Precision Level

T-Type Cross Level

Instruction Manual

To ensure correct use, please read this instruction manual carefully before use. After reading, keep it in a safe place where the user can always refer to it.

OBISHI KEIKI SEISAKUSHO Co., Ltd.

Safety Precautions

※Before use, please read this instruction manual carefully and use the product correctly.

※The precautions shown here are intended to ensure the safe and proper use of the product and to prevent any potential hazards to the user.

※The precautions are categorized into three levels — **Danger, Warning, and Caution** — to clearly indicate the severity and urgency of potential harm or damage that may occur if the product is mishandled.

<table>
<tr><th colspan="3">For Safe and Proper Use</th></tr>
<tr><td colspan="3">This instruction manual includes various symbols and pictograms throughout the text to ensure correct use of the product and to prevent harm or damage to the user.

The symbols and their meanings are as follows.

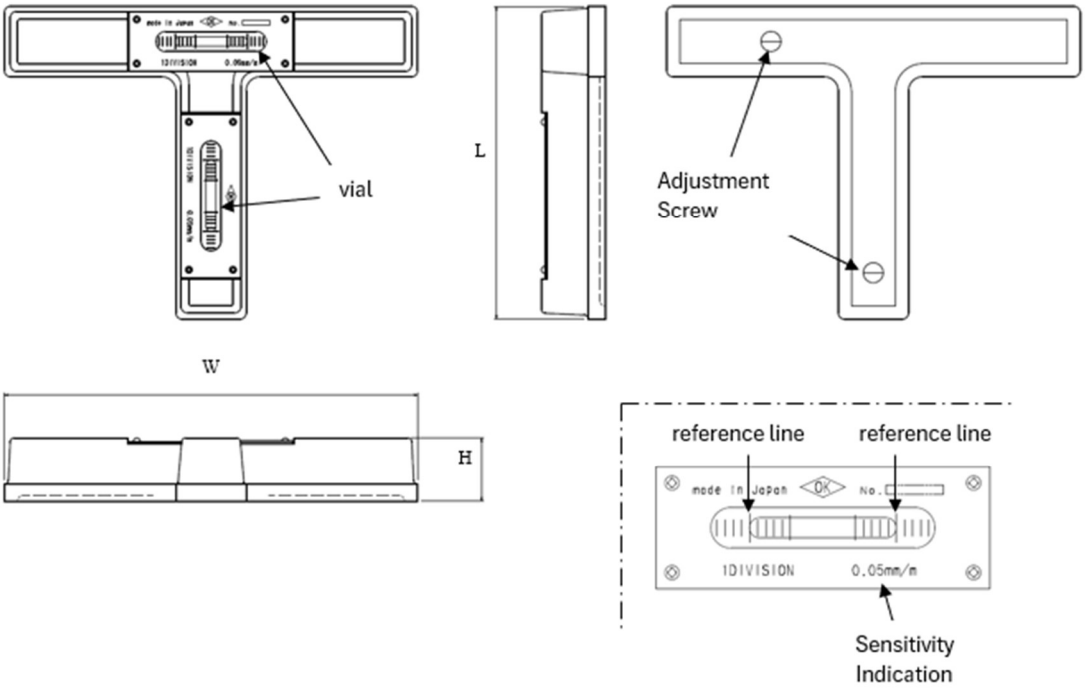
● Please read the text after fully understanding the symbols and their meanings.
● After reading, be sure to keep this manual in a place where anyone using the product can easily refer to it at any time.
● All of these are safety-related instructions, so please be sure to follow them.</td></tr>
<tr><td colspan="2">⚠ Danger</td><td>This indicates situations where incorrect handling could result in imminent risk of death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Warning</td><td>This indicates situations where incorrect handling could potentially result in death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Caution</td><td>This indicates situations where incorrect handling may result in injury to persons or only property damage.</td></tr>
<tr><td rowspan="3">Examples of symbols</td><td>  </td><td>The △ symbol indicates the presence of danger, warning, or caution messages, with specific precautions described within the figure.
(The left figure is used to indicate general danger, warning, or caution without specifying details.)</td></tr>
<tr><td>  </td><td>The ○ symbol indicates prohibited actions, with specific precautions described within or below the figure.
(The figure on the left is used for general prohibition notices without specifying particular actions.)</td></tr>
<tr><td>  </td><td>The ● symbol indicates mandatory actions, with specific instructions detailed within the figure.
(The figure on the left is used for general mandatory actions or instructions without specifying details.)</td></tr>
</table>

T-Type Cross Level Instruction Manual

1. Product Features

- It enables simultaneous measurement of horizontal levels in both the X and Y directions.
- The horizontal level can be finely adjusted using the adjustment screw.
- It is useful for the installation and alignment of various machines.

2. Names of Parts and External View



3. Specifications

Code No.	Nominal	Size (W×L×H mm)	Sensitivity (mm/m)	Mass (kg)
AL101	200	206×156×32	0.05	1.7
AL102			0.1	
AL103			0.2	

4. Sensitivity

The sensitivity of a level refers to the inclination required to move the bubble in the vial by one division (Fig. 2).

This inclination is expressed as the height difference per 1 m of base length or as an angle in seconds.

Note: The relationship between the angle and the height relative to the base length is as follows.

Angle 1 second = 4.85 μm per 1 m (≈ 5 μm per 1 m)

The sensitivity is as follows.

Sensitivity: 0.05 mm/1 m (≈ 10 seconds)

Sensitivity: 0.1 mm/1 m (≈ 20 seconds)

Sensitivity: 0.2 mm/1 m (≈ 40 seconds)

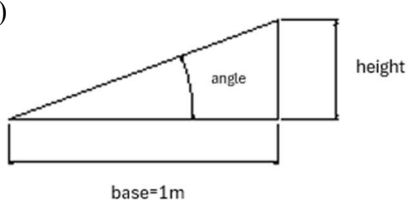
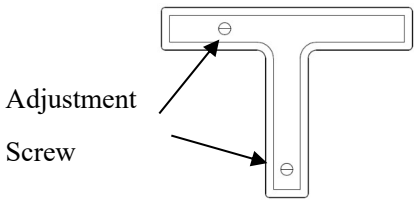


Fig. 2 Inclination for One-Division Bubble Displacement

5. Operation of Adjustment Screw



Application: Adjustment of Bubble Position in the Vial

- Turning the adjustment screw clockwise moves the bubble to the left.
- Turning the adjustment screw counterclockwise moves the bubble to the right.

△ Excessive turning of the adjustment screw may cause damage.

The bubble position can be adjusted with only a slight turn of the adjustment screw.

6. Method of Horizontal Adjustment

（1） Place the level on the reference surface plate and check the position of the bubble.

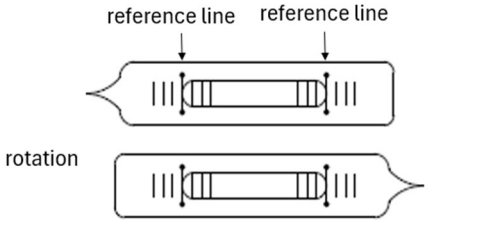
（2） At the same position, rotate the level 180 degrees and check the position of the bubble.

（3） Adjustment is required depending on the position of the bubble.

【No Adjustment Required】

When the bubble remains in the same position within the reference lines after rotation.

No adjustment is required because both the level and the reference surface plate are horizontal.



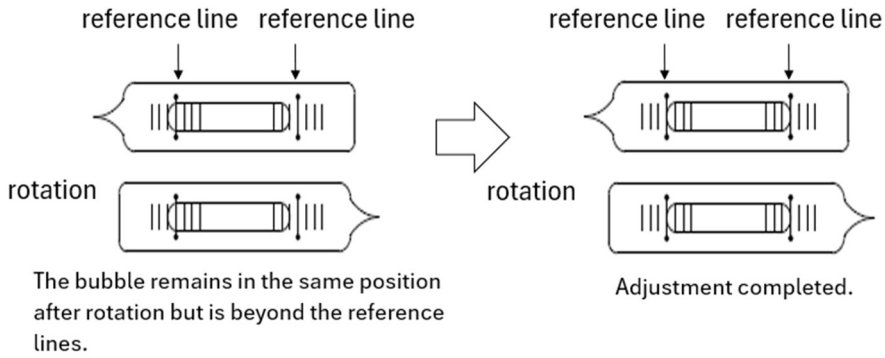
The bubble remains in the same position within the reference lines after rotation.

①【Adjustment of the reference surface plate is required.】

When the bubble remains in the same position after rotation but is beyond the reference lines.

The level is horizontal, but the reference surface plate is not.

Adjust the inclination of the reference surface plate using the adjustment bolts, and adjust so that both ends of the bubble of the level remain on the reference lines even after rotation.

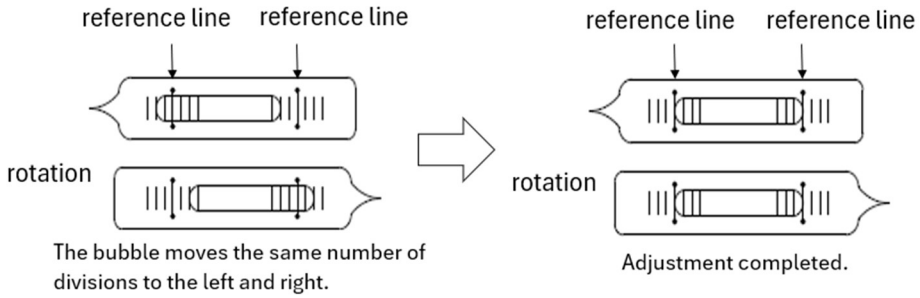


②【Zero-point adjustment of the level is required.】

When the bubble moves the same number of divisions to the left and right.

The reference surface plate is level, but the level itself is not.

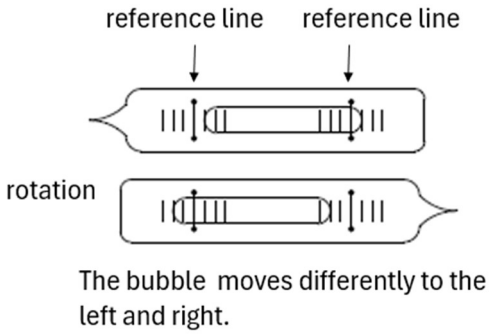
Adjust the bubble in the vial using the level's adjustment screw so that, after rotation, both ends of the bubble contact the reference lines.



③【Adjustment of the reference surface plate and zero-point adjustment of the level are required】

When the bubble moves differently to the left and right.

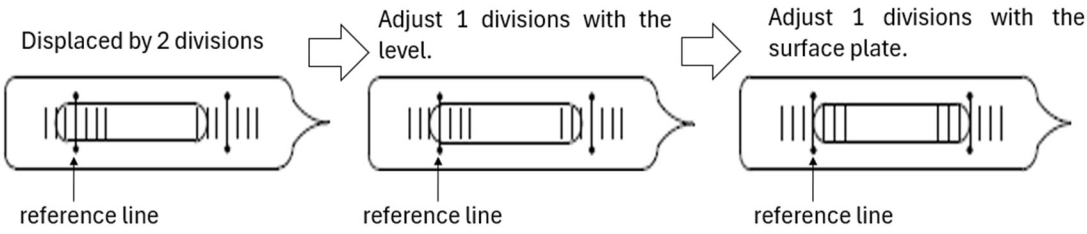
Neither the level nor the reference surface plate is horizontal.



In this case, start the adjustment from the side with the larger horizontal error.

※From the "reversed" side in the above figure, adjust half of the maximum error (in the figure, 1 divisions for a total of 2 divisions) using the level adjustment screw, and perform zero-point adjustment of the level.

After performing zero-point adjustment of the level, adjust the horizontal alignment of the reference surface plate.



※After adjustment, always rotate the level 180 degrees and confirm that the bubble is centered on the scale.

If any deviation from level remains, repeat the above adjustment.

7. Precautions for Use

① Clean the Precision Surface and the measurement surface of the workpiece before use.

● ② Handle the instrument carefully during use and storage to avoid impact or shock.

③ Allow the instrument to acclimate to the ambient temperature before use.

④ Check the horizontal level of this instrument (see Section 6, Method of Level Adjustment).

When moving the instrument on the workpiece, avoid lifting it unnecessarily and move it by sliding.

⑤ Since the bubble in this instrument moves slowly, always take the reading only after the bubble has come to a complete stop.

⑥ When held by hand for an extended period, zero-point drift may occur due to temperature changes from hand contact.

⑦ To obtain an accurate reading with the level, always use the average value of the indications at both ends of the bubble.

△ ⑧ Do not use or store the instrument in locations subject to drastic temperature changes.

Storing or leaving the instrument in environments below −15 °C or above +40 °C may cause damage to the vial, such as breakage.

● ⑨ After use, always apply rust prevention treatment and store the instrument in its storage case.

⑩ Accurate measurement cannot be performed if there is rust, burrs, or scratches on the working surface, so handle with care.

Before use, remove minor scratches on the working surface locally with an Arkansas stone or similar tool.

⑪ When any of the following occurs, check the sensitivity of the instrument before use:

・If the instrument has been dropped.

・If an object has been dropped onto the instrument.

⑫ Check the accuracy regularly before using the product.

△ ⑬ If the product has sharp parts, please handle it carefully to avoid injuring your fingers or other parts of your body.

△ ⑭ Wear protective gloves and safety glasses as necessary to prevent injury while working.

△ ⑮ Do not use this product if it is damaged or deteriorated, as it may cause injury or accidents.

△ ⑯ If an injury occurs, give first aid immediately and seek medical attention if necessary.

Contact Information

JIS Certified Factory

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Head Office and Factory

Design, development, manufacturing, and calibration services for precision measuring instruments (levels, surface plates, straight edges, reference measuring instruments, square rulers, blocks, dial gauge stands, comparators, angle measuring instruments, bench centers, squareness measuring instruments).