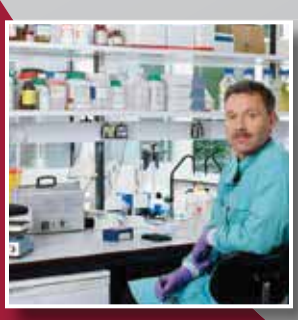
REZNOR®

Fully Integrated Heat Pump and Total Enthalpy Wheel Combination

DOAS - Dedicated Outdoor Air System



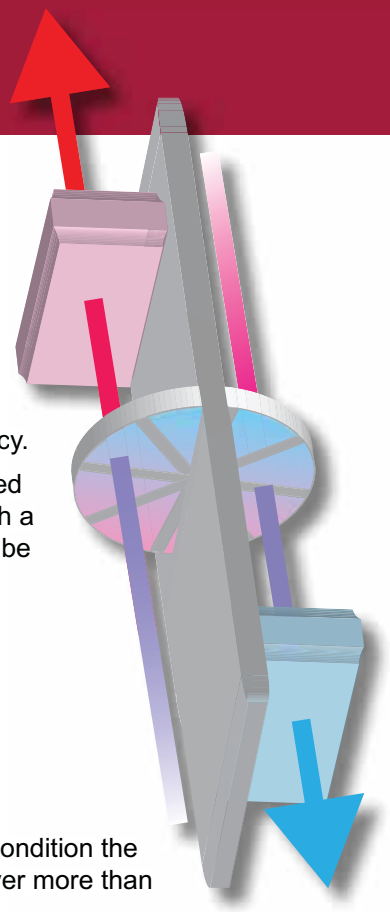
Capacities

500 - 1,500 CFM

-10° - 115° F

ZQYRA Series High Efficiency DOAS

Hybrid Ventilation



The Reznor ZQYRA is a new IAQ ventilator product in a class all by itself. As the HVAC industry needed this new class of product for engineers to use, Reznor met the call and provided a ventilator with superior control and energy efficiency; two capabilities that define this product. The Reznor ZQYRA technology takes two reliable elements and combines them into one product, thereby showing by example that the Reznor ZQYRA is greater than the sum of its parts.

As the HVAC industry needed this new class of product for engineers to use, Reznor met the call with a ventilator that offers superior control and energy efficiency.

It is the first dedicated outdoor air system (DOAS) unit that includes a fully integrated heat pump and total enthalpy wheel combination. It provides building designers with a tested and verified light commercial plug and play ventilation product. The unit can be used in a variety of light commercial building ventilation applications:

- Health / beauty / spa
- Pet shop / veterinary clinic
- Office / conference room
- School / university / day care
- Medical / pharmaceutical
- Museum / library
- Retail / recreational / theatre

Reznor ZQYRA technology uses the least amount of energy required to precisely condition the ventilation air year-round in low load, part load and full load conditions. It can recover more than 80% of the wasted energy. This is well beyond most energy recovery devices.

Reznor ZQYRA Capabilities

The Reznor ZQYRA is a hybrid unitary light commercial product which maximizes its entire system to provide hassle-free, year-round performance. Its two capacity sizes enable building design professionals to meet any need.

Advanced Energy Recovery Technology

- Recovers more than 80% of the exhaust air energy year round
- Cooling season energy efficiency ratio (EER) greater than 17
- Heating season:
  - COP > 7 @ 17°F Outside Air Temperature
  - COP > 3.0 at 0°F entering air
- Integrated Seasonal Moisture Removal Efficiency (ISMRE) > 5.2

Tested and Verifiable Performance

- Tested to ventilation standard AHRI 920
- The capacity modulation directly controls the supply air temperature and dewpoint
- The DX system handles the full load even without the enthalpy wheel

Plug and Play

- Operates in extreme weather
- Hassle free airflow settings and adjustments through unit mounted display.

Unique Features

The Reznor ZQYRA contains unique features that are combined with reliable mechanical design. Updated unit performance software matches actual improved performance by measuring both the amount of air and incoming temperature, and then using proprietary software to make the performance calculation.

- Nominal 3 or 3.5 ton modulating heat pump
- Standard 2 year warranty on all parts
- Double wall construction
- Slide-out wheel panel for easy cleaning and maintenance
- Built-in refrigerant charge compensation
- 10 kw auxiliary heat

The unit includes configurable airflow performance.

- 500-1500 CFM @ 1" E.S.P.
- 96% efficient EC fan motors with speed control
- Field convertible vertical or horizontal supply/ return air openings
- Factory installed spring return outside air damper
- MERV 8 or MERV 13 filters for outside and return air

Versatile installation methods allow the unit to meet the needs of building design professionals.

- Roof curb or outdoor pad mount
- Outdoors durability with double wall insulated for whetted areas for durability and IAQ; pre-painted gloss galvanized steel
- Bottom lifting lugs
- Flanged connections

Intuitive controls afford the Reznor ZQYRA the flexibility that building design professionals are looking for.

- Demand based ventilation: CO_2, VOC, occupancy, and time schedule control
- Remote mounted display
- Intelligent frost management

The Reznor ZQYRA includes demand based control. These controls are designed to meet all ventilation demand needs.

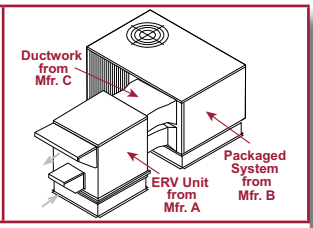
- Time schedules
- Occupancy sensors
- CO_2 sensors
- VOC sensors
- On/off wall switch
- BMS integration using BACNet and Lon protocols

Reznor ZQYRA Options

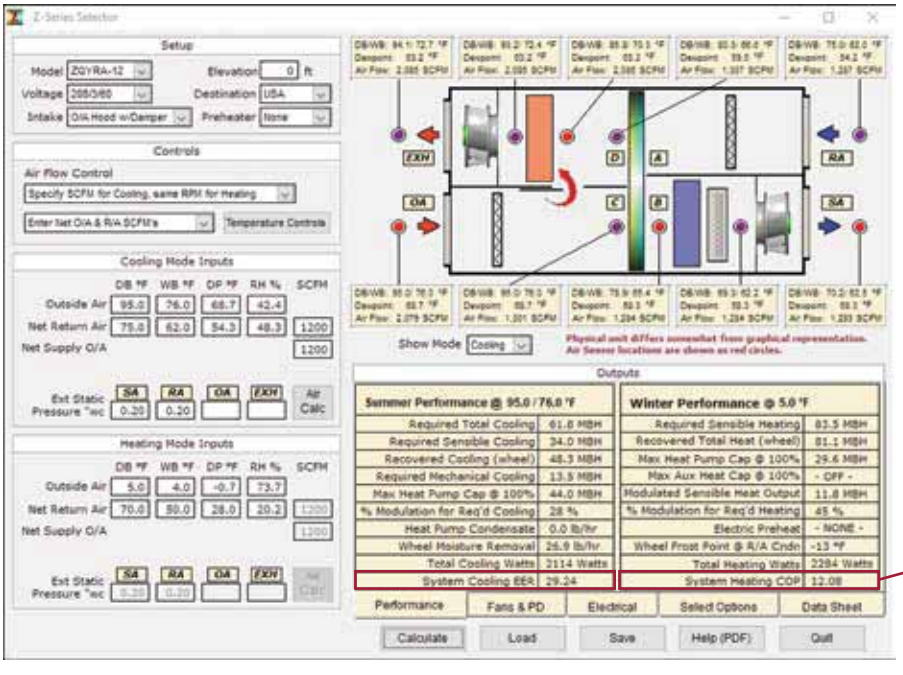
- Durable total enthalpy wheel (ARI Certified)
- 5- or 10-year warranty on all parts
- Long lasting G90 painted exterior
- ElectroFin® coil coating option
- Corrosion-proof sloped drain
- 208/230V or 460V power
- Unit mounted or remote disconnect
- Field or factory installed electric heat for extreme weather
- Unit mounted LCD display
- Unit test mode

Reznor versus the Competitors

No other competitor can offer a one-stop, self-contained solution that measures up to the Reznor ZQYRA design. Competitors use a “compromise” approach, where a customer is given options that combine several energy recovery ventilation components and standard unitary products; all from different suppliers which leads to several issues. The Reznor ZQYRA eliminates these issues by having all its components single-sourced.

The Reznor ZQYRA Advantage		
Single-Sourcing – All products and components from same supplier.	✓	
Superior Latent Performance – Tight control of building humidity.	✓	
No Excessive Air Movement – Only the required amount of air is moved based on the scenario, resulting in fan energy savings.	✓	
Precise Control – Regulates discharge temperature that decreases building load and minimizes system complexity. Provides unlimited economizer for maximum energy efficiency.	✓	
Small Footprint – Downsized equipment for minimal space requirements.	✓	
Simple Design – Non-complex system provides easy access, effortless system integration and uncomplicated maintenance.	✓	

Software



Not only does the Reznor ZQYRA have the capabilities to meet any requirements, but it can also tell you how it will perform in relation to your application. This is accomplished through advanced software that calculates several options and conditions:

- Inputs – Airflow, Design Conditions, Power
- Outputs – Performance, Fan & Pressure Drop, Electrical, Unit Options, Data Sheet

High Efficiency Performance

Adaptive Sequence

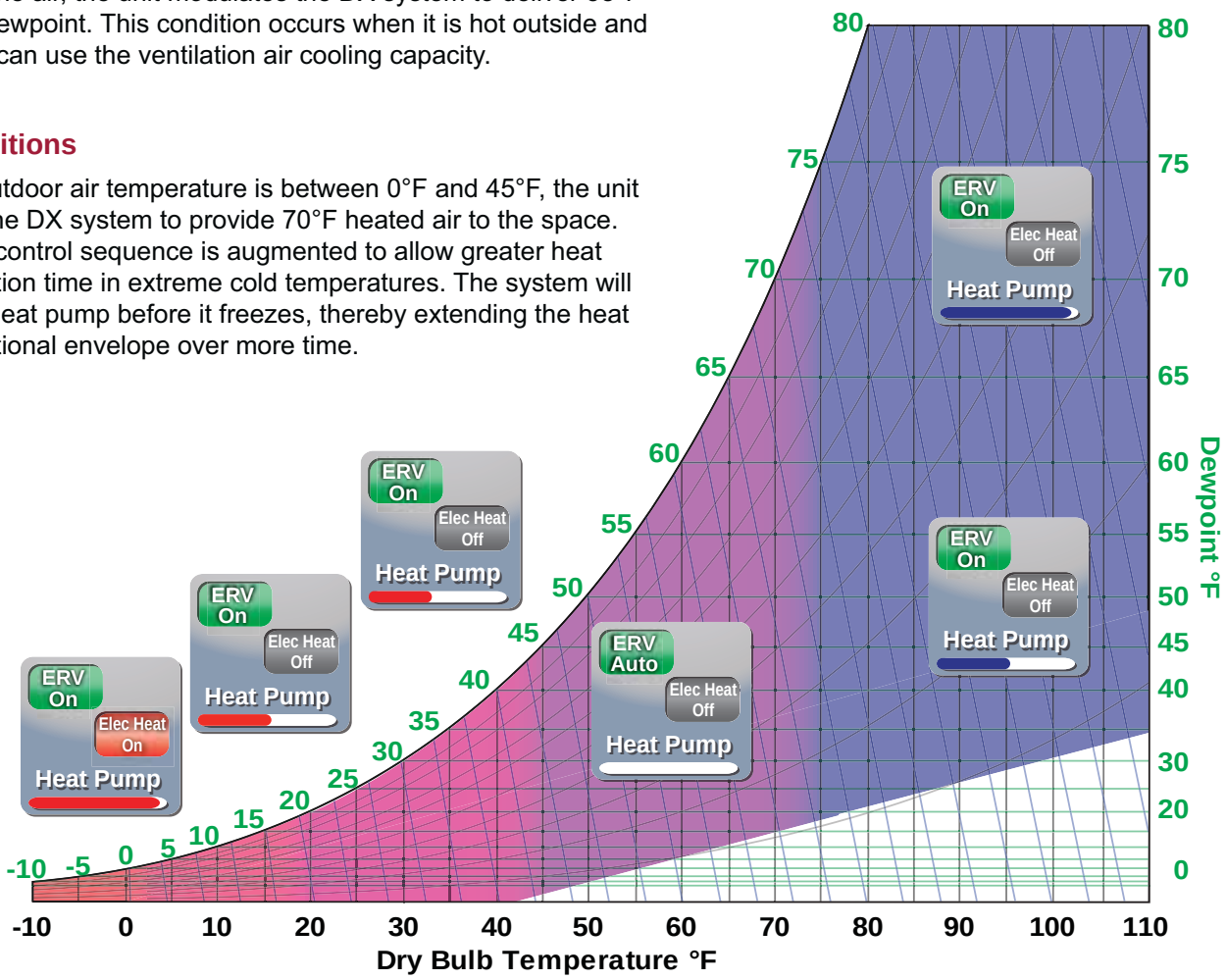
The Reznor ZQYRA meets all IAQ ventilation conditions.

Hot Conditions

If the outdoor air dewpoint increases beyond the wheel's capacity to dehumidify the air, the unit modulates the DX system to deliver 58°F leaving air dewpoint. This condition occurs when it is hot outside and the building can use the ventilation air cooling capacity.

Cold Conditions

When the outdoor air temperature is between 0°F and 45°F, the unit modulates the DX system to provide 70°F heated air to the space. The defrost control sequence is augmented to allow greater heat pump operation time in extreme cold temperatures. The system will turn off the heat pump before it freezes, thereby extending the heat pump operational envelope over more time.



Frost & Defrost Control

The Reznor ZQYRA maintains year-round superior energy performance in all weather conditions. The unit avoids frost by intelligently switching to the optimum heat source for any given outdoor ambient. This avoids mechanical freeze up of the unit. At 0°F entering air temperature, the unit delivers conditioned ventilation air to the space with a system COP > 3.0.

Energy Efficiency and Tangible Savings

Intelligent Reheat

Building loads and the need for ventilation air vary throughout a day as well as throughout the year. When the Air Change (ACH) rate associated with the ventilation air is less than 5-6, a new energy saving reheat methodology can be used. This intelligent reheat takes advantage of the building load conditions.

In the low building cooling load conditions, the Reznor ZQYRA delivers 70°Fdb /59°Fwb neutral air to the building. The ventilation air is dehumidified without the costly method of subcooling the air and then reheating it again.

In the high building cooling load conditions, the Reznor ZQYRA provides 58°F conditioned air to the building. This cooler air assists with the building cooling demand with the net result being lower overall building energy usage.

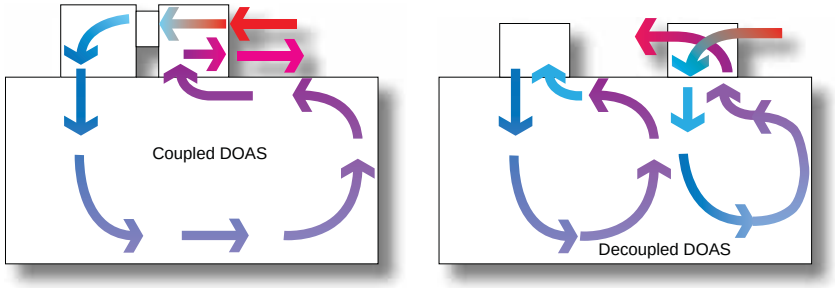
Typical HVAC Loads (btuh)

	Source	Sensible
People	Theatre	225
	Office	250
	Retail	550
	Light Factory	275
	Dancing	305
	Heavy Factory	635
	Athletics	710
Equipment	Computer	300
	Copier	3685
	Snack Machine	940
	Refrigerator	1330
	Cash Register	160
	Florescent Fixture	558

ASHRAE Fundamentals Handbook

Application

Units can be applied in multiple ways allowing you the flexibility to design the system that you need.



Typical Ventilation Rates*

Occupancy Category	CFM/person
Health Club /Weight Room	26
Pet Shop	26
Beauty and Nail Salon	25
Pharmacy (prep area)	23
Aerobics Room	22
Disco/Dance Floor	21
Art Classroom	19
Wood/Metal Shop	19
Day-care	17
Office Space	17
Photo Studio	17
Science Lab	17
Retail Store	16
Classroom	15
Supermarket	15
Bowling Alley	13
Music/Theater/Dance	12
Coin-operated Laundries	11
Hotel Room	11
Break Room	10
Confinement Center	10
Lobbies	10
Restaurant Dining Room	10
Bar/Cocktail Lounge	9
Booking/Waiting Room	9
Gym Spectator Area	8
Lecture Room	8
Multi-Use Assembly	8
Reception Area	7
Conference/Meeting Room	6
Courtroom	6

** See Std 62.1 for more information.*

Standards, Codes and Beyond

With a vast array of potential uses, building design professionals struggle to strike a balance between codes, real-world design parameters and costs. Evolving standards along with good design practices recommend increased ventilation air to achieve acceptable indoor air quality. Good indoor air quality reduces pollution such as mold, pollen and odors, and in many cases reduces viruses and other biological contaminants.

How do you implement evolving building standards requirements while minimizing cost?

One such energy efficiency standard that the ZQYRA directly addresses is Integrated Seasonal Moisture Removal Efficiency (ISMRE), based on the AHRI 920 standard. AHRI 920 encompasses the performance rating for direct exchange dedicated outdoor air system units (DX-DOAS) tested under different conditions of inlet air temperature and humidity. ISMRE is an estimation of annual dehumidification performance at full-load and part-load conditions based on pounds of moisture removed per kWh used.

Additional standards include:

- ASHRAE 62.1 – Ventilation air per building type and activity
- ASHRAE 90.1 – Equipment efficiency
- ASHRAE 189.1 – High performance green buildings
- LEED – 30% more ventilation air using 30% less energy

Industry First Adopter of ISMRE Standard

ISMRE is the weighted average of MRE. MRE is a measurement of energy efficiency associated with the dehumidification process. It consists of a ratio of the Moisture Removal Capacity expressed in pound of moisture/h to the total power input in kW at any given set of Rating Conditions expressed in pound of moisture/kWh, including any additional auxiliary energy required to raise the temperature to the supply airflow design condition.

The basic summation is:

- How much water is removed?
- What is the cost associated with removing that water?

The formula used to come to this summation per AHRI Std 920 is:

$$MRE = \frac{lbs\ water/hr}{Power\ Input\ kWh} = \#.\#$$

Per the formula, the following table demonstrates the super high efficiency of the ZQYRA regardless of how the rating is calculated.

Test Condition (OAT)	Weighted Value	Leaving Air Dewpoint	Unit EER	MRC lbs/hr	MRE
98°F/78°F	12%	54°F	22.6	43.9	7.2
80°F/73°F	28%	55°F	22.1	39.2	12.7
68°F/66°F	36%	54°F	15.0	25.6	8.8
60°F/58°F	24%	55°F	–	4.2	3.6
				ISMRE*	8.5

** ISMRE per AHRI Std. 920 - 2012 (1250 CFM)*

The Reznor ZQYRA provides a solution that assists design professionals in meeting codes, standards and real-world design parameters while also minimizing costs. Evolving standards and good design practices recommend increased ventilation air to achieve acceptable indoor air quality, and the Reznor ZQYRA is the only solution on the market that achieves this.

Check out what we can do for heating as well!

OAT	COP	LAT
47°F	5.9	74.4
17°F	11.1	70.0
0°F	5.3	70.0

For complete catalog information including submittals, energy calculations, dimension drawings, and more go to ReznorHVAC.com or call 800-695-1901.

Note: In keeping with our policy of continuous product improvement, we reserve the right to alter, at any time, the design, construction, dimensions, weights, etc., of equipment information shown here.

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