Task 1. Use a weather forecast website, and utilize the psychrometric chart and the formula we went through in the class to determine the <u>absoloute humidity</u>, the <u>wet-bulb temperature</u> and the <u>mass of water vapour in the air in ClassRoom A</u> (Aula A) of Piacenza campus in the moment that you are solving this exercise (provide the inputs that you utilized)
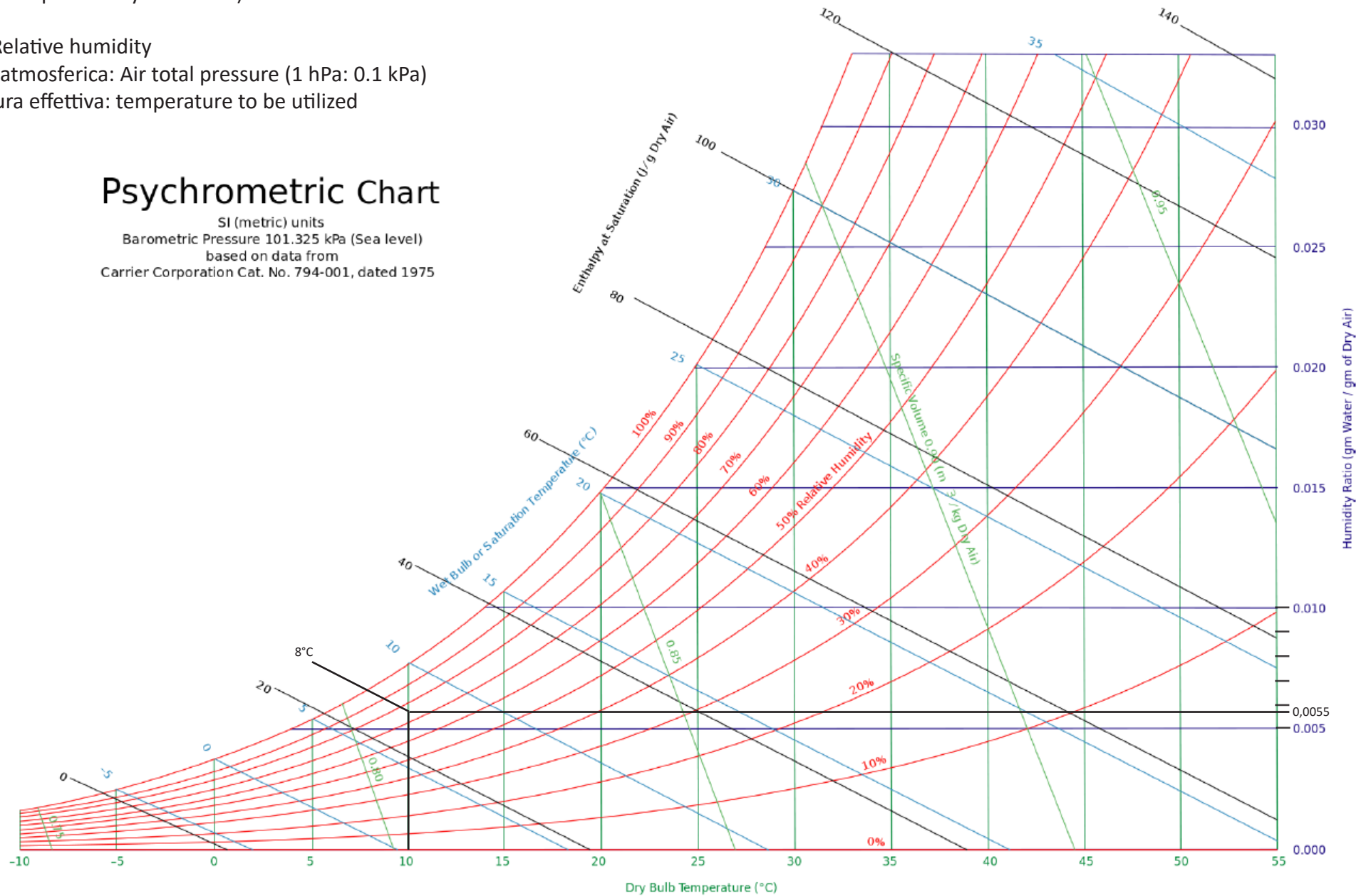
Umidità: Relative humidity
Pressione atmosferica: Air total pressure (1 hPa: 0.1 kPa)
Temperatura effettiva: temperature to be utilized

Psychrometric Chart

SI (metric) units
Barometric Pressure 101.325 kPa (Sea level)
based on data from
Carrier Corporation Cat. No. 794-001, dated 1975

a) Wet-bulb temperature

From the psychrometric chart we can obtain that the Wet-bulb temperature is equal to 8°C.

b) Absolute humidity

Info obtaing from the suggested weather webpage:

T= 10°C

P=1025 Hpa = 102,5Kpa

φ= 65% = 0,65

$P_v = \varphi \cdot P_g$

P_v= 0,65 . 1,227Kpa

P_v= 0,79 Kpa

P_a= P - P_v

P_a= 102,5 Kpa - 0,79Kpa

P_a= 101,71Kpa

ω= 0,622 (P_v/P_a)

ω= 0,622 (0,79Kpa / 101,71Kpa)

ω= 0,622 . 0,007

ω= 0,0043 Kg_{vapour}/Kg_{dryair}

The absolute humidity is equal to 0,0043 Kg_{vapour}/Kg_{dryair}

c) Mass of water

M_a= $\dfrac{P_a \cdot (Volume)}{R_a \cdot T}$

M_a= $\dfrac{101,71Kpa \cdot (5m \cdot 15m \cdot 3m)}{0,287 \cdot (275 + 10)}$

M_a= $\dfrac{101,71Kpa \cdot 225m^3}{81,795}$

M_a= $\dfrac{22884,75}{81,795}$

M_a= 279,78 Kg   The mass of water vapour in the air, on the classroom is equal to 279,78Kg