FläktGroup

AIR TREATMENT

CAIR*plus*

CAIR*plus*®

» MULTIFLOW LIQUID-COUPLED ENERGY RECOVERY SYSTEM

CAIR*plus*® – AIR HANDLING UNITS

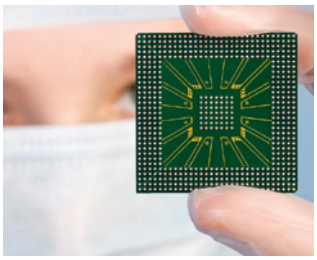
Air treatment (heating, cooling, filtering, humidification and dehumidification) with economic energy recovery for energetic building rehabilitation, hospitals, the pharmaceutical industry and microprocessor production.

Central air-handling tailor-made for the future

The reduction of greenhouse gases enjoys a high political priority. The strategy of the European Union aims at decreasing greenhouse gas emissions by 20%, increasing the proportion of renewable energies by 20% and enhancing energy efficiency by 20% by the year 2020. HVAC Systems provide Air Eco²nomy ventilation and air conditioning solutions that feature maximum economical and ecological efficiency.

Air-handling units play an important role in the building's air conditioning. If the state of the room air is in the close comfort range, we feel well. However, the climate in rooms is affected by many factors and the requirements for air conditioning can differ depending upon the type of room and/or its use. A regular fresh air supply is important. In hospitals and in the pharmaceutical industry as well as in microprocessor production, hygiene is also a special challenge.

Great emphasis is placed on a hygienically appropriate construction in the design and structure of the CAIR*plus* central air handling units. Completely smooth inner surfaces without edges or screw connections and good access to all components guarantee adherence to high hygiene standards. The compliance with all relevant requirements is regularly monitored.



Your advantages:

- Great potential energy sacings
- High hygiene standards
- Compact model design
- Modern control technology
- Performance data
- TÜV certified

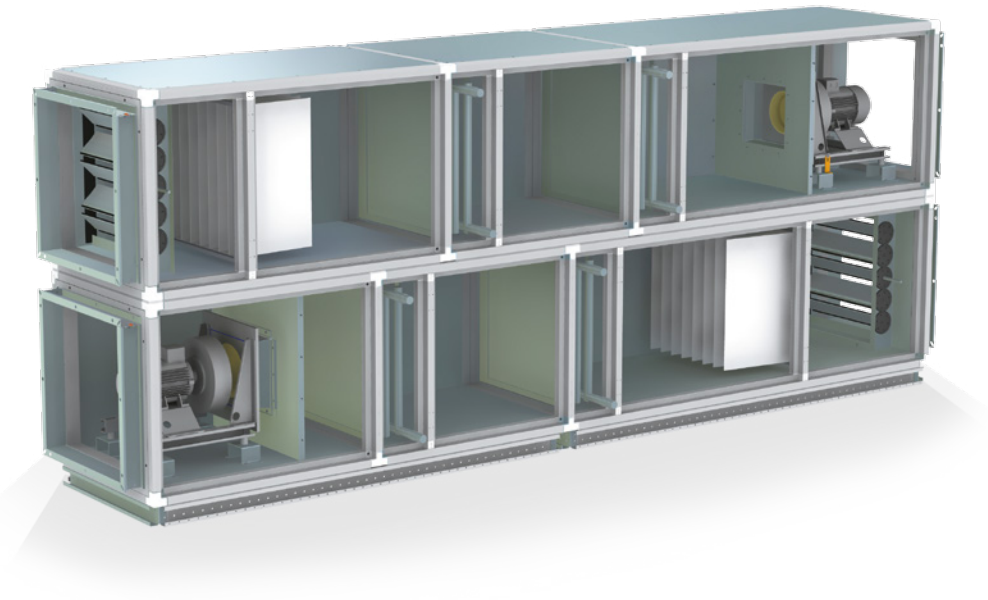
The liquid-coupled heat exchanger **MULTIFLOW**

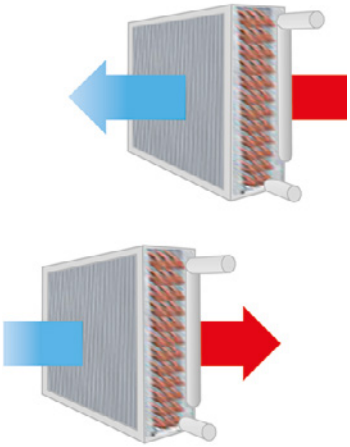
Not the acquisition, but rather the operating costs over the entire lifetime determines the largest part of the costs of a central air-handling unit. For this reason, saving energy and efficient heat recovery are two of the most elementary functions of CAIR*plus*.

It is no longer possible to imagine areas with high hygienic requirements such as the healthcare systems without liquid-coupled energy recovery systems. However, not only for human air conditioning, but also in many sensitive manufacturing areas the MULTIFLOW liquid-coupled energy recovery system is becoming increasingly popular. MULTIFLOW is used when supply air and extract air are completely separated from one another, or in separately installed supply- and extract- air units as well as in applications requiring a high corrosion resistance.

Energy recovery with the liquid-coupled energy recovery system MULTIFLOW:

- Efficiency of more than 80% is possible
- No mixing of the air volume flow – spatially separated placement of supply air and extract air is possible
- Thermodynamically optimized heat exchanger
- Reduction of cooling energy requirements up to 60%
- Frequency-controlled pumps
- Adiabatic cooling (optional)
- Also retrofitting into existing plant





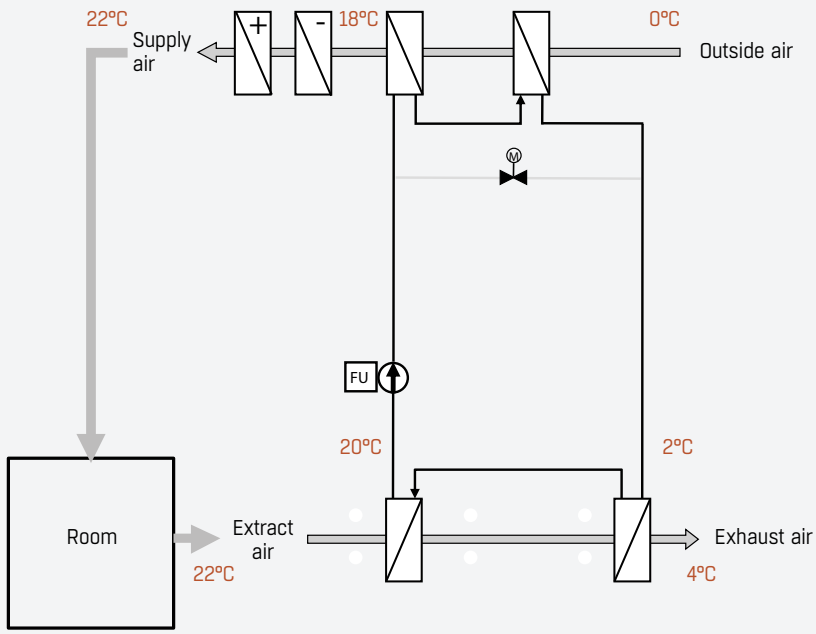
The heat exchangers are thermodynamically optimized. The high counterflow exposure ensures a maximum degree of transfer between the media. With the Multiflow System, the energy efficiency class H1 (according to EN 13053) can be achieved. The performance data are verified and certified by TÜV.

Additional heating or cooler batteries is no longer needed due to the supply of heat and/or cooling to the brine circuit.

Operation mode
Liquid-coupled energy recovery systems

MULTIFLOW

The liquid-coupled energy recovery system as a heat recovery



ECOFLOW as energy recovery

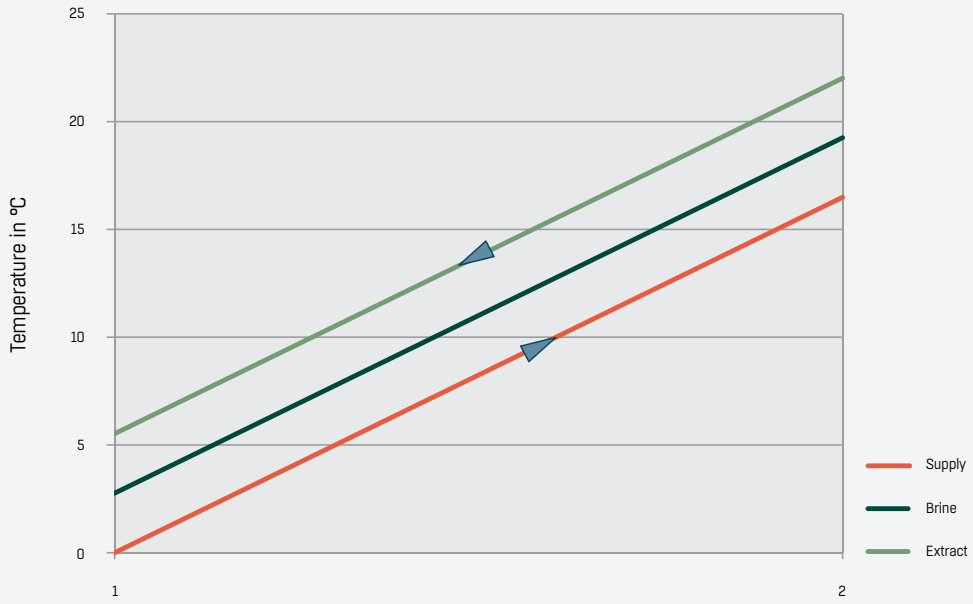
In liquid-coupled energy recovery systems fin-type heat exchangers in the outside and extract-air flow are connected through a brine circuit in the cross-counterflow. In order to guarantee high efficiency, several heat exchangers are installed for each air flow and piped together in cross-counterflow.

The finned overall depth of each heat exchanger meets the standards stipulated by VDI 3803, VDI 6022, DIN 1946, DIN EN 13053 and enables most thorough cleanability. Additionally, a heat exchanger with large fin spacing can be installed for filter pre-warming.

At low outside temperatures there is a risk that condensate freezes in the extract air. Therefore air temperature and humidity are measured at the extract-air inlet and the dew point is calculated on this basis. If the outside-air temperature is within the freeze range, the 2-way control valve is used to adjust the brine temperature above the dew point temperature of the extract air before entering the extract-air heat exchanger. Thus a freezing of condensate in the extract air can be effectively prevented.

Temperature processes | MULTIFLOW

The liquid-coupled energy recovery system as a heat recovery



Temperature changes in the brine flow, supply air and extract-air flow

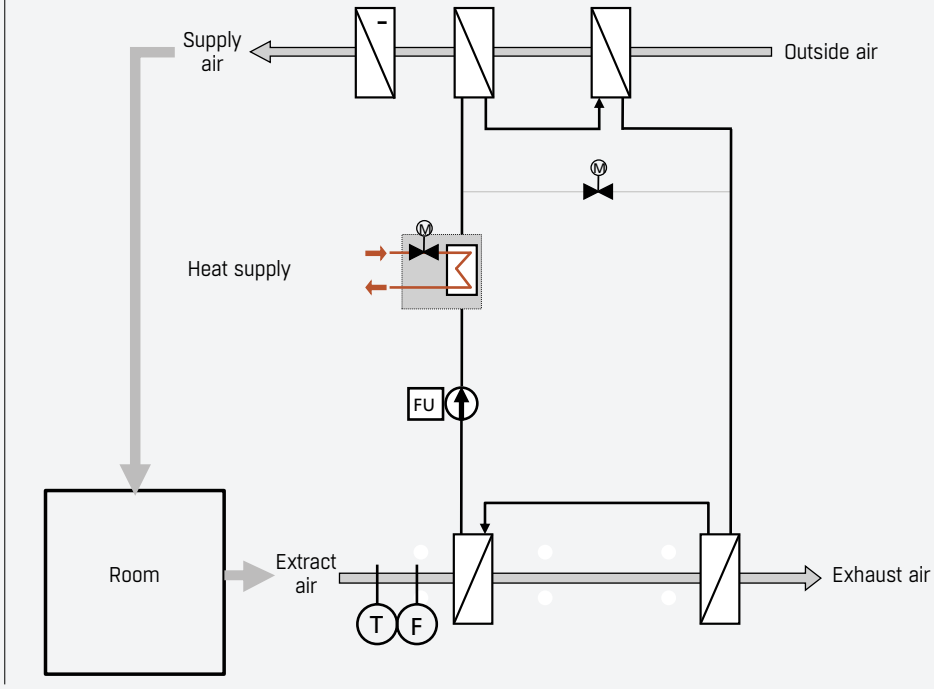
The exact adjustment of the brine volume is crucial for a high efficiency. The highest heat recovery rates can be achieved with the same heat capacity flows m x cp on the air and brine side. Temperature changes in the brine flow, supply air and extract-air flows are then of the same proportion.

Frequency-controlled pumps are used in order to adjust the brine volume accordingly. The control includes the air / water side temperatures and controls the pump for maximum energy recovery.

System extensions

MULTIFLOW | Heat supply into the brine flow

Heat supply into the brine flow



Besides the energy recovery, further functions can be integrated into the system:

- Air warming on the setpoint temperature
- Air cooling
- Cooling energy recovery by integrated adiabatic cooling

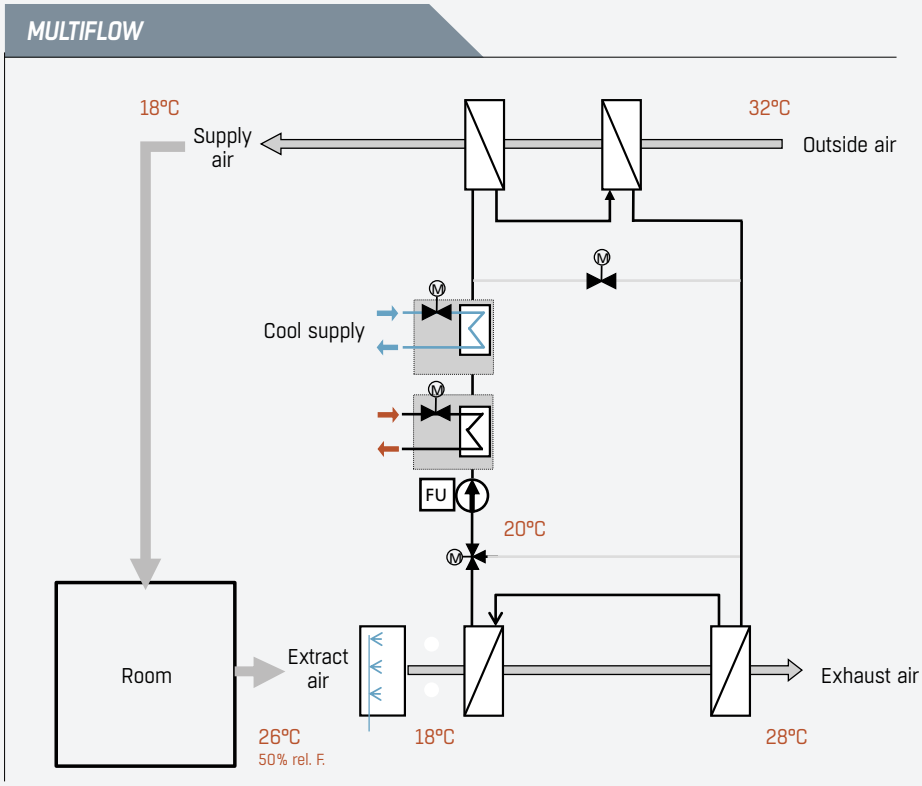
As the heat and cold are directly fed into the brine flow, additional heaters or coolers are no longer required. Thus, the air-side pressure drops and the overall length of the units can be reduced.

Heat supply into the brine flow

Heat is fed into the brine flow via a plate-type heat exchanger.
Thus, a heater assembly in the supply air flow is no longer necessary.

System extensions

MULTIFLOW | Cold supply into the brine flow



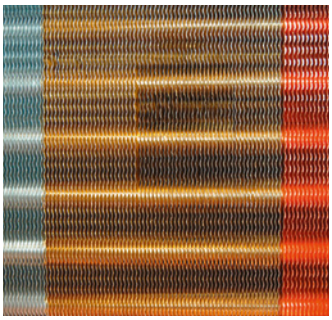
The cold supply into the brine flow usually makes it possible to do without an air-side cooler. The greatest efficiency is particularly achieved in combination with an adiabatic cooling system in the extract-air flow. The extract air is humidified up to saturation and thereby cooled.

The fins of the heat exchanger are epoxy-coated and thus protected against corrosion. Depending on the application, the cooling energy requirement can be reduced by 60%.

Everything from one source
Features and components

Full-face heat transmission

The larger the ribbed face area of the heat transmitter, the lower the pressure drops and the higher the degree of transmission of the system. In the full-face configuration the coil header is located outside the cross-section of the unit, so that virtually the entire cross-section of the unit is available as a ribbed surface. The air-side pressure losses can thereby be reduced by up to 30%. As an experienced manufacturer in the field of air conditioning and air treatment, FläktGroup manufactures high-quality and tailor-made heat exchangers in its own production facilities. Different fin materials and coatings can be delivered in applications which require a high resistance to corrosion:

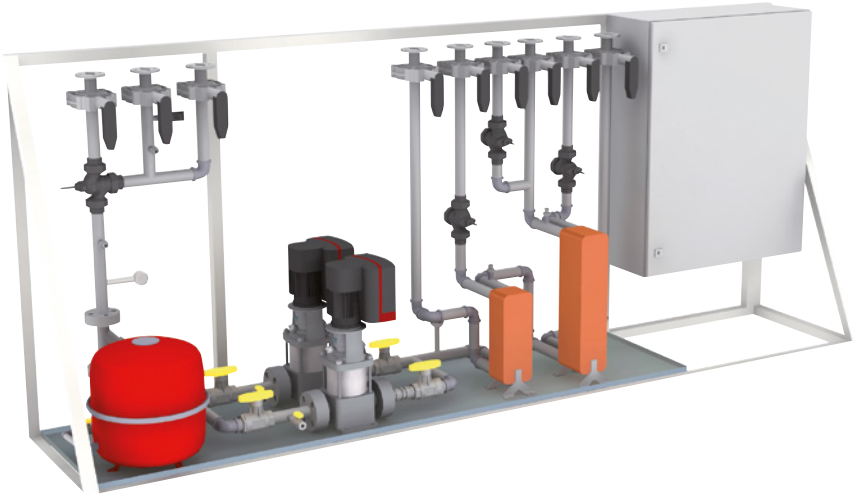


- Aluminum fins
- Aluminum fins, epoxy-coated
- Heat exchanger completely dip-coated
- Copper fins
- Further configurations on request

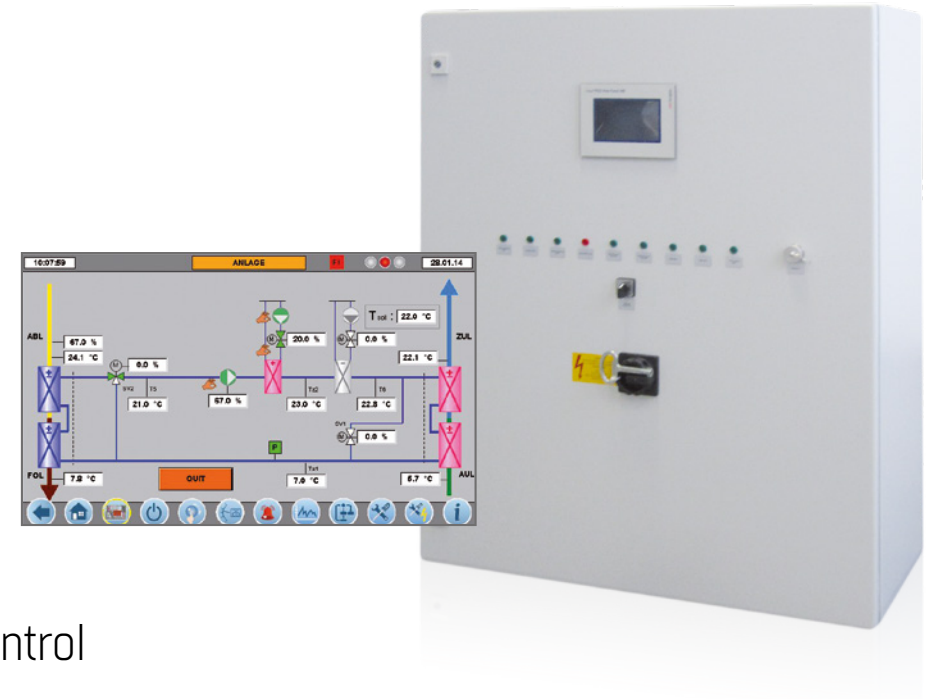
Hydraulic module

All components such as pumps, instruments, plate heat exchanger, compensation tanks, sensor systems, etc. are completely mounted on a base frame. Thus, a complex pipework installation on the construction site can be reduced. The pipework is carried out in welded steel pipe version, painted and insulated. A second pump can be integrated to enhance the operational safety. The multi-level rotary pumps are equipped with high-efficiency motors IE4 up to 2.2 kW, above that with IE3 motors.

Optionally, the hydraulic assembly can be installed in a closed unit casing. All connections for the supply air equipment, extract air unit, heating and cooling connections are found to the upper side of the pump assembly.



SYSTEM CONTROL
CONTROL CABINET



PLC control

State-of-the-art control technology makes an optimal management of the entire air-handling system possible. The PLC control system for Multiflow has the following performance features:

- Programmable microprocessor control
- Active monitoring of the integrated circuit systems
- Pumps controlled according to the optimal operating point
- High-resolution touch screen display (optional)
- Graphic analysis of all operating modes & information
- Manual operation (optional)
- Web Server Application (Tablet / Smart Phone compatible)

The switch cabinet can be mounted either externally or on the hydraulic module.

Fast processor technology makes it possible to determine an optimal operating point with the measured temperatures for the continuously variable regulated pump. All measured data and operating messages are saved continuously. The long-term data can be shown with the Touch Screen Display in the form of a trend display or read out directly in CSV format. The manager of the Multiflow system integrated in the software monitors the function of the pump, the optional redundancy pump and the frost protection avoidance of the liquid-coupled heat exchanger. An interface with the most common BMS systems using ModBus or LON Bus is integrated as a standard. A BACnet GLT can be optionally supported. The software is able to use web server technology for full remote control via external devices.

FläktGroup

EXCELLENCE IN SOLUTIONS

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FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

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