

Water content in cooling circuits

The cooled water distribution circuits should have a minimum water content to avoid excessive compressors starts and stops.

In fact, each time the compressor starts up, an excessive quantity of oil goes from the compressor's pump and simultaneously there is a rise in the temperature of the compressor motor's stator, due to the inrush current during the start-up.

To prevent damage to the compressors, it has been envisaged the application of a device to limit frequent stops and restarts.

During the span of one hour there will be no more than 6 starts of the compressor. The plant side should therefore ensure that the overall water content allows a more constant functioning of the unit and consequently greater environmental comfort. The minimum water content per unit should be calculated using this simplified formula:

For 1 compressor unit

$$M(\text{Liters}) = (0.94 \times \Delta T(^{\circ}\text{C}) + 5.87) \times P(\text{kW})$$

For 2 compressors unit

$$M(\text{Liters}) = (0.1595 \times \Delta T(^{\circ}\text{C}) + 3.0825) \times P(\text{kW})$$

where:

M minimum water content per unit expressed in litres

P Cooling Capacity of the unit expressed in kW

ΔT evaporator entering / leaving water temperature difference expressed in $^{\circ}\text{C}$

This formula is valid for:

- standard microprocessor parameters

For more accurate determination of quantity of water, it is advisable to contact the designer of the plant.