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THE ISOLATOR

As the new year gains momentum, we reaffirm our commitment to innovation and excellence in HVAC technology. As we celebrate the holy month of Ramadan, we reflect on the values of community, well-being, and sustainability—principles that align with our mission of delivering cleaner, healthier air.

Fresh Air Handling Units (FAHUs) are essential to maintaining superior indoor air quality while optimizing energy efficiency. This edition highlights our latest FAHU projects, showcasing our expertise in designing, installing, and optimizing air handling systems across the GCC. From advanced heat recovery to high-efficiency filtration, our FAHUs continue to push the boundaries of performance and sustainability.

As we move forward, we remain committed to trust, quality, and tailored solutions that meet our clients' evolving needs. We hope these updates inspire and inform—here's to a year of progress, innovation, and success.

Enjoy the read!

VISION PLATINUM LIWAN, DUBAI-UAE



KGC proudly reinforces its commitment to cutting-edge HVAC solutions with the successful delivery of **Fresh Air Handling Units (FAHUs) and VRF Outdoor Units** for this prestigious site. Our advanced systems ensure superior indoor air quality, optimal humidity control, and enhanced energy efficiency—creating a healthier, more sustainable living environment.

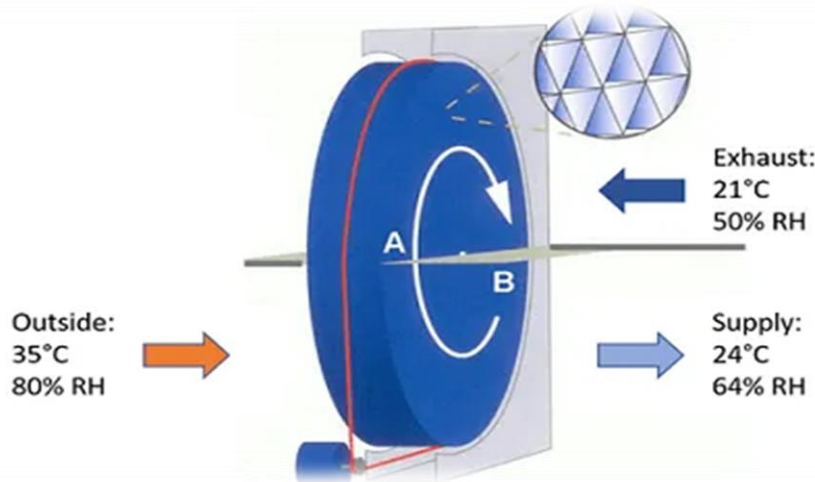
Platinum: The Epitome of Luxury & Innovation

Welcome to **Platinum**, where elegance meets state-of-the-art technology. Designed for those who appreciate excellence, every detail is meticulously crafted to deliver **unparalleled comfort, seamless convenience, and a refined living experience.**

Strategically located in the heart of Dubai, **Platinum offers more than just a residence—it fosters a thriving, dynamic community.** With quick access to the city's top attractions, it seamlessly blends luxury with connectivity, redefining modern living.

TECHNICAL DISCUSSION: HOW TO SAVE ENERGY USING HEAT RECOVERY WHEEL IN FAHU UNITS

Introduction to Heat Recovery Wheel (HRW) IN FAHU units: Heat recovery wheels (HRW), also known as energy recovery wheels, play a crucial role in improving energy efficiency in Fresh Air Handling Units (FAHUs). These rotary devices recover waste heat from exhaust air and transfer it to the incoming fresh air, reducing the energy required for heating or cooling, thus improving HVAC system efficiency.



Types of Heat recovery wheels

1. Sensible Heat Recovery Wheel

- Transfers only sensible heat (temperature-related energy) between the exhaust and fresh air streams.
- Typically made of aluminum or synthetic materials with high thermal conductivity.

2. Enthalpy (Total Energy) Wheel

- Transfers both sensible and latent heat (moisture-related energy), enhancing overall energy efficiency.
- Includes a desiccant coating that absorbs and releases moisture to balance humidity levels.

3. Double Heat Recovery Wheel

- Uses two separate wheels: one for sensible heat recovery and another for latent heat recovery.
- Offers superior efficiency, particularly in extreme climate conditions requiring both temperature and humidity control.

Sensible and Latent Energy Recovery

- **Sensible Energy Recovery:** The transfer of heat without moisture exchange, contributing to temperature regulation.
- **Latent Energy Recovery:** The transfer of moisture along with heat, which helps in maintaining indoor humidity levels.

Working Principle of Heat Recovery Wheel

1. Rotation Mechanism:

- The wheel rotates slowly (typically 10-20 RPM) between the exhaust and fresh air streams.
- The energy transfer occurs as air passes through the porous structure of the wheel.

2. Heat and Moisture Transfer:

- When warm, humid air passes through the wheel, heat and moisture are absorbed.
- As the wheel rotates into the incoming fresh air stream, the stored heat and moisture are transferred, pre-conditioning the fresh air.

3. Efficiency Optimization:

- Advanced wheels with desiccant coatings enhance latent energy recovery.
- Integration with Building Management Systems (BMS) ensures optimized performance by adjusting rotation speed and airflow.

Energy Savings and Benefits

- Reduces heating and cooling load by up to **70-80%**.
- Enhances **indoor air quality** by balancing temperature and humidity levels.
- Lowers **operating costs** by minimizing energy wastage.
- Extends the **lifespan of HVAC components** by reducing strain on heating and cooling systems.

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KINAIR Product Highlight:

KINAIR-Fresh Air Handling Units with VRF Outdoor Units – Detailed Breakdown

The KINAIR-Fresh Air Handling Units (AHUs) with VRF Outdoor Units are designed to optimize air quality, comfort, and energy efficiency in various commercial and industrial applications. Below are the detailed components and features that make up the system, showcasing its advanced design and functionality.

1. PRE FILTER

- **Purpose:** The pre-filter is the first line of defense in removing larger particles such as dust, dirt, and debris from the incoming air.
- **Material:** Typically made of synthetic fibers or wire mesh, which trap particulate matter before it reaches more sensitive components.
- **Benefit:** Helps maintain the efficiency of the system, extends the lifespan of the unit, and reduces the overall maintenance requirement.

2. BAG FILTER

- **Purpose:** After the pre-filter, the bag filter provides a finer level of filtration, capturing smaller particles such as pollen, soot, and finer dust.
- **Construction:** Made of fabric bags that have high dust-holding capacity, they ensure better filtration compared to other types of filters.
- **Benefit:** Improves indoor air quality (IAQ), reduces contaminants, and ensures cleaner air circulation within the building.

3. HEAT RECOVERY WHEEL

- **Purpose:** The heat recovery wheel (also known as a rotary heat exchanger) facilitates energy-efficient ventilation by recovering thermal energy from the exhaust air and transferring it to the incoming fresh air.
- **Functionality:** It rotates between the exhaust and fresh air streams, transferring heat from one to the other, thus reducing the load on the HVAC system and improving overall energy efficiency.
- **Benefit:** Significantly reduces heating or cooling energy consumption, ensuring a lower operational cost.

4. HORSE SHOE HEAT PIPE

- **Purpose:** The heat pipe enhances thermal exchange by using a sealed pipe filled with a liquid refrigerant or coolant.
- **Functionality:** It works in conjunction with the heat recovery wheel or independently, transferring heat from the exhaust air stream to the supply air stream, thus optimizing energy use.
- **Benefit:** It maximizes heat transfer without using additional energy, improving overall system efficiency.

5. DX (DIRECT EXPANSION) COOLING COIL

- **Purpose:** The DX cooling coil is used to cool the incoming fresh air by direct contact with refrigerant flowing through the coil, where heat is absorbed from the air.
- **Design:** Equipped with a coil heat exchanger, the system uses a refrigerant cycle to cool and dehumidify the incoming air to the desired temperature.
- **Benefit:** Efficiently cools air without the need for large volumes of water, making it ideal for environments where space or water usage is limited.

6. SUPPLY AND RETURN PLUG FAN

- **Purpose:** Plug fans are used to circulate air through the unit. The supply fan pushes the conditioned air into the ductwork, while the return fan draws the air back into the system for reconditioning.

- **Design:** These fans are highly energy-efficient, providing optimal airflow while minimizing power consumption. They are designed to be both compact and effective.
- **Benefit:** Ensures consistent airflow across the system, optimizing performance and providing stable indoor air quality. The plug fan design is ideal for high static pressure applications, ensuring efficient air movement.

7. VFD (VARIABLE FREQUENCY DRIVE)

- **Purpose:** The VFD controls the speed of the fans and motors, allowing the system to adjust airflow based on the actual demand for air conditioning and ventilation.
- **Functionality:** It regulates the speed of the fan or pump to match the required load, which helps to reduce energy consumption and wear on mechanical parts.
- **Benefit:** Provides significant energy savings by adjusting the fan speed and reduces operational costs. It also increases the longevity of system components by avoiding unnecessary mechanical stress.

8. VRF OUTDOOR UNITS

- **Purpose:** The VRF outdoor units are responsible for providing the cooling or heating required by the Fresh AHUs. These outdoor units are connected to the AHU's DX coils for direct refrigeration.
- **Design:** VRF systems use multiple indoor units connected to a single outdoor unit, with the ability to modulate the refrigerant flow based on the needs of each zone. This allows for tailored cooling/heating in different areas.
- **Benefit:** VRF systems are highly energy-efficient, offering precise control over temperature and airflow while maintaining individual zone comfort. The flexibility of a VRF system allows for a more optimized and cost-effective solution compared to traditional HVAC systems.

OVERALL SYSTEM BENEFITS:

- **Energy Efficiency:** The combination of heat recovery, DX cooling coils, and VRF outdoor units ensures energy savings by recovering waste heat and optimizing cooling loads.
- **Air Quality:** The system effectively filters and conditions incoming air, ensuring a cleaner and healthier environment.
- **Flexibility:** The modular nature of the system and the use of advanced components like the VFD and VRF provide flexibility for custom installations and scalability.
- **Environmental Impact:** The use of advanced filtration, energy recovery, and eco-friendly refrigerants contributes to a reduced environmental footprint.
- **Ease of Maintenance:** The system's design includes accessible components, and the integration of VFDs helps in reducing mechanical stress, lowering the need for frequent maintenance.

By integrating these advanced components, the KINAIR-Fresh Air Handling Units with VRF outdoor units offer superior performance in terms of energy efficiency, air quality, and comfort.

Conclusion

The incorporation of heat recovery wheels in FAHU units is a highly effective strategy for optimizing HVAC performance and achieving significant energy savings. By leveraging advanced technologies, such as double heat recovery wheels and AI-driven monitoring, buildings can achieve superior air quality while reducing overall energy consumption. This makes HRW-equipped FAHUs an essential component for modern sustainable building designs.