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**BS-FC24A-300-A1ES**  
**Fiber Optic Gyroscope**  
**Use and Maintenance**  
**Instructions**

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# BS-FC24A-300-A1ES Micro-Nano Fiber Optic Gyroscope Operation and Maintenance Manual

## 1 Scope

This document specifies the requirements and methods for the use and maintenance of BS-FC24A-300-A1ES micro-nano fiber optic gyroscope (product for short).

## 2 References and Standards

GJB1649-1993                      ESD Control Program for Electronic Products

## 3 Definitions

None.

## 4 Product introduction

### 4.1 Product Overview

BS-FC24A-300-A1ES micro-nano fiber optic gyroscope (hereinafter referred to as this product) is an angular rate sensor integrating optics with analog output, mechanics and electronics. It is based on the Sagnac effect, integrates a variety of micro-nano fiber devices, and realizes the detection process by detecting, processing and feeding back the phase difference generated by two beams of light propagating in opposite directions.

This product is mainly composed of optical path components, circuit components and structural components. It has the characteristics of simple structure, no moving parts, no wear parts, fast start, small size, light weight and so on. And can be apply to that attitude control and measurement of the carrier.

### 4.2 Composition

The product is mainly composed of the following components:

- A) an optical path assembly;
- B) Detection and control signal circuit board;
- C) Optical fiber ring skeleton, shell and other structural parts;

### 4.3 Dimensions

φ24mm×51.6mm (standard version)

\* d24.4 x 51.6 mm is available as a customized version - cost and lead time may vary



Fig. 1 Outline drawing of BS-FC24A-300-A1ES micro-nano fiber optic gyroscope

#### 4.4 Weight

≤30g。

#### 4.5 Operating temperature

-40°C~+65°C。

#### 4.6 Storage temperature

-55°C~+85°C。

#### 4.7 Random vibration

Random vibration level: 20g, frequency range: 20Hz ~ 2000Hz.

#### 4.8 Main performance parameters

Table 1 Main Performance Parameters

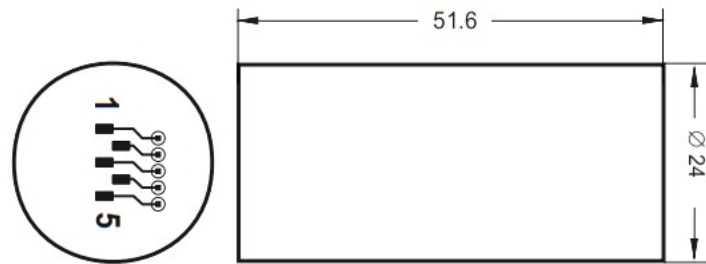
1	Input range (°/s)	±300
2	Scale factor (mv/°/s)	7±0.7
3	Bias stability (10s, 1σ, °/h)	≤2
4	Bias repeatability (1σ, °/h)	≤2
5	Random walk (°/h <sup>1/2</sup> )	≤0.02
6	Bias offset (10s,1σ)	≤0.05
7	3dB Band Width (Hz)	≥450
8	Zero-bias stability at full temperature (10s, 1 σ , -40°C ~ + 65°C)	≤90
9	Supply voltage (V)	5±0.15
10	Power consumption (W)	≤0.7

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## 4.9 Mechanical and electrical interfaces

### 4.9.1 Mechanical interface

The bottom surface of the product is the mounting surface, with 3 M3 threads and external mechanical connection.



\*d24.4 x 51.6 mm is available as a customized version - cost and lead time may vary

Figure 2 Installation Dimension

### 4.9.2 Power Requirements

The external power supply to the product has two circuits, and the requirements are shown in Table 2:

Table 2 External Power Supply Requirements

	+5V
Voltage	4.85V~5.15V
Ripple	20mV
Electric current	0.25A

### 4.9.3 Electrical interface

The BS-FC24A-300-A1ES micro-nano fiber optic gyroscope is electrically connected to the outside through the bonding pad, as shown in the figure. See Table 3 for the definition of the bonding pad.

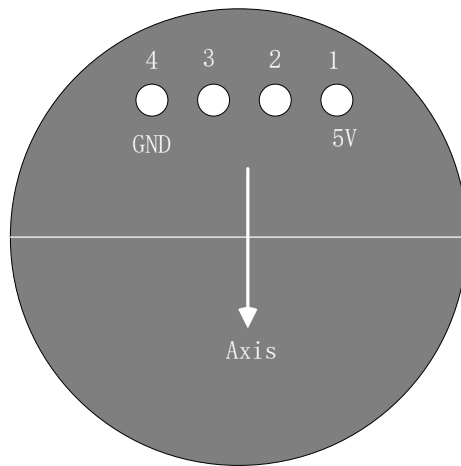


Figure 3 Node Arrangement

Table 3 Node Definition

Num.	Definition
1	5V
2	Out-
3	Out+
4	GND

Note: the biased voltage of 1 V between (out- and GND) and (out+ and GND)

## 5 Installation of the product

### 5.1 Installation requirements

The user shall be responsible for the installation and disassembly of the product. During this process, the product shall not be impacted, and the outer surface of the product shall not be machined.

### 5.2 Inspection before installation

A) Check the appearance of the product for physical damage such as collision;

### 5.3 Inspection after installation

Check whether each mounting screw is secure.

## 6. Product maintenance

A) Before the product is loaded into the carrier, it is required to electrify the product at least

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once a year for 3600s, and it is not required to detect the electrical parameters of the product when electrifying;

B) After the product is loaded into the carrier, it is required to electrify the product at least once a year for 3600 s, and it is not required to detect the electrical parameters of the product when electrifying;

## 7 Common fault phenomena and troubleshooting methods

This product is in a fully sealed state, and cannot be repaired on site after any failure of the user, and needs to be returned to the production unit for maintenance. The following only lists some fault phenomena that may occur other than the product itself, see Table 5. If other technical problems occur during the use of the product, please contact the product manufacturer.

Table 5 Common Faults and Troubleshooting

Serial number	Fault symptom	Cause analysis	Exclusion method
1	When the product is powered on, the current indication of the + 5V ammeter is basically 0	The product is not supplied with power or the power supply current is too small	Check the power supply and power supply circuit, and restore the power supply of the product
2	When the product is powered on, the current indication of the + 5V ammeter is normal, but the computer acquisition program does not work.	Abnormal acquisition system of test equipment	Check the connection cable and equipment power supply
3	The product is powered on, and the current indication of the + 5V ammeter is abnormal	There may be a short circuit inside the test equipment	Check the test equipment

## 8 Transportation and storage requirements of products

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## 8.1 Transportation precautions

- A) Place the product in the direction shown in the packing box;
- B) When the temperature range is  $-40\text{ }^{\circ}\text{C} \sim +65\text{ }^{\circ}\text{C}$ , it is allowed to transport by road, railway, air and water;
- C) Ensure that the packing case is fastened to the carrier and will not move during transportation.

## 8.2 Storage precautions

- A) The products placed in the packing box shall be stored in the air-conditioned warehouse under the standard atmospheric pressure, and the ambient temperature is  $15\text{ }^{\circ}\text{C} \sim 35\text{ }^{\circ}\text{C}$ ;
- B) The storage life of the product is 15 years.

## 9 Unpacking and inspection

### 9.1 Unpacking inspection

- A) Check the appearance of the packing case for physical damage such as collision;
- B) Electrostatic protection shall be carried out when the product is taken out.

### 9.2 Inspection of supporting delivery documents

- A) Product certificate;
- B) Acceptance report of BS-FC24A-300-A1ES micro-nano fiber optic gyroscope;
- C) Instructions for use and maintenance of BS-FC24A-300-A1ES micro-nano fiber optic gyroscope (one copy for each batch).