

SensorsX SX-MTMDB Series

Dual-Axis MEMS Inclinometer
Industrial Motion & Position Measurement



0.001° Resolution	±15° to ±60° Selectable Range	0.10% / 0.25% / 0.5% FS Total Accuracy
IP67 / IP68 Ingress Protection	-40 to +100 °C Operating Temperature	Analog / Fieldbus Output Options

Industrial Motion Measurement | Inclination | Tilt | Leveling

■ PRODUCT OVERVIEW

The SensorsX SX-MTMDB Series is a dual-axis MEMS inclinometer designed for continuous tilt measurement in industrial applications. It supports independent X-axis and Y-axis angle measurement with selectable ranges up to $\pm 60^\circ$, 0.001° resolution, and analog or digital output options including 4–20 mA, voltage output, CANopen, Modbus, Profibus, and RS-485. With a 12–32 V DC supply range, aluminum-alloy housing, IP67 protection with Binder 712 connector, and IP68 protection with direct cable outlet, the series is suitable for aerospace, high-speed rail, engineering machinery, marine equipment, and related industrial tilt-measurement applications.



■ KEY FEATURES

◆ Selectable angular ranges: $\pm 15^\circ$, $\pm 30^\circ$, $\pm 40^\circ$, $\pm 50^\circ$ and $\pm 60^\circ$	◆ Total accuracy options: 0.25% FS or 0.5% FS
◆ Output choices: 4-20 mA, 0.5-4.5 V, 0-5 V, CANopen, Modbus, Profibus or RS-485	◆ Wide 12-32 V DC supply range and 50 V DC overvoltage protection
◆ 0.001° resolution with $\pm 0.005^\circ/\text{°C}$ temperature drift	◆ 50 g shock resistance and 5 g vibration resistance
◆ IP67 with connector; IP68 with direct cable outlet	

■ TYPICAL APPLICATIONS

- Aerospace
- High-speed rail
- Engineering machinery
- Marine equipment
- Related industrial tilt-measurement

■ MEASUREMENT PERFORMANCE

Measurement principle	Dual-axis inclinometer measurement
Angular range	$\pm 15^\circ$, $\pm 30^\circ$, $\pm 40^\circ$, $\pm 50^\circ$ or $\pm 60^\circ$
Resolution	0.001°
Total accuracy	0.25% FS or 0.5% FS
Temperature drift	$\pm 0.005^\circ/\text{C}$
Long-term stability	$\leq \pm 0.1\%$ FS/year (typical)

■ ELECTRICAL

Supply voltage	12-32 V DC, 3-conductor
Output signal	4-20 mA (3-wire); 0.5-4.5 V (3-wire); 0-5 V (3-wire); CANopen (4-wire); Modbus (4-wire); Profibus (4-wire); RS-485 (4-wire)
Current consumption	≤ 40 mA
Overvoltage protection	50 V DC
Insulation resistance	≥ 100 M Ω at 100 V DC
Protection	Power-supply reverse-polarity protection; 50 V DC overvoltage protection

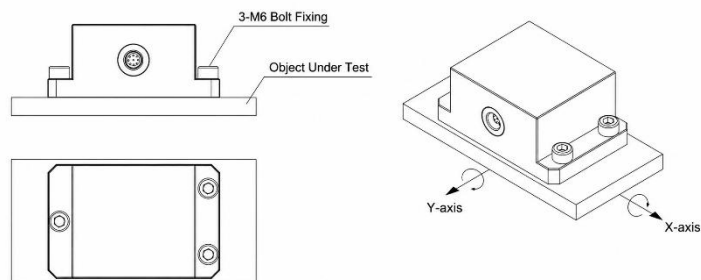
■ ENVIRONMENTAL & MECHANICAL

Operating temperature	-40 to +100 °C
Storage temperature	-40 to +120 °C
Shock resistance	IEC 60068-2-27, 50 g, 11 ms
Vibration resistance	IEC 60068-2-6, 49.1 m/s ² (5 g)
EMC / Surge Immunity	IEC 61000-6-2 / IEC 61000-6-3 / IEC 61000-6-4; surge immunity tested
Housing material	Aluminum alloy
Ingress protection	IP67: Binder 712 ; IP68: direct cable outlet

■ CERTIFICATIONS & APPROVALS

Compliance	RoHS / CE
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■ INSTALLATION ORIENTATION

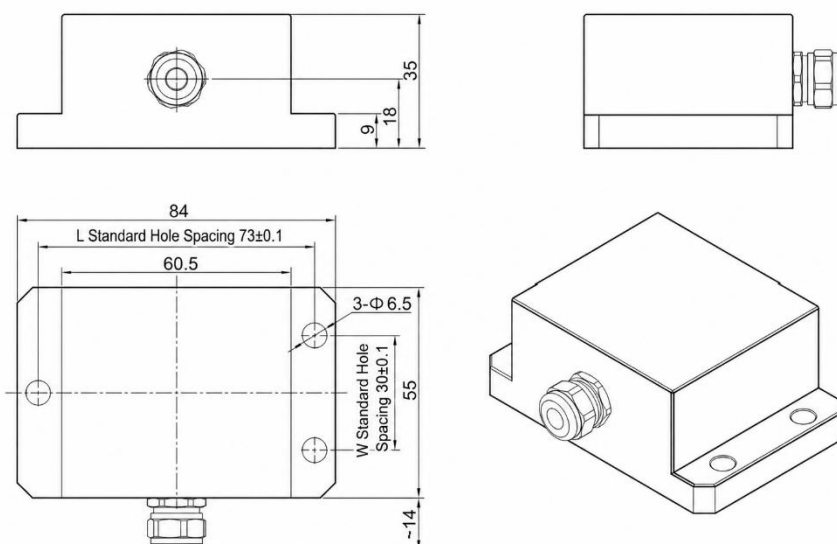


Install the sensing axis in the specified orientation. Install the sensor using three M6 fasteners. Confirm the X/Y axis direction according to the installation diagram. The SensorsX ordering configuration must be confirmed for the required orientation.

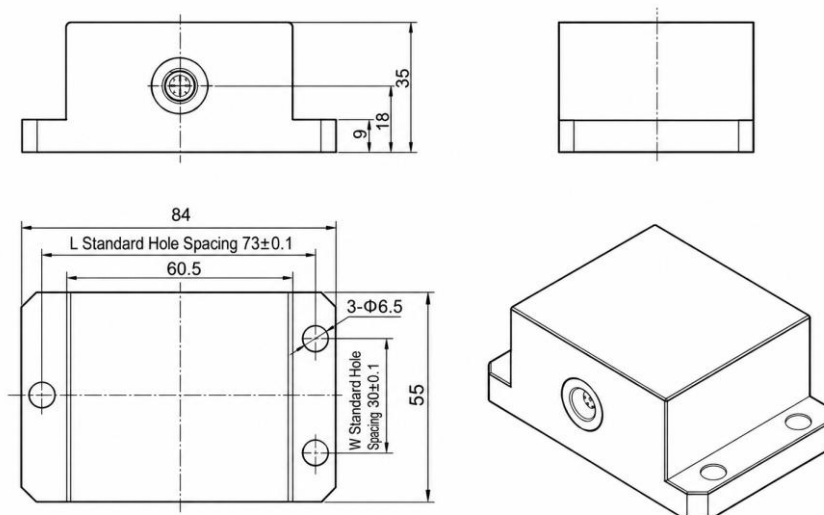
- ◆ Secure the unit using three M6 fasteners through the mounting holes.
- ◆ Avoid mounting stress and ensure the reference surface is flat and rigid.
- ◆ The direction of rotation and zero reference must be verified during system commissioning.

MECHANICAL DIMENSIONS

Direct Cable Outlet



Binder Connector



Note: Mounting hole spacing L and W can be customized.

■ WIRING DIAGRAM

Direct Cable Outlet

Wire color	Analog variants (4 / 1 / 2)	Digital variants (K / M / P / Q)
Brown	+24 V DC	+24 V DC
Gray	X Signal+	X Signal+
Pink	X & Y Signal-	X & Y Signal-
White	0 V	0 V
Blue	Y Signal+	Y Signal+
Green	RS-485 / Signal-	RS-485 / Signal-
Yellow	RS-485 / Signal+	RS-485 / Signal+
Red	n.c.	n.c.
Shield braid	Shield	Shield

Connector Pin Assignment

Connector	Pin	Analog variants	Digital variants
Binder 712	1	+24 V DC	+24 V DC
Binder 712	2	X Signal+	X Signal+
Binder 712	3	X & Y Signal-	X & Y Signal-
Binder 712	4	0 V	0 V
Binder 712	5	Y Signal+	Y Signal+
Binder 712	6	RS-485 / Signal-	RS-485 / Signal-
Binder 712	7	RS-485 / Signal+	RS-485 / Signal+

※ Viewed from the mating side with the keyway facing down, PIN1 is the leftmost pin. The pins are numbered clockwise from PIN1 to PIN7.

■ ORDERING INFORMATION

Complete model number example: **SX-MTMDB-40±30°30°25D**

Output	
4	4-20 mA
1	0.5-4.5 V
2	0-5 V
K	CANopen
M	Modbus
P	Profibus
Q	RS-485
Electrical Connection	
0	Direct cable outlet
9	Binder connector
X-Axis Measurement Range	
±15°	±15° full scale
±30°	±30° full scale
±40°	±40° full scale
±50°	±50° full scale
±60°	±60° full scale
Y-Axis Measurement Range	
±15°	±15° full scale
±30°	±30° full scale
±40°	±40° full scale
±50°	±50° full scale
±60°	±60° full scale
Total Accuracy	
10	0.10% FS
25	0.25% FS
50	0.5% FS
Optional / Customized	
D	Customized requirements; specify in order remarks

※ Example interpretation: 4-20 mA output, direct cable outlet, ±30° X-Axis measurement range, ±30° Y-Axis measurement range, 0.25% FS total accuracy, customized requirements specified in the order remarks.

※ Specify mounting orientation (top-surface or side-surface); for direct cable versions, specify cable length (source example uses 2 m); confirm interface protocol and pin assignment for digital-output variants; confirm customized mounting-hole distances L and W when required.