



HTS6 High-Precision Voltage Output Tilt Sensor

Product manual

V2.0-20250917

Technical Highlights

- ❖ Measuring range $\pm 1 \sim \pm 90^\circ$ selectable;
- ❖ Accuracy: 0.005° ;
- ❖ Resolution: 0.001° ;
- ❖ Output mode: 0~5V;
- ❖ Wide voltage input: 11.5~36V;
- ❖ Wide operating temperature: $-40 \sim +85^\circ\text{C}$.



Product Introduction

The HTS6 series analog voltage output tilt sensor, a representative product in the domestic high-precision tilt measurement field, supports single-axis/dual-axis measurement modes, achieving an industrial-grade accuracy of 0.005° in small-range applications. Based on the principle of gravity field vector decomposition, this product senses changes in the static gravity field through a miniature solid-state pendulum structure, converting the tilt change into a standard voltage signal (0-5V) output via a high-precision sensing element.

The core component employs a 24-bit differential-to-analog converter, coupled with an embedded MCU system for real-time signal processing, featuring automatic temperature compensation and nonlinear correction. This design significantly reduces the impact of ambient temperature fluctuations on measurement accuracy, allowing users to directly obtain industrially calibrated linearized output without secondary calibration.

The product innovatively adopts a non-contact measurement solution, eliminating the need for reference surface alignment during installation. Based on advanced MEMS manufacturing processes, it boasts a compact structure for easy installation and strong resistance to electromagnetic interference; suitable for industrial-grade attitude monitoring and control.

Application scope

Typical applications of this product series include: engineering machinery platform leveling systems, photovoltaic tracking bracket control systems, aerospace attitude reference systems, and precision instrument leveling devices.



Performance Parameters

HTS6		Condition	Parameter			
Measurement range		-	±10°	±30°	±60°	±90°
Measurement axis		-	X / XY axis			
Zero output		-	2.5V			
Resolution ¹⁾		-	0.001°			
Accuracy	Maximum Absolute Error (MAE) ²⁾	Room Temp	0.005°	0.01°	0.02°	0.03°
	Root Mean Square Error (RMSE) ³⁾	Room Temp	0.003°	0.003°	0.005°	0.008°
Zero-point tempcoefficient ⁴⁾		-40~85℃	0.0005°/℃			
Sensitivity temp coefficient ⁵⁾		-40~85℃	≤100ppm/℃			
Power-on start-up time		0.5S				
Response frequency		20Hz				
Electromagnetic compatibility		According to EN61000 and GBT17626				
Insulation resistance		≥100MΩ				
Shock resistance		100g@11ms, 3 Axial Direction (Half Sinusoid)				
Vibration resistance		10grms, 10~1000Hz				
Protection class		IP67				
Cables		Standard 2m cable, wire diameter 6.8mm, wire weight < 155g				
Weight		≤270g (excluding cable)				
1) Resolution : The smallest identifiable angular change within the effective measurement range, reflecting its ability to monitor minute tilt fluctuations.						
2) MAXE : refers to the biggest error of the product within the range and at multiple angle points.						
3) RMSE : refers to the root mean square difference between the measured value and the actual angle of the product within the range and for multiple times (more than 16 times).						
4) Zero Temp Drift Coefficient : the change rate of the indication value relative to normal temperature within the rated operating temperature range of the sensor at the zero degree.						
5) Sensitivity Temp Drift Coefficient : The percentage change rate with temperature of the full-scale indication relative to the full-scale indication at room temperature of the sensor in its rated operating temperature range.						

Electrical parameters

Parameter	Condition	Min	Typical Value		Max	Unit
Supply voltage	Standard	11.5	12	24	36	V
Operating current	No load		40			mA
Output load	Resistive	10				kΩ
	Capacitive				20	nF
Operating temp		-40			+85	℃
Storage temp		-40			+85	℃

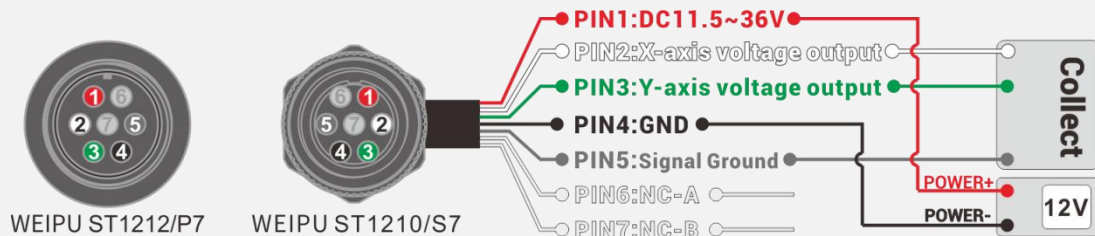
Ordering and Selecting

Model	Measuring Axis	Range	Voltage Output	Installation Direction
HTS6	X: X-axis	10: $\pm 10^\circ$	V1: 0~5V	H: Horizontal installation
	Y: Y-axis	15: $\pm 15^\circ$	V2: 0.5~4.5V	HD: Horizontal downwards
	D: Dual-axis	30: $\pm 30^\circ$	V3: 0~10V	V: Vertical installation
		45: $\pm 45^\circ$		VL: Vertical leftwards
		60: $\pm 60^\circ$		VR: Vertical rightwards
		90: $\pm 90^\circ$		

E.g: HTS6X10-V1-H: X-axis / Range $\pm 10^\circ$ / 0~5V output / Horizontal installation.

Interface Definition

Pin/line color	Definition	Description
PIN1 / Red	DC9~36V	Power supply positive terminal
PIN2 / White	X_OUT	X-axis voltage output
PIN3 / Green	Y_OUT	Y-axis voltage output
PIN4 / Black	GND	Power supply negative terminal
PIN5 / Gray	signal ground	Signal ground
PIN6 / ----	NC	No connection
PIN7 / ----	NC	No connection



* Signal ground: The ground of the circuit that acquires and measures the voltage signal output by the sensor.

Indicator light operation instructions

When the product is powered on and connected to transmit data, the red indicator light remains constantly lit.

Angle output calculation formula

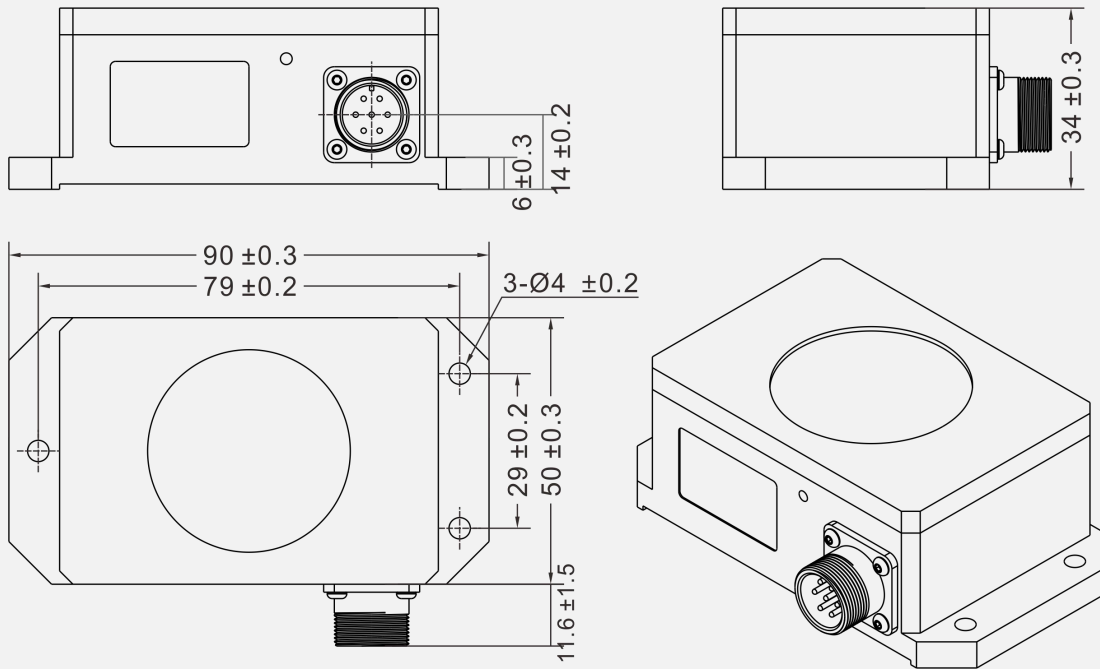
$$\text{Angle} = (\text{Output Voltage} - \text{Zero-Point Voltage}) \div \text{Angle Sensitivity}$$

$$\text{Angle sensitivity} = \text{Output voltage range} \div \text{Angle measurement range}$$

Example: HTS6X-10-V1-H($\pm 10^\circ$ measurement range, 0~5V output voltage range)

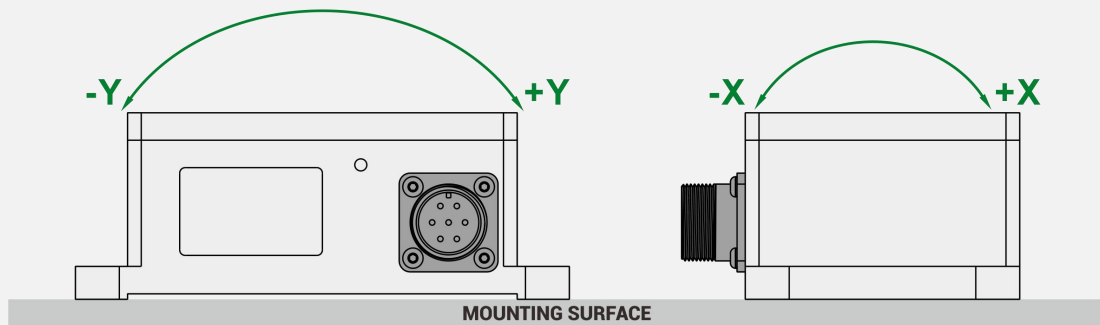
$$\text{Angular sensitivity} = 5V \div (+10^\circ - (-10^\circ)) = 5 \div 20 = 0.25 V/^\circ$$

✓ Product Dimensions

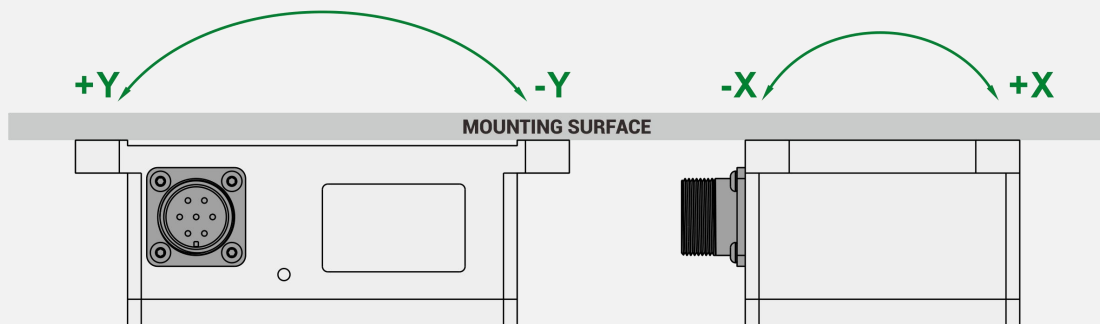


Case dimensions: L90×W61.6×H34mm
Recommended screws: 3 M4 screws

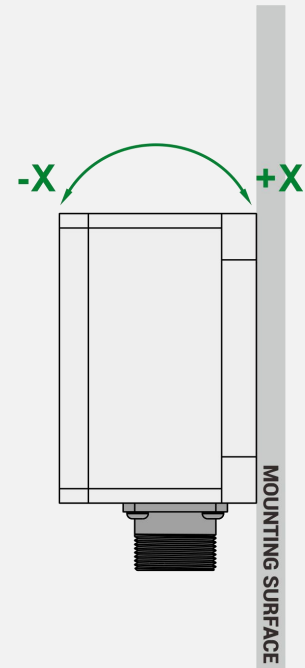
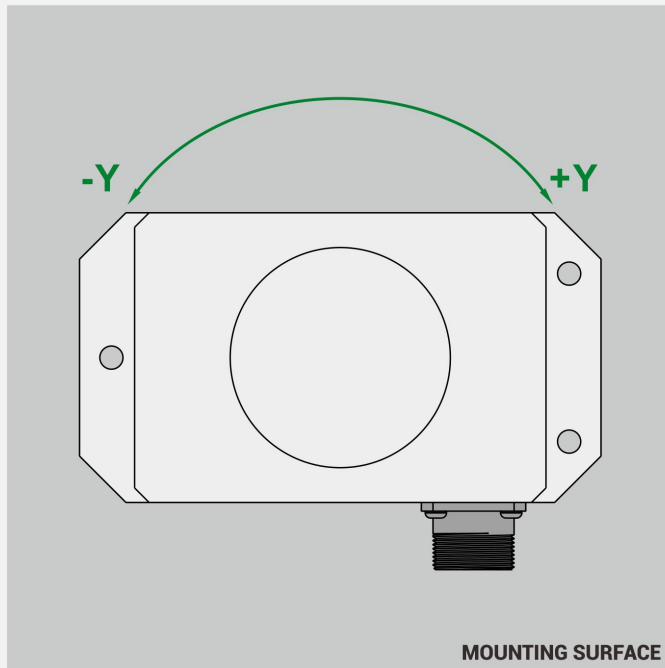
✓ Measurement Direction



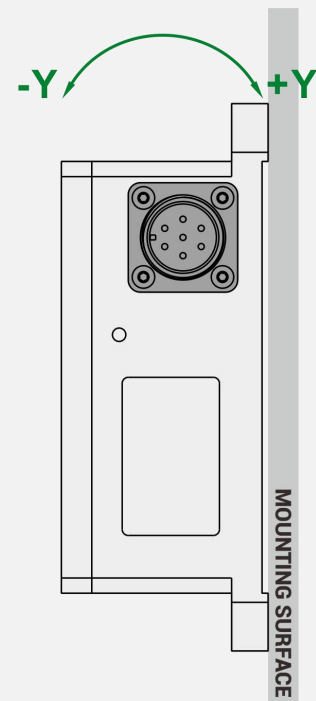
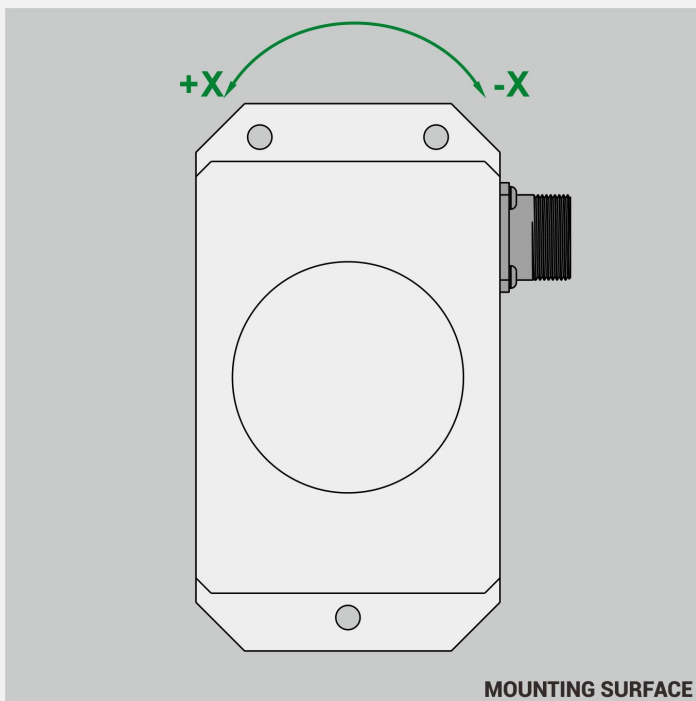
Horizontal installation



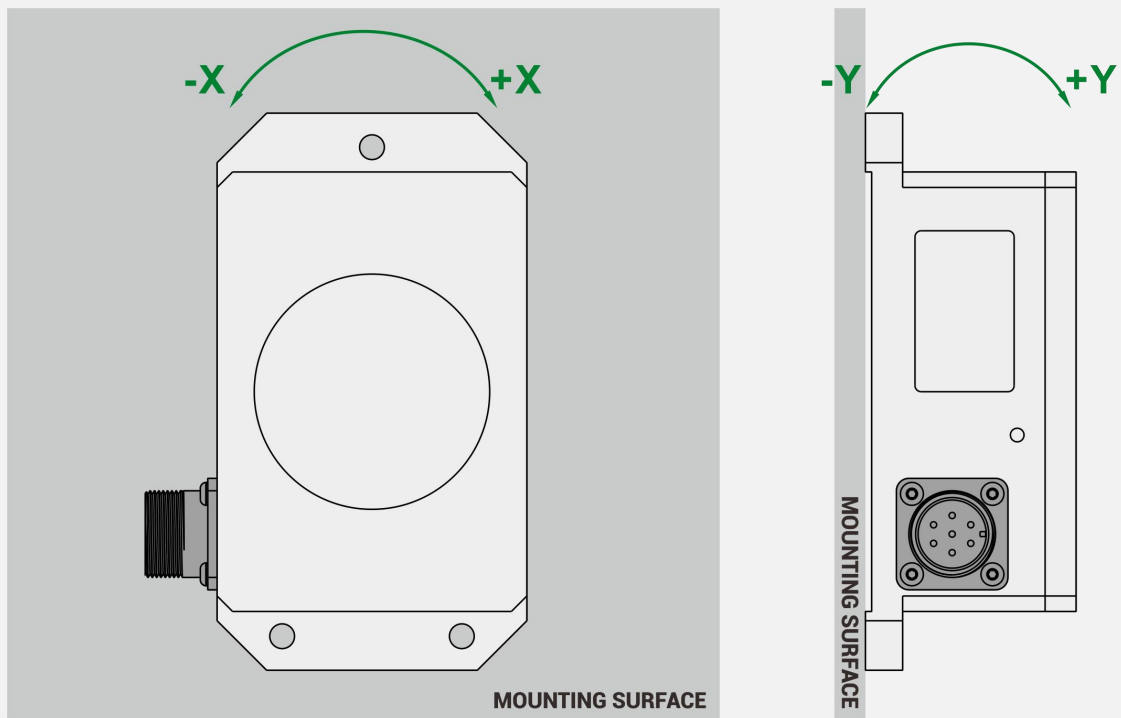
Horizontal-down installation



Vertical installation



Vertical-left installation



Vertical-right installation