

Pedal Position Sensing in Heavy-Duty Vehicles

An Application Note

Background

Honeywell solid-state Hall-effect Rotary Position Sensors (RTY and RTP Series) may potentially 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 can be mounted adjacent to the pedal to measure how far the pedal is depressed or released by the operator (see Figure 1). The sensor senses the change in pedal position and sends a signal to the engine control unit to either increase or reduce the flow of gasoline and air across the throttle plate, as needed. This type of drive-by-wire system can be safer and more cost-effective than cable-connected systems.

Value to Customer

Longer Application Life

- Rated for 35 million product cycles (RTY Series); rated for infinite rotation (RTP Series)
- Provides non-contact operation, low torque actuation and reduces worn-out mechanisms (RTP Series)

Wider Sensing Range

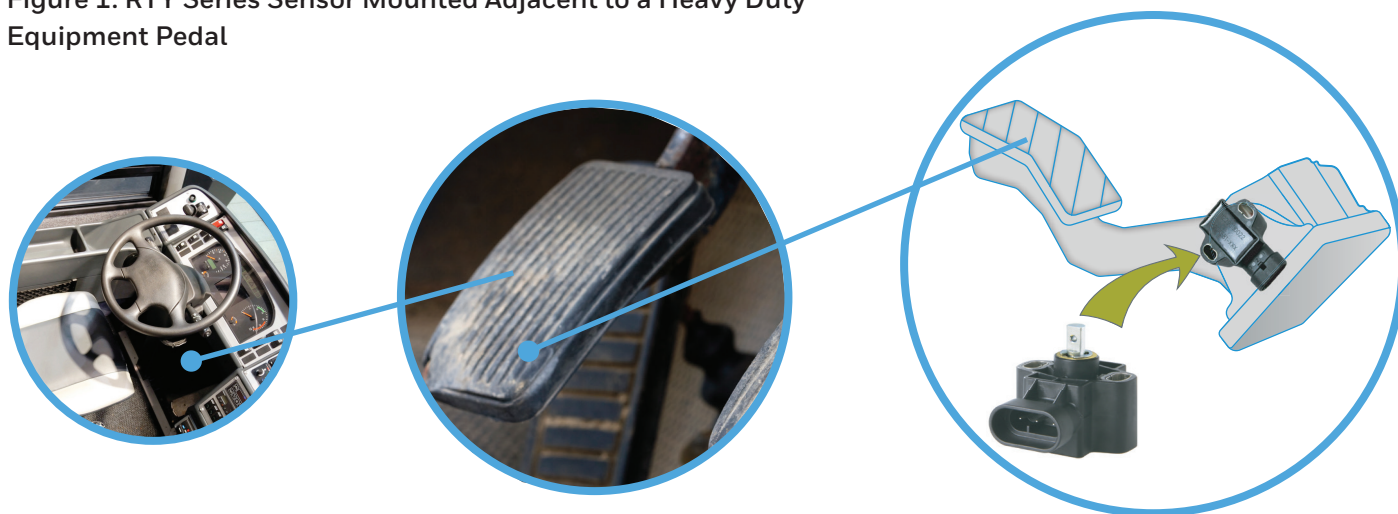
- Eight factory-set operating ranges (50°, 60°, 70°, 90°, 120°, 180°, 270° 360°) allow the customer the ability to select the range of travel needed for the application



Enhanced Design Flexibility

- Industry-standard AMP termination with North American and European pinout styles
- IP69K rated when used with mating connector AMP Superseal 282087-1
- No rotating shaft/bearing arrangement allows performance in corrosive environmental conditions (RTP Series)
- Supply voltage options: Low voltage (LV) 5.0 Vdc or high voltage (HV) 10 Vdc to 30 Vdc

Figure 1. RTY Series Sensor Mounted Adjacent to a Heavy Duty Equipment Pedal



- Output voltages of 0.5 Vdc to 4.5 Vdc for the standard option, and 4.5 Vdc to 0.5 Vdc for the inverted option
- Wide operating temperature range from -40°C to 125°C [-40°F to 257°F]
- Available with or without a lever; lever may allow customers to reduce the number of mechanical linkages required for their application (RTY Series) (see Figure 2)
- Two-piece design provides more installation flexibility with reduced concern for possible side-loading (RTP Series) (see Figure 2)

Enhanced Durability

- Long product life of 35 M cycles (RTY Series); unlimited rotation (RTP Series)
- EMI/EMC tested, integrated reverse polarity and short circuit protection against installation errors and frequencies in the installed environment
- Media-compatible with heavy-duty transportation fluids, such as diesel and gasoline fuels, engine oils and coolants
- Shock-rated to 50 G peak (RTP Series, RTY Series without lever)
- Vibration-tested to 20 G peak (RTP Series, RTY Series without lever)
- Salt fog-tested:
 - To concentration 5% ±1% for 240 hours per SAE J1455 Section 4.3.3.1 (at 5.0 Vdc, 38°C [100°F]) (RTY Series)
 - On bare magnet 96 hours per ASTM B117; housed magnet 240 hours per ASTM B117 (RTP Series)
- 2-channel output option for customers requiring redundancy in their systems (RTY Series)

CE Approvals

Honeywell Assurance

- Our industry-leading capabilities in research and development provide the customer with improved quality and support.

Other Potential Applications




Transportation

- Position and movement detection (pedals, throttles, gear shifts, levers, steering, linkages and hitches) in trucks, buses, off-road vehicles, cranes and industrial/construction/ agricultural vehicles and equipment
- Suspension/kneeling position (buses, trucks)
- Tilt/trim position (boat engines, tilling equipment)

Industrial

- HVAC damper control
- Irrigation equipment pivot control
- Valve control

Figure 2. RTY Series and RTP Series Available Configurations

RTY SERIES (INTEGRAL SHAFT)	RTP SERIES (SEPARATE MAGNET)	FEATURES
Without lever 	Bare magnet 	<ul style="list-style-type: none"> • 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°
With lever 	Housed magnet 	

Warranty/Remedy

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