SERIE TST12 - dual-axis inclinometer

The TST series inclinometer which developed by DPF is a small volume MEMS dual-axis tilt sensor, because of built-in the latest MEMS production technology inclination unit, small size, long distance transmission can up to over 2000 Meters, strong ability of resisting external electromagnet interference, can be adapted to long-term working in the industry harsh environment.

This product adopts the non-contact measuring principle, can real-time output the current attitude angle, simple to use, no need to find the relative variation of the two surface for mounting. It is a ideal choice for Industrial automation control and platform measuring attitude !

	TST-12/10/x	TST-12/30/x	TST-12/60/x	TST-12/90/x	UNIT
Measuring rang	±10	±30	±60	±90	°
Measuring axis	2	2	2	2	
Resolution	0,05	0,05	0,05	0,05	°
Absolute accuracy	0,1	0,1	0,15	0,2	°
Zero temp. coefficient -40～85°	±0.008	±0.008	±0.008	±0.008	°/C
Sensitivity Temp. coeff -40～85°	=150	=150	=150	=150	ppm/?
Response time	0.05	0.05	0.05	0.05	Seg.
Output	Output mode RS232/RS485/TTL 0....5 Vcc / 4...20 mA				
Power supply	9....36 Vdc				
Working temperature	-40...+85				°/C
Store temperature	-50...+85				°/C
Electromagnetic compatibility	According to EN61000 and GBT17626				
MTBF	=45000 hours/times				
Insulation Resistance	=100M				
Shockproof	100g@11ms、3Times/Axis(half sinusold))				
Anti-vibration	10grms、10～1000Hz				
Protection class	IP67				
Cables	Standard 1M length、wearproof、grease proofing、widetemperature、Shielded cables4*0.4mm2				
Weight	90g(without cable)				

Working Principle

Adopt the European import of core control unit, using the capacitive micro pendulum principle and the earth gravity principle, when the the inclination unit is tilted, the Earth's gravity on the corresponding pendulum will produce a component of gravity, corresponding to the electric capacity will change, , by enlarge the amount of electric capacity , filtering and after conversion then get the inclination.
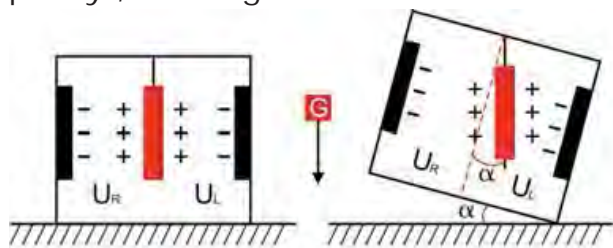
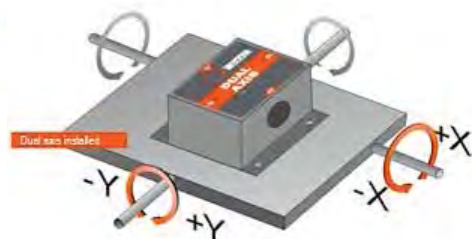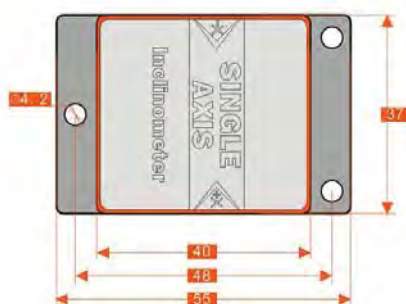U_R, U_L Respectively is the pendulum left plate and the right plate corresponding to their respective voltage between the electrodes, when the tilt sensor is tilted, U_R, U_L Will change according to certain rules, so $f(U_R, U_L,)$ On the inclination of α function:

$$\alpha = (U_R, U_L,)$$

mechanical characteristics

Enclosure material：Aluminum Oxide
Installation：4*M3 screws

Angle output calculation formula
Angle=(Output current - Zero position current)÷Angle sensitivity
Angle sensitivity=output current range÷ Angle measuring range
E.g：TST-12/30/A (±30° Measruing range 16mA output current range)
Angle sensitivity= 16÷60=0.266666 mA/°

Ordering information:

| GND | X | Y | DC9-36 |

TST-12	-XX	X
	10 (10°)	A (4...20 MA)
	30 (30°)	B (0...5 VDC)
	60 (60°)	C (RS232)
	90 (90°)	

be measured surface   be measured surface

E.g：TST12-30-A, Dual-axis/Standard/±30°Measuring range/4-20mA output current