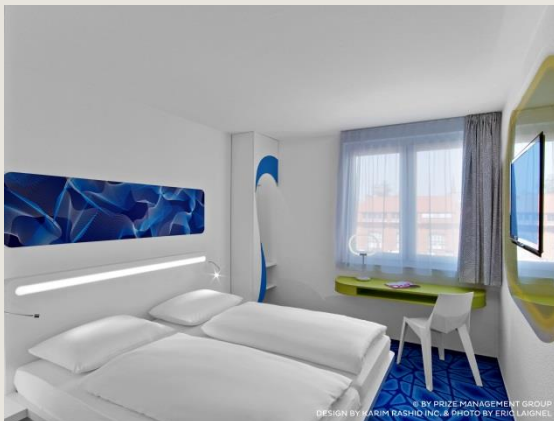


WE MAKE EXCESS ENERGY USEFUL.

Our VRF R2 system in Prizeotel.

New buildings with exciting hotel-business concepts are emerging in many places. The Prizeotel signature-brand hotels, for example, offer an exclusive design ambience with the charm of a private hotel. They combine high-quality design and low accommodation prices to create a consistent concept. The investor is equally consistent on the buildingservices front, using intelligent VFR R2 heat-pump technology to take advantage of excess energy in the building for cost-conscious and environmentally aware heating and hotwater production.



Consistent design for the quality- and price-conscious meets consistent thermal recovery.

In hotels with high design standards we ensure low energy costs.

The Prizeotel concept offers a distinctive combination of low-priced accommodation and remarkable design. For the development of its hotels in Germany the hotel brand, established by hotelier Marco Nussbaum and real estate economist Dr. Matthias Zimmerman in 2006, arranged exclusive collaboration with New York-based international designer Karim Rashid. The first Prizeotel, the Prizeotel Bremen-City, was opened in 2009. It has 127 rooms and has since become established in the market. The second Prizeotel – this time with an impressive 216 rooms – opened in Hamburg in 2014, followed in 2015 by the opening of a third hotel in Hanover with 220 rooms, and

further Prizeotels are being planned in other cities.

Rashid's signature can be found in all the budget-design hotels, from the design of the individual rooms and corridors through to the lounge and lobby areas. The holistic approach to hotels as design objects permits the creative evolution of a concept that can best be described as being smart, pleasant and inspirational, as well as profitable. The combination of comfort and profitability in particular is of particular importance to the group of owners, but it isn't just about quickly generating added value from a cost-optimized investment. It is also important to integrate the ongoing operating costs into the overall economic concept and keep them low in the current financial climate.

Our consistent heat recovery

It is well known that running a hotel gives rise to a variety of operational expenditures. In addition to staff costs, the outlay on technical building services, for instance the heating and air conditioning of a building, is now a key factor in the presentation of a property as being economically sustainable and healthy. The aim: cutting variable costs by permanently reducing the total energy consumption in the building. This is particularly true in

times of energy prices that, while highly volatile, still tend to be rising.

Having acquired initial experience with a classic chiller-based air conditioning system at the Bremen Prizeotel, with the Hamburg project the investor went a step further with the installation of a modern VRF air conditioning system with a heat recovery function. This refrigerant-based system uses thermal energy, which is drawn from the rooms in the building that have a cooling requirement. The thermal energy is then transported within the closed system, which has only 2 pipes, to places where it is of use, resulting in significant savings as well as an increased level of comfort. The system also scores highly with regard to environmental and climate protection on account of the much smaller amount of energy consumed.

Made for major challenges: Technology from Mitsubishi Electric.

Since under the building regulations no outdoor units could be installed on the roof of the Hamburg Prizeotel, a solution using water-cooled VRF direct evaporation machines has been adopted here. They are installed in an internal equipment room on the sixth floor of the hotel. A total of 17 compressor units provide a cooling capacity of approximately 290 kW. The VRF-R2 heat pump system from Mitsubishi Electric's City Multi Series was developed for large and challenging buildings that require individual solutions. It is suitable in particular for hotels, large public buildings and office blocks. Like their air-cooled counterparts, the units in the R2 series with a water-cooled heat exchanger are characterized by a very high level of efficiency in cooling and heat-pump operation.



There are 17 City Multi Series outdoor units in the technical center.

The system in Hamburg has successfully been in operation for around two years, and the energy-consumption data speaks for itself. "Our calculated energy savings of between 30% and 40% have been achieved," explains Bernhard Rieger, sales engineer at Mitsubishi Electric.

Energy shift with a system

The R2-system's central component is the so-called BC controllers (refrigerant distributors), which with the outdoor units form a refrigeration and control entity. Depending on the need for heating or cooling, they distribute the refrigerant as hot gas or fluid to the different internal devices in the hotel rooms. "The BC controllers are assigned to the corresponding floors so that heat can be extracted from the rooms that are to be cooled and transported to the areas of the building that need heat. The heat is thus not discharged unused into the environment via external systems, but remains in a closed circuit," explains qualified engineer Thomas Singer, project manager at Johann Osmer's GmbH & Co. KG, which executed the system and building technology.

The R2 system installed has also proved extremely user-friendly from the control perspective: Heat recovery takes place by means of automatic switchover from cooling to heating, adjusting to the individually set room temperature thanks to an intelligent arrangement of switchover valves, making it possible for each indoor unit to be activated in heating or cooling mode as required independently of the other units. Moreover, guests can set the air conditioning in their hotel room individually within a pre-set temperature range with the compact type PAC-YT52CRA hotel remote control.

The distributors (BC controllers) are housed in the service rooms behind the lift. Only on the sixth floor are they located in the equipment room. The refrigerant pipes are laid in the corridors and then branch off to the respective ceiling-concealed unit in each room. The ceiling-concealed units have a very low cooling capacity of 1.7 kW and a 1.9 kW heating capacity, in line with the requirement, and thanks to their compact design and optimized fan technology they have hardly any visual or audible impact on the sophisticated requirements and habits of the hotel guests, even when operating at the highest power setting.

In the hotel foyer, other unit types are used for design reasons. Four ceiling cassettes create a pleasant climate here. This area is conventionally heated using floor convectors. The system architecture is configured so that the heat can be utilized in a variety of ways. As already described, the excess heat is used primarily to heat the hotel rooms, but should they not need any heating the system offers the option of using the energy to heat water.

Three buffer tanks, each holding 2,000 liters, are preloaded to 40/45 degrees and transfer their heat to the tap water via a fresh-water module using a through-flow process. Sufficient heat is normally available, as the dining room and the server room, in which thermal loads are to be dissipated virtually continuously, have been integrated into the R2 system.

We ensure maximum operating safety using intelligent control technology.

Apart from the individual control of the different appliances in the rooms mentioned earlier, for a property of this size control and monitoring via a central remote controller is desirable. With two AG 150 visual control system units and six expansion controllers in all, as well as input modules for the outside temperature, each individual unit in the building can be monitored and optimized by the building services team from a central location, to ensure optimal functionality. This ranges from recording of the operating status in question, by entering or changing set-point values, through to service reports in certain cases.

However, the system is capable of even more, so as to offer the operator maximum reliability. The option of remote servicing and remote monitoring by Joh. Osmer's GmbH & Co. KG's service technicians is provided by activating the Maintenance Tool Advance. From their location the technicians can log into the local system at any time on the Internet using protected access, and can call up the unit status and change it if necessary. Remote readout of the individual operating states and the sensor system simplifies the search for potential malfunctions. The possibility of

access not only at operational level but also at service level saves both the servicing company and the installation operator unnecessary call-outs to the property.

Conclusion

Several savings potentials can be realized using controlled transportation of thermal energy in a closed system within the building. Firstly, heat from particularly load-intensive areas such as the kitchen, the server room or the rooms on the south side can be moved to where it is needed. Secondly, buffer tanks are loaded with the excess heat, and they heat the tap water, e.g. for showering, or at least preheat the water in the event of especially high water use.

Only in exceptional situations is the heat removed via a heat exchanger or supplied via district heating when there is a very big need for heating.

The Prizeotel Hamburg-City has opted for a sophisticated, quality-oriented concept with regard to system technology. As a result, the investor decided to go for a 2-pipe system from Mitsubishi Electric, as this system can be implemented for monovalent heating. A conventional heating system in the hotel rooms was thus dispensed with completely.

