Honeywell

Application Note

RTY Series and RTP Series Hall-effect Rotary Position Sensors

Background

The RTY Series and RTP Series Hall-effect Rotary Position Sensors provide non-contact sensing in harsh transportation and industrial applications at a competitive cost.

- RTY Series: These shaft activated products are available in two versions: an integral shaft with or without a lever. The lever may allow customers to reduce the number of mechanical linkages required for their applications, which may reduce the cost of the overall customer solution.
- RTP Series: Takes non-contact sensing to the next level by separating the magnet from the sensor body. The absence of the actuator shaft removes the wear and tear on the bearings caused by radial forces. A choice of a bare or a housed magnet is available.

These products use a magnetically biased, Hall-effect integrated circuit (IC) to sense rotary movement of the actuator over a set operating range. Rotation of the actuator changes the 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, is sealed in an IP69K-qualified rugged package for durability in most harsh environments.

Eight operating ranges from 50° to 360° are tolerant to over-travel and allow use in most common applications. Low voltage and high voltage versions cover an input voltage range of 4.5 Vdc to 30 Vdc.

Honeywell's industry-leading capabilities in research and development provide the customer with known quality and support.

Solutions

TRANSPORTATION

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.

Customer Benefits: Enhances fuel economy, equipment and engine performance, and safety.

Which product to use? Either the RTP Series or the RTY Series may be suitable, depending on installation specifications. The RTP Series would be conducive to applications with exposure to harsh environments. An installation location protected from environmental conditions could accommodate the RTY Series.

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, potentially aiding vehicle ingress/egress (liability), trailer height for warehouse docking (faster turns and liability), and suspension performance monitoring (diagnostic check). The IP69K rating and EMC testing meet customer requirements. The infinite life cycle helps reduce warranty concerns.

Which product to use? The RTP Series' two piece design eliminates bearing wear and tear caused by debris, misalignment, or contamination.

Tilt/Trim Position: May be used to sense the position of the boat engine tilt/trim.

Customer Benefits: Accurate position reporting helps the operator to maintain peak performance of the boat and protects against propeller damage. The IP69K rating, EMC testing, and AMP seal connector protect against marine conditions. The 35 M (RTY Series) or infinite (RTP Series) life cycle helps reduce end user replacement requirements.

Which product to use? Either the RTY Series or the RTP Series would be suitable as the sensor is typically installed in an enclosed, protected environment.

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INDUSTRIAL

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 IP69K rating, EMC testing, and AMP seal connector protect against dust and wet conditions. The 35 M (RTY Series) or infinite (RTP Series) 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.

Which product to use? Either the RTP Series or the RTY Series would be suitable. Integration of the sensor into the valve assembly typically mitigates the risk of shaft misalignment, and is generally installed in a controlled environment.

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 IP69K rating, EMC testing, and AMP seal connector protect against dust and wet conditions. The 35 M (RTY Series) or infinite (RTP Series) 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.

Which product to use? Typical installation methods mitigate risk of shaft misalignment, and are generally installed in a controlled environment, therefore, either the RTY Series or the RTP Series would be suitable.

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

Customer Benefits: Accurate positioning provides water where it is needed, potentially reducing water consumption and increasing crop yield. The IP69K rating, EMC testing, and AMP seal connector protect against dust and wet conditions. The infinite life cycle (RTP Series) 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.

Which product to use? The RTP Series will eliminate bearing wear and tear caused by debris, misalignment, or contamination.

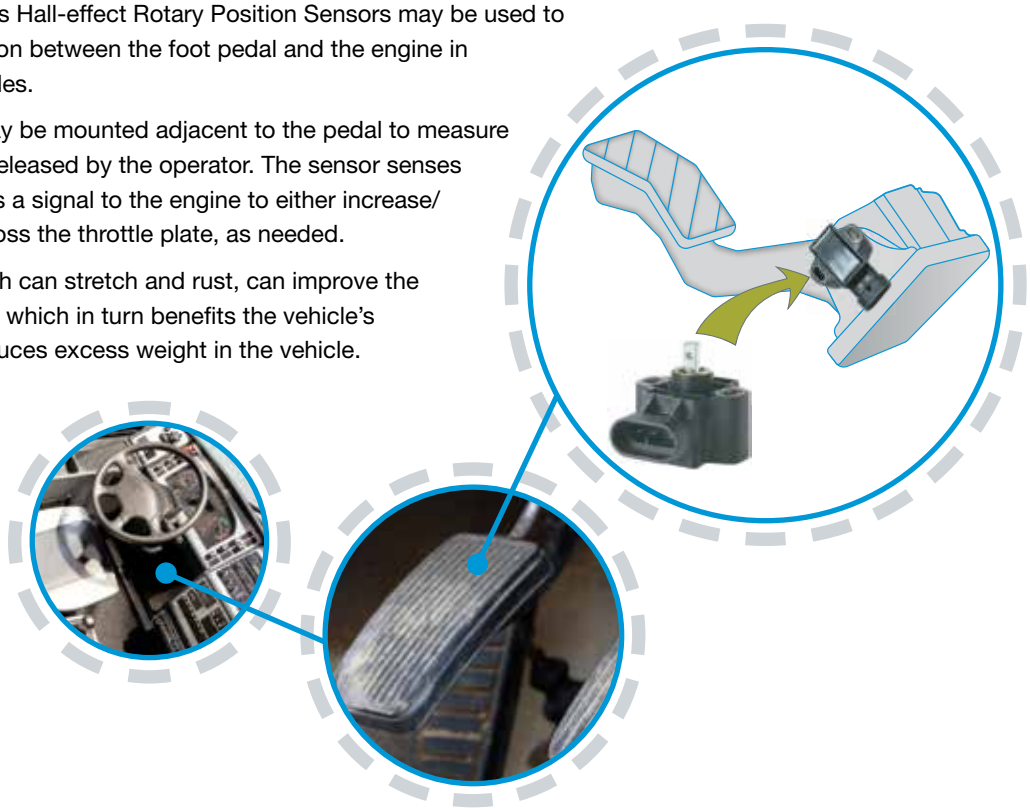
How the sensor may be used

Honeywell's RTY Series and RTP Series 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.



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RTY Series and RTP Series		Features
RTY Series	**RTP Series**	• True, non-contact operation • 35 M cycle product life (RTY Series); unlimited rotation (RTP Series) • Solid-state Hall-effect technology • Rugged IP69K-sealed package with integral connector • Automotive-grade EMI/EMC testing, integrated reverse polarity, and short circuit protection • Industry-standard AMP termination, 32 mm mounting pitch, North American or European pinout styles, and compact package • Eight operating ranges up to 360°
Integral shaft without lever	Separate bare magnet	
Integral shaft with lever	Separate housed magnet	

Find out more
To learn more about Honeywell's sensing and control products, call **1-800-537-6945**, visit **sensing.honeywell.com**, or e-mail inquiries to **info.sc@honeywell.com**

Warranty. Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. 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 it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all 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 we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

Sensing and Control
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