

# CLIMASTAT™

## The industry's first true low cost dehumidification solution.

### Enhanced humidity control with lower manufacturing costs.

**F**orty-six percent\* of buyers indicate that low energy costs is their most important factor in choosing new air-conditioning equipment. Forty-one percent\*\* indicate that better humidity control is the characteristic in their systems most in need of improvement. ClimaStat offers true comfort management by actively controlling both temperature and humidity.

Most air conditioning equipment only controls temperature. The ClimaStat system is a proven, reliable, efficient, and affordable option. It's comfort management benefits are superior to that of high-end systems costing much more. In fact, ClimaStat's unit cost is comparable to the least expensive equipment. Moreover, it's operating and maintenance costs are well below those of all systems now available that claim to control both temperature and humidity, while reducing electric bills as much as 50%.

#### ClimaStat Features

- Enhanced Dehumidification
- Variable Coil Face Velocity
- No Coil Freezing

ClimaStat was developed through unique engineering and an innovative combination of proven, time-tested components. The patented technology takes advantage of the efficiency gains obtained by increasing coil-face velocity when less dehumidification is needed, and will operate at a very low coil face velocity when enhanced dehumidification is needed.

Uniquely, the design overcomes the coil-freezing, oil flow, and compressor-slugging hurdles presented by other systems. The result, already demonstrated on a six-ton, two-stage prototype, is an increase of as much as 53 percent in dehumidification over a conventional system with little added cost.

#### Manufacturer Benefits

- Simple Configuration
- Widespread Applications
- Lower Upgrade Cost
- Low Startup Costs

#### Competitive Advantage

	Relative Cost to OEM	Humidity Removal lbs water/hr	SHR Sen/Tot	EER MBH/kW
Standard	\$	30	0.74	13.3
<b>ClimaStat</b>	<b>\$\$</b>	<b>58</b>	<b>0.59</b>	<b>12.0</b>
Fan Speed Control	\$\$\$	44	0.66	12.6
Hot-gas Reheat	\$\$\$\$	53	0.42	5.4
Subcool Reheat	\$\$\$\$	54	0.61	12.0
Heat Pipe	\$\$\$\$\$	49	0.64	12.2
Moisture Exchange	\$\$\$\$\$\$	56	0.55	13.3

#### The Competition

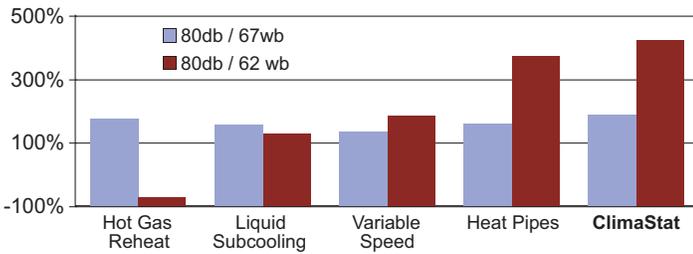
ClimaStat's entrance into dehumidification controls is well timed. ClimaStat's competitive advantages (see table left) clearly validate an improved technology with more humidity removal and lower costs. In addition, both SHR and EER ratings for ClimaStat illustrate improved efficiencies compared to other current applications.

**CLIMASTAT combines the power of today's programmed electronics with proven refrigeration components producing the industry's first true low cost dehumidification solution.**

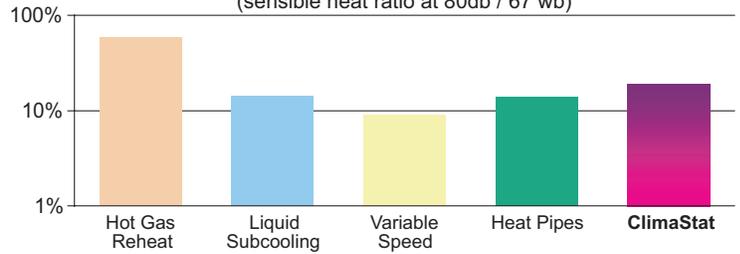
Feature	Benefits
1. Designed with simple parts	Lowest cost Easily field serviceable
2. Airside components	Suitable for any refrigerant Suitable for both DX and chilled water systems Doesn't require a third refrigerant line on DX split systems Ideal for smaller units like PTACs and FCUs
3. Modulation capability	Matches equipment SHR to load SHR to better maintain %RH
4. Designed to accommodate higher face velocities	Allows improved SEERs beyond standard ARI ratings at higher load SHR
5. Removes 170% more moisture than other technologies' average at lower humidity conditions	Especially appropriate for supermarkets, archival storage, etc.
6. Microprocessor controller	Specific control sequences available
7. Liquid/suction heat exchanger and coil temp sensor	Eliminates concerns about freezing

\* Contracting Business \*\* CEE (Consortium for Energy Efficiency)

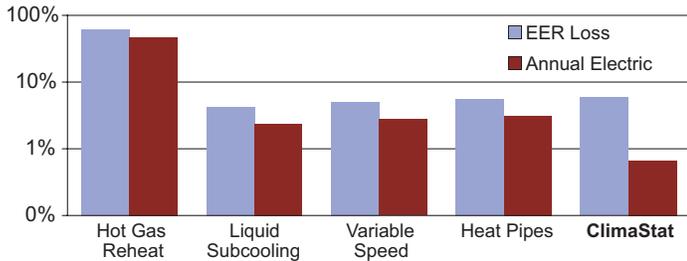
### More Humidity Removed



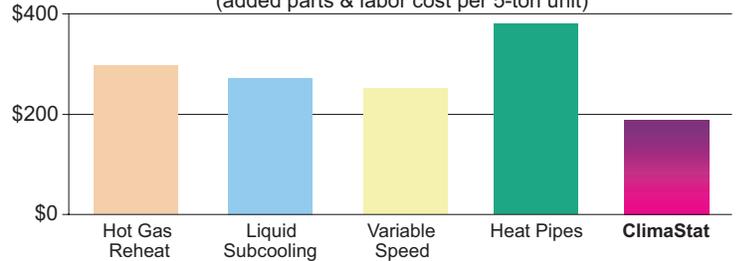
### Improved SHR (sensible heat ratio at 80db / 67 wb)



### Lower Annual Energy Cost



### Less Cost to OEM (added parts & labor cost per 5-ton unit)



## Why ClimaStat?

ClimaStat technology is applicable to all small-to medium-sized unitary DX package and split systems, and chilled-water AHU systems (less than 60 tons) serving budget-conscious facilities of all types. This comprises approximately 8 million new systems purchased each year and 70% of all existing equipment.

### Consumer/Product Benefits

- High Energy Efficiency
- Superior Reliability
- Lower Electric Bills
- Set-and-forget

**Up to 50% lower upgrade cost.** ClimaStat adds about \$200 to a standard 5-ton package unit at factory unburdened cost level versus about \$300 beyond the base unit cost for competing sub-cool/re-heat or hot-gas bypass equipped unitary systems.

### Meant for widespread

**application.** ClimaStat is a low purchase cost, low energy use, easily maintained, simple technology. The unit delivers relatively dry air at a comfortable temperature no colder than 58 degrees. The components cost less and are simpler to install than those needed for competing technologies such as hot gas reheat. The main components are a liquid-suction heat exchanger suction accumulator, a bypass-damper, and a thermostat-humidistat controller.

**Superior reliability.** Only one moving part, no extra contactors, solenoids, or other failure prone components. Fail-safe protection against coil freezing and compressor slugging.

**Lower electric bills.** Operating costs 40 to 50 percent lower than hot-gas reheat systems, based on energy efficiency ratings with a coil inlet of 80°F and 67wb.

**Comfort under all conditions.** Latent capacity as much as 53 percent higher than conventional systems under identical conditions (coil inlet condition of 75°F and 40% relative humidity). More perfect control of humidity level than any other system at comparable cost.

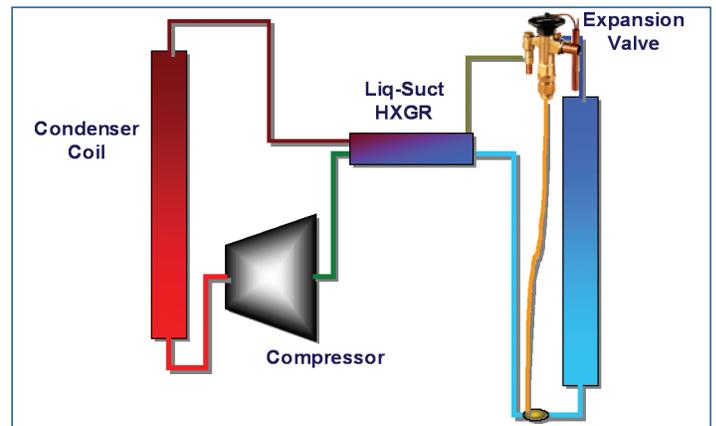
**Set-and-forget.** Self-adapts to a wide range of climate conditions.

## ClimaStat Effectiveness

There is little doubt about (a) the ability of a liquid-suction heat exchanger to subcool refrigerant before the cooling coil and superheat it before it reaches the compressor, (b) the increase in energy efficiency obtained by higher coil face velocity, (c) the effectiveness of bypassing air around the cooling coil to reduce face velocity and increase dehumidification, and (d) use of a suction accumulator and a coil temperature sensor to prevent freezing and damage to the compressor. ClimaStat combines these well proven elements into a patented, reliable system.

ClimaStat automatically adjusts to optimize comfort within three operating modes: (1) damper closed for minimum dehumidification and maximum coil heat transfer efficiency with maximum EER during periods of low humidity to (2) partly open for mid loads to (3) fully open to provide maximum dehumidification.

ClimaStat represents the industry's first true low cost dehumidification solution. This patented technology is being shown exclusively to select manufacturers. For more information about ClimaStat please contact Advantek Engineering.



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# Advantek

Advantek Engineering

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