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Mitutoyo Digimatic Caliper CD-30AX Instruction Manual

Model: CD-30AX

1. INTRODUCTION

This instruction manual provides essential information for the safe and effective use of your Mitutoyo Digimatic Caliper, Model CD-30AX. Please read this manual thoroughly before operating the instrument and keep it for future reference. This digital caliper is designed for precise measurement of external, internal, depth, and step dimensions.

2. PRODUCT FEATURES

- **Enhanced Readability:** Large LCD display with 11.0mm character height for improved visibility.
- **Absolute (ABS) Scale:** Eliminates the need for origin setting every time the power is turned ON, allowing for direct measurement.
- **High Parallelism:** 20mm main scale width ensures high parallelism of measuring faces, contributing to stable and accurate measurements.
- **Long Battery Life:** Achieves approximately 5 years of battery life (18,000 hours of continuous use) under normal operating conditions.
- **Data Output Capability:** Equipped with data output functionality for integration with external devices.

3. COMPONENTS AND CONTROLS



Figure 1: Overview of the Mitutoyo Digimatic Caliper CD-30AX. Shows the main body, jaws, display, and thumb roller.

- **Outer Jaws:** Used for external measurements.
- **Inner Jaws:** Used for internal measurements.
- **Depth Bar:** Extends from the end of the main scale for depth measurements.
- **Main Scale:** The fixed part of the caliper with the measurement scale.
- **Slider:** The movable part of the caliper.
- **LCD Display:** Shows measurement readings, units, and function indicators.
- **Thumb Roller:** Allows for fine adjustment of the slider position.
- **Power ON/OFF Button:** Turns the instrument on or off.
- **ORIGIN Button:** Sets the absolute origin point.
- **ZERO/ABS Button:** Switches between incremental (ZERO) and absolute (ABS) measurement modes.
- **Data Output Port:** For connecting to external data processing devices.

4. SETUP

4.1. Battery Installation

1. Locate the battery cover on the back of the display unit.
2. Use a small screwdriver or coin to open the battery cover.
3. Insert one SR44 silver oxide battery with the positive (+) side facing up.
4. Close the battery cover securely.

4.2. Initial Setup

Due to the ABS (Absolute) scale system, the caliper retains its origin point even when powered off. Therefore, an origin setting is generally not required each time the power is turned on. If the battery is replaced or if an error occurs, an origin setting may be necessary.

1. Turn on the power by pressing the ON/OFF button.
2. Close the measuring jaws completely.

3. Press the ORIGIN button to set the absolute origin point. The display should show "0.00".

5. OPERATING INSTRUCTIONS

5.1. Power ON/OFF

- Press the **ON/OFF** button to turn the power on.
- Press the **ON/OFF** button again to turn the power off.

5.2. ZERO/ABS Function

- **ABS Mode:** This is the default mode. The display shows the absolute position from the set origin point.
- **ZERO Mode (Incremental Measurement):** To set a temporary zero point at any position, open the jaws to the desired point and press the **ZERO/ABS** button. The display will show "0.00" at this position, allowing for incremental measurements from that point.
- To return to ABS mode, press the **ZERO/ABS** button again.

5.3. Taking Measurements

Ensure the measuring surfaces are clean before taking any measurements.

1. **External Measurement:** Place the workpiece between the outer jaws. Use the thumb roller for fine adjustment until the jaws lightly contact the workpiece. Read the value on the LCD.
2. **Internal Measurement:** Insert the inner jaws into the feature to be measured. Open the jaws until they lightly contact the internal surfaces. Read the value on the LCD.
3. **Depth Measurement:** Place the end face of the main scale on the reference surface. Extend the depth bar into the hole or step until it contacts the bottom. Read the value on the LCD.
4. **Step Measurement:** Place the end face of the main scale on the higher surface of the step. Extend the slider until the end of the slider contacts the lower surface. Read the value on the LCD.

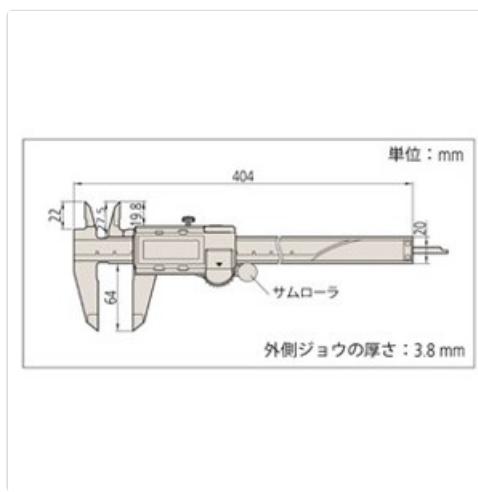


Figure 2: Dimensional diagram of the caliper, illustrating key measurement points and overall dimensions. Note the 20mm main scale width for improved parallelism.

6. ADVANCED FUNCTIONS

6.1. Data Output

The CD-30AX caliper is equipped with a data output port. To utilize this function, a dedicated connection cable (with DATASY switch) is required. Connect the cable to the data output port on the caliper and to your external

data processing device. Refer to the connection cable's manual for specific instructions on data transfer.

6.2. Data Hold

The data hold function allows you to freeze the displayed measurement value. This function requires an optional hold unit (with HOLD switch). Connect the hold unit to the data output port. When activated, the current measurement will be held on the display, even if the jaws are moved.

7. MAINTENANCE AND CARE

7.1. Cleaning

- Wipe the measuring surfaces and main scale with a clean, dry, lint-free cloth after each use.
- For stubborn dirt, use a cloth lightly dampened with alcohol. Avoid using strong solvents.
- Do not allow liquids to enter the display unit or data output port.

7.2. Storage

- Store the caliper in its protective case when not in use.
- Avoid storing in areas with direct sunlight, high humidity, extreme temperatures, or excessive dust.
- Keep the jaws slightly open to prevent stress on the measuring surfaces.

7.3. Battery Replacement

When the low voltage alarm appears on the display, replace the SR44 battery as described in Section 4.1. Prompt battery replacement ensures continuous accurate operation.

8. TROUBLESHOOTING

The caliper is equipped with alarm functions to indicate potential issues:

- **Low Voltage Alarm:** Indicates that the battery power is low. Replace the SR44 battery immediately.
- **Scale Contamination Error:** Appears if the main scale is dirty or obstructed. Clean the main scale thoroughly. If the error persists, contact customer support.
- **Over-flow Error:** Occurs if the measurement exceeds the caliper's measuring range (0-300mm) or if there is an internal processing error. Ensure measurements are within range. If the error persists within range, try resetting the origin or replacing the battery.

If any other issues arise that are not covered here, please contact Mitutoyo customer support.

9. SPECIFICATIONS

Parameter	Value
Measuring Range	0-300mm
Minimum Display Value	0.01mm
Instrument Error	±0.03mm (Does not include quantization error)
Repeatability	0.01mm

Thumb Roller	Yes
Data Output	Yes
Power Supply	Silver oxide battery (SR44) x 1
Battery Life	Approx. 5 years (normal use, 18,000 hours continuous)
Position Detection Method	Electromagnetic induction absolute encoder system
Response Speed	Unlimited
LCD Display Section	7-segment, 5-digit, minus sign, character height 11.0mm
Functions	Power ON/OFF, Origin setting (ORIGIN), ZERO/ABS, Data output, Data hold
Alarm Devices	Low voltage, Scale contamination error, Over-flow error
Operating Temperature	0~40°C
Storage Temperature	-10~60°C
Protection Class	None
Dimensions	45.11 x 14.1 x 3.51 cm
Weight	771 g

10. SAFETY INFORMATION

- Always handle the caliper with care to avoid dropping or impacting it, which can affect its accuracy.
- Do not apply excessive force when clamping the jaws onto a workpiece.
- Keep the caliper away from strong magnetic fields, as this may interfere with its electronic components.
- Avoid exposing the caliper to water or other liquids, as it does not have a specified protection class against ingress.
- Do not attempt to disassemble or modify the caliper, as this will void the warranty and may cause damage.

11. WARRANTY AND SUPPORT

Mitutoyo products are manufactured to high standards of quality and precision. For warranty information, technical support, or service inquiries, please contact your local Mitutoyo distributor or visit the official Mitutoyo website. Please have your model number (CD-30AX) and serial number (if applicable) ready when contacting support.