Comparison by Performance

REVOLUTION®
Active Desiccant - Vapor Compression Hybrid Rooftop

	Conventional Rooftop Unit [1]	Customized DX Outdoor Air Unit [2]	All Electric Active Desiccant	SEMCO Revolution	Key Advantages Offered by the Revolution Technology
SA humidity (grains/dew point) attainable 100% OA, nominal airflow [5] 30% OA, nominal airflow [5]	115 gr. / 71°F dp 76 gr. / 59.4°F dp	63 gr. / 54.3°F dp 49.5 gr. / 48°F dp	62 gr. / 54°F dp 49.5 gr. / 48°F dp	50 gr. / 48°F dp 35 gr. / 39°F dp	Lowest dew point at extreme conditions. Lowest dew point air at part load conditions.
Latent (Dehumidification) Capacity/1000 cfm 100% OA, nominal airflow [6] 30% OA, nominal airflow [6]	3,400 Btu/Hr. 2,720 Btu/Hr.	38,760 Btu/Hr. 20,740 Btu/Hr.	39,440 Btu/Hr. 20,740 Btu/Hr.	47,600 Btu/Hr. 30,600 Btu/Hr.	Delivers the greatest peak latent capacity. Delivers the greatest part load latent capacity.
SA Temperature (100% OA) Nominal airflow, operated to supply 54°F dew point	56°F [7] (135 cfm/ton not advised)	65°F	80°F	65°F (variable)	Delivers cool/dry air and allows for variable supply air temperatures at a given humidity level.
SA Temperature Attainable Operated to supplying a 54°F dew point, 100% OA	56°F [7] (135 cfm/ton not advised)	55°F or 70°F (some systems modulate)	80°F (no modulation)	55°F - 85°F	Independent control of supply air temperature and humidity allows the system to function as a total conditioning system, handling all the outdoor air and space sensible and latent loads.
Sensible Heat Ratio Range (SHR) (Nom. airflow, 95°F/120 grains, 100% OA)	0.9	0.54	0.53 or .25	.55 thru .24	Variable sensible heat ratio capability.
Input Tons required (per 1000 SA cfm) 100% OA [5] 30% OA [5]	10.5 Tons [7] 6.8 Tons (115 cfm/ton not advised)	10.6 Tons 6.0 Tons)	6.9 Tons [8] 3.4 Tons [8] (post cooling required)	6.8 Tons 3.4 Tons	Fewest installed tons.

Footnotes:

(1) Conventional rooftop is provided for comparison only and should not be used as shown. The manufactures recommend against use as a high percentage outdoor air or low dew point system.
(2) Typical of a refrigeration based outdoor air dehumidification system. Analysis is based upon the Trane FADA unit. This type of unit over-cools to reach the desired dew point. The supply dew point attainable is limited by leaving coil temperature. Reheat is provided by condenser heat, as available, but is not easily varied or controlled.
(3) Hot gas bypass is available as a field installed capacity control option. Cooling output is reduced but energy consumption remains high.
(4) The ASHRAE Energy Standard 90.1 requires the use of total enthalpy recovery having an efficiency of at least 50% for systems greater than 5,000 cfm with more than 70% outdoor air.
(5) This analysis used the nominal airflow rating set by the manufacturer, assumes outdoor air conditions of 95°F and 120 grains and supply air at 65°F/47°F dew point/48 grains
(6) This analysis used the nominal airflow rating set by the manufacturer, assumes outdoor air conditions of 95°F and 120 grains and a supply dew point mentioned.
(7) Operating below about 300 cfm/ton is not recommended by the manufactures of conventional packaged equipment and can result in serious equipment failure.
(8) This system precools air then passes all of it through the active desiccant wheel. The leaving air temperature at a given humidity level can not be controlled and is often hotter than desired.
(9) Energy cost estimates assume the delivery of air in accordance with note 5 during the cooling season. Energy costs used were $.07/KWH and gas at $7.00/million BTU.
(10) Continuous operation is assumed for this analysis and is provided per 1,000 cfm of supply air
(11) Cost/cfm based on flow required to reach conditions listed in note 5. Unit cost is based upon the best available data obtained in the marketplace and is provided for comparison only.