The Experiments of Weather Instruments & Observations lab.

(First Semester)
ASD / 2nd Stage
2021 - 2022

Lecturers: L. Ruaa mazin , L. Hasan mahmood, A.L. Yasamin qusay

Preparing by: L. Nagham T. Ibraheem, L. Ruaa M. Ibraheem

The Temperature

It is an indicator of the amount of thermal energy stored by the body, and there are many units for measuring temperature:

a.   Celsius (°C): where water freezes at (0°C) and boils at (100°C).

b.   Fahrenheit (°F): water freezes at (32°F) and boils at (212°F).

$$T(°F) = 9/5 \; T(°C) + 32$$

c.   Absolute (K): in which water freezes at (273 K) and boils at (373 K).

$$T(K) = T(°C) + 273$$

Temperature measuring devices:

At the station there is a box called a box of thermometers made made of wood and painted white, it has double walls with openings in the form of slits to allow air to pass inside to keep the devices or thermometers far from the influence of solar radiation, and these devices include:
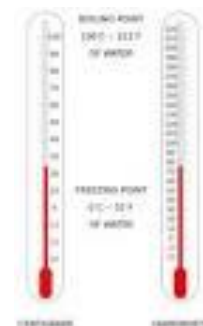
1. Dry bulb thermometer.
2. Wet bulb thermometer.
3. Maximum and minimum temperature thermometer.
4. The registered thermometer (double).
5. Soil depth thermometer.
6. Infrared thermometer.
7. Electrothermal thermometer.

registered thermometer   Infrared thermometer   Max. & min. temp. thermometer

Temperature group: where (1) is the group index.

S_n *is the sign of the temperature and takes the values (0) if the temperature is* **positive** *or* **equal to zero**, *and (1) if the temperature is* **negative**.

TTT *Temperature with tenths where tenths are rounded when drawing on the station as follows:*

10237 $\implies$ TT= +23.7 $\implies$ TT= +24

10064 $\implies$ TT= +06.4 $\implies$ TT= +06

11106 $\implies$ TT= -10.6 $\implies$ TT= -11

The location of the temperature on the station is as follows: TT ◯

Relative Humidity

It is defined as the ratio of the partial pressure of water vapor in a mixture to the saturated vapor pressure of water at a given temperature.

1:2 Relative humidity meters

1. Sycrometer (dry and wet bulb thermometer).

2. Hygrograph.

3. Hygrometers by means of electrical resistance.

4. Humidity measuring devices by electrical capacitance.

5. Hygrometers by absorption method ($CaCl_2$ absorption of moisture).

6. Hygrometers by condensation method.

Hygrograph   *Sycrometer*

$2S_nT_dT_dT_d$ ←

Dew point temperature group: where (2) is the group index.

S_n *is the sign of the dew point temperature and takes the values (0) if the dew point temperature is **positive** or **equal to zero**, and (1) if the dew point temperature is **negative**.*

$T_dT_dT_d$ *The temperature of the dew point with its tenths, as tenths are rounded when drawing on the station, as in temperature.*

The location of the dew point temperature on the station is as follows:

T_dT_d ◯

*In the absence of information for the dew point temperature, the information is for **relative humidity** and S_n is encoded by the number (9), rounded by tenths (29UUU), and drawn on the station in the same place as follows:*

ex: 29653 ⟹ UU=65.3% ⟹ UU=65%