

Hall-Effect Rotary Position Sensors Line Guide



Round and round the globe, it's Honeywell. So trust Honeywell Sensing and Control (S&C) for your Hall-effect rotary position sensor needs. These sensors vary output voltage or current in response to changes in a magnetic field — using a magnetically biased Hall-effect integrated circuit (IC) to sense rotary movement of the actuator shaft. The rotation of the shaft changes the IC's position to the magnets, and then detects the change in

flux density. The output of the IC is converted to a linear output up to 360 degrees of travel. Honeywell S&C seals the IC together with conditioning and protection circuitry and two permanent magnets in a rugged package featuring enhanced reliability. What's more, our non-contacting approach to Hall-effect rotary position applications provides longer-life solutions that excel in most harsh environments.

FEATURES

HALL-EFFECT ROTARY POSITION SENSORS

RTY Series.

Features: 35 M cycle product life

- Solid-state Hall-effect technology
- Rugged IP67-sealed package with integral connector
- Automotive-grade EMI/EMC testing, integrated reverse polarity, and short circuit
- Industry-standard AMP termination, 32 mm mounting pitch, North American and European pinout styles, and compact package
- Eight sensing ranges up to 360°
- Low voltage and high voltage versions

Benefits: Angle monitoring in harsh transportation and industrial applications at a competitive cost. 12 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. IP67 sealing and integral connector allows for use in harsh environments. EMI/EMC testing, reverse polarity and short circuit provide protection against installation errors and frequencies in the environment. Industry standard termination, mounting pitch and pinout provide drop-in replacement for existing

applications. Choice of sensing ranges provides flexibility in multiple applications, allowing OEMs the range of travel needed for the application. Potential applications include position and movement detection of pedals, throttles, gear shift, levers, steering, linkages, and hitches (trucks, buses, off-road vehicles, industrial/construction/agricultural vehicles and equipment, cranes); suspension displacement/kneeling (buses, trucks); tilt/trim position (boat engines, tilling equipment), as well as industrial valve and HVAC damper control, and irrigation pivot control

RPN Series.

Features: Solid-state Hall-effect technology • 30 M cycle product life

- Eight sensing ranges up to 360°
- Reverse polarity, short circuit and EMC protection
- Choice of operating ranges, outputs, and levers
- IP67- or IP69K-sealed package with integral connector

Benefits: Long service life, low torque actuation, and reduced mechanism wear-out. Enhanced resistance to damage from incorrect wiring and electrical noise. Wide choice of sensing ranges provides range of travel for most applications; tolerant to overtravel. Output choices provide

application flexibility. Sealed package with integral connector for durability. Often ideal for detecting position and movement of potential applications such as pedals, throttles, gear shift levers, linkages, suspension and hitches in trucks, offroad vehicles, cranes and construction/agricultural/industrial equipment.

HRS100 Series.

Features: Solid-state Hall-effect technology • 10 M cycle product life (typical) • Two sensing ranges • Choice of termination

Benefits: Use of magnetically coupled technology in place of a mechanical wiper assembly provides long life and a cost-effective solution for harsh environments that include temperature, vibration, dither, moisture and dirt. Non-contact operation, long service life, low torque actuation and reduced wear-out of mechanisms. Potential applications include position and movement detection of pedals, throttles, gear shift, levers, steering, linkages, and hitches (off-road vehicles and industrial/construction/agricultural vehicles/equipment), tilt/trim position (boat engines), and industrial material handling equipment (forklifts, robotics)

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More are turning to Honeywell, for more value.

Honeywell S&C RTY and RPN Series Hall-effect rotary position sensors respond to the presence or to the interruption of a magnetic field, using a solid-state Hall-effect IC to sense rotary movement of the actuator shaft and then producing a proportional output. The IC, circuitry and magnets are galvanized with an integral connector — more than a match for the most unforgiving conditions. The HRS100 Series uses magnetically-coupled technology in place of a mechanical wiper assembly which provides long life and a cost-effective solution for harsh environments. These sensors are often ideal for potential transportation applications, such as throttle and speed position and control, inboard lever control, foot pedal, gearshift, steering, lever, linkage, seat, mirror, tilt and manipulator arm position.

Other benefits include: 360-degree operating range with multi-turn allowable rotation, low torque actuation and greatly reduced wear-out mechanisms, enhanced resistance to damage from incorrect wiring and electrical noise, wide operating angle tolerant to overtravel, integrated reverse polarity, short circuit and EMC protection.



Hall-Effect Rotary Position Sensors

RTY Series	
Sensing range	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)
Redundant version	no
Input voltage	low voltage: 5 Vdc ±0.5 Vdc high voltage: 10 Vdc to 30 Vdc
Output	low voltage: 0.5 V to 4.5 V ratiometric high voltage: 0.5 V to 4.5 V non-ratiometric
Input current	low voltage: 20 mA max.; during output to ground short, 25 mA max. high voltage: 32 mA max.; during output to ground short, 47 mA max.
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]
Connector	AMP super seal
Life	35 M cycles
EMI/EMC	<ul style="list-style-type: none"> • EMI radiated immunity: 100 V/m from 200 MHz to 1000 MHz per ISO11452-2 • EMI conducted immunity: <ul style="list-style-type: none"> - low voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 200 MHz - high voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 400 MHz • EMC: exceeds CE requirements
Housing material	PBT plastic
Dimensions	55 mm L x 43 mm W x 41 mm H [2.17 in L x 1.69 in W x 1.61 in H]



Hall-Effect Rotary Position Sensors

RPN Series

HRS100 Series

Sensing range	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)	90° ±2°, 180° ±2°
Redundant version	yes	no
Input voltage	5 Vdc, 8 to 30 Vdc, 10 Vdc to 30 Vdc	5 Vdc ±10%
Output	0.25 V to 4.75 V, 0.5 V to 4.5 V, 1 V to 9 V, 3 V to 5 V, 4.5 V to 0.5 V, 4.75 V to 0.25 V, 4 mA to 20 mA, 20 mA to 4 mA	5% to 95% of applied Vdd, approx. (programmable) (output ratiometric to supply)
Input current	20 mA max.	5 mA typ.
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Connector	AMP 1-1419168-1, AMP Superseal 282087-1, Deutsch DT04-3P	solder lug, flying wire leads
Life	30 M cycles	10 M cycles
EMI/EMC	EMC: 200 V/m ISO 11452-3	EMI: 30 V/m, 10 kHz to 1000 MHz at 3 m
Housing material	PA66 plastic	metal
Dimensions	63 mm L x 38,8 mm W x 56 mm H [2.48 in L x 1.53 in W x 2.20 in H]	32,27 mm [1.3 in] H x 27,79 mm [1.1 in] W

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.

For more information about Sensing and Control products, visit www.honeywell.com/sensing or call +1-815-235-6847. Email inquiries to info.sc@honeywell.com

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005892-4-EN IL50 GLO
October 2012
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RTY Series

Hall-Effect Rotary Position Sensors



DESCRIPTION

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

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-qualified rugged package for durability in most harsh environments.

FEATURES AND BENEFITS (★=competitive differentiator)

- ★ **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-sealed package with integral connector:** Allows for use in harsh environments
- **Automotive-grade EMI/EMC testing, integrated reverse polarity, and short circuit:** Provides protection against installation errors and frequencies in the environment
- **Industry-standard AMP termination, 32 mm mounting pitch, North American and European pinout styles, and compact package:** Provide drop-in replacement
- **Eight operating ranges up to 360°:** Provides flexibility in multiple applications, allowing OEMs the range of travel needed for the application

Eight operating ranges (50°, 60°, 70°, 90°, 120°, 180°, 270° and 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.

Most applications require no lever, and no brackets are necessary.

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

POTENTIAL APPLICATIONS

Transportation:

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

Industrial:

- Valve control
- HVAC damper control
- Irrigation pivot control

RTY Series

Table 1. Specifications

Characteristic	Parameter	
	LV (Low Voltage)	HV (High Voltage)
Supply voltage	5 ±0.5 Vdc	10 Vdc to 30 Vdc
Supply current	20 mA max.	32 mA max.
Supply current (during output to ground short)	25 mA max.	47 mA max.
Output	0.5 V to 4.5 V ratiometric	0.5 V to 4.5 V non-ratiometric
Output signal delay	4 ms typ.	
Overvoltage protection	10 Vdc	–
Reverse polarity protection	-10 Vdc	-30 Vdc
Output to ground short circuit protection	continuous	
Output load resistance (pull down to ground)	10 kOhm	
EMI:	100 V/m from 200 MHz to 1000 MHz per ISO11452-2	
radiated immunity	100 mA BCI per ISO11452-4	
conducted immunity	from 1 MHz to 200 MHz	100 mA BCI per ISO11452-4 from 1 MHz to 400 MHz
EMC	exceeds CE requirements	
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]	
Storage temperature range	-40 °C to 125 °C [-40 °F to 257 °F]	
Ingress protection	IP67 according to DIN 40050	
Expected life	35 M cycles	
Media compatibility	heavy transportation fluids	
Housing material	PBT plastic	
Shock	50 G peak	
Vibration	20 G peak tested from 10 Hz to 2000 Hz	
Salt fog	concentration 5% ±1% for 240 hr per SAE M1455 Section 4.3.3.1 (at 5.0 Vdc. 38 °C [100 F °])	
Resolution	12 bit	
Mating connector	AMP Superseal 282087-1	
Mechanical end stop	no	
Approvals	CE	

Hall-Effect Rotary Position Sensors

Figure 1. Mounting Dimensions (For Reference Only: mm/[in.])

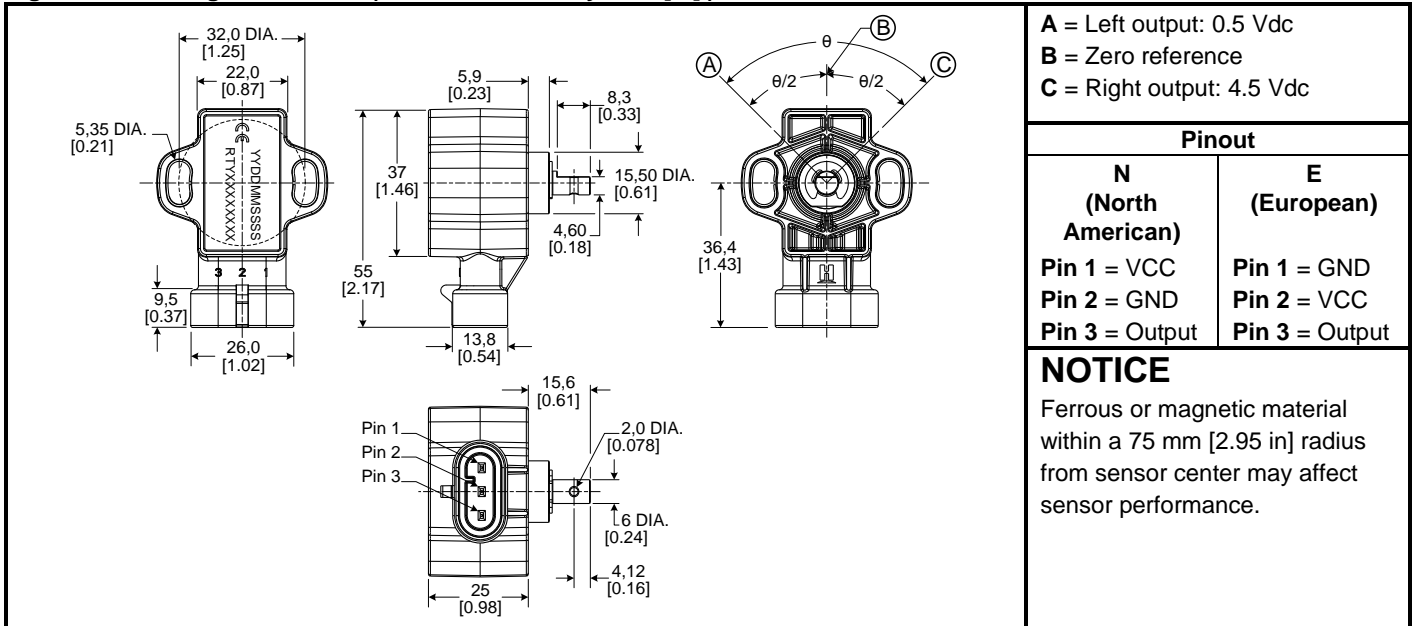


Figure 2. Functional Characteristics

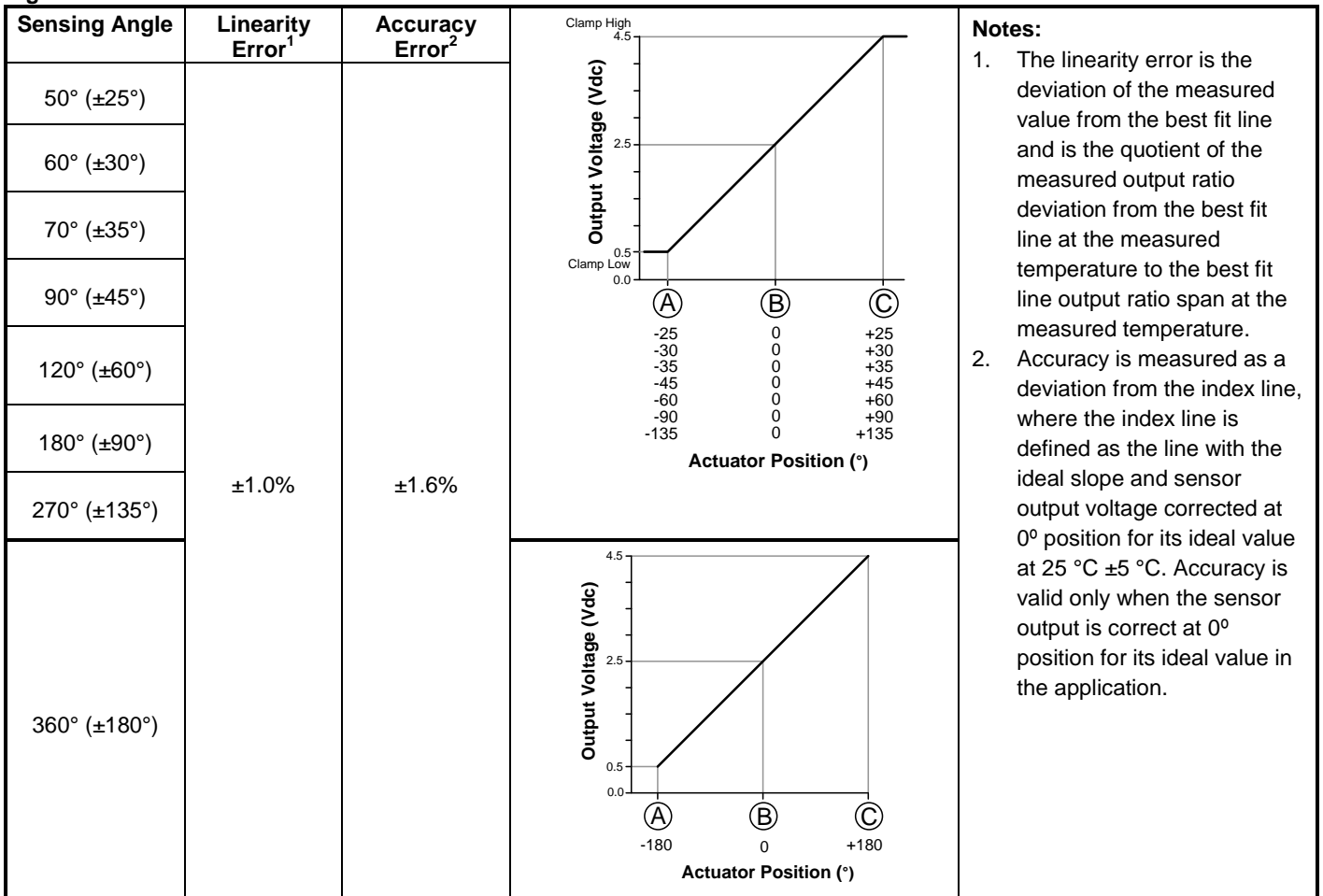
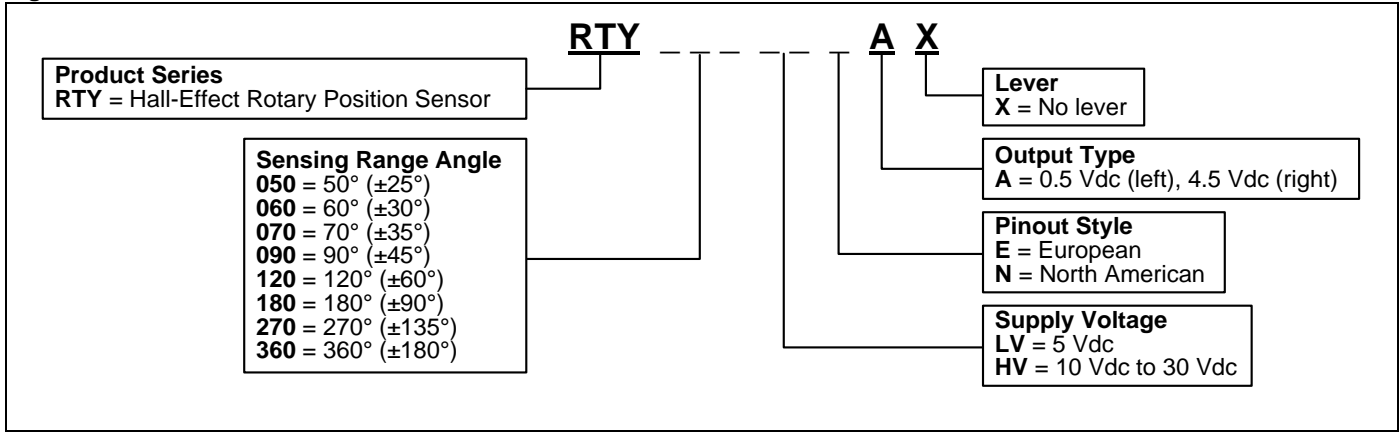


Figure 3. Nomenclature and Order Guide



⚠ WARNING
PERSONAL INJURY
 DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.
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. 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 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 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.

⚠ WARNING
MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

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

SALES AND SERVICE
 Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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