BS-FU29/1-3-D1EC high accuracy single axis FOG

1.1 Composition

The main components of the product are as follows：

a) optical path unit: including erbium-doped light source, fiber ring, integrated optical phase modulator, fiber coupler, photodetector;

b) circuit unit: light source driving circuit, detection and control signal circuit board;

c) Gyro structural parts.

1.2 Shape and installation dimensions

Dimensions (mm): （120±0.1）×（120±0.1）×（37±0.1） (length × width × height);

Installation dimensions (mm): （94±0.042）×（94±0.042）, Φ 6.4 mm × 4, as shown in Figure 1.

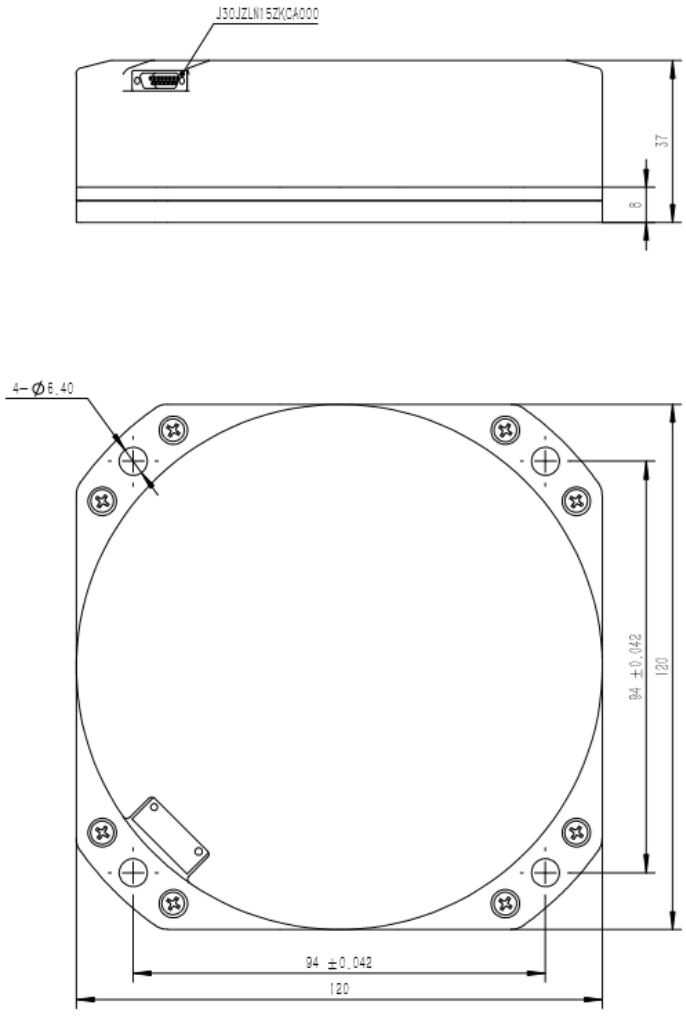

Figure 1 BS-FU29/1-3-D1EC fiber optic gyroscope shape and installation diagram

1.3 Weight

The total weight of the product is less than 900g.

1.3 main performance parameters

The main performance parameters of the product are shown in Table 1.

Table 1 Main performance parameters

No.	Test items	Unit	Technical index
1	Measure range	°/s	±300
2	Zero bias instability（100s，test for 90min，subtract previous 5min）	°/h	≤0.002
3	Zero bias repeatability （1σ，100s，after 5min）	°/h	≤0.002
4	Scale factor asymmetry（1σ）	ppm	≤20
5	Scale factor repeatability（1σ）	ppm	≤20
6	Threshold	°/h	≤0.005
7	Random walk	(º)/h1/2	≤0.0005
8	Supply voltage	V	+5
9	Steady state power consumption	W	≤6
10	Bandwidth	Hz	≥500
11	Working temp.	℃	-45~+65
12	Store temp.	℃	-50~+70
13	Dimension	mm	120×120×37
14	Weight	g	≤900

1.5 Mechanical and electrical interface

1.5.1 Power supply requirements

The product is powered by a +5 DC power supply.

The power supply requirements are shown in Table 2.

Table 2 BS-FU29/1-3-D1EC fiber optic gyroscope power requirements

No.	Name	Requirements
1	Power supply accuracy	±5%
2	Power ripple （Vpp）	20mV
3	Supply current	>1.8A

1.5.2 electrical connection interface

The connector for the product to be connected externally is RS-485, as defined in Table 3.

Table 3 BS-FU29/1-3-D1EC Fiber Optic Gyroscope Connector Point Definition

Connector point number	Connector identification	Connector point definition
1，9	+5V	Power input
2，10	GND	Power input ground
5	Rx+	Differential pass signal positive
13	Rx-	Differential pass signal negative
6	Tx+	Gyro output positive
14	Tx-	Gyro output negative
3，4，7，8，11，12，15	——	Reserved

1.5.3 Output signal form

The signal output form of the product is RS485, and the fiber optic gyro communication is controlled by the gyro differential pass signal.The gyro processing circuit starts transmitting the gyro data in the period through the serial interface within 5 us after the falling edge of the gyro differential pass signal signal arrives.

1.5.4 Communication protocol

The communication protocol is as follows: RS485 serial interface, baud rate is 460.8kbps, communication frame character format: 1 bit start bit, 8 data bits, 1 stop bit, no parity, communication period is 1ms ~ 10ms.
External synchronization signal frequency 1000Hz.
The total data frame length of the gyroscope is 11 bytes.
The data definition is shown in Table 4 below.

Table 4 data definition

Byte number	Name	Content	Remark
1	Frame header	99H	
2	Frame header	66H	
3	Status flag	FFH	
4～7	Gyro data	——	Bytes from low to high
8～9	Temperature data	——	Bytes from low to high
10	Frame number	——	Frame sequence number,add 1 for each transmission,cycle count.
11	Checksum	——	
Note 1: The status flag of the gyroscope normal output is FFH. Note 2: The checksum is the lower 8 bits of the accumulated sum of 3 to10 bytes. Note 3: The temperature data is divided by 16 as the actual measured temperature value.			