



ERV DISCUSSION *sheet 1*

- HRV Heat Recovery Ventilator
 - recovers sensible (heat only) energy
- ERV Energy Recovery Ventilator
 - recovers sensible and latent (moisture) energy

HRV's transfer only sensible heat. The apparent sensible effectiveness is the difference the incoming air temperature will be relative to the leaving air temperature.

ERV's transfer sensible heat (same as hrv's) plus moisture. An ERV will move a percentage of the moisture (LPC latent performance coefficient) from the higher specific humidity air stream – to the lower specific humidity air stream (specific humidity – same as humidity ratio in the following slides). So – is your HRV or ERV humidifying or dehumidifying your HOUSE? That's a tricky question.



ERV DISCUSSION *sheet 2*

RELATIVE HUMIDITY

Why do I feel hot, and you feel cold?
[Same inside temperature and humidity]

Perspiration!

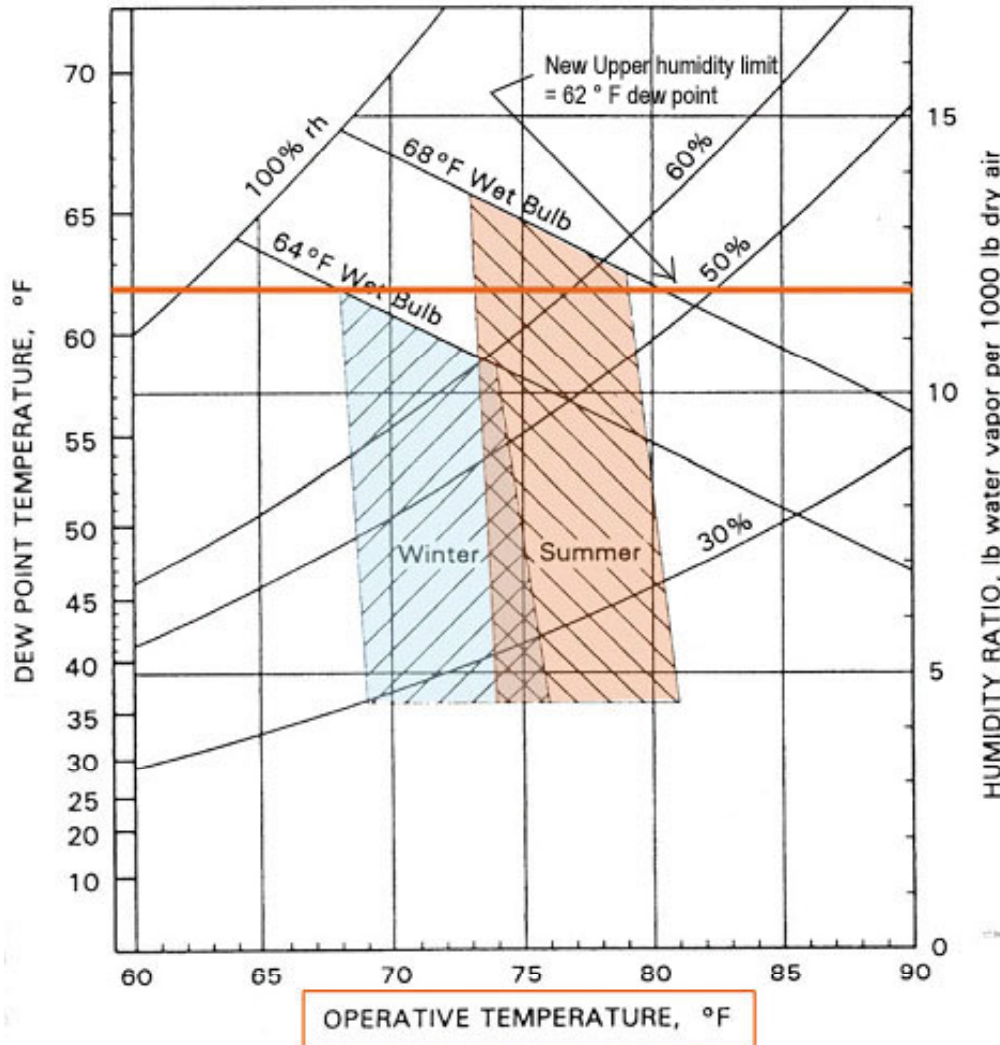
"skin relies on the air to get rid of moisture. The process of sweating is your body's attempt to keep cool and maintain its current temperature. If the air is at 100-percent relative humidity, sweat will not evaporate into the air. As a result, we feel much hotter than the actual temperature when the relative humidity is high. If the relative humidity is low, we can feel much cooler than the actual temperature because our sweat evaporates easily, cooling -us off"

*taken from 'How stuff
Works'*

Science.howstuffworks.com

ERV DISCUSSION *sheet 3*

WHERE ARE WE COMFORTABLE



Summer accepted limits?

81 F @ 30%RH to 74 F @ 65%RH
 Humidity ratio range [X100]:

0.6 - 1.1

Winter accepted limits?

75 F @ 30%RH to 69 F @ 65%RH
 Humidity ratio range [X100]:

0.5 - 1.0

Humidity Ratio:

Mass of water/Mass of dry air
 Kg/Kg

ERV DISCUSSION *sheet 4*

WHERE ARE WE COMFORTABLE

Summer accepted limits?

81 F @ 30%RH to 74 F @ 65%RH

Humidity ratio range [X100]:

0.6 - 1.1

Winter accepted limits?

75 F @ 30%RH to 69 F @ 65%RH

Humidity ratio range [X100]:

0.5 - 1.0

AS compared to Typical outside conditions per climates of interest

Climate	Typical Outside Condition		Humidity ratio
	<i>Temp (F)</i>	<i>RH</i>	<i>kg/kg X100</i>
Very Cold	-10.0	80.0	0.05
Marine	55.0	70.0	0.64
Mixed and Humid	75.0	55.0	1.02
Mixed and Dry	75.0	28.0	0.51
Hot and Humid	88.0	68.0	1.95
Hot and Dry	90.0	32.0	0.96
Inside Comfortable Level	72.0	40.0	0.67

ERV DISCUSSION *sheet 5*

CONDENSATION ON MY WINDOWS!

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WHY?

1. The inside surface temperature of the glass is below the room dew point temperature!

WHY AGAIN?

1. The inside RH is too HIGH
2. The glass R value is too LOW

WHAT TO DO?

1. Ventilation will usually bring down inside humidity (dew point temp) = RECOUPAERATOR
2. And/or install a better window (>R value)
3. And/or blow room air on the window.

Temperature <i>F</i>	RH %	DewPoint <i>F</i>
68.0	25.0	30.9
68.0	35.0	39.3
68.0	45.0	45.9
68.0	60.0	53.6
71.0	25.0	33.4
71.0	35.0	42.0
71.0	45.0	48.6
71.0	60.0	56.4
74.0	25.0	35.9
74.0	35.0	44.6
74.0	45.0	51.3
74.0	60.0	59.2
76.0	25.0	37.6
76.0	35.0	46.4
76.0	45.0	53.1
76.0	60.0	61.1