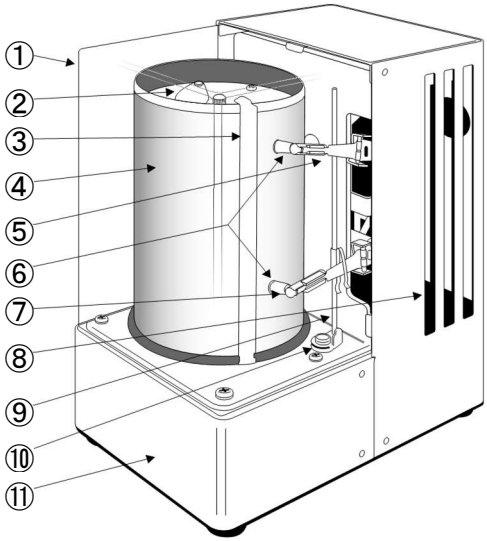
Instruction Manual
No. 7008-00/-10 Thermohygrograph
Model Mini-Cube

Thank you for purchasing the Thermohygrograph Model Mini-Cube

- This instrument is designed to measure and record the indoor temperature and humidity. Do not use this instrument for any other purposes.
- Read this manual thoroughly before using and keep this manual in a secure place for future references.

Name of each section

① Acrylic cover
② Recording cylinder
③ Chart holder
④ Chart paper
⑤ Pen arm for temperature
⑥ Cartridge pens
⑦ Pen arm for humidity
⑧ Sensing elements
(Bimetal strip, Human hair bundle)
⑨ Pen lifting bar
⑩ Pen lifting lever
⑪ Main body



SATO KEIRYOKI MFG. CO., LTD.

⚠ Warning

The Mini-cube is not explosion-proof. Never use it in an atmosphere containing flammable gases

Beware of Explosion!
There is a risk of explosion. Take extreme care

⚠ Cautions in Use

Be sure to observe the following precautions in order to use this unit correctly.

- Use this unit in a normal atmosphere.
- This model is not waterproof type. Do not wet the unit.
- Be sure to use the unit within the specified measurement range. Using the unit outside the specified measurement range will result in failure or damage.
- If condensing occurred in the unit, stop using it. Then after removing the battery, dry the unit naturally in normal temperature.
- Do not drop this unit or apply impact to it. This unit is a precision instrument.
- Never disassemble or modify this unit. Doing so may result in failure.
- Do not wash or wipe this unit with alcohol, thinner, or other solvents. Also, do not wash it in water. If the unit becomes dirty, wipe it with a tightly wrung cloth that has been dipped in warm water with neutral detergent.
- If this unit is not to be used for a long time, always remove the battery from the unit. Otherwise, the battery may leak fluid, resulting in failure.
- Keep the batteries out of reach of children. If swallowed accidentally, consult a medical attention immediately.

* For repair or calibration, contact us or the shop where you purchased from.

Procedure for use

- Installation of recording cylinder

1. Remove the acrylic cover by sliding it in the transverse direction. (Figure 1)

2. Remove the drum holding nut from the center shaft of recording cylinder by turning it counterclockwise.

3. Carefully lift the recording cylinder off the center shaft. Remove two protective white packings located under the recording cylinder. (Keep these packings in case unit is to be transported)

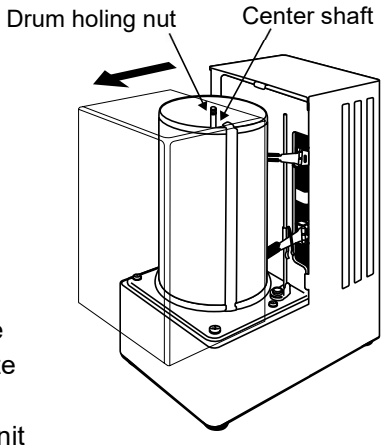


Figure 1

4. Slide the battery cover (on top of cylinder) to open. Insert the AA battery in the battery compartment, the positive pole is upward, and push it down. Slide the battery cover closed to hold the battery in position. (Figure 2)

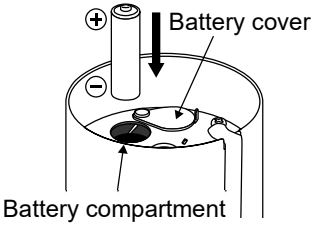


Figure 2

- Setting the chart on recording cylinder

1. Hold the upper part of the chart holder on the cylinder, and then gently lift the chart holder in the direction of the arrow to remove it (Figure 3).

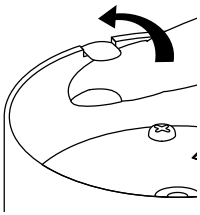


Figure 3

2. Wrap the chart firmly around the cylinder. Be sure to overlap two ends of the chart at the chart holder. The overlap is positioned so that the right end becomes below.
   Ensure that the lower edge of the chart aligns on the bottom collar of cylinder. (Figure 4)

   * Temperature is recorded in the upper section of the chart and humidity is recorded in the lower section.

   * It is recommended to write the recording start date on the upper of the chart before setting the chart.

Figure 4

3. Clip the chart holder back in place after correctly setting the chart.

   NB: Unless the chart is set on the cylinder correctly, temperature and humidity reading errors will result.

- Preparation the main unit

1. Cut the tape that secures pen arm.

2. Lift the pen arm holding clip upward to remove it from the pen release bar (Figure 5).

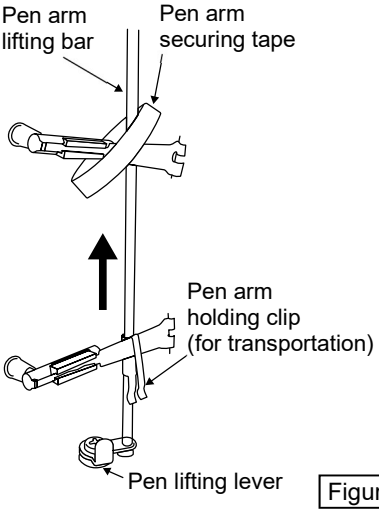


Figure 5

3. Carefully pull out the Styrofoam in the traverse direction that holds the cam (Figure 6).

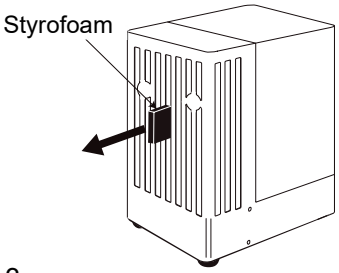


Figure 6

4. Remove cap for cartridge pen by turning it (Figure 7).

   NB: Be careful not to bend the pen arm when remove the cap.

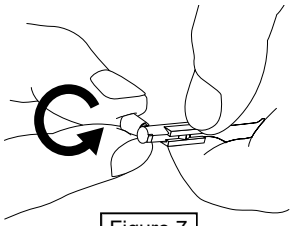


Figure 7

5. Pull the pen lifting lever fully toward you to move the pen arm toward you

6. Mount the recording cylinder that the paper has been wound. Turn the cylinder a little to check that gears are engaged. After checking, tighten the cylinder holding nut.

   NB: Be careful not to bend the pen arm when mount the cylinder.

7. Holding the upper part of the cylinder, move the cylinder so that the chart holder is at right of the pen tips.

8. To avoid play in the drum gear mechanism, turn the cylinder clockwise first and stop it at the position on 2 hours or more forwarder than present time. Set it present time turning the cylinder counterclockwise.

9. Push pen lifting lever away from you so that both pen tips are touching the chart paper.

10. Install the acrylic cover to the unit in reverse order when it was removed.

    NB: Carefully set the cover so that the pen arm does not touch the cover.

Replacing the cartridge pens

Normally, cartridge pens will be continuously used for six months, but the life may be shortened by the conditions of use. When ink becomes dim, replace it to new one.

1. Remove the recording cylinder referring to the “Procedure to remove cylinder”

2. To remove the cartridge pen, hold the pen arm and pull the cartridge pen in the direction of the arrow. At this time, pull the cartridge pen straightly, never give a twist. (Figure 8)

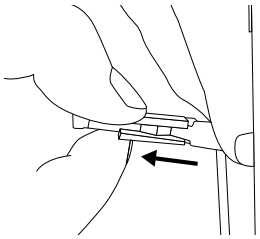


Figure 8

3. To set the new cartridge pen, slide it onto the arm until it stops while holding the pen arm.

4. After setting, be sure to check that the readings of temperature and humidity and the time are correct

   NB. Don't touch pen tip. If touched, ink will not flow smoothly due to grease on hand. Replace the cartridge pen as the cap is put on the pen tip.

   * Use our dedicated cartridge pens we provide.

Fine adjustment

The unit is calibrated at our factory, so it is not necessary for you to make any other adjustments before use, however if some adjustment is required, follow these procedures.

1. Prior to fine adjustment, place the unit and the reference thermohygrometer in the circumstance where measurements will be made for 30 minutes or more.

2. Remove the label at right lateral of the unit. Turn the fine adjustment screw with a screwdriver setting the values of the temperature and humidity that reference thermohygrometer indicates. (Figure 9)

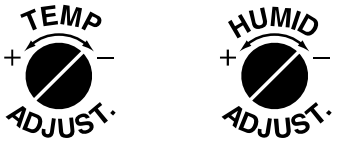


Figure 9

3. To increase indicated reading, turn the fine adjustment screw counterclockwise (+).

   To lower the indicated readings, turn the fine adjustment clockwise (−).

   * It is desirable to calibrate the unit periodically once a year.

Recording measured values

1. Temperature is recorded in upper section of chart and humidity is in lower section.
2. Install the unit horizontally at the measurement place.

Caution

- Do not use the unit in a place subject to vibration, shocks or inclination.
- When you move the unit to a new ambient, leave the unit until it adopts the new ambient.
- In outdoor use, be sure to place the unit in an instrument screen
- Do not use this unit in a place exposed to direct sunlight or near heating equipment.
- Do not install the unit in dusty or sooty environment.
- The grid of the case is used for ventilation. Do not cover it.
- Do not use it in corrosive gases and farmable gases
- Correct value will not be obtained if the unit is covered with a vinyl sheet for waterproof purpose

Replacement of chart

The usable chat for this unit is for 7-day rotation only. When replacing the chart, refer to “Setting the chart on recording cylinder” of this manual.
Make sure to use the dedicated chart we provide.

Replacement of the battery

Replace the battery to new one every six months. Be sure to load the battery so that each positive (+) or negative (–) terminal faces in correction direction. At replacement, refer to “Installation of recording cylinder”

Caution

- At replacement of battery, use new AA size zinc-carbon battery.
- Do not dispose of used batteries in a fire.
- For environmental protection, dispose of used batteries in compliance with local rules and regulations.

Specifications

Cat. No.	No. 7008-00/-10
Model	Mini-Cube Thermohygrograph
Cylinder clock	Quartz Type
Measuring Range	Temperature: –15 to +40˚C Humidity: 5 to 100%rh
Sensing elements	Temperature: Bimetal strip Humidity: Human hair bundle
Accuracy	Temperature: ±2˚C at 10 to +30˚C ±3˚C at other range Humidity: ±5%rh at 30 to 90%rh at –15 to +25˚C ±7%rh at other range
Min. graduation	Temperature: 2˚C Humidity: 5%
Recording cycle	7 day
Drum rotation accuracy	about ±1H per 7 days
Battery life	about 6 months
Power requirement	one AA zinc-carbon battery (R6P)
Storage ambient	Temperature: 0 to +40˚C, Humidity: 20 to 80%rh (no condensing)
Recording pens	Cartridge pens in violet
Dimensions	148(W) x 190(D) x 97(H) mm
Weight	1.6kg
Accessories	1 box (55 sheets) of 7-day chart, one AA zinc-carbon battery

Consumable

No. 7008-62: 1 box (55 sheets) of 7-day chart
No. 7210-90: Cartridge pen (violet)
No. 7238-02: Cartridge pen (violet) for a box of 12 pcs.
No. 7210-92: Cartridge pen (red)
No. 7238-06: Cartridge pen (red) for a box of 12 pcs.

SATO KEIRYOKI MFG. CO., LTD.
3-4, Kanda-kajicho, Kanda, Chiyoda-ku, Tokyo 101-0045 Japan
http://www.sksato.co.jp/en/

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