GENERAL

air handling units systemair

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Introduction

In the world of building climate control, the term **air handling units** often appears in the same breath as HVAC, ventilation, and indoor air quality. These critical components are responsible for regulating temperature, humidity, and contaminant levels throughout commercial, industrial, and institutional spaces. Among the many manufacturers that deliver reliable performance, **Systemair**has emerged as a trusted name, offering a range of air handling units (AHUs) that combine advanced technology with energy efficiency.

This article explores the fundamentals of AHUs, delves into the specific strengths of Systemair's product line, and provides practical guidance for selection, installation, and maintenance. Whether you are an HVAC professional, a facilities manager, or a building owner, the information here will help you make informed decisions that enhance comfort, reduce operating costs, and support sustainability goals.

What Are Air Handling Units?

Air handling units are modular devices that process and distribute conditioned air throughout a building. They perform a series of functions—cooling, heating, filtering, humidifying, and dehumidifying—before delivering the air through the ductwork system to individual rooms or zones.

Core Components

Typical AHU components include:

- Fan Assembly – Moves air through the unit.
- Heat Exchanger – Transfers heat between supply and return air.
- Filters – Capture particulates and contaminants.
- Coils – Provide cooling or heating.
- Control System – Regulates fan speed, temperature, and airflow.

Types of AHUs

Depending on the building's requirements, AHUs can be categorized as:

1. Single-duct – Uses one duct for both supply and return air.
2. Dual-duct – Separates supply and return ducts for greater flexibility.
3. Variable air volume (VAV) – Adjusts airflow based on demand, improving energy savings.
4. Dedicated outdoor air units (DOAUs) – Provide 100% fresh air to meet ventilation standards.

The Role of Systemair in AHU Design

Systemair has positioned itself as a pioneer in the AHU market, delivering units that are engineered for high performance, reliability, and ease of integration. Their approach blends proven engineering with forward thinking features that address the evolving needs of modern buildings.

Systemair''s Innovations

Key innovations include:

- Modular Design – Facilitates rapid installation and future upgrades.
- Advanced Filtration – Incorporates HEPA and electrostatic filters for superior air quality.
- Smart Controls – Enables integration with Building Management Systems (BMS) and IoT platforms.
- Low Noise Fan Technology – Utilizes variable frequency drives (VFD) and sound absorbing housings.

Benefits of Systemair AHUs

By choosing Systemair units, building owners gain:

- Energy Efficiency – Reduced power consumption through optimized fan curves and heat recovery.
- Reliability – Robust construction and rigorous testing lead to lower downtime.
- Scalability – Modular components can be added or removed as space requirements change.
- Enhanced Indoor Air Quality – Multi stage filtration and humidity control maintain healthy environments.

Key Features of Systemair Air Handling Units

Systemair's AHUs are engineered around several core features that set them apart from competitors.

Energy Efficiency

Systemair's units incorporate variable speed drives and advanced heat exchangers, reducing energy use by up to 30% compared to standard models. The use of high efficiency motors and optimized fan blade design further contributes to lower operating costs.

Filtration Systems

Indoor air quality is paramount. Systemair offers:

- Pre Filters – Capture dust and large particles.
- Electrostatic Filters – Electrically charged fibers attract fine particulates.
- HEPA Filters – Remove 99.97% of particles 0.3 microns in size.
- Optional UV C Light modules for microbial control.

Controls & Automation

Modern buildings demand intelligent control. Systemair's AHUs come with:

- Integrated PLCs – For local control and fault detection.
- Modbus/TCP and BACnet interfaces – Seamless BMS integration.
- Real time monitoring dashboards – Accessible via web or mobile apps.

Noise Reduction

Low noise operation is essential in office spaces, hospitals, and schools. Systemair achieves this through:

- Variable frequency drives that adjust fan speed to match demand.
- Sound attenuating housings and vibration isolation mounts.
- Optimized ductwork layout to minimize turbulence.

Installation and Integration

Proper installation ensures that Systemair AHUs perform at their best. Below are key steps for a successful deployment.

Site Assessment

1. Measure available space, including clearances for maintenance.
2. Evaluate existing ductwork and determine required modifications.

3. Assess electrical capacity and plan for VFD installation.
4. Identify noise constraints for sensitive areas.

Ductwork Design

Systemair's modular units allow for flexible duct sizing. Use the following guidelines:

- Maintain a pressure drop of less than 0.5 /in /WC for most applications.
- Use smooth walled ducts to reduce turbulence.
- Incorporate dampers and return air grilles for balanced airflow.
- Apply acoustic panels where necessary to meet noise regulations.

Electrical & Controls

Electrical connections should follow local codes and manufacturer recommendations:

- Install a dedicated circuit with a 125 /V or 208 /V supply, depending on fan size.
- Use a VFD rated for the fan's maximum horsepower.
- Configure PLC inputs for temperature, pressure, and airflow sensors.
- Integrate with the building's BMS using Modbus/TCP or BACnet/IP.

Maintenance Best Practices

Regular maintenance is vital to preserve the performance and lifespan of Systemair AHUs.

Routine Checks

1. Inspect fan belts and bearings for wear.
2. Verify VFD operation and check for error codes.
3. Examine duct connections for leaks.
4. Confirm that control settings match design specifications.

Filter Replacement

Filter life varies with usage and air quality. Typical schedules include:

- Pre filters: every 3–6 /months.
- HEPA or electrostatic filters: every 6–12 /months.
- UV C modules: replace lamps annually.

Performance Monitoring

Use the built in monitoring system to track:

- Airflow rates versus setpoints.
- Temperature differentials across coils.
- Fan motor temperature and vibration.
- Energy consumption trends.

Address any deviations promptly to prevent system inefficiencies or failures.

Case Studies & Applications

Systemair AHUs have proven effective across a variety of building types.

Commercial Buildings

In a downtown office tower, a Systemair dual duct AHU was installed to provide both cooling and heating with

variable air volume control. The result was a 25% reduction in HVAC energy usage and a noticeable improvement in occupant comfort.

Healthcare Facilities

A regional hospital required stringent air quality controls to protect patients. Systemair's HEPA filtered units, combined with UV C sterilization, ensured that airborne contaminants were minimized, meeting the stringent standards set by health authorities.

Educational Institutions

In a university science building, Systemair's low noise AHUs allowed for quiet study environments while delivering fresh air to laboratories. The modular design enabled future expansion as the campus grew.

Choosing the Right Systemair AHU

Selecting the appropriate unit involves balancing performance, cost, and future needs.

Performance Metrics

Key metrics to evaluate include:

- Airflow capacity (CFM).
- Static pressure rating.
- Coil efficiency.
- Fan power consumption.
- Noise level (dB).

Budget Considerations

While Systemair units may have a higher upfront cost, they often offer lower operating expenses. Consider:

- Energy savings over the unit's lifespan.
- Reduced maintenance requirements.
- Warranty and service agreements.

Sustainability Goals

Many buildings now pursue LEED or WELL certifications. Systemair units contribute by:

- Using recyclable materials.
- Providing high efficiency controls.
- Supporting indoor air quality targets.

Future Trends in AHU Technology

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