

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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**
QUICK REFERENCE DATA

| | |
|------------------|-------------------------------------|
| Sensor type | ROTATIONAL, single turn hall effect |
| Output type | Wires |
| Market appliance | Industrial |
| Dimensions | 47 mm x 22 mm |

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° $\pm 3^\circ$ |
| Bearing type | Sleeve bearing |
| Standard | IP 50; other on request |
| Weight | 19 g ± 2 g hollow shaft model/22 g ± 2 g D-shaft model |

ORDERING INFORMATION/DESCRIPTION

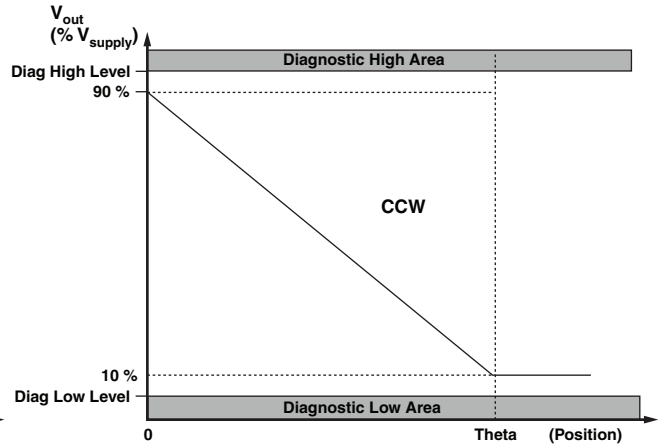
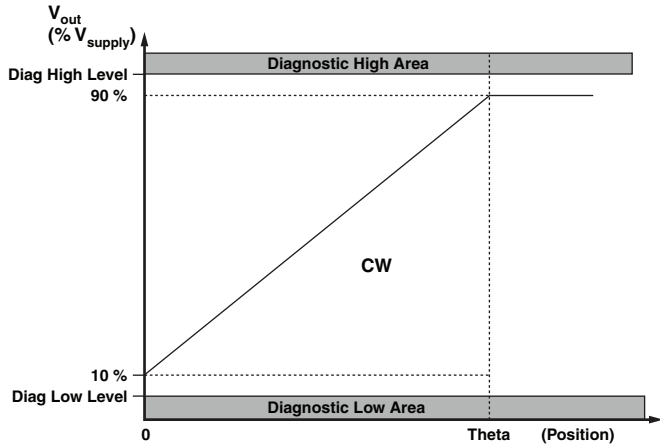
| 981HE | 0 | A | 1 | W | A | 1F16 | XXXX | BO 10 | e1 |
|-------------------------------|-----------------------|------------------------|------------------|------------------------|----------------------|---|-----------------|------------------|-------------|
| MODEL | FEATURES | LINEARITY | ELECTRICAL ANGLE | OUTPUT TYPE | OUTPUT SIGNAL | SHAFT TYPE | SPECIAL REQUEST | PACKAGING | LEAD FINISH |
| 0: Continuous rotation | A: $\pm 1\%$ | 1: 90° | W: Wires | A: Analog CW | 1: 6.35 mm | | | Box of 10 pieces | |
| 1: Mechanical stops | B: $\pm 0.5\%$ | 2: 180° | Z: Custom | B: Analog CCW | 9: Special | | | | |
| 2: Spring return CW | | 3: 270° | | C: PWM CW | P: Plain | | | | |
| 3: Spring return CCW | | 4: 360° | | D: PWM CCW | F: Flatted | | | | |
| | | 5: 120° | | Z: Other output | S: Slotted | | | | |
| | | 9: Other angles | | | Z: Other type | | | | |
| | | | | | | Shaft length from mounting face (standard: 16 mm) | | | |
| | | | | | | 8H00 hollow shaft | | | |
| | | | | | | 8H01 hollow D-shaft | | | |

SAP PART NUMBERING GUIDELINES

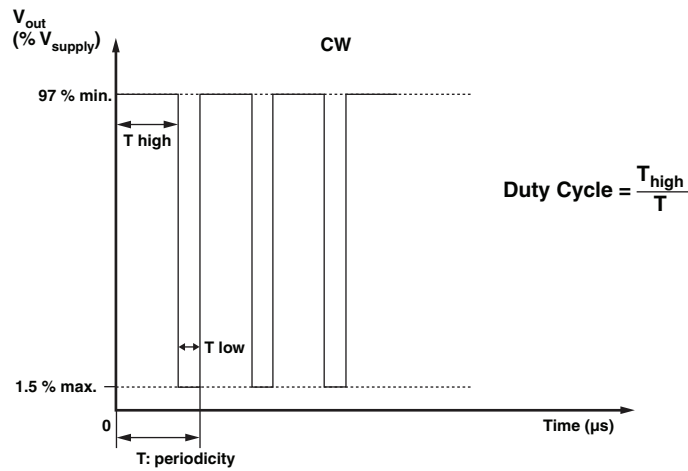
| 981HE | 1 | B | 9 | Z | C | 8H01 | XXXX |
|-------|---------------------|-----------|------------------|-------------|---------------|------------|-----------------|
| MODEL | MECHANICAL FEATURES | LINEARITY | ELECTRICAL ANGLE | OUTPUT TYPE | OUTPUT SIGNAL | SHAFT TYPE | SPECIAL REQUEST |



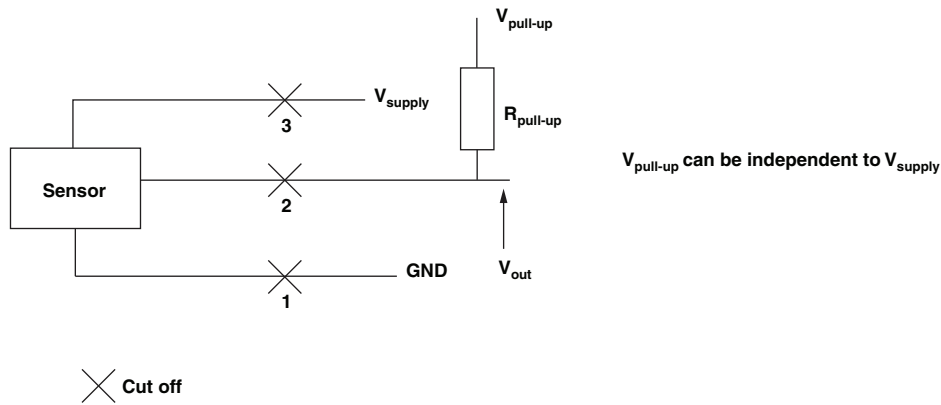
V_{OUT} ANALOG



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 |



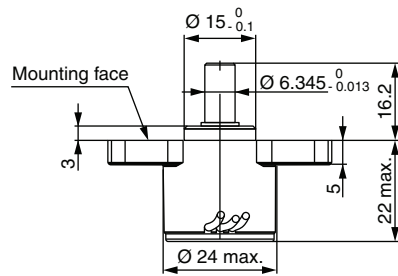
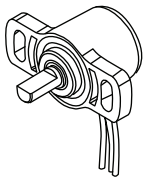
| ENVIRONMENTAL SPECIFICATIONS | |
|---|--|
| Vibrations | 20 g from 10 Hz to 2000 Hz, EN 60068-2-6 |
| Shocks | 3 shocks/axis; 50 g half a sine 11 ms, EN 60068-2-7 |
| Operating temperature range | - 45 °C to+ 125 °C |
| Life (in cycles) | > 5M for hollow shaft model/> 10M for D-shaft model |
| Rotational 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 |



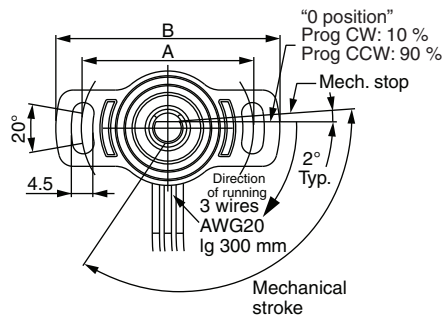
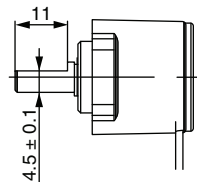
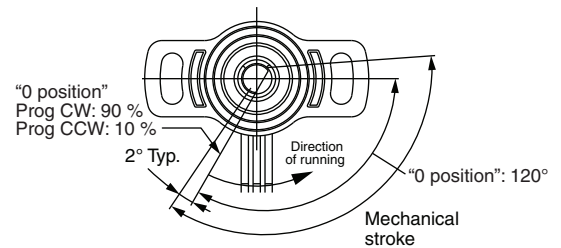
DIMENSIONS in millimeters

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

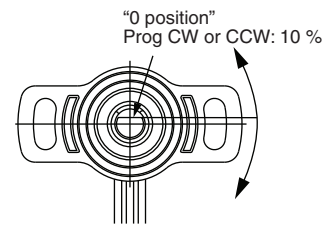
① 981 HE D-Shaft
Spring return CCW
Shaft: \varnothing 6.35 flatted length 16 mm FMF
Model: 981HE-3-x-x-W-x-1F16



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



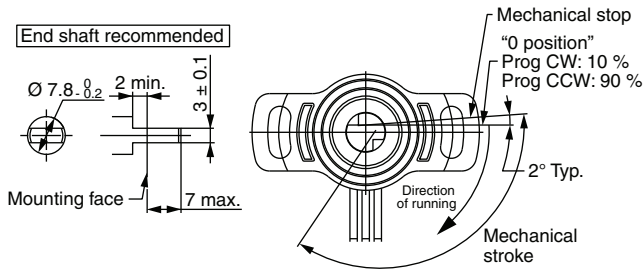
| Dimension | Standard | Option | Wires |
|-----------|----------|--------|------------------------------|
| A | 36 | 38 | Yellow GND (-) Red Signal |
| B | 47 | 48 | Green V _{CC} (+) |



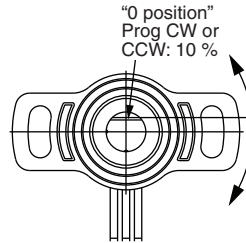
DIMENSIONS in millimeters

VARIOUS POSSIBLE TYPES OF MODEL 981 HE IN HOLLOW SHAFT VERSION

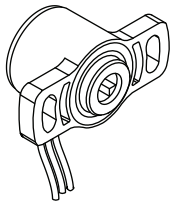
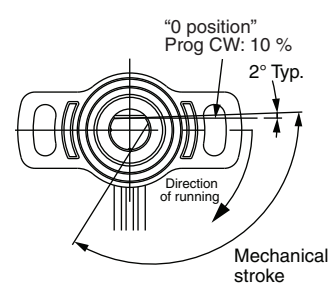
④ 981 HE Hollow shaft Spring return CCW Shaft: Ø 8 Model: 981HE-3-x-x-W-x-8H00



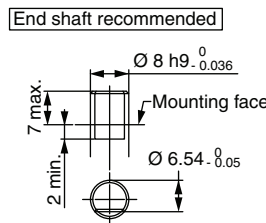
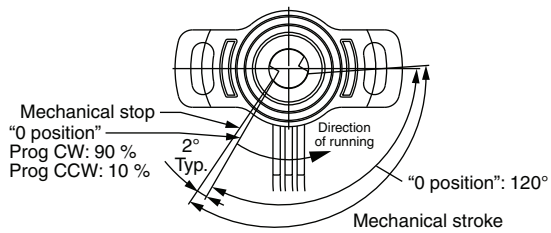
⑥ 981 HE Hollow D-Shaft Continuous rotation Shaft: Ø 8 Model: 981HE-0-x-x-W-x-8H01



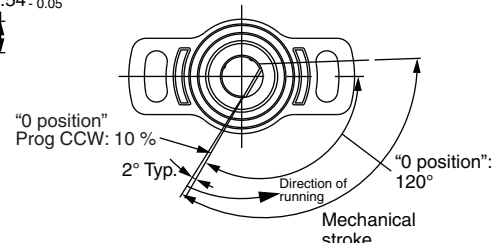
⑦ 981 HE Hollow D-Shaft CW Shaft: Ø 8 Model: 981HE-1-x-x-W-x-8H01



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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