



Thermozyklus combines room unit and humidity sensor

Intelligent heating and ventilation to combat mould and its friends

ThermoZYKLUS SARL, France



The problem of moisture and mould in homes is assuming ever greater proportions. This is partly due to the rising cost of energy and the resulting sometimes excessive energy-saving behaviour of consumers. ThermoZYKLUS has therefore developed a combined individual room control, which, at a critical combination of room temperature and air humidity, raises the target room temperature to a safe value or keeps a ventilator running long enough for the air humidity in the rooms to return to the comfort zone.

Mould damages because of bad humidity regulation

Roughly every fifth apartment in Germany suffers from damage to walls, ceilings and windows due to high humidity. A joint study conducted by the University of Jena, and the Technical Universities of Dresden and Berlin¹ concludes that mould is visible - with a latent health risk - in almost every tenth German apartment. In about 5.8 % of the flats investigated, the visible mould could be clearly attributed to residents' limited ventilation activities. Mould infestation occurs largely in old buildings that have not been insulated, in the corners, especially on outer walls behind cupboards and at typical cold spots such as window frames, lintels, and on connections to balconies.

Because of rising energy costs, many tenants tend only to heat the living room and to control the temperature of the adjacent rooms by leaving their doors ajar. However, as the warm air from the heated living room cools down in adjoining rooms, the problem of humidity and moisture in these critical room zones is increased even further.

Thermozyklus GmbH, Germany, supplier of a high-quality system for controlling the temperature of individual rooms, has looked into the issue and developed a combined room unit with an integrated humidity sensor. If the room unit, with its additional software installed, measures a critical value of indoor temperature and room air humidity, the target temperature will be raised automatically within a defined set point in the h x diagram. By keeping well within the saturation limits, condensation formation on cold walls and ceilings can easily be avoided.

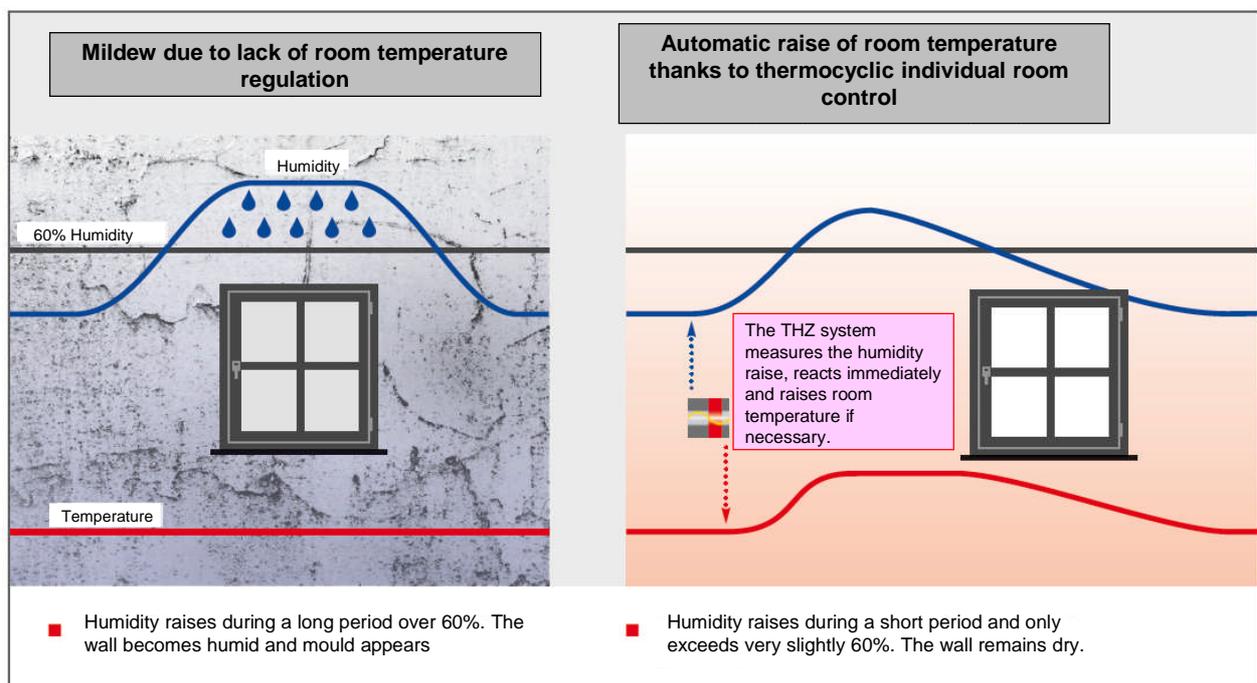
If the room air humidity changes because of occasional ventilation via windows or a ventilator, the combination unit will regulate the room temperature and get it back to the set, uncritical target temperature.

¹ Reference: S. Brasche et al.: Vorkommen, Ursachen und gesundheitliche Aspekte von Feuchteschäden in Wohnungen. Bundesgesundheitsbl – Gesundheitsforsch - Gesundheitsschutz, 8, 2003, Page 683-693



Thus, only as much energy as is necessary to prevent the growth of mould is used. Ideally, all room units are fitted with humidity sensors. In the minimum version, one central unit with a humidity sensor can also monitor several room units. This way, for instance, the temperatures of basement rooms that are critically sensitive to moisture can be set in such a way that there is no mould formation in summer. As an option, a fan or a home ventilation system can be directly controlled via the humidity sensor. Combinations of centralised and decentralised moisture control systems are also possible.

The patented thermocyclic control method is suitable for ceiling, wall, floor, skirting board and radiator heating systems. What distinguishes it from conventional single room controllers is a novel mathematical model that limits the temperature hysteresis to ± 0.15 °C. Even temperature deviations in the order of 1/100 Kelvin are recorded and weighted by the mathematical model. This way, control interventions against the likely reactions of the room by disturbances such as the heat dissipated by people, lights or computers, or by open windows and doors, can be detected early and processed as control signals. The typical undershoots and overshoots experienced with conventional controllers can this way be avoided. The higher control accuracy of the ThermoZYKLUS controller alone can lead to energy savings of 12-18 %.



The THZ individual room control regulates room temperatures depending on humidity to avoid mildew.

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