

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



### DESIGN SUPPORT TOOLS AVAILABLE



#### QUICK REFERENCE DATA

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

#### FEATURES

- Accurate linearity down to:  $\pm 0.5\%$
- All electrical angles available up to:  $360^\circ$  (no dead band)
- Long life: over 20M cycles
- Non contacting technology: Hall effect
- Model dedicated to all applications in harsh environments
- Robust tool machined aluminum housing
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

#### 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 for PWM output
Output signal	Analog ratio metric 10 % to 90 % of $V_{supply}$ or PWM 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	$< 0.2\%$	

#### MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical travel	$360^\circ$ continuous
Bearing type	Sleeve bearing Ball bearing upon request
Standard	IP 50; other on request
Weight	20 g $\pm$ 2 g

#### ORDERING INFORMATION/DESCRIPTION

631HE	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: $90^\circ$ 2: $180^\circ$ 3: $270^\circ$ 4: $360^\circ$ 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	
Shaft length from mounting face 22 mm to 72 mm max. per step of 5 mm									

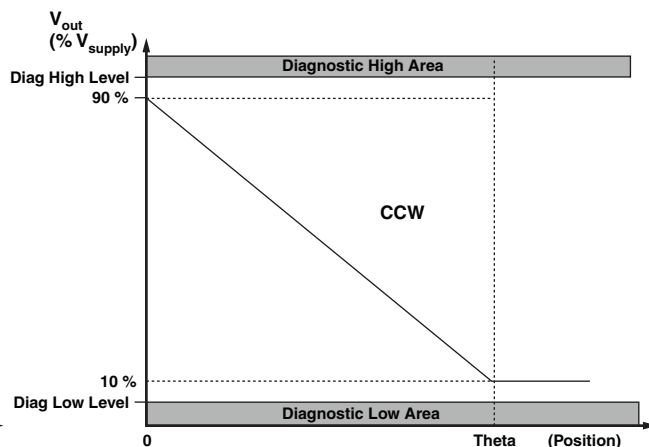
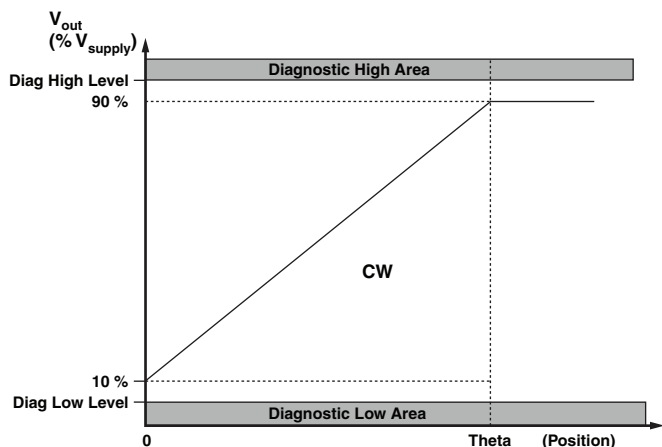
#### SAP PART NUMBERING GUIDELINES

631HE	1	B	9	Z	C	0P27	XXXX
MODEL	MECHANICAL FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST

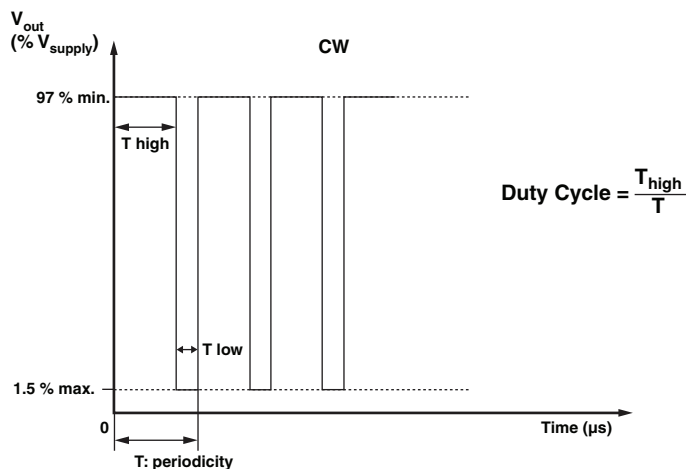


### V<sub>OUT</sub> ANALOG

Operating temperature	85 °C	125 °C
Diagnostic high level	96 % min.	96 % min.
Diagnostic low level	2 % max.	4 % max.

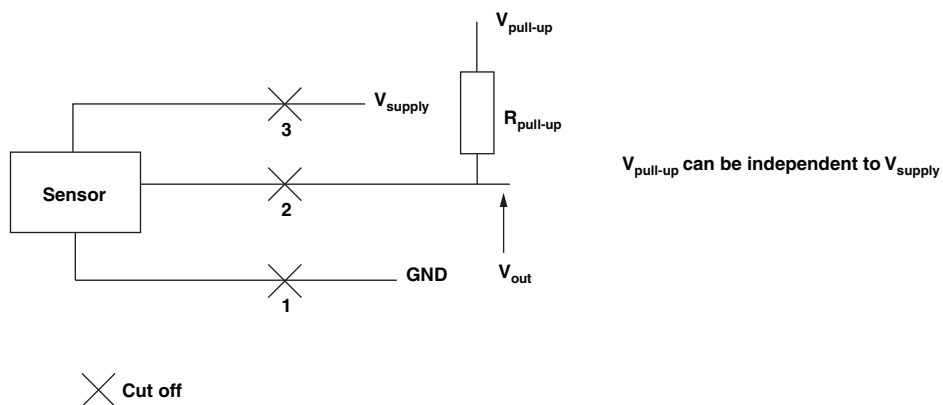


### V<sub>OUT</sub> PWM



**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 to +125 °C
Life	20M 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 dB $\mu$ V/m
Electrostatic discharges	Contact discharges: $\pm 4\text{ kV}$ Air discharges: $\pm 8\text{ kV}$

**MATERIALS**

Housing	Aluminum anodized
Shaft	Stainless steel
Output	3 lead wires

**BUSHING MOUNT HARDWARE**

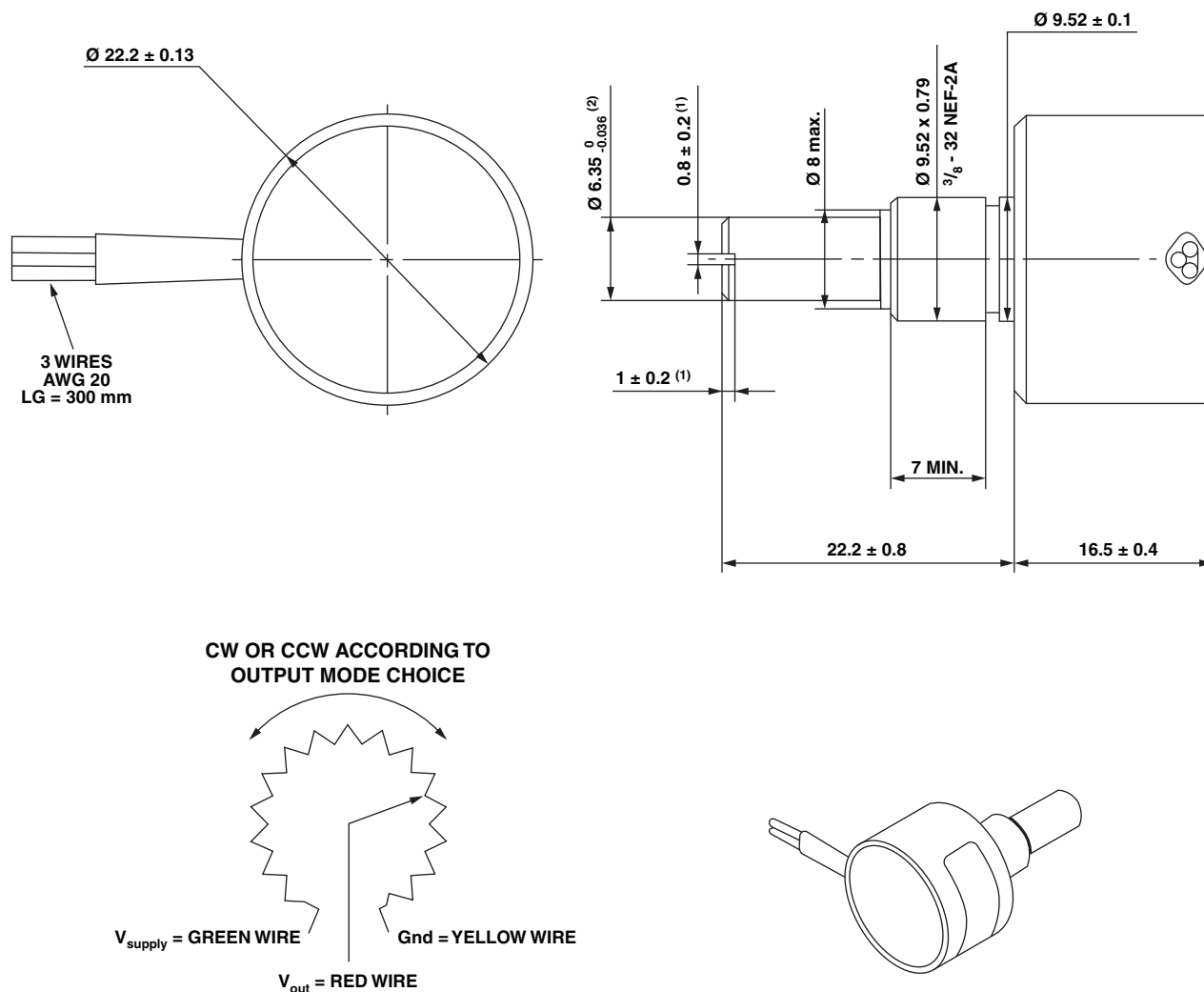
Lockwasher internal tooth	Steel nickel plated
Panel nut	Brass nickel plated

**Note**

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



**DIMENSIONS** in millimeters



**Dimensions** in millimeter  
Delivered with nut and washer

**Notes**

- (1) For version slotted shaft
- (2) For shaft type "1"

**MARKING**

Unit identification	Manufacturer's name and complete sap part reference, date code, and wiring correspondence: colors versus connections
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