



# Single Turn Servo Mount Hall Effect Sensor in Size 05 (12.7 mm)



### FEATURES

- Accurate linearity down to:  $\pm 0.5\%$
- All electrical angles available up to:  $360^\circ$  (no dead band)
- Long life: Greater than 50M cycles
- Non contacting technology: Hall effect
- Smallest size available
- 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	Wires
Market appliance	Professional
Dimensions	1/2" (12.7 mm) dia.

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 max.	16 mA for PWM output
Output signal	Analog ratiometric 10 % to 90 % of V <sub>supply</sub> or PWM 1 kHz, 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 static	< 0.2° max.	

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical travel	360° continuous
Bearing type	2 ball bearings
Standard	IP 51; other on request

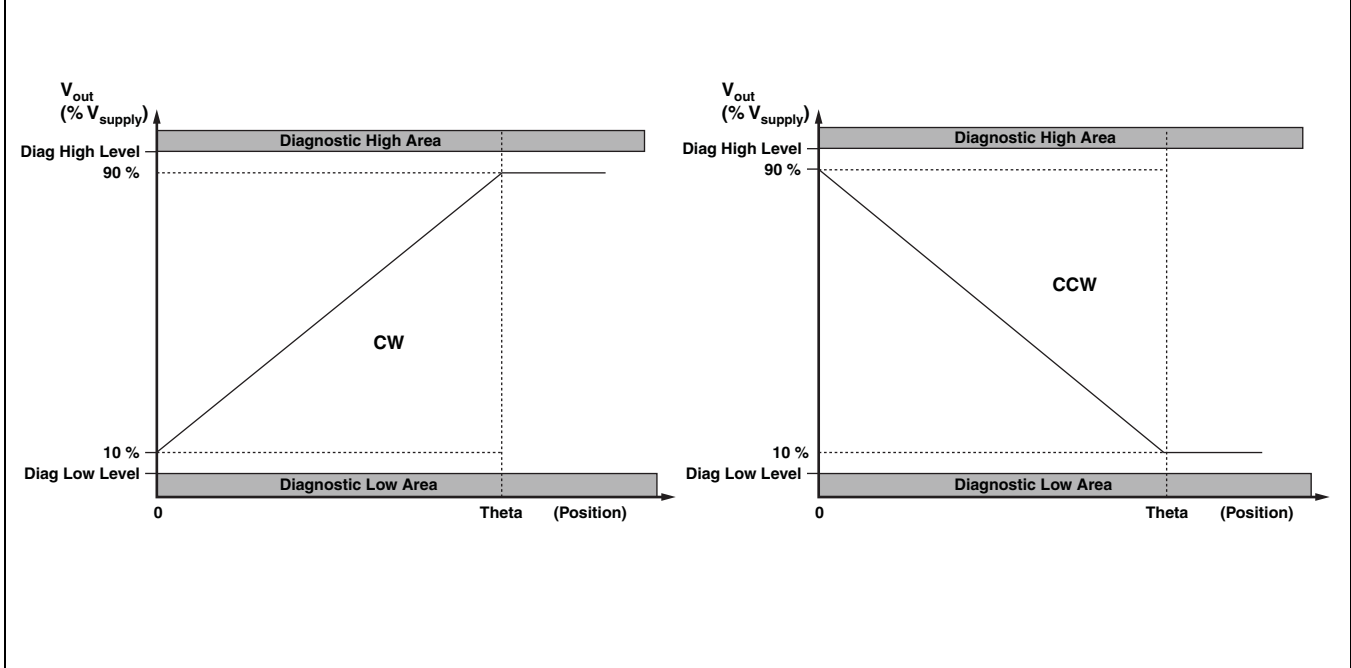
ORDERING INFORMATION/DESCRIPTION									
50 SHE	1	A	1	W	A	2S13	XXXX	BO 10	e1
MODEL	NUMBER OF CUP	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST	PACKAGING	LEAD FINISH
	1:1 Cup	A: $\pm 1\%$ B: $\pm 0.5\%$	1: 90° 2: 180° 3: 270° 4: 360° 9: Other angles	W: Wires Z: Custom	A: Analog CW B: Analog CCW C: PWM CW D: PWM CCW Z: Other output	2: 3.175 mm 9: Special P: Plain S: Slotted Z: Other type		Box of 10 pieces	
Shaft length from mounting face, standard: 13 mm									

SAP PART NUMBERING GUIDELINES							
50 SHE	1	B	9	Z	C	2P22	XXXX
MODEL	1: 1 cup	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST
	OUTPUT SIGNAL						

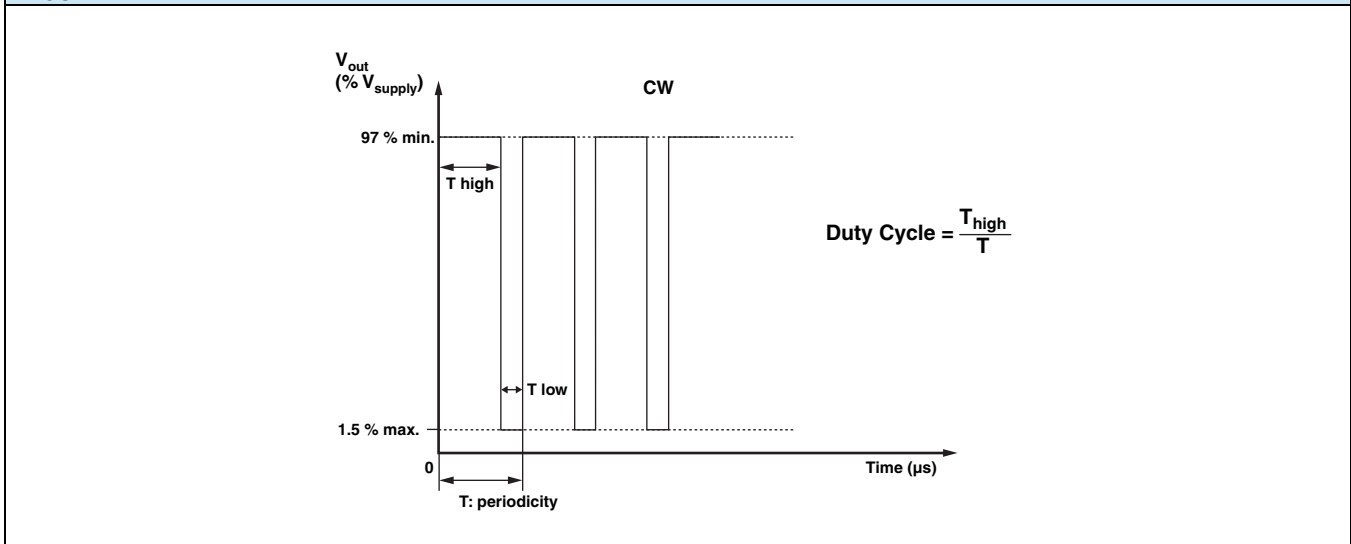


**V<sub>OUT</sub> ANALOG**

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**



<b>DIAGNOSTIC MODES</b>			
<b>FAILURE</b>	<b><math>V_{out}</math> ANALOG <math>R_{pull-up}</math></b>	<b><math>V_{out}</math> ANALOG <math>R_{pull-down}</math></b>	<b><math>V_{out}</math> PWM <math>R_{pull-up} = 1\text{ k}\Omega</math> <math>V_{pull-up} = V_{supply} = 5\text{ V}</math></b>
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

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

$\times$  Cut off

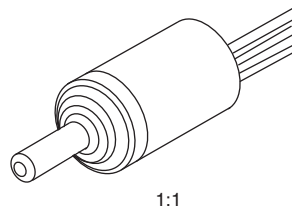
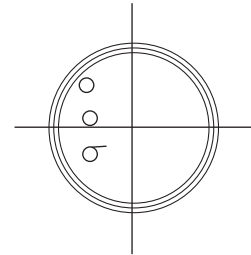
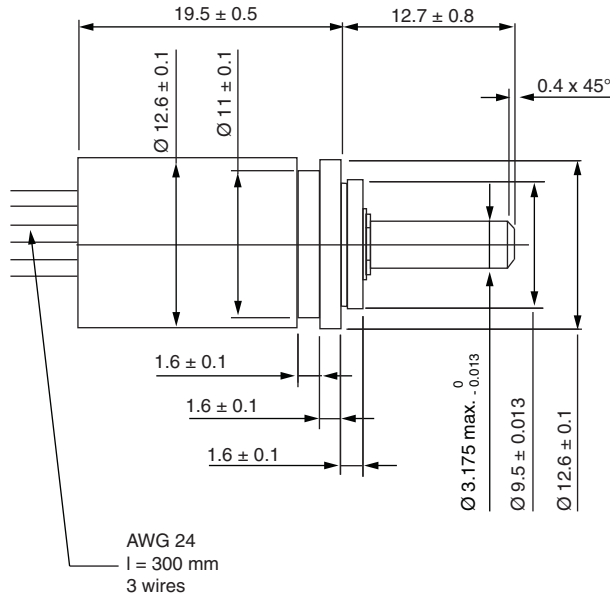
<b>ENVIRONMENTAL SPECIFICATIONS</b>	
Vibrations	20 g from 10 Hz to 2000 Hz, EN 60068-2-6
Shocks	3 shocks/axis; 50 g half a sine 11 ms, EN 60068-2-7
Operating temperature range	-40 °C; +125 °C
Life	> 50M of cycles
Rotational speed (max.)	120 rpm
Immunity to radiated electromagnetic disturbances	200 V/m 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 dB $\mu$ 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	Aluminum
Shaft	Stainless steel
Output	3 lead wires (AWG 24)

**Note**

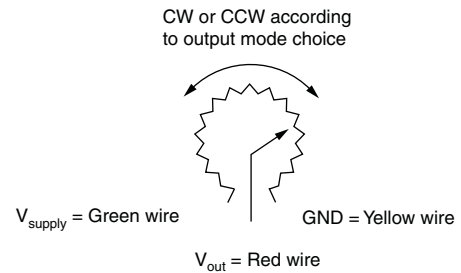
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## DIMENSIONS in millimeters



General tolerance: ± 0.5 mm



View from shaft side



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