

# Improving HVAC Performance at Military Installations

**PRODUCT:**

## ClimaStat

ClimaStat is a refrigeration science technology that can significantly improve the energy efficiency and dehumidification capacity of unitary HVAC systems, while reducing their lifecycle cost. ClimaStat uses off-the-shelf components to adjust HVAC system coil temperatures, refrigerant levels, and fan speeds to meet cooling demands.

**BENEFITS FOR MILITARY INSTALLATIONS:**

**\$**  
**REDUCED HVAC ENERGY CONSUMPTION**  
**20%-40% REDUCTION**  
 and up to 60% reduction where reheat is used for humidity control

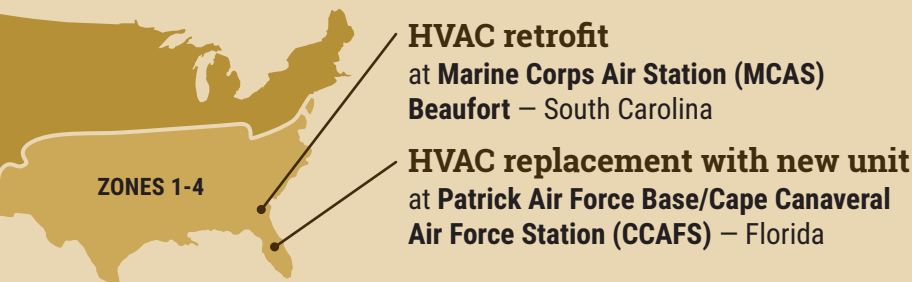
**INCREASED ENERGY EFFICIENCY**  
**17%-29% IEER INCREASE**

**STRONG INVESTMENT PERFORMANCE**  
**3-4 YEAR ESTIMATED PAYBACK**

**INCREASED DEHUMIDIFICATION CAPABILITY**  
**39% INCREASE**  
 in new HVAC unit

- + ADDITIONAL BENEFITS**
- Relies on readily-available parts that are reliable, easily maintained, and low cost
  - Extends HVAC compressor life
  - Applies to both retrofits of existing packaged HVAC units and new/replacement units

**DEMONSTRATION SITES AND GEOGRAPHIC APPLICABILITY:**



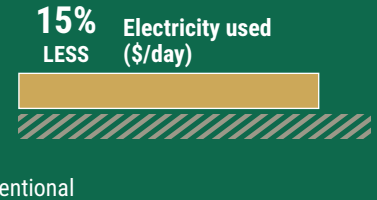
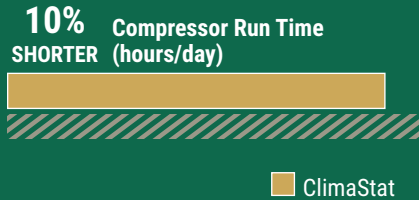
APPLICABLE IN ALL ASHRAE CLIMATE ZONES AND MOST EFFECTIVE IN ZONES 1-4.

**✓ POTENTIAL DOD-WIDE APPLICATIONS**

- DX package and rooftop HVAC systems
  - retrofit of newer existing units or factory-installed on replacement units
  - new construction
- System Size Ranges: best for 10 to 60-ton+ HVAC units & small to medium-sized commercial buildings
- Appropriate for systems typically installed on DoD installations

## MILITARY DEMONSTRATION DETAILS:

ClimaStat used 90 performance measurement sensors during the demonstrations for rigorous testing of amps, electricity demand, temperature, humidity, refrigerants, CO2 level, maintenance, and other actions and outcomes of the technology.



### TARGET AUDIENCES:

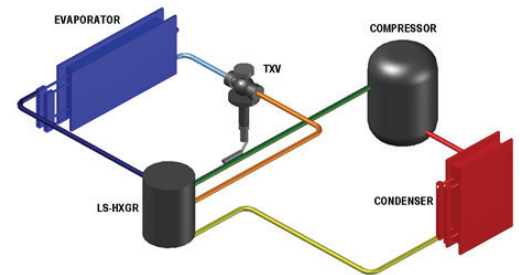
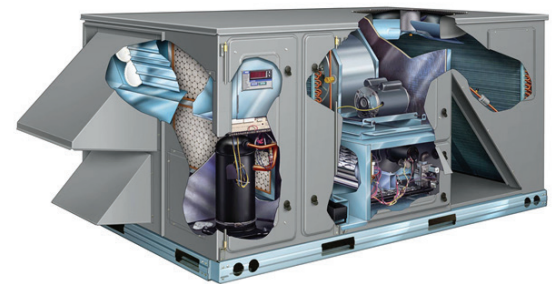
- military energy & facility managers, HVAC engineers, and contracting officials
- energy service company (ESCO) staff
- electric utility personnel

## PRODUCT/TECHNOLOGY OVERVIEW:

### ClimaStat is a cost-effective system based on reliable, familiar, and easily maintainable components

Unlike standard unitary HVAC systems, ClimaStat responds to varying moisture loads in addition to performing conventional temperature load control. ClimaStat raises energy efficiency by increasing cooling coil efficiency under most conditions, while reducing air velocity across the cooling coil when dehumidification is needed. ClimaStat has cold liquid refrigerant flowing through the entire cooling coil, so the maximum coil/tube surface is always utilized for cooling. The liquid-suction heat-exchanger accumulator (LS-HXGR) is a major component of ClimaStat that enhances conventional unitary air conditioning systems.

- ClimaStat results are achieved by both increasing the effectiveness of liquid refrigerant in the evaporator coil and modulating the quantity of bypass air to more effectively control latent (moisture) cooling
- AdvanTek now can pair its EER Optimizer Technology controller with ClimaStat to continuously maximize the HVAC unit's energy efficiency ratio (EER) by adjusting the coil airflow, refrigerant level, condenser fan speed, and other parameters. DoD demonstrations of the EER Optimizer are underway at three installations.



## NEXT STEPS:

### FIND OUT MORE

For full ClimaStat product results and final report, please see Project EW- 201144 on the ESTCP website:

<https://www.serdp-estcp.org/Program-Areas/Energy-and-Water/Energy/Conservation-and-Efficiency/EW-201144>

EER Optimizer information is available for Project EW-201338 on the ESTCP website.

### VENDOR INFORMATION

#### AdvanTek

[www.advantekinc.com](http://www.advantekinc.com)  
(321) 733-1426

*AdvanTek specializes in facility performance, systems engineering, and resource efficiency, including deployment of its patented ClimaStat refrigeration science technology to significantly improve HVAC efficiency ratings and dehumidification capacity.*

### PROCUREMENT

Consider ClimaStat within energy conservation investment program (ECIP) transactions or within broader energy savings performance contracts (ESPCs), utility energy services contracts (UESCs), or other DoD energy investments.

## ESTCP DEMONSTRATION PROGRAM

Over the period 2011-2013, the U.S. Department of Defense's (DoD's) Environmental Security Technology Certification Program (ESTCP) supported a demonstration of ClimaStat in both HVAC unit retrofit and replacement applications. The retrofit application was at a Base Exchange at

MCAS Beaufort and the replacement was at an instrument laboratory within Patrick AFB/Cape Canaveral AFS.

These ClimaStat demonstrations, which won ESTCP Project of the Year in 2013, are part of ESTCP's program of test bed investments for cutting-edge technologies and methods to reduce DoD's installation energy consumption

and carbon footprint, improve energy security, and facilitate water conservation. By reducing real and perceived risks, these demonstrations accelerate the broader deployment of innovative energy technologies across DoD. The joint Energy and Water Program of ESTCP and the Strategic Environmental Research and Development Program (SERDP) has funded over 100 demonstration projects since 2008.