

Throttle Position Sensor in Hall Effect Technology Hollow and D-Shaft Versions



FEATURES

- Accurate linearity down to: $\pm 0.5\%$
- Easy mounting principle
- Non contacting technology: Hall effect
- Model dedicated to all applications in harsh environments
- Spring loaded types available



RoHS
COMPLIANT

ELECTRICAL SPECIFICATIONS		
PARAMETER	STANDARD	SPECIAL
Electrical Angle	90°, 120°, 180°, 270°, 360°	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 Ω for analog output and PWM output	
Hysteresis Static (D-Shaft Version)		< 0.3°

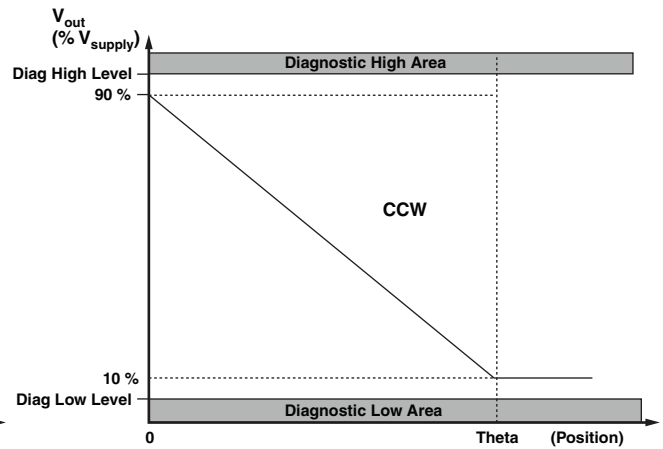
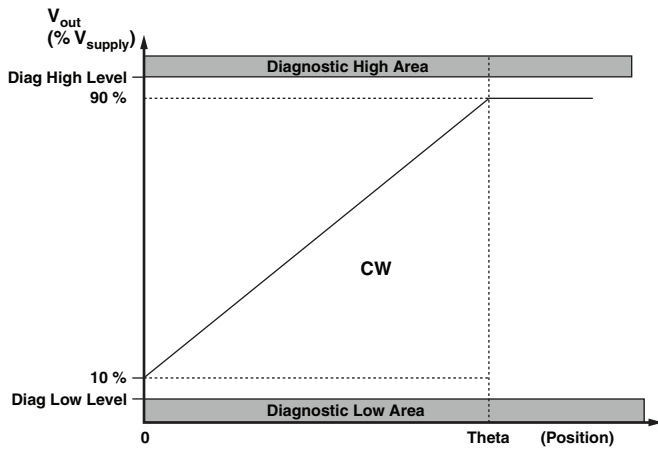
MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical travel	360° continuous, stops upon request: 124° \pm 3°
Bearing type	Sleeve bearing
Standard	IP 50; other on request
Weight	19 g \pm 2 g Hollow shaft model/22 g \pm 2 g D-Shaft model

ORDERING INFORMATION/DESCRIPTION									
981HE	0	A	1	W	A	1F16	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° 5: 120° 9: Other angles	W: Wires Z: Custom	A: Analog CW B: Analog CCW C: PWM CW D: PWM CCW Z: Other output	1: 6.35 mm 9: Special P: Plain F: Flatted S: Slotted Z: Other type		Box of 10 pieces	
Shaft length from mounting face (Standard: 16 mm) 8H00 Hollow shaft 8H01 Hollow D-Shaft									

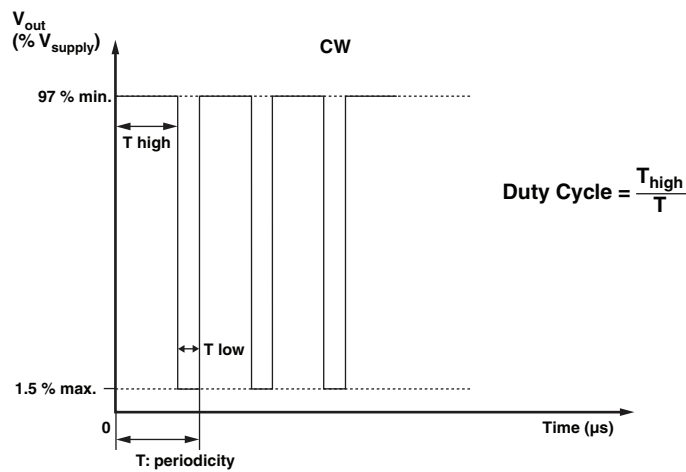
SAP PART NUMBERING GUIDELINES							
981HE	1	B	9	Z	C	8H01	XXXX
MODEL	MECHANICAL FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST



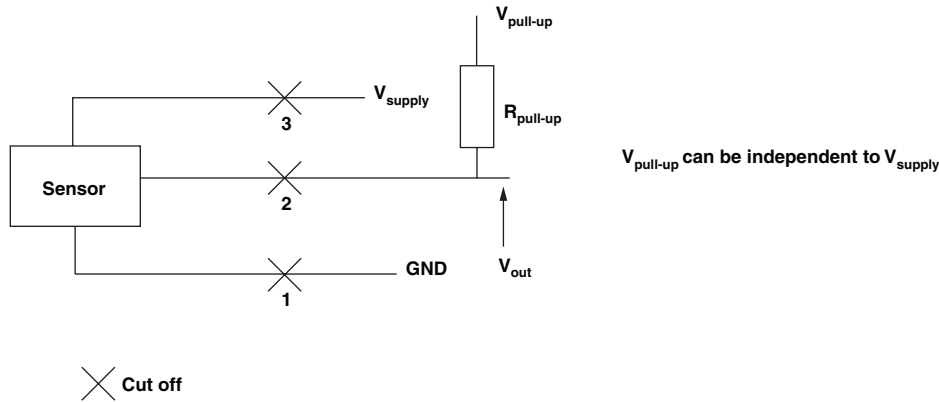
V_{OUT} ANALOG



V_{OUT} 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



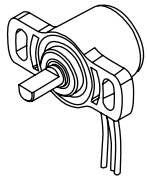
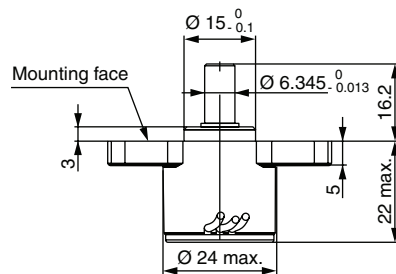
ENVIRONMENTAL SPECIFICATIONS	
Vibrations	20 G from 10 Hz to 2000 Hz, EN 60068-2-6
Shocks	3 shocks/axis; 50 G half a sine 11 ms, EN 60068-2-7
Operating Temperature Range	- 45 °C; + 125 °C
Life (in cycles)	> 5M for hollow shaft model/> 10M for D-Shaft model
Rotational Speed (max.)	120 rpm
Immunity to Radiated 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 μ V/m, EN 61000-6-4 (Level A)
Electrostatic Discharges	Contact discharges: $\pm 8\text{ kV}$ Air discharges: $\pm 15\text{ kV}$, EN 61000-4-2
Materials	
Housing	Thermoplastic housing
Shaft	Stainless steel
Output	3 lead wires



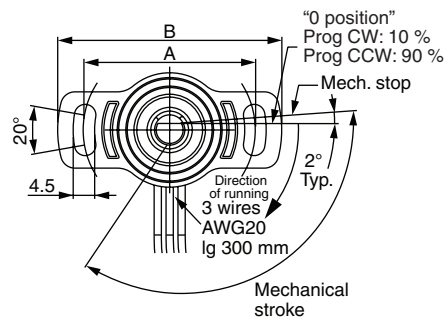
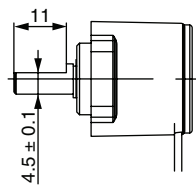
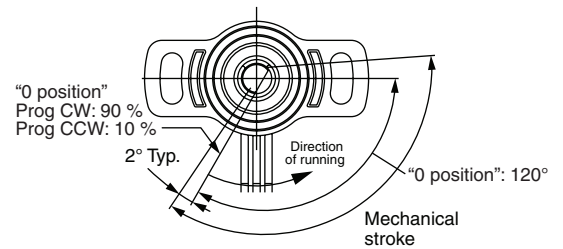
DIMENSIONS in millimeters

**VARIOUS POSSIBLE TYPES OF MODEL 981 HE
IN D-SHAFT VERSION**

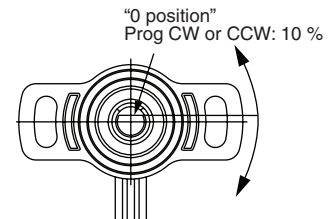
① 981 HE D-Shaft
Spring return CCW
Shaft: \varnothing 6.35 flatted length 16 mm FMF
Model: 981HE-3-x-x-W-x-1F16



② 981 HE D-Shaft
Spring return CW
Shaft: \varnothing 6.35 flatted 16 mm FMF
Model: 981HE-2-x-x-W-x-1F16



③ 981 HE D-Shaft
Continuous rotation
Shaft: \varnothing 6.35 flatted 16 mm FMF
Model: 981HE-0-x-x-W-x-1F16

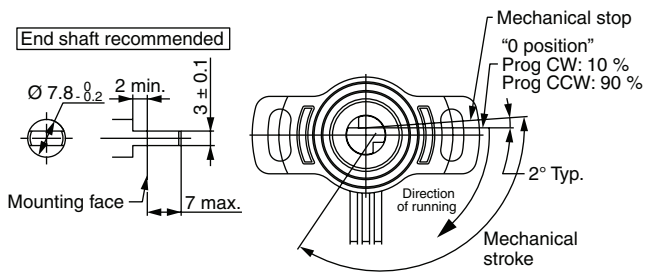


Dimension	Standard	Option	Wires
A	36	38	Yellow GND (-) Red Signal
B	47	48	Green V _{CC} (+)

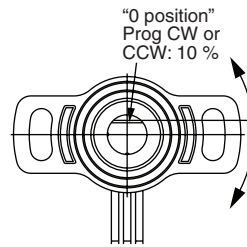
DIMENSIONS in millimeters

VARIOUS POSSIBLE TYPES OF MODEL 981 HE IN HOLLOW SHAFT VERSION

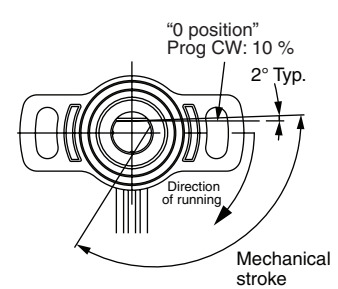
④ 981 HE Hollow shaft
Spring return CCW
Shaft: Ø 8
Model: 981HE-3-x-x-W-x-8H00



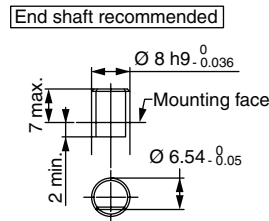
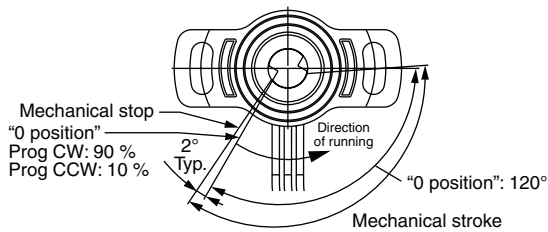
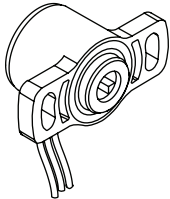
⑥ 981 HE Hollow D-Shaft
Continuous rotation
Shaft: Ø 8
Model: 981HE-0-x-x-W-x-8H01



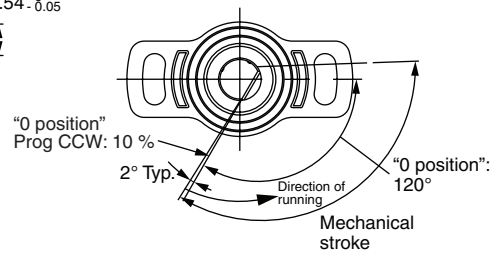
⑦ 981 HE Hollow D-Shaft
CW
Shaft: Ø 8
Model: 981HE-1-x-x-W-x-8H01



⑤ 981 HE Hollow shaft
Spring return CW
Shaft: Ø 8
Model: 981HE-2-x-x-W-x-8H00



⑧ 981 HE Hollow D-Shaft
CCW
Shaft: Ø 8
Model: 981HE-1-x-x-W-x-8H01





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