



Bochumer Hütte - Room by room ventilation

Author: Tobias Hatt (EIV)

Push-Pull heat recovery systems

HVAC

What is the solution?

Push-Pull heat recovery systems are small ventilation units with reversing operation and regenerative heat exchanger in the outer wall. In addition to a wall opening with approx. \varnothing 160 mm, only one power connection is required. These electrical ventilation units change their direction every few minutes to return the heat stored in the heat exchanger when the air is blown into the room. For efficient and controlled air exchange, the units should be installed in pairs room by room so that one fan is switched to supply air mode whenever the adjacent fan is in exhaust air mode.

Why does the solution work?

Push-Pull heat recovery systems are suited for historic buildings, because the conventional supply air distribution system (ductwork, supply air valve and silencers) can be omitted. The indoor air quality is improved and the indoor air humidity is reduced due to the continuous air exchange. Nevertheless, high indoor noise emissions (35 dB(A)) occur, when the system is working within the necessary airflow for good air quality. Because of the short air routing, the wind resistance and therefore the power consumption of the fans is lower compared to a central ventilation system. This leads to a low ventilation energy demand.

Description of the context:

If demand-controlled, manual ventilation can't be guaranteed by the user and the installation of a central ventilation system is not possible, the installation of small ventilation units with reversing operation is an option.

Pros and cons of the solution:

Push-Pull heat recovery systems are suited for historic buildings, because the conventional supply air distribution system (ductwork, supply air valve and silencers) can be omitted. One disadvantage of the system are the too high indoor noise emissions (35 dB(A)) when the system is working within the necessary airflow for good air quality. Therefore, it is difficult to install such systems in quiet rooms. Other disadvantage is the visible exterior air in-and outlet. In historic buildings with a façade without intervention, those elements (min. 20x20 cm) can change the exterior appearance of the building, because there is minimum one element per room.

Type of data available (level of information, simulation):

Part of best practice Bochumer Huette

Are there any related publications or pictures of the solution?

https://www.hiberatlas.com/smartedit/projects/92/Datenblatt_Bochumer_Huette.pdf

Data sheet of best practice Bochumer Huette

<https://www.hiberatlas.com/smartedit/projects/92/pendellüfter.pdf>

Ecological and economical comparison of ventilation systems