

Wind & Weather

#IN6809 Galileo Weather Station

Galileo Thermometer

Manufactured after the idea of Galileo Galilei (1564~1642)

History

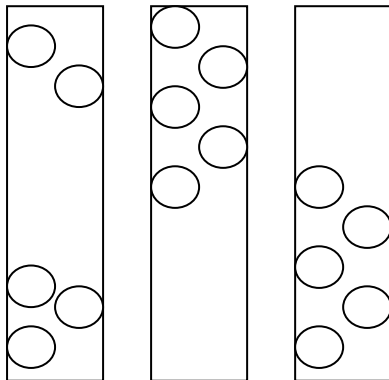
Searching for exact temperature measurements, Galileo Galilei discovered this fascinating method. Galilei put 4~5 exactly weighted balls in a cylinder filled with a special liquid. The balls go up or down according to the existing temperature. By this method you can determine the correct temperature.

How it works

This is a replica of Galileo's thermometer based on his discovery that the density of liquids change as temperature varies. Each of the glass balls is exactly weighted by partially filling the spheres with liquid. When the temperature rises the liquid in the glass cylinder becomes less dense and the balls sink slowly to the bottom.

How to read it

The lowest temperature ball within the group at the top of the thermometer tells the correct temperature.



A

B

C

A. The temperature is determined by the lowest floating ball.

B. If all the balls float to the top, the temperature is under the lowest floating ball.

C. If all the balls sink, the temperature is over the highest ball.

Wind & Weather IN6809

Home Comfort Monitor with Quartz Clock & Galileo Thermometer

Instructions

Clock Battery Replacement

When replacing an old battery, insert a fresh “AA”(1.5v) alkaline battery in a correct manner in the battery compartment.

Care and Cleaning of your Home Comfort Monitor

Wood Case

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

Instruments

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

How your Home Comfort Monitor Instruments Work

Galileo Thermometer

Galileo Galilei, the pioneer of modern physics and astronomy (1564-1642), discovered that liquids change density as the temperature increases or decreases. The higher the temperature the less dense the liquid becomes and vice versa. When the temperature rises, the liquid in the glass tube becomes less dense and the bulbs will sink slowly one at a time. In the same way, the bulbs will rise as the temperature decreases. The lowest temperature ball within the group at the top of the tube tells the approximate temperature. If all of the temperature balls float to the top, the temperature is BELOW the lowest temperature ball. If all the temperature balls sink to the bottom, the temperature is HIGHER than the highest temperature ball.

Hygrometer (Humidity Meter)

Hygrometers measure relative air moisture indoors. These instruments operate by a sensitive coil spring that is bonded with a moisture absorbent material.

Hygrometers register the percentage of water vapor present compared to the maximum amount that could be present in the air temperature. This is why the instruments are also referred to Humidity Meters. All air contains microscopic water particles that are invisible to the human eye. If enough water is vaporized into the air, the air will become “saturated”. This is considered to be 100% humidity.

The coils in hygrometers respond slowly and when 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 , not the outdoor humidity as reported by the weather service.

It is not uncommon to have low humidity readings during cold weather when indoor air is heated. Humidity readings of 10 to 25% are typical where humidifiers are not used to add water vapor in the air. The optimum humidity levels should be between 45 and 50% during heating seasons. Low humidity levels could cause health problems and can be hard on wood furnishings.

All hygrometers are preset at the factory and typically should need no further adjustment. Remember to allow ample time for the instrument to stabilize in its new location before determining whether accurate humidity levels are being indicated. If you decide that the instrument needs readjustments, this can be done as follows:

Soak a folded face cloth or dish cloth with water and place the cloth on a plate, saucer, or another relatively flat container. Remove the hygrometer from the home comfort monitor plaque by simply placing your hand against the back plate and pushing the instrument out of its mounting hole. Carefully lay the back edge of the hygrometer flat on the damp cloth. Allow 30-45 minutes for the hygrometer to ready approximately 95% humidity. If this reading is not indicated, carefully rotate the coil by using a small screwdriver counter clockwise until the indicator hand is reading 95%.

Remount the hygrometer into the wooden plaque. The hygrometer will gradually return to indicate the actual condition of the air moisture content.

IMPORTANT: Any other method than what has been described here to adjust the hygrometer could damage the instrument.

Aneroid Barometer

It is highly advisable to lightly tap the glass near the center brass knob with your fingers before taking a barometer reading. This light tap will overcome any friction that may affect accurate hand readings, especially during periods of slow atmospheric changes.

The ability of the barometer to indicate changes in atmospheric pressures makes it a useful instrument in weather forecasting. The following basic rule of thumb will hold true in using the barometer to predict weather conditions:

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

Barometric readings should be taken daily. Remember the rate of change is as important as the amount of change in determining weather changes. You may want to take multiple barometric readings each day during periods of unstable weather conditions.

How to adjust my aneroid barometer?

Aneroid barometer have a small screw on the back. 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. If not, tap the barometer to see where the needle settles. Continue until proper pressure reading is obtained. Do not turn the screw counter-clockwise (to the left) too far since it could come out. Your barometer will operate from sea level up to 7000 feet with reliable accuracy. After the initial calibration no further adjustment will be required unless the barometer is moved to a new geographic location.

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