Pressure dew point measurement technology

Measure of production quality

testo

The high quality standards in modern industrial production require continuous humidity monitoring of compressed air. Adherence to a low pressure dew point guarantees problem-free system operation in the long-term.

Physical units

Maximum humidity f_{max} [g/m³]

 is the maximum amount of vapour which 1 m³ of air can hold at a specific temperature.

Absolute humidity f [g/m³]

 is the actual amount of vapour which 1 m³ of air can hold.

Relative humidity ϕ [% RH]

 is the ratio of absolute humidity to maximum humidity.

Atmospheric dew point [°C_{td}]

 is the temperature to which atmospheric air (1 bar_{abs}) can be cooled without losing water.

Pressure dew point [°C_{tod}]

 is the temperature to which condensed air can be cooled without losing condensate. Pressure dew point depends on the condensation final pressure. The pressure dew point also drops when the pressure drops.

ppm (V/V)

 The unit ppm (V/V) stands for "parts per million". It is the ratio of vapour parts to the overall moist air parts, with reference to volume.

How does water get into compressed air?

Air is able to bind vapour. The higher the temperature, the better the air is able to bind vapour and vice versa. The larger the air volume, the larger the amount of vapour which the air can carry and vice versa. From this it follows that the ability to bind vapour is less in condensed air.

Example:

A compressor with an operating pressure of 7 bar compresses ambient air to 1/8 of its volume which means that the ability of air to bind water drops to 1/8. At one defined point in the compression process, the water level in the air exceeds the reduced ability of air to bind water. The air is saturated and one part of the vapour condenses.

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