

$$(5) \text{ Night_cooling allowed, if } \left\{ \begin{array}{l} T_{\text{representative_day}} > T_{\text{limit}} \\ t_{\text{cooling_day}} > 0 \end{array} \right\} \cup \left\{ t \in \langle t_{\text{night_cooling}} \rangle \right\}$$

Window open, if $\left\{ (\text{Night_cooling allowed}) \cap (T_{\text{outside}} < T_{\text{room}}) \cap (T_{\text{setpoint}} < T_{\text{room}}) \right\}$

(6) Where;

- $T_{\text{representative_day}}$ - Representative temperature of the room (air) during the day
- T_{limit} - Temperature limit to detect the overheating
- $t_{\text{cooling_day}}$ - Operation time of the cooling unit
- T_{outside} - Outside air temperature
- T_{room} - Room air temperature
- T_{setpoint} - Set point of the indoor temperature
- t - Actual time
- $t_{\text{night_cooling}}$ - Time constraints, in which night cooling is permitted

$$(7) T_{\text{setpoint}(n)} = T_{\text{setpoint}(n-1)} + \Delta T_{\text{setpoint}(n)}$$

Where;

$$(8) \Delta T_{\text{setpoint}(n)} = \begin{cases} -1; & (T_{\text{inside}} \geq T_{\text{limit}}) \cap (T_{\text{outside}(n)} > T_{\text{outside}(n-1)}) \\ 0; & \left((T_{\text{inside}} \geq T_{\text{limit}}) \cap (T_{\text{outside}(n)} < T_{\text{outside}(n-1)}) \right) \cup \\ & \left((T_{\text{inside}} < T_{\text{limit}}) \cap (T_{\text{outside}(n)} > T_{\text{outside}(n-1)}) \right) \\ 1; & (T_{\text{inside}} < T_{\text{limit}}) \cap (T_{\text{outside}(n)} < T_{\text{outside}(n-1)}) \end{cases}$$

Where;

- T_{inside} - Representative temperature during the day (e.g. air temperature at the end of the occupied period)
- T_{limit} - Limit temperature above which the room is considered overheated
- $T_{\text{setpoint}(n)}$ - Set point of the indoor temperature established for actual day
- $T_{\text{setpoint}(n-1)}$ - Set point of the indoor temperature from one day before
- $\Delta T_{\text{setpoint}(n)}$ - Set point correction.
- $T_{\text{outside}(n-1)}$ - Outside temperature measured one day before
- $T_{\text{outside}(n)}$ - Actual outside temperature