



DX Units

Ranging from 15 to 750 tons
and 1,000 to 300,000+ CFM



INDUSTRY-LEADING HVAC MANUFACTURER

Nortek Air Solutions is the largest custom HVAC manufacturer in North America, with a combined total of more than 350 years of experience, five strategically located manufacturing facilities which encompass over 1.5 million square feet of manufacturing space and 150 sales representative offices. Our brands serve customers in the commercial, institutional and industrial markets with a full range offering of small, mid and large size air handling products ranging from 15 to 750 tons and 1,000 to 300,000+ CFM.

Energy Recovery Systems

Nortek Air Solutions offers innovative energy recovery systems that integrate advanced technologies and components into the HVAC system design. These systems extract energy in the airstream reuses it to either pre-heat or pre-cool the outdoor airstream, resulting in significant energy savings with a reduction in the building's heating and cooling loads.

During warmer seasons, the system pre-cools and dehumidifies the incoming ventilation air by sending the rejected heat into the exhaust airstream to cool the condenser coil at a lower temperature. During cooler seasons, the system uses the heat from the exhaust airstream to pre-heat and add humidity the incoming ventilation air.

We offer several types of energy recovery technologies:

- Rotary wheels - Air-to-air energy recovery wheels that draw in heat energy and releases it into the colder airstream.
- Flat plate exchangers - Alternating layers of plates that are separated and sealed with a heat or energy recovery core that treats the incoming air.
- Heat pipes - Air-to-air heat exchangers consisting of metal tubes charged with a refrigerant.

Our innovative energy recovery systems offer several benefits, including:

- Improved indoor air quality
- Energy savings
- Moisture control
- Compliance to outdoor air, energy efficiency, humidity control and occupant satisfaction standards

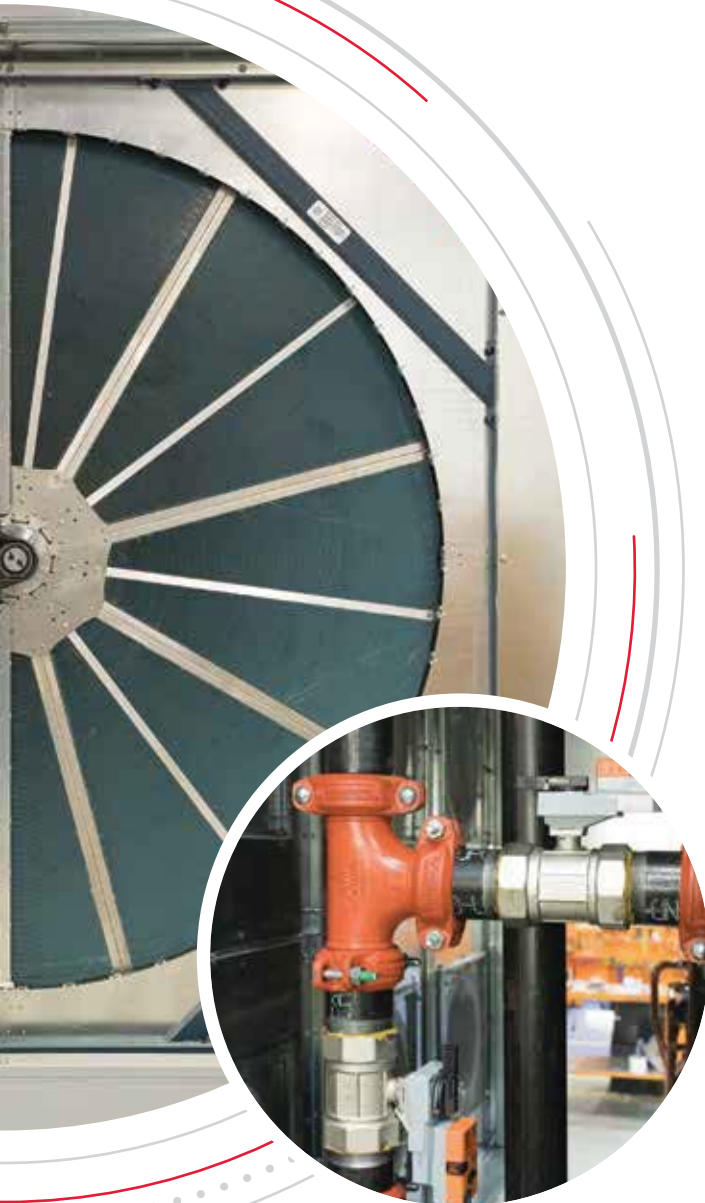


Energy Recovery Ventilators with Integrated Heating & Cooling

The VHC Series is a flexible, cost-effective 100% outdoor air energy recovery ventilator with integrated heating and cooling. It is a high-end light commercial product offering with a full list of custom options. The cabinet is constructed with fiberglass insulation as standard (rigid foam optional). The equipment features a high-performance enthalpy wheel, certified to AHRI Standard 1060, that can be custom selected for multiple performance levels to meet your requirements.

VHC Series units are engineered for maximum efficiency and deliver the highest Combined Efficiency (CEF) not just by having a high-performance enthalpy wheel, but also by including a variety of options that, when combined, provide the highest application energy efficiency ratio (EER) on the market:

- Minimum Outdoor Air Correction Factor (OACF) to eliminate unwanted OA requirements with oversize exhaust fan motors for extra CFM.
- Scroll Digital™ Compressors for superior temperature control and part-load operation.
- Microchannel heat exchanger for all integrated air-cooled packages for maximum efficiency in a compact, lightweight package.
- High efficiency polymer ECM fan wheels in both supply and exhaust airstreams.



Category	Product	Tons	Placement	CFM	Energy Recovery
Energy Recovery Systems	VHC	3 to 21	Rooftop/Interior	800 to 5,500	Yes
Packaged Systems	EnergyPack®	5 to 380	Rooftop/Interior	1,000 to 300,000+	Yes
	Ultraline™	5 to 380	Rooftop/Interior	1,000 to 300,000+	No
Vertical, Self-Contained	V-Cube™	9 to 180	Interior	3,000 to 42,500	No
	V-Cube™ Slim	15 to 70	Interior	5,500 to 24,100	No

Energy Recovery Ventilators with Integrated Heating & Cooling continued

The VHC unit is suitable for both indoor and outdoor applications and features an integrated base rail for strong structural integrity. The unit includes a Direct Digital Controller (DDC) to provide complete integration with existing BMS and network systems.

Frost control options include:

- Electric preheat
- Recirculation
- Exhaust only
- Variable Speed Drive (VSD)

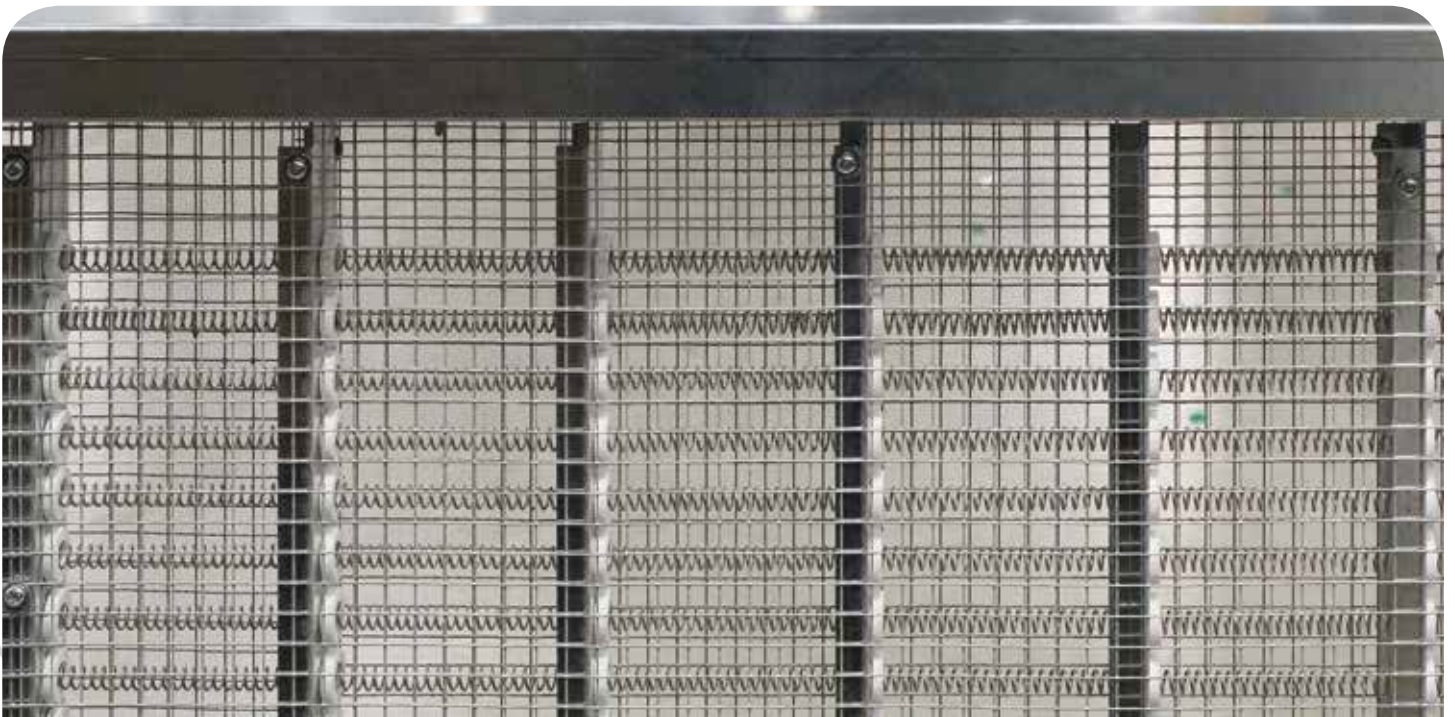
Innovative Features

Post conditioning cooling options:

- Non-integrated chilled water or split direct expansion (DX)
- Integrated air cooled direct expansion (DX)
- Integrated water source heat pump or ground source heat pump

Post conditioning heating options:

- Indirect fired gas heat
- Hot water coils
- Steam coils
- Electric reheat
- Integrated water source heat pump or ground source heat pump



Packaged, Energy Recovery Systems

Packaged, energy recovery systems meet specific application requirements by providing all components of the air handling system including energy recovery capabilities in a self-contained enclosure. A complete, factory prebuilt structure adds flexibility to the design of the system, resulting in the lowest possible footprint that maximizes the internal space available for the architecture it is being integrated with.

Packaged, energy recovery systems can be delivered to a jobsite complete or in shipping sections that can be lifted into place and connected to electrical, plumbing or other utility services. Ample service access through walk-in doors and/or service vestibules provide protection from outdoor weather conditions and simplifies regular maintenance and service for optimal performance.

EnergyPack®

EnergyPack is a self-contained system that integrates energy recovery ventilation into the architecture of a structure for a very cost-effective method of introducing the maximum amount of outdoor air for dilution, resulting in precise environmental control. It offers a variety of features and options to provide superior temperature and humidity control along with quiet operation, including FANWALL TECHNOLOGY®, specialty filtration, integrated or non-integrated post conditioning technologies and integrated DDC controls.

The packaged unit features a low leakage cabinet with thermally broken exterior panels, center partition, roof and base structures to maximize heat transfer and minimize the possibility of condensation on interior or exterior surfaces. Standard double wall, no-through-metal Integrated Thermal Break Framing™ (ITF) cabinet construction with no exposed insulation and optional direct drive fans eliminate fiber erosion in the supply airstream. IAQ sloped drain pans and materials help prevent microbial growth and provide easily cleanable surfaces, along with easy access for regular cleaning and scheduled maintenance.

EnergyPack components consist of high performance enthalpy wheels, heat pipes, aluminum plates, polypropylene plate and heat and moisture (HM) membrane latent cores (in single or multiple heat exchanger combinations); all certified to AHRI Standard 1060. Digital scrolls for modulating temperature control and operation.



Packaged Systems

Ultraline™

Ultraline is a self-contained, custom packaged system that is integrated into the architecture of the structure; either in an interior room or on the rooftop. It sets the bar for meeting the comfort, sound, efficiency, environmental, and indoor air quality requirements of the individual building it serves. Virtually unlimited options optimize efficiency, indoor comfort and indoor air quality.

The unit incorporates innovative technology like optimized condenser and coil options, flexible configurations and FANWALL TECHNOLOGY® that solves even the most challenging applications. Ultraline units can be delivered to a jobsite complete or in shipping sections, reducing installation time and cost for both new construction and retrofit projects.

Quality construction includes tube frame, self-flashing base frame with 3-inch, double-wall construction that maximizes durability and integrity. Ample service access is provided through walk-in doors and/or service vestibules that provide protection from outdoor weather conditions and simplify regular maintenance and service for optimal performance.

Multiple configurations are available to match application requirements, including blow-through or draw-through operation, return or exhaust fan operation and custom configurations to match footprint requirements. Standalone or integrated controls are offered for optimum performance using the building management system and leading communications protocols: BACnet®, Modbus® and N2®.

Multiple heating options provide the most economical solution and consist of an integrated system of state-of-the-art fans, efficient motors, controls, ultra-quiet condenser fans and accessories are matched in each solution to meet air handling requirements.



Vertical, Self-Contained

Vertical, self-contained systems provide a customized configuration that affords tremendous design flexibility and quiet operation since they are typically installed near occupied spaces. Taking a floor-by-floor approach gives occupants more individual control over comfort conditions and utility costs for their space with multiple compressors that allow for efficient turndown in variable air volume (VAV) applications.

V-Cube™

V-Cube vertical self-contained systems are high efficiency, value-driven solutions for floor-by-floor air conditioning in medium- to high-rise commercial and institutional buildings. These units combine a compact design and flexible configurations with advanced features like FANWALL TECHNOLOGY®, an integrated EPIC™ DDC system controller, and a factory-installed Variable Frequency Drive (VFD). They are highly flexible to meet application requirements, offering a range of capacities and airflow, configurations, coil and filter options, exceptionally quiet and efficient fan options — including FANWALL TECHNOLOGY — and additional features to improve system performance, increase energy efficiency or reduce sound levels.

Integrated Thermal Break Framing™ (ITF) cabinet construction for industrial-grade, high-sealing integrity. Airtight and watertight floor membrane to improve leakage characteristics and minimize sound transmission. 3-inch R12.9 insulation in the walls, roof, and doors, a welded base frame (6-inch structural tubing perimeter), and double-seal thermal break doors. Easy maintenance design, including unit tooled access panels, cleanable-in-place shell and tube condenser, and a dual sloped, stainless steel drain pan.

Each V-Cube is custom designed and built to meet project requirements. The compact footprint reduces the unit's space requirements, and its modular construction allows the unit to fit through

standard 3-foot doorways and in-service elevators. Additionally, the unit features independent refrigerant circuits, an easy maintenance design, and standalone integrated system controls.



Vertical, Self-Contained continued

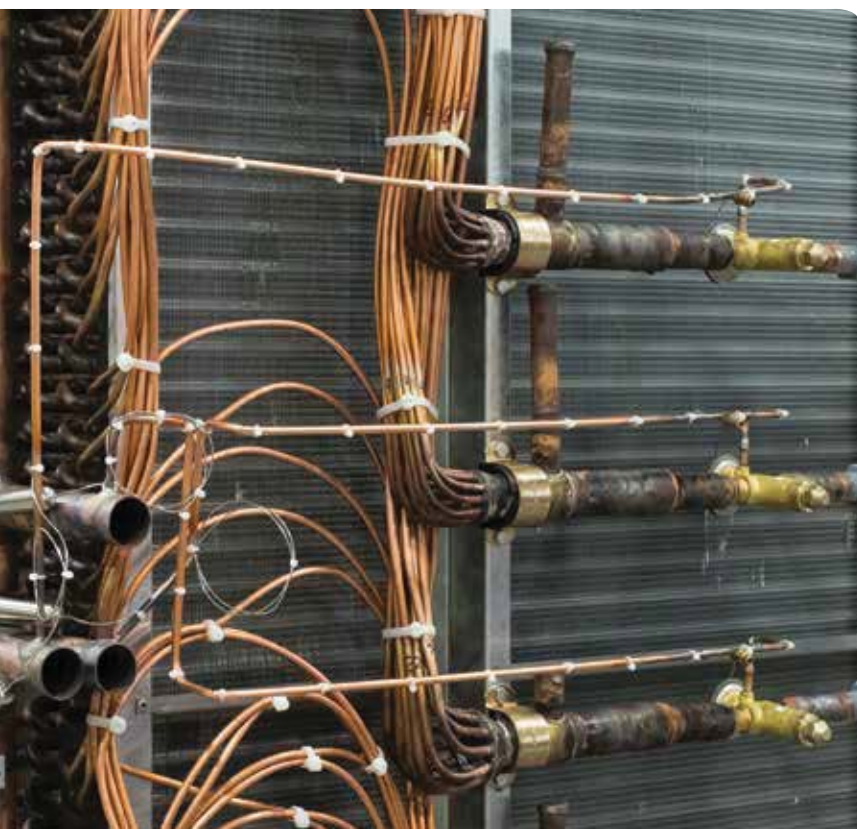
V-Cube Slim™

V-Cube Slim vertical self-contained systems are a high efficiency, solution for floor-by-floor air conditioning in medium- to high-rise commercial and institutional buildings. The V-Cube Slim combines advanced features such as FANWALL TECHNOLOGY® and a standard, factory-installed variable frequency drive (VFD). Standard double-wall construction and dual-sloped stainless-steel drain pan help prevent microbial growth and provide an easily cleanable surface.

They are highly flexible in meeting application requirements by offering filter and coil options and multiple configurations that include water cooling, direct expansion (DX) with optional waterside economizer, standard or geothermal water source heat pump and makeup air units. A compact footprint, and quick-connect design of the V-Cube™ Slim make these units ideal for retrofit applications.

Its modular construction allows units to be disassembled into sections that fit through standard 3-foot doors with electrical quick-connects between sections. The refrigeration system remains intact for easy reassembly, thereby allowing for quicker field assembly.

FLEXIBLE DX HEATING AND COOLING OPTIONS THAT MEET A VARIETY OF DEMANDS



Nortek Air Solutions complete line of Energy Recovery, Packaged, Vertical Self-Contained systems offer direct expansion (DX) coil options. DX coils are ideal for utilization in situations that require smaller footprints, thereby lowering installation costs and minimizing the quantity of components requiring installation or maintenance (or servicing). This type of coil configuration allows these air handler units to be integrated into a greater number of scenarios, including rooftops and internal spaces.

COMPLETE LINE OF DX COOLING TECHNOLOGIES



Nortek Air Solutions offers a full line of DX coils that meet any demand or application. The coils come in 3-, 4-, 5-, 6-, 8-, 10- and 12-row configurations.

- Split DX optional post conditioning – Split system allows for a more flexible system designs and variable performance.
- Integrated air-cooled DX – Can be combined with additional components that offer further or extra capabilities such as heat recovery.
- Water-cooled DX with or without water-side economizer – Cools the compressor and may/may not implement a water-side economizer.
- Air-cooled DX with remote condensing, water-side economizer – Takes advantage of “free cooling”, where applicable.
- DX with optional waterside economizer with reheat – Used in occupancy cooling solutions where the air is cooled, and then dehumidified before being reheated.
- Packaged DX with VAV – Enables the airflow to be varied while keeping it at a constant temperature.
- Packaged DX with Make-up air systems – Brings new air into a location that is constantly having air removed.
- Packaged DX with brazed plate condensers – Corrugated, blazed plate heat exchangers that are joined to form two closed circuits on different levels.
- Packaged DX with cleanable shell and tube condensers – Shell with tubes design where fluid runs through the tubes while different fluid flows over the tubes to create a heat exchange.
- Evaporative Condensing Option – Reduces the amount of mechanical cooling needed by using the evaporation process to improve the heat rejection process.

CAPABILITIES AND OPTIONS

	VHC	V-Cube™ Slim	V-Cube™	EnergyPack®	Ultraline™
Energy Recovery Device (Air to Air)	X			X	
Integrated Air-Cooled DX	X			X	X
Split Air-Cooled DX	X		X	X	X
Air-Source Heat Pump (Integrated or Split)				X	X
Evaporative Condensing				X	X
Integrated Water-Cooled DX	X	X	X	X	X
Water-Source Heat Pump	X	X		X	X
Airside Economizer	X	***	X	X	X
Waterside Economizer		X	X	X	X
Hot Gas Reheat with Dehumidification Controls	X	X	X	X	X
Indirect Fired Gas Heat	X			X	X
Hot Water Heating Coil	X	X	X	X	X
Steam Heating Coil	X	X	X	X	X
Electric Heating Coil	X		X	X	X
Direct Digital Controls (DDC) with Communication Protocol	X	X	X	X	X

*** V-Cube Slim offers Airside Economizer Controls for remote Dampers only

INDUSTRY PIONEERS AND LEADING INNOVATORS



Nortek Air Solutions offers the expertise of the largest group of custom heating, ventilation, and air conditioning (HVAC) brands in North America. With that level of experience, we take pride in being industry pioneers and leading innovators. It's our goal to provide you with the best performing, most energy efficient, and most cost-effective HVAC solutions on the market.

COMMITMENT TO SUPERIOR PERFORMANCE

Nortek Air Solutions offers the expertise of the largest group of custom heating, ventilation, and air conditioning (HVAC) brands in North America. We are driven to help you create the right experience with our solutions, to provide dependable products tailored to meet your specific needs, and to collaborate with you in an easy-to-do-business-with manner. We take pride in being industry pioneers and leading innovators. And we aim to earn your business through our performance. Find your local Nortek Air Solutions Representative by visiting www.nortekair.com.



INDUSTRY-LEADING CUSTOM DX UNITS



Nortek Air Solutions Venmar CES produces cost-effective, energy-efficient, energy recovery packaged DX solutions for the commercial ventilation market. It is committed to preserving the environment through exhaust air energy recovery and by recycling waste energy and using it to precondition outdoor air. This significantly reduces the heating, cooling, and humidification loads required to maintain proper levels of temperature and humidity within occupied spaces, and is all contained within one packaged unit.

Specializes in:

- 1,000 to 300,000+ CFM
- High-performance, custom-built DX units
- AHRI Certified™ energy recovery systems (enthalpy wheels, plate exchangers and heat pipes)
- Air/water cooled condensing units and water/ground source heat pumps
- Evaporative condensing
- Nearly unlimited options for air movement, filtration, air-to-air energy recovery and DDC controls
- Standalone DDC Controls with Protocol
- FANWALL TECHNOLOGY®
- ASHP (air source heat pumps)



Nortek Air Solutions Mammoth produces custom, packaged HVAC systems. The company is a leader in providing and meeting a variety of indoor environmental needs; whether it be a change to an existing building or a new structure. Solutions include meeting impossibly small footprints, extremely low sound requirements, high operating efficiency and filtration standards and providing multiple levels of redundancy; all concealed within the building design.

Specializes in:

- Packaged rooftop systems
- Packaged interior systems
- Vertical, self-contained systems
- ASHP (air source heat pumps)
- WSHP (water source heat pumps)
- Evaporative condensing
- Flexible compressor selections
- Quiet operation for sound sensitive operation
- Serviceability
- FANWALL TECHNOLOGY®
- Standalone DDC Controls with Protocol



Specifications and illustrations subject to change without notice and without incurring obligation.



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www.nortekair.com
nortekairinfo@nortek.com

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