Next Generation: High Efficiency Energy Recovery Ventilator (ERV)

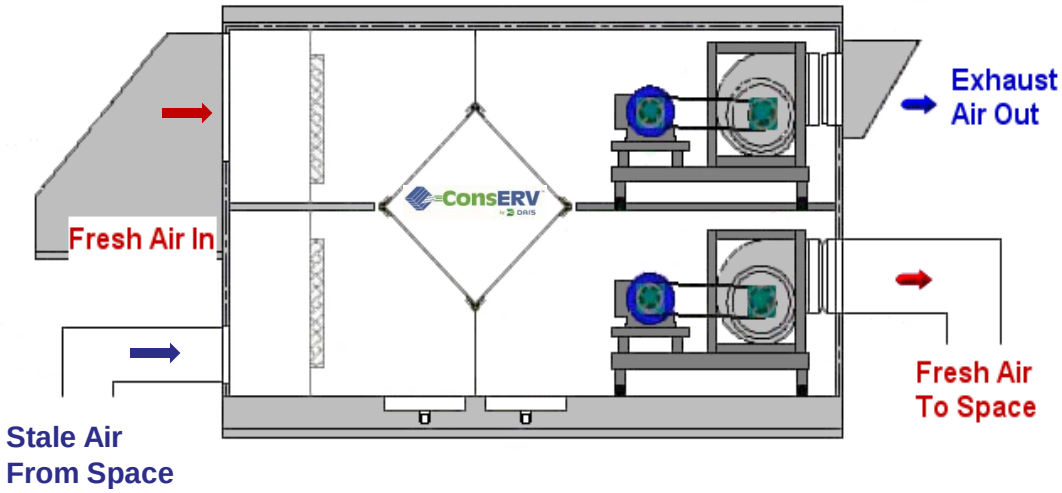
ConsERV™ by DAIS

AHRI CERTIFIED™ www.ahridirectory.org

Why use an ERV?

- Required by code in many states (ASHRAE & IBC)
- Pre-condition incoming fresh air using exhaust air
- EPA study - Lowers triggers for allergies, asthma & manages mold
- Saves capital cost - by reducing AC size
- Reduces energy costs and CO2 emissions– great ROI
- Improves IAQ
- Utility rebates
- LEED points

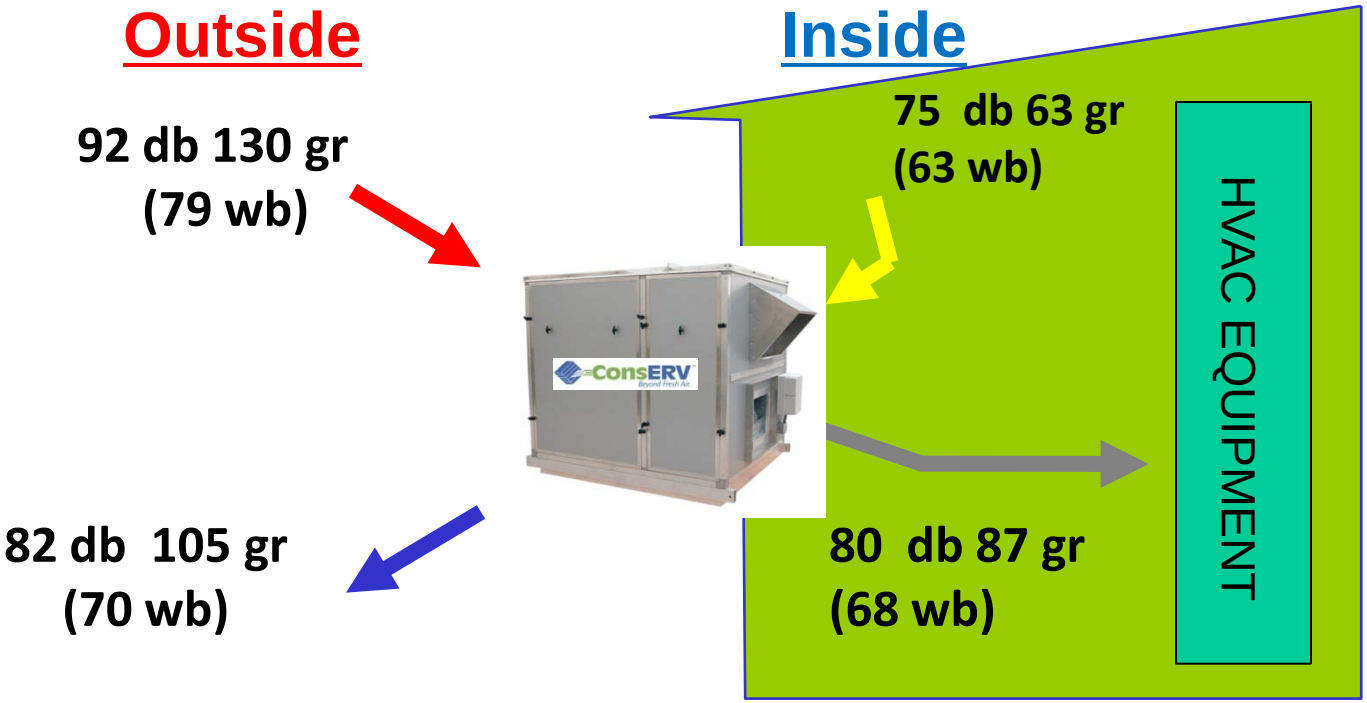
How does it work?



Drivers for Energy Recovery Ventilation

- Indoor Air Quality Standards requiring outside air:
  - ASHRAE 62 ***Ventilation for Acceptable Indoor Air Quality***
- Thermal Comfort Standard
  - ASHRAE 55 ***Thermal Environmental Conditions for Human Occupancy***
- Energy Efficiency Standards
  - ASHRAE 90.1 ***Energy Standard for Buildings Except Low-Rise Residential Buildings***
  - ASHRAE 189.1 ***High-Performance Green Buildings***

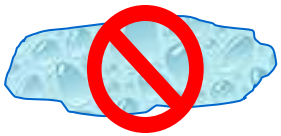
How Fixed Plate ERV's Work - Summer Operation Performance



- On a **hot, humid** day brings cooler, drier air into the building HVAC
- On a **cold, dry** day brings warmer, moister air into the building HVAC
- Payback: (1) Less Equipment, (2) Lower operating costs
- Largest savings occur co-incident with utility system peak

Why use ConsERV™?

- Industry leading performance - **AHRI** certified
- Fixed plate design exchanges -
  - Heat (**SENSIBLE**) ***and*** Moisture (**LATENT**)
- Certified **ZERO** leakage
- Moisture is managed in **vapor state**:
  - **No condensate** → no drains, no mold
  - Plate is **anti-microbial** & **anti-fungal**
- Fixed plate means **NO** moving parts
  - Reduced maintenance – just filter changes
  - Increased reliability & equipment life
- *"Effectiveness of a wheel, with the simplicity a fixed plate"*



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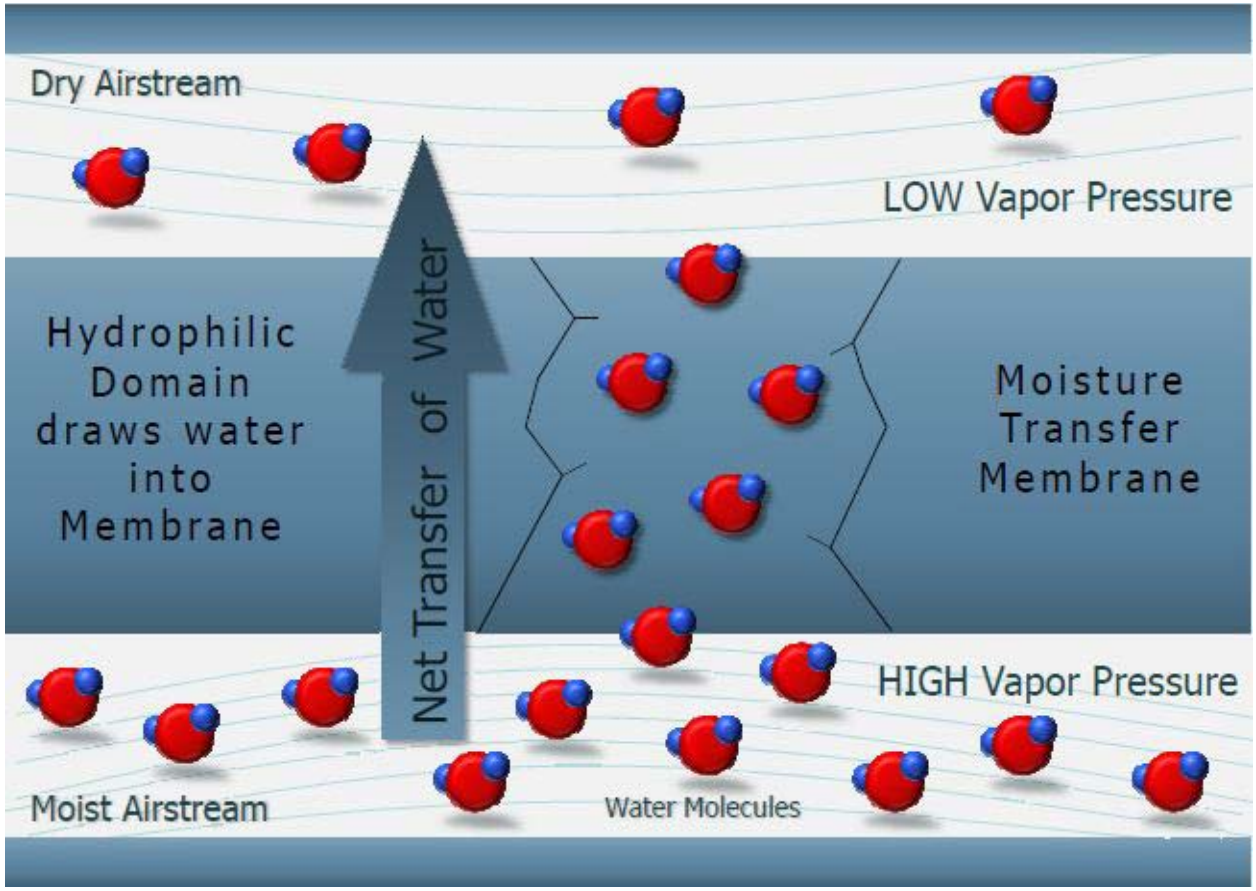
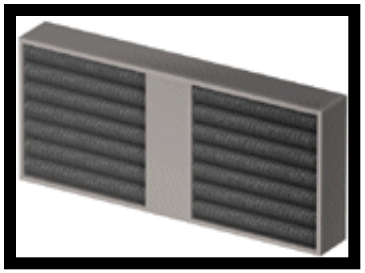


- Nanotechnology polymer hydrophilic (it 'likes moisture') membrane
- Water molecules travel through the membrane from charge to charge
- Water vapor moves from High vapor pressure to low vapor pressure trying to equalize

Types of Energy Recovery Ventilators



Heat pipes & Run around coils:
Sensible Only

Enthalpy wheels:
Sensible + Latent

Fixed plate exchangers: mostly
Sensible Only - **until now!**

ConsERV Total ERV

Effectiveness Ratings

(AHRI - April 2011)

		Fixed Plate			ConsERV	
Effecti-veness	**Airxchange Wheel 500 cfm**	**Innergy 530 cfm**	**Renewaire (G5) 750 cfm**	**dPoint 400 cfm**	**C510 400 cfm**	**C500S 400 cfm**
Sensible (AHRI Summer)	68%	54%	71%	80%	66%	71%
Latent (AHRI Summer)	60%	30%	43%	39%	55%	64%
Sensible (AHRI Winter)	68%	58%	72%	72%	66%	71%
Latent (AHRI Winter)	60%	41%	52%	52%	53%	60%

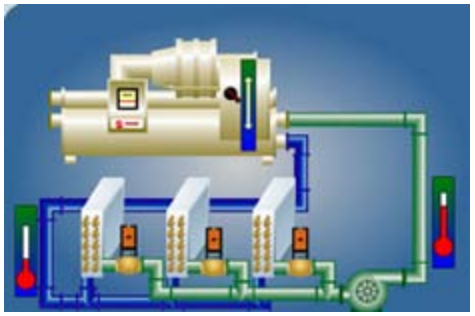
49% BETTER

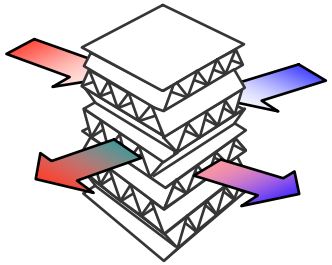
Competition - Rotating Wheels - Issues

- Wheel stops → ERV stops
  - Downsizing of A/C not practical
  - Potential failure: 100% outside air
  - Liability issue for designer
- High maintenance
  - Belts, gears, seals, bearings
- Power and control wiring
  - Parasitic load
  - Freeze potential < 25 F
- Reliability & longevity
  - Replace media (7 yrs) , performance degrades
- Cross leakage (purge) between airstreams

ConsERV Features & Benefits

- Reduce Capital Cost – chillers, piping, pumping, cooling tower, air handler
- Downsize cooling by 1.0 ton per C500S core
- No condensation pan required
- Typical face velocity range
  - 200 - 400 ft./ min.
- Static pressure loss – about the same as a wheel. 0.6 to 1.0” (core only)





Ease of Maintenance

- Recommended ConsERV core maintenance
  - Change filters as required – monthly or bi-monthly
  - Vacuum face of core 2 times per year to remove dust
- No accumulation of particulate matter in core
  - After long term operation and destructive testing
  - In fact the design of the flow field allows matter to “tumble” through.

LEED Qualifying Points

- New LEED v.3
- ConsERV contributes to LEED points
- Points available are:
  - Optimized Energy Performance
  - Outside Air Delivery Monitoring
  - Increased Ventilation
  - Thermal Control Design
  - Innovation in Design

Florida Utility ERV Incentives

- **Florida Power and Light (FP&L)**
  - Must be AHRI certified and total net effectiveness > 50%
  - $.33 to $.89/cfm no electric heat
  - $.65 to $1.75/cfm with electric heat
  - Fill in Energy Recovery Ventilator Form
  - FPL Personnel will field verify installation
  - Many sites have been qualified and paid
- **Tampa Electric Company (TECO)**
- **Progress Energy**
- **Arizona Utilities**

ConsERV Models

- ConsERV:
  - **Commercial**
    - D Series
    - G Series
  - **Residential**
    - H Series
  - **Custom**
    - Core Sales
    - >10,000 CFM

- Warranty:
  - **10 years** on core
  - 2 years on cabinet

ConsERV Models

- D Series
  - Utilizes C500S cores
  - Aluminum (painted) double walled boxes with foam insulation
  - 1,000-5,400 cfm cataloged
  - Up to 21,000 cfm semi-custom
  - Indoor and rooftop
  - Fanned and non-fanned
  - Flexible air flows (co and counter flow)

ConsERV Models

- G Series
  - 250 to 3,250 cfm
  - Utilizes C510 cores
  - Double wall painted aluminum
  - Foam insulation
  - Flexible air flows
  - Indoor and rooftop versions available
  - Compete vs. RenewAire

Non-fanned & Custom Cassettes

- Non-fanned cabinets
- Flexible aspect ratio to match AHU
- Multi row cassettes
- Custom Applications *(up to 70,000 CFM)*

ConsERV Advantage Summary

- No moving parts in core
- Less energy and demand usage
- Failsafe for downsizing HVAC plant
- AHRI certified, UL Recognized and ETL Listed
- Zero leakage between airstreams
- No condensation (reduces environment for mold)
- Easy to maintain, only filter changing & vacuuming
- Works with wide variety of equipment
- 10 year warranty on cores

Up to

30%

Energy Savings

AHRI CERTIFIED™

2006 AHR Expo Value Impact Application INNOVATION Awards

ConsERV™ by DAIS

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