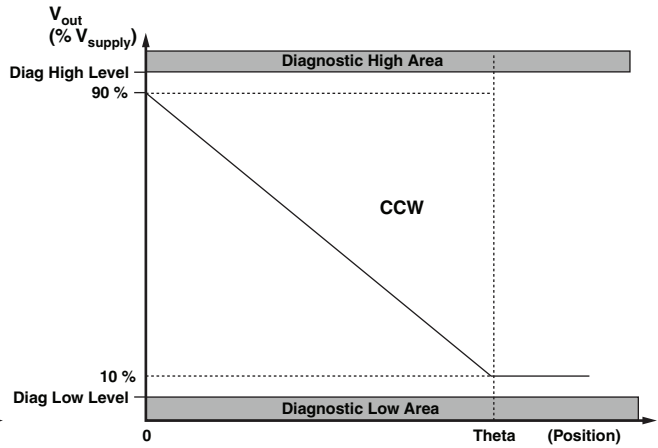
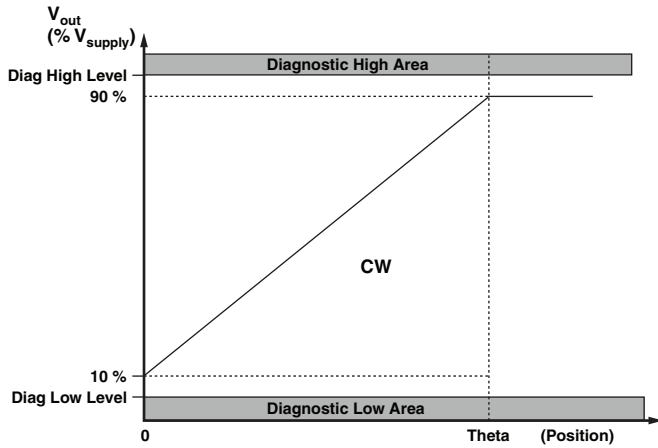
ORDERING INFORMATION/DESCRIPTION									
351HE	0	A	1	W	A	1S22	XXXX	BO 10	e1
MODEL	FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST	PACKAGING	LEAD FINISH
0:	Continuous rotation and antirotation pin	A: $\pm 1\%$ B: $\pm 0.5\%$	1: 90° 2: 180° 3: 270° 4: 360° 9: Other angles	W: Wires Z: Custom	A: Analog CW B: Analog CCW C: PWM CW D: PWM CCW Z: Other output	0: 6 mm 1: 6.35 mm 2: 3.175 mm 9: Special P: Plain S: Slotted Z: Other type		Box of 10 pieces	
1:	Continuous rotation and no antirotation pin								
2:	Stops at 340° and antirotation pin								
3:	Stops at 340° and no antirotation pin								
Shaft length from mounting face 22 mm to 72 mm max. per step of 5 mm									

SAP PART NUMBERING GUIDELINES							
351HE	1	B	9	Z	C	0P27	XXXX
MODEL	MECHANICAL FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST

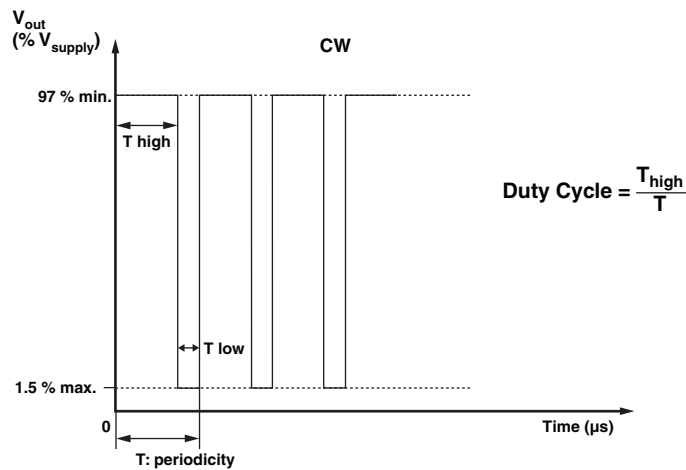


**V<sub>OUT</sub> ANALOG**

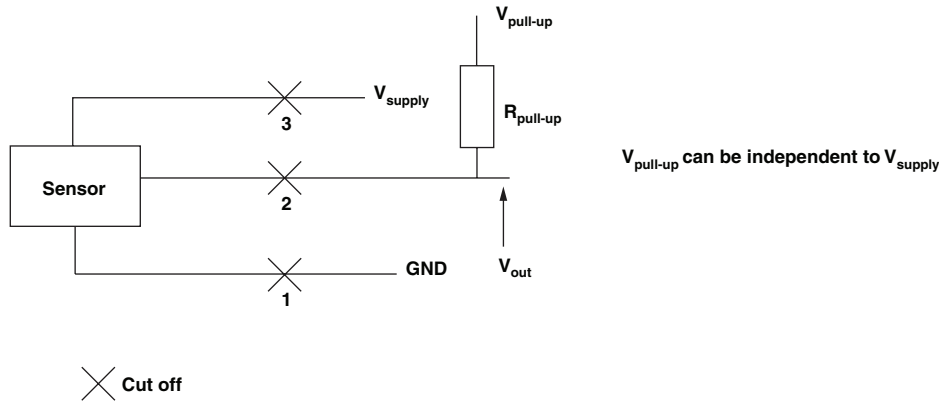
Operating Temperature	85 °C	125 °C
Diagnostic High Level	96 % min.	96 % min.
Diagnostic Low Level	2 % max.	4 % max.



**V<sub>OUT</sub> PWM**

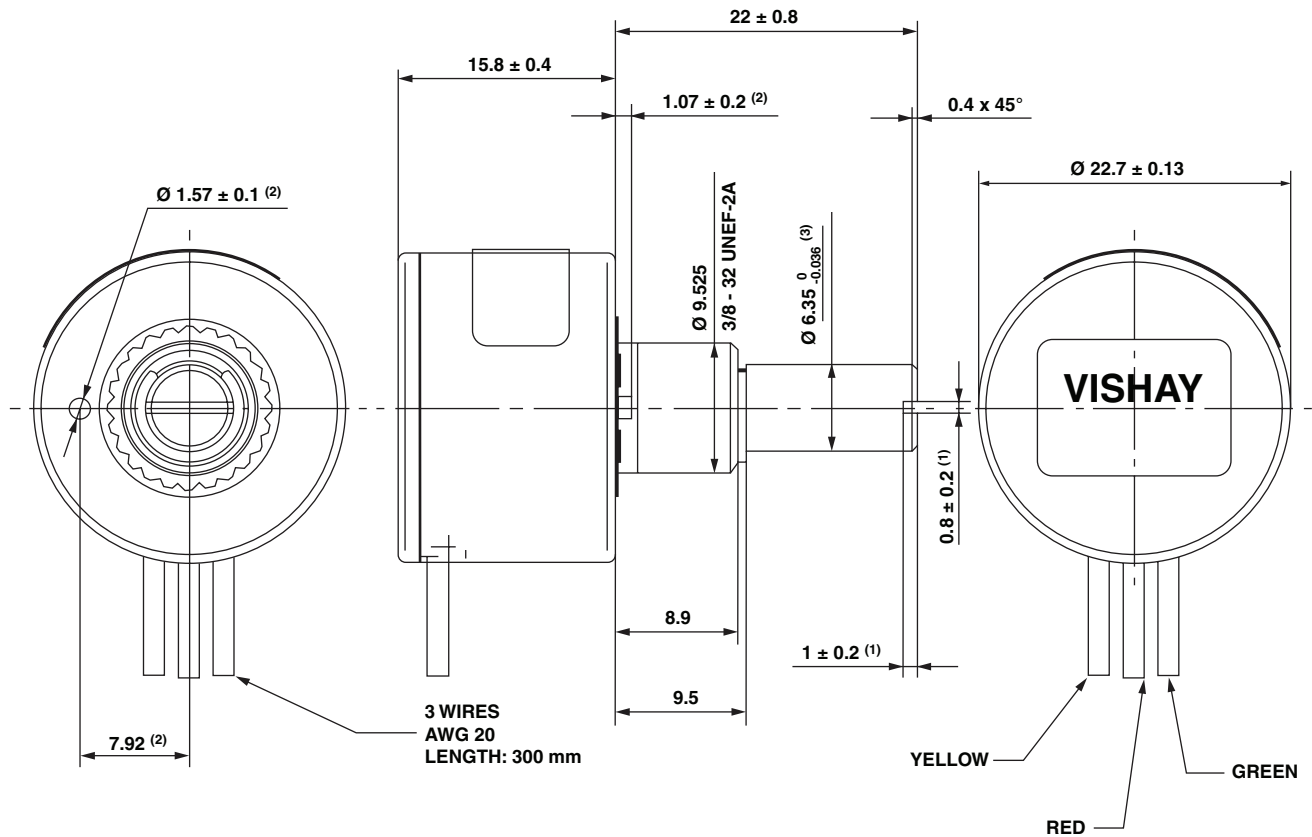


DIAGNOSTIC MODES			
FAILURE	$V_{out}$ Analog $R_{pull-up}$	$V_{out}$ Analog $R_{pull-down}$	$V_{out}$ PWM $R_{pull-up} = 1\text{ k}\Omega$ $V_{pull-up} = V_{supply} = 5\text{ V}$
1: Broken GND	Diagnostic high area	Diagnostic low area	> 97 % $V_{supply}$ without modulation
2: Broken $V_{out}$	Diagnostic high area	Diagnostic low area	> 97 % $V_{supply}$ without modulation
3: Broken $V_{supply}$	Diagnostic high area	Diagnostic low area	> 97 % $V_{supply}$ without modulation
Over Voltage $V_{supply} > 7\text{ V}$	Diagnostic high area	Diagnostic low area	> 97 % $V_{supply}$ without modulation
Under Voltage $V_{supply} < 2.7\text{ V}$	Diagnostic high area	Diagnostic low area	> 97 % $V_{supply}$ without modulation

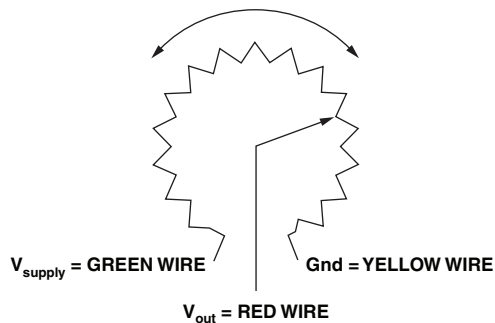


ENVIRONMENTAL SPECIFICATIONS	
Vibrations	20 G from 10 Hz to 2000 Hz
Shocks	3 shocks/axis; 50 G half a sine 11 ms
Operating Temperature Range	- 45 °C; + 125 °C
Life	> 10M of cycles
Rotational Speed (max)	120 rpm
Immunity to Radiated Electromagnetic Disturbances	200 V/m 150 kHz/1 GHz
Immunity to Power Frequency Magnetic Field	200 A/m 50 Hz/60 Hz
Radiated Electromagnetic Emissions	30 MHz/1 GHz < 30 dBμV/m
Electrostatic Discharges	Contact discharges: ± 4 kV Air discharges: ± 8 kV
<b>Materials</b>	
Housing	Thermoplastic housing
Bushing	Brass nickel plated
Shaft	Stainless steel
Output	3 lead wires
<b>Bushing Mount Hardware</b>	
Lockwasher Internal Tooth	Steel nickel plated
Panel Nut	Brass nickel plated

### DIMENSIONS in millimeters

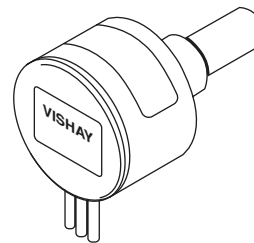


CW OR CCW ACCORDING  
OUTPUT MODE CHOICE



VIEWED FROM SHAFT

GENERAL TOLERANCE:  $\pm 0.5$  mm



### Notes:

- (1) For version slotted shaft
- (2) For version non turn pin
- (3) For shaft type "1"

MARKING	
Unit Identification	Manufacturer's name and complete sap part reference, date code, and wiring correspondance: colors versus connections.



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