Introduction

For manual transmissions, the Bourns® Neutral Reverse Gear Position Sensor is used to determine the neutral gear position for stop/start applications. The start/stop system shuts the engine down automatically when the vehicle comes to a stop. For a vehicle with a manual transmission, the engine will restart once the gear lever is placed in neutral and the clutch pedal has been released.

A neutral position detection sensor is used in automatic transmissions only to prevent in-gear starting. An automatic transmission uses neutral gear detection as a safety function to disable the starter operation if the gear selection is not in either neutral or park mode. If the engine was allowed to start in any other gear, the car would immediately lurch forward once the engine started.

On many vehicles, the reverse light function is integrated into the neutral position sensor; the same function is now also used for engaging park position sensors and/or the reverse camera. The Bourns® Neutral Reverse Gear Position Sensor can be configured with two independent signals that provide a clearly separate signal for the neutral and reverse detection function.

The sensor may be placed internally in the gearbox or outside of the gearbox casing.

1D Rotary Sensor - Reverse Gear

Output: Gear shift (Rotary) (Reverse gear)

1D Rotary Sensor - Gears #1 through #6

Output: Gear shift (Rotary) (Gears #1 to #6)

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.
# Neutral Reverse Gear Position Sensor

## Typical Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Length</td>
<td>(2 \times \text{MR} + X \text{ mm})</td>
</tr>
<tr>
<td>Air Gap Magnet Sensor</td>
<td>(5 \sim 8 \text{ mm typical})</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>(-40 \sim +125^\circ)</td>
</tr>
<tr>
<td>Protection Degree</td>
<td>TBD*</td>
</tr>
<tr>
<td>Linearity</td>
<td>(\pm 2.0% \text{ MR})</td>
</tr>
<tr>
<td>Resolution</td>
<td>(&lt; 0.1% \text{ MR})</td>
</tr>
<tr>
<td>Ratiometry Error</td>
<td>(\pm 0.15% V_{dd})**</td>
</tr>
<tr>
<td>Temperature Drift</td>
<td>(0.5% V_{dd}) typical</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>(5 \pm 0.25 \text{ V})</td>
</tr>
<tr>
<td>Supply Current</td>
<td>(&lt; 30 \text{ mA})</td>
</tr>
<tr>
<td>Output Modes</td>
<td>Analogue, PWM</td>
</tr>
</tbody>
</table>

\* Application Dependent  
\** Analogue mode only

For higher temperature range or improved accuracy applications, please contact Bourns engineering.

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