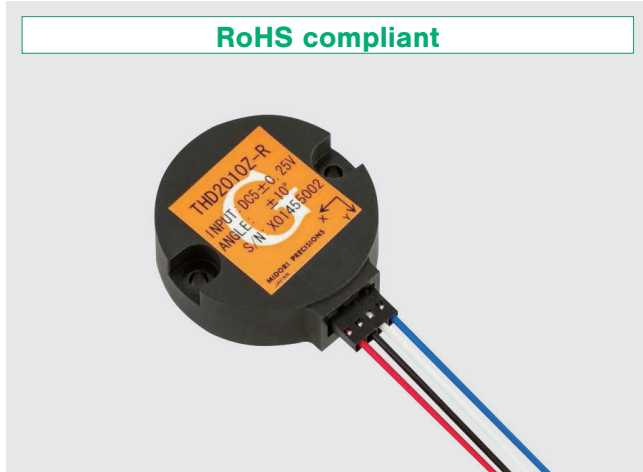


COMPACT, VIBRATION-RESISTANT DIGITAL OUTPUT CONTACTLESS MEMS TILT ANGLE SENSOR

THD2000Z series



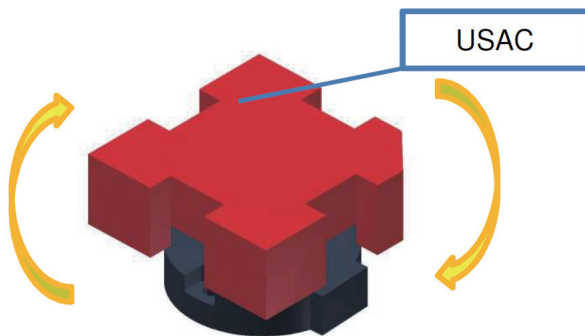
FEATURES

THD2000Z Series high-performance inclinometers utilize MEMS accelerometers to precisely measure inclination across both X and Y axes. This series features a compact, highly vibration-resistant design.

- Dual-Axis Measurement: Up to $\pm 60^\circ$
- High Accuracy: Absolute linearity $< \pm 1\%$ F.S., stable temperature characteristics
- High Vibration Resistance: The sensing element eliminates mechanical resonance, ensuring excellent immunity to external vibrations.
- User-Friendly Functions: Index point reset, Digital damper

NEW USER-FRIENDLY FUNCTIONS

① Easy Resetting Function for Index Point(0°)



※ Touch USAC 5 times each 90° CW rotation to THD2000Z

Using RS-485 serial communication commands, this inclinometer allows easy on-site adjustment of the 0° output position within $\pm 5^\circ$. The "Index Key" (USAC) feature also enables the current position to be reset as the 0° tilt reference without any wiring or electrical connections.

*Note:

- USAC is optional item.
 - Resetting index point by USAC type is option.
- Please choose "THD20xxx-xxK"

③ Serial communication Function

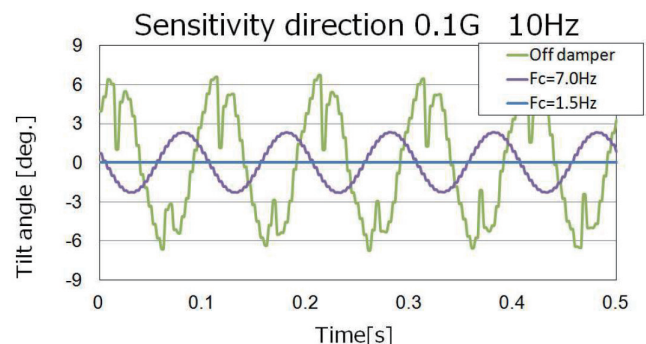
Certain models in this series are equipped with an RS-485 interface. The following functions are available via RS-485 serial communication commands.

1. Read electrical angle position
2. Read serial number
3. Teach-in zero point setting (Optional)
4. Baud rate configuration (Optional)
5. Serial data output cycle configuration (Optional)

*Note:

1. Serial communication is for output only.
2. Items 3 to 5 are optional features. Please specify your requirements when ordering.

② Digital damper

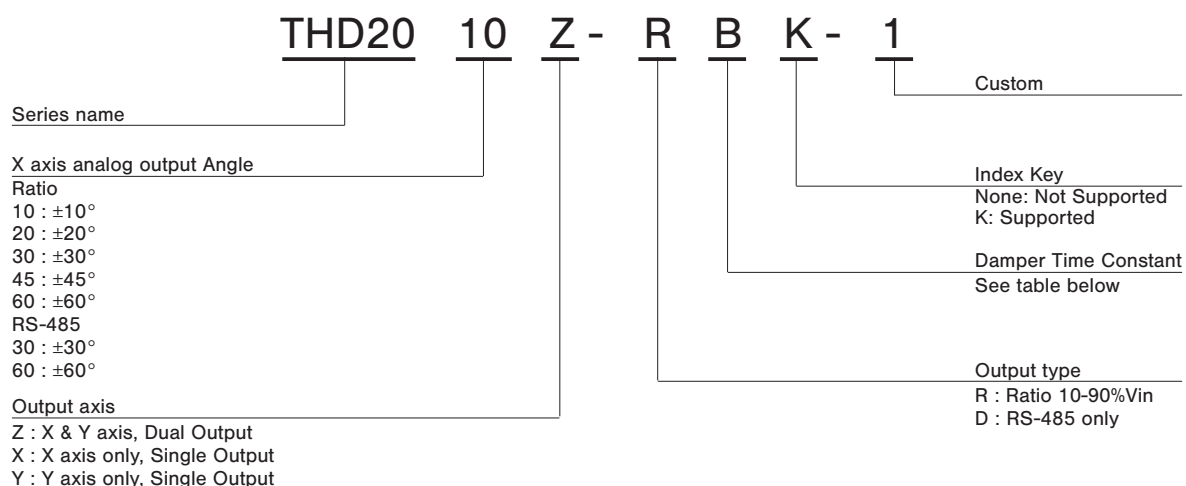


The THD2000Z Series features a digital damper optimized for tilt measurement, offering a choice of 16 frequency response settings. Selecting the optimal digital damper setting for your operating environment ensures that the output values more closely reflect the actual tilt angle.

THD2000Z

INCLINOMETERS

■ PART NUMBER DESIGNATION



* The table below shows the cut-off frequency and time constant corresponding to each damper setting.
Users can select the optimum damper time constant according to the operating speed and vibration level.

Part No.	Level	Cut-off frequency	Time constant
0	0	11.2 Hz	150 ms
1	1	9.27 Hz	170 ms
2	2	7.65 Hz	180 ms
3	3	6.32 Hz	190 ms
4	4	5.21 Hz	200 ms
5	5	4.30 Hz	240 ms
6	6	3.55 Hz	250 ms
7	7	2.93 Hz	290 ms
8	8	2.42 Hz	330 ms
9	9	2.00 Hz	360 ms
A	10	1.65 Hz	420 ms
B	11	1.36 Hz	500 ms (Standard)
C	12	1.21 Hz	590 ms
D	13	0.92 Hz	700 ms
E	14	0.76 Hz	840 ms
F	15	0.62 Hz	990 ms

■ HANDLING INSTRUCTION

- This product is not designed to measure resistance.
- Take appropriate electrostatic discharge (ESD) protection measures when handling this product.
- Depending on the installation environment, electrostatic charges generated during operation may cause unexpected malfunctions.
- Under vibration conditions, it may be difficult to measure the inclination angle accurately.
- Depending on the operating temperature, the zero-point output may experience a gradual drift over time.

THD2000Z

INCLINOMETERS

STANDARD SPECIFICATIONS

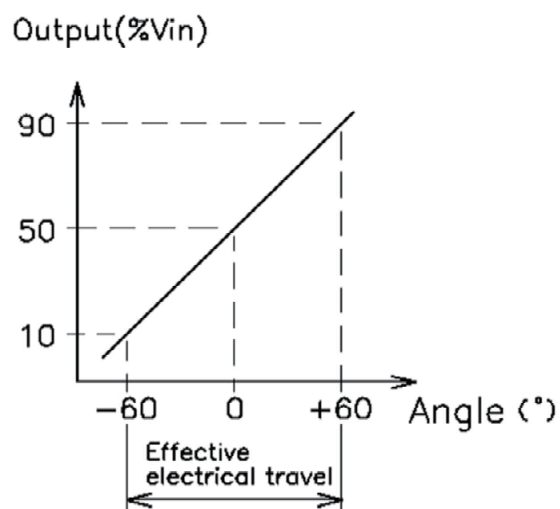
Item		Ratiometric Voltage	RS-485 (Serial)
Effective Tilt Angle		$\pm 10^\circ, \pm 20^\circ, \pm 30^\circ, \pm 45^\circ, \pm 60^\circ$ Independent selection of X and Y axes (Optional)	$\pm 30^\circ, \pm 60^\circ$
Absolute Linearity		$\pm 1\%FS$	
Input Voltage		5 $\pm$ 0.25 VDC	
Current Consumption		30 mA max.	
Output Resolution		12 bit equivalent	0.006° (Excluding noise)
Response Time		Step Response (Time Constant): 500 ms (Std.) Selectable in 16 steps from 150 ms to 990 ms (Optional)	
Temp. Characteristics -30 ~ 85°C (25°C std.)	0° position	$\pm 0.2^\circ$	$\pm 0.2^\circ$
	Tilt position	$\pm 10^\circ: \pm 0.7^\circ$ $\pm 20^\circ: \pm 1.2^\circ$ $\pm 30^\circ: \pm 2.1^\circ$ $\pm 45^\circ: \pm 3.6^\circ$ $\pm 60^\circ: \pm 6.0^\circ$	$\pm 30^\circ: 1.6^\circ$ $\pm 60^\circ: 4.4^\circ$
EMS		IEC 61000-4-3 : Level 3 (10 V/m)	
ESD		IEC 61000-4-2 : ± 16 kV	
Operating Temp. Range		-30 ~ 85°C	
Vibration		70 m/s ² , 5 ~ 500 Hz (10 min.) 2 hours	
Shock		1000 m/s ² , Half sine wave 6 ms	
IP Rating		IP50	
Index Point Teach-in		0° Position Reconfiguration: Within $\pm 5^\circ$ of horizontal (Optional)	

TEMPERATURE CHARACTERISTICS

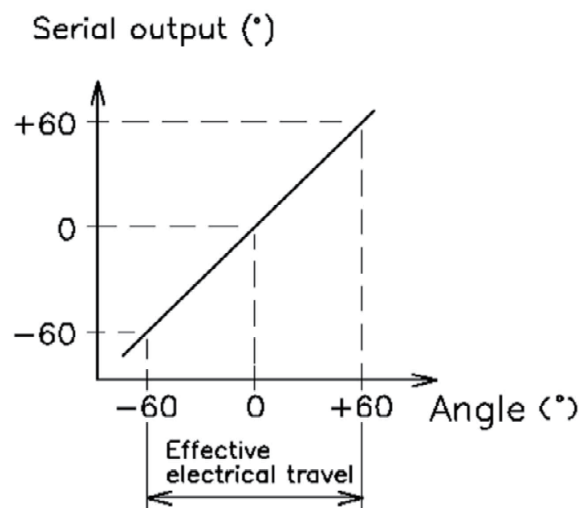
While MEMS sensors often exhibit significant unit-to-unit temperature variation, our proprietary temperature compensation system individually calibrates each sensor to ensure stable performance across a wide temperature range.

■ OUTPUT CHARACTERISTICS

● Ratiometric Voltage

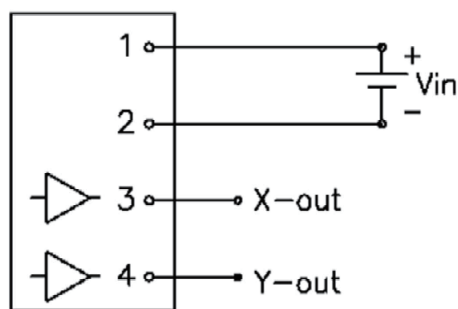


● RS-485 Serial Interface



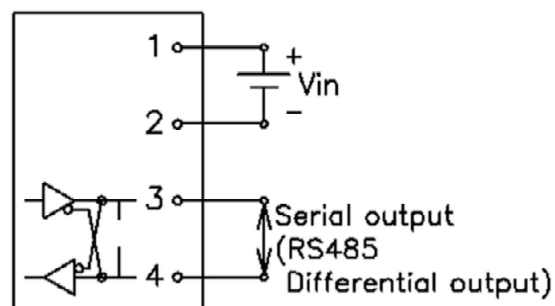
■ SCHEMATIC

● Ratiometric Voltage



Terminal No.: 1, 2, 3, 4

● Serial RS-485



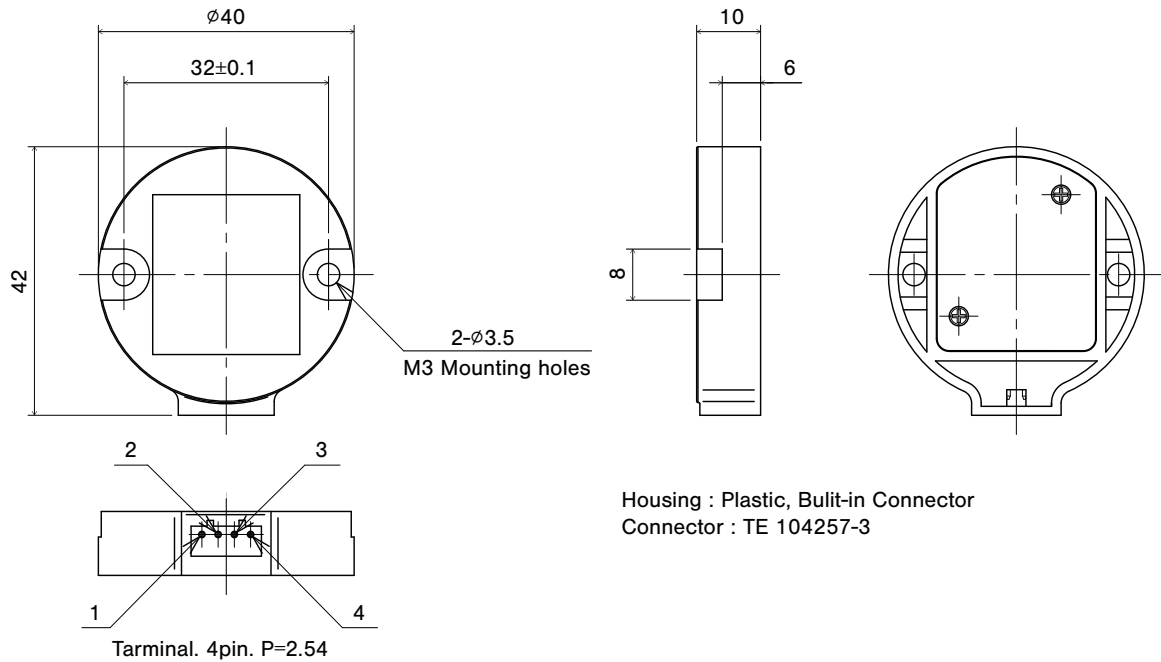
Terminal No.: 1, 2, 3, 4

THD2000Z

INCLINOMETERS

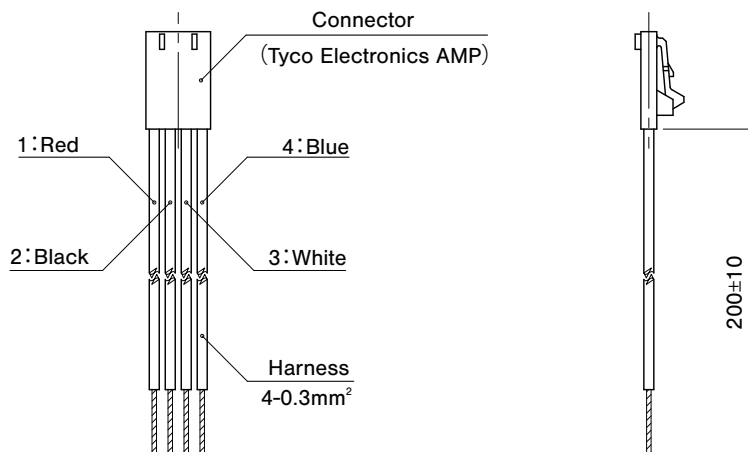
OUTLINE DIMENSIONS

(Unit:mm)



ACCESSORY

(Unit:mm)



TILT ANGLE DIRECTION

