



THYVENT

**ENERGY
RECOVERY
VENTILATOR**



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**THYBAR
CORPORATION**

ENERGY RECOVERY VENTILATOR

FOR COMMERCIAL, INDUSTRIAL
AND INSTITUTIONAL BUILDINGS



EXCLUSIVE
DOUBLE WALL
CONSTRUCTION

SCRUBBABLE
SHEET METAL
LINER

THE ENTIRE UNIT
IS EASILY CLEANED
WITH MILD DETERGENT

2" PLEATED
FILTER IN RACK

LONG LIFE RECOVERY
WHEEL SLIDES EASILY
IN AND OUT FOR CLEANING

NO NEED FOR CONDENSATE
DRAINS...MOISTURE IS
TRANSFERRED ENTIRELY
IN THE VAPOR PHASE

ECONOMICAL INDOOR AIR
QUALITY WITH EFFECTIVE
HUMIDITY CONTROL

FACTORY SELECTED
FANS & MOTORS
ENSURE PERFORMANCE

POWER PANEL

Fully factory wired per
National Recognized
Testing Laboratory
Standards.



ENERGY RECOVERY TECHNOLOGY

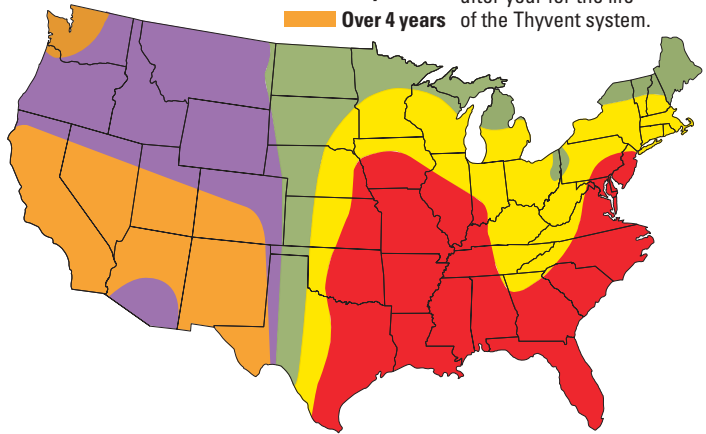
Heart of the energy recovery system is the enthalpy wheel. Silica gel desiccant is permanently bonded to the polymer, which provides efficient and reliable energy transfer. Supply and exhaust air travels through the slowly rotating recovery wheel where the temperature and moisture content is exchanged from one airstream to the other. Designed for comfort ventilation applications up to 24,000 cfm, the Thyvent system offers the best all around total energy recovery and control.

RAPID PAYBACK

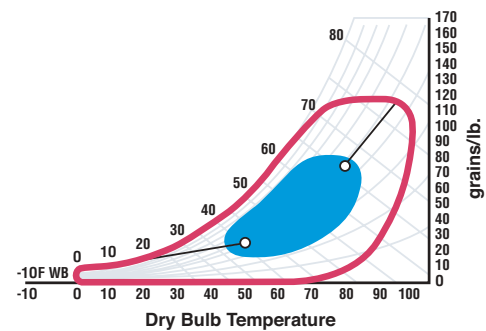
PAYBACK CYCLES

- Instant
- 1 year
- 1-2 years
- 2-4 years
- Over 4 years

After rapid equipment amortization for many climates, operating savings continue year after year for the life of the Thyvent system.

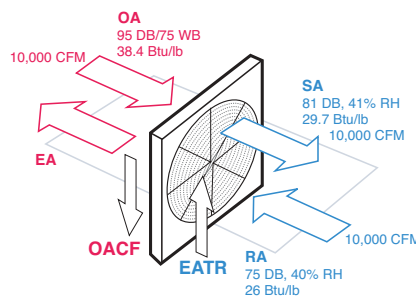


As shown at right, with the use of enthalpy wheel energy recovery, the conditions entering the unit are in a more advantageous area of the psychrometric chart, reducing the workload on the HVAC system.



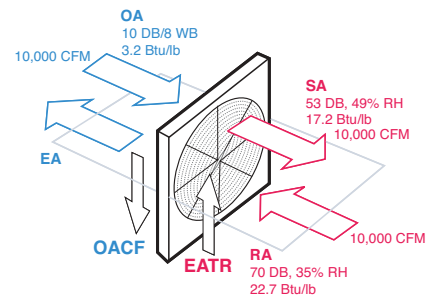
EFFECTIVE LOAD REDUCTIONS

Enthalpy energy recovery reduces the size and cost of operation of any HVAC system by reclaiming both sensible and latent energy. The energy is used to precondition the outdoor air and to improve humidity control. The following conditions and calculations are used to determine the savings when using a Thybar Energy Recovery Unit on a Trane rooftop unit.



Capacity Reduction, Summer Cooling

$$\begin{aligned} \text{Btuh} &= 4.5 \times \text{SCFM} \times (H_{oa} - H_{sa}) \\ &= 4.5 \times 10,000 \times (38.4 - 29.7) \\ &= 391,500 \text{ Btuh} \\ \text{Tonnage} &= 391,500 / 12,000 \\ &= 32.6 \text{ tons} \end{aligned}$$



Capacity Reduction, Winter Heating

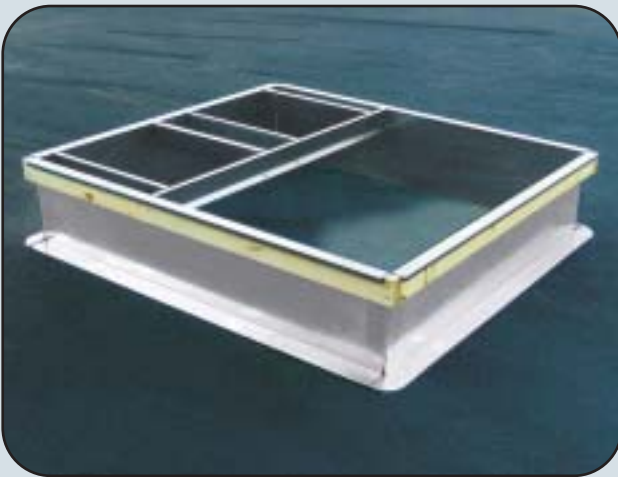
$$\begin{aligned} \text{Btuh} &= 4.5 \times \text{SCFM} \times (H_{oa} - H_{sa}) \\ &= 4.5 \times 10,000 \times (3.2 - 17.2) \\ &= 630,000 \text{ Btuh} \\ \text{Boiler HP} &= \text{Btuh} / 33,470 \text{ Btuh/hp} \\ &= 630,000 / 33,470 \\ &= 18.8 \text{ hp} \end{aligned}$$

THYVENT APPLICATIONS

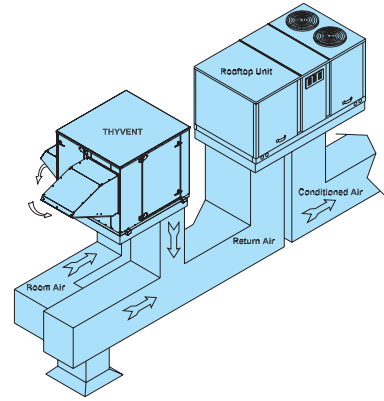
Thyvent energy recovery ventilators are applicable to many HVAC installations. Integrating the ERV into the air conditioning duct system is a common application. The main modification, as compared to traditional systems, involves routing fresh outdoor air through the ERV.

Since the ERV and air conditioning equipment are integrated, or coupled together, the appropriate amount of fresh outdoor air is provided whenever the air conditioning equipment is operating.

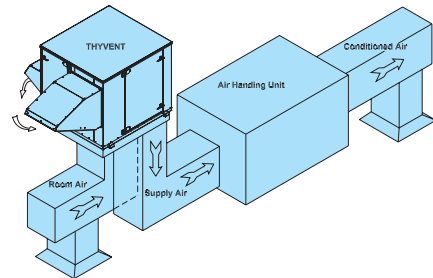
A decoupled system should be utilized where thermal loads vary significantly from space to space. The decoupled system allows independent control of ventilation air and thermal conditioning.



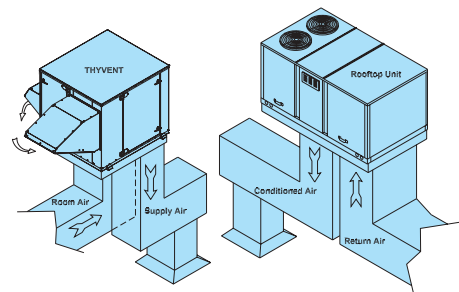
[1] WITH PACKAGED ROOFTOP EQUIPMENT



[2] WITH DUCTED AIR HANDLERS

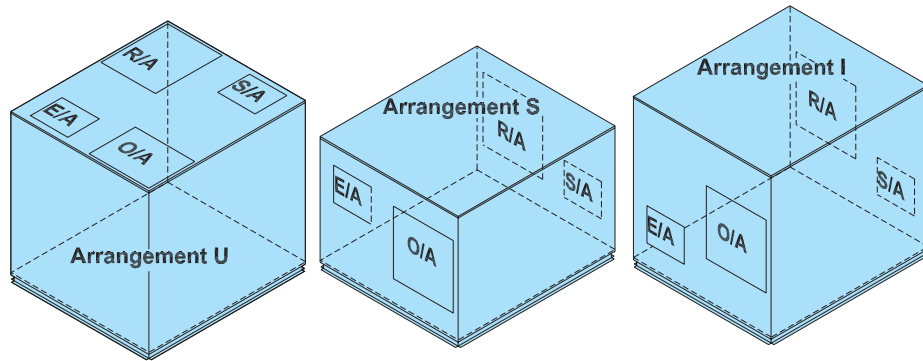


[3] DECOUPLED SYSTEM



INTERIOR INSTALLATION

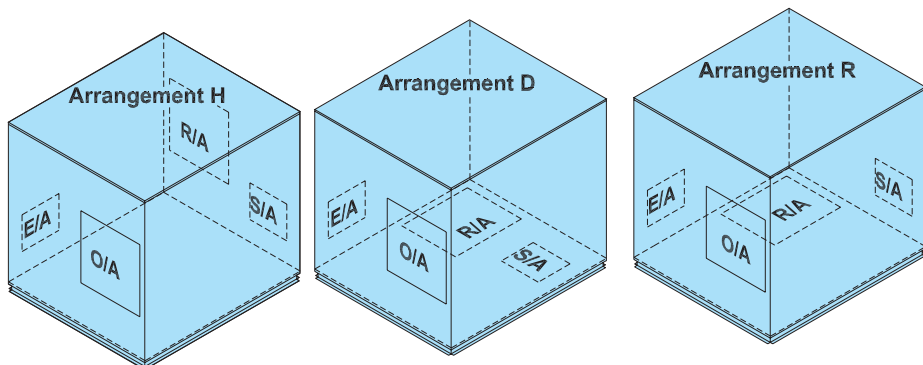
Adjustable belt drives are standard for all installations. The diagram below shows the arrangement for interior mounting. Series TV-3615 to TV-5245 Thyvents are available in arrangement S. All single wheel Thyvents are available in arrangements U and I. We understand the system designer's need for a variety of Thyvent arrangements that will accommodate multiple building design requirements. We welcome your inquiry for special system needs.



EXTERIOR INSTALLATION

Adjustable belt drives are standard for all installations. If roof mount or pad mount installations are preferred, the arrangements shown provide the flexibility to simplify system design and installation.

- [D] IDEAL FOR ROOF MOUNT WHERE BOTH EXHAUST AND SUPPLY DUCTS PENETRATE THE ROOF DECK AND ATTACH TO THE BOTTOM OF THE THYVENT.
- [R] IDEAL FOR ROOF MOUNT WHERE THE SUPPLY AIR STREAM IS TO BE ROUTED DIRECTLY INTO A ROOFTOP HVAC.
- [H] SUITED FOR PAD MOUNTING WHERE BOTH THE EXHAUST AND SUPPLY DUCTS CONNECT TO THE SIDE OF THE THYVENT.



THYVENT ERV SPECIFICATIONS

UNIT BASEFRAME:

The base frame is constructed of formed heavy gauge galvanized steel C channel perimeter with cross channel bracing under all internal components all welded into one solid frame. Exposed welds are spray painted with chromate aluminum paint. The floor is 14 gauge galvanized steel covering 1" thick – 3 pound density fiberglass insulation and a 20 gauge galvanized steel under liner to moisture seal the bottom of the unit.

UNIT CASING:

Outdoor double wall construction consists of an 18 gauge pre-painted steel outer 'C' panel skin and fiberglass insulation between a 20 gauge galvanized steel inner liner. All joints are caulked for air and watertight integrity. All wall and roof panels are mechanically secured to each other and the structural base frame. Indoor units substitute galvanized 18 gauge steel for the outer skin in lieu of pre-painted steel.

WEATHERHOODS:

Intake and exhaust hoods of the same pre-painted steel as the units shall be provided. Intake hoods come equipped with two-inch thick moisture eliminators that also double as an outdoor air pre-filter. Exhaust hoods come with bird screens over the exhaust opening.

ACCESS DOORS:

Doors have double wall construction same as walls and are mounted by a minimum of, two chrome plated, offset hinges each fastened to the doorframe. Industrial grade door handles fasten doors. Size and location are selected to fit the need or the customer's preference.

ENERGY RECOVERY WHEEL:

Wheel shall be enthalpy type for both sensible and latent heat recovery and be designed to ensure laminar airflow. Desiccant shall be silica gel permanently bonded to wheel media. Wheel shall be constructed of lightweight polymer media mounted on a stainless steel rotor. Wheel shall consist of removable segments. Wheels shall be mounted on a slide out rack. Energy transfer ratings shall be in accordance with ASHRAE Standard 84. Wheel assembly shall be ARI and U.L. rated. Wheels are to be provided with optional frost control when low ambient operation is required.

FANS:

Fans are DWDI FC computer selected to fit job conditions. Fans are factory mounted in the AHUs. Fan bearings have a 200,000-hour average life (L50).

MOTORS:

Motors should be standard duty, open drip proof with resilient mount. All motors are to be thermally protected. Motors shall be permanently lubricated, heavy-duty types, matched to the fan load, and furnished at the specified voltage, phase, and enclosure.

DRIVES:

Drives are belt type with variable pitched pulleys for airflow balancing.

FILTERS / EXHAUST FILTERS:

2" thick Farr 30/30 pleated filters in galvanized steel frames are provided for both supply and exhaust air streams sized for a maximum of 500 FPM. They shall be center loading with 25% efficiency.

DAMPERS:

Low leak parallel blade dampers with galvanized steel construction are provided on the outside air intakes and exhaust outlets of units. Outside air intake dampers are 24VAC motorized spring return. Exhaust dampers are gravity back draft.

ELECTRICAL:

Units shall be completely wired at the factory for single point power connection in the field. Integral motor starters for supply fans, exhaust fans, and energy recovery wheels shall be provided. All unit electrical components shall be U.L. listed and shall bear the U.L. label.

AVAILABLE OPTIONS:

ROOF CURB:

All outdoor units shall be provided with 14" high NRCA approved roof curbs (un-insulated) with all welded galvanized steel construction, integral duct supports, gaskets, and wood nailing strip.

FROST CONTROL:

A. ON/OFF Frost Control: Allows intermittent ventilation below the frost threshold temperature. A temperature control is provided to shut down the energy recovery ventilation system when outdoor temperature drops to the control set point. Operation is automatically restored when outdoor air temperature rises above the thermostat set point. The thermostat is located in the outdoor air intake hood or outdoor air intake duct as close as practical to the intake hood.

B. Exhaust Fan Only Frost Control: Allows cyclical mechanical exhaust fan only below the frost threshold temperature, a thermostat control is provided to intermittently shut down the supply blower when outdoor temperatures reach the selected frost control setting, allowing exhaust air to warm the wheel. The thermostat is located in the outdoor air intake hood or outdoor air intake duct as close as practical to the intake hood.

C. Electric Preheat Frost Control: Preheat frost control is the recommended method of preventing frost formation and ensuring design outdoor air ventilation rates for most cold climate applications. For continuous operation below the frost threshold temperature, an electric pre-heater is installed in the outdoor air inlet airstream. The pre-heater is automatically controlled to maintain a predetermined inlet air temperature.

ECONOMIZERS:

Through the use of an Enthalpy Sensor, the sensor de-energizes the ERC wheel when outdoor enthalpy is below the field adjustable set point, and when system is in the cooling mode, allowing free air cooling.

DIRTY FILTER SWITCH:

A sensing probe / air flow measuring device used to allow user to know when filter is due for change, and to relay information on how well air flow is happening within unit. Operates off of 24V (AC or DC).

ROTATION SENSOR:

Magnetic rotational sensor used to indicate rotational operation of the ERC wheel.

VFD:

(Variable Frequency Drives) Unit can be wired without motor contactors/overloads to allow field installation of customer supplied VFDs.

ThyVent

by the fabricating division of
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