

## Virtual Temperature

From the user, an air temperature ( $T$ ), a dewpoint temperature ( $T_d$ ), and a station pressure ( $P_{sta}$ ) are given.

To calculate the virtual temperature, the temperatures must be converted to units of degrees Celsius ( $^{\circ}C$ ) and the station pressure ( $P_{sta}$ ) must be converted to millibars ( $mb$ ) or hectoPascals ( $hPa$ ).

To see how to convert these units see the links below:

[Temperature Conversion](#)

[Pressure Conversion](#)

Then, the virtual temperature can be calculated using the formula below:

$$T_v = \frac{T + 273.15}{1 - 0.379 \times \left( \frac{6.11 \times 10^{\left( \frac{7.5 \times T_d}{237.7 + T_d} \right)}}{P_{sta}} \right)}$$

The virtual temperature answer will be in units of Kelvin ( $K$ ), but virtual temperatures can be converted to other units using the link above.