



SLING PSYCHROMETER

SPCRKIT

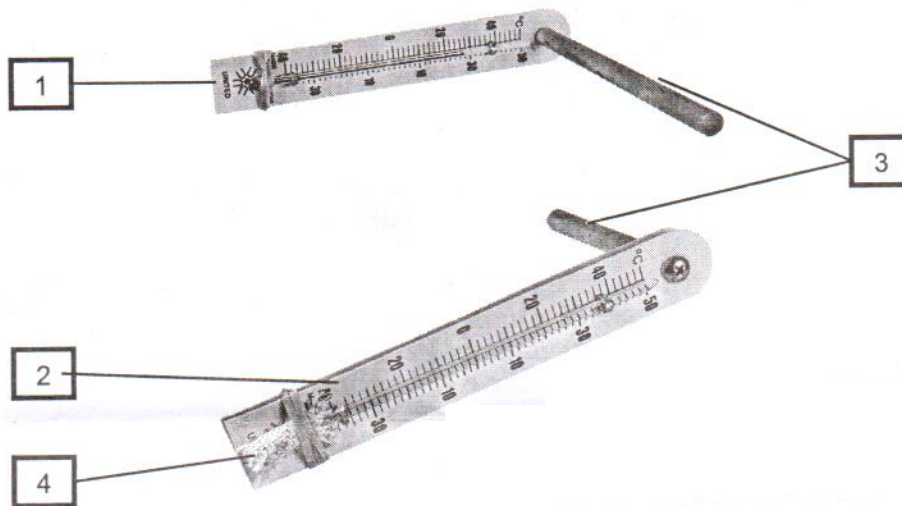


Figure 1

DESCRIPTION

The SPS001 Sling Psychrometer is a simple instrument for estimating the relative humidity of the air. It consists of a pair of identical thermometers mounted on a handle so that they can be swung around together. One of the thermometers has a wick fitted over the bulb and the other bulb is open to the air.

In use, the wick is wetted with water and then the thermometers are whirled around for about two minutes. The water on the wick evaporates more quickly while moving through the air and cools the bulb surrounded by the wick. The increased rate of evaporation and the amount by which the thermometer bulb is cooled depend on the relative humidity of the air. If the air is very dry, the evaporation is rapid, but if the air is saturated with water vapor, no enhanced evaporation occurs.

After the whirling, the temperatures of both thermometers are read. A chart of wet bulb temperature, dry bulb temperature and relative humidity is used to find the relative humidity that corresponds to the two measured temperatures. The chart is known as a Psychrometric Chart. An example is included with the psychrometer.

COMPONENTS (see Figure 1)

1. Dry Bulb Thermometer
2. Wet Bulb Thermometer
3. Handle
4. Wick

INSTRUCTION MANUAL

ASSEMBLING THE SLING PSYCHROMETER

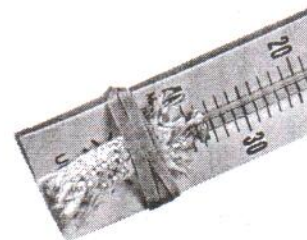
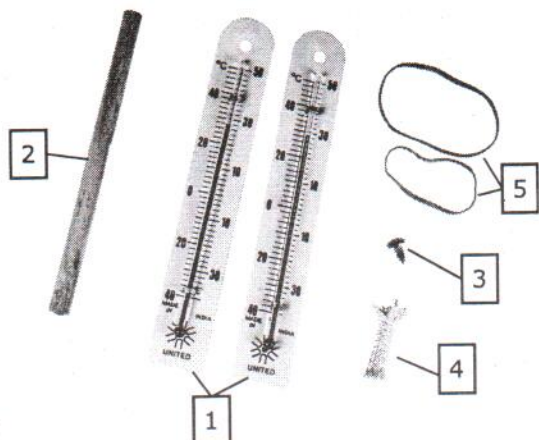
Check the contents of the kit:

1. Thermometers (2)
2. Handle (1)
3. Screw (1)
4. Wick (1)
5. Rubber bands (2)

Place the thermometers back-to-back with the suspension holes at the same end. The end of the handle has a pre-drilled hole for the screw. Pass the screw through the holes in the thermometers and screw it into the end of the handle using a Phillips screwdriver.

Check that the thermometers can rotate freely about the screw. If the screw is too tight to allow this, back it off about half a turn.

Slide the wick over the bulb of the thermometer facing away from the handle and secure it in place with a rubber band wrapped around both thermometers. (*The second rubber band is a spare.*) Make sure the rubber band is around the necks of the thermometers above the bulbs and does not cover the bulbs themselves.



USING THE SLING PSYCHROMETER

Wet the wick with room temperature water (preferably distilled), making sure that the bulb of the second thermometer on the back remains dry. The wick should be thoroughly wet, but not dripping excess water.

Read the temperatures indicated by both thermometers. They should be closely the same. If not, the water may have been too cold or too warm. In that case, wait a couple of minutes and check again. When the temperatures are stable, continue. Hold the handle upright with the thermometers on top and raise it above your head. Twirl the handle to make the thermometers rotate around the handle rapidly but steadily.

Continue to rotate the thermometers for about 2 minutes, then read both thermometers immediately after stopping the rotation. The wet bulb thermometer will read lower than before due to the evaporation, while the dry bulb thermometer should read the same.

Look up the relative humidity of the room air on the accompanying psychrometric chart.

READING THE PSYCHROMETRIC CHART

The psychrometric chart relates the values for three quantities:

- The air temperature (the dry bulb temperature, in °C)
- The wet bulb temperature (in °C)
- The relative humidity of the air (in percent)

The dry bulb temperature is shown along the horizontal axis of the chart and indicated by the vertical gridlines.

The wet bulb temperature is shown along the curve at the top of the chart and indicated by the right-slanting gridlines.

The relative humidity is shown by the series of curves from bottom to top in the body of the chart.

To find the relative humidity:

Find the measured dry bulb temperature along the bottom of the chart

Find the measured wet bulb temperature along the top of the chart

Follow the gridlines for these two temperatures into the body of the chart to the point where they intersect

Read off the relative humidity from the nearest curve to the intersection point. (You may have to make an estimated interpolation between two curves if the intersection point lies between them.)

STORAGE

When storing the sling psychrometer after use, make sure to store it in a place where the wick can dry out in a short time to avoid the formation of mold in the fabric.

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PSYCHROMETRIC CHART

