

# CUSTOM AIR HANDLING UNITS

ENGINEERED TO EXCEED CUSTOMER DEMANDS





# The Leader in CUSTOM HVAC SOLUTIONS



## Customer Focused Solutions

Energy Labs custom air handling solutions are the result of over 35 years of design, sales and manufacturing experience. Our customer's needs have been, and continue to be our first priority. Designed to satisfy diverse building requirements and environments, our custom air handlers are available in a virtually limitless array of capabilities, configurations, sizes, and capacities. Whether your application is an office building, healthcare facility, university or data center, Energy Labs has the long lasting, energy efficient, full system solution to fulfil your air handling needs.

## Design Flexibility

Energy Labs continues its focus and commitment to meet and exceed the needs and expectations of every customer. Our approach is simple, to utilize advanced engineering technology to design innovative, efficient and high quality products, and then build them in our modern manufacturing facility. Energy Labs offers a wide variety of custom components which can be configured into an air handling system to meet any application requirement. Our highly engineered products offer factory options such as single point electrical panels; chilled water, hot water, steam or refrigerant



## ETL Listing

All Energy Labs custom air handling units are ETL listed.



## Quality Construction

All Energy Labs units are engineered and manufactured for durability and long life, providing trouble free performance and energy efficient operation. Each unit features a fully welded, structural base frame, available in conventional painted steel, in stainless steel for caustic atmospheres, such as coastal installations, or in aluminum where corrosion resistance and light weight are required. Casing panels are offered in 2" & 4" depths, and also come with your choice of galvanized steel, stainless steel, and aluminum materials. Insulation choices include fiberglass, foam and mineral wool. Casings and bases are offered with a full thermal break. To ensure the highest quality and compatibility, Energy Labs manufactures critical components including coils, fans, dampers, louvers and electrical control panels. This unique capability allows Energy Labs to maintain the highest level of quality while providing the benefits of true single-source responsibility to our customers. An added benefit is the elimination of potential delays and errors caused by component delivery and design issues.

... piping packages; a wide variety of energy recovery solutions; and a variety of humidification and dehumidification capabilities. Energy Labs also takes the next step, offering factory installation and integration of control components and systems provided by an independent control manufacturer or integrator. This offers the customer substantial cost savings, as well as the confidence that the unit's performance and low leakage rate are delivered at the specified level.





## AMCA 210 Air Flow Testing

Good engineering practices allow a manufacturer of custom air handling equipment to estimate system air and sound performance. However, fans that perform at a given horsepower and sound level in a single fan test don't always perform the same way inside a complicated air handling system or in a fan array arrangement. There is only one way to make sure the system performs exactly as specified, and that is for the manufacturer to have accurate and accredited factory testing capability during design, and after assembly, in an environment that closely resembles the actual operating environment.

Energy Labs is one of a select few manufacturers able to offer a full **AMCA Reverberant Room** test in its own state of the art testing facility. Built in 2011, our newest testing laboratory meets all the criteria required by **AMCA** for repeatable testing and is fully **AMCA** accredited.

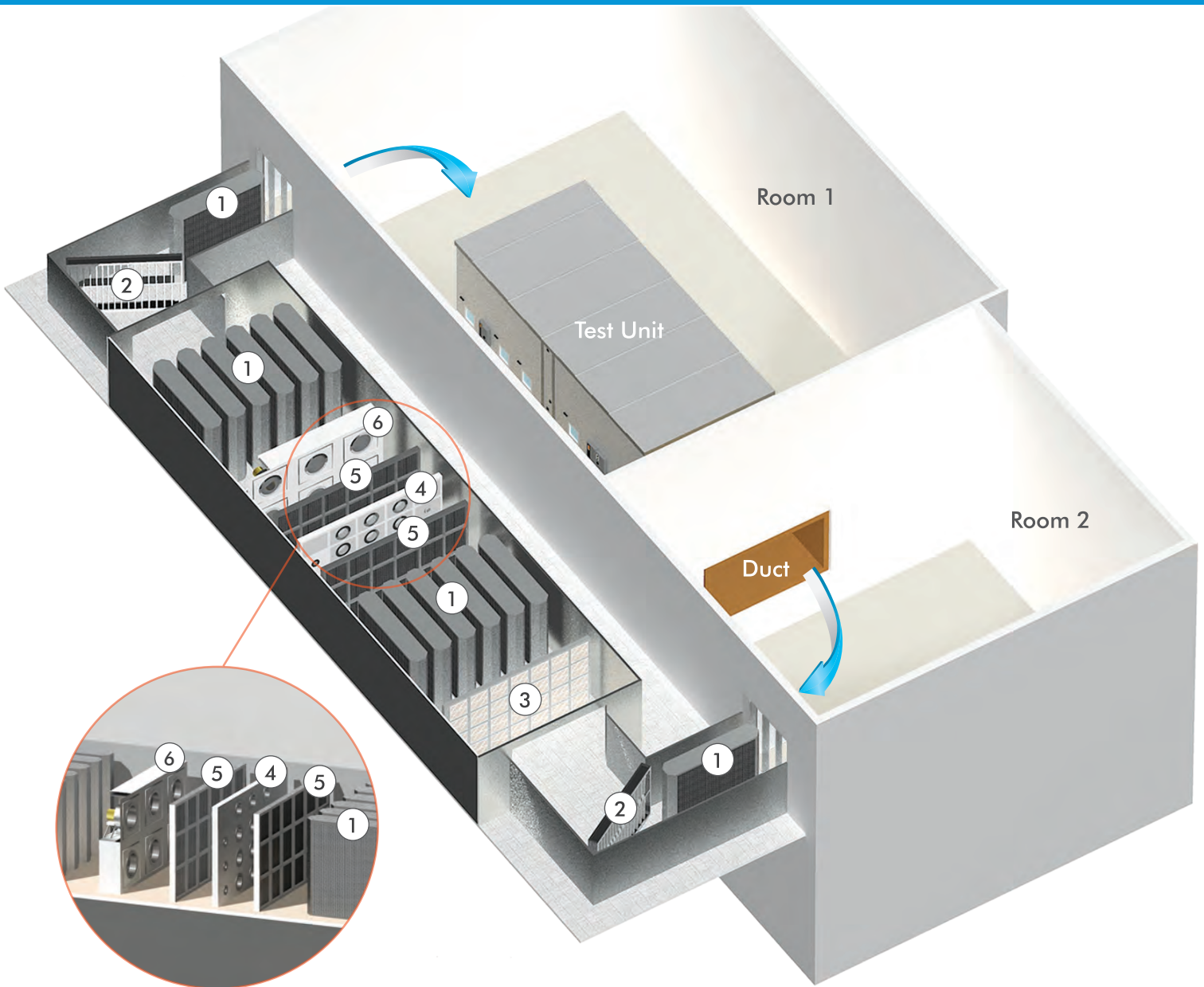
### Factory AIR FLOW, SOUND and POWER MEASUREMENT

A unit sound test cannot provide useful or valid results if accurate system air flow cannot first be established, therefore, perhaps the most important part of any accurate sound test is precise flow measurement data at the specified project static pressure. To do this, the Energy Labs facility features a 65,000 CFM calibrated and certified flow station that accurately provides the needed flow data at the exact static pressure requirements of the project, as well as the air density information required by AMCA 300 and AMCA 210.

### LEAKAGE and DEFLECTION TESTING

Leaking panel seams waste energy and cause condensation to form at the leak site, creating additional issues with cabinet corrosion and even the formation of unsafe puddles of water on the equipment room floor below the leak. Long life, operator safety and energy efficient operation are therefore assured only by employing units with a very low leakage rate. Designed for SMACNA Class 5 or lower leakage rates and low panel deflection, all Energy Labs air handling systems can be factory tested for performance verification at test pressures of 8" or higher.





Flow Station - Close Up.

## COMPONENTS OF FLOW STATION

- |   |                |
|---|----------------|
| ① | Sound Traps    |
| ② | Air Bender     |
| ③ | Filters        |
| ④ | Nozzle Wall    |
| ⑤ | Settling Walls |
| ⑥ | Makeup Fans    |

Energy Labs' state-of-the-art recirculating Aero Acoustic Laboratory offers the simultaneous measurement of airflow, static pressure, power consumption, and inlet and outlet sound power levels; all to the accuracy required by AMCA 210 and 300 standards. System curve modulation takes place inside the Airflow Measurement Station, which is acoustically isolated from the sound chambers. Large reverberant chambers yield low air velocity across the microphones and heighten accurate sound measurement at frequencies of 50 Hz and below.





# HIGH EFFICIENCY AIRFOIL FAN WHEEL

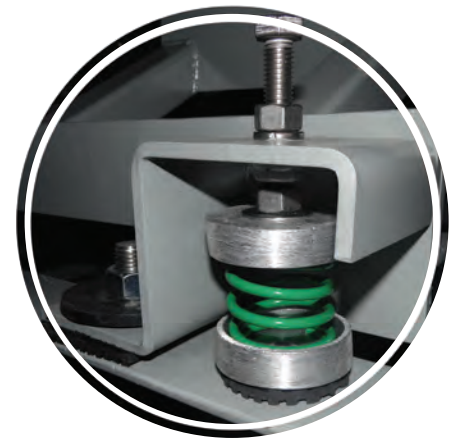
Energy Labs OptiFlow™ fans feature a fully welded, aluminum airfoil blade design for high operating efficiency and quiet operation, with the characteristic non-overloading horsepower curve. These fans provide very stable operation due to a steeply rising pressure curve and are available to meet AMCA Class II or Class III requirements. All fans, whether in single or multiple fan configurations, are mounted on spring isolators with seismic restraints, and are available to satisfy the most stringent seismic requirements of the International Building Code.

Many competitive fans are **AMCA certified** only for air performance, whereas the full range of Energy Labs fans is licensed to bear both the **AMCA Standard 210** seal for air performance and the **AMCA Standard 300** seal for sound performance.

**Energy Labs spring isolators are designed with SEISMIC RESTRAINTS as a standard feature.**



## OptiFlow™ fan systems



Multiple fan configurations are frequently the best choice for a building owner because they offer many valuable system benefits that readily justify the higher cost and greater complexity of using multiple fans. Such benefits include:

- ▶ **Optimum Energy Efficiency**
- ▶ **System Redundancy**
- ▶ **Improved Acoustical Performance**
- ▶ **Reduced Unit Footprint**

▶ **Optimum Energy Efficiency** - Benefitting from the advantages of a multiple fan system does not mean that system efficiency has to suffer as a result of using smaller fans and lower efficiency motors. Eliminating energy robbing bearings and belt drives, offering optimum size fan and motor selections that offer best overall efficiency by keeping fan diameters larger and utilizing fan motors with high operating efficiencies, all contribute to optimum energy efficiency.

▶ **System Redundancy** - For critical applications that must be capable of 100% airflow at all times, multiple fans can be selected to insure 100% air flow is available even when any one fan is inoperable for any reason.

▶ **Improved Acoustic Performance** - By their very nature, fans in multiple fan systems will operate at a higher RPM than one large single fan in an identical application, resulting in reduced sound levels in the hard to attenuate 1st and 2nd octave bands.

▶ **Reduced Unit Footprint** - Smaller fans require less cabinet length to house their assemblies, and they require less space both upstream and downstream of the fans while still ensuring good air distribution and efficient operation. However, the space cannot be reduced below what is needed to provide proper service access. A four fan system can typically reduce unit length by 4' or more when compared to a single fan system.





## BASE FRAME

The base frame is constructed of structural "C" channel, welded for optimal strength and rigidity designed to reduce unit deflection during manufacturing, rigging and installation. Intermediate structural steel cross-members are located at critical junctions to support components such as coils and fans. Formed sheetmetal and bolted base frames simply cannot provide the same level of strength and rigidity. Bases are available in painted steel, stainless steel or aluminum.

## UNIT FLOORS

Unit floors are constructed from a minimum of 14 gauge sheet metal and are available with anti-slip tread plate or paint in the walking areas. Many options are available including various types of tread plate, and materials such as painted steel, bright galvanized steel, aluminum or stainless steel. Energy Labs bases are always insulated with high R value, water impervious foam as standard. An optional base underliner is available in galvanized steel, stainless steel and aluminum.

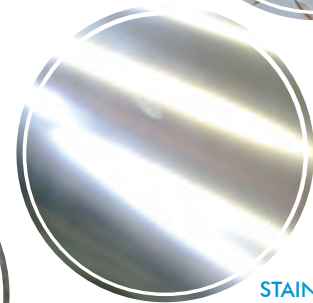
STEEL OR  
ALUMINUM  
TREAD PLATE



PAINTED STEEL



BRIGHT GALVANIZED STEEL



STAINLESS STEEL

Energy Labs offers a large number of choices  
in wall and roof construction.

## WALL CONSTRUCTION

More and more of our customers have increasingly requested the benefits of foam wall and roof insulation. Energy Labs has invested heavily in state-of-the-art foam panel manufacturing technology that can provide the high R value, moisture impervious, thermal break performance, that customers are seeking, all at an economical cost. Traditional glass fiber insulation provides no structural strength to the panel and requires heavier material gauges and structure. Foam insulation, on the other hand, provides significant structural rigidity and requires less added sheetmetal or structure for equal deflection characteristics, while providing superior thermal performance. This has led some manufacturers to significantly reduce panel metal gauges. Energy Labs, however, continues to feature 18 or 20 gauge galvanized steel exteriors with 20 gauge steel interiors. Aluminum panel units feature an 0.050" exterior with an 0.040" interior liner, and Energy Labs also offers type 304 and type 316 stainless steel exterior and interior options. By choosing Energy Labs' thermal break floor and door construction, a complete, no through metal, thermal break unit can be selected. For critical sound applications, the interior walls can be furnished with a dual layer fiberglass acoustic blanket protected by perforated metal covers. All panel types and materials have been rigorously ASTM tested to insure rigidity and uniformity.



## ROOF CONSTRUCTION

Outdoor unit roof panels feature bolted standing seam construction to insure a leak tight assembly. Drive cleats cover all roof panel seams. Outdoor unit roofs are sloped at 1/4" per foot to ensure proper water drainage.

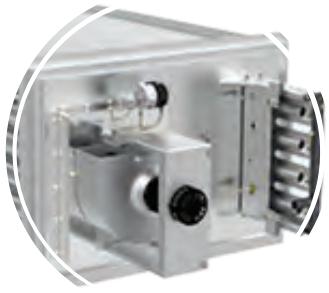




# Internal Components and Options

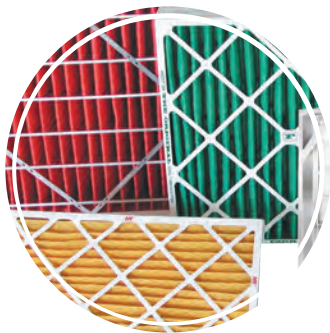
## HEATERS

Energy Labs offers a wide variety of options to meet your heating requirements. Available heating options include conventional hot water and steam coils, heating coils with integral face and bypass dampers, both indirect and direct fired gas furnaces and electric heaters.



## IAQ CONDENSATE DRAIN PANS

Energy Labs' standard drain pans are constructed of 16 gauge, type 304 stainless steel, with stainless steel drain connections for rapid condensate removal. Each drain pan has a double-sloped design that prevents standing water in the pan. All drain pans are designed to completely cover the coil plenum section, and are insulated with a minimum of 2" expanded spray foam insulation as standard.



## FILTERS

Energy Labs offers a full range of filter capabilities from 2", 30% efficient, MERV 8 panel filters up to ultra-high efficiency HEPA filters. For maximum efficiency, filter sections use gasketed, face loading racks, with side-access options also available. Special filters such as carbon, electronic or roll filters are available to meet any filtration requirement.



## HUMIDIFIERS

Energy Labs offers a variety of humidification options utilizing either steam or high pressure atomization. Each humidifier section is supplied with a factory installed stainless steel drain pan. Air atomizing and ultrasonic humidifiers are also available.



## UV LIGHTS

Energy Labs offers flexible and effective UVC irradiation options for coil and drain pan surface disinfection. Low intensity, full time irradiation of the coil and drain pan surfaces has been proven effective as a low energy demand, effective disinfectant. Direct air stream disinfection, also known as "on the fly kill", is also available.



## COILS

Energy Labs is an AHRI certified coil manufacturer and features a complete line of chilled water, DX, hot water and steam coils. Coils are aluminum plate fin, copper tube design with brazed return bends. Multiple tube wall and fin thickness options are available. For severe corrosion resistance requirements, copper fins or aluminum fins with ElectroFin® coating are available. 16 gauge stainless steel casings are standard on all cooling coils, and all Energy

Labs cooling coils over 48" tall feature a unique intermediate drain pan design built right in the fin pack, allowing the use of single coils as tall as 60" with a maximum of 36" between drain pans.



## DAMPERS AND LOUVERS

Energy Labs' low leak dampers and our outside air louvers are AMCA tested and rated for pressure drop, leakage and water penetration. Energy Labs' standard damper blades feature an aluminum airfoil design to minimize pressure drop in the fully open damper position. The airfoil design also minimizes noise levels due to the reduced friction of the air movement across the blades. The low leak design features neoprene blade edge seals and an overlapping blade edge for secure shut off without the worry of possible damper over travel and have a stainless steel side seal. Damper frames are constructed of 16 gauge galvanized steel and have a robust linkage system for flawless operation and long life. Factory mounted damper actuators and locking quadrant options are also available.



## ACCESS DOORS

All access doors are double wall construction, using the same exterior and interior construction materials and insulation thickness used in the section and are mounted in a rugged extruded aluminum frame. Heavy-duty hinges and latches are supplied with adjustable, corrosion resistant hardware, and are designed to be operable from the exterior and interior of the unit. Optional thermal break doors and frames, view windows, lockable handles and test ports are also available.



## ENERGY RECOVERY

Good Indoor Air Quality (IAQ) is essential in modern buildings, and poor IAQ has been directly associated with "sick-building syndrome", a condition that can result in high illness rates, absenteeism, reduced productivity, and employee turnover. Today's systems must provide ventilation rates that comply with ASHRAE Standard 62.1. Energy Labs only uses AHRI listed energy recovery systems to ensure our customers get the performance they require.

The challenge for both building owners and system designers is to provide this without increasing energy consumption. Some of the strategies employed at Energy Labs include evaporative cooling, energy recovery coil loops, heat pipes, energy recovery heat exchangers, and energy recovery wheels.



# Internal Components and Options

## UNIT DESIGN SOFTWARE

Every Energy Labs Sales Representative has access to our ELITE unit design and configuration software. This powerful software package allows them to provide complete unit details; including dimensions, AutoCAD drawings, weights, electrical data, fan curves, coil selection details and even budget pricing for most unit configurations, right from their office. This enables them to support the design process from the initial design all the way through the equipment order, in a timely manner.



## FLOW TRAC

Energy Labs Flow Trac™ measures airflow using the fan inlet cone as a calibrated nozzle with no obstructions in the inlet of the fan, whereas many traditional airflow measuring devices partially obstruct the air entering the fan inlet, affecting fan performance. The use of the Flow Trac™ system assures that airflow and sound levels are not affected.

Flow Trac™ operates by measuring the differential pressure across the inlet cone, converting it into flow using a calibrated gauge or pressure transducer. Flow Trac™ equipped units include a calibrated flow gauge as a standard feature.



## SOUND TRAPS

Energy Labs sound traps are available for any application. This includes special "low frequency" traps specifically designed for the 63 Hz, 125 Hz and 250 Hz octave bands. Conventional sound traps with a Mylar sheet over the fill, or packless sound traps with a complete absence of fill, are ideally suited for hospitals, clean rooms, pharmaceutical, food and electronic manufacturing applications where particulate matter (or fiber erosion from conventional fill) could contaminate the airstream.

## VARIABLE FREQUENCY DRIVES

Variable speed fan control offers the most efficient method of air volume control. By varying the fan speed, the system brake horsepower will be reduced in accordance with the fan laws. This means fan brake horsepower will reduce by the cube of the reduction in air volume, providing significant energy savings. Significant reduction in sound power levels can also be expected. Multi-fan units can utilize a single variable frequency drive per fan section, redundant drives per fan section, or a separate drive for each fan.



## SINGLE-SOURCE POWER PANEL

Energy Labs offers optional U.L 508 listed single-source power panels. These panels include a main disconnect switch, fuses, starters, transformer, H-O-A-switches, relays, and pilot lights. Single-source power panels simplify installation by allowing the jobsite electrician to connect main power to each unit at a single point. NEMA 1, NEMA 3R, and NEMA 12 enclosures are available.



## FACTORY INSTALLED CONTROLS

To save installation time and field cost, Energy Labs offers factory installation of most control devices, sensors, actuators, flow dampers, etc. that are provided by any BAS supplier. All of the wiring is run in EMT rigid conduit, and the point to point wiring is shown on our factory wiring schematics. This is a cost effective way to make a unit truly ready to start-up when delivered. Not only does this save significant field labor, but all of the wiring penetrations are done prior to unit final testing, the openings are sealed properly and the specified low leakage rate is maintained.



## INDIRECT EVAPORATIVE COOLING

Indirect evaporative coolers sensibly cool the air with an air to air heat exchanger where the evaporation of water effectively cools the secondary side of the heat exchanger tubes. Indirect evaporative coolers are very energy efficient in applications located in dryer areas of the country or applications that exhaust large quantities of warm dry air in almost any location.



## DIRECT EVAPORATIVE COOLING

Energy Labs' direct evaporative coolers are manufactured with 304 stainless steel casings and sumps to prevent corrosion and efficient, trouble-free submersible or end-suction pumps.



Contact your Energy Labs sales representative and request information on the industries largest line of Evaporative Cooling Products from the leader in Evaporative Cooling since 1979.







# ENERGY LABS PROJECTS

For 35 years Energy Labs products have been part of the most prestigious projects in the U.S. and around the world.

We have a diversified client base, including hospitals, laboratories, office buildings, clean rooms, manufacturing, schools and research centers.



## San Jose Airport

San Jose, CA

## Walt Disney Concert Hall

Los Angeles, CA



## NMAI - Museum

Washington, DC

**Data Center**

Oregon, USA

**Wells Fargo**

Minnesota, USA



**San Diego Convention Center**

San Diego, CA

**High Technology Office**

Washington, USA

**“OVER  
35 YEARS  
OF EXCELLENCE”**

# Energy Labs | PRODUCTS

## • DATA CENTER COOLING SYSTEMS

- Fully custom designed for any climate
- Usage Effectiveness (PUE) as low as 1.1
- Hybrid, Indirect/Direct cooling combined with DX
- CRAH, DX and Air Handling Systems for Data Centers
- Sizes from 15,000 to over 100,000 CFM

## • INDIRECT / DIRECT EVAPORATIVE COOLING SYSTEMS

- 35 years of experience building evaporative cooling solutions for all kinds of applications
- Complete freedom of design utilizing polymer tube heat exchangers
  - Sizes from 2,000 to over 50,000 CFM

## • CUSTOM DX COOLING SYSTEMS

- Air cooled, water cooled or evaporative condensing units are available from 65 to 500 TR
  - Fully integrated DDC controls
  - R-410a and R-134a refrigerants
  - Scroll or screw compressors
- High R value foam insulation in 2", 3" or 4" thicknesses
  - Galvanized, Stainless Steel or Aluminum casings

## • CUSTOM AIR HANDLING UNITS

- High R value foam construction in 2" or 4" thicknesses
- Optional no through metal Thermal Break construction
  - Capacities from 500 to 200,000 CFM
- Galvanized, Stainless Steel or Aluminum casings
  - All aluminum construction

## • ENERGY RECOVERY SYSTEMS

- Ideal for Make-up Air applications
- Heat Wheel, Heat Pipe and Plate Heat Exchanger designs
  - Chilled water or DX cooling

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