

Advanced Control Strategy

VENTILATION FORWARD

Overview

Dectron delivers enhanced performance, efficiency, and control by integrating active airflow monitoring and control with Ventilation Forward technology, now standard across all Dectron machines.

This upgrade provides smarter air management for optimized building environments by actively monitoring and modulating airflow to maintain consistent performance under varying conditions.

Key Technical Enhancements

Active CFM Monitoring & Control

2-16 Ton [DS Systems]:

- Transition from percentage-based control to direct CFM control for supply air blowers, **improving room stability and indoor air quality while maintaining efficiency.**
- **Consistent airflow, even as conditions change.** A built-in sensor on the fan continuously monitors and adjusts speed to maintain target CFM, even as filters load with dust or coils become dirty. This ensures steady ventilation performance without manual recalibration.
- User-activated energy savings during downtime. When enabled, the unoccupied setback mode **significantly reduces blower power during periods of no occupancy**, helping save energy without compromising future system readiness. This feature is available on both DS and LD systems.

20-120 Ton [LD Systems]:

- Transition from percentage-based control to direct CFM control for supply air blowers.
- Full CFM monitoring and control are implemented on all outdoor air (OA) and exhaust air (EA) openings, ensuring **proper balance and ventilation performance**.
- Enthalpy sensor integration on OA to inform economizer decisions. (see Figure 1).
- Enables the use of the maximum available airflow openings for enhanced economizer cooling and dehumidification.

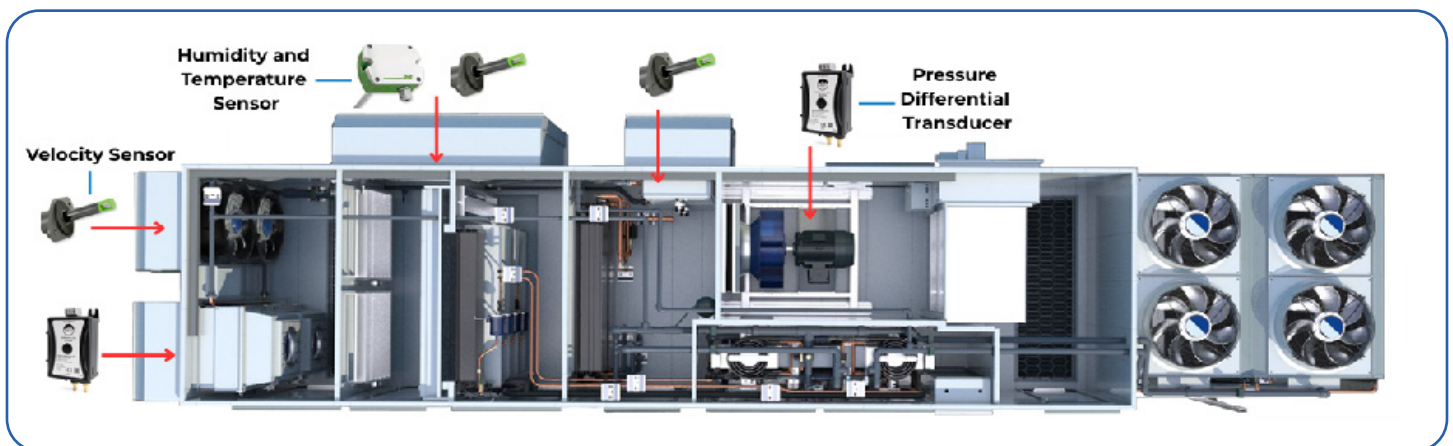


Figure 1. Sensor placement diagram showing the location of all sensors on the LD model.

Energy Efficiency and Performance Improvements

2-16 Ton [DS Systems] Example:

- A 5-ton unit with 2500 CFM supply air and 500 CFM outdoor air **can reduce supply air to 2000 CFM during unoccupied mode**.
- This adjustment reduces blower power from 1.28 kW to 0.83 kW (approximately 35% power reduction), resulting in **significant annual energy savings** (up to 1.6 MWhrs).

20-120 Ton [LD System] Example:

- A 60-ton unit with 30,000 CFM supply air and 7,000 CFM outdoor air can reduce supply air to 23,000 CFM in unoccupied mode.

- This results in a blower power reduction from 25.1 kW to 14.8 kW (about a 41% reduction), **saving over 30 MWhrs annually.**

Optimized Air Management

Ensures maintained space negativity by **actively modulating the balance between outdoor and exhaust air**, which is critical for environments that require controlled indoor air quality such as indoor pools.

Intelligent modulation enables the **effective use of available opening sizes**, enhancing economizer performance by **transitioning from fixed to variable airflow strategies (up to 1.6 MWhrs).**

Implementation Considerations

Seamless Integration:

- The upgrade applies to all new production units and quoted systems as of April 1 2025, without changes to unit size, weight, or drawings.
- Additional control components are included, but no physical modifications to the unit structure are required.

Field Application:

- The shift from a fixed percentage control to active CFM monitoring means **improved reliability in maintaining airflow targets, even as environmental conditions vary.**
- In Ton 20-120 [LD], the expanded use of available outdoor and exhaust air capacity ensures that the economizer function is optimized for **energy savings and equipment longevity.**

For further technical details or field application support, please contact your Regional Sales Manager.