

PRODUCT INFORMATION SHEET

DISPLAY CASE HYGROMETER (Items: 167-2739C and 167-2739F) - INSTRUCTIONS

Instructions: High-Accuracy Hygro-Thermometer (Model HD-120F)

1. General

When an accurate numerical humidity measurement is required; the most commonly used measuring instrument is the "Assmann psychrometer". Other choices are the hair-tension hygrometer and the simplified psychrometer (wet- and dry-bulb thermometers), but these are seldom used when high precision is required.

However, none of these instruments is easy to use, nor are any of them capable of measuring relative humidity directly. In addition, they are expensive, they require water and power supplies (power sources include battery power and spring force), and their large size makes them very hard to use in small spaces.

The HD-120F Hygro-Thermometer is the ideal alternative. Compact, affordable, and extremely accurate, it can be used wherever precise humidity and temperature control is required, including small spaces such as display cases containing valuable museum pieces or objects of art.

2. Features

1. Direct indication of temperature and relative humidity values.
2. Compact, space-saving size (48 mm x 28 mm x 14 mm)
3. Does not require water or power supply
4. Suitable for mobile use.

3. Configuration, Operating Principles

3-1 Configuration

This instrument is composed of the following meters:

- (1) Thermometer
- (2) Hygrometer

3-2 Operating principles

- (1) Thermometer: Bimetal sensor.

(2) Hygrometer: A material that expands and contracts according to changes in humidity is attached to a metallic sheet by means of thermo-compression bonding, and the sheet is wound into a spiral shape. This sensor functions on the same principle as the bimetal sensor.

4. Setup

4-1 Selecting the installation location

1. Select a location that typifies the overall humidity of the measured space.
2. Select a well-ventilated location (it is recommended to maintain some distance from the wall surface).
3. For accurate measurement, avoid a location subject to high radiant heat or exposed to direct sunlight.
4. Do not install in the following locations.
 - Anywhere exposed to steam, water vapor, or water drops. Anywhere continuously subject to high humidity of 95% or more.
 - Anywhere the temperature may rise to 140°F or more.
 - A space filled with a volatile substance.

cont.

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- A space filled with an oily substance.
- A place subject to strong impacts or vibrations.

4-2 Installation

Install the instrument in either of the following ways.

1. Place it directly on a table.
2. Attach it using the provided adhesive tape.

5. Measurement

1. When the instrument has been moved before installation, wait for 60 minutes (the time until the case reaches the temperature of the measured space) before reading the first measurements. This wait time is not necessary if the instrument is installed permanently in a single location.
2. Always read the scales from the front.
3. When measuring temperature and humidity that vary suddenly, for example, when measuring in a constant temperature and humidity chamber, wait about 60 minutes after the temperature has stabilized before reading the measurements.

(Note) The relative humidity is dependent on the temperature. If the temperature varies by 1.8°F depending on the position in the measured space, the relative humidity may differ by 6 to 7%. To obtain an accurate measurement, the temperature inside the space must be constant. It is also important that the temperature inside the instrument's case and the temperature inside the measured space have stabilized.

6. Calibration

The pointers may be displaced by vibrations or an impact. If this happens, use the following procedure to re-calibrate them.

1. Use an Assmann psychrometer as the calibration standard. If a simplified psychrometer (wet- and dry-bulb thermometers on wood plaque) is used, expose it to wind from an electric fan (high power) located at a distance of 2 to 3 meters (the humidity measurement may increase by about 10% if it is not exposed to the wind).
2. Install the standard and this instrument in the same space, and read the measurements after both the temperature and humidity values have stabilized.
3. If the temperature or humidity measurement differs from the standard, correct the indication by inserting a flat-blade screwdriver in the adjustment hole on the back.

7. Maintenance

1. When the case gets dirty, wipe it clean with a soft cloth.
If the scales get dirty, remove the transparent case by pushing the tabs on both sides of the case and wipe the scales, while taking care not to touch the pointers.
2. Dirt on the ventilation hole can be removed using a soft brush. Take care not to touch the temperature/humidity sensors.

cont.

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8. Caution

1. Do not install the instrument in the locations specified in section 4-1-4.
2. Do not drop the instrument.
3. Avoid sudden temperature changes of 36°F or more.
4. Perform precise calibration.
5. Take care not to touch the pointers and temperature/humidity sensors during maintenance.

9. Specifications

Temperature range: 10°F to +110°F (2°F scale)

Humidity range: 0% to 100% (2% scale).

Measurement range: 35% to 85% under normal temperature

Dimensions: 48 x 28 x 14 (mm)