Ambient Weather WS-YG710-6 Galileo Thermometer, Barometer, Hygrometer and Clock Weather Station

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1. Introduction

Thank you for your purchase of the Ambient Weather WS-YG710-6 Cherry Finish Silver Dial Traditional Weather Station. The following is a guide for preparation, care and operation of your traditional weather station.

2. Preparation

Your weather instrument includes a protective pad to prevent damage to the barometer glass case during shipment. Remove this protective pad and circular instruction sheet. The barometer is ready to use.

3. Care and Cleaning

The solid wood case is finished with a clear, satin lacquer to protect and preserve the appearance. Although occasional use of a good furniture polish is acceptable, we recommend periodic cleaning with a very lightly water dampened soft cloth. Be sure to wipe the wood dry with a soft cloth before cleaning.

Avoid use of harsh household cleaners and coarse paper towels, which can damage the lacquer coating or scratch the bezel or lens. Fingerprints and dirt may be removed the lenses and bezels with a soft cloth lightly dampened with a mixture of water and mild dishwashing liquid. Be sure to dry the lens and bezel with a soft cloth after cleaning.

Do not install the weather station outside. The weather station is intended for indoor use only.

4. Hygrometer (Humidity Meter)

4.1 How the hygrometer works

The hygrometer measures the indoor relative humidity. The sensor measures the air moisture by a sensitive mechanical coil spring that is bonded with a moisture absorbent material.

Hygrometers register the percentage of water vapor present in the air, compared to the maximum amount that can be present at a given temperature.

The coils in hygrometers respond slowly and while humidity levels change abruptly, it can take an hour or more for the meter to reach an accurate reading. Remember that the hygrometer is reading indoor humidity, and is vastly different than outdoor humidity, as reported by the National Weather Service.

It is not uncommon to have low humidity reading during cold weather when indoor air is heater. Air conditioning also removes moisture from the air. The optimum levels are 45% to 50% during heating and cooling seasons. Low humidity can cause health problems and can be hard on wood furnishings. High humidity can cause mold or mildew to grow.

4.2 Hygrometer Accuracy

Humidity measurement is among the more difficult problems in basic meteorology. Accuracy is difficult to achieve and are subject to drift, so need regular recalibration.

A further difficulty is that most hygrometers sense relative humidity rather than the absolute amount of water present, but relative humidity is a function of both temperature and absolute moisture content, so small temperature variations within the air in a test chamber will translate into relative humidity variations.

5. Aneroid Barometer

5.1 How the aneroid barometer works

An aneroid barometer uses a small, flexible metal box called an aneroid cell. This aneroid capsule (cell) is made from an alloy of beryllium and copper. The evacuated capsule (or usually more capsules) is prevented from collapsing by a strong spring. Small changes in external air pressure cause the cell to expand or contract. This expansion and contraction drives mechanical levers such that the tiny movements of the capsule are amplified and displayed on the face of the aneroid barometer. Many models include a manually set needle which is used to mark the current measurement so a change can be seen. It was invented by Blaise Pascal.

5.2 Reading the barometer

It is highly advisable to lightly tap the glass near the center brass knob with your fingers before taking a barometer reading. The light tap will overcome any friction that may affect accurate hand readings, especially during periods of slow atmospheric changes. The Coast Guard has informed us that tapping the barometer is even required on the most expensive aneroid barometers, because the mechanism is made deliberately “stiff”.

The ability of the barometer to indicate changes in barometric pressure makes it a useful instrument in weather forecasting.

The weather forecast or pressure tendency is based on the rate of change of barometric pressure. In general, when the pressure increases, the weather improves (sunny to partly cloudy) and when the pressure decreases, the weather degrades (cloudy to rain).

The weather forecast is an estimation or generalization of weather changes in the next 24 to 48 hours, and varies from location to location. The tendency is simply a tool for projecting weather conditions and is never to be relied upon as an accurate method to predict the weather.

The barometer includes a manually set needle, which is used to mark the current measurement so a change can be seen. Barometric readings should be taken daily. Remember that the rate of change of barometric pressure is important in determining weather changes. You may want to take multiple readings each day during periods of unstable weather conditions.

The following basic rule of thumb will hold true in using the barometer to predict weather conditions.

- A fast rise in barometric pressure means goo weather of short duration.
- A rapid drop in barometric pressure means disturbances nearby, showers of short duration.
- Regular elevation in barometric pressure usually will indicate a clear, dry weather conditions (cold and dry in the winter).
- A slow but continuous drop in barometric pressure will indicate persistent, bad weather.
- Slow drops of 2-3 tenths mbar per 24 hours a depression of some distance away.
- Drops of 1-2 tenths mbar per hour means disturbances nearby of short duration.
- Steep drops of 6-10 tenths mbar within 4-5 hours period indicates coming rain and/or storm with strong winds.

5.3 Absolute vs. Relative Pressure

To compare pressure conditions from one location to another, meteorologists correct pressure to sea-level conditions. Because the air pressure decreases as you rise in altitude, the sea-level corrected pressure (the pressure your location would be at if located at sea-level) is generally higher than your measured pressure.

Thus, your absolute pressure (measured at your location) may read 28.62 inHg (969 mb) at an altitude of 1000 feet (305 m), but the relative pressure (sea-level) is 30.00 inHg (1016 mb).

The standard sea-level pressure is 29.92 in Hg (1013 mb). This is the average sea-level pressure around the world. Relative pressure measurements greater than 29.92 inHg (1013 mb) are considered high pressure and relative pressure measurements less than 29.92 inHg are considered low pressure.

To determine the relative pressure for your location, locate an official reporting station near you (the internet is the best source for real time barometer conditions, such as Weather.com or Wunderground.com), and set your weather station to match the official reporting station.

5.4 Barometer Calibration

Your barometer will operate from -100 to 3,000 feet with reliable accuracy. Aneroid barometers have a small screw on the back for sea-level calibration. With a flat blade screwdriver, turn this screw in either direction slightly while looking at the indicator needle. It should move in one direction or the other. Tap the barometer to see where the needle settles. Continue this procedure until the proper

pressure reading is obtained. Do not turn the screw counter-clockwise (to the left) too far, since the screw can fall out. After the initial calibration, no further adjustment will be required unless the barometer is moved to a new geographic location.

6. Galileo Thermometer

6.1 How the Galileo thermometer works

The Galileo thermometer consists of a sealed glass tube that is filled with paraffin oil and several floating bubbles. The bubbles are glass spheres filled with a colored liquid mixture.

Attached to each bubble is a little metal tag that indicates a temperature. These metal tags are calibrated counterweights. The weight of each tag is slightly different from the others. Since the bubbles are all hand-blown glass, they aren't exactly the same size and shape.

The bubbles are calibrated by adding a certain amount of fluid to them so that they have the exact same density. So, after the weighted tags are attached to the bubbles, each differs very slightly in density (the ratio of mass to volume) from the other bubbles, and the density of all of them is very close to the density of the surrounding paraffin oil.

As the temperature of the air outside the thermometer changes, so does the temperature of the paraffin oil surrounding the bubbles. As the temperature of the paraffin oil changes, it either expands or contracts, thereby changing its density. So, at any given density, some of the bubbles will float and others will sink. The bubble that sinks the most indicates the approximate current temperature.

6.2 How to read the Galileo thermometer

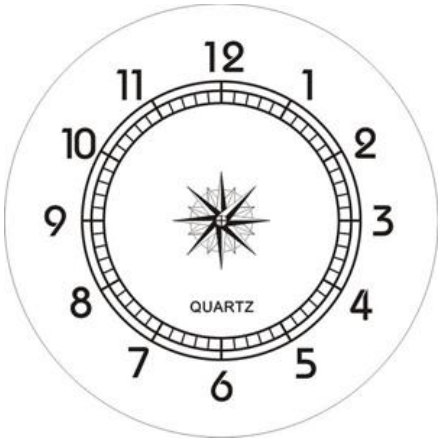
Make certain the weather station is installed on a flat surface. The lowest temperature bubble within the group at the top of the cylinder displays the current temperature.

- The lowest floating ball indicates the current temperature.
- If all of the balls float to the top, the temperature is below the lowest floating ball.
- If all of the balls sink, the temperature is above the highest ball.

6.3 Galileo thermometer warnings

- **Warning:** This product is not a toy; keep away from children
- **Warning:** Contains paraffin oil. In case of breakage and contact with liquid contents, wash hands with soap and water.
- **Warning:** Do not ingest liquid. In case of ingestion, wash mouth with water and call a physician or your local poison control center.
- **Warning:** Use protective gloves to clean up spilled liquid and broken glass.

7. Quartz Clock



To energize the quartz clock, pull the plastic tab from the battery compartment. To set the clock, turn the adjustment knob clockwise to advance the time.

8. Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	64 to 80 °F	---	4 °F
Indoor Humidity	0 to 100 %	20% – 45%: ± 9% 45% – 75%: ± 6% 75% – 98%: ± 9%	1 %
Barometric Pressure	940 hPa to 1070 hPa (about -100 to 7,000')	1060hPa – 1030hPa: ± 10hPa 1030hPa – 990hPa: ± 5hPa 990hPa – 960hPa: ± 10hPa	1 hPa

9. Warranty Information

Ambient, LLC provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and only to the original purchaser of this product. To receive warranty service, the purchaser must contact Ambient, LLC for problem determination and service procedures.

Warranty service can only be performed by a Ambient, LLC. The original dated bill of sale must be presented upon request as proof of purchase to Ambient, LLC.

Your Ambient, LLC warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (lack of reasonable and necessary maintenance); (2) damage resulting from failure to follow instructions contained in your owner's manual; (3) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (4) units used for other than home use (5) applications and uses that this product was not intended, such as outdoor use.

This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

