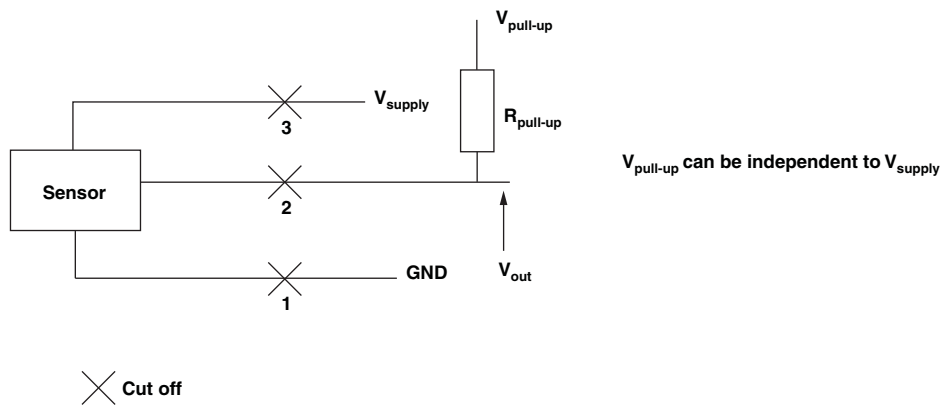


DIAGNOSTIC MODES			
FAILURE	$V_{out}$ ANALOG $R_{pull-up}$	$V_{out}$ ANALOG $R_{pull-down}$	$V_{out}$ PWM $R_{pull-up} = 1\text{ k}\Omega$ $V_{pull-up} = V_{supply} = 5\text{ V}$
1: Broken GND	Diagnostic high area	Diagnostic low area	$> 97\% V_{supply}$ without modulation
2: Broken $V_{out}$	Diagnostic 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)	$> 5\text{M}$ for hollow shaft model/ $> 10\text{M}$ 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 $< 30\text{ dB}\mu\text{V/m}$ , 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

**Note**

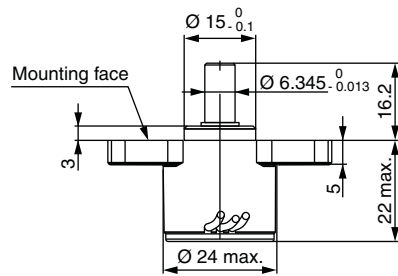
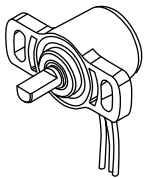
- Nothing stated herein shall be construed as a guarantee of quality or durability.



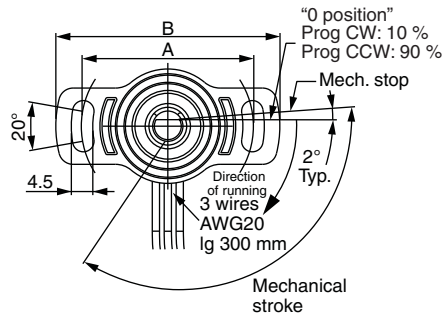
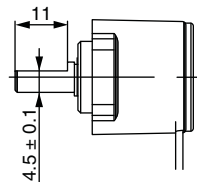
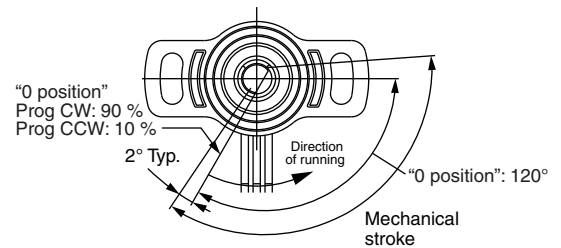
**DIMENSIONS** in millimeters

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

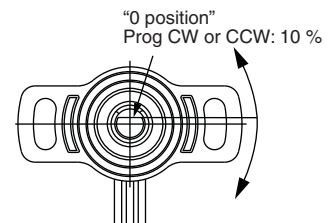
① 981 HE D-Shaft  
Spring return CCW  
Shaft:  $\varnothing$  6.35 flatted length 16 mm FMF  
Model: 981HE-3-x-x-W-x-1F16



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 <sub>CC</sub> (+)