

# BS-FL12x-5-D1EC

## High Precision Fiber Optical Gyroscope



### Features

- High precision single-axial fiber optic gyroscope
- Data output frequency: 5000Hz
- Range:  $\pm 500^\circ / S$
- Zero bias stability:  $0.006^\circ / h$
- Dimensions: 120 x 120 x 38 (mm)
- Weight: < 200g
- Operating temperature:  $-40^\circ C \sim +70^\circ C$

Advantages: Fast start-up, wide measurement range and high reliability. BS-FL12x-5-D1EC can be applied to the application requirements of medium and high precision inertial navigation systems.

Series includes three models:

BS-FL12A-5-D1EC

BS-FL12B-5-D1EC

BS-FL12C-5-D1EC

### Typical Applications

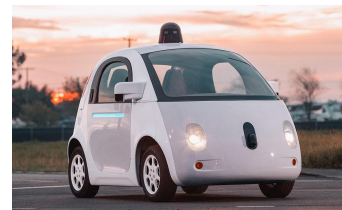
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Agricultural Machine



AGV



Unmanned Vehicle

# BS-FL12x-5-D1EC

## High Precision Fiber Optical Gyroscope

### Technical Parameter

Technical Parameter				
Parameter	Value			Remark
	BS-FL12A-5-D1EC	BS-FL12A-5-D1EC	BS-FL12A-5-D1EC	
<b>Performance</b>				
Measuring range ° /s	± 500			
Bias Stability °/hr (1σ,10s)	≤0.010	≤0.007	≤0.006	
Bias repeatability °/hr(1σ)	≤0.010	≤0.007	≤0.006	
Full temperature repeatability °/hr	≤0.05	≤0.05	≤0.03	
Scale factor nonlinearity ppm(1σ)	≤10	≤10	≤10	
Scale factor repeatability ppm(1σ)	≤10	≤10	≤10	
Full Temperature Scale factor repeatability ppm(1σ)	≤100	≤100	≤50	
Random Walk °/√hr	≤0.002	≤0.001	≤0.001	
Stabilization time s	< 10	< 10	< 10	
Bandwidth	200Hz	200Hz	200Hz	
<b>Environment Conditions</b>				
Working temperature	-40~+70 ° C			
Storage temperature	-50~+70 ° C			
Housing material	aluminum			
<b>Electrical performance</b>				
Input voltage	5 VDC			
Power consumption	3 W			
Interface	RS422			
Output frequency	1000Hz			最大5000Hz
<b>Physical characteristics</b>				
Size	120.0 x 120.0 x 38.0 mm			
Weight	<150g			
Connector	J30J-15ZK			

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## High Precision Fiber Optical Gyroscope

### Pin Definition

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The fiber optic gyroscope is led out of j30-15zk socket, and the wiring definition is shown in the table below

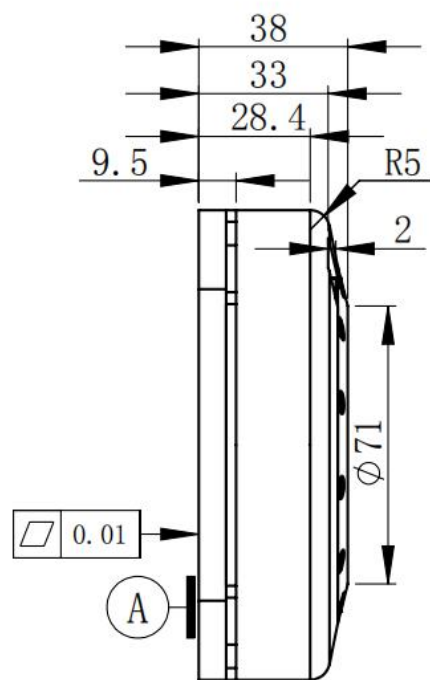
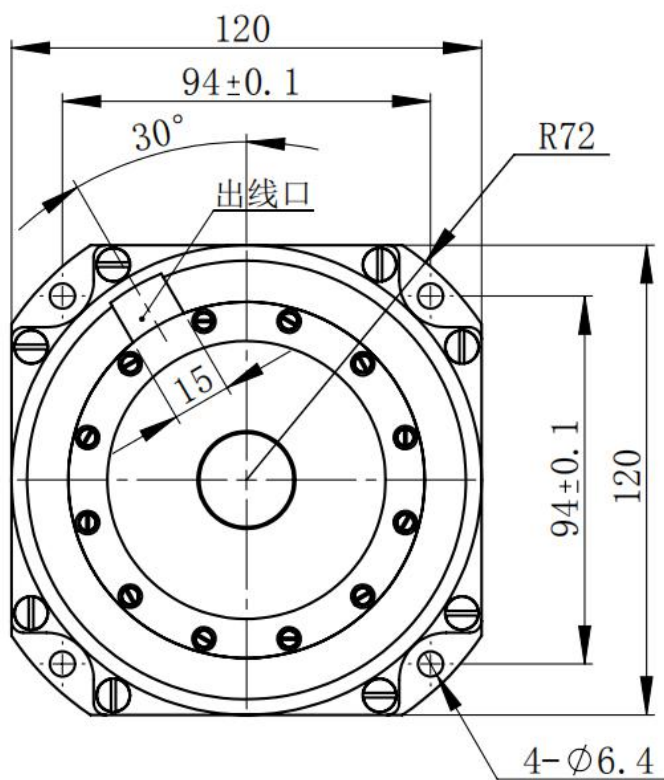
Pin Definition			
No	Name	Color	Definition
1	TX+	Yellow	RS422 T+
2	TX-	Orange	RS422 T-
3	RX+	Blue	RS422 R+
4	RX-	Green	RS422 R-
5	+5V	Red	Power+5V
6	GND	Black	Power Ground
7	GND	Black	Power Ground
8	-5V		电源-5V
9	DNC		None
10	DNC		None
11	DNC		NONE
12	DNC		None
13	+5V	Red	Power+5V
14	DNC		None
15	DNC		None

# BS-FL12x-5-D1EC

## High Precision Fiber Optical Gyroscope

### Size

Unit: mm



## BS-FL12x-5-D1EC

### High Precision Fiber Optical Gyroscope

#### Communication - UART

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- 1) Two way serial communication, conforming to RS-422 interface standard;
- 2) After the gyro detects the falling edge of the external trigger signal, it starts to send data outward;
- 3) Gyro valid data is 32 bits;
- 4) The effective data of temperature is 14 bits;
- 5) The baud rate of data transmission is 460.8kbps;
- 6) Data format:
  - Data transmission format: the data of each frame is 11 bits, including: the first bit is the start bit (0), the second to ninth bits are the data bits, the tenth bit is the even check bit, and the eleventh bit is the stop bit;
  - Verification method: even verification;
  - The gyro valid data is 32 bits (the highest bit is the symbol bit, 0 is "+" and 1 is "-"), and the temperature valid data is 14 bits (the highest bit is the symbol bit, 0 is "+" and 1 is "-");
  - Data packet format: each transmission includes 10 bytes, and the first byte is the frame header (80h); The second byte is the first byte of gyro data (low byte); The third byte is the second byte data of the gyro; The fourth byte is the third byte of gyro data; The 5th byte is the fourth byte of gyro data; The 6th byte is the fifth byte of gyro data (high byte); The 7th byte is the check bit, which is the XOR value of the first 5 bytes (gyro data) in the data packet; The 8th byte is the low byte of temperature data; The 9th byte is the high byte of temperature data; The 10th bit is the check bit, which is the XOR value of the first 8 bytes (gyro data) in the data packet;
  - Data storage method.

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## High Precision Fiber Optical Gyroscope

### Communication - UART

UART RS422 communication protocol parameters are configured as follows:

- Initial bit: 1
- Data bits: 8
- Stop bit: 1
- Check bit: None
- Baud rate: 460800
- Each packet of data consists of 10 bytes, which are described as follows:

Data Stream Definition								
Byte	High							Low
1	1	0	0	0	0	0	0	0
2	0	D6	D5	D4	D3	D2	D1	D0
3	0	D13	D12	D11	D10	D9	D8	D7
4	0	D20	D19	D18	D17	D16	D15	D14
5	0	D27	D26	D25	D24	D23	D22	D21
6	0	0	0	0	D31	D30	D29	D28
7	0	X	X	X	X	X	X	X
8		T6	T5	T4	T3	T2	T1	T0
9		T13	T12	T11	T10	T9	T8	T7
10		X	X	X	X	X	X	X