Vapor Pressure

From the user, an air temperature \((T)\), a dewpoint temperature \((T_d)\) are given.

To convert the saturated vapor pressure and/or the actual vapor pressure, the temperature values must be converted to degrees Celsius \((°C)\).

To see how to convert temperatures see the link below:

Temperature Conversion

Then, saturated vapor pressure \((e_s)\) and the actual vapor pressure \((e)\) can be calculated using the formula listed below:

\[
e = 6.11 \times 10^{\left(\frac{7.5 \times T_d}{237.3 + T_d}\right)}
\]

\[
e_s = 6.11 \times 10^{\left(\frac{7.5 \times T}{237.3 + T}\right)}
\]

For a bonus answer, after calculating both vapor pressures the relative humidity \((rh)\) can be calculated using the equation below:

\[
rh = \frac{e}{e_s} \times 100
\]

The vapor pressure answers will be in units of millibars \((mb)\) or hectoPascals \((hPa)\).

To convert the vapor pressure to other units, see the link below:

Pressure Conversion