

## | 9360 SERIES

### SINGLE AND DUAL OUTPUT ROTARY POSITION SENSOR

#### Introduction

The 9360 Series rotary sensor is a non-contacting Hall effect device with up to 360° of rotation and single or dual outputs. This rugged design is ideally suited for continuous rotation applications where reliability and durability are a priority. The sensor provides absolute position at power on and offers two completely isolated outputs. The packaging is similar to other BEI® devices and meets the severe durability requirements that are typical in off-highway and agriculture environments. This combination of magnet, sensor and sealed packaging offers excellent temperature stability and corrosion resistance. The sensor can be configured for Analog (voltage) or PWM output. These programmability features are configured at the factory and allow for greater flexibility in creating custom limited electrical angle outputs (i.e.  $\pm 20^\circ$  degrees for full scale) with short turnaround times. Fully sealed, (meeting and/or exceeding IP67 and IP69K standards) the 9360 is resistant to contamination and moisture. An integrally molded 6-pin Metri-Pack or Ampseal connector makes a sealed connection with industry standard mating connectors. The 2 outputs are available in either inverse option (9360) or direct option (9362).



#### Features

- Fully programmable: The standard sensor provides 15°-360° electrical degrees. Multiple outputs with limited electrical angles up to 360° and temperature compensation are also available
- Compression molded Neodymium magnets: Provide excellent temperature stability and corrosion resistance
- Ratiometric analog output or PWM output: Reduced sensitivity to voltage changes
- Factory programming through connector: Allows for quick turn-around on custom electrical angles
- Sealed construction: IP66 / IP67, 6-pin I/O interface to Packard Electric Metri-Pack Pull-to-Seat 150.2 Series P/N 12162261 or P/N 12162260 connector; Ampseal 16 - 6 position, P/N 776433-1 sealed receptacle housings 2-Row
- Temperature range: -40° to +125°C standard
- Operating life: 35M cycles; Over one million cycles at 1kg side load



#### SPECIFICATIONS

#### Mechanical

<b>Range</b>	0° to 360° with no stops/no spring, allowing for continuous rotations*
<b>Spring/Rotor Return Direction Options</b>	0° to 180° with spring return options 1 & 2; 0° to 360° with no spring option 3 (other, custom limited angles ranges available)
<b>Mounting</b>	2 x 4.5mm Ø on 32mm centers
<b>Shaft</b>	6mm Ø with 4.6mm flat
<b>Termination</b>	Metri-Pack or Ampseal
<b>Housing</b>	Glass filled PBT (Polybutylene terephthalate)
<b>Life</b>	35 M cycles; 1 M cycles w/1kg side load
<b>Frequency Response</b>	1 kHz minimum
<b>Rotational Torque</b>	0.025 - 0.110 N-m
<b>Weight</b>	35 grams (approx.)

## Electrical

<b>Active Electrical Angle</b>	15° to 360° in 15° increments (no spring option). 15° to 165° in 15° increments (spring option)
<b>Input Voltage</b>	5.0 V±0.25V DC
<b>Overvoltage Protection</b>	20V
<b>Reverse Polarity Protection</b>	Yes
<b>Short Circuit Protection</b>	10VDC
<b>Output Signal</b>	5% to 95% Analog Ratiometric/PWM*
<b>Resolution</b>	12 Bit
<b>Accuracy</b>	±0.6% of full scale at room temperature ±0.9% of full scale over operating temperature range
<b>EMC</b>	100 V/m (14 kHz-1 GHz range)
<b>ESD</b>	8kV
<b>Input current</b>	18mA maximum per output 36mA maximum total (both channels)

## Environmental

<b>Sealing</b>	IP67 and IP69K per DIN 40050-9
<b>Vibration</b>	10G peak, 20 - 2,000 Hz
<b>Humidity</b>	95% RH @ 40° C
<b>Liquid Exposure</b>	Salt water, cola, motor oil, ethylene glycol, paint, diesel fuel
<b>RoHS</b>	Yes
<b>Operating Temperature Range</b>	-40°C to +125°C
<b>Storage Temperature Range</b>	-40°C to +125°C
<b>Shock</b>	50Gs, half-sine pulse, 5 msec duration

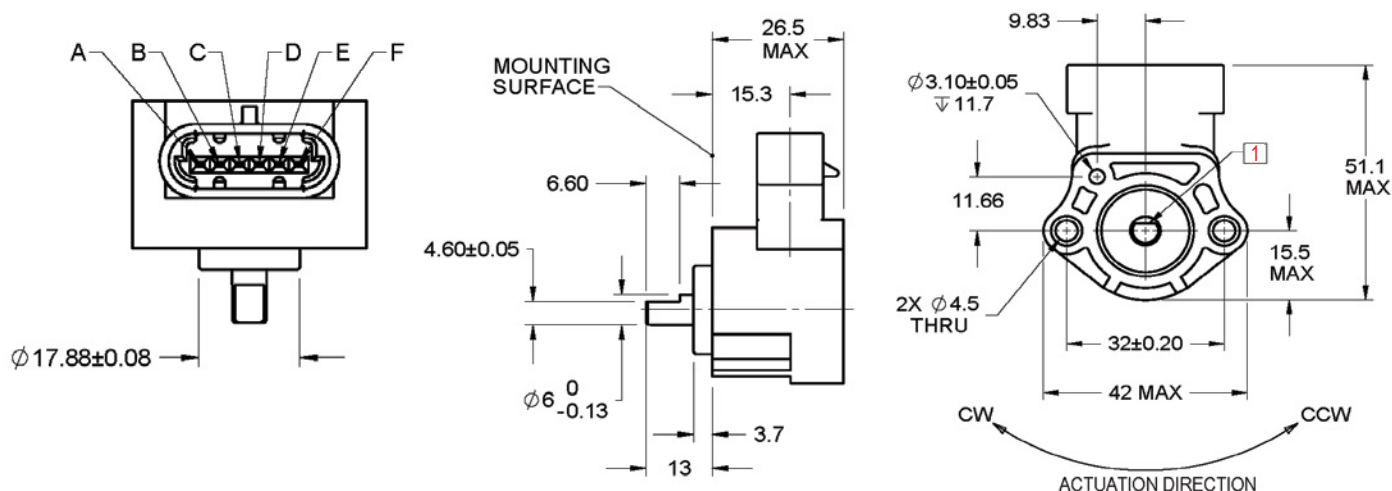
\*Different outputs and mechanical range(s) available

## DIMENSIONS

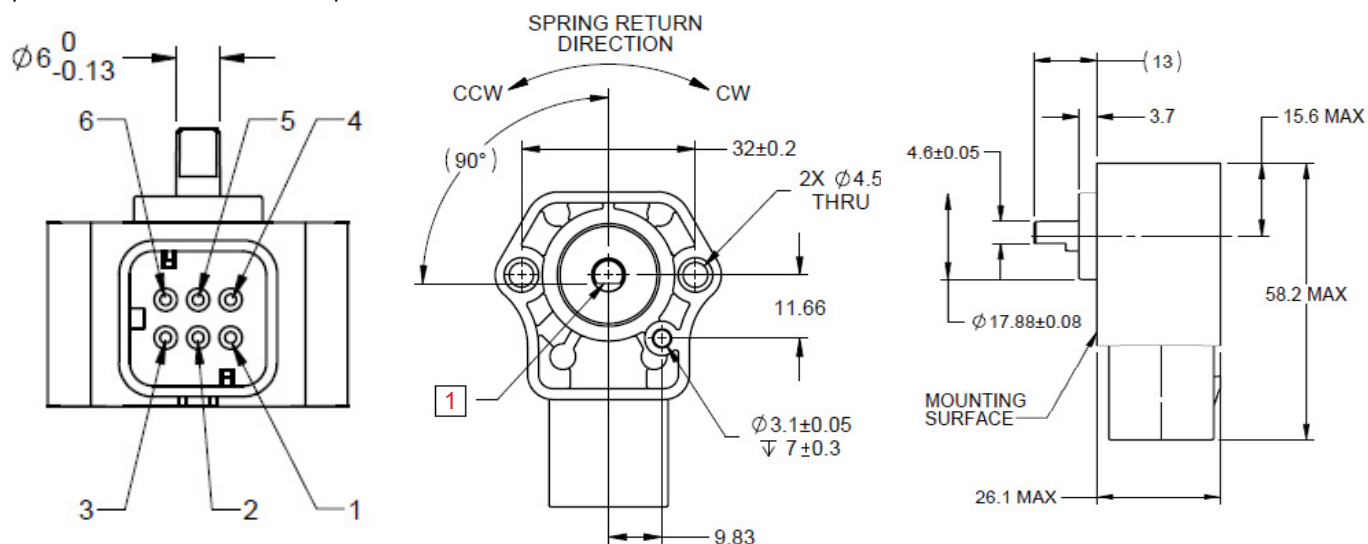
TOLERANCES, UNLESS OTHERWISE NOTED: x.x= +/- 0.3 x.xx= +/- 0.13

All dimensions are in millimeters

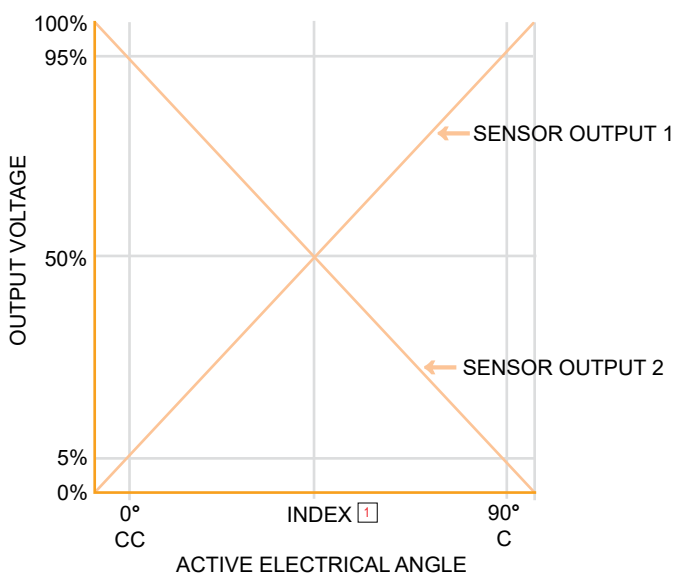
### MetriPack connector (9360, 9361 & 9362 Option)



## Ampseal connector (9360A Option)



### Output signal 9360

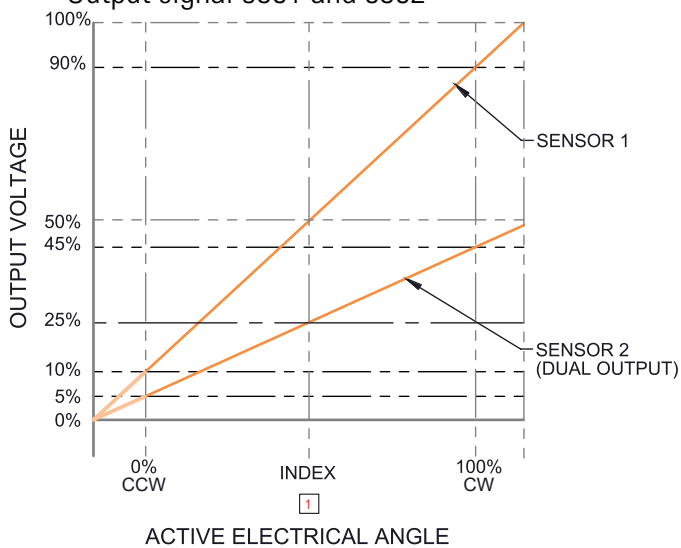


### Connector Pin Outputs 9360

	METRI-PACK		AMPSEAL	
	SENSOR 1	SENSOR 2	SENSOR 1	SENSOR 2
Vs	F	B	1	4
OUTPUT	C	D	2	5
GROUND	E	A	3	6

[1] SHAFT FLAT IS SHOWN WITH SENSOR AT 50%±3% VOLTAGE (INDEX)

### Output signal 9361 and 9362



### Connector Pin Outputs 9361 and 9362

	METRI-PACK	
	SENSOR 1	SENSOR 2
Vs	F	B
OUTPUT	C	D
GROUND	E	A

[1] SHAFT FLAT IS SHOWN WITH SENSOR 1 AT 50%±3% VOLTAGE (INDEX)  
SHAFT FLAT IS SHOWN WITH SENSOR 2 AT 25%±3% VOLTAGE (INDEX)



## ORDERING OPTIONS

Use this diagram, working from left to right to construct your model number

**9360** - - - -

**Family**

**9360:** Dual Channel - Inverse Outputs  
**9361:** Single Channel  
**9362:** Dual Channel - Direct Outputs

**Termination**

**Blank:** Metri-Pack  
**A:** Ampseal 16 - 6 position (for 9360 only)

**Standard Electrical Angles**

015 = +/- 7.5°; 030 = +/- 15°; 045 = +/- 22.5°,  
060 = +/- 30°, etc. up to 360 = +/- 180°  
**NOTE:** Other angles available, consult factory

**Spring/ Rotor Return Direction**

**1:** Counter Clockwise Spring Return  
**2:** Clockwise Spring Return  
**3:** No Spring, Continuous Rotation  
\*Spring return: available for active electrical angles  
15° to 165° only

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, valuation, and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular datasheet. Sensata may make corrections, enhancements, improvements, and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata datasheets with the Sensata component(s) identified in each particular datasheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATASHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATASHEETS OR USE OF THE DATASHEETS, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATASHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at [www.sensata.com](http://www.sensata.com) SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY, AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA

## CONTACT US

### Americas

+1 (800) 350 2727

[sensors@sensata.com](mailto:sensors@sensata.com)

### Europe, Middle East & Africa

+33 (3) 88 20 8080

[position-info.eu@sensata.com](mailto:position-info.eu@sensata.com)

### Asia Pacific

[sales.isasia@list.sensata.com](mailto:sales.isasia@list.sensata.com)

China +86 (21) 2306 1500

Japan +81 (45) 277 7117

Korea +82 (31) 601 2004

India +91 (80) 67920890

Rest of Asia +886 (2) 27602006  
ext 2808

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Sensata:](#)

[93621201](#)