

RTY SERIES DUAL HALL-EFFECT ROTARY SENSORS

Application Note

The RTY Series Hall-Effect Rotary Position Sensors provide angle monitoring in harsh transportation and industrial applications at a competitive cost.

BACKGROUND

These products use a magnetically biased, Hall-effect integrated circuit (IC) to sense rotary movement of the actuator shaft over a set operating range. Rotation of the actuator shaft changes a magnet's position relative to the IC. The resulting flux density change is converted to a linear output.

The IC, together with conditioning and protection circuitry, and the permanent magnet, is sealed in an IP67 & IP69K qualified rugged package for durability in most harsh environments. The sensor is equipped with a six-pin AMPSEAL-16 Connector.

The RTY Series dual-output sensor provides two independent opposing analog output signals for enhanced system integrity.

Eight operating ranges (50°, 60°, 70°, 90°, 120°, 180°, 270° and 360°) are tolerant to over-travel and allow use in most common applications. The sensor's low power consumption makes it ideal for low voltage applications.

The sensor's output may be customized to best meet specific application needs. Solutions may be tailored to exact specifications for improved time to market, lower total system cost, and improved reliability.

Although most applications require no lever, a lever version is available. The lever may allow customers to reduce the number of mechanical linkages required for their application, which may reduce the cost of the overall customer solution. No brackets are necessary.

Partner with a proven partner and supplier in the transportation and industrial fields. Honeywell has industry-leading capabilities in research and development to provide our customers with known quality and support.



RTY Series Dual Hall-effect Rotary Position Sensor



Honeywell



TRANSPORTATION SOLUTIONS

Position and Movement Detection:

May be used to sense angular position of pedals, throttles, gear shift, levers, steering, linkages, and hitches in trucks, buses, off-road vehicles, cranes, and industrial/construction/agricultural vehicles and equipment.

Tilt/Trim/Rudder Position may be used to sense the position of the boat engine tilt/trim/rudder.

Customer Benefits: Accurate position reporting helps the operator to maintain peak performance of the vehicle and protects against propeller damage. The IP67 rating, EMC testing, and **AMPSEAL-16** connector protect against marine conditions. The 35 M life cycle helps reduce end user replacement requirements.

Throttle Position (trucks, buses, off-road vehicles, industrial/construction/agricultural vehicles and equipment, cranes) may be used to sense throttle plate angle.

Customer Benefits: Accurate throttle position can enhance fuel economy and engine performance. The IP67 rating and EMC testing meet customer requirements. The 35 M life cycle helps reduce warranty concerns.

Bus/Truck Suspension/Kneeling

Position may be used to sense angular travel of the suspension system.

Customer Benefits: Accurate sensing validates the correct height for the application's system requirements, aiding vehicle ingress/egress (liability), trailer height for warehouse docking (faster turns and liability), and suspension performance monitoring (diagnostic check). The IP67 & IP69K rating and EMC testing meet customer requirements. The 35 M life cycle helps reduce warranty concerns.

Valve Control may be used to sense valve position to regulate flow.

Customer Benefits: Accurate sensing of the valve's open/close condition allows facilities to achieve greater throughputs and higher product quality levels. The IP67 & IP69K rating, EMC testing, and **AMPSEAL-16** connector protect against dust and wet conditions. The 35 M life cycle helps reduce warranty concerns. The wide temperature range (-40 °C to 125 °C [-40 °F to [257 °F]]) of the sensor allows for use in hot and cold environments.

INDUSTRIAL SOLUTIONS

HVAC Damper Control may be used to sense damper position to regulate airflow.

Customer Benefits: Accurate sensing of the damper's open/close condition allows greater system efficiency and facility occupant comfort. The IP67 rating, EMC testing, and AMPSEAL-16 connector protect against dust and wet conditions. The 35 M life cycle helps reduce warranty concerns. The wide temperature range (-40 °C to 125 °C [-40 °F to [257 °F]]) of the sensor allows for use in hot and cold environments.

Irrigation Pivot Control may be used to sense irrigation equipment steering angle.

Customer Benefits: Accurate positioning delivers water where it is needed, potentially reducing water consumption and increasing crop yield. The IP67 & IP69K rating, EMC testing, and AMPSEAL-16 connector protect against dust and wet conditions. The 35 M life cycle helps reduce end user replacement requirements and OEM warranty exposure. The wide temperature range (-40 °C to 125 °C [-40 °F to [257 °F]]) of the sensor allows for use in hot and cold environments.

HOW THE SENSOR MAY BE USED

Honeywell RTY Series Dual Hall-effect Rotary Position Sensors may be used to replace the mechanical cable connection between the foot pedal and the engine in heavy-duty equipment and other vehicles.

For example, an RTY Series sensor may be mounted adjacent to the pedal to measure how far down the pedal is depressed/released by the operator.

The sensor senses the change in pedal

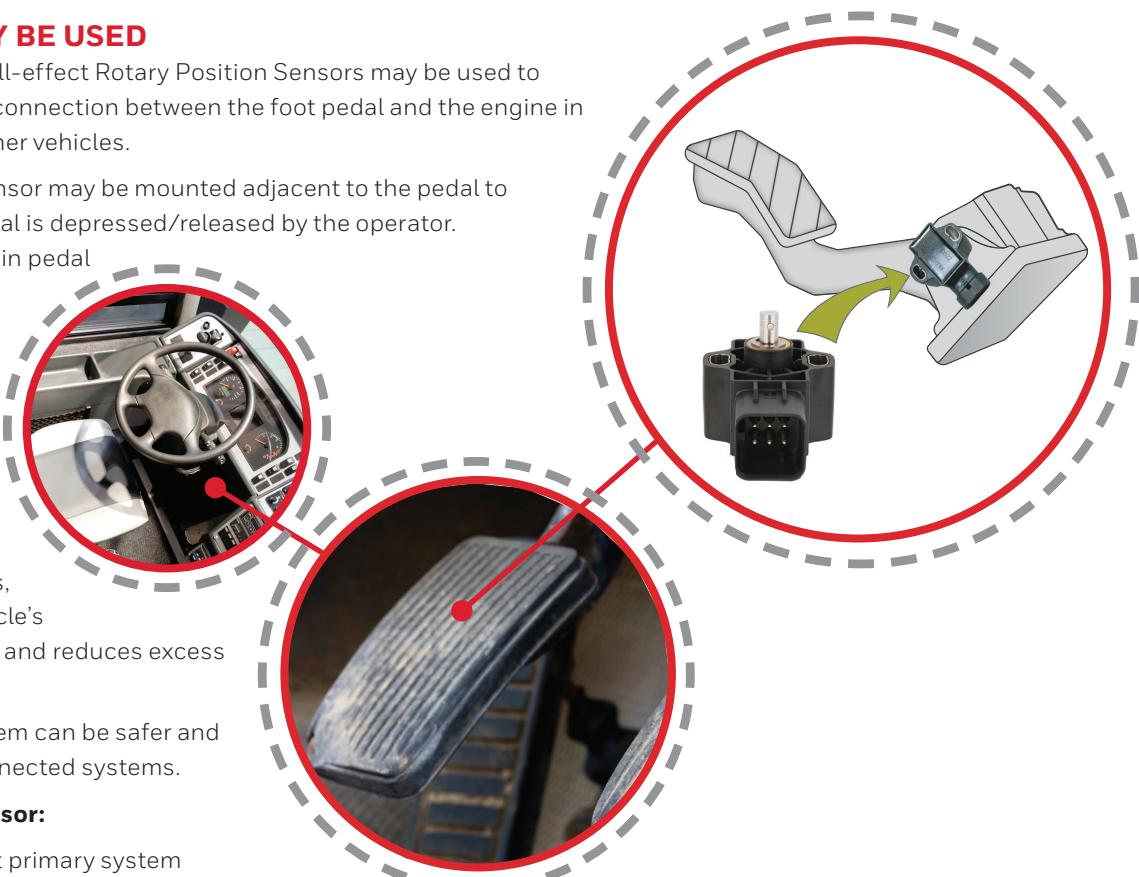
position and sends a signal to the engine to either increase/reduce the flow of gasoline and air across the throttle plate, as needed.

Eliminating the mechanical cable, which can stretch and rust, can improve the engine control system responsiveness, which in turn benefits the vehicle's emissions, improves reliability, and reduces excess weight in the vehicle.

This type of drive-by-wire system can be safer and less expensive than cable-connected systems.

Benefits of a Dual Signal Sensor:

- Chanel-1 utilized to detect primary system
- Chanel-2 used to detect a fault or interruption
- If any anomalies occur between Channel 1 and Chanel 2, a fault is detected
 - System integrators would use this interruption to put the system in a safe mode
- Dual signals help to identify wiring and intermittent issues due to bad connections





RTY Series Features and Benefits

- ★ 35 M cycle product life: Provides long life in the application
- Solid-state Hall-effect technology: Provides non-contact operation, long service life, low torque actuation and reduces worn-out mechanisms
- Rugged IP67& IP69K sealed package with integral connector: Allows for use in harsh environments
- Stable performance over temperature range
- Vibration immunity and diagnostic functions
- Automotive-grade EMI/EMC testing, integrated reverse polarity, and short circuit: Provides protection against installation errors and frequencies in the environment
- Industry-standard six position AMPSEAL-16 connector
- Eight operating ranges up to 360°: Provides flexibility in multiple applications, allowing OEMs the range of travel needed for the application
- Linearity: $\pm 1\%$
- Accuracy: $\pm 1.6\%$
- Sensor provides two provides two analog output signals for enhanced system integrity

★= Competitive differentiator



⚠WARNING IMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide information or engineering support for its products through Honeywell personnel, literature and website, it is the buyer's sole responsibility to determine the suitability of the Honeywell product(s) for the buyer's requirements.

Specifications may change without notice. The information we supply is believed to be accurate as of this writing. However, Honeywell assumes no responsibility for its use.

For more information

Honeywell Sensing Solutions services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit [our website](#) or call:

USA/Canada	+1 302 613 4491
Latin America	+1 305 805 8188
Europe	+44 1344 238258
Japan	+81 (0) 3-6730-7152
Singapore	+65 6355 2828
Greater China	+86 4006396841

Honeywell Sensing Solutions

830 East Arapaho Road
Richardson, TX 75081
www.honeywell.com