Precision Level

Communicating Water 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.

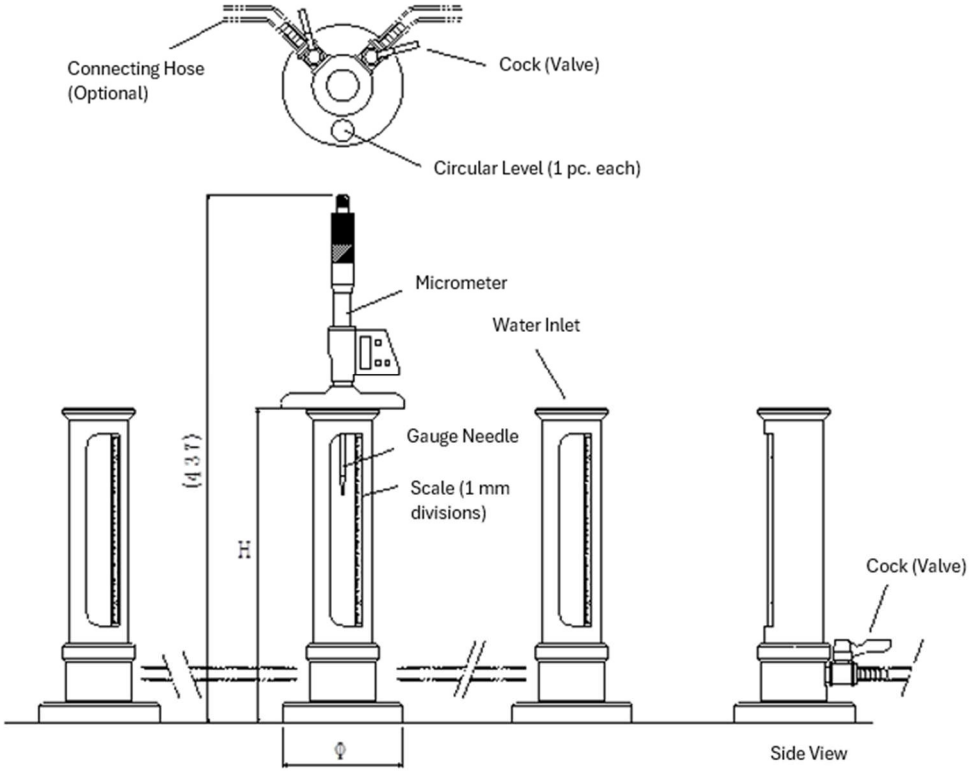
● Please read the text after fully understanding the symbols and their meanings.
● After reading, be sure to keep this manual in a place where anyone using the product can easily refer to it at any time.
● All of these are safety-related instructions, so please be sure to follow them.</td></tr>
<tr><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>

Communicating Water Level Instruction Manual

1. Product Features

- It allows easy measurement of flatness of large floor surfaces as well as height differences in foundations for the installation of machines and turbines.
- The height difference is measured using the water level method.
- Measurements in 1 mm increments can be made with the main scale on the body.
- For high-accuracy measurement, use the attached digital micrometer and read the value when the gauge needle contacts the water surface.

2. Names of Parts and External View



3. Specifications

Code No.	Model	Size (φ ×H mm)	Parallelism (μm)	Mass (kg)	Summary
AP101	AP-1	100×260	10	4.5	2 pieces per set
AP201	AP-2	100×260		6.5	3 pieces per set

Accessories

・Rod-Type Depth Micrometer (with interchangeable rods) **……** 1 pc.

・Interchangeable Rods (25 mm intervals) **……** 5 pcs.

・Circular Level (mounted on the body) …… 1 pc.

Options

・Water Level Connecting Hose

Inner diameter: 8 mm / Outer diameter: 12 mm, made of polyurethane, length manufactured to requested size.

・Printer for Depth Micrometer

4. Instructions for Use

Preparation

① Connect the connecting hose to the water level.

② Open the cock of the water level and fill with water up to any desired point on the main scale of the body.

③ Attach a rod of appropriate length to the depth micrometer.

Measurement

【Measuring height difference using two water levels, with a depth micrometer attached to one unit】

① Place the two water levels on the reference measuring surface, and record the value when the rod tip of the depth micrometer touches the water surface. (This value is A.)

② Close the cock once. Note: Water may spill during transport.

③ Keep the reference water level on the reference measuring surface, and place the measuring water level on the measuring surface.

④ Open the cock and wait until the water level stabilizes.

⑤ Since the water level will shift, readjust the depth micrometer and record the value when the rod tip touches the water surface again. (This value is B.)

Note: The depth micrometer may be installed on either the reference side or the measuring side, but use only one side consistently throughout the measurement.

⑥ The displacement of the water level corresponds to only half of the actual height difference. Multiply the displacement by 2 to obtain the actual height difference between the reference surface and the measuring surface.

【Measurement Example】

Measurement value on the reference surface (A = 5 mm)

Measurement value after placing on the measuring surface (B = 12 mm)

Formula

Actual height difference = (A – B) × 2 = (5 – 12) × 2 = –14

This indicates that the measuring surface is 14 mm higher.

【Measuring with Two Water Levels Using a Depth Micrometer】

① Place the two water levels on the reference measuring surface and close the cock.

② Place the measuring water level on the measuring surface.

③ Open the cock and wait until the water level stabilizes.

④ Measure both water levels. Record the value when the rod tip of the depth micrometer touches the water surface. (Let the measurement on the reference surface be A, and the measurement on the measuring surface be B.)

⑤ The difference between A and B represents the actual height difference between the reference surface and the measuring surface.

【Measurement Example】

Measurement value on the reference surface (A = 12 mm)

Measurement value on the measuring surface (B = 5 mm)

Formula

Actual height difference = A – B = 12 – 5 = 7

This indicates that the reference surface is 7 mm higher.

【Features and Precautions of the Depth Micrometer】

Features

・Measurement up to 25 mm can be made with a single rod.

（By replacing the rod, measurements up to 125 mm are possible.）

・Five rods are included, in 25 mm increments.

・The dimensional accuracy of the rods is within ±0.005 mm.

・For the rod replacement method, refer to the instruction manual of the depth micrometer.

Precautions

・Do not damage the tips of the rods.

・After use, wipe off any moisture and store the rods to prevent rust.

5. 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 When filling the water level with water, ensure that no bubbles remain inside the connecting hose.

If bubbles remain, accurate measurement may not be possible.

If bubbles are present, lightly tap the section of the hose containing the bubbles to move and discharge them before measurement.

⑤ Always use water in the water level. If any liquid other than water is used, accurate measurement may not be possible.

⑥ When moving the water level for measurement or transport, always close the cock beforehand. If the cock is not closed, water may spill.

⑦ Do not spill water during measurement. If water is spilled, the measurement value will change.

⑧ Do not bend or step on the hose. If the hose is bent or stepped on, accurate measurement may not be possible.

⑨ After use, drain the water completely before storage.

⑩ After use, always wipe off any water. Apply rust prevention to the bottom surface before storage.

△ ⑪ 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.

⑫ Apply rust prevention treatment to the base surface to prevent rusting.

⑬ 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.

⑭ 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.

△ ⑮ If the product has sharp edges, handle it carefully to avoid injuring your fingers or other parts of your body.

△ ⑯ Wear protective gloves and safety glasses as necessary to prevent injury while working.

△ ⑰ Do not use this product if it is damaged or deteriorated, as it may cause injury or accidents.

△ ⑱ 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).