



**HS-MS-FG**

Wide band, Low Noise, Fluxgate Sensor

## **Selection Guide**

 **Xi'an Huashun Measuring Equipment Co., Ltd.**

# General Description

The Fluxgate Sensor is to measure the magnitude of magnetic field with non linear relationship between magnetic flux density of the core of high conductivity magnet stimulated by alternating magnetic field and the target magnetic field.

The product can measure stationary magnetic field, alternating magnetic field accurately and three axial magnetic fields maximally, which are perpendicular to each other with the features of high resolution, good linearity, wide frequency response, low noise and other features. It is very suitable for vector measurement of weak magnetic field and high resolution measurement of magnetic field such as geomagnetic measurement, geological survey, weapon detection, material nondestructive inspection, space magnetic measurement and so on. The product is water proof therefore it can be used under water and in the wild.



# 1. Models

## 1) Low cost

Number of axis	3
Measuring range	$\pm 70\mu\text{T} \sim \pm 250\mu\text{T}$
Output voltage	$\pm 10\text{V}$
Sensitivity	$7 \sim 25\mu\text{T/V}$
Bandwidth	DC $\sim$ 1KHz(0.5dB)
Linearity error	$\leq 0.02\%$ FS
Orthogonality error	$\leq \pm 0.5^\circ$
Time Domain noise	$< 1\text{nT RMS @ 10 times per second}$
Supply voltage	$\pm 13\text{V} \sim \pm 17\text{VDC}$ , with power indicator
Power consumption	$\leq 0.4\text{W}$
Ingress protection	IP68
Weight	165g
Size	30mm $\times$ 30mm $\times$ 110mm

## 2) Standard

Number of axis	3
Measuring range	$\pm 70\mu\text{T} \sim \pm 250\mu\text{T}$
Output voltage	$\pm 10\text{V}$
Sensitivity	$7 \sim 25\mu\text{T/V}$
Bandwidth	DC $\sim$ 1KHz(0.3dB)
Linearity error	$\leq 0.01\%$ FS
Orthogonality error	$\leq \pm 0.2^\circ$
Time Domain noise	$< 1\text{nT RMS @ 10 times per second}$
Supply voltage	$\pm 13\text{V} \sim \pm 17\text{VDC}$ , with power indicator
Power consumption	$\leq 0.4\text{W}$
Ingress protection	IP68
Weight	165g
Size	30mm $\times$ 30mm $\times$ 110mm

### 3) Low noise

Number of axis	3
Measuring range	$\pm 70\mu\text{T} \sim \pm 250\mu\text{T}$
Output voltage	$\pm 10\text{V}$
Sensitivity	$7 \sim 25\mu\text{T/V}$
Bandwidth	DC $\sim$ 1KHz(0.3dB)
Linearity error	$\leq 0.01\%$ FS
Orthogonality error	$\leq \pm 0.2^\circ$
Frequency domain noise	$\leq 6\text{pT}/\text{rms}\sqrt{\text{Hz}}@1\text{Hz}$
Time Domain noise	$< 0.1\text{nT RMS @ 10 times per second}$
Supply voltage	$\pm 13\text{V} \sim \pm 17\text{VDC}$ , with power indicator
Power consumption	$\leq 0.4\text{W}$
Weight	165g
Size	30mm $\times$ 30mm $\times$ 110mm

### 4) Wide band

Number of axis	3
Measuring range	$\pm 70\mu\text{T} \sim \pm 250\mu\text{T}$
Output voltage	$\pm 10\text{V}$
Sensitivity	$7 \sim 25\mu\text{T/V}$
Bandwidth	DC $\sim$ 13KHz(3dB)
Linearity error	$\leq 0.01\%$ FS
Orthogonality error	$\leq \pm 0.2^\circ$
Time Domain noise	$\leq 15\text{pT}/\text{rms}\sqrt{\text{Hz}}@10\text{Hz}$
Supply voltage	$\pm 13\text{V} \sim \pm 17\text{VDC}$ , with power indicator
Power consumption	$\leq 0.55\text{W}$
Ingress protection	IP68
Weight	165g
Size	30mm $\times$ 30mm $\times$ 110mm

## 5) Band-pass

Number of axis	3
Measuring range	$\pm 1\mu\text{T} \sim \pm 10\mu\text{T}$
Output voltage	$\pm 10\text{V}$
Sensitivity	$0.1 \sim 1\mu\text{T}/\text{V}$
Bandwidth	$100\text{Hz} \sim 2.5\text{KHz}(3\text{dB})$
Linearity error	$\leq 0.1\% \text{ FS}$
Orthogonality error	$\leq \pm 0.2^\circ$
Time Domain noise	$\leq 2\text{pT}/\text{rms}\sqrt{\text{Hz}}@500\text{Hz}$
Supply voltage	$\pm 13\text{V} \sim \pm 17\text{VDC}$ , with power indicator
Power consumption	$\leq 0.45\text{W}$
Ingress protection	IP68
Weight	165g
Size	$30\text{mm} \times 30\text{mm} \times 110\text{mm}$

## 6) Digital low power

Number of axis	3
Measuring range	$\pm 70\mu\text{T} \sim \pm 100\mu\text{T}$
Sensitivity	$7 \sim 10\mu\text{T}/\text{V}$
Bandwidth	$\text{DC} \sim 10\text{Hz}(-0.3\text{dB})$
Linearity error	$\leq 0.01\% \text{ FS}$
Time domain noise	$< 1\text{nT}$ Peak to peak
Output data rate	10 times per second, 5 times per second, 2 times per second, 1 time per second
Output baud rate	RS232/RS485 @ 9600
Supply voltage	$+3.3\text{V} \sim +3.6\text{VDC}$
Current consumption	$\leq 3.5\text{mA}$
Environmental protection	IP68
Weight	165g
Size	$30\text{mm} \times 30\text{mm} \times 110\text{mm}$

## 7) Customization

The following are 3 customized models we produced according to our customers' requirement for your reference.

### A. With cable version

Number of axis	3
Measuring range	$\pm 2.5\mu\text{T}$
Sensitivity	$1\mu\text{T}/\text{V}$
Bandwidth	300Hz~1.2KHz(0.1dB)
Linearity error	$\leq 0.1\% \text{ FS}$
Orthogonality error	$\leq \pm 0.2^\circ$
Frequency domain noise	$\leq 3\text{pT}/\text{rms}\sqrt{\text{Hz}}@500\text{Hz}$
Supply voltage	+6VDC
Power consumption	$\leq \pm 0.25\text{W}$
Weight	<250g
Size	$\varnothing 34\text{mm} \times 120\text{mm}$

### B. Mooring

Number of axis	2
Measuring range	$\pm 50\mu\text{T}$
Out put	$2.5\text{V} \pm 1\text{V}$
Sensitivity	$7 \sim 25\mu\text{T}/\text{V}$
Bandwidth	300Hz~800Hz(-3dB)
Linearity error	$\leq 0.09\% \text{ FS}$
Frequency domain noise	$\leq 10\text{pT}/\text{rms}\sqrt{\text{Hz}}@450\text{Hz}$
Supply voltage	6V~36VDC
Working depth	>100m
Size	28mm×28mm×32mm
Size of the hole	$\varnothing 11\text{mm}$

### C. Anti-overload    Overload capability    >20000G

Number of axis	3
Measuring range	±100μT
Out put	2.5V±1.25V
Bandwidth	DC~1KHz(0.5dB)
Linearity error	≤0.01% FS
Time Domain noise	<1nT RMS @ 10 times per second
Supply voltage	7.2V±1VDC
Power consumption	≤0.3W
Size	Ø45mm×25mm

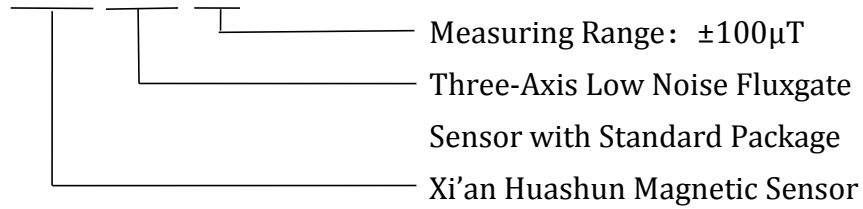
## 2. Selection Guide

HS-MS	FG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Huashun Magnetic Sensor	Fluxgate Sensor				Measuring Range	Economical: 70~250 (μT) Standard: 70~250 (μT) Low Noise:70~250 (μT) Wide Band: 70~250 (μT) Band Pass: 1~10 (μT) Digital Low Consumption: 70~100 (μT) Customization: 1~10 (μT) /70~250 (μT)
						T
				C、S、LN、 W、B、M、 D	C: Low Cost;S: Standard; LN: Low Noise; W: Wide Band; B: Band Pass; M: Digital Low Power Consumption; D: Customized	
		1、2、3	1: Single Axis; 2: Double-Axis; 3: Three-Axis			

Note: The item *T* is optional. If it is not selected, it can be considered as standard package.

Example 1

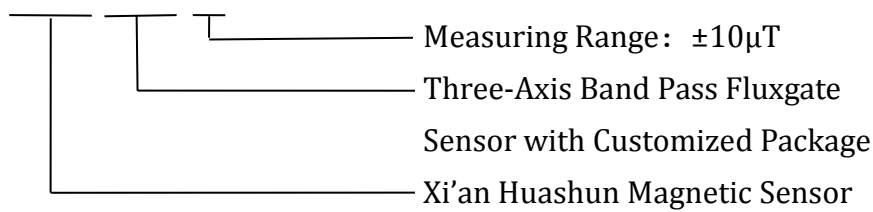
HS-MS-FG3LN-100



Three-Axis Low Noise Fluxgate Sensor with Measuring range of  $\pm 100\mu\text{T}$  and Standard Package

Example 2:

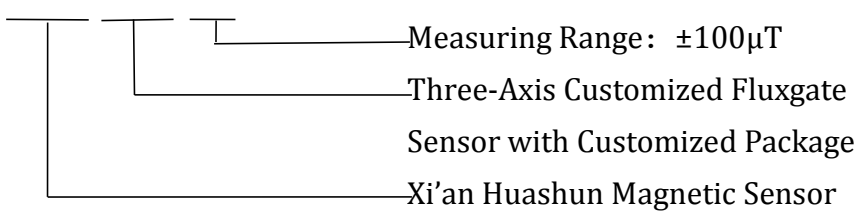
HS-MS-FG3BT-10



Three-Axis Band Pass Fluxgate Sensor with Measuring range of  $\pm 10\mu\text{T}$  and Custom Package

Example 3:

HS-MS-FG3DT-100



Three-Axis Customized Fluxgate Sensor with Measuring range of  $\pm 10\mu\text{T}$  and Customized Package



# 3. Connection

## 3.1 Connection method

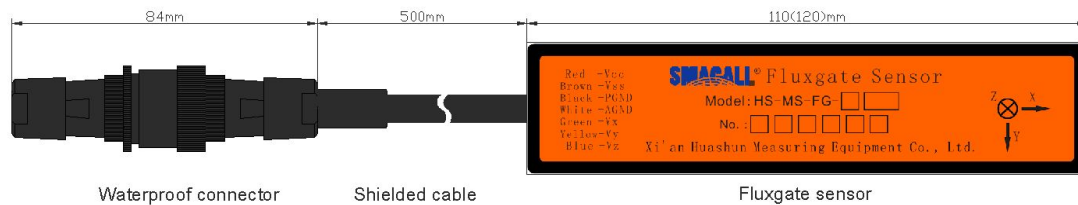


Fig. 1

## 3.2 Cable

Cable Color	Symbol	Function
Red	Vcc	Power+
Brown	Vss	Power-
Black	PGND	Power ground
White	AGND	Signal ground
Green	Vx	X axis output
Yellow	Vy	Y axis output
Blue	Vz	Z axis output

## 3.3 Joint Structure

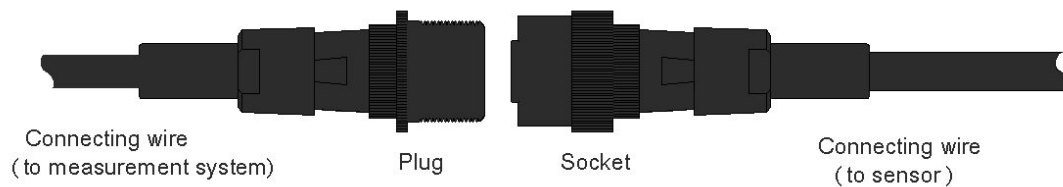


Fig. 2

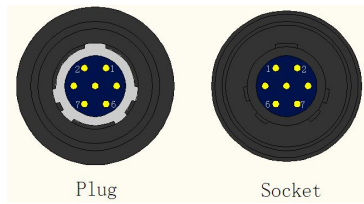


Fig.3

### 3.4 Joint

Terminal No.	Function	Cable Color
	1: PGND	Black
	2: +13V	Red
	3: -13V	Brown
	4: Vy	Yellow
	5: Vz	Blue
	6: Vx	Green
	7: AGND	White

## 4. Our Main Customers



## Contacts

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