

Office building with high level of comfort and energy savings

Control signal for fan coils offers efficient control and noiseless fan operation

EKINEX Fan coil units are a very common and successful solution for room heating and cooling in functional buildings. In order to save energy and reduce the noise at workplaces, there is a growing demand for units equipped with brushless electronic motors and inverter boards. These types of devices need to be controlled by actuators which generate a 0–10 V control signal in order to allow a continuous air flow. In this project, KNX was chosen for its native interoperability and the availability of a new ekinex® solution for the 0–10 V control of fan coil units which made the integration of heating, cooling and ventilation in the building automation's overall concept much easier.

The office building, whose project was focused on comfort and energy saving, was equipped with a building automation system based on KNX. It is located in the north west of Italy and has demanding heating and cooling requirements, due to the external temperatures ranging from -10°C in winter to over 35°C in summer. The HVAC solution includes the temperature regulation for the conveying fluids and the single-room air temperature control.

The production of hot and cold fluids occurs in the boiler room where a chiller and a boiler are installed; the correct temperature of the conveying fluid in winter is ensured by an ekinex® KNX mixing actuator. The device allows a climatic compensation based on the external air temperature; the value used by the mixing actuator is measured by a KNX weather station that also sends further information on the bus.

The control of the air temperature is achieved with the ekinex® fan coil actuators installed in the fan coil cabinets and ekinex® wall-mounted room temperature controllers. In some large rooms, the setpoint value for the regulation is obtained as a weighted average between the temperatures measured by the room temperature controller and the sensor integrated in an ekinex® KNX pushbutton used for the light switching. In service rooms, where no room temperature controllers are installed, the fan coil actuators also act as controllers, receiving the room temperature via a KNX temperature sensor. In this case setpoints and change of operating modes are received via KNX by the building supervision system.



ekinex® KNX fan coil actuator / controller mounted on a fan coil unit. A 0–10 V signal is generated to control the brushless motor with inverter board



An ekinex® KNX mixing actuator controls the servo motor of a mixing valve delivering the correct temperature to the fan coil circuits



The room control with the delégo app for mobile devices offers great user friendliness



End users can modify the setpoint of $\pm 2^\circ\text{C}$ and manually control the fan speed

An ekinex® delégo supervision system allows users with iOS and Android smartphones to individually control room functions such as lighting and heating / cooling / ventilation with a simple and user-friendly app.

The ekinex® KNX fan coil actuators / controllers offer several functions to save energy, obtain a higher level of comfort and make the maintenance easier. A temperature sensor measures the coil temperature and is connected to an input of the device, configured as analogue; in the heating season, the fan start is delayed until the conveying fluid temperature at the coil reaches the configured threshold, in order to avoid an air flow at an uncomfortable temperature for the occupants. A window contact is connected to a second input, configured as digital, to automatically switch the operating mode each time a window is opened. In cooling mode, a third input is used to detect the status of the floating sensor in the drip tray, starting the condensate pump when necessary. A dedicated counter triggers a warning when the configured threshold for the total operating hours is reached, relaying the need to clean or replace the air filter.

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