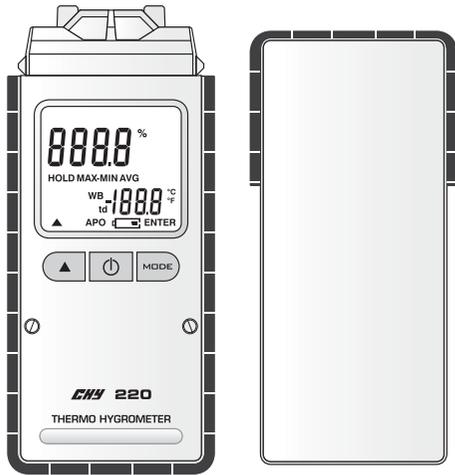


OPERATING INSTRUCTIONS

MODEL 220

THERMO HYGROMETER



INTRODUCTION

This instrument is a portable easy use and compact digital Thermo-Hygrometer designed for simple one hand operation. It uses thermistor as temperature sensor, and a digitalized humidity sensor as the hygrometer sensor with excellent long term stability.

Humidity measurement is shown on upper display and temperature in lower display.

SAFETY INFORMATION

It is recommended that you read the safety and operation instructions before using the thermometer.

1. When not use for long time remove battery.
2. Don't keep in place with high Temp, or high humidity.

CAUTION

- Do not immerse the hygrometer sensor head into liquids since this causes permanent damage to the sensor.
- The meter when not in use, please use protective cover to extend sensors life.

SPECIFICATIONS

HUMIDITY MEASURING

Sensor: Digital Capacitive humidity sensor
Range: 0% to 100% RH

Accuracy:
 $\pm 2.5\%$ at $23\pm 5^\circ\text{C}$ ($73.4\pm 9^\circ\text{F}$), 10% to 90% RH
 $\pm 5\%$ at $23\pm 5^\circ\text{C}$ ($73.4\pm 9^\circ\text{F}$), 0% to 10% RH,
 90% to 100% RH

Sensor Response Time for 90% of Total Range:
 60sec typical

Sensor Hysteresis (excursion of 10% to 90% to 10% RH): $\pm 1\%$ RH typical

TEMPERATURE MEASURING

Sensor: Thermistor temperature sensor
Range: -20°C to 60°C (-4°F to 140°F)

Accuracy:
 $\pm 0.5^\circ\text{C}$ for 0°C to 45°C , at $23^\circ\text{C}\pm 5^\circ\text{C}$
 $\pm 1.0^\circ\text{C}$ for -20°C to 0°C , 45°C to 60°C , at $23^\circ\text{C}\pm 5^\circ\text{C}$
 $\pm 1.0^\circ\text{F}$ for 32°F to 113°F , at $73.4^\circ\text{F}\pm 9^\circ\text{F}$
 $\pm 2.0^\circ\text{F}$ for -4°F to 32°F ,
 113°F to 140°F , at $73.4^\circ\text{F}\pm 9^\circ\text{F}$

Resolution: $0.1^\circ\text{C}/^\circ\text{F}$

Measuring Rate: 1 measurement/second

Temperature Coefficient: 10% per $^\circ\text{C}$ out of $23\pm 5^\circ\text{C}$ ($73.4\pm 9^\circ\text{F}$)

Operation Environment: -20 to 60°C (-4°F to 140°F) at $<70\%$ R.H.

Storage Environment: -20 to 60°C (-4°F to 140°F), 0 to 80% R.H. with battery removed from meter.

Battery: 1.5Vx2pcs AAA size

Battery Life: 260 hours typical with alkaline battery

Low battery indication: The " is displayed when the battery voltage drops below the operating level

Dimensions: 24.7mm(T) x 50.9mm(W) x 132.9 mm(H)

Weight: Approx 118g including batteries.

OPERATIONS

There are 3 operation modes, namely Measurement Mode, Set Mode and Hold Mode.

1. Turning on and off the meter:

When power is off, a short push on " key turns on the meter and enter Measurement Mode.

Press and hold " key for 2 seconds turns the power off.

Right after power on, all the indicators on the LCD display lights up for one second.

2. Measurement Mode:

When power is on, the meter start measuring and refresh every second.

Changing among temperatures:

Press the " key, the meter can cycle through Dry-bulb temperature (no indicator) \rightarrow Dew Point (with indicator "td" \rightarrow Wet-bulb temperature (with indicator "WB") reading on lower display.

Backlight:

In measurement mode, a short push on " key turns on the backlight for dark environment, it goes off automatically after 15 seconds if without further operation.

3. Set Mode:

In set mode, user can set $^\circ\text{C}/^\circ\text{F}$ unit and turn on/off APO function (APO = Auto Power Off, when APO is ON, the meter power off automatically if no operation in 10 minutes).

When power is off, press and hold " key for 2 seconds to enter Set Mode.

3.1 $^\circ\text{C}/^\circ\text{F}$ Unit: short push on " key switches between $^\circ\text{C}$ and $^\circ\text{F}$.

3.2 Push "MODE" key to save the setting, exit $^\circ\text{C}/^\circ\text{F}$ setting mode and enter APO setting mode.

3.3 APO ON/OFF: short push on " key switches between ON and OFF.

3.4 Push "MODE" key to save the setting, exit APO setting mode and enter measuring mode.

※Note: To turn off power in Set Mode abandon the current setting and previous settings remain unchanged. If " indicator appeared, the setting value can works till power off but did not save to meter.

4. Hold Mode:

In Measurement Mode, short push "Mode" key to enter Hold Mode with indicator "HOLD" shows at center of LCD.

Right after entering this mode, shown in the LCD is the last measurement and the reading will not be updated with new measurement.

Push "Mode" key each time the display changes in following sequence:

4.1 Last Measurement: with indicator "HOLD".

4.2 Maximum value recorded: with indicator "HOLD" + "MAX".

4.3 Minimum value recorded: with indicator "HOLD" + "MIN".

4.4 Maximum-Minimum value recorded: with indicator "HOLD" + "MAX-MIN".

4.5 Average of values recorded: with indicator "HOLD" + "AVG".

4.6 Exit the Hold Mode and return to Measurement Mode.

To clear the recorded values:

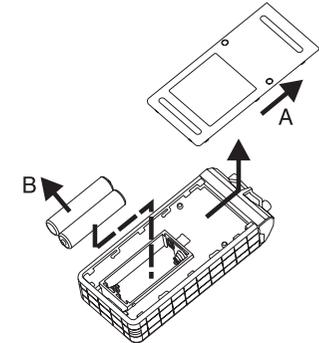
In Hold Mode and during viewing MAX, MIN, MAX-MIN or AVG, press and hold "Mode" key for 2 seconds, to clear the recorded data and return to measurement mode.

SPECIAL CONSIDERATIONS

- Before a reliable measurement can be made, the measuring hygrometer and medium to be measured must be in temperature and humidity equilibrium.
- Temperature measurement errors
 Due to too short measurement time, sunshine during the measurement, heating, cold outer walls, air draft (e.g. fans), radiating hand and / or body heat etc.
- Humidity measurement errors
 Due to steam, water splashes, dripping water or condensation (not water condensate) on the sensor etc. However, repeatability and long-term stability are not impaired by this.

MAINTENANCE

Installing and Replacing Battery



- A. Battery Cover
 B. Battery

1. Power is supplied by 2pcs 1.5V (AAA SIZE).
2. The " appears on the LCD display when replacement is needed.
3. Push the Battery Cover and lift it in the direction as shown in the figure.
4. Remove the batteries from battery compartment.
5. Replace with 2 new AAA batteries with polarity as indicated on the bottom of Battery Compartment.
6. Replace the Battery Cover.

Cleaning

Periodically wipe the case with a damp cloth and detergent, do not use abrasives or solvents.