

Factory recycles waste heat from production

KNX automates ventilation, lighting and heating in industrial company



The new factory has production plants, warehouses and offices on its 5700 square metres site.

An industrial installation by Anton Hieber GmbH & Co Elektroanlagen AG shows how a ventilation system can be controlled efficiently with KNX in addition to the usual functions. At Ritter GmbH in Schwabmünchen, a manufacturer of plastic cartridge systems, considerable levels of waste heat accumulate when producing the castings. Ventilation functions in the new factory building are controlled via KNX, so that the room remains pleasantly cool in the summer while the residual heat helps to heat the room in the winter. The presence- and daylight-dependent lighting control is also efficient. The energy saving achieved and the short-term return of investment were amongst the factors which impressed the KNX jury for the National Award for Germany.

The production in the new factory runs 306 days a year round the clock. So that the lighting need not to always be switched on at full brightness with over 600 fluorescent lamps, KNX automatically regulates the light intensity in connection with DALI. Presence detectors keep watch simultaneously, so that the light is only switched on when people are present. A saving effect of up to 70 percent is achieved. The sophisticated ventilation control brings further savings and even an energy gain. Ventilation flaps in the skylights – exterior and interior flaps – as well as openings for additional air in the side windows are opened and closed dependent on the temperature. While the extracted air is discharged over large areas during the summer, the ventilation in the winter is limited to the smaller interior flaps. This prevents the building from cooling down rapidly. The

KNX control of the ventilation flaps communicates with the fire alarm system so that they open automatically as a flue in the event of a fire. Finally, a weather station monitors the flap control and protects against rain and storms.

The waste heat of the production plants incurs heat gain: KNX temperature controllers control the heat removal so that it is either conducted over the roof or inside. The heating system itself, consisting of dark emitters, is controlled fully automatically via KNX.

A facility server with a corresponding 3D visualisation acts as a control point. Remote access using a smart phone or tablet PC is thus also possible. The server collects all the KNX fault signals, for example from the transformer station, compensation system, overvoltage monitoring, lifting system, air pressure monitoring etc. and relays important signals. Consumption values are also evaluated here.

The automated suction of ozone from the printing machines and harmful gases from the washing plant are among the technical refinements of the KNX system.

The system integrator points to a significantly smaller energy footprint: "Due to the temperature-dependent ventilation and use of waste heat, the use of fossil fuels can almost completely be avoided." Including the lighting and the ventilation, this means around 280 tonnes less CO₂ or 50,310 euros lower operating costs per year.

Winner
KNX Award 2012
Category
National



Benefits provided by KNX in this project

- Economical and comfortable lighting (savings up to 70%)
- Good indoor climate due to temperature-controlled ventilation
- Low heating costs through heat gain in the winter
- Central visualisation in a clear 3D environment
- Users can set parameters and setpoint values themselves
- Technical fault signals and central monitoring
- Remote operation via Internet

Technical refinements

- Complex control for electrically operated ventilation flaps and windows
- Control of the waste heat from industrial production
- Technical monitoring with integration of fault signals from the energy supply and production plants
- Integrated emergency lighting

Companies involved

Building owner:

Ritter GmbH, Schwabmünchen, www.ritter-online.de

Planning:

Hermann Wiedemann, Ritter GmbH

Electrical Engineers, KNX System Integrator:

Anton Hieber GmbH & Co Elektroanlagen KG, Schwabmünchen, www.elektrohieber.de

Area of application:

Industry

Functions:

- Lighting
- Heating, ventilation
- Technical monitoring
- Energy management
- Visualisation
- Interfaces
- Remote monitoring/control

Scope

Number of KNX devices: 120, ABB, Arcus-eds, Gira, Merten, Siemens, Theben

Costs:

600,000 euros