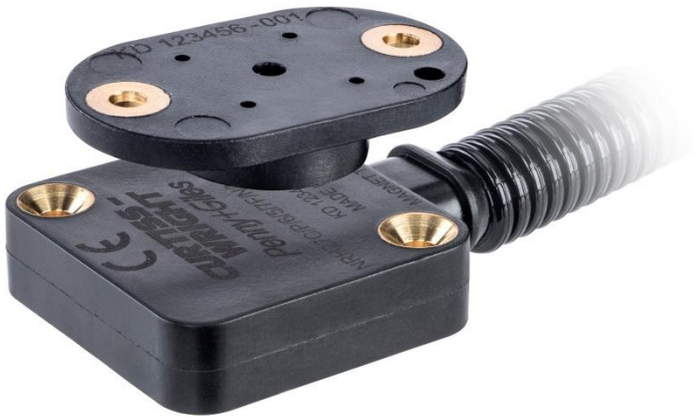
Penny & Giles

No-Contact, CANbus Rotary Position Sensor

NRH27C

- **Non-Contact – Hall-effect technology**
- **Wear-Free – no mechanical degradation**
- **CANbus J1939 output**
- **Simple mounting, low-profile design**
- **360° Measurement angle**
- **5V or 9-30V supply options**
- **Dual Hall-effect sensors**
- **On-board diagnostics – pre-defined error messages**
- **Encapsulated electronics**
- **Sealing up to IP69K (connector dependent)**
- **AMP or Deutsch connector options**
- **Flying-lead option**
- **Protective cable conduit option**



The NRH27C is a CANbus output sensor from the family of NRH27x No-Contact, Rotary Position Sensors that offers the optimal combination of performance, safety and cost. All variants utilise proven Hall-effect, sensing technology and are accommodated in a low-profile (9.5mm) housing with a compact footprint of just 36 x 35mm.

The full range of the digital output span corresponds to a rotation of 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 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.

Two physically independent, Hall-effect sensing signals are sent separately with the CAN message structure, to allow for system error checking of the positional data meaning high-performing, safety-critical applications can easily be addressed. Furthermore, an on-board diagnostic function means pre-defined error messages can be sent to define the present state of the sensor. The versatile, factory-programmable electronics can be easily set to different baud and/or frame rates according to system requirements.

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 (IP68 rated) or Deutsch DT04 series (IP67 rated) connectors, or simple flying leads for customer termination. The sensor can also be supplied with a protective conduit for the cabling.

SPECIFICATIONS

ELECTRICAL	
MEASUREMENT RANGE	360°
RESOLUTION	14-bit (0.022° per LSB)
SUPPLY VOLTAGE	5Vdc ± 0.5Vdc and 9-30Vdc – auto-selects
SUPPLY CURRENT	<60mA
SHORT-CIRCUIT PROTECTION TO GND	Yes
SHORT-CIRCUIT PROTECTION TO SUPPLY	When used with 5Vdc supply only
OVER-VOLTAGE PROTECTION	up to 40Vdc
POWER-ON SETTLEMENT	<1s
TEMPERATURE COEFFICIENT	<±30ppm/°C
LINEARITY (ABSOLUTE)	<±0.4%
OUTPUT	
PROTOCOL	SAE-J1939
BAUD RATE	50, 125, 250, 500 kbit/s or 1 Mbit/s
NODE ID (IN HEXADECIMAL)	Between 01 and F7
FRAME RATE	10, 25, 50 or 100ms
INPUT/OUTPUT DELAY (MAX.)	Selected frame rate
MECHANICAL	
MECHANICAL ANGLE	360° continuous
MAXIMUM OPERATING SPEED	3600°/s
WEIGHT	<100g
MOUNTING	2x 3.4Ø holes provided
CABLE	Spec 44A wires 18AWG 1.65mm OD
ENVIRONMENTAL	
OPERATING TEMPERATURE	-40°C to +85°C (derate by 5°C for each 1Vdc increase above 26Vdc of Vsupply)
STORAGE TEMPERATURE RANGE	-55°C to 125°C
SEALING	AMP connector (when fully mated): IP68, Deutsch connector (when fully mated): IP67 Sensor body (no connector option): IP69K, IP68, IP67
VIBRATION	BS EN 60068-2-64:1995 section 8.4 (31.4gn rms) 20-2000Hz random
SHOCK	3m drop onto concrete and 2500g
MTTFd	> 150 years
ELECTROMAGNETIC INTERFERENCE	Directive 2014/30/EU, EN 61000-4-3 to 100V/m 80-1000MHz & 1.4-2.7GHz
HUMIDITY	EN 60068-2-30; 2005 severity Db (55°C, 93%RH)
SALT SPRAY	BS EN 60068-2-52 test Kb severity 2

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