# GZR6191A

## Rotation Speed Sensor

**Magneto-electric Type**

Datasheet

Version: V1.3

Issued Date：2024.05.28

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## Document Revision History

| Revision | Description | Date |
|---|---|---|
| V1.0 | Initial version | 2022.07.01 |
| V 1.1 | Uniform template | 2022.09.05 |
| V 1.2 | Optimize template | 2023.03.20 |
| V 1.3 | Standard template | 2024.05.28 |
| | | |

# 1. Product Description

The GZR6191 is a mature and reliable passive magnetoelectric rotation speed sensor product launched by Sencoch for the automotive market. The product has no circuit module; its structure mainly consists of a coil, permanent magnet, magnetically conductive pure iron, terminals, flange gaskets, and sealing rings, all injection molded into a single unit. The product has a simple structure and good performance consistency.

## 1.1 Product Features

- High-performance speed sensor
- High temperature resistance
- One-piece injection molding, dimensional stability

The product utilizes a high-flux, stable samarium-cobalt magnet as its magnetic field source, and employs low-coercivity, high-permeability electromagnetic pure iron to improve the utilization rate and response time of the permanent magnet's magnetic field. High-temperature resistant, high-pulse-voltage enameled wire is used as the signal generation source. Finally, the coil, permanent magnet, and electromagnetic pure iron are assembled and injection molded. The product process is simple, the injection molding consistency is good, the size is small, and the cost is low.

## 1.2 Application Areas

This product is primarily targeted at the commercial vehicle and passenger vehicle markets, where it is applied to the engine powertrain to measure the rotational speed and position of the engine camshaft and crankshaft, as well as to detect the wheel speed for ABS in the braking system.

# 2. Function Description

## 2.1 Electrical Connections

The recommended female electrical connector for this product is AMP 936059 or BOSCH 1 928 403 874 .

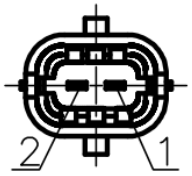



Figure 1. Pin wiring diagram

Table 1. Pin Correspondence

| Serial Number | Description | Remark |
|---|---|---|
| **1** | **V-** | It outputs an AC signal, which is neither positive nor negative. The signal acquisition pin is defined according to the application requirements. |
| **2** | **V+** | |

## 2.2 Product Output Characteristics

The output waveform diagram of the product is shown in Figure 2 , and the relationship between the output signal voltage and the rotational speed is shown in Figure 3.

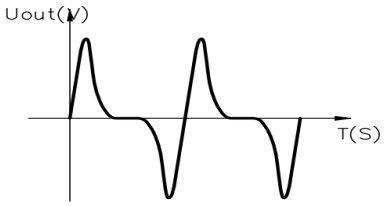
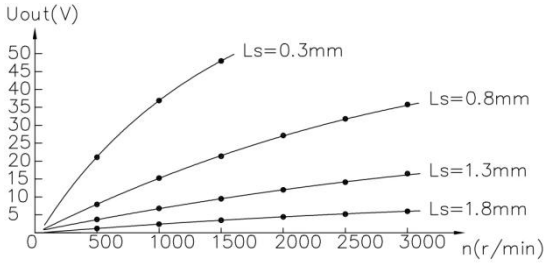



Figure 2

Signal Sequence: When the signal wheel transitions from a recessed tooth to a raised tooth, pin 2 produces a positive half-wave.

Diagram of the relationship between output signal voltage and rotational speed.




Note:LS refers to the gap distance between the sensor head and the signal wheel.

Figure 3

# 3. Technical Indicators

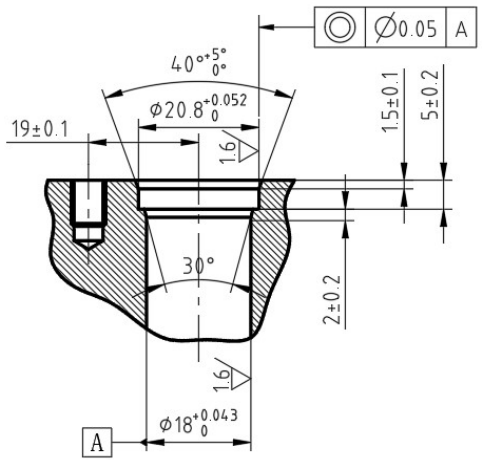
The following sensor parameters were all measured at a temperature of 20 °C.

## 3.1 Performance Indicators

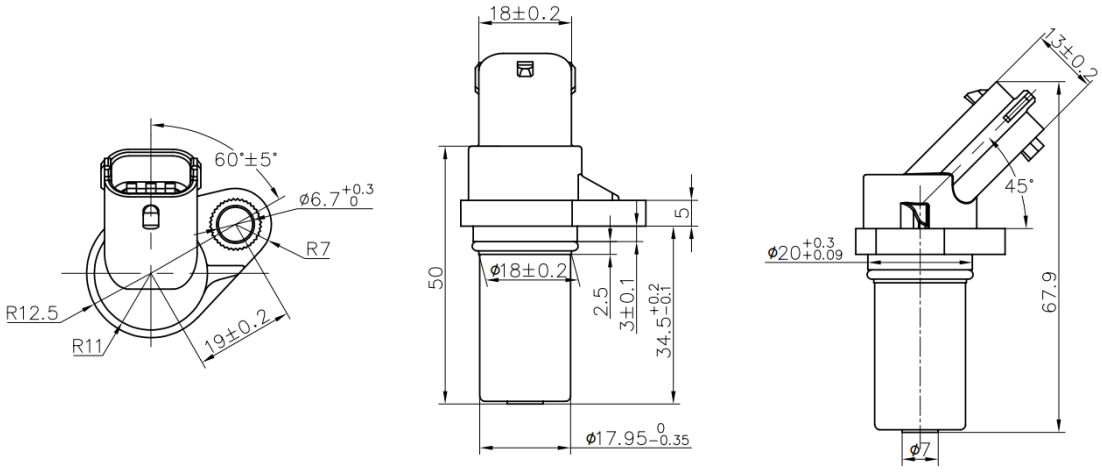
Table 1. Performance Indicators

| Attribute | Values | Unit |
|---|---|---|
| Resistance | 860 ± 86 | Ω |
| Inductance | 370 ± 60 | mH |
| Low speed performance | ≥0.25 | V |
| Low speed performance | ≤100 | V |
| Protection level | IP67 | |
| Insulation resistance | ≥10MΩ/500VDC | MΩ |
| Operating temperature | -40～ 150 | ℃ |
| Storage temperature | - 40 ～ 160 | ℃ |

# 4. Recommended Assembly Interface



## 5. Structure Specification ( unit: mm)




## 6. Selection Guide

GZR 6191 A – P345 B001 W005 B02 WX

| | |
|---|---|
| GZR | Rotation Speed Sensor Series |
| 6191A | Product Categories |
| P345 | Overall injection molding probe length P345 : 34.5mm |
| B001 | Connectors and Direction<br>Matched with AMP 936059 and oriented at an angle of 45 ° to the horizontal plane. |
| W 005 | Power supply and output methods<br>No power supply required, DC resistance 860 Ω ± 10% , inductance 370 ± 60mH , similar to sine wave output. |
| B0 2 | Packaging B0 2 : Blister tray |
| WX | Interior code |

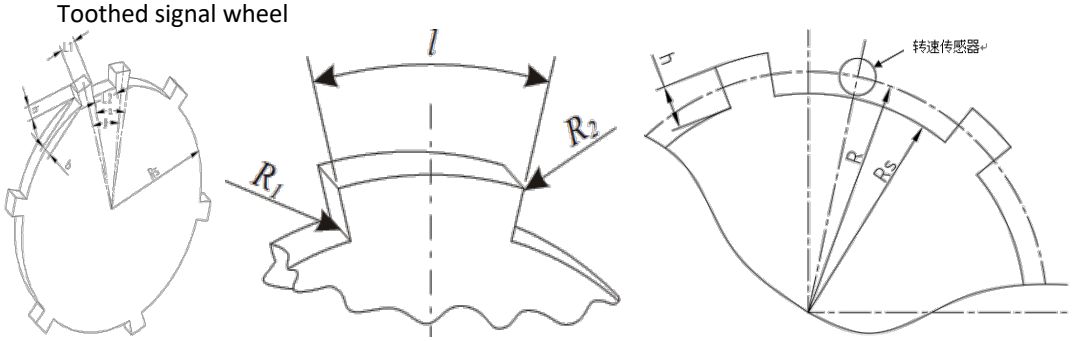
## 7. Ordering Instructions:

If you have any special requirements for the product's performance parameters and functions, please consult with our company.

# 8. Precautions for use

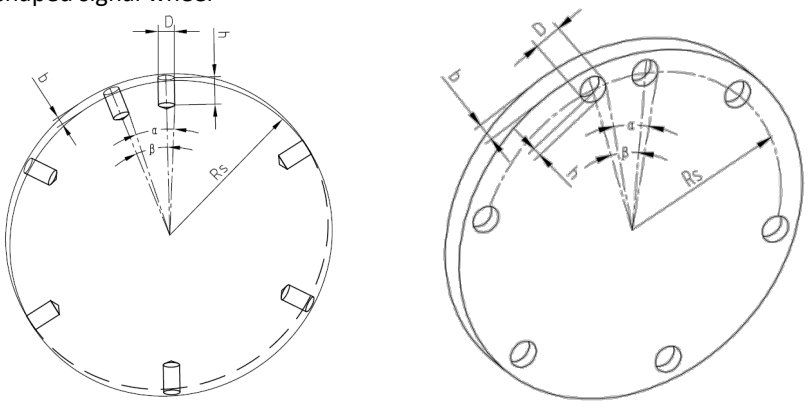
## 8.1 Requirements for using the target wheel

Toothed signal wheel



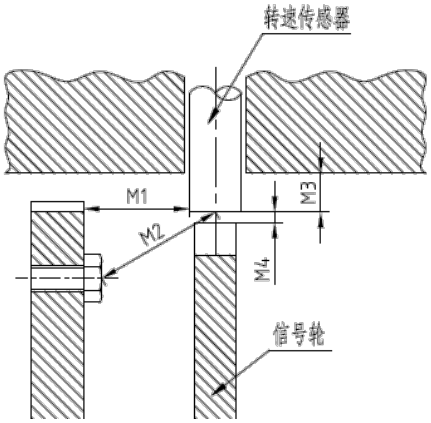

| Signal wheel requirements | Radial installation | Axial installation |
|---|---|---|
| tooth height h | ≥5 mm | ≥1 2 mm |
| Convex tooth thickness b | ≥6 mm | ≥6 mm |
| Tooth length l1 | ≥6 mm | ≥6 mm |
| Concave tooth length l 2 | ≥8 mm | ≥8 mm |
| Signal wheel radius Rs | ≥45mm | ≥45mm |
| odd tooth angle α<br>(Only effective for camshaft signal wheel) | =15 °<br>(Recommended value) | =20 °<br>(Recommended value) |
| Sensor Installation Instructions | When axially mounted, the center point of the sensor probe must be aligned with the center point of the tooth height.<br>R -Rs = h/2 | |

Hole-shaped signal wheel




| Signal wheel requirements | Radial installation | Axial installation |
|---|---|---|
| Hole depth h | ≥ 5 mm | ≥ 5 mm |
| Signal wheel thickness b | ≥ 5 mm | ≥ 5 mm |
| Hole diameter D | ≥8mm | ≥8mm |
| Signal wheel radius Rs | ≥45mm | ≥45mm |
| Odd tooth angle α<br>(Only effective for camshaft signal wheel) | =15 °<br>(Recommended value) | =15 °<br>(Recommended value) |

## 8.2 Usage Boundary Requirements



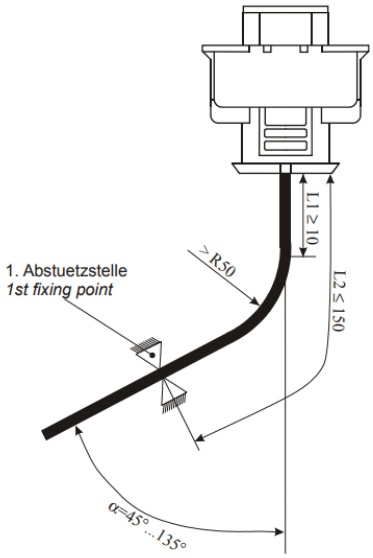

1 ) The minimum distance M1 between the sensor probe boundary and the adjacent magnetic conductor is ≥ 8 mm;

2) The minimum distance M2 between the center of the sensor probe and the adjacent protruding magnetic conductor is ≥ 40 mm;

3) The minimum distance M3 between the bottom of the sensor probe and the inner surface of the mounting hole is ≥ 8 mm;

4) Working air gap 0.5mm ≤ M4 ≤ 1.5mm .

## 8.3 Requirements for using plugins and binding




1 ) The distance L1 from the bend in the sensor connector cable to the connector sheath body is ≥ 10 mm;

2) The distance L2 from the first binding point of the sensor-to-plug cable to the connector sheath body is ≤ 150 mm.

## 8.4 Other Requirements

1 ) The sensor should only be unpacked before it is installed on the engine . For applications requiring oil seals, it is recommended to apply grease to the sealing ring before assembly.

2 ) The sensor is designed for use in internal combustion engines or as part of a complete machine that use gasoline, diesel, LNG or CNG as fuel. For use in other applications, please consult with our company.

3 ) The sensor mounting torque is 8±2 Nm ( when using 8.8 grade M6 × 12 bolts ) ;

4) Standard packaged speed sensors can be transported using ordinary conveyor systems. Please note: Protect the product from strong magnets, moisture, impact, sun damage, and pressure during transportation .

5 ) Please feel free to contact us if you have any questions.

■ Please confirm under actual usage conditions.

Since this specification is for a single product, please verify the performance and quality under actual use to improve reliability.