

## Industrial Servo 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### QUICK REFERENCE DATA

Sensor type	ROTATIONAL, single turn hall effect
Output type	Output by turrets
Market appliance	Industrial
Dimensions	7/8" (22.2 mm)

### ELECTRICAL SPECIFICATIONS

PARAMETER	STANDARD	SPECIAL
Electrical angle	$90^\circ, 180^\circ, 270^\circ, 360^\circ$	Any other angle upon request
Linearity	$\pm 1\%$	$\pm 0.5\%$
Supply voltage	$5 V_{DC} \pm 10\%$	Other upon request
Supply current	10 mA typical/16 mA max.	16 mA for PWM output
Output signal	Analog ratiometric 10 % to 90 % of $V_{supply}$ or PWM 1 kHz, 10 % to 90 % duty cycle	Other upon request
Over voltage protection	$+20 V_{DC}$	
Reverse voltage protection	$-10 V_{DC}$	
Load resistance recommended	Min. 1 k $\Omega$ for analog output and PWM output	
Hysteresis static	$< 0.2^\circ$	

### MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical travel	$360^\circ$ continuous
Bearing type	2 ball bearings
Standard	IP 50; other on request

### ORDERING INFORMATION/DESCRIPTION

151HE	1	A	1	T	A	2S12	XXXX	BO 10	e1
MODEL	FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST	PACKAGING	LEAD FINISH
1:	Continuous rotation and no antirotation pin	A: $\pm 1\%$ B: $\pm 0.5\%$	1: $90^\circ$ 2: $180^\circ$ 3: $270^\circ$ 4: $360^\circ$ 9: Other angles	T: Turrets Z: Custom	A: Analog CW B: Analog CCW C: PWM CW D: PWM CCW Z: Other output	2: 3.175 mm 9: Special P: Plain S: Slotted Z: Other type		Box of 10 pieces	

Shaft length from mounting face 12 mm to 72 mm max. per step of 5 mm

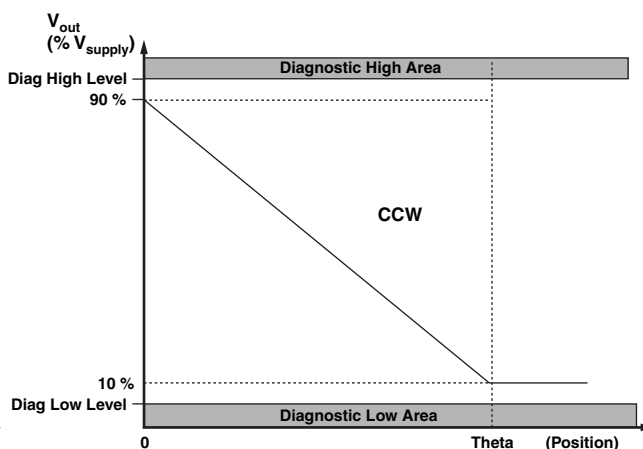
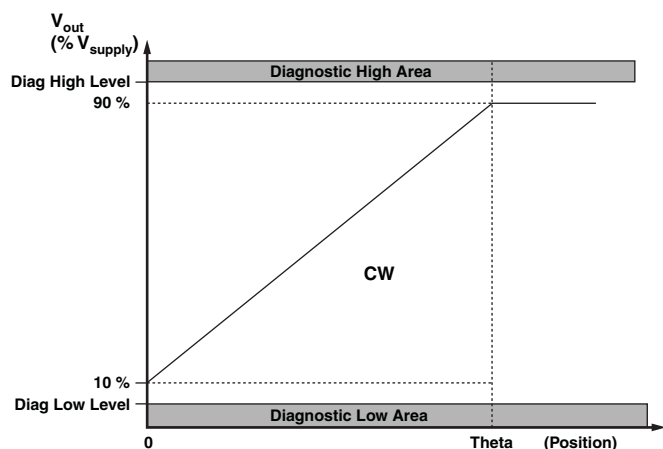
### SAP PART NUMBERING GUIDELINES

151HE	1	B	9	Z	C	2P22	XXXX
MODEL	MECHANICAL FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST

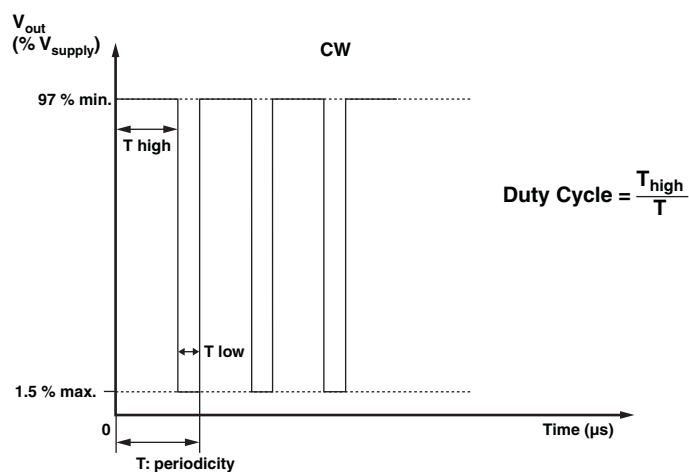


### V<sub>OUT</sub> ANALOG

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

$\times$  Cut off

$V_{pull-up}$  can be independent to  $V_{supply}$

**ENVIRONMENTAL SPECIFICATIONS**

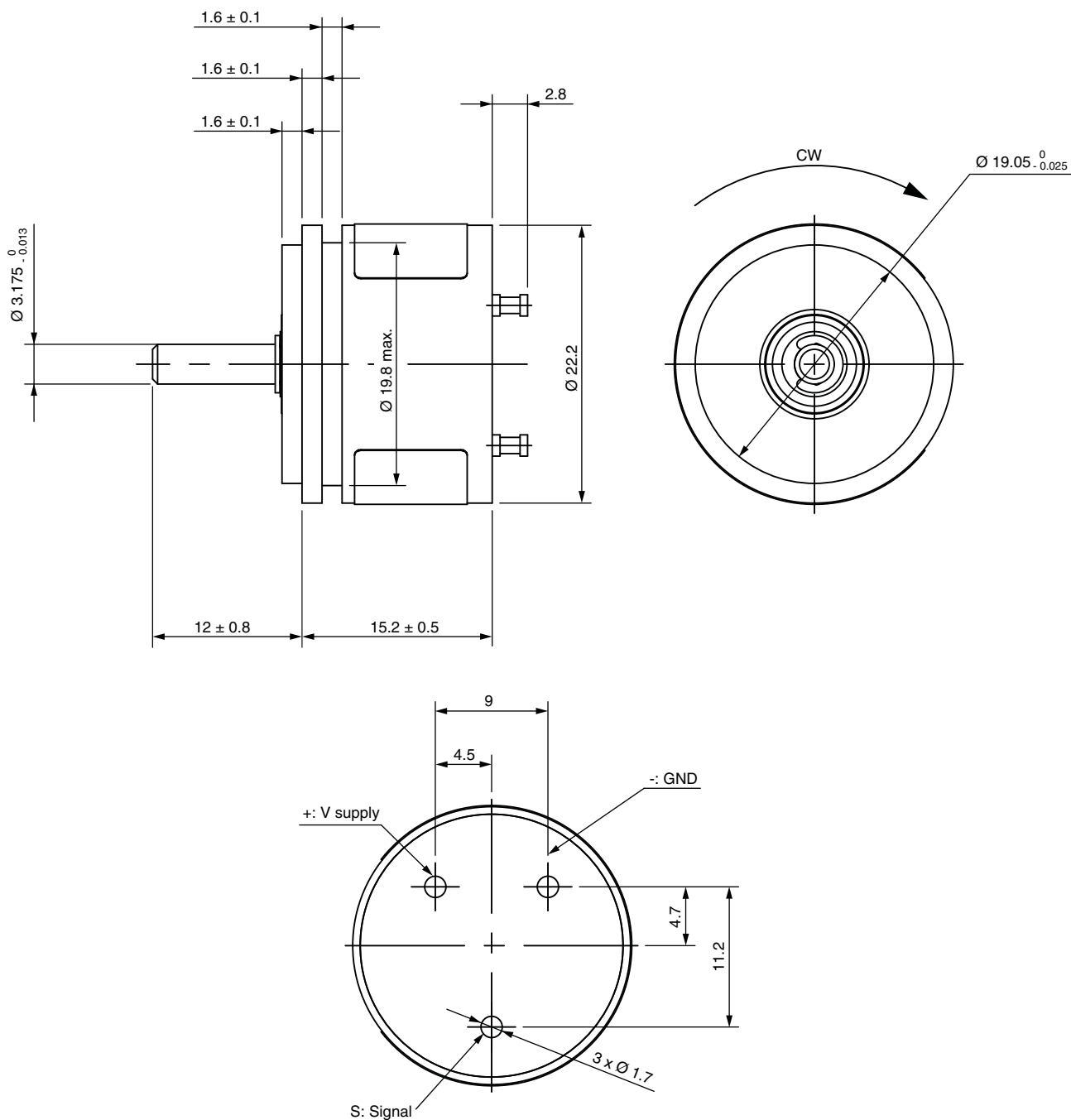
Vibrations	20 g from 10 Hz to 2000 Hz, EN 60068-2-6
Shocks	3 shocks/axis; 50 g half a sine 11 ms, EN 60068-2-7
Operating temperature range	-45 °C; +125 °C
Life	$> 10\text{M}$ of cycles
Rotational speed (max)	120 rpm
Immunity to radiated electromagnetic disturbances	200 V/m 150 kHz/1 GHz, IEC 62132-2 part 2 (level A)
Immunity to power frequency magnetic field	200 A/m 50 Hz/60 Hz, EN 61000-4-8 (level A)
Radiated electromagnetic emissions	30 MHz/1 GHz $< 30\text{ dB}\mu\text{V/m}$ , EN 61000-6-4 (level A)
Electrostatic discharges	Contact discharges: $\pm 4\text{ kV}$ Air discharges: $\pm 8\text{ kV}$ , EN 61000-4-2
<b>MATERIALS</b>	
Housing	Anodized aluminum
Mounting type	Servo
Shaft	Stainless steel
Output	Standard: 3 turrets (other on request)

**Note**

- Nothing stated herein shall be construed as a guarantee of quality or durability.



## DIMENSIONS in millimeters



Dimensions in mm  
General tolerances:  $\pm 0.5 \text{ mm}$



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