CURTISS-WRIGHT

Penny & Giles
No-Contact, Rotary Position Sensor
NRH300DP

- **No-contact, Hall-effect technology**
- **Wear free – unlimited mechanical life**
- **Simple mounting, low-profile design**
- **Measurement angle 20-360°**
- **5V or 9-30V supply options**
- **Dual redundant outputs**
- **Analog output – 0.5-4.5V or 0.2-4.8V**
- **PWM output option**
- **Fail-safe outputs**
- **Sealing to IP69K**
- **Flying leads**

The NRH300DP is a no-contact, Rotary Position Sensor that offers the optimal combination of performance, safety and cost. The sensor utilises proven Hall-effect, sensing technology in a low-profile (8mm) housing with separate magnet for true no-contact sensing.

The electrical output span can be set to correspond to rotations of 20° to 360°, and the positional information is determined by the angle of the supplied magnet relative to the sensor body. The maximum air gap between magnet and sensor is 5.5mm, while concentric offsets of up to 2mm can be tolerated with minimal impact on output linearity. The magnet can be supplied in a convenient carrier, housed in a bolt, as a plug or loose.

Innovative circuit design allows the sensor to be powered from a regulated 5V supply or a varying voltage in the range of 9-30V, such as a vehicle's battery.

To enhance system performance, the NRH300DP has a second, redundant output that can be used for error checking in safety-critical applications. The versatile, factory-programmable electronics can be easily set to one of two analog voltage output ranges or one of three PWM frequencies. In addition, the polarities of each of the analog outputs can be independently set. On-board diagnostic functions ensure the outputs are put into safe, pre-defined states should an internal sensor error be detected.

The sealed design offers exceptional levels of performance with respect to water and dust, shock, vibration and temperature, meaning the sensor is ideal for use in hostile, on- and off-highway vehicle environments.

Connection to the sensor is with simple flying leads for customer termination.

Industrial Group

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SPECIFICATIONS

ELECTRICAL	
MEASUREMENT RANGE	20-360° in 1° increments
SUPPLY VOLTAGE	5Vdc ± 0.5Vdc or 9Vdc to 30Vdc
SUPPLY CURRENT	<25mA
SUPPLY REVERSE POLARITY PROTECTION	Yes
SHORT-CIRCUIT PROTECTION TO GND	Yes
SHORT-CIRCUIT PROTECTION TO SUPPLY	When used with 5Vdc regulated supply only
OVER-VOLTAGE PROTECTION	up to 40Vdc
POWER-ON SETTLEMENT	<1s
RESOLUTION	12-bit (0.025% of measurement range)
LINEARITY (ABSOLUTE)	<±0.4%
TEMPERATURE COEFFICIENT	<50ppm/°C (<100ppm/°C in 9-30Vdc mode)
VOLTAGE OUTPUTS	
0.5-4.5V OUTPUT OPTION (5V SUPPLY)	10-90% ±1% of Vsupply over measurement range
0.5-4.5V OUTPUT OPTION (9-30V SUPPLY)	0.5-4.5V ±3% absolute over measurement range
MONOTONIC RANGE (0.5-4.5V OUTPUT OPTION)	5%/0.25V to 95%/4.75V nominal
0.2-4.8V OUTPUT OPTION (5V SUPPLY)	4-96% ±1% of Vsupply over measurement range
0.2-4.8V OUTPUT OPTION (9-30V SUPPLY)	0.2-4.8V ±3% absolute over measurement range
MONOTONIC RANGE (0.2-4.8V OUTPUT OPTION)	2%/0.1V to 98%/4.9V nominal
LOAD RESISTANCE	10kΩ min. (resistive to GND)
OUTPUT NOISE	<1mVrms
INPUT/OUTPUT DELAY	<2ms
PWM OUTPUTS	
PWM FREQUENCY	244Hz, 500Hz or 1kHz ±20%
PWM LEVELS (5V SUPPLY)	0V and Vsupply ±1%
PWM LEVELS (9-32V SUPPLY)	0V and 5V ±3% nominal
DUTY CYCLE	10-90% over measurement range
MONOTONIC RANGE	5-95% nominal
LOAD RESISTANCE	10kΩ min. (resistive to GND)
RISE/FALL TIME	<15µs typical
MECHANICAL	
MECHANICAL ANGLE	360° continuous
WEIGHT	<45g
MOUNTING	2x M4 screws (recommended tightening torque 2.0Nm)
CABLE	4-core, FDR25 jacket, 24AWG type 55A wire
ENVIRONMENTAL	
OPERATING TEMPERATURE	-40°C to 120°C
STORAGE TEMPERATURE	-40°C to 120°C
SEALING	IP68, IP69K
VIBRATION	BS EN 60068-2-64: 2008 section 8.4 (31.4gn RMS) 20 – 2000Hz random
SHOCK	2500g
LIFE	Virtually infinite
MTTFd	>400 years
ELECTROMAGNETIC INTERFERENCE	EN 61000-4-3: 1999 to 100V/m 80-1000MHz & 1.4-2.7GHz
SALT SPRAY	BS EN 60068-2-52: 1996 test Kb severity 2

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