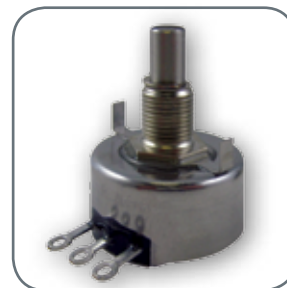




## Hall-effect Rotary Position Sensors **HRS Series**



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# HRS Series Hall-Effect Rotary Position Sensors

The HRS Series uses Hall-effect technology to supply reliable and repeatable angular position information. The use of this magnetically coupled information, in place of a mechanical wiper assembly, provides long life and a cost-effective solution for harsh environments that include temperature, vibration, shock, dither, moisture and dirt.

The HRS Series is packaged in a stainless steel metal housing with a 9,5 mm [0.375 in] diameter unthreaded or threaded bushing and a 6,35 mm [0.25 in] diameter stainless steel shaft. A variety of termination types are available. Mounting hardware is available on some catalog listings.

## Key Features and Benefits

- **Solid state Hall-effect technology provides non-contact operation for:**
  - Long service life
  - Low torque actuation
  - Enhanced performance in harsh environments, especially those with vibration, shock and extreme temperatures
  - Reduces mechanical wear concerns
- **10 M cycle product life (typical):** Promotes extended life in the application
- **Choice of termination types:** Contributes to design flexibility in the application
- **Voltage output allows direct connection to the control system:** Can reduce external circuitry and overall system complexity, lowering overall installation cost to the customer
- **Choice of anti-rotation locating pins:** Limits rotation of the device in the application, preventing over-travel on levers and throttles
- **Rotary potentiometer package form factor:** Designed to provide direct replacement for potentiometers, often allowing drop-in conversion to Hall-effect technology

## Potential Applications

### TRANSPORTATION

Position and movement detection in off-road vehicles and construction/agricultural vehicles/equipment:

- Gear shifter, joystick, and throttle position
- Pedal position
- Hitch location
- Bucket/loader position
- Steering position
- Auto-pilot/drive-by-wire system feedback

### INDUSTRIAL

Position and movement detection in material handling equipment:

- Industrial vehicle attachment position (e. g. forklift truck forks)
- Machine control joystick position
- Robotic arm position
- Valve actuator position

**Table 1. Electrical Specifications**

Characteristic	Parameter			
	HRS100SSAB090	HRS100SSAB180	HRS100SWAB090	HRSRES05A090
	Solder Lugs, Unformed		Flying Wire Leads	Solder Lugs, Formed 90° Down
				
Electrical angle	90° ±2° CW	180° ±2° CW	90° ±2° CW	
Output voltage	CW: 4.750 V min., 4.850 V max. CCW: 0.150 V min., 0.250 V max.	CW: 4.750 V min., 4.850 V max. CCW: 0.050 V min., 0.150 V max.	CW: 4.750 V min., 4.850 V max. CCW: 0.150 V min., 0.250 V max.	CW: 2.095 V min., 2.205 V max. CCW: 0.245 V min., 0.294 V max.
Linearity (% of span)	±2% typ.	±4% typ.	±2% typ.	
Output current	2 mA max.			
Output type	sink/source			
Overvoltage protection	18 Vdc. max.			
Supply voltage	5 Vdc			
Supply current	5 mA typ.			

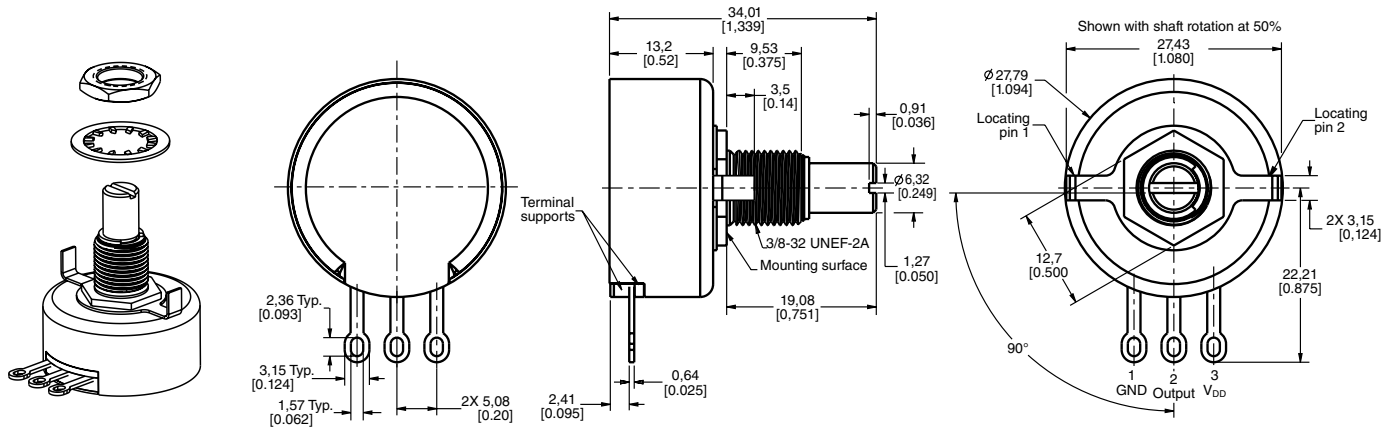
**Table 2. Mechanical Specifications**

Characteristic	Parameter			
	HRS100SSAB090	HRS100SSAB180	HRS100SWAB090	HRSRES05A090
Mechanical angle of rotation	90° ±2°	180° ±2°	90° ±2°	
Rotational cycles	10 million typ.			
Rotational torque	0.014 N m [2.0 in-oz] max. at 25 °C [77 °F]			
Stop torque	0,56 N m [5 in-lb] min.			
Push out	89 N m [20 in lb] min.			
Pull out	44 N m [10 in lb] min.			
Shaft:				
diameter	6,35 mm [0.25 in]			
material	stainless steel			
Bushing:				
diameter	9,5 mm [0.375 in]			
material	nickel-plated brass			
Housing material	stainless steel			
Terminal material:				
solder lug terminals	tin-plated brass, SAC305 solder dip	—		tin-plated brass, SAC305 solder dip
flying wire leads	—	XL insulated, 20 AWG stranded		—
Terminal support material	thermoplastic			
Mounting hardware material:				
mounting nut	nickel-plated brass			
lock washer	nickel-plated brass			

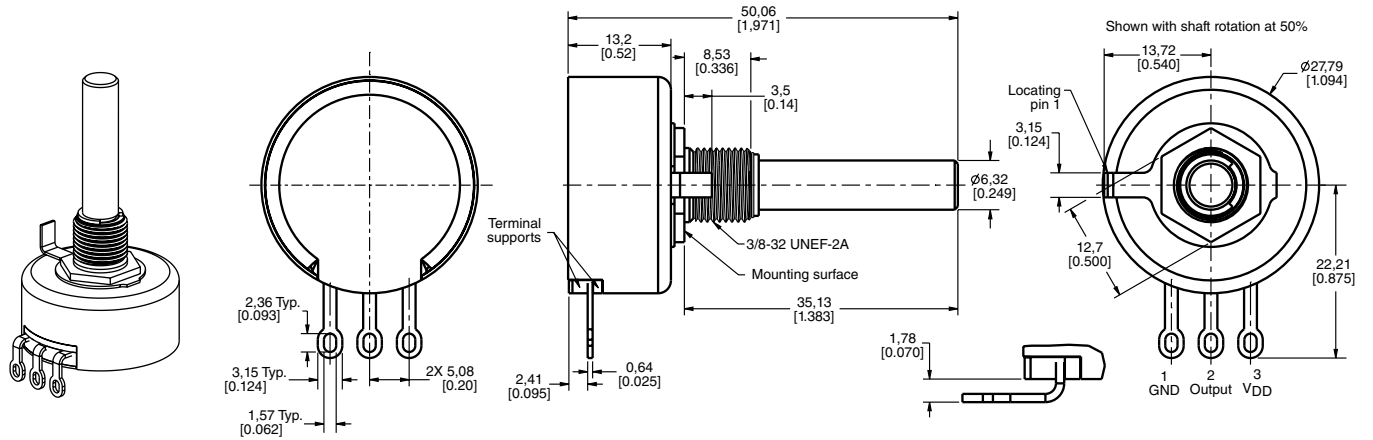


Figure 2. Dimensional Drawings (For reference only: mm [in.] )

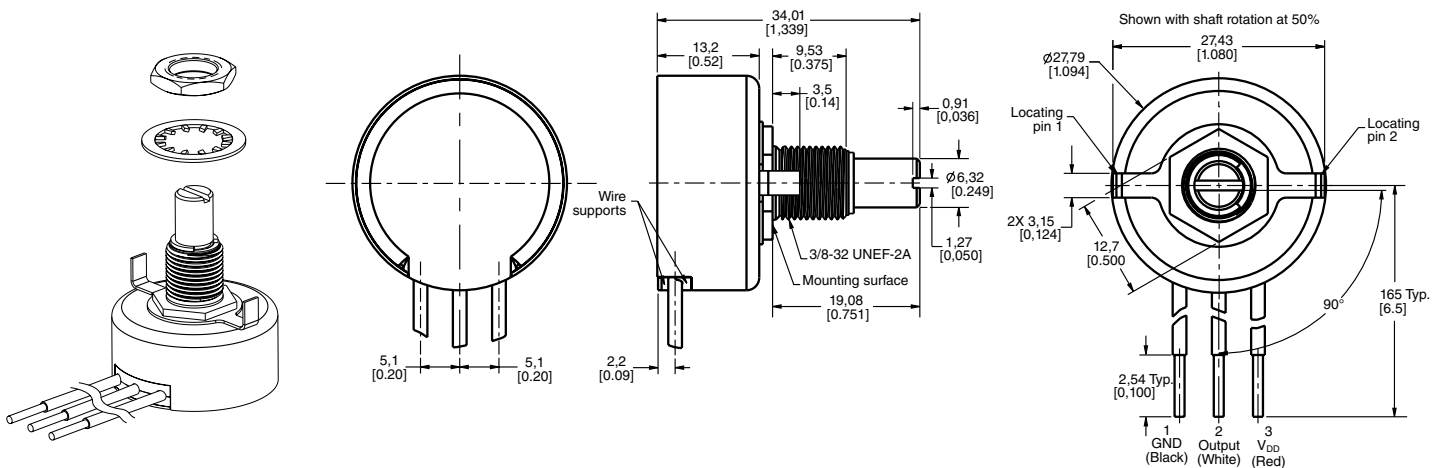
**HRS100SSAB090, HRS100SSAB180: Solder lugs, unformed**



**HRSRES05A090C: Solder lugs, formed 90° down (formed per detail; unformed dimensions for reference only)**



**HRS100SWAB09: Flying wire leads**

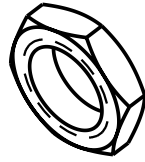


# Hall-Effect Rotary Position Sensors, HRS Series

Figure 3. Mounting Hardware

**Mounting Nut**

9,5 mm [0.375 in], 3/8-32 UNEF-2A



**Lock Washer**

17,8 mm [0.70 in] internal diameter  
1,59 mm [0.0625 in] thick



Figure 4. Order Guide

Catalog Listing	Description
HRS100SSAB090	HRS Series Hall-effect rotary position sensor, slotted shaft, solder lug terminals unformed, 90° electrical angle, unassembled mounting hardware included
HRS100SSAB180	HRS Series Hall-effect rotary position sensor, slotted shaft, solder lug terminals unformed, 180° electrical angle, unassembled mounting hardware included
HRS100SWAB090	HRS Series Hall-effect rotary position sensor, slotted shaft, flying wire leads, 90° electrical angle, unassembled mounting hardware included
HRSRES05A090C	HRS Series Hall-effect rotary position sensor, round shaft, solder lug terminals formed 90° down, 90° electrical angle, mounting hardware not included

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