Penny & Giles

No-Contact Rotary Position Sensor

NRH275DR

- **No-contact, Hall-effect technology**
- **Wear free – unlimited mechanical life**
- **Simple mounting, low profile design**
- **Measurement angle 20-360°**
- **5V supply**
- **Dual redundant outputs**
- **Analog output – 0.5-4.5V or 0.2-4.8V**
- **Fail-safe outputs**
- **PWM output**
- **Encapsulated electronics**
- **Sealing to IP67**
- **AMP or Deutsch connector options**
- **Flying lead option**
- **Protective cable conduit option**

The NRH275DR is a no-contact, Rotary Position Sensor that is accommodated in a low profile (9.5mm) housing of compact footprint (36 x 35mm) with dual-redundant outputs. Versatile, factory programmable electronics, which are supplied from 5Vdc, can be easily set to one of two analog voltage output ranges or one of three PWM frequencies. In addition, the polarities of the analog outputs can be set to one of three combinations – both tracking in the same direction or one opposite to the other.

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 7mm, while concentric offsets of up to 2mm can be tolerated with minimal impact on output linearity. The magnet can be supplied loose, housed in a bolt or as a plug.

The sensor contains two independent measuring circuits, each with its own power connections, meaning safety critical applications can be addressed. Furthermore, on-board diagnostic functions mean that the outputs can be put into safe, pre-defined states should an internal error be detected.

A fully encapsulated 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 options are industry-standard AMP Superseal or Deutsch DT04 series connectors, or simple flying-leads for customer termination. The sensor can also be supplied with a protective conduit for the cabling.

SPECIFICATIONS

SUPPLY	
SUPPLY VOLTAGE	5Vdc ± 0.5Vdc
SUPPLY CURRENT	< 25mA
OVER VOLTAGE	12Vdc (-40°C to 60°C)
REVERSE POLARITY PROTECTED	Yes
POWER-ON TIME	< 1s
CONNECTIONS	Amp Superseal, Deutsch DT04 or flying leads
OUTPUT	
MEASUREMENT RANGE	20-360° in 1° increments
OUTPUT DIRECTION	Both increase CW, both decrease CCW or opposing
OUTPUT VOLTAGE (0.5-4.5V)	10-90% ±1% of Vsupply
MONTONIC RANGE (0.5-4.5V)	5-95% of Vsupply
OUTPUT VOLTAGE (0.2-4.8V)	4-96% ±1% of Vsupply
MONTONIC RANGE (0.5-4.5V)	2-98% of Vsupply
OUTPUT NOISE	<1mV rms
INPUT/OUTPUT DELAY	<2ms or <0.6ms (option)
PWM FREQUENCY	244, 500 or 1000Hz
PWM LEVEL	0-Vsupply ±1%
PWM DUTY CYCLE	10-90% over measurement range
MONOTONIC RANGE (PWM)	5-95% nominal
PWM RISE/FALL TIME	<15µs typical
RESOLUTION	12-bit (0.025% of measurement range)
LINEARITY	< ±0.4%
TEMPERATURE COEFFICIENT	< ±30ppm/°c
LOAD RESISTANCE	10kΩ min. to GND
SHORT CIRCUIT PROTECTION	Output to GND and output to 10V max.
MECHANICAL	
ANGLE	360° continuous
MAXIMUM OPERATING SPEED	3600°/s
WEIGHT	<100g
FIXING	4 x ø3.4mm holes
ENVIRONMENTAL	
OPERATING TEMPERATURE	-40°C to 140°C
STORAGE TEMPERATURE	-55°C to 140°C (120°C with conduit)
VIBRATION	EN 60068-2-64 (31.4gn rms) 20-2000Hz random
SHOCK	3m drop onto concrete and 2500g
EMC	Directive 2004/108/EC
SALT SPRAY	EN 60068-2-11 severity 48h
SEALING	IP67

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