Custom Air Handling Units

Energy Labs was GREEN before GREEN was cool

ELI

Energy Labs Inc

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Product Description

Energy Labs custom air handling units provide solutions for controlling building environments. Our custom air handlers are available in a limitless number of configurations, sizes, and capacities. We offer a large selection of materials to produce the perfect system to meet the cooling, heating, humidification and filtration needs of any building.

Design Flexibility, Quality Engineering

Energy Labs is committed to meeting customer needs and expectations. Our approach is to utilize advanced engineering to design innovative and high quality products. Energy Labs offers a wide variety of custom components, which can be configured to create air-handling units to meet any application requirement. Our highly engineered products offer many factory options such as fully installed and programmed direct digital controls, single point electrical panels, chilled water, hot water, steam or refrigerant piping packages and a wide variety of energy recovery solutions.

All Energy Labs custom air handling units are ETL listed.

Leader in Custom HV Systems

All Energy Labs units are engineered and manufactured for long life, providing trouble-free performance and cost-effective operation. Each unit features a fully welded structural steel base frame, galvanized steel casing and polyurethane paint finish for superior resistance against corrosion, sun, and harsh environments. Optional paint finishes and materials are available to satisfy special requirements. To ensure the highest quality and compatibility, Energy Labs manufactures critical components including coil, fans, dampers, louvers and electrical control panels. This unique capability allows Energy Labs to maintain the highest level of quality while providing the benefit of true single-source responsibility to its customers. An added benefit is the elimination of potential delays and errors caused by sub-component delivery and design issues.

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Before we actually build anything, we set product performance targets that stretch beyond typical requirements.

Energy Labs engineers use Fluid Dynamics software for modeling the airflow patterns of different configurations. This technology allows them to "see" how the air moves, its velocity, direction, and most importantly, the areas of turbulence. This modeling and analysis allows us to design a unit with complete assurance that all important criteria (such as the distance from the fan's where uniform airflow begins) are always taken into consideration.

A byproduct of all air movement is noise and vibration. Another software tool is used to analyze each fan's design to minimize low frequency sound that can "travel" through a building's structural members. This allows our engineers to design the quietest, most efficient fan system for each individual application.

After completing computer simulations of alternative fan arrangements we test them extensively in our AMCA accredited test facility. Each prototype is carefully tested for airflow, power consumption, and sound levels. Extensive testing ensures accurate performance data for all Energy Labs fan systems.

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Energy Labs' 35,000 cubic foot reverberant room has been designed to test in accordance with AMCA Standard 300 "Reverberant Room Method for Sound Testing" and ARI Standard 260 "Sound Rating of Ducted Air Moving and Conditioning Equipment." It is used to accurately measure air handling unit inlet, outlet, and radiated sound power levels. The room was designed to create a true diffuse environment and eliminate standing waves by angling the walls and ceiling. Precision Bruel & Kjaer microphones affixed to a rotating boom are fed to a 5 channel Bruel & Kjaer PULSE system. Data is collected and processed from the control room via a computer-based analysis platform.

* "Product performance data based on tests in an AMCA Accredited Laboratory are not to be construed as being licensed to bear the AMCA Seal."

Sound Calculation Program

Energy Labs' sound power calculation software provides predicted sound power levels for air handling unit inlet, outlet, and casing radiation.

Our Sound predictions can be verified by actual testing of your air handling unit in our AMCA accredited laboratory.*

Energy Labs' test facility is equipped with a calibrated AMCA Air Flow Measuring Station to accurately measure airflow. The station is operated in strict accordance with AMCA Standard 210, "Laboratory Methods of Testing Fans for Rating." It has the capability of measuring airflow up to 65,000 CFM, in both AMCA Figure 12 (blow thru) and 15 (draw-thru) configurations.

Leak Testing

Energy Labs' factory leak testing will verify that the air handler will not leak excessively under pressure. The test is performed by sealing all unit openings. A pressure blower, connected to a variable frequency drive, is used to pressurize the cabinet to the appropriate test pressure. Energy Labs' design standard allows a maximum leakage rate of less than 1% of the design airflow at 1.5 times the design static pressure, to a maximum of 12 inches w.g.

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Optiline Fan Array ™

Our in-house engineering talent, experience, AMCA accredited testing facilities and leading edge CFD tools are used to design each fan system to meet the optimum energy, sound, and redundancy requirements of any application.

Our Optiline Fan Array™ design offer's,

- ‡2SWLPXP)DQ (IILFLHQF\ E\ XWLOL]LQJ WKH FRUUHFW QXPEHU RI fans. We avoid the inherent inefficiency that results from simply using a large number of small fans. More is not always better when it comes to fan wall efficiency.
- ‡2SWLPXP 0RWRU (IILFLHQF\ E\ XWLOL]LQJ GHVLJQV ZKLFK operate closer to the synchronous speed of motors and using premium efficiency motors Energy Labs' designs assure the minimum electrical power consumption.
- ‡2SWLPXP 6RXQG /HYHOV UHVXOW IURP XWLOL]LQJ PXOWLSOH IDQV operating at lower rpms and velocities, instead of one larger fan.
- ‡2SWLPXP 6\VWHP 5HOLDELOLW\ ² FDQ EH DFKLHYHG ZLWK IDQ selections possible that deliver 100% CFM with one or more fans inoperative.
- ‡2SWLPXP 0RWRU 5HOLDELOLW\ LV HQVXUHG E\ DYRLGLQJ WKH XVH of inexpensive and inefficient small horsepower fan motors that fail at rates far above those of more robust industrial design motors.
- ‡2SWLPXP 8QLW)RRWSULQW ² 2SWLOLQH)DQ $UUD\™ units provide shorter overall unit lengths than single fan units.
- ‡2SWLPXP $LU)ORZ E\ SURYLGLQJ PRUH XQLIRUP DLU distribution across the unit cross sectional area than a single fan design.

As an experienced manufacturer of air handling units and AMCA certified plenum fans, Energy Labs provides truly advanced technology in ways that yield the lowest overall operating cost to its customers.

The Energy Labs ELP Fan Wheel features an airfoil blade design for the highest possible efficiency and quietest operation with a non-overloading horsepower curve. These fans are very stable due to a steeply rising pressure curve. The ELP Fan Wheel has been tested at the AMCA laboratory for both sound and air performance in accordance with AMCA standards 210 and 300.

The ELP Fan Wheel is manufactured utilizing 6000 series aluminum. All wheels feature fully welded construction and are designed to a minimum of AMCA Class II requirements. Every wheel is statically and dynamically balanced to grade G6.3 per ANSI 52.19 and ISO 1940/1. Vibration is measured in the X, Y and Z-axis with a maximum peak velocity of 0.125 in/sec: for direct drive applications, 0.050 in/sec is available.

An important factor in the design of an efficient air handling system is the selection of the most appropriate and efficient fan. Energy Labs is an AMCA licensed fan manufacturer. We offer forward-curved fans for low pressure applications and backward inclined and airfoil fans (housed and plenum) for medium and higher pressure applications.

Fan cabinets are designed with ample clearances to ensure proper airflow into the fan wheel and provide for ease of maintenance. Energy Labs' standard plenum fans feature an AMCA arrangement 1 design which provides an open unobstructed inlet for lower sound levels and higher efficiency.

Fans are selected at peak efficiency to minimize power consumption and noise generation. All fans are statically and dynamically balanced before shipment. Fan performance is based on tests conducted in accordance with AMCA standard 210. All Energy Labs fans are licensed to bear the AMCA seal for air performance and sound.

All fans manufactured by Energy Labs have a minimum L-10 bearing life of 200,000 hours.

When one fan fails in a fan wall, the performance of the system is significantly reduced, not only by the loss of that one fan, but also by air flowing back through the failed fan. Energy Labs' Flow Valve can prevent this efficiency loss. Automatic or manually operated versions of Flow Valve are available. Automatic versions are enabled through current monitoring controls.

For the best in fan isolation, specify the Energy Labs Flow Valve. This system consists of a high quality spun disk and machined hub that is designed to minimize airflow obstruction in the fan inlet. Testing in Energy Labs AMCA accredited lab* shows that the Flow Valve provides lower sound power levels than a parallel blade shut off damper.

Vibration Isolators

Fan assemblies are mounted on spring isolators to reduce the transmission of fan and motor vibration to the unit structure. This eliminates the need for spring isolated roof curbs and flex-connected piping, ductwork, and electrical conduits to the air handling unit. Energy Labs spring isolators are designed with seismic restraints to meet zone four requirements per the International Building Code (IBC).

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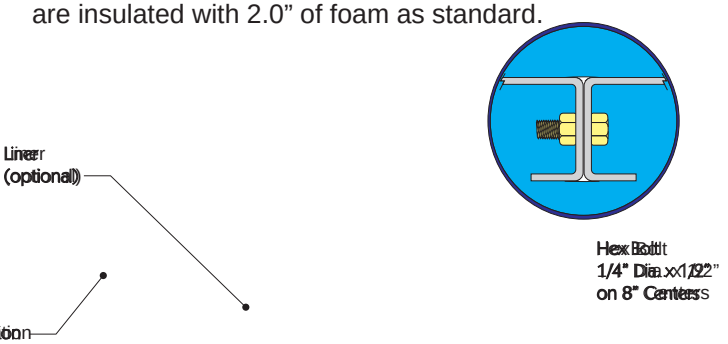
Base Frame

The unit base frame is constructed of structural steel “C” channels welded for optimal strength to reduce unit deflection during manufacturing, rigging, and installation. Intermediate structural-steel cross members are located at critical junctions to further support components such as coils and fans. Unit distortion, racking of doors, air and water leaks, and many other issues are greatly minimized by the use of a true structural steel base in lieu of a formed steel channel.

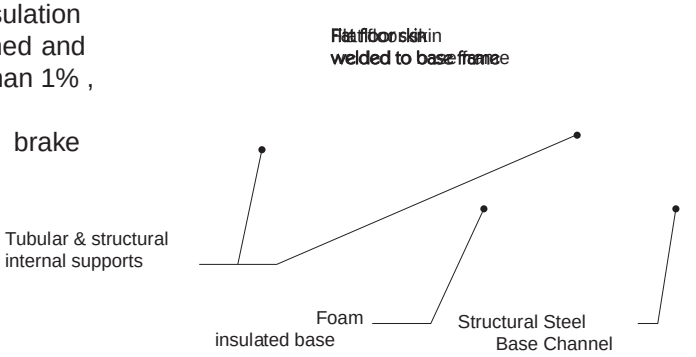
Unit floors are constructed from a minimum of 14 gauge galvanized steel. Many other options are available. Unit bases are insulated with 2.0” of foam as standard.



Casing

The standard air handler casing is fabricated from a minimum of 16-gauge paint-ready galvanized steel and features a bolted, standing-seam construction. Optional casing wall materials include aluminum and stainless steel. Each panel is pre-punched and securely bolted to provide both an air and water-tight seal. All panels have return break seams, which encapsulate the raw edges of the insulation and ensure cabinet rigidity. Unit casings are designed and manufactured for a maximum leakage rate of less than 1% , up to 1.5 times the design static pressure.

Casings with foam panels and full thermal brake construction are available as an option.



Insulation

The unit casing walls are insulated with either NFPA 90A approved thermal/acoustic fiberglass insulation glued directly to the casing. Many different thicknesses and densities are available. All panels have return break seams so no raw insulation edges are ever exposed to the air stream. Different thickness and densities are available as required.

Optional wall insulation choices also include 2.0” thick polyurethane foam insulation with an R value of 17 within a double wall panel. Composite walls utilizing both foam and fiberglass are also an option.

To protect interior insulation, perforated and solid interior metal liners are available in various gauges of galvanized steel, stainless steel or aluminum may be requested for any insulation system.

Roof Construction

Roofs are reinforced with heavy-gauge steel channels to ensure rigidity. All panels feature bolted standing seam construction to permit complete disassembly of any section. To prevent water penetration, roof panels are bolted to outside casing flanges assuring no penetrations of the air tunnel. Drive cleats cover all roof panel seams. Roofs on outdoor units are sloped at ¼" per foot to ensure proper water drainage.

Access Doors

Standard access doors are double wall 16 gauge galvanized steel, with fully encapsulated insulation, mounted in an extruded aluminum frame. Fully adjustable heavy-duty hinges and latches are supplied with non-corrosive hardware. The standard door is designed to be operable from the exterior and interior of the unit. Optional thermal brake doors are available.

Dampers and Louvers

Energy Labs' standard damper blades features an aluminum airfoil design to minimize pressure drop in the fully open damper position. This airfoil design minimizes noise levels due to air movement. The standard low leak design includes neoprene seals that are backed by the extruded damper blade. This provides excellent sealing when fully closed (see picture) the standard leak rate is a very low 5CFM/sqft of damper at 6" WG.

Damper frames are constructed of 16 gauge galvanized steel with stainless steel side seals for low leakage.

Dampers and louvers, manufactured by Energy Labs, have been tested and rated for pressure drop, leakage and water penetration by the AMCA laboratories.