



# HALL-EFFECT SENSOR

981 HE



## 981 HE

Throttle-Position, Hall-Effect Sensor, Hollow and D-Shaft Versions

### FEATURES

- Continuous, drift-free performance over the life of the device
- All electrical angles available up to 360° - no dead band
- Available in spring-loaded version
- Hollow shaft or D-shaft versions available
- Designed for use in harsh environments
- Extremely easy and fast mounting

### APPLICATIONS

- Foot-pedal position sensors
- Throttle position sensors
- Steering position sensors
- Drive-by-wire
- Lift-and-shuttle position sensors
- Tilt control and tilt-positioning feedback
- Suspension-system position sensors

# 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
Electrical Angle	90°, 120°, 180°, 270°, 360°
Linearity	$\pm 1\%$ Any other angle upon request $\pm 0.5\%$
Supply Voltage	5 V <sub>CC</sub> $\pm 10\%$
Supply Current	10 mA typical/16 mA max. Other upon request
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>CC</sub>
Reverse Voltage Protection	-10 V <sub>CC</sub>
Load Resistance Recommended	Min., 1 kΩ for analog output and PWM output
Hysteresis Static (D-Shaft Version)	< 0.3°

**MECHANICAL SPECIFICATIONS**

PARAMETER	
Mechanical travel	360° continuous, stops upon request: 124° $\pm 3^\circ$
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**

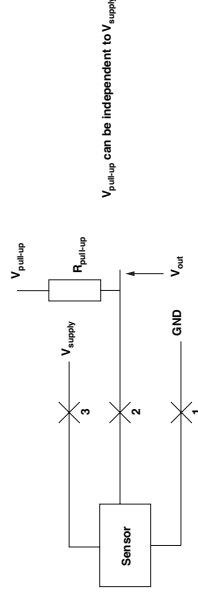
981HE	0	A	1	W	A	1F16	XXXX	BO 10	61
MODEL	FEATURES	LINEARITY	ELECTRICAL ANGLE	OUTPUT TYPE	SHAFT TYPE	SIGNAL	SPECIAL REQUEST	PACKAGING	LEAD FINISH
0:	Continuous rotation	A: $\pm 1\%$	1: 90°	W: Wires	A: Analog CW	1: 6.35 mm		Box of 10 pieces	
1:	Mechanical stops	B: $\pm 0.5\%$	3: 270°	Z: Custom	B: Analog CCW	9: Sprocket			
2:	Spring return CW		4: 360°	D: PWM CCW	F: Flatted	S: Slotted			
3:	Spring return CCW		5: 120°	Z: Other output					
			9:	Other angles					

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

DIAGNOSTIC MODES			
FAILURE	V <sub>out</sub> Analog R <sub>pull-up</sub>	V <sub>out</sub> Analog R <sub>pull-down</sub>	V <sub>out</sub> PWM R <sub>pull-up</sub> = 1 kΩ V <sub>pull-up</sub> = V <sub>supply</sub> = 5 V
1: Broken GND	Diagnostic high area	Diagnostic low area	> 97 % V <sub>supply</sub> without modulation
2: Broken V <sub>out</sub>	Diagnostic high area	Diagnostic low area	> 97 % V <sub>supply</sub> without modulation
3: Broken V <sub>supply</sub>	Diagnostic high area	Diagnostic low area	> 97 % V <sub>supply</sub> without modulation
Over Voltage V <sub>supply</sub> > 7 V	Diagnostic high area	Diagnostic low area	> 97 % V <sub>supply</sub> without modulation
Under Voltage V <sub>supply</sub> < 2.7 V	Diagnostic high area	Diagnostic low area	> 97 % V <sub>supply</sub> 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 - 45°C; + 125°C
Operating Temperature Range	> 5M for hollow shaft model/> 10M for D-Shaft model
Life (in cycles)	120 rpm
Rotational Speed (max.)	200 V/m 150 kHz/1 GHz, IEC 62132-2 Part 2 (Level A) 200 A/m 50 Hz/60 Hz, EN 61000-4-8 (Level A)
Immunity to Radiated Electromagnetic Disturbances	30 MHz/1 GHz < 30 dBμV/m, EN 61000-6-4 (Level A)
Immunity to Power Frequency Magnetic Field	
Radiated Electromagnetic Emissions	Contact discharges: $\pm 8$ kV Air discharges: $\pm 15$ kV, EN 61000-4-2
Electrostatic Discharges	
<b>Materials</b>	
Housing	Thermoplastic housing
Shaft	Stainless steel
Output	3 lead wires

Revision 17-Dec-09

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