

# | 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. ±20° 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 776433-1sealed 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

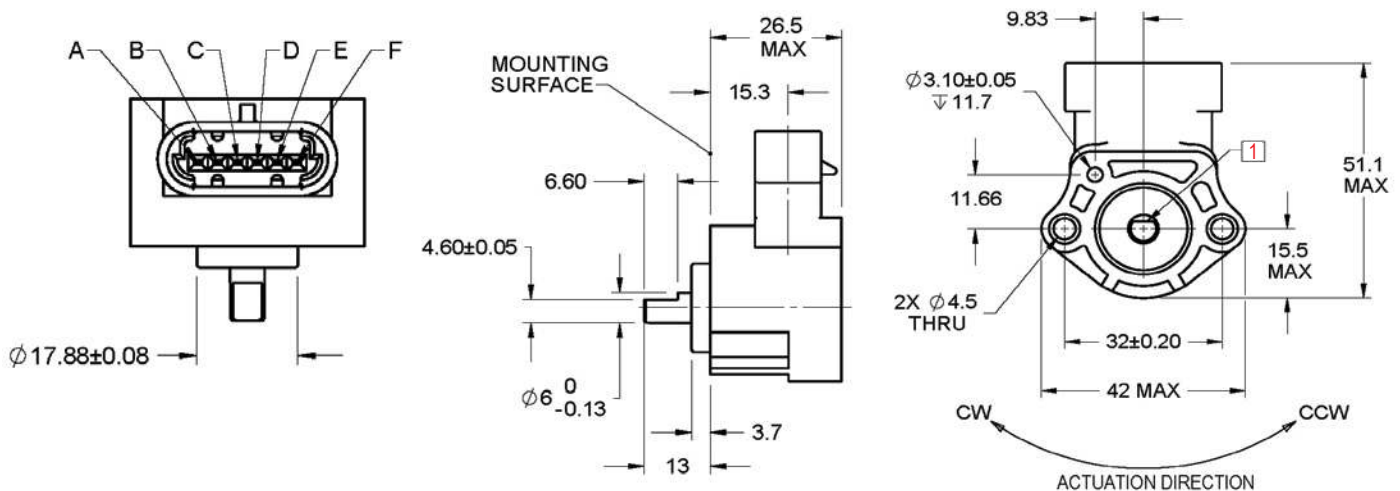
\*Different outputs and mechanical range(s) available

## DIMENSIONS

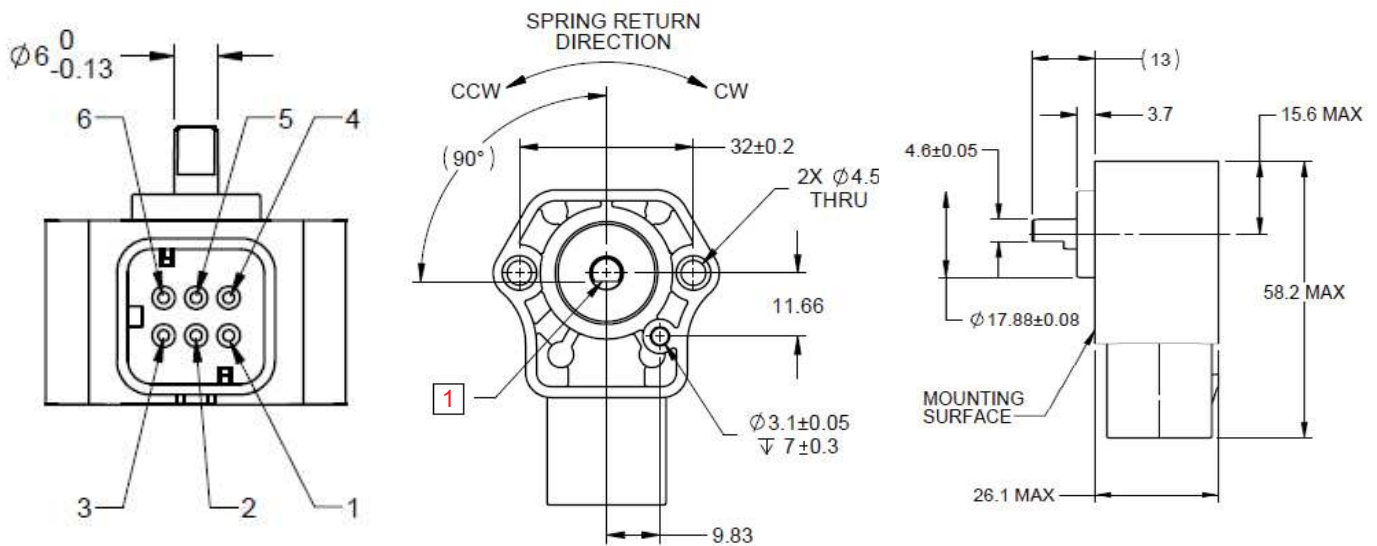
TOLERANCES, UNLESS OTHERWISE NOTED: x.x= +/- 0.3 x.xx= +/- 0.13

All dimensions are in millimeters

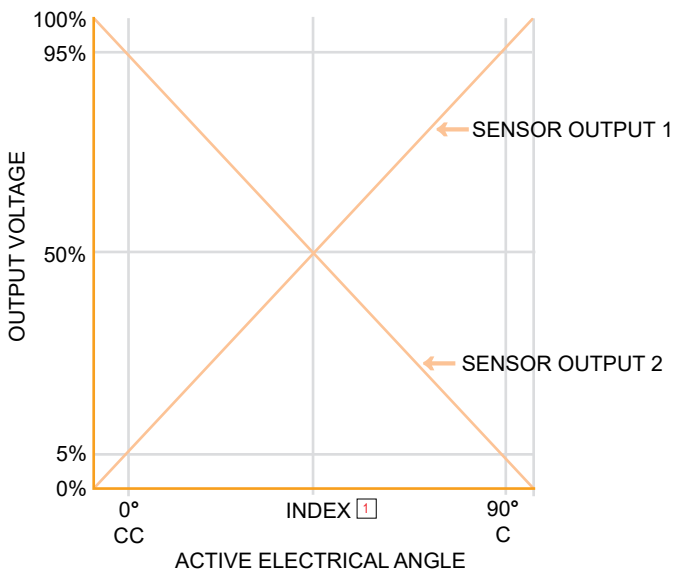
### MetriPack connector (9360, 9361 & 9362 Option)



## Ampseal connector (9360A Option)



### Output signal 9360

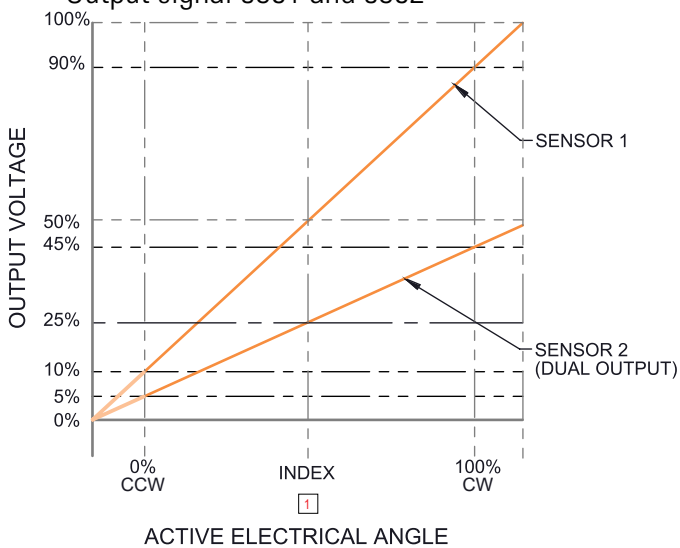


### Connector Pin Outputs 9360

	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

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