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